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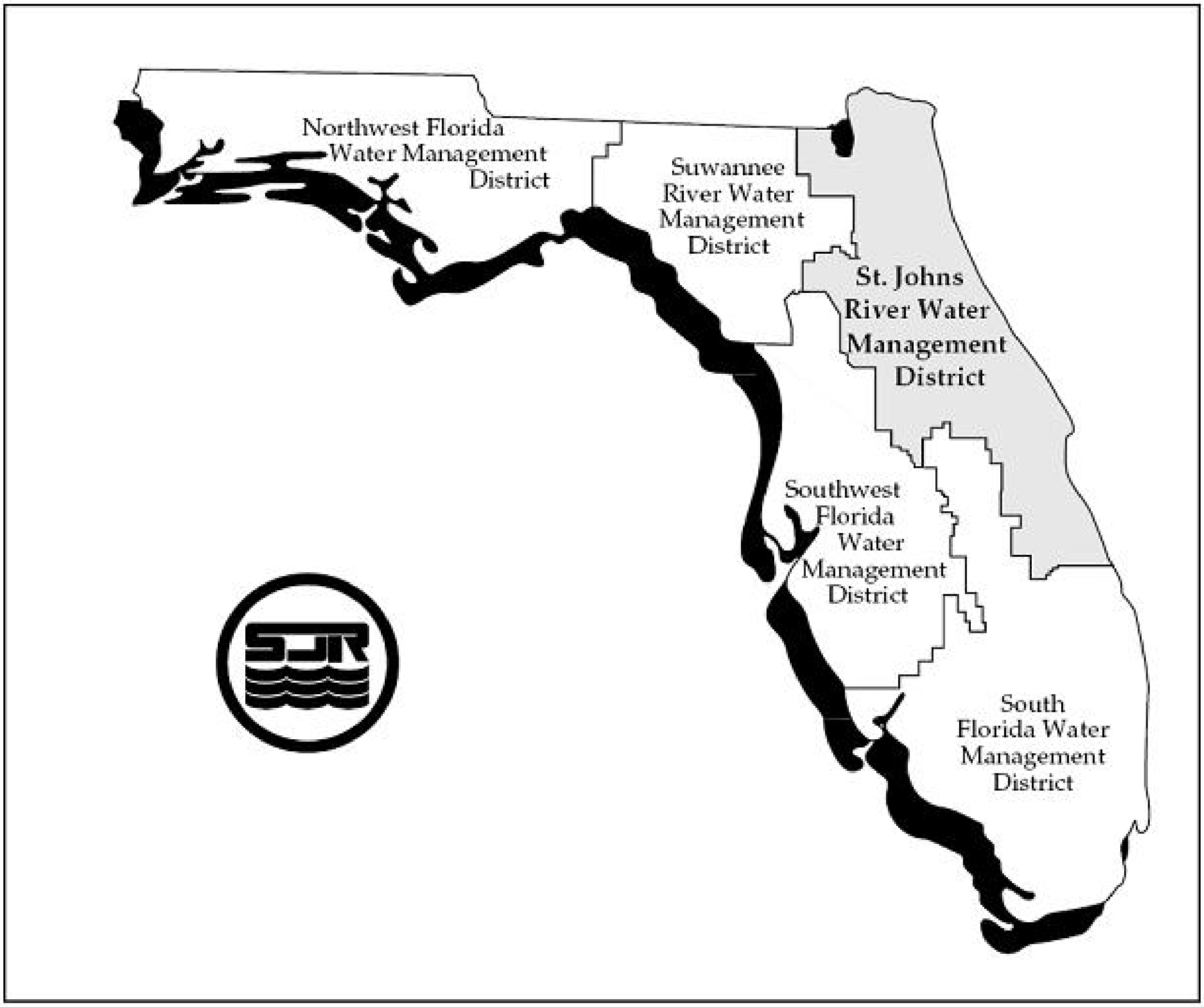
CENTRAL FLORIDA AQUIFER RECHARGE ENHANCEMENT PROGRAM PHASE 1 – ARTIFICIAL RECHARGE WELL DEMONSTRATION PROJECT

Central Florida Aquifer Recharge Enhancement Program
Phase 1 – Artificial Recharge Well Demonstration Project

CH2MHILL

St. Johns River Water Management District
Palatka, Florida

2006
October



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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ADF	average daily flow
CFARE	Central Florida Aquifer Recharge Enhancement
CFARE1	Central Florida Aquifer Recharge Enhancement Phase 1
cfu	colony forming unit
DCE	Dichloroethene
DO	dissolved oxygen
DWS	Drinking Water Standard
EPA	U.S. Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
ft	foot or feet
GCTL	groundwater cleanup target level
GWMP	groundwater monitoring plan
in.	inch or inches
MCL	maximum contaminant level
MEK	methyl ethyl ketone
mg/L	milligrams per liter
mgd	million gallons per day
msl	mean sea level
mL	milliliter
MSDS	Material Safety Data Sheet
NCDC	National Climatological Data Center
NTU	Nephelometric Turbidity Unit
PCB	polychlorinated biphenyl
PCE	Tetrachloroethene (perchloroethylene)
pfu	plaque forming units
redox	Redox potential
RBC	risk-based criteria
SVOC	semi-volatile organic compound
TCE	Trichloroethene

TDS	total dissolved solid
TOC	total organic carbon
TRPH	total recoverable petroleum hydrocarbons
UIC	underground injection control
USGS	U.S. Geological Survey
VOC	volatile organic compound
QA / QC	quality assurance / quality control
WTP	water treatment plant

INTRODUCTION

PURPOSE

The purpose of the Central Florida Aquifer Recharge Enhancement Program (CFARE) is to investigate the feasibility of increasing recharge to the Floridan aquifer to potentially increase available groundwater as part of the St. Johns River Water Management District (SJRWMD) Alternative Water Supply Strategy Investigation. The CFARE – Phase 1 (CFARE1) project investigated the feasibility of increasing recharge to the Floridan aquifer through stormwater recharge wells in Orange and Seminole counties by assessing the water quality impact of prolonged operation of the recharge wells. Key issues addressed are the acceptability of current conditions, the feasibility of implementing improvements, if needed, and how to increase recharge if conditions are acceptable.

GOAL

At the onset of the project, the goal of CFARE1 was to quantify the potential for bacterial contamination of the aquifer using lake water or treated stormwater. This goal was to be accomplished by assessing the:

- Fate of bacteria in the Floridan aquifer
- Effectiveness of passive stormwater treatment for reducing bacteria
- Effectiveness and cost feasibility of physically reducing bacteria in lake water recharge

The pre-project prevailing understanding was that microbial impact to the Floridan aquifer would be of dominant concern. Additionally, there was concern that synthetic organic chemicals in stormwater could be transported to groundwater.

HISTORY OF CENTRAL FLORIDA RECHARGE WELLS

Much of the central Florida surface water system is composed of a series of internally drained basins with few streams. Historically, stormwater flowed over land to lakes and then percolated to groundwater or evaporated. Over the years, increased development diverted stormwater to lakes more quickly, resulting in local flooding. Stormwater recharge wells were installed into the Floridan aquifer from 1904 to the late 1960s to alleviate this local flooding.

As a result of promulgation of the Clean Water Act and the development of Underground Injection Control (UIC) regulations, construction of new stormwater recharge wells has not occurred. Wells that predate the regulations have been allowed to continue to operate and be maintained for their original hydraulic capacity. Stormwater recharge wells are classified as Class V, Group 6 wells in Chapter 62-528 of the Florida Administrative Code.

Currently, approximately 500 recharge wells in Orange and Seminole counties divert an estimated 39 to 52 million gallons per day (mgd) of average daily flow (ADF) to the Floridan aquifer (CH2M HILL 1998) (Figure 1).

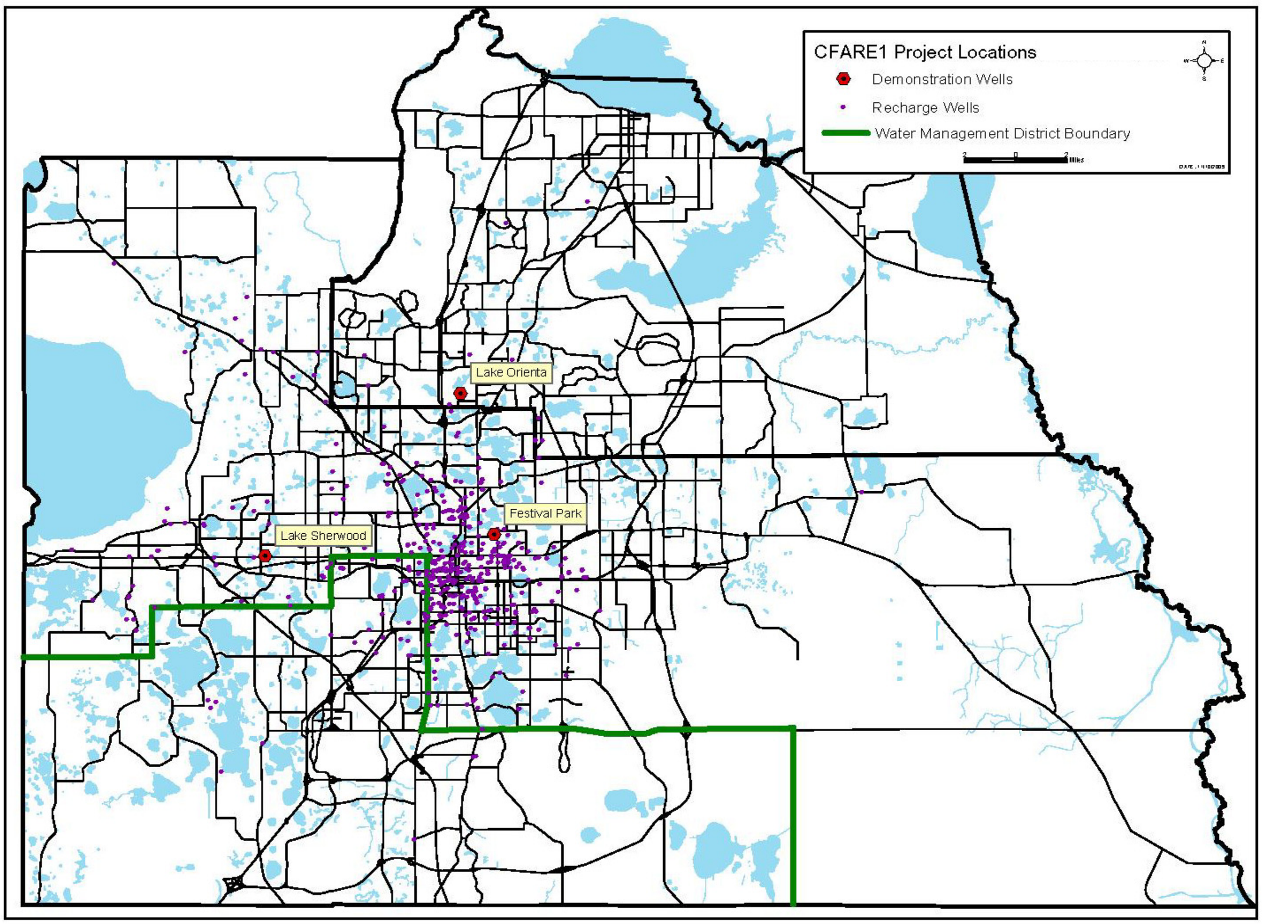

Figure 1. Stormwater recharge well locations

Two types of recharge wells evolved in central Florida, those receiving direct urban runoff that collect curb and gutter flow but whose flow is erratic and dependent on rain events, and lake level control wells that receive more steady inflow when lake levels rise to overflow elevations. CFARE1 addresses both types of wells and their impacts on Floridan aquifer water quality.

PLANNED PROJECT TASKS

A series of project tasks were planned for the CFARE1 project. These projects activities included the following:

- Literature review
- Site selection
- Dry-period characterization
- Monitoring well installation
- Groundwater tracer test
- Baseline characterization
- Operational site characterization
- Evaluation of data for potential pathogen treatment
- Development and implementation of pathogen treatment program
- Post-pathogen treatment operational site characterization

During the term of the project, 10 status reports were prepared and distributed at various project milestones. These reports contain decision documents and updates of project results (Appendix A).

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LITERATURE REVIEW

A review of relevant literature indicated that while there is an emerging body of research involving elements of this study, there are few demonstrably similar research endeavors. This literature review included the analysis of research involving surface water contamination, ecotoxicity, groundwater tracing (including biotracing), Floridan aquifer drainage wells, and water quality.

Of relevance is published research conducted by Bradner (1991) involving tests conducted to detect microbial activity in drainage wells in Orlando.

Sandrin et al. (2004) recommend conducting biotracer tests to describe levels of biodegradation and microbial activity. Field tests conducted by Sandrin et al. (2004) confirm the applicability of this method and note that levels of degradation were time related. Further, the use of tracer dyes to test for contamination is well documented (i.e., Harden, Chanton, Rose, John, and Hooks (2003); Field, Wilhelm, Quinlan, and Aley. (1995)).

The Schiner and German (1983) study evaluated the impact of recharge to the Floridan aquifer through drainage wells at selected locations in central Florida. The study presents valuable data on water quality implications associated with recharge. Similarly, another U.S. Geological Survey (USGS) study conducted by Kimrey and Fayard (1984) in Florida suggests the viability of using recharge wells for urban drainage. These studies collected samples from the drainage wells.

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SITE DESCRIPTIONS

The site-selection objective for CFARE1 was to select at least one site with a recharge well used for lake-level control (lake-level control well) and one site with a recharge well that received water directly from urban runoff (direct-urban runoff well). Selecting these two types of sites provided the opportunity to assess differences in groundwater quality impacts related to two different sources of water: lakes and urban stormwater. The sites selected had land use conditions that allowed for the construction and sampling of monitoring wells. Water samples were collected at these three sites during the project and discussions were limited to these sites. The sites are Lake Sherwood in west Orange County, Lake Orienta in Altamonte Springs, and Festival Park in Orlando (see Figure 1).

LAKE SHERWOOD

Lake Sherwood is located in a suburban, mixed-use residential and commercial setting in west Orange County. Initially, the Lake Sherwood site (noted in Figure 2) was selected because of the impact that the lake's level could have on nearby houses. However, during the initial investigation, the field team observed that the lake level was well below the overflow elevation, resulting in no recharge into the existing recharge well. Figure 3 presents the lake levels for Lake Sherwood. These data show that levels in Lake Sherwood rarely reach the elevation for drainage to occur. For this reason, although sampling for dry-period characterization was conducted at this site, no further CFARE1 work was performed in association with this site.

LAKE ORIENTA

Lake Orienta is a Florida, Class III fresh surface water, designated for recreational use, and located in south-central Altamonte Springs, Florida. The drainage basin for the area consists of a 135-acre lake with a 916-acre tributary watershed for a total basin area of 1,051 acres (CH2M HILL 1998). The area around and near the lake is characterized by residential and commercial land uses in a suburban setting. Some properties around Lake Orienta were prone to chronic flooding when the rainfall runoff and direct rainfall exceeded the capacity of the two recharge wells located on the southern shore of the lake (Figure 4). The wells were installed to prevent flooding of surrounding land. However, the capacity of the two recharge wells known at the beginning of the study was insufficient to prevent flooding problems resulting from exceptionally heavy rainfall.

Figure 2. Lake Sherwood location

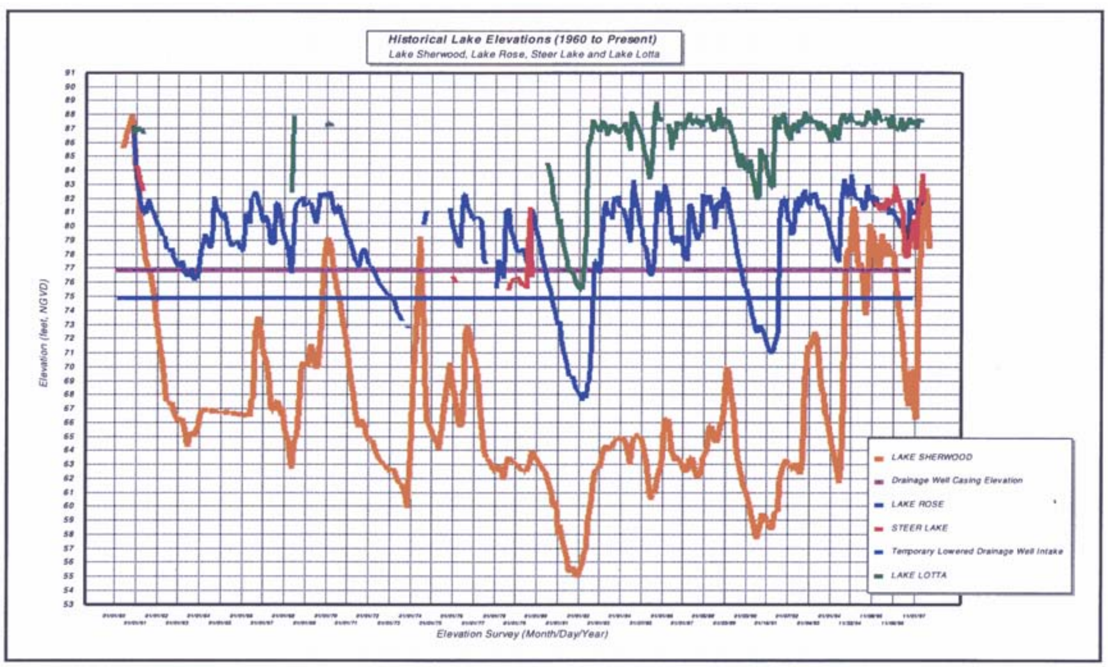


Figure 3. Observed lake levels for Lakes Sherwood, Rose, Steer, and Lotta (PEC, 1999)

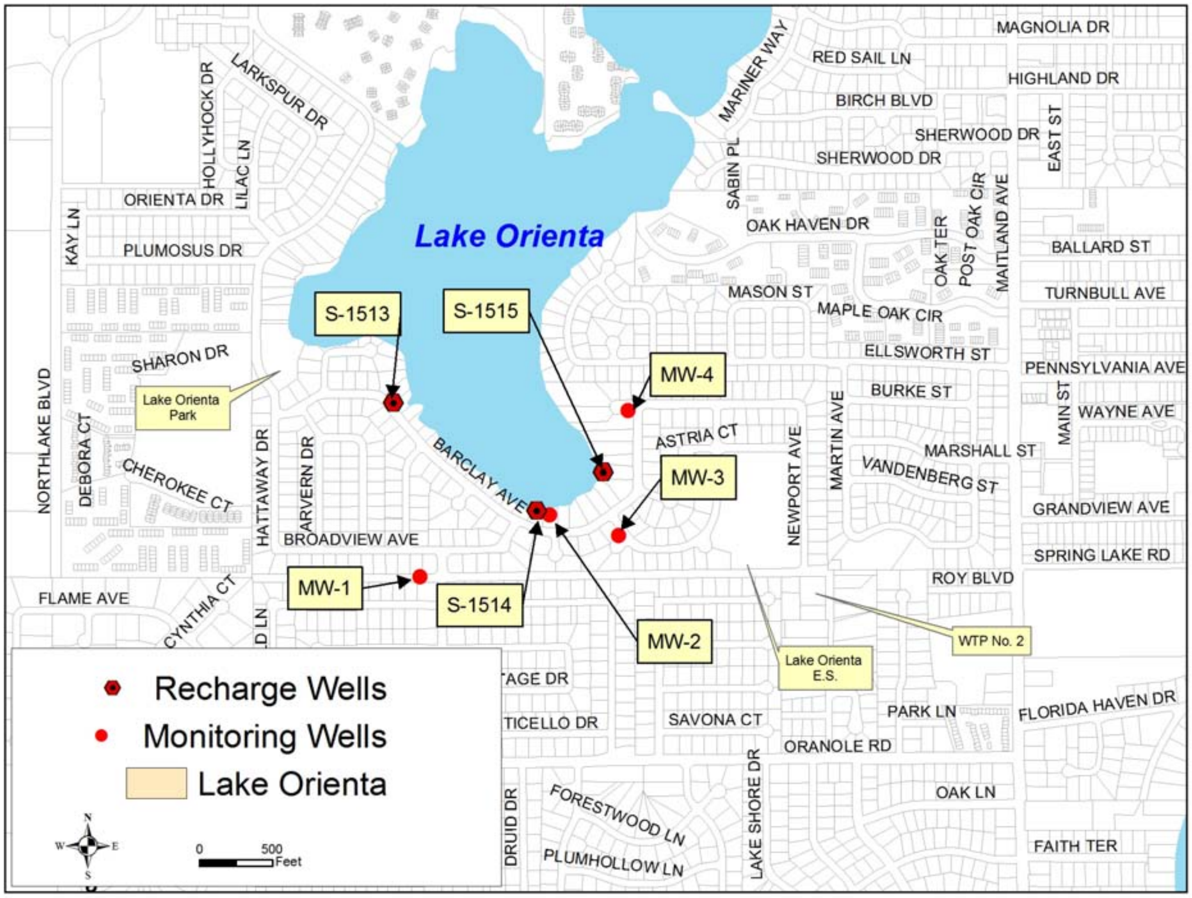


Figure 4. Lake Orienta well locations

Two wells at the site were identified at the beginning of the project: S-1514 and S-1515. Wells S-1514 and S-1515 are fitted with two inlets at different elevations. Upper inlets are used for normal operations while lower inlets are used to prepare for or during extreme wet weather events. Use of these lower inlets requires an Emergency Order from the Florida Department of Environmental Protection (FDEP). During the project a third recharge well (S-1513) was located. An investigation by the City of Altamonte Springs revealed that the inlet pipe to the well had been severed, apparently in association with residential construction. The City reinstalled the inlet pipe, cleaned the recharge well, and received permission from FDEP to place the well back into service.

In addition, as a result of geophysical logging performed as part of CFARE1 S-1515 was found to be clogged by vegetation.

The City cleaned the well and restored it to service. These improvements may have sufficiently improved the total recharge capacity of the Lake Orienta recharge well system, alleviating the need for additional capacity.

Specific construction dates of these recharge wells are unknown. However, they were constructed prior to promulgation of the Safe Drinking Water Act in 1972. Completion characteristics of the wells are presented in Table 1.

Table 1. Completion characteristics of the recharge wells for Lake Orienta

Well	Estimated Land Surface Elevation (ft, msl)	Diameter (in.)	Cased Depth (ft)	Total Depth (ft)
Lake Orienta S-1513	75	10	Unknown	120
Lake Orienta S-1514	70	12	270	326
Lake Orienta S-1515	65	10	56	125

An inventory of private wells located within one mile of each of the Lake Orienta drainage wells was conducted. Based on this inventory, numerous publicly owned and presumed privately owned water supply wells were identified within 1 mile of the each of the drainage wells. Discussions with City of Altamonte Springs staff indicated that very few records on locations and construction characteristics are available on the private wells in the area based on previous searches and coordination with the Health Department. Four utilities provide potable water service within 1-mile of each of the three recharge wells: City of Altamonte Springs; Seminole County; Utilities, Incorporated; and City of Maitland. The four utilities identified the locations of customers served by the utilities. Locations that were not identified as water customers by the utilities were assumed to be supplied by privately owned domestic self-supply wells. No publicly or privately owned water supply wells were identified within 1,000 ft (an FDEP-establish notification distance) from each of the three recharge wells.

The City of Altamonte Springs Water Treatment Plant (WTP) No. 2 is located southeast of the lake. City staff advised that two Upper Floridan aquifer supply wells (Well No. 3 and Well No. 4) were abandoned in 1995 because of chronic bacteriological exceedences. WTP No. 2 is currently provided water by three Lower Floridan aquifer wells (Figure 4).

FESTIVAL PARK

Festival Park is located in east Orlando within an urban commercial, light industrial, and recreational setting. There are two direct urban runoff wells at this site, specifically wells R-143 and R-40 (Figure 5). The wells are typical of numerous wells installed in the area to manage storm water runoff to alleviate local flooding caused by urbanization. The drainage area for the wells is primarily commercial property in an urban setting. The earliest records of information on the wells are U.S. Geological Survey (USGS) inventory cards dated May 14, 1943 (Hartman and Associates 2003); therefore, the wells were constructed and have been operational at least since that time. Completion characteristics of the wells are presented in Table 2.

Table 2. Completion characteristics of the recharge wells for Festival Park

Well	Estimated Land Surface Elevation (ft, msl)	Diameter (in.)	Cased Depth (ft)	Total Depth (ft)
Festival Park (Well 40)	102	12	195	490[b]
Festival Park (Well 143)	102	10	140	315

[a] Original reported total depth was 450 ft (PEC 1999)
[b] Total depth through geophysical logging (8/3/00), reported total constructed depth – 1049 ft, USGS inventory card depth – 350 ft

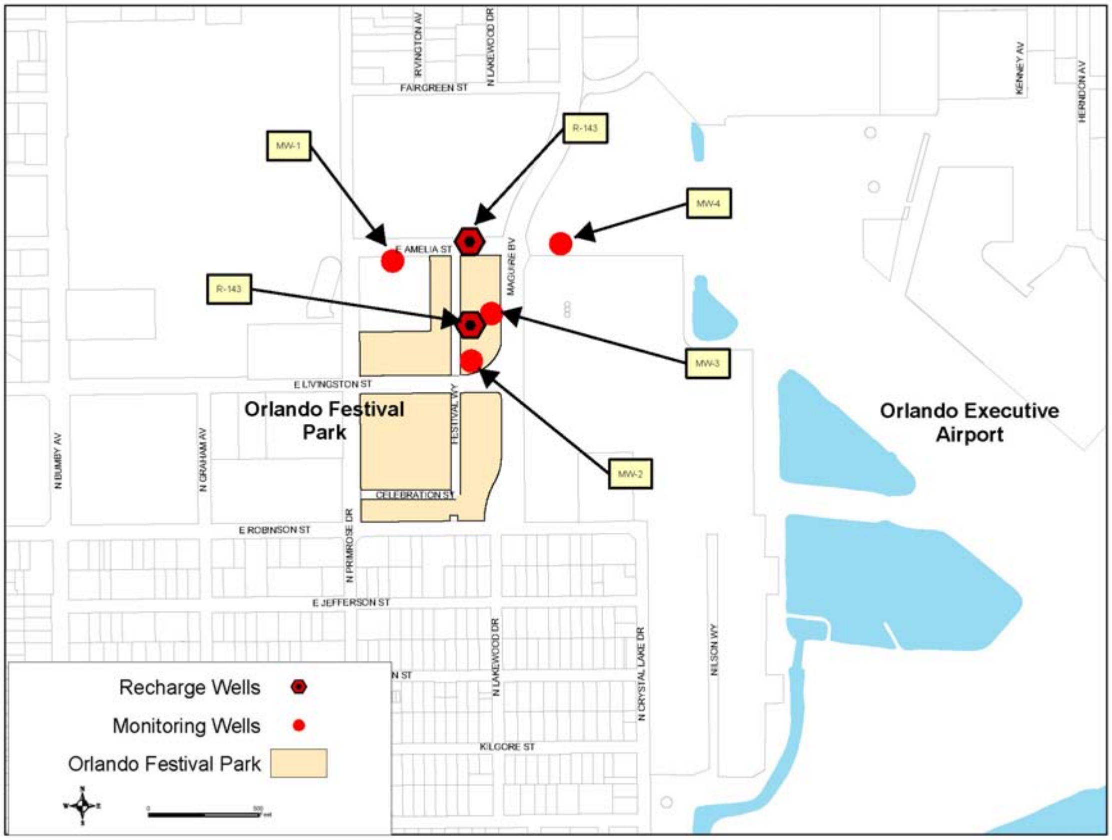


Figure 5. Festival Park well locations

ANALYTE LIST

A groundwater monitoring plan (GWMP) was prepared and implemented based on comments by FDEP (Status Report 4, Appendix A).

MICROBIOLOGICAL

Groundwater samples were collected based on established procedures (Appendix D of Appendix A) and were analyzed for the following organisms: total coliforms, fecal coliforms, *Escherichia coli* (*E. coli)*, enterococci, C. perfringens, coliphage, giardia, and cryptosporidium. The microbiological data were evaluated and compared to indicator guidelines for ambient surface water quality (Class III waters). Class III surface water is a designation for surface water used for recreational purposes. Lake Orienta and Lake Sherwood are Class III surface waters.

CHEMICAL

The samples were analyzed for the chemical analyte groups listed below. The sampling procedures and quality assurance / quality control (QA / QC) procedures are presented in Appendixes B and C of Appendix A of this document.

- Field parameters – temperature, pH, specific conductance, redox potential, and dissolved oxygen.
- Common ions – calcium, potassium, magnesium, sodium, carbonate / bicarbonate, chloride, and sulfate.
- Nutrients – nitrate, nitrite, ammonia, TKN, total nitrogen, orthophosphate, and total phosphorus.
- Other parameters – turbidity, color, BOD5, and total dissolved solids (TDS).
- Metals using SW-846 6000 and 7000 series methods.
- Volatile Organic Compounds using SW-846 8260.
- Semi-volatile Organic Compounds using SW-846 8270.
- Organochlorine Pesticides and PCBs using SW-846 8081 and 8082.
- Chlorinated Herbicides using SW-846 8151.
- Total Petroleum Hydrocarbons using the Flo-Pro method

- Gross Alpha and Gross Beta.

The chemical data were validated using the following U.S. EPA and FDEP guidelines for evaluating inorganic and organic chemical data and compared to regulatory criteria:

- U.S. Environmental Protection Agency, Office of Water. Drinking Water Standards and Health Advisories. EPA 822-B-00-001. Washington, D.C. Summer 2000.

  http://www.epa.gov/ost/drinking/standards/summary.html

- U.S. Environmental Protection Agency. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA-540/R-94-013 (PB94-963502). Atlanta, GA. February 1994.
- U.S. Environmental Protection Agency. USEPA Contract Laboratory Program. National Functional Guidelines for Organic Data Review. EPA-540/R-99-008 (PB99-963506). Atlanta, GA. October 1999.
- Florida Department of Environmental Protection. Drinking Water Standards, Monitoring, and Reporting. Chapter 62-550, Florida Administrative Code.

  http://www.dep.state.fl.us/legal/Rules/rulelistnum.htm

Dry Period Characterization

Dry-period characterization was conducted during August 2001 to take advantage of an abnormally prolonged period of low rainfall when the lake-level control wells did not receive water. The goal of this task was to collect site reference water quality data. Because the recharge wells have been present and operating on an as-needed basis for more than 40 years, this represented a reasonable opportunity to evaluate baseline conditions of groundwater quality. One well at Lake Sherwood and two wells at Lake Orienta (S-1514 and S-1515) were sampled for chemical and biological parameters. During this event, the recharge wells (not monitoring wells) were directly sampled. The Festival Park site was not formally established as a project site at the time, and therefore dry-period characterization was not performed. The Lake Sherwood site was not investigated beyond dry-period characterization because the lake level was sufficiently low that it was considered unlikely that the level would rise to an elevation greater than the inlet of the well during the time period of the project. The presence of S-1513 at the Lake Orienta site was not identified at the time, and therefore dry-period characterization was not performed for that well.

The wells were sampled using dedicated bladder pumps with the pump bodies and pump intakes positioned near the bottoms of the wells. The three wells were not operational at the times of samplings because the water levels in the lakes were below the intake levels for the wells. Based on the lake level data, these wells had not received recharge for a significant period of time prior to sampling.

The water samples were analyzed for chemical constituents using the procedures consistent with the analyte group method numbers presented in the Analyte List section of this document.

Sampling Results

A summary of the results of the microbiological analyses are provided in Table 3, and are provided in their entirety in Appendix B. The organisms found and their concentrations fall within the guidelines for Class III surface waters. The total coliform concentrations of the three samples exceed the primary drinking water standard (DWS) for Class G-II groundwater of 4 colonies per 100 mL.

Table 3. Microbial data

Organism	Location SampleID ==> Date Collected ==> Units	Lake Orienta East LO-E-R-DP 8/23/2001	Lake Orienta West LO-W-R-DP 8/23/2001	Lake Sherwood LS-R 8/13/2001	Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
Total Coliform	cfu/100 mL	250	210	235	1,000 cfu/100 mL – Single Sample 400 cfu/100 mL – Average
Fecal Coliform	cfu/100 mL	<1	36	7	800 cfu/100 mL – Single Sample 200 cfu/100 mL – Geometric Mean
E. coli	cfu/100 mL	2	1	<1	126 cfu/100 mL – Geometric Mean
Enterococci	cfu/100 mL	<1	4	9	35 cfu/100 mL – Fresh Water 104 cfu/100 mL – Geometric Mean
C. *perfringens*	cfu/100 mL	<1	<1	<1	50 cfu/100 mL
Cryptosporidium	no./100 L	<2	<34	<30.5	
Giardia	no./100 L	<2	<34	<30.5	
Somatic Coliphage	pfu/100 mL	<5	<5	<5	100 pfu/100 mL
1 Liter enrichment	pfu/100 mL	not done	not done	negative	
F+ coliphage	pfu/100 mL	<5	<5	<5	100 pfu/100 mL
1 Liter enrichment	pfu/100 mL	not done	not done	negative	

Notes:

cfu – Colony forming units

pfu – plaque forming units

[1] Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100ml, average of 400 cfu/100ml
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean, 33-35 cfu/100 mL for marine and fresh water respectively.
C. perfringens	Guidelines used by state of Hawaii based on research by Dr. Roger Fujioka et al at the University of Hawaii of 50 cfu/100 mL for fresh and brackish water and 5 cfu/100 mL for marine waters.
Coliphage	Level used – 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

The water quality from the three recharge wells exhibited characteristics and influence of surface water contribution compared to Upper Floridan aquifer water, for example:

- Total Coliform concentration of 210 to 250 colony forming units (cfu) per 100 milliliters (cfu / 100 mL). Floridan aquifer concentrations are expected to be less than 1 cfu / 100 mL.
- Color measurement of 10 to 50 color units. Floridan aquifer concentrations are expected to be less than 1 color unit.
- Total organic carbon (TOC) concentrations between 1.2 and 22 mg / L. Floridan aquifer concentrations are expected to be less than 1 mg / L.
- Turbidity measurement of 0.75 to 36 (estimated value) Nephelometric Turbidity Units (NTUs). Measurement of Floridan aquifer water is expected to be less than 1 NTU.
- The presence of ammonia nitrogen between 0.13 and 1.2 milligrams per liter (mg / L). Ammonia nitrogen is expected to be undetected in Floridan aquifer groundwater.
- Iron concentrations of 0.29 to 6.3 mg / L. Iron is expected to be undetected in Floridan aquifer groundwater.

The detections from the chemical analyses are provided in Table 4. Detections were encountered in the following analyte groups: general chemicals, common anions and cations, nutrients, metals, volatile organic chemicals, and radionuclides. These detections were compared to primary and secondary drinking water standards. A detailed comparison of the detections, criteria, and screening values is also provided in Appendix B. A summary of comparisons follows:

- No chemicals detected exceeded the primary DWSs. Turbidity exceeded 1 NTU in waters from the Lake Orienta West and Lake Sherwood wells.
- Secondary DWSs were exceeded for color, aluminum, iron, and manganese from selected wells.
- Two volatile organic compounds (VOCs) were positively detected: methyl ethyl keytone (MEK) and methylene chloride. No DWS is established for MEK. The concentrations of methylene chloride were approximately below the DWS.

The chemical data presented in Table 4, and the other chemical data tables in the remainder of this report, are provided with qualifiers that resulted from the data validation process. The data validation process for this data set and the remainder of the chemical data sets presented in this report were performed in accordance with U.S. Environmental Protection Agency (USEPA) guidance for data review for inorganic chemicals and organic chemicals, February 1994 and USEPA October 1999, respectively.

The chemical data were compared to various regulatory criteria and risk-based criteria (RBC); the results were identified by different formatting (bolding, shading, and boxing). No chemical from the monitoring well samples was detected at a concentration greater than Florida Primary and Secondary DWSs. The concentration of iron exceeded the DWS in two of the three recharge wells; see Table 4. Please refer to the notes at the bottom of data tables for explanations to identify comparisons of the chemical results and various regulatory and risk-based criteria (Appendix C).

Table 4. Chemical Detections During Dry-Period Characterization

	Location	Lake Orienta East		Lake Orienta West		Lake Sherwood	
	SampleID ==>	LO-E-R-DP		LO-W-R-DP		LS-R	
	Date Collected ==>	8/23/2001		8/23/2001		8/13/2001	
	Time Collected ==>	12:45		11:20		15:00	
	Matrix ==>	WA		WA		WA	
	Sample Type ==>	N		N		N	
Parameter Group and Name	Units	Result	Qual.	Result	Qual.	Result	Qual
Radionuclides							
Alpha, gross	pCi/L	5.5	=	9.8	=	3.3	=
Beta, gross	pCi/L	4.7	=	6.8	=	10.4	=
General Chemistry							
Total Dissolved Solids (residue, filterable)	mg/L	240	=	270	=	150	=
Turbidity	NTU	0.75	=	**12**	=	**36**	J
Color	Color Units	10	=	**50**	=	**20**	J
Total Organic Carbon	mg/L	1.2	=	2.1	=	22	=
Dissolved Organic Carbon	mg/L	1.2	=	1.4	=	2.5	=
Methylene Blue Active Substances	mg/L	0.047	U	0.095	J	0.047	U
Nutrients							
Nitrogen, ammonia (as N)	mg/L	0.13	=	0.46	=	1.2	=
Nitrogen, Kjeldahl, Total	mg/L	0.36	J	2	=	1.4	=

Table 4. Chemical Detections During Dry-Period Characterization

Location		Lake Orienta East		Lake Orienta West		Lake Sherwood	
SampleID ==>		LO-E-R-DP		LO-W-R-DP		LS-R	
Date Collected ==>		8/23/2001		8/23/2001		8/13/2001	
Time Collected ==>		12:45		11:20		15:00	
Matrix ==>		WA		WA		WA	
Sample Type ==>		N		N		N	
Parameter Group and Name	Units	Result	Qual.	Result	Qual.	Result	Qual
Phosphorus, Total (as p)	mg/L	0.036	=	0.42	=	0.045	=
Phosphorus, Total Orthophosphate (as P)	mg/L	0.09	=	0.045	=	0.009	J
Anions							
Chloride (as Cl)	mg/L	17	=	19	=	9.7	=
Fluoride	mg/L	0.062	U	0.062	U	0.36	=
Sulfate (as SO4)	mg/L	14	=	55	=	16	=
Alkalinity, bicarbonate (as CaCO3)	mg/L	140	=	130	=	110	=
Metals							
Aluminum	µg/L	120	U	**1610**	=	88.4	U
Arsenic	µg/L	0.4	U	6.36	=	1.09	=
Barium	µg/L	8.79	J	21	J	14.1	=
Beryllium	µg/L	0.041	J	0.04	U	0.04	U
Cadmium	µg/L	0.233	J	1.46	=		
Calcium	µg/L	60000	=	65900	=	36600	=
Chromium, total	µg/L	0.4	U	3.17	J	0.478	U
Cobalt	µg/L	0.142	J	0.37	J	0.434	J
Copper	µg/L	0.12	UJ	16.6	J	3	U
Iron	µg/L	292	=	**4680**	=	**6310**	=
Lead	µg/L	0.0131	U	9.24	=	0.972	J
Magnesium	µg/L	2410	=	9260	=	10600	=
Manganese	µg/L	10.8	=	**61.4**	=	**76.5**	=
Nickel	µg/L	5.08	=	6.77	=	23	=
Potassium	µg/L	1380	J	1780	J	2760	J
Silver	µg/L	0.047	J	0.02	U	10.3	U
Sodium	µg/L	6630	=	10900	=	14900	J
Vanadium	µg/L	0.351	J	6.95	J	0.08	U
Zinc	µg/L	1	U	26.8	=	1.66	J
Volatile Organic Compounds							
Methyl ethyl ketone (2-butanone)	µg/L	27	J	3.9	J	160	=
Methylene chloride	µg/L	0.43	J	0.55	J	10	U

Table 4. Chemical Detections During Dry-Period Characterization

	Location	Lake Orienta East		Lake Orienta West		Lake Sherwood	
	SampleID ==>	LO-E-R-DP		LO-W-R-DP		LS-R	
	Date Collected ==>	8/23/2001		8/23/2001		8/13/2001	
	Time Collected ==>	12:45		11:20		15:00	
	Matrix ==>	WA		WA		WA	
	Sample Type ==>	N		N		N	
Parameter Group and Name	Units	Result	Qual.	Result	Qual.	Result	Qual

Notes:

Bolded values represent positive detections above promulgated regulatory criteria.

Boxed values represent positive detections above Risk-Based Criteria.

Bolded and boxed values represent positive detections above promulgated regulatory criteria and Risk-Based Criteria.
The value and the qualifier must be taken together to properly understand the laboratory results. For example, if a result for a chemical was “10” mg/L with an “=” qualifier then the chemical was detected at a concentration of 10 mg/L. However, if a result was “10” mg/L with a “U” qualifier then the chemical was not detected at a reporting limit of 10 mg/L.

Sources for regulatory and risk-based criteria:

1. Florida Ground Water Guidance Concentrations, 17-520.400 FAC, June 2, 1994: Primary Drinking Water Standards (17-550.310 FAC), Secondary Drinking Water Standards (17-550.320 FAC).
2. Brownfield's Cleanup Criteria Rule, Groundwater Cleanup Target Levels, Draft Chapter 62-785 F.A.C., 1997.
3. Drinking Water Regulations and Health Advisories, Office of Water, USEPA, October 1996.
4. EPA Region III Risk-Based Concentration Table, Tap Water Values, R.L. Smith, October 1997.
5. EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment, November 1995; HQ=0.1 applied to noncarcinogens.

Explanation of Abbreviations and Qualifiers (Qual.)

“WA” is water.

“N” is a normal sample.

"=" Represents a detection at the value shown.

"J" Represents an estimated value that is above the method detection limit and below the practical quantitation limit.

“U” Represents not detected at the detection limit value shown.

Blanks for the chemical data represent nondetection.

Blanks for the criteria and screening values represent no established value.

MONITORING WELL INSTALLATIONS

Monitoring wells were installed with the intent to mimic the completion depth intervals of the onsite recharge wells. The locations of the wells were based on the direction of regional flow in the Upper Floridan aquifer. Monitoring well locations at sites that were up-gradient, down-gradient, and cross-gradient of recharge wells were selected. The installation was coordinated with appropriate local governments and FDEP.

The construction reports for the Lake Orienta and Festival Park monitoring wells are provided in Appendix D. Dedicated, air-actuated bladder pumps were installed in the monitoring wells to collect samples. The pump bodies were made of PVC, the bladders were made of Teflon® and the sample tubing was Teflon-lined polyethylene tubing. The pumps were installed to the approximate depths of the casings in each monitoring well.

LAKE ORIENTA

Four monitoring wells (MW-1 through MW-4) were installed at the site to allow groundwater sampling to measure changes of water quality during the project. Construction characteristics are presented in Table 5 and their locations are shown in Figure 4.

Table 5. Completion characteristics of the monitoring wells with SJRWMD well designations for Lake Orienta

Well	Estimated Land Surface Elevation (ft, msl)	Diameter (in.)	Cased Depth (ft)	Total Depth (ft)	Depth to Water [a] (ft)
MW-1 (S-0344)	110	4	210	290	51.98
MW-2 (S-0345)	70	4	130	320	22.08
MW-3 (S-0346)	95	4	170	290	33.88
MW-4 (S-0347)	70	4	160	300	25.09

[a] Water level collected at the completion of monitoring well construction.

FESTIVAL PARK

Four monitoring wells (MW-1 through MW-4) were installed at the site to monitor for changes of water quality during the project. Construction characteristics are presented in Table 6 and their locations are shown in Figure 5.

Table 6. Completion characteristics of the monitoring wells with SJRWMD well designations for Festival Park

Well	Estimated Land Surface Elevation (ft, msl)	Diameter (in.)	Cased Depth (ft)	Total Depth (ft)	Depth to Water [a] (ft)
MW-1 (OR-0140)	102	4	210	400	54.8
MW-2 (OR-0141)	102	4	120	250	54.1
MW-3 (OR-0818)	102	4	180	250	55.6
MW-4 (OR-0819)	102	4	65	250	54.15

[a] Water level collected at the completion of monitoring well construction.

QUALITATIVE GROUNDWATER TRACER TESTS

Qualitative groundwater tracer tests were conducted to demonstrate complete pathways of groundwater flow in the Floridan aquifer between the recharge wells and the monitoring wells. The benefits of performing these tests are that the results will improve the sampling plan design for the operational characterization tasks and support the results of groundwater sampling and analysis. The groundwater tracer test plan was presented in Status Report 5 contained in Appendix A. As previously described in the Site Descriptions section of this document, many water supply wells were identified within 1 mile and no water supply wells were identified within 1,000 feet of the Lake Orienta recharge wells. FDEP requested that a public meeting be held to inform the property owners near the Lake Orienta recharge wells of the intent to perform a tracer test. The meeting was conducted and no negative comments were communicated at the meeting. As a result, the tracer test proceeded at Lake Orienta without additional coordination activities. No water supply wells were identified within one mile of the Festival Park recharge wells. As a result, the tracer test proceeded at that site without further coordination activities.

QUALITATIVE GROUNDWATER TRACER TEST

The qualitative groundwater tracer tests were performed at each site to provide evidence of which monitoring wells were in hydraulic connection with which recharge wells through the aquifer. This led to modification of the sampling plans for better focused sampling for the characterization phases of the project.

At both sites different tracers were introduced into each of the recharge wells while the recharge wells were receiving water. The use of different tracers allowed the verification of hydraulic connection between individual recharge wells and individual monitoring wells. Two tracers were used at Festival Park: fluorescein and eosine. Three tracers were used at Lake Orienta: fluorescein, eosine, and Rhodamine WT. Prior to tracer introduction, the monitoring wells were sampled for background indications of the tracers that could interfere with the interpretation of the results of the tests. Results of the background sampling were that the tracers were either not detected or detected at sufficiently low concentrations to not interfere with the interpretation the laboratory results.

TRACER TEST PROCEDURES

The strings of tracer sample packs were designed based on the cased depths and open-hole intervals of the monitoring wells. For each well, tether lines were made to extend from the tops of the monitoring wells to the bottom of the casings and detachable strings of sample packs were made to extend over the open-hole intervals. Sample packs were positioned at generally 10-foot intervals along the strings. This allowed for simple and rapid replacement of sample pack strings by pulling the tether line from the well and exchanging the strings, then lowering the assemblies back into the wells. This procedure provided better confidence that the sample packs were located at consistent intervals within the wells. Stainless steel weights were placed at the bottom-end of the sampler strings to keep the strings in tension and to assist in identifying obstructions in the wells. Figure 6 shows a photograph of the sample packs on the strings as they were received from the laboratory and Figure 7 an example of an exchange event.
The individual sample packs were cut from the string and placed in individual plastic bags, labeled and placed on ice for preservation and preparation for transport to the laboratory. Labeling consisted of well, depth, date, and time. The same information was recorded on the chain-of-custody form that accompanied the shipment of the sample pack to the laboratory.

Figure 6. Sample packs on strings

Figure 7. Example of an exchange event
Note: The white cord is the sample string and the yellow cord is the tether line.

For the tests at the sites, strings of activated carbon sample packs were positioned over the open-hole intervals of the monitoring wells to intercept tracers in the groundwater flowing past the monitoring wells. Sample packs were spaced on the strings at intervals between 10 and 15 feet. The strings were replaced at approximately two-week intervals then sample packs were preserved and transported to the laboratory for analysis. Laboratory results represent the accumulation of tracer on the activated carbon during a particular two-week interval when the sample packs were in the monitoring wells. The durations of the tracer tests were 12 weeks.

In the laboratory the activated carbon of the sample packs were rinsed with known volumes of a solvent and the resulting solution, or elutant, was analyzed for presence of tracer. Therefore, the concentrations reported by the laboratory represent the amount of tracer that accumulated on the carbon and not concentrations of tracers in the groundwater. However, because the residence time of the samples packs in the monitoring wells were the same, the results provide insight into travel time between wells based on time of appearance and relative robustness of the hydraulic connection between wells based on the concentration value.

LAKE ORIENTA TESTING

Background Tracer Characterization

Two rounds of background characterization occurred at Festival Park. Each round consisted of suspending two carbon sample packs in the monitoring wells within the open-hole intervals and in the lake where they resided for two weeks. These procedures were consistent with the residence duration of the sample packs for the tracer test. One set of grab water samples was collected from each location at the beginning of the first event. The presence of tracer adsorbed by the sample packs was evaluated by rinsing the carbon with a known aliquot of a solvent then analyzing the solvent for tracer. The results are presented in Table 7. The results indicated very low concentrations of fluorescein and eosine at levels that would not interfere with interpreting the test results. The laboratory reports of the background tracer characterization are presented in Appendix E.

Tracer Test Procedure

As previously described, the drinking water well survey indicated the presence of privately-owned and public supply utility-owned water supply wells between 1000 feet and 1 mile of the recharge wells. No water supply wells were identified within 1000 feet of the recharge wells. Because of this, a public meeting was held on November 17, 2004, in Altamonte Springs, Florida. The purpose of the public meeting was to:

- Present the role of recharge wells in managing storm water in central Florida and the level of Lake Orienta
- Describe the CFARE1 project
- Describe the need for and the intent to conduct a groundwater tracer test
- Solicit comments and cooperation on the tracer test

In preparation for the meeting, Seminole and Orange County property owners within 1 mile of the recharge wells were identified from property tax records. Meeting notices were sent to each of the approximate 1600 identified property owners. No negative comments were received during the meeting. As a result, the tracer test was conducted without further coordination activities.

Table 7. Lake Orienta artificial recharge well demonstration project - groundwater tracer test

Results of Charcoal Pack and Water Background Samples Analyzed for the Presence of Fluorescein and Eosine Dyes.

Station Name	Sample Type	Date Placed	Date Recovered	Fluorescein Results		Eosine Results		Eosine Results	
				Peak (nm)	Conc. (ppb) [a]	Peak (nm)	Conc. (ppb) [a]	Peak (nm)	Conc. (ppb) [a]
MW-1	Grab Water		8/11/2004	ND		ND		ND	
MW-2	Grab Water		8/11/2004	ND		ND		ND	
MW-3	Charcoal Pack		8/11/2004	ND		ND		ND	
MW-4	Charcoal Pack		8/11/2004	ND		ND		ND	
Lake	Charcoal Pack		8/11/2004	ND		ND		575.0*	0.116
MW-1 @ 215 ft	Charcoal Pack	8/24/2004	9/7/2004	515.4*	0.550	ND		ND	
MW-1 @ 240 ft	Charcoal Pack	8/24/2004	9/7/2004	516.2*	0.621	ND		ND	
MW-2 @ 135 ft	Charcoal Pack	8/24/2004	9/7/2004	514.8*	0.447	ND		ND	
MW-2 @ 170 ft	Charcoal Pack	8/24/2004	9/7/2004	516.4*	0.410	ND		ND	
MW-3 @ 175 ft	Charcoal Pack	8/24/2004	9/7/2004	517.0*	0.807	ND		ND	
MW-3 @ 210 ft	Charcoal Pack	8/24/2004	9/7/2004	513.8*	0.385	ND		ND	
MW-4 @ 165 ft	Charcoal Pack	8/24/2004	9/7/2004	513.8*	0.797	ND		ND	
MW-4 @ 200 ft	Charcoal Pack	8/24/2004	9/7/2004	515.4*	0.949	ND		ND	
1.6 ft depth above Lake bottom	Charcoal Pack	8/24/2004	9/7/2004	514.4*	0.811	ND		569.8*	10.3
3.4 ft depth above Lake bottom	Charcoal Pack	8/24/2004	9/7/2004	514.0*	0.599	ND		571.3*	8.07

Notes:

* A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated for background purposes as though it were the dye.

nm - wavelength of chromatograph peak in nanometers

ppb - parts per billion

[a] Blanks indicate no calculated concentration

The release was made on November 18, 2004, by pumping tracer solution into the three recharge wells and the tracer was delivered to the aquifer by the water flowing from the lake into the wells. Locations and quantities of tracer introduced into the recharge wells are 50 pounds of fluorescein into S-1513; 75 pounds of eosine into S-1514; and 100 pounds of rhodamine WT into S-1515.

Fresh carbon sample packs were installed in the monitoring wells prior to introducing the tracer into the recharge wells. The sample packs were replaced and analyzed at two-week intervals (with the exception of the week of the year-end holidays) through February 17, 2005. The duration of the planned test was 13 weeks.

Results of sample pack analyses from MW-2 indicated the presence of two tracers. As a result additional focused sampling was conducted at MW-2. The focused sampling consisted of placing additional sample packs at two depths in the well and replacing the packs at two-week intervals. Sampling at MW-2 ended on April 14, 2005, 21 weeks after tracer introduction. Tracer test locations and monitoring wells for Lake Orienta are presented in Figure 8. The lower inlets of wells S-1514 and S-1515 were open for the duration of the planned tracer test to allow lake water to recharge the aquifer during the test.

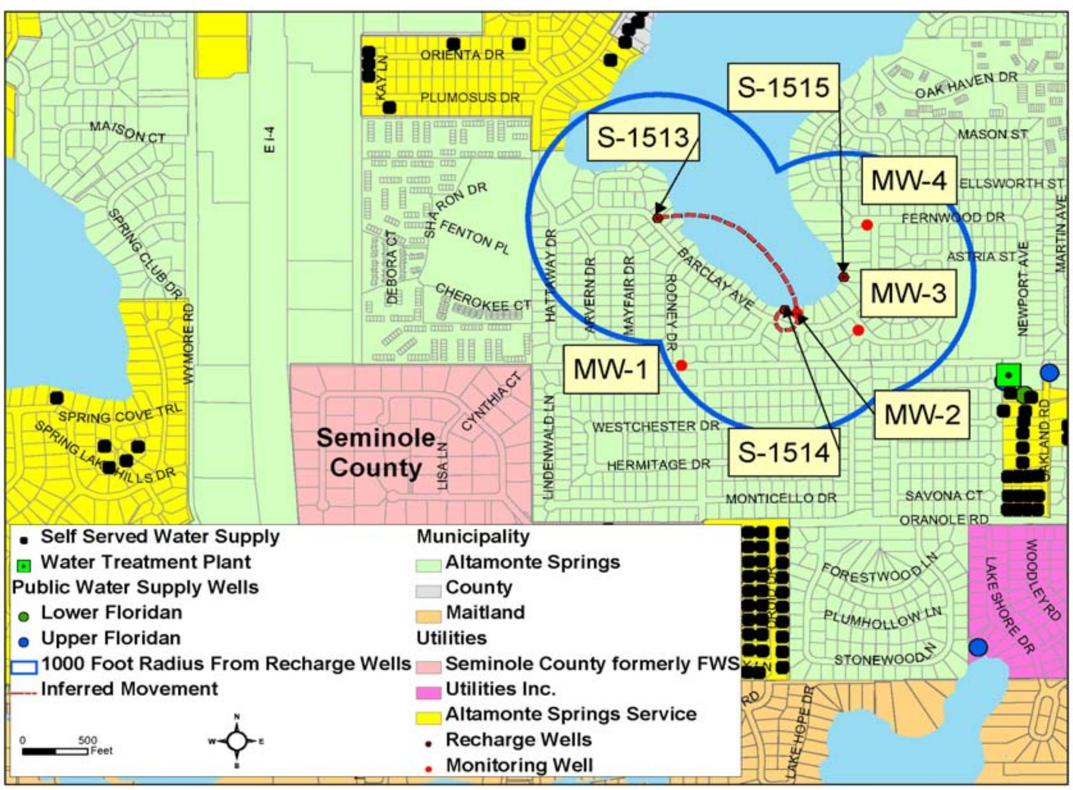


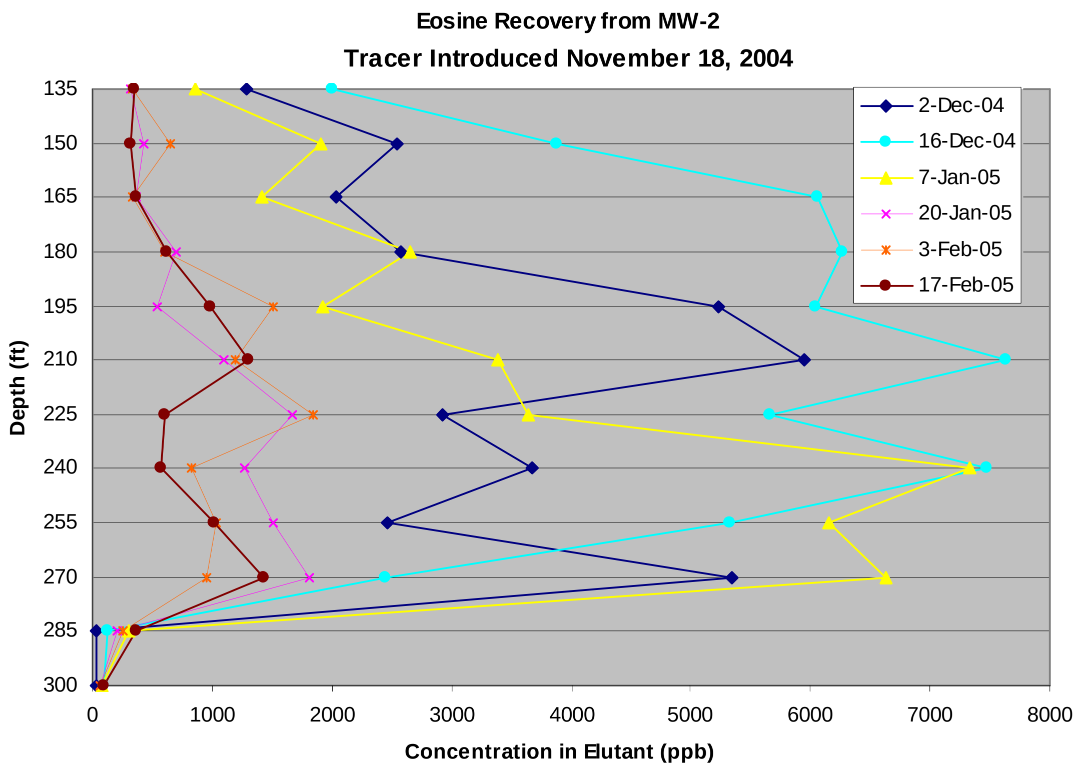
Figure 8. Lake Orienta testing sites

Tracer Test Results

The goal of the tracer test was achieved. Two tracers, eosine and fluorescein, were detected at one monitoring well, MW-2. The results of this test demonstrate a hydraulic connection between recharge well S-1514 and monitoring well MW-2, and between recharge well S-1513 and monitoring well MW-2. The presence of tracer was not identified at the other three monitoring wells.

Tracer test locations are shown in Figure 8 and a summary of the results of the tracer test at Lake Orienta follows.

- Tracers introduced into two recharge wells were recovered from one monitoring well.
- Tracer (eosine) from S-1514 was recovered in sample packs from MW-2 within the first two-week interval of the tracer test indicating that MW-2 is hydraulically connected to the recharge well. This indicates that the travel time between S-1514 and MW-2 is less than two weeks. MW-2 is located approximately 100 ft east of S-1514. Results of the eosine and fluorescein recovery for MW-2 are graphically presented in Figure 9. The graph shows that eosine from S-1514 appeared at MW-2 during the first two-week period (collected December 2), reached its highest concentrations during the second two-week period (collected December 16), and eosine concentrations declined in the remaining four samplings.
- Tracer (fluorescein) from S-1513 was positively identified in sample packs from MW-2 within the fourth two-week interval of the tracer test indicating that MW-2 is hydraulically connected to the recharge well. This indicates that the travel time between S-1513 and MW-2 is between 6 and 8 weeks. MW-2 is located approximately 1350 ft east of S-1513. While evaluating the results of the fourth sample set, the laboratory speculated that fluorescein was appearing at MW-2, but the laboratory was unable to segregate the two tracers. This was based on an elongated leading edge and widening of the breakthrough curves of the chromatograms. The pattern continued and became more pronounced through the remainder of the scheduled 12 weeks of the tracer test. As a result, additional focused monitoring at MW-2 was continued to confirm or deny the presence of fluorescein. The additional monitoring consisted of monitoring for tracer at two depths (240 ft and 255 ft) for four additional two-week intervals.



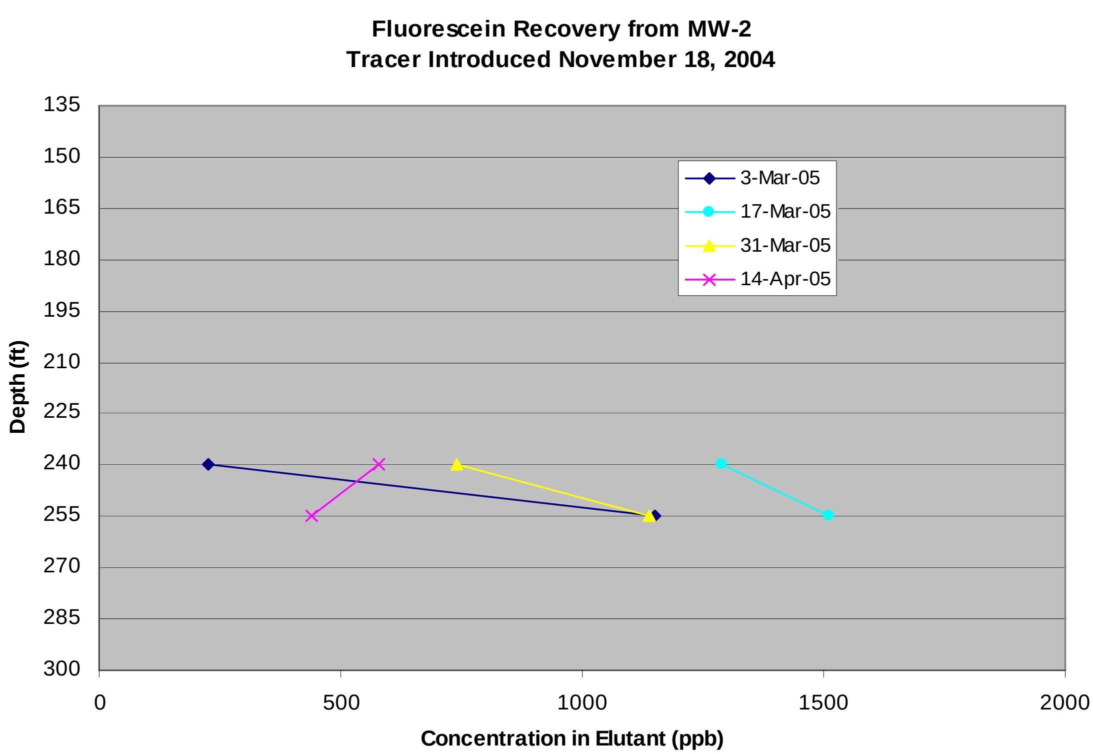


Figure 9. Eosine and fluorescein recovery at MW-2, Lake Orienta

The laboratory recommended these two depths as those where the pattern was most pronounced. Testing ended on April 14, 2005 after the presence of fluorescein was confirmed. Table 8 presents tracer concentrations detected at MW-2 during the additional focused testing period.

Table 8. Results from additional monitoring in MW-2 at 240 feet and 255 feet, Lake Orienta

Date Collected	Fluorescein (240 ft)	Eosine (240 ft)	Fluorescein (255 ft)	Eosine (255 ft)
3/3/2005	227 ppb	400 ppb	1150 ppb	2170 ppb
3/17/2005	1290 ppb	1330 ppb	1510 ppb	1610 ppb
3/31/2005	739 ppb	484 ppb	1140 ppb	878 ppb
4/14/2005	578 ppb	313 ppb	438 ppb	246 ppb

Observations and interpretations of the results are:

- Rhodamine WT from S-1515 was not recovered from the four monitoring wells during the 12-week interval of the tracer test.
- Tracers (fluorescein and eosine) were not recovered from MW-1, MW-3, and MW-4.
- Eosine and fluorescein were encountered in MW-2.
- The peak of eosine passing by MW-2 was from the December 16, 2004, sampling, four weeks after the tracer was introduced into S-1514.
- Because of the nature of the supplemental sampling for fluorescein in MW-2, the arrival characteristics of the tracer could not be evaluated. However, the results were sufficient to positively identify this tracer in the monitoring well meeting the goal of the qualitative tracer test.

Appendix E presents laboratory sampling reports for the tracer testing for this site.

- Resulting from the test the following designations were assigned to the remaining sampling locations: Lake Orienta from a dock near the inlet to S-1514 for the source location; MW-2 as the characterization location; and MW-1 as the site reference location; and MW-3 and MW-4 were removed from further sampling.

FESTIVAL PARK TESTING

Background Tracer Characterization

Two rounds of background characterization occurred at Festival Park. Each round consisted of suspending two carbon sample packs in the monitoring wells within the open-hole intervals and in the lake where they resided for two weeks. These procedures were consistent with the residence duration of the sample packs for the tracer test. One set of grab water samples was collected from each location at the beginning of the first event. The presence of tracer adsorbed by the sample packs was evaluated by rinsing the carbon with a known aliquot of a solvent then analyzing the solvent for tracer.

The results are presented in Table 9. The results indicated very low concentrations of fluorescein at levels that would not interfere with interpreting the test results.

Table 9. Results of charcoal pack and water background samples analyzed for the presence of fluorescein and eosine dyes, Festival Park

Results of Charcoal Pack and Water Background Samples Analyzed for the Presence of Fluorescein and Eosine Dyes.

Station Name	Sample Type	Date Placed	Date Recovered	Fluorescein Results		Eosine Results	
				Peak (nm)	Conc. (ppb) [a]	Peak (nm)	Conc. (ppb) [a]
R-40 South Recharge Well	Grab Water		5/13/2003	ND		ND	
R-143 North Recharge Well	Grab Water		5/13/2003	ND		ND	
R-40 South Recharge Well	Charcoal Pack	5/13/2003	5/20/2003	ND		ND	
R-143 North Recharge Well	Charcoal Pack	5/13/2003	5/20/2003	ND		ND	
MW-1 @ 167 ft	Charcoal Pack	5/13/2003	5/20/2003	515.2 *	0.213	ND	
MW-1 @ 197 ft	Charcoal Pack	5/13/2003	5/20/2003	513.8 *	0.233	ND	
MW-2 @ 195 ft	Charcoal Pack	5/13/2003	5/20/2003	ND		ND	
MW-2 @ 225 ft	Charcoal Pack	5/13/2003	5/20/2003	517.2 *	0.215	ND	
MW-3 @ 195 ft	Charcoal Pack	5/13/2003	5/20/2003	ND		ND	
MW-3 @ 225 ft	Charcoal Pack	5/13/2003	5/20/2003	ND		ND	
MW-4 @ 195 ft	Charcoal Pack	5/13/2003	5/20/2003	516.6 *	0.476	ND	
MW-4 @ 225 ft	Charcoal Pack	5/13/2003	5/20/2003	516.4 *	0.549	ND	
R-143 North Recharge Well	Charcoal Pack	5/20/2003	5/27/2003	ND		ND	

Table 9. Results of charcoal pack and water background samples analyzed for the presence of fluorescein and eosine dyes, Festival Park

Results of Charcoal Pack and Water Background Samples Analyzed for the Presence of Fluorescein and Eosine Dyes.

Station Name	Sample Type	Date Placed	Date Recovered	Fluorescein Results		Eosine Results	
				Peak (nm)	Conc. (ppb) [a]	Peak (nm)	Conc. (ppb) [a]
MW-1 @ 167 ft	Charcoal Pack	5/20/2003	5/27/2003	515.4 *	0.877	ND	
MW-1 @ 197 ft	Charcoal Pack	5/20/2003	5/27/2003	514.2 *	0.533	ND	
MW-2 @ 195 ft	Charcoal Pack	5/20/2003	5/27/2003	517.0 *	0.345	ND	
MW-2 @ 225 ft	Charcoal Pack	5/20/2003	5/27/2003	517.4 *	0.352	ND	
MW-3 @ 195 ft	Charcoal Pack	5/20/2003	5/27/2003	ND		ND	
MW-3 @ 225 ft	Charcoal Pack	5/20/2003	5/27/2003	ND		ND	
MW-4 @ 195 ft	Charcoal Pack	5/20/2003	5/27/2003	516.2 *	0.350	ND	
MW-4 @ 225 ft	Charcoal Pack	5/20/2003	5/27/2003	516.4 *	0.842	ND	

Notes:

* A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated for background purposes as though it were the dye.

nm - wavelength of chromatograph peak in nanometers

ppb - parts per billion

[a] Blanks indicate no calculated concentration

Tracer Test Procedure

At Festival Park, tracer release was conducted on Friday, May 30, 2003, after completing baseline sampling. In conducting the test, tracer solution was pumped into the two recharge wells through tremie pipes. The release point was approximately 180 ft below ground and approximately 5-10 ft above the bottom of the casing. The recharge wells continually flow; therefore, the ambient flow was used to move the tracer from the well bores into the aquifer. Approximately 50 pounds of fluorescein were introduced into Well R-143 and 75 pounds of eosine were introduced into Well R-40.

Carbon sample packs were installed in the monitoring wells at the end of the baseline sampling and prior to the releasing the tracer. The sample packs were replaced with fresh sample packs and analyzed at two-week intervals. The duration of the tracer test was 12 weeks.

When the first string of sample packs was lowered into MW-1, it did not extend to the length consistent with the well construction information. Approximately 50 ft of tether line remained at the surface when the bottom of the string touched the bottom of the well. Several unsuccessful attempts were made to get past the obstruction. As a result, the string was allowed to remain suspended in the well gathering and securing remaining tether line at the top portion of the monitoring well, within the casing. The string of sample packs was positioned from the attainable depth of the open-hole interval of the well and extended into the casing.

Approximately five weeks later, on July 7, 2003, the driller was able to remobilize to the site to investigate the condition of the well. The well was found to be obstructed at the approximate depth of 190 ft. The well was redeveloped and the sampler string was reinserted into the well; however, the string was only able to be lowered into the well an additional 20 ft. Because laboratory results, received on July 1, 2003, of sample pack analyses from the string collected on June 13, 2003, indicated positive recovery of tracer, the tracer test was successful for its purpose and no further drilling or development work was performed to achieve the original drilled depth of the well.

Festival Park is a direct-urban runoff recharge site and flow to the recharge wells directly relates to rainfall events. Although no attempts were made to measure the flow rate into the two recharge wells, rainfall amounts and timing provide indications of flow activity. Daily rainfall measurements were obtained from data downloads NOAA National Climatological Data Center (NCDC) for the Orlando Executive Airport (call sign: ORL). The Orlando Executive Airport is immediately east of Festival Park and because of its closeness to the site rainfall recorded at ORL represents reasonable rainfall data for the site. Daily rainfall and project activities are presented in Figure 10. During 2003, 49.26 in. of rainfall were recorded at the station. During the period of the tracer test, May 30 through August 25, 2003, 22.10 in. of rainfall were recorded at the station. During the first two-week interval of the tracer test, 2.39 in. of rain was recorded. Rainfall was recorded on five separate days with the range of 0.1 to 0.94 in.

Tracer Test Results

Fluorescein from R-143 was detected in the sample packs from MW-1 and MW-2, but not detected in the sample packs from MW-3 and MW-4 during the 12-week period of the test. Eosine from R-40 was not detected in sample packs from the four monitoring wells during the 12-week period of the test. Since tracer was detected at one or more of the monitoring wells, the goal of the Festival Park tracer test was achieved: it was demonstrated that MW-1 and MW-2 are hydraulically connected to R-143. MW-1 is approximately 250 ft west of R-143, and MW-2 is approximately 400 ft south of R-143.

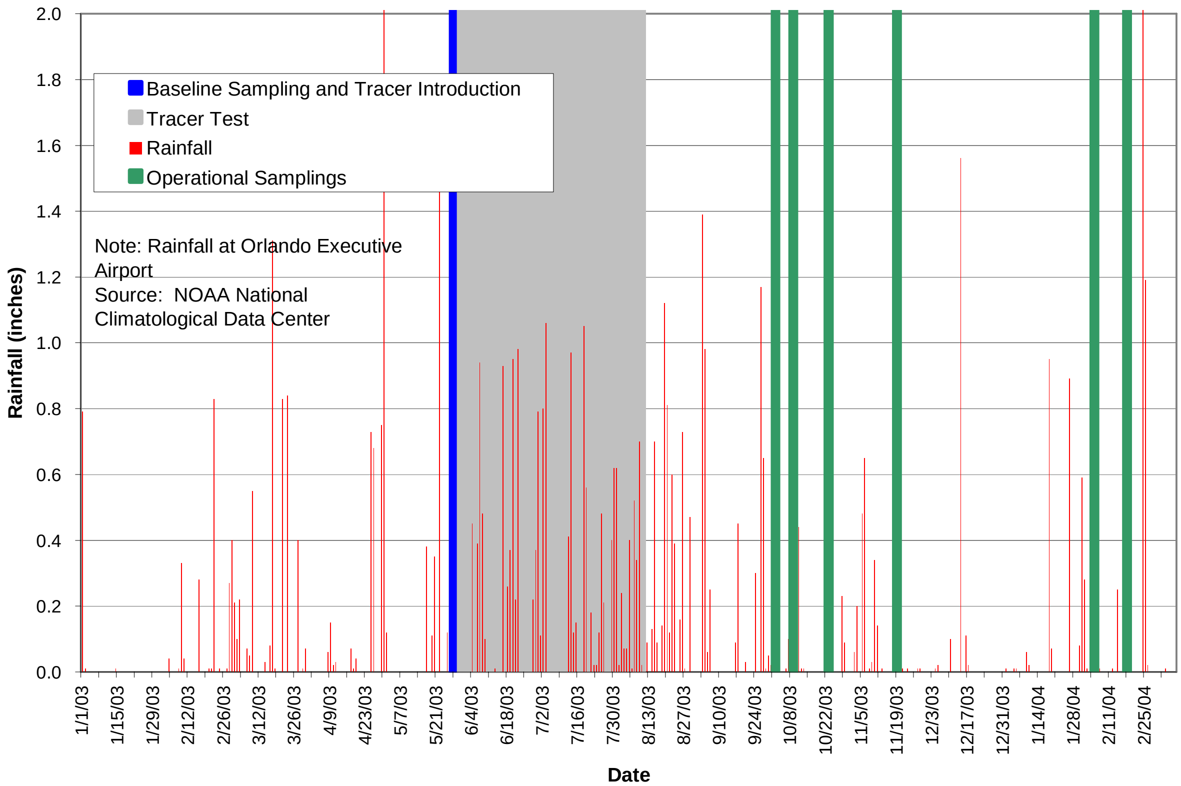


Figure 10. Rainfall at Orlando Executive Airport and project milestones

Graphs presenting the tracer recovery with depth and through time are presented in Figure 11 for MW-1 and in Figure 12 for MW-2. Sample packs from the June 27, 2003, sampling were lost in transit from the site to the laboratory. Inspection of the graphs reveals the advancement and retreat of the tracer front. Observations and interpretations of the results are:

- Tracer from one recharge well was recovered from two monitoring wells.
- Tracer (fluorescein) introduced into R-143 was recovered in sample packs from MW-1 and MW-2 within the first two-week interval of the tracer test indicating that the two monitoring wells are in hydraulic connection with the recharge well.
- The peak of the tracer front passed MW-1 at approximately the eight-week interval from the July 29 sample string analyses and MW-2 at approximately the six-week interval from the July 14 sample string analyses.

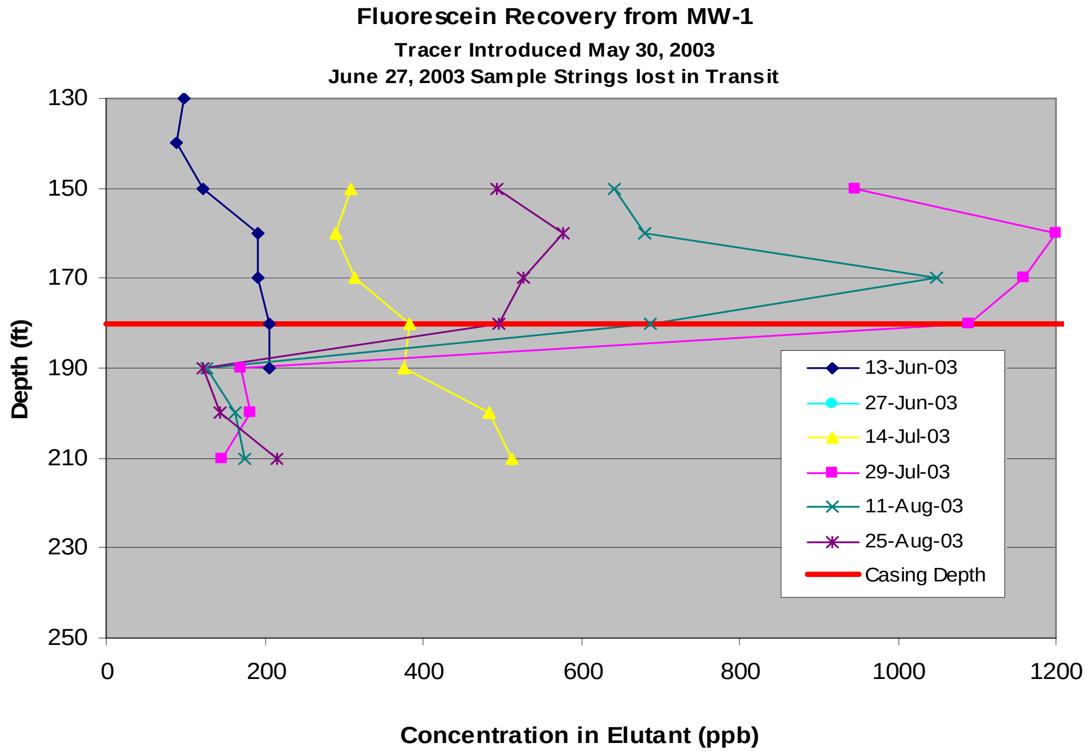


Figure 11. Tracer recovery for MW-1

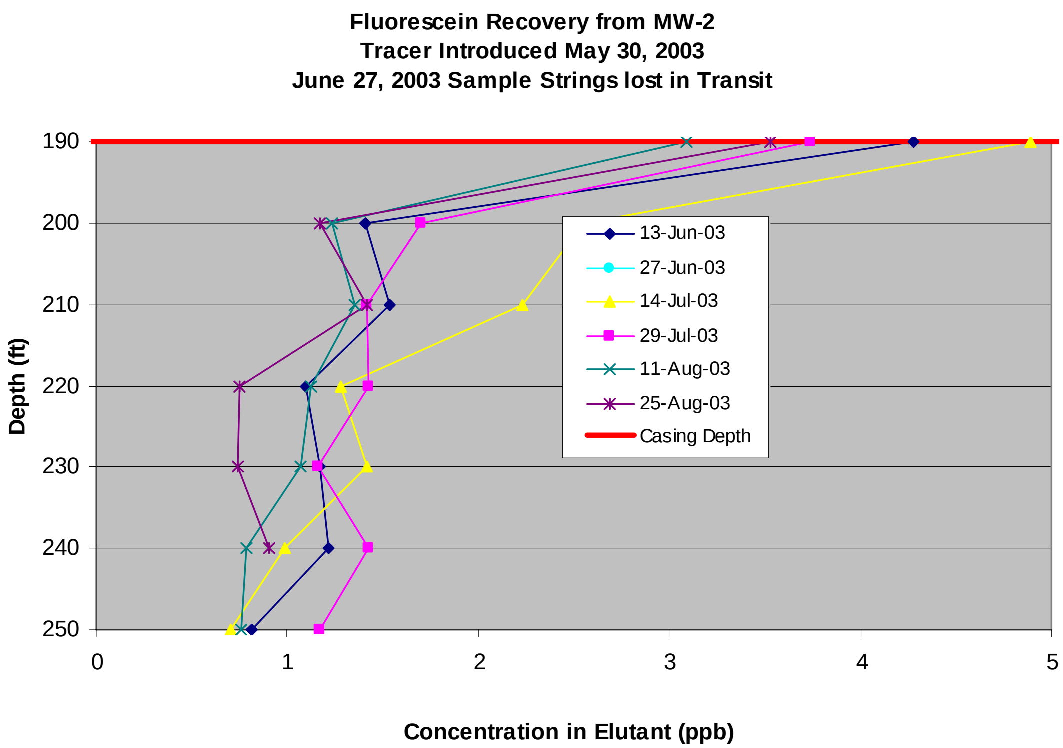


Figure 12. Tracer recovery for MW-2

- Amounts of fluorescein encountered at MW-1 were two orders of magnitude greater than the amounts encountered at MW-2. The results of this test confirm a connection between R-143 and monitoring wells MW-1 and MW-2. A map of the inferred movement is provided in Figure 13.

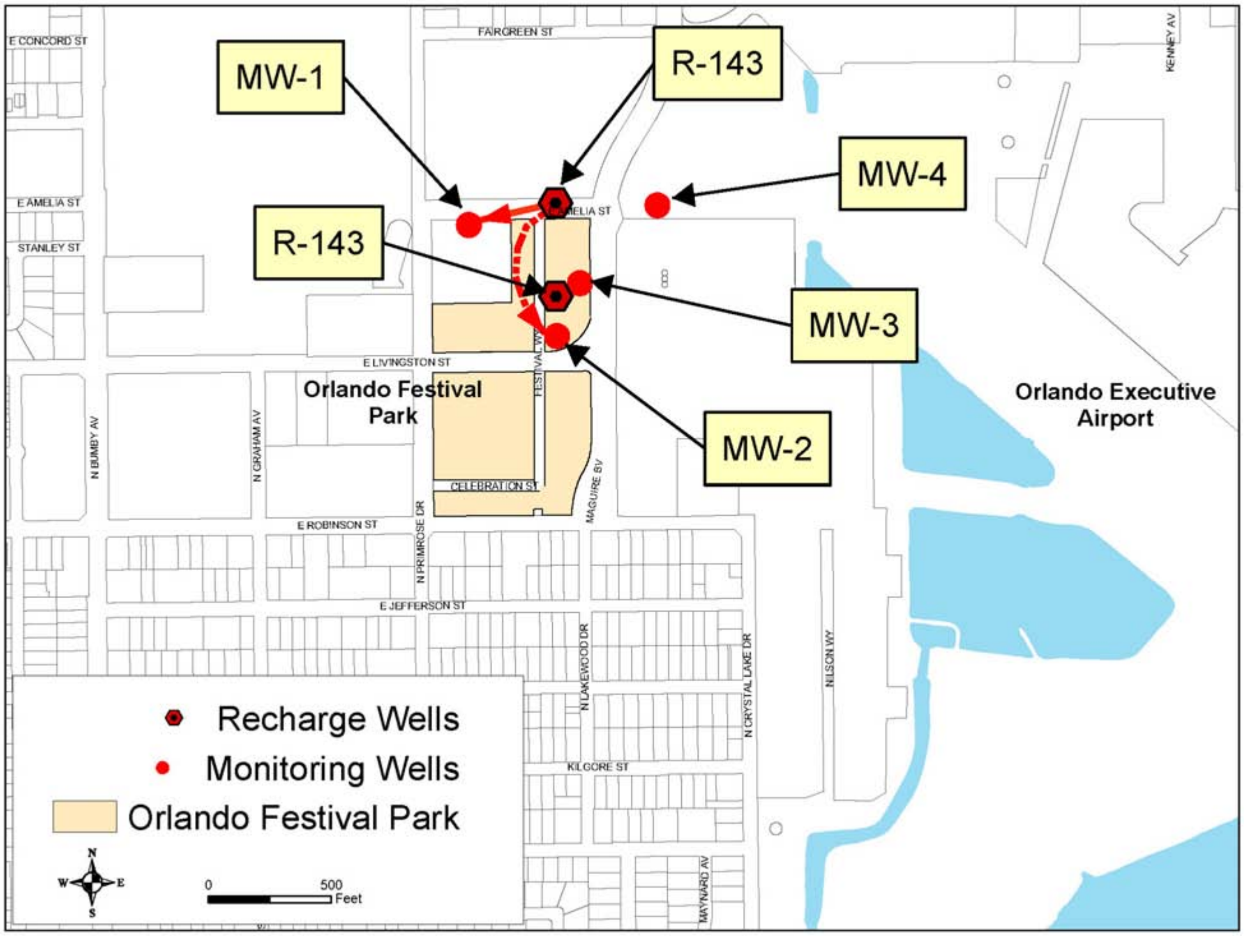


Figure 13. Inferred fluorescein flow at Festival Park

- The strength of the tracer recovery from MW-1 was approximately 200 times greater than the strength of the tracer recovery from MW-2. This suggests that the pathway between R-143 to MW-1 is more robust than the pathway between R-143 and MW-2.
- The greatest amounts of tracer recovery from MW-1 occurred above the bottom of the casing. This suggests upward transport within the casing.
- The greatest amounts of tracer recovery from MW-2 occurred at the sample packs positioned approximately at the bottom of the casing. This

suggests the hydraulic contribution to the well is just below the bottom of the casing, upward transport of tracer, or both.

- Tracer (eosine) from R-40 was not recovered from the four monitoring wells during the 12-week interval of the tracer test. This suggests that the monitoring wells do not individually share flow paths that are common to R-40 with transport times of 12 weeks or less.
- Tracers were not recovered in sample packs placed in MW-3 and MW-4. As such, fluorescein was not detected at the MW-3 and MW-4 during the study.
- Given these results, the sampling plan was modified to sample inflow to R-143 as the site source monitoring location; MW-1 and MW-2 as characterization monitoring locations; MW-4 as the site reference monitoring location. The inflow to R-40 and MW-3 were removed from further sampling.

Appendix E contains laboratory reports for the tracer testing for this site.

CONCLUSION

The tracer tests resulted in verifying that one or more monitoring wells are in hydraulic connection with one or more recharge wells through the Upper Floridan aquifer. Sampling plans for subsequent characterization tasks were modified to focus on monitoring well(s) that are in connection with the recharge well(s), plus one well for each site not in hydraulic connection to monitor site reference conditions. The wells and their functional designations are presented in Table 10.

Table 10. Sampling locations and functional designations for baseline and operational characterization tasks

Site	Source Water Location	Characterization Locations	Reference Location
Lake Orienta	Lake Orienta	MW-2	MW-1
Festival Park	Inflow to R-143	MW-1 and MW-2	MW-4

QA/QC samples were collected for each characterization event for duplicate, matrix spike, and matrix spike duplicate, for all chemical analyses, and trip blank for volatile organic chemicals.

The tracers applied are commonly used in water resource investigations. Material Safety Data Sheets (MSDSs) for each of the tracer compounds in included in Appendix F.

BASELINE CHARACTERIZATION

Baseline task samplings were intended to sample the sites prior to recharging conditions to establish condition at that time. Samples were analyzed for microbiological and chemical parameters. As previously presented in the Analyte List section of this document, the water samples were analyzed for microbial constituents using procedures presented in the GWMP (Status Report 4, Appendix D of Appendix A). . The microbiological parameters were bacteria (total coliform, fecal coliform, *E. coli*, and enterococci), virus (coliphage), and parasites (*Giardia* spp. and *Cryptosporidium* spp.). Chemical analyte groups were field parameter measurements, general chemistry, nutrients, metals, radiologicals, total recoverable petroleum hydrocarbons (TRPH), volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), organochlorine pesticides, polychlorinated biphenyls (PCBs), organophosphorous pesticides, and chlorinated herbicides.

LAKE ORIENTA

Baseline characterization was not performed at Lake Orienta as planned because the City of Altamonte Springs obtained an Emergency Order from FDEP to open the lower inlets to prepare for anticipated high rainfall before planned sampling occurred. The lower inlets to wells S-1514 and S-1515 were opened on June 17, 2005, and remained open through the Operational Characterization task of the investigation. In addition, because recharge through the wells occurs when lake levels are sufficiently high and the lower inlets remained open, rainfall events are not the direct events to trigger recharge. Therefore, rainfall data were not collected.

FESTIVAL PARK

Baseline sampling for Festival Park occurred on May 30, 2003, prior to the beginning of the tracer test. Appendix G presents the Data Quality Evaluation report for Festival Park. Field sampling logs and field notes, as applicable, are presented in Appendix H.

Microbiological Results

The results of the microbial analyses are presented in Table 11. The results are also presented in Appendix B.

Table 11. Results of microbial analyses

Location		R-40	R-143	MW-1	MW-2	MW-3	MW-4	Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
SampleID ==>								
Date Collected ==>		5/28/2003	5/28/2003	5/29/2003	5/29/2003	5/29/2003	5/28/2003	
Organism	**Units**							
Total Coliform	cfu/100 mL	380,000	69,000	20	3.8	<0.2	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average 4 cfu/100 mL - Groundwater criteria
Fecal Coliform	cfu/100 mL	270,000	58,000	20	1.6	<0.2	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	72,000	15,000	5	0.4	<0.2	<0.2	126 cfu/100 mL - Geometric Mean
Enterococcus	cfu/100 mL	6	30	0.2	0.2	<0.2	<0.2	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric Mean
Cryptosporidium	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Giarida	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Coliphage								100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	30	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	80	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	+/RNA	+/DNA	+/DNA	+/RNA	+/RNA	

Notes:

cfu - Colony forming units

pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF
	A “+” indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a “+” with a “<5” pfu/100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value.
	A "-" indicates that the the presence of coliphage was not detected in the sample.

The interpretation of the microbiological results are straight-forward, with the exception of Host Famp+ Enrichment for coliphage. This analysis is a qualitative one; the two overlay methods provide quantitative results. Two designations are present for the results. The "+" indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a "+" with a "<5" pfu/100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value. The "DNA" designation indicates that more of the coliphage were of the DNA type rather than the RNA type, and conversely for the "RNA" designation. RNA phage are more highly correlated with human *E. coli.*
As was presented in the Qualitative Groundwater Tracer Tests section, regarding the tracer test, MW-1 and MW-2 are hydraulically connected to R-143 through the Floridan aquifer. Comparing the results from these three locations shows that total coliform concentrations decrease three to four orders of magnitude from the influent water at R-143 to the groundwater at MW-1 and MW-2.

Chemical Results

With the exception of the detection of several VOCs from several locations at Festival Park and TRPH in the inflow to the recharge wells at the site, no other synthetic organic chemicals were positively detected from samples collected. The results are presented in Appendix B.

Inorganic Chemicals

Many of the inorganic chemicals were detected from the water samples taken during the baseline characterization, and are presented in Appendix B. While descriptions are not specifically presented here, selected chemicals are included in the geochemical and microbial analyses of the data presented later in this report. The following inorganic chemicals were positively detected at concentrations greater than drinking water standards (DWS) during the baseline characterization at Festival Park:

- Iron was detected from the inflow to R-40 and R-143 at 496 µg/L and 448 µg/L, respectively. The DWS for iron is 300 µg/L.
- Arsenic was detected in MW-1 and MW-2 at 10.5 µg/L and 19.4 µg/L, respectively. The DWS for arsenic is 10 µg/L. On January 1, 2005, the DWS for arsenic was changed from 50 µg/L to 10 µg/L.

Volatile Organic Chemicals

The following VOCs were positively detected during the baseline characterization at Festival Park:

- Cis-1,2-dichloroethylene at 2.3 µg/L and 2.4 µg/L from MW-2 and MW-3, respectively. The DWS is 70 µg/L.
- 1,1-dichloroethane at 1.1 µg/L and 1.2 µg/L from MW-1 and MW-2, respectively. The groundwater cleanup target level (GCTL) is 700 µg/L.
- 1,1-dichloroethene at 1.4 µg/L. The DWS is 7 µg/L.

Total Recoverable Petroleum Hydrocarbons

TRPH was positively detected from the inflow to R-40 and R-143 at 0.43 mg/L and 0.49 mg/L, respectively. The GCTL is 5 mg/L.

OPERATIONAL CHARACTERIZATION

The operational characterization task was to evaluate aquifer conditions for temporal changes of quality to recharging conditions. Eight operational characterization samplings were conducted at Lake Orienta while the lower inlets were open and the wells were receiving water throughout the period. Six operational characterization samplings were conducted at Festival Park under two conditions: four samplings during the fall of 2003, at the end of the rainy season, and two samplings in February 2004. Consistent with the modified sampling approach that resulted from the tracer test, the February samplings at Festival Park were in response to three relatively isolated rainfall events in the dry season that occurred during the last week of January 2004, see Figure 10. The water samples were analyzed for chemical constituents using the procedures consistent with the analyte group method numbers presented in the Analyte List section of this document. The water samples were analyzed for microbial constituents using procedures presented in the GWMP (Status Report 4, Appendix D of Appendix A).

LAKE ORIENTA

Eight operational characterization samples were collected from the Lake Orienta site from July through December 2005. The specific schedule of events follows.

Event 1 – July 12-13, 2005
Event 2 – July 20-21, 2005
Event 3 – July 27-28, 2005
Event 4 – August 8-9, 2005
Event 5 – September 7-8, 2005
Event 6 – October 5, 2005
Event 7 – October 31, 2005
Event 8 – December 5, 2005

The microbial and chemical results are fully presented in Appendix B. Field sampling logs and field notes, as applicable, are presented in Appendix H.

Microbial Results

The water samples were analyzed for several microorganisms within three classifications: bacteria, virus, and parasites:

- Bacteria – total coliform, fecal coliform, *E. coli*, and enterococci

- Virus – coliphage
- Parasites - *Giardia* spp. and *Cryptosporidium* spp.

Surface Water Sampling Results. Comparison of the surface water microbial concentrations to Florida Class III Surface Water criteria for parameters that criteria are established reveals the following:

- **Total Coliform** – The maximum total coliform concentration [1400 colony forming units per 100 milliliters (cfu / 100 mL)] exceeded the criterion (1000 cfu / 100 mL) from one sample that was collected September 7, 2005. The average of the results was 378 cfu / 100 mL, which is below the criterion of 400 cfu / 100 mL.
- **Fecal Coliform** –The maximum fecal coliform concentration (833 cfu / 100 mL) exceeded the criterion (800 cfu / 100 mL) from one sample that was collected September 7, 2005. The geometric mean of the results was 122 cfu / 100 mL, which is below the criterion of 200 cfu / 100 mL.
- ***E. coli*** –The geometric mean of the results for *E. coli* was 43.3 cfu / 100 mL, which is below the criterion of 126 cfu / 100 mL.
- **Coliphage** – No detections of coliphage were reported.
- **Giardia** – No detections of *Giardia* spp. were reported.
- **Cryptosporidium** - *Cryptosporidium* spp. was detected from the September 7 and October 6, 2005, samples of the lake water. One organism with internal features was detected from these two sampling events with equivalent concentrations of 7.9 and 13.2 pfu / 100 mL, respectively. The organism is encapsulated in a coating; the coating may be present with or without viable organism inside. The designation of “internal features” means that viable organism was encountered.

Groundwater Sampling Results. Comparison of the groundwater microbial concentrations to Florida groundwater criteria for parameters for which criteria are established reveals:

- **Total Coliform** – The maximum total coliform concentration exceeded the groundwater criterion (4 cfu / 100 mL) from two samples: 7.7 cfu / 100 mL collected on October 6, 2005 and 60 cfu / 100 mL collected on December 5, 2005.
- **Fecal Coliform** –The maximum fecal coliform concentration (833 cfu / 100 mL) exceeded the criterion (800 cfu / 100 mL) from one sample that was collected September 7, 2005.

- ***E. coli*** – No detections of *E. coli* in the groundwater samples were reported.
- **Coliphage** – No detections of coliphage in the groundwater samples were reported.
- **Giardia** – No detections of *Giardia spp*. in the groundwater samples were reported.
- **Cryptosporidium -** No detections of *Cryptosporidium spp*. in the groundwater samples were reported.

There is qualification of the fecal coliform sample results from Event 1 that is associated with the receipt temperature of the samples at the laboratory. After discussion with the laboratory personnel, it was determined that amount of ice packed in the coolers was insufficient relative to the amount of water sample to chill and maintain sample temperature. During subsequent sampling events, more coolers were used to ship the samples increasing the relative amount of ice per sample to pack the coolers.

Resulting from this, reductions of bacteria concentrations from the lake to the monitoring wells are observed. The range of bacteria concentrations from samples collected at Lake Orienta is presented in Table 12.

Table 12. Range of bacteria concentrations at Lake Orienta

		Lake Source		MW-2 Characterization		MW-1 Reference	
Organism	Units	Low	High	Low	High	Low	High
Total Coliform	cfu/100 mL	27	1,400	<0.09	60	<0.09	7.7
Fecal Coliform	cfu/100 mL	32	833	<0.09	0.09	<0.09	0.65
E. coli	cfu/100 mL	15	167	<0.09	0.09	<0.09	<3
Enterococcus	cfu/100 mL	2.7	36,000	0.19	0.83	<0.09	0.37

Chemical Results

Synthetic Organic Chemicals – No analytes were positively detected for the parameter groups of volatile organic compounds, semi-volatile organic compounds, organochlorine pesticides, organophosphorous pesticides, PCBs, and chlorinated herbicides using EPA SW-846 methods. These nondetections will not be presented further.

Inorganic Chemicals – Many of the inorganic chemicals were detected from the water samples taken during the baseline characterization (Appendix B). While descriptions are not specifically presented here, selected chemicals are included in the geochemical and microbial analyses of the data presented later in this report. The following inorganic chemicals were positively detected at concentrations greater than DWS during the baseline characterization at Lake Orienta:

- **Aluminum** – No positive detection resulted from the analyses of the 16 groundwater samples. Five positive detections resulted from the analyses of the surface water samples. There is no surface water criterion for aluminum. One of five positive detections [277 micrograms per liter (µg/L)] exceeded the Secondary DWS for groundwater (200 µg/L).
- **Arsenic** –Ten of 12 positive detections from groundwater samples exceeded the DWS of 10 µg/L for arsenic. The range of concentrations was 8.16 to 17.1 µg/L. Twelve of 12 positive detections from the groundwater samples exceeded the RBC for arsenic of 0.045 µg/L.

One positive detection for arsenic resulted from the eight surface water samples. The concentration was 7.03 µg/L, which is below the Class III Surface Water criterion for fresh surface water, 50 µg/L. The occurrence of arsenic from the one lake water sample may have resulted from leaching of the wood preservative used in dock construction.

- **Iron** – Of the 16 normal groundwater samples collected from the Lake Orienta site, two resulted in positive detections for iron. Both of those concentrations were less than the DWS of 300 µg/L.
- **Selenium** – Of the 16 normal groundwater samples, two positive detections resulted for selenium. The range of concentrations was 23.8 to 27.3 µg/L. The regulatory criterion of 50 µg/L was not exceeded. The RBC of 18 µg/L was exceeded.

The most pertinent result of this project is the presence of arsenic in the groundwater at concentrations that exceed the Drinking Water Standard (DWS) (10 µg/L), when it was infrequently (1 of 8 samples) detected in the source water. A summary of the results of influent water and groundwater analyses for arsenic is presented in Table 13. One of eight samples of the surface water at Lake Orienta resulted in the positive detection of arsenic.

Table 13. Range of arsenic concentrations at Lake Orienta

	Purpose	Source		Characterization		Reference	
	Location	Lake		MW-2		MW-1	
Parameter	Units	Low	High	Low	High	Low	High
Arsenic	µg/L	nd	7.03	8.88	17.2	8.16	15.3

Color –The DWS for color is 15 Color Units (CU). The range of color measurements for the lake samples from Lake Orienta was 40 to 60 CU. The range of color measurements was 10 to 25 CU from MW-1, with one of eight samples below the DWS. The range of color measurements was 15 to 25 CU from MW-2.

FESTIVAL PARK

Six operational characterization samplings were conducted from the Festival Park site during the period of October 2003, through February 2004, and split into four wet season samplings and 2 dry season samplings that were triggered by a rainfall event of approximately 1 in. or greater in 24 hours during the dry season. The relationship of the samplings to rainfall recorded at Orlando Executive Airport was previously presented in Figure 10.

- 4 wet season samplings

  Sampling Event 1 - October 1-3, 2003
  Sampling Event 2 - October 8-10, 2003
  Sampling Event 3 - October 22-24, 2003
  Sampling Event 4 - November 18-20, 2003

- 2 dry season samplings

  Sampling Event 5 - February 4-6, 2004
  Sampling Event 6 - February 16-18, 2004

The results of the sample analyses are summarized below. The results are fully presented relative to detections and DWS values in Appendix B. Field sampling logs and field notes, as applicable, are presented in Appendix H.

Microbial Results

The water samples were analyzed for several microorganisms within three classifications: bacteria, virus, and parasites:

- Bacteria – total coliform, fecal coliform, *E. coli*, and enterococci
- Virus – coliphage
- Parasites - *Giardia* spp. and *Cryptosporidium* spp.

The microbial and chemical results for the operational characterization task are fully presented in Appendix B. Field sampling logs and field notes, as applicable, are presented in Appendix H.

Surface Water Sampling Results. A comparison of the surface water microbial concentrations to Florida Class III Surface Water criteria is presented in Table 14.

Table 14. Range of bacteria concentrations at Festival Park

	Purpose	Source		Characterization				Reference	
	Well	R-143		MW-1		MW-2		MW-4	
Organism	Units	Low	High	Low	High	Low	High	Low	High
Total Coliform	cfu/100 mL	990	1,000,000	<0.2	7.4	<0.2	474	<0.2	5.5
Fecal Coliform	cfu/100 mL	860	980,000	<0.2	5.9	<0.2	585	<0.2	5.3
E. coli	cfu/100 mL	180	2,400	<0.2	2.3	<0.2	1.52	<0.2	<0.2
Enterococcus	cfu/100 mL	69	3,400	<0.2	23	<0.2	3.16	<0.2	13

Chemical Results

Synthetic Organic Chemicals – Positive detections of synthetic organic chemicals occurred from two sampling locations from the six Operational Characterization samplings. These detections were in low concentrations and below DWS values. The chemicals, locations and potential sources relative to Festival Park are listed below. The complete list of sample analysis results for Festival Park is presented in Appendix B.

<u>R-143 (stormwater)</u>

- Total Recoverable Petroleum Hydrocarbons: = 0.82 mg/L, two of six events (oil, grease, fuel from automobile traffic; no DWS)

- Tetrachloroethene (PCE): 1.1 µg/L, five of six events (dry cleaning fluid, industrial solvent; DWS=3 µg/L)

- Trichloroethene (TCE): < 0.32J µg/L, four of six events (industrial solvent and product of reductive dechlorination of PCE; DWS=3 µg/L)

- cis-1,2-Dichloroethene (cis-1,2-DCE): 2.9 µg/L, five of six events (product of reductive dechlorination of PCE and TCE; DWS=70µg/L)
- 1,1 DCE: 0.96J µg/L, three of six events (component of flexible plastic food wrap and flame retardant fabrics, and in piping, coating for steel pipes, and adhesives; DWS=7 µg/L)
- 1,2 Dichlorobenzene: 0.52J µg/L, one of six events (chemical intermediate for making agricultural chemicals, primarily herbicides; DWS=600 µg/L)
- Toluene: < 0.7J µg/L, four of six events (component of gasoline; DWS=1,000 µg/L)

MW-2 (groundwater)

- cis-1,2-DCE: 4.5 µg/L, six of six events (product of reductive dechlorination of PCE and TCE; DWS=70µg/L)
- 1,1-Dichloroethane (DCA): 2.5 µg/L, six of six events (component of degreasing agents, and paint, varnish and finish removers; no DWS)

Inorganic Chemicals – Many of the inorganic chemicals were detected from the water samples taken during the baseline characterization, and are presented in Appendix B. While descriptions are not specifically presented here, selected chemicals are included in the geochemical and microbial analyses of the data presented later in this report. The following inorganic chemicals were positively detected at concentrations greater than DWS during the baseline characterization at Festival Park:

- **Aluminum** – Aluminum in the Sampling Event 2 sample from MW-4 exceeded the secondary standard of 200 micrograms per liter (µg/L). Iron, in every instance, and aluminum from one sample from the recharge water at R-143 exceeded their respective standards.
- **Arsenic** – The most pertinent result of this project is the presence of arsenic in the groundwater at concentrations that exceed the revised DWS (10 µg/L), when it was not present in the source water. Summaries of the results of influent water and groundwater analyses for arsenic are presented in Table 15. None of the seven samples from the inflow to R-143 at Festival Park resulted in positive detection of arsenic. None of the seven samples from the site reference well (MW-4) at Festival Park resulted in positive detection of arsenic. Thirteen of 14 groundwater samples from the two characterization wells at Festival Park resulted in positive detections

of arsenic, with five of those detections resulting in concentrations that exceeded the DWS.

Table 15. Range of arsenic concentrations at Festival Park

Range of Arsenic Concentrations of Floridan Aquifer Water at Festival Park

	Purpose	Source		Characterization				Reference	
	Well	R-143		MW-1		MW-2		MW-4	
Parameter	Units	Low	High	Low	High	Low	High	Low	High
Arsenic	µg/L	nd	nd	6.0	9.39	nd	19.4	nd	nd

nd – not detected

Color – The range of color measurements for the inflow to R-143 at Festival Park was 20 to 25 CU from the seven samples (one Baseline Characterization and seven Operational Characterization Task samples). R-40 was sampled once during the Baseline Characterization task with a result of 20 CU. The results of the color measurements from MW-1 were less than or equal to 15 CU for the seven samplings, with one sample result of 15 CU. The results of the color measurements from MW-2 were less than or equal to 15 CU for the seven samplings, with two sample results of 15 CU. The results of the color measurements from MW-4 were less than or equal to 15 CU for the seven samplings, with two sample results of 15 CU.

ANALYSIS AND DISCUSSION

One baseline characterization sample and six operational characterization samples were collected from the Festival Park site. The opportunity to collect a baseline characterization sample set at Lake Orienta was missed because the City of Altamonte Springs received an Emergency Order from FDEP to operate the lower inlets of the wells before the characterization sampling could occur. The City applied for and received the order to be prepared for stormwater management volume in anticipation of a more active than usual hurricane season. As a result, zero baseline characterization samples and eight operational characterization samples were collected from the Lake Orienta site.

The differing flow characteristics (more ephemeral at Festival Park versus more seasonal and steady at Lake Orienta) between the sites and the groundwater travel times for both sites will be considered when comparing the results of the characterization samplings.

MICROBIOLOGICAL RESULTS AND COMPARISON OF SITES

The microbiological parameters were bacteria (total coliform, fecal coliform, *E. coli*, and enterococci), virus (coliphage), and parasites (*Giardia* spp. and *Cryptosporidium* spp.). Coliphage (virus that attacks coliform bacteria) were not detected in the samples at either site and will not be presented further. *Giardia* were not detected in the samples from either site and will not be presented further. *Cryptosporidium* was detected in one lake sample from Lake Orienta at 1 (oo)cyst per 100 mL and will not be presented further.

The range of bacteria concentrations of the influent water at the two sites are presented in Table 16 and the range of bacteria concentrations in the groundwater from the characterization monitoring wells from the two sites are presented in Table 17.

Table 16. Range of bacteria concentrations of source water

Organism	Units	Festival Park Inflow to R-143 Low	Festival Park Inflow to R-143 High	Lake Orienta Low	Lake Orienta High
Total Coliform	cfu/100 mL	990	1,000,000	27	1,400
Fecal Coliform	cfu/100 mL	860	980,000	32	833
E. coli	cfu/100 mL	180	2,400	15	167
Enterococcus	cfu/100 mL	69	3,400	2.7	36,000

Festival Park - 1 Baseline characterization and 6 Operational Characterization sample sets
Lake Orienta - 0 Baseline characterization and 8 Operational Characterization sample sets

Table 17. Range of bacteria concentrations of Floridan aquifer water

	Location	Festival Park						Lake Orienta			
	Purpose	Characterization				Reference		Characterization		Reference	
	Well	MW-1		MW-2		MW-4		MW-2		MW-1	
Organism	Units	Low	High	Low	High	Low	High	Low	High	Low	High
Total Coliform	cfu/100 mL	<0.2	7.4	<0.2	474	<0.2	5.5	<0.09	60	<0.09	7.7
Fecal Coliform	cfu/100 mL	<0.2	5.9	<0.2	585	<0.2	5.3	<0.09	0.09	<0.09	0.65
E. coli	cfu/100 mL	<0.2	2.3	<0.2	1.52	<0.2	<0.2	<0.09	0.09	<0.09	<3
Enterococcus	cfu/100 mL	<0.2	23	<0.2	3.16	<0.2	13	0.19	0.83	<0.09	0.37

Festival Park - 1 Baseline characterization and 6 Operational Characterization sample sets
Lake Orienta - 1 Baseline characterization and 7 Operational Characterization sample sets

Summary of Comparison of Microbial Results

Inspection of the tables provides the following conclusions:

- Concentrations of bacteria measured from the influent to R-143 at Festival Park were significantly higher than measured from Lake Orienta water.
- At both sites, comparison of the values indicates that groundwater concentrations are at least two orders-of-magnitude lower and up to six orders-of-magnitude lower than the source waters.
- For Festival Park, the concentrations for the reference sampling location (MW-4) compare well with the lesser of the two characterization sampling locations (MW-1); and for Lake Orienta the concentrations for the reference sampling location (MW-1) compare well with the characterization sampling location (MW-2), but to a lesser degree. This indicates that the groundwater is impacted more broadly than the results

of the tracer test would indicate. This is expected considering the long period of recharge operation at the sites.

CHEMICAL RESULTS

Chemical analyte groups were field parameter measurements, general chemistry, nutrients, metals, radiologicals, TRPH, VOCs, SVOCs, organochlorine pesticides, PCBs, organophosphorous pesticides, and chlorinated herbicides. With the exception of the detection of several VOCs from several locations at Festival Park and of TRPH at one location at Festival Park, no other synthetic organic chemicals were positively detected from samples collected at either site. These nondetections will not be presented further.

Volatile Organic Chemicals

The following VOCs were positively detected during the different tasks of this project:

- Lake Sherwood recharge well during the dry-period characterization
  - Methyl ethyl ketone at 160 µg/L. The Groundwater Cleanup Target Level (GCTL) is 4200 µg/L.
- Festival Park during the baseline characterization
  - Cis-1,2-dichloroethylene at 2.3 µg/L and 2.4 µg/L from MW-2 and MW-3, respectively. The DWS is 70 µg/L.
  - 1,1-dichloroethane at 1.1 µg/L and 1.2 µg/L from MW-1 and MW-2, respectively. The GCTL is 700 µg/L.
  - 1,1-dichloroethene at 1.4 µg/L. The DWS is 7 µg/L.
- Festival Park during the operational characterization
  - Cis-1,2-dichloroethylene at three detections between 1.1 and 2.9 µg/L from inflow to R-143, and six detections between 3.5 and 4.5 µg/L from MW-2. The DWS is 70 µg/L.
  - 1,1-dichloroethane at six detections between 2.1 and 2.5 µg/L from MW-2. The GCTL is 700 µg/L.
  - Tetrachloroethylene at 1.1 µg/L from inflow to R-143. The DWS is 3 µg/L.

Total Recoverable Petroleum Hydrocarbons

TRPH was positively detected twice from the inflow to R-143 at 0.82 mg/L. The GCTL is 5 mg/L.

Arsenic

The most pertinent result of this project is the presence of arsenic in the groundwater at concentrations that exceed the Drinking Water Standard (10 µg/L), when it was not present in the source water. Summaries of the results of influent water and groundwater analyses for arsenic are presented in Tables 18 and 19.

For the Festival Park site, none of the seven samples from the inflow to R-143 at Festival Park resulted in positive detection of arsenic. Thirteen of fourteen groundwater samples from the characterization wells resulted in positive detections of arsenic. None of the eight groundwater samples from site reference well (MW-4) resulted in positive detections of arsenic.

For the Lake Orienta site, one of eight samples of the surface water at Lake Orienta resulted in the positive detection of arsenic that was below the revised DWS. Five of the eight samples from the characterization well (MW-2) resulted in positive detections; four of those were greater than the revised DWS. Seven of the eight groundwater samples from site reference well (MW-1) resulted in positive detections of arsenic. The concentrations of six of these samples exceeded the revised DWS.

Table 18. Range of arsenic concentrations of influent water

		Festival Park Inflow to R-143		Lake Orienta	
Parameter	Units	Low	High	Low	High
Arsenic	µg/L	nd	nd	nd	7.03

nd – not detected

Table 19. Range of arsenic concentrations of Floridan aquifer water

	Location	Festival Park						Lake Orienta			
	Purpose	Characterization				Reference		Characterization		Reference	
	Well	MW-1		MW-2		MW-4		MW-2		MW-1	
Parameter	Units	Low	High	Low	High	Low	High	Low	High	Low	High
Arsenic	µg/L	6.0	9.39	nd	19.4	nd	nd	8.88	17.2	8.16	15.3

nd – not detected

Color

Color is an indication of the presence of naturally occurring organic acids in water and highly colored water is typical of surface waters in central Florida. The effect of color relative to water treatment is that it renders some disinfection processes less effective and the organic acids can be converted to deleterious chemicals when chlorine is the disinfectant. These are referred to as disinfection byproducts that have promulgated regulatory criteria.

Color was identified in the water of Lake Orienta, which was expected, and there was a high occurrence of color greater than the DWS in the monitoring wells.

Color was identified in the recharge water at Festival Park at concentrations generally greater than the DWS, but lower than the measurement results from Lake Orienta. Correspondingly, there was lower frequency and concentration of occurrence of color in the groundwater from the Festival Park monitoring wells, relative to the Lake Orienta results.

Summary of Comparison of Chemical Results

These observations indicate that the recharge of surface water to the Upper Floridan aquifer at these two sites results in the increase of arsenic concentrations in the groundwater. This has been a recent topic in aquifer storage and recovery systems where a similar phenomenon has been observed. Research is being conducted on the cause and effect relationship between recharge of treated, partially treated, and untreated water to the Upper Floridan aquifer at various locations in Florida.

GEOCHEMICAL EVALUATION OF CHARACTERIZATION RESULTS

Further evaluation of the chemical data for geochemical considerations was provided by Lisle (2006) and Mirecki (2006) (Appendices I and J). Summaries of the results of the evaluations for each site are presented below. The reports presented in the referenced appendices provide a more thorough explanation of the methodologies, results, and conclusions.

Lake Orienta Evaluation

The Lake Orienta geochemical evaluation and the ensuing microbial evaluation were based on the following aquifer flowpath hypotheses:

- Lake Orienta through the recharge wells is hydraulically connected to MW-2, but not MW-1.
- MW-2 is not hydraulically connected to MW-1.
- MW-1 represents site reference conditions.

Lisle (2006) investigated the correlation of the chemical, nutrient, and physical results based on the combination of flowpath endpoints, and reported:

> *The lake data are significantly correlated with chloride, water color, dissolved phosphate and turbidity data from MW-1 and MW-2. These positive correlations suggest that perhaps the flow path between the Lake Orienta inlet and MW-2 is not as isolated, in regard to MW-1, as previously assumed. The relatively high number of correlated data sets (9 of 13 or 69.2%) between MW-1 and MW-2 supports this hypothesis. Additionally, those parameters that would be considered possible conservative tracers (i.e., chloride, color, turbidity) were all positively and significantly correlated between MW-1 and MW-2. As with MW-4 at the Festival Park site, if MW-1 at the Lake Orienta site is to be used as the "native control" further investigation into the hydrogeology of this site may be necessary.*

The flowpath analysis was also evaluated by Mirecki (2006) for geochemical trends. Mirecki reports the following from analysis of the Lake Orienta data:

- *Statistically significant increases in bicarbonate alkalinity and calcium concentrations in all down-gradient wells.*
- *Statistically significant increases in arsenic, total and ortho-phosphorus, and ammonia nitrogen concentrations.*
- *Increased (but only weakly significant) concentrations of magnesium in all down-gradient wells.*
- *Lower sodium, chloride, and sulfate in MW-1 samples compared to MW-2*

- *Statistically significant decreased concentrations of aluminum, barium, manganese, sodium, total nitrogen and total Kjeldahl nitrogen in MW-1 and MW-2*
- *Statistically significant decreased concentrations of total and dissolved organic carbon (TOC, DOC) in MW-1 and MW-2*
- *More reducing redox environment, characterized by more negative ORP values and diminished dissolved oxygen concentration in MW-1 and MW-2.*
- *No statistically significant changes in cadmium, chromium, cobalt, copper, iron, lead, mercury, nickel, potassium, selenium, vanadium, and zinc concentrations along the flowpath.*

Water-quality changes along the short Lake Orienta flowpath to MW-2 are affected primarily by limestone dissolution and microbial-redox reactions. These controls on water-quality are not clearly evident when lake samples are compared to MW-1 samples. Concentrations of sodium, chloride, and sulfate are lower in MW-1 compared to Lake Orienta and MW-2 samples. Because these constituents behave conservatively, it is not possible to simulate water-quality changes without invoking halite and gypsum precipitation along the flowpath between Lake Orienta and MW-1. For reasons discussed below, this is unlikely. Therefore, it appears that MW-1 samples do not reflect water-quality changes along a flowpath that extends from Lake Orienta. The dominant geochemical reactions that control water-quality changes along the Lake Orienta flowpath ending MW-2 are:

- *Dissolution of calcium carbonate and possibly gypsum/ anhydrite*
- *Microbe-mediated oxidation of organic carbon with increasing alkalinity*
- *Increased ammonia (NH_4^+) from rain or microbe-mediated nitrogen fixation*
- *Minor pyrite oxidation, sometimes coupled with precipitation of iron oxyhydroxide*

Figure 14 shows the median concentrations and the maxima of field parameters and inorganic constituents from surface-water inflow samples (lake), and groundwater samples from MW-1 and MW- at Lake Orienta.

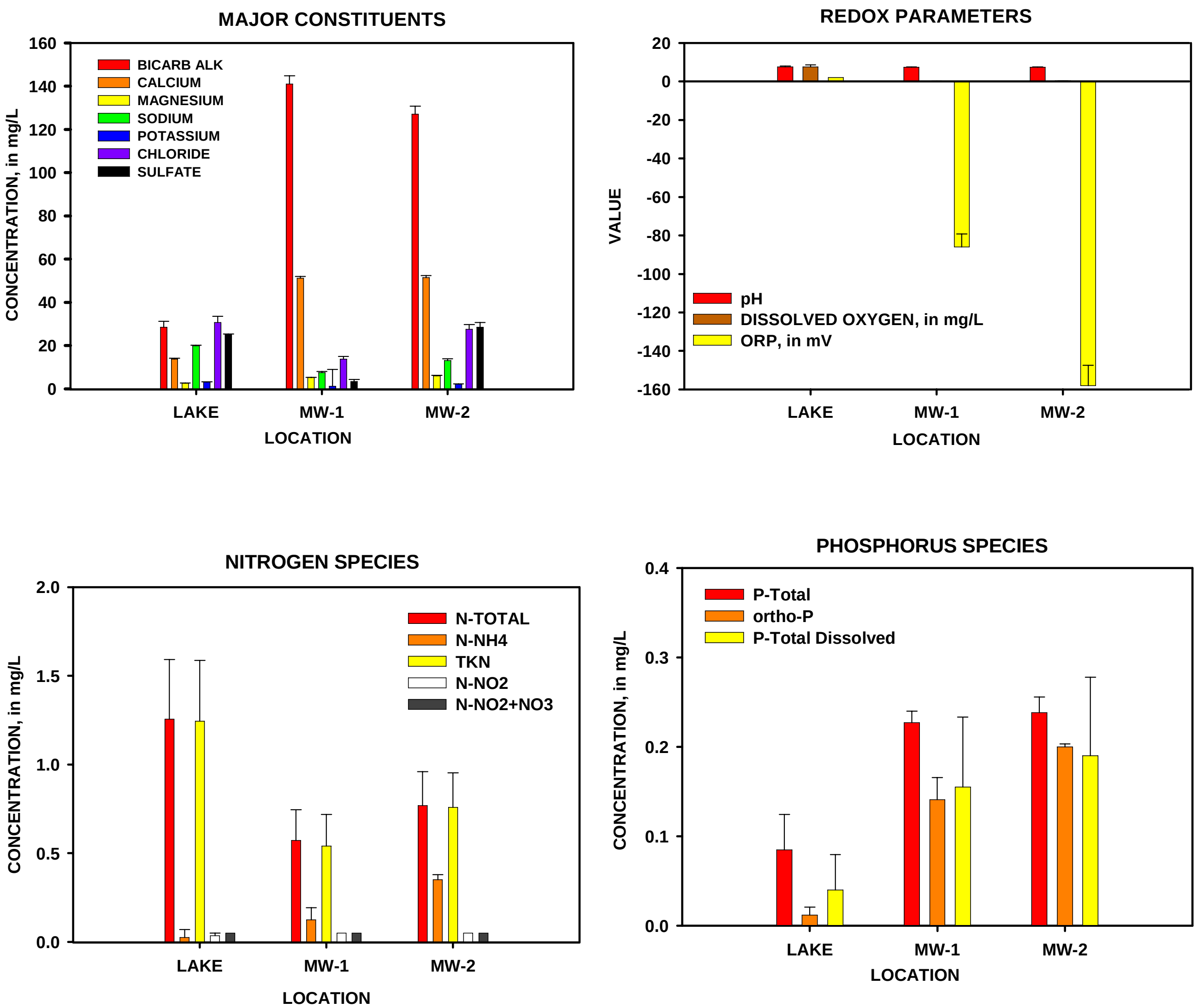


Figure 14. Median concentrations of field parameters and inorganic constituents Lake Orienta (Mirecki 2006)

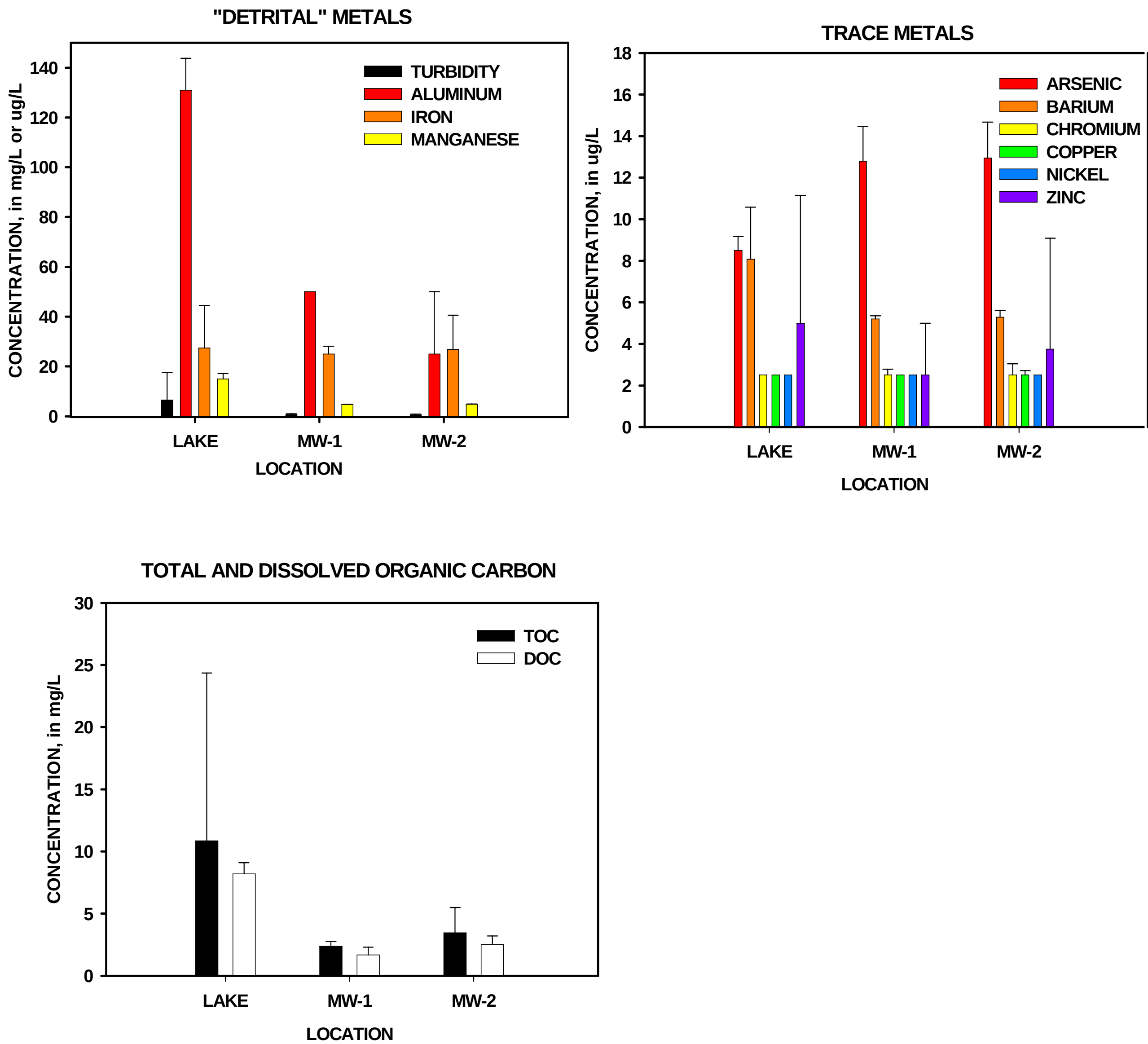


Figure 14 continued. Median concentrations of field parameters and inorganic constituents Lake Orienta (Mirecki 2006)

Festival Park Evaluation

The Festival Park geochemical evaluation and the ensuing microbial evaluation were based on the following aquifer flowpath hypotheses:

- R-143 is hydraulically connected to MW-1 and MW-2, but not MW-4.
- MW-1 and MW-2 are not hydraulically connected to MW-4

- MW-4 represents site reference conditions.

Lisle (2006) investigated the correlation of the chemical, nutrient, and physical results based on the combination of flowpath endpoints, and reported:

> *Evaluating the statistically significant correlation coefficients for the Festival Park chemical, nutrient and physical data, from the perspective of the hypotheses stated previously, increases in concentrations of organic phosphate, ortho-phosphate, sulfates, total nitrogen species and total organic carbon at the inlet also occur at MW-4. Also, the fluctuations in water color data, which could be used as a conservative tracer, from all of the monitoring wells at the Festival Park site are positively correlated. Additionally, the calcium, water color, total phosphate, total nitrogen, total organic carbon and turbidity data from MW-1 and MW-4 are positively correlated. Collectively, these data indicate that MW-4 may not be as isolated from R143, MW-1 and MW-2 as previously assumed. These associations may be positively influenced by the relatively greater flow rate between R143 and MW-1 as MW-1 and MW-4 have several parameters that are positively correlated. However, an additional hydraulic connection to the aquifer zone from which MW-4 extracts water cannot be ruled out. If MW-4 is to be used as a "native control" for this zone within the aquifer, further investigation into the hydrogeology of this site may be warranted.*

Lisle (2006) reports that the water quality data from Festival Park cluster in discrete zones from factor analysis. This suggests that water quality trends and the relative relationships between the sampling points remain similar in the dataset. The data from Lake Orienta collect in clusters for each sampling location, but in trends and not in discrete zones like the Festival Park data. This suggests that water quality trends shift but the relative relationships between the sampling points remain similar in the data set.

Figure 15 shows the median concentrations of field parameters and inorganic constituents from surface-water inflow samples (R-143), and groundwater samples from MW-1, MW-2, and MW-4 at Festival Park. Mirecki (2006) reports the following from analysis of the Festival Park data:

> *Water-quality changes occur as surface water recharge (or inflow) flows down-gradient toward MW-1, MW-2. The ground-water flowpath begins at the point of inflow, and extends to MW-1 and MW-2. Based on tracer test data, MW-4 does not sample this flowpath, and may represent site reference conditions in the Upper Floridan aquifer. As such, water-quality data from MW-4 appears not influenced by surface water, and is consistent with the results of the groundwater tracer test. Bar graphs comparing all dissolved constituents along the flowpath*

are shown in Figure 10-1. Water-quality evolution along the flowpath is interpreted from bar graphs in Figure 10-1 and is summarized below.

- Statistically significant increases in calcium carbonate saturation, marked by increased bicarbonate alkalinity, calcium, and magnesium concentrations in all downgradient wells.
- Increased (but only weakly significant) concentrations of sodium, potassium, and sulfate in all downgradient wells.
- Increased (but only weakly significant) concentrations of arsenic and barium in downgradient wells MW-1 and MW-2. MW-4 does not show significant increases of these two constituents.
- Decreased (but only weakly significant) concentrations of iron, manganese, zinc, and dissolved organic carbon (DOC) in all downgradient wells.
- More reducing redox environment in the groundwater, characterized by more negative ORP values and diminished dissolved oxygen concentration in the wells. Water quality at MW-4 indicates the most extensive reducing environment.
- No statistically significant changes in nutrients (nitrogen and phosphorus species), aluminum, cadmium, cobalt, copper, lead, mercury, nickel, and vanadium concentrations along the flowpath.
- No statistically significant changes in total organic carbon (TOC) concentrations along the flowpath.

Water-quality changes along the Festival Park flowpath are affected by mixing of runoff constituents, microbial activity, and water-rock interactions. Inverse geochemical modeling methods can define and quantify the mass transfer values that result from dominant reactions along the flowpath.

The dominant reactions are listed below:

- $CaCO_3$ saturation after limited $CaCO_3$ dissolution and microbial oxidation of TOC / DOC
- Gypsum / anhydrite dissolution resulting in increased sulfate and decreased DOC in MW-1 and MW-2
- Microbial sulfate reduction resulting in low sulfate and negative ORP in MW-4

- Pyrite oxidation resulting in release of arsenic and possibly other trace elements
- Iron oxyhydroxide precipitation
- Mixing of barium-rich inflow with native aquifer waters along the flowpath

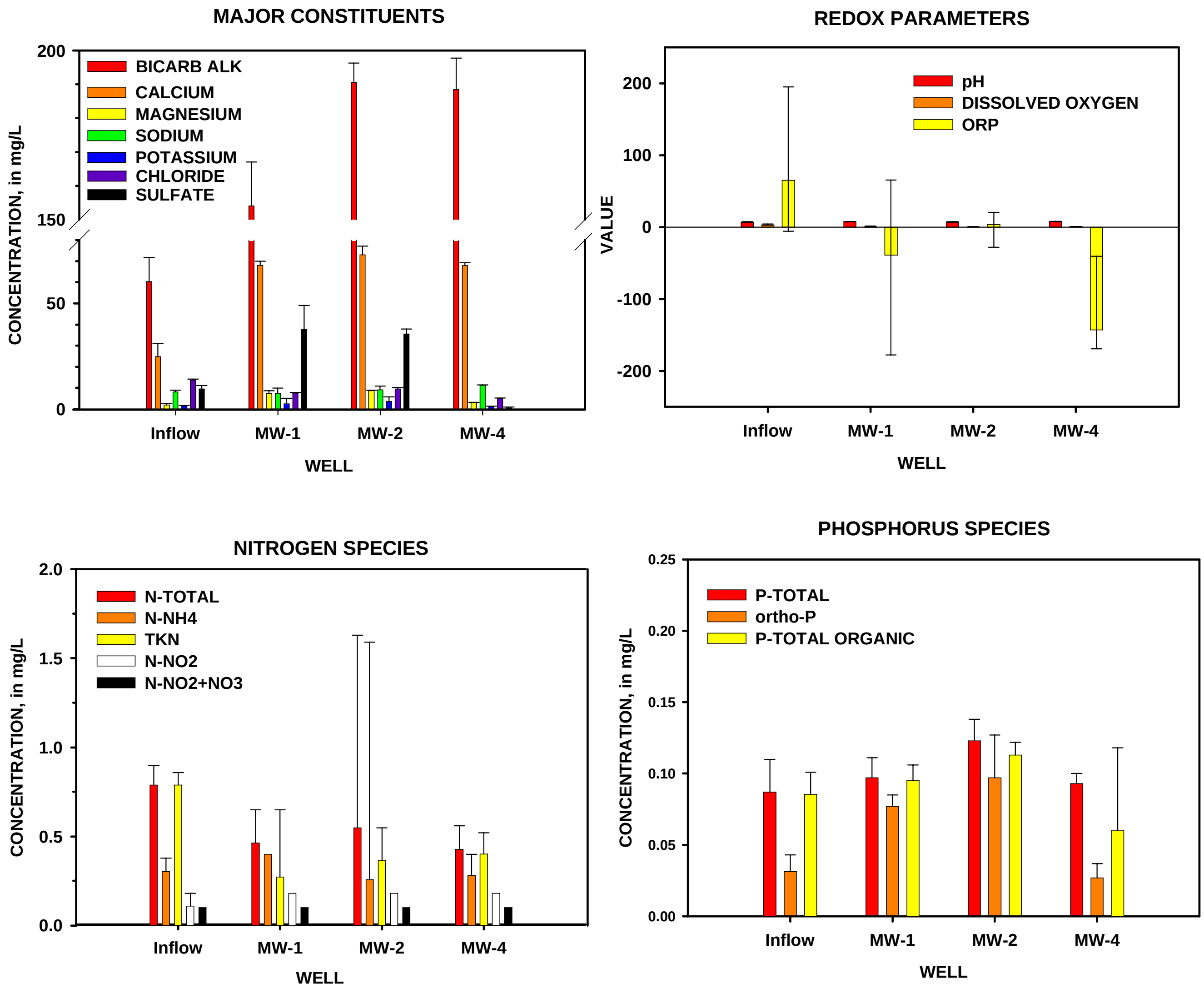


Figure 15. Median concentrations of field parameters and inorganic constituents Festival Park (Mirecki 2006)

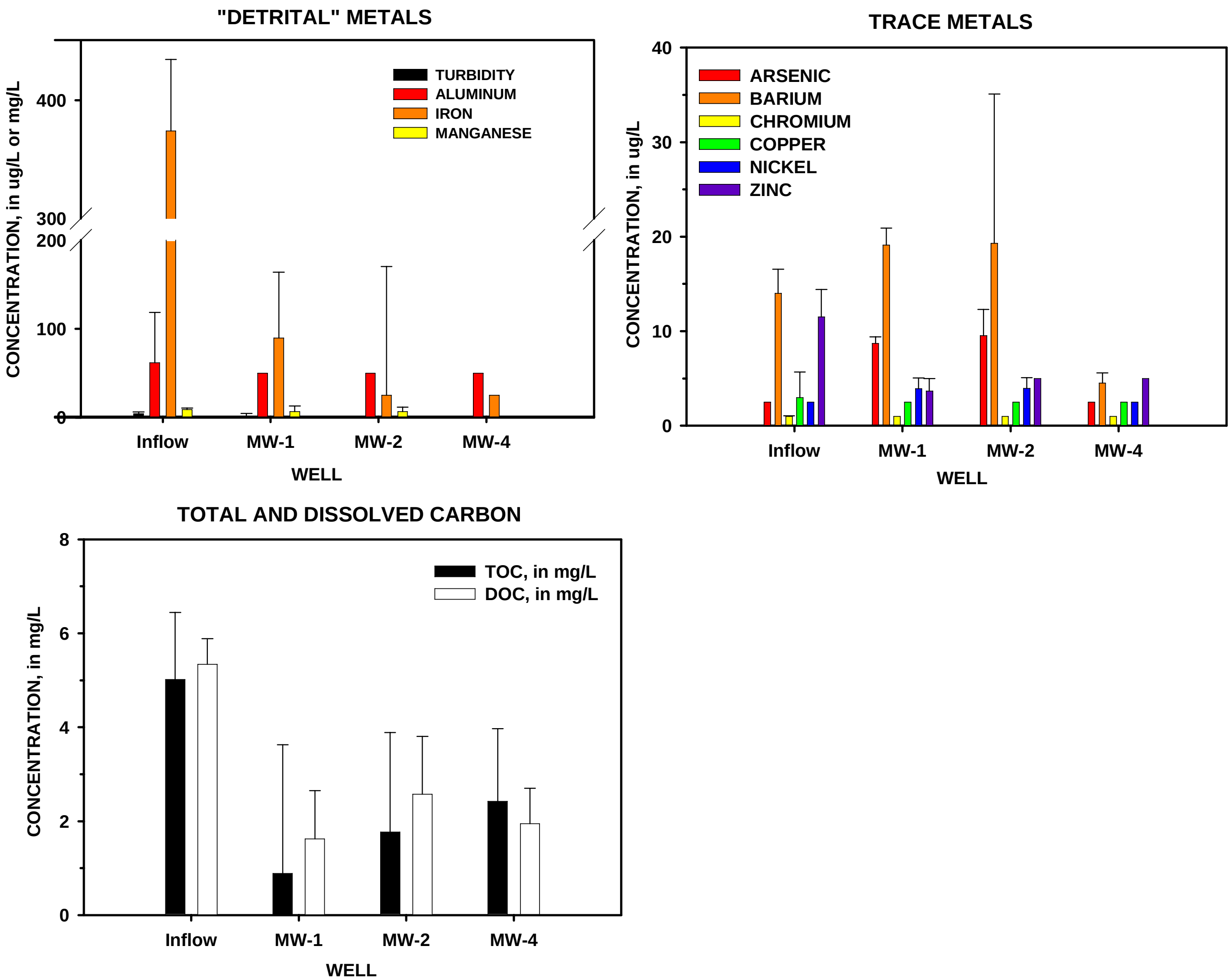


Figure 15 Continued. Median concentrations of field parameters and inorganic constituents Festival Park (Mirecki 2006)

MICROBIAL EVALUATION OF CHARACTERIZATION RESULTS

Lisle (2006) further evaluated the chemical, nutrient and physical data and the microbial data resulting from the characterization events to gain further insight into microbial data. Dissolved oxygen (DO) concentrations changed from near saturation levels at the inlets to approximately 2 mg/L at the monitoring wells. Geochemical reactions and microbial respiration were attributed to this observed change. Ratios of carbon to nitrogen to phosphorus (C:N:P) were also evaluated between the inlets and the monitoring wells. These were evaluated because they represent food sources. For both sites the C:N:P ratios at the monitoring wells indicated more than sufficient amounts of these constituents to support microbial activity in the aquifer.

DISCUSSION OF MICROBIAL AND ARSENIC TREATMENT

This discussion focuses on the evaluation of the necessity and effectiveness of treatment for microbial reduction of surface water prior to recharge and mobilization of arsenic in aquifers associated with artificial recharge.

The original goals of the project were to:

- Evaluate the impact of recharge to the aquifer.
- Evaluate the effectiveness of passive treatment to manage the effect of recharge of surface water through wells to the microbial quality of the Floridan aquifer.
- If warranted, evaluate the effectiveness of implementing treatment to increase recharge of stormwater through wells. If the quantity of groundwater recharge through wells were to increase, that incremental “stream” of water would need to meet DWSs. Resulting from the samplings of this study, targeted constituents would be coliform bacteria and color.

As previously described, the in-place stormwater recharge well systems in central Florida predate promulgation of the current regulations and can be operated and maintained at the originally installed condition. Rehabilitation and maintenance activities are allowed by FDEP through the Underground Injection Control (UIC) Program to maintain the capacities without implementing treatment to improve water quality. Increases to capacity must meet the current regulations, which means that the portion of increased recharge water quality must meet DWSs and not cause a violation of groundwater quality as a result of the recharge activity.

Microbial Treatment

The results of CFARE1 show that the recharge wells have impacted groundwater quality at the two project sites. The following observations are made:

- Bacteria are present at the monitoring wells at concentrations that are greater than expected in the Upper Floridan aquifer in central Florida.

- Bacteria concentrations decrease two to six orders of magnitude between the source water and the monitoring wells, suggesting inactivation processes are occurring.
- Comparison of bacteria concentrations between source waters and groundwaters at the monitoring wells indicates that inactivation rates are less than rates suggested from other studies (Lisle 2006) and indicates that sustained bacterial communities are present at the sites.

The original concept of the project was to implement passive treatment of stormwater to improve the quality of recharge through existing wells or increase quantity of recharge through new wells. Primary characteristics of stormwater quality that make it unacceptable for recharge are the presence of total coliform bacteria and color above DWSs. Treatment of this water to meet DWSs is disinfection and color reduction. Color reduction would allow the disinfectant to be more effective and / or manage the potential for formation of DBPs at unacceptable concentrations. Passive stormwater treatment (settling basins, etc.) does not provide for disinfection of the water. Therefore, the original concept of passive surface water treatment is not implementable without regulatory relief because it would not reduce bacterial concentrations of the water to below the DWS prior to recharge.

In addition, the locations of the wells and the land uses near the wells were compared using geographic information systems (GIS) techniques to evaluate availability of land near the recharge wells. Because the recharge wells were installed in reaction to urbanization and development, they were typically installed to alleviate local flooding after development occurred. Densities of recharge wells are high where land use densities are high, see Figure 1 for insight to recharge well densities. As a result, little unused land remains near the recharge well systems to implement passive or active treatment.

Furthermore, results of the microbial evaluation indicate that the presence of bacteria in the monitoring wells is greater than predicted by inactivation rate equations. This implies that microbial communities are prospering in the Floridan aquifer near the recharge wells likely from continual input of food sources, nutrients and oxygen from the recharged water. To implement treatment to disinfect the recharge water would imply that the goal would be to return the subsurface microbial condition to its original condition. Considering the number of wells, the amount of recharge that has and is occurring, the duration of the recharge (leading to a presumed combined presence of microbial communities in the aquifer), and lack of available land, implementing disinfection seems to be an ineffective activity to undertake.

Arsenic Mobilization

Arsenic mobilization in groundwater related to artificial recharge applications emerged as a regulatory issue during this project and became significant when the DWS for arsenic was reduced from 50 µg/L to 10 µg/L in January 2005, for Florida. Because of the change in the DWS for arsenic, multiple detections of arsenic above the revised DWS, but below the former DWS, resulted from sampling the monitoring wells. This is of interest because, although present in lower concentrations, arsenic was not detected above the revised DWS in the source waters. In addition, through monitoring of other artificial recharge activities by others in Florida and other locations in the United States, detections of arsenic in the recovered water were above the revised DWS, and in some instances above the former DWS, when arsenic was not detected in the recharged water. These other artificial recharge applications were aquifer storage and recovery (ASR) systems using potable or reclaimed water for recharge. The observations of increased arsenic concentrations indicate that arsenic is being mobilized from the aquifer matrix as a result of recharge activities.

The results of CFARE1 show that the recharge wells have impacted groundwater quality at the two project sites. The following observations are made:

- Changes to the distributions of ions and other physical parameters of waters are observed between source waters and groundwaters at the monitoring wells.
- The delivery of oxygenated water to the Floridan aquifer with the resulting observation of arsenic in selected monitoring wells is consistent with arsenic mobilization observed in other investigations.
- Arsenic was detected in the influent water, which contributes to the levels of this constituent in the monitoring wells.

During the past several years, there has been increased investigation to identify the source of arsenic and the reason(s) arsenic is found in and around recharge well systems. The generally accepted current conclusion from these studies is that arsenic is associated with pyrite and that artificial recharge changes aquifer conditions, mobilizing arsenic from pyrite to the groundwater.

Pyrite is a commonly occurring mineral that is contained within the limestone matrix of the rocks that comprise the Upper Floridan aquifer. The native aquifer condition is of very low to no levels of dissolved oxygen, referred to as a reduced condition. At this condition the rock / water condition is stable relative to the solubility of pyrite. Recharge of oxygenated surface or treated water locally converts the groundwater to an oxidized condition and the rock / water condition becomes unstable. The oxygenated water in contact with the aquifer matrix dissolves the pyrite that is exposed to the water and when the pyrite dissolves the arsenic is mobilized into the groundwater. A condensed but more thorough explanation is provided by Price and Pichler (2004) (Appendix K). Although the setting for the Price and Pichler study was the Suwannee Limestone in southwest Florida, the mineralogy and water condition is presumed sufficiently similar to explain the occurrence of arsenic in the monitoring wells at the two project sites.

Further geochemical, mineralogical, and treatment research is underway by others to identify mechanisms and / or treatment processes to apply in order to manage the rock / water condition to effectively manage mobilization of arsenic from artificial recharge activities through wells.

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CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS FROM SITE CHARACTERIZATIONS

Work performed in association with CFARE1 at the Festival Park and Lake Orienta sites demonstrates the effects of recharge on the Upper Floridan aquifer from the operations of five of approximately 500 stormwater recharge wells in central Florida. This project was conducted to evaluate conditions at these two sites; it was not a study to evaluate the collective impact of the entire stormwater recharge well system of central Florida. Given that these two sites are representative of the settings and the periods of operation for many of the other recharge wells, the results are considered indicative of conditions at those sites.

This study included:

- Installation and use of monitoring wells to evaluate impacts to the Upper Floridan aquifer at locations removed from the recharge wells
- Use of a broad analyte list to evaluate chemical and microbial fate and transport
- Use of groundwater tracer tests to verify hydraulic connections between one or more recharge wells and one or more monitoring wells within the Upper Floridan aquifer
- Consideration of ongoing, unpublished recharge-related research to assist in evaluating the results

The results of the investigations at these two sites indicate that additional work and coordination is needed to better understand and manage the effects of recharge. The two recharge well systems have been active for greater than 40 to 60 years. Results represent effects of long-term operations. The following were found from this work:

- Two- to six- order-of-magnitude reduction of bacteria concentrations in groundwater was observed, but the amount of inactivation is less than predicted.
- Arsenic is present at the monitoring wells at concentrations greater than at the source locations. It is concluded that arsenic mobilization from the aquifer matrix is occurring.

- Synthetic organics were largely undetected at the Festival Park site, with detections less than DWSs.
- Synthetic organics were undetected at the Lake Orienta site.
- Observations were different than pre-project prevailing thought.
  - The pre-project thought was that microbes in the Upper Floridan aquifer were the dominant contaminants resulting from the recharge. Results of the sampling indicated 2 to 6 order-of-magnitude reduction of coliform concentrations when comparing the recharge water samples and samples from monitoring wells in hydraulic connection with the recharge wells. However, the measured concentrations are generally greater than concentrations calculated using simple microbial inactivation rate models. This suggests that microbial colonies are proliferating in the aquifer as a result of continued recharge.
  - Significant synthetic organics were expected, but none were detected above DWSs.
  - Arsenic was not originally expected to be an issue, but is now a significant consideration as a result of the change in the DWS for arsenic from 50 µg/L to 10 µg/L during the study.

RECOMMENDATIONS

- Do not proceed with evaluating treatment enhancements at the recharge wells used for the study. The original objective of this project was to evaluate the need for and benefit of implementing enhanced treatment to better manage bacterial inflow to the Floridan aquifer through recharge wells. The presence of sustaining microbial colonies of non-indigenous coliform bacteria should be considered representative of many of the other recharge well locations in central Florida. Based on the results that communities of the indicator organisms (coliform bacteria) are proliferating in the groundwater matrix at the study sites, treatment enhancements may not work to reduce bacteria levels at all recharge well locations. However, implementing enhanced treatment at selected locations could be feasible where microbial contamination from recharge well operations is an issue, or where stormwater management capacity needs to be increased. But, implementing enhanced treatment on a broad scale at the locations of the approximately 500 recharge wells would be technically and economically demanding.

- Support public health agencies in Orange and Seminole counties in addressing potential impacts to private and public groundwater supplies. This recommendation is offered because many potential private and some public supply utility water supply wells exist near the recharge wells at the Lake Orienta site. The private / domestic, non-utility wells would be considered a greater risk to public health because of the unregulated nature of these water supplies. There are likely more locations in Orange and Seminole counties with similar conditions.
- Support additional microbiological survivability research.
- Participate in continued mineralogy and geochemical research to identify operations changes or implement treatment processes that would control the mobilization of arsenic at artificial recharge well sites. The results of this study are consistent with other artificial recharge projects (specifically aquifer storage and recovery) where mobilization of arsenic and other constituents appears to be occurring. Arsenic concentrations at the Festival Park and Lake Orienta sites were observed to be up to approximately twice the recently promulgated standard; arsenic concentrations at some of the other sites are significantly higher. Review of other projects indicates that dissolution of pyrite through exposure of oxygen-laden groundwater from recharge is a principal cause.
- Properly plug and abandon the monitoring wells at the two sites when they are no longer needed.

Recommended Follow-on Activities

Public Health., The central Florida residents are largely served with potable water from public water supply systems or domestic self-supply wells whose source is groundwater. The water supply wells are typically located at sufficient distances from recharge wells, or they obtain water from deeper portions of the Floridan aquifer beyond the influence of the recharge wells. However, as in the case of the Lake Orienta site, domestic self-supply or public supply system wells could be sufficiently close to the recharge wells to have their quality potentially impacted. Water supply wells close to recharge wells and obtaining water from the same zone as the recharge wells should be identified and further investigated to verify that the water quality is not negatively impacted. Appropriate measures (supplemental treatment, connection to an unimpacted public water supply system, supplied bottled water, etc.) should be implemented if water supply wells are negatively impacted to a sufficient degree to impact public health. Emphasis should be placed on self-served domestic water supplies, because these sources are not required to be monitored for water quality. It is unlikely that the owners of domestic water supply wells would be aware of adverse impacts to water quality, whereas public water supply systems are required to monitor source waters and deliver water of a regulated quality.

Continued Research. Continued research is progressing to evaluate the need for better ways to manage microbial and geochemical impacts to the Floridan aquifer associated with artificial recharge applications. The options for the next steps for microbial and geochemical research associated with the central Florida recharge wells fall into several categories focused on the need to implement disinfection and the need to better control the mobilization of arsenic. However, overall, the results of this project demonstrated microbial and geochemical impacts to the Upper Floridan aquifer at the two project sites. During the project many meetings and conversations were conducted with scientists, engineers, and regulators to coordinate activities and conclusions on similar projects. Much of this work is emerging technology as the microbial and/or arsenic conditions are encountered at artificial recharge sites. Resulting from these meetings and conversations were multiple options to further investigate and manage these conditions for sustainable solutions.

Microbial Research. This project focused on several indicator microbial parameters that are enteric in nature and regulatory based. Microbial research is emerging to increase the understanding of the fate and transport of microbes in groundwater systems. The following activities could further our understanding of microbial fate and transport in groundwater systems.

- Investigate employing diffusion chamber techniques to quantify in-situ survivability of selected microbes.
- Coordinate with FDEP to develop and implement survivability investigations.

Arsenic/Geochemical Research. Significant research has recently been conducted and continues to be conducted to identify the source and mechanism(s) by which arsenic is mobilized in the Floridan aquifer. Continued support of the research with emphasis on how to effectively treat or amend the source water to sequester the mobilization and/or transport of arsenic should continue.

Techniques to Map Flow Paths. The results of this project indicate that water movement in the Floridan aquifer cannot always be predicted using granular porous media flow concepts. It is important that researchers verify hydraulic connections between source and monitoring locations. Tracer tests can be used to verify the connection(s); however, they provide insight only at the monitoring points. Other techniques like surface geophysics and subsurface techniques like cross-hole tomography can be use to better define discrete flow paths. Candidate connections identified during this study are the ones between R-143 and MW-1 and R-143 and MW-2 at Festival Park.

Regulatory Remedies. FDEP has presented a position paper to USEPA regarding an approach to manage arsenic mobilization identified specifically for ASR sites. The proposed approach principally consists of groundwater monitoring and land use management controls. If management for arsenic mobilization is needed or becomes needed in association with recharge wells in central Florida, a similar approach may be employed to separate groundwater influenced by the recharge wells from potable water supplies.

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PHASE 1 – ARTIFICIAL RECHARGE WELL DEMONSTRATION PROJECT

FILE ID: GNV31013363823.DOC / 063380004

PROJECT MANAGER: AL AIKENS / ORL

PROJECT NUMBER: 177652.LO.MP.MP

EDITOR: LETICIA SOLAUN / GNV

DATE: OCTOBER 2006

St. Johns River Water Management District
Palatka, Florida

2006
October

Appendix A

Project Status Reports

CFARE Status Report No. 1

From: Aikens, Al/ORL
Sent: Thursday, July 12, 2001 4:21 PM
To: Anil Desai (E-mail); Chris Ferraro (E-mail); Chris Sweazy (E-mail); Doug Munch (E-mail); Duane Watroba (E-mail); Elizabeth Thomas (E-mail); George Heuler (E-mail); Jerry Salsano (E-mail); Larry Pearson (E-mail); Leslee Williams (E-mail); Rich Deuerling (E-mail); Richard Drew (E-mail)
Cc: Barbara Vegara (E-mail); Jim Hunt (Business Fax); Joan B. Rose (E-mail); John Peters (E-mail); Kristin Rombeck (E-mail); Mark McNeal; Rick Howard (E-mail); Rodney Lynn (E-mail)
Subject: July 2001 - Central Florida Artificial Recharge Well Status Report

Attachments: GWMP Comments from A. Desai.doc

This is the first in a series of monthly status reports for the Central Florida Artificial Recharge Well Demonstration Project as agreed to with FDEP at the June 18 meeting to review the Groundwater Monitoring Plan. The reports will be distributed through e-mail.

GWMP Review

Comments on the GWMP were received from Anil Desai/FDEP-Orlando regarding the overall program and from Leslee Williams/FDEP-Tallahassee regarding the microbiological testing plan. Anil's comments have been incorporated into the plan, and the comments were copied into the attached Word document and responses are provided following the specific comment. Leslee's comments were received and forwarded to Joan Rose. Joan responded and Leslee requested further clarification. Joan is out of the country until July 19. Upon her return, she and Leslee will get together and reach a resolution. In my discussions with Leslee, further clarification and discussion were requested to better define the scope of the microbiological work (generally a statement of intent, what's included, what's not included, and clearer explanations of sampling and analyses procedures). This should be resolved quickly. When the GWMP is reissued it will be provided in revision mode to clearly show the changes.

Dry-period sampling preparation

The pumps, air compressor, and controller for the four recharge wells have been received.

A laboratory is under contract to provide sampling kits and to perform chemical analyses as described in the GWMP.

USF is under contract to perform the microbiological sampling and testing for the task.

CH2M HILL have contracted with a local consulting firm (a disadvantaged business enterprise) to install the pumps and collect the groundwater samples. The subconsultant visited the sites and evaluated site conditions to install the pumps. An amount of "field engineering" is needed to securely install the protective pipes and pumps in the wells and to allow ready access to the pumps for sampling. This may require slight modification of grates or other fixtures. These details are being sketched, after which we will coordinate with the local partner for approval then installation.

GWMP Comments
from A. Desai.do...

Please provide me with your input so that this report will better meet your needs. I will be out of the office for most of the next two weeks on business and vacation. I'll respond as quickly as I can when I return.

Regards
Al Aikens
CH2M HILL/Orlando, FL

Dear Al:

This is a follow up message regarding the requested e-mail addresses for the DEP folks who would like to be copied on all progress reports for the aforementioned project.

Chris.Ferraro@dep.state.fl.us
Anil.Desai@dep.state.fl.us
Duane.Watroba@dep.state.fl.us
Richard.Deuerling@dep.state.fl.us
Richard.Drew@dep.state.fl.us
George.Heuler@dep.state.fl.us
Leslee.Williams@dep.state.fl.usAlthough we have already discussed at the meeting today, I would like to give our official comments as under;

1) We would like to have on our file a private drinking water well inventory in a one-mile radius from the three drain well sites proposed for the pilot study. From your proposed activities, I don't expect any additional adverse impact on the private wells but it will be prudent to keep this information ready, in the event that it becomes necessary to sample any of the private wells in the vicinity of the proposed drain well sites.

Response: A new task, Task 2 – Private Drinking Water Well Survey, was added to the plan.

> Surveys for private drinking water wells will be conducted for each of the three sites. Records of building departments and health departments of the city or county applicable to the well sites, SJRWMD, and SFWMD will be accessed to find wells identified as private drinking water wells. The search radius will be one mile from each well.

2) Regarding measuring the rain fall, I would recommend that we assign at least one designated gauge station for rain fall monitoring in the vicinity of each site rather then averaging the data from multiple monitoring stations.

Response: Discussion was added in Appendix G - Precipitation Characteristics for a Triggering Storm Event as follows:

> The locations and availability of rain gauge data near the project sites will be reviewed with the intent to select gauges where rainfall conditions are reasonably similar to that of the project sites. As rainfall is a triggering event, the gauges need to monitored and readily available on a daily basis. A list of gauge locations with monitoring frequency will be prepared and submitted to FDEP for discussion and agreement.

3) Under the analyte list depicted on Appendix A in the nutrients category, nitrate was listed twice. Nitrite shall be added along with Nitrate. I would also include total nitrogen along with total phosphorus.

Response: Corrections and additions were made as requested.

4) Duane and myself would like to do the field reconnaissance with you to decide the placement of upgradient, sidegradient and downgradient monitoring wells one you have had the opportunity to come up with tentative locations based on all published

hydrogeologic information available. Once we proceed with the study and gather more information on the ground water flow direction and hydraulic gradient, we shall be in a position to refine the well placement, if found to be necessary. I would certainly keep a strong emphasis in selecting the location of upgradient well outside the influence of drain well injection area (if feasible), so that we would have a good background water quality data in the upper Floridan Aquifer for comparison purposes.

Response: As always FDEP participation in project implementation is welcome. The renumbered Task 4 – Baseline Site Characterization was revised to include the following statements:

The project team, including FDEP staff, will coordinate on locating monitoring wells for the three sites. This will include field visits to evaluate site options and constraints, as necessary.5) Regarding the progress reports to be submitted quarterly as proposed, we would like to see a monthly update through e-mail correspondence. If any meetings are required to discuss the progress or to obtain any DEP approvals, Duane and I shall be available at short notice.

Response: Agreed. This transmittal is the first of the progress reports.

6) Under references, you mentioned about the EPA Document " Functional Guidelines for evaluating Data (Inorganic and Organic), Atlanta, February 1994. I would like to have a copy of this document if possible. If not, you can provide me the resource or contact at EPA.

Response: This document has been split into two documents: one for inorganics and the other for organics. The reference list was updated to reflect the change. The revised references and URLs are

> U.S. Environmental Protection Agency. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data. EPA-540/R-94-013 (PB94-963502). Atlanta, GA. February 1994. http://www.epa.gov/superfund/programs/clp/download/fginorg.pdf
>
> U.S. Environmental Protection Agency. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA-540/R-99-008 (PB99-963506). Atlanta, GA. October 1999. http://www.epa.gov/superfund/programs/clp/download/fgorg.pdf

You have done a wonderful job of putting together the above proposal and developing an appropriate conceptual study plan for the above project. Although the results of this pilot study can either be positive or negative but nobody had tried to conduct this type of study before and we can only be hopeful to get either success with the study or put this issue at rest for ever.

Please forward this message to all interested parties and partners, as deemed feasible.

Thanks and good luck with your efforts,

Anil Desai, P.G.

Program Manager - Ground Water/UIC

Tel: 407-893-3305

Fax: 407-897-2966

E-mail: Anil.Desai@dep.state.fl.us

CFARE Status Report No. 2

This report no longer exists.

CFARE Status Report No. 3

From: Aikens, Al/ORL
Sent: Friday, December 28, 2001 1:29 PM
To: 'Anil Desai (E-mail)'; 'Chris Ferraro (E-mail)'; 'Chris Sweazy (E-mail)'; 'Duane Watroba (E-mail)'; 'Elizabeth Thomas (E-mail)'; 'George Heuler (E-mail)'; 'Jerry Salsano (E-mail)'; 'Larry Pearson (E-mail)'; 'Leslee Williams (E-mail)'; 'Rich Deuerling (E-mail)'; 'Richard Drew (E-mail)'
Cc: 'Barbara Vegara (E-mail)'; 'David John (E-mail)'; 'David W. Hamstra (E-mail)'; 'Doug Munch (E-mail)'; 'Jim Hunt (E-mail)'; 'Joan B. Rose (E-mail)'; 'John Peters (E-mail)'; 'Kristin Rombeck (E-mail)'; McNeal, Mark/TPA; 'Rick Howard (E-mail)'; 'Rodney Lynn (E-mail)'; Wycoff, Ron/GNV
Subject: Central Florida Artificial Recharge Well Status Report No. 3

Attachments: Dry Period Detections.xls

Dry Period Detections.xls

Three topics are covered in this status update regarding the Central Florida Artificial Recharge Project:

* Provisional results of sampling of the lake level control recharge wells
* Likely change in urban runoff recharge well site
* Groundwater Monitoring Plan (GWMP) status
* Follow-on activities

Provisional results of sampling of the lake level control recharge wells

In August 2001 the recharge wells at Lake Orienta and Lake Sherwood were sampled for the chemical and biological parameters as were provided in the GWMP. The wells were sampled using dedicated bladder pumps with the pump bodies and pump intakes positioned near the bottoms of the wells. The three wells were not operational at the times of samplings because the water level in the lakes were below the intake levels for the wells. Judging from the lake levels, these wells have did not receive recharge for significant periods of time prior to sampling. The well at the intersection of Marks Street and Shine Avenue was not sampled for reasons as described below under the heading "Likely change in urban runoff recharge well site."

The groundwater samples were analyzed for the following organisms: total coliforms, fecal coliforms, E.coli, enterococci, C. perfringens, coliphage, giardia and cryptosporidium. The microbiological data were evaluated and compared to indicator guidelines for ambient surface water quality (Class III waters). Class III surface water is a designation for surface water used for recreational purposes. Lake Orienta and Lake Sherwood are Class III surface waters.

The groundwater samples were analyzed for the following chemical analyte groups: general chemicals, common anions and cations, nutrients, Target Analyte List metals, volatile organic chemicals, semivolatile organic chemicals, herbicides, pesticides, PCBs, and radionuclides. The chemical data were validated using US EPA guidelines for evaluating chemical data and compared to regulatory criteria and screening values. The results of the microbiological analyses and detections resulting from the chemical analyses are provided as separate tabs in the attached Excel file: Dry Period Detections.xls.

<<Dry Period Detections.xls>>

The provisional results of the microbiological analyses are provided in Table 1 found in the Microbiological Data and Criteria tab from the Excel file. The organisms found and their concentrations fall within the guidelines for Class III surface waters. The total coliform concentrations of the three samples exceed the primary drinking water standard for Class G-II groundwater of 4 colonies per 100 mL.

The provisional detections from the chemical analyses are provided in Table 2 found in the Chemical Data and Criteria tab from the Excel file. Detections were encountered in the following analyte groups: general chemicals, common anions and cations, nutrients, Target Analyte List metals, volatile organic chemicals, and radionuclides. These detections were compared to primary and secondary drinking water standard MCLs, Brownfields criteria, and risk-based screening criteria (RBCs) as described in the GWMP. A detailed comparison of the detections and criteria and screening values are provided in Table 2. A summary of comparisons follows:

* No chemicals detected exceeded the primary drinking water standard MCLs. Turbidity exceeded 1 NTU in waters from the Lake Orienta West and Lake Sherwood wells.
* Secondary drinking water standard MCLs were exceeded for color, aluminum, iron, and manganese from selected wells.
* Screening values for chemicals designated as non-carcinogens were exceeded for fluoride and iron from selected wells.
* Screening values for chemicals designated as carcinogens were exceeded for arsenic and beryllium from selected wells.
* Two VOCs were encountered: methyl ethyl keytone (MEK) and methylene chloride. The concentrations of MEK fell below the RBC screening value: no MCL is established for MEK. The concentrations of methylene chloride were approximately one-tenth of the MCL and the RBC.

Likely change in urban runoff recharge well site

The well at the intersection of Marks Street and Shine Avenue was not sampled as planned because the well experienced back-flowing conditions following a rain storm within one week prior to sampling the well. Water flowed out of the well from what is believed to be the release of entrained air that entered the aquifer with the storm water. The force of the back-flowing water was sufficient to remove the manhole cover and extract the pump and pump assembly from the well. Based on this observation it was decided to look for a different site. The manhole cover has been welded to the manhole.

Discussions ensued with the City of Orlando and their consultant on their drainage well inventory project. Several candidate wells were provided by the consultant and subsequently visited. Based on the available information a recommendation for the wells at Festival Park was made. The Festival Park site receives direct urban runoff and provides ample open space for the installation of monitoring wells and the lack of need to close streets to install and sample wells. Representatives from FDEP, Jerry Salsano and Al Aikens are scheduling to visit the site likely during the second week of January to select monitoring well locations.

Groundwater Monitoring Plan status

Several iterations of dialog regarding the were received and are being worked into the revised GWMP. With concurrence on the Festival Park site and monitoring well locations, the GWMP will be updated and redistributed. The goal is to complete the plan by the end of January 2002.

Lake Sherwood continues to be dry with the bottom of the lake approximately 30 feet below the intake level for the well. I will be contacting Orange County for the possibility continuing with the project or relocating to another recharge well site.

Follow-on Activities for January through June 2002

* Install and sample monitoring wells at the Festival Park Site.
* Reevaluate the viability of Lake Sherwood site.

*   Plan to install monitoring wells at the Lake Orienta site.

Al Aikens
CH2M HILL/Orlando, FL

Table 1.
Summary of Results of Microbiological Sampling and Testing
from the Dry-Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

Organism	Units	Lake Orienta East	Lake Orienta West	Lake Sherwood	Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
	Location / SampleID ==> / Date Collected ==>	LO-E-R-DP 8/23/2001	LO-W-R-DP 8/23/2001	LS-R 8/13/2001	
Total Coliform	cfu/100 mL	250	210	235	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average
Fecal Coliform	cfu/100 mL	<1	36	7	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	2	1	<1	126 cfu/100 mL - Geometric Mean
Enterococci	cfu/100 mL	<1	4	9	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric Mean
C. *perfringens*	cfu/100 mL	<1	<1	<1	50 cfu/100 mL
Cryptosporidium	no./100 L	<2	<34	<30.5	
Giarida	no./100 L	<2	<34	<30.5	
Somatic Coliphage	pfu/100 mL	<5	<5	<5	100 pfu/100 mL
1 Liter enrichment	pfu/100 mL	not done	not done	negative	
F+ coliphage	pfu/100 mL	<5	<5	<5	100 pfu/100 mL
1 Liter enrichment	pfu/100 mL	not done	not done	negative	

Notes:
cfu - Colony forming units
pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100ml, average of 400 cfu/100ml
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
C. perfringens	for fresh and brackish water and 5 cfu/100 mL for marine waters.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

Table 2.
Summary of Detections and Comparisons to Criteria and Screening Values
from the Dry-Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location	Lake Orienta East		Lake Orienta West		Lake Sherwood		**Criteria and Screening Values**													
	SampleID ==>	LO-E-R-DP		LO-W-R-DP		LS-R		**Maximum Contaminant Levels**								**Brownfields**		**Risk-based Concentrations**			
	Date Collected ==>	8/23/2001		8/23/2001		8/13/2001		Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=1.0)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
	Time Collected ==>	12:45		11:20		15:00															
	Matrix ==>	WA		WA		WA															
	Sample Type ==>	N		N		N															
Parameter Group and Name	Units							Criteria	Units	Criteria	Units	Criteria	Units	Criteria	Units	Criteria	Units	Criteria	Units	Criteria	Units
Radionuclides																					
Alpha, gross	pCi/L	5.5	=	9.8	=	3.3	=	15	pCi/L			15	pCi/L								
Beta, gross	pCi/L	4.7	=	6.8	=	10.4	=	none													
General Chemistry																					
Total Dissolved Solids (residue, filterable)	mg/L	240	=	270	=	150	=			500	mg/L			500	mg/L	500	mg/L				
Turbidity	NTU	0.75	=	**12**	=	**36**	J	1	NTU			1	NTU								
Color	Color Units	10	=	**50**	=	**20**	J			15	Color Units										
Total Organic Carbon	mg/L	1.2	=	2.1	=	22	=	none													
Dissolved Organic Carbon	mg/L	1.2	=	1.4	=	2.5	=	none													
Methylene Blue Active Substances	mg/L			0.095	J									0.5	mg/L						
Nutrients																					
Nitrogen, ammonia (as N)	mg/L	0.13	=	0.46	=	1.2	=	10	mg/L			10	mg/L			10	mg/L	580	mg/L	58	mg/L
Nitrogen, Kjeldahl, Total	mg/L	0.36	J	2	=	1.4	=	none													
Phosphorus, Total (as p)	mg/L	0.036	=	0.42	=	0.045	=	none													
Phosphorus, Total Orthophosphate (as P)	mg/L	0.09	=	0.045	=	0.009	J	none													
Anions																					
Chloride (as Cl)	mg/L	17	=	19	=	9.7	=			250	mg/L			250	mg/L						
Fluoride	mg/L					$\boxed{0.36}$	=	4	mg/L	2	mg/L			2	mg/L	2	mg/L	2.2	mg/L	0.22	mg/L
Sulfate (as SO4)	mg/L	14	=	55	=	16	=			250	mg/L			250	mg/L	250	mg/L				
Alkalinity, bicarbonate (as CaCO3)	mg/L	140	=	130	=	110	=	none													
Metals																					
Aluminum	µg/L			**1610**	=					200	µg/L			50	µg/L			37000	µg/L	3700	µg/L
Arsenic	µg/L			$\boxed{6.36}$	=	$\boxed{1.09}$	=	50	µg/L			50	µg/L			50	µg/L	0.045	µg/L	0.045	µg/L
Barium	µg/L	8.79	J	21	J	14.1	=	2000	µg/L			2000	µg/L			2000	µg/L	2600	µg/L	260	µg/L
Beryllium	µg/L	$\boxed{0.041}$	J					4	µg/L			4	µg/L			4	µg/L	0.016	µg/L	0.016	µg/L
Cadmium	µg/L	$\boxed{0.233}$	J	1.46	=			5	µg/L			5	µg/L			5	µg/L	18	µg/L	1.8	µg/L
Calcium	µg/L	60000	=	65900	=	36600	=	none													
Chromium, total	µg/L			3.17	J			100	µg/L			100	µg/L			100	µg/L				
Cobalt	µg/L	0.142	J	0.37	J	0.434	J											2200	µg/L	220	µg/L
Copper	µg/L			16.6	J					1000	µg/L			1000	µg/L	1000	µg/L	130000	µg/L	13000	µg/L
Iron	µg/L	292	=	$\boxed{\mathbf{4680}}$	=	$\boxed{\mathbf{6310}}$	=			300	µg/L			300	µg/L	300	µg/L	11000	µg/L	1100	µg/L
Lead	µg/L			9.24	=	0.972	J	15	µg/L			15	µg/L			15	µg/L				
Magnesium	µg/L	2410	=	9260	=	10600	=	none													
Manganese	µg/L	10.8	=	**61.4**	=	**76.5**	=			50	µg/L			50	µg/L	50	µg/L	840	µg/L	84	µg/L
Nickel	µg/L	5.08	=	6.77	=	23	=	100	µg/L			100	µg/L			100	µg/L	730	µg/L	73	µg/L
Potassium	µg/L	1380	J	1780	J	2760	J	none													
Silver	µg/L	0.047	J							100	µg/L			100	µg/L	100	µg/L	180	µg/L	18	µg/L
Sodium	µg/L	6630	=	10900	=	14900	J	160000	µg/L												
Vanadium	µg/L	0.351	J	6.95	J											49	µg/L	260	µg/L	26	µg/L
Zinc	µg/L			26.8	=	1.66	J			5000	µg/L			5000	µg/L	5000	µg/L	11000	µg/L	1100	µg/L
Volatile Organic Compounds																					
Methyl ethyl ketone (2-butanone)	µg/L	27	J	3.9	J	160	=									4200	µg/L	1900	µg/L	190	µg/L
Methylene chloride	µg/L	0.43	J	0.55	J			5	µg/L			5	µg/L			5	µg/L	4.1	µg/L	4.1	µg/L

Notes:

Bolded values represent positive detections above promulgated regulatory criteria.

Boxed values represent positive detections above Risk-Based Criteria.

Bolded and boxed values represent positive detections above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifers

"=" Represents a detection at the value shown

"J" Represents an estimated value that is above the method detection limit and below the practical quantitation limit.

Blanks for the chemical data represent nondetection

Blanks for the criteria and screening values represent no established value.

Sources:

[1] *Florida Ground Water Guidance Concentrations*, 17-520.400 FAC, June 2, 1994: Primary Drinking Water Standards (17-550.310 FAC), Secondary Drinking Water Standards (17-550.320 FAC).

[2] *Brownfield's Cleanup Criteria Rule*, *Groundwater Cleanup Target Levels*, Draft Chapter 62-785 F.A.C., 1997.

[3] *Drinking Water Regulations and Health Advisories*, Office of Water, USEPA, October 1996.

[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.

[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment*, November 1995; HQ=0.1 applied to noncarcinogens.

CFARE Status Report No. 4

From: Aikens, Al/ORL
Sent: Monday, January 27, 2003 5:57 PM
To: 'Anil Desai (E-mail)'; 'Chris Ferraro (E-mail)'; 'Chris Sweazy (E-mail)'; 'Duane Watroba (E-mail)'; 'Elizabeth Thomas (E-mail)'; 'George Heuler (E-mail)'; 'Jerry Salsano (E-mail)'; 'Larry Pearson (E-mail)'; 'Leslee Williams (E-mail)'; 'Rich Deuerling (E-mail)'; 'Richard Drew (E-mail)'; Bart Bibler (Bart_Bibler@doh.state.fl.us); Peter J. Kwiatkowski, P.G. (pkwiat@sfwmd.gov); Don Ellison (Ellison, Don/SWFWMD)
Cc: 'Barbara Vegara (E-mail)'; 'David John (E-mail)'; 'Doug Munch (E-mail)'; 'Jim Hunt (E-mail)'; McNeal, Mark/TPA; 'Rick Howard (E-mail)'; 'Rodney Lynn (E-mail)'; Wycoff, Ron/GNV; 'rosejo@msu.edu'; Peters, Chris/DFB; Chris Sweazy (Sweazy, Chris/SFWMD); rarenken@usgs.gov; Rick Howard (Howard, Rick/Orlando)
Subject: Central Florida Artificial Recharge Well Status Report No. 4

Follow Up Flag: Follow up
Due By: Monday, January 27, 2003 9:00 PM
Flag Status: Flagged

Folks,

This e-mail transmits the Groundwater Monitoring Plan files. The other transmits the tracer test plan. The files for this project have become sufficiently large to e-mail. I have posted the files on the CH2M HILL ftp site under two folders: "GWMP" for the Ground Water Monitoring Plan, and "TracerTest" contains the files for the tracer test (Attachment G to the GWMP). The ftp site can be reached through this link: ftp://ftp.ch2m.com/pub/SJRWMD_Recharge_Well/ .

It has been quite some time since the last update on the status of this project. We have spent from December 2001 until now obtaining access to the sites to construct monitoring wells and to sample the wells. An agreement between the SJRWMD and the City of Orlando to access Festival Park is in place. An agreement between the SJRWMD and the Greater Orlando Aviation Authority is close to being in place for MW-4. We now plan to begin well installation in mid-February 2003.

One task has been added to the project: to perform a qualitative groundwater tracer test prove or disprove hydraulic connection between the recharge wells and the monitoring wells. The tracer test is positioned between the Baseline Sampling task and the Operational Testing Plan. An updated groundwater monitoring plan and the tracer testing plan can be found at the above referenced ftp site.

Please let me know if you were unable to access the site and obtain the files.

Al Aikens
CH2M HILL/Orlando, FL

Groundwater Monitoring Plan
Central Florida Artificial Recharge Demonstration Program
Artificial Recharge Well Demonstration Project

Background

As part of the St. Johns River Water Management District's (SJRWMD) District Water Supply Plan (DWSP, 2000) the ability of the groundwater resources of the Floridan aquifer to accommodate projected future water demands was evaluated. It was concluded that the groundwater resources of the Floridan aquifer would fall about 200 million gallons a day short of the projected need in the Central Florida area, which includes all or parts of Lake, Orange, Osceola, and Seminole Counties.

This project is a cooperative effort between the SJRWMD, the South Florida Water Management District, City of Altamonte Springs, City of Orlando, and Orange County.

A multifaceted approach is being investigated to meet the projected deficit. As a part of this approach, the SJRWMD is sponsoring an Alternatives Water Supply Investigation Program to identify beneficial ways to augment the groundwater resource. Augmentation can take the form of alternate sources, such as brackish water or surface water, or investigating the feasibility of expanding and improving artificial recharge through basins or wells.

The Orlando area is a basin almost absent of streams; stormwater that falls on Orlando that is not evaporated or infiltrated into the soils, travels by overland flow to one of many lakes. As Orlando became urbanized, land was covered with impervious surfaces reducing the area available for infiltration and decreasing the time for overland flow to collect and travel to lakes. This resulted in chronic local flooding. Recharge wells were installed to alleviate the flooding. The U.S. Geological Survey (USGS), State, and Local governments have generated an inventory of over 400 artificial recharge wells in the Central Florida area that were installed for various purposes, stormwater management being the most prevalent purpose. A significant portion of stormwater in the Orlando area is managed through recharge wells, which were installed beginning in approximately 1904 and through the 1960's. Approximately 39 to 52 million gallons per day (mgd) of water are estimated to recharge to the Floridan aquifer through these wells, CH2M HILL, 1998.

Purpose and Overview of the Project

The intent of this project is to

- Characterize the chemical and microbiological quality of the source storm water. Identify the constituents that may be degrading groundwater quality, if any;
- Characterize any changes in groundwater quality due to time and distance of travel from the recharge wells.
- After characterization, develop and implement a plan to improve the quality of the recharged water through treatment to reduce concentrations of those constituents, if necessary, and to monitor any subsequent improvement in groundwater quality.

The overall goal of the program is to expand the recharge well system in the Orlando area, recharging more water into the aquifer, to assist in offsetting the projected groundwater supply deficit in a manner that is not detrimental to human health or the environment. The planned recharge well demonstration program is intended provide data needed to support future regulatory actions, whether through wellhead pretreatment, natural treatment in the aquifer, or some combination of these options that is appropriate for the Orlando area.

This is one of three projects being conducted in Florida to characterize the fate of microbiological and chemical water quality constituents of waters artificially recharging the Floridan aquifer in various settings and ambient water qualities. Participating agencies are the Florida Department of Environmental Protection, South Florida Water Management District, and Southwest Florida Water Management District. This program is developed to be consistent with the other studies to provide comparable results.

Demonstration Sites

A previous study was conducted to identify existing or potential new sites where artificial recharge demonstration projects could address to appropriate use of artificial recharge wells the Orlando metropolitan area (CH2M HILL, 1998). Three sites were selected during that study that represented locations where local governments were experiencing problems in managing stormwater runoff. Three sites to be investigated are the lake level control at Lake Sherwood, the lake level control at Lake Orienta, and an urban runoff capture facility near the intersection of Marks Street and Shine Avenue near downtown Orlando, Figure 1. Well completion details, as known, are presented in Table 1.

Presented with the maps of the three demonstration sites are four sets of potentiometric surface contours for the Upper Floridan aquifer: May 1995, September 1995, September 1998, and May 2000. The May contours represent the annual “dry period” sampling, while the September contours represent the annual “wet period” sampling. The reasons for selecting the these four episodes are

- May 1995 – recent dry period high
- September 1995 – recent wet period high
- September 1998 – recent wet period low
- May 2000 – recent dry period high

The purpose of the showing the contours is to demonstrate the consistency or inconsistency of the magnitude and direction of the inferred groundwater flow direction between various sampling episodes.

Lake Orienta, Altamonte Springs – The properties around Lake Orienta are prone to chronic flooding when the runoff from rainfall and direct rainfall exceeds the capacity of the two recharge wells on the southern shore of the lake. The desire is to improve the recharge capacity to assist in alleviating the storm water management capacity of the recharge wells.

Lake Orienta is located in south central Altamonte Springs, Florida, Figure 1. The drainage basin for the lake consists of 135-acre lake with a 916-acre tributary watershed for a total basin area of 1,015 acres (CH2M HILL, 1998). The area around and near the lake is completely developed by residential and commercial land uses in a suburban setting. A map showing the recharge wells, the proposed monitoring wells, the four sets of potentiometric surface contours is presented in Figure 2. The City's Water Treatment Plant (WTP) No. 2 is located southeast of the lake. In personal communications with City staff, two Upper Floridan aquifer supply wells (Well No. 3 and Well No. 4) were abandoned in 1995 because of chronic bacteriological exceedences. WTP No. 2 is currently provided water by three Lower Floridan aquifer wells.

Lake Sherwood, west Orange County – The properties around Lake Sherwood are prone to encroachment of the lake during periods of high rainfall. The desire of the project is to lower the elevation of the intake for the recharge well approximately 2 feet to assist in reducing the encroachment of the shoreline on the properties.

Lake Sherwood is located in western Orange County along State Road 50, see Figure 1. The Lake Sherwood watershed encompasses approximately 5,400 acres in a semi-suburban setting, and becoming more developed. A map showing the location of the recharge well, the proposed monitoring wells and the four sets of potentiometric surface contours is presented in Figure 3. The area around and near the lake is completely developed by residential and commercial land uses in a suburban setting. The watershed is comprised of five primary lake systems that are connected through a series of culverts and natural drainage channels. The primary lake systems are Lake Lotta, Lake Olivia, Lake Rose, Lake Sherwood, and Steer Lake (PEC, 1999). Lake Sherwood is the lowest elevation lake in the watershed. A more complete description and hydrologic evaluation of the Lake Sherwood watershed is presented in *Engineering Report, Lake Sherwood Drainage Basin Study*, PEC, 1999.

Orange County Utility (OCU) records were reviewed for water customers near the lake. The search revealed that the parcels on the west and north shore of the lake, north of S.R. 50 do not have connections to OCU's water distribution system, which are identified in Figure 3. Therefore, the residences are assumed to be self-supplied for water service. During the study, the construction of the private wells will be investigated for correlation to the construction of the recharge well.

Intersection of Marks Avenue and Shine Street – This site is located in a residential and commercial area approximately 1½ miles east-northeast of downtown Orlando. The storm water collection system for the recharge well at the intersection of Marks Avenue and Shine Street (Marks and Shine) is of insufficient capacity to properly manage the volume of storm water. The desire of the project is increase the capacity of the collection system.

One of the recommended sites, Mills Avenue Street Drainage Treatment Project site originally described (CH2M HILL, 1998) was replaced by a similar project near the intersection of Marks Avenue and Shine Street, which is in a similar setting and approximately 3,000 feet south of the Mills Avenue site. The well at Marks and Shine is typical of numerous wells installed in the area to manage storm water runoff to alleviate local flooding while Orlando was urbanized. The drainage area for the Marks and Shine well is approximately 27 acres of residential and commercial property in an urban setting. This well was installed in April 1926. A map showing the location of the recharge well, the proposed monitoring wells and the four sets of potentiometric surface contours is presented in Figure 4.

The recharge well at Marks and Shine receives direct runoff from the storm water collection system without an interceding surface water body. As a result, when it the rainfall exceed a certain intensities and durations, runoff occurs that is collected by the system and is routed to the recharge well. Once the monitoring wells are installed and sampled, the current condition performance sampling can occur after a triggering rainfall event occurs.

TABLE 1
General Completion Characteristics of the Recharge Wells

Well	Diameter (Inches)	Cased Depth (Feet)	Total Depth (Feet)
Lake Orienta (west) 421 Barclay Ave.	12	261	317
Lake Orienta (east) 505 Barclay Ave.	10	Unknown	Unknown
Lake Sherwood	24	140	375 [a]
Marks and Shine	12	119	219

[a] Original reported total depth was 450 feet (PEC, 1999)

Project Approach

The overall approach of the project is four-fold.

1. The first point of emphasis will be dry period monitoring of the four recharge wells for characterization of the chemical and microbiological quality the recharge water within the Upper Floridan aquifer at the three demonstration sites.
2. The investigation will then be expanded to include monitoring wells at the three demonstration test sites. Monitoring wells will be installed for additional water quality sampling throughout the project as well as for characterizing localized directions of flow within the upper Floridan aquifer.
3. Thirdly, the project will characterize the chemical and microbiological quality of recharge water derived directly from street runoff and indirectly from lake level control overflow. Once introduced to the upper Floridan aquifer water samples will be collected from monitoring wells to evaluate the fate of the chemical and microbiological constituents with respect to distance and time in order to assess the degree of impact that the recharge water has on the in-situ aquifer water.
4. Using these data select and implement above ground treatment processes to enhance the quality of the recharge water and then reassess the fate of chemical and microbiological constituents within the aquifer resulting from this treatment. The pre- and post-treatment data will then be compared, and compared to regulatory criteria to identify the benefit and value that treatment provided.

The project is divided into six major tasks which includes a Literature Review, dry period characterization, baseline site characterization, operational (wet or recharging) site characterization, enhanced treatment site characterization, and reporting and documentation. Each of the “characterization” Phases involves a significant amount of fieldwork, water quality sample collection, monitoring well construction and hydrogeologic interpretation.

Task 1 - Literature Survey

Background information relating to well construction, hydrogeology and water quality at this site, and in this area, will be gathered as part of a literature search, and will be presented in the form of a Technical Memorandum, supporting presentation and interpretation of data collected subsequently in this sampling program. The literature search will include prior investigations by the U.S. Geological Survey regarding drainage wells and groundwater quality in the Central Florida area. It will also include applicable published investigations and other experience relating to the fate of microorganisms and other constituents in storm water runoff during recharge into aquifers such as the Upper Floridan aquifer.

Task 2 – Private Drinking Water Well Survey

Surveys for private drinking water wells will be conducted for each of the three sites. Records of building departments and health departments of the city or county applicable to the well sites, SJRWMD, and SFWMD will be accessed to find wells identified as private drinking water wells. The search radius will be one mile from each well.

TASK 3 – Dry Period Characterization

Central Florida has experienced drought conditions for several years and significantly reduced quantities of stormwater has recharged the aquifer through the wells during this time. Currently the stage of Lake Orienta is approximately 5 to 7 feet below the intake elevation for the recharge wells and Lake Sherwood is nearly dry.

The purpose of this task is to collect reference water quality data for the three demonstration sites that has resulted from the drought conditions. The following subtasks will be performed at the sites:

- Collect water quality samples from the recharge wells and analyze the water for a broad suite of analytes (see Appendix A- Analyte List) to assess the current condition of aquifer water quality. The samples will be collected in accordance to the Sampling Equipment and Procedures (Appendix B) and Quality Assurance/Quality Control and Data Validation Plan attached (Appendix C).
- Collect water from the recharge wells to evaluate indicator microbes and to conduct laboratory beaker studies on microorganism survivability (see Appendix D for the approach).
- Validate the chemical data.

- Compare the validated chemical data from both wells to regulatory criteria and the recharge water quality data to the site reference data to identify baseline water quality (Appendix E).
- Evaluate the microbial sampling and survivability testing to literature results.

TASK 4 – Baseline Site Characterization

The purpose of this task is to collect baseline water quality data at all three demonstration sites. The installation of monitoring wells will occur in order to map local hydraulic gradients within the Floridan aquifer, and to assist in tracking the fate and transport of recharge water to be accomplished in a following task of this project. The project team, including FDEP staff, will coordinate on locating monitoring wells for the three sites. This will include field visits to evaluate site options and constraints, as necessary.

In this task, background water quality samples which are representative of in-situ upper Floridan aquifer formation water will be collected to have laboratory studies on the survivability of microorganisms performed.

The following subtasks will be performed at the sites:

- Track area rainfall from the agreed upon rain gauges.
- Install one reference monitoring well, upgradient of the recharge well. The well will be surveyed for horizontal and vertical control to allow determination of the hydraulic gradient of the potentiometric surface of the Floridan aquifer.
- Collect reference and baseline water quality data using the protocols previously described. This will provide reference data and baseline water quality data early on in the well installation process in case significant recharge events occur.
  - Collect water quality sample from the newly constructed monitoring wells and the recharge wells then analyze the water for a broad suite of analytes to assess the current condition of aquifer water quality. All samples will be collected in accordance to the Quality Assurance/Quality Control and Data Validation Plan attached (Appendix C) and Sampling Equipment and Procedures (Appendix D). A description of proposed monitoring well construction is attached in Appendix F.
  - Validate the chemical data.
  - Compare the validated chemical data from both wells to regulatory criteria and the recharge water quality data to the site reference data to identify baseline water quality (Appendix E).
- Collect and map water level elevation data from nearby recharge wells and the reference monitoring wells to better evaluate groundwater flow direction. The purpose of this step is to better identify the aquifer gradient near the recharge wells and to collect water quality data to better assess reference conditions at the sites.
- Using the aquifer gradient data, install at least one cross-gradient and two to three more down gradient monitoring wells at appropriate locations of spacing and direction and

physical site constraints. This can be done concurrently with the sampling of the reference monitoring well and the recharge well. The wells will be surveyed for horizontal and vertical control to allow determination of the hydraulic gradient of the potentiometric surface of the Floridan aquifer.

- Review the results of the laboratory microorganism survivability testing. Identify microorganisms to sample in subsequent tasks, which address water quality monitoring during or as a result of recharge events.
- Verify or modify the chemical and microbiological analyte list to monitor recharge events.
- Evaluate the water level and water quality data to validate locations and number of monitoring well or the need for additional wells.
- Install and sample the remaining monitoring wells and evaluate the data as previously described.
- Manage the data and provide status reports on the results.

Task 5 – Operational Site Characterization

The purpose of this task is to monitor and track aquifer water quality resulting from a recharge event.

- Track area rainfall from the Orlando International Airport or other appropriate gauging stations.

After an appropriate storm and recharge event (Appendix G) begin sampling to track groundwater quality changes.

- Sample the recharge well and the monitoring wells and analyze the groundwater for constituents of the analyte list. The sampling frequency will be 1, 5, 10, 30, 60, 120, and optionally 180 days after a triggering recharge event.
- Collect and map water level elevation data for each sampling event.
- Validate the chemical water quality data.
- Compare the validated data to regulatory criteria and site reference data.
- Manage and track the data.
- Verify or modify the chemical and microbiological analyte list for the 60-day, 120-day, and the optional 180-day sampling events based on the results of the previous samplings.
- Manage the data and provide status reports on the results.

Task 6 – Enhanced Treatment Site Characterization

The objectives of Phase 3 are to evaluate, design, and implement storm water treatment then evaluate the degree that the treatment improves groundwater quality. The treatment evaluation and design will occur concurrently with Phases 1 and 2 after the reference, baseline, and recharge water quality are characterized. The steps are

- Track area rainfall from the Orlando International Airport and other appropriate gauging stations.
- Evaluate the site reference, baseline, and recharge water quality from Phases 1 and 2.
- Determine water quality goals for the treatment process.
- Design and construct treatment system.
- After an appropriate storm and recharge event begin sampling to track groundwater quality changes.
- Sample the recharge well and the monitoring wells and analyze the groundwater for constituents of the analyte list. The sampling frequency will be 1, 5, 10, 30, 60, 120, and optionally 180 days after a triggering recharge event.
- Collect and map water level elevation data for each sampling event.
- Validate the chemical water quality data.
- Compare the validated data to regulatory criteria and site reference data.
- Manage and track the data.
- Verify or modify the chemical and microbiological analyte list for the 60-day, 120-day, and the optional 180-day sampling events based on the results of the previous samplings.
- Manage the data and provide status and final reports on the results.

The final data evaluation for the program is to compare the pre- and post-treatment data from the three sites to identify the effectiveness and value that treatment had on aquifer water quality.

Task 7 – Reporting and Documentation

Status progress reports will be prepared and submitted to FDEP monthly through e-mail. The chemical and microbial data will be included in the reports. Data reports will be distributed approximately 8 weeks after the sampling events occur.

The data and final reports will contain cumulative data for the project showing minimum values, maximum values, and arithmetic mean values of the data.

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Appendix A

Analyte List

The intent of the sampling plan that includes the analyte list, quality assurance/quality control (QA/QC) program, and data validation is to provide data that is collected using industry standard procedures and data that will withstand scrutiny for public review. The broad suite analyte list for site screening is presented below. The purposes of collecting data from a broad list of constituents is to more fully characterize the geochemical conditions of the sites, to more fully characterize the status of contaminants that may be present at the sites, and to provide information to evaluate and select treatment processes for the sites.

- Field parameters using calibrated meters – temperature, pH, specific conductance, ReDox potential, and dissolved oxygen.
- Common ions – calcium, potassium, magnesium, sodium, carbonate/bicarbonate, chloride, sulfate and total dissolved solids.
- Nutrients – nitrate, nitrite, ammonia, TKN, total nitrogen, orthophosphate, and total phosphorus.
- Other parameters – turbidity, color, BOD5.
- Metals using SW-846 6000 and 7000 series methods – 23 metals.
- Volatile Organic Compounds using SW-846 8260.
- Semi-volatile Organic Compounds using SW-846 8270.
- Organochlorine Pesticides and PCBs using SW-846 8081 and 8082.
- Chlorinated Herbicides using SW-846 8151.
- Total Petroleum Hydrocarbons using the Flo-Pro method
- Gross Alpha and Gross Beta.
- The microorganisms or populations, which consist of bacteria, viruses, and protozoa, are*Cryptosporidium, Giardia,* total and fecal Coliforms, Enterococci, and Coliphage. The sampling and analyses for the microorganisms are provided in Appendix D.

Appendix B

Sampling Equipment and Procedures

The recharge wells and the monitoring wells will be sampled using dedicated bladder pumps. For the recharge wells the pumps will be inserted into a 2-inch diameter PVC pipe to protect the pump and the pipe will be reduced to ¾-inch PVC pipe below the pump. The bottom open-end of the reduced-diameter drop pipe will extend to the desired sampling depth of the recharge well. The purpose of the drop pipe is to protect the pump during recharge events, to isolate the sampling level, and to reduce the volume of purge water and sampling time.

Samples will be collected using low-flow sampling procedures to collect representative groundwater samples with a minimum of disturbance to the groundwater system, Puls and Barcelona, April 1996.

Appendix C

Quality Assurance /Quality Control and Data Validation for Chemical Analyses

QA/QC for the resulting laboratory data resulting from the chemical analyses will be achieved through the use of QA/QC samples.

- Blind duplicate samples to check the accuracy of the laboratory results
- Field blank samples to check for the potential of remnant contamination in the laboratory equipment.
- Trip blank samples for VOCs to check for transit-based contaminant intrusion into the samples
- Matrix spike and matrix spike duplicate samples (MS/MSD) to check the precision and accuracy of the laboratory equipment.

The laboratory data, including QA/QC sample results will be validated using USEPA *Functional Guidelines for Evaluating Data (Inorganic and Organic),* USEPA, February 1994. The process results in placing validation flags for the data which indicate that the data are valid, qualified valid, or invalid. Other than valid data the two categories with the next greatest number of qualified values are "estimated" values and "non-detections." These values will be retained and included in the mathematical management of the data. Estimated values (results between the reporting limit and method detection limit – "J"-flagged) will be included in the calculation of mean values at their reported values. Non-detections (results below the method detection limit – "U"-flagged) will be included in the mean value calculations at one-half of the method detection limit for those particular analyses.

Appendix D

Microbiological Monitoring

Introduction

Recharge of the Floridan aquifer through wells with surface water and storm water has occurred in Central Florida since the early 1900's. As part of the SJRWMD Artificial Recharge Demonstration Program, it is desired to evaluate the impact of this practice on the quality of the aquifer to determine the effectiveness and value of treatment to expand this practice in a way to not affect human health and the environment in an unacceptable manner. The purpose of this scope focuses on monitoring and evaluating the fate of the microbiological components of the recharged water.

Fecal coliform bacteria have long been used for assessing ambient water quality and total coliform bacteria have been used to assess drinking water treatment (disinfection) however, several types of alternative indicator organisms have also been suggested for Florida tropical waters or as better predictors of risk. These indicators include coliphage and *Enterococcus*. The evaluation of groundwaters and surface waters and the distinction between them based on water quality variables will be extremely important in Florida particularly for applications of aquifer recharge. The types of indicators, monitoring approaches for both assessing the risk to native ground water and the recovery of the input water is not clearly defined. In addition, these microorganisms will die-off at different rates and their differential survival in stored groundwater systems has not been assessed.

Intent of the project

As stated in the purpose and overview of the Project: "The intent of this project is to Characterize the chemical and microbiological quality of the source storm water. Identify the constituents that may be degrading the groundwater quality if any." Specifically for the microbiology, the goal of the project is to undertake a descriptive study of ground and surface microbiological water quality seasonally. This study will use a number of routine and alternative microbial indicators of fecal pollution in addition to sampling directly for the enteric protozoa to describe the water quality. Finally, using the native ground water, the survival of these fecal indicators will be examined in the laboratory.

Monitoring Program Goals

The goals of a monitoring program for the recharge well demonstration projects are

- To demonstrate any change in water quality (improvement or degradation) in the water recovered from the recharge wells and monitoring wells
- To develop a system which can aid in greater assurance of maintaining the operations without adverse impacts

Background on Indicators/Pathogen monitoring:

Coliphage are viruses that infect bacteria, specifically the bacterium *E. coli*. The various types of coliphage may have some value as indicators, particularly for human enteric viruses (Havelaar et al., 1993; Payment and Franco, 1993). These model viruses behave in the environment and survive many treatment processes (i.e. disinfection) in a manner that is similar to the human viruses of health concern. The coliphage are also easily assayed by sampling the water and mixing it with the host bacterium. When plated, the bacteria produce a lawn of cells in which the viruses will produce holes or plaques in the lawn through lysis of the bacterial cells. The analysis takes less than 24 hours and the quantitative measurement for the viruses is referred to as "plaque forming units" or PFU. Havelaar et al, (1993) evaluated wastewater both untreated and treated, river water, treated river water and lake water for coliphage and human enteric viruses. Significant correlations between coliphage and enteric viruses suggest that coliphage may predict the concentration of human viral pathogens. However, no correlation was found in untreated and treated wastewater, and this suggests there are other unknown factors involved which may complicate the use of this surrogate with recent sewage inputs into a water body. More recently, coliphage have been used to distinguish between animal and human wastes (Hsu et al., 1995). This may be useful when applied to groundwaters impacted by primarily pristine surface water that receive little or no human wastewater.

The genus *Enterococcus* is a subgroup of the fecal streptococci (bacterial cocci of fecal origin) which possess the group D antigen and conform to the Sherman criteria (Clausen *et al.,* 1977). The *Enterococcus* group includes *Enterococcus faecium, E. faecalis, E. durans,* and related biotypes (Clausen *et al.* 1977). *Enterococcus* generally appears to be more persistent than either bacterial pathogens or fecal coliforms (Davies-Colley *et al,* 1994; Sinton *et al*, 1994).

E.coli is a specific genus and species found as part of the fecal coliform bacteria group. It may be more indicative of fecal pollution and risk.

While conventional and alternative indicators are rapid and fairly inexpensive, they do not always represent the presence/absence of parasites such as *Cryptosporidium* and *Giardia* or enteric viruses, thus direct pathogen monitoring is often warranted. *Giardia* and *Cryptosporidium* are two protozoan parasites that form hardy cysts and oocysts that can survive water treatment disinfection and are one of the biggest concerns of water utilities today. The cysts and oocysts are very infectious and the presence of low numbers of cysts and oocysts in water poses a health threat. In developed regions all surface water supplies are subjected to contamination with *Giardia* and *Cryptosporidium* (Rose et al., 1996). Waterborne transmission of cysts and oocysts has become more prevalent in recent years, and regulatory agencies are urging that source and finished water be screened for these organisms. [Should this be a new paragraph?] Five major groups of human viruses have been identified to cause gastrointestinal diseases in humans: rotavirus, enteric adenovirus, Norwalk virus, calicivirus, and astrovirus. Enteric viruses may also contaminate water supplies and come from human feces (Rusin et al., 2000).

TASKS

In order to evaluate the water quality in ground and surface waters, the distinction between them over time associated with aquifer recharge a variety of tasks associated with microbial water quality monitoring will be undertaken.

1. Evaluate indicator microbes in background groundwaters and in pre and post treated waters over time: total and fecal coliform, enterococci, *E.coli* bacteria, coliphage viruses
2. Evaluate *crytrosporidium* and *giardia* parasites in background groundwaters and in pre and post treated waters over time.
3. Assess in a beaker study the survival of conventional and alternative indicators in natural surface waters.

Methods for Collection

Grab samples of 2L will be collected directly from the well (after purging) in sterile 1 L polypropylene bottles. These will be pumped out using clean tubing, placed immediately on ice, stored at 40C and then transported to the USF laboratory for analysis within 24 hours. Surface waters will be collected from the edge of the lakes, using sterile bottles. Parasites will be collected in the field by filtering water (volume may range from 10 L to 100L depending on the clarity, turbidity of the water) through the Gelman Filters, placed on ice and shipped to the laboratory for processing. The SOPs will be available which detail the methods of analysis.

Methods of Analysis

Bacterial analysis total coliform and fecal coliform bacteria, *E.coli* and *Enterococcus* will be performed using a membrane filtration technique according to the methods described in Standard Methods for the Examination of Water and Wastewater (APHA, 1998).

Enterococcus will be enumerated using Method 1600 (USEPA, 1996). Water samples will be filtered as described previously. The filters will be placed on mEI agar (mE agar base, Difco Laboratories, Detroit, MI; amended with indoxyl *B*-D glucoside, nalidixic acid and triphenyl tetrazolium chloride) and incubated at 41± 0.5^{0}C. After 24 hour incubation, colonies with a blue halo will be counted as enterococci.

Detection and quantification of *E.coli* will be performed on MUG agar plates incubated at 37^{o}C for 24 hours. Fluorescent colonies will be counted as *E.coli*.

Coliphage will be analyzed using the agar overlay method of Adams (1959).). This method incorporates the use of semisolid top agar that is inoculated with a log phase culture of host bacteria (*E. coli*) along with the sample to be analyzed. This mixture is then poured onto a petri plate containing a solid agar surface. The resulting plate is allowed to rest on a horizontal surface for several minutes while the top agar solidifies. Finally the sample plate is inverted and placed into a 37^{0}C incubator for 24 hours ±2 hours. During the incubation period, the phage particles that were present in the water sample will begin to infiltrate the bacterial host cells. The phage will replicate within the bacterial cells and ultimately reach a concentration that will lyse the bacterium. The destruction of the bacterial cells that make up the confluent lawn results in clear areas known as plaques. The concentration of bacteriophage originally present in a water sample can be determined by visually enumerating the plaques.

Parasite detection will be performed by filtering approximately 100 liters of water through a 10-inch polypropylene yarn-wound cartridge filter or 1.0 nominal porosity using a gasoline powered portable water pump with a flow rate of 4.0 liter per minute. After collection, the filters will be placed on ice and transported to the University for analysis within 24 hours. Samples will be processed using EPA Method 1623. Final concentrates (post magnetic separation) will be enumerated using IFA microscopy and further analyzed for infectivity using cell culture techniques.

Efficiency of the Methods

Standard Operating Procedures will be used for the bacteria and coliphage analysis. Positive and negative controls will be used to assure media quality and the sterile techniques in the laboratory. Recoveries for the protozoa will be evaluated for each water sample by seeding 10 L of water from the sites in the laboratory with approximately 100 to 1000 oocysts and 100 to 1000 cysts. The samples will be filtered and processed and recoveries will be reported.

Bench-scale Survival Studies

Beaker studies will include studies on three natural waters incubated at 20 and 30^{o}C, and PBS control at 4^{o}C, and TDS (NaCl) of 200, 500 and 1500. Survival of coliphage, total and fecal coliforms, enterococci and MS2 and PRD 1 phage will be evaluated.

Protocol for Bench-scale Survival Studies

The objective of this portion of the survival study is to isolate potential factors that could impact survival of several types of water quality indicator microorganisms if introduced via recharged storm water into Florida ground water. Specifically, temperature and total dissolved solid (TDS) concentrations are the parameters to be examined in this phase. In addition, the impact of native (both sterilized and unsterilized) ground water versus sterile artificial water with sodium chloride will be examined to compare the effect of in-situ microbial populations and native biogeochemical factors on the survival of introduced organisms. A control solution of phosphate buffered saline will also be used. Conditions and organisms to be evaluated are described in Table 1.

Experiments will be conducted using 250-mL Erlenmeyer flasks as reaction vessels. Each flask will be acid-washed and sterilized by autoclaving before water is added. Rubber stoppers, also pre-sterilized, will be used to cap each flask. For experiments involving artificial water, the appropriate TDS concentration will be created using sodium chloride (NaCl) and sterilized before adding to the pre-sterilized flask. Native ground waters will be used as both sterilized and nonsterile trials. For sterilizing native water samples, a pasteurization process will be employed so as to eliminate living microorganisms but to avoid thermal degradation of natural compounds that may affect survival. Phosphate buffered saline will be made according to EPA Method 1623 and sterilized by autoclaving. The TDS concentration of each experimental flask will also be verified by measurement using a conductivity meter at the beginning and end of each experimental time frame.

The following organisms will be evaluated: MS-2 bacteriophage, PRD-1 bacteriophage, natural population of fecal coliforms, natural population of total coliforms (verified as non-fecal), natural population of enterococci, and natural population of coliphage. The MS-2 and PRD-1 bacteriophage will be propagated from existing pure-culture stocks on hand in the laboratory. The natural populations will be created from organisms isolated from surface water obtained from both Bullfrog creek (Hillsborough county, Florida) or storm water runoff (Hillsborough county). Bacteria will initially be picked from colonies or plaques on the appropriate selective media, then streaked on a non-selective media (tryptic soy agar) to obtain isolated colonies, and one colony will then be transferred to a tryptic soy agar slant tube for storage and simultaneously confirmed as the desired organism. Natural bacteriophage will be selected from plaques on the appropriate bacteriophage host overlay plate (Escherichia coli 15597), transferred to a 5 mL aliquot of log-phase host culture to propagate the phage isolate, and re-confirmed as a coliphage after the phage suspension is grown and purified. Isolates will be stored separately at 4 C on tryptic soy agar slants (bacteria) or in tryptic soy broth tubes (phage) and re-propagated prior to each experiment. For each natural population, 10 separate organism cultures will be used to comprise the mixture. Experiments will group compatible organisms to reduce the number of trials to be run. The three groups are (1) natural coliphage alone, (2) total coliform, fecal coliform, and enterococci, and (3) MS-2 and PRD-1.

Flasks will be maintained at the appropriate temperature using water baths or in a refrigerator, and will be kept in the dark to negate the potential effect of light. To initiate each experiment, a known concentration of each organism will be added to flasks, which will then simply be stored under the prescribed conditions and sampled at the appropriate time point. One-mL samples will be taken and diluted as necessary to achieve a readable plate count for colony forming units (cfu) or plaque forming units (pfu). Samples will be plated in duplicate on the appropriate selective media for bacteria or using the appropriate bacterial host culture as an overlay plate for phage. Time points for each experiment will be 0, 1, 2, 3, 5, 7, 10, 14, 18, 21, 24, and 30 days. The results of analyses at these times will reveal the inactivation rates of the various organisms under the given set of conditions. Table 1 summarizes the experimental parameters for the bench-scale survival study.

TABLE 1: Parameters to be compared in survival study

Water Parameters	Temperatures (degrees C)	Organisms	
Artificial, 200 mg/L NaCl	4	Coliphage (natural population)	group 1
Artificial, 500 mg/L NaCl	20	fecal coliform (natural population)	group 2
Artificial, 1500 mg/L NaCl	30	total coliform (natural population)	
Natural Water 1, sterile		enterococci (natural population)	
Natural Water 2, sterile		MS-2	group 3
Natural Water 3, sterile		PRD-1	
Natural Water 1, nonsterile			
Natural Water 2, nonsterile			
Natural Water 3, nonsterile			
Phosphate buffered saline			

Site	Recharge Wells	Monitoring wells	Total	Total # samples
Marks and Shine	1	5	6	96
Lake Orienta	2	4	6	96
Lake Sherwood	1	3	4	64

1 Reference sample, 1 baseline sample, 7 pretreatment and 7 post-treatment

Appendix E

Regulatory Criteria and Data Screening Process for Chemical Data

The State and Federal regulatory criteria for comparison of chemical data are listed below. Table E1 provides the source of the criteria and levels for the regulated constituents from the below listed sources:

- Florida Primary and Secondary Maximum Contaminant Levels – Chapter 62-550, Florida Administrative Code (FAC).
- Groundwater Cleanup Target Levels – Chapter 62-785, FAC.
- Federal Primary and Secondary Maximum Contaminant Level – USEPA Drinking Water Regulations and Health Advisories, August 2000.
- USEPA Risk-based Criteria – Hubbard, October 2000.

These criteria and the site reference data from the each site's reference monitoring well will be used to screen the data to evaluate the groundwater quality to identify constituents to monitor and track during the program. The screening process is a cascading one where constituents that are detected below a specific criterion are not carried to the next level of the process, with the exception of constituents detected above Primary and Secondary Drinking Water Standards, which will be retained through the monitoring program. Constituents that remain through the process are the constituents to track for changes in subsequent sampling events. Microorganisms will not be screened out. The order of the screens is

1. Florida Primary and Secondary Maximum Contaminant Levels – Constituents detected above these criteria will remain in the process regardless of the results of subsequent screens.
2. Federal Primary and Secondary Maximum Contaminant Level – Constituents detected above these criteria will remain in the process regardless of the results of subsequent screens.
3. Site reference water quality data
4. Groundwater Cleanup Target Levels
5. USEPA Risk-based Criteria

Appendix F

Monitoring Well Construction

The SJRWMD will install the monitoring wells. The monitoring wells will be constructed of either 4-inch diameter PVC or carbon steel casing manufactured for well construction. The wells will be completed open-hole from the bottom of the casing to the desired depth. The profile of the wells, cased depth and total depth, will mimic the profile of the associated recharge well, as best as can be accomplished given currently unknown constraints of the local geology. Larger diameter surface casing may be used to assist in stabilizing the borehole during construction. Well construction activities will be documented in the project report.

FDEP staff will be coordinated with to participate in the process of locating the monitoring wells for the three sites.

Mud rotary and reverse-air rotary drilling techniques will be used to drill the boreholes for the monitoring wells.

Upon completion, the monitoring wells will be developed using pumping and hydraulic surging until the water discharged from the well is clear and free of debris, or until further improvement in clarity cannot be made. Mechanical or airlift pumping procedures will be used. Well development process and results will be documented in the project report.

Appendix G

Precipitation Characteristics for a Triggering Storm Event

The NPDES storm water sampling program defined representative storm events to be greater than 0.1-inch in volume and at least 72 hours between measurable events (40 CFR Chapter 122.21(7)). A minimum volume is desired to ensure that sufficient runoff has occurred to sample. Very small rainfall events may wet the land surface, but little runoff will enter the ponds or wells. A slightly higher rainfall event may have runoff, but will not transport many solids or runoff from pervious areas. To provide a uniform methodology for this study, the following protocols will be used to identify when to sample the wells.

The locations and availability of rain gauge data near the project sites will be reviewed with the intent to select gauges where rainfall conditions are reasonably similar to that of the project sites. As rainfall is a triggering event, the gauges need to monitored and readily available on a daily basis. A list of gauge locations with monitoring frequency will be prepared and submitted to FDEP for discussion and agreement.

Rainfall records will be obtained from the agreed upon gauges as soon as possible after a substantial rainfall event. Only rainfall exceeding 0.1 inch will be sampled. Sometimes, rainfall can be spotty and very localized. An inspection of the area surrounding the recharge well will be made during or soon after a rain event for evidence of runoff, of possible. If the program team judges that there may not have been local rainfall and runoff, then no sampling will be conducted.

The NPDES requirements for storm water sampling from ponds are different than from a free outfall (i.e., a pipe discharging into a stream). For ponds with a retention time greater than 24 hours, one grab sample is all that is required. Generally, this sample is taken within 24 hours after the storm. The Lake Orienta and Lake Sherwood sites are in essence ponds with the recharge well as the outfall, while the Marks and Shine site is in a vault under a street. For this recharge well, the groundwater acts like a pond regardless of the nature of the surface conditions. As long as there is a fairly substantial flow into the well, 1 sample within 24 hours of a runoff event will capture the quality of the discharge.

Waiting between events for a period of time is useful to allow pollutants to buildup before a sampling event. If a sample was collected too soon after multiple events, lower concentrations would be expected. However, rainfall in Florida is much more frequent than in some parts of the country and 72 hours between storm events may cause significant delay in the program. Therefore, an antecedent dry period of 24 hours will be used. Any rainfall greater than 0.02 inch (i.e., slightly more than a trace), but less than 0.1 inch, would not be sampled and would require that the antecedent dry period be extended by another 24 hours. Rainfall events of less than 0.02 inch would not be sampled, and would not be counted as a runoff event.

CFARE Status Report No. 5

From:	Aikens, Al/ORL
Sent:	Wednesday, June 04, 2003 1:47 PM
To:	'Anil Desai (E-mail)'; 'Chris Ferraro (E-mail)'; 'Chris Sweazy (E-mail)'; 'Duane Watroba (E-mail)'; 'Elizabeth Thomas (E-mail)'; 'George Heuler (E-mail)'; 'Jerry Salsano (E-mail)'; 'Larry Pearson (E-mail)'; 'Leslee Williams (E-mail)'; 'Rich Deuerling (E-mail)'; 'Richard Drew (E-mail)'; 'Bart Bibler (Bart_Bibler@doh.state.fl.us)'; 'Peter J. Kwiatkowski, P.G. (pkwiat@sfwmd.gov)'; 'Don Ellison (Ellison, Don/SWFWMD)'; Jim Gross/SJRWMD
Cc:	'Barbara Vegara (E-mail)'; 'David John (E-mail)'; 'Doug Munch (E-mail)'; 'Jim Hunt (E-mail)'; McNeal, Mark/TPA; 'Rodney Lynn (E-mail)'; Wycoff, Ron/GNV; 'rosejo@msu.edu'; Peters, Chris/DFB; 'Chris Sweazy (Sweazy, Chris/SFWMD)'; 'rarenken@usgs.gov'; 'Rick Howard (Howard, Rick/Orlando)'; Rob Teegarden (Teegarden, Rob/OCU); Lydia Wing (Wing, Lydia/Nodarse); Lehnen, Jeff/GNV; Sanders, Kevin/GNA
Subject:	Central Florida Artificial Recharge Well Status Report No. 5
Attachments:	tracer test conceptual plan final.doc

Folks,

This e-mail transmits the fifth Status Report for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The last report was January 27, 2003. The reports are issued at times associated with project milestones. Since the last report the following has been accomplished: monitoring wells were installed, baseline groundwater sampling was conducted, and the groundwater tracer test was begun. These are briefly described below.

Monitoring Well Installations

The monitoring wells were installed at Festival Park, Orlando, Florida during the latter part of February through early April 2003.

Baseline Groundwater Sampling

Baseline sampling of the two recharge wells and four monitoring wells was conducted Tuesday, May 27 through Thursday, May 29, 2003. The samples will be analyzed for chemical and microbiological parameters as documented in the Groundwater Monitoring Plan (Status Report 4).

Groundwater Tracer Test

Test Planning - Planning to conduct the groundwater tracer test was coordinated with FDEP. The following documents were submitted to FDEP for consideration:

- Groundwater Tracer Test Conceptual Plan - revised (attached)
- Results of private well surveys from the Florida Department of Health and the SJRWMD. No potable water supply wells were identified within 1 mile of the project site.
- Materials Safety Data Sheets for fluorescein and eosine

A letter was issued by FDEP approving of the groundwater tracer test plan.

Background Tracer Sampling - Groundwater quality was monitored at the two recharge wells and four monitoring wells for background indications of tracer signature. Activated carbon sample packs are used for tracer dye adsorption. Sample packs were placed in the wells and left for one week, then replaced with fresh packs for another week (two weeks total). Eosine was not detected from any sample pack. Low concentrations (sub ppm) were reported for fluorescein in MW-1, MW-2, and MW-4. These low concentrations should not interfere with the ability to detect fluorescein tracer anticipated at the monitoring wells based on the planned mass loading, based on consultation with Ozark Underground Laboratory.

Tracer Release - Tracer release was conducted on Friday, May 30, 2003 after the baseline sampling was finished. The release was made by pumping tracer solution into the two recharge wells through tremie pipes. The release point was 5-10 feet above the bottom of the casing. The tracer was pumped in at approximately 3-4 gpm. The recharge wells continually flow; therefore, the ambient flow was used to move the tracer from the well bores into the aquifer. 75 pounds of fluorescein was introduced into Well 40, the southern well, and 50 pounds of eosine was introduced into Well 143, the northern well.

Fresh carbon sample packs were installed in the monitoring wells prior to the releasing the tracer. The sample packs will be replaced and analyzed at two week intervals. The scheduled duration of the tracer test is three months.

Other Data Collection

- Groundwater levels are being collected in the monitoring wells using pressure transducers and recorded by data loggers for the duration of the tracer test.
- Daily rainfall from the Orlando Executive Airport have been collected since February 2003 and will continue through the Operational Testing phase of the project at a minimum.

Next Anticipated Status Report

The next anticipated status report will be at the conclusion of the groundwater tracer test. At that time, if the chemical and/or microbiological data are available from the baseline sampling they will be included. If the data are not available a separate status report will be issued to transmit those data.

Please let me know if you have any questions regarding this project.

tracer test
conceptual plan fi...

Al Aikens
CH2M HILL/Orlando, FL

Festival Park Tracer Test Conceptual Plan

PREPARED FOR: SJRWMD

PREPARED BY: CH2M HILL

DATE: May, 8, 2003 (Revised)

1.0 Introduction

The St. John's River Water Management District (SJRWMD) seeks to demonstrate the existence of a hydrologic connection between Festival Park recharge wells 40 and 143 and monitoring wells MW-1, -2, -3, and –4, Figure 1. A qualitative groundwater tracer test will be conducted for the purpose of demonstrating this connection.

2.0 Site Conceptual Model

The Festival Park site is located immediately west of Orlando Executive Airport (OEA). The site contains two recharge wells that receive direct runoff from the stormwater collection system. Table 1 contains the completion details of the Festival Park recharge wells. These intervals for each of the wells will be selected in the field based on actual conditions encountered during drilling.

TABLE 1
General Completion Characteristics of the Recharge Wells and Monitoring Wells

Well	Diameter (Inches)	Cased Depth (Feet)	Total Depth (Feet)
Festival Park (Well 40)	12	195	490[a]
Festival Park (Well 143)	10	140	315
MW-1	4	180	250
MW-2	4	180	250
MW-3	4	185	250
MW-4	4	190	250

[a] Total depth through geophysical logging (8/3/00), reported total constructed depth - 1049 feet, USGS inventory card depth – 350 feet. Additional geophysical and television camera surveys conducted in March 2003 show that the water enters the aquifer between the approximate interval of 195 feet to 200 feet below grade. Below 200 feet, little evidence of flow from the well into the aquifer was observed.

The wells are open to the upper Floridan aquifer, and are completed using open-hole construction.

3.0 Literature review

The most viable mechanism for identifying the presence of tracer in the monitoring wells to is the use of activated carbon fluorescent dye receptors. Information on dye detection mechanisms may be found in Section 6.3, below. A literature review was conducted to identify fluorescent dyes that had been successfully used for groundwater tracer tests.

Mull *et. al*. (1988) provide information on the use of tracers in karst terranes, however they present tracer test analysis methods that can be applied to any environment. Kass (1998) provides an overview of the planning, execution, and analysis of tracer tests using a variety of tracers. Aley (1999) developed a groundwater tracing handbook, which addresses topics such as the selection of dyes and their quantities, methods of dye introduction and sampling, and dye analysis.

A comprehensive study of the use of a variety of fluorescent dyes for hydrologic studies has been presented by Smart and Laidlaw (1976). Their report discusses the variation of fluorescence with temperature, pH, salinity, and other water quality parameters. Adsorption of a variety of tracer dyes onto dissolved limestone was found to be approximately 5% (Smart and Laidlaw, 1976). Adsorption onto consolidated in-situ limestone in the study area is expected to be even lower its lower surface area compared to the dissolved limestone used by Smart and Laidlaw.

Tai and Rathbun (1988) present a study on the photolysis (photodecay) of Rhodamine-WT dye. Photolysis is not expected to be a factor in the tracer study conducted under this scope of work because the tracer will be released into groundwater, not surface water. Sabatini and Austin (1991) examined the sorption of fluorscent dyes and herbicides on alluvial aqufier sand. Rhodamine WT was found to have the highest level of absorption, followed in decreasing order by alachlor, atrazine, and fluorescein.

Sabatini (2000) studied the sorption of fluorescein and sulforhodamine B onto sandstone and limestone. Fluorescein was found to readily sorb to negatively charged sandstone due to its positive charge. Though not a component of the study, Sabatini noted that Rhodamine WT, which has both cationic and anionic groups has the potential to sorb to most mineral surfaces.

4.0 Expected Travel Time

If it is assumed that the tracer is inert and that advection is the dominant transport mechanism through the aquifer (*i.e.*, the tracer moves at the same velocity as the groundwater, and is not retarded by the aquifer matrix), the expected travel time of the tracer can be estimated by calculating the average linear velocity of the groundwater:

$$\bar{v} = \frac{-K}{n}\frac{\partial h}{\partial l} \quad \text{(Freeze and Cherry, 1979)} \qquad (1)$$

where

$\bar{v}$ = average linear velocity

K = hydraulic conductivity (assume 250 ft/d)

n = porosity (assume 0.2)

$\frac{\partial h}{\partial l}$ = hydraulic gradient (assume 0.0001)

Aquifer characteristics uses to compute the travel time were collected as follows: The Upper Floridan aquifer in the area was assigned a transmissivity of 87,500 ft^2/d in the East-Central Florida Groundwater Flow Model, (McGurk and Presley, 2000). The aquifer is approximately 350 feet thick in its representation in the model. The porosity is estimated to be 0.2. Potentiometric surface elevations measured in May 2000 indicate an eastward hydraulic gradient of approximately 0.0001.

Since the distances between the recharge wells and the proposed monitoring wells are known, the travel time can be estimated by dividing the distance by the average linear velocity. The results for each monitor well and recharge well combination are presented in Table 2.

TABLE 2
Expected travel time for each recharge/monitor well pair

Well (with position)	**Distance from Recharge Well 39 (feet)**	**Distance from Recharge Well 40 (feet)**	**Expected travel time from Well 39 (days)**	**Expected travel time from Well 40 (days)**
MW-1 (up gradient)	350	450	44 [a]	56 [a]
MW-2 (cross gradient)	500	150	63	16
MW-3 (down gradient)	350	100	44	13
MW-4 (down gradient)	500	650	63	81[a]
Average	**425**	**338**	**53**	**42**

[a] Given the historic west to east and northwest to southeast gradients, flow to the northwest (towards MW-1) or northeast (Well 40 to MW-4) is not considered likely.

6.0 Tracer Test Execution

6.1 Background Sampling and Tracer Selection

The source of recharge water for the Festival Park recharge wells is stormwater runoff. The recharge water can reasonably expected to contain a variety of compounds, some of which may have characteristics similar to fluorescent tracer dyes. False positive results may result if these compounds are sorbed onto the activated carbon detectors.

Prior to the introduction of tracer, background sampling will be conducted to evaluate for the presence of compounds that fluoresce and may interfere with the tracer test. The background sampling will consist of two activated carbon samplers placed at approximately one-third and two-thirds of the open-hole interval of the monitoring wells and in the two recharge wells at the vault boxes. The activated carbon samplers will be left in place for a week during the background sampling. These samples will be analyzed in order to determine the degree of background fluorescence in the runoff and/or groundwater.

Aley (2002, personal communication) suggests that fluorescein and eosine would be the most likely choices for the test. However, the dyes selected for the tracer test will be confirmed from the results of the background sampling. Multiple dyes will be used for the following reasons:

- Use of multiple dyes can help eliminate false positives.
- The material cost of additional dye is small compared to the total cost of the project, and provides an excellent benefit for marginal cost.
- There is no additional analytical cost for more than one dye. The eluted solution from the activated carbon receptors is analyzed using a spectrofluorophotometer, which reports the fluorescence of the elution. Multiple dyes will show up as multiple peaks.

In order to assess preferential flow pathways, one dye will be introduced into Festival Park Well 40, and another dye will be introduced into Festival Park Well 143.

6.2 Quantity of Tracer

The initial concentration must be sufficient so that the tracer can be detected in the laboratory after the carbon samplers have been eluted. Because the tracer test is intended to be qualitative in nature, the precise determination of an initial concentration is not as significant as it would be if the test were quantitative in nature. Furthermore, the use of activated carbon samplers allows the tracer to adsorb over time, so the instantaneous concentration is less important at any one time.

Aley (2002, personal communication) recommends using between 50 and 75 pounds of dye solution (75% dye and 25% dilutant) for each well. This quantity is greater than would typically be used for this type of application, and is intended to serve as a safety factor on the test. A lack of dye in the monitoring wells could be attributed to preferential pathways rather than insufficient dye.

6.3 Tracer Release

The dye will be pre-mixed in plastic "carboy" containers, and added to the top of the open-hole interval of the recharge wells with a tremie pipe. Water continually flows from the stormwater collection system into the recharge wells. This water will be used to transport the dyes from the well bore into the aquifer. Rainfall from the OEA will be monitored during the tracer test.

6.4 Tracer Detection

A cost-effective sampling approach is the use of activated carbon samplers. A string of samplers will be deployed in the open-hole intervals of the monitoring wells, and will continuously absorb and accumulate fluorescent dye. Sampler strings will be installed into the monitoring wells for a period of time. The strings will then be removed from the wells for laboratory analyses, and a replacement string of samplers will be inserted to continue monitoring. The string will consist of samplers positioned at 10-foot intervals through the open hole portion of the monitoring wells.

In the laboratory, the samplers are washed in chlorine-free water and treated with a solution that elutes the tracer dyes from the activated carbon. The elutant is then run through a spectrofluorophotometer for analysis. The anticipated turn-around time for laboratory analysis is approximately one week.

6.5 Sampling Frequency

The expected travel time ranges from 13 to 63 days (Table 3). The adsorption of dye onto activated carbon decreases as the length of time increases (Aley, 1999). Due to the variety of distances between the monitoring wells and recharge wells, and the unknown gradients that change in response to recharge events and non-recharge periods, it is recommended that the samplers be collected and changed every two weeks. Once tracer is positively detected in a monitoring well in two successive sampling intervals, sampling will be discontinued at that well.

Water samples will be collected from each monitoring well at the same time that the activated carbon samplers are collected and replaced. The purpose of collecting water samples is to provide a “snapshot” dye concentration at a known point in time. The activated carbon samplers can tell whether or not dye had reached a sampling station, but cannot tell when it occurred.

6.6 Groundwater Level Monitoring

The groundwater levels in the two recharge wells and the four monitoring wells will be monitored through the duration of the test. The purpose of collecting the data is to evaluate the changes to the groundwater gradient in response to recharge events and quiescent periods.

6.7 QA/QC

6.5.1 Background Sampling

The background sampling described in Section 6.1 will help identify and manage false positives and assist that the dyes used are appropriate based on antecedent conditions.

6.5.2 Activated Carbon Samplers and Water Samples

Standard sampling and chain-of-custody procedures will be followed at all times. These procedures are described in Attachment 1. Additionally, the following procedures will be implemented:

- Sample bags will be labeled only on the outside; no labels will be put inside. Colored pens or markers will not be used, only black Sharpie™ pens, or similar will be used (other pens may have trace dyes in their ink.
- Ice contained in double wrapped sealed plastic bags (Zip-Lock™, or similar) will be used to keep samples cool during field work and shipping.

- Samples will be kept refrigerated upon receipt by the laboratory until analysis to inhibit bacteriological growth.
- Samplers will not be washed in chlorinated tap water.

7.0 Reporting

The laboratory results will be used to identify the presence of traced water, relative to baseline conditions, at the monitoring wells from the activated carbon samplers and the grab samples from the monitoring wells over time and distance from the recharge wells. The results will be reported in the form a technical memorandum.

8.0 Schedule

The travel times presented in Table 3 suggest that it may take approximately 2 months for tracer to reach the furthest downgradient monitor well. Table 4, below, summarizes the project schedule

Table 4 – Project Schedule

Milestone	Date from Notice to Proceed
Conduct background sampling, receive results from laboratory, finalize dye selection, prepare letter to FDEP, add dye to wells	1 month
Complete sampling	3 months (assumes recharge wells operate as soon as possible (*i.e.* within a few days) after the dry sets are installed
Delivery of draft report	5 months
Delivery of final report	6 months (assumes two-week review of draft report by SJRWMD)

9.0 Preliminary Budget

A preliminary budget of $79,000 was developed for the tracer test based on the plan as described. Much of the field work is planned to be accomplished by Nodarse & Associates (a WBE) as an extension to the work associated with the monitoring well installation, baseline sampling, and operational testing sampling for the Recharge Well Demonstration Project at Festival Park.

10.0 References

Aley, T., 1999. Groundwater Tracing Handbook. Ozark Underground Laboratory, Protem, MO.

Freeze, R.A. and J. Cherry, 1979. Groundwater. Prentice-Hall, Englewood Cliffs, N.J.

McGurk, Brian, and P. Presley. 2000. Simulation of the Effects of Groundwater Withdrawals of the Floridan Aquifer System in East-Central Florida: Model Expansion Revision - Draft. St. Johns River Water Management District. Palatka, FL.

Mull, D.S., T.D. Libermann, J.L. Smoot, L.H. Woosley, Jr., 1988. Application of Dye-Tracing Techniques for Determining Solute-Transport Characteristics of Ground Water in Karst Terranes. EPA904-6-88-001. U.S. Environmental Protection Agency Region IV, Atlanta, GA.

Sabatini, D.A., and T. Austin, 1991. Characteristics of Rhodamine WT and Fluorescein as Adsorbing Ground-Water Tracers. Ground Water. vol. 29, no. 3, pp. 341-349.

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Smart, P.L. and I.M.S. Laidlaw, 1977. An Evaluation of Some Fluorescent Dyes for Water Tracing. Water Resources Research. vol. 13, no. 1., pp. 15-32.

Tai, D.Y. and R. E. Rathburn, 1988. Photolysis of Rhodamine WT Dye. Chemosphere. vol. 17, no. 3, 99 559-573.

Werner Kass, 1998. Tracing Techniques in Geohydrology. A.A. Balkema, Rotterdam, The Netherlands

CFARE Status Report No. 6

Folks,

This e-mail transmits the sixth Status Report for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The last report was June 4, 2003. The reports are issued at times associated with project milestones. Since the last report the following two tasks were accomplished for the Festival Park site: analyses of the baseline samples to identify the chemical and microbial components of the inflow at the two recharge wells and groundwater from the monitoring wells, and completion of the groundwater tracer test. These are briefly described below.

The intent of this status report is to provide in-progress results of the project. So far, we have the results of monitoring well installation, one set of water sample results, and the results of a groundwater tracer test. While some analysis and data interpretation is presented, it is not intended to be an exhaustive evaluation of the results. We are gaining considerable insight on the Festival Park site. As with any study, we will gain more insight as we collect more data.

Preliminary coordination activities began with the City of Altamonte Springs to conduct a similar study at Lake Orienta. Where the recharge wells at Festival Park represent direct urban runoff recharge wells, the recharge wells at Lake Orienta represent lake level control wells. These activities are presented near the end of this status report.

Festival Park Recharge Well Site

Festival Park is a park (several city blocks) approximately two miles east of downtown Orlando, see *Festival Park Site Map.pdf*. At the site are two volleyball courts, a recently constructed skate park and an open area for festivals. Two recharge wells are present at the site, R-40 and R-143. The two recharge wells were constructed during the 1940's and have been active since that time. Water has been observed to continually flow into the wells each time that the site was visited. The wells divert urban stormwater from the stormwater collection system to Upper Floridan aquifer. Four monitoring wells were installed in at the park and vicinity. Their locations are shown on the site map.

Baseline Sampling – Baseline sampling of the water flowing into the two recharge wells and groundwater from the four monitoring wells was conducted Tuesday, May 27 through Thursday, May 29, 2003. The samples were analyzed for chemical and microbiological parameters as documented in the Groundwater Monitoring Plan (Status Report 4). Results of the chemical and microbial analyses of the waters are provided in the attached Portable Document File: *Baseline Sampling Results.pdf*. The sampling occurred before the tracers were introduced into the recharge wells.

Results of Baseline Sampling – Two sets of data are presented in the results. Table 1 is the Summary of Results from Microbiological Analyses from the Baseline Sampling Event. Table 2 is the Summary of Results from Chemical Analyses and Comparison to Criteria from the Baseline Sampling Event.

Microbiological Results – The interpretation of the microbiological results presented in Table 1 are fairly straight-forward, with the exception of Host Famp+ Enrichment for coliphage. This analysis is a qualitative one; the two overlay methods provide quantitative results. Two designations are present for the results. The "+" indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a "+" with a "<5" pfu/100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value. The "DNA" designation indicates that more of the coliphage were of the DNA type rather than the RNA type, and conversely for the "RNA" designation. RNA phage are more highly correlated with human *E. coli*.

As will be presented in the tracer test portion of this status report, MW-1 and MW-2 are hydraulically connected to R-143 through the Floridan aquifer. Comparing the results from these 3 wells shows that total coliform concentrations decrease 3 to 4 orders of magnitude from the influent water at R-143 to the groundwater at MW-1 and MW-2.

Chemical Results – The chemical data presented in Table 2 are provided with qualifiers that resulted from the data validation process. The value and the qualifier must be taken together to properly understand the laboratory results. For instance, if a result for a chemical was "10" mg/L with an "=" qualifier then the chemical was detected at a concentration of 10 mg/L. However, if a result was "10" mg/L with a "U" qualifier then the chemical was not detected at a reporting limit of 10 mg/L. Please refer to the notes at the bottom of the table for explanations of the qualifiers.

The chemical data were compared to various regulatory criteria and risk-based criteria; the results were identified by different formatting (bolding, shading, and boxing). No chemical from the monitoring well samples was detected at a concentration greater than Florida Primary and Secondary Maximum Contaminant Levels (MCLs). The concentration of iron exceeded the MCL for the stormwater flowing into the two recharge wells. Please refer to the notes at the bottom of Table 2 for explanations to identify comparisons of the chemical results and various regulatory and risk-based criteria.

Groundwater Tracer Test – Planning to conduct the groundwater tracer test was coordinated with FDEP. The following documents were submitted to FDEP for consideration:

- Groundwater Tracer Test Conceptual Plan (Status Report 5)
- Results of private well surveys from the Florida Department of Health and the SJRWMD. No potable water supply wells were identified within 1 mile of the project site.
- Materials Safety Data Sheets for fluorescein and eosine

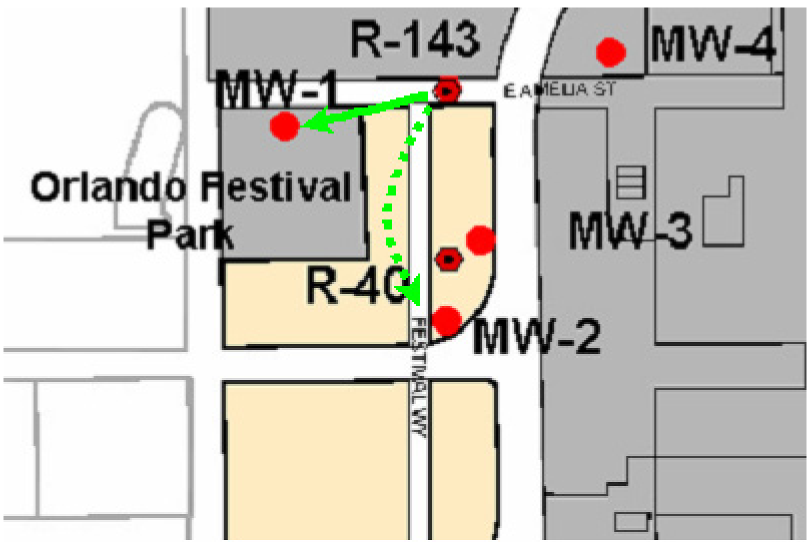
A letter was issued by FDEP approving of the groundwater tracer test plan.

Goal of the Tracer Test – Demonstrate complete pathway in the Floridan aquifer between the recharge wells and one or of the more monitoring wells. The test will assist to support results of groundwater sampling and analysis, and to adapt sampling plan for future project phases.

Tracer Release and Monitoring – Tracer release was conducted on Friday, May 30, 2003 after the baseline sampling was finished. Pumping tracer solution into the two recharge wells through tremie pipes made the release. The release point was approximately 180 feet below ground, approximately 5-10 feet above the bottom of the casing. The recharge wells continually flow; therefore, the ambient flow was used to move the tracer from the well bores into the aquifer. 50 pounds of fluorescein were introduced into Well R-143, the northern well, and 75 pounds of eosine were introduced into Well R-40, the southern well.

Fresh carbon sample packs were installed in the monitoring wells at the end of the Baseline Sampling, prior to the releasing the tracer. The sample packs were replaced and analyzed at two-week intervals. The duration of the tracer test was 12 weeks.

Results of the Tracer Test – The goal of the tracer test was attained. Fluorescein was encountered at monitoring wells MW-1 and MW-2. Eosine was not detected at any monitoring well. Amounts of fluorescein encountered at MW-1 were two orders of magnitude greater than the amounts encountered at MW-2. The results of this test confirm a connection between R-143 and monitoring wells MW-1 and MW-2. A map of the inferred movement is provided below. The data further indicate that water entering R-40 does not appear at the four monitoring wells.



Other Data Collection

- Groundwater levels are being collected in the monitoring wells using pressure transducers and recorded by data loggers for the duration of the tracer test.
- Daily rainfall from the Orlando Executive Airport were collected since February 2003 and will continue through the Operational Testing phase of the project at a minimum. Rainfall data are obtained from the National Climatological Data Center (NCDC) of the National Oceanographic and Atmospheric Administration (NOAA) through an Internet subscription service.

Modification of the Sampling Plan – The results of the groundwater tracer test indicated that MW-1 and MW-2 are hydraulically connected to R-143 through the Floridan aquifer and that MW-3 and MW-4 are connected to neither recharge well. Further, the groundwater travel time from R-143 and MW-1/MW-2 was less than two weeks. Therefore, at a meeting with the Central District of FDEP on September 4, 2003 it was agreed upon to modify the sampling plan to

- Discontinue sampling of the influent to R-40 and MW-3. The influent to R-143 and groundwater from MW-1, MW-2, and MW-4 will continue to be sampled for an unchanged list of microbes and chemicals.
- Change the sample collection frequency for the Operational Characterization phase of the project from be 1, 5, 10, 30, 60, 120, and optionally 180 days after a triggering recharge event to 1, 2, 4, and 8 weeks after a triggering recharge (0.5 inch to 1 inch of rainfall in 24 hours) event during the Fall of 2003 to monitor the end of the 2003 wet season, then sample 1 and 2 weeks after a triggering recharge event during the Winter/Spring of 2004 to monitor the system after a period of little rainfall.

Upcoming Tasks at Festival Park

- Complete of Operational Characterization phase as modified Fall 2003 through Spring 2004.
- Evaluate data for possible treatment, Summer 2004
- Implement treatment 2005, as needed
- Perform Post-treatment Operational Characterization 2006, as needed

Lake Orienta Recharge Well Site

The request for funding for the project at the Lake Orienta Recharge Well Site in Altamonte Springs is on the October 2003 agenda for the SJRWMD Governing Board. Planning discussions occurred with representatives of City of Altamonte Springs to begin the project. The current schedule of activities is

- Monitoring well construction Fall-Winter 2003/2004
- Baseline Sampling - Characterize chemical and biological quality of source water and groundwater, Winter 2004
- Qualitative Tracer Test, Winter-Spring 2003/2004
- Operational Testing - Evaluate fate and transport of biological and chemical components in the aquifer (Spring/Summer 2004)
- Evaluate and implement treatment, as needed
- Post-treatment operational testing - Evaluate effectiveness of treatment

Next Anticipated Status Report

The next anticipated status report will be at the conclusion of the groundwater tracer test. At that time, if the chemical and/or microbiological data are available from the baseline sampling they will be included. If the data are not available, a separate status report will be issued to transmit those data.

Please let me know if you have any questions regarding this project.

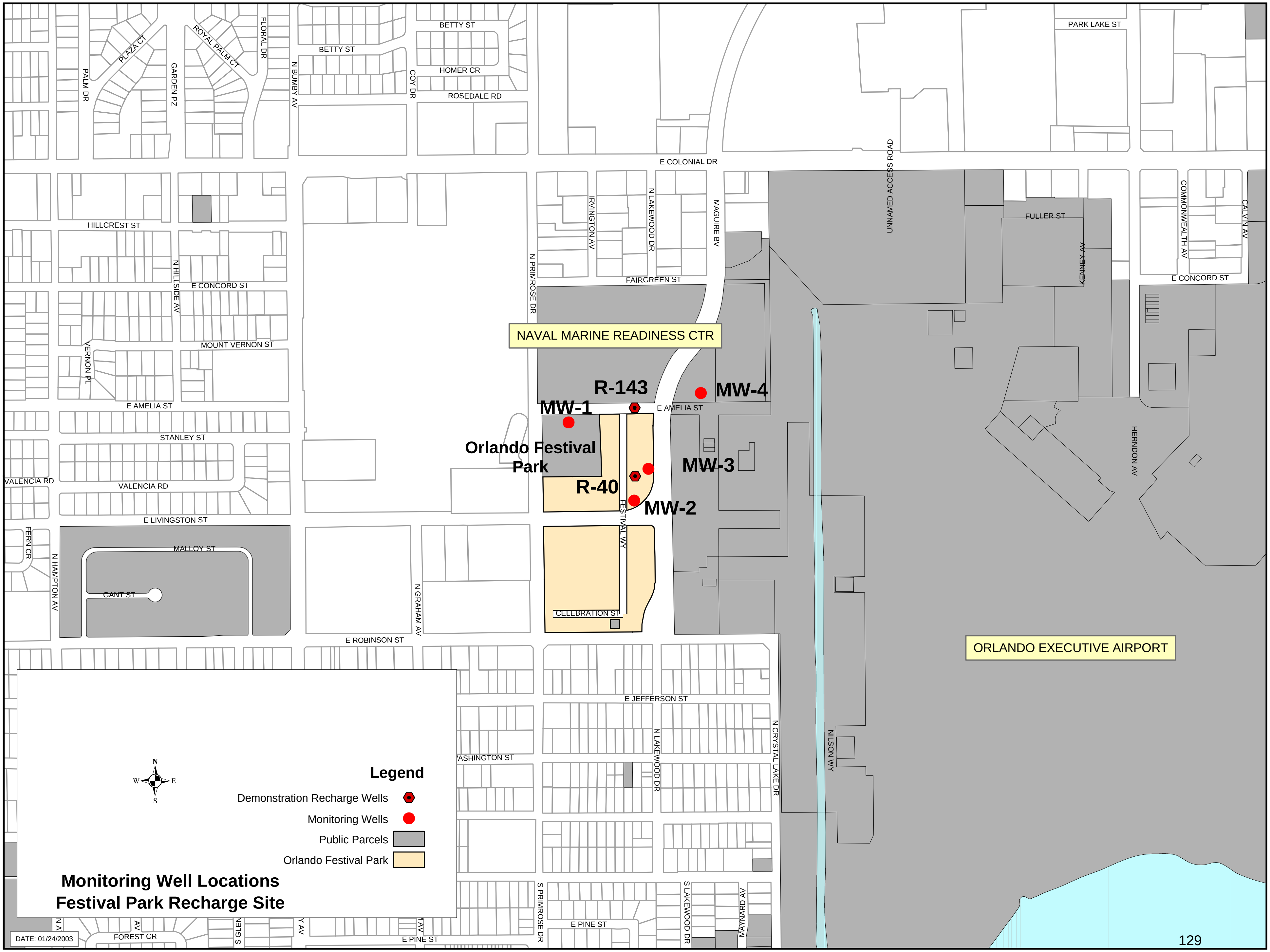

NAVAL MARINE READINESS CTR
R-143
MW-1
MW-4
Orlando Festival Park
MW-3
R-40
MW-2
ORLANDO EXECUTIVE AIRPORT
E COLONIAL DR
E AMELIA ST
E ROBINSON ST
E JEFFERSON ST
E LIVINGSTON ST
E CONCORD ST
FAIRGREEN ST
HILLCREST ST
MOUNT VERNON ST
STANLEY ST
VALENCIA RD
MALLOY ST
GANT ST
CELEBRATION ST
FESTIVAL WY
N PRIMROSE DR
IRVINGTON AV
N LAKEWOOD DR
MAGUIRE BV
UNNAMED ACCESS ROAD
FULLER ST
KENNEY AV
COMMONWEALTH AV
CALVIN AV
HERNDON AV
NILSON WY
N CRYSTAL LAKE DR
N GRAHAM AV
N HAMPTON AV
FERN CR
N HILLSIDE AV
VERNON PL
PALM DR
PLAZA CT
GARDEN PZ
ROYAL PALM CT
FLORAL DR
N BUMBY AV
BETTY ST
HOMER CR
ROSEDALE RD
COY DR
PARK LAKE ST
S PRIMROSE DR
S LAKEWOOD DR
MAYNARD AV
E PINE ST
FOREST CR
WASHINGTON ST
Legend
Demonstration Recharge Wells
Monitoring Wells
Public Parcels
Orlando Festival Park
Monitoring Well Locations
Festival Park Recharge Site
DATE: 01/24/2003

Table 1.
Summary of Results from Microbiological Analyses from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location SampleID ==> Date Collected ==>	R-40 05/28/2003	R-143 05/28/2003	MW-1 05/29/2003	MW-2 05/29/2003	MW-3 05/29/2003	MW-4 05/28/2003	Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
Organism	**Units**							
Total Coliform	cfu/100 mL	380,000	69,000	20	3.8	<0.2	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average 4 cfu/100 mL - Groundwater criteria
Fecal Coliform	cfu/100 mL	270,000	58,000	20	1.6	<0.2	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	72,000	15,000	5	0.4	<0.2	<0.2	126 cfu/100 mL - Geometric Mean
Enterococcus	cfu/100 mL	6	30	0.2	0.2	<0.2	<0.2	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric Mean
Cryptosporidium	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Giarida	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Coliphage								100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	30	<5	<5	<5	<5	<5	
Host Famp+ Overlay	pfu/100 mL	80	<5	<5	<5	<5	<5	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	+/RNA	+/DNA	+/DNA	+/RNA	+/RNA	

Notes:

cfu - Colony forming units

pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100ml, average of 400 cfu/100ml
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

Parameter Group and Name	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Parameters															
pH	Std. Units	5.89		6.45		9.22		7.38		11.1		11.1		10.17	
TEMPERATURE	°C	32.8		29.2		25.4		25.5		25.4		25.4		24.9	
CONDUCTANCE	µmhos	139		218		226		360		501		501		131	
TURBIDITY	NTU	2.95		4.79		1.2		1.24		6.72		6.72		1.45	
DISSOLVED OXYGEN	mg/L	2.7		3.19		0.82		1.81		0.22		0.22		0.24	
OXIDATION/REDUCTION POTENTIAL	mV	211		195		1		252		-140		-140		10	
Radiologicals															
ALPHA, GROSS	pCi/l	2.4	U	0.9	U	3.1	U	4.5	=	3.9	=	2.5	U	2.9	=
BETA, GROSS	pCi/l	2.5	=	1	=	3.3	=	37.8	=	54.7	=	42.1	=	2.2	U
Anions															
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	45.5	=	53	=	152	=	211	=	1	U	11	=	188	=
CHLORIDE (AS CL)	µg/L	10600	=	14300	=	6590	=	3580	=	3060	=	3000	=	4470	=
SULFATE (AS SO4)	mg/L	9.09	=	11.3	=	37.5	=	26.7	=	3.26	=	3.19	=	0.912	J
Nutrients															
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.484	=	0.358	=	0.198	=	1.99	=	0.901	=	0.741	=	0.453	=
NITROGEN, AMMONIA (AS N)	mg/L	0.213	J	0.21	U	0.427	=	1.59	=	1.04	=	0.431	=	0.21	U
NITROGEN, KJELDAHL, TOTAL	mg/L	0.484	U	0.358	U	0.198	U	1.322	=	0.901	U	0.741	U	0.453	U
NITROGEN, NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.535	=	0.05	U	0.05	U	0.05	U
NITROGEN, NITRATE-NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.67	=	0.05	U	0.05	U	0.05	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.148	=	0.103	=	0.226	=	0.084	=	0.051	=	0.101	=	0.143	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.078	=	0.046	=	0.037	=	0.031	=	0.027	=	0.038	=	0.122	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.102	=	0.075	=	0.082	=	0.075	=	0.054	=	0.057	=	0.048	=
General Chemistry															
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE	mg/L	102	=	125	=	117	=	361	=	386	=	274	=	265	=
TURBIDITY	NTU	1.6	=	1.7	=	0.12	U	0.12	U	0.12	U	1	=	0.12	U
pH	PH UNITS	6.53	=	6.31	=	7.5	=	7.44	=	11.1	=	10.6	=	7.79	=
COLOR	COLOR UNIT	20	=	20	=	5	J	0	U	5	J	5	J	0	U
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	4.85	=	27.5	=	27.8	=	3.19	U	2.18	U	2.83	U	20.8	=
DISSOLVED ORGANIC CARBON	mg/L	4.94	U	23.8	=	24.3	=	1.52	U	2.67	U	2.81	U	2.79	U
Metals															
ALUMINUM	µg/L	**73.7**	U	**76.3**	U	**150**	U	35	U	37.7	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	2.5	U	2.5	U	2.66	J	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	2.04	U	10.5	=	19.4	=	3.06	J	2.04	U	2.04	U
BARIUM	µg/L	14.3	=	16.6	=	11.1	=	35.9	=	51.1	=	35.3	=	6	=
BERYLLIUM	µg/L	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U
CALCIUM	µg/L	18500	=	21500	=	61800	=	52700	=	17100	=	20400	=	65600	=
CHROMIUM, TOTAL	µg/L	0.712	J	0.57	U	0.57	U	1.13	U	1.79	U	1.13	U	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	3.43	U	4.34	U	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**496**	=	**448**	=	16.7	U	16.7	U	30.5	U	16.7	U	18.4	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	2.05	U	3.26	U	1.76	U
MAGNESIUM	µg/L	1530	=	2030	=	4700	=	6420	=	1030	=	2080	=	3150	=
MANGANESE	µg/L	9.28	=	10.1	=	3.94	=	2.21	=	0.413	U	0.515	U	1.35	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	2.31	J	1.64	J	4.66	J	0.997	U	0.997	U	0.997	U
POTASSIUM	µg/L	1350	=	1510	=	1760	=	25400	=	56000	=	41400	=	1450	=
SELENIUM	µg/L	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.75	U
SODIUM	µg/L	6110	=	8000	=	5380	=	25600	=	29300	=	22900	=	10200	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.93	U	1.82	U	1.8	U	3.73	=	0.47	J	0.447	U	0.573	U
ZINC	µg/L	14.2	=	11.2	=	1.54	U	1.66	U	1.33	U	0.951	U	1.31	U
Total Petroleum Hydrocarbons															
PETROLEUM HYDROCARBONS	mg/L	0.43	=	0.49	=	0.35	U	0.34	U	0.34	U	0.38	=	0.36	U
Volatile Organic Compounds															
ACETONE	µg/L	3	J	3.9	J	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACROLEIN	µg/L	10	UJ	10	UJ	10	U	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	0.18	J	1	U	1	U	0.64	J	0.48	J	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	UJ
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Parameter Group and Name	Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
Parameter Group and Name	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Field Parameters																
pH																
TEMPERATURE																
CONDUCTANCE																
TURBIDITY																
DISSOLVED OXYGEN																
OXIDATION/REDUCTION POTENTIAL																
Radiologicals																
ALPHA, GROSS	15	pCi/L		pCi/L	15	pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
BETA, GROSS		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
Anions																
ALKALINITY, BICARBONATE (AS CACO3)		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
CHLORIDE (AS CL)		µg/L	250000	µg/L		µg/L	250000	µg/L	250000	µg/L	2500000	µg/L		µg/L		µg/L
SULFATE (AS SO4)		mg/L	250	mg/L		mg/L	250	mg/L	250	mg/L	2500	mg/L		mg/L		mg/L
Nutrients																
TOTAL NITROGEN, ALL FORMS,CALCULATED		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, AMMONIA (AS N)		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, KJELDAHL, TOTAL		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, NITRITE	1	mg/L		mg/L	1	mg/L		mg/L	1	mg/L		mg/L	3.7	mg/L	3.7	mg/L
NITROGEN, NITRATE-NITRITE		mg/L		mg/L	10	mg/L		mg/L	10	mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL (AS P)		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORGANIC (AS P)		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
General Chemistry																
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE		mg/L	500	mg/L		mg/L	500	mg/L	500	mg/L	500	mg/L		mg/L		mg/L
TURBIDITY		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
pH		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
COLOR		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BIOLOGIC OXYGEN DEMAND, FIVE DAY		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
TOTAL ORGANIC CARBON		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
DISSOLVED ORGANIC CARBON		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Metals																
ALUMINUM		µg/L	200	µg/L		µg/L	50	µg/L		µg/L	200	µg/L	37000	µg/L	3700	µg/L
ANTIMONY	6	µg/L		µg/L	6	µg/L		µg/L	6	µg/L	60	µg/L	15	µg/L	1.5	µg/L
ARSENIC	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	5000	µg/L	0.045	µg/L	0.045	µg/L
BARIUM	2000	µg/L		µg/L	2000	µg/L		µg/L	2000	µg/L	20000	µg/L	2600	µg/L	260	µg/L
BERYLLIUM	4	µg/L		µg/L	4	µg/L		µg/L	4	µg/L	400	µg/L	0.016	µg/L	0.016	µg/L
CADMIUM	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	515	µg/L	18	µg/L	1.8	µg/L
CALCIUM		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHROMIUM, TOTAL	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L		µg/L		µg/L
COBALT		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2200	µg/L	220	µg/L
COPPER		µg/L	1000	µg/L		µg/L	1000	µg/L	1000	µg/L	10000	µg/L	130000	µg/L	13000	µg/L
IRON		µg/L	300	µg/L		µg/L	300	µg/L	300	µg/L		µg/L	11000	µg/L	1100	µg/L
LEAD	15	µg/L		µg/L	15	µg/L		µg/L	15	µg/L	150	µg/L		µg/L		µg/L
MAGNESIUM		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MANGANESE		µg/L	50	µg/L		µg/L	50	µg/L	50	µg/L	500	µg/L	840	µg/L	84	µg/L
MERCURY	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
NICKEL	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	730	µg/L	73	µg/L
POTASSIUM		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SELENIUM	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	180	µg/L	18	µg/L
SILVER		µg/L	100	µg/L		µg/L	100	µg/L	100	µg/L	1000	µg/L	180	µg/L	18	µg/L
SODIUM	160000	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THALLIUM	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L		µg/L		µg/L		µg/L
VANADIUM		µg/L		µg/L		µg/L		µg/L	49	µg/L	490	µg/L	260	µg/L	26	µg/L
ZINC		µg/L	5000	µg/L		µg/L	5000	µg/L	5000	µg/L	50000	µg/L	11000	µg/L	1100	µg/L
Total Petroleum Hydrocarbons																
PETROLEUM HYDROCARBONS		mg/L		mg/L		mg/L		mg/L	5	mg/L	50	mg/L		mg/L		mg/L
Volatile Organic Compounds																
ACETONE		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	3700	µg/L	370	µg/L
ACROLEIN		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ACRYLONITRILE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ALLYL CHLORIDE (3-CHLOROPROPENE)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZENE	1	µg/L		µg/L	5	µg/L		µg/L	1	µg/L	100	µg/L	0.36	µg/L	0.36	µg/L
BROMODICHLOROMETHANE	100	µg/L		µg/L	100	µg/L		µg/L	0.6	µg/L	60	µg/L	0.17	µg/L	0.17	µg/L
BROMOFORM	100	µg/L		µg/L	100	µg/L		µg/L	4	µg/L	40	µg/L	2.4	µg/L	2.4	µg/L
BROMOMETHANE		µg/L		µg/L		µg/L		µg/L	9.8	µg/L		µg/L	8.7	µg/L	0.87	µg/L
CARBON DISULFIDE		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	1000	µg/L	100	µg/L
CARBON TETRACHLORIDE	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.16	µg/L	0.16	µg/L
CHLOROBENZENE	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	39	µg/L	3.9	µg/L
CHLOROETHANE		µg/L		µg/L		µg/L		µg/L	2800	µg/L	28000	µg/L	3.6	µg/L	3.6	µg/L
CHLOROFORM	100	µg/L		µg/L	100	µg/L		µg/L	6	µg/L	600	µg/L	0.15	µg/L	0.15	µg/L
CHLOROMETHANE		µg/L		µg/L		µg/L		µg/L	2.7	µg/L	270	µg/L	1.4	µg/L	1.4	µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

Location:		Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
SJRWMD No.		None		None		OR0018		OR0819		OR0818		OR0818		OR0141																	
SampleID :		FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
DateCollected :		05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003																	
Matrix :		Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater																	
SampleType :		Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal																	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
cis-1,2-DICHLOROETHYLENE	µg/L	0.54	J	0.52	J	1	U	2.3	=	2.4	=	3	=	1	U	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	0.4	µg/L	40	µg/L	0.13	µg/L	0.13	µg/L
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	1400	µg/L		µg/L	390	µg/L	39	µg/L
1,1-DICHLOROETHANE	µg/L	1.1	=	1	U	1	U	1.2	=	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	810	µg/L	81	µg/L
1,1-DICHLOROETHENE	µg/L	1.4	=	1	U	1	U	1	U	1	U	1	U	1	U	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	700	µg/L	0.044	µg/L	0.044	µg/L
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.02	µg/L		µg/L	0.05	µg/L		µg/L	0.02	µg/L	2	µg/L	0.00075	µg/L	0.00075	µg/L
1,2-DICHLOROBENZENE	µg/L	0.34	J	0.6	J	1	U	1	U	1	U	1	U	1	U	600	µg/L		µg/L	600	µg/L		µg/L	600	µg/L	6000	µg/L	64	µg/L	6.4	µg/L
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.12	µg/L	0.12	µg/L
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	0.16	µg/L	0.16	µg/L
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	540	µg/L	54	µg/L
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	75	µg/L		µg/L	75	µg/L		µg/L	75	µg/L	7500	µg/L	0.44	µg/L	0.44	µg/L
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	700	µg/L	30	µg/L	700	µg/L		µg/L	30	µg/L	300	µg/L	1300	µg/L	130	µg/L
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	1500	µg/L	150	µg/L
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	4.1	µg/L	4.1	µg/L
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	1600	µg/L	160	µg/L
TETRACHLOROETHYLENE(PCE)	µg/L	0.37	J	0.81	J	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.1	µg/L	1.1	µg/L
TOLUENE	µg/L	0.65	J	0.18	J	1	U	1	U	1	U	1	U	1	U	1000	µg/L	40	µg/L	1000	µg/L		µg/L	40	µg/L	400	µg/L	750	µg/L	75	µg/L
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	0.16	J	1	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	120	µg/L	12	µg/L
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
trans-1,4-DICHLORO-2-BUTENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.6	µg/L	1.6	µg/L
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	1300	µg/L	130	µg/L
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L	2000	µg/L	540	µg/L	54	µg/L
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	0.5	µg/L	50	µg/L	0.052	µg/L	0.052	µg/L
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	0.0015	µg/L	0.0015	µg/L
VINYL ACETATE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	90	µg/L	900	µg/L	37000	µg/L	3700	µg/L
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	µg/L		µg/L	2	µg/L		µg/L	1	µg/L	100	µg/L	0.019	µg/L	0.019	µg/L
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	0.16	J	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	10000	µg/L	20	µg/L	10000	µg/L		µg/L	20	µg/L	200	µg/L	12000	µg/L	1200	µg/L
Semi-volatile Organic Compound																															
ACETOPHENONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	6.1	µg/L	610	µg/L	10	µg/L	10	µg/L
ARAMITE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-ACETYLAMINOFLUORENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZYL ALCOHOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	11000	µg/L	1100	µg/L
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	1400	µg/L	14000	µg/L	7300	µg/L	730	µg/L
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	210	µg/L
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	560	µg/L	5600	µg/L	2900	µg/L	290	µg/L
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	35	µg/L		µg/L	180	µg/L	18	µg/L
1,3-DINITROBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5.1**	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	110	µg/L	11	µg/L
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	140	µg/L	1400	µg/L	730	µg/L	73	µg/L
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ		µg/L		µg/L		µg/L		µg/L	30	µg/L		µg/L	73	µg/L	7.3	µg/L
2,4-DINITROTOLUENE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U		µg/L		µg/L		µg/L		µg/L	0.2	µg/L	20	µg/L	73	µg/L	7.3	µg/L
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ET	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0092	µg/L	0.0092	µg/L
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIALLATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	5600	µg/L	56000	µg/L	29000	µg/L	2900	µg/L
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	70000	µg/L	700000	µg/L	370000	µg/L	37000	µg/L
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20.2	UJ	20.4	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
3,3'-DICHLOROBENZIDINE	µg/L	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5.1	UJ		µg/L		µg/L		µg/L		µg/L	12	µg/L		µg/L	0.15	µg/L	0.15	µg/L
3,3'-DIMETHYLBENZIDINE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISOPHORONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	37	µg/L		µg/L	71	µg/L	71	µg/L
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
KEPONE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40	Inflow to R-143	MW-1	MW-2	MW-3	MW-3 (Dup)	MW-4	Maximum Contaminant Levels				Florida Brownfields		Risk-based Concentrations	
	SJRWMD No.	None	None	OR0018	OR0819	OR0818	OR0818	OR0141								
	SampleID :	FP-03-01-007	FP-03-01-008	FP-03-01-009	FP-03-01-001	FP-03-01-002	FP-03-01-003	FP-03-01-006	Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL	Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL	Federal MCL/SMCL [2] MCL	Federal MCL/SMCL [2] SMCL	Florida Brownfield (62-785) [3] GCTL	Florida Brownfield (62-785) [3] Groundwater LY/PQ	Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)	Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)
	DateCollected :	05/28/2003	05/28/2003	05/29/2003	05/27/2003	05/27/2003	05/27/2003	05/28/2003								
	Matrix :	Stormwater	Stormwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater								
	SampleType :	Normal	Normal	Normal	Normal	Normal	Field Duplicate	Normal								
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit
METHAPYRILENE	µg/L	10.1 UJ	10.1 UJ	10.1 UJ	10.1 UJ	10 UJ	10.1 UJ	10.2 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
METHYL METHANESULFONATE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-METHYLNAPHTHALENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	20 µg/L	200 µg/L	1500 µg/L	1500 µg/L
2-METHYLPHENOL (o-CRESOL)	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	350 µg/L	3500 µg/L	1800 µg/L	180 µg/L
3-METHYLCHOLANTHRENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
4-METHYLPHENOL (p-CRESOL)	µg/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.1 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1,4-NAPHTHOQUINONE	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1-NAPHTHYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-NITROANILINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	50 µg/L	500 µg/L	2.2 µg/L	0.22 µg/L
3-NITROANILINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	110 µg/L	11 µg/L
4-NITROANILINE	µg/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5.1 UJ	µg/L	µg/L	µg/L	µg/L	20 µg/L	200 µg/L	110 µg/L	11 µg/L
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1 U	10.1 U	10.1 UJ	10.1 UJ	10 UJ	10.1 UJ	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
5-NITRO-o-TOLUIDINE	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N-NITROSODI-n-PROPYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	4 µg/L	400 µg/L	0.0096 µg/L	0.0096 µg/L
N-NITROSODIETHYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N-NITROSODIMETHYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	2 µg/L	200 µg/L	0.0013 µg/L	0.0013 µg/L
N-NITROSODIPHENYLAMINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 UJ	5.1 U	µg/L	µg/L	µg/L	µg/L	7 µg/L	700 µg/L	14 µg/L	14 µg/L
N-NITROSOMORPHOLINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1,3,5-TRINITROBENZENE	µg/L	20.2 U	20.2 U	20.2 U	20.2 U	20.1 U	20.2 U	20.4 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N-NITROSOPIPERIDINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N-NITROSOPYRROLIDINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NITROBENZENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	4 µg/L	40 µg/L	3.4 µg/L	0.34 µg/L
NITROSOMETHYLETHYLAMINE	µg/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.1 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
o-TOLUIDINE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.1 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
p-PHENYLENEDIAMINE	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PENTACHLOROBENZENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PENTACHLOROETHANE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PENTACHLORONITROBENZENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PENTACHLOROPHENOL	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	1 µg/L	µg/L	1 µg/L	µg/L	1 µg/L	µg/L	0.56 µg/L	0.56 µg/L
PHENACETIN	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PHENOL	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	10 µg/L	100 µg/L	22000 µg/L	2200 µg/L
PRONAMIDE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PYRIDINE	µg/L	5 UJ	5 UJ	5 UJ	5 U	5 U	5 U	5.1 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SAFROLE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1,2,4,5-TETRACHLOROBENZENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1 U	10.1 U	10.1 U	10.1 U	10 U	10.1 U	10.2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1,2,4-TRICHLOROBENZENE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	70 µg/L	µg/L	70 µg/L	µg/L	70 µg/L	700 µg/L	190 µg/L	19 µg/L
2,4,5-TRICHLOROPHENOL	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	4 µg/L	µg/L	3700 µg/L	370 µg/L
2,4,6-TRICHLOROPHENOL	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	µg/L	µg/L	µg/L	µg/L	5 µg/L	µg/L	6.1 µg/L	6.1 µg/L
Organochlorine Pesticides																
ALDRIN	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.005 µg/L	0.5 µg/L	0.004 µg/L	0.004 µg/L
ALPHA-CHLORDANE	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	2 µg/L	µg/L	2 µg/L	µg/L	2 µg/L	200 µg/L	0.19 µg/L	0.19 µg/L
GAMMA-CHLORDANE	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	2 µg/L	µg/L	2 µg/L	µg/L	2 µg/L	200 µg/L	0.19 µg/L	0.19 µg/L
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.006 µg/L	0.6 µg/L	0.011 µg/L	0.011 µg/L
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.02 µg/L	2 µg/L	0.037 µg/L	0.037 µg/L
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062 UJ	0.064 UJ	0.062 U	0.063 UJ	0.062 UJ	0.061 UJ	0.062 UJ	µg/L	µg/L	µg/L	µg/L	2.1 µg/L	21 µg/L	0.037 µg/L	0.037 µg/L
GAMMA BHC (LINDANE)	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	0.2 µg/L	µg/L	0.2 µg/L	µg/L	0.2 µg/L	20 µg/L	0.052 µg/L	0.052 µg/L
DIELDRIN	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.005 µg/L	0.5 µg/L	0.0042 µg/L	0.0042 µg/L
ALPHA ENDOSULFAN	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BETA ENDOSULFAN	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ENDOSULFAN SULFATE	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ENDRIN	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	2 µg/L	µg/L	2 µg/L	µg/L	2 µg/L	20 µg/L	11 µg/L	1.1 µg/L
ENDRIN ALDEHYDE	µg/L	0.062 U	0.064 U	0.062 U	0.063 U	0.062 U	0.061 U	0.062 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ENDRIN KETONE	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
HEPTACHLOR	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	0.4 µg/L	µg/L	0.4 µg/L	µg/L	0.4 µg/L	40 µg/L	0.0023 µg/L	0.0023 µg/L
HEPTACHLOR EPOXIDE	µg/L	0.052 U	0.028 J	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	0.2 µg/L	µg/L	0.2 µg/L	µg/L	0.2 µg/L	20 µg/L	0.0012 µg/L	0.0012 µg/L
p,p'-DDD	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.1 µg/L	10 µg/L	0.28 µg/L	0.28 µg/L
p,p'-DDE	µg/L	0.062 U	0.064 U	0.062 U	0.063 U	0.062 U	0.061 U	0.062 U	µg/L	µg/L	µg/L	µg/L	0.1 µg/L	10 µg/L	0.2 µg/L	0.2 µg/L
p,p'-DDT	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	µg/L	µg/L	µg/L	µg/L	0.1 µg/L	10 µg/L	0.2 µg/L	0.2 µg/L
METHOXYCHLOR	µg/L	0.052 U	0.053 U	0.052 U	0.053 U	0.052 U	0.051 U	0.052 U	40 µg/L	µg/L	40 µg/L	µg/L	40 µg/L	400 µg/L	180 µg/L	18 µg/L
TOXAPHENE	µg/L	3.1 U	3.2 U	3.1 UJ	3.2 UJ	3.1 UJ	3.1 UJ	3.1 U	3 µg/L	µg/L	3 µg/L	µg/L	3 µg/L	300 µg/L	0.061 µg/L	0.061 µg/L
Organophosphorous Pesticides																
ATRAZINE	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3 µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
AZINPHOS, METHYL (GUTHION)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	10.5 µg/L	105 µg/L	µg/L	µg/L
BOLSTAR	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CHLORPYRIFOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	21 µg/L	210 µg/L	110 µg/L	11 µg/L
COUMAPHOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	2.1 µg/L	21 µg/L	µg/L	µg/L
DEMETON-O	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DEMETON-S	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ
NALED	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, ETHYL	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)															
PCB-1016 (AROCHLOR 1016)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1221 (AROCHLOR 1221)	µg/L	**1**	U	**1.1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1248 (AROCHLOR 1248)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1260 (AROCHLOR 1260)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
Herbicides															
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DALAPON	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
DICAMBA	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DICHLOROPROP	µg/L	**0.53**	U	**0.53**	U	0.53	R	**0.52**	U	**0.51**	U	**0.51**	U	**0.53**	U
DINOSEB	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
PICLORAM	µg/L	11	UJ	10	UJ	11	R	10	UJ	10	UJ	10	UJ	11	UJ
SILVEX (2,4,5-TP)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U

	Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
Parameter Group and Name	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
DIAZINON		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	33	µg/L	3.3	µg/L
DICHLORVOS		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L	0.23	µg/L	0.23	µg/L
DIMETHOATE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DISULFOTON		µg/L		µg/L		µg/L		µg/L	0.3	µg/L	3	µg/L	1.5	µg/L	0.15	µg/L
ETHOPROP		µg/L		µg/L		µg/L		µg/L	0.11	µg/L	1.1	µg/L		µg/L		µg/L
FAMPHUR		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
FENSULFOTHION		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
FENTHION		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MERPHOS		µg/L		µg/L		µg/L		µg/L	0.21	µg/L		µg/L	1.1	µg/L	0.11	µg/L
MEVINPHOS		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
NALED		µg/L		µg/L		µg/L		µg/L	14	µg/L	140	µg/L	73	µg/L	7.3	µg/L
PARATHION, ETHYL		µg/L		µg/L		µg/L		µg/L	42	µg/L	420	µg/L	220	µg/L	22	µg/L
PARATHION, METHYL		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHORATE		µg/L		µg/L		µg/L		µg/L	1.4	µg/L	14	µg/L	7.3	µg/L	0.73	µg/L
RONNEL		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
SIMAZINE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
STIROFOS (TETRACHLORVINPHOS)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THIODIPHOSPHORIC ACID TETRAETHYL ESTER		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TOKUTHION (PROTHIOFOS)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLORONATE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ZINOPHOS		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
Polychlorinated biphenols (PCBs)																
PCB-1016 (AROCHLOR 1016)		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	2.6	µg/L	0.26	µg/L
PCB-1221 (AROCHLOR 1221)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1232 (AROCHLOR 1232)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1242 (AROCHLOR 1242)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PCB-1248 (AROCHLOR 1248)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1254 (AROCHLOR 1254)		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	0.73	µg/L	0.073	µg/L
PCB-1260 (AROCHLOR 1260)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
Herbicides																
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)		µg/L		µg/L		µg/L		µg/L	70	µg/L	700	µg/L	370	µg/L	37	µg/L
2,4-D (DICHLOROPHENOXYACETIC ACID)	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
DALAPON	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L		µg/L	1100	µg/L	110	µg/L
DICAMBA		µg/L		µg/L		µg/L		µg/L	210	µg/L		µg/L	1100	µg/L	110	µg/L
DICHLOROPROP		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L		µg/L		µg/L
DINOSEB	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	70	µg/L	37	µg/L	3.7	µg/L
PICLORAM		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SILVEX (2,4,5-TP)	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	290	µg/L	29	µg/L

Notes:

Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers

"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units

pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Sources:

[1] *Florida Ground Water Guidance Concentrations* , 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
[2] *Drinking Water Regulations and Health Advisories* , Office of Water, USEPA, October 1996.
[3] *Brownfield's Cleanup Criteria Rule , Groundwater Cleanup Target Levels* , Draft Chapter 62-785 F.A.C., 1997.
[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment* , November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:

MCL - Maximum Contaminant Level
SMCL - Secondary MCL
GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141																	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003																	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater																	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal																	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Field Parameters																															
pH	Std. Units	5.89		6.45		9.22		7.38		11.1		11.1		10.17																	
TEMPERATURE	°C	32.8		29.2		25.4		25.5		25.4		25.4		24.9																	
CONDUCTANCE	µmhos	139		218		226		360		501		501		131																	
TURBIDITY	NTU	2.95		4.79		1.2		1.24		6.72		6.72		1.45																	
DISSOLVED OXYGEN	mg/L	2.7		3.19		0.82		1.81		0.22		0.22		0.24																	
OXIDATION/REDUCTION POTENTIAL	mV	211		195		1		252		-140		-140		10																	
Radiologicals																															
ALPHA, GROSS	pCi/l	2.4	U	0.9	U	3.1	U	4.5	=	3.9	=	2.5	U	2.9	=	15	pCi/L		pCi/L	15	pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
BETA, GROSS	pCi/l	2.5	=	1	=	3.3	=	37.8	=	54.7	=	42.1	=	2.2	U		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
Anions																															
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	45.5	=	53	=	152	=	211	=	1	U	11	=	188	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
CHLORIDE (AS CL)	µg/L	10600	=	14300	=	6590	=	3580	=	3060	=	3000	=	4470	=		µg/L	250000	µg/L		µg/L	250000	µg/L	250000	µg/L	2500000	µg/L		µg/L		µg/L
SULFATE (AS SO4)	mg/L	9.09	=	11.3	=	37.5	=	26.7	=	3.26	=	3.19	=	0.912	J		mg/L	250	mg/L		mg/L	250	mg/L	250	mg/L	2500	mg/L		mg/L		mg/L
Nutrients																															
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.484	=	0.358	=	0.198	=	1.99	=	0.901	=	0.741	=	0.453	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, AMMONIA (AS N)	mg/L	0.213	J	0.21	U	0.427	=	1.59	=	1.04	=	0.431	=	0.21	U		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, KJELDAHL, TOTAL	mg/L	0.484	U	0.358	U	0.198	U	1.322	=	0.901	U	0.741	U	0.453	U		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.535	=	0.05	U	0.05	U	0.05	U	1	mg/L		mg/L	1	mg/L		mg/L	1	mg/L		mg/L	3.7	mg/L	3.7	mg/L
NITROGEN, NITRATE-NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.67	=	0.05	U	0.05	U	0.05	U		mg/L		mg/L	10	mg/L		mg/L	10	mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL (AS P)	mg/L	0.148	=	0.103	=	0.226	=	0.084	=	0.051	=	0.101	=	0.143	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.078	=	0.046	=	0.037	=	0.031	=	0.027	=	0.038	=	0.122	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.102	=	0.075	=	0.082	=	0.075	=	0.054	=	0.057	=	0.048	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
General Chemistry																															
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE	mg/L	102	=	125	=	117	=	361	=	386	=	274	=	265	=		mg/L	500	mg/L		mg/L	500	mg/L	500	mg/L	500	mg/L		mg/L		mg/L
TURBIDITY	NTU	1.6	=	1.7	=	0.12	U	0.12	U	0.12	U	1	=	0.12	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
pH	PH UNITS	6.53	=	6.31	=	7.5	=	7.44	=	11.1	=	10.6	=	7.79	=		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
COLOR	COLOR UNIT	20	=	20	=	5	J	0	U	5	J	5	J	0	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
TOTAL ORGANIC CARBON	mg/L	4.85	=	27.5	=	27.8	=	3.19	U	2.18	U	2.83	U	20.8	=		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
DISSOLVED ORGANIC CARBON	mg/L	4.94	U	23.8	=	24.3	=	1.52	U	2.67	U	2.81	U	2.79	U		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Metals																															
ALUMINUM	µg/L	**73.7**	U	**76.3**	U	**150**	U	35	U	37.7	U	35	U	35	U		µg/L	200	µg/L		µg/L	50	µg/L		µg/L	200	µg/L	37000	µg/L	3700	µg/L
ANTIMONY	µg/L	2.5	U	2.5	U	2.5	U	2.66	J	2.5	U	2.5	U	2.5	U	6	µg/L		µg/L	6	µg/L		µg/L	6	µg/L	60	µg/L	15	µg/L	1.5	µg/L
ARSENIC	µg/L	2.04	U	2.04	U	10.5	=	19.4	=	3.06	J	2.04	U	2.04	U	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	5000	µg/L	0.045	µg/L	0.045	µg/L
BARIUM	µg/L	14.3	=	16.6	=	11.1	=	35.9	=	51.1	=	35.3	=	6	=	2000	µg/L		µg/L	2000	µg/L		µg/L	2000	µg/L	20000	µg/L	2600	µg/L	260	µg/L
BERYLLIUM	µg/L	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	4	µg/L		µg/L	4	µg/L		µg/L	4	µg/L	400	µg/L	0.016	µg/L	0.016	µg/L
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	515	µg/L	18	µg/L	1.8	µg/L
CALCIUM	µg/L	18500	=	21500	=	61800	=	52700	=	17100	=	20400	=	65600	=		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHROMIUM, TOTAL	µg/L	0.712	J	0.57	U	0.57	U	1.13	U	1.79	U	1.13	U	0.57	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L		µg/L		µg/L
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2200	µg/L	220	µg/L
COPPER	µg/L	3.43	U	4.34	U	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U		µg/L	1000	µg/L		µg/L	1000	µg/L	1000	µg/L	10000	µg/L	130000	µg/L	13000	µg/L
IRON	µg/L	**496**	=	**448**	=	16.7	U	16.7	U	30.5	U	16.7	U	18.4	U		µg/L	300	µg/L		µg/L	300	µg/L	300	µg/L		µg/L	11000	µg/L	1100	µg/L
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	2.05	U	3.26	U	1.76	U	15	µg/L		µg/L	15	µg/L		µg/L	15	µg/L	150	µg/L		µg/L		µg/L
MAGNESIUM	µg/L	1530	=	2030	=	4700	=	6420	=	1030	=	2080	=	3150	=		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MANGANESE	µg/L	9.28	=	10.1	=	3.94	=	2.21	=	0.413	U	0.515	U	1.35	U		µg/L	50	µg/L		µg/L	50	µg/L	50	µg/L	500	µg/L	840	µg/L	84	µg/L
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
NICKEL	µg/L	0.997	U	2.31	J	1.64	J	4.66	J	0.997	U	0.997	U	0.997	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	730	µg/L	73	µg/L
POTASSIUM	µg/L	1350	=	1510	=	1760	=	25400	=	56000	=	41400	=	1450	=		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SELENIUM	µg/L	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	180	µg/L	18	µg/L
SILVER	µg/L	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.75	U		µg/L	100	µg/L		µg/L	100	µg/L	100	µg/L	1000	µg/L	180	µg/L	18	µg/L
SODIUM	µg/L	6110	=	8000	=	5380	=	25600	=	29300	=	22900	=	10200	=	160000	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L		µg/L		µg/L		µg/L
VANADIUM	µg/L	1.93	U	1.82	U	1.8	U	3.73	=	0.47	J	0.447	U	0.573	U		µg/L		µg/L		µg/L		µg/L	49	µg/L	490	µg/L	260	µg/L	26	µg/L
ZINC	µg/L	14.2	=	11.2	=	1.54	U	1.66	U	1.33	U	0.951	U	1.31	U		µg/L	5000	µg/L		µg/L	5000	µg/L	5000	µg/L	50000	µg/L	11000	µg/L	1100	µg/L
Total Petroleum Hydrocarbons																															
PETROLEUM HYDROCARBONS	mg/L	0.43	=	0.49	=	0.35	U	0.34	U	0.34	U	0.38	=	0.36	U		mg/L		mg/L		mg/L		mg/L	5	mg/L	50	mg/L		mg/L		mg/L
Volatile Organic Compounds																															
ACETONE	µg/L	3	J	3.9	J	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	3700	µg/L	370	µg/L
ACROLEIN	µg/L	10	UJ	10	UJ	10	U	10	UJ	10	UJ	10	UJ	10	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZENE	µg/L	1	U	0.18	J	1	U	1	U	0.64	J	0.48	J	1	U	1	µg/L		µg/L	5	µg/L		µg/L	1	µg/L	100	µg/L	0.36	µg/L	0.36	µg/L
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	100	µg/L		µg/L	100	µg/L		µg/L	0.6	µg/L	60	µg/L	0.17	µg/L	0.17	µg/L
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	4	µg/L	40	µg/L	2.4	µg/L	2.4	µg/L
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	9.8	µg/L		µg/L	8.7	µg/L	0.87	µg/L
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	1000	µg/L	100	µg/L
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.16	µg/L	0.16	µg/L
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	39	µg/L	3.9	µg/L
CHLOROETHANE	µg/L	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	UJ		µg/L		µg/L		µg/L		µg/L	2800	µg/L	28000	µg/L	3.6	µg/L	3.6	µg/L
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	6	µg/L	600	µg/L	0.15	µg/L	0.15	µg/L
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	2.7	µg/L	270	µg/L	1.4	µg/L	1.4	µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141																	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003																	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater																	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal																	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
cis-1,2-DICHLOROETHYLENE	µg/L	0.54	J	0.52	J	1	U	2.3	=	2.4	=	3	=	1	U	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	0.4	µg/L	40	µg/L	0.13	µg/L	0.13	µg/L
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	1400	µg/L		µg/L	390	µg/L	39	µg/L
1,1-DICHLOROETHANE	µg/L	1.1	=	1	U	1	U	1.2	=	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	810	µg/L	81	µg/L
1,1-DICHLOROETHENE	µg/L	1.4	=	1	U	1	U	1	U	1	U	1	U	1	U	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	700	µg/L	0.044	µg/L	0.044	µg/L
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.02	µg/L		µg/L	0.05	µg/L		µg/L	0.02	µg/L	2	µg/L	0.00075	µg/L	0.00075	µg/L
1,2-DICHLOROBENZENE	µg/L	0.34	J	0.6	J	1	U	1	U	1	U	1	U	1	U	600	µg/L		µg/L	600	µg/L		µg/L	600	µg/L	6000	µg/L	64	µg/L	6.4	µg/L
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.12	µg/L	0.12	µg/L
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	0.16	µg/L	0.16	µg/L
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	540	µg/L	54	µg/L
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	75	µg/L		µg/L	75	µg/L		µg/L	75	µg/L	7500	µg/L	0.44	µg/L	0.44	µg/L
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	700	µg/L	30	µg/L	700	µg/L		µg/L	30	µg/L	300	µg/L	1300	µg/L	130	µg/L
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	1500	µg/L	150	µg/L
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	4.1	µg/L	4.1	µg/L
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	1600	µg/L	160	µg/L
TETRACHLOROETHYLENE(PCE)	µg/L	0.37	J	0.81	J	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.1	µg/L	1.1	µg/L
TOLUENE	µg/L	0.65	J	0.18	J	1	U	1	U	1	U	1	U	1	U	1000	µg/L	40	µg/L	1000	µg/L		µg/L	40	µg/L	400	µg/L	750	µg/L	75	µg/L
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	0.16	J	1	U	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	120	µg/L	12	µg/L
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
trans-1,4-DICHLORO-2-BUTENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.6	µg/L	1.6	µg/L
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	1300	µg/L	130	µg/L
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L	2000	µg/L	540	µg/L	54	µg/L
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	0.5	µg/L	50	µg/L	0.052	µg/L	0.052	µg/L
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	0.0015	µg/L	0.0015	µg/L
VINYL ACETATE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L	90	µg/L	900	µg/L	37000	µg/L	3700	µg/L
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	µg/L		µg/L	2	µg/L		µg/L	1	µg/L	100	µg/L	0.019	µg/L	0.019	µg/L
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	0.16	J	1	U	1	U	1	U	1	U	1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	10000	µg/L	20	µg/L	10000	µg/L		µg/L	20	µg/L	200	µg/L	12000	µg/L	1200	µg/L
Semi-volatile Organic Compound																															
ACETOPHENONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	6.1	µg/L	610	µg/L	10	µg/L	10	µg/L
ARAMITE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-ACETYLAMINOFLUORENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZYL ALCOHOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	11000	µg/L	1100	µg/L
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	1400	µg/L	14000	µg/L	7300	µg/L	730	µg/L
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	210	µg/L
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	560	µg/L	5600	µg/L	2900	µg/L	290	µg/L
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	35	µg/L		µg/L	180	µg/L	18	µg/L
1,3-DINITROBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	110	µg/L	11	µg/L
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	140	µg/L	1400	µg/L	730	µg/L	73	µg/L
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ		µg/L		µg/L		µg/L		µg/L	30	µg/L		µg/L	73	µg/L	7.3	µg/L
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	0.2	µg/L	20	µg/L	73	µg/L	7.3	µg/L
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ET	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0092	µg/L	0.0092	µg/L
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIALLATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	5600	µg/L	56000	µg/L	29000	µg/L	2900	µg/L
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	70000	µg/L	700000	µg/L	370000	µg/L	37000	µg/L
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20.2	UJ	20.4	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
3,3'-DICHLOROBENZIDINE	µg/L	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5.1	UJ		µg/L		µg/L		µg/L		µg/L	12	µg/L		µg/L	0.15	µg/L	0.15	µg/L
3,3'-DIMETHYLBENZIDINE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISOPHORONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	37	µg/L		µg/L	71	µg/L	71	µg/L
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
KEPONE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141																	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		Florida MCL / SMCL (Chapter 62-550, FAC) [1]		Florida MCL / SMCL (Chapter 62-550, FAC) [1]		Federal MCL/SMCL [2]		Federal MCL/SMCL [2]		Florida Brownfield (62-785) [3]		Florida Brownfield (62-785) [3]		Regional USEPA RBC [4]		Regional USEPA RBC [4, 5]	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003														EPA Region III		EPA Region IV	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		MCL		SMCL		MCL		SMCL		GCTL		Groundwater LY/PQ		Tap Water			
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal														(HQ=0.1)		(HQ=0.1)	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
METHAPYRILENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	1500	µg/L	1500	µg/L
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-METHYLPHENOL (p-CRESOL)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,4-NAPHTHOQUINONE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	50	µg/L	500	µg/L	2.2	µg/L	0.22	µg/L
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	110	µg/L	11	µg/L
4-NITROANILINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5.1	UJ		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	110	µg/L	11	µg/L
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
5-NITRO-o-TOLUIDINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0096	µg/L	0.0096	µg/L
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODIMETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	2	µg/L	200	µg/L	0.0013	µg/L	0.0013	µg/L
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	UJ	5.1	U		µg/L		µg/L		µg/L		µg/L	7	µg/L	700	µg/L	14	µg/L	14	µg/L
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,3,5-TRINITROBENZENE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
NITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	40	µg/L	3.4	µg/L	0.34	µg/L
NITROSOMETHYLETHYLAMINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
o-TOLUIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-PHENYLENEDIAMINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROETHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROPHENOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	1	µg/L		µg/L	1	µg/L		µg/L	1	µg/L		µg/L	0.56	µg/L	0.56	µg/L
PHENACETIN	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	22000	µg/L	2200	µg/L
PRONAMIDE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PYRIDINE	µg/L	5	UJ	5	UJ	5	UJ	5	U	5	U	5	U	5.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	190	µg/L	19	µg/L
2,4,5-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	4	µg/L		µg/L	3700	µg/L	370	µg/L
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	6.1	µg/L	6.1	µg/L
Organochlorine Pesticides																															
ALDRIN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.004	µg/L	0.004	µg/L
ALPHA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
GAMMA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.006	µg/L	0.6	µg/L	0.011	µg/L	0.011	µg/L
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.02	µg/L	2	µg/L	0.037	µg/L	0.037	µg/L
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062	UJ	0.064	UJ	0.062	U	0.063	UJ	0.062	UJ	0.061	UJ	0.062	UJ		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L	0.037	µg/L	0.037	µg/L
GAMMA BHC (LINDANE)	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.052	µg/L	0.052	µg/L
DIELDRIN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.0042	µg/L	0.0042	µg/L
ALPHA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BETA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDOSULFAN SULFATE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
ENDRIN ALDEHYDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN KETONE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEPTACHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.4	µg/L		µg/L	0.4	µg/L		µg/L	0.4	µg/L	40	µg/L	0.0023	µg/L	0.0023	µg/L
HEPTACHLOR EPOXIDE	µg/L	0.052	U	0.028	J	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.0012	µg/L	0.0012	µg/L
p,p'-DDD	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.28	µg/L	0.28	µg/L
p,p'-DDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
p,p'-DDT	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
METHOXYCHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	40	µg/L		µg/L	40	µg/L		µg/L	40	µg/L	400	µg/L	180	µg/L	18	µg/L
TOXAPHENE	µg/L	3.1	U	3.2	U	3.1	UJ	3.2	UJ	3.1	UJ	3.1	UJ	3.1	U	3	µg/L		µg/L	3	µg/L		µg/L	3	µg/L	300	µg/L	0.061	µg/L	0.061	µg/L
Organophosphorous Pesticides																															
ATRAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	3	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L	10.5	µg/L	105	µg/L		µg/L		µg/L
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L	21	µg/L	210	µg/L	110	µg/L	11	µg/L
COUMAPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L		µg/L		µg/L
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L

Table 2.
Summary of Results from Chemical Analyses and Comparison to Criteria
from the Baseline Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	05/28/2003		05/28/2003		05/29/2003		05/27/2003		05/27/2003		05/27/2003		05/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
DIAZINON	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	μg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	μg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	μg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	μg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	μg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	μg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ
NALED	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, ETHYL	μg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
PARATHION, METHYL	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	μg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
RONNEL	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
STIROFOS (TETRACHLORVINPHOS)	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	μg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)															
PCB-1016 (AROCHLOR 1016)	μg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1221 (AROCHLOR 1221)	μg/L	**1**	U	**1.1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	μg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1242 (AROCHLOR 1242)	μg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1248 (AROCHLOR 1248)	μg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1254 (AROCHLOR 1254)	μg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1260 (AROCHLOR 1260)	μg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
Herbicides															
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	μg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	μg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DALAPON	μg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
DICAMBA	μg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DICHLOROPROP	μg/L	**0.53**	U	**0.53**	U	0.53	R	**0.52**	U	**0.51**	U	**0.51**	U	**0.53**	U
DINOSEB	μg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
PICLORAM	μg/L	11	UJ	10	UJ	11	R	10	UJ	10	UJ	10	UJ	11	UJ
SILVEX (2,4,5-TP)	μg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U

	Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	Florida MCL / SMCL (Chapter 62-550, FAC) [1] MCL		Florida MCL / SMCL (Chapter 62-550, FAC) [1] SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC [4] EPA Region III Tap Water (HQ=0.1)		Regional USEPA RBC [4, 5] EPA Region IV (HQ=0.1)	
Parameter Group and Name	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
DIAZINON		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L	33	μg/L	3.3	μg/L
DICHLORVOS		μg/L		μg/L		μg/L		μg/L	0.1	μg/L	1	μg/L	0.23	μg/L	0.23	μg/L
DIMETHOATE		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
DISULFOTON		μg/L		μg/L		μg/L		μg/L	0.3	μg/L	3	μg/L	1.5	μg/L	0.15	μg/L
ETHOPROP		μg/L		μg/L		μg/L		μg/L	0.11	μg/L	1.1	μg/L		μg/L		μg/L
FAMPHUR		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
FENSULFOTHION		μg/L		μg/L		μg/L		μg/L	1.75	μg/L	17.5	μg/L		μg/L		μg/L
FENTHION		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
MERPHOS		μg/L		μg/L		μg/L		μg/L	0.21	μg/L		μg/L	1.1	μg/L	0.11	μg/L
MEVINPHOS		μg/L		μg/L		μg/L		μg/L	1.75	μg/L	17.5	μg/L		μg/L		μg/L
NALED		μg/L		μg/L		μg/L		μg/L	14	μg/L	140	μg/L	73	μg/L	7.3	μg/L
PARATHION, ETHYL		μg/L		μg/L		μg/L		μg/L	42	μg/L	420	μg/L	220	μg/L	22	μg/L
PARATHION, METHYL		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
PHORATE		μg/L		μg/L		μg/L		μg/L	1.4	μg/L	14	μg/L	7.3	μg/L	0.73	μg/L
RONNEL		μg/L		μg/L		μg/L		μg/L	350	μg/L	3500	μg/L	1800	μg/L	180	μg/L
SIMAZINE		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
STIROFOS (TETRACHLORVINPHOS)		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
THIODIPHOSPHORIC ACID TETRAETHYL ESTER		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
TOKUTHION (PROTHIOFOS)		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
TRICHLORONATE		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
ZINOPHOS		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
Polychlorinated biphenols (PCBs)																
PCB-1016 (AROCHLOR 1016)		μg/L		μg/L		μg/L		μg/L	1	μg/L	10	μg/L	2.6	μg/L	0.26	μg/L
PCB-1221 (AROCHLOR 1221)		μg/L		μg/L	0.5	μg/L		μg/L	0.5	μg/L	50	μg/L	0.034	μg/L	0.034	μg/L
PCB-1232 (AROCHLOR 1232)		μg/L		μg/L	0.5	μg/L		μg/L	0.5	μg/L	50	μg/L	0.034	μg/L	0.034	μg/L
PCB-1242 (AROCHLOR 1242)		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
PCB-1248 (AROCHLOR 1248)		μg/L		μg/L	0.5	μg/L		μg/L	0.5	μg/L	50	μg/L	0.034	μg/L	0.034	μg/L
PCB-1254 (AROCHLOR 1254)		μg/L		μg/L		μg/L		μg/L	1	μg/L	10	μg/L	0.73	μg/L	0.073	μg/L
PCB-1260 (AROCHLOR 1260)		μg/L		μg/L	0.5	μg/L		μg/L	0.5	μg/L	50	μg/L	0.034	μg/L	0.034	μg/L
Herbicides																
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)		μg/L		μg/L		μg/L		μg/L	70	μg/L	700	μg/L	370	μg/L	37	μg/L
2,4-D (DICHLOROPHENOXYACETIC ACID)	70	μg/L		μg/L	70	μg/L		μg/L	70	μg/L	700	μg/L	61	μg/L	6.1	μg/L
DALAPON	200	μg/L		μg/L	200	μg/L		μg/L	200	μg/L		μg/L	1100	μg/L	110	μg/L
DICAMBA		μg/L		μg/L		μg/L		μg/L	210	μg/L		μg/L	1100	μg/L	110	μg/L
DICHLOROPROP		μg/L		μg/L		μg/L		μg/L	0.1	μg/L	1	μg/L		μg/L		μg/L
DINOSEB	7	μg/L		μg/L	7	μg/L		μg/L	7	μg/L	70	μg/L	37	μg/L	3.7	μg/L
PICLORAM		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L
SILVEX (2,4,5-TP)	50	μg/L		μg/L	50	μg/L		μg/L	50	μg/L	500	μg/L	290	μg/L	29	μg/L

Notes:

Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers

"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units

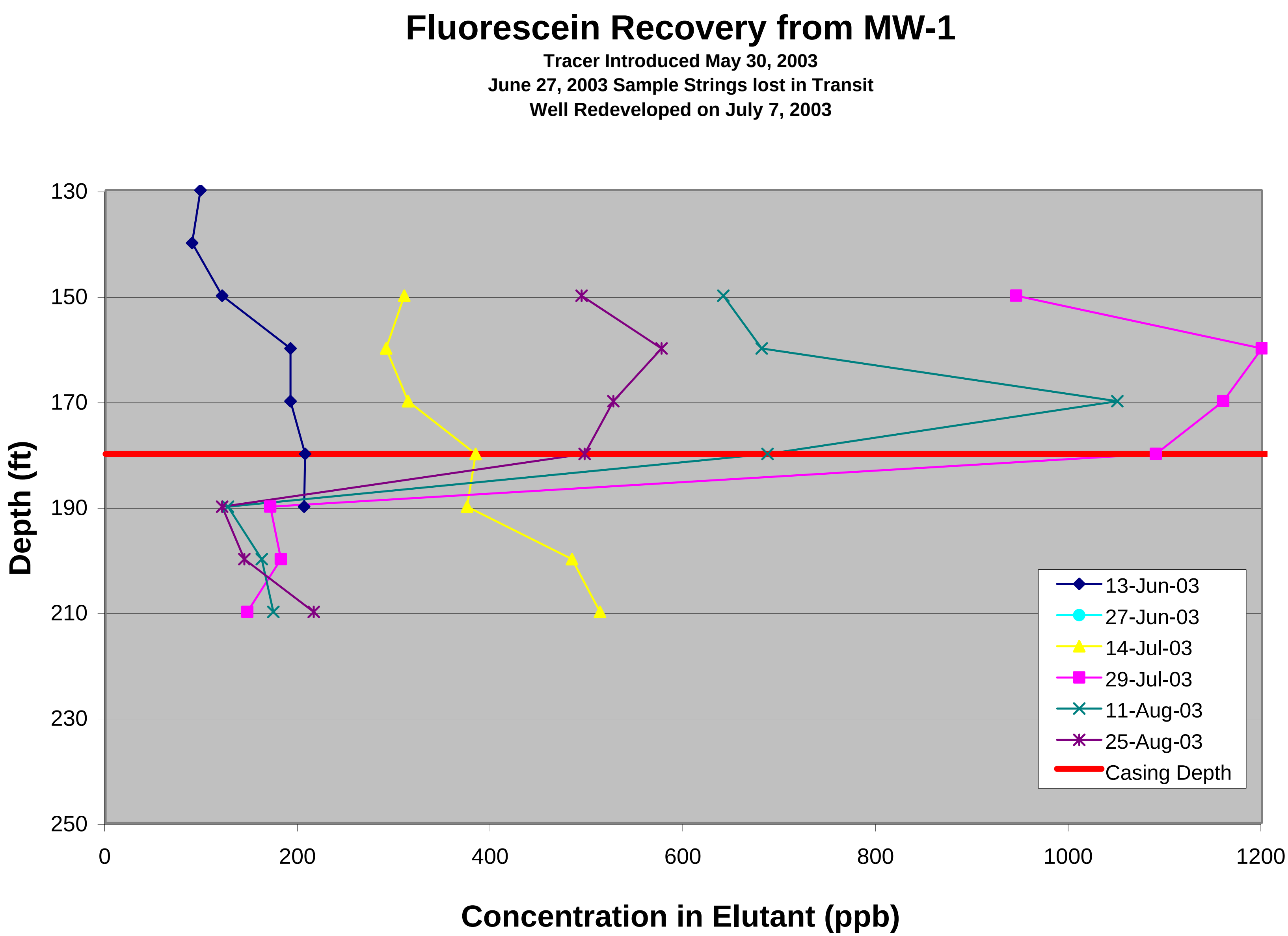
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
μg/L - micrograms per liter

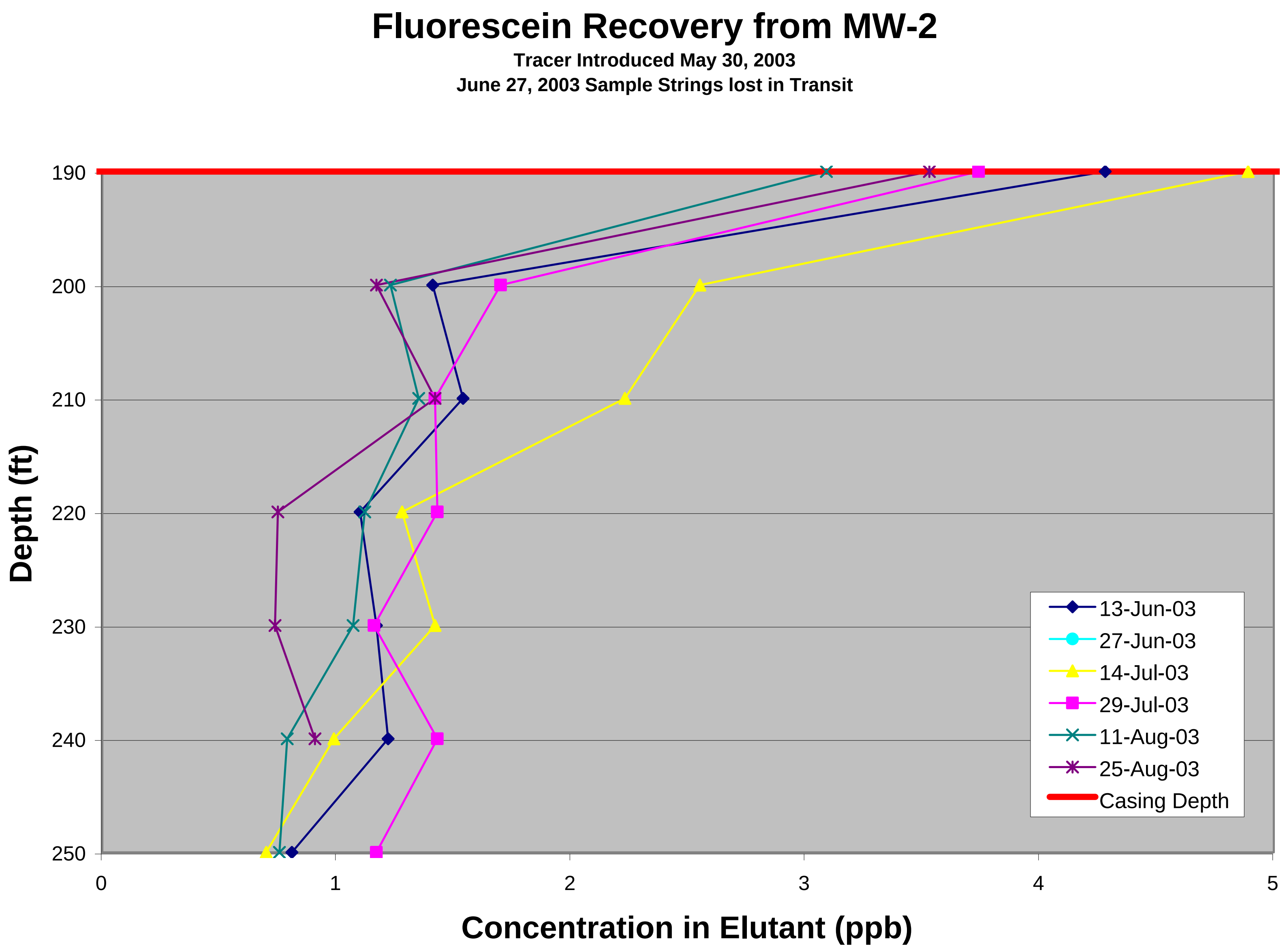
Sources:

[1] *Florida Ground Water Guidance Concentrations* , 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
[2] *Drinking Water Regulations and Health Advisories* , Office of Water, USEPA, October 1996.
[3] *Brownfield's Cleanup Criteria Rule , Groundwater Cleanup Target Levels* , Draft Chapter 62-785 F.A.C., 1997.
[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment* , November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:

MCL - Maximum Contaminant Level
SMCL - Secondary MCL
GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration


Fluorescein Recovery from MW-1
Tracer Introduced May 30, 2003
June 27, 2003 Sample Strings lost in Transit
Well Redeveloped on July 7, 2003
Depth (ft)
130
150
170
190
210
230
250
0
200
400
600
800
1000
1200
Concentration in Elutant (ppb)
13-Jun-03
27-Jun-03
14-Jul-03
29-Jul-03
11-Aug-03
25-Aug-03
Casing Depth


Fluorescein Recovery from MW-2
Tracer Introduced May 30, 2003
June 27, 2003 Sample Strings lost in Transit
Depth (ft)
190
200
210
220
230
240
250
0
1
2
3
4
5
Concentration in Elutant (ppb)
13-Jun-03
27-Jun-03
14-Jul-03
29-Jul-03
11-Aug-03
25-Aug-03
Casing Depth

CFARE Status Report No. 7

Status Report No. 7 – Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study

This report provides Status Report No. 7 for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The last report was October 2, 2003. The reports are issued at times associated with project milestones. Since the last report two significant tasks were completed:

- Six Operational Characterization samples were collected and analyzed for the Festival Park site in Orlando, Florida. The samples were collected to monitor trends of the chemical and microbial components of the stormwater inflow and the affected groundwater at selected monitoring wells.
- Four monitoring wells were installed, the three recharge wells and the monitoring wells were geophysically logged, and the potable water supply well survey was completed with the exception of one utility for the Lake Orienta site in Altamonte Springs, Florida.

The intent of this status report is to provide in-progress results of the project. While some analysis and data interpretation is presented, it is not intended to be an exhaustive evaluation of the results.

The locations of the two project sites are presented in Figure 1. The activities and results are briefly described below.

Festival Park Recharge Well Site

The tasks of the project and their status at Festival Park are:

- Literature Survey – Completed. The survey results are compiled with other literature search activities for ASR and recharge wells. Posted at http://www.asrforum.com/fatestudy/literature.html
- Potable Water Supply Well Survey - Completed (No public or private potable water supply wells were identified within 1 mile of the project site.)
- Dry Period Sampling - Not Applicable
- Baseline Characterization – Completed and presented in Status Report 6
- Groundwater Tracer Test - Completed and presented in Status Report 6
- Operational Characterization – Completed and presented in this status report
- Enhanced Treatment Site Characterization - On hold and discussed in this status report

Festival Park is a City of Orlando park, comprised of several city blocks approximately two miles east of downtown Orlando. A site map is presented in Figure 2. The tracer test results and baseline characterization sampling results indicated that monitoring wells MW-1 and MW-2 are in hydraulic connection with recharge well R-143, and none of the four monitoring wells are in hydraulic connection with R-40. Refer to Status Report No. 6 for discussions of the groundwater tracer test results and baseline sampling results. The sampling plan was modified regarding the wells to be sampled

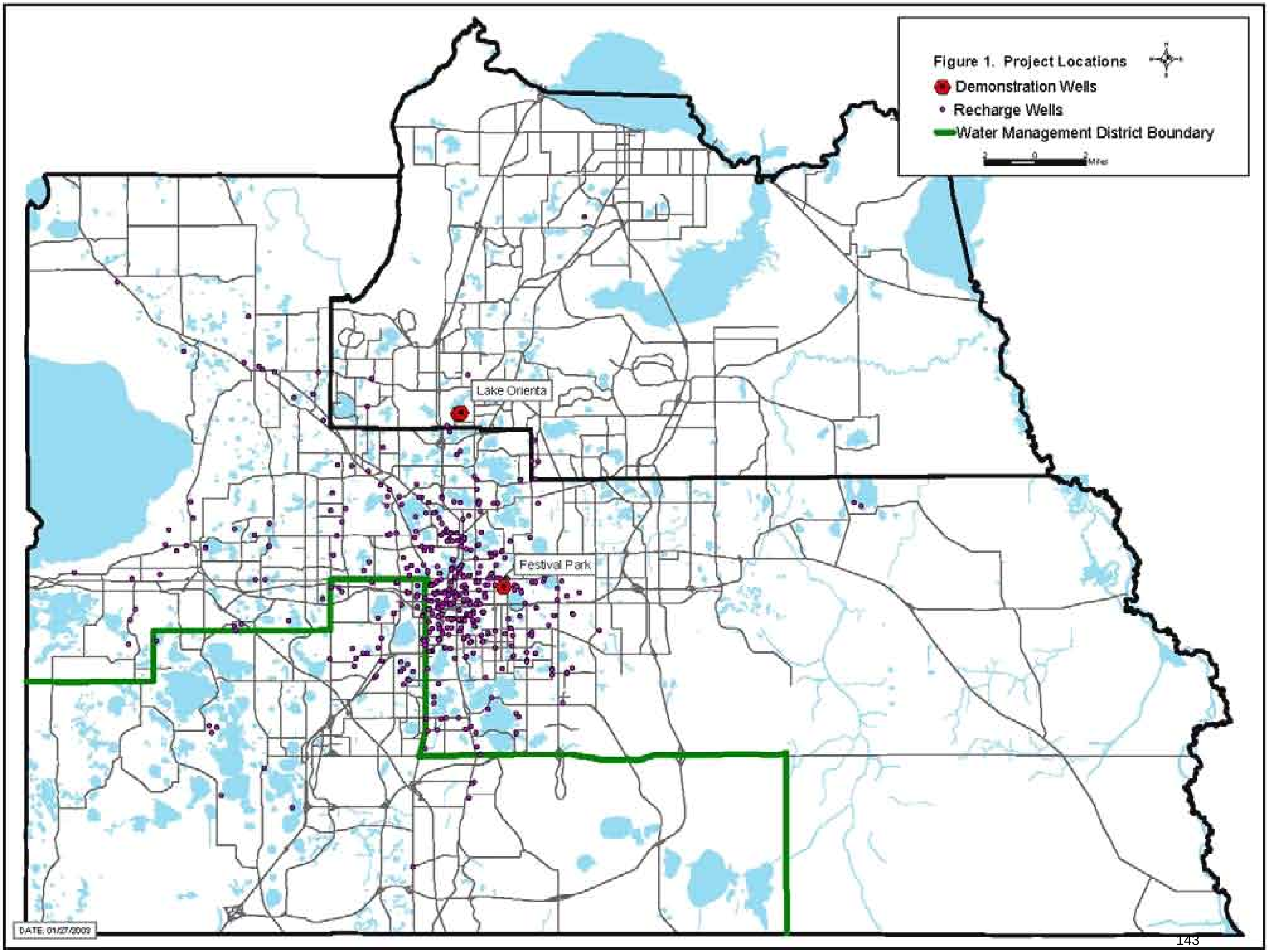


Figure 1. Project Locations
Demonstration Wells
Recharge Wells
Water Management District Boundary
Lake Orienta
Festival Park
DATE: 01/27/2009

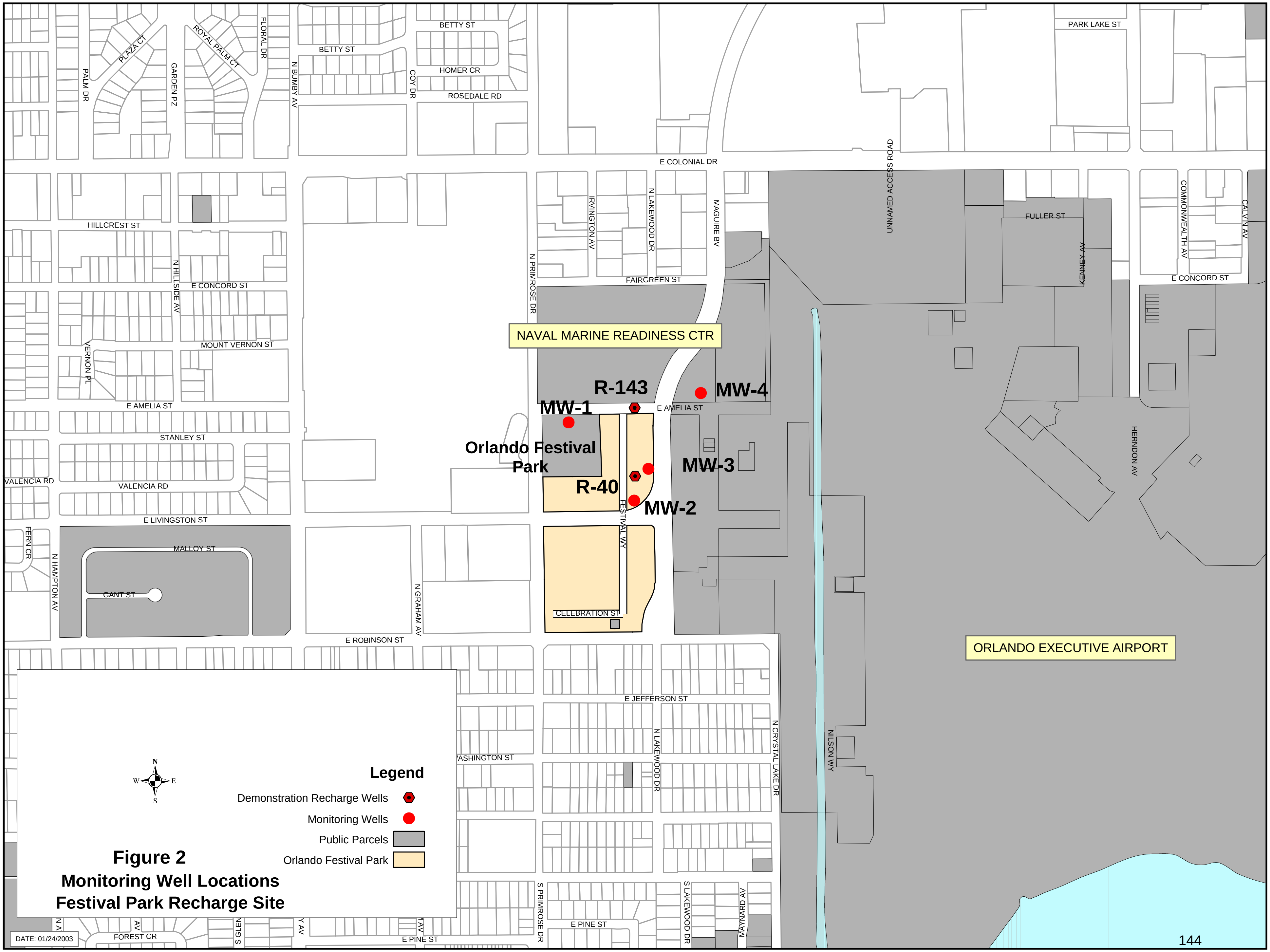
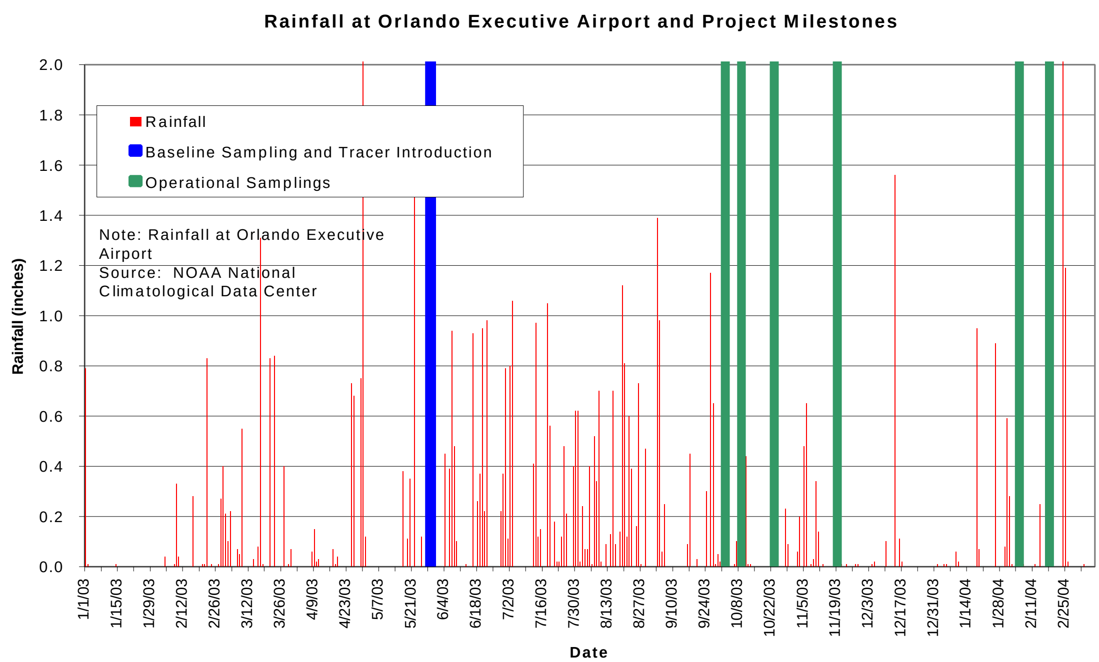


Figure 2
Monitoring Well Locations
Festival Park Recharge Site

and the timing and the frequency of sampling relative to the Groundwater Monitoring Plan. Those changes were presented in Status Report No. 6 and are presented below.

> ***Modification of the Sampling Plan*** *– The results of the groundwater tracer test indicated that MW-1 and MW-2 are hydraulically connected to R-143 through the Floridan aquifer and that MW-3 and MW-4 are connected to neither recharge well. Further, the groundwater travel time from R-143 and MW-1/MW-2 was less than two weeks. Therefore, at a meeting with the Central District of FDEP on September 4, 2003 it was agreed upon to modify the sampling plan to*
>
> - *Discontinue sampling of the influent to R-40 and MW-3. The influent to R-143 and groundwater from MW-1, MW-2, and MW-4 will continue to be sampled for an unchanged list of microbes and chemicals. MW-4 will serve as a background monitoring well.*
> - *Change the sample collection frequency for the Operational Characterization phase of the project from 1, 5, 10, 30, 60, 120, and optionally 180 days after a triggering recharge event to 1, 2, 4, and 8 weeks after a triggering rainfall event (0.5 inch to 1 inch of rainfall in 24 hours) during the Fall of 2003 to monitor the end of the 2003 wet season, then sample 1 and 2 weeks after a triggering rainfall event during the Winter/Spring of 2004 to monitor the system after a period of little rainfall.*

Daily rainfall at the Orlando Executive Airport and project milestones are presented in the following chart.



Triggering rainfall events occurred on September 26-27, 2003 and January 31, 2004 to initiate the respective sampling events. Operational characterization sampling events occurred as follows:

> Sampling Event 1 - October 1-3, 2003
> Sampling Event 2 - October 8-10, 2003

Sampling Event 3 - October 22-24, 2003
Sampling Event 4 - November 18-20, 2003
Sampling Event 5 - February 4-6, 2004
Sampling Event 6 - February 16-18, 2004

The microbial and chemical analyte list was the same for the Baseline Characterization and Operational Characterization sampling events as documented in the Groundwater Monitoring Plan presented in Status Report 4, distributed January 27, 2003.

Operational Characterization

Six Operational Characterization samplings occurred at the times presented above. The results of the microbial and chemical analyses of the waters are provided in Attachments A and Attachment B, respectively.

Microbial Results

The interpretation of the microbiological results presented are straightforward, with the exception of Host F amp+ Enrichment for coliphage. This analysis is a qualitative one; the two overlay methods provide quantitative results. Two designations are present for the results. The "+" indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a "+" with a "<5" pfu / 100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value. The "DNA" designation indicates that more of the coliphage were of the DNA type rather than the RNA type, and conversely for the "RNA" designation. RNA phage are more highly correlated with human E. *coli* than DNA phage.

Comparing the total coliform results of the stormwater inflow at R-143 to the groundwater at MW-1 and MW-2 shows that concentrations decrease 3 to 4 orders of magnitude or more. Relative fecal coliform, E. *coli*, and Enterococcus concentrations between R-143 and MW-1 / MW-2 are consistent with the Baseline Characterization results. *Cryptosporidium spp.* and *Giardia spp.* were not detected in any of the Operational Characterization samples. These observations are also consistent with the observations from the Baseline Characterization.

Stormwater recharge operations at Festival Park have been ongoing since the mid-1940's. The differences of total coliform concentrations between R-143 and the monitoring wells is encouraging and demonstrates the assimilative capability of the aquifer system to manage these bacteria on a long-term basis. The data are evaluated in two ways. First the concentration and rainfall data were evaluated in an attempt to correlate inflow concentrations at R-143 against rainfall for source characteristics. Second, the concentrations at the monitoring wells were evaluated against rainfall lagged in time to further evaluate correlation between rainfall and concentrations at the monitoring wells.

Total coliform concentrations at R-143 were compared to the occurrence of rainfall to evaluate correlation of high or low concentrations to rainfall events. The current and previous day rainfall totals were used to recognize the brief, but cumulative time of concentration of the stormwater collection system. The observations are presented in Table 1 arranged from high to low concentrations. Data from seven sample sets of the Baseline Characterization and the Operational Characterization were included in this analysis. With the exception of the May 28, 2003 sampling there appears to be good correlation between rainfall and coliform concentration, as one would expect.

TABLE 1
Total Coliform Concentrations at R-143 and Rainfall

Sample Date	Concentration (cfu/100mL)	Total Rainfall of Sample Date and Previous 2 Days (inches)
October 23, 2003	990	0.00
February 4, 2003	3,300	0.01
October 8, 2003	5,900	0.11
October 1, 2003	45,000	0.35
May 28, 2003	69,000	0.00
February 16, 2004	161,000	0.25
November 21, 2004	1,000,000	0.36

Now that it seems reasonable that inflow concentrations are correlated to rainfall, the next assessment is to evaluate the lag between rainfall and concentration trends at the monitoring wells. Results of the groundwater tracer test indicated that the times of the first arrival of tracer from R-143 to MW-1 and MW-2 were less than 2 weeks. Therefore, calculations were performed to evaluate if correlations are present between concentration trends at the wells and rainfall lagged backward in time. This was evaluated for the two monitoring wells by calculating the correlation between the concentration trends at the monitoring wells using 3-day and 4-day rainfall totals lagged between 3 days and 14 days prior to sample collection. 3-day and 4-day rainfall totals were used to recognize that overall groundwater quality at the monitoring wells is an integration of rainfall/recharge events, and not single event driven. The greatest correlations and the lag times are presented in Table 2.

TABLE 2
Correlations and Time Lags between Rainfall and Total Coliform Concentrations

Well	3-Day Rainfall Total		4-Day Rainfall Total	
	Time Lag	Correlation	Time Lag	Correlation
MW-1	5 Days	0.961	6 Days	0.774
MW-2	14 Days	0.695	14 Days	0.710

These analyses indicate that rain events drive coliform impacted water into the aquifer, as expected, and that concentration trends correlate strongly to lagged rainfall in a manner consistent with results of the tracer test. The conclusion is that concentration differences between inflow and at the monitoring wells are indicative of the assimilative capacity of the Upper Floridan aquifer at the site.

Chemical Results

The chemical data are presented with qualifiers that resulted from the data validation process. The value and the qualifier must be taken together to properly understand the laboratory results. For instance, if a result for a chemical was "10" milligrams per liter (mg/L) with an "=" qualifier then the chemical was detected at a concentration of 10 mg/L. However, if a result was "10" mg/L with a "U" qualifier then the chemical was not detected at a reporting limit of 10 mg/L. A "J" qualifier designates an estimated concentration at the value shown, and that concentration is between the method detection limit and the practical quantitation limit (PQL) – less confidence is placed on these concentrations relative to concentrations with an "=" qualifier. A combined "UJ" qualifier indicates that the chemical was not detected at the value shown. Notes at the bottom of the table provide explanations of the qualifiers and explanations to identify comparisons of the chemical results and various regulatory and risk-based criteria. Results shown in bolded text represent concentrations that exceed Maximum Contaminant Levels (MCLs).

Inorganic Chemicals - The chemical data were compared to various regulatory criteria and risk-based criteria; the results of the comparison are presented by different formatting (bolding, shading, and boxing) of the cells of the table. Aluminum in the Sampling Event 2 sample from MW-4 exceeded the secondary standard of 200 micrograms per liter (µg/L). Iron, in every instance, and aluminum from one sample from the recharge water at R-143 exceeded their respective standards. Concentrations of arsenic at MW-2 from Sampling Events 2 and 3 slightly exceeded the revised MCL. The revised MCL of 10 µg/L is effective January 1, 2005. Arsenic was not detected in any sample from the recharge water at R-143, or from MW-4. No other inorganic chemical from the monitoring well samples was detected at a concentration greater than the current Florida Primary and Secondary Maximum Contaminant Levels (MCLs).

An explanation that may accommodate the observed changes in arsenic concentrations is the time lag between well completions and the first sampling during the Baseline Characterization. Mobilization of arsenic possibly occurred as a result of the drilling process. The act of drilling exposes new exchange site surfaces in the native rock which in turn are exposed to drilling materials (e.g., drilling mud) and methods (e.g., air-lift development). The fact that the first samples showed the highest concentration supports this theory. If this is the case, it is anticipated that arsenic concentrations will continue to decline as the open borehole approaches equilibrium with the undisturbed portion of the aquifer. For this site, the lag period may have been insufficient.

Data that support this theory are the relatively high pH values of the groundwater samples and relatively high concentrations of barium. High pH values and barium are indications of remnant drilling mud. The wells were constructed using mud-rotary drilling techniques without the loss of circulation of drilling fluid. This is an unusual occurrence for drilling in the Upper Floridan aquifer in Central Florida. Therefore, the drilling mud could have penetrated the formation sufficiently that residual effects were observed during the Baseline Characterization sampling.

Organic Chemicals - Positive detections of synthetic organic chemicals occurred from two sampling locations from the six Operational Characterization samplings. These detections were in low concentrations and below MCL values. The chemicals, locations and potential sources relative to Festival Park are:

R-143 (stormwater)

- Total Recoverable Petroleum Hydrocarbons: = 0.82 mg/L, 2 of 6 events (oil, grease, fuel from automobile traffic; no MCL)
- Tetrachloroethene (PCE): = 1.1 µg/L, 5 of 6 events (dry cleaning fluid, industrial solvent; MCL=3 µg/L)
- Trichloroethene (TCE): < 0.32J µg/L, 4 of 6 events (industrial solvent and product of reductive dechlorination of PCE; MCL=3 µg/L)
- cis-1,2-Dichloroethene (cis-1,2-DCE): = 2.9 µg/L, 5 of 6 events (product of reductive dechlorination of PCE and TCE; MCL=70µg/L)
- 1,1 DCE: =0.96J µg/L, 3 of 6 events (component of flexible plastic food wrap and flame retardant fabrics, and in piping, coating for steel pipes, and adhesives; MCL=7 µg/L)
- 1,2 Dichlorobenzene: 0.52J µg/L, 1 of 6 events (chemical intermediate for making agricultural chemicals, primarily herbicides; MCL=600 µg/L)
- Toluene: < 0.7J µg/L, 4 of 6 events (component of gasoline; MCL=1,000 µg/L)

MW-2 (groundwater)

- cis-1,2-DCE: = 4.5 µg/L, 6 of 6 events (product of reductive dechlorination of PCE and TCE; MCL=70µg/L)
- 1,1-Dichloroethane (DCA): = 2.5 µg/L, 6 of 6 events (component of degreasing agents, and paint, varnish and finish removers; no MCL)

Stormwater Treatment Evaluation

A meeting was held with FDEP-Central District on March 31, 2004 to provide an update on the progress of the project and review data from the first four samplings of the Operational Characterization phase of the project. Because of the consistent concentration differences of coliform bacteria between R-143, and MW-1 and MW-2, it was decided to postpone implementation of disinfection treatment until data from the Lake Orienta project are available to consider the data sets together.

Upcoming Tasks at Festival Park

The Enhanced Treatment phase of the project is on hold at Festival Park pending the outcome of the investigation at Lake Orienta.

Lake Orienta Recharge Well Site

The request for funding for the project at the Lake Orienta Recharge Well Site in Altamonte Springs was approved by the SJRWMD Governing Board in October 2003. The current schedule of activities is:

- Literature Survey - Completed (Compiled with other literature search activities for ASR and recharge wells. Posted at http://www.asrforum.com/fatestudy/literature.html)
- Potable Water Supply Well Survey - >90 percent completed
- Dry Period Sampling - Completed (transmitted in Status Report No. 3, December 28, 2001)
- Baseline Characterization - August/September 2004, pending rise of lake stage to generate inflow into the recharge wells. This is based on the review of lake stage

data for the period of 1979 through 2003. The stage must be greater than elevation 61 feet to exceed the inflow elevation of the wells.
- Groundwater Tracer Test - August / September 2004, pending rise of lake stage to generate inflow into the recharge wells
- Operational Characterization – Spring through Summer 2005, pending rise of lake stage to generate inflow into the recharge wells
- Enhanced Treatment Site Characterization - Future

Monitoring Well Construction

Four Upper Floridan aquifer monitoring wells were installed by the SJRWMD during January through March 2004. The wells were installed at the locations as agreed to with FDEP. SJRWMD staff is preparing a report on the construction of the wells.

Potable Water Supply Well Survey

FDEP requires a survey for potable water supply wells within 1 mile of the recharge wells. The purpose is to notify owners of the performance of the groundwater tracer test. Four utilities supply potable water to this area of interest; City of Altamonte Springs, City of Maitland, Florida Water Services (FWS), and Utilities, Inc. These utilities were contacted to identify water customers within the area of interest, and the inverse was used to infer locations that are self-supplied for potable water. Three of the four utilities have provided customer information; Utilities, Inc. will continue to be prompted to supply customer location information within the area of interest. If customer locations are not provided for the Utilities, Inc. service area within the area of interest, the project will proceed under the assumption that the locations are self-supplied and all property owners will be notified. Utility water supply wells were gathered from GIS information provided by the SJRWMD. The parcels that, to date, were identified as self-supplied for potable water are displayed in Figure 3.

Upcoming Tasks at Lake Orienta

The following tasks are scheduled for the Lake Orienta site:

- Completion of the potable water supply well survey
- Baseline Characterization
- Groundwater Tracer Test

The baseline characterization and the groundwater tracer test are planned to occur after the stage in the lake has risen to the level that water would continuously flow into the recharge wells. The groundwater tracer test will begin immediately after sample collection for the baseline characterization. It is anticipated that this will occur during the middle to late summer.

Schedule

A Gantt chart showing the schedule for the investigations at the two recharge well sites is presented in Attachment C.

Next Anticipated Status Report

The next anticipated status report will be after the receipt of the microbiological and chemical data from the Baseline Characterization sampling and completion of the groundwater tracer test. This report should include results of monitoring well installation at the Lake Orienta site. This report will likely be issued late fall 2004.

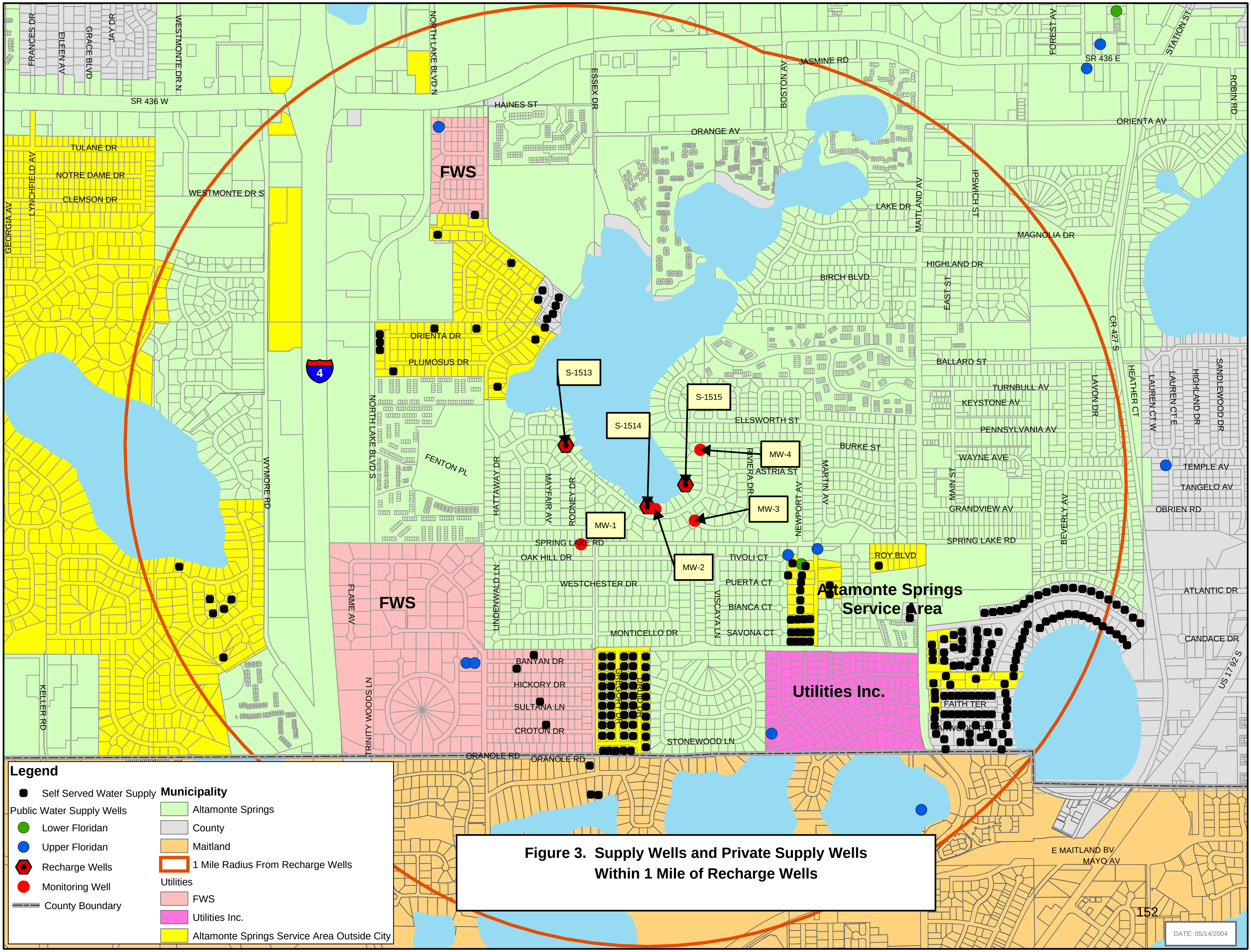


Figure 3. Supply Wells and Private Supply Wells Within 1 Mile of Recharge Wells

Attachment A
Microbial Results from Operational Characterization Phase at Festival Park

Summary of Results from Microbiological Analyses from the Operational Characterization Samplings

Organism	Units	Sampling Event 1				Sampling Event 2				Sampling Event 3				Sampling Event 4				Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
	Location	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	
	Date Collected ==>	10/01/2003	10/01/2003	10/02/2003	10/03/2003	10/08/2003	10/08/2003	10/10/2003	10/09/2003	10/23/2003	10/24/2003	10/22/2003	10/23/2003	11/21/2003	11/19/2003	11/20/2003	11/21/2003	
Total Coliform	cfu/100 mL	45,000	5.2	3.7	<0.2	5,900	7.4	0.3	<0.2	990	<0.2	2.2	<0.2	1,000,000	7.4	0.9	5.5	400 cfu/100 mL - Average 4 cfu/100 mL - Groundwater criteria
Fecal Coliform	cfu/100 mL	22,000	1.1	2	<0.2	3,400	2.9	0.7	<0.2	860	<0.2	1.6	<0.2	980,000	5.9	1	5.3	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	410	0.2	0.6	<0.2	410	<0.2	<0.2	<0.2	180	<0.2	0.3	<0.2	2,400	2.3	<0.2	<0.2	126 cfu/100 mL - Geometric Mean
Enterococcus	cfu/100 mL	1,700	0.3	<0.2	0.3	140	9.4	<0.2	13	69	<0.2	<0.2	<0.2	3,400	23	<0.2	0.7	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric Mean
Cryptosporidium	no./100 L	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<5	<0.01	<0.01	<0.01	<10	
Giardia	no./100 L	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<5	<0.01	<0.01	<0.01	<10	
Coliphage																		100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	-	-	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	+ (<5)	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	n/a	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	n/a	+/DNA	+/DNA	+/DNA	+/DNA	

Organism	Units	Sampling Event 5				Sampling Event 6				Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
	Location	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	
	Date Collected ==>	02/04/2004	02/04/2004	02/06/2004	02/05/2004	02/16/2004	02/17/2004	02/18/2004	02/16/2004	
Total Coliform	cfu/100 mL	3,300	0.8	<0.2	<0.2	161,000	<0.2	474	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average
Fecal Coliform	cfu/100 mL	1,900	1.8	<0.2	<0.2	77,000	<0.2	585	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	680	0.2	<0.2	<0.2	720	<0.2	1.52	<0.2	126 cfu/100 mL - Geometric Me
Enterococcus	cfu/100 mL	45	<0.2	2.2	<0.2	1,220	<0.2	3.16	<0.2	35 cfu/100 mL - Fresh Water
Cryptosporidium	no./100 L	<7.0	<0.1	<0.2	<0.1	<5	<0.1	<0.1	<0.1	
Giardia	no./100 L	<7.0	<0.1	<0.2	<0.1	<5	<0.1	<0.1	<0.1	
Coliphage										100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	+ (<5)	-	-	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	+ (<5)	+ (<5)	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	+/DNA	+/DNA	+/RNA	+/DNA	+/DNA	+/DNA	+/DNA	

Notes:

cfu - Colony forming units

pfu - plaque forming units

[1] Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF
	A "+" indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a "+" with a "<5" pfu/100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value.
	A "-" indicates that the presence of coliphage was not detected in the sample.

Attachment B
Chemical Analyses Results from Operational Characterization Phase at Festival Park

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

		Sampling Event 1										Sampling Event 2									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007		FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003		10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																					
pH	Std. Units	8.0		7.4		7.4		7.2		7.9		6.1		7.5		7.5		7.4		7.8	
TEMPERATURE	°C	27.0		24.8		24.8		25.1		25.1		27.4		24.8		24.8		24.9		24.8	
CONDUCTANCE	µmhos	210		478		478		464		321		197		328		328		455		368	
TURBIDITY	NTU	3.7		0.85		0.85		0.68		0.3		3.58		4.56		4.56		1.02		0.19	
DISSOLVED OXYGEN	mg/L	3.25		3.8		3.8		0.71		0.55		1.29		0.29		0.29		0.59		0.54	
OXIDATION/REDUCTION POTENTIAL	mV	124		135		135		0.8		-164		62		42		42		8		-185	
Radiologicals																					
ALPHA, GROSS	pCi/L	2.4	=	10.2	=	4.6	=	3.7	=	2.2	=	3.3	=	1.6	U	3.2	=	1.3	=	2.5	=
BETA, GROSS	pCi/L	2.9	=	12.9	=	10.7	=	8.6	=	2	=	3.5	=	2.8	=	2.4	=	4.5	=	2.6	=
Ion Balance																					
Calcium	meq/L	1.2		3.3		3.4		3.9		3.3		1.3		3.5		3.4		3.9		3.5	
Magnesium	meq/L	0.2		0.6		0.6		0.7		0.3		0.2		0.6		0.6		0.7		0.3	
Sodium	meq/L	0.3		0.6		0.6		0.5		0.5		0.5		0.3		0.3		0.4		0.5	
Potassium	meq/L	0.0		0.3		0.2		0.2		0.0		0.0		0.1		0.1		0.1		0.0	
Sum of cations	meq/L	1.7		4.8		4.8		5.3		4.1		2.1		4.5		4.4		5.2		4.3	
Bicarbonate	meq/L	1.2		3.5		3.4		3.8		2.3		1.3		3.1		3.1		4.1		3.9	
Carbonate	meq/L																				
Hydroxide	meq/L																				
Chloride	meq/L	0.4		0.2		0.2		0.3		0.1		0.5		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.1		0.9		0.9		0.8		0.0		0.2		0.9		0.8		0.7		0.0	
Sum of anions	meq/L	1.6		4.6		4.5		4.8		2.4		2.0		4.2		4.1		5.1		4.1	
Balance (% difference)		-2.0%		-3.0%		-3.5%		-4.8%		-20.4%		-1.6%		-2.8%		-2.7%		-1.2%		-2.1%	
Anions																					
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	57.5	=	173	=	170	=	189	=	114	=	65	=	157	=	157	=	203	=	197	=
CHLORIDE (AS CL)	mg/L	12.5	=	7.44	=	7.4	=	9.16	=	4.82	J	16.2	=	7.51	=	7.54	=	9.52	=	5.07	=
SULFATE (AS SO4)	mg/L	6.25	=	42.4	=	41	=	36.3	=	0.5	U	11.2	=	41.7	=	37.7	=	34.7	=	0.785	J
Nutrients																					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.795	=	0.469	=	0.42	=	0.446	=	0.427	=	0.896	=	0.65	=	0.332	=	0.549	=	0.401	=
NITROGEN, AMMONIA (AS N)	mg/L	0.381	J	0.203	J	0.107	U	0.127	J	0.247	J	0.368	J	0.107	U	0.107	U	0.257	J	0.28	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.795	J	0.401	=	0.359	J	0.364	=	0.427	=	0.83	=	0.65	=	0.332	=	0.549	=	0.401	=
NITROGEN, NITRITE	mg/L	0.037	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0147	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0677	J	0.0614	J	0.0824	J	0.0201	U	0.0656	J	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.085	=	0.08	=	0.085	=	0.099	=	0.037	J	0.062	=	0.086	=	0.103	=	0.109	=	0.04	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.017	J	0.048	=	0.044	=	0.079	=	0.014	U	0.024	=	0.077	=	0.073	=	0.091	=	0.03	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.059	=	0.074	=	0.079	=	0.091	=	0.063	=	0.067	=	0.095	=	0.085	=	0.113	=	0.035	=
General Chemistry																					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	125	=	295	=	297	=	328	=	270	=	100	=	240	=	190	=	270	=	230	=
TURBIDITY	NTU	1.4	=	1.4	=	0.6	=	0.2	J	2	=	1	=	1	=	0.6	=	0.3	=	0.5	=
pH (laboratory)	PH UNITS	6	=	7.12	=	6.99	=	7.24	=	8.23	=	6.42	=	7.46	=	7.4	=	7.63	=	7.89	=
COLOR	COLOR UNIT	25	=	5	J	5	U	5	J	5	J	20	=	10	=	10	=	15	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	=	2	R	2	=	2	=	2	=	2	UJ	2	U
TOTAL ORGANIC CARBON	mg/L	6.54	=	4.09	=	4.51	=	1.44	U	1.72	=	6.15	=	3.47	=	2.68	=	4.15	=	3.9	=
DISSOLVED ORGANIC CARBON	mg/L	5.96	=	1.88	U	2.74	U	1.82	U	1.71	=	5.67	=	2.94	=	3.32	=	3.99	=	3.43	=
Metals																					
ALUMINUM	µg/L	59.4	U	41	U	42.8	U	35	U	46.6	U	71.7	U	95.5	U	44.1	U	35	U	**220**	U
ANTIMONY	µg/L	2.91	J	2.5	U	5.02	=	2.5	U	2.5	U	2.75	J	2.5	U	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	6.72	=	7.25	=	9.51	=	2.04	U	2.04	U	9.18	=	9.52	=	**10.6**	=	2.04	U
BARIUM	µg/L	12.5	=	55	=	47.7	=	35.1	=	5.39	=	13.4	=	16.9	=	16.3	=	23.9	=	4.52	=
BERYLLIUM	µg/L	0.0945	U	0.197	U	0.203	U	0.168	U	0.0945	U	0.304	U	0.108	U	0.0945	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.522	J	0.546	J	0.369	J	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U
CALCIUM	µg/L	23300	=	66600	=	67900	=	77100	=	66300	=	26700	=	70100	=	68800	=	77100	=	69500	=
CHROMIUM, TOTAL	µg/L	0.57	U	0.96	J	0.774	J	0.651	J	0.57	U	0.8	J	0.57	U	0.57	U	0.57	U	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	8.41	=	1.17	U	1.17	U	1.17	U	1.17	U	5.82	=	1.17	U	1.22	J	1.17	U	1.17	U
IRON	µg/L	**393**	=	48.2	U	57.3	U	16.7	U	22.1	U	**355**	=	89.5	U	68.4	U	40.4	U	16.7	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	1900	=	7420	=	7410	=	8320	=	3100	=	2610	=	7090	=	6860	=	8930	=	3210	=
MANGANESE	µg/L	8.46	=	2.05	=	2.15	=	4.28	=	1.11	U	8.53	=	18.8	=	17.8	=	11.8	=	0.327	J
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	9.12	=	8.8	=	5.09	=	0.997	U	0.997	U	4.85	J	4.68	J	4.35	J	0.997	U
POTASSIUM	µg/L	1430	=	10600	=	8680	=	8110	=	1340	=	1870	=	2420	=	2330	=	5020	=	1230	=
SELENIUM	µg/L	2.1	U	4.28	J	2.1	U	2.1	U	2.1	U	3.09	U	2.1	U	3.8	U	2.1	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U
SODIUM	µg/L	7860	J	14300	J	12900	J	12600	J	11300	J	10500	J	7150	J	7000	J	10300	J	11700	J
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.57	J	2.91	J	2.16	J	3.72	=	0.447	U	1.84	J	1.52	J	1.48	J	2.08	J	0.447	U
ZINC	µg/L	10.4	=	3.7	J	3.01	J	2.69	U	2.77	U	8.6	J	17.5	=	5.88	J	5.57	J	67.6	=
Total Petroleum Hydrocarbons																					
PETROLEUM HYDROCARBONS	mg/L	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.82	=	0.34	U	0.34	U	0.34	U	0.34	U
Volatile Organic Compounds																					
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
cis-1,2-DICHLOROETHYLENE	µg/L	0.89	J	1	U	1	U	3.5	=	1	U	0.88	J	1	UJ	1	UJ	4.4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ
DIBROMOCHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	UJ	**1**	UJ
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.2	=	1	U	1	U	1	U	1	U	2.5	=	1	U
1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U	0.48	J	1	U	1	U	1	U	1	U	0.53	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	0.52	J	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.7	J	1	U	1	U	1	U	1	U	1.1	=	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.29	J	1	U	1	U	1	U	1	U	0.67	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	UJ	3.6	UJ	3.6	UJ	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	UJ	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	0.23	J	1	U	1	U	1	U	1	U	0.32	J	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	**1**	UJ	**1**	UJ	**1**	UJ	**1**	U	**1**	UJ	**1**	U	**1**	U	**1**	U	**1**	UJ	**1**	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U

		Sampling Event 3										Sampling Event 4									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002		FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003		11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																					
pH	Std. Units	7.7		7.5		7.5		7.3		7.9		6.4		7.4		7.4		6.9		7.6	
TEMPERATURE	°C	28.5		25.2		25.2		25.4		25.1		24.4		25.0		25.0		24.5		23.6	
CONDUCTANCE	µmhos	246		361		361		425		411		197		319		319		408		328	
TURBIDITY	NTU	32.8		1.64		1.64		0.5		0.6		6.73		5.61		5.61		0.85		0.19	
DISSOLVED OXYGEN	mg/L	3		0.16		0.16		0.2		0.98		4.63		0.4		0.4		0.35		0.58	
OXIDATION/REDUCTION POTENTIAL	mV	65		-158		-158		6		-123		-47		12		12		58		-109	
Radiologicals																					
ALPHA, GROSS	pCi/L	2.1	=	2.9	=	2.8	=	4.3	=	2.6	=	1.2	=	1.7	U	1.5	U	1.4	U	2.1	=
BETA, GROSS	pCi/L	1.9	=	2.7	=	3.1	=	4.8	=	4.1	=	3.5	=	4	=	3.9	=	2.6	=	2.4	=
Ion Balance																					
Calcium	meq/L	2.0		3.1		3.1		3.8		3.4		1.6		3.1		3.1		3.4		3.3	
Magnesium	meq/L	0.3		0.5		0.5		0.7		0.3		0.2		0.6		0.6		0.7		0.3	
Sodium	meq/L	0.4		0.2		0.3		0.4		0.4		0.4		0.4		0.4		0.4		0.5	
Potassium	meq/L	0.0		0.0		0.0		0.1		0.0		0.0		0.1		0.1		0.1		0.0	
Sum of cations	meq/L	2.7		3.8		3.9		5.0		4.1		2.2		4.2		4.2		4.6		4.1	
Bicarbonate	meq/L	1.5		3.0		3.1		3.9		4.0		1.6		3.0		3.1		3.8		3.8	
Carbonate	meq/L																				
Hydroxide	meq/L																				
Chloride	meq/L	0.4		0.2		0.2		0.2		0.1		0.4		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.2		0.6		0.7		0.8		0.0		0.2		0.7		0.6		0.6		0.0	
Sum of anions	meq/L	2.1		3.8		4.1		4.9		4.1		2.2		3.9		3.9		4.8		4.0	
Balance (% difference)		-11.4%		-0.3%		2.0%		-1.0%		0.2%		0.3%		-3.4%		-2.7%		1.9%		-2.0%	
Anions																					
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	74	=	151	=	157	=	194	=	200	=	81	=	151	=	154	=	192	=	189	=
CHLORIDE (AS CL)	mg/L	13.9	=	6.18	=	6.06	=	7.72	=	3.2	=	13.8	=	8.66	=	8.53	=	9.96	=	5.19	=
SULFATE (AS SO4)	mg/L	9.04	=	30.2	=	35.9	=	37.6	=	0.609	J	11.2	=	31.2	=	29.5	=	30.6	=	1.18	=
Nutrients																					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.781	=	0.272	=	0.315	=	0.442	=	0.366	=	0.45	=	0.232	=	0	U	0.168	=	0.209	=
NITROGEN, AMMONIA (AS N)	mg/L	0.301	J	0.107	U	0.107	U	0.193	J	0.182	J	0.183	J	0.107	U	0.107	U	0.174	J	0.225	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.781	=	0.272	=	0.315	=	0.442	=	0.366	=	0.385	=	0.154	J	0.128	U	0.168	J	0.209	J
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0243	U	0.0118	U	0.0118	U	0.021	U	0.0119	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0637	J	0.108	=	0.0252	J	0.0604	J	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.112	=	0.097	=	0.118	=	0.138	=	0.097	=	0.089	=	0.102	=	0.098	=	0.123	=	0.093	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.034	=	0.085	=	0.078	=	0.097	=	0.025	=	0.033	=	0.069	=	0.121	=	0.15	=	0.021	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.098	=	0.106	=	0.111	=	0.101	=	0.058	=	0.149	=	0.078	=	0.084	=	0.122	=	0.154	=
General Chemistry																					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	137	=	233	=	245	=	296	=	268	=	143	=	246	=	255	=	295	=	278	=
TURBIDITY	NTU	2.5	=	0.4	=	0.5	=	0.12	U	0.12	U	2.2	=	0.3	=	0.3	=	0.12	U	0.12	U
pH (laboratory)	PH UNITS	6.61	=	7.87	=	7.69	=	7.32	=	7.84	=	6.9	=	7.42	=	7.58	=	7.28	=	7.87	=
COLOR	COLOR UNIT	20	=	10	=	10	=	15	=	10	=	25	=	10	=	10	=	10	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	=	2	=	2	=	2	=	2	=	3.4	=	2	U	2	U	2	=	2	U
TOTAL ORGANIC CARBON	mg/L	5.18	=	1.23	J	1.17	J	3.8	=	2.65	=	3.95	=	0.54	J	0.64	J	0.368	U	2.2	=
DISSOLVED ORGANIC CARBON	mg/L	5.57	=	1.13	J	1.31	J	3.74	=	2.18	=	5.11	=	2.55	U	3.67	U	3.07	U	2.46	U
Metals																					
ALUMINUM	µg/L	**2660**	=	35	U	35	U	35	U	35	U	121	=	41	J	35	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	3.27	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	3.51	J	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	8.05	=	9.9	=	**12.3**	=	2.04	U	2.04	U	6	=	6.76	=	7.05	=	2.04	U
BARIUM	µg/L	29.4	=	12.1	=	11.8	=	19.3	=	4.34	=	13.7	=	20.9	=	20.7	=	16.9	=	4.45	=
BERYLLIUM	µg/L	0.188	U	0.156	U	0.0945	U	0.265	U	0.104	U	0.0945	U	0.219	U	0.234	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.372	J	0.356	U	0.356	U	0.358	J	0.548	J	0.356	U	0.356	U
CALCIUM	µg/L	39700	=	61400	=	62500	=	75500	=	67200	=	32400	=	62800	=	62500	=	68800	=	66700	=
CHROMIUM, TOTAL	µg/L	10.6	=	0.57	U	0.576	J	0.57	U	0.57	U	1.01	J	0.826	J	0.614	J	0.812	J	0.57	U
COBALT	µg/L	1.19	J	0.569	U	0.569	U	0.779	J	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	5.25	=	1.17	U	1.17	U	1.17	U	1.17	U	2.33	J	1.27	J	1.22	J	1.17	U	1.52	J
IRON	µg/L	**4370**	=	123	U	114	U	40.7	U	16.7	U	**310**	=	81.6	U	84.3	U	18.5	U	16.7	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	4.32	J	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	3000	=	5780	=	5780	=	8870	=	3100	=	2360	=	7330	=	7230	=	8030	=	3060	=
MANGANESE	µg/L	24.2	=	6.69	=	6.48	=	11.6	=	1.36	U	8.09	=	12.9	=	13.3	=	9.73	=	0.278	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.183	U	0.0162	U	0.0162	U	0.0162	U	0.16	U
NICKEL	µg/L	5.65	=	2.38	J	2.86	J	5.1	=	0.997	U	0.997	U	5.07	=	4.73	J	3.94	J	0.997	U
POTASSIUM	µg/L	1510	=	1770	=	1660	=	3730	=	1000	=	1920	=	3160	=	3050	=	3350	=	1100	=
SELENIUM	µg/L	2.1	U	2.18	U	2.33	U	2.24	U	2.1	U	2.1	U	3.24	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.504	J	0.526	J
SODIUM	µg/L	9050	=	5690	=	5840	=	8620	=	10100	=	8380	=	8390	=	8150	=	8990	=	11400	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.93**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	12.5	=	1.17	J	1.31	J	1.57	J	0.447	U	1.89	J	1.07	J	0.81	J	1.89	J	0.447	U
ZINC	µg/L	23.9	=	1.27	J	1.51	J	0.409	U	0.409	U	14.5	=	3.67	J	3.09	J	1.23	U	0.694	U
Total Petroleum Hydrocarbons																					
PETROLEUM HYDROCARBONS	mg/L	0.34	U	0.36	U	0.35	U	0.34	U	0.34	U	0.82	=	0.34	U	0.34	U	0.35	U	0.34	U
Volatile Organic Compounds																					
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHYLENE	µg/L	2.3	=	1	U	1	U	4	=	1	U	1.1	=	1	U	1	U	4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	U	1	UJ
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.2	=	1	U	1	U	1	U	1	U	2.2	=	1	U
1,1-DICHLOROETHENE	µg/L	0.96	J	1	U	1	U	0.48	J	1	U	0.38	J	1	U	1	U	0.44	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.81	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.56	J	1	U	1	U	1	U	1	U	0.24	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	0.27	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

		Sampling Event 5					Sampling Event 6					Maximum Contaminant Levels				Florida Brownfields		Risk-based Concentrations	
	Location:	Inflow to R-143	MW-1	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-1	MW-2	MW-4	Florida MCL / SMCL	Florida MCL / SMCL	Federal MCL/SMCL[2]	Federal MCL/SMCL[2]	Florida Brownfield	Florida Brownfield	Regional USEPA RBC	Regional USEPA RBC[4]
	Event:	Sampling Event 5	Sampling Event 5	Sampling Event 5	Sampling Event 5	Sampling Event 5	Sampling Event 6	Sampling Event 6	Sampling Event 6	Sampling Event 6	Sampling Event 6								
	SJRWMD No.:	None	OR0018	OR0018	OR819	OR0141	None	OR0018	OR0018	OR819	OR0141	Chapter 62-550, FAC) MCL	Chapter 62-550, FAC) SMCL	MCL	SMCL	(62-785)[3] GCTL	(62-785)[3] Groundwater LY/PQ	EPA Region III Tap Water	EPA Region IV
	SampleID:	FP-04-06-005	FP-04-06-001	FP-04-06-002	FP-04-06-007	FP-04-06-006	FP-04-007-02	FP-04-07-003	FP-04-07-004	FP-04-07-007	FP-04-07-001								
	DateCollected:	02/04/2004	02/04/2004	02/04/2004	02/06/2004	02/05/2004	02/16/2004	02/17/2004	02/17/2004	02/18/2004	02/16/2004								
	Matrix:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater								
	SampleType:	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Normal	Field Duplicate	Normal	Normal								
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit	Criteria Unit
Field Measurements																			
pH	Std. Units	6.05	7.29	7.29	7.49	7.56	6.63	7.62	7.62	6.61	7.81								
TEMPERATURE	°C	20.1	24.4	24.4	24.9	24.2	20.6	24.1	24.1	24.3	23.8								
CONDUCTANCE	µmhos	157.3	403	403	410	317	192	393	393	305	371								
TURBIDITY	NTU	4.68	0.98	0.98	1.04	0.17	3.04	0.25	0.25	0.87	0.04								
DISSOLVED OXYGEN	mg/L	5.02	0.34	0.34	0.29	0.37	3.1	0.2	0.2	0.21	0.2								
OXIDATION/REDUCTION POTENTIAL	mV	-6	-90	-90	-19	164	no data	-237	-237	-55	-163								
Radiologicals																			
ALPHA, GROSS	pCi/L	0.838 U	2.62 J	0.649 U	1.93 U	6.82 =	0.805 U	1.48 U	3.44 =	1.93 U	3.45 =	15 pCi/L	pCi/L	15 pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
BETA, GROSS	pCi/L	1.36 U	2.84 U	2.69 U	2.81 U	2.69 U	0.812 U	3.19 J	3.05 J	3.41 J	1.07 U	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
Ion Balance																			
Calcium	meq/L	0.9	3.5	3.5	3.4	3.5	1.3	3.5	3.5	3.5	3.4								
Magnesium	meq/L	0.1	0.7	0.7	0.7	0.3	0.2	0.7	0.7	0.7	0.3								
Sodium	meq/L	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.5								
Potassium	meq/L	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0								
Sum of cations	meq/L	1.3	4.6	4.6	4.6	4.2	1.9	4.5	4.5	4.7	4.2								
Bicarbonate	meq/L	1.0	3.3	3.2	3.6	3.7	1.3	2.7	3.0	3.7	3.8								
Carbonate	meq/L																		
Hydroxide	meq/L																		
Chloride	meq/L	0.2	0.2	0.2	0.3	0.1	0.4	0.2	0.2	0.3	0.1								
Sulfate	meq/L	0.1	1.4	1.5	0.8	0.0	0.2	0.7	0.8	0.6	0.0								
Sum of anions	meq/L	1.4	4.9	4.9	4.7	3.9	1.9	3.6	4.0	4.5	3.9								
Balance (% difference)		3.4%	3.5%	3.9%	1.3%	-4.2%	-0.6%	-10.1%	-5.4%	-1.6%	-3.3%								
Anions																			
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	51 =	165 =	161 =	182 =	187 =	63 =	135 =	150 =	184 =	188 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CHLORIDE (AS CL)	mg/L	8.49 =	7.02 =	7.19 =	10.5 =	5.21 =	13.7 =	7.64 =	7.42 =	9.48 =	5.04 =	µg/L	250 mg/L	mg/L	250 mg/L	250 mg/L	250 mg/L	mg/L	mg/L
SULFATE (AS SO4)	mg/L	6.77 =	68.5 =	71.8 =	38.3 =	0.22 U	9.96 =	33.7 =	39.9 =	28.8 =	0.22 U	mg/L	250 mg/L	mg/L	250 mg/L	250 mg/L	2500 mg/L	mg/L	mg/L
Nutrients																			
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.81 =	1.52 =	1.47 =	1.63 =	2.36 =	0.899 =	0.463 =	0.432 =	0.553 =	0.559 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NITROGEN, AMMONIA (AS N)	mg/L	0.21 J	0.126 J	0.125 J	0.308 U	4.57 =	0.306 J	0.149 J	0.142 J	9.33 =	0.282 J	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NITROGEN, KJELDAHL, TOTAL	mg/L	1.7 J	1.48 J	1.45 J	1.6 U	2.33 =	0.867 =	0.443 U	0.412 U	0.533 U	0.521 U	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NITROGEN, NITRITE	mg/L	0.0142 J	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0158 J	0.0118 U	0.0118 U	0.0118 U	0.0118 U	1 mg/L	mg/L	1 mg/L	mg/L	1 mg/L	mg/L	3.7 mg/L	3.7 mg/L
NITROGEN, NITRATE-NITRITE	mg/L	0.11 =	0.0366 J	0.0201 U	0.0328 J	0.0261 J	0.032 J	0.0201 U	0.0201 U	0.0201 U	0.0381 J	mg/L	mg/L	10 mg/L	mg/L	10 mg/L	mg/L	mg/L	mg/L
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.061 =	0.111 =	0.107 =	0.129 =	0.062 =	0.082 =	0.094 =	0.12 =	0.223 =	0.1 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.029 =	0.09 =	0.097 =	0.113 =	0.037 =	0.03 =	0.083 =	0.095 =	0.127 =	0.027 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.061 =	0.098 =	0.096 =	0.121 =	0.06 =	0.096 =	0.152 =	0.181 =	0.143 =	0.118 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
General Chemistry																			
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	89 =	263 =	271 =	237 =	271 =	125 =	242 =	255 =	272 =	252 =	mg/L	500 mg/L	mg/L	500 mg/L	500 mg/L	500 mg/L	mg/L	mg/L
TURBIDITY	NTU	1.5 =	1.1 =	1.2 =	7 =	0.25 =	1.5 =	0.12 U	0.5 =	0.6 =	0.12 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
pH (laboratory)	PH UNITS	6.93 =	7.62 =	7.55 =	7.45 =	8.01 =	6.63 =	7.44 =	7.41 =	7.43 =	7.81 =	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
COLOR	COLOR UNIT	25 =	15 =	10 =	15 =	15 =	25 =	10 =	15 =	15 =	10 =	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2 U	2 U	2 U	2 U	3.3 =	2 U	2 U	2 U	2 U	2 U	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TOTAL ORGANIC CARBON	mg/L	2.28 =	0.368 U	0.368 U	2.1 U	0.368 U	0.368 U	0.368 U	0.368 U	0.368 UJ	4.19 =	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
DISSOLVED ORGANIC CARBON	mg/L	3.2 =	1.36 U	1.45 U	2.08 U	1.35 U	4.09 =	0.368 UJ	0.62 J	0.8 J	0.368 U	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Metals																			
ALUMINUM	µg/L	111 =	35 =	41.8 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	µg/L	200 µg/L	µg/L	50 µg/L	µg/L	200 µg/L	37000 µg/L	3700 µg/L
ANTIMONY	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	4.3 U	3.5 U	2.5 U	2.5 U	6 µg/L	µg/L	6 µg/L	µg/L	6 µg/L	60 µg/L	15 µg/L	1.5 µg/L
ARSENIC	µg/L	2.04 U	8.71 =	**10.6** =	2.93 J	2.04 U	2.04 U	9.39 =	9.59 =	7.77 =	2.04 U	50 µg/L	µg/L	50 µg/L	µg/L	50 µg/L	5000 µg/L	0.045 µg/L	0.045 µg/L
BARIUM	µg/L	11 =	20.9 =	19.7 =	16.3 =	5.58 =	16.4 =	19.1 =	18.6 =	15.9 =	4.47 =	2000 µg/L	µg/L	2000 µg/L	µg/L	2000 µg/L	20000 µg/L	2600 µg/L	260 µg/L
BERYLLIUM	µg/L	0.0945 U	0.0945 U	0.0945 U	0.179 U	0.0945 U	0.0945 U	0.315 U	0.368 U	0.0945 U	0.0945 U	4 µg/L	µg/L	4 µg/L	µg/L	4 µg/L	400 µg/L	0.016 µg/L	0.016 µg/L
CADMIUM	µg/L	0.356 U	0.356 U	0.356 U	0.356 U	0.356 U	0.356 U	0.406 J	0.453 J	0.356 U	0.356 U	5 µg/L	µg/L	5 µg/L	µg/L	5 µg/L	515 µg/L	18 µg/L	1.8 µg/L
CALCIUM	µg/L	18500 =	69500 =	69200 =	68400 =	69100 =	26300 =	69800 =	70100 =	70400 =	68700 =	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CHROMIUM, TOTAL	µg/L	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	1.07 J	1.16 J	0.57 U	0.751 J	0.601 J	100 µg/L	µg/L	100 µg/L	µg/L	100 µg/L	1000 µg/L	µg/L	µg/L
COBALT	µg/L	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	0.569 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	2200 µg/L	220 µg/L
COPPER	µg/L	1.17 U	1.17 U	1.17 U	1.17 U	1.17 U	1.67 U	1.17 U	1.17 U	1.17 U	1.17 U	µg/L	1000 µg/L	µg/L	1000 µg/L	1000 µg/L	10000 µg/L	130000 µg/L	13000 µg/L
IRON	µg/L	**394** =	164 =	150 U	170 U	16.7 U	**331** =	217 U	222 U	210 =	16.7 U	µg/L	300 µg/L	µg/L	300 µg/L	300 µg/L	µg/L	11000 µg/L	1100 µg/L
LEAD	µg/L	2.1 J	1.76 U	1.76 U	1.76 U	1.76 U	1.76 U	1.76 U	1.93 J	1.76 U	1.76 U	15 µg/L	µg/L	15 µg/L	µg/L	15 µg/L	150 µg/L	µg/L	µg/L
MAGNESIUM	µg/L	1160 =	8790 =	8600 =	8580 =	3160 =	1810 =	8530 =	8360 =	8800 =	3160 =	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MANGANESE	µg/L	6.77 =	9.99 =	7 =	6.78 =	0.259 U	10.8 =	6.6 =	6.61 =	5.21 =	0.167 U	µg/L	50 µg/L	µg/L	50 µg/L	50 µg/L	500 µg/L	840 µg/L	84 µg/L
MERCURY	µg/L	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	0.0162 U	2 µg/L	µg/L	2 µg/L	µg/L	2 µg/L	20 µg/L	11 µg/L	1.1 µg/L
NICKEL	µg/L	0.997 U	3.92 J	4.2 J	2.95 J	0.997 U	0.997 U	2.96 J	3.08 J	2.7 J	0.997 U	100 µg/L	µg/L	100 µg/L	µg/L	100 µg/L	1000 µg/L	730 µg/L	73 µg/L
POTASSIUM	µg/L	1100 =	2540 =	2400 =	3450 =	1500 J	1640 J	2010 J	1960 J	2800 =	1130 J	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SELENIUM	µg/L	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	50 µg/L	µg/L	50 µg/L	µg/L	50 µg/L	500 µg/L	180 µg/L	18 µg/L
SILVER	µg/L	0.587 U	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U	0.695 U	0.472 U	0.54 U	0.472 U	µg/L	100 µg/L	µg/L	100 µg/L	100 µg/L	1000 µg/L	180 µg/L	18 µg/L
SODIUM	µg/L	6030 =	7630 =	7400 =	9040 =	11300 =	8500 J	6550 J	6430 J	8630 J	10400 J	160000 µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
THALLIUM	µg/L	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	**2.54** U	2 µg/L	µg/L	2 µg/L	µg/L	2 µg/L	µg/L	µg/L	µg/L
VANADIUM	µg/L	1.53 J	0.623 J	0.447 U	0.771 U	0.447 U	1.8 J	1.3 J	1.29 J	0.749 J	0.447 U	µg/L	µg/L	µg/L	µg/L	49 µg/L	490 µg/L	260 µg/L	26 µg/L
ZINC	µg/L	10.9 =	0.68 J	2.99 J	0.755 U	1.66 U	11.8 J	0.85 J	0.409 UJ	0.409 U	1.71 UJ	µg/L	5000 µg/L	µg/L	5000 µg/L	5000 µg/L	50000 µg/L	11000 µg/L	1100 µg/L
Total Petroleum Hydrocarbons																			
PETROLEUM HYDROCARBONS	mg/L	0.34 U	0.12 J	0.12 J	0.34 UJ	0.1 J	0.34 U	0.34 UJ	0.34 U	0.34 U	0.35 U	mg/L	mg/L	mg/L	mg/L	5 mg/L	50 mg/L	mg/L	mg/L
Volatile Organic Compounds																			
ACETONE	µg/L	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ	µg/L	µg/L	µg/L	µg/L	700 µg/L	7000 µg/L	3700 µg/L	370 µg/L
ACROLEIN	µg/L	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ACRYLONITRILE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 µg/L	µg/L	5 µg/L	µg/L	1 µg/L	100 µg/L	0.36 µg/L	0.36 µg/L
BROMODICHLOROMETHANE	µg/L	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	100 µg/L	µg/L	100 µg/L	µg/L	0.6 µg/L	60 µg/L	0.17 µg/L	0.17 µg/L
BROMOFORM	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	100 µg/L	µg/L	100 µg/L	µg/L	4 µg/L	40 µg/L	2.4 µg/L	2.4 µg/L
BROMOMETHANE	µg/L	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	9.8 µg/L	µg/L	8.7 µg/L	0.87 µg/L
CARBON DISULFIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	700 µg/L	7000 µg/L	1000 µg/L	100 µg/L
CARBON TETRACHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3 µg/L	µg/L	5 µg/L	µg/L	3 µg/L	300 µg/L	0.16 µg/L	0.16 µg/L
CHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	100 µg/L	µg/L	100 µg/L	µg/L	100 µg/L	1000 µg/L	39 µg/L	3.9 µg/L
CHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	2800 µg/L	28000 µg/L	3.6 µg/L	3.6 µg/L
CHLOROFORM	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	100 µg/L	µg/L	100 µg/L	µg/L	6 µg/L	600 µg/L	0.15 µg/L	0.15 µg/L
CHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	µg/L	µg/L	µg/L	µg/L	2.7 µg/L	270 µg/L	1.4 µg/L	1.4 µg/L
2-CHLORO-1,3-BUTADIENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
cis-1,2-DICHLOROETHYLENE	µg/L	2.9 =	1 U	1 U	4.5 =	1 U	1 U	1 U	1 U	4.4 =	1 U	70 µg/L	µg/L	70 µg/L	µg/L	70 µg/L	700 µg/L	61 µg/L	6.1 µg/L
cis-1,3-DICHLOROPROPENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DIBROMOCHLOROMETHANE	µg/L	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	100 µg/L	µg/L	100 µg/L	µg/L	0.4 µg/L	40 µg/L	0.13 µg/L	0.13 µg/L
DICHLORODIFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	1400 µg/L	µg/L	390 µg/L	39 µg/L
1,1-DICHLOROETHANE	µg/L	1 U	1 U	1 U	2.2 =	1 U	1 U	1 U	1 U	2.1 =	1 U	µg/L	µg/L	µg/L	µg/L	700 µg/L	7000 µg/L	810 µg/L	81 µg/L
1,1-DICHLOROETHENE	µg/L	0.96 J	1 U	1 U	0.44 J	1 U	1 U	1 U	1 U	0.49 J	1 U	7 µg/L	µg/L	7 µg/L	µg/L	7 µg/L	700 µg/L	0.044 µg/L	0.044 µg/L
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	0.02 µg/L	µg/L	0.05 µg/L	µg/L	0.02 µg/L	2 µg/L	0.00075 µg/L	0.00075 µg/L
1,2-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	600 µg/L	µg/L	600 µg/L	µg/L	600 µg/L	6000 µg/L	64 µg/L	6.4 µg/L
1,2-DICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3 µg/L	µg/L	5 µg/L	µg/L	3 µg/L	300 µg/L	0.12 µg/L	0.12 µg/L
1,2-DICHLOROPROPANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 µg/L	µg/L	5 µg/L	µg/L	5 µg/L	500 µg/L	0.16 µg/L	0.16 µg/L
1,3-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	10 µg/L	100 µg/L	540 µg/L	54 µg/L
1,4-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	75 µg/L	µg/L	75 µg/L	µg/L	75 µg/L	7500 µg/L	0.44 µg/L	0.44 µg/L
ETHYLBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	700 µg/L	30 µg/L	700 µg/L	µg/L	30 µg/L	300 µg/L	1300 µg/L	130 µg/L
2-HEXANONE	µg/L	5 U	5 U	5 U	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 UJ	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	1500 µg/L	150 µg/L
IODOMETHANE (METHYL IODIDE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
METHYLENE CHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 µg/L	µg/L	5 µg/L	µg/L	5 µg/L	500 µg/L	4.1 µg/L	4.1 µg/L
STYRENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	100 µg/L	µg/L	100 µg/L	µg/L	100 µg/L	1000 µg/L	1600 µg/L	160 µg/L
TETRACHLOROETHYLENE(PCE)	µg/L	0.48 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3 µg/L	µg/L	5 µg/L	µg/L	3 µg/L	300 µg/L	1.1 µg/L	1.1 µg/L
TOLUENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1000 µg/L	40 µg/L	1000 µg/L	µg/L	40 µg/L	400 µg/L	750 µg/L	75 µg/L
trans-1,2-DICHLOROETHENE	µg/L	1 U	1 U	1 U	0.24 J	1 U	1 U	1 U	1 U	1 U	1 U	100 µg/L	µg/L	100 µg/L	µg/L	100 µg/L	1000 µg/L	120 µg/L	12 µg/L
trans-1,3-DICHLOROPROPENE	µg/L	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
TRICHLOROETHYLENE (TCE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3 µg/L	µg/L	5 µg/L	µg/L	3 µg/L	300 µg/L	1.6 µg/L	1.6 µg/L
TRICHLOROFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	2100 µg/L	21000 µg/L	1300 µg/L	130 µg/L
1,1,1-TRICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	200 µg/L	µg/L	200 µg/L	µg/L	200 µg/L	2000 µg/L	540 µg/L	54 µg/L
1,1,2,2-TETRACHLOROETHANE	µg/L	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	**1** U	µg/L	µg/L	µg/L	µg/L	0.5 µg/L	50 µg/L	0.052 µg/L	0.052 µg/L
1,2,3-TRICHLOROPROPANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	5 µg/L	µg/L	0.0015 µg/L	0.0015 µg/L
VINYL ACETATE	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	µg/L	µg/L	µg/L	µg/L	90 µg/L	900 µg/L	37000 µg/L	3700 µg/L
VINYL CHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 µg/L	µg/L	2 µg/L	µg/L	1 µg/L	100 µg/L	0.019 µg/L	0.019 µg/L
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	12000 µg/L	12000 µg/L
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	12000 µg/L	12000 µg/L
XYLENES, TOTAL	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	10000 µg/L	20 µg/L	10000 µg/L	µg/L	20 µg/L	200 µg/L	12000 µg/L	1200 µg/L

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

Sampling Event 1

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007	
	DateCollected:	10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5	U	5	U	5	U	5.1	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	U	5	U	5.1	UJ
ARAMITE	µg/L	10	U	10	U	10	U	10	U	10.2	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	UJ	5.1	UJ
2-ACETYLAMINOFLUORENE	µg/L	10	U	10	U	10	U	10	U	10.2	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5.1	UJ
BENZYL ALCOHOL	µg/L	10	U	10	U	10	U	10	U	10.2	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5.1	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
1,3-DINITROBENZENE	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,4-DINITROPHENOL	µg/L	10	UJ	10	UJ	10	UJ	10	U	10.2	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5.1	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5	U	5	U	5.1	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5.1	U
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
DIALLATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5.1	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20	R	20.1	R	20	R	20.4	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10	U	10	U	10	U	10.2	U
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10	U	10	U	10	UJ	10.2	UJ
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5.1	U
ISOPHORONE	µg/L	5	U	5	U	5	U	5	U	5.1	U
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5.1	U
KEPONE	µg/L	20	UJ	20	UJ	20.1	UJ	20	R	20.4	R
METHAPYRILENE	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5.1	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5.1	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10	U	10	U	10	U	10.2	U
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	UJ
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10	U	10	U	10	U	10.2	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODIMETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
1,3,5-TRINITROBENZENE	µg/L	20	UJ	20	UJ	20.1	UJ	20	UJ	20.4	UJ
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
NITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
NITROSOMETHYLETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5	U	5	U	5.1	U
o-TOLUIDINE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	U	5	U	5	U	5	UJ	5.1	UJ
p-PHENYLENEDIAMINE	µg/L	10	U	10	U	10	U	10	U	10.2	U
PENTACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROETHANE	µg/L	5	U	5	U	5	U	5	U	5.1	UJ
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROPHENOL	µg/L	6.2	J	10	U	10	U	10	UJ	10.2	U
PHENACETIN	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
PHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
PRONAMIDE	µg/L	5	U	5	U	5	U	5	U	5.1	U
PYRIDINE	µg/L	5	U	5	U	5	U	5	U	5.1	UJ
SAFROLE	µg/L	5	U	5	U	5	U	5	U	5.1	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	5.4	J	10	U	10	U	10	U	10.2	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,4,5-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5.1	U
Organochlorine Pesticides											
ALDRIN	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ALPHA-CHLORDANE	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
GAMMA-CHLORDANE	µg/L	0.05	UJ	0.05	UJ	0.052	UJ	0.05	U	0.051	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.06	U	0.06	U	0.062	U	0.061	U	0.061	U
GAMMA BHC (LINDANE)	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
DIELDRIN	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ALPHA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
BETA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDOSULFAN SULFATE	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDRIN	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDRIN ALDEHYDE	µg/L	0.06	UJ	0.06	UJ	0.062	UJ	0.061	U	0.061	U
ENDRIN KETONE	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR EPOXIDE	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
p,p'-DDD	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
p,p'-DDE	µg/L	0.06	U	0.06	U	0.062	U	0.061	U	0.061	U
p,p'-DDT	µg/L	0.05	UJ	0.05	UJ	0.052	UJ	0.05	U	0.051	U
METHOXYCHLOR	µg/L	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
TOXAPHENE	µg/L	3	U	3	U	3.1	U	3	U	3.1	U

Sampling Event 2

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5	U	5.2	U	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5.2	U	5	UJ	5	UJ
ARAMITE	µg/L	10	U	10	U	10.3	U	10	U	10	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10	U	10.3	U	10	U	10	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	UJ	5	UJ	5.2	UJ	5	U	5	U
BENZYL ALCOHOL	µg/L	10	U	10	U	10.3	U	10	U	10	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-CHLOROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
2,4-DICHLOROPHENOL	µg/L	5	UJ	5	U	5.2	UJ	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	UJ	5.2	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	U	10	U	10.3	U	10	UJ	10	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIALLATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIBENZOFURAN	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20	R	20.6	R	20	R	20	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10	U	10.3	U	10	U	10	U
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
ISODRIN	µg/L	5	U	5	U	5.2	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5	U	5.2	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5	U	5.2	U	5	U	5	U
KEPONE	µg/L	20	UJ	20	UJ	20.6	UJ	20	UJ	20	UJ
METHAPYRILENE	µg/L	10	R	10	R	10.3	R	10	UJ	10	UJ
METHYL METHANESULFONATE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5.2	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10	U	10.3	U	10	U	10	U
1-NAPHTHYLAMINE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
2-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
3-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10	U	10.3	U	10	U	10	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	R	5	R	5.2	R	5	R	5	R
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,3,5-TRINITROBENZENE	µg/L	20	UJ	20	UJ	20.6	UJ	20	UJ	20	UJ
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
NITROBENZENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
NITROSOMETHYLETHYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
o-TOLUIDINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	U	5	U	5.2	U	5	U	5	U
p-PHENYLENEDIAMINE	µg/L	10	U	10	U	10.3	U	10	U	10	U
PENTACHLOROBENZENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
PENTACHLOROETHANE	µg/L	5	U	5	UJ	5.2	UJ	5	UJ	5	UJ
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
PENTACHLOROPHENOL	µg/L	10	UJ	10	U	10.3	U	10	U	10	U
PHENACETIN	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
PHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
PRONAMIDE	µg/L	5	UJ	5	UJ	5.2	UJ	5	U	5	U
PYRIDINE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
SAFROLE	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
2,3,4,6-TETRACHLOROPHENOL	µg/L	10	U	10	U	10.3	U	10	U	10	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2,4,5-TRICHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
Organochlorine Pesticides											
ALDRIN	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	UJ	0.05	UJ	0.053	UJ	0.05	UJ	0.05	UJ
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062	UJ	0.06	UJ	0.063	UJ	0.061	UJ	0.061	UJ
GAMMA BHC (LINDANE)	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ENDRIN	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.062	U	0.06	U	0.063	U	0.061	U	0.061	U
ENDRIN KETONE	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.062	U	0.06	U	0.063	U	0.061	U	0.061	U
p,p'-DDT	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.052	U	0.05	U	0.053	U	0.05	U	0.05	U
TOXAPHENE	µg/L	3.1	U	3	U	3.2	U	3	UJ	3	UJ

Sampling Event 3

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ARAMITE	µg/L	10	UJ	10.2	U	10.2	U	10	U	10.1	UJ
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10.2	U	10.2	U	10	UJ	10.1	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
BENZYL ALCOHOL	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
4-CHLOROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5.1	UJ	5.1	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
2,4-DICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	UJ	10.2	U	10.2	U	10	U	10.1	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIALLATE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
DIBENZOFURAN	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.1	UJ	20.5	R	20.5	R	20	R	20.2	UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10.2	U	10.2	U	10	U	1.6	J
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10.2	U	10.2	U	10	UJ	10.1	U
ETHYL METHANESULFONATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	UJ	5.1	U	5.1	U	5	U	5	UJ
ISODRIN	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
KEPONE	µg/L	20.1	UJ	20.5	U	20.5	U	20	UJ	20.2	UJ
METHAPYRILENE	µg/L	10	UJ	10.2	UJ	10.2	UJ	10	UJ	10.1	UJ
METHYL METHANESULFONATE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
2-METHYLNAPHTHALENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
1-NAPHTHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
2-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10.2	UJ	10.2	UJ	10	UJ	10.1	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODIPHENYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSOMORPHOLINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
1,3,5-TRINITROBENZENE	µg/L	20.1	U	20.5	U	20.5	U	20	UJ	20.2	U
N-NITROSOPIPERIDINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSOPYRROLIDINE	µg/L	5	UJ	5.1	U	5.1	U	5	U	5	UJ
NITROBENZENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
NITROSOMETHYLETHYLAMINE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
o-TOLUIDINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
p-PHENYLENEDIAMINE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
PENTACHLOROBENZENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
PENTACHLOROETHANE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
PENTACHLORONITROBENZENE	µg/L	5	U	5.1	UJ	5.1	UJ	5	UJ	5	U
PENTACHLOROPHENOL	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
PHENACETIN	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
PHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
PRONAMIDE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
PYRIDINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
SAFROLE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
2,3,4,6-TETRACHLOROPHENOL	µg/L	10	U	10.2	U	10.2	U	10	UJ	10.1	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,4,5-TRICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	UJ	5	UJ	5	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
Organochlorine Pesticides											
ALDRIN	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.06	UJ	0.062	UJ	0.061	UJ	0.06	UJ	0.06	UJ
GAMMA BHC (LINDANE)	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ENDRIN	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.06	U	0.062	U	0.061	U	0.06	U	0.06	U
ENDRIN KETONE	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.06	U	0.062	U	0.061	U	0.06	U	0.06	U
p,p'-DDT	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.05	U	0.052	U	0.05	U	0.05	U	0.05	U
TOXAPHENE	µg/L	3	U	3.1	U	3	U	3	U	3	U

Sampling Event 4

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
ARAMITE	µg/L	10	U	10.1	U	10	U	10	U	10	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
BENZYL ALCOHOL	µg/L	10	U	10.1	U	10	U	10	U	10	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIALLATE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20.2	R	20	R	20	R	20	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10.1	UJ	10	UJ	10	UJ	10	U
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	UJ	5	U
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5	UJ	5	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U
KEPONE	µg/L	20	U	20.2	U	20	U	20	U	20	U
METHAPYRILENE	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10.1	U	10	U	10	U	10	U
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	UJ	5	U
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	UJ	5	U
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10.1	U	10	U	10	U	10	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	U	5	U	5	U	5	UJ	5	UJ
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5	U	5	U	5	U
1,3,5-TRINITROBENZENE	µg/L	20	UJ	20.2	UJ	20	UJ	20	UJ	20	UJ
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
NITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U
NITROSOMETHYLETHYLAMINE	µg/L	5	UJ	5	U	5	U	5	U	5	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5	U	5	U	5	U
o-TOLUIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	U	5	U	5	U	5	U	5	U
p-PHENYLENEDIAMINE	µg/L	10	U	10.1	U	10	U	10	U	10	U
PENTACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U
PENTACHLOROETHANE	µg/L	5	U	5	U	5	U	5	U	5	U
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	U	5	UJ	5	U
PENTACHLOROPHENOL	µg/L	10	U	10.1	U	10	U	10	U	10	U
PHENACETIN	µg/L	10	U	10.1	U	10	U	10	U	10	U
PHENOL	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
PRONAMIDE	µg/L	5	U	5	U	5	U	5	U	5	U
PYRIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
SAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	10	U	10.1	U	10	U	10	U	10	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U
2,4,5-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
Organochlorine Pesticides											
ALDRIN	µg/L	0.051	U	0.05	U	0.052	U	0.05	UJ	0.05	U
ALPHA-CHLORDANE	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	UJ	0.05	UJ	0.052	UJ	0.05	U	0.05	UJ
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.061	UJ	0.061	UJ	0.062	UJ	0.06	UJ	0.06	UJ
GAMMA BHC (LINDANE)	µg/L	0.051	UJ	0.05	UJ	0.052	UJ	0.05	U	0.05	UJ
DIELDRIN	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
ENDRIN	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.061	UJ	0.061	UJ	0.062	UJ	0.06	U	0.06	UJ
ENDRIN KETONE	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.061	U	0.061	U	0.062	U	0.06	U	0.06	U
p,p'-DDT	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.051	U	0.05	U	0.052	U	0.05	U	0.05	U
TOXAPHENE	µg/L	3.1	UJ	3	UJ	3.1	UJ	3	U	3	UJ

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

		Sampling Event 5										Sampling Event 6										Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
Location:		Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Florida MCL / SMCL		Florida MCL / SMCL		Federal MCL/SMCL[2]		Federal MCL/SMCL[2]		Florida Brownfield		Florida Brownfield		Regional USEPA RBC		egional USEPA RBC[4]	
Event:		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6																	
SJRWMD No.:		None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141		Chapter 62-550, FAC)		Chapter 62-550, FAC)						(62-785)[3]		(62-785)[3]		EPA Region III		EPA Region IV	
SampleID:		FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-07-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001		MCL		SMCL		MCL		SMCL		GCTL		Groundwater LY/PQ		Tap Water			
DateCollected:		02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004																	
Matrix:		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater																	
SampleType:		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal																	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Semi-volatile Organic Compound																																					
ACETOPHENONE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	6.1	µg/L	610	µg/L	10	µg/L	10	µg/L
ARAMITE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-ACETYLAMINOFLUORENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	UJ	10.2	U	10.1	U	10.1	U	10.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZYL ALCOHOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	11000	µg/L	1100	µg/L
BENZYL BUTYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	1400	µg/L	14000	µg/L	7300	µg/L	730	µg/L
4-BROMOPHENYL PHENYL ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	210	µg/L
4-CHLOROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
4-CHLOROPHENYL PHENYL ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-CHLORONAPHTHALENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	560	µg/L	5600	µg/L	2900	µg/L	290	µg/L
2-CHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	35	µg/L		µg/L	180	µg/L	18	µg/L
1,3-DINITROBENZENE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	110	µg/L	11	µg/L
2,6-DICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	UJ	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DIMETHYLPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	140	µg/L	1400	µg/L	730	µg/L	73	µg/L
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	U	10.1	UJ		µg/L		µg/L		µg/L		µg/L	30	µg/L		µg/L	73	µg/L	7.3	µg/L
2,4-DINITROTOLUENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	0.2	µg/L	20	µg/L	73	µg/L	7.3	µg/L
bis(2-CHLOROETHOXY) METHANE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	UJ		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0092	µg/L	0.0092	µg/L
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLOROBENZILATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIALLATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	UJ	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBENZOFURAN	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
DIETHYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	5600	µg/L	56000	µg/L	29000	µg/L	2900	µg/L
DIMETHYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	70000	µg/L	700000	µg/L	370000	µg/L	37000	µg/L
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	R	20	R	20	R	20.3	R	20.2	R	20.2	R	20.2	R		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.1	U	4	U	4	U	4	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
3,3'-DICHLOROBENZIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	12	µg/L		µg/L	0.15	µg/L	0.15	µg/L
3,3'-DIMETHYLBENZIDINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	R	20.3	U	20.2	U	20.2	UJ	20.2	R		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ETHYL METHANESULFONATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEXACHLOROPROPENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISODRIN	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISOPHORONE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	37	µg/L		µg/L	71	µg/L	71	µg/L
ISOSAFROLE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	UJ	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
KEPONE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	R	20.2	R	20.2	UJ	20.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHAPYRILENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	UJ	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYL METHANESULFONATE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-METHYLNAPHTHALENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	1500	µg/L	1500	µg/L
2-METHYLPHENOL (o-CRESOL)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
3-METHYLCHOLANTHRENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-METHYLPHENOL (p-CRESOL)	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,4-NAPHTHOQUINONE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	UJ	10.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1-NAPHTHYLAMINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	50	µg/L	500	µg/L	2.2	µg/L	0.22	µg/L
3-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	110	µg/L	11	µg/L
4-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	110	µg/L	11	µg/L
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	UJ	10.1	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
5-NITRO-o-TOLUIDINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	UJ	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODI-n-PROPYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0096	µg/L	0.0096	µg/L
N-NITROSODIETHYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODIMETHYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	UJ	4	UJ	4	UJ	4	U		µg/L		µg/L		µg/L		µg/L	2	µg/L	200	µg/L	0.0013	µg/L	0.0013	µg/L
N-NITROSODIPHENYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	7	µg/L	700	µg/L	14	µg/L	14	µg/L
N-NITROSOMORPHOLINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,3,5-TRINITROBENZENE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20	UJ	20	UJ	20.3	U	20.2	U	20.2	U	20.2	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPIPERIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPYRROLIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
NITROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	4	µg/L	40	µg/L	3.4	µg/L	0.34	µg/L
NITROSOMETHYLETHYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
o-TOLUIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-PHENYLENEDIAMINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROETHANE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLORONITROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROPHENOL	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U	1	µg/L		µg/L	1	µg/L		µg/L	1	µg/L		µg/L	0.56	µg/L	0.56	µg/L
PHENACETIN	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHENOL	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20	U	20	UJ	20.3	U	20.2	U	20.2	U	20.2	UJ		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	22000	µg/L	2200	µg/L
PRONAMIDE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PYRIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	R	4.1	U	4	U	4	U	4	R		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SAFROLE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4-TRICHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	190	µg/L	19	µg/L
2,4,5-TRICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	4	µg/L		µg/L	3700	µg/L	370	µg/L
2,4,6-TRICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	6.1	µg/L	6.1	µg/L
Organochlorine Pesticides																																					
ALDRIN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.004	µg/L	0.004	µg/L
ALPHA-CHLORDANE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
GAMMA-CHLORDANE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.05	U	0.05	U	0.05	UJ	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.006	µg/L	0.6	µg/L	0.011	µg/L	0.011	µg/L
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.02	µg/L	2	µg/L	0.037	µg/L	0.037	µg/L
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.06	U	0.06	U	0.061	U	0.061	UJ	0.061	U	0.06	U	0.061	U	0.061	U	0.061	U	0.061	U		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L	0.037	µg/L	0.037	µg/L
GAMMA BHC (LINDANE)	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.052	µg/L	0.052	µg/L
DIELDRIN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.0042	µg/L	0.0042	µg/L
ALPHA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BETA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDOSULFAN SULFATE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	UJ	0.05	UJ	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
ENDRIN ALDEHYDE	µg/L	0.06	U	0.06	U	0.061	U	0.061	U	0.061	UJ	0.06	UJ	0.061	UJ	0.061	UJ	0.061	UJ	0.061	UJ		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN KETONE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEPTACHLOR	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	0.4	µg/L		µg/L	0.4	µg/L		µg/L	0.4	µg/L	40	µg/L	0.0023	µg/L	0.0023	µg/L
HEPTACHLOR EPOXIDE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.0012	µg/L	0.0012	µg/L
p,p'-DDD	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.28	µg/L	0.28	µg/L
p,p'-DDE	µg/L	0.06	U	0.06	U	0.061	U	0.061	U	0.061	U	0.06	U	0.061	U	0.061	U	0.061	U	0.061	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
p,p'-DDT	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
METHOXYCHLOR	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U	40	µg/L		µg/L	40	µg/L		µg/L	40	µg/L	400	µg/L	180	µg/L	18	µg/L
TOXAPHENE	µg/L	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3.1	U	3	µg/L		µg/L	3	µg/L		µg/L	3	µg/L	300	µg/L	0.061	µg/L	0.061	µg/L

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

		Sampling Event 1										Sampling Event 2									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007		FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003		10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides																					
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
MERPHOS	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
NALED	µg/L	10	UJ	10	UJ	10	UJ	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U
PARATHION, ETHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
PHORATE	µg/L	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	U	**10**	U	**10**	UJ	**10**	U	**10**	U
RONNEL	µg/L	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	UJ	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)																					
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	UJ	0.5	UJ	0.52	UJ	0.5	UJ	0.51	U	0.52	UJ	0.5	UJ	0.53	UJ	0.5	UJ	0.5	UJ
PCB-1221 (AROCHLOR 1221)	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	0.5	U	**0.52**	U	0.5	U	**0.51**	U	**0.52**	U	0.5	U	**0.53**	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.5	U	0.52	U	0.5	U	0.51	U	0.52	U	0.5	U	0.53	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	0.5	U	**0.52**	U	0.5	U	**0.51**	U	**0.52**	U	0.5	U	**0.53**	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.5	U	0.52	U	0.5	U	0.51	U	0.52	U	0.5	U	0.53	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	UJ	0.5	UJ	**0.52**	UJ	0.5	UJ	**0.51**	UJ	**0.52**	UJ	0.5	UJ	**0.53**	UJ	0.5	UJ	0.5	UJ
Herbicides																					
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
DALAPON	µg/L	0.56	U	0.56	UJ	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.5	UJ	0.5	UJ
DICAMBA	µg/L	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
DICHLOROPROP	µg/L	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.5**	U	**0.5**	U
DINOSEB	µg/L	0.56	UJ	0.56	UJ	0.56	UJ	0.56	R	0.56	R	0.56	UJ	0.56	UJ	0.56	UJ	0.5	R	0.5	UJ
PICLORAM	µg/L	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	10	U	10	U
SILVEX (2,4,5-TP)	µg/L	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U

		Sampling Event 3										Sampling Event 4									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002		FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003		11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides																					
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
MEVINPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
NALED	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, ETHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)																					
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	U	0.52	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U	0.52	U	0.5	U	0.5	U
PCB-1221 (AROCHLOR 1221)	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	**0.52**	U	0.5	U	0.5	U	0.5	U	**0.51**	U	0.5	U	**0.52**	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.52	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U	0.52	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	**0.52**	U	0.5	U	0.5	U	0.5	U	**0.51**	U	0.5	U	**0.52**	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.52	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U	0.52	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	UJ	**0.52**	UJ	0.5	UJ	0.5	UJ	0.5	UJ	**0.51**	UJ	0.5	UJ	**0.52**	UJ	0.5	U	0.5	UJ
Herbicides																					
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
DALAPON	µg/L	0.5	UJ	0.52	UJ	0.52	UJ	0.51	UJ	0.5	UJ	0.5	UJ	0.51	UJ	0.52	UJ	0.52	UJ	0.51	UJ
DICAMBA	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U	0.5	UJ	0.51	UJ	0.52	UJ	0.52	U	0.51	UJ
DICHLOROPROP	µg/L	**0.5**	U	**0.52**	UJ	**0.52**	UJ	**0.51**	U	**0.5**	U	**0.5**	UJ	**0.51**	U	**0.52**	U	**0.52**	U	**0.51**	U
DINOSEB	µg/L	0.5	UJ	0.52	UJ	0.52	UJ	0.51	R	0.5	UJ	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
PICLORAM	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	UJ
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U

Notes:
Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers
"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Sources:
[1] *Florida Ground Water Guidance Concentrations*, 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
[2] *Drinking Water Regulations and Health Advisories*, Office of Water, USEPA, October 1996.
[3] *Brownfield's Cleanup Criteria Rule*, *Groundwater Cleanup Target Levels*, Draft Chapter 62-785 F.A.C., 1997.
[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment*, November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:
MCL - Maximum Contaminant Level
SMCL - Secondary MCL
GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration

Festival Park Operational Characterization Sampling Results
Organized by Event
SJRWMD CFARE1

		Sampling Event 5										Sampling Event 6									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6	
	SJRWMD No.:	None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141	
	SampleID:	FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-007-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001	
	DateCollected:	02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides																					
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
NALED	µg/L	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	UJ	10	U
PARATHION, ETHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)																					
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	UJ	**0.51**	UJ	**0.51**	U
Herbicides																					
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.25	U	0.25	U	0.25	U	0.5	U	0.25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DALAPON	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
DICAMBA	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
DICHLOROPROP	µg/L	**0.25**	U	**0.25**	U	**0.25**	U	**0.5**	U	**0.25**	U	**0.5**	U	**0.5**	U	**0.5**	U	**0.5**	U	**0.5**	U
DINOSEB	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
PICLORAM	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
SILVEX (2,4,5-TP)	µg/L	0.25	U	0.25	U	0.25	U	0.5	U	0.25	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U

	Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
	Florida MCL / SMCL (Chapter 62-550, FAC) MCL		Florida MCL / SMCL (Chapter 62-550, FAC) SMCL		Federal MCL/SMCL[2] MCL		Federal MCL/SMCL[2] SMCL		Florida Brownfield (62-785)[3] GCTL		Florida Brownfield (62-785)[3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		Regional USEPA RBC[4] EPA Region IV	
Parameter Group and Name	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Organophosphorous Pesticides																
ATRAZINE	3	µg/L		µg/L	3	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
AZINPHOS, METHYL (GUTHION)		µg/L		µg/L		µg/L		µg/L	10.5	µg/L	105	µg/L		µg/L		µg/L
BOLSTAR		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLORPYRIFOS		µg/L		µg/L		µg/L		µg/L	21	µg/L	210	µg/L	110	µg/L	11	µg/L
COUMAPHOS		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L		µg/L		µg/L
DEMETON-O		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DEMETON-S		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIAZINON		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	33	µg/L	3.3	µg/L
DICHLORVOS		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L	0.23	µg/L	0.23	µg/L
DIMETHOATE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DISULFOTON		µg/L		µg/L		µg/L		µg/L	0.3	µg/L	3	µg/L	1.5	µg/L	0.15	µg/L
ETHOPROP		µg/L		µg/L		µg/L		µg/L	0.11	µg/L	1.1	µg/L		µg/L		µg/L
FAMPHUR		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
FENSULFOTHION		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
FENTHION		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MERPHOS		µg/L		µg/L		µg/L		µg/L	0.21	µg/L		µg/L	1.1	µg/L	0.11	µg/L
MEVINPHOS		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
NALED		µg/L		µg/L		µg/L		µg/L	14	µg/L	140	µg/L	73	µg/L	7.3	µg/L
PARATHION, ETHYL		µg/L		µg/L		µg/L		µg/L	42	µg/L	420	µg/L	220	µg/L	22	µg/L
PARATHION, METHYL		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHORATE		µg/L		µg/L		µg/L		µg/L	1.4	µg/L	14	µg/L	7.3	µg/L	0.73	µg/L
RONNEL		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
SIMAZINE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
STIROFOS (TETRACHLORVINPHOS)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THIODIPHOSPHORIC ACID TETRAETHYL ESTER		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TOKUTHION (PROTHIOFOS)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLORONATE		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ZINOPHOS		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
Polychlorinated biphenols (PCBs)																
PCB-1016 (AROCHLOR 1016)		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	2.6	µg/L	0.26	µg/L
PCB-1221 (AROCHLOR 1221)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1232 (AROCHLOR 1232)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1242 (AROCHLOR 1242)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PCB-1248 (AROCHLOR 1248)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1254 (AROCHLOR 1254)		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	0.73	µg/L	0.073	µg/L
PCB-1260 (AROCHLOR 1260)		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
Herbicides																
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)		µg/L		µg/L		µg/L		µg/L	70	µg/L	700	µg/L	370	µg/L	37	µg/L
2,4-D (DICHLOROPHENOXYACETIC ACID)	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
DALAPON	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L		µg/L	1100	µg/L	110	µg/L
DICAMBA		µg/L		µg/L		µg/L		µg/L	210	µg/L		µg/L	1100	µg/L	110	µg/L
DICHLOROPROP		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L		µg/L		µg/L
DINOSEB	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	70	µg/L	37	µg/L	3.7	µg/L
PICLORAM		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SILVEX (2,4,5-TP)	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	290	µg/L	29	µg/L

Notes:
Shaded cells with bolded values represent detections equal to or above promulgated regulatory c
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated r
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
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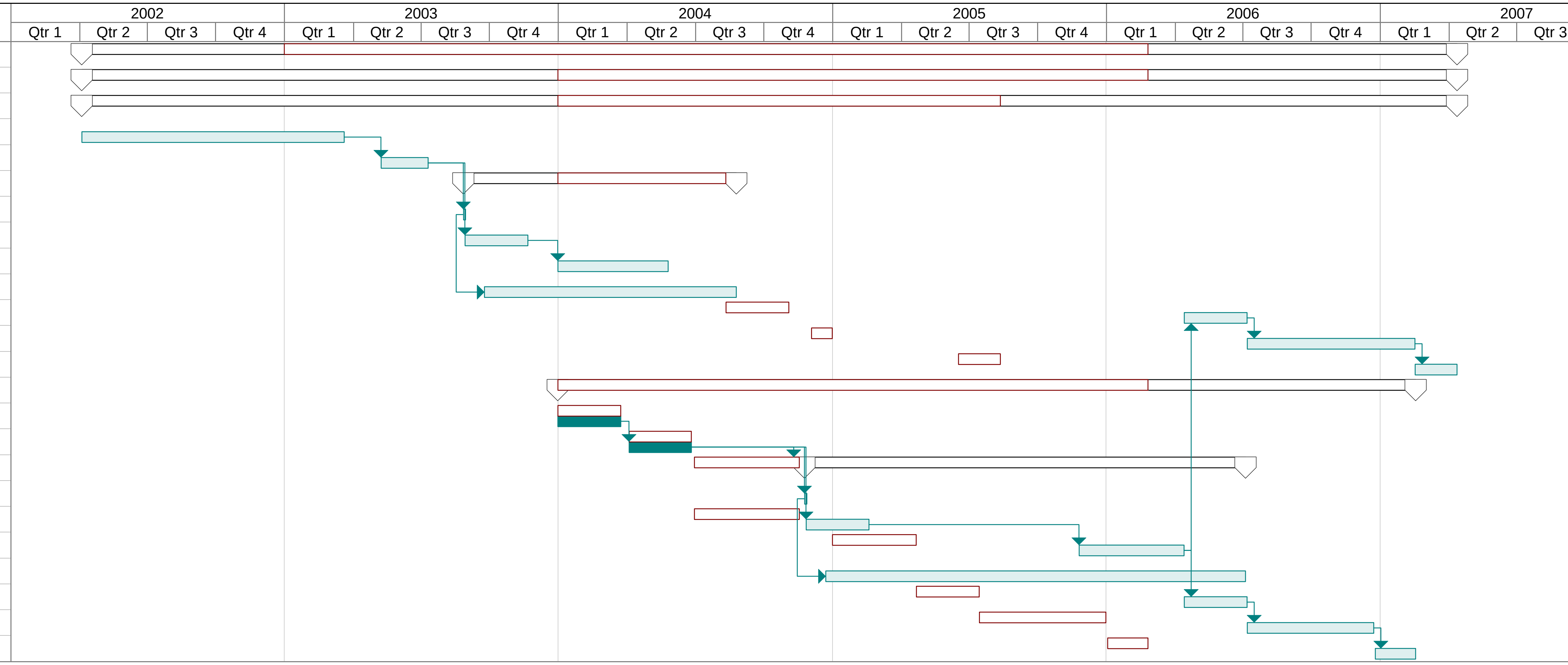
Explanation of Qualifiers
"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitati
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.
Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Attachment C
Project Schedule

St. Johns River Water Management District
Central Florida Aquifer Recharge Enhancement Program
Stormwater Recharge Well Demonstration Project

ID	Task Name
1	**CENTRAL FL AQUIFER RECHARGE ENHANCEMENT PROGRAM**
2	**Phase I**
3	**City of Orlando: Festival Park**
4	Secure Monitoring Well Access Permission
5	Monitoring Well Installation
6	**Pretreatment Testing**
7	Baseline Characterization
8	Tracer Test
9	Operational Characterization
10	Data Evaluation
11	Treatment System Installation
12	Post Treatment Testing
13	Final Report
14	**City of Altamonte Springs--Lake Orienta**
15	Secure Monitoring Well ROW Use Permits
16	Monitoring Well Installation
17	**Pretreatment Testing**
18	Baseline Characterization
19	Tracer Test
20	Operational Characterization
21	Data Evaluation
22	Treatment System Installation
23	Post Treatment Testing
24	Final Report



Task
Progress
Baseline
Milestone
Baseline Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Baseline Summary
Rolled Up Baseline
Rolled Up Baseline Milestone
Rolled Up Progress
Split
Baseline Split
External Tasks
Project Summary
Group By Summary
Deadline

CFARE Status Report No. 8

Introduction

This report provides Status Report No. 8 for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The last report was July 14, 2004. The reports are issued at project milestones. Since the last report the potable water supply well survey and the groundwater tracer test for the Lake Orienta Site were completed. The project progress and schedule are presented in Table 1.

TABLE 1
Project Tasks, Progress, and Schedule

Task	Site and Type of Recharge Well		
	Lake Sherwood *Lake-Level Control*	Festival Park *Direct Runoff*	Lake Orienta *Lake-Level Control*
Literature Review	Completed	Completed	Completed
Dry Period Characterization	Completed	N/A	Completed
Water Supply Well Survey	Completed	Completed	Completed
Baseline Characterization	Discontinued	Completed	Summer 2005
Groundwater Tracer Test	N/A	Completed	Completed
Operational Site Characterization	N/A	Completed	Fall 2005
Enhanced Treatment Site Characterization	N/A	On Hold Potential Future (2006)	Potential Future (2006)
Reporting and Documentation	N/A	(2006/2007)	(2006/2007)

Additional treatment evaluation, treatment implementation, and post-treatment characterization for the Festival Park site are on hold until the Operation Site Characterization task at Lake Orienta is completed. Then the results from the two sites will be compared together.

Lake Orienta Recharge Well Site

Lake Orienta is a 135-acre lake located in south central Seminole County in Altamonte Springs, Florida. The area around and near the lake is completely developed by residential and commercial land uses in a suburban setting. Three Upper Floridan aquifer (UFA) recharge wells are located on the south side of the lake and UFA four monitoring wells were constructed as part of this project. A map showing the wells is attached.

Water flows from the lake to the recharge wells once the lake stage is greater than approximately 61 feet above sea level. Monthly lake stage data, from 1979 through 2003 supplied by the City of Altamonte Springs, show that water levels typically are higher than 61 feet during August through November of a given year. Therefore, lake water recharges the aquifer during this period.

Potable Water Supply Well Survey and Public Meeting

A survey for potable water supply wells within 1 mile of the recharge wells was conducted to identify sources of water for local residents. In the 1-mile radius of the Lake Orienta site are four water supply utilities (City of Altamonte Springs, Maitland Utilities, Seminole County Utilities, and Utilities Inc.) providing potable water. There are also several neighborhoods that are self-supplied for potable water through wells. These locations are shown on the attached map. The map shows the locations of the utility service areas, municipal water supply wells, and locations inferred to be self-supplied for water. This inference was derived by communicating with utility staff; and in the case of Altamonte Springs, matching customer addresses with Seminole County Property Appraisers office addresses. Locations that did not match were inferred to be self-supplied.

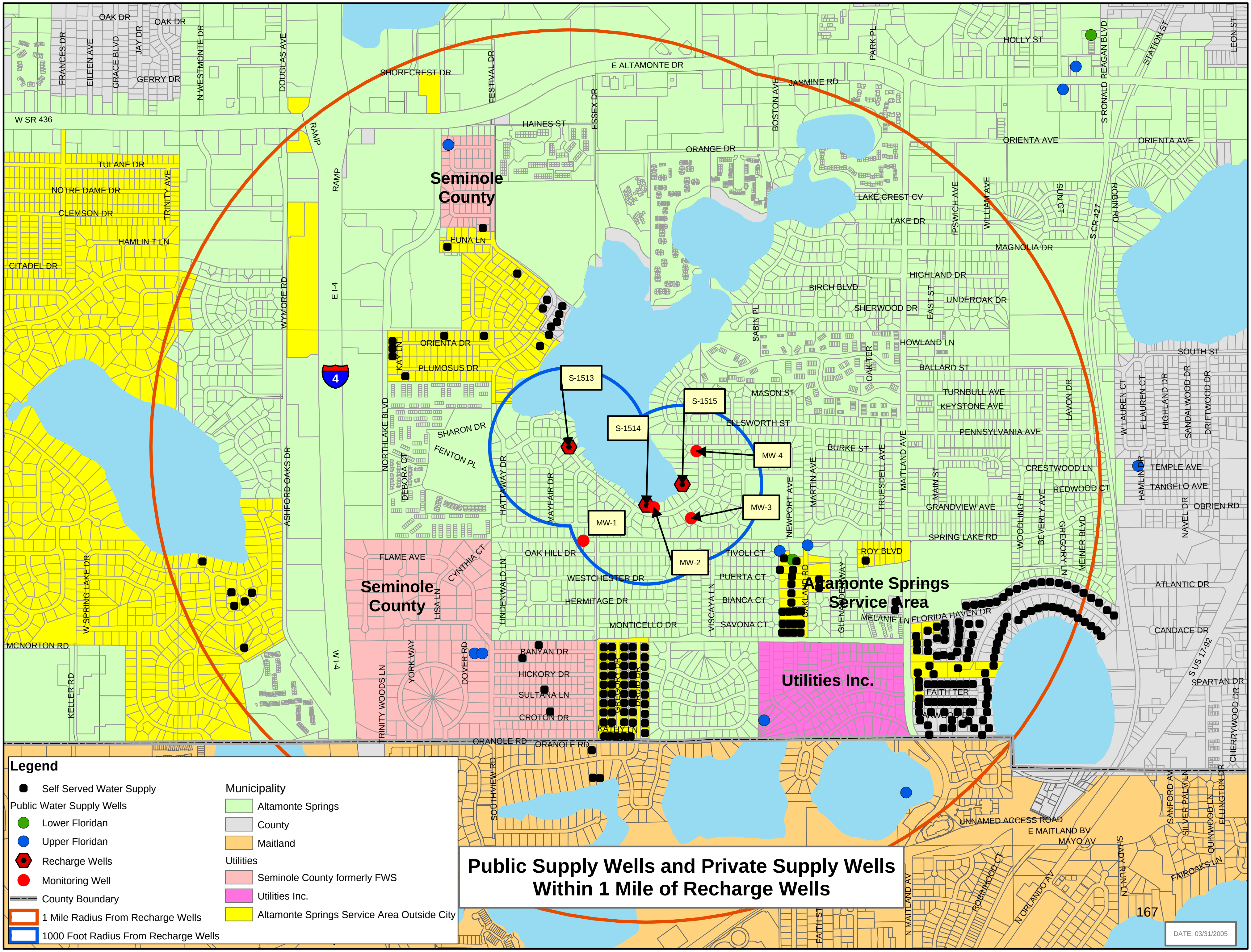
Prior to conducting the public meeting, meeting notices were sent to approximately 1600 property owners. The list of owners was generated from the inferred self-supply locations and property owners on the lake perimeter and in the vicinity of the project for their general interest. Properties around the lake include three condominium complexes, which assisted in making the list of noticed owners large.

On November 17, 2004 the public meeting was held in Altamonte Springs to inform the community on the project, its goals and objectives, the intent to conduct groundwater tracer test, and what characteristics to look for if tracer would appear in the water supply. A primary message of the meeting was that if tinted water was observed, notify project representatives immediately and discontinue drinking the water. Twenty-one people signed the attendance list for the meeting. No adverse comments were received during the meeting. During the tracer test no calls were received indicating the presence of tinted water.

Groundwater Tracer Test

Goal of the Tracer Test – The tracer test was a qualitative test and the goal was to identify complete pathways in the UFA between the recharge wells and one or more monitoring wells. This was done by introducing a unique tracer into each of the three recharge wells and collecting samples from the monitoring wells. The samples were analyzed for the presence of tracer. Sample collection consisted of collecting grab water samples and by placing carbon sample packs in the monitoring wells for a period of time then retrieving the packs. The test will assist to support results of groundwater sampling and analysis, and to adapt the sampling plan for future project tasks. The tracers used were eosine, fluorescein, and rhodamine WT. Eosine and fluorescein were used at the Festival Park site.

Background Characterization – In August 2004 samples were collected from the lake and the monitoring wells to characterize the water relative to tracer signatures. If tracer were identified in the samples in sufficient concentrations to interfere with interpreting the test results, different tracers would be used. Two rounds of background characterization occurred. Each round consisted of suspending two carbon sample packs in the monitoring wells within the open-hole intervals and in the lake where they resided for two weeks. These procedures were consistent with the residence duration of the sample packs for the tracer test. One set of grab water samples was collected from each location at the beginning of the first event.


Public Supply Wells and Private Supply Wells
Within 1 Mile of Recharge Wells
Legend
Self Served Water Supply
Public Water Supply Wells
Lower Floridan
Upper Floridan
Recharge Wells
Monitoring Well
County Boundary
1 Mile Radius From Recharge Wells
1000 Foot Radius From Recharge Wells
Municipality
Altamonte Springs
County
Maitland
Utilities
Seminole County formerly FWS
Utilities Inc.
Altamonte Springs Service Area Outside City
Seminole County
Seminole County
Altamonte Springs Service Area
Utilities Inc.
S-1513
S-1514
S-1515
MW-1
MW-2
MW-3
MW-4
4
W SR 436
E ALTAMONTE DR
OAK DR
SHORECREST DR
HAINES ST
ORANGE DR
JASMINE RD
HOLLY ST
ORIENTA AVE
ORIENTA AVE
TULANE DR
NOTRE DAME DR
CLEMSON DR
HAMLIN T LN
CITADEL DR
LAKE CREST CV
LAKE DR
MAGNOLIA DR
HIGHLAND DR
BIRCH BLVD
UNDEROAK DR
SHERWOOD DR
HOWLAND LN
BALLARD ST
SOUTH ST
EUNA LN
ORIENTA DR
PLUMOSUS DR
MASON ST
ELLSWORTH ST
TURNBULL AVE
KEYSTONE AVE
PENNSYLVANIA AVE
BURKE ST
SHARON DR
FENTON PL
CRESTWOOD LN
TEMPLE AVE
REDWOOD CT
TANGELO AVE
OBRIEN RD
GRANDVIEW AVE
SPRING LAKE RD
FLAME AVE
CYNTHIA CT
OAK HILL DR
TIVOLI CT
ROY BLVD
WESTCHESTER DR
PUERTA CT
ATLANTIC DR
HERMITAGE DR
BIANCA CT
MONTICELLO DR
SAVONA CT
MELANIE LN
FLORIDA HAVEN DR
CANDACE DR
MCNORTON RD
BANYAN DR
HICKORY DR
SULTANA LN
CROTON DR
FAITH TER
SPARTAN DR
ORANOLE RD
ORANGE RD
KATHY LN
UNNAMED ACCESS ROAD
E MAITLAND BV
MAYO AV
FAIROAKS LN
E I-4
W I-4
RAMP
RAMP
ASHFORD OAKS DR
WYMORE RD
N WESTMONTE DR
DOUGLAS AVE
FESTIVAL DR
ESSEX DR
BOSTON AVE
PARK PL
S RONALD REAGAN BLVD
STATION ST
LEON ST
FRANCES DR
EILEEN AVE
GRACE BLVD
JAY DR
GERRY DR
TRINITY AVE
IPSWICH AVE
WILLIAM AVE
SUN CT
S CR 427
ROBIN RD
SABIN PL
EAST ST
OAK TER
NORTHLAKE BLVD
KATY LN
DEBORA CT
HATTAWAY DR
MAYFAIR DR
NEWPORT AVE
MARTIN AVE
TRUESDELL AVE
MAITLAND AVE
MAIN ST
LAVON DR
W LAUREN CT
E LAUREN CT
HIGHLAND DR
SANDALWOOD DR
DRIFTWOOD DR
HAMLIN DR
NAVEL DR
WOODLING PL
BEVERLY AVE
GREGORY LN
MEINER BLVD
W SPRING LAKE DR
KELLER RD
LISA LN
LINDENWALD LN
VISCAYA LN
OAKLAND RD
S US 17-92
CHERRYWOOD DR
TRINITY WOODS LN
YORK WAY
DOVER RD
SOUTHVIEW RD
N MAITLAND AV
FAITH ST
ROBINHOOD CT
N ORLANDO AV
SHADY RUN LN
SANFORD AV
SILVER PALM LN
QUINWOOD LN
ELLINGTON DR
DATE: 03/31/2005

The presence of tracer adsorbed by the sample packs was evaluated by rinsing the carbon with a known aliquot of a solvent then analyzing the solvent for tracer.

Detections resulting from the background characterization are as follows:

- Rhodamine WT was detected in the grab water sample from the lake at approximately 0.1 part per billion (ppb).
- Rhodamine WT was detected in the elutant from four of four carbon sample packs from the lake. The range of rhodamine WT concentrations was 7.96 ppb to 10.3 ppb.
- Fluorescein was detected in 16 of 16 carbon sample packs (4 wells, 2 packs per well, and 2 rounds of sampling) from the monitoring wells. The elutant concentrations were less than 1 ppb.

The results of the background characterization indicated that tracer was not present in sufficient concentrations to interfere with interpreting tracer test results, and test could proceed as planned.

Tracer Release and Monitoring – Tracer release was conducted on November 18, 2004. The release was made by pumping tracer solution into the three recharge wells and the tracer was delivered to the aquifer by the water flowing from the lake into the wells. Locations and quantities of tracer introduced into the recharge wells are

- 50 pounds of fluorescein into S-1513
- 75 pounds of eosine into S-1514
- 100 pounds of rhodamine WT into S-1515

Fresh carbon sample packs were installed in the monitoring wells prior to introducing the tracer into the recharge wells. The sample packs were replaced and analyzed at two-week intervals (with the exception of the week of the year-end holidays) through February 17, 2005. The duration of the test was 13 weeks. Based on the sampling results, additional focused sampling was conducted at MW-2. Four additional sampling events were completed at two week intervals. Sampling at MW-2 ended on April 14, 2005, 21 weeks after tracer introduction.

Results of the Tracer Test – The goal of the tracer test was attained. Two tracers, eosine and fluorescein, were detected at one monitoring well, MW-2. The results of this test demonstrate a hydraulic connection between recharge well S-1514 and monitoring well MW-2, and between recharge well S-1513 and monitoring well MW-2. The presence of tracer was not identified at the other three monitoring wells.

Eosine, introduced into S-1514, was encountered at MW-2 beginning with the first set of sample packs collected 2 weeks after the tracer introduction. MW-2 is located approximately 100 feet west of S-1514. Results of the tracer sampling for MW-2 are graphically presented in Figure 1. The graph shows that eosine from S-1514 appeared at MW-2 from the first 2-week period (collected December 2), reached its highest concentrations from the second 2-week period (collected December 16), and eosine concentrations declined from the remaining four samplings.

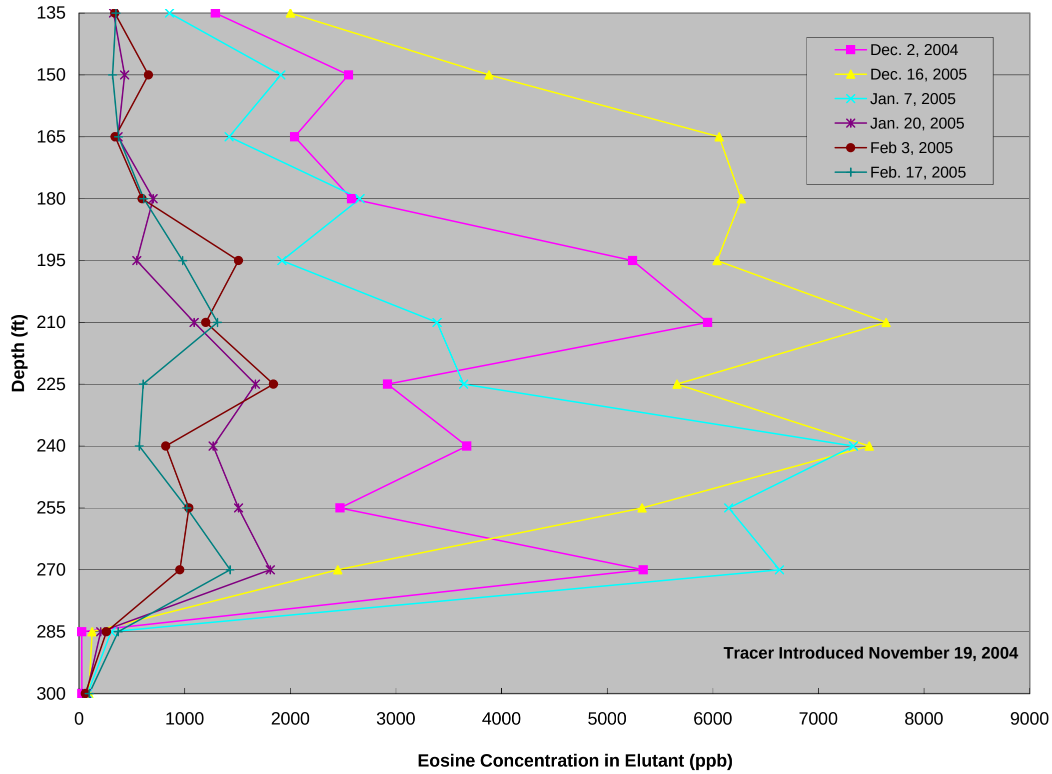


Figure 1. Eosine Detection at MW-2

While evaluating the results of the fourth sample set, the laboratory speculated that fluorescein was appearing at MW-2, but the laboratory was unable to segregate the two tracers. This was based on an elongated leading edge and widening of the breakthrough curves of the chromatograms. The pattern continued and became more pronounced through the remainder of the scheduled 12 weeks of the tracer test. As a result, additional focused monitoring at MW-2 was continued to confirm or deny the presence of fluorescein. The additional monitoring consisted of monitoring for tracer at two depths (240 feet and 255 feet) for four additional 2-week intervals. The laboratory recommended these depths as ones where the pattern was pronounced. Testing ended on April 14, 2005 after the presence of fluorescein was confirmed. Table 2 presents tracer concentrations detected at MW-2 during the additional focused testing period.

TABLE 2.
Results from Additional Monitoring in MW-2 at 240 feet and 255 feet

Date Collected	Fluorescein (240 ft)	Eosine (240 ft)	Fluorescein (255 ft)	Eosine (255 ft)
3/3/2005	227 ppb	400 ppb	1150 ppb	2170 ppb
3/17/2005	1290 ppb	1330 ppb	1510 ppb	1610 ppb
3/31/2005	739 ppb	484 ppb	1140 ppb	878 ppb
4/14/2005	578 ppb	313 ppb	438 ppb	246 ppb

Rhodamine WT was not detected at any monitoring well, therefore, the data indicate that S-1515 is not hydraulically connected with the four monitoring wells within the timeframe of this test.

Modification of the Groundwater Monitoring Plan

The results of the groundwater tracer test indicate that MW-2 is hydraulically connected to S-1514 and S-1513 through the Floridan aquifer and that monitoring wells MW-1, MW-3, and MW-4 are not hydraulically connected to the recharge wells. Further, the groundwater travel time from S-1514 to MW-2 was less than two weeks. The groundwater travel time from S-1513 to MW-2 was less than 8 weeks. These results support modifying the Groundwater Monitoring Plan (GWMP) for the Baseline Characterization and the Operational Characterization tasks.

The initial GWMP provided for sampling the inflowing water from the lake at each of the 3 recharge wells and the four monitoring wells at the frequency of 1, 5, 10, 30, 60, 120, and optionally 180 days after a triggering recharge event. For the case of Lake Orienta, a triggering recharge event would be when the lake stage rises to the overflow elevation (elevation 61 feet) and lake water flows into the wells. Based on the results of the groundwater tracer test and the experiences from conducting these tasks at Festival Park the following sampling plan is recommended:

- Sample Locations – Sample the lake near the inlet to S-1514 and monitoring wells MW-1 and MW-2. Samples from the lake are to characterize the quality of the source water. Samples form MW-2 will be used to assess how groundwater quality is affected by artificial recharge. Samples from MW-1 are to establish and maintain site reference conditions. No samples are to be collected from MW-3 and MW-4.

- Sample Frequency – The recommended sampling frequency is 1, 2, 4, 8, 12, 16, and optionally 20 weeks following the beginning of recharge. Based on past lake stage data and barring extreme weather patterns, the duration of the typical recharge season is approximately 10 to 12 weeks. Therefore, the week 16 sampling event is intended to be in a quiescent period following the recharge season. If the recharge season persists longer than the typical duration, then the last sampling event will follow approximately 4 weeks of a non-recharge condition, here assumed to be 20 weeks after recharge begins.

- Parameter List – The parameter list for the microbial and chemical analyses is unchanged.

Next Anticipated Status Report

The next anticipated status report will be after the receipt and validation of the microbial and chemical data from the Baseline Characterization task for Lake Orienta. This report will likely be issued October 2005.

CFARE Status Report No. 9

Introduction

This report provides Status Report No. 9 for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The reports are issued at project milestones. The last report was May 24, 2005. Status Report No. 8 provided the procedures and results of the groundwater tracer test conducted at the Lake Orienta site in Altamonte Springs, Florida. This status report presents the results of the Baseline Characterization and the Operational Characterization tasks of the project. The project progress and schedule are presented in Table 1.

TABLE 1
Project Tasks, Progress, and Schedule

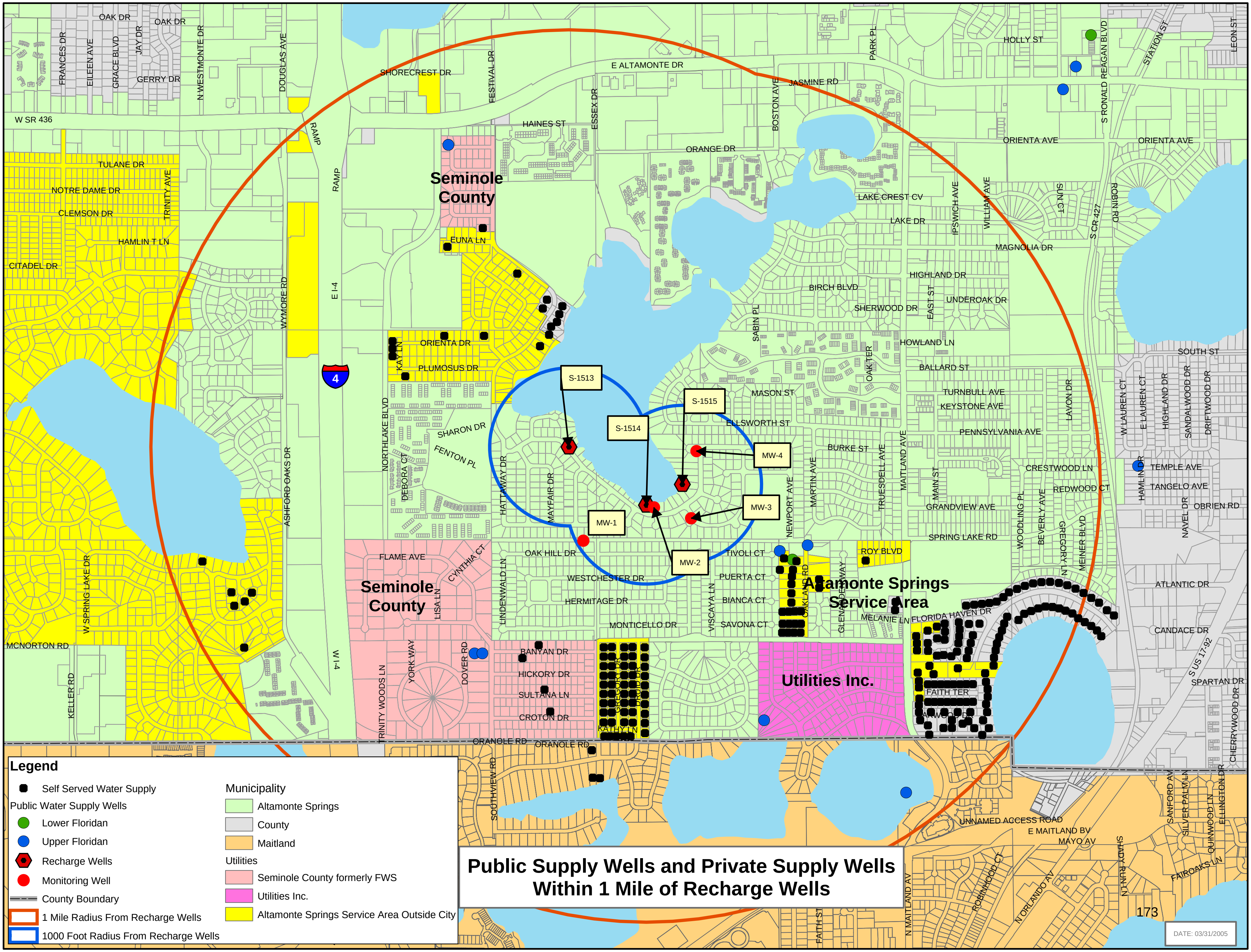
Task	Site and Type of Recharge Well		
	Lake Sherwood *Lake-Level Control*	Festival Park *Direct Runoff*	Lake Orienta *Lake-Level Control*
Literature Review	Completed	Completed	Completed
Dry Period Characterization	Completed	N/A	Completed
Water Supply Well Survey	Completed	Completed	Completed
Baseline Characterization	Discontinued	Completed	Completed
Groundwater Tracer Test	N/A	Completed	Completed
Operational Site Characterization	N/A	Completed	Completed
Enhanced Treatment Site Characterization	N/A	On Hold Potential Future (2007)	On Hold Potential Future (2007)
Reporting and Documentation	N/A	(2006/2007)	(2006/2007)

Additional treatment evaluation, treatment implementation, and post-treatment characterization for the Festival Park site are on hold until the Operation Site Characterization task at Lake Orienta is completed. Then the results from the two sites will be compared together.

Greater than 400 recharge wells were installed between 1904 and the late 1960's to manage stormwater as urban development occurred in Orlando and vicinity. Two types of wells are present: urban runoff and lake level control. The wells at Lake Orienta are lake level control wells.

Lake Orienta Recharge Well Site

Lake Orienta is a 135-acre lake located in south central Seminole County in Altamonte Springs, Florida. The area around and near the lake is completely developed by residential and commercial land uses in a suburban setting. Three Upper Floridan aquifer (UFA) recharge wells are located on the south side of the lake and four UFA monitoring wells were constructed as part of this project. A map showing the wells is presented in Figure 1.



Public Supply Wells and Private Supply Wells
Within 1 Mile of Recharge Wells
Legend
Self Served Water Supply
Public Water Supply Wells
Lower Floridan
Upper Floridan
Recharge Wells
Monitoring Well
County Boundary
1 Mile Radius From Recharge Wells
1000 Foot Radius From Recharge Wells
Municipality
Altamonte Springs
County
Maitland
Utilities
Seminole County formerly FWS
Utilities Inc.
Altamonte Springs Service Area Outside City
Seminole County
Seminole County
Altamonte Springs Service Area
Utilities Inc.
S-1513
S-1514
S-1515
MW-1
MW-2
MW-3
MW-4
DATE: 03/31/2005

Water flows from the lake to the recharge wells once the lake stage is greater than approximately 61 feet above sea level. Monthly lake stage data, from 1979 through 2003 supplied by the City of Altamonte Springs, show that water levels typically are higher than 61 feet during August through November of a given year. Therefore, lake water recharges the aquifer during this period.

Additional operational flexibility is afforded to the City of Altamonte Springs by the presence of lower elevation inlet pipes for the wells located at 421 Barclay Avenue (SJRWMD Well No. S-1514) and 505 Barclay Avenue (SJRWMD Well No. S-1515). The well at 319 Barclay Avenue (SJRWMD Well No. S-1514) does not have a lower inlet pipe. The lower inlets typically opened at times when the lake stage is high and significant rain is foreseen. This allows the lake stage to decline providing additional storage for stormwater.

The City may open the lower inlets upon request of and receipt of an Emergency Order from FDEP. The City requested and was granted an Emergency Order in spring of 2005. The lower inlets for the two wells were opened on June 17, 2005.

Results of the Qualitative Groundwater Tracer Test and Modification of the Groundwater Monitoring Plan

The goal of the qualitative tracer test was to determine the presence or absence of hydraulic connection between the recharge wells and the monitoring wells. As documented in Status Report No. 8, the results of the groundwater tracer test indicate that MW-2 is hydraulically connected to recharge wells S-1513 and S-1514 through the Floridan aquifer and that monitoring wells MW-1, MW-3, and MW-4 are not hydraulically connected to the three recharge wells. Further, the groundwater travel time from S-1514 to MW-2 was less than two weeks. The groundwater travel time from S-1513 to MW-2 was 6 to 8 weeks. The approximate distances between S-1513 and MW-2, and S-1514 and MW-2 are 1350 feet and 75 feet, respectively. The goal of the tracer test was attained.

Based on the results of the groundwater tracer test and the experiences from conducting these tasks at Festival Park the following sampling plan was recommended:

- **Sample Locations** – Sample the lake near the inlet to S-1514 and monitoring wells MW-1 and MW-2. Samples from the lake were used to characterize the quality of the source water. Samples form MW-2 will be used to assess how groundwater quality is affected by artificial recharge. Samples from MW-1 were used to establish and maintain site reference conditions. No samples were to be collected from MW-3 and MW-4.

- **Sample Frequency** – The recommended sampling frequency is 1, 2, 4, 8, 12, 16, and optionally 20 weeks following the beginning of recharge.

- **Parameter List** – The parameter lists for the chemical and microbial analyses are unchanged as presented in Status Report 4, distributed January 27, 2003.

Baseline and Operational Characterization Schedule

Baseline and Operational Characterization sampling events occurred as follows:

Baseline – July 12-13, 2005
Event 1 – July 20-21, 2005 (1 week)
Event 2 – July 27-28, 2005 (2 weeks)
Event 3 – August 8-9, 2005 (4 weeks)
Event 4 – September 7-8, 2005 (8 weeks)
Event 5 – October 5, 2005 (12 weeks)
Event 6 – October 31, 2005 (16 weeks)
Event 7 – December 5, 2005 (20 weeks)

Results of Baseline and Operational Characterizations

Results are presented from chemical and microbiological analyses of groundwater and surface water. Included in this discussion are the results from the one Baseline Characterization and the seven Operational Characterization sample sets, using the results of "normal" (non-field duplicate) groundwater and surface water samples. Therefore, the data set results from analyses of 16 groundwater samples from two monitoring wells and 8 surface water samples from Lake Orienta.

Chemical Results

The chemical data presented in Table 2, located at the end of this report, are provided with qualifiers that resulted from the data validation process. The value and the qualifier must be taken together to properly understand the laboratory results. For instance, if a result for a chemical was "10" mg/L with an "=" qualifier then the chemical was detected at a concentration of 10 mg/L. However, if a result was "10" mg/L with a "U" qualifier then the chemical was not detected at a reporting limit of 10 mg/L. Please refer to the notes at the bottom of the table for explanations of the qualifiers. Concentration values with an "=" qualifier represent confirmed or positive detections of analytes.

The chemical data were compared to various regulatory criteria and risk-based criteria; the results of the comparison are identified by different formatting of the table cells using bolding, shading, and boxing. A shaded cell represents that the concentration is greater than or equal to promulgated regulatory criterion or a risk-based criterion (RBC). Of the shaded cells, bolded text indicates that the concentration is greater than or equal to a regulatory criterion; normal text indicates that the concentration is greater than or equal to an RBC. Notes at the bottom of Table 2 provide other explanations of formatting to identify comparisons of the chemical results and various regulatory and risk-based criteria.

Lake Orienta is a Florida Class III fresh surface water, designated for recreational use.

The comparison provided the following results. The presentation is limited to the analytes with positive detections greater than regulatory criteria or risk-based criteria.

- **Aluminum** – No positive detection resulted from the analyses of the 16 groundwater samples. Five positive detections resulted from the analyses of the surface water samples. There is no criterion for aluminum. One of five positive detections [277 micrograms per liter (µg/L)] exceeded the Secondary MCL for groundwater (200 µg/L).

- **Arsenic** –Ten of 12 positive detections from groundwater samples exceeded the MCL of 10 µg/L for arsenic. The range of concentrations was 8.16 to 17.1 µg/L. Twelve of 12 positive detections from the groundwater samples exceeded the RBC for arsenic of 0.045 µg/L.

One positive detection resulted for the eight surface water samples. The concentration was 7.03 µg/L, which is below the Class III Surface Water criterion for fresh surface water, 50 µg/L.

- **Iron** – Two of two positive detections of normal groundwater samples resulted for iron. The concentrations were 78.6 and 186 µg/L, and greater than the regulatory criterion of 30 µg/L.
- **Selenium** – Of the 16 normal groundwater samples, two positive detections resulted for selenium. The range of concentrations was 23.8 to 27.3 µg/L. The regulatory criterion of 50 µg/L was not exceeded. The RBC of 18 µg/L was exceeded.
- **Synthetic Organic Compounds** – No analytes were positively detected for the parameter groups of volatile organic compounds, semi-volatile organic compounds, organochlorine pesticides, organophosphorous pesticides, PCBs, and chlorinated herbicides using EPA SW-846 methods.

Microbiological Results

The water samples were analyzed for several microorganisms within three classifications: bacteria, virus, and parasites:

- Bacteria – total coliform, fecal coliform, *Escherichia coli* (*E. coli*), and enterococci
- Virus – coliphage
- Parasites - *Giardia* spp. and *Cryptosporidium* spp.

Surface Water Sampling Results

Results of the analyses are provided in Table 3, located at the end of this report. Comparison of the surface water microbial concentrations to Florida Class III Surface Water criteria for parameters that criteria are established reveals the following:

- **Total Coliform** – The maximum total coliform concentration [1400 colony forming units per 100 milliliters (cfu/100 mL)] exceeded the criterion (1000 cfu/100 mL) from one sample that was collected September 7, 2005. The average of the results was 378 cfu/100 mL, which is below the criterion of 400 cfu/100 mL.
- **Fecal Coliform** –The maximum fecal coliform concentration (833 cfu/100 mL) exceeded the criterion (800 cfu/100 mL) from one sample that was collected September 7, 2005. The geometric mean of the results was 122 cfu/100 mL, which is below the criterion of 200 cfu/100 mL.
- ***E. coli*** –The geometric mean of the results for *E. coli* was 43.3 cfu/100 mL, which is below the criterion of 126 cfu/100 mL.
- **Coliphage** – No detections of coliphage were reported.
- **Giardia** – No detections of *Giardia spp*. were reported.
- **Cryptosporidium -** *Cryptosporidium spp*. was detected from the September 7 and October 6, 2005 samples of the lake water. One organism with internal features was detected

from these two sampling events with equivalent concentrations of 7.9 and 13.2 pfu/100 mL, respectively. The organism is encapsulated in a coating; the coating may be present with or without viable organism inside. The designation of "internal features" means that viable organism was encountered.

Discussion – There is qualification of the fecal coliform sample results from the Baseline characterization event that is associated with the receipt temperature of the samples at the laboratory. After discussion with the laboratory personnel, it was determined that amount of ice packed in the coolers was insufficient relative to the amount of water sample to chill and maintain sample temperature. During subsequent sampling events, more coolers were used to ship the samples increasing the relative amount of ice per sample to pack the coolers.

Groundwater Sampling Results

Comparison of the groundwater microbial concentrations to Florida Groundwater criteria for parameters that criteria are established reveals:

- **Total Coliform** – The maximum total coliform concentration exceeded the groundwater criterion (4 cfu/100 mL) from two samples: 7.7 cfu/100 mL collected on October 6, 2005 and 60 cfu/100 mL collected on December 5, 2005.
- **Fecal Coliform** –The maximum fecal coliform concentration (833 cfu/100 mL) exceeded the criterion (800 cfu/100 mL) from one sample that was collected September 7, 2005.
- ***E. coli*** – No detections of *E. coli* in the groundwater samples were reported.
- **Coliphage** – No detections of coliphage in the groundwater samples were reported.
- **Giardia** – No detections of *Giardia spp*. in the groundwater samples were reported.
- **Cryptosporidium -** *Cryptosporidium spp*. was not detected from the groundwater samples.

Next Anticipated Status Report

The next task of the project is to compare the results from the Festival Park site and from the Lake Orienta site. This status report is anticipated to be issued by the end of May 2006.

Table 2.
Chemical Analyses Results
Lake Orienta Site

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Baseline		Baseline		Baseline		Baseline	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2	
DateCollected:		13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	7.96		7.65		7.65		7.59	
TEMPERATURE	℃	32.2		24.2		24.2		24.3	
CONDUCTANCE	µmhos	248		277		277		409	
TURBIDITY	NTU	4.66		2.35		2.35		0.55	
DISSOLVED OXYGEN	mg/L	7.39		0.17		0.17		0.36	
OXIDATION/REDUCTION POTENTIAL	mV	no data		no data		no data		no data	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	120	=	160	=	175	=	206	=
TURBIDITY	NTU	4	=	0.3	U	0.3	U	0.3	UJ
pH (laboratory)	PH UNITS	7.4	=	7.5	=	7.68	=	7.33	J
COLOR	COLOR UNIT	40	=	10	=	10	=	15	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	10	U	10	U	10	U	2	U
TOTAL ORGANIC CARBON	mg/L	9.9	=	1	U	1.31	U	0.53	U
DISSOLVED ORGANIC CARBON	mg/L	0.368	U	1.36	=	1.88	=	0.68	UJ
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.22	=	0.766	=	0.844	=	0.808	=
NITROGEN, AMMONIA (AS N)	mg/L	0.0568	U	0.206	U	0.18	U	0.39	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.2	=	0.746	=	0.823	=	0.781	J
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0205	J	0.0269	J
PHOSPHORUS, TOTAL (AS P)	mg/L	0.056	=	0.143	=	0.152	=	0.249	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.138	=	0.137	=	0.213	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.048	=	0.24	=	0.188	=	0.253	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	27	=	141	=	141	=	127	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	27	=	141	=	141	=	127	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	30.6	=	13	=	12.9	=	26.4	=
SULFATE (AS SO4)	mg/L	25.4	=	2.61	=	2.91	=	21.4	=
Metals									
ALUMINUM	µg/L	69.9	J	23.4	J	18	J	24	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	8.41	U	13.2	=	10.5	U	14	=
BARIUM	µg/L	1.78	J	6.37	=	6.21	=	5.4	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.218	J
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	14300	=	50300	=	50000	=	51900	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	1.6	J	0.62	U	0.62	U	0.62	U
IRON	µg/L	27.6	U	34.8	U	33.6	U	22.8	U
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2520	=	5350	=	5320	=	6330	=
MANGANESE	µg/L	15.5	=	4.36	J	4.34	J	4.79	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	2.79	J	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3100	=	1290	=	1250	=	2120	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	20100	=	8330	=	8210	=	12600	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	1.98	J	1.1	U	1.1	U	1.28	J
ZINC	µg/L	13.1	U	0.94	U	0.94	U	4.86	U
Ion Balance									
Calcium	meq/L	0.72		2.52		2.50		2.60	
Magnesium	meq/L	0.21		0.45		0.44		0.53	
Sodium	meq/L	0.87		0.36		0.36		0.55	
Potassium	meq/L	0.08		0.03		0.03		0.05	
Sum of cations	meq/L	1.9		3.36		3.33		3.72	
Bicarbonate	meq/L	0.54		2.82		2.82		2.54	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.86		0.37		0.36		0.75	
Sulfate	meq/L	0.53		0.05		0.06		0.45	
Sum of anions	meq/L	1.9		3.24		3.25		3.73	
Balance (% difference)		1.5%		-1.7%		-1.3%		0.1%	
Radiologicals									
Alpha, gross	pCi/L	2.36	U	2.47	U	2.45	U	2.61	U
Beta, gross	pCi/L	3.64	U	3.77	U	3.68	U	3.98	J

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 1		Event 1		Event 1		Event 1	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2	
DateCollected:		20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05	
Matrix:		Groundwater		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	7.30		7.40		7.40		7.47	
TEMPERATURE	℃	30.4		23.9		23.9		24.2	
CONDUCTANCE	µmhos	197		299		299		257	
TURBIDITY	NTU	6.5		1.08		1.08		0.37	
DISSOLVED OXYGEN	mg/L	5.28		0.13		0.13		0.62	
OXIDATION/REDUCTION POTENTIAL	mV	no data		no data		no data		no data	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	28	=	257	=	298	=	282	=
TURBIDITY	NTU	33	=	3	=	3	=	3	=
pH (laboratory)	PH UNITS	7.12	=	7.52	=	7.52	=	7.36	=
COLOR	COLOR UNIT	45	=	15	=	15	=	15	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	10	U	10	U	10	U	4	U
TOTAL ORGANIC CARBON	mg/L	62.9	J	2.57	=	1.52	U	4.19	J
DISSOLVED ORGANIC CARBON	mg/L	7.85	=	0.685	U	2.69	U	1.3	U
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.6	=	0.743	=	0.684	=	1.26	=
NITROGEN, AMMONIA (AS N)	mg/L	0.07	J	0.14	J	0.14	J	0.35	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.6	J	0.743	=	0.684	=	1.26	J
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0206	J	0.0201	U	0.0201	U	0.0318	J
PHOSPHORUS, TOTAL (AS P)	mg/L	0.041	=	0.219	=	0.202	=	0.217	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.131	=	0.13	=	0.197	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.046	=	0.207	=	0.201	=	0.185	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28	=	141	=	129	=	132	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	301	=	141	=	129	=	132	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	30.8	=	13.2	=	13.3	=	26.3	=
SULFATE (AS SO4)	mg/L	24.2	=	4.55	=	4.69	=	30.3	=
Metals									
ALUMINUM	µg/L	83.9	J	15	U	15	U	24.3	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	4.88	J
ARSENIC	µg/L	8.58	U	8.16	=	9.7	=	13.5	=
BARIUM	µg/L	5.13	=	5.21	=	5.31	=	5.26	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13600	=	50500	=	51700	=	51800	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	4.42	U	0.62	U	0.62	U	9.58	=
IRON	µg/L	29.9	J	20.7	J	19.1	J	28.6	J
LEAD	µg/L	2.2	U	2.2	U	2.2	U	9.81	=
MAGNESIUM	µg/L	2520	=	5080	=	5240	=	6170	=
MANGANESE	µg/L	17.2	=	4.81	J	6.17	=	4.88	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3110	=	916	=	933	=	2210	=
SELENIUM	µg/L	2.6	UJ	2.6	U	2.6	U	2.6	UJ
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	19200	=	7280	=	7390	=	13000	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	1.96	J	1.1	U	1.1	U	1.16	J
ZINC	µg/L	3.21	U	0.94	U	7.28	J	14.3	=
Ion Balance									
Calcium	meq/L	0.68		2.53		2.59		2.59	
Magnesium	meq/L	0.21		0.42		0.44		0.51	
Sodium	meq/L	0.83		0.32		0.32		0.57	
Potassium	meq/L	0.08		0.02		0.02		0.06	
Sum of cations	meq/L	1.80		3.29		3.37		3.73	
Bicarbonate	meq/L	0.56		2.82		2.58		2.64	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.87		0.37		0.38		0.74	
Sulfate	meq/L	0.50		0.09		0.10		0.63	
Sum of anions	meq/L	1.93		3.29		3.05		4.01	
Balance (% difference)		3.6%		0.0%		-4.7%		3.9%	
Radiologicals									
Alpha, gross	pCi/L	2.08	U	2.49	U	1.69	U	1.94	U
Beta, gross	pCi/L	5.58	=	3.82	U	3.83	U	4.77	J

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 2		Event 2		Event 2		Event 2	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2	
DateCollected:		27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	no data		8.29		8.29		7.32	
TEMPERATURE	℃	no data		23.5		23.5		23.6	
CONDUCTANCE	µmhos	no data		300		300		339	
TURBIDITY	NTU	no data		0.69		0.69		1.01	
DISSOLVED OXYGEN	mg/L	no data		0.26		0.26		0.25	
OXIDATION/REDUCTION POTENTIAL	mV	no data		-215		-215		-159	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	187	=	137	=	146	=	119	=
TURBIDITY	NTU	20	=	5	=	8	=	3	=
pH (laboratory)	PH UNITS	6.62	=	7.32	=	7.36	=	7.18	=
COLOR	COLOR UNIT	60	=	25	=	15	=	20	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	J	10	U	10	U	10	U
TOTAL ORGANIC CARBON	mg/L	28.1	J	2.73	=	1.97	U	3.9	J
DISSOLVED ORGANIC CARBON	mg/L	42.1	J	1.86	U	1.66	U	3.2	J
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.29	=	0.93	=	0.662	=	0.776	=
NITROGEN, AMMONIA (AS N)	mg/L	0.001	U	0.07	J	0.07	J	0.28	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.29	=	0.93	=	0.662	=	0.776	=
NITROGEN, NITRITE	mg/L	0.0143	J	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.126	J	0.185	=	0.169	=	0.241	J
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.171	=	0.157	=	0.204	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.131	=	0.213	=	0.199	=	0.286	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28	=	137	=	140	=	119	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	28	=	185	=	140	=	331	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	29.3	=	12.5	=	12.5	=	24.4	=
SULFATE (AS SO4)	mg/L	25.2	=	4.45	=	3.71	=	30.8	=
Metals									
ALUMINUM	µg/L	142	=	15	U	15	U	18.8	J
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.73	J
ARSENIC	µg/L	8.88	U	10.9	=	10.3	=	12.4	U
BARIUM	µg/L	7.13	=	5.18	=	5.05	=	5.17	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.218	J
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13900	=	51200	=	51400	=	50300	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	2.07	U	0.62	U	0.62	U	1.9	U
IRON	µg/L	48.3	J	17.5	J	17.8	J	24.5	J
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2520	=	5310	=	5320	=	5750	=
MANGANESE	µg/L	16.7	=	4.82	J	4.77	J	4.91	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3040	=	914	=	878	=	2010	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	19600	=	7130	=	7120	=	12600	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.27	J	1.1	U	1.1	U	1.1	U
ZINC	µg/L	4.98	U	3.32	U	0.94	U	4.48	U
Ion Balance									
Calcium	meq/L	0.70		2.56		2.57		2.52	
Magnesium	meq/L	0.21		0.44		0.44		0.48	
Sodium	meq/L	0.85		0.31		0.31		0.55	
Potassium	meq/L	0.08		0.02		0.02		0.05	
Sum of cations	meq/L	1.83		3.34		3.35		3.59	
Bicarbonate	meq/L	0.56		2.74		2.80		2.38	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.83		0.35		0.35		0.69	
Sulfate	meq/L	0.53		0.09		0.08		0.64	
Sum of anions	meq/L	1.91		3.19		3.23		3.71	
Balance (% difference)		2.1%		-2.2%		-1.7%		1.6%	
Radiologicals									
Alpha, gross	pCi/L	5.07	=	2.51	U	3.09	U	2.61	U
Beta, gross	pCi/L	4.96	U	4.11	U	4.36	U	4.15	U

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 3		Event 3		Event 3		Event 3	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
DateCollected:		08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	no data		7.56		7.56		7.65	
TEMPERATURE	℃	no data		23.3		23.3		23.8	
CONDUCTANCE	µmhos	no data		198		198		254	
TURBIDITY	NTU	no data		0.58		0.58		0.23	
DISSOLVED OXYGEN	mg/L	no data		0.1		0.1		0.17	
OXIDATION/REDUCTION POTENTIAL	mV	no data		-87		-87		-158	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	115	=	174	=	174	=	168	=
TURBIDITY	NTU	30	=	2	=	2	=	3	=
pH (laboratory)	PH UNITS	7.2	=	7.42	=	7.45	=	7.33	=
COLOR	COLOR UNIT	50	=	15	=	15	=	15	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	J	3	J	3	J	3	J
TOTAL ORGANIC CARBON	mg/L	10.5	J	2.86	=	2.47	=	5.94	J
DISSOLVED ORGANIC CARBON	mg/L	8.48	J	2.33	U	2.4	U	4.94	J
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.661	J	0.27	=	0.218	=	0.377	J
NITROGEN, AMMONIA (AS N)	mg/L	0.001	U	0.14	J	0.07	J	0.21	=
NITROGEN, KJELDAHL, TOTAL	mg/L	0.661	J	0.27	=	0.218	J	0.377	J
NITROGEN, NITRITE	mg/L	0.0245	J	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	UJ	0.0201	U	0.0201	U	0.0201	UJ
PHOSPHORUS, TOTAL (AS P)	mg/L	0.034	J	0.24	=	0.259	=	0.236	J
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.021	J	0.206	=	0.207	=	0.198	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.09	=	0.253	=	0.266	=	0.37	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	32	=	141	=	139	=	115	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	32	=	141	=	139	=	115	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	28.9	=	12.5	=	12.2	=	24.3	=
SULFATE (AS SO4)	mg/L	25.4	=	3.68	=	3.48	=	33.6	=
Metals									
ALUMINUM	µg/L	144	U	24.8	U	29	U	15	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	9.27	U	11	U	10.9	U	10	U
BARIUM	µg/L	11	=	5	=	5.22	=	5.22	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13900	=	51100	=	52700	=	50000	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	0.62	U	0.62	U	0.62	U	0.62	U
IRON	µg/L	31.2	U	186	=	80.2	=	12.3	U
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2620	=	5200	=	5350	=	5990	=
MANGANESE	µg/L	17.4	=	5.36	=	5.35	=	4.44	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3230	=	829	=	885	=	2360	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.678	J
SODIUM	µg/L	20100	=	6980	=	7270	=	14200	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.05	J	1.1	U	1.1	U	1.1	U
ZINC	µg/L	4.26	U	0.94	U	0.94	U	3.03	U
Ion Balance									
Calcium	meq/L	0.70		2.56		2.64		2.50	
Magnesium	meq/L	0.22		0.43		0.45		0.50	
Sodium	meq/L	0.87		0.30		0.32		0.62	
Potassium	meq/L	0.08		0.02		0.02		0.06	
Sum of cations	meq/L	1.87		3.31		3.42		3.68	
Bicarbonate	meq/L	0.64		2.82		2.78		2.30	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.82		0.35		0.34		0.69	
Sulfate	meq/L	0.53		0.08		0.07		0.70	
Sum of anions	meq/L	1.99		3.25		3.20		3.69	
Balance (% difference)		3.1%		-1.0%		-3.3%		0.1%	
Radiologicals									
Alpha, gross	pCi/L	4.55	J	1.63	U	2.32	U	2.89	UJ
Beta, gross	pCi/L	5.53	=	3.77	U	4.97	=	4.83	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

Location:		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
Event:		Event 4		Event 4		Event 4		Event 4		Event 5		Event 5		Event 5		Event 5	
SJRWMD No.:		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
SampleID:		LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02		LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
DateCollected:		07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05		05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																	
pH	Std. Units	no data		7.38		7.38		7.35		7.85		7.39		7.39		7.42	
TEMPERATURE	°C	no data		23.5		23.5		23.8		28.3		23.5		23.5		23.2	
CONDUCTANCE	µmhos	no data		217		217		311		231		310		310		306	
TURBIDITY	NTU	no data		0.75		0.75		0.28		5.97		0.07		0.07		1.05	
DISSOLVED OXYGEN	mg/L	no data		0.24		0.24		0.2		9.38		0.13		0.13		0.21	
OXIDATION/REDUCTION POTENTIAL	mV	no data		-74		-74		-143		no data		-81		-81		-194	
General Chemistry																	
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	110	=	115	=	125	=	165	=	169	=	224	=	231	=	250	=
TURBIDITY	NTU	2.6	=	0.4	=	0.4	=	0.4	=	2.5	=	1.2	=	0.4	=	1.23	=
pH (laboratory)	PH UNITS	7.2	=	7.46	=	7.42	=	7.36	=	7.45	=	7.56	=	7.58	=	7.56	=
COLOR	COLOR UNIT	45	=	15	=	15	=	15	=	40	=	15	=	15	=	15	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	J	2	U	2	U	10	U	3	=	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	13.1	J	1.93	U	3.41	U	8.98	J	10.6	=	2.18	U	2.21	U	2.37	U
DISSOLVED ORGANIC CARBON	mg/L	7.5	=	2.34	U	2.65	U	2.59	U	9.14	=	2.28	U	1.97	U	2.46	U
Nutrients																	
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.57	=	0.668	=	0.619	=	0.762	=	0.415	U	0.323	U	0.156	U	0.435	U
NITROGEN, AMMONIA (AS N)	mg/L	0.07	J	0.21	=	0.21	=	0.35	=	0.14	=	0.28	=	0.21	=	0.35	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.55	=	0.648	=	0.599	=	0.742	=	0.415	U	0.323	U	0.156	U	0.435	U
NITROGEN, NITRITE	mg/L	0.0195	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.114	J	0.235	=	0.217	=	0.305	=	0.217	=	0.254	=	0.322	=	0.258	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.017	J	0.14	=	0.133	=	0.172	=	0.027	J	0.137	=	0.141	=	0.197	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.029	J	0.103	=	0.143	=	0.195	=	0.017	U	0.093	=	0.105	=	0.151	=
Anions																	
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	29	=	150	=	138	=	119	=	27.8	=	138	=	138	=	127	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	29	=	150	=	138	=	119	=	27.8	=	138	=	138	=	127	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	32.6	=	14.5	=	14.1	=	28.5	=	33.9	=	15.2	=	15.4	=	29.7	=
SULFATE (AS SO4)	mg/L	27.1	=	3.17	=	2.95	=	21.3	=	24.9	=	3.84	=	5.36	=	29.7	=
Metals																	
ALUMINUM	µg/L	120	=	17.8	U	15	U	15	U	93.4	J	15	U	15	U	87	J
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	6.96	U	13.2	=	11.5	=	14.9	=	11.8	U	15.3	=	19.1	=	17.1	=
BARIUM	µg/L	9.03	=	5	=	4.98	J	5.25	=	6.91	=	5.24	=	5.16	=	5.32	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U	1.32	U	3.38	J	3.6	J	3.7	J
CALCIUM	µg/L	13500	=	52300	=	52300	=	50400	=	12900	=	50000	=	49800	=	53800	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U	1.77	J	2.89	J	2.7	J	3.27	J
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	1.31	J	0.956	U	0.62	U	2.78	J	0.76	J	0.62	U	0.62	U	0.984	J
IRON	µg/L	24.7	J	28.3	U	26.5	U	41.2	J	20.6	J	29.1	J	29	J	78.6	=
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2650	=	5310	=	5310	=	5470	=	2570	=	5180	=	5140	=	5760	=
MANGANESE	µg/L	14.4	=	5.24	U	5.14	U	4.87	J	13.1	=	4.85	J	4.77	J	5.48	=
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.0808	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	2.61	J	1.7	U	1.7	U
POTASSIUM	µg/L	3310	=	1010	=	969	=	2300	=	3100	=	857	=	925	=	2070	=
SELENIUM	µg/L	2.6	U	13	U	2.6	U	2.6	U	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	20900	=	8130	=	7590	=	14400	=	19500	=	6910	=	7080	=	13000	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.42	J	1.1	U	1.1	U	1.3	J	1.94	J	1.1	U	1.1	U	1.1	U
ZINC	µg/L	3.51	J	0.94	U	0.94	U	5.43	J	1.75	J	0.94	UJ	0.94	UJ	0.94	UJ
Ion Balance																	
Calcium	meq/L	0.68		2.62		2.62		2.52		0.65		2.50		2.49		2.69	
Magnesium	meq/L	0.22		0.44		0.44		0.46		0.21		0.43		0.43		0.48	
Sodium	meq/L	0.91		0.35		0.33		0.63		0.85		0.30		0.31		0.57	
Potassium	meq/L	0.08		0.03		0.02		0.06		0.08		0.02		0.02		0.05	
Sum of cations	meq/L	1.89		3.44		3.41		3.66		1.79		3.25		3.25		3.79	
Bicarbonate	meq/L	0.58		3.00		2.76		2.38		0.56		2.76		2.76		2.54	
Carbonate	meq/L																
Hydroxide	meq/L																
Chloride	meq/L	0.92		0.41		0.40		0.81		0.96		0.43		0.44		0.84	
Sulfate	meq/L	0.56		0.07		0.06		0.44		0.52		0.08		0.11		0.62	
Sum of anions	meq/L	2.07		3.48		3.22		3.63		2.03		3.27		3.31		4.00	
Balance (% difference)		4.7%		0.6%		-2.8%		-0.4%		6.9%		0.2%		0.9%		2.8%	
Radiologicals																	
Alpha, gross	pCi/L	2.73	J	1.77	U	1.21	U	3.52	U	4.17	J	2.53	U	1.72	U	3.77	U
Beta, gross	pCi/L	5.26	U	4.3	U	3.66	U	4.73	U	5.02	=	4.57	U	3.56	U	4.83	U

Location:		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
Event:		Event 6		Event 6		Event 6		Event 6		Event 7		Event 7		Event 7		Event 7	
SJRWMD No.:		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
SampleID:		LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02		LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
DateCollected:		31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05		05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																	
pH	Std. Units	8.19		7.40		7.40		7.62		8.03		7.43		7.43		7.39	
TEMPERATURE	°C	21.8		23.5		23.5		23.8		20.3		23.4		23.4		23.7	
CONDUCTANCE	µmhos	176		298		298		319		182		297		297		278	
TURBIDITY	NTU	6.54		0.15		0.15		0.45		10.6		0.28		0.28		0.47	
DISSOLVED OXYGEN	mg/L	7.58		0.15		0.15		0.39		7.69		0.11		0.11		0.41	
OXIDATION/REDUCTION POTENTIAL	mV	2		-85		-85		-152		no data		-214		-214		no data	
General Chemistry																	
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	138	=	206	=	197	=	259	=	97	=	160	=	174	=	204	=
TURBIDITY	NTU	3.4	=	0.3	U	0.3	U	1.1	=	2.86	=	0.3	U	0.3	U	0.3	U
pH (laboratory)	PH UNITS	7.52	=	7.78	=	7.74	=	7.62	=	7.1	=	7.41	=	7.66	=	7.49	=
COLOR	COLOR UNIT	45	=	15	=	15	=	15	=	40	=	15	=	15	=	15	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	=	2	U	2	U	2	U	2.6	=	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	11.1	=	2.79	=	2.96	=	3.02	=	10.6	=	1.78	=	2.15	=	2.63	=
DISSOLVED ORGANIC CARBON	mg/L	9.02	=	3.01	=	3.27	=	3.19	=	7.91	=	1.86	=	1.75	=	2.04	=
Nutrients																	
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.174	=	0.232	=	0.289	=	0.222	=	1.82	=	0.478	U	1.86	=	1.01	=
NITROGEN, AMMONIA (AS N)	mg/L	0.017	UJ	0.0316	J	0.0339	J	0.179	J	0.0322	=	0.108	J	0.114	J	0.474	J
NITROGEN, KJELDAHL, TOTAL	mg/L	1.14	=	0.603	=	0.609	=	0.481	=	1.82	=	0.478	U	1.86	=	1.01	=
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0449	J	0.0449	J	0.0449	J	0.0449	J
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.017	U	0.097	=	0.017	U	0.08	=	0.12	=	0.174	=	0.165	=	0.171	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.15	=	0.147	=	0.202	=	0.02	J	0.142	=	0.126	=	0.202	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.017	U	0.056	=	0.017	U	0.058	=	0.034	J	0.093	=	0.116	=	0.117	=
Anions																	
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28.8	J	141	J	141	J	127	J	42	=	146	=	140	=	136	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	28.8	J	141	J	141	J	127	J	42	=	146	=	140	=	136	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	30	=	14.3	=	29.6	=	29.5	=	34.3	=	15.2	=	15.1	=	30.7	=
SULFATE (AS SO4)	mg/L	21.6	=	2.89	=	0.92	J	27.1	=	22.1	=	0.64	J	0.608	J	21.8	=
Metals																	
ALUMINUM	µg/L	143	=	49.4	J	223	=	18.3	J	277	=	37.7	J	15	U	19.3	J
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	8.05	U	14.9	=	14.2	=	9.85	U	7.03	=	12.4	=	12.8	=	8.88	=
BARIUM	µg/L	9.31	=	5.39	=	5.42	=	5.69	=	11.9	=	5.12	=	5.02	=	6.47	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	1.7	J	0.902	J	0.664	J	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13300	=	52100	=	51800	=	51100	=	14400	=	51500	=	50100	=	52500	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.91	J	2.21	J	2.15	J	2.17	J	3.73	J	3.54	J	3.22	J
COBALT	µg/L	0.7600001	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	1.59	U	0.879	U	0.62	U	3.07	U	2.82	U	2.35	U	0.62	U	1.4	U
IRON	µg/L	59.5	=	22.7	J	62.3	=	38.9	J	33.2	J	23.4	J	19.1	J	13.9	J
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	5.15	=	2.51	J	2.2	U
MAGNESIUM	µg/L	2520	=	5390	=	5350	=	5980	=	2620	=	5260	=	5150	=	6490	=
MANGANESE	µg/L	14	=	4.8	J	5.07	=	4.51	J	11.2	=	4.56	J	4.41	J	4.67	J
MERCURY	µg/L	0.0262	J	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.84	J	2.08	J	1.7	U	1.7	U	1.88	J	1.7	U	1.7	U
POTASSIUM	µg/L	3120	=	1010	=	980	=	2180	=	3220	=	1040	=	995	=	2100	=
SELENIUM	µg/L	2.6	U	13	U	13	U	2.6	U	6.01	U	27.3	=	24.7	=	23.8	=
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.722	U	0.65	U	0.65	U
SODIUM	µg/L	19300	=	7510	=	7410	=	12500	=	20100	=	7460	=	7230	=	13100	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.35	J	1.1	U	1.1	U	1.1	U	2.57	J	1.1	U	1.1	U	1.42	J
ZINC	µg/L	16.6	=	6.2	J	7.48	J	10.3	=	13.2	=	0.94	U	0.94	U	0.94	U
Ion Balance																	
Calcium	meq/L	0.67		2.61		2.59		2.56		0.72		2.58		2.51		2.63	
Magnesium	meq/L	0.21		0.45		0.45		0.50		0.22		0.44		0.43		0.54	
Sodium	meq/L	0.84		0.33		0.32		0.54		0.87		0.32		0.31		0.57	
Potassium	meq/L	0.08		0.03		0.03		0.06		0.08		0.03		0.03		0.05	
Sum of cations	meq/L	1.79		3.41		3.38		3.65		1.89		3.36		3.27		3.79	
Bicarbonate	meq/L	0.58		2.82		2.82		2.54		0.84		2.92		2.80		2.72	
Carbonate	meq/L																
Hydroxide	meq/L																
Chloride	meq/L	0.85		0.40		0.84		0.83		0.97		0.43		0.43		0.87	
Sulfate	meq/L	0.45		0.06		0.02		0.56		0.46		0.01		0.01		0.45	
Sum of anions	meq/L	1.87		3.28		3.68		3.94		2.27		3.36		3.24		4.04	
Balance (% difference)		2.2%		-1.8%		4.3%		3.9%		9.9%		0.0%		-0.5%		3.3%	
Radiologicals																	
Alpha, gross	pCi/L	2.87	J	4.04	U	2.23	U	1.98	J	2.89	U	2.68	U	2.84	U	1.91	U
Beta, gross	pCi/L	4.63	U	4.66	U	4.51	U	4.39	U	5.19	=	4.48	U	4.5	U	4.18	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Baseline		Baseline		Baseline		Baseline		Event 1		Event 1		Event 1		Event 1		Event 2		Event 2		Event 2		Event 2		Event 3		Event 3		Event 3		Event 3	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2		L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2		L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2		LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
	DateCollected:	13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05		20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05		27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05		08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Total Petroleum Hydrocarbons																																	
PETROLEUM HYDROCARBONS	mg/L	0.358	U	0.349	U	0.349	U	0.356	U	0.349	U	0.34	U	0.34	U	0.358	U	0.12	J	0.34	U	0.34	U	0.34	U	0.12	J	0.368	U	0.368	U	0.354	U
Volatile Organic Compounds																																	
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHYLENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4	U	4	U	4	UJ
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	UJ	1	UJ	1	U	1	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compounds																																	
ACETOPHENONE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
ARAMITE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	R	4	R	4.2	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	U	4.1	U	4.2	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2-ACETYLAMINOFLUORENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	UJ	4.1	UJ	4.2	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
BENZYL ALCOHOL	µg/L	10.8	UJ	10.5	UJ	10.5	UJ	5	R	10.5	UJ	10	UJ	10	UJ	10.5	UJ	10	U	10	U	10	U	10	U	10.5	UJ	10.2	U	10.2	U	10.5	UJ
BENZYL BUTYL PHTHALATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
4-BROMOPHENYL PHENYL ETHER	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
4-CHLOROANILINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	UJ	4.1	U	4.1	U	4.2	UJ
4-CHLOROPHENYL PHENYL ETHER	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2-CHLORONAPHTHALENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2-CHLOROPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
1,3-DINITROBENZENE	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	U	20	U	21	UJ	20	UJ	20	U	20	U	20	UJ	21	U	20.5	U	20.5	U	21	U
2,4-DICHLOROPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ	4	U	4	U	4	U	4	U	4.2	UJ	4.1	U	4.1	U	4.2	UJ
2,6-DICHLOROPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	U	4.1	U	4.2	U
2,4-DIMETHYLPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2,4-DINITROPHENOL	µg/L	21.6	UJ	21	UJ	21	UJ	10	U	21	UJ	20	UJ	20	UJ	21	UJ	20	U	20	U	20	U	20	U	21	U	20.5	U	20.5	U	21	U
2,4-DINITROTOLUENE	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	**4**	U	4.2	UJ	**4**	U	**4**	U	**4.2**	UJ	4	U	**4**	U	**4**	U	**4**	U	4.2	R	**4.1**	UJ	**4.1**	UJ	**4.2**	U
bis(2-CHLOROETHOXY) METHANE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	4	U	4.2	UJ	4	U	4	U	**4.2**	UJ	4	U	4	U	4	U	4	U	4.2	U	**4.1**	U	**4.1**	U	**4.2**	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
CHLOROBENZILATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4.1	R	4.2	UJ	4	R	4	R	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
DIALLATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
DIBENZOFURAN	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
DIETHYL PHTHALATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4.1	R	4.2	UJ	4	R	4	R	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
DIMETHYL PHTHALATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4.1	R	4.2	UJ	4	R	4	R	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
DIMETHYLPHENYLETHYLAMINE	µg/L	21.6	UJ	21	UJ	21	UJ	20	UJ	21	UJ	20	U	20	U	21	UJ	20	UJ	20	UJ	20	UJ	20	UJ	21	R	20.5	R	20.5	R	21	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	U	4.1	U	4.2	U
3,3'-DICHLOROBENZIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
3,3'-DIMETHYLBENZIDINE	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	U	20	U	21	UJ	20	UJ	20	UJ	20	UJ	20	UJ	21	U	20.5	U	20.5	U	21	U
ETHYL METHANESULFONATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
HEXACHLOROPROPENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
ISODRIN	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
ISOPHORONE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
ISOSAFROLE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 4		Event 4		Event 4		Event 4		Event 5		Event 5		Event 5		Event 5	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02		LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
	DateCollected:	07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05		05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Total Petroleum Hydrocarbons																	
PETROLEUM HYDROCARBONS	mg/L	0.358	U	0.34	U	0.349	UJ	0.349	U	0.349	U	0.34	U	0.349	U	0.349	U
Volatile Organic Compounds																	
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHYLENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	2	UJ	2	UJ	2	UJ	2	UJ	2	U	2	U	2	U	2	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	UJ	1	U	1	U	1	UJ	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compounds																	
ACETOPHENONE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4	U	4.1	UJ	4.1	UJ	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
ARAMITE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2-ACETYLAMINOFLUORENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
BENZYL ALCOHOL	µg/L	10	U	10.2	U	10.2	U	10.5	U	10.2	U	10.2	U	10.2	U	10.2	U
BENZYL BUTYL PHTHALATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-BROMOPHENYL PHENYL ETHER	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-CHLOROANILINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2-CHLORONAPHTHALENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2-CHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
1,3-DINITROBENZENE	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
2,4-DICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
2,6-DICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2,4-DIMETHYLPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2,4-DINITROPHENOL	µg/L	20	UJ	20.5	U	20.5	U	21	UJ	20.5	U	20.5	U	20.5	U	20.5	U
2,4-DINITROTOLUENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
bis(2-CHLOROETHOXY) METHANE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
CHLOROBENZILATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
DIALLATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
DIBENZOFURAN	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
DIETHYL PHTHALATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
DIMETHYL PHTHALATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20.5	R	20.5	R	21	R	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
3,3'-DICHLOROBENZIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
3,3'-DIMETHYLBENZIDINE	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
ETHYL METHANESULFONATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
HEXACHLOROPROPENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
ISODRIN	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
ISOPHORONE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
ISOSAFROLE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 6		Event 6		Event 6		Event 6		Event 7		Event 7		Event 7		Event 7	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02		LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
	DateCollected:	31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05		05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Total Petroleum Hydrocarbons																	
PETROLEUM HYDROCARBONS	mg/L	0.349	U	0.358	U	0.349	U	0.349	U	0.349	U	0.358	UJ	0.349	U	0.349	UJ
Volatile Organic Compounds																	
ACETONE	µg/L	10	U	10	U	9.4	J	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	4	U	4	U	4	U	4	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHYLENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compounds																	
ACETOPHENONE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	UJ	4.2	UJ	4.4	UJ	4	UJ
ARAMITE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	UJ	4.2	UJ	4.4	UJ	4	UJ
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-ACETYLAMINOFLUORENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
BENZYL ALCOHOL	µg/L	10.1	U	10.4	U	10.4	U	10.2	U	10.2	U	10.5	U	11.1	U	10	U
BENZYL BUTYL PHTHALATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
4-BROMOPHENYL PHENYL ETHER	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
4-CHLOROANILINE	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	U	4.2	U	4.4	U	4	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-CHLORONAPHTHALENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-CHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
1,3-DINITROBENZENE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
2,4-DICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,6-DICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,4-DIMETHYLPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,4-DINITROPHENOL	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
2,4-DINITROTOLUENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
bis(2-CHLOROETHOXY) METHANE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	UJ	4.2	UJ	4.4	UJ	4	UJ
CHLOROBENZILATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
DIALLATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
DIBENZOFURAN	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	U	4.2	U	4.4	U	4	U
DIETHYL PHTHALATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
DIMETHYL PHTHALATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.8	UJ	20.8	UJ	20.4	UJ	20.5	UJ	21	UJ	22.2	UJ	20	UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
3,3'-DICHLOROBENZIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
3,3'-DIMETHYLBENZIDINE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
ETHYL METHANESULFONATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
HEXACHLOROPROPENE	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	U	4.2	U	4.4	U	4	U
ISODRIN	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
ISOPHORONE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
ISOSAFROLE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

Location:		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
Event:		Baseline		Baseline		Baseline		Baseline		Event 1		Event 1		Event 1		Event 1	
SJRWMD No.:		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
SampleID:		L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2		L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2	
DateCollected:		13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05		20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
KEPONE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	UJ	4.2	UJ	4	UJ	4	UJ	4.2	UJ
METHAPYRILENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ
METHYL METHANESULFONATE	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	U	20	U	21	UJ
2-METHYLNAPHTHALENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
2-METHYLPHENOL (o-CRESOL)	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ
3-METHYLCHOLANTHRENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ
4-METHYLPHENOL (p-CRESOL)	µg/L	10.8	UJ	10.5	UJ	10.5	UJ	5	U	10.5	UJ	10	UJ	10	UJ	10.5	UJ
1,4-NAPHTHOQUINONE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4.1	R	4.2	UJ	4	R	4	R	4.2	UJ
1-NAPHTHYLAMINE	µg/L	10.8	UJ	10.5	UJ	10.5	UJ	10	U	10.5	UJ	10	U	10	U	10.5	UJ
2-NITROANILINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
3-NITROANILINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
4-NITROANILINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
4-NITROQUINOLINE-N-OXIDE	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	UJ	20	UJ	21	UJ
5-NITRO-o-TOLUIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
N-NITROSODI-n-PROPYLAMINE	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	4	U	4.2	UJ	4	U	4	U	**4.2**	UJ
N-NITROSODIETHYLAMINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
N-NITROSODIMETHYLAMINE	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	**4**	U	4.2	UJ	**4**	U	**4**	U	**4.2**	UJ
N-NITROSODIPHENYLAMINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
N-NITROSOMORPHOLINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
1,3,5-TRINITROBENZENE	µg/L	21.6	UJ	21	UJ	21	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
N-NITROSOPIPERIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	20	U	21	UJ	20	UJ	20	UJ	21	UJ
N-NITROSOPYRROLIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
NITROBENZENE	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	4	U	4.2	UJ	4	U	4	U	**4.2**	UJ
NITROSOMETHYLETHYLAMINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
o-TOLUIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
2-PICOLINE (ALPHA-PICOLINE)	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	U	20	U	21	UJ
p-PHENYLENEDIAMINE	µg/L	21.6	UJ	21	UJ	21	UJ	20	U	21	UJ	20	U	20	U	21	UJ
PENTACHLOROBENZENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
PENTACHLOROETHANE	µg/L	21.6	UJ	21	UJ	21	UJ	20.5	R	21	UJ	20	R	20	R	21	UJ
PENTACHLORONITROBENZENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
PENTACHLOROPHENOL	µg/L	21.6	UJ	**21**	UJ	**21**	UJ	**10**	U	21	UJ	**20**	UJ	**20**	UJ	**21**	UJ
PHENACETIN	µg/L	4.3	UJ	4.2	UJ	4.2	U	4	U	4.2	UJ	4	U	4	U	4.2	UJ
PHENOL	µg/L	21.6	UJ	**21**	UJ	**21**	UJ	10	U	21	UJ	**20**	UJ	**20**	UJ	**21**	UJ
PRONAMIDE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
PYRIDINE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
SAFROLE	µg/L	10.8	UJ	10.5	UJ	10.5	UJ	10	U	10.5	UJ	10	U	10	U	10.5	UJ
1,2,4,5-TETRACHLOROBENZENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
2,3,4,6-TETRACHLOROPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ
1,2,4-TRICHLOROBENZENE	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	4	U	4.2	UJ	4	U	4	U	4.2	UJ
2,4,5-TRICHLOROPHENOL	µg/L	4.3	UJ	**4.2**	UJ	**4.2**	UJ	2	U	4.2	UJ	4	UJ	4	UJ	**4.2**	UJ
2,4,6-TRICHLOROPHENOL	µg/L	4.3	UJ	4.2	UJ	4.2	UJ	2	U	4.2	UJ	4	UJ	4	UJ	4.2	UJ
Organochlorine Pesticides																	
ALDRIN	µg/L	0.052	U	**0.051**	U	**0.051**	U	**0.051**	U	0.058	U	**0.051**	UJ	**0.051**	U	**0.05**	U
ALPHA-CHLORDANE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	UJ	0.051	UJ	0.051	UJ	0.05	UJ
GAMMA-CHLORDANE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	UJ	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	UJ	**0.051**	UJ	**0.051**	UJ	**0.051**	UJ	0.058	U	**0.051**	UJ	**0.051**	U	**0.05**	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	U	**0.051**	U	**0.051**	U	**0.051**	U	0.058	U	**0.051**	UJ	**0.051**	U	**0.05**	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.052	UJ	0.051	UJ	0.051	UJ	0.051	UJ	0.058	U	0.051	UJ	0.051	U	0.05	U
GAMMA BHC (LINDANE)	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
DIELDRIN	µg/L	0.052	U	**0.051**	U	**0.051**	U	**0.051**	U	0.058	U	**0.051**	UJ	**0.051**	U	**0.05**	U
ALPHA ENDOSULFAN	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
BETA ENDOSULFAN	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	UJ	0.051	UJ	0.051	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
ENDRIN	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	UJ	0.051	UJ	0.051	UJ	0.05	UJ
ENDRIN KETONE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
HEPTACHLOR	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	R	0.051	R	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
p,p'-DDD	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	U	0.05	U
p,p'-DDE	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	U	0.051	UJ	0.051	UJ	0.05	U
p,p'-DDT	µg/L	0.052	UJ	0.051	UJ	0.051	UJ	0.051	UJ	0.058	U	0.051	UJ	0.051	U	0.013	J
METHOXYCHLOR	µg/L	0.052	U	0.051	U	0.051	U	0.051	U	0.058	UJ	0.051	UJ	0.051	UJ	0.05	UJ
TOXAPHENE	µg/L	0.52	U	0.51	U	0.51	U	0.51	U	0.58	U	0.51	UJ	0.51	U	0.5	U

Location:		LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
Event:		Event 2		Event 2		Event 2		Event 2		Event 3		Event 3		Event 3		Event 3	
SJRWMD No.:		None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
SampleID:		L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2		LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
DateCollected:		27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05		08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
KEPONE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	U	4.1	U	4.2	U
METHAPYRILENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
METHYL METHANESULFONATE	µg/L	20	U	20	U	20	U	20	U	21	U	20.5	U	20.5	U	21	U
2-METHYLNAPHTHALENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2-METHYLPHENOL (o-CRESOL)	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
3-METHYLCHOLANTHRENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
4-METHYLPHENOL (p-CRESOL)	µg/L	10	U	10	U	10	U	10	U	10.5	U	10.2	U	10.2	U	10.5	U
1,4-NAPHTHOQUINONE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	UJ	4.1	UJ	4.2	U
1-NAPHTHYLAMINE	µg/L	10	U	10	U	10	U	10	U	10.5	U	10.2	U	10.2	U	10.5	U
2-NITROANILINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	UJ	4.1	UJ	4.2	U
3-NITROANILINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	UJ	4.1	UJ	4.2	U
4-NITROANILINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
4-NITROQUINOLINE-N-OXIDE	µg/L	20	UJ	20	UJ	20	UJ	20	UJ	21	U	20.5	U	20.5	U	21	U
5-NITRO-o-TOLUIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	UJ	4.1	UJ	4.2	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
N-NITROSODI-n-PROPYLAMINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	**4.1**	U	**4.1**	U	**4.2**	U
N-NITROSODIETHYLAMINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
N-NITROSODIMETHYLAMINE	µg/L	4	U	**4**	U	**4**	U	**4**	U	4.2	U	**4.1**	U	**4.1**	U	**4.2**	U
N-NITROSODIPHENYLAMINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
N-NITROSOMORPHOLINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
1,3,5-TRINITROBENZENE	µg/L	4	U	4	U	20	UJ	4	U	4.2	U	4.1	U	4.1	U	4.2	U
N-NITROSOPIPERIDINE	µg/L	20	UJ	20	UJ	4	U	20	UJ	21	U	20.5	U	20.5	U	21	U
N-NITROSOPYRROLIDINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
NITROBENZENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	**4.1**	U	**4.1**	U	**4.2**	U
NITROSOMETHYLETHYLAMINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
o-TOLUIDINE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20	U	20	U	20	U	20	U	21	U	20.5	U	20.5	U	21	U
p-PHENYLENEDIAMINE	µg/L	20	UJ	20	UJ	20	UJ	20	UJ	21	U	20.5	U	20.5	U	21	U
PENTACHLOROBENZENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
PENTACHLOROETHANE	µg/L	20	U	20	U	20	U	20	U	21	U	20.5	U	20.5	U	21	U
PENTACHLORONITROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	UJ	4.1	UJ	4.2	U
PENTACHLOROPHENOL	µg/L	20	U	**20**	U	**20**	U	**20**	U	21	UJ	**20.5**	U	**20.5**	U	**21**	UJ
PHENACETIN	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	U	4.1	U	4.2	U
PHENOL	µg/L	20	U	**20**	U	**20**	U	**20**	U	21	U	**20.5**	U	**20.5**	U	**21**	U
PRONAMIDE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
PYRIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	R	4.1	U	4.1	U	4.2	R
SAFROLE	µg/L	10	U	10	U	10	U	10	U	10.5	U	10.2	U	10.2	U	10.5	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4.2	U	4.1	UJ	4.1	UJ	4.2	U
1,2,4-TRICHLOROBENZENE	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
2,4,5-TRICHLOROPHENOL	µg/L	4	U	4	U	4	U	4	U	4.2	U	**4.1**	U	**4.1**	U	**4.2**	U
2,4,6-TRICHLOROPHENOL	µg/L	4	U	4	U	4	U	4	U	4.2	U	4.1	U	4.1	U	4.2	U
Organochlorine Pesticides																	
ALDRIN	µg/L	0.053	U	**0.05**	U	**0.05**	U	**0.05**	U	0.051	U	**0.052**	U	**0.05**	U	**0.051**	U
ALPHA-CHLORDANE	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
GAMMA-CHLORDANE	µg/L	0.053	U	0.05	UJ	0.05	UJ	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.053	U	**0.05**	U	**0.05**	U	**0.05**	U	0.051	U	**0.052**	U	**0.05**	U	**0.051**	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.053	U	**0.05**	U	**0.05**	U	**0.05**	U	0.051	UJ	**0.052**	U	**0.05**	U	**0.051**	UJ
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
GAMMA BHC (LINDANE)	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
DIELDRIN	µg/L	0.053	U	**0.05**	U	**0.05**	U	**0.05**	U	0.051	U	**0.052**	U	**0.05**	U	**0.051**	U
ALPHA ENDOSULFAN	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
BETA ENDOSULFAN	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
ENDOSULFAN SULFATE	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
ENDRIN	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
ENDRIN ALDEHYDE	µg/L	0.053	U	0.05	UJ	0.05	UJ	0.05	U	0.051	UJ	0.052	U	0.05	U	0.051	UJ
ENDRIN KETONE	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR EPOXIDE	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
p,p'-DDD	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
p,p'-DDE	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
p,p'-DDT	µg/L	0.053	U	0.05	U	0.05	U	0.05	U	0.051	U	0.052	U	0.05	U	0.051	U
METHOXYCHLOR	µg/L	0.053	U	0.05	UJ	0.05	UJ	0.05	U	0.051	UJ	0.052	U	0.05	U	0.051	UJ
TOXAPHENE	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	0.52	U	0.5	U	0.51	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 4		Event 4		Event 4		Event 4		Event 5		Event 5		Event 5		Event 5	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02		LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
	DateCollected:	07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05		05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
KEPONE	µg/L	4	U	4.1	UJ	4.1	UJ	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
METHAPYRILENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
METHYL METHANESULFONATE	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	U	20.5	U	20.5	U	20.5	U
2-METHYLNAPHTHALENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2-METHYLPHENOL (o-CRESOL)	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
3-METHYLCHOLANTHRENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-METHYLPHENOL (p-CRESOL)	µg/L	10	U	10.2	U	10.2	U	10.5	U	10.2	U	10.2	U	10.2	U	10.2	U
1,4-NAPHTHOQUINONE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
1-NAPHTHYLAMINE	µg/L	10	U	10.2	U	10.2	U	10.5	U	10.2	U	10.2	U	10.2	U	10.2	U
2-NITROANILINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
3-NITROANILINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-NITROANILINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
4-NITROQUINOLINE-N-OXIDE	µg/L	20	UJ	20.5	U	20.5	U	21	UJ	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
5-NITRO-o-TOLUIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSODI-n-PROPYLAMINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSODIETHYLAMINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSODIMETHYLAMINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSODIPHENYLAMINE	µg/L	4	U	4.1	UJ	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSOMORPHOLINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
1,3,5-TRINITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	20.5	U	20.5	U	20.5	U	20.5	U
N-NITROSOPIPERIDINE	µg/L	20	U	20.5	U	20.5	U	21	U	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSOPYRROLIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
NITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
NITROSOMETHYLETHYLAMINE	µg/L	4	UJ	4.1	U	4.1	UJ	4.2	UJ	4.1	U	4.1	U	4.1	U	4.1	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
o-TOLUIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	U	20.5	U	20.5	U	20.5	U
p-PHENYLENEDIAMINE	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	U	20.5	U	20.5	U	20.5	U
PENTACHLOROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
PENTACHLOROETHANE	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	U	20.5	U	20.5	U	20.5	U
PENTACHLORONITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
PENTACHLOROPHENOL	µg/L	20	UJ	20.5	U	20.5	U	21	UJ	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
PHENACETIN	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
PHENOL	µg/L	20	U	20.5	U	20.5	U	21	U	20.5	U	20.5	U	20.5	U	20.5	U
PRONAMIDE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
PYRIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
SAFROLE	µg/L	10	U	10.2	U	10.2	U	10.5	U	10.2	U	10.2	U	10.2	U	10.2	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4	UJ	4.1	UJ	4.1	UJ	4.2	UJ	4.1	U	4.1	U	4.1	U	4.1	U
1,2,4-TRICHLOROBENZENE	µg/L	4	R	4.1	U	4.1	U	4.2	R	4.1	U	4.1	U	4.1	U	4.1	U
2,4,5-TRICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
2,4,6-TRICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U	4.1	U	4.1	U	4.1	U	4.1	U
Organochlorine Pesticides																	
ALDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
GAMMA BHC (LINDANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN KETONE	µg/L	0.01	U	0.01	UJ	0.01	UJ	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.01	U	0.01	U	0.0026	J	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDT	µg/L	0.01	UJ	0.01	UJ	0.0057	J	0.01	UJ	0.05	U	0.051	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.05	U	0.051	U	0.05	U	0.05	U
TOXAPHENE	µg/L	0.1	U	0.1	UJ	0.1	UJ	0.1	U	0.5	U	0.51	U	0.5	U	0.5	U

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 6		Event 6		Event 6		Event 6		Event 7		Event 7		Event 7		Event 7	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02		LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
	DateCollected:	31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05		05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
KEPONE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
METHAPYRILENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
METHYL METHANESULFONATE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
2-METHYLNAPHTHALENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-METHYLPHENOL (o-CRESOL)	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	U	4.2	U	4.4	U	4	U
3-METHYLCHOLANTHRENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
4-METHYLPHENOL (p-CRESOL)	µg/L	10.1	UJ	10.4	UJ	10.4	UJ	10.2	UJ	10.2	U	10.5	U	11.1	U	10	U
1,4-NAPHTHOQUINONE	µg/L	4	UJ	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
1-NAPHTHYLAMINE	µg/L	10.1	U	10.4	U	10.4	U	10.2	U	10.2	U	10.5	U	11.1	U	10	U
2-NITROANILINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
3-NITROANILINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
4-NITROANILINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
4-NITROQUINOLINE-N-OXIDE	µg/L	20.2	UJ	20.8	UJ	20.8	UJ	20.4	UJ	20.5	UJ	21	UJ	22.2	UJ	20	UJ
5-NITRO-o-TOLUIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSODI-n-PROPYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSODIETHYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSODIMETHYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSODIPHENYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSOMORPHOLINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
1,3,5-TRINITROBENZENE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	UJ	21	UJ	22.2	UJ	20	UJ
N-NITROSOPIPERIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
N-NITROSOPYRROLIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
NITROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
NITROSOMETHYLETHYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
o-TOLUIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
p-PHENYLENEDIAMINE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
PENTACHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
PENTACHLOROETHANE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
PENTACHLORONITROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
PENTACHLOROPHENOL	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
PHENACETIN	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
PHENOL	µg/L	20.2	U	20.8	U	20.8	U	20.4	U	20.5	U	21	U	22.2	U	20	U
PRONAMIDE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
PYRIDINE	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ	4.1	U	4.2	U	4.4	U	4	U
SAFROLE	µg/L	10.1	U	10.4	U	10.4	U	10.2	U	10.2	U	10.5	U	11.1	U	10	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	UJ	4.2	UJ	4.4	UJ	4	UJ
1,2,4-TRICHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,4,5-TRICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
2,4,6-TRICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U	4.1	U	4.2	U	4.4	U	4	U
Organochlorine Pesticides																	
ALDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
GAMMA BHC (LINDANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN KETONE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDT	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.05	U	0.05	U
TOXAPHENE	µg/L	0.51	U	0.51	U	0.51	U	0.51	U	0.51	U	0.51	U	0.5	U	0.5	U

Table 2.
Chemical Analyses Results
Lake Orienta Site

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Baseline		Baseline		Baseline		Baseline		Event 1		Event 1		Event 1		Event 1	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2		L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2	
	DateCollected:	13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05		20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides																	
ATRAZINE	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
BOLSTAR	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
CHLORPYRIFOS	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
COUMAPHOS	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	U	**5.1**	U	**5.2**	U	**5.3**	U
DEMETON-O	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
DEMETON-S	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
DIAZINON	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
DICHLORVOS	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	UJ	**5.1**	UJ	**5.2**	UJ	**5.3**	UJ
DIMETHOATE	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
DISULFOTON	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	U	**5.1**	U	**5.2**	U	**5.3**	U
ETHOPROP	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	U	**5.1**	U	**5.2**	U	**5.3**	UJ
FAMPHUR	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
FENSULFOTHION	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	U	**5.1**	U	**5.2**	U	**5.3**	U
FENTHION	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
MERPHOS	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	U	**5.1**	U	**5.2**	U	**5.3**	U
MEVINPHOS	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	UJ	**5.1**	UJ	**5.2**	UJ	**5.3**	UJ
NALED	µg/L	5.2	UJ	5.1	UJ	5	UJ	5	UJ	5.4	UJ	5.1	UJ	5.2	U	5.3	UJ
PARATHION, ETHYL	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	UJ
PARATHION, METHYL	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
PHORATE	µg/L	5.2	U	**5.1**	U	**5**	U	**5**	U	5.4	UJ	**5.1**	UJ	**5.2**	UJ	**5.3**	UJ
RONNEL	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	UJ	5.1	UJ	5.2	UJ	5.3	UJ
SIMAZINE	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	UJ	5.1	UJ	5.2	UJ	5.3	UJ
TOKUTHION (PROTHIOFOS)	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
TRICHLORONATE	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
ZINOPHOS	µg/L	5.2	U	5.1	U	5	U	5	U	5.4	U	5.1	U	5.2	U	5.3	U
Polychlorinated biphenols (PCBs)																	
PCB-1016 (AROCHLOR 1016)	µg/L	0.52	UJ	0.51	UJ	0.51	UJ	0.51	UJ	0.58	UJ	0.51	U	0.51	U	0.5	UJ
PCB-1221 (AROCHLOR 1221)	µg/L	0.52	U	**0.51**	U	**0.51**	U	**0.51**	U	0.58	U	**0.51**	U	**0.51**	U	0.5	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.52	U	**0.51**	U	**0.51**	U	**0.51**	U	0.58	U	**0.51**	U	**0.51**	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52	U	0.51	U	0.51	U	0.51	U	0.58	U	0.51	U	0.51	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.52	U	**0.51**	U	**0.51**	U	**0.51**	U	0.58	U	**0.51**	U	**0.51**	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52	U	0.51	U	0.51	U	0.51	U	0.58	U	0.51	U	0.51	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.52	U	**0.51**	U	**0.51**	U	**0.51**	U	0.58	U	**0.51**	U	**0.51**	U	0.5	U
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	UJ	0.53	U	0.52	UJ
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
DALAPON	µg/L	0.66	UJ	0.64	UJ	0.65	UJ	0.64	UJ	0.62	U	0.62	U	0.66	U	0.64	U
DICAMBA	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	U	0.53	UJ	0.52	UJ
DICHLOROPROP	µg/L	0.53	U	**0.51**	U	**0.52**	U	**0.51**	U	0.5	U	**0.5**	U	**0.53**	U	**0.52**	U
DINOSEB	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
PICLORAM	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
SILVEX (2,4,5-TP)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	UJ	0.53	U	0.52	UJ

	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 2		Event 2		Event 2		Event 2		Event 3		Event 3		Event 3		Event 3	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2		LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
	DateCollected:	27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05		08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides																	
ATRAZINE	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
BOLSTAR	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
CHLORPYRIFOS	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
COUMAPHOS	µg/L	5.2	U	**5**	U	**5**	U	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
DEMETON-O	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
DEMETON-S	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
DIAZINON	µg/L	5.2	UJ	5	U	5	U	5	UJ	5.3	U	5.1	UJ	5.1	UJ	5.4	U
DICHLORVOS	µg/L	5.2	UJ	**5**	UJ	**5**	UJ	**5**	UJ	5.3	U	**5.1**	UJ	**5.1**	UJ	**5.4**	U
DIMETHOATE	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
DISULFOTON	µg/L	5.2	U	**5**	U	**5**	U	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
ETHOPROP	µg/L	5.2	U	**5**	U	**5**	U	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
FAMPHUR	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
FENSULFOTHION	µg/L	5.2	U	**5**	U	**5**	U	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
FENTHION	µg/L	5.2	U	5	U	5	U	5	U	5.3	R	5.1	U	5.1	U	5.4	R
MERPHOS	µg/L	5.2	U	**5**	U	**5**	U	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
MEVINPHOS	µg/L	5.2	U	**5**	UJ	**5**	UJ	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
NALED	µg/L	5.2	U	5	UJ	5	UJ	5	U	5.3	U	5.1	U	5.1	U	5.4	U
PARATHION, ETHYL	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
PARATHION, METHYL	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
PHORATE	µg/L	5.2	U	**5**	UJ	**5**	UJ	**5**	U	5.3	U	**5.1**	U	**5.1**	U	**5.4**	U
RONNEL	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
SIMAZINE	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.2	UJ	5	U	5	U	5	UJ	5.3	U	5.1	UJ	5.1	UJ	5.4	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
TOKUTHION (PROTHIOFOS)	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
TRICHLORONATE	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
ZINOPHOS	µg/L	5.2	U	5	U	5	U	5	U	5.3	U	5.1	U	5.1	U	5.4	U
Polychlorinated biphenols (PCBs)																	
PCB-1016 (AROCHLOR 1016)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	0.52	U	0.5	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	**0.52**	U	0.5	U	**0.51**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	**0.52**	U	0.5	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	0.52	U	0.5	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	**0.52**	U	0.5	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	UJ	0.52	UJ	0.5	UJ	0.51	UJ
PCB-1260 (AROCHLOR 1260)	µg/L	0.53	U	0.5	U	0.5	U	0.5	U	0.51	U	**0.52**	U	0.5	U	**0.51**	U
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
DALAPON	µg/L	0.68	UJ	0.62	U	0.62	U	0.62	U	0.63	U	0.62	U	0.63	U	0.63	U
DICAMBA	µg/L	0.54	UJ	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
DICHLOROPROP	µg/L	0.54	UJ	**0.5**	U	**0.5**	U	**0.5**	U	0.5	U	**0.5**	U	**0.51**	U	**0.5**	U
DINOSEB	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
PICLORAM	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
SILVEX (2,4,5-TP)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U

Notes:
Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded and boxed cells represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers
"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Sources:
1 *Florida Ground Water Guidance Concentrations*, 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
2 *Drinking Water Regulations and Health Advisories*, Office of Water, USEPA, October 1996.
3 *Brownfield's Cleanup Criteria Rule*, *Groundwater Cleanup Target Levels*, Draft Chapter 62-785 F.A.C., 1997.
4 *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
5 *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment*, November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:
MCL - Maximum Contaminant Level
SMCL - Secondary MCL
GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration

Table 2.
Chemical Analyses Results
Lake Orienta Site

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 4		Event 4		Event 4		Event 4	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02	
DateCollected:		07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides									
ATRAZINE	µg/L	5	U	5	U	5.2	U	5	U
AZINPHOS, METHYL (GUTHION)	µg/L	5	U	5	U	5.2	U	5	U
BOLSTAR	µg/L	5	U	5	U	5.2	U	5	U
CHLORPYRIFOS	µg/L	5	U	5	U	5.2	U	5	U
COUMAPHOS	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
DEMETON-O	µg/L	5	U	5	U	5.2	U	5	U
DEMETON-S	µg/L	5	U	5	U	5.2	U	5	U
DIAZINON	µg/L	5	U	5	U	5.2	U	5	U
DICHLORVOS	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
DIMETHOATE	µg/L	5	U	5	U	5.2	U	5	U
DISULFOTON	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
ETHOPROP	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
FAMPHUR	µg/L	5	U	5	U	5.2	U	5	U
FENSULFOTHION	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
FENTHION	µg/L	5	U	5	U	5.2	U	5	U
MERPHOS	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
MEVINPHOS	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
NALED	µg/L	5	U	5	U	5.2	U	5	U
PARATHION, ETHYL	µg/L	5	U	5	U	5.2	U	5	U
PARATHION, METHYL	µg/L	5	U	5	U	5.2	U	5	U
PHORATE	µg/L	5	U	**5**	U	**5.2**	U	**5**	U
RONNEL	µg/L	5	U	5	U	5.2	U	5	U
SIMAZINE	µg/L	5	U	5	U	5.2	U	5	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5	U	5	U	5.2	U	5	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5	U	5	U	5.2	U	5	U
TOKUTHION (PROTHIOFOS)	µg/L	5	U	5	U	5.2	U	5	U
TRICHLORONATE	µg/L	5	U	5	U	5.2	U	5	U
ZINOPHOS	µg/L	5	U	5	U	5.2	U	5	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
Herbicides									
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	UJ	0.51	U	0.51	U	0.53	UJ
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ
DALAPON	µg/L	0.62	UJ	0.64	U	0.64	U	0.66	UJ
DICAMBA	µg/L	0.5	UJ	0.51	U	0.51	U	0.53	UJ
DICHLOROPROP	µg/L	0.5	U	**0.51**	U	**0.51**	U	**0.53**	UJ
DINOSEB	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ
PICLORAM	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 5		Event 5		Event 5		Event 5	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
DateCollected:		05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides									
ATRAZINE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
BOLSTAR	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
CHLORPYRIFOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
COUMAPHOS	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
DEMETON-O	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DEMETON-S	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DIAZINON	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DICHLORVOS	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
DIMETHOATE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DISULFOTON	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
ETHOPROP	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
FAMPHUR	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
FENSULFOTHION	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
FENTHION	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
MERPHOS	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
MEVINPHOS	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
NALED	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
PARATHION, ETHYL	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
PARATHION, METHYL	µg/L	5.1	UJ	5.1	UJ	5.1	UJ	5.1	UJ
PHORATE	µg/L	5.1	U	**5.1**	U	**5.1**	U	**5.1**	U
RONNEL	µg/L	5.1	U	5.1	U	5.1	U	5.1	UJ
SIMAZINE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
TOKUTHION (PROTHIOFOS)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
TRICHLORONATE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
ZINOPHOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	UJ	0.51	UJ	0.5	UJ	0.5	UJ
PCB-1221 (AROCHLOR 1221)	µg/L	0.5	U	**0.51**	U	0.5	U	0.5	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	**0.51**	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	**0.51**	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	U	**0.51**	U	0.5	U	0.5	U
Herbicides									
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.5	UJ	0.5	UJ	0.5	U
DALAPON	µg/L	0.62	UJ	0.62	UJ	0.62	UJ	0.62	UJ
DICAMBA	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
DICHLOROPROP	µg/L	0.5	U	**0.5**	UJ	**0.5**	UJ	**0.5**	U
DINOSEB	µg/L	0.5	U	0.5	UJ	0.5	UJ	0.5	U
PICLORAM	µg/L	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.5	UJ	0.5	UJ	0.5	U

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 6		Event 6		Event 6		Event 6	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02	
DateCollected:		31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides									
ATRAZINE	µg/L	5	U	5	U	5	U	5	U
AZINPHOS, METHYL (GUTHION)	µg/L	5	U	5	U	5	U	5	U
BOLSTAR	µg/L	5	U	5	U	5	U	5	U
CHLORPYRIFOS	µg/L	5	U	5	U	5	U	5	U
COUMAPHOS	µg/L	5	U	**5**	U	**5**	U	**5**	U
DEMETON-O	µg/L	5	U	5	U	5	U	5	U
DEMETON-S	µg/L	5	U	5	U	5	U	5	U
DIAZINON	µg/L	5	U	5	U	5	U	5	U
DICHLORVOS	µg/L	5	UJ	**5**	UJ	**5**	UJ	**5**	UJ
DIMETHOATE	µg/L	5	U	5	U	5	U	5	U
DISULFOTON	µg/L	5	U	**5**	U	**5**	U	**5**	U
ETHOPROP	µg/L	5	U	**5**	U	**5**	U	**5**	U
FAMPHUR	µg/L	5	U	5	U	5	U	5	U
FENSULFOTHION	µg/L	5	U	**5**	U	**5**	U	**5**	U
FENTHION	µg/L	5	U	5	U	5	U	5	U
MERPHOS	µg/L	5	U	**5**	U	**5**	U	**5**	U
MEVINPHOS	µg/L	5	U	**5**	U	**5**	U	**5**	U
NALED	µg/L	5	U	5	U	5	U	5	U
PARATHION, ETHYL	µg/L	5	U	5	U	5	U	5	U
PARATHION, METHYL	µg/L	5	U	5	U	5	U	5	U
PHORATE	µg/L	5	U	**5**	U	**5**	U	**5**	U
RONNEL	µg/L	5	U	5	U	5	U	5	U
SIMAZINE	µg/L	5	U	5	U	5	U	5	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5	U	5	U	5	U	5	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5	U	5	U	5	U	5	U
TOKUTHION (PROTHIOFOS)	µg/L	5	U	5	U	5	U	5	U
TRICHLORONATE	µg/L	5	U	5	U	5	U	5	U
ZINOPHOS	µg/L	5	U	5	U	5	U	5	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
Herbicides									
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U
DALAPON	µg/L	0.64	UJ	0.62	UJ	0.62	UJ	0.62	UJ
DICAMBA	µg/L	0.51	U	0.5	U	0.5	U	0.5	U
DICHLOROPROP	µg/L	0.51	U	**0.5**	U	**0.5**	U	**0.5**	U
DINOSEB	µg/L	0.51	U	0.5	U	0.5	U	0.5	U
PICLORAM	µg/L	0.51	U	0.5	U	0.5	U	0.5	U
SILVEX (2,4,5-TP)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U

Location:		LAKE		MW-1		MW-1		MW-2	
Event:		Event 7		Event 7		Event 7		Event 7	
SJRWMD No.:		None		S-0334		S-0334		S-0335	
SampleID:		LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
DateCollected:		05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
Matrix:		Surface Water		Groundwater		Groundwater		Groundwater	
SampleType:		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Organophosphorous Pesticides									
ATRAZINE	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
BOLSTAR	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
CHLORPYRIFOS	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
COUMAPHOS	µg/L	5.1	UJ	**5.3**	UJ	**5.3**	UJ	**5.1**	UJ
DEMETON-O	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
DEMETON-S	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
DIAZINON	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
DICHLORVOS	µg/L	5.1	UJ	**5.3**	U	**5.3**	U	**5.1**	U
DIMETHOATE	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
DISULFOTON	µg/L	5.1	UJ	**5.3**	UJ	**5.3**	UJ	**5.1**	UJ
ETHOPROP	µg/L	5.1	UJ	**5.3**	UJ	**5.3**	UJ	**5.1**	UJ
FAMPHUR	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
FENSULFOTHION	µg/L	5.1	UJ	**5.3**	U	**5.3**	U	**5.1**	U
FENTHION	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
MERPHOS	µg/L	5.1	UJ	**5.3**	UJ	**5.3**	UJ	**5.1**	UJ
MEVINPHOS	µg/L	5.1	U	**5.3**	U	**5.3**	U	**5.1**	U
NALED	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
PARATHION, ETHYL	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
PARATHION, METHYL	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
PHORATE	µg/L	5.1	UJ	**5.3**	UJ	**5.3**	UJ	**5.1**	UJ
RONNEL	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
SIMAZINE	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
TOKUTHION (PROTHIOFOS)	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
TRICHLORONATE	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
ZINOPHOS	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	**0.51**	U	0.5	U	0.5	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	**0.51**	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	**0.51**	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	**0.51**	U	0.5	U	0.5	U
Herbicides									
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
DALAPON	µg/L	0.64	U	0.64	U	0.64	U	0.64	U
DICAMBA	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
DICHLOROPROP	µg/L	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
DINOSEB	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PICLORAM	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
SILVEX (2,4,5-TP)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U

Notes:
Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded and boxed cells represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers
"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Sources:
[1] *Florida Ground Water Guidance Concentrations*, 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
[2] *Drinking Water Regulations and Health Advisories*, Office of Water, USEPA, October 1996.
[3] *Brownfield's Cleanup Criteria Rule*, *Groundwater Cleanup Target Levels*, Draft Chapter 62-785 F.A.C., 1997.
[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment*, November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:
MCL - Maximum Contaminant Level
SMCL - Secondary MCL
GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration

Table 3.
Microbial Analyses Results
Lake Orienta Site

	Site Location	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2
	Event	Baseline	Baseline	Baseline	Event 1	Event 1	Event 1	Event 2	Event 2	Event 2	Event 3	Event 3	Event 3
	SJRWMD No.:	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335
	Sample ID	LO-00-Lake	LO-00-MW1	LO-00-MW2	LO-01-Lake	LO-01-MW1	LO-01-MW2	LO-02-Lake	LO-02-MW1	LO-02-MW2	LO-03-03 Lake	LO-03-01 MW1	LO-03-02 MW2
	Date Collected	7/11/2005	7/11/2005	7/11/2005	7/20/2005	7/20/2005	7/20/2005	7/27/2005	7/27/2005	7/27/2005	8/8/2005	8/8/2005	8/8/2005
	Unit												
Volume Collected	Liters	27.6	98.41	99.5	27.75	98.8	98.41	27.25	99.17	99.17	27.25	31.8	99.2
Sample Volume Examined	Liters	8.625	24.6	37.3	10.41	37.05	36.9	11.9	37.2	37.2	12.9	11.9	36.1
Method		Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering
Turbidity (Lab.)	NTU	6.23	2.88	0.79	6.5	1.19	0.37	6.1	1.26	1.01	9.0	2.13	0.34
Sample Temperature upon arrival	°C	17	17	17	17	17	17	8	8	8	8	8	8
Cooler Temperature	°C	no data	no data	no data	no data	no data	no data	no data	no data	no data	3	2	3
Organism Bacteria													
Total Coliform	CFU/100mL	103[b]	<3	<3	27	0.26[b]	2.6[b]	48	2.7	<0.09	90[b]	0.6	<0.2
Fecal Coliform	CFU/100mL	390	<3	<3	32	<0.1	<0.1	42	<0.09	0.09[ab]	65[b]	<0.4[a]	<0.2
E.coli [c]	CFU/100mL	21[b]	<3	<3	15[a]	<0.1	<0.1	33	<0.09	0.09[ab]	50[b]	<0.4[a]	<0.2
Enterococci	CFU/100mL	36,000	<3	<3	2.7[b]	0.28[b]	<0.1	33	0.18	<0.09	20.5	0.09[ab]	0.83
Virus													
Coliphage (*E.coli* C3000 host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Coliphage (*E.coli* p(Famp)R host)	pfu/100 mL	<9.5	<9.5	<9.5	<10	<10	<10	<10	<10	<10	<10	<10	<10
Parasites													
Giardia	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
	Equivalent Concentration (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
	Equivalent Concentration with internal structure (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
Cryptosporidium	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
	Equivalent Concentration (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
	Equivalent Concentration with internal structure (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77

	Site Location	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2
	Event	Event 4	Event 4	Event 4	Event 5	Event 5	Event 5	Event 6	Event 6	Event 6	Event 7	Event 7	Event 7
	SJRWMD No.:	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335
	Sample ID	LO-04-03	LO-04-01	LO-04-02	LO-05-03	LO-05-01	LO-05-02	LO-06-03	LO-06-01	LO-06-02	L0-07-03	L0-07-01	L0-07-02
	Date Collected	9/7/2005	9/7/2005	9/7/2005	10/6/2005	10/6/2005	10/6/2005	10/31/2005	10/31/2005	10/31/2005	12/6/2005	12/6/2005	12/6/2005
	Unit												
Volume Collected	Liters	27	99.17	98.41	13.25	98.41	98.41	7.95	102.2	98.41	11.7	98.41	98.41
Sample Volume Examined	Liters	12.66	37.2	36.9	7.6	36.9	36.9	2.96	57.5	36.9	10.97	36.9	36.9
Method		Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering
Turbidity (Lab.)	NTU	6.25	1.36	0.49	6.42	1.12	0.91	6.54	0.1	0.67	10.6	0.18	0.45
Sample Temperature upon arrival	°C	7.5	7.5	7.5	5	5	5	6.9	6.9	6.9	5.9	5.9	5.9
Cooler Temperature	°C	4	4	4	3	3	3	5.4	5.4	5.4	0.8	0.8	0.8
Organism Bacteria													
Total Coliform	CFU/100mL	1400[b]	0.09[ab]	<0.09	853	7.7[b]	<0.09	360	0.19	<0.09	147	0.09	60
Fecal Coliform	CFU/100mL	833[b]	0.65[b]	<0.09	237	<0.09	<0.09	290	<0.9[b]	<0.33	60	<0.09	<0.09
E.coli [c]	CFU/100mL	167[b]	<0.09	<0.09	70[b]	<0.09	<0.09	23	<0.9	<0.33	47	<0.09	<0.09
Enterococci	CFU/100mL	3633	<0.09	<0.09	570	<0.09	<0.09	52.7	0.37[b]	<0.9	95	<0.09	0.19
Virus													
Coliphage (*E.coli* C3000 host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Coliphage (*E.coli* p(Famp)R host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Parasites													
Giardia	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
	Equivalent Concentration (oo)cysts/100L	<7.9	<2.69	<2.71	<13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
	Equivalent Concentration with internal structure (oo)cysts/100L	<7.9	<2.69	<2.71	<13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
Cryptosporidium	Total Organisms Detected	1	0	0	1	0	0	0	0	0	0	0	0
	Number with Internal Features	1	0	0	1	0	0	0	0	0	0	0	0
	Equivalent Concentration (oo)cysts/100L	7.9	<2.69	<2.71	13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
	Equivalent Concentration with internal structure (oo)cysts/100L	7.9	<2.69	<2.71	13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71

Notes:

(orange)	Problem with media batch - Positive control failure
a	Qualified data - data from one plate
b	Qualified data - less than 20 colonies per plate
c	Filter transferred from fecal coliform (mFC agar) plates to *E.coli* (EC with MUG agar) plates
	cfu - Colony forming units
	pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

CFARE Status Report No. 10

Status Report No. 10 – Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study

Introduction

This report provides Status Report No. 10 for the Central Florida Aquifer Recharge Enhancement Program, Artificial Recharge Well Study. The reports are issued at project milestones. The last report was April 24, 2006. Status Report No. 9 provided the results of the Baseline Characterization and the Operational Characterization tasks of the project conducted at the Lake Orienta site in Altamonte Springs, Florida. This status report presents comparison and contrasts of the sites and results of project activities. The project progress and schedule are presented in Table 1.

TABLE 1
Project Tasks, Progress, and Schedule

Task	Site and Type of Recharge Well	
	Festival Park	Lake Orienta
	Direct Runoff	*Lake-Level Control*
Literature Review	Completed	Completed
Dry Period Characterization	N/A	Completed
Water Supply Well Survey	Completed	Completed
Groundwater Tracer Test	Completed	Completed
Baseline Characterization	Completed	Completed
Operational Site Characterization	Completed	Completed
Enhanced Treatment Site Characterization	Not recommended	Not recommended
Final Report	(2006)	(2006)

The overriding observations from this project are

- The recharge well systems at the two locations have been operating for 40 to 60 years implying that these results are indicative of groundwater conditions resulting from long-term recharge of surface water.
- The recharge wells at Festival Park receive flow in direct response to rainfall, with an observed component of baseflow. The recharge wells at Lake Orienta receive flow in response to the lake level rising to above the inlets. Flow at Lake Orienta tends to be more steady and seasonal with the period of August through October being the most active time.

- 2 orders-of-magnitude and up to 6 orders-of-magnitude reductions in bacteria concentrations were observed from source locations to monitoring wells that were demonstrated to be in hydraulic connection with the recharge wells.
- Arsenic from the monitoring well samples showed concentrations up to approximately 20 micrograms per liter (µg/L) and greater than the Drinking Water Standard (DWS) of 10 µg/L. Arsenic was not detected in seven source location samples from Festival Park, and was detected in one of eight lake samples from Lake Orienta below at a concentration below the DWS. The activity of surface water recharge to the Upper Floridan aquifer appears to increase the occurrence and concentration of arsenic in groundwater.
- Synthetic organic chemicals were largely undetected, and when selected volatile organic chemicals were detected they were detected at low concentrations below regulatory standards and guidance concentrations.

The organization of this status report is

1. Settings of the sites
2. Operations
3. Results and Conclusions
   - Dry-period characterization
   - Qualitative groundwater tracer test
   - Baseline and Operational characterization
     - Microbiological
     - Chemical
4. Preliminary Recommendations

Settings of the Sites

Greater than 400 recharge wells were installed between 1904 and the late 1960's to manage stormwater runoff as urban development occurred in Orlando and vicinity. The vast majority of the recharge wells are completed into the Upper Floridan aquifer. Two types of wells are present: urban runoff and lake level control. The relative locations of the sites are presented in Figure 1.

Festival Park

Festival Park is located immediately west of Orlando Executive Airport. Two recharge wells are present at the site. They receive direct urban runoff. The wells are typical of numerous wells installed in the area to manage storm water runoff to alleviate local flooding while Orlando was urbanized. The drainage area for the wells is primarily commercial property in an urban setting. The earliest record of information on the wells were U.S. Geological Survey (USGS) inventory cards that were dated May 14, 1943, therefore the wells was constructed and operating prior to then. The completion characteristics of the wells are presented in Table 2. A site map is presented in Figure 2.

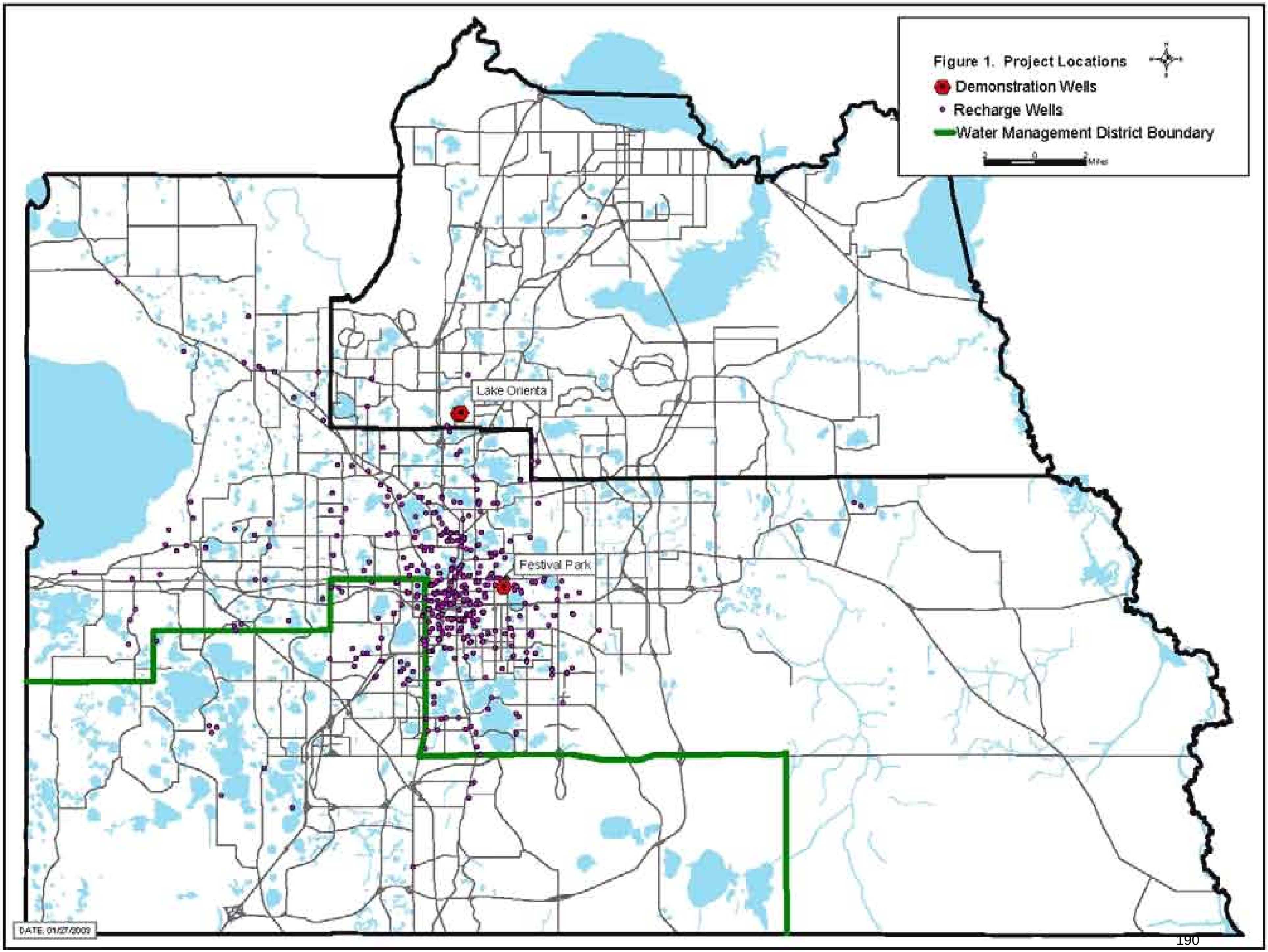
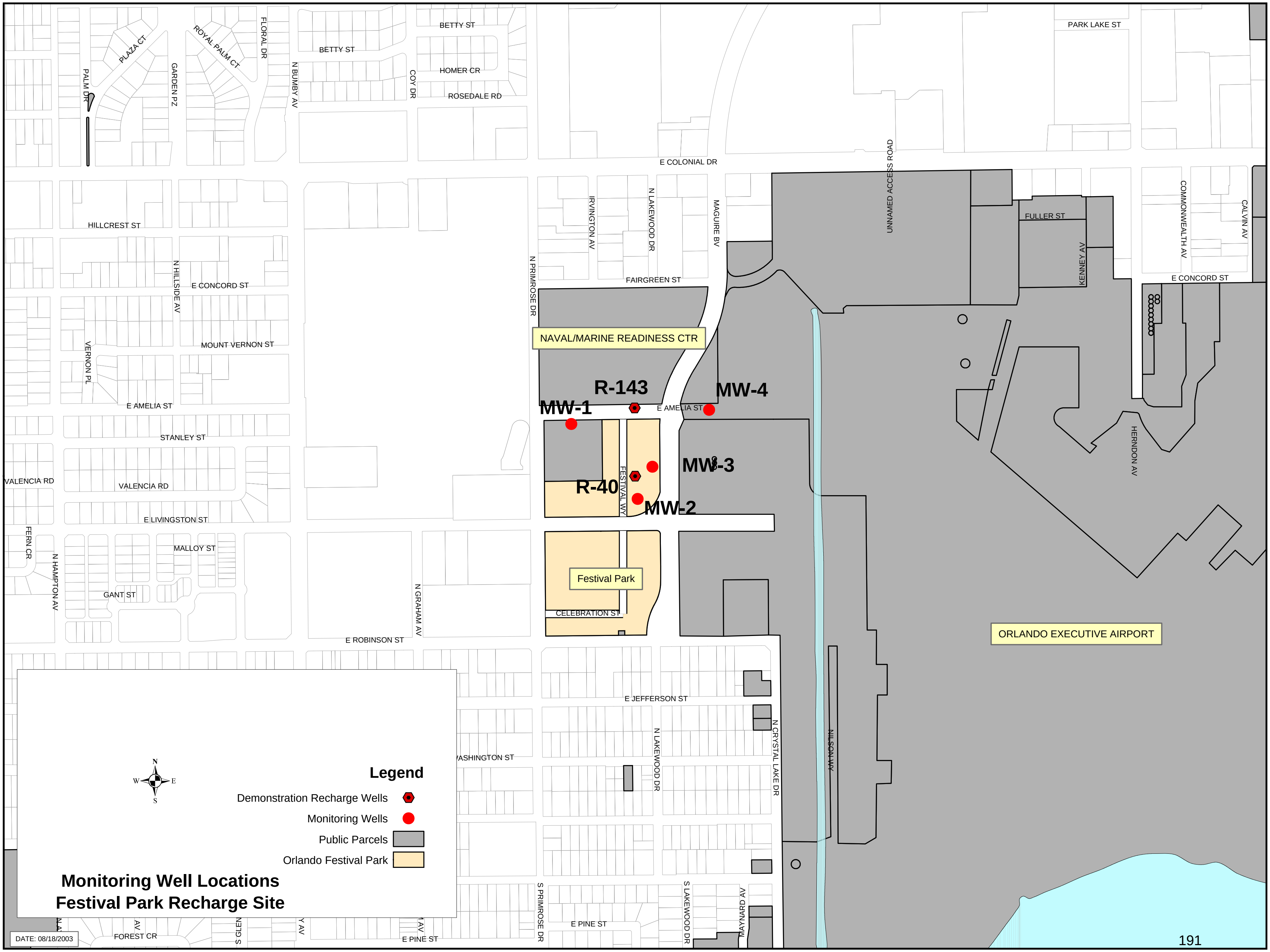


Figure 1. Project Locations
Demonstration Wells
Recharge Wells
Water Management District Boundary
Lake Orienta
Festival Park
DATE: 01/27/2009



Monitoring Well Locations
Festival Park Recharge Site

TABLE 2
Completion Characteristics of the Recharge Wells

Well	Diameter (Inches)	Cased Depth (Feet)	Total Depth (Feet)
Festival Park (Well 40)	12	195	490[b]
Festival Park (Well 143)	10	140	315
Lake Orienta 319 Barclay Avenue (S-1513)	10	Unknown	120
Lake Orienta 421 Barclay Avenue (S-1514)	12	270	326
Lake Orienta 505 Barclay Avenue (S-1515)	10	56	125

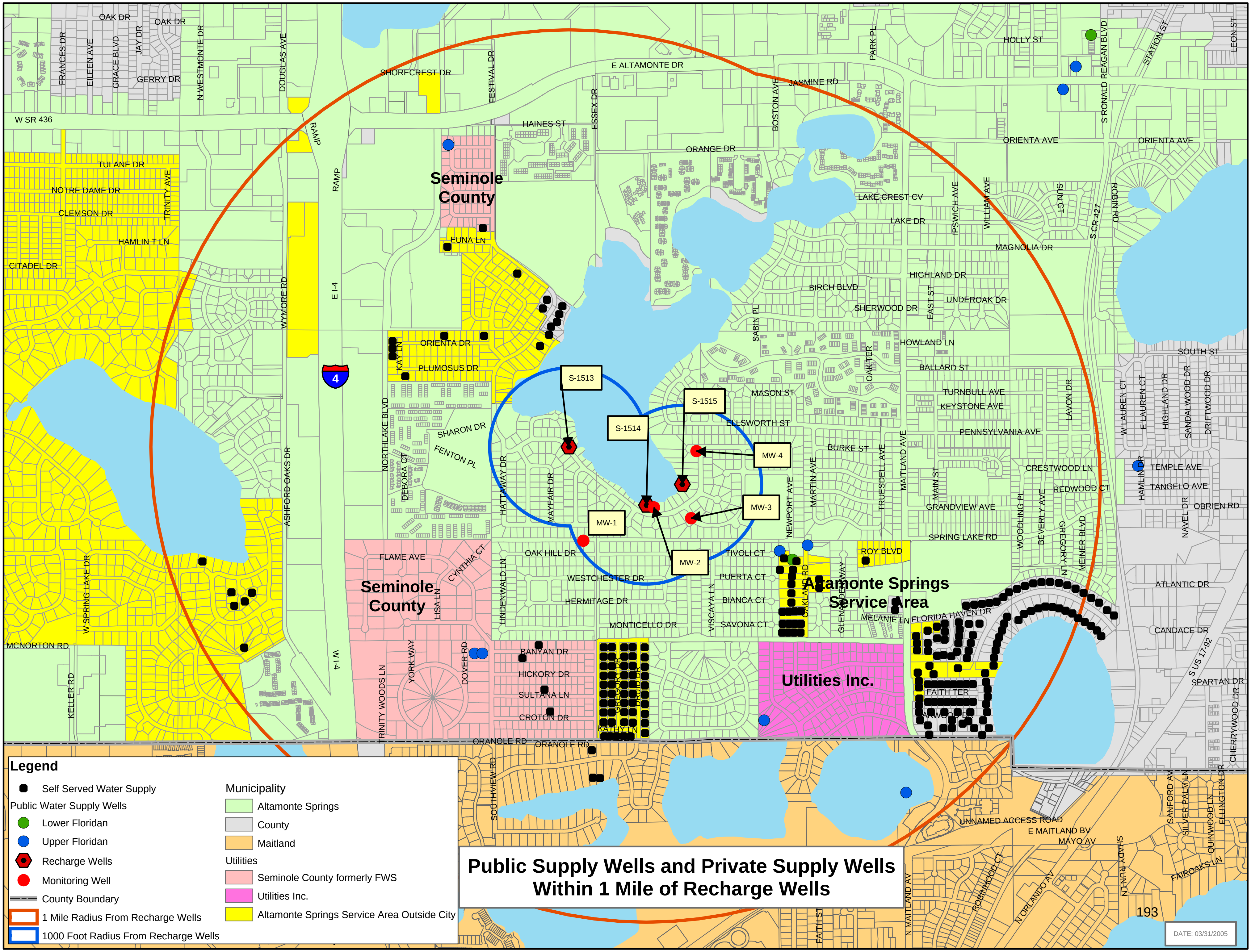
[a] Original reported total depth was 450 feet (PEC, 1999)
[b] Total depth through geophysical logging (8/3/00), reported total constructed depth - 1049 feet, USGS inventory card depth – 350 feet.

Lake Orienta

Lake Orienta is located in south central Altamonte Springs, Florida. The drainage basin for the lake consists of 135-acre lake with a 916-acre tributary watershed for a total basin area of 1,015 acres (CH2M HILL, 1998). The area around and near the lake is developed by residential and commercial land uses in a suburban setting. The properties around Lake Orienta are prone to chronic flooding when the runoff from rainfall and direct rainfall exceeds the capacity of the two recharge wells on the southern shore of the lake. The dates of the installations of the recharge wells are unknown. However, they were constructed prior to promulgation of the Safe Drinking Water Act in 1972. Completion characteristics of the wells are presented in Table 2. A site map is presented in Figure 3.

Surveys for private wells were conducted that concluded with the finding that numerous public and private water supply well were within 1 mile of the site. Discussions with City of Altamonte Springs staff indicated that very few records on locations construction characteristics are available on the private wells in the area based on previous searches and coordination with the Health Department. Therefore, the four water supply utilities within 1 mile of the recharge wells were contacted for locations that were not served potable water by the utilities. By inference, these locations are served water through private wells. The locations of the private water supply wells or suspected locations of private supply wells are shown in Figure 3.

The City's Water Treatment Plant (WTP) No. 2 is located southeast of the lake. In personal communications with City staff, two Upper Floridan aquifer supply wells (Well No. 3 and Well No. 4) were abandoned in 1995 because of chronic bacteriological exceedences. WTP No. 2 is currently provided water by three Lower Floridan aquifer wells.



Public Supply Wells and Private Supply Wells Within 1 Mile of Recharge Wells

Operations

Festival Park

The recharge wells at Festival Park receive direct runoff from gravity flow of the storm water collection system without an interceding surface water body. As a result, when it the rainfall exceed a certain intensities and durations, runoff occurs that is collected by the system and is routed to the recharge well. As a result, the durations of recharge events from rainfall are short and intensities of the events are consistent with the intensities of rainfall events. However, it was observed during the project that wells consistently receive inflow of water even during prolonged rainless periods. The source of this water is unknown and could be intercepted surficial aquifer water.

Four monitoring wells (MW-1 through MW-4) were installed at the site to monitor for changes of water quality during the project. The subsequent use of the wells for monitoring was verified through the groundwater tracer test. Their locations are presented in Figure 2.

Lake Orienta Park

The recharge wells at Lake Orienta receive water through gravity flow when the lake stage exceeds the elevation of the intake structures. Lake stage elevation data from the City indicate that the stage generally exceeds the inlet elevations during August through October. As a result of the intervening storage characteristics of the lake, the recharge through the wells is prolonged, steady, and seasonally consistent with the end of the summer rainy season.

Additionally, the wells at 421 and 505 Barclay are fitted with lower elevation inlets than the normal operations inlets. The lower inlets can be opened to lower the lake stage to provide additional storage in preparation of unusually wet conditions. The lower inlets can opened after the receipt of an Emergency Order from FDEP. The City of Altamonte Springs must apply for an Emergency Order.

Four monitoring wells (MW-1 through MW-4) were installed at the site to allow groundwater sampling to measure changes of water quality during the project. The subsequent use of the wells for monitoring was verified through the groundwater tracer test. Their locations are presented in Figure 3.

Conclusion

The primary observation on the operations of the two recharge well systems is that the Festival Park well receive water wells on an ephemeral basis directly related to rainfall events with a baseflow component, while the Lake Orienta receive water on a seasonal basis with relatively steady flow conditions when the level of the lake rises above the inlet elevations.

Results and Conclusions

Results from three tasks will be presented: qualitative groundwater tracer test, dry-period characterization, baseline characterization, and operational characterization.

Dry-Period Characterization

Dry-period characterization was conducted during August 2001 to take advantage of an abnormally prolonged period of low rainfall when the lake-level control recharge wells did not receive water. Since the recharge wells have been present and operating on an as-needed basis for over 40 years, this represented a reasonable opportunity to evaluate baseline conditions of groundwater quality. One well at Lake Sherwood and two wells at Lake Orienta (S-1514 and S-1515) were sampled. During this event, the recharge wells (not monitoring wells) were directly sampled. During subsequent characterization events, inflow or lake waters were sampled for influent water quality, and monitoring wells were sampled for groundwater quality.

The water quality from the three recharge wells exhibited characteristics and influence of surface water contribution relative to Upper Floridan aquifer water, for example:

- Total Coliform concentration of 210 to 250 colony forming units per 100 milliliters (cfu/100 mL). Floridan aquifer concentrations are expected to be less than 1 cfu/100 mL.
- Color measurement of 10 to 50 color units. Floridan aquifer concentrations are expected to be less than 1 color unit.
- Total organic carbon (TOC) concentrations between 1.2 and 22 mg/L. Floridan aquifer concentrations are expected to be less than 1 mg/L.
- Turbidity measurement of 0.75 to 36J (estimated) Nephelometric Turbidity Units (NTU). Measurement of Floridan aquifer water is expected to be less than 1 NTU.
- The presence of ammonia nitrogen between 0.13 and 1.2 milligrams per liter (mg/L). Ammonia nitrogen is expected to be undetected in Floridan aquifer groundwater.
- Iron concentrations of 0.29 to 6.3 mg/L. Iron is expected to be undetected in Floridan aquifer groundwater.

The Lake Sherwood site was not investigated beyond dry-period characterization because the lake level was sufficiently low that it was considered unlikely that the level would rise to greater than the inlet of the well during the time period of the project.

The presence of S-1513 was not identified at the time, and therefore dry-period characterization was not performed. The relevant results of the dry-period characterization will be included the section operational characterization phase for Lake Orienta.

The Festival Park site was not formally established as a project site at the time, and therefore dry-period characterization was not performed.

A more detailed description of the dry-period characterization and its results was presented in Status Report 3, distributed through email on December 28, 2001.

Conclusion

The primary conclusion from the Dry Period Characterization is that the water in the recharge wells has characteristics of surface water.

Qualitative Groundwater Tracer Test

The qualitative groundwater tracer tests were performed at each site to provide evidence of which monitoring wells were in hydraulic connection with which recharge wells through the aquifer. This led to modification of the sampling plans for better focused sampling for the characterization phases of the project.

At both sites different tracers were introduced into each of the recharge wells while the recharge wells were receiving water. Two tracers were used at Festival Park: fluorescein and eosine. Three tracers were used at Lake Orienta: fluorescein, eosine, and Rhodamine WT. Prior to tracer introduction, the monitoring wells were sampled for background indications of the tracers that could interfere with the interpretation of the results of the tests. Tracers were either not detected or detected at sufficiently low concentrations to not interfere with the interpretation the laboratory results. The use of different tracers allowed the verification of hydraulic connection between individual recharge wells and individual monitoring wells.

For the tests at both sites, strings of activated carbon sample packs were positioned over the open-hole intervals of the monitoring wells to intercept tracers in the groundwater flowing past the monitoring wells. Sample packs were spaced on the strings at intervals between 10 and 15 feet. The strings were replaced at approximately 2-week intervals then sample packs were preserved and transported to the laboratory for analysis. Laboratory results represent the accumulation of tracer on the activated carbon during a particular 2-week interval when the sample packs were in the monitoring wells. The durations of the tracer tests were 12 weeks.

Festival Park

The results of the tracer test at Festival Park were

- Tracer from one recharge well was recovered from two monitoring wells.
- Tracer (fluorescein) introduced into R-143 was recovered in sample packs from MW-1 and MW-2 within the first 2-week interval of the tracer test indicating that the two monitoring wells are in hydraulic connection with the recharge well. This further indicates that the groundwater travel time between the recharge well and the two monitoring wells is less than 2 weeks. MW-1 is approximately 350 feet west of R-143; MW-2 is approximately 500 feet south of R-143.
- The strength of the tracer signature from MW-1 was approximately 200 times greater than the strength of the tracer signature from MW-2. This suggests that the pathway between R-143 to MW-1 is more robust than the pathway between R-143 and MW-2.
- Tracer (eosine) from R-40 was not recovered from the four monitoring wells during the 12-week interval of the tracer test.
- Tracers were not recovered in sample packs placed in MW-3 and MW-4.
- The sampling plan for the operational characterization phase was modified as a result of the tracer test. MW-3 was removed from the sampling plan and MW-4 was retained as the site reference sampling location for the characterization phase.

A more detailed description of the Festival Park tracer test and its results was presented in Status Report 6, distributed through email on October 2, 2003.

Lake Orienta

The results of the tracer test at Lake Orienta were

- Tracers introduced into two recharge wells were recovered from one monitoring well.
- Tracer (eosine) from S-1514 was recovered in sample packs from MW-2 within the first 2-week interval of the tracer test indicating that the two monitoring well is in hydraulic connection with the recharge well. This indicates that the travel time between S-1514 and MW-2 is less than 2 weeks. MW-2 is located approximately 100 feet east of S-1514.
- Tracer (fluorescein) from S-1513 was positively identified in sample packs from MW-2 within the fourth 2-week interval of the tracer test indicating that the two monitoring well is in hydraulic connection with the recharge well. This indicates that the travel time between S-1513 and MW-2 is between 6 and 8 weeks. MW-2 is located approximately 1350 feet east of S-1513.
- Tracer (Rhodamine WT) from S-1515 was not recovered from the four monitoring wells during the 12-week interval of the tracer test.
- Traces were not recovered in sample packs from MW-1, MW-3, and MW-4.
- The sampling plan for the Operational Characterization task was modified as a result of the tracer test. MW-3 and MW-4 were removed from the sampling plan and MW-1 was retained as the site reference sampling location for the characterization phase.

A more detailed description of the Festival Park tracer test and its results was presented in Status Report 8, distributed through email on May 24, 2005.

Conclusion

The tracer tests resulted in verifying that one or more monitoring wells are in hydraulic connection with one or more monitoring wells through the Upper Floridan aquifer. Sampling plans for subsequent characterization tasks were modified to focus on monitoring well(s) that are in connection with the recharge well(s), plus one well for each site not in hydraulic connection to monitor site reference conditions.

Baseline and Operational Characterizations

Samples were collected from both sites during the baseline and operational characterization tasks as presented in Table 3.

TABLE 3.
Sampling Locations for Operational Characterization Tasks

Site	Source Water Location	Characterization Locations	Reference Location
Festival Park	Inflow to R-143	MW-1 and MW-2	MW-4
Lake Orienta	Lake Orienta	MW-2	MW-1

QA/QC samples were collected for each characterization event for duplicate, matrix spike, and matrix spike duplicate, for all chemical analyses, and trip blank for volatile organic chemicals.

One baseline characterization sample and six operational characterization samples were collected from the Festival Park site. The opportunity to collect a true baseline characterization sample set at Lake Orienta was missed because the City received an Emergency Order to operate the lower inlets of the wells before the characterization sampling could occur. The City applied for and received the order to be prepared for stormwater management volume in anticipation in a more active than usual hurricane season. One baseline characterization sample and seven operational characterization samples were collected from the Lake Orienta site.

The differing flow characteristics (more ephemeral at Festival Park versus more seasonal and steady at Lake Orienta) between the sites and the groundwater travel times for both sites will be considered to compare the results of the characterization samplings.

Microbiological Results

The microbiological parameters were bacteria (total coliform, fecal coliform, *Escherichia coli* [*E. coli*], and enterococci), virus (coliphage), and parasites (*Giardia* spp. and *Cryptosporidium* spp.). Coliphage (virus that attacks coliform bacteria) were not detected in the samples at either site and will not be presented further. *Giardia* were not detected in the samples from either site and will not be presented further. *Cryptosporidium* was detected in one lake sample from Lake Orienta at 1 (oo)cyst per 100 mL and will not be presented further.

The range of bacteria concentrations of the influent water at the two sites are presented in Table 4 and the range of bacteria concentrations in the groundwater from the characterization monitoring wells from the two sites are presented in Table 5.

TABLE 4
Range of Bacteria Concentrations of Source Water

Organism	Units	Festival Park Inflow to R-143 Low	Festival Park Inflow to R-143 High	Lake Orienta Low	Lake Orienta High
Total Coliform	cfu/100 mL	990	1,000,000	27	1,400
Fecal Coliform	cfu/100 mL	860	980,000	32	833
E. coli	cfu/100 mL	180	2,400	15	167
Enterococcus	cfu/100 mL	69	3,400	2.7	36,000

Festival Park - 1 Baseline characterization and 6 Operational Characterization sample sets
Lake Orienta - 1 Baseline characterization and 7 Operational Characterization sample sets

TABLE 5
Range of Bacteria Concentrations of Floridan Aquifer Water

	Location	Festival Park						Lake Orienta			
	Purpose	Characterization				Reference		Characterization		Reference	
	Well	MW-1		MW-2		MW-4		MW-2		MW-1	
Organism	Units	Low	High	Low	High	Low	High	Low	High	Low	High
Total Coliform	cfu/100 mL	<0.2	7.4	<0.2	474	<0.2	5.5	<0.09	60	<0.09	7.7
Fecal Coliform	cfu/100 mL	<0.2	5.9	<0.2	585	<0.2	5.3	<0.09	0.09	<0.09	0.65
E. coli	cfu/100 mL	<0.2	2.3	<0.2	1.52	<0.2	<0.2	<0.09	0.09	<0.09	<3
Enterococcus	cfu/100 mL	<0.2	23	<0.2	3.16	<0.2	13	0.19	0.83	<0.09	0.37

Festival Park - 1 Baseline characterization and 6 Operational Characterization sample sets
Lake Orienta - 1 Baseline characterization and 7 Operational Characterization sample sets

Conclusions

Inspection of the tables provides the following conclusions:

- Concentrations of bacteria measured from the influent to R-143 at Festival Park were significantly higher than measured from Lake Orienta water.
- Comparison of the values indicates that groundwater concentrations are at least 2 orders-of-magnitude lower and up to 6 orders-of-magnitude lower than the source waters.
- For Festival Park, the concentrations for the reference sampling location (MW-4) compare well with the lesser of the two characterization sampling locations (MW-1); and for Lake Orienta the concentrations for the reference sampling location (MW-1) compare well with the characterization sampling location (MW-2), but to a lesser degree. This indicates that the groundwater is impacted more broadly than indicated by the results of the tracer test would imply. This is expected considering the long period of recharge operation at the sites.

Chemical Results

Chemical analyte groups were field parameter measurements, general chemistry, nutrients, metals, radioligicals, total recoverable petroleum hydrocarbons (TRPH), volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), organochlorine pesticides, polychlorinated byphenols (PCBs), organophosphorous pesticides, and chlorinated herbicides. With the exception of the detection of several VOCs from several locations at Festival Park and of TRPH at one location at Festival Park, no other synthetic organic chemicals were positively detected from samples collected at either site. These nondetections will not be presented further.

Volatile Organic Chemicals

The following VOCs were positively detected during the different tasks of this project:

- Lake Sherwood recharge well during the dry-period characterization
  - Methyl ethyl keytone at 160 µg/L. The Groundwater Cleanup Target Level (GCTL) is 4200 µg/L.

- Festival Park during the baseline characterization
  - Cis-1,2-dichloroethylene at 2.3 µg/L and 2.4 µg/L from MW-2 and MW-3, respectively. The DWS is 70 µg/L.
  - 1,1-dichloroethane at 1.1 µg/L and 1.2 µg/L from MW-1 and MW-2, respectively. The GCTL is 700 µg/L.
  - 1,1-dichloroethene at 1.4 µg/L. The DWS is 7 µg/L.

- Festival Park during the operational characterization
  - Cis-1,2-dichloroethylene at three detections between 1.1 and 2.9 µg/L from inflow to R-143, and six detections between 3.5 and 4.5 µg/L from MW-2. The DWS is 70 µg/L.
  - 1,1-dichloroethane six detections between 2.1 and 2.5 µg/L from MW-2. The GCTL is 700 µg/L.
  - Tetrachloroethylene at 1.1 µg/L from inflow to R-143. The DWS is 3 µg/L.

Total Recoverable Petroleum Hydrocarbons

TRPH was positively detected twice from the inflow to R-143 at 0.82 mg/L. The GCTL is 5 mg/L.

Arsenic

The most pertinent result of this project is the presence of arsenic in the groundwater at concentrations that exceed the Drinking Water Standard (10 µg/L), when it was not present in the source water. Summaries of the results of influent water and groundwater analyses for arsenic are presented in Tables 6 and 7. None of the seven samples from the inflow to R-143 at Festival Park resulted in positive detection of arsenic. One of eight samples of the surface water at Lake Orienta resulted in the positive detection of arsenic. Thirteen of fourteen groundwater samples from wells characterization wells at Festival Park resulted in positive detections of arsenic. None Zero of the eight groundwater samples from site reference well (MW-4) at Festival Park resulted in positive detections of arsenic.

TABLE 6
Range of Arsenic Concentrations of Influent Water

Parameter	Units	Festival Park Inflow to R-143 Low	Festival Park Inflow to R-143 High	Lake Orienta Low	Lake Orienta High
Arsenic	µg/L	nd	nd	nd	7.03

nd – not detected

TABLE 7
Range of Arsenic Concentrations of Floridan Aquifer Water

Location		Festival Park						Lake Orienta			
Purpose		Characterization				Reference		Characterization		Reference	
Well		MW-1		MW-2		MW-4		MW-2		MW-1	
Parameter	Units	Low	High	Low	High	Low	High	Low	High	Low	High
Arsenic	µg/L	6.0	9.39	nd	19.4	nd	nd	8.88	17.2	8.16	15.3

nd – not detected

Conclusion

These observations indicate that the recharge of surface water to the Upper Floridan aquifer at these two sites results in the increase of arsenic concentrations in the groundwater. This has been a recent topic in aquifer storage/recovery systems where a similar phenomenon has been observed. Research is being conducted on the cause and affect relationship between recharge of treated, partially treated, and untreated water to the Upper Floridan aquifer at various locations in Florida.

Overall Conclusions

Based on the tasks completed to data the following is concluded:

- The two recharge well systems active for greater than 40 to 60 years. Results represent effects of long-term operations.
- 2- to 6- orders-of-magnitude reduction of bacteria concentrations was observed in groundwater based on differences between source water concentrations and Floridan aquifer concentrations.
- Arsenic mobilization is observed at concentrations that exceed the MCL at both sites.
- Synthetic organics largely undetected at Festival Park, detections were less than the MCLs.
- Synthetic organics were undetected at Lake Orienta.
- Results of the project were different than the prevailing thought at the beginning of the project:
  - Microbial impact to groundwater was thought to be the dominant constituent set of concern.

– Significant synthetic organics were expected to be detected from urban runoff site (Festival Park) because of the nature of the runoff
– Arsenic was not considered as a decision-driving constituent. It is now because of the change on the Maximum Contaminant Level from 50 µg/L to 10 µg/L during the project.

Preliminary Recommendations

- Do not proceed with treatment facilities and subsequent characterization evaluations
- Prepare final report
- Notify public heath agencies in Orange and Seminole Counties concerning potential impacts to private groundwater supplies
- Promote and participate in increased research of microbiological survivability in the Floridan aquifer
- Participate in continued mineralogy and geochemistry research regarding mechanisms for arsenic mobilization and treatment strategies and processes to control it.
- Coordinate with FDEP on interpretation of regulations

Reference

CH2M HILL. *Central Florida Artificial Recharge Demonstration Program: Alternative Water Supply Strategies in the St. Johns River Water Management District.* Special Publication SJ98-SP11. SJRWMD. Palatka, FL. 1998

Appendix B

Characterization Sampling Results

Water Quality Data Comparison to Criteria
from the Dry Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

		Location:	Lake Orienta S-1515		Lake Orienta S-1514		Lake Sherwood	
		SampleID :	LO-E-R-DP		LO-W-R-DP		LS-R	
		DateCollected :	23-Aug-01		23-Aug-01		13-Aug-01	
		Matrix :	WA		WA		WA	
		SampleType :	Groundwater		Groundwater		Groundwater	
Class	Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual
	Radiologicals							
Genchem	ALPHA, GROSS	pCi/L	5.5	=	9.8	=	3.3	=
Genchem	BETA, GROSS	pCi/L	4.7	=	6.8	=	10.4	=
	Ion Balance							
	Calcium	meq/L	3.0		3.3		1.8	
	Magnesium	meq/L	0.2		0.8		0.9	
	Sodium	meq/L	0.3		0.5		0.6	
	Potassium	meq/L	0.0		0.0		0.1	
	Sum of cations	meq/L	3.5		4.6		3.4	
	Bicarbonate	meq/L	2.8		2.6		2.2	
	Carbonate	meq/L						
	Hydroxide	meq/L						
	Chloride	meq/L	0.5		0.5		0.3	
	Sulfate	meq/L	0.3		1.1		0.3	
	Sum of anions	meq/L	3.6		4.3		2.8	
	Balance (% difference)		0.7%		-3.3%		-9.1%	
	Anions							
Genchem	ALKALINITY, BICARBONATE (AS CACO3)	mg/L	140	=	130	=	110	=
Genchem	CHLORIDE (AS CL)	mg/L	17	=	19	=	9.7	=
Genchem	CARBONATE (AS CO3)	mg/L	1.534	U	1.534	U	1.534	U
Genchem	FLUORIDE	mg/L	0.062	U	0.062	U	0.36	=
Genchem	SULFATE (AS SO4)	mg/L	14	=	55	=	16	=
	Nutrients							
Genchem	NITROGEN, KJELDAHL, TOTAL	mg/L	0.36	J	2	=	1.4	=
Genchem	NITROGEN, AMMONIA (AS N)	mg/L	0.13	=	0.46	=	1.2	=
Genchem	NITROGEN, NITRITE	mg/L	0.042	U	0.042	U	0.042	U
Genchem	NITROGEN, NITRATE (AS N)	mg/L	0.054	U	0.054	U	0.054	U
Genchem	NITROGEN, NITRATE (AS N)	mg/L	0.054	U	0.054	U	0.054	U
Genchem	PHOSPHORUS, TOTAL (AS P)	mg/L	0.036	=	0.42	=	0.045	=
Genchem	PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.09	=	0.045	=	0.009	J
	General Chemistry							
Genchem	TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	240	=	270	=	150	=
Genchem	TURBIDITY	NTU	0.75	=	**12**	=	**36**	J
Genchem	COLOR	COLOR UNIT	10	=	**50**	=	20	J
Genchem	BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	0.99	U	0.99	U	0.99	U
Genchem	TOTAL ORGANIC CARBON	mg/L	1.2	=	2.1	=	22	=
Genchem	DISSOLVED ORGANIC CARBON	mg/L	1.2	=	1.4	=	2.5	=
Genchem	METHYLENE BLUE ACTIVE SUBSTANCES	mg/L	0.047	U	0.095	J	0.047	U
	Metals							
Metals	ALUMINUM	µg/L	120	U	**1610**	=	88.4	UJ
Metals	ANTIMONY	µg/L	0.14	U	0.14	U	0.14	U
Metals	ARSENIC	µg/L	0.4	U	6.36	=	1.09	=
Metals	BARIUM	µg/L	8.79	J	21	J	14.1	=
Metals	BERYLLIUM	µg/L	0.041	J	0.04	U	0.04	U
Metals	CADMIUM	µg/L	0.233	J	1.46	=	0.08	U
Metals	CALCIUM	µg/L	60000	=	65900	=	36600	=
Metals	CHROMIUM, TOTAL	µg/L	0.4	U	3.17	J	0.478	U
Metals	COBALT	µg/L	0.142	J	0.37	J	0.434	J
Metals	COPPER	µg/L	0.12	UJ	16.6	J	3	U
Metals	IRON	µg/L	292	=	**4680**	=	**6310**	=
Metals	LEAD	µg/L	0.131	U	9.24	=	0.972	J
Metals	MAGNESIUM	µg/L	2410	=	9260	=	10600	=
Metals	MANGANESE	µg/L	10.8	=	**61.4**	=	**76.5**	=
metals	MERCURY	µg/L	0.1	U	0.1	U	0.1	U
Metals	NICKEL	µg/L	5.08	=	6.77	=	23	=
Metals	POTASSIUM	µg/L	1380	J	1780	J	2760	J
Metals	SELENIUM	µg/L	1	U	2.38	U	1	U
Metals	SILVER	µg/L	0.047	J	0.02	U	10.3	U
Metals	SODIUM	µg/L	6630	=	10900	=	14900	J
Metals	THALLIUM	µg/L	0.02	U	0.02	U	0.02	U
Metals	VANADIUM	µg/L	0.351	J	6.95	J	0.08	U
Metals	ZINC	µg/L	1	U	26.8	=	1.66	J
	Total Petroleum Hydrocarbons							
TPH	TPH (C8 - C40 PRO)	mg/L	0.2	U	0.2	U	0.2	U
	Volatile Organic Compounds							
VOC	ACETONE	µg/L	50	UJ	50	UJ	50	U
VOC	ACROLEIN	µg/L	100	UJ	100	UJ	100	UJ
VOC	ACRYLONITRILE	µg/L	10	UJ	10	UJ	10	U
VOC	BENZENE	µg/L	1	U	1	U	1	U
VOC	BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U
VOC	BROMOFORM	µg/L	1	UJ	1	UJ	1	U
VOC	BROMOMETHANE	µg/L	1	U	1	U	1	U
VOC	METHYL ETHYL KETONE (2-BUTANONE)	µg/L	27	J	3.9	J	160	=
VOC	CARBON DISULFIDE	µg/L	5	U	5	U	5	U
VOC	CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U
VOC	CHLOROBENZENE	µg/L	1	U	1	U	1	U
VOC	CHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	2-CHLOROETHYL VINYL ETHER	µg/L	5	UJ	5	UJ	5	U

Water Quality Data Comparison to Criteria
from the Dry Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

		Location:	Lake Orienta S-1515		Lake Orienta S-1514		Lake Sherwood	
		SampleID :	LO-E-R-DP		LO-W-R-DP		LS-R	
		DateCollected :	23-Aug-01		23-Aug-01		13-Aug-01	
		Matrix :	WA		WA		WA	
		SampleType :	Groundwater		Groundwater		Groundwater	
Class	Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual
VOC	CHLOROFORM	µg/L	1	U	1	U	1	U
VOC	CHLOROMETHANE	µg/L	1	U	1	U	1	U
VOC	DIBROMOCHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U
VOC	1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U
VOC	1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U
VOC	1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U
VOC	DICHLORODIFLUOROMETHANE	µg/L	5	U	5	U	5	U
VOC	1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U
VOC	cis-1,2-DICHLOROETHYLENE	µg/L	1	U	1	U	1	U
VOC	trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U
VOC	1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U
VOC	cis-1,2-DICHLOROETHYLENE	µg/L	1	U	1	U	1	U
VOC	trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U
VOC	ETHYLBENZENE	µg/L	1	U	1	U	1	U
VOC	2-HEXANONE	µg/L	25	UJ	25	UJ	25	U
VOC	METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	25	U	25	U	25	U
VOC	METHYLENE CHLORIDE	µg/L	0.43	J	0.55	J	**10**	U
VOC	STYRENE	µg/L	1	U	1	U	1	U
VOC	1,1,1,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	TETRACHLOROETHYLENE(PCE)	µg/L	1	U	1	U	1	U
VOC	TOLUENE	µg/L	1	U	1	U	1	U
VOC	1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U
VOC	TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U
VOC	TRICHLOROFLUOROMETHANE	µg/L	5	U	5	U	5	U
VOC	1,2,3-TRICHLOROPROPANE	µg/L	5	UJ	5	UJ	5	U
VOC	BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U
VOC	DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U
VOC	BROMOFORM	µg/L	1	UJ	1	UJ	1	U
VOC	CHLOROFORM	µg/L	1	U	1	U	1	U
VOC	VINYL CHLORIDE	µg/L	1	U	1	U	1	U
VOC	M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U
VOC	O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U
VOC	XYLENES, TOTAL	µg/L	3	U	3	U	3	U
	Semi-volatile Organic Compound							
SVOC	ACENAPHTHENE	µg/L	5	U	5	U	5	UJ
SVOC	ACENAPHTHYLENE	µg/L	5	U	5	U	5	UJ
SVOC	ACETOPHENONE	µg/L	5	U	5	U	5	UJ
SVOC	4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	UJ
SVOC	2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	UJ
SVOC	ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	UJ
SVOC	ANTHRACENE	µg/L	5	U	5	U	5	UJ
SVOC	AZOBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	BENZIDINE	µg/L	20	U	20	U	20	UJ
SVOC	BENZO(a)ANTHRACENE	µg/L	5	U	5	U	5	UJ
SVOC	BENZO(a)PYRENE	µg/L	**5**	U	**5**	U	**5**	UJ
SVOC	BENZO(b)FLUORANTHENE	µg/L	5	U	5	U	5	UJ
SVOC	BENZO(g,h,i)PERYLENE	µg/L	5	U	5	U	5	UJ
SVOC	BENZO(k)FLUORANTHENE	µg/L	5	U	5	U	5	UJ
SVOC	BENZYL ALCOHOL	µg/L	5	U	5	U	5	UJ
SVOC	bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	UJ
SVOC	bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5	UJ
SVOC	2,2'-OXYBIS(1-CHLORO)PROPANE	µg/L	5	U	5	U	5	UJ
SVOC	bis(2-ETHYLHEXYL) PHTHALATE	µg/L	5	U	5	U	5	UJ
SVOC	4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	UJ
SVOC	BENZYL BUTYL PHTHALATE	µg/L	10	U	10	U	10	UJ
SVOC	CARBAZOLE	µg/L	5	U	5	U	5	UJ
SVOC	4-CHLORO-3-METHYLPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	4-CHLOROANILINE	µg/L	5	U	5	U	5	UJ
SVOC	1-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	UJ
SVOC	2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	UJ
SVOC	2-CHLOROPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	UJ
SVOC	CHRYSENE	µg/L	5	U	5	U	5	UJ
SVOC	DIBENZ(a,h)ANTHRACENE	µg/L	5	U	5	U	5	UJ
SVOC	DIBENZOFURAN	µg/L	5	U	5	U	5	UJ
SVOC	1,2-DICHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	1,3-DICHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	1,4-DICHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5	UJ
SVOC	2,4-DICHLOROPHENOL	µg/L	5	U	5	UJ	5	UJ
SVOC	2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	DIETHYL PHTHALATE	µg/L	5	U	5	U	5	UJ
SVOC	DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	UJ
SVOC	p-DIMETHYLAMINOAZOBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	UJ

Water Quality Data Comparison to Criteria
from the Dry Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

		Location:	Lake Orienta S-1515		Lake Orienta S-1514		Lake Sherwood	
		SampleID :	LO-E-R-DP		LO-W-R-DP		LS-R	
		DateCollected :	23-Aug-01		23-Aug-01		13-Aug-01	
		Matrix :	WA		WA		WA	
		SampleType :	Groundwater		Groundwater		Groundwater	
Class	Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual
SVOC	3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10	U	10	UJ
SVOC	2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	DI-n-BUTYL PHTHALATE	µg/L	5	U	5	U	5	UJ
SVOC	4,6-DINITRO-2-METHYLPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	1,3-DINITROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	2,4-DINITROPHENOL	µg/L	20	U	20	U	20	UJ
SVOC	2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	UJ
SVOC	2,6-DINITROTOLUENE	µg/L	5	U	5	U	5	UJ
SVOC	2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	UJ
SVOC	2,6-DINITROTOLUENE	µg/L	5	U	5	U	5	UJ
SVOC	DI-n-OCTYLPHTHALATE	µg/L	10	U	10	U	10	UJ
SVOC	DIPHENYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	1,2-DIPHENYLHYDRAZINE	µg/L	5	U	5	U	5	UJ
SVOC	FLUORANTHENE	µg/L	5	U	5	U	5	UJ
SVOC	FLUORENE	µg/L	5	U	5	U	5	UJ
SVOC	HEXACHLOROBENZENE	µg/L	**5**	U	**5**	U	**5**	UJ
SVOC	HEXACHLOROBUTADIENE	µg/L	5	U	5	U	5	UJ
SVOC	HEXACHLOROCYCLOPENTADIENE	µg/L	5	U	5	U	5	UJ
SVOC	HEXACHLOROETHANE	µg/L	5	UJ	5	UJ	5	UJ
SVOC	HEXACHLOROPROPENE	µg/L	5	U	5	U	5	UJ
SVOC	INDENO(1,2,3-c,d)PYRENE	µg/L	5	U	5	U	5	UJ
SVOC	ISOPHORONE	µg/L	5	U	5	U	5	UJ
SVOC	3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	UJ
SVOC	1-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	UJ
SVOC	2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	UJ
SVOC	2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	UJ
SVOC	CRESOLS, m & p	µg/L	10	U	10	U	10	UJ
SVOC	NAPHTHALENE	µg/L	5	U	5	U	5	UJ
SVOC	1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	2-NITROANILINE	µg/L	5	U	5	U	5	UJ
SVOC	3-NITROANILINE	µg/L	5	U	5	U	5	UJ
SVOC	4-NITROANILINE	µg/L	5	U	5	U	5	UJ
SVOC	NITROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	2-NITROPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	4-NITROPHENOL	µg/L	20	U	20	U	20	UJ
SVOC	N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	N-NITROSODIMETHYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5	U
SVOC	N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	UJ
SVOC	N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	UJ
SVOC	PENTACHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	PENTACHLOROPHENOL	µg/L	**20**	U	**20**	U	**20**	UJ
SVOC	PHENACETIN	µg/L	5	U	5	U	5	UJ
SVOC	PHENANTHRENE	µg/L	5	U	5	U	5	UJ
SVOC	PHENOL	µg/L	5	U	5	U	5	UJ
SVOC	2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	U	5	U	5	UJ
SVOC	PYRENE	µg/L	5	U	5	U	5	UJ
SVOC	PYRIDINE	µg/L	5	U	5	U	5	UJ
SVOC	1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	2,3,4,6-TETRACHLOROPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	UJ
SVOC	2,4,5-TRICHLOROPHENOL	µg/L	5	U	5	U	5	UJ
SVOC	2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	UJ
	Pesticides							
pest	ALDRIN	µg/L	0.02	U	0.02	U	0.02	U
pest	ALPHA-CHLORDANE	µg/L	0.02	U	0.02	U	0.02	U
pest	GAMMA-CHLORDANE	µg/L	0.02	U	0.02	U	0.02	U
pest	p,p'-DDD	µg/L	0.02	U	0.02	U	0.02	U
pest	p,p'-DDE	µg/L	0.02	U	0.02	U	0.02	U
pest	p,p'-DDT	µg/L	0.02	U	0.02	U	0.02	U
pest	DIELDRIN	µg/L	0.02	U	0.02	U	0.02	U
pest	ENDOSULFAN SULFATE	µg/L	0.02	U	0.02	U	0.02	U
pest	ALPHA ENDOSULFAN	µg/L	0.02	UJ	0.02	UJ	0.02	U
pest	BETA ENDOSULFAN	µg/L	0.02	UJ	0.02	UJ	0.02	UJ
pest	ENDRIN	µg/L	0.02	U	0.02	U	0.02	U
pest	ENDRIN ALDEHYDE	µg/L	0.02	U	0.02	U	0.02	U
pest	ENDRIN KETONE	µg/L	0.02	U	0.02	U	0.02	U
pest	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	UJ	0.02	U
pest	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	GAMMA BHC (LINDANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	UJ	0.02	U
pest	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	GAMMA BHC (LINDANE)	µg/L	0.02	U	0.02	U	0.02	U
pest	HEPTACHLOR	µg/L	0.02	U	0.02	U	0.02	U

Water Quality Data Comparison to Criteria
from the Dry Period Sampling Event
SJRWMD Alternative Water Supply Program
Central Florida Artificial Recharge Project

Class	Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual
		Location:	Lake Orienta S-1515		Lake Orienta S-1514		Lake Sherwood	
		SampleID :	LO-E-R-DP		LO-W-R-DP		LS-R	
		DateCollected :	23-Aug-01		23-Aug-01		13-Aug-01	
		Matrix :	WA		WA		WA	
		SampleType :	Groundwater		Groundwater		Groundwater	
pest	HEPTACHLOR EPOXIDE	µg/L	0.02	U	0.02	U	0.02	U
pest	METHOXYCHLOR	µg/L	0.02	U	0.02	U	0.02	U
pest	TOXAPHENE	µg/L	0.5	U	0.5	U	0.5	U
	Polychlorinated biphenols (PCBs)							
PCB	PCB, TOTAL	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1016 (AROCHLOR 1016)	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1221 (AROCHLOR 1221)	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.5	U	0.5	U
PCB	PCB-1260 (AROCHLOR 1260)	µg/L	0.5	U	0.5	U	0.5	U
	Herbicides							
HERB	2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.2	U	0.2	U	0.2	U
HERB	2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	2	U	2	U	2	U
HERB	2,4 DB	µg/L	2	U	2	U	2	U
HERB	DALAPON	µg/L	5	U	5	U	5	U
HERB	DICHLOROPROP	µg/L	2	U	2	U	2	U
HERB	DICAMBA	µg/L	0.2	U	0.2	U	0.2	U
HERB	DINOSEB	µg/L	1	U	1	U	1	U
HERB	MCPA (Methyl-4-chlorophenoxy acetic acid, 2-)	µg/L	200	U	200	U	200	U
HERB	MCPP ((2-Methyl-4-chlorophenoxy)butyric acid, 4-)	µg/L	200	U	200	U	200	U
HERB	SILVEX (2,4,5-TP)	µg/L	0.2	U	0.2	U	0.2	U

Notes:

Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.

Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.

Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory and Risk-Based Criteria.

Bolded values represent reporting limits equal to above promulgated regulatory criteria.

Boxed values represent reporting limits equal to above Risk-Based Criteria.

Bolded and boxed values represent reporting limits equal to above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifers

"=" Represents a detection at the value shown

"U" Represents a nondetection above the reporting limit shown

"J" Represents an estimated value between the method detection limit and the practical quantitation limit.

"UJ" Represents a nondetection above the value shown

Blanks for the chemical data represent nondetections

Blanks for the criteria and screening values represent no established values.

Explanation of Units

pCi/L - picoCuries per liter

mg/L - milligrams per liter

NTU - Nephelometric Turbidity Units

µg/L - micrograms per liter

Initial microbiological results for stormwater recharge project, Orlando, Florida

Organism	**Sherwood Lake** 8/13/01	**Lake Orienta-West** 8/23/01	**Lake Orienta-East** 8/23/01
Total coliform	235	210	250
Fecal coliform	7	36	< 1
E. coli	< 1	1	2
Enterococci	9	4	< 1
C. perfringens	< 1	< 1	< 1
Cryptosporidium	< 30.5 / 100 L	< 34 / 100 L	< 2 / 100 L
Giardia	< 30.5 / 100 L	< 34 / 100 L	< 2 / 100 L
Somatic coliphage	< 5	< 5	< 5
1 liter enrichment	neg.	not done	not done
F+ coliphage	< 5	5	< 5
1liter enrichment	neg.	not done	not done

* Organism concentrations in cfu/pfu per 100 ml except as noted for parasites

Festival Park Baseline Characterization Sampling Results
SJRWMD CFARE1

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements															
pH	Std. Units	5.89		6.45		9.22		7.38		11.1		11.1		10.17	
TEMPERATURE	℃	32.8		29.2		25.4		25.5		25.4		25.4		24.9	
CONDUCTANCE	µmhos	139		218		226		360		501		501		131	
TURBIDITY	NTU	2.95		4.79		1.2		1.24		6.72		6.72		1.45	
DISSOLVED OXYGEN	mg/L	2.7		3.19		0.82		1.81		0.22		0.22		0.24	
OXIDATION/REDUCTION POTENTIAL	mV	211		195		1		252		-140		-140		10	
General Chemistry															
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	102	=	125	=	117	=	361	=	386	=	274	=	265	=
TURBIDITY	NTU	1.6	=	1.7	=	0.12	U	0.12	U	0.12	U	1	=	0.12	U
pH (laboratory)	PH UNITS	6.53	=	6.31	=	7.5	=	7.44	=	11.1	=	10.6	=	7.79	=
COLOR	COLOR UNIT	**20**	=	**20**	=	5	J	0	U	5	J	5	J	0	U
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	4.85	=	27.5	=	27.8	=	3.19	U	2.18	U	2.83	U	20.8	=
DISSOLVED ORGANIC CARBON	mg/L	4.94	U	23.8	=	24.3	=	1.52	U	2.67	U	2.81	U	2.79	U
Nutrients															
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.484	=	0.358	=	0.198	=	1.99	=	0.901	=	0.741	=	0.453	=
NITROGEN, AMMONIA (AS N)	mg/L	0.213	J	0.21	U	0.427	=	1.59	=	1.04	=	0.431	=	0.21	U
NITROGEN, KJELDAHL, TOTAL	mg/L	0.484	U	0.358	U	0.198	U	1.322	=	0.901	U	0.741	U	0.453	U
NITROGEN, NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.535	=	0.05	U	0.05	U	0.05	U
NITROGEN, NITRATE-NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.67	=	0.05	U	0.05	U	0.05	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.148	=	0.103	=	0.226	=	0.084	=	0.051	=	0.101	=	0.143	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.078	=	0.046	=	0.037	=	0.031	=	0.027	=	0.038	=	0.122	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.102	=	0.075	=	0.082	=	0.075	=	0.054	=	0.057	=	0.048	=
Anions															
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	45.5	=	53	=	152	=	211	=	1	U	11	=	188	=
ALKALINITY, CARBONATE (AS CACO3)	mg/L									60	=	92	=		
ALKALINITY, HYDROXIDE (AS CACO3)	mg/L									94	=	46	=		
CHLORIDE (AS CL)	mg/L	10.6	=	14.3	=	6.59	=	3.58	=	3.06	=	3.0	=	4.47	=
SULFATE (AS SO4)	mg/L	9.09	=	11.3	=	37.5	=	26.7	=	3.26	=	3.19	=	0.912	J
Metals															
ALUMINUM	µg/L	**73.7**	U	**76.3**	U	**150**	U	35	U	37.7	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	2.5	U	2.5	U	2.66	J	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	2.04	U	10.5	=	19.4	=	3.06	J	2.04	U	2.04	U
BARIUM	µg/L	14.3	=	16.6	=	11.1	=	35.9	=	51.1	=	35.3	=	6	=
BERYLLIUM	µg/L	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U
CALCIUM	µg/L	18500	=	21500	=	61800	=	52700	=	17100	=	20400	=	65600	=
CHROMIUM, TOTAL	µg/L	0.712	J	0.57	U	0.57	U	1.13	U	1.79	U	1.13	U	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	3.43	U	4.34	U	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**496**	=	**448**	=	16.7	U	16.7	U	30.5	U	16.7	U	18.4	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	2.05	U	3.26	U	1.76	U
MAGNESIUM	µg/L	1530	=	2030	=	4700	=	6420	=	1030	=	2080	=	3150	=
MANGANESE	µg/L	9.28	=	10.1	=	3.94	=	2.21	=	0.413	U	0.515	U	1.35	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	2.31	J	1.64	J	4.66	J	0.997	U	0.997	U	0.997	U
POTASSIUM	µg/L	1350	=	1510	=	1760	=	25400	=	56000	=	41400	=	1450	=
SELENIUM	µg/L	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.75	U
SODIUM	µg/L	6110	=	8000	=	5380	=	25600	=	29300	=	22900	=	10200	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.93	U	1.82	U	1.8	U	3.73	=	0.47	J	0.447	U	0.573	U
ZINC	µg/L	14.2	=	11.2	=	1.54	U	1.66	U	1.33	U	0.951	U	1.31	U
Ion Balance															
Calcium	meq/L	0.9		1.1		3.1		2.6		0.9		1.0		3.3	
Magnesium	meq/L	0.1		0.2		0.4		0.5		0.1		0.2		0.3	
Sodium	meq/L	0.3		0.3		0.2		1.1		1.3		1.0		0.4	
Potassium	meq/L	0.0		0.0		0.0		0.6		1.4		1.1		0.0	
Sum of cations	meq/L	1.4		1.6		3.8		4.9		3.6		3.2		4.0	
Bicarbonate	meq/L	0.9		1.1		3.0		4.2		0.0		0.2		3.8	
Carbonate	meq/L									1.2		1.8			
Hydroxide	meq/L									1.9		0.9			
Chloride	meq/L	0.3		0.4		0.2		0.1		0.1		0.1		0.1	
Sulfate	meq/L	0.2		0.2		0.8		0.6		0.1		0.1		0.0	
Sum of anions	meq/L	1.4		1.7		4.0		4.9		3.2		3.1		3.9	
Balance (% difference)		1.7%		2.1%		3.3%		-0.6%		-5.7%		-1.8%		-1.5%	
Radiologicals															
ALPHA, GROSS	pCi/l	2.4	U	0.9	U	3.1	U	4.5	=	3.9	=	2.5	U	2.9	=
BETA, GROSS	pCi/l	2.5	=	1	=	3.3	=	37.8	=	54.7	=	42.1	=	2.2	U
Total Petroleum Hydrocarbons															
PETROLEUM HYDROCARBONS	mg/L	0.43	=	0.49	=	0.35	U	0.34	U	0.34	U	0.38	=	0.36	U
Volatile Organic Compounds															
ACETONE	µg/L	3	J	3.9	J	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACROLEIN	µg/L	10	UJ	10	UJ	10	U	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	0.18	J	1	U	1	U	0.64	J	0.48	J	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	UJ
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Festival Park Baseline Characterization Sampling Results
SJRWMD CFARE1

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	0.54	J	0.52	J	1	U	2.3	=	2.4	=	3	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1.1	=	1	U	1	U	1.2	=	1	U	1	U	1	U
1,1-DICHLOROETHENE	µg/L	1.4	=	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	0.34	J	0.6	J	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.37	J	0.81	J	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.65	J	0.18	J	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	0.16	J	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	0.16	J	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound															
ACETOPHENONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
ARAMITE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-ACETYLAMINOFLUORENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
BENZYL ALCOHOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
1,3-DINITROBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5.1**	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ
2,4-DINITROTOLUENE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
DIALLATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20.2	UJ	20.4	UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
3,3'-DICHLOROBENZIDINE	µg/L	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5.1	UJ
3,3'-DIMETHYLBENZIDINE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	U	10	U	10.1	U	10.2	U
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
ISOPHORONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
KEPONE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U
METHAPYRILENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ
1,4-NAPHTHOQUINONE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
4-NITROANILINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5.1	UJ
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	U
5-NITRO-o-TOLUIDINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODI-n-PROPYLAMINE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODIMETHYLAMINE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U

Festival Park Baseline Characterization Sampling Results
SJRWMD CFARE1

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-4	
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	UJ	5.1	U
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
1,3,5-TRINITROBENZENE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
NITROBENZENE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
NITROSOMETHYLETHYLAMINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
o-TOLUIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ
p-PHENYLENEDIAMINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
PENTACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROETHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROPHENOL	µg/L	**10.1**	U	**10.1**	U	**10.1**	U	**10.1**	U	**10**	U	**10.1**	U	**10.2**	U
PHENACETIN	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
PHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
PRONAMIDE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
PYRIDINE	µg/L	5	UJ	5	UJ	5	UJ	5	U	5	U	5	U	5.1	UJ
SAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U
2,4,5-TRICHLOROPHENOL	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5.1**	U
Organochlorine Pesticides															
ALDRIN	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U
ALPHA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
GAMMA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062	UJ	0.064	UJ	0.062	U	0.063	UJ	0.062	UJ	0.061	UJ	0.062	UJ
GAMMA BHC (LINDANE)	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
DIELDRIN	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U
ALPHA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
BETA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
ENDOSULFAN SULFATE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
ENDRIN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
ENDRIN ALDEHYDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U
ENDRIN KETONE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
HEPTACHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
HEPTACHLOR EPOXIDE	µg/L	0.052	U	0.028	J	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
p,p'-DDD	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
p,p'-DDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U
p,p'-DDT	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
METHOXYCHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U
TOXAPHENE	µg/L	**3.1**	U	**3.2**	U	**3.1**	UJ	**3.2**	UJ	**3.1**	UJ	**3.1**	UJ	**3.1**	U
Organophosphorous Pesticides															
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ
NALED	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, ETHYL	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)															
PCB-1016 (AROCHLOR 1016)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1221 (AROCHLOR 1221)	µg/L	**1**	U	**1.1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1248 (AROCHLOR 1248)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U
PCB-1260 (AROCHLOR 1260)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U

Festival Park Baseline Characterization Sampling Results
SJRWMD CFARE1

Parameter Group and Name	Unit	Inflow to R-40 Result	Qual	Inflow to R-143 Result	Qual	MW-1 Result	Qual	MW-2 Result	Qual	MW-3 Result	Qual	MW-3 (Dup) Result	Qual	MW-4 Result	Qual
	SJRWMD No.	None		None		OR0018		OR0819		OR0818		OR0818		OR0141	
	SampleID :	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006	
	DateCollected :	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003	
	Matrix :	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType :	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal	
Herbicides															
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DALAPON	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
DICAMBA	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U
DICHLOROPROP	µg/L	**0.53**	U	**0.53**	U	0.53	R	**0.52**	U	**0.51**	U	**0.51**	U	**0.53**	U
DINOSEB	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ
PICLORAM	µg/L	11	UJ	10	UJ	11	R	10	UJ	10	UJ	10	UJ	11	UJ
SILVEX (2,4,5-TP)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U

Notes:
Shaded cells with bolded values represent detections equal to or above promulgated regulatory criteria.
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated regulatory criteria and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
Boxed values represent reporting limits equal or above Risk-Based Criteria.
Bolded and boxed values represent reporting limits equal or above promulgated regulatory criteria and Risk-Based Criteria.

Explanation of Qualifiers
"=" Represents a detection at the value shown
"U" Represents a nondetection above the reporting limit shown
"J" Represents an estimated value between the method detection limit and the practical quantitation limit.
"UJ" Represents a nondetection above the value shown
"R" Represents rejected data
Blanks for the criteria and screening values represent no established values.

Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

REPORT

Central Florida Artificial Recharge Demonstration Program
Festival Park, Baseline Sampling Event– Orlando, FL

Microbial Baseline Sampling Results

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Central Florida Artificial Recharge Demonstration Program Festival Park, Baseline Sampling Event – Orlando, FL

SAMPLING METHODS:

FIELD SAMPLING METHODS:

Four groundwater monitoring wells (MW1, MW2, MW3, MW4) and two storm-water recharge wells (Well R-143, the north recharge well and Well R-40, the south recharge well) were sampled for *Cryptosporidium spp., Giardia spp., Enterococcus spp.*, total coliforms, fecal coliforms, *E. coli*, and coliphage in order to establish baseline levels of these microbial indicators for the Artificial Recharge Well Demonstration Project. Envirochek HV filters were used, according to EPA Method 1623 to detect the presence of *Cryptosporidium spp.* and *Giardia spp.* at each site. The sampling apparatus used at the monitoring well sites consisted of the submersible pump attached to 125ft.of tubing, attached to the Envirochek HV filter, attached to a flow meter, attached to an outlet hose. The sampling apparatus was modified at the recharge site to incorporate a diaphragm pump, which was placed after the flow meter. Flow meters were attached to the sampling apparatus to provide accurate measurement of volume sampled.

Matrix spike (MS) and matrix spike duplicate (MSD) samples were processed according to USEPA method 1623 (USEPA, 2001) to determine the recovery efficiency of the sampling apparatus under specific field conditions and with differing water matrices (i.e. groundwater and stormwater wells). Following collection of filter samples for *Cryptosporidium spp.* and *Giardia spp.,* grab samples were collected in sterile one or two liter bottles for laboratory analysis of the concentration of four bacterial indicators and coliphage.

All equipment used in the sampling apparatus was new, and once used, it was “dedicated” to the site, labeled, and stored in separate plastic bags. These measures were taken to prevent cross contamination during later sample collection events at these sites. Also, to eliminate the need for decontamination, all tubing that precedes the filter in the sampling apparatus will be replaced with new tubing at each future sampling event.

General chemical and physical parameters of the source water were tested at the sampling sites. Water temperature, pH, turbidity, and conductivity were measured at each site and recorded on field data sheets (Table 1).

Groundwater Monitoring Wells:

Samples were collected from the monitoring wells using a submersible pump that was lowered to a depth of 120 to 125 feet bellow ground level. Following submersion, the water level was allowed to stabilize before sampling began. The pump was decontaminated between each use. In the future, sampling will be completed using dedicated bladder pumps.

Following the EPA Method 1623 approximately 946 liters of water were filtered through Envirochek HV filter capsules at sites MW2, MW3, and MW4 at a rate between 2.3 and 3.8 liters/minute (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA)(Table 1). Nine hundred twenty six liters were filtered at site MW1 due to a slightly high turbidity and clogging of the filter. Also, at MW1 large amounts of air were present in the water as it entered the filter. The aeration may be due to the geological substrate in which this well was located. The degree of water aeration was not found to be correctable with slight variation in the flow rate or pump depth.

MS and MSD samples were collected at Monitoring Well 4 (MW4) to check the precision and accuracy of the equipment used to sample for *Cryptosporidium spp.* and *Giardia spp.* For each spiked sample approximately 100 liters of water were pumped into a 32 gallon plastic trash can. *Giardia* cysts and *Cryptosporidium* oocysts (100±2 and 100±2, respectively) were added to the 100 liter sample according to the ColorSeedC&G matrix spike package insert (ColorSeed C&G; BTF, Decisive Microbiology, North Ryde, BC, Australia). The final 2-3 liters of system effluent were used to rinse the inside of the garbage can in efforts to recover any affixed (oo)cysts. The equipment used for the matrix spikes was dedicated to be used for matrix spikes only at MW4, if they are necessary in the future.

Following the collection of filter samples, a total of 7 liters of water was collected in sterile grab sample bottles. The filters and grab samples were placed in coolers with ice packs and transported to the Water Pollution Laboratory at Michigan State University for analysis.

Stormwater Recharge Wells:

Samples were collected from recharge wells using a car-battery operated automatic-demand diaphragm pump that drew water from the stormwater collection sumps of the well vaults at a depth of approximately 10ft. A 13 ft. piece of tubing was inserted into a 10ft long PVC pipe which was lowered through the well grate into the water. The sampling apparatus consisted of tubing encased in PVC piping attached to the Envirochek HV filter, attached to a flow meter, attached to a diaphragm pump, attached to an outlet hose.

At the north and south recharge wells 18.9 and 49.2 liters were filtered, respectively, due to clogging of the filter. The samples were collected at a rate between 4.2 and 5.7 liters/minute. Sampling at the North Recharge (R-143) site was complicated by recurring sudden rises in the water level. Approximately every 20 minutes the water level would rapidly rise from approximately 10 ft. below ground level to approximately 1ft. above ground level and would spray from the top of the well grate.

MS and MSD samples were collected at R-143. Approximately 10 liters of water were collected in a new 32 gallon plastic garbage can, to which the ColorSeed sample containing 100±2 *Giardia* cysts and 100±2 *Cryptosporidium* oocysts was added, according to the manufacturer specifications. The entire 10L sample was filtered at a rate of approximately 3.8 liters/minute and the final 2-3liters of system effluent were used to rinse the sides of the garbage can in efforts to recover any affixed (oo)cysts. A 10 liter sample was spiked instead of the recommended 100L due to the high turbidity and the observation that the R-143 sample filter became clogged after 18.9 liters had been filtered. The procedure was repeated for the matrix spike duplicate.

A total of 7 liters of grab samples were also collected at each stormwater recharge site. The filters and grab samples were placed in coolers with ice packs and transported to the Water Pollution Laboratory at Michigan State University for laboratory analysis.

LABORATORY METHODS:

The filters and grab samples were stored on ice and transported to the laboratory via Fed Ex next-day delivery service. The initial laboratory processing of samples was completed within 36 hours after collection. Recovery efficiency experiments are also routinely done in the laboratory to determine the accuracy and precision of laboratory methods and equipment.

Cryptosporidium spp. **and** ***Giardia spp.*****:**

Cryptosporidium spp. and *Giardia spp.* were enumerated using standard methods for filtration, elution, concentration, purification (IMS), staining and examination by IFA according to the methods described in Method 1623 (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA) (USEPA, 2001). The concentration of the final pellet was recorded on laboratory data sheets.

The resuspended pellet containing (oo)cysts was purified using immunomagnetic separation (IMS) using a Dynal Dynabeads CG combo kit. IMS was completed according to the protocol described in EPA Method 1623 with some modification. Namely, the dissociation of the bead-(oo)cyst complex was accomplished by washing the beads with 100ul of 0.1N HCl two times, instead of the suggested 50ul (Dynabeads anti-*Cryptosporidium* and anti-*Giardia*; product 730.02; Dynal A.S., Oslo, Norway). This resulted in a 200ul suspension containing cysts and oocysts, and 50ul of solution was placed on each of four slides with 5ul NaOH to neutralize the HCL. The slides were then fixed and stained using fluorescein isothiocyanate-conjugated anti-*Cryptosporidium* sp. and anti-*Giardia* sp. monoclonal antibodies (EasyStain; BTF, Decisive Microbiology, North Ryde, BC Australia) and a solution 4',6'-diamidino-2-phenylindole and propidium iodide (DAPI-PI).

(Oo)cysts on the slides were viewed and enumerated using epifluorescence microscopy. For naturally occurring (oo)cysts, the number of cysts and oocysts per 100L of water was calculated (Table 2). Also, for the spiked samples (MS and MSD), the recovery efficiency and relative percent difference statistics were calculated (Tables 3 and 4).

Bacterial Indicators:

To assess the concentration of total coliforms, fecal coliforms, *E. coli* and *Entercoccus spp.*, in the monitoring wells, sample volumes of 1, 100, 250, 500 mL were filtered using a 0.45 um (pore size) 47mm (diameter) filter membrane (Gelman Sciences) according to the *Standard Methods for the Examination of Water and Wastewater* (APHA 1998). The same was done with samples derived from recharge wells; however, the 500 mL volume could not be processed due to clogging of the filter. The filters were plated on indicator-specific media and incubated for 24 hours at temperatures specific to each indicator.

For enumeration of *Enterococcus spp.* the filters were placed on MEI agar plates (modified medium for detection of *Enterococcus spp.*; Difco Laboratories, Detroit, MI) and incubated at 41°C. After 24 hours colonies with a blue halo were counted as *Entercoccus spp*. as described in Method 1600 (USEPA, 1996). To assess numbers of total coliform bacteria, membrane filters were placed on m-ENDO agar (Difco Laboratories, Detroit, MI) and incubated at 37°C. To detect fecal coliform bateria the filters were placed on mFC agar (modified medium for fecal coliform bacteria; Difco Laboratories, Detroit, MI) and incubated at 45° C. The bacterial concentrations were then quantified and expressed as the number of colony forming units per 100mL (CFU/ 100mL) (Table 5).

To assess *E.coli* concentrations the membrane filter used in the total coliform evaluation was removed from the m-ENDO agar and transferred to a plate with EC medium with MUG (Difco Laboratories, Detroit, MI). The plates were incubated at 37°C for 24 hours and then viewed under a UV lamp. Those colonies which fluoresced were counted as positive *E.coli* colonies (Table 5).

Coliphages:

Two methods were used to determine the concentration and types of coliphages present in the water samples: an agar overlay method and an enrichment method. Two different host bacterium strains were used in the agar overlay method, *E. coli* C3000 and *E. coli* p(Famp)R Each host *E. coli* was grown to logarithmic stage in tryptic soy broth (TSB) at 37° C for approximately 4 hours. 1mL of the host bacteria and 2mL of sampled water was mixed with a molten trypticase soy agar (TSA) (3mL) and then poured over a solid TSA plate. 5 replicate plates were used for each sample site and for each host. Coliphage concentration at each sampling site was determined using the following formula: (total number of plaques/ volume of sampled water analyzed)*100. The concentration is reported in numbers of plaque-forming units per 100mL (PFU/100mL) (Table 5).

The enrichment test provides information about the presence or absence of coliphages rather than a quantitative assessment of coliphage numbers, and is commonly used to detect low levels of coliphages that may be present in groundwater samples. In order to detect low numbers of coliphages in the sampled water, an enrichment experiment was run with water from each of the sites. A 1 L water sample was inoculated with 10mL of host bacterial culture (*E. coli* p(Famp)R) and 100mL of 11X tryptone broth with antibiotics (Ampicillin-Streptomycin). The sample was then incubated at 35°C for 48 hours.

Two mL of enrichment sample from the sites that were initially coliphage-negative (using the agar overlay method) was filtered through a 0.22um syringe filter. Ten ul of the filtrate was then spotted on the center of a plate with TSA base and a TSA agar overlay containing host bacterium. The plates were incubated at 37°C for 24 hours and examined for lysis zones.

Also, to determine if the samples contained F+DNA or F+RNA phages, RNase was incorporated into plating growth medium containing an *E. coli* p(Famp)R baterial lawn. Ten ul (filtered) of the enriched samples for each sample site were spotted in the center of TSA (RNase+) plates containing *E. coli* (Famp+) and incubated at 37°C for 24 hours. The plates were then scored as either F+DNA or F+RNA phages (Table 5).

Recovery Efficiency Experiments:

Recovery efficiency experiments are routinely conducted in the Water Pollution Laboratory at Michigan State University to verify that proper quality assurance standards are met. These experiments are carried out as described in the April 2001 version of USEPA method 1623 to demonstrate acceptable method performance and include: (i) initial precision and recovery tests, (IPR) (ii) ongoing precision and recovery tests (OPR), (iii) matrix spikes

(MS) and (iv) method blanks. A combination of filtered tap water and distilled water are used as the reagent water sample for blanks, IPR and OPR tests.

IPR tests are intended to establish the ability to demonstrate control over the analytical system and to generate acceptable precision and recovery (USEPA, 2001). For this purpose, 100 L of reagent water sample was filtered, eluted, concentrated, purified (IMS), stained and examined by IFA using method 1623 and the Envirochek HV cartridge filtration method. Four reagent water samples were processed and the results of these analyses were used to compute the average percent recovery (Mean) and the relative standard deviation (RSD) of the recovery. The RSD is the standard deviation divided by the mean times 100. The mean and RSD are compared with the corresponding limits for initial precision and recovery described in method 1623 (USEPA, 2001) in order to determine method performance (Tables 3 and 4).

OPR tests will be carried out throughout the study to verify all performance criteria (data not shown). For this purpose, one (to date) spike reagent water sample has been filtered, eluted, concentrated, purified (IMS), stained and examined by IFA. The frequency of OPR tests is typically one spiked reagent water sample for every 20 samples analyzed.

Matrix spike (MS) along with matrix spike duplicates (MSD) were carried out with the spiked field samples described above to determine the effect of the method's oocyst and cyst recovery. For this purpose, four spiked water matrix was processed filtered, eluted, concentrated, purified (IMS) stained and examined by IFA. MS for each water type were processed and the mean of the number of (oo)cysts were computed as follows: Matrix spike duplicate (MSD) or Mean = (MS1+MS2/2). From these results, the relative percent difference (RPD) was computed as follows: RPD = 100 x [(oo)cysts detected in MS1 – oocysts detected in MS2]/Mean. The results of these calculations were then compared with the corresponding limits established in method 1623 (USEPA, 2001) to determine precision and recovery of the methods using the different water matrices (Tables 3 and 4).

The filtration device used in the study was the Envirochek HV sampling capsule (Pall Gelman Laboratory, Ann Arbor, MI). ColorSeed^{TM} C&G (BTF, Decisive Microbiology, North Ryde, BC, Australia) was used as the spike suspensions in IPR tests, matrix spike, matrix spike duplicates, and recovery efficiency experiments. These spikes consist of 100±2 red fluorescent labeled and gamma irradiated *Cryptosporidium* oocysts and *Giardia* cysts in approximately 1 mL of saline solution. They can be used as internal quality control parameters to determine the performance or percent recovery achieved with every test (see http://www.biotechfrontiers.com). For spiked experiments, water volumes of 100 L were filtered through the Envirochek HV capsule filter. Spiked samples were filtered on-site and the filters were transported to the laboratory on ice.

RESULTS

Tables 1, 2 3, 4 and 5 show the results obtained from samples collected at the different sites.

Table 1 describes the physical-chemical parameters determined at each monitoring well and stormwater recharge site. Table 2 describes the results obtained from the analysis of protozoan parasites. Neither *Cryptosporidium* oocysts nor *Giardia* cysts were detected in any of the samples colleted. Further sampling will allow determining the parasitological status of these sites. In detection, a lot of interferences from particles and other debris were observed for those samples collected from MW3 which significantly limited the detection step. Among the different sites, the highest turbidity (6.72 NTU) was registered at site MW3. Further sampling will include either adjustment of the volume in relation to the turbidity or two capsule filters at sites with high turbidities in an effort to eliminate/diminish interferences caused by organic and/or inorganic materials.

Table 3 and 4 describe the results obtained from the matrix spike recoveries from samples collected at monitoring well 4 and recharge well north (R-143), respectively. The data indicate that the mean recovery (as percent) and precision (as maximum relative percent difference, RPD) obtained for *Cryptosporidium* oocysts from water samples collected from MW4 and recharge well north falls within the quality control acceptance criteria established by US Environmental Protection Agency (USEPA, 2001) (Mean percent 13%-111%, RPD 61%). *Giardia* cysts spiked into samples from MW4 were efficiently recovered as determined by the mean percent and RPD obtained from this site, however the results obtained from those samples processed from recharge well north did not fall within the QC criteria of the method. Even though the results of the IPR tests obtained in the laboratory have indicated that the performance of the method for *Cryptosporidium* and *Giardia* is appropriate for testing waterborne oocysts, the effects of different unknown water matrix components still may have an adverse effect on the recovery efficiency of spiked and naturally occurring oocysts. The laboratory is intensively studying new methods and applying more sensitive techniques (molecular techniques and tissue cell culture) to assess the occurrence of waterborne *Cryptosporidium* and *Giardia*. The goal is to apply the standard method approved by USEPA with modifications including additional assays for enhancing the recovery efficiency and detection of (oo)cysts in different water matrices.

The standard assay used to report the number of spiked and naturally occurring (oo)cysts in this study is based on the immunofluorescence assay and the vital dye assay (DAPI/PI) plus differential interference contrast microscopy (D.I.C) for enumeration and confirmation of spiked and recovered (oo)cysts, respectively. Additional parasite testing is recommended to determine the effect of the water matrix components on the recovery efficiency of (oo)cysts and more importantly on *Giardia* cysts from samples obtained from Festival park.

Table 5 summarizes the results of the microbial indicator analysis from monitoring wells and stormwater recharge sites. There were differences in the number of microbial indicators among the different monitoring wells. MW1 and MW2 were positive for all microbial indicators, while MW4 and MW3 were negative for microbial indicators. Nevertheless, the enrichment protocol determined the occurrence of coliphages in all monitoring wells, therefore indicating vulnerability to microbial contamination in all wells. The stormwater recharge sites had high numbers of microbial indicators of fecal contamination as determined by the levels of bacteria and coliphage detected. There may be some regrowth of some of the bacteria in the recharge wells and the quality of the water should be examined in view of the well characteristics and/or other considerations.

Table 1 Summary of chemical and physical parameters measured at the Festival Park sampling sites during the Baseline Sampling Event.

DATE COLLECTED	SITE LOCATION	Water Temperature (º C)	Turbidity	pH	Time of Collection	Flow Rate (liters/minute)
05/28/03	Monitoring Well 4	24.9	1.45	10.17	9:22-15:00	2.6
05/28/03	R-40	32.8	2.95	5.89	11:36-11:44	5.7
05/28/03	R-143	32.8	4.79	6.45	16:15-17:05	3.8
05/29/03	Monitoring Well 1	24.9	1.91	11.61	8:40-12:50	3.8
05/29/03	Monitoring Well 3	25.4	6.72	11.1	9:45-14:20	3.8
05/29/03	Monitoring Well 2	25.5	1.24	7.59	13:45-18:15	3.8

Table 2 Results of the Baseline Sampling Event in Festival Park: May 2003

DATE COLLECTED	SITE LOCATION	Total Volume Collected (Liters)	Sample Volume examined (Liters)	Organism detected	Total	# with internal features DAPI/DIC	# without internal features	Equivalent Concentration Oo(cysts)/100 L
05/28/03	Monitoring Well 4	946.25	946.25	*Giardia*	0	0	0	<0.10
				Cryptosporidium	0	0	0	<0.10
05/28/03	R-40	49.20	49.20	*Giardia*	0	0	0	<2.0
				Cryptosporidium	0	0	0	<2.0
05/28/03	R-143	18.92	18.92	*Giardia*	0	0	0	<5.0
				Cryptosporidium	0	0	0	<5.0
05/29/03	Monitoring Well 1	926.25	926.25	*Giardia*	0	0	0	<0.10
				Cryptosporidium	0	0	0	<0.10
05/29/03	Monitoring Well 3	946.25	946.25	*Giardia*	0	0	0	<0.10
				Cryptosporidium	0	0	0	<0.10
05/29/03	Monitoring Well 2	942.46	942.46	*Giardia*	0	0	0	<0.10
				Cryptosporidium	0	0	0	<0.10

Table 3 Matrix Spike and Matrix Spike Duplicate: Monitoring Wells, Baseline Sampling Event

DATE COLLECTED	SITE LOCATION	Total Volume Collected (Liters)	Organism	Recovered	% Recovery Efficiency
05/28/03	Monitoring Well 4	100	***Giardia***	13	13
			Cryptosporidium	39	39
05/28/03	Monitoring Well 4	100	***Giardia***	7	7
			Cryptosporidium	17	17

Relative Percent Difference (RPD): *Cryptosporidium* = 78%
Giardia = 60%

Table 4 Matrix Spike and Matrix Spike Duplicate: Stormwater recharge sites, Baseline Sampling Event

DATE COLLECTED	SITE LOCATION	Total Volume Collected (Liters)	Organism	Recovered	% Recovery Efficiency
05/28/03	R-143	10	***Giardia***	13	13%
			Cryptosporidium	31	31%
05/28/03	R-143	10	***Giardia***	3	3%
			Cryptosporidium	47	47%

Relative Percent Difference (RPD): *Cryptosporidium* = 41
Giardia = 125%

Table 5 Summary results for bacterial indicators and coliphage: Festival Park, Baseline Sampling Event

Date sample collection	Site location	Indicator Organisms						
		Bacteria (CFU/100 mL)				Coliphage (PFU/100 mL)		
		Total Coliforms	Fecal Coliforms	*E. coli*	Enterococcus	Host C3000*	Host Famp+	
							Overlay*	Enrichment
05/28/03	Monitoring Well 4	<0.2	<0.2	<0.2	<0.2	<5	<5	+ /DNA
05/28/03	R-40	$3.8x10^5$	$2.7x10^5$	$7.2\ x10^4$	$6x10^0$	$30x10^0$	$80x10^0$	+/DNA
05/28/03	R-143	$6.9x10^4$	$5.8x10^4$	$1.5x10^4$	$30x10^0$	<5	<5	+/RNA
05/29/03	Monitoring Well 1	$20x10^0$	$20x10^0$	$5x10^0$	$0.2x10^0$	<5	<5	+/DNA
05/29/03	Monitoring Well 3	<0.2	<0.2	<0.2	<0.2	<5	<5	+ /RNA
05/29/03	Monitoring Well 2	$3.8x10^0$	$1.6x10^0$	$0.4x10^0$	$0.2x10^0$	<5	<5	+/DNA

* Strains: *E. coli* C3000 and *E.coli* Famp+. The results of these tests are expressed as plaque forming units per 100 mL of sample using the agar overlay technique for enumeration of coliphage in water samples. The enrichment protocol is used to determine presence/absence of coliphage. DNA or RNA coliphage are differentiated by incorporating RNAse in the media.

Festival Park Baseline Characterization Microbial Sampling Results
SJRWMD CFARE1

Organism	Units	R-40	R-143	MW-1	MW-2	MW-3	MW-4	Indicator Guidelines for Ambient Surface Water Quality (Class III Waters) [1]
	Location	R-40	R-143	MW-1	MW-2	MW-3	MW-4	
	SampleID ==>							
	Date Collected ==>	5/28/2003	5/28/2003	5/29/2003	5/29/2003	5/29/2003	5/28/2003	
Total Coliform	cfu/100 mL	380,000	69,000	20	3.8	<0.2	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average 4 cfu/100 mL - Groundwater criteria
Fecal Coliform	cfu/100 mL	270,000	58,000	20	1.6	<0.2	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. *coli*	cfu/100 mL	72,000	15,000	5	0.4	<0.2	<0.2	126 cfu/100 mL - Geometric Mean
Enterococcus	cfu/100 mL	6	30	0.2	0.2	<0.2	<0.2	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric Mean
Cryptosporidium	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Giarida	no./100 L	<2	<5	<0.1	<0.1	<0.1	<0.1	
Coliphage								100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	30	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	80	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	+/RNA	+/DNA	+/DNA	+/RNA	+/RNA	

Notes:

cfu - Colony forming units

pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

Baseline Event

	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-3		MW-4	
	Event:	Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline	
	SJRWMD No.:	None		None		OR0018		OR0819		OR0818		OR0818		OR0141		OR0141	
	SampleID:	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		FP-03-01-006	
	DateCollected:	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003		5/28/2003	
	Matrix:	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																	
pH	Std. Units	5.89		6.45		9.22		7.38		11.1		11.1		10.17		10.17	
TEMPERATURE	°C	32.8		29.2		25.4		25.5		25.4		25.4		24.9		24.9	
CONDUCTANCE	µmhos	139		218		226		360		501		501		131		131	
TURBIDITY	NTU	2.95		4.79		1.2		1.24		6.72		6.72		1.45		1.45	
DISSOLVED OXYGEN	mg/L	2.7		3.19		0.82		1.81		0.22		0.22		0.24		0.24	
OXIDATION/REDUCTION POTENTIAL	mV	211		195		1		252		-140		-140		10		10	
General Chemistry																	
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	102	=	125	=	117	=	361	=	386	=	274	=	265	=	265	=
TURBIDITY	NTU	1.6	=	1.7	=	0.12	U	0.12	U	0.12	U	1	=	0.12	U	0.12	U
pH (laboratory)	PH UNITS	6.53	=	6.31	=	7.5	=	7.44	=	11.1	=	10.6	=	7.79	=	7.79	=
COLOR	COLOR UNIT	**20**	=	**20**	=	5	J	0	U	5	J	5	J	0	U	0	U
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	4.85	=	27.5	=	27.8	=	3.19	U	2.18	U	2.83	U	20.8	=	20.8	=
DISSOLVED ORGANIC CARBON	mg/L	4.94	U	23.8	=	24.3	=	1.52	U	2.67	U	2.81	U	2.79	U	2.79	U
Nutrients																	
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.484	=	0.358	=	0.198	=	1.99	=	0.901	=	0.741	=	0.453	=	0.453	=
NITROGEN, AMMONIA (AS N)	mg/L	0.213	J	0.21	U	0.427	=	1.59	=	1.04	=	0.431	=	0.21	U	0.21	U
NITROGEN, KJELDAHL, TOTAL	mg/L	0.484	U	0.358	U	0.198	U	1.322	=	0.901	U	0.741	U	0.453	U	0.453	U
NITROGEN, NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.535	=	0.05	U	0.05	U	0.05	U	0.05	U
NITROGEN, NITRATE-NITRITE	mg/L	0.05	U	0.05	U	0.05	U	0.67	=	0.05	U	0.05	U	0.05	U	0.05	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.148	=	0.103	=	0.226	=	0.084	=	0.051	=	0.101	=	0.143	=	0.143	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.078	=	0.046	=	0.037	=	0.031	=	0.027	=	0.038	=	0.122	=	0.122	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.102	=	0.075	=	0.082	=	0.075	=	0.054	=	0.057	=	0.048	=	0.048	=
Anions																	
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	45.5	=	53	=	152	=	211	=	1	U	11	=	188	=	188	=
Carbonate	mg/L									60	=	92	=				
Hydroxide	mg/L									94	=	46	=				
CHLORIDE (AS CL)	mg/L	10.6	=	14.3	=	6.59	=	3.58	=	3.06	=	3.0	=	4.47	=	4.47	=
SULFATE (AS SO4)	mg/L	9.09	=	11.3	=	37.5	=	26.7	=	3.26	=	3.19	=	0.912	J	0.912	J
Metals																	
ALUMINUM	µg/L	**73.7**	U	**76.3**	U	**150**	U	35	U	37.7	U	35	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	2.5	U	2.5	U	2.66	J	2.5	U	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	2.04	U	10.5	=	19.4	=	3.06	J	2.04	U	2.04	U	2.04	U
BARIUM	µg/L	14.3	=	16.6	=	11.1	=	35.9	=	51.1	=	35.3	=	6	=	6	=
BERYLLIUM	µg/L	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U
CALCIUM	µg/L	18500	=	21500	=	61800	=	52700	=	17100	=	20400	=	65600	=	65600	=
CHROMIUM, TOTAL	µg/L	0.712	J	0.57	U	0.57	U	1.13	U	1.79	U	1.13	U	0.57	U	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	3.43	U	4.34	U	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**496**	=	**448**	=	16.7	U	16.7	U	30.5	U	16.7	U	18.4	U	18.4	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	2.05	U	3.26	U	1.76	U	1.76	U
MAGNESIUM	µg/L	1530	=	2030	=	4700	=	6420	=	1030	=	2080	=	3150	=	3150	=
MANGANESE	µg/L	9.28	=	10.1	=	3.94	=	2.21	=	0.413	U	0.515	U	1.35	U	1.35	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	2.31	J	1.64	J	4.66	J	0.997	U	0.997	U	0.997	U	0.997	U
POTASSIUM	µg/L	1350	=	1510	=	1760	=	25400	=	56000	=	41400	=	1450	=	1450	=
SELENIUM	µg/L	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.325	U	0.75	U	0.75	U
SODIUM	µg/L	6110	=	8000	=	5380	=	25600	=	29300	=	22900	=	10200	=	10200	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.93	U	1.82	U	1.8	U	3.73	=	0.47	J	0.447	U	0.573	U	0.573	U
ZINC	µg/L	14.2	=	11.2	=	1.54	U	1.66	U	1.33	U	0.951	U	1.31	U	1.31	U
Ion Balance																	
Calcium	meq/L	0.9		1.1		3.1		2.6		0.9		1.0		3.3		3.3	
Magnesium	meq/L	0.1		0.2		0.4		0.5		0.1		0.2		0.3		0.3	
Sodium	meq/L	0.3		0.3		0.2		1.1		1.3		1.0		0.4		0.4	
Potassium	meq/L	0.0		0.0		0.0		0.6		1.4		1.1		0.0		0.0	
Sum of cations	meq/L	1.4		1.6		3.8		4.9		3.6		3.2		4.0		4.0	
Bicarbonate	meq/L	0.9		1.1		3.0		4.2		0.0		0.2		3.8		3.8	
Carbonate	meq/L									1.2		1.8					
Hydroxide	meq/L									1.9		0.9					
Chloride	meq/L	0.3		0.4		0.2		0.1		0.1		0.1		0.1		0.1	
Sulfate	meq/L	0.2		0.2		0.8		0.6		0.1		0.1		0.0		0.0	
Sum of anions	meq/L	1.4		1.7		4.0		4.9		3.2		3.1		3.9		3.9	
Balance (% difference)		1.7%		2.1%		3.3%		-0.6%		-5.7%		-1.8%		-1.5%		-1.5%	
Radiologicals																	
ALPHA, GROSS	pCi/L	2.4	U	0.9	U	3.1	U	4.5	=	3.9	=	2.5	U	2.9	=	2.9	=
BETA, GROSS	pCi/L	2.5	=	1	=	3.3	=	37.8	=	54.7	=	42.1	=	2.2	U	2.2	U
Total Petroleum Hydrocarbons																	
PETROLEUM HYDROCARBONS	mg/L	0.43	=	0.49	=	0.35	U	0.34	U	0.34	U	0.38	=	0.36	U	0.36	U
Volatile Organic Compounds																	
ACETONE	µg/L	3	J	3.9	J	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACROLEIN	µg/L	10	UJ	10	UJ	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	0.18	J	1	U	1	U	0.64	J	0.48	J	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	UJ	1	UJ
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Sampling Event 1

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007	
	DateCollected:	10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements											
pH	Std. Units	8.0		7.4		7.4		7.2		7.9	
TEMPERATURE	°C	27.0		24.8		24.8		25.1		25.1	
CONDUCTANCE	µmhos	210		478		478		464		321	
TURBIDITY	NTU	3.7		0.85		0.85		0.68		0.3	
DISSOLVED OXYGEN	mg/L	3.25		3.80		3.80		0.71		0.55	
OXIDATION/REDUCTION POTENTIAL	mV	124		135		135		0.8		-164	
General Chemistry											
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	125	=	295	=	297	=	328	=	270	=
TURBIDITY	NTU	1.4	=	1.4	=	0.6	=	0.2	J	2	=
pH (laboratory)	PH UNITS	6	=	7.12	=	6.99	=	7.24	=	8.23	=
COLOR	COLOR UNIT	**25**	=	5	J	5	U	5	J	5	J
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	=	2	R
TOTAL ORGANIC CARBON	mg/L	6.54	=	4.09	=	4.51	=	1.44	U	1.72	=
DISSOLVED ORGANIC CARBON	mg/L	5.96	=	1.88	U	2.74	U	1.82	U	1.71	=
Nutrients											
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.795	=	0.469	=	0.42	=	0.446	=	0.427	=
NITROGEN, AMMONIA (AS N)	mg/L	0.381	J	0.203	J	0.107	U	0.127	J	0.247	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.795	J	0.401	=	0.359	J	0.364	=	0.427	=
NITROGEN, NITRITE	mg/L	0.037	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0677	J	0.0614	J	0.0824	J	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.085	=	0.08	=	0.085	=	0.099	=	0.037	J
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.017	J	0.048	=	0.044	=	0.079	=	0.014	U
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.059	=	0.074	=	0.079	=	0.091	=	0.063	=
Anions											
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	57.5	=	173	=	170	=	189	=	114	=
Carbonate	mg/L										
Hydroxide	mg/L										
CHLORIDE (AS CL)	mg/L	12.5	=	7.44	=	7.4	=	9.16	=	4.82	J
SULFATE (AS SO4)	mg/L	6.25	=	42.4	=	41	=	36.3	=	0.5	U
Metals											
ALUMINUM	µg/L	59.4	U	41	U	42.8	U	35	U	46.6	U
ANTIMONY	µg/L	2.91	J	2.5	U	5.02	=	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	6.72	=	7.25	=	9.51	=	2.04	U
BARIUM	µg/L	12.5	=	55	=	47.7	=	35.1	=	5.39	=
BERYLLIUM	µg/L	0.0945	U	0.197	U	0.203	U	0.168	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.522	J	0.546	J	0.369	J	0.356	U
CALCIUM	µg/L	23300	=	66600	=	67900	=	77100	=	66300	=
CHROMIUM, TOTAL	µg/L	0.57	U	0.96	J	0.774	J	0.651	J	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	8.41	=	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**393**	=	48.2	U	57.3	U	16.7	U	22.1	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	1900	=	7420	=	7410	=	8320	=	3100	=
MANGANESE	µg/L	8.46	=	2.05	=	2.15	=	4.28	=	1.11	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	9.12	=	8.8	=	5.09	=	0.997	U
POTASSIUM	µg/L	1430	=	10600	=	8680	=	8110	=	1340	=
SELENIUM	µg/L	2.1	U	4.28	J	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U
SODIUM	µg/L	7860	J	14300	J	12900	J	12600	J	11300	J
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.57	J	2.91	J	2.16	J	3.72	=	0.447	U
ZINC	µg/L	10.4	=	3.7	J	3.01	J	2.69	U	2.77	U
Ion Balance											
Calcium	meq/L	1.2		3.3		3.4		3.9		3.3	
Magnesium	meq/L	0.2		0.6		0.6		0.7		0.3	
Sodium	meq/L	0.3		0.6		0.6		0.5		0.5	
Potassium	meq/L	0.0		0.3		0.2		0.2		0.0	
Sum of cations	meq/L	1.7		4.8		4.8		5.3		4.1	
Bicarbonate	meq/L	1.2		3.5		3.4		3.8		2.3	
Carbonate	meq/L										
Hydroxide	meq/L										
Chloride	meq/L	0.4		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.1		0.9		0.9		0.8		0.0	
Sum of anions	meq/L	1.6		4.6		4.5		4.8		2.4	
Balance (% difference)		-2.0%		-3.0%		-3.5%		-4.8%		-20.4%	
Radiologicals											
ALPHA, GROSS	pCi/L	2.4	=	10.2	=	4.6	=	3.7	=	2.2	=
BETA, GROSS	pCi/L	2.9	=	12.9	=	10.7	=	8.6	=	2	=
Total Petroleum Hydrocarbons											
PETROLEUM HYDROCARBONS	mg/L	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U
Volatile Organic Compounds											
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	U	10	U	10	U	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

Sampling Event 2

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements											
pH	Std. Units	6.1		7.5		7.5		7.4		7.8	
TEMPERATURE	°C	27.4		24.8		24.8		24.9		24.8	
CONDUCTANCE	µmhos	197		328		328		455		368	
TURBIDITY	NTU	3.58		4.56		4.56		1.02		0.19	
DISSOLVED OXYGEN	mg/L	1.29		0.29		0.29		0.59		0.54	
OXIDATION/REDUCTION POTENTIAL	mV	62		42		42		8		-185	
General Chemistry											
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	100	=	240	=	190	=	270	=	230	=
TURBIDITY	NTU	1	=	1	=	0.6	=	0.3	=	0.5	=
pH (laboratory)	PH UNITS	6.42	=	7.46	=	7.4	=	7.63	=	7.89	=
COLOR	COLOR UNIT	**20**	=	10	=	10	=	**15**	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	=	2	=	2	=	2	UJ	2	U
TOTAL ORGANIC CARBON	mg/L	6.15	=	3.47	=	2.68	=	4.15	=	3.9	=
DISSOLVED ORGANIC CARBON	mg/L	5.67	=	2.94	=	3.32	=	3.99	=	3.43	=
Nutrients											
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.896	=	0.65	=	0.332	=	0.549	=	0.401	=
NITROGEN, AMMONIA (AS N)	mg/L	0.368	J	0.107	U	0.107	U	0.257	J	0.28	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.83	=	0.65	=	0.332	=	0.549	=	0.401	=
NITROGEN, NITRITE	mg/L	0.0147	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0656	J	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.062	=	0.086	=	0.103	=	0.109	=	0.04	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.024	=	0.077	=	0.073	=	0.091	=	0.03	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.067	=	0.095	=	0.085	=	0.113	=	0.035	=
Anions											
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	65	=	157	=	157	=	203	=	197	=
Carbonate	mg/L										
Hydroxide	mg/L										
CHLORIDE (AS CL)	mg/L	16.2	=	7.51	=	7.54	=	9.52	=	5.07	=
SULFATE (AS SO4)	mg/L	11.2	=	41.7	=	37.7	=	34.7	=	0.785	J
Metals											
ALUMINUM	µg/L	71.7	U	95.5	U	44.1	U	35	U	**220**	U
ANTIMONY	µg/L	2.75	J	2.5	U	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	9.18	=	9.52	=	**10.6**	=	2.04	U
BARIUM	µg/L	13.4	=	16.9	=	16.3	=	23.9	=	4.52	=
BERYLLIUM	µg/L	0.304	U	0.108	U	0.0945	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U
CALCIUM	µg/L	26700	=	70100	=	68800	=	77100	=	69500	=
CHROMIUM, TOTAL	µg/L	0.8	J	0.57	U	0.57	U	0.57	U	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	5.82	=	1.17	U	1.22	J	1.17	U	1.17	U
IRON	µg/L	**355**	=	89.5	U	68.4	U	40.4	U	16.7	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	2610	=	7090	=	6860	=	8930	=	3210	=
MANGANESE	µg/L	8.53	=	18.8	=	17.8	=	11.8	=	0.327	J
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	4.85	J	4.68	J	4.35	J	0.997	U
POTASSIUM	µg/L	1870	=	2420	=	2330	=	5020	=	1230	=
SELENIUM	µg/L	3.09	U	2.1	U	3.8	U	2.1	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U
SODIUM	µg/L	10500	J	7150	J	7000	J	10300	J	11700	J
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.84	J	1.52	J	1.48	J	2.08	J	0.447	U
ZINC	µg/L	8.6	J	17.5	=	5.88	J	5.57	J	67.6	=
Ion Balance											
Calcium	meq/L	1.3		3.5		3.4		3.9		3.5	
Magnesium	meq/L	0.2		0.6		0.6		0.7		0.3	
Sodium	meq/L	0.5		0.3		0.3		0.4		0.5	
Potassium	meq/L	0.0		0.1		0.1		0.1		0.0	
Sum of cations	meq/L	2.1		4.5		4.4		5.2		4.3	
Bicarbonate	meq/L	1.3		3.1		3.1		4.1		3.9	
Carbonate	meq/L										
Hydroxide	meq/L										
Chloride	meq/L	0.5		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.2		0.9		0.8		0.7		0.0	
Sum of anions	meq/L	2.0		4.2		4.1		5.1		4.1	
Balance (% difference)		-1.6%		-2.8%		-2.7%		-1.2%		-2.1%	
Radiologicals											
ALPHA, GROSS	pCi/L	3.3	=	1.6	U	3.2	=	1.3	=	2.5	=
BETA, GROSS	pCi/L	3.5	=	2.8	=	2.4	=	4.5	=	2.6	=
Total Petroleum Hydrocarbons											
PETROLEUM HYDROCARBONS	mg/L	0.82	=	0.34	U	0.34	U	0.34	U	0.34	U
Volatile Organic Compounds											
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	UJ	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ

Sampling Event 3

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements											
pH	Std. Units	7.7		7.5		7.5		7.3		7.9	
TEMPERATURE	°C	28.5		25.2		25.2		25.4		25.1	
CONDUCTANCE	µmhos	246		361		361		425		411	
TURBIDITY	NTU	32.8		1.64		1.64		0.5		0.6	
DISSOLVED OXYGEN	mg/L	3.00		0.16		0.16		0.20		0.98	
OXIDATION/REDUCTION POTENTIAL	mV	65		-158		-158		6		-123	
General Chemistry											
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	137	=	233	=	245	=	296	=	268	=
TURBIDITY	NTU	2.5	=	0.4	=	0.5	=	0.12	U	0.12	U
pH (laboratory)	PH UNITS	6.61	=	7.87	=	7.69	=	7.32	=	7.84	=
COLOR	COLOR UNIT	**20**	=	10	=	10	=	**15**	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	=	2	=	2	=	2	=	2	=
TOTAL ORGANIC CARBON	mg/L	5.18	=	1.23	J	1.17	J	3.8	=	2.65	=
DISSOLVED ORGANIC CARBON	mg/L	5.57	=	1.13	J	1.31	J	3.74	=	2.18	=
Nutrients											
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.781	=	0.272	=	0.315	=	0.442	=	0.366	=
NITROGEN, AMMONIA (AS N)	mg/L	0.301	J	0.107	U	0.107	U	0.193	J	0.182	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.781	=	0.272	=	0.315	=	0.442	=	0.366	=
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.112	=	0.097	=	0.118	=	0.138	=	0.097	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.034	=	0.085	=	0.078	=	0.097	=	0.025	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.098	=	0.106	=	0.111	=	0.101	=	0.058	=
Anions											
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	74	=	151	=	157	=	194	=	200	=
Carbonate	mg/L										
Hydroxide	mg/L										
CHLORIDE (AS CL)	mg/L	13.9	=	6.18	=	6.06	=	7.72	=	3.2	=
SULFATE (AS SO4)	mg/L	9.04	=	30.2	=	35.9	=	37.6	=	0.609	J
Metals											
ALUMINUM	µg/L	**2660**	=	35	U	35	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	3.27	J	2.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	8.05	=	9.9	=	**12.3**	=	2.04	U
BARIUM	µg/L	29.4	=	12.1	=	11.8	=	19.3	=	4.34	=
BERYLLIUM	µg/L	0.188	U	0.156	U	0.0945	U	0.265	U	0.104	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.372	J	0.356	U
CALCIUM	µg/L	39700	=	61400	=	62500	=	75500	=	67200	=
CHROMIUM, TOTAL	µg/L	10.6	=	0.57	U	0.576	J	0.57	U	0.57	U
COBALT	µg/L	1.19	J	0.569	U	0.569	U	0.779	J	0.569	U
COPPER	µg/L	5.25	=	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**4370**	=	123	U	114	U	40.7	U	16.7	U
LEAD	µg/L	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	3000	=	5780	=	5780	=	8870	=	3100	=
MANGANESE	µg/L	24.2	=	6.69	=	6.48	=	11.6	=	1.36	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	5.65	=	2.38	J	2.86	J	5.1	=	0.997	U
POTASSIUM	µg/L	1510	=	1770	=	1660	=	3730	=	1000	=
SELENIUM	µg/L	2.1	U	2.18	U	2.33	U	2.24	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U
SODIUM	µg/L	9050	=	5690	=	5840	=	8620	=	10100	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.93**	U	**2.54**	U
VANADIUM	µg/L	12.5	=	1.17	J	1.31	J	1.57	J	0.447	U
ZINC	µg/L	23.9	=	1.27	J	1.51	J	0.409	U	0.409	U
Ion Balance											
Calcium	meq/L	2.0		3.1		3.1		3.8		3.4	
Magnesium	meq/L	0.3		0.5		0.5		0.7		0.3	
Sodium	meq/L	0.4		0.2		0.3		0.4		0.4	
Potassium	meq/L	0.0		0.0		0.0		0.1		0.0	
Sum of cations	meq/L	2.7		3.8		3.9		5.0		4.1	
Bicarbonate	meq/L	1.5		3.0		3.1		3.9		4.0	
Carbonate	meq/L										
Hydroxide	meq/L										
Chloride	meq/L	0.4		0.2		0.2		0.2		0.1	
Sulfate	meq/L	0.2		0.6		0.7		0.8		0.0	
Sum of anions	meq/L	2.1		3.8		4.1		4.9		4.1	
Balance (% difference)		-11.4%		-0.3%		2.0%		-1.0%		0.2%	
Radiologicals											
ALPHA, GROSS	pCi/L	2.1	=	2.9	=	2.8	=	4.3	=	2.6	=
BETA, GROSS	pCi/L	1.9	=	2.7	=	3.1	=	4.8	=	4.1	=
Total Petroleum Hydrocarbons											
PETROLEUM HYDROCARBONS	mg/L	0.34	U	0.36	U	0.35	U	0.34	U	0.34	U
Volatile Organic Compounds											
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	UJ	10	UJ	10	U	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U

Sampling Event 4

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements											
pH	Std. Units	6.4		7.4		7.4		6.9		7.6	
TEMPERATURE	°C	24.4		25.0		25.0		24.5		23.6	
CONDUCTANCE	µmhos	197		319		319		408		328	
TURBIDITY	NTU	6.73		5.61		5.61		0.85		0.19	
DISSOLVED OXYGEN	mg/L	4.63		0.40		0.40		0.35		0.58	
OXIDATION/REDUCTION POTENTIAL	mV	-47		12		12		58		-109	
General Chemistry											
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	143	=	246	=	255	=	295	=	278	=
TURBIDITY	NTU	2.2	=	0.3	=	0.3	=	0.12	U	0.12	U
pH (laboratory)	PH UNITS	6.9	=	7.42	=	7.58	=	7.28	=	7.87	=
COLOR	COLOR UNIT	**25**	=	10	=	10	=	10	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3.4	=	2	U	2	U	2	=	2	U
TOTAL ORGANIC CARBON	mg/L	3.95	=	0.54	J	0.64	J	0.368	U	2.2	=
DISSOLVED ORGANIC CARBON	mg/L	5.11	=	2.55	U	3.67	U	3.07	U	2.46	U
Nutrients											
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.45	=	0.232	=	0	U	0.168	=	0.209	=
NITROGEN, AMMONIA (AS N)	mg/L	0.183	J	0.107	U	0.107	U	0.174	J	0.225	J
NITROGEN, KJELDAHL, TOTAL	mg/L	0.385	=	0.154	J	0.128	U	0.168	J	0.209	J
NITROGEN, NITRITE	mg/L	0.0243	U	0.0118	U	0.0118	U	0.021	U	0.0119	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0637	J	0.108	=	0.0252	J	0.0604	J	0.0201	U
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.089	=	0.102	=	0.098	=	0.123	=	0.093	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.033	=	0.069	=	0.121	=	0.15	=	0.021	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.149	=	0.078	=	0.084	=	0.122	=	0.154	=
Anions											
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	81	=	151	=	154	=	192	=	189	=
Carbonate	mg/L										
Hydroxide	mg/L										
CHLORIDE (AS CL)	mg/L	13.8	=	8.66	=	8.53	=	9.96	=	5.19	=
SULFATE (AS SO4)	mg/L	11.2	=	31.2	=	29.5	=	30.6	=	1.18	=
Metals											
ALUMINUM	µg/L	121	=	41	J	35	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	2.5	U	3.51	J	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	6	=	6.76	=	7.05	=	2.04	U
BARIUM	µg/L	13.7	=	20.9	=	20.7	=	16.9	=	4.45	=
BERYLLIUM	µg/L	0.0945	U	0.219	U	0.234	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.358	J	0.548	J	0.356	U	0.356	U
CALCIUM	µg/L	32400	=	62800	=	62500	=	68800	=	66700	=
CHROMIUM, TOTAL	µg/L	1.01	J	0.826	J	0.614	J	0.812	J	0.57	U
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	2.33	J	1.27	J	1.22	J	1.17	U	1.52	J
IRON	µg/L	**310**	=	81.6	U	84.3	U	18.5	U	16.7	U
LEAD	µg/L	4.32	J	1.76	U	1.76	U	1.76	U	1.76	U
MAGNESIUM	µg/L	2360	=	7330	=	7230	=	8030	=	3060	=
MANGANESE	µg/L	8.09	=	12.9	=	13.3	=	9.73	=	0.278	U
MERCURY	µg/L	0.183	U	0.0162	U	0.0162	U	0.0162	U	0.16	U
NICKEL	µg/L	0.997	U	5.07	=	4.73	J	3.94	J	0.997	U
POTASSIUM	µg/L	1920	=	3160	=	3050	=	3350	=	1100	=
SELENIUM	µg/L	2.1	U	3.24	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.472	U	0.472	U	0.472	U	0.504	J	0.526	J
SODIUM	µg/L	8380	=	8390	=	8150	=	8990	=	11400	=
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.89	J	1.07	J	0.81	J	1.89	J	0.447	U
ZINC	µg/L	14.5	=	3.67	J	3.09	J	1.23	U	0.694	U
Ion Balance											
Calcium	meq/L	1.6		3.1		3.1		3.4		3.3	
Magnesium	meq/L	0.2		0.6		0.6		0.7		0.3	
Sodium	meq/L	0.4		0.4		0.4		0.4		0.5	
Potassium	meq/L	0.0		0.1		0.1		0.1		0.0	
Sum of cations	meq/L	2.2		4.2		4.2		4.6		4.1	
Bicarbonate	meq/L	1.6		3.0		3.1		3.8		3.8	
Carbonate	meq/L										
Hydroxide	meq/L										
Chloride	meq/L	0.4		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.2		0.7		0.6		0.6		0.0	
Sum of anions	meq/L	2.2		3.9		3.9		4.8		4.0	
Balance (% difference)		0.3%		-3.4%		-2.7%		1.9%		-2.0%	
Radiologicals											
ALPHA, GROSS	pCi/L	1.2	=	1.7	U	1.5	U	1.4	U	2.1	=
BETA, GROSS	pCi/L	3.5	=	4	=	3.9	=	2.6	=	2.4	=
Total Petroleum Hydrocarbons											
PETROLEUM HYDROCARBONS	mg/L	0.82	=	0.34	U	0.34	U	0.35	U	0.34	U
Volatile Organic Compounds											
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	U	10	U	10	U	10	U	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Sampling Event 5										Sampling Event 6									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6	
	SJRWMD No.:	None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141	
	SampleID:	FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-007-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001	
	DateCollected:	02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements																					
pH	Std. Units	6.05		7.29		7.29		7.49		7.56		6.63		7.62		7.62		6.61		7.81	
TEMPERATURE	°C	20.1		24.4		24.4		24.9		24.2		20.6		24.1		24.1		24.3		23.8	
CONDUCTANCE	µmhos	157.3		403		403		410		317		192		393		393		305		371	
TURBIDITY	NTU	4.68		0.98		0.98		1.04		0.17		3.04		0.25		0.25		0.87		0.04	
DISSOLVED OXYGEN	mg/L	5.02		0.34		0.34		0.29		0.37		3.10		0.20		0.20		0.21		0.20	
OXIDATION/REDUCTION POTENTIAL	mV	-6		-90		-90		-19		164		no data		-237		-237		-55		-163	
General Chemistry																					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	89	=	263	=	271	=	237	=	271	=	125	=	242	=	255	=	272	=	252	=
TURBIDITY	NTU	1.5	=	1.1	=	1.2	=	7	=	0.25	=	1.5	=	0.12	U	0.5	=	0.6	=	0.12	U
pH (laboratory)	PH UNITS	6.93	=	7.62	=	7.55	=	7.45	=	8.01	=	6.63	=	7.44	=	7.41	=	7.43	=	7.81	=
COLOR	COLOR UNIT	**25**	=	**15**	=	10	=	**15**	=	**15**	=	**25**	=	10	=	15	=	**15**	=	10	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2	U	2	U	2	U	2	U	3.3	=	2	U	2	U	2	U	2	U	2	U
TOTAL ORGANIC CARBON	mg/L	2.28	=	0.368	U	0.368	U	2.1	U	0.368	U	0.368	U	0.368	U	0.368	U	0.368	UJ	4.19	=
DISSOLVED ORGANIC CARBON	mg/L	3.2	=	1.36	U	1.45	U	2.08	U	1.35	U	4.09	=	0.368	UJ	0.62	J	0.8	J	0.368	U
Nutrients																					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.81	=	1.52	=	1.47	=	1.63	=	2.36	=	0.899	=	0.463	=	0.432	=	0.553	=	0.559	=
NITROGEN, AMMONIA (AS N)	mg/L	0.21	J	0.126	J	0.125	J	0.308	U	4.57	=	0.306	J	0.149	J	0.142	J	9.33	=	0.282	J
NITROGEN, KJELDAHL, TOTAL	mg/L	1.7	J	1.48	J	1.45	J	1.6	U	2.33	=	0.867	=	0.443	U	0.412	U	0.533	U	0.521	U
NITROGEN, NITRITE	mg/L	0.0142	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U	0.0158	J	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.11	=	0.0366	J	0.0201	U	0.0328	J	0.0261	J	0.032	J	0.0201	U	0.0201	U	0.0201	U	0.0381	J
PHOSPHORUS, TOTAL (AS =P)	mg/L	0.061	=	0.111	=	0.107	=	0.129	=	0.062	=	0.082	=	0.094	=	0.12	=	0.223	=	0.1	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.029	=	0.09	=	0.097	=	0.113	=	0.037	=	0.03	=	0.083	=	0.095	=	0.127	=	0.027	=
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L	0.061	=	0.098	=	0.096	=	0.121	=	0.06	=	0.096	=	0.152	=	0.181	=	0.143	=	0.118	=
Anions																					
ALKALINITY, BICARBONATE (AS CACO3)	mg/L	51	=	165	=	161	=	182	=	187	=	63	=	135	=	150	=	184	=	188	=
Carbonate	mg/L																				
Hydroxide	mg/L																				
CHLORIDE (AS CL)	mg/L	8.49	=	7.02	=	7.19	=	10.5	=	5.21	=	13.7	=	7.64	=	7.42	=	9.48	=	5.04	=
SULFATE (AS SO4)	mg/L	6.77	=	68.5	=	71.8	=	38.3	=	0.22	U	9.96	=	33.7	=	39.9	=	28.8	=	0.22	U
Metals																					
ALUMINUM	µg/L	111	=	35	=	41.8	U	35	U	35	U	35	U	35	U	35	U	35	U	35	U
ANTIMONY	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	4.3	U	3.5	U	2.5	U	2.5	U
ARSENIC	µg/L	2.04	U	8.71	=	**10.6**	=	2.93	J	2.04	U	2.04	U	9.39	=	9.59	=	7.77	=	2.04	U
BARIUM	µg/L	11	=	20.9	=	19.7	=	16.3	=	5.58	=	16.4	=	19.1	=	18.6	=	15.9	=	4.47	=
BERYLLIUM	µg/L	0.0945	U	0.0945	U	0.0945	U	0.179	U	0.0945	U	0.0945	U	0.315	U	0.368	U	0.0945	U	0.0945	U
CADMIUM	µg/L	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.356	U	0.406	J	0.453	J	0.356	U	0.356	U
CALCIUM	µg/L	18500	=	69500	=	69200	=	68400	=	69100	=	26300	=	69800	=	70100	=	70400	=	68700	=
CHROMIUM, TOTAL	µg/L	0.57	U	0.57	U	0.57	U	0.57	U	0.57	U	1.07	J	1.16	J	0.57	U	0.751	J	0.601	J
COBALT	µg/L	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U	0.569	U
COPPER	µg/L	1.17	U	1.17	U	1.17	U	1.17	U	1.17	U	1.67	U	1.17	U	1.17	U	1.17	U	1.17	U
IRON	µg/L	**394**	=	164	=	150	U	170	U	16.7	U	**331**	=	217	U	222	U	210	=	16.7	U
LEAD	µg/L	2.1	J	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.76	U	1.93	J	1.76	U	1.76	U
MAGNESIUM	µg/L	1160	=	8790	=	8600	=	8580	=	3160	=	1810	=	8530	=	8360	=	8800	=	3160	=
MANGANESE	µg/L	6.77	=	9.99	=	7	=	6.78	=	0.259	U	10.8	=	6.6	=	6.61	=	5.21	=	0.167	U
MERCURY	µg/L	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U	0.0162	U
NICKEL	µg/L	0.997	U	3.92	J	4.2	J	2.95	J	0.997	U	0.997	U	2.96	J	3.08	J	2.7	J	0.997	U
POTASSIUM	µg/L	1100	=	2540	=	2400	=	3450	=	1500	J	1640	J	2010	J	1960	J	2800	=	1130	J
SELENIUM	µg/L	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
SILVER	µg/L	0.587	U	0.472	U	0.472	U	0.472	U	0.472	U	0.472	U	0.695	U	0.472	U	0.54	U	0.472	U
SODIUM	µg/L	6030	=	7630	=	7400	=	9040	=	11300	=	8500	J	6550	J	6430	J	8630	J	10400	J
THALLIUM	µg/L	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U	**2.54**	U
VANADIUM	µg/L	1.53	J	0.623	J	0.447	U	0.771	U	0.447	U	1.8	J	1.3	J	1.29	J	0.749	J	0.447	U
ZINC	µg/L	10.9	=	0.68	J	2.99	J	0.755	U	1.66	U	11.8	J	0.85	J	0.409	UJ	0.409	U	1.71	UJ
Ion Balance																					
Calcium	meq/L	0.9		3.5		3.5		3.4		3.5		1.3		3.5		3.5		3.5		3.4	
Magnesium	meq/L	0.1		0.7		0.7		0.7		0.3		0.2		0.7		0.7		0.7		0.3	
Sodium	meq/L	0.3		0.3		0.3		0.4		0.5		0.4		0.3		0.3		0.4		0.5	
Potassium	meq/L	0.0		0.1		0.1		0.1		0.0		0.0		0.1		0.1		0.1		0.0	
Sum of cations	meq/L	1.3		4.6		4.6		4.6		4.2		1.9		4.5		4.5		4.7		4.2	
Bicarbonate	meq/L	1.0		3.3		3.2		3.6		3.7		1.3		2.7		3.0		3.7		3.8	
Carbonate	meq/L																				
Hydroxide	meq/L																				
Chloride	meq/L	0.2		0.2		0.2		0.3		0.1		0.4		0.2		0.2		0.3		0.1	
Sulfate	meq/L	0.1		1.4		1.5		0.8		0.0		0.2		0.7		0.8		0.6		0.0	
Sum of anions	meq/L	1.4		4.9		4.9		4.7		3.9		1.9		3.6		4.0		4.5		3.9	
Balance (% difference)		3.4%		3.5%		3.9%		1.3%		-4.2%		-0.6%		-10.1%		-5.4%		-1.6%		-3.3%	
Radiologicals																					
ALPHA, GROSS	pCi/L	0.838	U	2.62	J	0.649	U	1.93	U	6.82	=	0.805	U	1.48	U	3.44	=	1.93	U	3.45	=
BETA, GROSS	pCi/L	1.36	U	2.84	U	2.69	U	2.81	U	2.69	U	0.812	U	3.19	J	3.05	J	3.41	J	1.07	U
Total Petroleum Hydrocarbons																					
PETROLEUM HYDROCARBONS	mg/L	0.34	U	0.12	J	0.12	J	0.34	UJ	0.1	J	0.34	U	0.34	UJ	0.34	U	0.34	U	0.35	U
Volatile Organic Compounds																					
ACETONE	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	UJ
ACROLEIN	µg/L	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	UJ
BENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

Parameter Group and Name		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
		Baseline Event																Sampling Event 1									
	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-3		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1	
	SJRWMD No.:	None		None		OR0018		OR0819		OR0818		OR0818		OR0141		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		FP-03-01-006		FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007	
	DateCollected:	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003		5/28/2003		10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003	
	Matrix:	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	0.54	J	0.52	J	1	U	2.3	=	2.4	=	3	=	1	U	1	U	0.89	J	1	U	1	U	3.5	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1.1	=	1	U	1	U	1.2	=	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.2	=	1	U
1,1-DICHLOROETHENE	µg/L	1.4	=	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.48	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	0.34	J	0.6	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.37	J	0.81	J	1	U	1	U	1	U	1	U	1	U	1	U	0.7	J	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.65	J	0.18	J	1	U	1	U	1	U	1	U	1	U	1	U	0.29	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U	0.16	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3.6	UJ	3.6	UJ	3.6	UJ	3.6	U	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.23	J	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	U	1	UJ
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	0.16	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound																											
ACETOPHENONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	UJ
ARAMITE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	UJ	5.1	UJ
2-ACETYLAMINOFLUORENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	UJ
BENZYL ALCOHOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
1,3-DINITROBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5.1**	U	**5.1**	U	5	U	5	U	5	U	5	U	**5.1**	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ	10.2	UJ	10	UJ	10	UJ	10	UJ	10	U	10.2	UJ
2,4-DINITROTOLUENE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
DIALLATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20.2	UJ	20.4	UJ	20.4	UJ	20	R	20	R	20.1	R	20	R	20.4	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
3,3'-DICHLOROBENZIDINE	µg/L	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	U	5.1	U
3,3'-DIMETHYLBENZIDINE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	UJ	10.2	UJ
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
ISOPHORONE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
KEPONE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U	20.4	U	20	UJ	20	UJ	20.1	UJ	20	R	20.4	R
METHAPYRILENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	UJ	10.2	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	U	5.1	U
1,4-NAPHTHOQUINONE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	UJ
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
4-NITROANILINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	U	5.1	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1	U	10.1	U	10.1	UJ	10.1	UJ	10	UJ	10.1	UJ	10.2	U	10.2	U	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
5-NITRO-o-TOLUIDINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODI-n-PROPYLAMINE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSODIMETHYLAMINE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

Sampling Event 2

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	0.88	J	1	UJ	1	UJ	4.4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	UJ	1	UJ
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	UJ	1	UJ
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.5	=	1	U
1,1-DICHLOROETHENE	µg/L	1	U	1	U	1	U	0.53	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	0.52	J	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	1.1	=	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.67	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	U	3.6	U	3.6	U	3.6	UJ	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	0.32	J	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	UJ	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5	U	5.2	U	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	U	5.2	U	5	UJ	5	UJ
ARAMITE	µg/L	10	U	10	U	10.3	U	10	U	10	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10	U	10.3	U	10	U	10	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	UJ	5	UJ	5.2	UJ	5	U	5	U
BENZYL ALCOHOL	µg/L	10	U	10	U	10.3	U	10	U	10	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-CHLOROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
2,4-DICHLOROPHENOL	µg/L	5	UJ	5	U	5.2	UJ	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5.2	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	UJ	5.2	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	U	10	U	10.3	U	10	UJ	10	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5.2	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5.2	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIALLATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIBENZOFURAN	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20	R	20.6	R	20	R	20	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10	U	10.3	U	10	U	10	U
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5.2	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
ISODRIN	µg/L	5	U	5	U	5.2	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5	U	5.2	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5	U	5.2	U	5	U	5	U
KEPONE	µg/L	20	UJ	20	UJ	20.6	UJ	20	UJ	20	UJ
METHAPYRILENE	µg/L	10	R	10	R	10.3	R	10	UJ	10	UJ
METHYL METHANESULFONATE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5.2	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5	U	5.2	U	5	U	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10	U	10.3	U	10	U	10	U
1-NAPHTHYLAMINE	µg/L	5	UJ	5	UJ	5.2	UJ	5	UJ	5	UJ
2-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
3-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10	UJ	10.3	UJ	10	UJ	10	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10	U	10.3	U	10	U	10	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5.2	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	R	5	R	5.2	R	5	R	5	R

Sampling Event 3

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	2.3	=	1	U	1	U	4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.2	=	1	U
1,1-DICHLOROETHENE	µg/L	0.96	J	1	U	1	U	0.48	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.81	J	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.56	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	0.27	J	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ARAMITE	µg/L	10	UJ	10.2	U	10.2	U	10	U	10.1	UJ
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10.2	U	10.2	U	10	UJ	10.1	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
BENZYL ALCOHOL	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
4-CHLOROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5.1	UJ	5.1	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
2,4-DICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	UJ	10.2	U	10.2	U	10	U	10.1	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIALLATE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
DIBENZOFURAN	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.1	UJ	20.5	R	20.5	R	20	R	20.2	UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10.2	U	10.2	U	10	U	1.6	J
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10.2	U	10.2	U	10	UJ	10.1	U
ETHYL METHANESULFONATE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	UJ	5.1	U	5.1	U	5	U	5	UJ
ISODRIN	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
KEPONE	µg/L	20.1	UJ	20.5	U	20.5	U	20	UJ	20.2	UJ
METHAPYRILENE	µg/L	10	UJ	10.2	UJ	10.2	UJ	10	UJ	10.1	UJ
METHYL METHANESULFONATE	µg/L	5	UJ	5.1	U	5.1	U	5	UJ	5	UJ
2-METHYLNAPHTHALENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
1-NAPHTHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
2-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
3-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5.1	U	5.1	U	5	UJ	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10.2	UJ	10.2	UJ	10	UJ	10.1	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10.2	U	10.2	U	10	U	10.1	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	U	5.1	U	5.1	U	5	U	5	U

Sampling Event 4

	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	1.1	=	1	U	1	U	4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	UJ	1	UJ	1	UJ	1	U	1	UJ
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.2	=	1	U
1,1-DICHLOROETHENE	µg/L	0.38	J	1	U	1	U	0.44	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	U
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	0.24	J	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound											
ACETOPHENONE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
ARAMITE	µg/L	10	U	10.1	U	10	U	10	U	10	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	5	U	5	U	5	U	5	U	5	U
2-ACETYLAMINOFLUORENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
BENZYL ALCOHOL	µg/L	10	U	10.1	U	10	U	10	U	10	U
BENZYL BUTYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
4-BROMOPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
4-CHLOROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
2-CHLORONAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U
2-CHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
1,3-DINITROBENZENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
2,4-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,6-DICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,4-DIMETHYLPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U
2,4-DINITROPHENOL	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
2,4-DINITROTOLUENE	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROETHOXY) METHANE	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	5	U	5	U	5	U	5	U	5	U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	5	U	5	U	5	U	5	U	5	U
CHLOROBENZILATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIALLATE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
DIBENZOFURAN	µg/L	5	U	5	U	5	U	5	U	5	U
DIETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIMETHYL PHTHALATE	µg/L	5	U	5	U	5	U	5	U	5	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20	R	20.2	R	20	R	20	R	20	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	5	U	5	U	5	U	5	U	5	U
p-DIMETHYLAMINOAZOBENZENE	µg/L	10	U	10.1	U	10	U	10	U	10	U
3,3'-DICHLOROBENZIDINE	µg/L	5	U	5	U	5	U	5	U	5	U
3,3'-DIMETHYLBENZIDINE	µg/L	10	U	10.1	UJ	10	UJ	10	UJ	10	U
ETHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U
HEXACHLOROPROPENE	µg/L	5	U	5	U	5	U	5	UJ	5	U
ISODRIN	µg/L	5	U	5	U	5	U	5	U	5	U
ISOPHORONE	µg/L	5	U	5	UJ	5	U	5	U	5	U
ISOSAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U
KEPONE	µg/L	20	U	20.2	U	20	U	20	U	20	U
METHAPYRILENE	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
METHYL METHANESULFONATE	µg/L	5	U	5	U	5	U	5	U	5	U
2-METHYLNAPHTHALENE	µg/L	5	U	5	U	5	U	5	U	5	U
2-METHYLPHENOL (o-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U
3-METHYLCHOLANTHRENE	µg/L	5	U	5	U	5	U	5	U	5	U
4-METHYLPHENOL (p-CRESOL)	µg/L	5	U	5	U	5	U	5	U	5	U
1,4-NAPHTHOQUINONE	µg/L	10	U	10.1	U	10	U	10	U	10	U
1-NAPHTHYLAMINE	µg/L	5	U	5	U	5	U	5	UJ	5	U
2-NITROANILINE	µg/L	5	U	5	U	5	U	5	UJ	5	U
3-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-NITROANILINE	µg/L	5	U	5	U	5	U	5	U	5	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ
5-NITRO-o-TOLUIDINE	µg/L	10	U	10.1	U	10	U	10	U	10	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	5	U	5	UJ	5	UJ	5	U	5	U
N-NITROSODI-n-PROPYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSODIETHYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U
N-NITROSODIMETHYLAMINE	µg/L	5	U	5	U	5	U	5	UJ	5	UJ

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Sampling Event 5										Sampling Event 6									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6	
	SJRWMD No.:	None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141	
	SampleID:	FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-007-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001	
	DateCollected:	02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
cis-1,2-DICHLOROETHYLENE	µg/L	2.9	=	1	U	1	U	4.5	=	1	U	1	U	1	U	1	U	4.4	=	1	U
cis-1,3-DICHLOROPROPENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	1	U	1	U	1	U	2.2	=	1	U	1	U	1	U	1	U	2.1	=	1	U
1,1-DICHLOROETHENE	µg/L	0.96	J	1	U	1	U	0.44	J	1	U	1	U	1	U	1	U	0.49	J	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	µg/L	5	U	5	U	5	U	5	U	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	UJ
IODOMETHANE (METHYL IODIDE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	µg/L	0.48	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOLUENE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	µg/L	1	U	1	U	1	U	0.24	J	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	µg/L	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,4-DICHLORO-2-BUTENE	µg/L	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
TRICHLOROETHYLENE (TCE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL ACETATE	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
VINYL CHLORIDE	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Semi-volatile Organic Compound																					
ACETOPHENONE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.1	U	4	U	4	U	4	U
ARAMITE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2-ACETYLAMINOFLUORENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	UJ	10.2	U	10.1	U	10.1	U	10.1	UJ
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
BENZYL ALCOHOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
BENZYL BUTYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-BROMOPHENYL PHENYL ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-CHLOROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-CHLOROPHENYL PHENYL ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2-CHLORONAPHTHALENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2-CHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
1,3-DINITROBENZENE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U
2,4-DICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2,6-DICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	UJ	4	U
2,4-DIMETHYLPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2,4-DINITROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	U	10.1	UJ
2,4-DINITROTOLUENE	µg/L	**4**	UJ	**4**	UJ	**4**	UJ	**4**	U	**4**	U	**4**	U	**4.1**	U	**4**	U	**4**	U	**4**	U
bis(2-CHLOROETHOXY) METHANE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	**4.1**	U	4	U	4	U	4	UJ
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
CHLOROBENZILATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
DIALLATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	UJ	4	U
DIBENZOFURAN	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
DIETHYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
DIMETHYL PHTHALATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
DIMETHYLPHENYLETHYLAMINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	R	20	R	20	R	20.3	R	20.2	R	20.2	R	20.2	R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4	UJ	4.1	U	4	U	4	U	4	UJ
p-DIMETHYLAMINOAZOBENZENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
3,3'-DICHLOROBENZIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
3,3'-DIMETHYLBENZIDINE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	R	20.3	U	20.2	U	20.2	UJ	20.2	R
ETHYL METHANESULFONATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
HEXACHLOROPROPENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
ISODRIN	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
ISOPHORONE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
ISOSAFROLE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	UJ	4	U	4.1	U	4	U	4	U	4	U
KEPONE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	R	20.2	R	20.2	UJ	20.2	U
METHAPYRILENE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	UJ	10.1	U
METHYL METHANESULFONATE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U
2-METHYLNAPHTHALENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2-METHYLPHENOL (o-CRESOL)	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
3-METHYLCHOLANTHRENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-METHYLPHENOL (p-CRESOL)	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
1,4-NAPHTHOQUINONE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	UJ	10.1	UJ
1-NAPHTHYLAMINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
2-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
3-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-NITROANILINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
4-NITROQUINOLINE-N-OXIDE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ	10.1	UJ	10.1	UJ	10.1	UJ
5-NITRO-o-TOLUIDINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	UJ	10.1	U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
N-NITROSODI-n-PROPYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	**4.1**	U	4	U	4	U	4	U
N-NITROSODIETHYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
N-NITROSODIMETHYLAMINE	µg/L	**4**	UJ	**4**	UJ	**4**	UJ	**4**	U	**4**	U	**4**	U	**4.1**	UJ	**4**	UJ	**4**	UJ	**4**	U

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Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Baseline Event																Sampling Event 1									
	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-3		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1	
	SJRWMD No.:	None		None		OR0018		OR0819		OR0818		OR0818		OR0141		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		FP-03-01-006		FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007	
	DateCollected:	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003		5/28/2003		10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003	
	Matrix:	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	UJ	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSOMORPHOLINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
1,3,5-TRINITROBENZENE	µg/L	20.2	U	20.2	U	20.2	U	20.2	U	20.1	U	20.2	U	20.4	U	20.4	U	20	UJ	20	UJ	20.1	UJ	20	UJ	20.4	UJ
N-NITROSOPIPERIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
N-NITROSOPYRROLIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
NITROBENZENE	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
NITROSOMETHYLETHYLAMINE	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	U	5.1	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
o-TOLUIDINE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	UJ	5.1	UJ
p-PHENYLENEDIAMINE	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	U	10	U	10	U	10	U	10.2	U
PENTACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROETHANE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	UJ
PENTACHLORONITROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
PENTACHLOROPHENOL	µg/L	**10.1**	U	**10.1**	U	**10.1**	U	**10.1**	U	**10**	U	**10.1**	U	**10.2**	U	**10.2**	U	**6.2**	J	**10**	U	**10**	U	**10**	UJ	**10.2**	U
PHENACETIN	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	10	UJ	10	UJ	10	UJ	10	UJ	10.2	UJ
PHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
PRONAMIDE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
PYRIDINE	µg/L	5	UJ	5	UJ	5	UJ	5	U	5	U	5	U	5.1	UJ	5.1	UJ	5	U	5	U	5	U	5	U	5.1	UJ
SAFROLE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1	U	10.1	U	10.1	U	10.1	U	10	U	10.1	U	10.2	U	10.2	U	5.4	J	10	U	10	U	10	U	10.2	U
1,2,4-TRICHLOROBENZENE	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5.1	U	5.1	U	5	U	5	U	5	U	5	U	5.1	U
2,4,5-TRICHLOROPHENOL	µg/L	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U	**5.1**	U	**5**	U	**5**	U	**5**	U	**5**	U	**5.1**	U
2,4,6-TRICHLOROPHENOL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5.1**	U	**5.1**	U	5	U	5	U	5	U	5	U	**5.1**	U
Organochlorine Pesticides																											
ALDRIN	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U	**0.052**	U	**0.05**	U	**0.05**	U	**0.052**	U	**0.05**	U	**0.051**	U
ALPHA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
GAMMA-CHLORDANE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	UJ	0.05	UJ	0.052	UJ	0.05	U	0.051	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U	**0.052**	U	**0.05**	U	**0.05**	U	**0.052**	U	**0.05**	U	**0.051**	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U	**0.052**	U	**0.05**	U	**0.05**	U	**0.052**	U	**0.05**	U	**0.051**	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062	UJ	0.064	UJ	0.062	U	0.063	UJ	0.062	UJ	0.061	UJ	0.062	UJ	0.062	UJ	0.06	U	0.06	U	0.062	U	0.061	U	0.061	U
GAMMA BHC (LINDANE)	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
DIELDRIN	µg/L	**0.052**	U	**0.053**	U	**0.052**	U	**0.053**	U	**0.052**	U	**0.051**	U	**0.052**	U	**0.052**	U	**0.05**	U	**0.05**	U	**0.052**	U	**0.05**	U	**0.051**	U
ALPHA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
BETA ENDOSULFAN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDOSULFAN SULFATE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDRIN	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
ENDRIN ALDEHYDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U	0.062	U	0.06	UJ	0.06	UJ	0.062	UJ	0.061	U	0.061	U
ENDRIN KETONE	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
HEPTACHLOR EPOXIDE	µg/L	0.052	U	0.028	J	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
p,p'-DDD	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
p,p'-DDE	µg/L	0.062	U	0.064	U	0.062	U	0.063	U	0.062	U	0.061	U	0.062	U	0.062	U	0.06	U	0.06	U	0.062	U	0.061	U	0.061	U
p,p'-DDT	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	UJ	0.05	UJ	0.052	UJ	0.05	U	0.051	U
METHOXYCHLOR	µg/L	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.051	U	0.052	U	0.052	U	0.05	U	0.05	U	0.052	U	0.05	U	0.051	U
TOXAPHENE	µg/L	**3.1**	U	**3.2**	U	**3.1**	UJ	**3.2**	UJ	**3.1**	UJ	**3.1**	UJ	**3.1**	U	**3.1**	U	3	U	3	U	**3.1**	U	3	U	**3.1**	U
Organophosphorous Pesticides																											
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	UJ
MEVINPHOS	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
NALED	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	U	10	UJ
PARATHION, ETHYL	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	U	**10**	U	**10**	U	**10**	UJ
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)																											
PCB-1016 (AROCHLOR 1016)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U	0.52	U	0.5	UJ	0.5	UJ	0.52	UJ	0.5	UJ	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	**1**	U	**1.1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U	**1**	U
PCB-1232 (AROCHLOR 1232)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U	**0.52**	U	0.5	U	0.5	U	**0.52**	U	0.5	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U	0.52	U	0.5	U	0.5	U	0.52	U	0.5	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U	**0.52**	U	0.5	U	0.5	U	**0.52**	U	0.5	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52	U	0.53	U	0.52	U	0.53	U	0.52	U	0.51	U	0.52	U	0.52	U	0.5	U	0.5	U	0.52	U	0.5	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	**0.52**	U	**0.53**	U	**0.52**	U	**0.53**	U	**0.52**	U	**0.51**	U	**0.52**	U	**0.52**	U	0.5	UJ	0.5	UJ	**0.52**	UJ	0.5	UJ	**0.51**	UJ

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

Parameter Group and Name	Unit	Sampling Event 2					Sampling Event 3					Sampling Event 4				
Location:		Inflow to R-143	MW-1	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-1	MW-2	MW-4
Event:		Sampling Event 2	Sampling Event 2	Sampling Event 2	Sampling Event 2	Sampling Event 2	Sampling Event 3	Sampling Event 3	Sampling Event 3	Sampling Event 3	Sampling Event 3	Sampling Event 4	Sampling Event 4	Sampling Event 4	Sampling Event 4	Sampling Event 4
SJRWMD No.:		None	OR0018	OR0018	OR0819	OR0141	None	OR0018	OR0018	OR0819	OR0141	None	OR0018	OR0018	OR0819	OR0141
SampleID:		FP-03-03-002	FP-03-03-001	FP-03-03-003	FP-03-03-007	FP-03-03-006	FP-03-04-003	FP-03-04-004	FP-03-04-005	FP-03-04-001	FP-03-04-002	FP-03-05-007	FP-03-05-001	FP-03-05-002	FP-03-05-005	FP-03-05-006
DateCollected:		10/08/2003	10/08/2003	10/08/2003	10/10/2003	10/09/2003	10/23/2003	10/24/2003	10/24/2003	10/22/2003	10/23/2003	11/20/2003	11/18/2003	11/18/2003	11/19/2003	11/20/2003
Matrix:		Stormwater	Groundwater	Groundwater	Groundwater	Groundwater	Stormwater	Groundwater	Groundwater	Groundwater	Groundwater	Stormwater	Groundwater	Groundwater	Groundwater	Groundwater
SampleType:		Normal	Normal	Field Duplicate	Normal	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Normal	Field Duplicate	Normal	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
N-NITROSODIPHENYLAMINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSOMORPHOLINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3,5-TRINITROBENZENE	µg/L	20 UJ	20 UJ	20.6 UJ	20 UJ	20 UJ	20.1 U	20.5 U	20.5 U	20 UJ	20.2 U	20 UJ	20.2 UJ	20 UJ	20 UJ	20 UJ
N-NITROSOPIPERIDINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSOPYRROLIDINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 UJ	5.1 U	5.1 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U
NITROBENZENE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
NITROSOMETHYLETHYLAMINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 UJ	5.1 U	5.1 U	5 UJ	5 UJ	5 UJ	5 U	5 U	5 U	5 U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
o-TOLUIDINE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 UJ	5.1 U	5.1 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U
p-PHENYLENEDIAMINE	µg/L	10 U	10 U	10.3 U	10 U	10 U	10 U	10.2 U	10.2 U	10 U	10.1 U	10 U	10.1 U	10 U	10 U	10 U
PENTACHLOROBENZENE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PENTACHLOROETHANE	µg/L	5 U	5 UJ	5.2 UJ	5 UJ	5 UJ	5 UJ	5.1 U	5.1 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U
PENTACHLORONITROBENZENE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 UJ	5.1 UJ	5 UJ	5 U	5 U	5 U	5 U	5 UJ	5 U
PENTACHLOROPHENOL	µg/L	10 UJ	10 U	10.3 U	10 U	10 U	10 U	10.2 U	10.2 U	10 U	10.1 U	10 U	10.1 U	10 U	10 U	10 U
PHENACETIN	µg/L	10 UJ	10 UJ	10.3 UJ	10 UJ	10 UJ	10 U	10.2 U	10.2 U	10 U	10.1 U	10 U	10.1 U	10 U	10 U	10 U
PHENOL	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U
PRONAMIDE	µg/L	5 UJ	5 UJ	5.2 UJ	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PYRIDINE	µg/L	5 UJ	5 UJ	5.2 UJ	5 UJ	5 UJ	5 U	5.1 U	5.1 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
SAFROLE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4,5-TETRACHLOROBENZENE	µg/L	5 UJ	5 UJ	5.2 UJ	5 UJ	5 UJ	5 UJ	5.1 U	5.1 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U
2,3,4,6-TETRACHLOROPHENOL	µg/L	10 U	10 U	10.3 U	10 U	10 U	10 U	10.2 U	10.2 U	10 UJ	10.1 U	10 U	10.1 U	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
2,4,6-TRICHLOROPHENOL	µg/L	5 U	5 U	5.2 U	5 U	5 U	5 U	5.1 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Organochlorine Pesticides																
ALDRIN	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 UJ	0.05 U
ALPHA-CHLORDANE	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
GAMMA-CHLORDANE	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 UJ	0.05 UJ	0.053 UJ	0.05 UJ	0.05 UJ	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 UJ	0.05 UJ	0.052 UJ	0.05 U	0.05 UJ
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.062 UJ	0.06 UJ	0.063 UJ	0.061 UJ	0.061 UJ	0.06 UJ	0.062 UJ	0.061 UJ	0.06 UJ	0.06 UJ	0.061 UJ	0.061 UJ	0.062 UJ	0.06 UJ	0.06 UJ
GAMMA BHC (LINDANE)	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 UJ	0.05 UJ	0.052 UJ	0.05 U	0.05 UJ
DIELDRIN	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
ALPHA ENDOSULFAN	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
BETA ENDOSULFAN	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
ENDOSULFAN SULFATE	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
ENDRIN	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
ENDRIN ALDEHYDE	µg/L	0.062 U	0.06 U	0.063 U	0.061 U	0.061 U	0.06 U	0.062 U	0.061 U	0.06 U	0.06 U	0.061 UJ	0.061 UJ	0.062 UJ	0.06 U	0.06 UJ
ENDRIN KETONE	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
HEPTACHLOR	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
p,p'-DDD	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
p,p'-DDE	µg/L	0.062 U	0.06 U	0.063 U	0.061 U	0.061 U	0.06 U	0.062 U	0.061 U	0.06 U	0.06 U	0.061 U	0.061 U	0.062 U	0.06 U	0.06 U
p,p'-DDT	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
METHOXYCHLOR	µg/L	0.052 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.052 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.052 U	0.05 U	0.05 U
TOXAPHENE	µg/L	3.1 U	3 U	3.2 U	3 UJ	3 UJ	3 U	3.1 U	3 U	3 U	3 U	3.1 UJ	3 UJ	3.1 UJ	3 U	3 UJ
Organophosphorous Pesticides																
ATRAZINE	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AZINPHOS, METHYL (GUTHION)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BOLSTAR	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLORPYRIFOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COUMAPHOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DEMETON-O	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DEMETON-S	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIAZINON	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DICHLORVOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIMETHOATE	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DISULFOTON	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ETHOPROP	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U
FAMPHUR	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FENSULFOTHION	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FENTHION	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
MERPHOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
MEVINPHOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
NALED	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PARATHION, ETHYL	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PARATHION, METHYL	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PHORATE	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
RONNEL	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SIMAZINE	µg/L	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TOKUTHION (PROTHIOFOS)	µg/L	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLORONATE	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ZINOPHOS	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Polychlorinated biphenols (PCBs)																
PCB-1016 (AROCHLOR 1016)	µg/L	0.52 UJ	0.5 UJ	0.53 UJ	0.5 UJ	0.5 UJ	0.5 U	0.52 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.52 U	0.5 U	0.5 U
PCB-1221 (AROCHLOR 1221)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
PCB-1232 (AROCHLOR 1232)	µg/L	0.52 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.52 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.52 U	0.5 U	0.5 U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.52 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.52 U	0.5 U	0.5 U
PCB-1248 (AROCHLOR 1248)	µg/L	0.52 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.52 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.52 U	0.5 U	0.5 U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.52 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.52 U	0.5 U	0.5 U
PCB-1260 (AROCHLOR 1260)	µg/L	0.52 UJ	0.5 UJ	0.53 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.52 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.51 UJ	0.5 UJ	0.52 UJ	0.5 U	0.5 UJ

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Sampling Event 5										Sampling Event 6									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6	
	SJRWMD No.:	None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141	
	SampleID:	FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-007-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001	
	DateCollected:	02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
N-NITROSOMORPHOLINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
1,3,5-TRINITROBENZENE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	UJ	20	UJ	20	UJ	20.3	U	20.2	U	20.2	U	20.2	UJ
N-NITROSOPIPERIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
N-NITROSOPYRROLIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
NITROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	**4.1**	U	4	U	4	U	4	U
NITROSOMETHYLETHYLAMINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
o-TOLUIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U
p-PHENYLENEDIAMINE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
PENTACHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
PENTACHLOROETHANE	µg/L	20.2	UJ	20.2	UJ	20.2	UJ	20.1	U	20	U	20	U	20.3	U	20.2	U	20.2	U	20.2	U
PENTACHLORONITROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
PENTACHLOROPHENOL	µg/L	**20.2**	UJ	**20.2**	UJ	**20.2**	UJ	**20.1**	U	**20**	U	**20**	U	**20.3**	U	**20.2**	U	**20.2**	U	**20.2**	U
PHENACETIN	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
PHENOL	µg/L	**20.2**	UJ	**20.2**	UJ	**20.2**	UJ	**20.1**	UJ	**20**	U	**20**	UJ	**20.3**	U	**20.2**	U	**20.2**	U	**20.2**	UJ
PRONAMIDE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
PYRIDINE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	R	4.1	U	4	U	4	U	4	R
SAFROLE	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	10.1	UJ	10.1	UJ	10.1	UJ	10	U	10	U	10	U	10.2	U	10.1	U	10.1	U	10.1	U
1,2,4-TRICHLOROBENZENE	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
2,4,5-TRICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	**4.1**	U	4	U	4	U	4	U
2,4,6-TRICHLOROPHENOL	µg/L	4	UJ	4	UJ	4	UJ	4	U	4	U	4	U	4.1	U	4	U	4	U	4	U
Organochlorine Pesticides																					
ALDRIN	µg/L	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.051**	U	**0.051**	U
ALPHA-CHLORDANE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
GAMMA-CHLORDANE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	UJ	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.051**	U	**0.051**	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.051**	U	**0.051**	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.06	U	0.06	U	0.061	U	0.061	UJ	0.061	U	0.06	U	0.061	U	0.061	U	0.061	U	0.061	U
GAMMA BHC (LINDANE)	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
DIELDRIN	µg/L	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.05**	U	**0.051**	U	**0.051**	U
ALPHA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
BETA ENDOSULFAN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
ENDOSULFAN SULFATE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	UJ	0.05	UJ	0.051	U	0.051	U
ENDRIN	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
ENDRIN ALDEHYDE	µg/L	0.06	U	0.06	U	0.061	U	0.061	U	0.061	UJ	0.06	UJ	0.061	UJ	0.061	UJ	0.061	UJ	0.061	UJ
ENDRIN KETONE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
HEPTACHLOR	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
HEPTACHLOR EPOXIDE	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
p,p'-DDD	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
p,p'-DDE	µg/L	0.06	U	0.06	U	0.061	U	0.061	U	0.061	U	0.06	U	0.061	U	0.061	U	0.061	U	0.061	U
p,p'-DDT	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
METHOXYCHLOR	µg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U
TOXAPHENE	µg/L	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	**3.1**	U
Organophosphorous Pesticides																					
ATRAZINE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
AZINPHOS, METHYL (GUTHION)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BOLSTAR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
CHLORPYRIFOS	µg/L	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U
COUMAPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DEMETON-O	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DEMETON-S	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DIAZINON	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DICHLORVOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
DIMETHOATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
DISULFOTON	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
ETHOPROP	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FAMPHUR	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
FENSULFOTHION	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
FENTHION	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
MERPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
MEVINPHOS	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U
NALED	µg/L	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10	U	10	U	10	UJ	10	U
PARATHION, ETHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PARATHION, METHYL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
PHORATE	µg/L	**10**	U	**10**	U	**10**	U	**10**	U	**10**	U	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ	**10**	UJ
RONNEL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
SIMAZINE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TOKUTHION (PROTHIOFOS)	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
TRICHLORONATE	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
ZINOPHOS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Polychlorinated biphenols (PCBs)																					
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.51**	U	**0.51**	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	UJ	**0.51**	UJ	**0.51**	U

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Baseline Event																Sampling Event 1									
	Location:	Inflow to R-40		Inflow to R-143		MW-1		MW-2		MW-3		MW-3 (Dup)		MW-3		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Baseline		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1		Sampling Event 1	
	SJRWMD No.:	None		None		OR0018		OR0819		OR0818		OR0818		OR0141		OR0141		None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-01-007		FP-03-01-008		FP-03-01-009		FP-03-01-001		FP-03-01-002		FP-03-01-003		FP-03-01-006		FP-03-01-006		FP-03-02-005		FP-03-02-001		FP-03-02-002		FP-03-02-006		FP-03-02-007	
	DateCollected:	5/28/2003		5/28/2003		5/29/2003		5/27/2003		5/27/2003		5/27/2003		5/28/2003		5/28/2003		10/01/2003		10/01/2003		10/01/2003		10/02/2003		10/03/2003	
	Matrix:	Stormwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																											
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U	0.53	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U	0.53	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U
DALAPON	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ	0.53	UJ	0.56	U	0.56	UJ	0.56	U	0.56	U	0.56	U
DICAMBA	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U	0.53	U	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U
DICHLOROPROP	µg/L	**0.53**	U	**0.53**	U	0.53	R	**0.52**	U	**0.51**	U	**0.51**	U	**0.53**	U	**0.53**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U	**0.56**	U
DINOSEB	µg/L	0.53	UJ	0.53	UJ	0.53	R	0.52	U	0.51	U	0.51	U	0.53	UJ	0.53	UJ	0.56	UJ	0.56	UJ	0.56	UJ	0.56	R	0.56	R
PICLORAM	µg/L	11	UJ	10	UJ	11	R	10	UJ	10	UJ	10	UJ	11	UJ	11	UJ	11	U	11	U	11	U	11	U	11	U
SILVEX (2,4,5-TP)	µg/L	0.53	U	0.53	U	0.53	R	0.52	U	0.51	U	0.51	U	0.53	U	0.53	U	0.5	U	0.5	U	0.5	U	0.52	UJ	0.52	UJ

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Explanation of Units
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mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Sampling Event 2									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2		Sampling Event 2	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-03-002		FP-03-03-001		FP-03-03-003		FP-03-03-007		FP-03-03-006	
	DateCollected:	10/08/2003		10/08/2003		10/08/2003		10/10/2003		10/09/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides											
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
DALAPON	µg/L	0.56	U	0.56	U	0.56	U	0.5	UJ	0.5	UJ
DICAMBA	µg/L	0.56	U	0.56	U	0.56	U	0.5	U	0.5	U
DICHLOROPROP	µg/L	**0.56**	U	**0.56**	U	**0.56**	U	**0.5**	U	**0.5**	U
DINOSEB	µg/L	0.56	UJ	0.56	UJ	0.56	UJ	0.5	R	0.5	UJ
PICLORAM	µg/L	11	U	11	U	11	U	10	U	10	U
SILVEX (2,4,5-TP)	µg/L	0.51	U	0.5	U	0.5	UJ	0.51	U	0.52	U

		Sampling Event 3									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3		Sampling Event 3	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-04-003		FP-03-04-004		FP-03-04-005		FP-03-04-001		FP-03-04-002	
	DateCollected:	10/23/2003		10/24/2003		10/24/2003		10/22/2003		10/23/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides											
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U
DALAPON	µg/L	0.5	UJ	0.52	UJ	0.52	UJ	0.51	UJ	0.5	UJ
DICAMBA	µg/L	0.5	U	0.52	UJ	0.52	UJ	0.51	U	0.5	U
DICHLOROPROP	µg/L	**0.5**	U	**0.52**	UJ	**0.52**	UJ	**0.51**	U	**0.5**	U
DINOSEB	µg/L	0.5	UJ	0.52	UJ	0.52	UJ	0.51	R	0.5	UJ
PICLORAM	µg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
SILVEX (2,4,5-TP)	µg/L	0.52	U	0.51	U	0.25	U	0.25	U	0.25	U

		Sampling Event 4									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4		Sampling Event 4	
	SJRWMD No.:	None		OR0018		OR0018		OR0819		OR0141	
	SampleID:	FP-03-05-007		FP-03-05-001		FP-03-05-002		FP-03-05-005		FP-03-05-006	
	DateCollected:	11/20/2003		11/18/2003		11/18/2003		11/19/2003		11/20/2003	
	Matrix:	Stormwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides											
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
DALAPON	µg/L	0.5	UJ	0.51	UJ	0.52	UJ	0.52	UJ	0.51	UJ
DICAMBA	µg/L	0.5	UJ	0.51	UJ	0.52	UJ	0.52	U	0.51	UJ
DICHLOROPROP	µg/L	**0.5**	UJ	**0.51**	U	**0.52**	U	**0.52**	U	**0.51**	U
DINOSEB	µg/L	0.5	UJ	0.51	U	0.52	U	0.52	U	0.51	U
PICLORAM	µg/L	10	UJ	10	UJ	10	UJ	10	U	10	UJ
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.25	U	0.5	U	0.5	U	0.5	UJ

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Explanation of Units
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mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
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		Sampling Event 5										Sampling Event 6									
	Location:	Inflow to R-143		MW-1		MW-1		MW-2		MW-4		Inflow to R-143		MW-1		MW-1		MW-2		MW-4	
	Event:	Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 5		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6		Sampling Event 6	
	SJRWMD No.:	None		OR0018		OR0018		OR819		OR0141		None		OR0018		OR0018		OR819		OR0141	
	SampleID:	FP-04-06-005		FP-04-06-001		FP-04-06-002		FP-04-06-007		FP-04-06-006		FP-04-007-02		FP-04-07-003		FP-04-07-004		FP-04-07-007		FP-04-07-001	
	DateCollected:	02/04/2004		02/04/2004		02/04/2004		02/06/2004		02/05/2004		02/16/2004		02/17/2004		02/17/2004		02/18/2004		02/16/2004	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Normal		Field Duplicate		Normal		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																					
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.25	U	0.25	U	0.25	U	0.5	U	0.25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DALAPON	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
DICAMBA	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
DICHLOROPROP	µg/L	**0.25**	U	**0.25**	U	**0.25**	U	**0.5**	U	**0.25**	U	**0.5**	U	**0.5**	U	**0.5**	U	**0.5**	U	**0.5**	U
DINOSEB	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
PICLORAM	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.5	U	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	290	µg/L	29	µg/L

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REPORT

Central Florida Artificial Recharge Demonstration Program
Festival Park – Orlando, FL

Microbiological Monitoring Results

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Central Florida Artificial Recharge Demonstration Program
Festival Park – Orlando, FL

SAMPLING METHODS:

FIELD SAMPLING METHODS:

Three groundwater monitoring wells (MW1, MW2, MW4) and one storm-water recharge wells (NR) were sampled for *Cryptosporidium spp., Giardia spp., Enterococcus spp.,*, total coliforms, fecal coliforms, *E. coli*, and coliphage in order to monitor levels of these microbial indicators for the Artificial Recharge Well Demonstration Project. Envirochek HV filters were used, according to EPA Method 1623 to detect the presence of *Cryptosporidium spp.* and *Giardia spp.* at each site. The sampling apparatus used at the monitoring well sites consisted of a submersed bladder pump attached to 125ft.of tubing, attached to the Envirochek HV filter, attached to a flow meter, attached to an outlet hose. The sampling apparatus was modified at the recharge site to incorporate a diaphragm pump, which was placed after the flow meter. Flow meters were attached to the sampling apparatus to provide accurate measurement of volume sampled.

Matrix spike (MS) and matrix spike duplicate (MSD) samples were processed according to USEPA method 1623 (USEPA, 2001) to determine the recovery efficiency of the sampling apparatus under specific field conditions and with differing water matrices (i.e. groundwater and recharge wells). Following collection of filter samples for *Cryptosporidium spp.* and *Giardia spp.,* grab samples were collected in sterile one or two liter bottles for laboratory analysis of the concentration of four bacterial indicators and coliphage.

All equipment used in the sampling apparatus was new, and once used, it was "dedicated" to the site, labeled, and stored in separate plastic bags. These measures were taken to prevent cross contamination during later sample collection events at these sites. Also, to eliminate the need for decontamination, all tubing that precedes the filter in the sampling apparatus will be replaced with new tubing at each future sampling event.

Groundwater Monitoring Wells:

Samples were collected from the monitoring wells using a submersible bladder pump that was at a depth of 120 to 125 feet bellow ground level. Following the EPA Method 1623 approximately 946 liters of water were filtered through Envirochek HV filter capsules at a rate between 2.3 and 3.8 liters/minute (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA). Lesser amounts were consistently filtered at site MW1 due to high turbidity and clogging of the filter. Also, at MW1 large amounts of air were present in the water as it entered the filter. The aeration may be due to the geological substrate in which this well was located. The degree of water aeration was not found to be correctable with slight variation in the flow rate or pump depth. Collection of volumes less than 946 at other sites was also due to clogging of the filter.

MS and MSD samples were collected at Monitoring Well 4 (MW4) to check the precision and accuracy of the equipment used to sample for *Cryptosporidium spp.* and *Giardia spp.* For each spiked sample approximately 100 liters of water were pumped into a 32 gallon plastic trash can. 100±2 *Giardia* cysts and 100±2 *Cryptosporidium* oocysts were added to the 100 liter sample according to the ColorSeedC&G matrix spike package insert (ColorSeed C&G; BTF, Decisive Microbiology, North Ryde, BC, Australia). The final 2-3 liters of system effluent were used to rinse the inside of the garbage can in efforts to recover any affixed (oo)cysts. The equipment used for the matrix spikes had been dedicated to matrix spikes at MW4.

The matrix spike procedures were completed twice during this sampling period in order to analyze any potential changes in recovery efficiency due to changes in the water matrix over time. Studies have shown that significant changes in recovery efficiency result from changes in amounts of precipitation received by the watershed (Francy et al. in press).

Following the collection of filter samples, a total of 7 liters of water were collected in sterile grab sample bottles. The filters and grab samples were placed in coolers with ice packs and transported to the Water Pollution Laboratory at Michigan State University for analysis.

Stormwater Recharge Wells:

Samples were collected from recharge wells using a car-battery operated automatic-demand diaphragm pump that drew water from a depth of approximately 10ft. A 13 ft. piece of tubing was inserted into a 10ft long PVC pipe, which was lowered through the well grate into the water. The sampling apparatus consisted of tubing encased in PVC piping attached to the Envirochek HV filter, attached to a flow meter, attached to a diaphragm pump, attached to an outlet hose.

At the north recharge well, the turbidity of the water and clogging of the filter limited volume that was collected. Additionally, sampling at the North Recharge (NR) site was complicated by recurring sudden rises in the water level. Approximately every 20 minutes the water level would rapidly rise from approximately 10 ft. below ground level to approximately 1ft. above ground level and would spray from the top of the well grate.

MS and MSD samples were collected at NR. Approximately 10 liters of water were collected in a new 32 gallon plastic garbage can, to which the ColorSeed sample containing 100±2 *Giardia* cysts and 100±2 *Cryptosporidium* oocysts was added, according to the manufacturer specifications. The entire 10L sample was filtered and the final 2-3liters of system effluent were used to rinse the sides of the garbage can in efforts to recover any affixed (oo)cysts. A 10 liter sample was spiked instead of the recommended 100L due to the high turbidity and the observation that the NR sample filters had become clogged after 10-40 liters had been filtered. The procedure was repeated for the matrix spike duplicate.

A total of 7 liters of grab samples were also collected at each stormwater recharge site. The filters and grab samples were placed in coolers with ice packs and transported to the Water Pollution Laboratory at Michigan State University for laboratory analysis.

LABORATORY METHODS:

The filters and grab samples were stored on ice and transported to the laboratory via Fed Ex next-day delivery service. The initial laboratory processing of samples was completed within 36 hours after collection. Recovery efficiency experiments are also routinely done in the laboratory to determine the accuracy and precision of laboratory methods and equipment.

Bacterial Indicators:

To assess the concentration of total coliforms, fecal coliforms, *E. coli* and *Entercoccus spp.*, in the monitoring wells, sample volumes of 1, 100, 250, 500 mL were filtered using a 0.45 um (pore size) 47mm (diameter) filter membrane (Gelman Sciences) according to the *Standard Methods for the Examination of Water and Wastewater* (APHA 1998). The same was done with samples derived from recharge wells; however, the 500 mL volume could not be processed due to clogging of the filter. The filters were plated on indicator-specific media and incubated for 24 hours at temperatures specific to each indicator.

For enumeration of *Enterococcus spp.* the filters were placed on MEI agar plates (modified medium for detection of *Enterococcus spp.*; Difco Laboratories, Detroit, MI) and incubated at 41°C. After 24 hours colonies with a blue halo were counted as *Entercoccus spp*. as described in Method 1600 (USEPA, 1996). To assess numbers of total coliform bacteria, membrane filters were placed on m-ENDO agar (Difco Laboratories, Detroit, MI) and incubated at 37°C. To detect fecal coliform bateria the filters were placed on mFC agar (modified medium for fecal coliform bacteria; Difco Laboratories, Detroit, MI) and incubated at 45° C. The bacterial concentrations were then quantified and expressed as the number of colony forming units per 100mL (CFU/ 100mL) (Table 1).

To assess *E.coli* concentrations the membrane filter used in the total coliform evaluation was removed from the m-ENDO agar and transferred to a plate with EC medium with MUG (Difco Laboratories, Detroit, MI). The plates were incubated at 37°C for 24 hours and then viewed under a UV lamp. Those colonies which fluoresced were counted as positive *E.coli* colonies (Table 1).

Coliphages:

Two methods were used to determine the concentration and types of coliphages present in the water samples: an agar overlay method and an enrichment method. Two different host bacterium strains were used in the agar overlay method, *E. coli* C3000 and *E. coli* p(Famp)R Each host *E. coli* was grown to logarithmic stage in tryptic soy broth (TSB) at 37° C for approximately 4 hours. 1mL of the host bacteria and 2mL of sampled water was mixed with a molten trypticase soy agar (TSA) (3mL) and then poured over a solid TSA plate. 5 replicate plates were used for each sample site and for each host. Coliphage concentration at each sampling site was determined using the following formula: (total number of plaques/

volume of sampled water analyzed)*100. The concentration is reported in numbers of plaque-forming units per 100mL (PFU/100mL) (Table 1).

The enrichment test provides information about the presence or absence of coliphages rather than a quantitative assessment of coliphage numbers, and is commonly used to detect low levels of coliphages that may be present in groundwater samples. In order to detect low numbers of coliphages in the sampled water, an enrichment experiment was run with water from each of the sites. A 1 L water sample was inoculated with 10mL of host bacterial culture (*E. coli* p(Famp)R) and 100mL of 11X tryptone broth with antibiotics (Ampicillin-Streptomycin). The sample was then incubated at 35°C for 48 hours.

2mL of enrichment sample from the sites that were initially coliphage-negative (using the agar overlay method) was filtered through a 0.22um syringe filter. 10ul of the filtrate was then spotted on the center of a plate with TSA base and a TSA agar overlay containing host bacterium. The plates were incubated at 37°C for 24 hours and examined for lysis zones.

Also, to determine if the samples contained F+DNA or F+RNA phages, RNase was incorporated into plating growth medium containing an *E. coli* p(Famp)R baterial lawn. 10ul (filtered) of the enriched samples for each sample site were spotted in the center of TSA (RNase+) plates containing *E. coli* (Famp+) and incubated at 37°C for 24 hours. The plates were then scored as either F+DNA or F+RNA phages (Table 1).

***Cryptosporidium spp.* and *Giardia spp.*:**

Cryptosporidium spp. and *Giardia spp.* were enumerated using standard methods for filtration, elution, concentration, purification (IMS), staining and examination by IFA according to the methods described in Method 1623 (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA) (USEPA, 2001). The concentration of the final pellet was recorded on laboratory data sheets.

The resuspended pellet containing (oo)cysts was purified using immunomagnetic separation (IMS) using a Dynal Dynabeads CG combo kit. IMS was completed according to the protocol described in EPA Method 1623 with some modification. Namely, the dissociation of the bead-(oo)cyst complex was accomplished by washing the beads with 100ul of 0.1N HCl two times, instead of the suggested 50ul (Dynabeads anti-*Cryptosporidium* and anti-*Giardia*; product 730.02; Dynal A.S., Oslo, Norway). This resulted in a 200ul suspension containing cysts and oocysts. 50ul of solution was placed on each of four slides with 5ul NaOH to neutralize the HCL. The slides were then fixed and stained using fluorescein isothiacyanate-conjugated anti-*Cryptosporidium* sp. and anti-*Giardia* sp. monoclonal antibodies (EasyStain; BTF, Decisive Microbiology, North Ryde, BC Australia) and a solution 4',6'-diamidino-2-phenylindole and propidium iodide (DAPI-PI).

(Oo)cysts on the slides were viewed and enumerated using epifluorescence microscopy. For naturally occurring (oo)cysts, the number of cysts and oocysts per 100L of water was calculated (Table 2). Also, for the spiked samples (MS and MSD), the recovery efficiency and relative percent difference statistics were calculated (Tables 3 and 4).

Recovery Efficiency Experiments:

Recovery efficiency experiments are routinely conducted in the Water Pollution Laboratory at Michigan State University to verify that proper quality assurance standards are met. These experiments are carried out as described in the April 2001 version of USEPA method 1623 to demonstrate acceptable method performance and include: (i) initial precision and recovery tests, (IPR) (ii) ongoing precision and recovery tests (OPR), (iii) matrix spikes (MS) and (iv) method blanks. A combination of filtered tap water and distilled water are used as the reagent water sample for blanks, IPR and OPR tests.

IPR tests are intended to establish the ability to demonstrate control over the analytical system and to generate acceptable precision and recovery (USEPA, 2001). For this purpose, 100 L of reagent water sample was filtered, eluted, concentrated, purified (IMS), stained and examined by IFA using method 1623 and the Envirochek HV cartridge filtration method. Four reagent water samples were processed and the results of these analyses were used to compute the average percent recovery (Mean) and the relative standard deviation (RSD) of the recovery. The RSD is the standard deviation divided by the mean times 100. The mean and RSD are compared with the corresponding limits for initial precision and recovery described in method 1623 (USEPA, 2001) in order to determine method performance.

OPR tests will be carried out throughout the study to verify all performance criteria (data not shown). For this purpose, two spike reagent water samples have been filtered, eluted, concentrated, purified (IMS), stained and examined by IFA. The frequency of OPR tests is typically one spiked reagent water sample for every 20 samples analyzed.

Matrix spike (MS) along with matrix spike duplicates (MSD) were carried out with the spiked field samples described above to determine the effect of the method's oocyst and cyst recovery. For this purpose, four spiked water matrices were processed filtered, eluted, concentrated, purified (IMS) stained and examined by IFA. MS for each water type was processed and the mean of the number of (oo)cysts were computed as follows: Matrix spike duplicate (MSD) or Mean = (MS1+MS2/2). From these results, the relative percent difference (RPD) was computed as follows: RPD = 100 x [(oo)cysts detected in MS1 – oocysts detected in MS2]/Mean. The results of these calculations were then compared with the corresponding limits established in method 1623 (USEPA, 2001) to determine precision and recovery of the methods using the different water matrices (Tables 3 and 4).

The filtration device used in the study was the Envirochek HV sampling capsule (Pall Gelman Laboratory, Ann Arbor, MI). ColorSeed^{TM} C&G (BTF, Decisive Microbiology, North Ryde, BC, Australia) was used as the spike suspensions in IPR tests, matrix spike, matrix spike duplicates, and recovery efficiency experiments. These spikes consist of 100±2 red fluorescent labeled and gamma irradiated *Cryptosporidium* oocysts and *Giardia* cysts in approximately 1 mL of saline solution. They can be used as internal quality control parameters to determine the performance or percent recovery achieved with every test (see http://www.biotechfrontiers.com). For spiked experiments, water volumes of 100 L were filtered through the Envirochek HV capsule filter. Spiked samples were filtered on-site and the filters were transported to the laboratory on ice.

Results:

Table 1. Summary Results for Bacterial Indicators and Coliphage: Festival Park 2003-2004

		Indicator Organisms						
Date sample collection	Site location	Bacteria (CFU/100 mL)				Coliphage Enrichment		
		Total Coliforms	Fecal Coliforms	*E. coli*	Enterococcus	Host C3000*	Host Famp+	
							Overlay*	DNA/RNA
10/1/03	Monitoring Well 1	5.2	1.1	0.2	0.3	-	-	N/A
10/2/03	Monitoring Well 2	3.7	2	0.6	< 0.2	-	+	DNA+
10/3/03	Monitoring Well 4	<0.2	<0.2	<0.2	0.3	+	+	DNA+
10/1/03	North Recharge Well	4.5x10^4	2.2x10^4	4.1x10^2	1.7x10^3	-	+	DNA+
10/8/03	Monitoring Well 1	7.4	2.9	<0.2	9.4	+	+	DNA+
10/10/03	Monitoring Well 2	0.3	0.7	<0.2	<0.2	+	+	DNA+
10/9/03	Monitoring Well 4	<0.2	<0.2	<0.2	1.3x10^1	+	+	DNA+
10/8/03	North Recharge Well	5.9x10^3	3.4x10^3	4.1x10^2	1.4x10^2	+	+	DNA+
10/24/03	Monitoring Well 1	<0.2	<0.2	<0.2	<0.2	-	+	DNA+
10/22/03	Monitoring Well 2	2.2	1.6	0.3	<0.2	+	+	DNA+
10/22/03	Monitoring Well 4	<0.2	<0.2	<0.2	<0.2	+	-	N/A
10/23/03	North Recharge Well	9.9x10^2	8.6x10^2	1.8x10^2	6.9x10^1	-	+	DNA+
11/19/03	Monitoring Well 1	7.4	5.9	2.3	2.3x10^1	+	+	DNA+
11/20/03	Monitoring Well 2	0.9	1	<0.2	<0.2	+	+	DNA+
11/21/03	Monitoring Well 4	5.5	5.3	<0.2	0.7	-	+	DNA+
11/21/03	North Recharge Well	1.0x10^6	9.8x10^5	2.4x10^3	3.4x10^3	+	+	DNA+
2/4/04	Monitoring Well 1	0.8	1.8	0.2	<0.2	-	+	DNA+
2/6/04	Monitoring Well 2	<0.2	<0.2	<0.2	2.2	-	+	DNA+
2/5/04	Monitoring Well 4	<0.2	<0.2	<0.2	<0.2	-	+	RNA+
2/4/04	North Recharge Well	3.3x10^3	1.9x10^3	6.8x10^2	4.5x10^1	+	+	DNA+
2/17/04	Monitoring Well 1	<0.2	<0.2	<0.2	<0.2	+	+	DNA+
2/18/04	Monitoring Well 2	4.74x10^2	5.85x10^2	1.52	3.16x10^1	-	+	DNA+
2/16/04	Monitoring Well 4	<0.2	<0.2	<0.2	<0.2	+	+	DNA+
2/16/04	North Recharge Well	1.61x10^5	7.7x10^4	7.2x10^2	1.22x10^3	+	+	DNA+

Table 2. Cryptosporidium and Giardia Detected: Festival Park 2003-2004

Date Collected	Site Location	Total Volume Collected (Liters)	Organisms Detected	Total	# with internal features (DAPI/DIC)	# without internal features	Equivalent concentration of (oo)cysts/ 100L
10/1/03	Monitoring Well 1	317.94	Cryptosporidium Giardia	0	0	0	<0.3
10/2/03	Monitoring Well 2	435.28	Cryptosporidium Giardia	0	0	0	<0.2
10/3/03	Monitoring Well 4	946.25	Cryptosporidium Giardia	0	0	0	<0.1
10/1/03	North Recharge Well	34.06	Cryptosporidium Giardia	0	0	0	<3.0
10/8/03	Monitoring Well 1	745.65	Cryptosporidium Giardia	0	0	0	<0.1
10/10/03	Monitoring Well 2	946.25	Cryptosporidium Giardia	0	0	0	<0.1
10/9/03	Monitoring Well 4	946.25	Cryptosporidium Giardia	0	0	0	<0.1
10/8/03	North Recharge Well	39.74	Cryptosporidium Giardia	0	0	0	<3.0
10/24/03	Monitoring Well 1	818.7	Cryptosporidium Giardia	0	0	0	<0.1
10/22/03	Monitoring Well 2	560.18	Cryptosporidium Giardia	0	0	0	<0.2
10/22/03	Monitoring Well 4	632.1	Cryptosporidium Giardia	0	0	0	<0.2

10/23/03	North Recharge Well	20.44	Cryptosporidium Giardia	0	0	0	<5.0
11/19/03	Monitoring Well 1	563.97	Cryptosporidium Giardia	0	0	0	<0.2
11/20/03	Monitoring Well 2	946.25	Cryptosporidium Giardia	0	0	0	<0.1
11/21/03	Monitoring Well 4	946.25	Cryptosporidium Giardia	0	0	0	<0.1
11/21/03	North Recharge Well	9.84	Cryptosporidium Giardia	0	0	0	<10.0
2/4/04	Monitoring Well 1	757.0	Cryptosporidium Giardia	0	0	0	<0.1
2/6/04	Monitoring Well 2	518.5	Cryptosporidium Giardia	0	0	0	<0.2
2/5/04	Monitoring Well 4	946.25	Cryptosporidium Giardia	0	0	0	<0.1
2/4/04	North Recharge Well	14.0	Cryptosporidium Giardia	0	0	0	<7.0
2/17/04	Monitoring Well 1	946.25	Cryptosporidium Giardia	0	0	0	<0.1
2/18/04	Monitoring Well 2	946.25	Cryptosporidium Giardia	0	0	0	<0.1
2/16/04	Monitoring Well 4	946.25	Cryptosporidium Giardia	0	0	0	<0.1
2/16/04	North Recharge Well	18.93	Cryptosporidium Giardia	0	0	0	<5.0

Table 3. Matrix Spike and Matrix Spike Duplicate: Monitoring Well – Festival Park 2003-2004

Date Collected	Site Location	Total Volume Collected (Liters)	Organism	Recovered	% Recovery Efficiency
10/23/03	Monitoring Well 4	100	Cryptosporidium	0	0
			Giardia	3	3
10/23/03	Monitoring Well 4	100	Cryptosporidium	1	1
			Giardia	4	4
11/20/03	Monitoring Well 4	100	Cryptosporidium	48	48
			Giardia	42	42
11/20/03	Monitoring Well 4	100	Cryptosporidium	31	31
			Giardia	36	36
2/16/04	Monitoring Well 4	100	Cryptosporidium	45	45
			Giardia	29	29
2/16/04	Monitoring Well 4	100	Cryptosporidium	36	36
			Giardia	35	35

Relative Percent Difference (RPD) 10/23/03: Cryptosporidium = 200.0%
Giardia = 28.6%
Relative Percent Difference (RPD) 11/20/03: Cryptosporidium = 43.0 %
Giardia = 15.4%
Relative Percent Difference (RPD) 2/16/04: Cryptosporidium = 22.2%
Giardia = 18.8%

Table 4. Matrix Spike and Matrix Spike Duplicate: Recharge Well – Festival Park 2003-2004

Date Collected	Site Location	Total Volume Collected (Liters)	Organism	Recovered	% Recovery Efficiency
10/23/03	North Recharge Well	10	Cryptosporidium	2	2
			Giardia	17	17
10/23/03	North Recharge Well	10	Cryptosporidium	2	2
			Giardia	12	12
11/20/03	North Recharge Well	10	Cryptosporidium	17	17
			Giardia	21	21
11/20/03	North Recharge Well	10	Cryptosporidium	25	25
			Giardia	31	31
2/16/04	North Recharge Well	10	Cryptosporidium	9	9
			Giardia	7	7
2/16/04	North Recharge	10	Cryptosporidium	7	7
			Giardia	9	9

Relative Percent Difference (RPD) 10/23/03: Cryptosporidium = 0.0%
Giardia = 34.5%

Relative Percent Difference (RPD) 11/20/03: Cryptosporidium = 38.1%
Giardia = 38.5%

Relative Percent Difference (RPD) 2/16/04: Cryptosporidium = 25%
Giardia = 25%

General Conclusions

Consistently high levels of all bacterial indicators were found during all sampling events at the North Recharge Well. It was expected that the recharge sites would have the highest levels of indicators compared to other sites sampled, as the recharge sites represent the point of stormwater input into the aquifer.

Levels of bacterial indicators present in Monitoring Well 1 were routinely higher than those found in the other monitoring wells. Meanwhile Monitoring Well 4 had consistently low levels of bacterial indicators relative to the other monitoring wells. Levels of microbial indicators were significantly lower in all monitoring wells compared to the recharge well.

There were no Cryptosporidium oocysts or Giardia cysts found in any of the wells during any of the sampling events.

Festival Park Operational Characterization Microbial Sampling Results
SJRWMD CFARE1

	Location	R-143	MW-1	MW-2	MW-4	R-143	MW-1	MW-2	MW-4	R-143	MW-1	MW-2	MW-4	Quality
	Date Collected ==>	10/1/2003	10/1/2003	10/2/2003	10/3/2003	10/8/2003	10/8/2003	10/10/2003	10/9/2003	10/23/2003	10/24/2003	10/22/2003	10/23/2003	(Class III Waters) [1]
Organism	**Units**	**Sampling Event 1**				**Sampling Event 2**				**Sampling Event 3**				
Total Coliform	cfu/100 mL	45,000	5.2	3.7	<0.2	5,900	7.4	0.3	<0.2	990	<0.2	2.2	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average
Fecal Coliform	cfu/100 mL	22,000	1.1	2	<0.2	3,400	2.9	0.7	<0.2	860	<0.2	1.6	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. coli	cfu/100 mL	410	0.2	0.6	<0.2	410	<0.2	<0.2	<0.2	180	<0.2	0.3	<0.2	126 cfu/100 mL - Geometric Mea
Enterococcus	cfu/100 mL	1,700	0.3	<0.2	0.3	140	9.4	<0.2	13	69	<0.2	<0.2	<0.2	35 cfu/100 mL - Fresh Water 104 cfu/100 mL - Geometric
Cryptosporidium	no./100 L	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<5	
Giarida	no./100 L	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<3	<0.01	<0.01	<0.01	<5	
Coliphage														100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	-	-	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	-	+ (<5)	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	+ (<5)	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	n/a	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	n/a	

	Location	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	Inflow to R-143	MW-1	MW-2	MW-4	Indicator Guidelines for Ambient Surface Water Quality
	Date Collected ==>	11/21/2003	11/19/2003	11/20/2003	11/21/2003	2/4/2004	2/4/2004	2/6/2004	2/5/2004	2/16/2004	2/17/2004	2/18/2004	2/16/2004	(Class III Waters) [1]
Organism	**Units**	**Sampling Event 4**				**Sampling Event 5**				**Sampling Event 6**				
Total Coliform	cfu/100 mL	1,000,000	7.4	0.9	5.5	3,300	0.8	<0.2	<0.2	161,000	<0.2	474	<0.2	1,000 cfu/100 mL - Single Sample 400 cfu/100 mL - Average
Fecal Coliform	cfu/100 mL	980,000	5.9	1	5.3	1,900	1.8	<0.2	<0.2	77,000	<0.2	585	<0.2	800 cfu/100 mL - Single Sample 200 cfu/100 mL - Geometric Mean
E. coli	cfu/100 mL	2,400	2.3	<0.2	<0.2	680	0.2	<0.2	<0.2	720	<0.2	1.52	<0.2	126 cfu/100 mL - Geometric Mea
Enterococcus	cfu/100 mL	3,400	23	<0.2	0.7	45	<0.2	2.2	<0.2	1,220	<0.2	3.16	<0.2	35 cfu/100 mL - Fresh Water
Cryptosporidium	no./100 L	<0.01	<0.01	<0.01	<10	<7.0	<0.1	<0.2	<0.1	<5	<0.1	<0.1	<0.1	
Giarida	no./100 L	<0.01	<0.01	<0.01	<10	<7.0	<0.1	<0.2	<0.1	<5	<0.1	<0.1	<0.1	
Coliphage														100 pfu/100 mL
Host C3000 Overlay	pfu/100 mL	+ (<5)	+ (<5)	-	+ (<5)	+ (<5)	-	-	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Overlay	pfu/100 mL	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	-	+ (<5)	+ (<5)	+ (<5)	+ (<5)	+ (<5)	
Host Famp+ Enrichment	pfu/100 mL	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/DNA	+/RNA	+/DNA	+/DNA	+/DNA	+/DNA	

Notes:

cfu - Colony forming units

pfu - plaque forming units

[1] Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF
	A "+" indicates that the samples tested positive for the presence of coliphage. When the enrichment method provides a "+" with a "<5" pfu/100 mL for the overlay methods results, then coliphage is interpreted to be present at concentrations less than that value.
	A "-" indicates that the the presence of coliphage was not detected in the sample.

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 1							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 1		Event 1		Event 1		Event 1	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2	
	DateCollected:	13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	7.96		7.65		7.65		7.59	
TEMPERATURE	°C	32.2		24.2		24.2		24.3	
CONDUCTANCE	µmhos	248		277		277		409	
TURBIDITY	NTU	4.66		2.35		2.35		0.55	
DISSOLVED OXYGEN	mg/L	7.39		0.17		0.17		0.36	
OXIDATION/REDUCTION POTENTIAL	mV	no data		no data		no data		no data	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	120	=	160	=	175	=	206	=
TURBIDITY	NTU	4	=	0.3	U	0.3	U	0.3	UJ
pH (laboratory)	PH UNITS	7.4	=	7.5	=	7.68	=	7.33	J
COLOR	COLOR UNIT	**40**	=	10	=	10	=	**15**	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	10	U	10	U	10	U	2	U
TOTAL ORGANIC CARBON	mg/L	9.9	=	1	U	1.31	U	0.53	U
DISSOLVED ORGANIC CARBON	mg/L	0.368	U	1.36	=	1.88	=	0.68	UJ
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.22	=	0.766	=	0.844	=	0.808	=
NITROGEN, AMMONIA (AS N)	mg/L	0.0568	U	0.206	U	0.18	U	0.39	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.2	=	0.746	=	0.823	=	0.781	J
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0205	J	0.0269	J
PHOSPHORUS, TOTAL (AS P)	mg/L	0.056	=	0.143	=	0.152	=	0.249	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.138	=	0.137	=	0.213	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.048	=	0.24	=	0.188	=	0.253	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	27	=	141	=	141	=	127	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	27	=	141	=	141	=	127	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	30.6	=	13	=	12.9	=	26.4	=
SULFATE (AS SO4)	mg/L	25.4	=	2.61	=	2.91	=	21.4	=
Metals									
ALUMINUM	µg/L	69.9	J	23.4	J	18	J	24	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	8.41	U	**13.2**	=	10.5	U	**14**	=
BARIUM	µg/L	1.78	J	6.37	=	6.21	=	5.4	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.218	J
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	14300	=	50300	=	50000	=	51900	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	1.6	J	0.62	U	0.62	U	0.62	U
IRON	µg/L	27.6	U	34.8	U	33.6	U	22.8	U
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2520	=	5350	=	5320	=	6330	=
MANGANESE	µg/L	15.5	=	4.36	J	4.34	J	4.79	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	2.79	J	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3100	=	1290	=	1250	=	2120	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	20100	=	8330	=	8210	=	12600	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	1.98	J	1.1	U	1.1	U	1.28	J
ZINC	µg/L	13.1	U	0.94	U	0.94	U	4.86	U
Ion Balance									
Calcium	meq/L	0.72		2.52		2.50		2.60	
Magnesium	meq/L	0.21		0.45		0.44		0.53	
Sodium	meq/L	0.87		0.36		0.36		0.55	
Potassium	meq/L	0.08		0.03		0.03		0.05	
Sum of cations	meq/L	1.9		3.36		3.33		3.72	
Bicarbonate	meq/L	0.54		2.82		2.82		2.54	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.86		0.37		0.36		0.75	
Sulfate	meq/L	0.53		0.05		0.06		0.45	
Sum of anions	meq/L	1.9		3.24		3.25		3.73	
Balance (% difference)		1.5%		-1.7%		-1.3%		0.1%	
Radiologicals									
Alpha, gross	pCi/L	2.36	U	2.47	U	2.45	U	2.61	U
Beta, gross	pCi/L	3.64	U	3.77	U	3.68	U	3.98	J
Total Petroleum Hydrocarbons									
PETROLEUM HYDROCARBONS	mg/L	0.358	U	0.349	U	0.349	U	0.356	U
Volatile Organic Compounds									
ACETONE	µg/L	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	U
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U

		Event 2							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 2		Event 2		Event 2		Event 2	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2	
	DateCollected:	20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05	
	Matrix:	Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	7.30		7.40		7.40		7.47	
TEMPERATURE	°C	30.4		23.9		23.9		24.2	
CONDUCTANCE	µmhos	197		299		299		257	
TURBIDITY	NTU	6.5		1.08		1.08		0.37	
DISSOLVED OXYGEN	mg/L	5.28		0.13		0.13		0.62	
OXIDATION/REDUCTION POTENTIAL	mV	no data		no data		no data		no data	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	28	=	257	=	298	=	282	=
TURBIDITY	NTU	33	=	3	=	3	=	3	=
pH (laboratory)	PH UNITS	7.12	=	7.52	=	7.52	=	7.36	=
COLOR	COLOR UNIT	**45**	=	**15**	=	15	=	**15**	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	10	U	10	U	10	U	4	U
TOTAL ORGANIC CARBON	mg/L	62.9	J	2.57	=	1.52	U	4.19	J
DISSOLVED ORGANIC CARBON	mg/L	7.85	=	0.685	U	2.69	U	1.3	U
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.6	=	0.743	=	0.684	=	1.26	=
NITROGEN, AMMONIA (AS N)	mg/L	0.07	J	0.14	J	0.14	J	0.35	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.6	J	0.743	=	0.684	=	1.26	J
NITROGEN, NITRITE	mg/L	0.0118	U	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0206	J	0.0201	U	0.0201	U	0.0318	J
PHOSPHORUS, TOTAL (AS P)	mg/L	0.041	=	0.219	=	0.202	=	0.217	=
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.131	=	0.13	=	0.197	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.046	=	0.207	=	0.201	=	0.185	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28	=	141	=	129	=	132	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	301	=	141	=	129	=	132	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	30.8	=	13.2	=	13.3	=	26.3	=
SULFATE (AS SO4)	mg/L	24.2	=	4.55	=	4.69	=	30.3	=
Metals									
ALUMINUM	µg/L	83.9	J	15	U	15	U	24.3	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	4.88	J
ARSENIC	µg/L	8.58	U	8.16	=	9.7	=	**13.5**	=
BARIUM	µg/L	5.13	=	5.21	=	5.31	=	5.26	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13600	=	50500	=	51700	=	51800	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	4.42	U	0.62	U	0.62	U	9.58	=
IRON	µg/L	29.9	J	20.7	J	19.1	J	28.6	J
LEAD	µg/L	2.2	U	2.2	U	2.2	U	9.81	=
MAGNESIUM	µg/L	2520	=	5080	=	5240	=	6170	=
MANGANESE	µg/L	17.2	=	4.81	J	6.17	=	4.88	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3110	=	916	=	933	=	2210	=
SELENIUM	µg/L	2.6	UJ	2.6	U	2.6	U	2.6	UJ
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	19200	=	7280	=	7390	=	13000	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	1.96	J	1.1	U	1.1	U	1.16	J
ZINC	µg/L	3.21	U	0.94	U	7.28	J	14.3	=
Ion Balance									
Calcium	meq/L	0.68		2.53		2.59		2.59	
Magnesium	meq/L	0.21		0.42		0.44		0.51	
Sodium	meq/L	0.83		0.32		0.32		0.57	
Potassium	meq/L	0.08		0.02		0.02		0.06	
Sum of cations	meq/L	1.80		3.29		3.37		3.73	
Bicarbonate	meq/L	0.56		2.82		2.58		2.64	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.87		0.37		0.38		0.74	
Sulfate	meq/L	0.50		0.09		0.10		0.63	
Sum of anions	meq/L	1.93		3.29		3.05		4.01	
Balance (% difference)		3.6%		0.0%		-4.7%		3.9%	
Radiologicals									
Alpha, gross	pCi/L	2.08	U	2.49	U	1.69	U	1.94	U
Beta, gross	pCi/L	5.58	=	3.82	U	3.83	U	4.77	J
Total Petroleum Hydrocarbons									
PETROLEUM HYDROCARBONS	mg/L	0.349	U	0.34	U	0.34	U	0.358	U
Volatile Organic Compounds									
ACETONE	µg/L	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U

		Event 3							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 3		Event 3		Event 3		Event 3	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2	
	DateCollected:	27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	no data		8.29		8.29		7.32	
TEMPERATURE	°C	no data		23.5		23.5		23.6	
CONDUCTANCE	µmhos	no data		300		300		339	
TURBIDITY	NTU	no data		0.69		0.69		1.01	
DISSOLVED OXYGEN	mg/L	no data		0.26		0.26		0.25	
OXIDATION/REDUCTION POTENTIAL	mV	no data		-215		-215		-159	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	187	=	137	=	146	=	119	=
TURBIDITY	NTU	20	=	5	=	8	=	3	=
pH (laboratory)	PH UNITS	6.62	=	7.32	=	7.36	=	7.18	=
COLOR	COLOR UNIT	**60**	=	**25**	=	15	=	**20**	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	J	10	U	10	U	10	U
TOTAL ORGANIC CARBON	mg/L	28.1	J	2.73	=	1.97	U	3.9	J
DISSOLVED ORGANIC CARBON	mg/L	42.1	J	1.86	U	1.66	U	3.2	J
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.29	=	0.93	=	0.662	=	0.776	=
NITROGEN, AMMONIA (AS N)	mg/L	0.001	U	0.07	J	0.07	J	0.28	=
NITROGEN, KJELDAHL, TOTAL	mg/L	1.29	=	0.93	=	0.662	=	0.776	=
NITROGEN, NITRITE	mg/L	0.0143	J	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	U	0.0201	U	0.0201	U	0.0201	U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.126	J	0.185	=	0.169	=	0.241	J
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014	U	0.171	=	0.157	=	0.204	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.131	=	0.213	=	0.199	=	0.286	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28	=	137	=	140	=	119	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	28	=	185	=	140	=	331	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	29.3	=	12.5	=	12.5	=	24.4	=
SULFATE (AS SO4)	mg/L	25.2	=	4.45	=	3.71	=	30.8	=
Metals									
ALUMINUM	µg/L	142	=	15	U	15	U	18.8	J
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.73	J
ARSENIC	µg/L	8.88	U	**10.9**	=	**10.3**	=	12.4	U
BARIUM	µg/L	7.13	=	5.18	=	5.05	=	5.17	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.218	J
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13900	=	51200	=	51400	=	50300	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	2.07	U	0.62	U	0.62	U	1.9	U
IRON	µg/L	48.3	J	17.5	J	17.8	J	24.5	J
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2520	=	5310	=	5320	=	5750	=
MANGANESE	µg/L	16.7	=	4.82	J	4.77	J	4.91	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3040	=	914	=	878	=	2010	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.65	U
SODIUM	µg/L	19600	=	7130	=	7120	=	12600	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.27	J	1.1	U	1.1	U	1.1	U
ZINC	µg/L	4.98	U	3.32	U	0.94	U	4.48	U
Ion Balance									
Calcium	meq/L	0.70		2.56		2.57		2.52	
Magnesium	meq/L	0.21		0.44		0.44		0.48	
Sodium	meq/L	0.85		0.31		0.31		0.55	
Potassium	meq/L	0.08		0.02		0.02		0.05	
Sum of cations	meq/L	1.83		3.34		3.35		3.59	
Bicarbonate	meq/L	0.56		2.74		2.80		2.38	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.83		0.35		0.35		0.69	
Sulfate	meq/L	0.53		0.09		0.08		0.64	
Sum of anions	meq/L	1.91		3.19		3.23		3.71	
Balance (% difference)		2.1%		-2.2%		-1.7%		1.6%	
Radiologicals									
Alpha, gross	pCi/L	5.07	=	2.51	U	3.09	U	2.61	U
Beta, gross	pCi/L	4.96	U	4.11	U	4.36	U	4.15	U
Total Petroleum Hydrocarbons									
PETROLEUM HYDROCARBONS	mg/L	0.12	J	0.34	U	0.34	U	0.34	U
Volatile Organic Compounds									
ACETONE	µg/L	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U

		Event 4							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 4		Event 4		Event 4		Event 4	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
	DateCollected:	08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Field Measurements									
pH	Std. Units	no data		7.56		7.56		7.65	
TEMPERATURE	°C	no data		23.3		23.3		23.8	
CONDUCTANCE	µmhos	no data		198		198		254	
TURBIDITY	NTU	no data		0.58		0.58		0.23	
DISSOLVED OXYGEN	mg/L	no data		0.1		0.1		0.17	
OXIDATION/REDUCTION POTENTIAL	mV	no data		-87		-87		-158	
General Chemistry									
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	115	=	174	=	174	=	168	=
TURBIDITY	NTU	30	=	2	=	2	=	3	=
pH (laboratory)	PH UNITS	7.2	=	7.42	=	7.45	=	7.33	=
COLOR	COLOR UNIT	**50**	=	**15**	=	15	=	**15**	=
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3	J	3	J	3	J	3	J
TOTAL ORGANIC CARBON	mg/L	10.5	J	2.86	=	2.47	=	5.94	J
DISSOLVED ORGANIC CARBON	mg/L	8.48	J	2.33	U	2.4	U	4.94	J
Nutrients									
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.661	J	0.27	=	0.218	=	0.377	J
NITROGEN, AMMONIA (AS N)	mg/L	0.001	U	0.14	J	0.07	J	0.21	=
NITROGEN, KJELDAHL, TOTAL	mg/L	0.661	J	0.27	=	0.218	J	0.377	J
NITROGEN, NITRITE	mg/L	0.0245	J	0.0118	U	0.0118	U	0.0118	U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201	UJ	0.0201	U	0.0201	U	0.0201	UJ
PHOSPHORUS, TOTAL (AS P)	mg/L	0.034	J	0.24	=	0.259	=	0.236	J
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.021	J	0.206	=	0.207	=	0.198	=
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.09	=	0.253	=	0.266	=	0.37	=
Anions									
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	32	=	141	=	139	=	115	=
ALKALINITY, TOTAL (AS CaCO3)	mg/L	32	=	141	=	139	=	115	=
Alkalinity, carbonate (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
Alkalinity, phenolphthalein	mg/L	0.5	U	0.5	U	0.5	U	0.5	U
CHLORIDE (AS CL)	mg/L	28.9	=	12.5	=	12.2	=	24.3	=
SULFATE (AS SO4)	mg/L	25.4	=	3.68	=	3.48	=	33.6	=
Metals									
ALUMINUM	µg/L	144	U	24.8	U	29	U	15	U
ANTIMONY	µg/L	2.3	U	2.3	U	2.3	U	2.3	U
ARSENIC	µg/L	9.27	U	11	U	10.9	U	10	U
BARIUM	µg/L	11	=	5	=	5.22	=	5.22	=
BERYLLIUM	µg/L	0.2	U	0.2	U	0.2	U	0.2	U
CADMIUM	µg/L	0.35	U	0.35	U	0.35	U	0.35	U
CALCIUM	µg/L	13900	=	51100	=	52700	=	50000	=
CHROMIUM, TOTAL	µg/L	1.3	U	1.3	U	1.3	U	1.3	U
COBALT	µg/L	0.76	U	0.76	U	0.76	U	0.76	U
COPPER	µg/L	0.62	U	0.62	U	0.62	U	0.62	U
IRON	µg/L	31.2	U	186	=	80.2	=	12.3	U
LEAD	µg/L	2.2	U	2.2	U	2.2	U	2.2	U
MAGNESIUM	µg/L	2620	=	5200	=	5350	=	5990	=
MANGANESE	µg/L	17.4	=	5.36	=	5.35	=	4.44	J
MERCURY	µg/L	0.025	U	0.025	U	0.025	U	0.025	U
NICKEL	µg/L	1.7	U	1.7	U	1.7	U	1.7	U
POTASSIUM	µg/L	3230	=	829	=	885	=	2360	=
SELENIUM	µg/L	2.6	U	2.6	U	2.6	U	2.6	U
SILVER	µg/L	0.65	U	0.65	U	0.65	U	0.678	J
SODIUM	µg/L	20100	=	6980	=	7270	=	14200	=
THALLIUM	µg/L	4.2	U	**4.2**	U	**4.2**	U	**4.2**	U
VANADIUM	µg/L	2.05	J	1.1	U	1.1	U	1.1	U
ZINC	µg/L	4.26	U	0.94	U	0.94	U	3.03	U
Ion Balance									
Calcium	meq/L	0.70		2.56		2.64		2.50	
Magnesium	meq/L	0.22		0.43		0.45		0.50	
Sodium	meq/L	0.87		0.30		0.32		0.62	
Potassium	meq/L	0.08		0.02		0.02		0.06	
Sum of cations	meq/L	1.87		3.31		3.42		3.68	
Bicarbonate	meq/L	0.64		2.82		2.78		2.30	
Carbonate	meq/L								
Hydroxide	meq/L								
Chloride	meq/L	0.82		0.35		0.34		0.69	
Sulfate	meq/L	0.53		0.08		0.07		0.70	
Sum of anions	meq/L	1.99		3.25		3.20		3.69	
Balance (% difference)		3.1%		-1.0%		-3.3%		0.1%	
Radiologicals									
Alpha, gross	pCi/L	4.55	J	1.63	U	2.32	U	2.89	UJ
Beta, gross	pCi/L	5.53	=	3.77	U	4.97	=	4.83	U
Total Petroleum Hydrocarbons									
PETROLEUM HYDROCARBONS	mg/L	0.12	J	0.368	U	0.368	U	0.354	U
Volatile Organic Compounds									
ACETONE	µg/L	10	U	10	U	10	U	10	U
ACROLEIN	µg/L	10	UJ	10	UJ	10	UJ	10	UJ
ACRYLONITRILE	µg/L	5	U	5	U	5	U	5	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1	U	1	U	1	U	1	U
BENZENE	µg/L	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
BROMOFORM	µg/L	1	U	1	U	1	U	1	U
BROMOMETHANE	µg/L	1	U	1	U	1	U	1	U
CARBON DISULFIDE	µg/L	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	µg/L	1	U	1	U	1	U	1	U
CHLOROBENZENE	µg/L	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	1	U	1	U	1	U	1	U
CHLOROFORM	µg/L	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	1	U	1	U	1	U	1	U
2-CHLORO-1,3-BUTADIENE	µg/L	1	U	1	U	1	U	1	U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 5			
	Location:	LAKE	MW-1	MW-1	MW-2
	Event:	Event 5	Event 5	Event 5	Event 5
	SJRWMD No.:	None	S-0334	S-0334	S-0335
	SampleID:	LO-04-LAKE	LO-04-01	LO-04-Dupe	LO-04-02
	DateCollected:	07-Sep-05	08-Sep-05	08-Sep-05	07-Sep-05
	Matrix:	Surface Water	Groundwater	Groundwater	Groundwater
	SampleType:	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual
Field Measurements					
pH	Std. Units	no data	7.38	7.38	7.35
TEMPERATURE	℃	no data	23.5	23.5	23.8
CONDUCTANCE	µmhos	no data	217	217	311
TURBIDITY	NTU	no data	0.75	0.75	0.28
DISSOLVED OXYGEN	mg/L	no data	0.24	0.24	0.2
OXIDATION/REDUCTION POTENTIAL	mV	no data	-74	-74	-143
General Chemistry					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	110 =	115 =	125 =	165 =
TURBIDITY	NTU	2.6 =	0.4 =	0.4 =	0.4 =
pH (laboratory)	PH UNITS	7.2 =	7.46 =	7.42 =	7.36 =
COLOR	COLOR UNIT	45 =	15 =	15 =	15 =
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3 J	2 U	2 U	10 U
TOTAL ORGANIC CARBON	mg/L	13.1 J	1.93 U	3.41 U	8.98 J
DISSOLVED ORGANIC CARBON	mg/L	7.5 =	2.34 U	2.65 U	2.59 U
Nutrients					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.57 =	0.668 =	0.619 =	0.762 =
NITROGEN, AMMONIA (AS N)	mg/L	0.07 J	0.21 =	0.21 =	0.35 =
NITROGEN, KJELDAHL, TOTAL	mg/L	1.55 =	0.648 =	0.599 =	0.742 =
NITROGEN, NITRITE	mg/L	0.0195 J	0.0118 U	0.0118 U	0.0118 U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201 U	0.0201 U	0.0201 U	0.0201 U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.114 J	0.235 =	0.217 =	0.305 =
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.017 J	0.14 =	0.133 =	0.172 =
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.029 J	0.103 =	0.143 =	0.195 =
Anions					
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	29 =	150 =	138 =	119 =
ALKALINITY, TOTAL (AS CaCO3)	mg/L	29 =	150 =	138 =	119 =
Alkalinity, carbonate (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, phenolphthalein	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
CHLORIDE (AS CL)	mg/L	32.6 =	14.5 =	14.1 =	28.5 =
SULFATE (AS SO4)	mg/L	27.1 =	3.17 =	2.95 =	21.3 =
Metals					
ALUMINUM	µg/L	120 =	17.8 U	15 U	15 U
ANTIMONY	µg/L	2.3 U	2.3 U	2.3 U	2.3 U
ARSENIC	µg/L	6.96 U	13.2 =	11.5 =	14.9 =
BARIUM	µg/L	9.03 =	5 =	4.98 J	5.25 =
BERYLLIUM	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
CADMIUM	µg/L	0.35 U	0.35 U	0.35 U	0.35 U
CALCIUM	µg/L	13500 =	52300 =	52300 =	50400 =
CHROMIUM, TOTAL	µg/L	1.3 U	1.3 U	1.3 U	1.3 U
COBALT	µg/L	0.76 U	0.76 U	0.76 U	0.76 U
COPPER	µg/L	1.31 J	0.956 U	0.62 U	2.78 J
IRON	µg/L	24.7 J	28.3 U	26.5 U	41.2 J
LEAD	µg/L	2.2 U	2.2 U	2.2 U	2.2 U
MAGNESIUM	µg/L	2650 =	5310 =	5310 =	5470 =
MANGANESE	µg/L	14.4 =	5.24 U	5.14 U	4.87 J
MERCURY	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
NICKEL	µg/L	1.7 U	1.7 U	1.7 U	1.7 U
POTASSIUM	µg/L	3310 =	1010 =	969 =	2300 =
SELENIUM	µg/L	2.6 U	13 U	2.6 U	2.6 U
SILVER	µg/L	0.65 U	0.65 U	0.65 U	0.65 U
SODIUM	µg/L	20900 =	8130 =	7590 =	14400 =
THALLIUM	µg/L	4.2 U	4.2 U	4.2 U	4.2 U
VANADIUM	µg/L	2.42 J	1.1 U	1.1 U	1.3 J
ZINC	µg/L	3.51 J	0.94 U	0.94 U	5.43 J
Ion Balance					
Calcium	meq/L	0.68	2.62	2.62	2.52
Magnesium	meq/L	0.22	0.44	0.44	0.46
Sodium	meq/L	0.91	0.35	0.33	0.63
Potassium	meq/L	0.08	0.03	0.02	0.06
Sum of cations	meq/L	1.89	3.44	3.41	3.66
Bicarbonate	meq/L	0.58	3.00	2.76	2.38
Carbonate	meq/L				
Hydroxide	meq/L				
Chloride	meq/L	0.92	0.41	0.40	0.81
Sulfate	meq/L	0.56	0.07	0.06	0.44
Sum of anions	meq/L	2.07	3.48	3.22	3.63
Balance (% difference)		4.7%	0.6%	-2.8%	-0.4%
Radiologicals					
Alpha, gross	pCi/L	2.73 J	1.77 U	1.21 U	3.52 U
Beta, gross	pCi/L	5.26 U	4.3 U	3.66 U	4.73 U
Total Petroleum Hydrocarbons					
PETROLEUM HYDROCARBONS	mg/L	0.358 U	0.34 U	0.349 UJ	0.349 U
Volatile Organic Compounds					
ACETONE	µg/L	10 U	10 U	10 U	10 U
ACROLEIN	µg/L	10 U	10 U	10 U	10 U
ACRYLONITRILE	µg/L	5 U	5 U	5 U	5 U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1 U	1 U	1 U	1 U
BENZENE	µg/L	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
BROMOFORM	µg/L	1 U	1 U	1 U	1 U
BROMOMETHANE	µg/L	1 UJ	1 UJ	1 UJ	1 UJ
CARBON DISULFIDE	µg/L	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	µg/L	1 U	1 U	1 U	1 U
CHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U
CHLOROETHANE	µg/L	1 U	1 U	1 U	1 U
CHLOROFORM	µg/L	1 U	1 U	1 U	1 U
CHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
2-CHLORO-1,3-BUTADIENE	µg/L	1 U	1 U	1 U	1 U

		Event 6			
	Location:	LAKE	MW-1	MW-1	MW-2
	Event:	Event 6	Event 6	Event 6	Event 6
	SJRWMD No.:	None	S-0334	S-0334	S-0335
	SampleID:	LO-05-LAKE	LO-05-01	LO-05-DUPE	LO-05-02
	DateCollected:	05-Oct-05	05-Oct-05	05-Oct-05	05-Oct-05
	Matrix:	Surface Water	Groundwater	Groundwater	Groundwater
	SampleType:	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual
Field Measurements					
pH	Std. Units	7.85	7.39	7.39	7.42
TEMPERATURE	℃	28.3	23.5	23.5	23.2
CONDUCTANCE	µmhos	231	310	310	306
TURBIDITY	NTU	5.97	0.07	0.07	1.05
DISSOLVED OXYGEN	mg/L	9.38	0.13	0.13	0.21
OXIDATION/REDUCTION POTENTIAL	mV	no data	-81	-81	-194
General Chemistry					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	169 =	224 =	231 =	250 =
TURBIDITY	NTU	2.5 =	1.2 =	0.4 =	1.23 =
pH (laboratory)	PH UNITS	7.45 =	7.56 =	7.58 =	7.56 =
COLOR	COLOR UNIT	40 =	15 =	15 =	15 =
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3 =	2 U	2 U	2 U
TOTAL ORGANIC CARBON	mg/L	10.6 =	2.18 U	2.21 U	2.37 U
DISSOLVED ORGANIC CARBON	mg/L	9.14 =	2.28 U	1.97 U	2.46 U
Nutrients					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.415 U	0.323 U	0.156 U	0.435 U
NITROGEN, AMMONIA (AS N)	mg/L	0.14 =	0.28 =	0.21 =	0.35 =
NITROGEN, KJELDAHL, TOTAL	mg/L	0.415 U	0.323 U	0.156 U	0.435 U
NITROGEN, NITRITE	mg/L	0.0118 U	0.0118 U	0.0118 U	0.0118 U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201 U	0.0201 U	0.0201 U	0.0201 U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.217 =	0.254 =	0.322 =	0.258 =
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.027 J	0.137 =	0.141 =	0.197 =
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.017 U	0.093 =	0.105 =	0.151 =
Anions					
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	27.8 =	138 =	138 =	127 =
ALKALINITY, TOTAL (AS CaCO3)	mg/L	27.8 =	138 =	138 =	127 =
Alkalinity, carbonate (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, phenolphthalein	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
CHLORIDE (AS CL)	mg/L	33.9 =	15.2 =	15.4 =	29.7 =
SULFATE (AS SO4)	mg/L	24.9 =	3.84 =	5.36 =	29.7 =
Metals					
ALUMINUM	µg/L	93.4 J	15 U	15 U	87 J
ANTIMONY	µg/L	2.3 U	2.3 U	2.3 U	2.3 U
ARSENIC	µg/L	11.8 U	15.3 =	19.1 =	17.1 =
BARIUM	µg/L	6.91 =	5.24 =	5.16 =	5.32 =
BERYLLIUM	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
CADMIUM	µg/L	1.32 U	3.38 J	3.6 J	3.7 J
CALCIUM	µg/L	12900 =	50000 =	49800 =	53800 =
CHROMIUM, TOTAL	µg/L	1.77 J	2.89 J	2.7 J	3.27 J
COBALT	µg/L	0.76 U	0.76 U	0.76 U	0.76 U
COPPER	µg/L	0.76 J	0.62 U	0.62 U	0.984 J
IRON	µg/L	20.6 J	29.1 J	29 J	78.6 =
LEAD	µg/L	2.2 U	2.2 U	2.2 U	2.2 U
MAGNESIUM	µg/L	2570 =	5180 =	5140 =	5760 =
MANGANESE	µg/L	13.1 =	4.85 J	4.77 J	5.48 =
MERCURY	µg/L	0.025 U	0.025 U	0.025 U	0.0808 U
NICKEL	µg/L	1.7 U	2.61 J	1.7 U	1.7 U
POTASSIUM	µg/L	3100 =	857 =	925 =	2070 =
SELENIUM	µg/L	2.6 U	2.6 U	2.6 U	2.6 U
SILVER	µg/L	0.65 U	0.65 U	0.65 U	0.65 U
SODIUM	µg/L	19500 =	6910 =	7080 =	13000 =
THALLIUM	µg/L	4.2 U	4.2 U	4.2 U	4.2 U
VANADIUM	µg/L	1.94 J	1.1 U	1.1 U	1.1 U
ZINC	µg/L	1.75 J	0.94 UJ	0.94 UJ	0.94 UJ
Ion Balance					
Calcium	meq/L	0.65	2.50	2.49	2.69
Magnesium	meq/L	0.21	0.43	0.43	0.48
Sodium	meq/L	0.85	0.30	0.31	0.57
Potassium	meq/L	0.08	0.02	0.02	0.05
Sum of cations	meq/L	1.79	3.25	3.25	3.79
Bicarbonate	meq/L	0.56	2.76	2.76	2.54
Carbonate	meq/L				
Hydroxide	meq/L				
Chloride	meq/L	0.96	0.43	0.44	0.84
Sulfate	meq/L	0.52	0.08	0.11	0.62
Sum of anions	meq/L	2.03	3.27	3.31	4.00
Balance (% difference)		6.9%	0.2%	0.9%	2.8%
Radiologicals					
Alpha, gross	pCi/L	4.17 J	2.53 U	1.72 U	3.77 U
Beta, gross	pCi/L	5.02 =	4.57 U	3.56 U	4.83 U
Total Petroleum Hydrocarbons					
PETROLEUM HYDROCARBONS	mg/L	0.349 U	0.34 U	0.349 U	0.349 U
Volatile Organic Compounds					
ACETONE	µg/L	10 U	10 U	10 U	10 U
ACROLEIN	µg/L	10 U	10 U	10 U	10 U
ACRYLONITRILE	µg/L	5 U	5 U	5 U	5 U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1 U	1 U	1 U	1 U
BENZENE	µg/L	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
BROMOFORM	µg/L	1 U	1 U	1 U	1 U
BROMOMETHANE	µg/L	1 U	1 U	1 U	1 U
CARBON DISULFIDE	µg/L	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	µg/L	1 U	1 U	1 U	1 U
CHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U
CHLOROETHANE	µg/L	1 U	1 U	1 U	1 U
CHLOROFORM	µg/L	1 U	1 U	1 U	1 U
CHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
2-CHLORO-1,3-BUTADIENE	µg/L	1 U	1 U	1 U	1 U

		Event 7			
	Location:	LAKE	MW-1	MW-1	MW-2
	Event:	Event 7	Event 7	Event 7	Event 7
	SJRWMD No.:	None	S-0334	S-0334	S-0335
	SampleID:	LO-06-LAKE	LO-06-01	LO-06-DUP	LO-06-02
	DateCollected:	31-Oct-05	31-Oct-05	31-Oct-05	31-Oct-05
	Matrix:	Surface Water	Groundwater	Groundwater	Groundwater
	SampleType:	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual
Field Measurements					
pH	Std. Units	8.19	7.40	7.40	7.62
TEMPERATURE	℃	21.8	23.5	23.5	23.8
CONDUCTANCE	µmhos	176	298	298	319
TURBIDITY	NTU	6.54	0.15	0.15	0.45
DISSOLVED OXYGEN	mg/L	7.58	0.15	0.15	0.39
OXIDATION/REDUCTION POTENTIAL	mV	2	-85	-85	-152
General Chemistry					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	138 =	206 =	197 =	259 =
TURBIDITY	NTU	3.4 =	0.3 U	0.3 U	1.1 =
pH (laboratory)	PH UNITS	7.52 =	7.78 =	7.74 =	7.62 =
COLOR	COLOR UNIT	45 =	15 =	15 =	15 =
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	3 =	2 U	2 U	2 U
TOTAL ORGANIC CARBON	mg/L	11.1 =	2.79 =	2.96 =	3.02 =
DISSOLVED ORGANIC CARBON	mg/L	9.02 =	3.01 =	3.27 =	3.19 =
Nutrients					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	0.174 =	0.232 =	0.289 =	0.222 =
NITROGEN, AMMONIA (AS N)	mg/L	0.017 UJ	0.0316 J	0.0339 J	0.179 J
NITROGEN, KJELDAHL, TOTAL	mg/L	1.14 =	0.603 =	0.609 =	0.481 =
NITROGEN, NITRITE	mg/L	0.0118 U	0.0118 U	0.0118 U	0.0118 U
NITROGEN, NITRATE-NITRITE	mg/L	0.0201 U	0.0201 U	0.0201 U	0.0201 U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.017 U	0.097 =	0.017 U	0.08 =
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.014 U	0.15 =	0.147 =	0.202 =
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.017 U	0.056 =	0.017 U	0.058 =
Anions					
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	28.8 J	141 J	141 J	127 J
ALKALINITY, TOTAL (AS CaCO3)	mg/L	28.8 J	141 J	141 J	127 J
Alkalinity, carbonate (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, phenolphthalein	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
CHLORIDE (AS CL)	mg/L	30 =	14.3 =	29.6 =	29.5 =
SULFATE (AS SO4)	mg/L	21.6 =	2.89 =	0.92 J	27.1 =
Metals					
ALUMINUM	µg/L	143 =	49.4 J	223 =	18.3 J
ANTIMONY	µg/L	2.3 U	2.3 U	2.3 U	2.3 U
ARSENIC	µg/L	8.05 U	14.9 =	14.2 =	9.85 U
BARIUM	µg/L	9.31 =	5.39 =	5.42 =	5.69 =
BERYLLIUM	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
CADMIUM	µg/L	0.35 U	1.7 J	0.902 J	0.664 J
CALCIUM	µg/L	13300 =	52100 =	51800 =	51100 =
CHROMIUM, TOTAL	µg/L	1.3 U	1.91 J	2.21 J	2.15 J
COBALT	µg/L	0.76 U	0.76 U	0.76 U	0.76 U
COPPER	µg/L	1.59 U	0.879 U	0.62 U	3.07 U
IRON	µg/L	59.5 =	22.7 J	62.3 =	38.9 J
LEAD	µg/L	2.2 U	2.2 U	2.2 U	2.2 U
MAGNESIUM	µg/L	2520 =	5390 =	5350 =	5980 =
MANGANESE	µg/L	14 =	4.8 J	5.07 =	4.51 J
MERCURY	µg/L	0.0262 J	0.025 U	0.025 U	0.025 U
NICKEL	µg/L	1.7 U	1.84 J	2.08 J	1.7 U
POTASSIUM	µg/L	3120 =	1010 =	980 =	2180 =
SELENIUM	µg/L	2.6 U	13 U	13 U	2.6 U
SILVER	µg/L	0.65 U	0.65 U	0.65 U	0.65 U
SODIUM	µg/L	19300 =	7510 =	7410 =	12500 =
THALLIUM	µg/L	4.2 U	4.2 U	4.2 U	4.2 U
VANADIUM	µg/L	2.35 J	1.1 U	1.1 U	1.1 U
ZINC	µg/L	16.6 =	6.2 J	7.48 J	10.3 =
Ion Balance					
Calcium	meq/L	0.67	2.61	2.59	2.56
Magnesium	meq/L	0.21	0.45	0.45	0.50
Sodium	meq/L	0.84	0.33	0.32	0.54
Potassium	meq/L	0.08	0.03	0.03	0.06
Sum of cations	meq/L	1.79	3.41	3.38	3.65
Bicarbonate	meq/L	0.58	2.82	2.82	2.54
Carbonate	meq/L				
Hydroxide	meq/L				
Chloride	meq/L	0.85	0.40	0.84	0.83
Sulfate	meq/L	0.45	0.06	0.02	0.56
Sum of anions	meq/L	1.87	3.28	3.68	3.94
Balance (% difference)		2.2%	-1.8%	4.3%	3.9%
Radiologicals					
Alpha, gross	pCi/L	2.87 J	4.04 U	2.23 U	1.98 J
Beta, gross	pCi/L	4.63 U	4.66 U	4.51 U	4.39 U
Total Petroleum Hydrocarbons					
PETROLEUM HYDROCARBONS	mg/L	0.349 U	0.358 U	0.349 U	0.349 U
Volatile Organic Compounds					
ACETONE	µg/L	10 U	10 U	9.4 J	10 U
ACROLEIN	µg/L	10 U	10 U	10 U	10 U
ACRYLONITRILE	µg/L	5 U	5 U	5 U	5 U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1 U	1 U	1 U	1 U
BENZENE	µg/L	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
BROMOFORM	µg/L	1 U	1 U	1 U	1 U
BROMOMETHANE	µg/L	1 U	1 U	1 U	1 U
CARBON DISULFIDE	µg/L	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	µg/L	1 U	1 U	1 U	1 U
CHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U
CHLOROETHANE	µg/L	1 U	1 U	1 U	1 U
CHLOROFORM	µg/L	1 U	1 U	1 U	1 U
CHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
2-CHLORO-1,3-BUTADIENE	µg/L	1 U	1 U	1 U	1 U

		Event 8			
	Location:	LAKE	MW-1	MW-1	MW-2
	Event:	Event 8	Event 8	Event 8	Event 8
	SJRWMD No.:	None	S-0334	S-0334	S-0335
	SampleID:	LO-07-LAKE	LO-07-01	LO-07-Dupe	LO-07-02
	DateCollected:	05-Dec-05	05-Dec-05	05-Dec-05	05-Dec-05
	Matrix:	Surface Water	Groundwater	Groundwater	Groundwater
	SampleType:	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual
Field Measurements					
pH	Std. Units	8.03	7.43	7.43	7.39
TEMPERATURE	℃	20.3	23.4	23.4	23.7
CONDUCTANCE	µmhos	182	297	297	278
TURBIDITY	NTU	10.6	0.28	0.28	0.47
DISSOLVED OXYGEN	mg/L	7.69	0.11	0.11	0.41
OXIDATION/REDUCTION POTENTIAL	mV	no data	-214	-214	no data
General Chemistry					
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L	97 =	160 =	174 =	204 =
TURBIDITY	NTU	2.86 =	0.3 U	0.3 U	0.3 U
pH (laboratory)	PH UNITS	7.1 =	7.41 =	7.66 =	7.49 =
COLOR	COLOR UNIT	40 =	15 =	15 =	15 =
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L	2.6 =	2 U	2 U	2 U
TOTAL ORGANIC CARBON	mg/L	10.6 =	1.78 =	2.15 =	2.63 =
DISSOLVED ORGANIC CARBON	mg/L	7.91 =	1.86 =	1.75 =	2.04 =
Nutrients					
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	1.82 =	0.478 U	1.86 =	1.01 =
NITROGEN, AMMONIA (AS N)	mg/L	0.0322 =	0.108 J	0.114 J	0.474 J
NITROGEN, KJELDAHL, TOTAL	mg/L	1.82 =	0.478 U	1.86 =	1.01 =
NITROGEN, NITRITE	mg/L	0.0449 J	0.0449 J	0.0449 J	0.0449 J
NITROGEN, NITRATE-NITRITE	mg/L	0.0201 U	0.0201 U	0.0201 U	0.0201 U
PHOSPHORUS, TOTAL (AS P)	mg/L	0.12 =	0.174 =	0.165 =	0.171 =
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L	0.02 J	0.142 =	0.126 =	0.202 =
PHOSPHORUS, DISSOLVED (AS P)	mg/L	0.034 J	0.093 =	0.116 =	0.117 =
Anions					
ALKALINITY, BICARBONATE (AS CaCO3)	mg/L	42 =	146 =	140 =	136 =
ALKALINITY, TOTAL (AS CaCO3)	mg/L	42 =	146 =	140 =	136 =
Alkalinity, carbonate (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, hydroxide (as CaCO3)	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
Alkalinity, phenolphthalein	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
CHLORIDE (AS CL)	mg/L	34.3 =	15.2 =	15.1 =	30.7 =
SULFATE (AS SO4)	mg/L	22.1 =	0.64 J	0.608 J	21.8 =
Metals					
ALUMINUM	µg/L	277 =	37.7 J	15 U	19.3 J
ANTIMONY	µg/L	2.3 U	2.3 U	2.3 U	2.3 U
ARSENIC	µg/L	7.03 =	12.4 =	12.8 =	8.88 =
BARIUM	µg/L	11.9 =	5.12 =	5.02 =	6.47 =
BERYLLIUM	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
CADMIUM	µg/L	0.35 U	0.35 U	0.35 U	0.35 U
CALCIUM	µg/L	14400 =	51500 =	50100 =	52500 =
CHROMIUM, TOTAL	µg/L	2.17 J	3.73 J	3.54 J	3.22 J
COBALT	µg/L	0.76 U	0.76 U	0.76 U	0.76 U
COPPER	µg/L	2.82 U	2.35 U	0.62 U	1.4 U
IRON	µg/L	33.2 J	23.4 J	19.1 J	13.9 J
LEAD	µg/L	2.2 U	5.15 =	2.51 J	2.2 U
MAGNESIUM	µg/L	2620 =	5260 =	5150 =	6490 =
MANGANESE	µg/L	11.2 =	4.56 J	4.41 J	4.67 J
MERCURY	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
NICKEL	µg/L	1.7 U	1.88 J	1.7 U	1.7 U
POTASSIUM	µg/L	3220 =	1040 =	995 =	2100 =
SELENIUM	µg/L	6.01 U	27.3 =	24.7 =	23.8 =
SILVER	µg/L	0.65 U	0.722 U	0.65 U	0.65 U
SODIUM	µg/L	20100 =	7460 =	7230 =	13100 =
THALLIUM	µg/L	4.2 U	4.2 U	4.2 U	4.2 U
VANADIUM	µg/L	2.57 J	1.1 U	1.1 U	1.42 J
ZINC	µg/L	13.2 =	0.94 U	0.94 U	0.94 U
Ion Balance					
Calcium	meq/L	0.72	2.58	2.51	2.63
Magnesium	meq/L	0.22	0.44	0.43	0.54
Sodium	meq/L	0.87	0.32	0.31	0.57
Potassium	meq/L	0.08	0.03	0.03	0.05
Sum of cations	meq/L	1.89	3.36	3.27	3.79
Bicarbonate	meq/L	0.84	2.92	2.80	2.72
Carbonate	meq/L				
Hydroxide	meq/L				
Chloride	meq/L	0.97	0.43	0.43	0.87
Sulfate	meq/L	0.46	0.01	0.01	0.45
Sum of anions	meq/L	2.27	3.36	3.24	4.04
Balance (% difference)		9.9%	0.0%	-0.5%	3.3%
Radiologicals					
Alpha, gross	pCi/L	2.89 U	2.68 U	2.84 U	1.91 U
Beta, gross	pCi/L	5.19 =	4.48 U	4.5 U	4.18 U
Total Petroleum Hydrocarbons					
PETROLEUM HYDROCARBONS	mg/L	0.349 U	0.358 UJ	0.349 U	0.349 UJ
Volatile Organic Compounds					
ACETONE	µg/L	10 U	10 U	10 U	10 U
ACROLEIN	µg/L	10 UJ	10 UJ	10 UJ	10 UJ
ACRYLONITRILE	µg/L	4 U	4 U	4 U	4 U
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	1 U	1 U	1 U	1 U
BENZENE	µg/L	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
BROMOFORM	µg/L	1 U	1 U	1 U	1 U
BROMOMETHANE	µg/L	1 U	1 U	1 U	1 U
CARBON DISULFIDE	µg/L	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	µg/L	1 U	1 U	1 U	1 U
CHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U
CHLOROETHANE	µg/L	1 U	1 U	1 U	1 U
CHLOROFORM	µg/L	1 U	1 U	1 U	1 U
CHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U
2-CHLORO-1,3-BUTADIENE	µg/L	1 U	1 U	1 U	1 U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

Parameter Group and Name	Unit	Event 1				Event 2				Event 3				Event 4			
Location:		LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2
Event:		Event 1	Event 1	Event 1	Event 1	Event 2	Event 2	Event 2	Event 2	Event 3	Event 3	Event 3	Event 3	Event 4	Event 4	Event 4	Event 4
SJRWMD No.:		None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335
SampleID:		L0-00-Lake	L0-00-MW1	L0-00-Dupe	L0-00-MW2	L0-01-Lake	L0-01-MW1	L0-01-Dup	L0-01-MW-2	L0-02-LAKE	L0-01-MW-1	L0-01-DUPE	L0-02-MW2	LO-03-Lake	LO-03-MW1	LO-03-Dup	LO-03-MW-2
DateCollected:		13-Jul-05	13-Jul-05	13-Jul-05	12-Jul-05	20-Jul-05	21-Jul-05	21-Jul-05	20-Jul-05	27-Jul-05	28-Jul-05	28-Jul-05	27-Jul-05	08-Aug-05	09-Aug-05	09-Aug-05	08-Aug-05
Matrix:		Surface Water	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater
SampleType:		Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
cis-1,2-DICHLOROETHYLENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-DICHLOROPROPENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DICHLORODIFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-HEXANONE	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
IODOMETHANE (METHYL IODIDE)	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
STYRENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHYLENE(PCE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-DICHLOROETHENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 U
trans-1,3-DICHLOROPROPENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,4-DICHLORO-2-BUTENE	µg/L	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4 U	4 U	4 UJ
TRICHLOROETHYLENE (TCE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-TRICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-TRICHLOROPROPANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL ACETATE	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	1 U	1 U	1 U	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Semi-volatile Organic Compounds																	
ACETOPHENONE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
ARAMITE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 R	4 R	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 U	4.1 U	4.2 U
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2-ACETYLAMINOFLUORENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 UJ	4.1 UJ	4.2 U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
BENZYL ALCOHOL	µg/L	10.8 UJ	10.5 UJ	10.5 UJ	5 R	10.5 UJ	10 UJ	10 UJ	10.5 UJ	10 U	10 U	10 U	10 U	10.5 UJ	10.2 U	10.2 U	10.5 UJ
BENZYL BUTYL PHTHALATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
4-BROMOPHENYL PHENYL ETHER	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
4-CHLOROANILINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 UJ	4.1 U	4.1 U	4.2 UJ
4-CHLOROPHENYL PHENYL ETHER	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2-CHLORONAPHTHALENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2-CHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
1,3-DINITROBENZENE	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	21 UJ	20 UJ	20 U	20 U	20 UJ	21 U	20.5 U	20.5 U	21 U
2,4-DICHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 UJ	4.1 U	4.1 U	4.2 UJ
2,6-DICHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 U	4.1 U	4.2 U
2,4-DIMETHYLPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2,4-DINITROPHENOL	µg/L	21.6 UJ	21 UJ	21 UJ	10 U	21 UJ	20 UJ	20 UJ	21 UJ	20 U	20 U	20 U	20 U	21 U	20.5 U	20.5 U	21 U
2,4-DINITROTOLUENE	µg/L	4.3 UJ	**4.2** UJ	**4.2** UJ	**4** U	4.2 UJ	**4** U	**4** U	**4.2** UJ	4 U	**4** U	**4** U	**4** U	4.2 R	**4.1** UJ	**4.1** UJ	**4.2** U
bis(2-CHLOROETHOXY) METHANE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4.3 UJ	**4.2** UJ	**4.2** UJ	4 U	4.2 UJ	4 U	4 U	**4.2** UJ	4 U	4 U	4 U	4 U	4.2 U	**4.1** U	**4.1** U	**4.2** U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
CHLOROBENZILATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4.1 R	4.2 UJ	4 R	4 R	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
DIALLATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
DIBENZOFURAN	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
DIETHYL PHTHALATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4.1 R	4.2 UJ	4 R	4 R	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
DIMETHYL PHTHALATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4.1 R	4.2 UJ	4 R	4 R	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
DIMETHYLPHENYLETHYLAMINE	µg/L	21.6 UJ	21 UJ	21 UJ	20 UJ	21 UJ	20 U	20 U	21 UJ	20 UJ	20 UJ	20 UJ	20 UJ	21 R	20.5 R	20.5 R	21 R
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
p-DIMETHYLAMINOAZOBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 U	4.1 U	4.2 U
3,3'-DICHLOROBENZIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
3,3'-DIMETHYLBENZIDINE	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	21 UJ	20 UJ	20 UJ	20 UJ	20 UJ	21 U	20.5 U	20.5 U	21 U
ETHYL METHANESULFONATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
HEXACHLOROPROPENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
ISODRIN	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
ISOPHORONE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
ISOSAFROLE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
KEPONE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 UJ	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 U	4.1 U	4.2 U
METHAPYRILENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
METHYL METHANESULFONATE	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	21 UJ	20 U	20 U	20 U	20 U	21 U	20.5 U	20.5 U	21 U
2-METHYLNAPHTHALENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2-METHYLPHENOL (o-CRESOL)	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
3-METHYLCHOLANTHRENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
4-METHYLPHENOL (p-CRESOL)	µg/L	10.8 UJ	10.5 UJ	10.5 UJ	5 U	10.5 UJ	10 UJ	10 UJ	10.5 UJ	10 U	10 U	10 U	10 U	10.5 U	10.2 U	10.2 U	10.5 U
1,4-NAPHTHOQUINONE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4.1 R	4.2 UJ	4 R	4 R	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 UJ	4.1 UJ	4.2 U
1-NAPHTHYLAMINE	µg/L	10.8 UJ	10.5 UJ	10.5 UJ	10 U	10.5 UJ	10 U	10 U	10.5 UJ	10 U	10 U	10 U	10 U	10.5 U	10.2 U	10.2 U	10.5 U
2-NITROANILINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 UJ	4.1 UJ	4.2 U
3-NITROANILINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 UJ	4.1 UJ	4.2 U
4-NITROANILINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
4-NITROQUINOLINE-N-OXIDE	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 UJ	20 UJ	21 UJ	20 UJ	20 UJ	20 UJ	20 UJ	21 U	20.5 U	20.5 U	21 U
5-NITRO-o-TOLUIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 UJ	4.1 UJ	4.2 U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
N-NITROSODI-n-PROPYLAMINE	µg/L	4.3 UJ	**4.2** UJ	**4.2** UJ	4 U	4.2 UJ	4 U	4 U	**4.2** UJ	4 U	4 U	4 U	4 U	4.2 U	**4.1** U	**4.1** U	**4.2** U
N-NITROSODIETHYLAMINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
N-NITROSODIMETHYLAMINE	µg/L	4.3 UJ	**4.2** UJ	**4.2** UJ	**4** U	4.2 UJ	**4** U	**4** U	**4.2** UJ	4 U	**4** U	**4** U	**4** U	4.2 U	**4.1** U	**4.1** U	**4.2** U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 5				Event 6				Event 7				Event 8			
	Location:	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2
	Event:	Event 5	Event 5	Event 5	Event 5	Event 6	Event 6	Event 6	Event 6	Event 7	Event 7	Event 7	Event 7	Event 8	Event 8	Event 8	Event 8
	SJRWMD No.:	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335
	SampleID:	LO-04-LAKE	LO-04-01	LO-04-Dupe	LO-04-02	LO-05-LAKE	LO-05-01	LO-05-DUPE	LO-05-02	LO-06-LAKE	LO-06-01	LO-06-DUP	LO-06-02	LO-07-LAKE	LO-07-01	LO-07-Dupe	LO-07-02
	DateCollected:	07-Sep-05	08-Sep-05	08-Sep-05	07-Sep-05	05-Oct-05	05-Oct-05	05-Oct-05	05-Oct-05	31-Oct-05	31-Oct-05	31-Oct-05	31-Oct-05	05-Dec-05	05-Dec-05	05-Dec-05	05-Dec-05
	Matrix:	Surface Water	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater
	SampleType:	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
cis-1,2-DICHLOROETHYLENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-DICHLOROPROPENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DICHLORODIFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ
1,2-DICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ
ETHYLBENZENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-HEXANONE	µg/L	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
IODOMETHANE (METHYL IODIDE)	µg/L	2 UJ	2 UJ	2 UJ	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
STYRENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHYLENE(PCE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-DICHLOROETHENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-DICHLOROPROPENE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,4-DICHLORO-2-BUTENE	µg/L	4 UJ	4 UJ	4 UJ	4 UJ	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
TRICHLOROETHYLENE (TCE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROFLUOROMETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-TRICHLOROETHANE	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-TRICHLOROPROPANE	µg/L	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL ACETATE	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Semi-volatile Organic Compounds																	
ACETOPHENONE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L	4 U	4.1 UJ	4.1 UJ	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 UJ	4.2 UJ	4.1 UJ	4.1 UJ	4.2 UJ	4.4 UJ	4 UJ
ARAMITE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 UJ	4.1 UJ	4.1 UJ	4.1 UJ	4 U	4.2 U	4.2 U	4.1 U	4.1 UJ	4.2 UJ	4.4 UJ	4 UJ
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2-ACETYLAMINOFLUORENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 UJ	4.1 UJ	4.1 UJ	4.1 UJ	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
BENZYL ALCOHOL	µg/L	10 U	10.2 U	10.2 U	10.5 U	10.2 U	10.2 U	10.2 U	10.2 U	10.1 U	10.4 U	10.4 U	10.2 U	10.2 U	10.5 U	11.1 U	10 U
BENZYL BUTYL PHTHALATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
4-BROMOPHENYL PHENYL ETHER	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
4-CHLOROANILINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 UJ	4.2 UJ	4.1 UJ	4.1 U	4.2 U	4.4 U	4 U
4-CHLOROPHENYL PHENYL ETHER	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2-CHLORONAPHTHALENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2-CHLOROPHENOL	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
1,3-DINITROBENZENE	µg/L	20 U	20.5 U	20.5 U	21 U	20.5 UJ	20.5 UJ	20.5 UJ	20.5 UJ	20.2 U	20.8 U	20.8 U	20.4 U	20.5 U	21 U	22.2 U	20 U
2,4-DICHLOROPHENOL	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 UJ	4.1 UJ	4.1 UJ	4.1 UJ	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2,6-DICHLOROPHENOL	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2,4-DIMETHYLPHENOL	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2,4-DINITROPHENOL	µg/L	20 UJ	20.5 U	20.5 U	21 UJ	20.5 U	20.5 U	20.5 U	20.5 U	20.2 U	20.8 U	20.8 U	20.4 U	20.5 U	21 U	22.2 U	20 U
2,4-DINITROTOLUENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
bis(2-CHLOROETHOXY) METHANE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
bis(2-CHLOROISOPROPYL) ETHER	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 UJ	4.2 UJ	4.4 UJ	4 UJ
CHLOROBENZILATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
DIALLATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
DIBENZOFURAN	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 UJ	4.2 UJ	4.1 UJ	4.1 U	4.2 U	4.4 U	4 U
DIETHYL PHTHALATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
DIMETHYL PHTHALATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
DIMETHYLPHENYLETHYLAMINE	µg/L	20 R	20.5 R	20.5 R	21 R	20.5 UJ	20.5 UJ	20.5 UJ	20.5 UJ	20.2 UJ	20.8 UJ	20.8 UJ	20.4 UJ	20.5 UJ	21 UJ	22.2 UJ	20 UJ
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
p-DIMETHYLAMINOAZOBENZENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
3,3'-DICHLOROBENZIDINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
3,3'-DIMETHYLBENZIDINE	µg/L	20 U	20.5 U	20.5 U	21 U	20.5 UJ	20.5 UJ	20.5 UJ	20.5 UJ	20.2 U	20.8 U	20.8 U	20.4 U	20.5 U	21 U	22.2 U	20 U
ETHYL METHANESULFONATE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
HEXACHLOROPROPENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 UJ	4.2 UJ	4.1 UJ	4.1 U	4.2 U	4.4 U	4 U
ISODRIN	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
ISOPHORONE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
ISOSAFROLE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
KEPONE	µg/L	4 U	4.1 UJ	4.1 UJ	4.2 U	4.1 UJ	4.1 UJ	4.1 UJ	4.1 UJ	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
METHAPYRILENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 UJ	4.1 UJ	4.1 UJ	4.1 UJ	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
METHYL METHANESULFONATE	µg/L	20 U	20.5 U	20.5 U	21 U	20.5 U	20.5 U	20.5 U	20.5 U	20.2 U	20.8 U	20.8 U	20.4 U	20.5 U	21 U	22.2 U	20 U
2-METHYLNAPHTHALENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
2-METHYLPHENOL (o-CRESOL)	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 UJ	4.2 UJ	4.1 UJ	4.1 U	4.2 U	4.4 U	4 U
3-METHYLCHOLANTHRENE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
4-METHYLPHENOL (p-CRESOL)	µg/L	10 U	10.2 U	10.2 U	10.5 U	10.2 U	10.2 U	10.2 U	10.2 U	10.1 UJ	10.4 UJ	10.4 UJ	10.2 UJ	10.2 U	10.5 U	11.1 U	10 U
1,4-NAPHTHOQUINONE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 UJ	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
1-NAPHTHYLAMINE	µg/L	10 U	10.2 U	10.2 U	10.5 U	10.2 U	10.2 U	10.2 U	10.2 U	10.1 U	10.4 U	10.4 U	10.2 U	10.2 U	10.5 U	11.1 U	10 U
2-NITROANILINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
3-NITROANILINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
4-NITROANILINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
4-NITROQUINOLINE-N-OXIDE	µg/L	20 UJ	20.5 U	20.5 U	21 UJ	20.5 UJ	20.5 UJ	20.5 UJ	20.5 UJ	20.2 UJ	20.8 UJ	20.8 UJ	20.4 UJ	20.5 UJ	21 UJ	22.2 UJ	20 UJ
5-NITRO-o-TOLUIDINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
N-NITROSO-DI-N-BUTYLAMINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
N-NITROSODI-n-PROPYLAMINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
N-NITROSODIETHYLAMINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U
N-NITROSODIMETHYLAMINE	µg/L	4 U	4.1 U	4.1 U	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U	4 U	4.2 U	4.2 U	4.1 U	4.1 U	4.2 U	4.4 U	4 U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

Parameter Group and Name	Unit	Event 1				Event 2				Event 3				Event 4			
Location:		LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2	LAKE	MW-1	MW-1	MW-2
Event:		Event 1	Event 1	Event 1	Event 1	Event 2	Event 2	Event 2	Event 2	Event 3	Event 3	Event 3	Event 3	Event 4	Event 4	Event 4	Event 4
SJRWMD No.:		None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335	None	S-0334	S-0334	S-0335
SampleID:		L0-00-Lake	L0-00-MW1	L0-00-Dupe	L0-00-MW2	L0-01-Lake	L0-01-MW1	L0-01-Dup	L0-01-MW-2	L0-02-LAKE	L0-01-MW-1	L0-01-DUPE	L0-02-MW2	LO-03-Lake	LO-03-MW1	LO-03-Dup	LO-03-MW-2
DateCollected:		13-Jul-05	13-Jul-05	13-Jul-05	12-Jul-05	20-Jul-05	21-Jul-05	21-Jul-05	20-Jul-05	27-Jul-05	28-Jul-05	28-Jul-05	27-Jul-05	08-Aug-05	09-Aug-05	09-Aug-05	08-Aug-05
Matrix:		Surface Water	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater	Surface Water	Groundwater	Groundwater	Groundwater
SampleType:		Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal	Normal	Normal	Field Duplicate	Normal
Parameter Group and Name	Unit	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
N-NITROSODIPHENYLAMINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
N-NITROSOMORPHOLINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
1,3,5-TRINITROBENZENE	µg/L	21.6 UJ	21 UJ	21 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	20 UJ	4 U	4.2 U	4.1 U	4.1 U	4.2 U
N-NITROSOPIPERIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	20 U	21 UJ	20 UJ	20 UJ	21 UJ	20 UJ	20 UJ	4 U	20 UJ	21 U	20.5 U	20.5 U	21 U
N-NITROSOPYRROLIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
NITROBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
NITROSOMETHYLETHYLAMINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
o-TOLUIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	21 UJ	20 U	20 U	20 U	20 U	21 U	20.5 U	20.5 U	21 U
p-PHENYLENEDIAMINE	µg/L	21.6 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	21 UJ	20 UJ	20 UJ	20 UJ	20 UJ	21 U	20.5 U	20.5 U	21 U
PENTACHLOROBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
PENTACHLOROETHANE	µg/L	21.6 UJ	21 UJ	21 UJ	20.5 R	21 UJ	20 R	20 R	21 UJ	20 U	20 U	20 U	20 U	21 U	20.5 U	20.5 U	21 U
PENTACHLORONITROBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 UJ	4.1 UJ	4.2 U
PENTACHLOROPHENOL	µg/L	21.6 UJ	21 UJ	21 UJ	10 U	21 UJ	20 UJ	20 UJ	21 UJ	20 U	20 U	20 U	20 U	21 UJ	20.5 U	20.5 U	21 UJ
PHENACETIN	µg/L	4.3 UJ	4.2 UJ	4.2 U	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 U	4.1 U	4.2 U
PHENOL	µg/L	21.6 UJ	21 UJ	21 UJ	10 U	21 UJ	20 UJ	20 UJ	21 UJ	20 U	20 U	20 U	20 U	21 U	20.5 U	20.5 U	21 U
PRONAMIDE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
PYRIDINE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 R	4.1 U	4.1 U	4.2 R
SAFROLE	µg/L	10.8 UJ	10.5 UJ	10.5 UJ	10 U	10.5 UJ	10 U	10 U	10.5 UJ	10 U	10 U	10 U	10 U	10.5 U	10.2 U	10.2 U	10.5 U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 UJ	4 UJ	4 UJ	4 UJ	4.2 U	4.1 UJ	4.1 UJ	4.2 U
1,2,4-TRICHLOROBENZENE	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	4 U	4.2 UJ	4 U	4 U	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2,4,5-TRICHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
2,4,6-TRICHLOROPHENOL	µg/L	4.3 UJ	4.2 UJ	4.2 UJ	2 U	4.2 UJ	4 UJ	4 UJ	4.2 UJ	4 U	4 U	4 U	4 U	4.2 U	4.1 U	4.1 U	4.2 U
Organochlorine Pesticides																	
ALDRIN	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ALPHA-CHLORDANE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 UJ	0.051 UJ	0.051 UJ	0.05 UJ	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
GAMMA-CHLORDANE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 UJ	0.05 U	0.053 U	0.05 UJ	0.05 UJ	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 UJ	0.051 UJ	0.051 UJ	0.051 UJ	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 UJ	0.052 U	0.05 U	0.051 UJ
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.052 UJ	0.051 UJ	0.051 UJ	0.051 UJ	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
GAMMA BHC (LINDANE)	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
DIELDRIN	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ALPHA ENDOSULFAN	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
BETA ENDOSULFAN	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 UJ	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ENDOSULFAN SULFATE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ENDRIN	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
ENDRIN ALDEHYDE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 UJ	0.051 UJ	0.051 UJ	0.05 UJ	0.053 U	0.05 UJ	0.05 UJ	0.05 U	0.051 UJ	0.052 U	0.05 U	0.051 UJ
ENDRIN KETONE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
HEPTACHLOR	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 R	0.051 R	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
HEPTACHLOR EPOXIDE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
p,p'-DDD	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 U	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
p,p'-DDE	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 U	0.051 UJ	0.051 UJ	0.05 U	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
p,p'-DDT	µg/L	0.052 UJ	0.051 UJ	0.051 UJ	0.051 UJ	0.058 U	0.051 UJ	0.051 U	0.013 J	0.053 U	0.05 U	0.05 U	0.05 U	0.051 U	0.052 U	0.05 U	0.051 U
METHOXYCHLOR	µg/L	0.052 U	0.051 U	0.051 U	0.051 U	0.058 UJ	0.051 UJ	0.051 UJ	0.05 UJ	0.053 U	0.05 UJ	0.05 UJ	0.05 U	0.051 UJ	0.052 U	0.05 U	0.051 UJ
TOXAPHENE	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 UJ	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
Organophosphorous Pesticides																	
ATRAZINE	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
AZINPHOS, METHYL (GUTHION)	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
BOLSTAR	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
CHLORPYRIFOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
COUMAPHOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
DEMETON-O	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
DEMETON-S	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
DIAZINON	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 UJ	5 U	5 U	5 UJ	5.3 U	5.1 UJ	5.1 UJ	5.4 U
DICHLORVOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 UJ	5.1 UJ	5.2 UJ	5.3 UJ	5.2 UJ	5 UJ	5 UJ	5 UJ	5.3 U	5.1 UJ	5.1 UJ	5.4 U
DIMETHOATE	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
DISULFOTON	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
ETHOPROP	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 UJ	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
FAMPHUR	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
FENSULFOTHION	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
FENTHION	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 R	5.1 U	5.1 U	5.4 R
MERPHOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
MEVINPHOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 UJ	5.1 UJ	5.2 UJ	5.3 UJ	5.2 U	5 UJ	5 UJ	5 U	5.3 U	5.1 U	5.1 U	5.4 U
NALED	µg/L	5.2 UJ	5.1 UJ	5 UJ	5 UJ	5.4 UJ	5.1 UJ	5.2 U	5.3 UJ	5.2 U	5 UJ	5 UJ	5 U	5.3 U	5.1 U	5.1 U	5.4 U
PARATHION, ETHYL	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 UJ	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
PARATHION, METHYL	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
PHORATE	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 UJ	5.1 UJ	5.2 UJ	5.3 UJ	5.2 U	5 UJ	5 UJ	5 U	5.3 U	5.1 U	5.1 U	5.4 U
RONNEL	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 UJ	5.1 UJ	5.2 UJ	5.3 UJ	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
SIMAZINE	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 UJ	5 U	5 U	5 UJ	5.3 U	5.1 UJ	5.1 UJ	5.4 U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 UJ	5.1 UJ	5.2 UJ	5.3 UJ	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
TOKUTHION (PROTHIOFOS)	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
TRICHLORONATE	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
ZINOPHOS	µg/L	5.2 U	5.1 U	5 U	5 U	5.4 U	5.1 U	5.2 U	5.3 U	5.2 U	5 U	5 U	5 U	5.3 U	5.1 U	5.1 U	5.4 U
Polychlorinated biphenols (PCBs)																	
PCB-1016 (AROCHLOR 1016)	µg/L	0.52 UJ	0.51 UJ	0.51 UJ	0.51 UJ	0.58 UJ	0.51 U	0.51 U	0.5 UJ	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
PCB-1221 (AROCHLOR 1221)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
PCB-1232 (AROCHLOR 1232)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
PCB-1242 (AROCHLOR 1242)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
PCB-1248 (AROCHLOR 1248)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U
PCB-1254 (AROCHLOR 1254)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 UJ	0.52 UJ	0.5 UJ	0.51 UJ
PCB-1260 (AROCHLOR 1260)	µg/L	0.52 U	0.51 U	0.51 U	0.51 U	0.58 U	0.51 U	0.51 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.5 U	0.51 U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 5							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 5		Event 5		Event 5		Event 5	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02	
	DateCollected:	07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	4	U	4.1	UJ	4.1	U	4.2	U
N-NITROSOMORPHOLINE	µg/L	4	U	4.1	U	4.1	U	4.2	U
1,3,5-TRINITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U
N-NITROSOPIPERIDINE	µg/L	20	U	20.5	U	20.5	U	21	U
N-NITROSOPYRROLIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U
NITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U
NITROSOMETHYLETHYLAMINE	µg/L	4	UJ	4.1	U	4.1	UJ	4.2	UJ
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	U	4.1	U	4.1	U	4.2	U
o-TOLUIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20	U	20.5	U	20.5	U	21	U
p-PHENYLENEDIAMINE	µg/L	20	U	20.5	U	20.5	U	21	U
PENTACHLOROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U
PENTACHLOROETHANE	µg/L	20	U	20.5	U	20.5	U	21	U
PENTACHLORONITROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U
PENTACHLOROPHENOL	µg/L	20	UJ	20.5	U	20.5	U	21	UJ
PHENACETIN	µg/L	4	U	4.1	U	4.1	U	4.2	U
PHENOL	µg/L	20	U	20.5	U	20.5	U	21	U
PRONAMIDE	µg/L	4	U	4.1	U	4.1	U	4.2	U
PYRIDINE	µg/L	4	U	4.1	U	4.1	U	4.2	U
SAFROLE	µg/L	10	U	10.2	U	10.2	U	10.5	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	U	4.1	U	4.1	U	4.2	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4	UJ	4.1	UJ	4.1	UJ	4.2	UJ
1,2,4-TRICHLOROBENZENE	µg/L	4	R	4.1	U	4.1	U	4.2	R
2,4,5-TRICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U
2,4,6-TRICHLOROPHENOL	µg/L	4	U	4.1	U	4.1	U	4.2	U
Organochlorine Pesticides									
ALDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ALPHA-CHLORDANE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
GAMMA-CHLORDANE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
GAMMA BHC (LINDANE)	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
DIELDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ALPHA ENDOSULFAN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
BETA ENDOSULFAN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ENDOSULFAN SULFATE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ENDRIN	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
ENDRIN ALDEHYDE	µg/L	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ
ENDRIN KETONE	µg/L	0.01	U	0.01	UJ	0.01	UJ	0.01	U
HEPTACHLOR	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
HEPTACHLOR EPOXIDE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
p,p'-DDD	µg/L	0.01	U	0.01	U	0.0026	J	0.01	U
p,p'-DDE	µg/L	0.01	U	0.01	U	0.01	U	0.01	U
p,p'-DDT	µg/L	0.01	UJ	0.01	UJ	0.0057	J	0.01	UJ
METHOXYCHLOR	µg/L	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ
TOXAPHENE	µg/L	0.1	U	0.1	UJ	0.1	UJ	0.1	U
Organophosphorous Pesticides									
ATRAZINE	µg/L	5	U	5	U	5.2	U	5	U
AZINPHOS, METHYL (GUTHION)	µg/L	5	U	5	U	5.2	U	5	U
BOLSTAR	µg/L	5	U	5	U	5.2	U	5	U
CHLORPYRIFOS	µg/L	5	U	5	U	5.2	U	5	U
COUMAPHOS	µg/L	5	U	5	U	5.2	U	5	U
DEMETON-O	µg/L	5	U	5	U	5.2	U	5	U
DEMETON-S	µg/L	5	U	5	U	5.2	U	5	U
DIAZINON	µg/L	5	U	5	U	5.2	U	5	U
DICHLORVOS	µg/L	5	U	5	U	5.2	U	5	U
DIMETHOATE	µg/L	5	U	5	U	5.2	U	5	U
DISULFOTON	µg/L	5	U	5	U	5.2	U	5	U
ETHOPROP	µg/L	5	U	5	U	5.2	U	5	U
FAMPHUR	µg/L	5	U	5	U	5.2	U	5	U
FENSULFOTHION	µg/L	5	U	5	U	5.2	U	5	U
FENTHION	µg/L	5	U	5	U	5.2	U	5	U
MERPHOS	µg/L	5	U	5	U	5.2	U	5	U
MEVINPHOS	µg/L	5	U	5	U	5.2	U	5	U
NALED	µg/L	5	U	5	U	5.2	U	5	U
PARATHION, ETHYL	µg/L	5	U	5	U	5.2	U	5	U
PARATHION, METHYL	µg/L	5	U	5	U	5.2	U	5	U
PHORATE	µg/L	5	U	5	U	5.2	U	5	U
RONNEL	µg/L	5	U	5	U	5.2	U	5	U
SIMAZINE	µg/L	5	U	5	U	5.2	U	5	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5	U	5	U	5.2	U	5	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5	U	5	U	5.2	U	5	U
TOKUTHION (PROTHIOFOS)	µg/L	5	U	5	U	5.2	U	5	U
TRICHLORONATE	µg/L	5	U	5	U	5.2	U	5	U
ZINOPHOS	µg/L	5	U	5	U	5.2	U	5	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U

		Event 6							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 6		Event 6		Event 6		Event 6	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
	DateCollected:	05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSOMORPHOLINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
1,3,5-TRINITROBENZENE	µg/L	20.5	U	20.5	U	20.5	U	20.5	U
N-NITROSOPIPERIDINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
N-NITROSOPYRROLIDINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
NITROBENZENE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
NITROSOMETHYLETHYLAMINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
o-TOLUIDINE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.5	U	20.5	U	20.5	U	20.5	U
p-PHENYLENEDIAMINE	µg/L	20.5	U	20.5	U	20.5	U	20.5	U
PENTACHLOROBENZENE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
PENTACHLOROETHANE	µg/L	20.5	U	20.5	U	20.5	U	20.5	U
PENTACHLORONITROBENZENE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
PENTACHLOROPHENOL	µg/L	20.5	UJ	20.5	UJ	20.5	UJ	20.5	UJ
PHENACETIN	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
PHENOL	µg/L	20.5	U	20.5	U	20.5	U	20.5	U
PRONAMIDE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
PYRIDINE	µg/L	4.1	UJ	4.1	UJ	4.1	UJ	4.1	UJ
SAFROLE	µg/L	10.2	U	10.2	U	10.2	U	10.2	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
1,2,4-TRICHLOROBENZENE	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
2,4,5-TRICHLOROPHENOL	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
2,4,6-TRICHLOROPHENOL	µg/L	4.1	U	4.1	U	4.1	U	4.1	U
Organochlorine Pesticides									
ALDRIN	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
GAMMA BHC (LINDANE)	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
ENDRIN KETONE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
p,p'-DDT	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.05	U	0.051	U	0.05	U	0.05	U
TOXAPHENE	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
Organophosphorous Pesticides									
ATRAZINE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
BOLSTAR	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
CHLORPYRIFOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
COUMAPHOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DEMETON-O	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DEMETON-S	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DIAZINON	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DICHLORVOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DIMETHOATE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
DISULFOTON	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
ETHOPROP	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
FAMPHUR	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
FENSULFOTHION	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
FENTHION	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
MERPHOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
MEVINPHOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
NALED	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
PARATHION, ETHYL	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
PARATHION, METHYL	µg/L	5.1	UJ	5.1	UJ	5.1	UJ	5.1	UJ
PHORATE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
RONNEL	µg/L	5.1	U	5.1	U	5.1	U	5.1	UJ
SIMAZINE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
TOKUTHION (PROTHIOFOS)	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
TRICHLORONATE	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
ZINOPHOS	µg/L	5.1	U	5.1	U	5.1	U	5.1	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.5	UJ	0.51	UJ	0.5	UJ	0.5	UJ
PCB-1221 (AROCHLOR 1221)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.5	U	0.51	U	0.5	U	0.5	U

		Event 7							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 7		Event 7		Event 7		Event 7	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02	
	DateCollected:	31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
N-NITROSOMORPHOLINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
1,3,5-TRINITROBENZENE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
N-NITROSOPIPERIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
N-NITROSOPYRROLIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
NITROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U
NITROSOMETHYLETHYLAMINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4	U	4.2	U	4.2	U	4.1	U
o-TOLUIDINE	µg/L	4	U	4.2	U	4.2	U	4.1	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
p-PHENYLENEDIAMINE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
PENTACHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U
PENTACHLOROETHANE	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
PENTACHLORONITROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U
PENTACHLOROPHENOL	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
PHENACETIN	µg/L	4	U	4.2	U	4.2	U	4.1	U
PHENOL	µg/L	20.2	U	20.8	U	20.8	U	20.4	U
PRONAMIDE	µg/L	4	U	4.2	U	4.2	U	4.1	U
PYRIDINE	µg/L	4	UJ	4.2	UJ	4.2	UJ	4.1	UJ
SAFROLE	µg/L	10.1	U	10.4	U	10.4	U	10.2	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U
1,2,4-TRICHLOROBENZENE	µg/L	4	U	4.2	U	4.2	U	4.1	U
2,4,5-TRICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U
2,4,6-TRICHLOROPHENOL	µg/L	4	U	4.2	U	4.2	U	4.1	U
Organochlorine Pesticides									
ALDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ALPHA-CHLORDANE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
GAMMA-CHLORDANE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
GAMMA BHC (LINDANE)	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
DIELDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ALPHA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
BETA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ENDOSULFAN SULFATE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ENDRIN	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ENDRIN ALDEHYDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
ENDRIN KETONE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
HEPTACHLOR	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
HEPTACHLOR EPOXIDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
p,p'-DDD	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
p,p'-DDE	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
p,p'-DDT	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
METHOXYCHLOR	µg/L	0.051	U	0.051	U	0.051	U	0.051	U
TOXAPHENE	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
Organophosphorous Pesticides									
ATRAZINE	µg/L	5	U	5	U	5	U	5	U
AZINPHOS, METHYL (GUTHION)	µg/L	5	U	5	U	5	U	5	U
BOLSTAR	µg/L	5	U	5	U	5	U	5	U
CHLORPYRIFOS	µg/L	5	U	5	U	5	U	5	U
COUMAPHOS	µg/L	5	U	5	U	5	U	5	U
DEMETON-O	µg/L	5	U	5	U	5	U	5	U
DEMETON-S	µg/L	5	U	5	U	5	U	5	U
DIAZINON	µg/L	5	U	5	U	5	U	5	U
DICHLORVOS	µg/L	5	UJ	5	UJ	5	UJ	5	UJ
DIMETHOATE	µg/L	5	U	5	U	5	U	5	U
DISULFOTON	µg/L	5	U	5	U	5	U	5	U
ETHOPROP	µg/L	5	U	5	U	5	U	5	U
FAMPHUR	µg/L	5	U	5	U	5	U	5	U
FENSULFOTHION	µg/L	5	U	5	U	5	U	5	U
FENTHION	µg/L	5	U	5	U	5	U	5	U
MERPHOS	µg/L	5	U	5	U	5	U	5	U
MEVINPHOS	µg/L	5	U	5	U	5	U	5	U
NALED	µg/L	5	U	5	U	5	U	5	U
PARATHION, ETHYL	µg/L	5	U	5	U	5	U	5	U
PARATHION, METHYL	µg/L	5	U	5	U	5	U	5	U
PHORATE	µg/L	5	U	5	U	5	U	5	U
RONNEL	µg/L	5	U	5	U	5	U	5	U
SIMAZINE	µg/L	5	U	5	U	5	U	5	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5	U	5	U	5	U	5	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5	U	5	U	5	U	5	U
TOKUTHION (PROTHIOFOS)	µg/L	5	U	5	U	5	U	5	U
TRICHLORONATE	µg/L	5	U	5	U	5	U	5	U
ZINOPHOS	µg/L	5	U	5	U	5	U	5	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	0.51	U	0.51	U	0.51	U

		Event 8							
	Location:	LAKE		MW-1		MW-1		MW-2	
	Event:	Event 8		Event 8		Event 8		Event 8	
	SJRWMD No.:	None		S-0334		S-0334		S-0335	
	SampleID:	LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
	DateCollected:	05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N-NITROSODIPHENYLAMINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
N-NITROSOMORPHOLINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
1,3,5-TRINITROBENZENE	µg/L	20.5	UJ	21	UJ	22.2	UJ	20	UJ
N-NITROSOPIPERIDINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
N-NITROSOPYRROLIDINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
NITROBENZENE	µg/L	4.1	U	4.2	U	4.4	U	4	U
NITROSOMETHYLETHYLAMINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L	4.1	U	4.2	U	4.4	U	4	U
o-TOLUIDINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
2-PICOLINE (ALPHA-PICOLINE)	µg/L	20.5	U	21	U	22.2	U	20	U
p-PHENYLENEDIAMINE	µg/L	20.5	U	21	U	22.2	U	20	U
PENTACHLOROBENZENE	µg/L	4.1	U	4.2	U	4.4	U	4	U
PENTACHLOROETHANE	µg/L	20.5	U	21	U	22.2	U	20	U
PENTACHLORONITROBENZENE	µg/L	4.1	U	4.2	U	4.4	U	4	U
PENTACHLOROPHENOL	µg/L	20.5	U	21	U	22.2	U	20	U
PHENACETIN	µg/L	4.1	U	4.2	U	4.4	U	4	U
PHENOL	µg/L	20.5	U	21	U	22.2	U	20	U
PRONAMIDE	µg/L	4.1	U	4.2	U	4.4	U	4	U
PYRIDINE	µg/L	4.1	U	4.2	U	4.4	U	4	U
SAFROLE	µg/L	10.2	U	10.5	U	11.1	U	10	U
1,2,4,5-TETRACHLOROBENZENE	µg/L	4.1	U	4.2	U	4.4	U	4	U
2,3,4,6-TETRACHLOROPHENOL	µg/L	4.1	UJ	4.2	UJ	4.4	UJ	4	UJ
1,2,4-TRICHLOROBENZENE	µg/L	4.1	U	4.2	U	4.4	U	4	U
2,4,5-TRICHLOROPHENOL	µg/L	4.1	U	4.2	U	4.4	U	4	U
2,4,6-TRICHLOROPHENOL	µg/L	4.1	U	4.2	U	4.4	U	4	U
Organochlorine Pesticides									
ALDRIN	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA-CHLORDANE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
GAMMA-CHLORDANE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
GAMMA BHC (LINDANE)	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
DIELDRIN	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ALPHA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
BETA ENDOSULFAN	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ENDOSULFAN SULFATE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN ALDEHYDE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
ENDRIN KETONE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
HEPTACHLOR EPOXIDE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDD	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDE	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
p,p'-DDT	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
METHOXYCHLOR	µg/L	0.051	U	0.051	U	0.05	U	0.05	U
TOXAPHENE	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
Organophosphorous Pesticides									
ATRAZINE	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
AZINPHOS, METHYL (GUTHION)	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
BOLSTAR	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
CHLORPYRIFOS	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
COUMAPHOS	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
DEMETON-O	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
DEMETON-S	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
DIAZINON	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
DICHLORVOS	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
DIMETHOATE	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
DISULFOTON	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
ETHOPROP	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
FAMPHUR	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
FENSULFOTHION	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
FENTHION	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
MERPHOS	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
MEVINPHOS	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
NALED	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
PARATHION, ETHYL	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
PARATHION, METHYL	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
PHORATE	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
RONNEL	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
SIMAZINE	µg/L	5.1	UJ	5.3	U	5.3	U	5.1	U
STIROFOS (TETRACHLORVINPHOS)	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
TOKUTHION (PROTHIOFOS)	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
TRICHLORONATE	µg/L	5.1	UJ	5.3	UJ	5.3	UJ	5.1	UJ
ZINOPHOS	µg/L	5.1	U	5.3	U	5.3	U	5.1	U
Polychlorinated biphenols (PCBs)									
PCB-1016 (AROCHLOR 1016)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1221 (AROCHLOR 1221)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1232 (AROCHLOR 1232)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1242 (AROCHLOR 1242)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1248 (AROCHLOR 1248)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1254 (AROCHLOR 1254)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U
PCB-1260 (AROCHLOR 1260)	µg/L	0.51	U	0.51	U	0.5	U	0.5	U

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 1								Event 2							
	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 1		Event 1		Event 1		Event 1		Event 2		Event 2		Event 2		Event 2	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	L0-00-Lake		L0-00-MW1		L0-00-Dupe		L0-00-MW2		L0-01-Lake		L0-01-MW1		L0-01-Dup		L0-01-MW-2	
	DateCollected:	13-Jul-05		13-Jul-05		13-Jul-05		12-Jul-05		20-Jul-05		21-Jul-05		21-Jul-05		20-Jul-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	UJ	0.53	U	0.52	UJ
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
DALAPON	µg/L	0.66	UJ	0.64	UJ	0.65	UJ	0.64	UJ	0.62	U	0.62	U	0.66	U	0.64	U
DICAMBA	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	U	0.53	UJ	0.52	UJ
DICHLOROPROP	µg/L	0.53	U	**0.51**	U	**0.52**	U	**0.51**	U	0.5	U	**0.5**	U	**0.53**	U	**0.52**	U
DINOSEB	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
PICLORAM	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	U	0.5	U	0.53	U	0.52	U
SILVEX (2,4,5-TP)	µg/L	0.53	U	0.51	U	0.52	U	0.51	U	0.5	UJ	0.5	UJ	0.53	U	0.52	UJ

		Event 3								Event 4							
	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 3		Event 3		Event 3		Event 3		Event 4		Event 4		Event 4		Event 4	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	L0-02-LAKE		L0-01-MW-1		L0-01-DUPE		L0-02-MW2		LO-03-Lake		LO-03-MW1		LO-03-Dup		LO-03-MW-2	
	DateCollected:	27-Jul-05		28-Jul-05		28-Jul-05		27-Jul-05		08-Aug-05		09-Aug-05		09-Aug-05		08-Aug-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
DALAPON	µg/L	0.68	UJ	0.62	U	0.62	U	0.62	U	0.63	U	0.62	U	0.63	U	0.63	U
DICAMBA	µg/L	0.54	UJ	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
DICHLOROPROP	µg/L	0.54	UJ	**0.5**	U	**0.5**	U	**0.5**	U	0.5	U	**0.5**	U	**0.51**	U	**0.5**	U
DINOSEB	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
PICLORAM	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U
SILVEX (2,4,5-TP)	µg/L	0.54	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.51	U	0.5	U

Notes:
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promulgated regulatory criteria.
Shaded cells with boxed values represent detections equal to or above Risk-Based Criteria.
Shaded cells with bolded and boxed values represent detections equal to or above promulgated
regulatory criteria and Risk-Based Criteria.
Bolded values represent reporting limits equal or above promulgated regulatory criteria.
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Blanks for the criteria and screening values represent no established values.

Explanation of Units
pCi/L - picoCuries per liter
mg/L - milligrams per liter
NTU - Nephelometric Turbidity Units
µg/L - micrograms per liter

Lake Orienta Operational Characterization Sampling Results
SJRWMD CFARE1

		Event 5								Event 6							
	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 5		Event 5		Event 5		Event 5		Event 6		Event 6		Event 6		Event 6	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-04-LAKE		LO-04-01		LO-04-Dupe		LO-04-02		LO-05-LAKE		LO-05-01		LO-05-DUPE		LO-05-02	
	DateCollected:	07-Sep-05		08-Sep-05		08-Sep-05		07-Sep-05		05-Oct-05		05-Oct-05		05-Oct-05		05-Oct-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.5	UJ	0.51	U	0.51	U	0.53	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
DALAPON	µg/L	0.62	UJ	0.64	U	0.64	U	0.66	UJ	0.62	UJ	0.62	UJ	0.62	UJ	0.62	UJ
DICAMBA	µg/L	0.5	UJ	0.51	U	0.51	U	0.53	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
DICHLOROPROP	µg/L	0.5	U	**0.51**	U	**0.51**	U	**0.53**	UJ	0.5	U	**0.5**	UJ	**0.5**	UJ	**0.5**	U
DINOSEB	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
PICLORAM	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
SILVEX (2,4,5-TP)	µg/L	0.5	U	0.51	U	0.51	U	0.53	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U

		Event 7								Event 8							
	Location:	LAKE		MW-1		MW-1		MW-2		LAKE		MW-1		MW-1		MW-2	
	Event:	Event 7		Event 7		Event 7		Event 7		Event 8		Event 8		Event 8		Event 8	
	SJRWMD No.:	None		S-0334		S-0334		S-0335		None		S-0334		S-0334		S-0335	
	SampleID:	LO-06-LAKE		LO-06-01		LO-06-DUP		LO-06-02		LO-07-LAKE		LO-07-01		LO-07-Dupe		LO-07-02	
	DateCollected:	31-Oct-05		31-Oct-05		31-Oct-05		31-Oct-05		05-Dec-05		05-Dec-05		05-Dec-05		05-Dec-05	
	Matrix:	Surface Water		Groundwater		Groundwater		Groundwater		Surface Water		Groundwater		Groundwater		Groundwater	
	SampleType:	Normal		Normal		Field Duplicate		Normal		Normal		Normal		Field Duplicate		Normal	
Parameter Group and Name	Unit	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U
DALAPON	µg/L	0.64	UJ	0.62	UJ	0.62	UJ	0.62	UJ	0.64	U	0.64	U	0.64	U	0.64	U
DICAMBA	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U
DICHLOROPROP	µg/L	0.51	U	**0.5**	U	**0.5**	U	**0.5**	U	0.51	U	**0.51**	U	**0.51**	U	**0.51**	U
DINOSEB	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U
PICLORAM	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U
SILVEX (2,4,5-TP)	µg/L	0.51	U	0.5	U	0.5	U	0.5	U	0.51	U	0.51	U	0.51	U	0.51	U

Notes:
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REPORT

Central Florida Artificial Recharge Demonstration Program
Lake Orienta – Orlando, FL

Microbiological Monitoring Results 2005

Rebecca Ives
Joan B. Rose, Ph.D

March 9, 2006

Central Florida Artificial Recharge Demonstration Program
Lake Orienta – Altamonte Springs, FL

SAMPLING METHODS:

FIELD SAMPLING METHODS:

Two groundwater monitoring wells (MW1, MW2) and one surface water site were sampled for *Cryptosporidium spp., Giardia spp., Enterococcus spp.,*, total coliforms, fecal coliforms, *E. coli*, and coliphage in order to monitor levels of these microbial indicators for the Artificial Recharge Well Demonstration Project. Envirochek HV filters were used, according to EPA Method 1623 to detect the presence of *Cryptosporidium spp.* and *Giardia spp.* at each site. The sampling apparatus used at the monitoring well sites consisted of a submersed bladder pump attached to 75 ft.of tubing, attached to the Envirochek HV filter, attached to a flow meter, attached to an outlet hose. Flow meters were attached to the sampling apparatus to provide accurate measurement of volume sampled.

Matrix spike (MS) samples were processed according to USEPA method 1623 (USEPA, 2001) to determine the recovery efficiency of the sampling apparatus under specific field conditions and with differing water matrices (i.e. groundwater and surface water). Following collection of filter samples for *Cryptosporidium spp.* and *Giardia spp.,* grab samples were collected in sterile one or two liter bottles for laboratory analysis of the concentration of the four bacterial indicators and coliphage.

All equipment used in the sampling apparatus was newly purchased for this project, and once used, it was “dedicated” to the site, labeled, and stored in separate plastic bags. These measures were taken to prevent cross contamination during subsequent sample collection events at the same sites.

Groundwater Monitoring Wells:

Samples were collected from the monitoring wells using a submersible bladder pump that was at a depth of 75 to 80 feet bellow ground level. Following the EPA Method 1623 approximately 100 liters of water were filtered through Envirochek HV filter capsules at a rate between 0.75 and 2.3 liters/minute (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA). Lesser amounts were consistently filtered at the surface water site due to high turbidity and clogging of the filter. Collection of volumes less than 100L at other sites was also due to clogging of the filter.

MS samples were collected at Monitoring Well 1(MW1) and Monitoring Well 2 (MW2) to check the precision and accuracy of the equipment used to sample for *Cryptosporidium spp.* and *Giardia spp.* For each spiked sample approximately 100 liters of water were pumped into a 32 gallon plastic trash can. 100±1.4 *Giardia* cysts and 100±1.5 *Cryptosporidium* oocysts were added to the sample according to the ColorSeedC&G matrix spike package insert (ColorSeed C&G; BTF, North Ryde, BC, Australia). In the spiked monitoring well samples, the final 2-3 liters of system effluent were used to rinse the inside of the garbage can in efforts to recover any affixed (oo)cysts. The equipment used for the matrix spikes had been dedicated to matrix spikes. The matrix spike procedures were completed once during this sampling period.

Following the collection of filter samples, a total of 4 liters of water were collected in sterile grab sample bottles. The filters and grab samples were placed in coolers with ice packs and transported to the Water Pollution Laboratory at Michigan State University for analysis.

Surface Water:

Surface water samples were collected from Lake Orienta using an automatic-demand diaphragm pump. The sampling apparatus consisted of tubing attached to the Envirochek HV filter, attached to a flow meter, attached to a diaphragm pump, attached to an outlet hose.

Matrix Spike (MS) samples were collected at the lake site. The equipment used for the matrix spikes had been dedicated to the matrix spike samples. The matrix spike procedures were completed once during this sampling period. Approximately 100 liters of water were pumped into a 32 gallon plastic trash can and 100±1.4 *Giardia* cysts and 100±1.5 *Cryptosporidium* oocysts were added to the 100 liter sample according to the ColorSeedC&G matrix spike package insert (ColorSeed C&G; BTF, North Ryde, BC, Australia). The filter for the surface water site clogged after filtering 9.08L. Four liter grab samples were also collected at each sampling event. The filters and grab samples were placed in coolers with frozen ice packs and transported to the Water Pollution Laboratory at Michigan State University for laboratory analysis.

LABORATORY METHODS:

The filters and grab samples were stored on ice and transported to the laboratory via Fed Ex next-day delivery service. The initial laboratory processing of samples was completed within 36 hours after collection. Recovery efficiency experiments are also routinely done in the laboratory to determine the accuracy and precision of laboratory methods and equipment.

Bacterial Indicators:

To assess the concentration of total coliforms, fecal coliforms, *E. coli* and *Entercoccus spp.*, in the monitoring wells, sample volumes of 1, 100, 250mL were filtered using a 0.45 um (pore size) 47mm (diameter) filter membrane (Gelman Sciences) according to the *Standard Methods for the Examination of Water and Wastewater* (APHA 1998). The same was done with samples derived from north recharge well; however, sample volumes of 1, 10, and 100mL were filtered. The filters were plated on indicator-specific media and incubated for 24 hours at temperatures specific to each indicator.

For enumeration of *Enterococcus spp.* the filters were placed on MEI agar plates (modified medium for detection of *Enterococcus spp.*; Difco Laboratories, Detroit, MI) and incubated at 41°C. After 24 hours colonies with a blue halo were counted as *Entercoccus spp*. as described in Method 1600 (USEPA, 1996). To assess numbers of total coliform bacteria, membrane filters were placed on m-ENDO agar (Difco Laboratories, Detroit, MI) and incubated at 37°C. To detect fecal coliform bateria the filters were placed on mFC agar (modified medium for fecal coliform bacteria; Difco Laboratories, Detroit, MI) and incubated at 45° C. The bacterial concentrations were then quantified and expressed as the number of colony forming units per 100mL (CFU/ 100mL) (Table 1).

To assess *E.coli* concentrations the membrane filter used in the total coliform evaluation was removed from the m-ENDO agar and transferred to a plate with EC medium with MUG (Difco Laboratories, Detroit, MI). The plates were incubated at 37°C for 24 hours and then viewed under a UV lamp. Those colonies that fluoresced were counted as positive *E.coli* colonies (Table 1).

Coliphages:

An agar overlay method was used to determine the concentration of coliphages present in the water samples. Two different host bacterium strains were used in the agar overlay method, *E. coli* C3000 and *E. coli* p(Famp)R. Each host *E. coli* was grown to logarithmic stage in tryptic soy broth (TSB) at 37° C for approximately 4 hours. 1mL of the host bacteria and 2mL of sampled water was mixed with a molten trypticase soy agar (TSA) (3mL) and then poured over a solid TSA plate. Five replicate plates were used for each sample site and for each host. Coliphage concentration at each sampling site was determined using the following formula: (total number of plaques/ volume of sample water analyzed)*100. The concentration is reported in numbers of plaque-forming units per 100mL (PFU/100mL).

***Cryptosporidium spp.* and *Giardia spp.*:**

Cryptosporidium spp. and *Giardia spp.* were enumerated using standard methods for filtration, elution, concentration, purification (IMS), staining and examination by IFA according to the methods described in Method 1623 (EPA Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/IFA) (USEPA, 2001). The concentration of the final pellet was recorded on laboratory data sheets.

The resuspended pellet containing (oo)cysts was purified using immunomagnetic separation (IMS) using a Dynal Dynabeads CG combo kit. IMS was completed according to the protocol described in EPA Method 1623 with some modification. Namely, the dissociation of the bead-(oo)cyst complex was accomplished by washing the beads with 100ul of 0.1N HCl two times, instead of the suggested 50ul (Dynabeads anti-*Cryptosporidium* and anti-*Giardia*; product 730.02; Dynal A.S., Oslo, Norway). This resulted in a 200ul suspension containing cysts and oocysts. 50ul of solution was placed on each of four slides with 5ul NaOH to neutralize the HCL. The slides were then fixed and stained using fluorescein isothiacyanate-conjugated anti-*Cryptosporidium* sp. and anti-*Giardia* sp. monoclonal antibodies (EasyStain; BTF, Decisive Microbiology, North Ryde, BC Australia) and a solution of 4',6'-diamidino-2-phenylindole and propidium iodide (DAPI-PI).

(Oo)cysts on the slides were viewed and enumerated using epifluorescence microscopy. For naturally occurring (oo)cysts, the number of cysts and oocysts per 100L of water was calculated (Table 2). Also, for the spiked samples (MS), the recovery efficiencies were calculated (Tables 3 and 4).

The filtration device used in the study was the Envirochek HV sampling capsule (Pall Gelman Laboratory, Ann Arbor, MI). ColorSeed™ C&G (BTF, Decisive Microbiology, North Ryde, BC, Australia) was used as the spike suspensions in IPR tests, matrix spike, and recovery efficiency experiments. These spikes consist of 100±1.5 red fluorescent labeled and gamma irradiated *Cryptosporidium* oocysts and 100±1.4 red fluorescent labeled and gamma irradiated *Giardia* cysts in approximately 1 mL of saline solution. They can be used as internal quality control parameters to determine the performance or percent recovery achieved (see http://www.biotechfrontiers.com).

Results:

Results of eight sampling events over 6 months are presented in the four tables below.

Table 1 contains information detailing the presence and abundance of bacterial indicators and coliphage in each of the monitoring wells and the surface water site sampled. Coliphage were not found in the source water, using the agar overlay method, at any of the sites during any of the sampling events. All four bacterial indicators were detected in all surface water samples. Bacterial indicators were present less often and at lower levels in the monitoring wells compared to the surface water. Enterococcus was detected in four out of the eight samples from MW1 and in 2 out of eight samples from MW2. Enterococcus was present in both monitoring wells during the same sampling event on August 8, 2005. Seven of eight samples from MW1 and two of seven samples from MW2 tested positive for total coliform bacteria. One of the seven total coliform positive MW1 samples was also positive for fecal coliform bacteria (9/7/2005 sample event), no sample from MW1 tested positive for the presence of *E. coli*.

There were four samples during this study where the level of fecal coliforms was higher than total coliforms. In surface water samples collected 7/11/2005 and 7/20/2005 , and the MW1 samples collected 9/7/2005, high levels of non-coliform bacteria were observed during analysis of the total coliform plates. In these samples, higher fecal coliform counts than total coliform counts may be due to growth suppression of the total coliform population by non-coliform bacteria. The growth conditions of the total coliform assay are not as selective as the growth conditions for the fecal coliform assay, which uses a higher incubation temperature. In the total coliform assay, non-coliform bacteria may outgrow the coliform bacteria, reducing the availability of nutrients and therefore suppressing growth of coliform bacteria. Fecal coliforms and *E.coli* were detected in the MW2 sample collected 7/27/2005, but no total coliforms were present. The levels of fecal coliform and *E.coli* were at the detection limit of the assay, so the non-detection of total coliforms in this sample may have been affected by Poisson distribution.

Table 1. Summary Results for Bacterial Indicators and Coliphage: Lake Orienta 2005

		Indicator Organisms					
Date sample collection	**Site location**	**Bacteria (CFU/100 mL)**				**Coliphage overlay (PFU/100mL)**	
		Total Coliforms	**Fecal Coliforms**	***E. coli***	**Enterococcus**	**Host C3000***	**Host Famp+**
7/11/2005	Lake Orienta	1.03×10^{2} b	3.90×10^{2}	2.10×10^{1} b	3.60×10^{4}	$<1.0 \times 10^{1}$	$<9.5 \times 10^{0}$
7/11/2005	Monitoring Well 1	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<1.0 \times 10^{1}$	$<9.5 \times 10^{0}$
7/11/2005	Monitoring Well 2	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<3 \times 10^{0}$	$<1.0 \times 10^{1}$	$<9.5 \times 10^{0}$
7/20/2005	Lake Orienta	2.7×10^{1}	3.2×10^{1}	1.50×10^{1} a	2.70×10^{0} b	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
7/20/2005	Monitoring Well 1	2.6×10^{-1} b	$<1 \times 10^{-1}$	$<1 \times 10^{-1}$	2.8×10^{-1} b	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
7/20/2005	Monitoring Well 2	2.6×10^{0} b	$<1 \times 10^{-1}$	$<1 \times 10^{-1}$	$<1 \times 10^{-1}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
7/27/2005	Lake Orienta	4.8×10^{1}	4.2×10^{1}	3.30×10^{1}	3.30×10^{1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
7/27/2005	Monitoring Well 1	2.7×10^{0}	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	1.8×10^{-1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
7/27/2005	Monitoring Well 2	$<9 \times 10^{-2}$	9×10^{-2} ab	9×10^{-2} ab	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
8/8/2005	Lake Orienta	9.0×10^{1} b	6.5×10^{1} b	5.00×10^{1} b	2.05×10^{1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
8/8/2005	Monitoring Well 1	6×10^{-1}	$<4 \times 10^{-1}$ a	$<4 \times 10^{-1}$ a	9×10^{-2} ab	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
8/8/2005	Monitoring Well 2	$<2 \times 10^{-1}$	$<2 \times 10^{-1}$	$<2 \times 10^{-1}$	8.3×10^{-1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
9/7/2005	Lake Orienta	1.4×10^{3} b	8.33×10^{2} b	1.67×10^{2} b	3.63×10^{3}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
9/7/2005	Monitoring Well 1	9×10^{-2} ab	6.5×10^{-1} b	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
9/7/2005	Monitoring Well 2	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/6/2005	Lake Orienta	8.53×10^{2}	2.37×10^{2}	7.00×10^{1} b	5.70×10^{2}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/6/2005	Monitoring Well 1	7.7×10^{0} b	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/6/2005	Monitoring Well 2	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/31/2005	Lake Orienta	3.6×10^{2}	2.90×10^{2}	2.30×10^{1}	5.27×10^{1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/31/2005	Monitoring Well 1	1.9×10^{-1}	$<9 \times 10^{-1}$ b	$<9 \times 10^{-1}$	3.7×10^{-1} b	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
10/31/2005	Monitoring Well 2	$<9 \times 10^{-2}$	$<3.3 \times 10^{-1}$	$<3.3 \times 10^{-1}$	$<9 \times 10^{-1}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
12/6/2005	Lake Orienta	1.47×10^{2}	6.0×10^{1}	4.70×10^{1}	9.50×10^{1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
12/6/2005	Monitoring Well 1	9×10^{-2}	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$
12/6/2005	Monitoring Well 2	6×10^{1}	$<9 \times 10^{-2}$	$<9 \times 10^{-2}$	1.9×10^{-1}	$<1.0 \times 10^{1}$	$<1.0 \times 10^{1}$

Notes on Table 1. Summary Results for Bacterial Indicators and Coliphage: Lake Orienta 2005

<	symbol indicates samples were below the level of detection
[a]	Bacterial counts from one plate
[b]	Less than 20 colonies per plate

Table 2 contains information on the collection and detection of *Cryptosporidium* oocysts and *Giardia* cysts at each site. There were no *Giardia* detected in any of the samples during any of the sampling events during the project (Table 2). One *Cryptosporidium* oocyst was detected in the Lake Orienta surface water site on two dates, 9/7/2005 and 10/6/2005 (Table 2). Volumes of water collected at the surface water sites varied from 7.95 liters 27.75 liters. Volumes collected at the monitoring well sites varied from 31.8 liters to 102.2 liters. EPA Method 1623 recommends collecting 1000 liters of a groundwater sample for detection of *Cryptosporidium* and *Giardia.* However, collection volumes were limited by time constraints and sometimes by the physical and chemical properties of the water matrix. For example, high turbidity greatly reduces the volume of water that can be collected using the Envirochek HV sampling capsule.

Method 1623 recommends collecting 10 liters of a surface water sample for detection of *Cryptosporidium* and *Giardia.* Yet, maximum volumes of water were collected at the surface water site in order maximize our ability to detect potential (oo)cysts present in the samples. Therefore, the volume of water collected for parasite analysis ranged from 7.95 liters 27.75 liters.

Table 2. *Cryptosporidium* and *Giardia* Detected: Lake Orienta 2005

Date Collected	Site Location	Total Volume Collected (Liters)	Organisms Detected	Total	# with internal features (DIC)	# without internal features	Equivalent concentration of (oo)cysts/ 100L
7/11/2005	Lake Orienta	27.6	*Cryptosporidium* *Giardia*	0	0	0	<11.6
7/11/2005	Monitoring Well 1	98.41	*Cryptosporidium* *Giardia*	0	0	0	<4.07
7/11/2005	Monitoring Well 2	99.5	*Cryptosporidium* *Giardia* *Giardia*	0	0	0	<2.70
7/20/2005	Lake Orienta	27.75	*Cryptosporidium* *Giardia*	0	0	0	<9.61
7/20/2005	Monitoring Well 1	98.8	*Cryptosporidium* *Giardia*	0	0	0	<2.70
7/20/2005	Monitoring Well 2	98.41	*Cryptosporidium* *Giardia*	0	0	0	<2.71
7/27/2005	Lake Orienta	27.25	*Cryptosporidium* *Giardia*	0	0	0	<8.40
7/27/2005	Monitoring Well 1	99.17	*Cryptosporidium* *Giardia*	0	0	0	<2.7
7/27/2005	Monitoring Well 2	99.17	*Cryptosporidium* *Giardia*	0	0	0	<2.7
8/8/2005	Lake Orienta	27.25	*Cryptosporidium* *Giardia*	0	0	0	<7.8
8/8/2005	Monitoring Well 1	31.8	*Cryptosporidium* *Giardia*	0	0	0	<8.4

8/8/2005	Monitoring Well 2	99.2	*Cryptosporidium* / *Giardia*	0	0	0	<2.77
9/7/2005	Lake Orienta	27	*Cryptosporidium*	1	1	0	7.9
			Giardia	0	0	0	<7.9
9/7/2005	Monitoring Well 1	99.17	*Cryptosporidium* / *Giardia*	0	0	0	<2.69
9/7/2005	Monitoring Well 2	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71
10/6/2005	Lake Orienta	13.25	*Cryptosporidium*	1	1	0	13.2
			Giardia	0	0	0	<13.2
10/6/2005	Monitoring Well 1	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71
10/6/2005	Monitoring Well 2	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71
10/31/2005	Lake Orienta	7.95	*Cryptosporidium* / *Giardia*	0	0	0	<33.6
10/31/2005	Monitoring Well 1	102.2	*Cryptosporidium* / *Giardia*	0	0	0	<1.74
10/31/2005	Monitoring Well 2	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71
12/6/2005	Lake Orienta	11.7	*Cryptosporidium* / *Giardia*	0	0	0	<9.1
12/6/2005	Monitoring Well 1	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71
12/6/2005	Monitoring Well 2	98.41	*Cryptosporidium* / *Giardia*	0	0	0	<2.71

Table 3 contains details on the Matrix Spike samples that were collected from each of the three sites October 6, 2005. The Lake Orienta site recovery efficiencies for *Cryptosporidium* and *Giardia* did not meet the acceptance criteria outlined in Method 1623. The method mandates quality control acceptance criteria for *Cryptosporidium* to have recovery efficiencies between 13 and 100%, For *Giardia*, the method dictates efficiencies between 15 and 100%. The MS samples collected from the monitoring wells conformed to these criteria.

One possible reason why the Lake Orienta sample did not meet acceptance criteria is that the filter clogged before a sufficient amount of the seeded volume was filtered. The volume filtered before the filtered clogged would be expected to have one *Giardia* cyst and 1 *Cryptosporidium* oocyst. The recovery efficiencies may have also been affected by physical and chemical constituents within the water.

Table 3. Matrix Spike Samples:– Lake Orienta 2005

Date Collected	Site Location	Total Volume Seeded (Liters)	Organism	Recovered	% Recovery Efficiency
10/6/2005	Lake Orienta*	98.4	*Cryptosporidium*	0	0
			Giardia	3	48.8
10/6/2005	Monitoring Well 1	81.98	*Cryptosporidium*	14	28
			Giardia	10	20
10/6/2005	Monitoring Well 2	79.79	*Cryptosporidium*	25	50
			Giardia	24	48

* Filter clogged after filtering 9.08L (~9.2% of seeded volume). 9.2 *Cryptosporidium* oocysts and 9.2 *Giardia* cysts are expected in this volume.

General Conclusions

- Bacterial indicator concentrations were consistently higher at the Lake Orienta surface water site compared to the Monitoring Wells.

- Bacterial indicators were found in each of the wells at some point during the project, thus each of the wells sampled are susceptible to microbial contamination.

- No coliphage were found using the overlay procedure, at any of the sites during all sampling events

- There were no *Giardia* cysts collected at any of the sites during any of the sampling events.

- One *Cryptosporidium* oocyst was detected in the Lake Orienta surface water site on two dates, 9/7/2005 and 10/6/2005.

Lake Orienta Operational Characterization Microbial Sampling Results
SJRWMD CFARE1

		Event 1			Event 2			Event 3			Event 4		
	Site Location	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2
	Event	Event 1	Event 1	Event 1	Event 2	Event 2	Event 2	Event 3	Event 3	Event 3	Event 4	Event 4	Event 4
	SJRWMD No.:	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335
	Sample ID	LO-00-Lake	LO-00-MW1	LO-00-MW2	LO-01-Lake	LO-01-MW1	LO-01-MW2	LO-02-Lake	LO-02-MW1	LO-02-MW2	LO-03-03 Lake	LO-03-01 MW1	LO-03-02 MW2
	Date Collected	7/11/2005	7/11/2005	7/11/2005	7/20/2005	7/20/2005	7/20/2005	7/27/2005	7/27/2005	7/27/2005	8/8/2005	8/8/2005	8/8/2005
	Unit												
Volume Collected	Liters	27.6	98.41	99.5	27.75	98.8	98.41	27.25	99.17	99.17	27.25	31.8	99.2
Sample Volume Examined	Liters	8.625	24.6	37.3	10.41	37.05	36.9	11.9	37.2	37.2	12.9	11.9	36.1
Method		Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering
Turbidity (Lab.)	NTU	6.23	2.88	0.79	6.5	1.19	0.37	6.1	1.26	1.01	9.0	2.13	0.34
Sample Temperature upon arrival	℃	17	17	17	17	17	17	8	8	8	8	8	8
Cooler Temperature	℃	no data	no data	no data	no data	no data	no data	no data	no data	no data	3	2	3
Organism Bacteria													
Total Coliform	CFU/100mL	103[b]	<3	<3	27	0.26[b]	2.6[b]	48	2.7	<0.09	90[b]	0.6	<0.2
Fecal Coliform	CFU/100mL	390	<3	<3	32	<0.1	<0.1	42	<0.09	0.09[ab]	65[b]	<0.4[a]	<0.2
E.coli [c]	CFU/100mL	21[b]	<3	<3	15[a]	<0.1	<0.1	33	<0.09	0.09[ab]	50[b]	<0.4[a]	<0.2
Enterococci	CFU/100mL	36,000	<3	<3	2.7[b]	0.28[b]	<0.1	33	0.18	<0.09	20.5	0.09[ab]	0.83
Virus													
Coliphage (*E.coli* C3000 host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Coliphage (*E.coli* p(Famp)R host)	pfu/100 mL	<9.5	<9.5	<9.5	<10	<10	<10	<10	<10	<10	<10	<10	<10
Parasites													
Giardia	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
Giardia	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
Giardia	Equivalent Concentration (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
Giardia	Equivalent Concentration with internal structure (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
Cryptosporidium	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
Cryptosporidium	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
Cryptosporidium	Equivalent Concentration (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77
Cryptosporidium	Equivalent Concentration with internal structure (oo)cysts/100L	<11.6	<4.07	<2.70	<9.61	<2.70	<2.71	<8.40	<2.7	<2.7	<7.8	<8.4	<2.77

		Event 5			Event 6			Event 7			Event 8		
	Site Location	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2	Lake	MW-1	MW-2
	Event	Event 5	Event 5	Event 5	Event 6	Event 6	Event 6	Event 7	Event 7	Event 7	Event 8	Event 8	Event 8
	SJRWMD No.:	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335	None	S-0334	S-0335
	Sample ID	LO-04-03	LO-04-01	LO-04-02	LO-05-03	LO-05-01	LO-05-02	LO-06-03	LO-06-01	LO-06-02	L0-07-03	L0-07-01	L0-07-02
	Date Collected	9/7/2005	9/7/2005	9/7/2005	10/6/2005	10/6/2005	10/6/2005	10/31/2005	10/31/2005	10/31/2005	12/6/2005	12/6/2005	12/6/2005
	Unit												
Volume Collected	Liters	27	99.17	98.41	13.25	98.41	98.41	7.95	102.2	98.41	11.7	98.41	98.41
Sample Volume Examined	Liters	12.66	37.2	36.9	7.6	36.9	36.9	2.96	57.5	36.9	10.97	36.9	36.9
Method		Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering	Filtering
Turbidity (Lab.)	NTU	6.25	1.36	0.49	6.42	1.12	0.91	6.54	0.1	0.67	10.6	0.18	0.45
Sample Temperature upon arrival	℃	7.5	7.5	7.5	5	5	5	6.9	6.9	6.9	5.9	5.9	5.9
Cooler Temperature	℃	4	4	4	3	3	3	5.4	5.4	5.4	0.8	0.8	0.8
Organism Bacteria													
Total Coliform	CFU/100mL	1400[b]	0.09[ab]	<0.09	853	7.7[b]	<0.09	360	0.19	<0.09	147	0.09	60
Fecal Coliform	CFU/100mL	833[b]	0.65[b]	<0.09	237	<0.09	<0.09	290	<0.9[b]	<0.33	60	<0.09	<0.09
E.coli [c]	CFU/100mL	167[b]	<0.09	<0.09	70[b]	<0.09	<0.09	23	<0.9	<0.33	47	<0.09	<0.09
Enterococci	CFU/100mL	3633	<0.09	<0.09	570	<0.09	<0.09	52.7	0.37[b]	<0.9	95	<0.09	0.19
Virus													
Coliphage (*E.coli* C3000 host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Coliphage (*E.coli* p(Famp)R host)	pfu/100 mL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Parasites													
Giardia	Total Organisms Detected	0	0	0	0	0	0	0	0	0	0	0	0
Giardia	Number with Internal Features	0	0	0	0	0	0	0	0	0	0	0	0
Giardia	Equivalent Concentration (oo)cysts/100L	<7.9	<2.69	<2.71	<13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
Giardia	Equivalent Concentration with internal structure (oo)cysts/100L	<7.9	<2.69	<2.71	<13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
Cryptosporidium	Total Organisms Detected	1	0	0	1	0	0	0	0	0	0	0	0
Cryptosporidium	Number with Internal Features	1	0	0	1	0	0	0	0	0	0	0	0
Cryptosporidium	Equivalent Concentration (oo)cysts/100L	7.9	<2.69	<2.71	13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71
Cryptosporidium	Equivalent Concentration with internal structure (oo)cysts/100L	7.9	<2.69	<2.71	13.2	<2.71	<2.71	<33.6	<1.74	<2.71	<9.1	<2.71	<2.71

Notes:

(orange)	Problem with media batch - Positive control failure
a	Qualified data - data from one plate
b	Qualified data - less than 20 colonies per plate
c	Filter transferred from fecal coliform (mFC agar) plates to *E.coli* (EC with MUG agar) plates
	cfu - Colony forming units
	pfu - plaque forming units

[1] **Indicator Guidelines for Ambient Surface Water Quality (used for Class III Waters)**

Total Coliforms	State of Florida guidelines for a single sample 1000 cfu/100mL, average of 400 cfu/100mL
Fecal Coliforms	EPA and the state of Florida recommended guidelines for a single sample of 800 cfu/100 mL, for a geometric mean, 200 cfu/100 mL
E.coli	EPA recommended guideline for a geometric mean sample 126 cfu/100 mL
Enterococci	EPA recommended guidelines for a single sample of 104 cfu/100 mL, for a geometric mean , 33-35 cfu/100 mL for marine and fresh water respectively.
Coliphage	Level used - 100 pfu/100 mL based on previous research by Dr. Joan Rose, USF

Appendix C

Chemical Regulatory Criteria

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
		Florida MCL / SMCL (Chapter 62-550, FAC) MCL		Florida MCL / SMCL (Chapter 62-550, FAC) SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		Regional USEPA RBC [4] EPA Region IV	
Parameter Group and Name	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Field Measurements																	
pH	Std. Units																
TEMPERATURE	°C																
CONDUCTANCE	µmhos																
TURBIDITY	NTU																
DISSOLVED OXYGEN	mg/L																
OXIDATION/REDUCTION POTENTIAL	mV																
General Chemistry																	
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	mg/L		mg/L	500	mg/L		mg/L	500	mg/L	500	mg/L	500	mg/L		mg/L		mg/L
TURBIDITY	NTU		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
pH (laboratory)	PH UNITS		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
COLOR	COLOR UNIT			15	CU												
BIOLOGIC OXYGEN DEMAND, FIVE DAY	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
TOTAL ORGANIC CARBON	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
DISSOLVED ORGANIC CARBON	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Nutrients																	
TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, AMMONIA (AS N)	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, KJELDAHL, TOTAL	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NITROGEN, NITRITE	mg/L	1	mg/L		mg/L	1	mg/L		mg/L	1	mg/L		mg/L	3.7	mg/L	3.7	mg/L
NITROGEN, NITRATE-NITRITE	mg/L		mg/L		mg/L	10	mg/L		mg/L	10	mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL (AS =P)	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORTHOPHOSPHATE (AS P)	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
PHOSPHORUS, TOTAL ORGANIC (AS P)	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Anions																	
ALKALINITY, BICARBONATE (AS CACO3)	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
Carbonate	mg/L																
Hydroxide	mg/L																
CHLORIDE (AS CL)	mg/L		µg/L	250	mg/L		mg/L	250	mg/L	250	mg/L	250	mg/L		mg/L		mg/L
SULFATE (AS SO4)	mg/L		mg/L	250	mg/L		mg/L	250	mg/L	250	mg/L	2500	mg/L		mg/L		mg/L
Metals																	
ALUMINUM	µg/L		µg/L	200	µg/L		µg/L	50	µg/L		µg/L	200	µg/L	37000	µg/L	3700	µg/L
ANTIMONY	µg/L	6	µg/L		µg/L	6	µg/L		µg/L	6	µg/L	60	µg/L	15	µg/L	1.5	µg/L
ARSENIC	µg/L	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	5000	µg/L	0.045	µg/L	0.045	µg/L
BARIUM	µg/L	2000	µg/L		µg/L	2000	µg/L		µg/L	2000	µg/L	20000	µg/L	2600	µg/L	260	µg/L
BERYLLIUM	µg/L	4	µg/L		µg/L	4	µg/L		µg/L	4	µg/L	400	µg/L	0.016	µg/L	0.016	µg/L
CADMIUM	µg/L	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	515	µg/L	18	µg/L	1.8	µg/L
CALCIUM	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHROMIUM, TOTAL	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L		µg/L		µg/L
COBALT	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2200	µg/L	220	µg/L
COPPER	µg/L		µg/L	1000	µg/L		µg/L	1000	µg/L	1000	µg/L	10000	µg/L	130000	µg/L	13000	µg/L
IRON	µg/L		µg/L	300	µg/L		µg/L	300	µg/L	300	µg/L		µg/L	11000	µg/L	1100	µg/L
LEAD	µg/L	15	µg/L		µg/L	15	µg/L		µg/L	15	µg/L	150	µg/L		µg/L		µg/L
MAGNESIUM	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MANGANESE	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	50	µg/L	500	µg/L	840	µg/L	84	µg/L
MERCURY	µg/L	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
NICKEL	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	730	µg/L	73	µg/L
POTASSIUM	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SELENIUM	µg/L	50	µg/L		µg/L	50	µg/L		µg/L	50	µg/L	500	µg/L	180	µg/L	18	µg/L
SILVER	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	100	µg/L	1000	µg/L	180	µg/L	18	µg/L
SODIUM	µg/L	160000	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THALLIUM	µg/L	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L		µg/L		µg/L		µg/L
VANADIUM	µg/L		µg/L		µg/L		µg/L		µg/L	49	µg/L	490	µg/L	260	µg/L	26	µg/L
ZINC	µg/L		µg/L	5000	µg/L		µg/L	5000	µg/L	5000	µg/L	50000	µg/L	11000	µg/L	1100	µg/L
Radiologicals																	
ALPHA, GROSS	pCi/L	15	pCi/L		pCi/L	15	pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
BETA, GROSS	pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L		pCi/L
Total Petroleum Hydrocarbons																	
PETROLEUM HYDROCARBONS	mg/L		mg/L		mg/L		mg/L		mg/L	5	mg/L	50	mg/L		mg/L		mg/L
Volatile Organic Compounds																	
ACETONE	µg/L		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	3700	µg/L	370	µg/L
ACROLEIN	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ACRYLONITRILE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZENE	µg/L	1	µg/L		µg/L	5	µg/L		µg/L	1	µg/L	100	µg/L	0.36	µg/L	0.36	µg/L
BROMODICHLOROMETHANE	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	0.6	µg/L	60	µg/L	0.17	µg/L	0.17	µg/L
BROMOFORM	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	4	µg/L	40	µg/L	2.4	µg/L	2.4	µg/L
BROMOMETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	9.8	µg/L		µg/L	8.7	µg/L	0.87	µg/L
CARBON DISULFIDE	µg/L		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	1000	µg/L	100	µg/L
CARBON TETRACHLORIDE	µg/L	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.16	µg/L	0.16	µg/L
CHLOROBENZENE	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	39	µg/L	3.9	µg/L
CHLOROETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	2800	µg/L	28000	µg/L	3.6	µg/L	3.6	µg/L

Festival Park Operational Characterization Sampling Results
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		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
		Florida MCL / SMCL Chapter 62-550, FAC) MCL		Florida MCL / SMCL Chapter 62-550, FAC) SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		egional USEPA RBC [4] EPA Region IV	
Parameter Group and Name	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
CHLOROFORM	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	6	µg/L	600	µg/L	0.15	µg/L	0.15	µg/L
CHLOROMETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	2.7	µg/L	270	µg/L	1.4	µg/L	1.4	µg/L
2-CHLORO-1,3-BUTADIENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
cis-1,2-DICHLOROETHYLENE	µg/L	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
cis-1,3-DICHLOROPROPENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBROMOCHLOROMETHANE	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	0.4	µg/L	40	µg/L	0.13	µg/L	0.13	µg/L
DICHLORODIFLUOROMETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	1400	µg/L		µg/L	390	µg/L	39	µg/L
1,1-DICHLOROETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	700	µg/L	7000	µg/L	810	µg/L	81	µg/L
1,1-DICHLOROETHENE	µg/L	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	700	µg/L	0.044	µg/L	0.044	µg/L
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.02	µg/L		µg/L	0.05	µg/L		µg/L	0.02	µg/L	2	µg/L	0.00075	µg/L	0.00075	µg/L
1,2-DICHLOROBENZENE	µg/L	600	µg/L		µg/L	600	µg/L		µg/L	600	µg/L	6000	µg/L	64	µg/L	6.4	µg/L
1,2-DICHLOROETHANE	µg/L	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	0.12	µg/L	0.12	µg/L
1,2-DICHLOROPROPANE	µg/L	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	0.16	µg/L	0.16	µg/L
1,3-DICHLOROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	540	µg/L	54	µg/L
1,4-DICHLOROBENZENE	µg/L	75	µg/L		µg/L	75	µg/L		µg/L	75	µg/L	7500	µg/L	0.44	µg/L	0.44	µg/L
ETHYLBENZENE	µg/L	700	µg/L	30	µg/L	700	µg/L		µg/L	30	µg/L	300	µg/L	1300	µg/L	130	µg/L
2-HEXANONE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	1500	µg/L	150	µg/L
IODOMETHANE (METHYL IODIDE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYLENE CHLORIDE	µg/L	5	µg/L		µg/L	5	µg/L		µg/L	5	µg/L	500	µg/L	4.1	µg/L	4.1	µg/L
STYRENE	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	1600	µg/L	160	µg/L
TETRACHLOROETHYLENE(PCE)	µg/L	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.1	µg/L	1.1	µg/L
TOLUENE	µg/L	1000	µg/L	40	µg/L	1000	µg/L		µg/L	40	µg/L	400	µg/L	750	µg/L	75	µg/L
trans-1,2-DICHLOROETHENE	µg/L	100	µg/L		µg/L	100	µg/L		µg/L	100	µg/L	1000	µg/L	120	µg/L	12	µg/L
trans-1,3-DICHLOROPROPENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
trans-1,4-DICHLORO-2-BUTENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLOROETHYLENE (TCE)	µg/L	3	µg/L		µg/L	5	µg/L		µg/L	3	µg/L	300	µg/L	1.6	µg/L	1.6	µg/L
TRICHLOROFLUOROMETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	1300	µg/L	130	µg/L
1,1,1-TRICHLOROETHANE	µg/L	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L	2000	µg/L	540	µg/L	54	µg/L
1,1,2,2-TETRACHLOROETHANE	µg/L		µg/L		µg/L		µg/L		µg/L	0.5	µg/L	50	µg/L	0.052	µg/L	0.052	µg/L
1,2,3-TRICHLOROPROPANE	µg/L		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	0.0015	µg/L	0.0015	µg/L
VINYL ACETATE	µg/L		µg/L		µg/L		µg/L		µg/L	90	µg/L	900	µg/L	37000	µg/L	3700	µg/L
VINYL CHLORIDE	µg/L	1	µg/L		µg/L	2	µg/L		µg/L	1	µg/L	100	µg/L	0.019	µg/L	0.019	µg/L
M,P-XYLENE (SUM OF ISOMERS)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	12000	µg/L	12000	µg/L
XYLENES, TOTAL	µg/L	10000	µg/L	20	µg/L	10000	µg/L		µg/L	20	µg/L	200	µg/L	12000	µg/L	1200	µg/L

Festival Park Operational Characterization Sampling Results
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		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
		Florida MCL / SMCL Chapter 62-550, FAC) MCL		Florida MCL / SMCL Chapter 62-550, FAC) SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		egional USEPA RBC [4] EPA Region IV	
Parameter Group and Name	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Semi-volatile Organic Compound																	
ACETOPHENONE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ANILINE (PHENYLAMINE, AMINOBENZENE)	µg/L		µg/L		µg/L		µg/L		µg/L	6.1	µg/L	610	µg/L	10	µg/L	10	µg/L
ARAMITE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-AMINOBIPHENYL (4-BIPHENYLAMINE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-ACETYLAMINOFLUORENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-AMINONAPHTHALENE (BETA NAPHTHYLAMINE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BENZYL ALCOHOL	µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	21000	µg/L	11000	µg/L	1100	µg/L
BENZYL BUTYL PHTHALATE	µg/L		µg/L		µg/L		µg/L		µg/L	1400	µg/L	14000	µg/L	7300	µg/L	730	µg/L
4-BROMOPHENYL PHENYL ETHER	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	2100	µg/L	210	µg/L
4-CHLOROANILINE	µg/L		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
4-CHLOROPHENYL PHENYL ETHER	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-CHLORONAPHTHALENE	µg/L		µg/L		µg/L		µg/L		µg/L	560	µg/L	5600	µg/L	2900	µg/L	290	µg/L
2-CHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	35	µg/L		µg/L	180	µg/L	18	µg/L
1,3-DINITROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DICHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	110	µg/L	11	µg/L
2,6-DICHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,4-DIMETHYLPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	140	µg/L	1400	µg/L	730	µg/L	73	µg/L
2,4-DINITROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	30	µg/L		µg/L	73	µg/L	7.3	µg/L
2,4-DINITROTOLUENE	µg/L		µg/L		µg/L		µg/L		µg/L	0.2	µg/L	20	µg/L	73	µg/L	7.3	µg/L
bis(2-CHLOROETHOXY) METHANE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	µg/L		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0092	µg/L	0.0092	µg/L
bis(2-CHLOROISOPROPYL) ETHER	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLOROBENZILATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIALLATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIBENZOFURAN	µg/L		µg/L		µg/L		µg/L		µg/L	28	µg/L	280	µg/L	150	µg/L	15	µg/L
DIETHYL PHTHALATE	µg/L		µg/L		µg/L		µg/L		µg/L	5600	µg/L	56000	µg/L	29000	µg/L	2900	µg/L
DIMETHYL PHTHALATE	µg/L		µg/L		µg/L		µg/L		µg/L	70000	µg/L	700000	µg/L	370000	µg/L	37000	µg/L
DIMETHYLPHENYLETHYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
7,12-DIMETHYLBENZ(a)ANTHRACENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-DIMETHYLAMINOAZOBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
3,3'-DICHLOROBENZIDINE	µg/L		µg/L		µg/L		µg/L		µg/L	12	µg/L		µg/L	0.15	µg/L	0.15	µg/L
3,3'-DIMETHYLBENZIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ETHYL METHANESULFONATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEXACHLOROPROPENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISODRIN	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ISOPHORONE	µg/L		µg/L		µg/L		µg/L		µg/L	37	µg/L		µg/L	71	µg/L	71	µg/L
ISOSAFROLE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
KEPONE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHAPYRILENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
METHYL METHANESULFONATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-METHYLNAPHTHALENE	µg/L		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	1500	µg/L	1500	µg/L
2-METHYLPHENOL (o-CRESOL)	µg/L		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
3-METHYLCHOLANTHRENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
4-METHYLPHENOL (p-CRESOL)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,4-NAPHTHOQUINONE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1-NAPHTHYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-NITROANILINE	µg/L		µg/L		µg/L		µg/L		µg/L	50	µg/L	500	µg/L	2.2	µg/L	0.22	µg/L
3-NITROANILINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	110	µg/L	11	µg/L
4-NITROANILINE	µg/L		µg/L		µg/L		µg/L		µg/L	20	µg/L	200	µg/L	110	µg/L	11	µg/L
4-NITROQUINOLINE-N-OXIDE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
5-NITRO-o-TOLUIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSO-DI-N-BUTYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODI-n-PROPYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L	4	µg/L	400	µg/L	0.0096	µg/L	0.0096	µg/L
N-NITROSODIETHYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSODIMETHYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L	2	µg/L	200	µg/L	0.0013	µg/L	0.0013	µg/L
N-NITROSODIPHENYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L	7	µg/L	700	µg/L	14	µg/L	14	µg/L
N-NITROSOMORPHOLINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,3,5-TRINITROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPIPERIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
N-NITROSOPYRROLIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
NITROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L	4	µg/L	40	µg/L	3.4	µg/L	0.34	µg/L
NITROSOMETHYLETHYLAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
O,O,O-TRIETHYL PHOSPHOROTHIOATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
o-TOLUIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2-PICOLINE (ALPHA-PICOLINE)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
p-PHENYLENEDIAMINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROETHANE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLORONITROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PENTACHLOROPHENOL	µg/L	1	µg/L		µg/L	1	µg/L		µg/L	1	µg/L		µg/L	0.56	µg/L	0.56	µg/L
PHENACETIN	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	10	µg/L	100	µg/L	22000	µg/L	2200	µg/L

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
		Florida MCL / SMCL Chapter 62-550, FAC) MCL		Florida MCL / SMCL Chapter 62-550, FAC) SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		egional USEPA RBC [4] EPA Region IV	
Parameter Group and Name	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
PRONAMIDE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PYRIDINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SAFROLE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4,5-TETRACHLOROBENZENE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
2,3,4,6-TETRACHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
1,2,4-TRICHLOROBENZENE	µg/L	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	190	µg/L	19	µg/L
2,4,5-TRICHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	4	µg/L		µg/L	3700	µg/L	370	µg/L
2,4,6-TRICHLOROPHENOL	µg/L		µg/L		µg/L		µg/L		µg/L	5	µg/L		µg/L	6.1	µg/L	6.1	µg/L
Organochlorine Pesticides																	
ALDRIN	µg/L		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.004	µg/L	0.004	µg/L
ALPHA-CHLORDANE	µg/L	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
GAMMA-CHLORDANE	µg/L	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	200	µg/L	0.19	µg/L	0.19	µg/L
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	µg/L		µg/L		µg/L		µg/L		µg/L	0.006	µg/L	0.6	µg/L	0.011	µg/L	0.011	µg/L
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	µg/L		µg/L		µg/L		µg/L		µg/L	0.02	µg/L	2	µg/L	0.037	µg/L	0.037	µg/L
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	µg/L		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L	0.037	µg/L	0.037	µg/L
GAMMA BHC (LINDANE)	µg/L	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.052	µg/L	0.052	µg/L
DIELDRIN	µg/L		µg/L		µg/L		µg/L		µg/L	0.005	µg/L	0.5	µg/L	0.0042	µg/L	0.0042	µg/L
ALPHA ENDOSULFAN	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
BETA ENDOSULFAN	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDOSULFAN SULFATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN	µg/L	2	µg/L		µg/L	2	µg/L		µg/L	2	µg/L	20	µg/L	11	µg/L	1.1	µg/L
ENDRIN ALDEHYDE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ENDRIN KETONE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
HEPTACHLOR	µg/L	0.4	µg/L		µg/L	0.4	µg/L		µg/L	0.4	µg/L	40	µg/L	0.0023	µg/L	0.0023	µg/L
HEPTACHLOR EPOXIDE	µg/L	0.2	µg/L		µg/L	0.2	µg/L		µg/L	0.2	µg/L	20	µg/L	0.0012	µg/L	0.0012	µg/L
p,p'-DDD	µg/L		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.28	µg/L	0.28	µg/L
p,p'-DDE	µg/L		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
p,p'-DDT	µg/L		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	10	µg/L	0.2	µg/L	0.2	µg/L
METHOXYCHLOR	µg/L	40	µg/L		µg/L	40	µg/L		µg/L	40	µg/L	400	µg/L	180	µg/L	18	µg/L
TOXAPHENE	µg/L	3	µg/L		µg/L	3	µg/L		µg/L	3	µg/L	300	µg/L	0.061	µg/L	0.061	µg/L

Festival Park Operational Characterization Sampling Results
SJRWMD CFARE1

		Maximum Contaminant Levels								Florida Brownfields				Risk-based Concentrations			
		Florida MCL / SMCL Chapter 62-550, FAC) MCL		Florida MCL / SMCL Chapter 62-550, FAC) SMCL		Federal MCL/SMCL [2] MCL		Federal MCL/SMCL [2] SMCL		Florida Brownfield (62-785) [3] GCTL		Florida Brownfield (62-785) [3] Groundwater LY/PQ		Regional USEPA RBC EPA Region III Tap Water		egional USEPA RBC [4] EPA Region IV	
Parameter Group and Name	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit	Criteria	Unit
Organophosphorous Pesticides																	
ATRAZINE	µg/L	3	µg/L		µg/L	3	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
AZINPHOS, METHYL (GUTHION)	µg/L		µg/L		µg/L		µg/L		µg/L	10.5	µg/L	105	µg/L		µg/L		µg/L
BOLSTAR	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
CHLORPYRIFOS	µg/L		µg/L		µg/L		µg/L		µg/L	21	µg/L	210	µg/L	110	µg/L	11	µg/L
COUMAPHOS	µg/L		µg/L		µg/L		µg/L		µg/L	2.1	µg/L	21	µg/L		µg/L		µg/L
DEMETON-O	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DEMETON-S	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DIAZINON	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	33	µg/L	3.3	µg/L
DICHLORVOS	µg/L		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L	0.23	µg/L	0.23	µg/L
DIMETHOATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
DISULFOTON	µg/L		µg/L		µg/L		µg/L		µg/L	0.3	µg/L	3	µg/L	1.5	µg/L	0.15	µg/L
ETHOPROP	µg/L		µg/L		µg/L		µg/L		µg/L	0.11	µg/L	1.1	µg/L		µg/L		µg/L
FAMPHUR	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
FENSULFOTHION	µg/L		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
FENTHION	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
MERPHOS	µg/L		µg/L		µg/L		µg/L		µg/L	0.21	µg/L		µg/L	1.1	µg/L	0.11	µg/L
MEVINPHOS	µg/L		µg/L		µg/L		µg/L		µg/L	1.75	µg/L	17.5	µg/L		µg/L		µg/L
NALED	µg/L		µg/L		µg/L		µg/L		µg/L	14	µg/L	140	µg/L	73	µg/L	7.3	µg/L
PARATHION, ETHYL	µg/L		µg/L		µg/L		µg/L		µg/L	42	µg/L	420	µg/L	220	µg/L	22	µg/L
PARATHION, METHYL	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PHORATE	µg/L		µg/L		µg/L		µg/L		µg/L	1.4	µg/L	14	µg/L	7.3	µg/L	0.73	µg/L
RONNEL	µg/L		µg/L		µg/L		µg/L		µg/L	350	µg/L	3500	µg/L	1800	µg/L	180	µg/L
SIMAZINE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
STIROFOS (TETRACHLORVINPHOS)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
THIODIPHOSPHORIC ACID TETRAETHYL ESTER	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TOKUTHION (PROTHIOFOS)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
TRICHLORONATE	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
ZINOPHOS	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
Polychlorinated biphenols (PCBs)																	
PCB-1016 (AROCHLOR 1016)	µg/L		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	2.6	µg/L	0.26	µg/L
PCB-1221 (AROCHLOR 1221)	µg/L		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1232 (AROCHLOR 1232)	µg/L		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1242 (AROCHLOR 1242)	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
PCB-1248 (AROCHLOR 1248)	µg/L		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
PCB-1254 (AROCHLOR 1254)	µg/L		µg/L		µg/L		µg/L		µg/L	1	µg/L	10	µg/L	0.73	µg/L	0.073	µg/L
PCB-1260 (AROCHLOR 1260)	µg/L		µg/L		µg/L	0.5	µg/L		µg/L	0.5	µg/L	50	µg/L	0.034	µg/L	0.034	µg/L
Herbicides																	
2,4,5-T (TRICHLOROPHENOXYACETIC ACID)	µg/L		µg/L		µg/L		µg/L		µg/L	70	µg/L	700	µg/L	370	µg/L	37	µg/L
2,4-D (DICHLOROPHENOXYACETIC ACID)	µg/L	70	µg/L		µg/L	70	µg/L		µg/L	70	µg/L	700	µg/L	61	µg/L	6.1	µg/L
DALAPON	µg/L	200	µg/L		µg/L	200	µg/L		µg/L	200	µg/L		µg/L	1100	µg/L	110	µg/L
DICAMBA	µg/L		µg/L		µg/L		µg/L		µg/L	210	µg/L		µg/L	1100	µg/L	110	µg/L
DICHLOROPROP	µg/L		µg/L		µg/L		µg/L		µg/L	0.1	µg/L	1	µg/L		µg/L		µg/L
DINOSEB	µg/L	7	µg/L		µg/L	7	µg/L		µg/L	7	µg/L	70	µg/L	37	µg/L	3.7	µg/L
PICLORAM	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L
SILVEX (2,4,5-TP)	µg/L	50	29														

Sources:

[1] *Florida Ground Water Guidance Concentrations*, 62-520.400 FAC, June 2, 1994: Chapter 62-550 *Drinking Water Standards, Monitoring and Reporting, April 10, 2003*
[2] *Drinking Water Regulations and Health Advisories*, Office of Water, USEPA, October 1996.

[3] *Brownfield's Cleanup Criteria Rule*, *Groundwater Cleanup Target Levels*, Draft Chapter 62-785 F.A.C., 1997.
[4] *EPA Region III Risk-Based Concentration Table, Tap Water Values,* R.L. Smith, October 1997.
[5] *EPA Region IV Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment*, November 1995; HQ=0.1 applied to noncarcinogens.

Definitions:
MCL - Maximum Contaminant Level
SMCL - Secondary MCL

GCTL - Groundwater Cleanup Target Level
LY/PQ - Low Yield/Poor Quality
RBC - Risk-based Concentration

Appendix D

Monitoring Well Construction Reports

LICENSE AGREEMENT

THIS LICENSE AGREEMENT, hereinafter the "Agreement", is hereby made and entered into this 5th day of February, 2003, by and between the **GREATER ORLANDO AVIATION AUTHORITY,** a public and governmental body, existing under and by virtue of the laws of the State of Florida, whose address is One Airport Boulevard, Orlando, Florida 32827-4399, (hereinafter referred to as the "**LICENSOR**"), and the **ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**, a public body existing under *Chapter 373, Florida Statutes*, whose address is P. O. Box 1429, Palatka, Florida 32178-1429, (hereinafter referred to as the "**LICENSEE**").

WITNESSETH:

WHEREAS, the City of Orlando (hereinafter the "City") is the owner of certain real property located at the northeast corner of the intersection of Amelia Avenue and Maguire Boulevard in Section 30, Township 22S, Range 30E, Latitude 28° 32' 50", Longitude 81° 20' 40", Orange County, Florida, Parcel Number 302230111208010, hereinafter referred to as **"LICENSE AREA"**, as more particularly identified in Exhibit "A", a copy of which is attached hereto.

WHEREAS, pursuant to an operation and use agreement dated September 27, 1976, as amended (City Document Number 13260-1), between the City and **LICENSOR**, the **LICENSOR** controls, operates, and maintains an airport in Orange County, State of Florida, known as Orlando Executive Airport (hereinafter referred to as the "Airport"); and

WHEREAS, the LICENSE AREA is located at the Airport; and

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
FEB 12 2003
PALATKA, FLORIDA MAIL CENTER

WHEREAS, LICENSEE desires to utilize LICENSE AREA for the purpose of monitoring and observing hydrogeologic conditions by drilling, constructing, operating and maintaining one (1) new well completed flush to grade within a 2 ft. x 2ft. concrete pad, and fitted with a lockable well cap to prevent vandalism, upon the LICENSE AREA; and

WHEREAS, LICENSOR is desirous of granting to **LICENSEE** a license to accomplish the aforementioned purpose.

NOW THEREFORE, for and in consideration of the terms, conditions, and mutual covenants hereinafter contained, **LICENSOR** and **LICENSEE**, both intending to be legally bound, hereby agree as follows:

1. **LICENSOR** hereby grants **LICENSEE**, its agents and employees, the right, privilege and license to utilize the LICENSE AREA to locate, construct, install, operate, inspect, alter, improve, maintain, repair, remove and rebuild a monitoring well as described above, for research and scientific purposes on, upon and across said LICENSE AREA; and attain ingress and egress to and upon said LICENSE AREA for the purpose of exercising the rights, privileges and license granted herein.

2. This Agreement shall be effective as of the date of execution of this Agreement by both parties and shall continue in full force and effect for a period of 12 months. This Agreement shall automatically renew for four (4) consecutive 12 month periods unless either party gives the other party written notice 90 days prior to the conclusion of the then existing 12 month term. Upon the conclusion of the initial term and the four subsequent renewal periods described above, this Agreement shall to

remain in full force and effect unless terminated by either party upon ninety (90) days written notice to the other party, which notice may be given at any time.

3. A. **LICENSEE** shall obtain **LICENSOR'S** written approval prior to any improvements or alterations to the LICENSE AREA. **LICENSEE's** activities associated with operation and maintenance (as defined below) of the LICENSE AREA shall not require **LICENSOR's** prior approval, unless such operation and maintenance involve the use of any equipment with a height in excess of fifteen (15) feet above ground level, whereby, in such event, **LICENSEE** shall give **LICENSOR** thirty (30) days advance written notice of such use for Federal Aviation Authority ("FAA") air traffic notification compliance.

B. For purposes of this Agreement, "operating" or "operation" is defined as access to the LICENSE AREA by **LICENSEE**, its agents and employees, to collect groundwater level measurements and/or groundwater samples from the monitoring well during the term of this Agreement.

C. For purposes of this Agreement, "maintaining" or "maintenance" is defined as access to the LICENSE AREA by **LICENSEE**, its agents and employees, to remove, repair, and/or replace equipment within the monitoring well, and repair and/or replace the concrete pad surrounding the monitoring well during the license period.

D. **LICENSEE**, its agents and employees shall be granted access to the access road, located on Amelia Street east of Maguire Boulevard, for the sole purpose of ingress and egress to the LICENSE AREA. Such access will permit the use of vehicles, pumps, pump control devices, water level sensors, water quality measuring devices, data collection devices, and/or temporary electrical power generating equipment at the site for the collection of data and samples.

E. **LICENSEE** may leave equipment and/or vehicles at the LICENSE AREA overnight during the installation of the monitoring well. Security of the equipment and/or vehicles left on-site during installation is the sole responsibility of the **LICENSEE,** its agents and employees. All other equipment will be removed from the site daily during operating activities, except equipment that is installed in the monitoring well. Equipment installed in the monitoring well will be secured within the monitoring well installation. Security of the equipment installed in the monitoring well is the sole responsibility of the **LICENSEE.**

4. **LICENSOR** retains the right to use the LICENSE AREA in any manner not inconsistent with the rights herein granted to **LICENSEE.**

5. A. Each party to this Agreement is responsible for all personal injury and property damage attributable to the negligent acts or omissions of that party and the officers and employees acting within the scope of their employment thereof. In addition, each party is subject to the provisions of Section 768.28, Fla. Stat. (2001). Neither this provision nor any other in this Agreement shall be construed as a waiver of Sovereign Immunity by either party.

B. The **LICENSEE** may hire a third party contractor to construct the monitoring well. In addition to the **LICENSEE'S** standard insurance requirements for contractors, it shall require the third party contractor to show both the **LICENSEE** and the **LICENSOR** as additional insured parties under all of the insurance policies, with the exception of the workers' compensation insurance policy. Prior to the contractor commencing installation of the wells, all plans and specifications of such construction shall be approved by **LICENSOR** as described in Section 3(A) of this Agreement and the **LICENSEE** shall provide the **LICENSOR** with a certificate of insurance evidencing the required coverages and naming the **LICENSEE** and **LICENSOR** as additional insureds.

C. The **LICENSEE** and **LICENSOR**, as public entities, warrant and represent that they are self-funded for liability insurance, or have liability insurance, both public and property, with such protection being applicable to its officers, employees, servants, and agents while acting within the scope of their employment with **LICENSEE** or **LICENSOR**, respectively.

D. The **LICENSEE** shall also acquire and maintain throughout the term of this Agreement such general liability, automobile insurance, and workers' compensation insurance as required by its current rules and regulations.

6. The **LICENSOR** does not warrant or represent that the LICENSE AREA is safe or suitable for the purpose for which the **LICENSEE** is permitted to use it, and the **LICENSEE** assumes all risks in its use.

7. Prior to initial use of LICENSE AREA by **LICENSEE, LICENSEE** shall give **LICENSOR** at least twenty-four (24) hours notification. **LICENSEE** agrees that any and all work performed in the LICENSE AREA and in association with the purpose of the Agreement shall be accomplished in a good, safe and workmanlike manner and in accordance with applicable Federal, State and local statutes, rules, regulations and ordinances.

8. **LICENSOR** may provide **LICENSEE,** its agents and employees, one set of paper or electronic file copies of appropriate maps, data tables, and/or reports sufficient to identify the type, concentrations, and horizontal and vertical extent of soil and groundwater contamination at the LICENSE AREA and vicinity to allow the preparation of health and safety plans to comply with OSHA regulations through 29 CFR 1910.120 and 29 CFR 1926.65 during well drilling, installation and monitoring activities. **LICENSEE** shall bear all of **LICENSOR's** costs associated with this Section 8.

9. Upon termination of this Agreement, or revocation by the **LICENSOR, LICENSEE** shall, at **LICENSEE's** sole cost and expense, remove all equipment, accessories, and materials owned by **LICENSEE** from the LICENSE AREA within ninety (90) days and restore said LICENSE AREA to as good a condition as it was before **LICENSEE** entered upon it and otherwise comply with all applicable Federal, State and local statutes, rules, regulations and ordinances.

10. **LICENSEE** shall not allow the public to access, utilize or go upon the LICENSE AREA.

11. **LICENSEE** shall, upon request, provide to **LICENSOR** an annual copy of any and all data collected as a result of **LICENSEE's** hydrogeological monitoring activities in the LICENSE AREA.

12. The license herein granted is subject to revocation by the **LICENSOR** if the LICENSE AREA is not utilized for the purposes outlined in this Agreement or if there is a change in ownership of the LICENSE AREA.

IN WITNESS WHEREOF, the undersigned parties have executed this License Agreement on the day and year first above written.

"LICENSOR"

ATTEST:

By: ______________________

Printed Name: DAYCI S. BURNETTE-SNYDER
ASSISTANT SECRETARY

GREATER ORLANDO AVIATION AUTHORITY

By: ______________________
C.W. JENNINGS, Executive Director

Date: 6 FEB 2003

APPROVED AS TO FORM AND LEGALITY for the use and reliance of the Greater Orlando Aviation Authority, only.
Marchena and Graham, P.A.
Counsel

By: ______________________
Marcos R. Marchena

Date: 1/27/03

"LICENSEE"

ATTEST:

By: ______________________

Printed Name: William H. Congdon

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

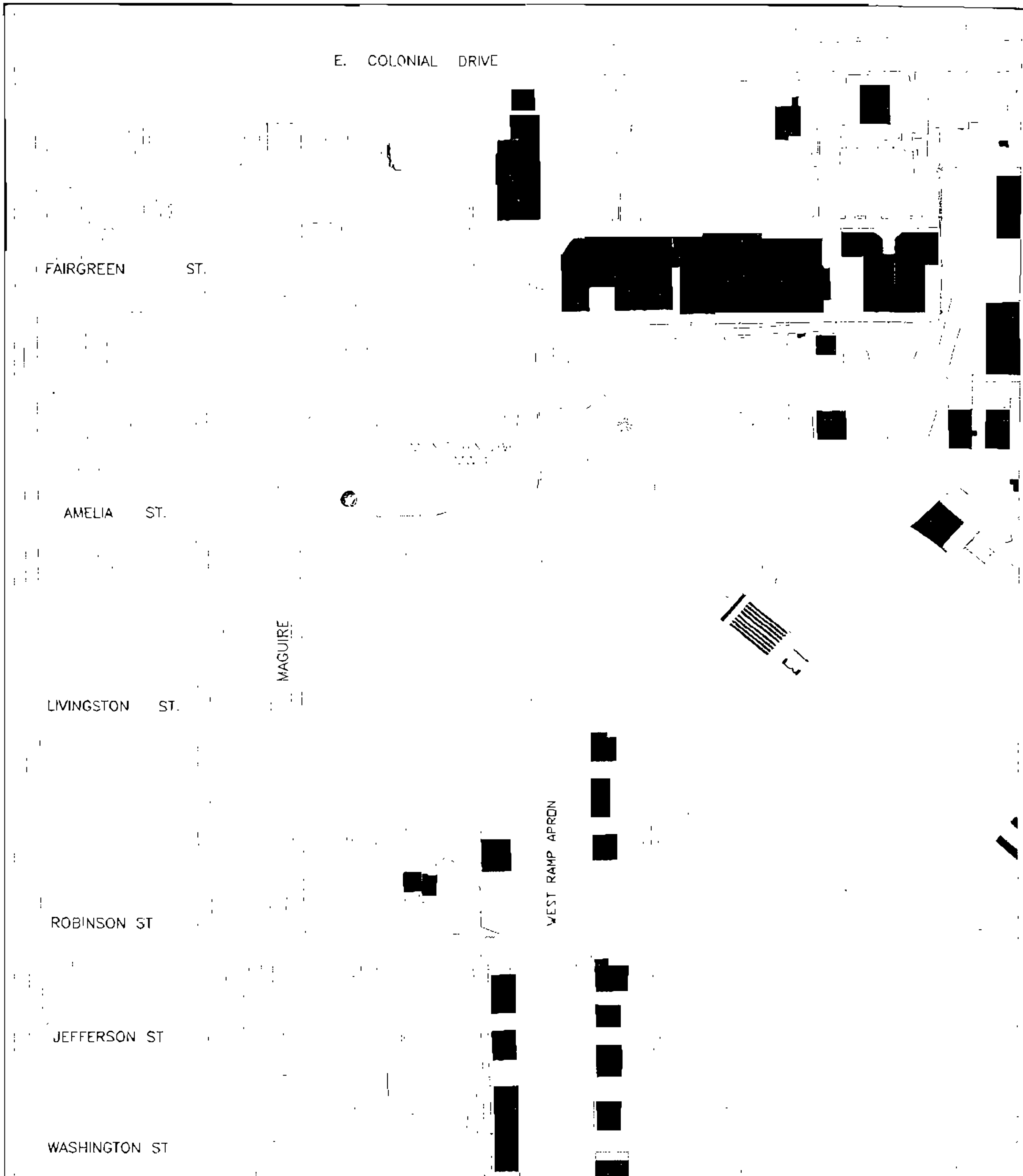
By: ______________________
KIRBY GREEN III, Executive Director

Date: 01/23/03

APPROVED BY
Office of General Counsel

By: ______________________
John W. Williams
Deputy General Counsel

Date: 01/23/03



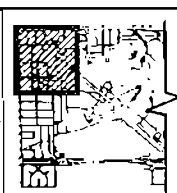
GREATER ORLANDO AVIATION AUTHORITY

"ORL"

ORLANDO EXECUTIVE AIRPORT

REVISION HISTORY

DATE	CHANGE
01/09/03	DATE REVISED



SHEET TITLE

SJWMD MONITORING WELL LOCATION

REFERENCE INFO.

PROJECT NO.:	T-3463
REQUESTED BY:	T. Shea
DRAWN BY:	P. Blanco
CHECKED BY:	CB & TS
DATE CREATED:	01/09/03

SHEET

1 OF 1

CITY OF ORLANDO

November 13, 2002

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
NOV 15 2002
PALATKA, FLORIDA MAIL CENTER

Ms. Carolyn W. Brown
Right of Way Specialist
Division of Land Acquisition
St. Johns River Water Management District
P. O. Box 1429
Palatka, Florida 32178-1429

RE: Festival Park Well Monitoring License Agreement

Dear Carolyn:

Enclosed please find one original fully-executed License Agreement for your records. If I can be of further assistance, please give me a call.

Sincerely yours,

John H. Somsen

JOHN H. SOMSEN
Assistant City Attorney

JHS/bcj
Enclosure
c: Rick M. Howard, P.E., City Engineer (w/encl.)

LICENSE AGREEMENT

THIS LICENSE AGREEMENT made and entered into this 11th day of November, 2002, by and between the **City of Orlando, Florida,** a municipal corporation existing under the laws of the State of Florida, whose mailing address is 400 South Orange Avenue, Orlando, Florida, 32801 (hereinafter referred to as "CITY") and **St. Johns River Water Management District,** a public body existing under Chapter 373, *Florida Statutes*, whose mailing address is Highway 100 West, Palatka, Florida 32178 (hereinafter referred to as "DISTRICT").

WITNESSETH:

WHEREAS, the CITY is the Owner of that certain parcel of real property known as Festival Park, located in Orange County, Florida; and

WHEREAS, the DISTRICT desires to install, monitor and maintain three (3) wells to monitor hydrogeologic conditions within that portion of Festival Park generally south of Amelia Street, west of Maguire Boulevard, north of Livingston Street and east of Festival Way, as well as the right-of-way on the south side of Amelia Street between Primrose Drive and Festival Way (hereinafter collectively referred to as the "premises" or "property").

WHEREAS, the CITY is desirous of granting to the DISTRICT a License Agreement to accomplish the aforementioned purpose.

NOW, THEREFORE, for and in consideration of the mutual covenants, promises, terms and conditions set forth herein, the CITY hereby grants to the DISTRICT a non-exclusive license in and upon the premises described above.

The CITY and the DISTRICT agree that this License Agreement shall be subject to the following terms and conditions:

1. The term of this License Agreement shall be for a term of five (5) years from the date of full execution of this License Agreement. The term may be extended by annual renewal(s) subject to the mutual written agreement of both parties. The CITY agrees that the DISTRICT shall have the right and privilege of ingress and egress to and from the premises and over and across that portion of the CITY's lands as currently anticipated to generally be as in Exhibit "A" attached hereto, and by reference made a part hereof, to carry out the purposes of this License Agreement. The actual field location of the three (3) wells must be approved by the City prior to installation. Well caps must be flush with the surface of the ground. None of the wells shall be installed on or within the volleyball courts and ingress and egress shall not include the area on, over, or below the volleyball courts. Well caps may be set within a 2' x 2' concrete pad and fitted with a lockable cap.

2. The CITY does not warrant its title to the subject property; however, the CITY does warrant that it has the power and authority to grant this License Agreement and the use granted herein. The DISTRICT takes this License Agreement subject to the restrictions and conditions of record, both public and private. The CITY does not represent the suitability of the subject property for monitoring wells and the DISTRICT hereby represents that it has not relied on the CITY's representations, statements, information, or otherwise and accepts the subject property "as is" and with all defects patent or latent and assumes all risks in its use.

3. The DISTRICT agrees to occupy and use the premises for the exclusive purpose necessary and in connection with 1) the installation, operation, maintenance, and repair of three (3) monitoring wells and 2) the routine monitoring and observation of hydrogeologic conditions, and for no other purposes. All costs incurred or required for installation, construction, operation, maintenance and repair of the well shall be at the sole expense of the DISTRICT. Further, the activities permitted by this Section shall be subject to the following restrictions:

a. The DISTRICT shall provide and shall drill, install, construct, operate, maintain, and repair the monitoring wells pursuant to plans and specifications approved in advance by the CITY and shall submit the plans and specifications in such detail as reasonably acceptable to the CITY regarding the proposed project. The DISTRICT shall provide as-built drawings showing in detail the exact location of each well which shall then become part of this License Agreement.

b. The drilling and installation of the proposed project shall not take place during public events on or near the site and the DISTRICT shall be required to coordinate their activities in this respect with the CITY's Parks Bureau or its successor.

c. The DISTRICT's drilling, installation, construction, operation, maintenance, and repair activities shall not unreasonably interfere with other CITY or non-CITY activities, including public access and use of the Park.

d. Any power or utilities needed to service the premises shall be obtained at the expense of the DISTRICT and must be reviewed and approved in advance by the CITY.

4. The DISTRICT, its officers, employees, agents, consultants, independent contractors and others working on behalf of the DISTRICT shall comply with all applicable laws, regulations, ordinances, and policies regarding the granting, or use of the premises including, but not limited to, the security of the premises, safety and zoning laws. The granting of this License Agreement by the CITY is not an automatic grant of zoning approval for the use of the premises for any particular use. The DISTRICT shall, if necessary, make all required applications in this regard and approval shall be obtained before any construction commences on the premises.

5. All information obtained by the DISTRICT shall be shared with the CITY and the CITY shall have the opportunity to visit and inspect the site with DISTRICT personnel to observe measurement techniques and other actions. A copy of the hydrogeologic report on the DISTRICT's findings shall be provided to the City by the DISTRICT.

6. The CITY shall continue to operate the property as a park and recreation site and may also enter the premises to ensure compliance with this License Agreement and to determine compliance with all other laws, regulations and policies.

7. The DISTRICT shall pay all lawful debts incurred by the DISTRICT with respect to the premises and shall satisfy all liens of contractors, sub-contractors, mechanics, laborers, and materialmen with respect to any construction, alteration and repair in and on the premises, and improvements thereon authorized by the DISTRICT, its agents or employees and shall indemnify and hold harmless the CITY, its employees and elected and appointed officials, against all costs and expenses, including attorneys' fees (and attorneys' fees and costs on appeal) reasonably incurred in any suit involving any claims, liens, judgments or encumbrances suffered by the CITY as a result of the use or occupancy of the premises or any part thereof by the DISTRICT, its agents, contractors, or employees. Furthermore, the DISTRICT shall have no authority to create any liens for labor or material on or against the CITY's interest in the premises, and all persons contracting with the DISTRICT for the construction or removal, or for the erection, installation, alteration or repair of any improvement on the premises, including all materialmen, contractors, mechanics and laborers involved in such work, shall be notified by the DISTRICT that they must look to the DISTRICT only to secure the payment of any bill or account for any material furnished during the term of this License Agreement.

8. The CITY reserves the right to require relocation of the well(s) (to another site on the premises and at the CITY's sole option) at no cost to the CITY upon thirty (30) days written notice to the DISTRICT after the beginning of this License Agreement, reserving unto the DISTRICT the right of termination pursuant to Paragraph 12 herein. The CITY shall not exercise this right arbitrarily. In any event, such relocation shall occur simultaneously with abandonment of the existing well to avoid interruption in the DISTRICT's monitoring program.

9. The DISTRICT must start construction and make (and continue to make) reasonable progress toward completion of the project within six (6) months from the date of this License Agreement, unless otherwise agreed by the parties.

10. Any destruction, damage, impairment, or other diminution by the DISTRICT employees, its agents, contractors, subcontractors and those working for them, to the premises that result from well-construction, monitoring-related activities, maintenance or operation activities, or other activities carried out under this License Agreement, improvements thereto, or other appurtenances, shall be repaired or restored within a reasonable time at the DISTRICT's expense so as to prevent an aesthetic or visual impairment of the surrounding property or a health, safety or welfare violation or threat.

11. The CITY reserves the right to use or authorize others to use the premises in any manner not inconsistent with or which will not unreasonably interfere with the rights granted herein, provided that the CITY shall not physically disturb the well-casing or well-cover in any way without prior approval from the DISTRICT. It is recognized, however, that the CITY cannot

guarantee, warranty and does not represent the security of the well, equipment, or improvements to the premises, and hereby disclaims liability or responsibility.

12. In the event the DISTRICT determines that the premises are no longer needed for the purposes set forth herein, the DISTRICT may terminate this License Agreement by notifying the CITY, in writing, at least thirty (30) days prior to the date of such termination. Upon termination in this manner or any other termination or expiration of this License Agreement, the DISTRICT shall abandon and plug the monitoring wells in accordance with all then applicable rules and regulations governing the abandonment of wells and in accordance with the requirements of the CITY, and shall submit a plan for approval to the CITY in advance of such abandonment. In addition, the DISTRICT shall restore the premises as nearly as practicable to its condition prior to the granting of this license provided, however, the CITY by giving notice in writing to the DISTRICT at least ten (10) days prior to the date of such termination, shall retain the option to require the improvements to remain in their then-current condition (including but not limited to, the well, well casing, and any and all improvements or appurtenances utilized in any manner previously on or in connection with the monitor well) in lieu of the removal and restoration requirements contained herein; in which event, upon receipt of such notification by the DISTRICT, all responsibilities and liabilities of the DISTRICT contained herein shall cease and such improvements shall become the sole responsibility of CITY.

13. a. Each party to this License Agreement is responsible for all personal injury and property damage attributable to the negligent acts or omissions of that party and the officers and employees acting within the scope of their employment thereof. In addition, each party is subject to the provisions of Section 768.28, Fla. Stat. (2001). Neither this provision nor any other in this License Agreement shall be construed as a waiver of Sovereign Immunity by either party.

b. The DISTRICT may hire a third party contractor to construct the three new monitoring wells. In addition to the DISTRICT'S standard insurance requirements for contractors, it shall require the third party contractor to show both the DISTRICT and the CITY as additional insured parties under all of the insurance policies, with the exception of the workers' compensation insurance policy. Prior to the contractor commencing installation of the wells, the DISTRICT shall provide the CITY with a certificate of insurance evidencing the required coverages and naming the DISTRICT and CITY as additional insureds.

c. The DISTRICT and CITY, as public entities, warrant and represent that they are self-funded for liability insurance, or have liability insurance with such protection being applicable to its officers, employees, servants, and agents while acting within the scope of their employment with DISTRICT or CITY respectively.

d. The DISTRICT shall also acquire and maintain throughout the term of this License Agreement such general liability, automobile insurance, and workers' compensation insurance as required by its current rules and regulations.

e. All personal property or improvements placed upon or moved in or upon the premises shall be at the risk of the DISTRICT and the CITY shall not be liable for any damage to said personal property or improvements.

14. As to all rights and obligations under this License Agreement, the parties hereby agree that time is of the essence.

15. All heavy equipment, tools, machinery, and other items utilized in the drilling of the well for construction of any improvements to the premises shall, if stored on the construction site, be safely enclosed and secured so as not to present a public health, safety or welfare threat.

a. This License Agreement does not constitute a waiver of the CITY's regulatory and police powers and is entered into pursuant to its proprietary powers only.

b. It shall be the responsibility of the DISTRICT at its sole cost and expense, to obtain or renew any and all permits, licenses, or other approvals which may be required by the CITY or any other federal, regional, state or local governmental agency or regulatory body.

16. In the event the DISTRICT shall breach, fail to observe, or be in default with respect to any of the provisions of this License Agreement or fail to comply with or observe a lawful order by the CITY or other entity with jurisdiction and such breach, failure, default or violation is not remedied by the DISTRICT within fifteen (15) days after written notice of same is given by the CITY (or the appropriate entity), then this License Agreement and the rights herein shall terminate immediately and the CITY shall not be liable for any damages caused by such termination and the wells will be abandoned by the DISTRICT in accordance with the provisions of Paragraph 12 herein.

17. All notices, consents, approvals, waivers and elections which any party shall be required or shall desire to make or give under this License Agreement shall be in writing and shall be sufficiently made or given by hand delivery or when mailed by certified mail, postage prepaid, return receipt requested, addressed as follows to the parties listed below or such other address as any party hereto shall designate by like notice given to the other party hereto:

DISTRICT: St. Johns River Water Management District
P. O. Box 1429
Palatka, Florida 32178-1429

CITY: City of Orlando, Florida
ATTN: City Engineer
400 S. Orange Avenue
Orlando, Florida 32801

18. Notices, consents, approvals, waivers and elections given or made aforesaid shall be deemed to have been given and received on the date of the mailing thereof.

19. This License Agreement shall not be assigned or transferred by the DISTRICT; any such attempted assignment or transfer shall be null, void, and of no legal effect.

20. This License Agreement constitutes the entire agreement of the parties, and there are no understandings dealing with the subject matter of this License Agreement other than those contained herein. This License Agreement may not be modified, changed or amended, except in writing, signed by the parties hereto, or their authorized representatives.

21. This License Agreement shall be construed and interpreted according to the laws of the State of Florida and any suit filed shall be in the courts of Orange County, Florida.

IN WITNESS WHEREOF, the parties hereto have duly executed this License Agreement on the date and year first above written.

St. Johns River Water Management District

By: ______________________

Kirby B. Green III
Executive Director

Approved by Office of General Counsel

By: ______________________

John W. Williams
Deputy General Counsel

City of Orlando, Florida

By Betty T. Wyman
Mayor Pro Tem

ATTEST:

Candice J. Crawford
Candice J. Crawford, City Clerk

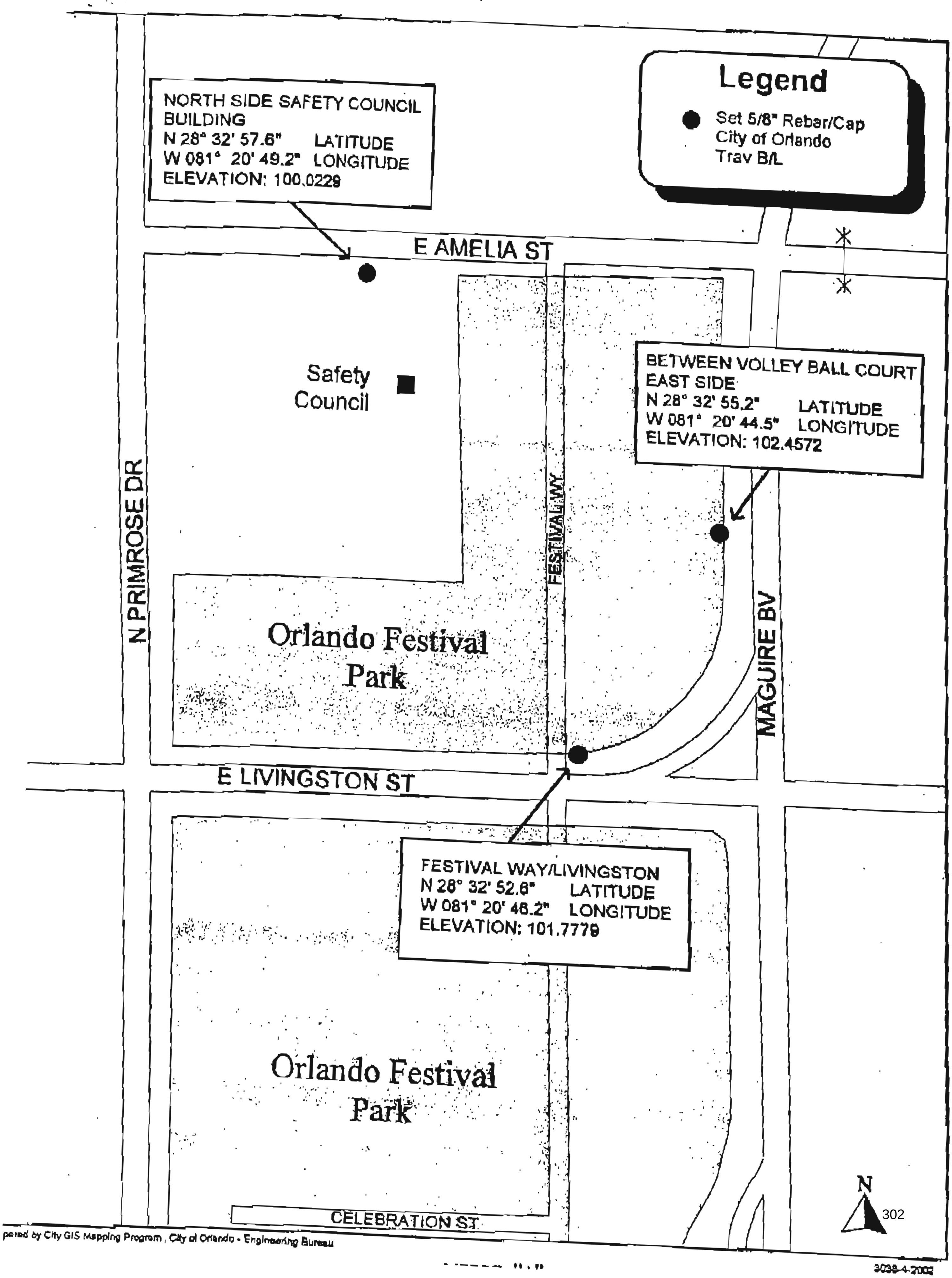
(SEAL)

APPROVED AS TO FORM AND LEGALITY
for the use and reliance of the
City of Orlando, Florida only.

August 21, 2002

Assistant City Attorney
Orlando, Florida

9931


Legend
Set 5/8" Rebar/Cap
City of Orlando
Trav B/L
NORTH SIDE SAFETY COUNCIL
BUILDING
N 28° 32' 57.6" LATITUDE
W 081° 20' 49.2" LONGITUDE
ELEVATION: 100.0229
E AMELIA ST
Safety
Council
BETWEEN VOLLEY BALL COURT
EAST SIDE
N 28° 32' 55.2" LATITUDE
W 081° 20' 44.5" LONGITUDE
ELEVATION: 102.4572
N PRIMROSE DR
FESTIVAL WY
MAGUIRE BV
Orlando Festival
Park
E LIVINGSTON ST
FESTIVAL WAY/LIVINGSTON
N 28° 32' 52.6" LATITUDE
W 081° 20' 46.2" LONGITUDE
ELEVATION: 101.7779
Orlando Festival
Park
CELEBRATION ST
N
pared by City GIS Mapping Program, City of Orlando - Engineering Bureau
3038-4-2002

Field Services
Construction
Preliminary Data

Festival Park
Orange County, Florida

Aquifer System Monitor Wells:
Floridan OR-0018
Floridan OR-0032
Floridan OR-0140
Floridan OR-0141
Floridan OR-0818
Floridan OR-0819

SJRWMD Program No. 5111-03001

May 20, 2003

Division of Ground Water Programs
Department of Resource Management
St. Johns River Water Management District
Palatka, Florida

This report was generated for the Division of Ground Water Program's use.
All data, figures, tables and information are provisional.

Table of Contents

General Information

Site: Festival Park Floridan Monitoring Wells

Service Request: Al Aikens, CH2MHill

Purpose: Install monitor wells as part of Central Florida Artificial Recharge Project. Wells will be used to help quantify the impact to groundwater quality from recharge wells.

Work:

Monitor Well/Testhole Construction:
Diversified Drilling Corporation, Inc.

Project Management:
CH2MHill

Health & Safety Monitoring:
Nodarse & Associates

Geophysical Logging:
Advanced Borehole Services

Report: Laura Nelms

Notes:
OR0-0018 03/19/03, drilled to 250 ft bls using mud rotary drilling method. Lithologic samples collected at ten foot intervals for FGS analysis. Eight inch surface casing set @ 67 ft bls in intermediate clay confining unit and four inch casing set 180 ft bls into basal hawthorne dolostone. Well Mud Rotary drilled to approximately 250 ft bls. Circulation loss @188 ft bls.and 230 ft bls. Well developed using rig pump at 150 gpm for 4 hours. Development water remained cloudy. Water quality samples collected at total depth for field analysis. Completion report reflects well construction start date of 03/13/03.

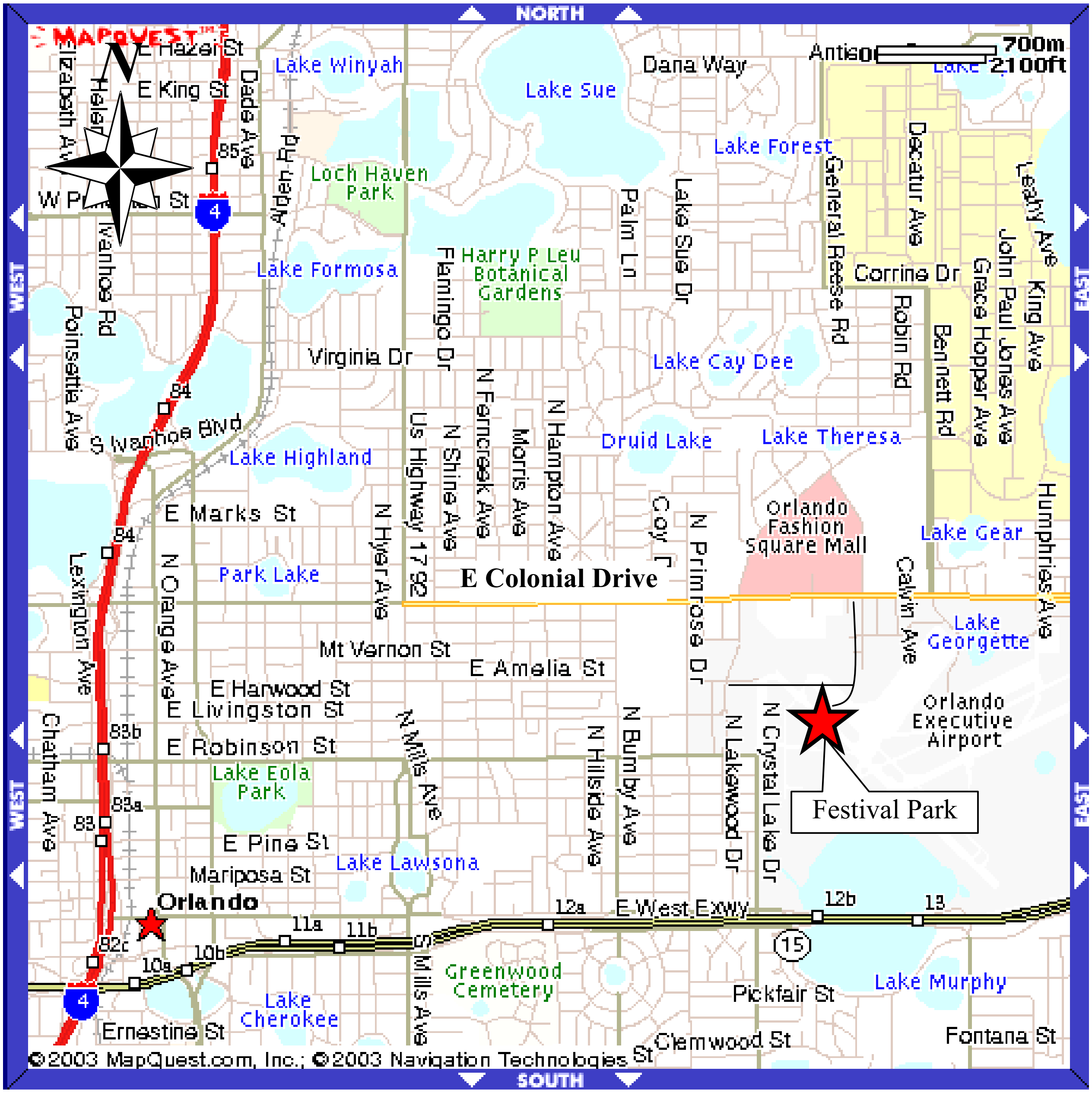
OR-0032 03/06/03, drilled to 600 ft bls using mud rotary drilling method. Lithologic samples collected at ten foot intervals for FGS analysis. Twelve inch surface casing set 65 ft bls in intermediate clay confining unit and four inch casing set 230 ft bls into top of rock. Well Mud Rotary drilled to approximately 600 ft bls. No circulation loss during drilling. Well developed using rig pump at 150 gpm for 2.2 hours. Water quality samples collected at total depth for field analysis. Development water clear. 02/28/03, Rods locked in borehole at 450 ft bls in limy/ clayey mud. Diversified used crane to free rods. Swival bent during lift but drilling resumed. Swival was replaced after well completion. Completion report reflects well construction start date of 02/24/03.

OR-0140 03/13/03, drilled to 400 ft bls using mud rotary drilling method. Eight inch surface casing set 65 ft bls in intermediate clay confining unit and four inch casing set 210 ft bls into top of rock. Well Mud Rotary drilled to approximately 400 ft bls. No circulation loss during drilling. Well developed using rig pump at 100 gpm for 2.2 hours. Development water clear. Water quality samples collected at total depth for field analysis. Skate park sewer drain installed next to well site and fill dirt piled on grass. No sod was added during final site rehabilitation due to the unfinished sewer project.

OR-0141 03/24/03, drilled to 250 ft bls using mud rotary drilling method. Lithologic samples collected at formation changes. Eight inch surface casing set 120 ft bls in intermediate clay confining unit and four inch casing set 190 ft bls into basal hawthorne dolostone. Well Mud Rotary drilled to approximately 250 ft bls. No circulation loss observed during drilling. Well developed using rig pump at 100 gpm for 2.8 hours. Development water clear. Water quality samples collected at total depth for field analysis.

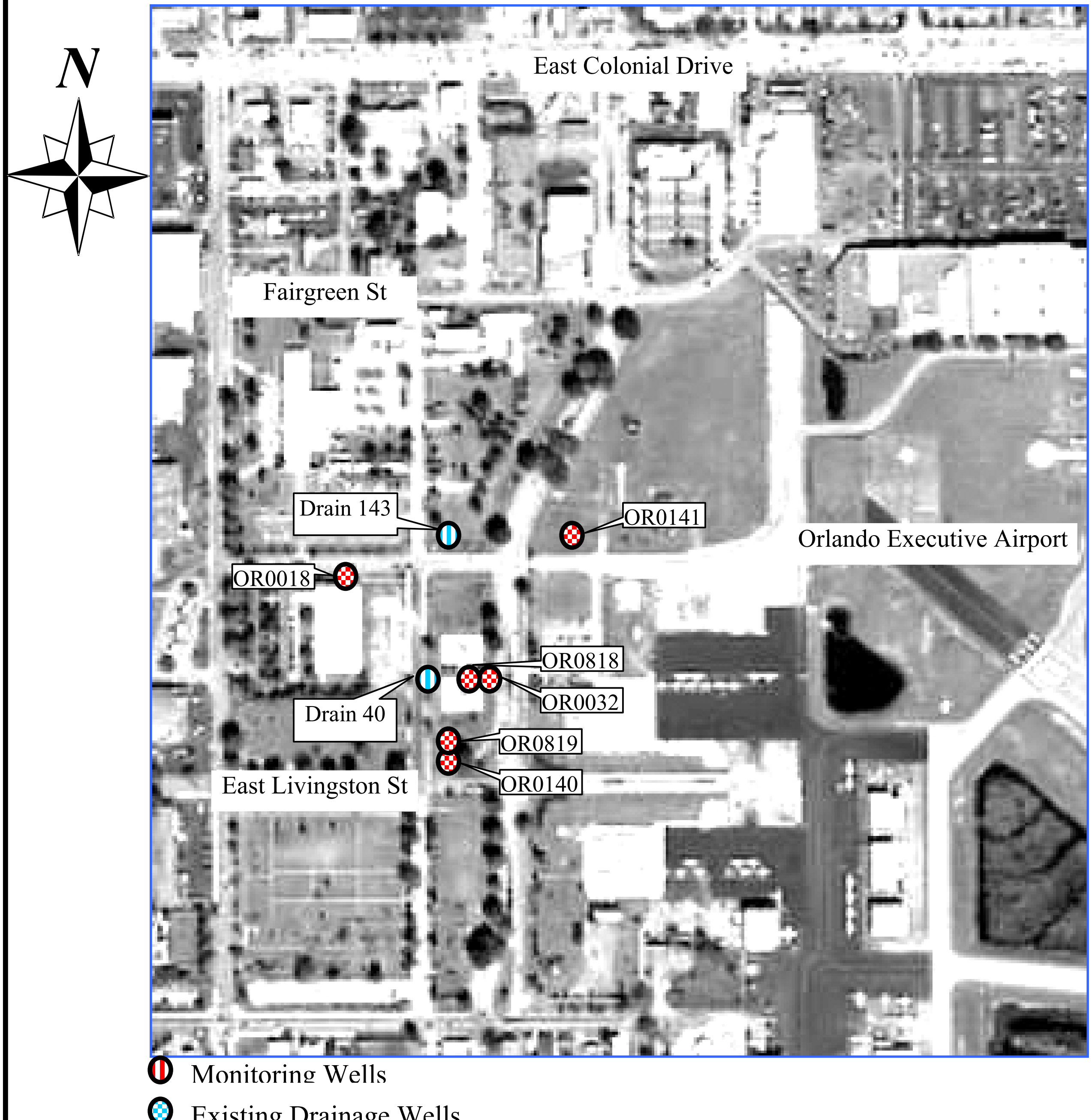
OR-0818 04/03/03,drilled to 250 ft bls using mud rotary drilling method. Eight inch surface casing set 65 ft bls in intermediate clay confining unit and four inch casing set 180 ft bls into basal hawthorne dolostone. Well Mud Rotary drilled to approximately 250 ft bls. No circulation loss observed during drilling. Well developed using rig pump at >100 gpm for 2 hours. Development water clear. Water quality samples collected at total depth for field analysis.

OR-0819 03/28/03, drilled to 250 ft bls using mud rotary drilling method. Eight inch surface casing set 65 ft bls in intermediate clay confining unit and four inch casing set 185 ft bls into basal hawthorne dolostone. Well Mud Rotary drilled to approximately 250 ft bls. No circulation loss observed during drilling. Well developed using rig pump at >100 gpm for 1.8 hours. Development water clear. Water quality samples collected at total depth for field analysis. 03/31/03, Below grade vault vandalized after pad was set and compression cap removed. 04/01/03, Well checked to TD with tremie for debris and redeveloped. Pad and below grade vault reset.

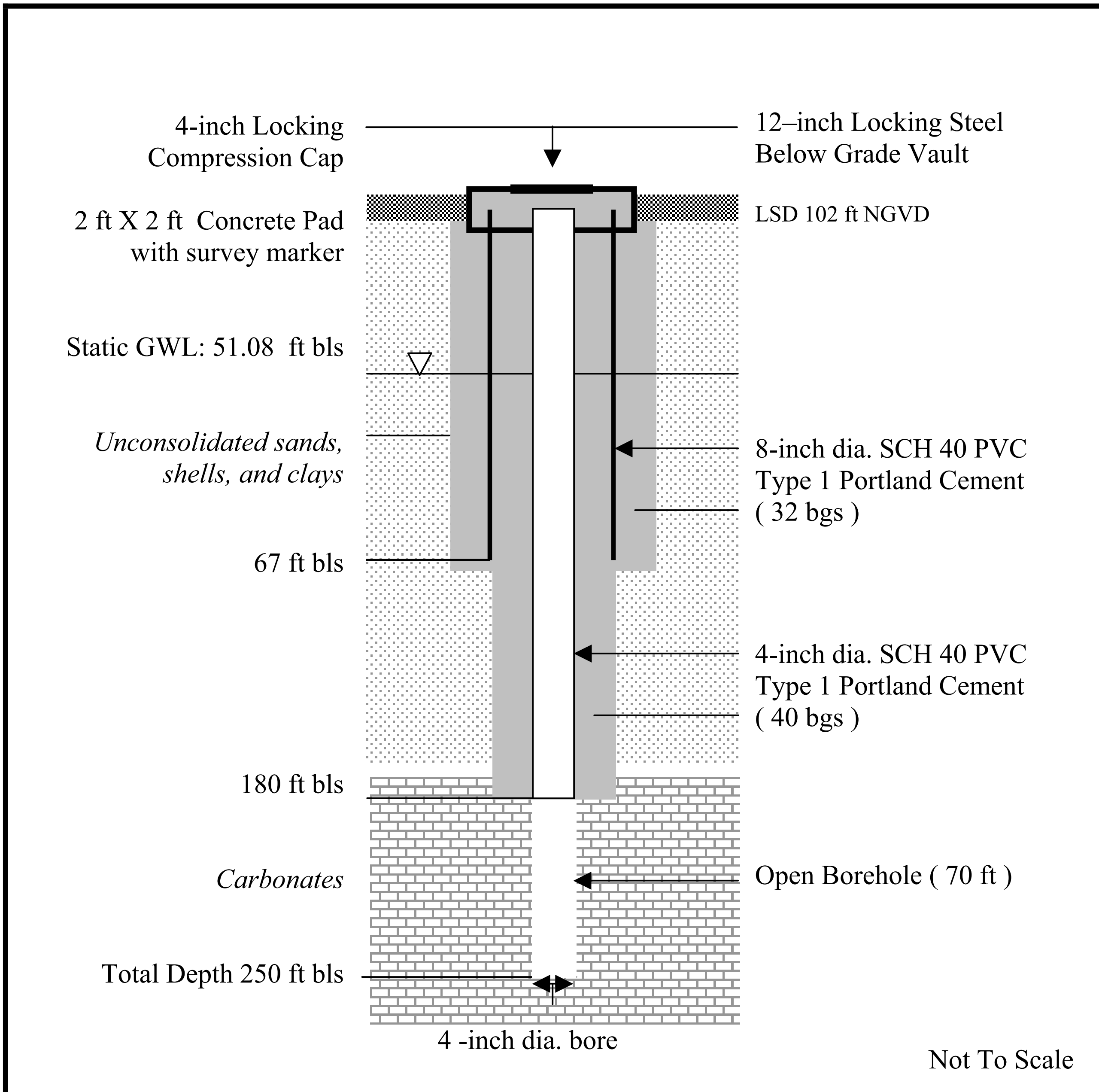


Not To Scale

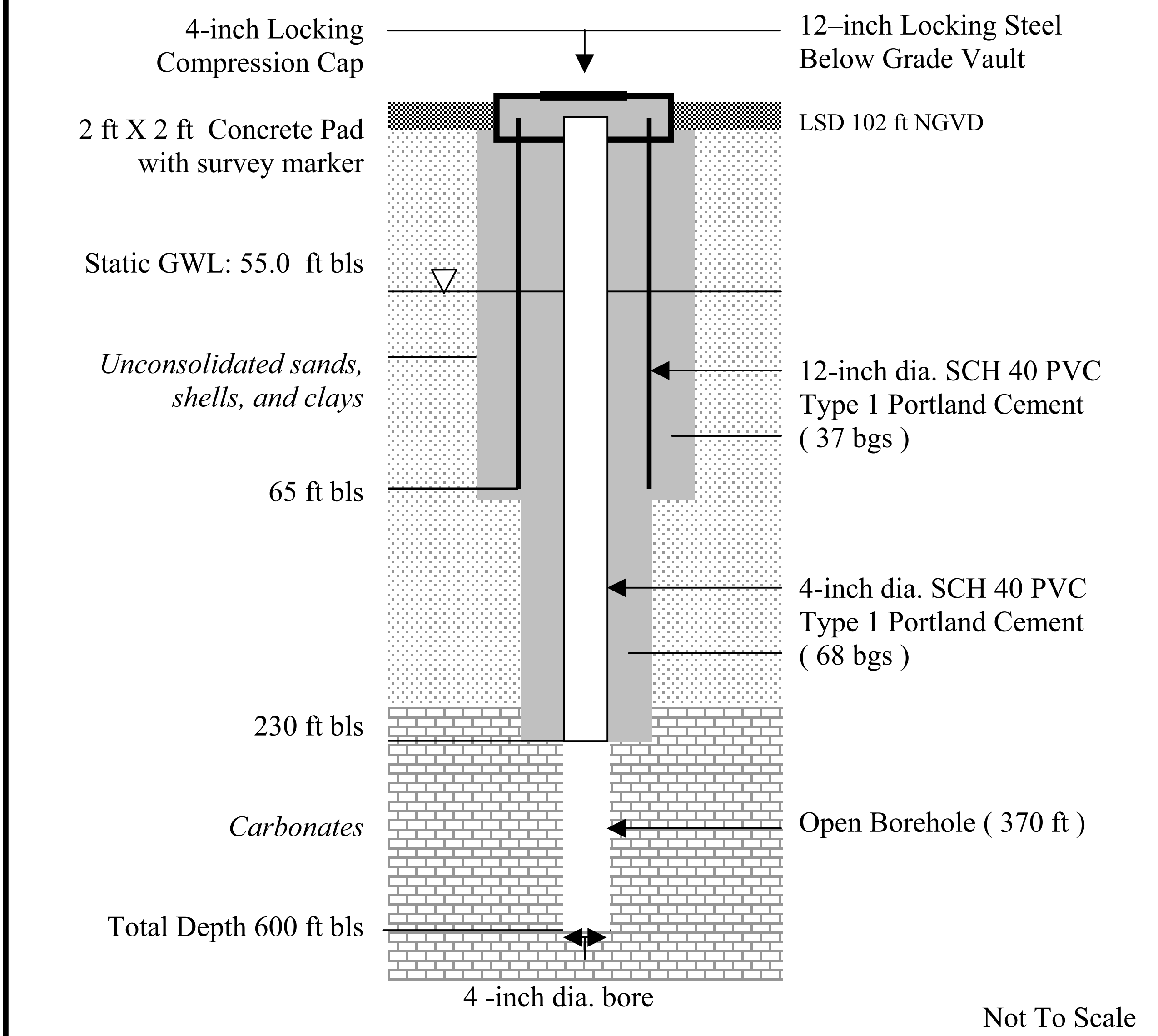
Site:	Festival Park	**SJRWMD**
GPS Lat/Long:	283252/812046	
TRS:	T22sR30eSec30	
Topo:	Orlando East	**Figure 1. Map of Festival Park**
Site Elevation	102 ft NGVD	



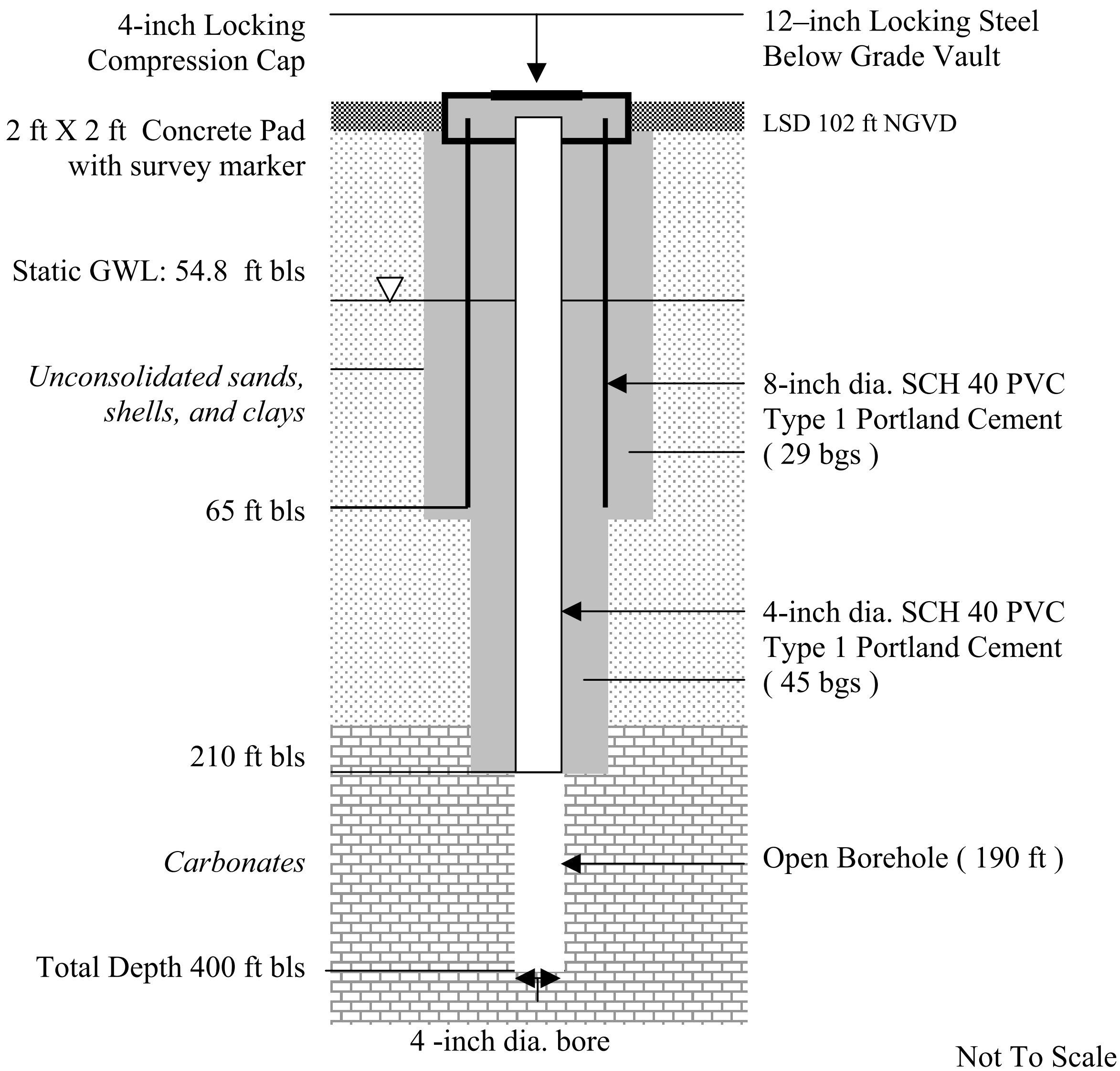
Site:	**Festival Park**	**SJRWMD**
GPS Lat/Long:	283252/812046	
TRS:	T22sR30eSec30	
Topo:	Orlando East	
Site Elevation	102 ft NGVD	**Figure 2. Map of Festival Park Wells**



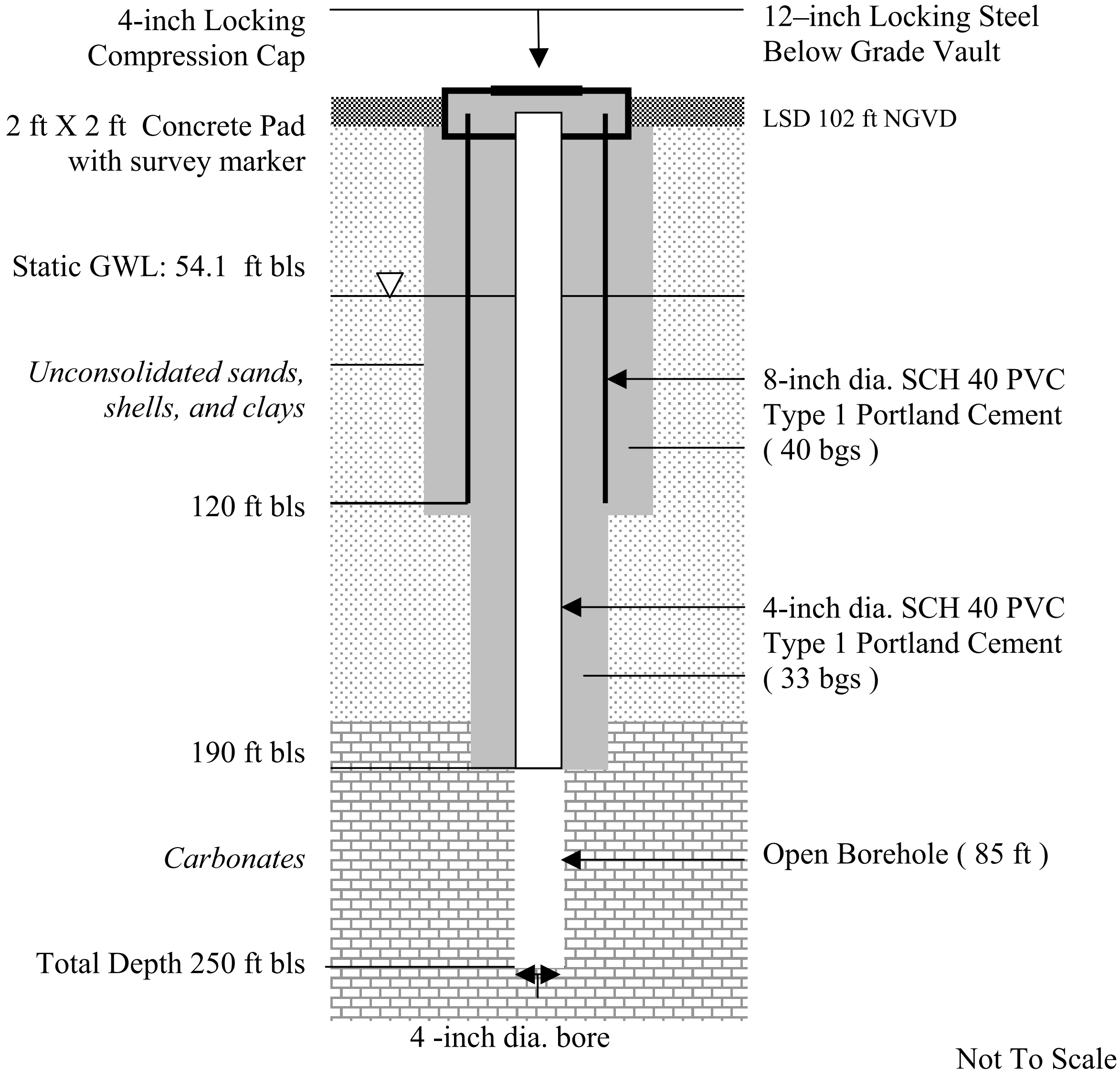
Site:	Safety Council	**SJRWMD**
GPS Lat/Long:	283257/812049	
Driller:	Diversified Drilling Corp.	**Figure 3. Floridan Monitor Well OR-0018**
Well Completed:	03/19/03	



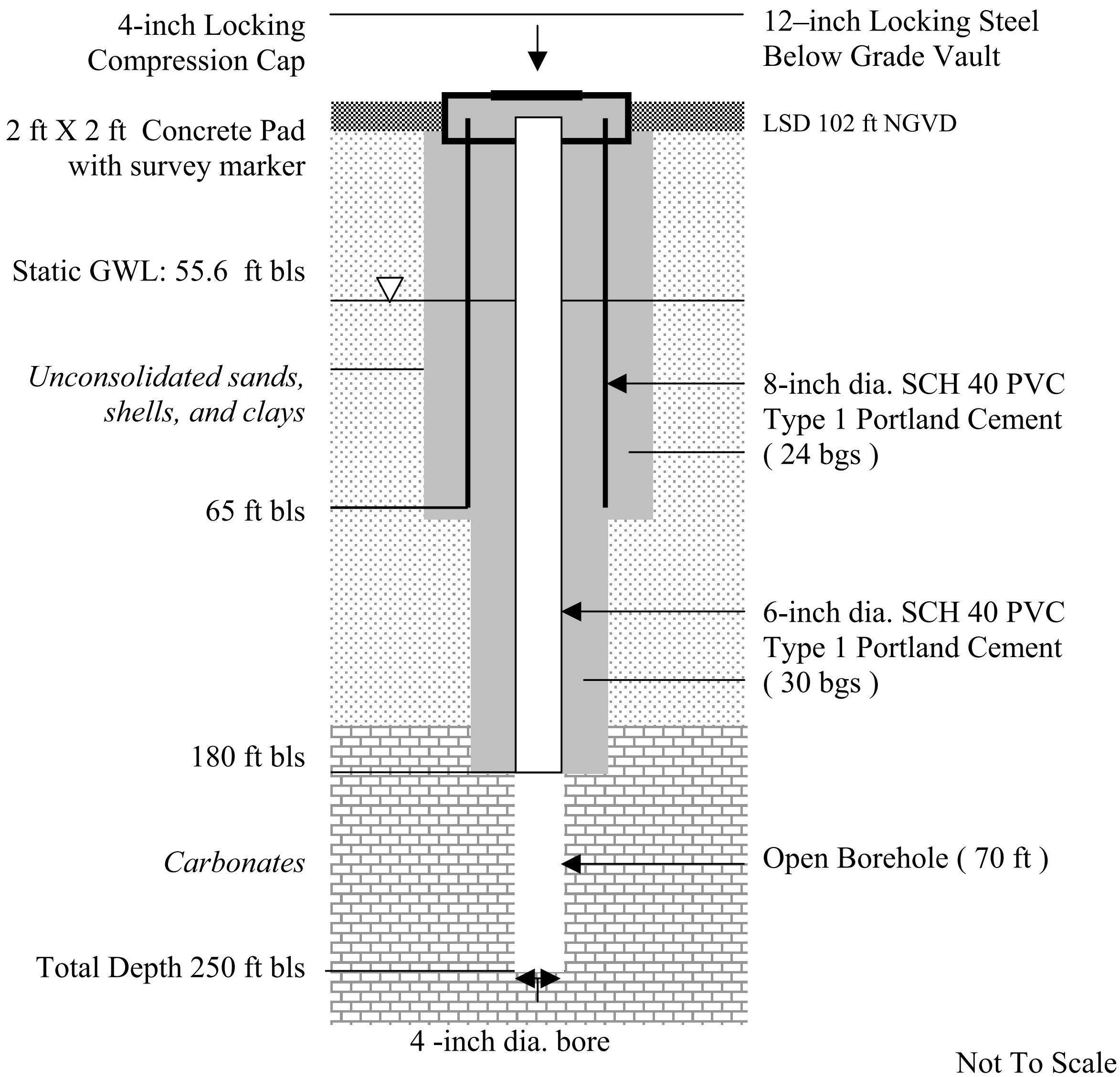
Site:	Volley Ball Court	**SJRWMD**
GPS Lat/Long:	283255/812044	
Driller:	Diversified Drilling Corp.	**Figure 4. Floridan Monitor Well OR-0032**
Well Completed:	03/06/03	



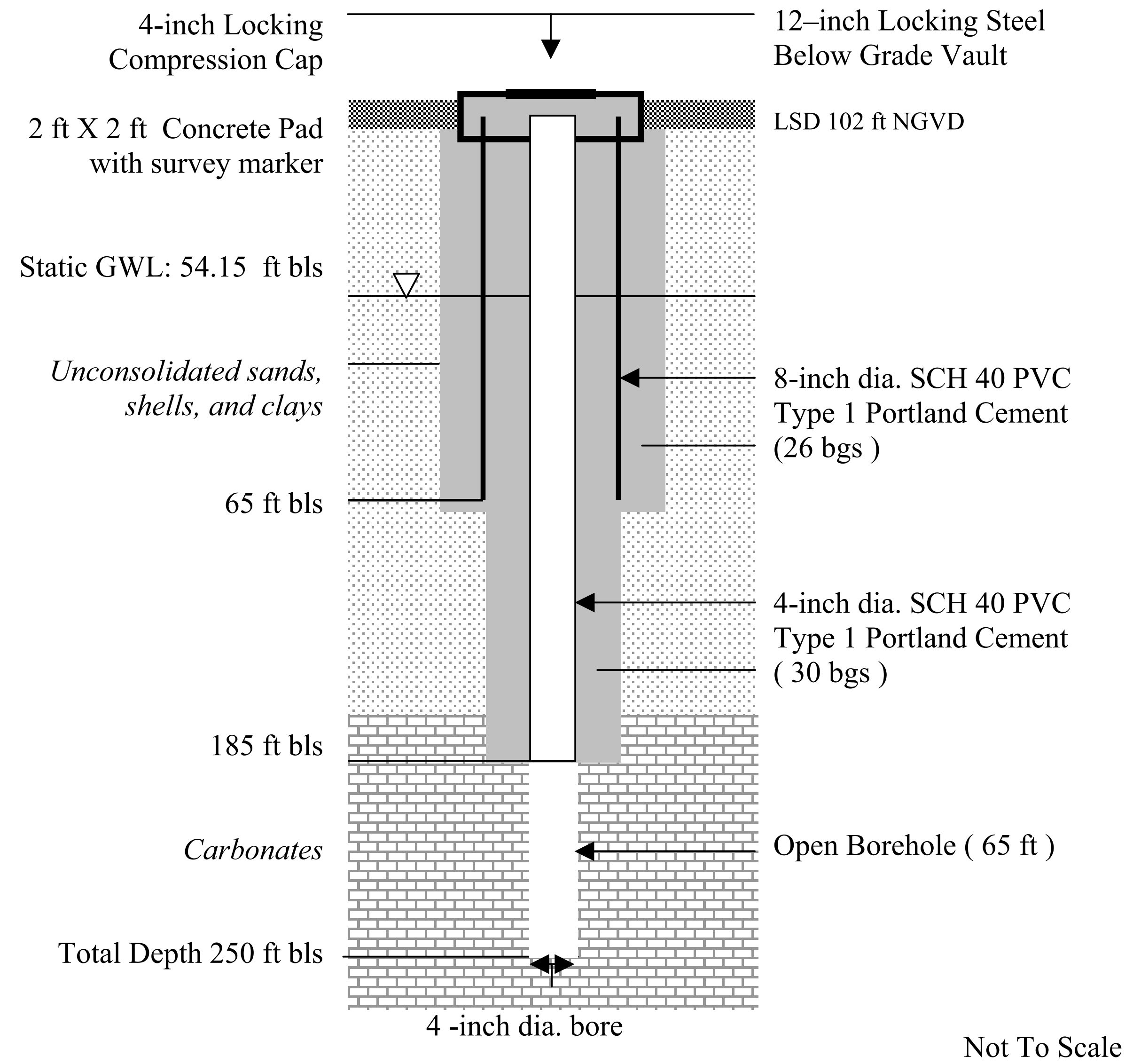
Site:	Festival Way	**SJRWMD**
GPS Lat/Long:	283252/812046	
Driller:	Diversified Drilling Corp.	**Figure 5. Floridan Monitor Well OR-0140**
Well Completed:	03/13/03	



Site:	Airport	**SJRWMD**
GPS Lat/Long:	283259/812045	
Driller:	Diversified Drilling Corp.	**Figure 6. Floridan Monitor Well OR-0141**
Well Completed:	03/24/03	



Site:	Volley Ball Court	**SJRWMD**
GPS Lat/Long:	283255/812045	
Driller:	Diversified Drilling Corp.	**Figure 7. Floridan Monitor Well OR-0818**
Well Completed:	04/03/03	



Site:	Festival Way	**SJRWMD**
GPS Lat/Long:	283253/812046	
Driller:	Diversified Drilling Corp.	**Figure 8. Floridan Monitor Well OR-0819**
Well Completed:	03/28/03	

Table 1. **Grout Data**

Site: Safety Council **Well ID:** OR-0018
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
03/13/03	70	A-6	-	-	Pilothole
03/13/03	67	A-12	32 bgs	P-94	Set 67 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/17/03	180	A-8	40 bgs	P-94	Set 180 ft of 4-inch SCH-40 PVC casing and pumped grout through 1-inch steel tremie..
03/19/03	250	B-4	2 bgs	Q-40	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 2. **Grout Data**

Site: Volley Ball Court **Well ID:** OR-0032
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
02/24/03	65	6	-	-	Pilothole
02/24/03	65	A-15	37 bgs	P-94	Set 65 ft of 12-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
02/26/03	230	A-8	68 bgs	P-94	Set 230 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/04/03	600	B-4	2 bgs	Q-40	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 3. **Grout Data**

Site: Festival Way **Well ID:** OR-0140
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
03/05/03	65	6	-	-	Pilothole
03/06/03	65	A-12	29 bgs	P-94	Set 65 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/10/03	210	A-8	45 bgs	P-94	Set 210 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/13/03	400	B-4	2 bgs	Q-40	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 4. **Grout Data**

Site: Airport **Well ID:** OR-0141
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
03/19/03	120	B-12	40 bgs	P-94	Set 120 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/20/03	190	A-8	33 bgs	P-94	Set 190 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/24/03	250	B-4	2 bgs	Q-40	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 5. **Grout Data**

Site: Volley Ball Court **Well ID:** OR-0818
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
03/31/03	65	B-12	24 bgs	P-94	Set 65 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
04/01/03	180	A-8	30 bgs	P-94	Set 180 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
04/03/03	250	B-4	-	-	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 6. **Grout Data**

Site: Festival Way **Well ID:** OR-0819
Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
03/25/03	65	B-12	26 bgs	P-94	Set 65 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/27/03	185	A-8	30 bgs	P-94	Set 185 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch steel tremie
03/28/03	250	B-4	-	-	Hand mix grout for 2 x 2 concrete pad and complete grout around 4-inch casing, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 7. **Drilling Data**

Site: Volley Ball Court **Well ID:** OR-0032
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
02/24/03	0	65	Mud	6	36	108	
02/24/03	0	65	Mud	15	100	39	
02/25/03	65	120	Mud	8	136	24.3	
02/25/03	120	140	Mud	8	10	120	
02/25/03	140	150	Mud	8	55	10.9	
02/25/03	150	170	Mud	8	115	10.4	
02/25/03	170	180	Mud	8	35	17.1	
02/26/03	180	190	Mud	8	30	20	
02/26/03	190	195	Mud	8	50	6	
02/26/03	195	200	Mud	8	25	12	
02/26/03	200	210	Mud	8	55	10.9	
02/26/03	210	220	Mud	8	35	17.1	
02/26/03	220	230	Mud	8	10	60	
02/27/03	230	240	Mud	4	50	12	
02/27/03	240	250	Mud	4	40	15	
02/27/03	250	260	Mud	4	15	40	
02/27/03	260	270	Mud	4	19	31.5	
02/27/03	270	280	Mud	4	11	54.5	
02/27/03	280	290	Mud	4	10	60	
02/27/03	290	300	Mud	4	12	50	
02/27/03	300	310	Mud	4	38	15.8	
02/27/03	310	320	Mud	4	14	43	
02/27/03	320	330	Mud	4	24	25	
02/27/03	330	340	Mud	4	20	30	
02/27/03	340	350	Mud	4	10	60	
02/27/03	350	360	Mud	4	12	50	
02/27/03	360	370	Mud	4	12	50	
02/27/03	370	380	Mud	4	6	100	
02/27/03	380	390	Mud	4	20	30	
02/27/03	390	400	Mud	4	15	40	
02/28/03	400	410	Mud	4	80	7.5	
02/28/03	410	420	Mud	4	33	18.8	
02/28/03	420	430	Mud	4	37	16.2	
02/28/03	430	440	Mud	4	25	24	
02/28/03	440	450	Mud	4	54	11.1	
03/03/03	450	460	Mud	4	55	10.9	
03/03/03	460	470	Mud	4	28	21.4	
03/03/03	470	472	Mud	4	22	27.2	

Table 7. **Drilling Data**

Site: Volley Ball Court **Well ID:** OR-0032
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/04/03	472	480	Mud	4	-	-	
03/04/03	480	490	Mud	4	21	28.6	
03/04/03	490	500	Mud	4	60	10	
03/04/03	500	510	Mud	4	44	13.6	
03/04/03	510	520	Mud	4	88	6.8	
03/04/03	520	530	Mud	4	69	8.7	
03/04/03	530	540	Mud	4	31	19.4	
03/04/03	540	550	Mud	4	12	50	
03/04/03	550	560	Mud	4	19	31.6	
03/04/03	560	570	Mud	4	16	37.5	
03/04/03	570	580	Mud	4	9	66.6	
03/04/03	580	590	Mud	4	15	40	
03/04/03	590	600	Mud	4	16	37.5	TD

Table 8. **Drilling Data**

Site: Festival Way **Well ID:** OR-0140
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/06/03	0	20	Mud	6	15	80	
03/06/03	20	60	Mud	6	60	60	
03/06/03	0	15	Mud	15	-	-	
03/06/03	15	20	Mud	12	-	-	
03/06/03	20	50	Mud	12	60	30	
03/06/03	50	65	Mud	12	40	22.5	
03/06/03	65	90	Mud	8	45	33.3	
03/06/03	90	105	Mud	8	50	18	
03/07/03	105	120	Mud	8	58	16	
03/07/03	120	145	Mud	8	32	46.8	
03/10/03	145	150	Mud	8	20	15	
03/10/03	150	160	Mud	8	50	12	
03/10/03	160	170	Mud	8	25	24	
03/10/03	170	180	Mud	8	36	16.6	
03/10/03	180	190	Mud	8	36	16.6	
03/10/03	190	200	Mud	8	59	10.2	
03/10/03	200	210	Mud	8	25	24	

Table 8. **Drilling Data**

Site: Festival Way **Well ID:** OR-0140
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/11/03	210	215	Mud	4	-	-	
03/11/03	215	220	Mud	4	13	23	
03/11/03	220	230	Mud	4	30	20	
03/11/03	230	240	Mud	4	11	54.5	
03/11/03	240	250	Mud	4	11	54.5	
03/11/03	250	260	Mud	4	20	30	
03/11/03	260	270	Mud	4	13	46.1	
03/11/03	270	280	Mud	4	7	85.7	
03/11/03	280	290	Mud	4	16	37.5	
03/11/03	290	300	Mud	4	11	54.5	
03/11/03	300	310	Mud	4	6	100	
03/11/03	310	320	Mud	4	15	40	
03/11/03	320	330	Mud	4	32	18.7	
03/11/03	330	340	Mud	4	6	100	
03/11/03	340	350	Mud	4	15	40	
03/11/03	350	360	Mud	4	7	85.7	
03/11/03	360	370	Mud	4	10	60	
03/11/03	370	380	Mud	4	15	40	
03/11/03	380	390	Mud	4	9	66.6	
03/11/03	390	400	Mud	4	-		TD

Table 9. **Drilling Data**

Site: Safety Council **Well ID:** OR-0018
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/13/03	0	10	Mud	6	9	66.6	
03/13/03	10	20	Mud	6	6	100	
03/13/03	20	30	Mud	6	7	85.7	
03/13/03	30	40	Mud	6	4	150	
03/13/03	40	50	Mud	6	4	150	
03/13/03	50	60	Mud	6	10	60	
03/13/03	60	70	Mud	6	7	85.7	
03/13/03	0	67	Mud	12	87	46.2	
03/14/03	67	155	Mud	8	-	-	offsite
03/17/03	155	160	Mud	8	55	5.45	

Table 9. **Drilling Data**

Site: Safety Council **Well ID:** OR-0018
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/17/03	160	170	Mud	8	20	30	
03/17/03	170	180	Mud	8	55	10.9	
03/17/03	180	190	Mud	8	14	42.8	Circulation loss
03/18/03	190	200	Mud	4	18	33.3	
03/18/03	200	210	Mud	4	18	33.3	
03/18/03	210	220	Mud	4	13	46.2	
03/18/03	220	230	Mud	4	27	22.2	
03/18/03	230	240	Mud	4	28	21.4	
03/18/03	240	250	Mud	4	-	-	TD

Table 10. **Drilling Data**

Site: Airport **Well ID:** OR-0141
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/19/03	0	20	Mud	12	25	48	
03/19/03	20	50	Mud	12	40	45	
03/19/03	50	70	Mud	12	15	80	
03/19/03	70	80	Mud	12	13	46.1	
03/19/03	80	100	Mud	12	57	21.1	
03/19/03	100	120	Mud	12	65	18.5	
03/20/03	120	130	Mud	8	35	17.1	
03/20/03	130	140	Mud	8	12	50	
03/20/03	140	150	Mud	8	14	42.8	
03/20/03	150	160	Mud	8	23	26.1	
03/20/03	160	170	Mud	8	35	17.1	
03/20/03	170	180	Mud	8	18	33.3	
03/20/03	180	190	Mud	8	15	40	
03/21/03	190	200	Mud	4	35	17.1	
03/21/03	200	210	Mud	4	9	66.6	
03/21/03	210	220	Mud	4	40	15	
03/21/03	220	230	Mud	4	19	31.6	
03/21/03	230	240	Mud	4	12	50	
03/21/03	240	250	Mud	4	15	40	TD

Table 11. **Drilling Data**

Site: Festival Way **Well ID:** OR-0819
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/25/03	0	30	Mud	12	79	25.7	
03/25/03	30	40	Mud	12	30	20	
03/25/03	40	50	Mud	12	20	30	
03/25/03	50	60	Mud	12	15	40	
03/25/03	60	65	Mud	12	25	12	
03/26/03	65	70	Mud	8	-	-	
03/26/03	70	80	Mud	8	13	46.1	
03/26/03	80	90	Mud	8	12	50	
03/26/03	90	100	Mud	8	13	46.1	
03/26/03	100	110	Mud	8	22	27.3	
03/26/03	110	120	Mud	8	28	21.4	
03/26/03	120	130	Mud	8	40	15	
03/26/03	130	140	Mud	8	25	24	
03/26/03	140	150	Mud	8	40	15	
03/26/03	150	160	Mud	8	16	37.5	
03/26/03	160	165	Mud	8	-	-	
03/27/03	165	170	Mud	8	35	8.57	
03/27/03	170	180	Mud	8	40	15	
03/27/03	180	185	Mud	8	5	60	
03/28/03	185	190	Mud	4	20	15	
03/28/03	190	200	Mud	4	14	42.8	
03/28/03	200	210	Mud	4	28	21.4	
03/28/03	210	220	Mud	4	24	25	
03/28/03	220	230	Mud	4	14	42.8	
03/28/03	230	240	Mud	4	9	66.6	
03/28/03	240	250	Mud	4	20	30	TD

Table 12. **Drilling Data**

Site: Volley Ball Court **Well ID:** OR-0818
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
03/31/03	0	20	Mud	12	40	30	
03/31/03	20	40	Mud	12	50	24	
03/31/03	40	60	Mud	12	20	60	
03/31/03	60	65	Mud	12	10	30	
04/01/03	65	70	Mud	8	15	20	
04/01/03	70	80	Mud	8	10	60	
04/01/03	80	90	Mud	8	15	40	
04/01/03	90	100	Mud	8	15	40	
04/01/03	100	110	Mud	8	13	46.2	
04/01/03	110	120	Mud	8	15	40	
04/01/03	120	130	Mud	8	43	13.9	
04/01/03	130	140	Mud	8	-	-	Change bit
04/01/03	140	150	Mud	8	25	24	
04/01/03	150	160	Mud	8	60	10	
04/01/03	160	170	Mud	8	50	12	
04/01/03	170	180	Mud	8	20	30	
04/02/03	180	190	Mud	4	80	7.5	
04/02/03	190	200	Mud	4	34	17.6	
04/02/03	200	210	Mud	4	12	50	
04/02/03	210	220	Mud	4	6	100	
04/02/03	220	230	Mud	4	23	26.1	
04/02/03	230	240	Mud	4	15	40	
04/02/03	240	250	Mud	4	45	13.3	TD

Table 13. **Groundwater Levels**

Site: Festival Park
Data Collection: L Nelms

Static Water Levels					Borehole	
Well ID:	**Date/Time (yymmdd/hhmm)**	**Water Level (ft, bls)**	**Casing (ft, bls)**	**Diameter (inches)**	**Total Depth (ft, bls)**	**Open Hole (ft)**
OR-0018	032403/1500	51.08	190	4	250	60
OR-0032	031203/0710	54.87	230	4	600	370
OR-0140	031803/0750	52.86	210	4	400	190
OR-0141	032503/0945	54.11	190	4	250	60
OR-0818	040303/1215	55.6	180	4	250	70
OR-0819	040203/0945	54.15	185	4	250	65

Table 14. **Groundwater Quality / Development**

Site: Festival Park
Data Collection: L Nelms **Development Method:** Air

Well ID:	**Date (yymmdd/hhmm)**	**Rate (gpm)**	**∑Vol (gal)**	**Temp (Deg C)**	**PH**	**Cl (mg/l)**	**Specific Conductivity (us/cm)**
OR-0018	030319/1305	150	36,000	25.1	7	8	460
OR-0032	030306/0825	150	20,000	23.4	7	6	325
OR-0140	030312/1218	100	13,400	24.5	7	4	265
OR-0141	030324/1430	100	17,000	23.5	7	6	294
OR-0818	030403/0945	100	12,000	23.4	7	6	337
OR-0819	030331/0958	100	11,000	23.1	7	6	354

Lithologic Description

Site: Safety Council **Well/Testhole:** OR-0018
Samples Described By: L. Nelms

From	To	Lithology
0	5	**Sand**, tan fine - medium
5	10	**Clay**, pale gray, soft
10	40	**Sand**, pale yellowish brown, fine - medium
40	60	**Sand**, light brownish gray/ pale yellowish brown, fine – medium, heavy minerals
60	70	**Clay**, light olive gray, soft, sandy, heavy minerals, dolomitic sand
70	80	**Clay**, olive gray, soft, phosphatic
80	100	**Clay**, light olive gray, soft, heavy minerals, phosphate, sand, mica
100	120	**Clay**, light olive gray, soft, heavy minerals, phosphate, sand
120	170	**Clay**, light olive gray, sandy, phosphatic, dolomitic sand, HCL reaction – none
170	180	**Dolomitic sand**, clayey, mottled dark/pale yellowish brown, phosphate, heavy minerals
180	200	**Dolomitic sand**, gray/ yellowish brown, peloidal phosphate
190	200	**Limestone**, very pale orange, fossiliferous, HCL reaction – vigorous
200	230	**Limestone**, very pale orange, HCL reaction - moderate
230	240	**Limestone**, very pale/yellowish orange, fossils and fossil molds, dictyconus
240	250	**Limestone**, light gray/ brown, HCL reaction - vigorous

*Lithologic samples will be sent to Florida Geological Survey for detailed description.

Lithologic Description

Site: Airport **Well/Testhole:** OR-0141
Samples Described By: L. Nelms

From	To	Lithology
0	15	**Clay**, pale gray, soft
15	50	**Sand**, pale yellowish brown
50	65	**Sand**, clayey, olive gray, phosphatic
65	80	**Shell bed**, clayey, olive gray, decreasing shell by 80 ft
80	120	**Clay**, light olive gray, soft, shell fragments, heavy minerals, phosphate
120	172	**Clay**, olive gray/ pale olive gray, phosphatic, shell fragments
172	183	**Clay**, olive gray/ pale olive gray, sandy, dolomitic sand stringers, phosphate, heavy minerals
183	210	**Dolomitic sand**, clayey, mottled dark/pale yellowish brown/ gray, phosphate, heavy minerals
210	250	**Limestone**, very pale orange, fossiliferous, lepidocyclina

Lithologic Description

Site: Volley Ball Court **Well/Testhole:** OR-0032
Samples Described By: L. Nelms

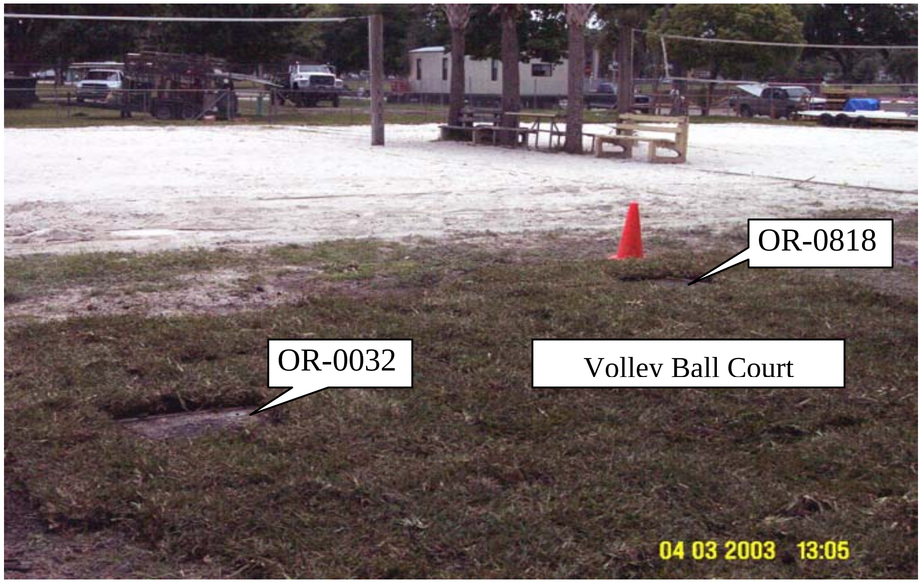
From	To	Lithology
0	60	**Sand**, pale yellowish brown, heavy minerals, black, fine - medium
60	80	**Clay**, olive green/ gray, moderately stiff, shell fragments
80	100	**Clay**, olive green/ gray, soft, sandy, phosphatic, some shell fragments
100	140	**Clay**, sandy, dolomitic sand, pale olive green/ gray, shell fragments, fossil teeth, phosphate, heavy minerals
140	160	**Clay**, olive gray/ pale olive gray, sandy, dolomitic sand, phosphate, heavy minerals
160	180	**Clay**, pale olive gray, some cherty dolostone, phosphate, heavy minerals
180	210	**Dolomitic sand**, clayey, mottled dark/pale yellowish brown, phosphate, heavy minerals
210	220	**Limestone**, very pale orange, dolomitic sand, pale yellowish brown, phosphatic
220	250	**Limestone**, very pale orange, fossiliferous, lepidocyclina, portions chalky, some remnant dolomitic sand
250	280	**Limestone**, light gray/ very pale orange, fossiliferous, mildly indurated
280	320	**Limestone**, very pale orange, indurated, some limy mud
320	360	**Limestone**, dolomitic, pale yellowish brown, sucrosic, soft, HCL reaction - moderate
360	400	**Limestone**, very pale orange/ pale yellowish brown, fossiliferous, dictyconus
400	410	**Limestone**, very pale orange, fossiliferous
410	430	**Dolostone**, grayish orange, sucrosic, HCL reaction - mild
430	450	**Limestone**, grayish orange, limy mud
450	490	**Dolostone**, moderate yellowish brown, indurated
490	520	**Dolostone**, dark yellowish brown, indurated, mild reaction to 10%HCL
520	600	**Dolostone**, moderate yellowish brown, indurated

*Lithologic samples will be sent to Florida Geological Survey for detailed description.

Lithologic Description

Site: Festival Way **Well/Testhole:** OR-0140
Samples Described By: L. Nelms

From	To	Lithology
0	60	**Sand**, tan fine - medium
60	80	**Clay**, light olive gray, moderately stiff
80	145	**Clay**, light olive gray, soft, shell fragments, heavy minerals, phosphate, sand
145	170	**Clay**, olive gray/ pale olive gray, sandy, dolomitic sand stringers, phosphate, heavy minerals
170	200	**Dolomitic sand**, clayey, mottled dark/pale yellowish brown/ gray, phosphate, heavy minerals
200	250	**Limestone**, very pale orange, fossiliferous, lepidocyclina, portions chalky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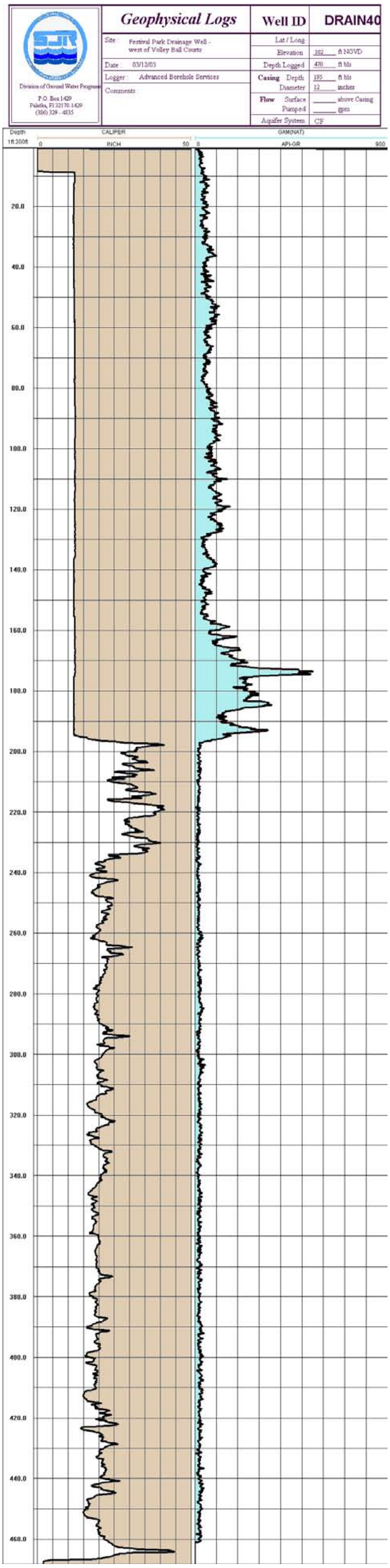
OR-0032
Vollev Ball Court
04 03 2003 13:05


OR-0141 Airport
04 03 2003 12:48


OR-0140
Festival Way
OR-0819
04 03 2003 13:08


OR-0018 Safety Council
04 03 2003 12:46


Geophysical Logs
Well ID
DRAIN40
Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835
Site : Festival Park Drainage Well - west of Volley Ball Courts
Date : 03/12/03
Logger : Advanced Borehole Services
Comments :
Lat / Long
Elevation 102 ft NGVD
Depth Logged 470 ft bls
Casing Depth 195 ft bls
Diameter 12 inches
Flow Surface above Casing
Pumped gpm
Aquifer System CF
Depth
1ft:200ft
CALIPER
0
INCH
50
GAM(NAT)
0
API-GR
900
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
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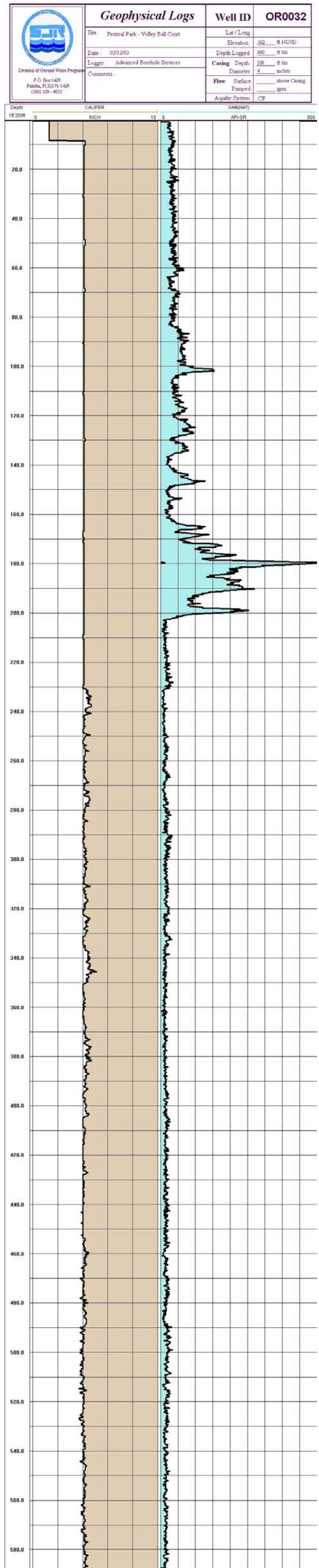
Geophysical Logs
Well ID
OR0032
Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835
Site : Festival Park - Volley Ball Court
Date : 03/12/03
Logger : Advanced Borehole Services
Comments :
Lat / Long
Elevation 102 ft NGVD
Depth Logged 600 ft bls
Casing Depth 230 ft bls
Diameter 4 inches
Flow Surface above Casing
Pumped gpm
Aquifer System CF
Depth
1ft:200ft
CALIPER
0
INCH
10
GAM(NAT)
0
API-GR
900
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
360.0
380.0
400.0
420.0
440.0
460.0
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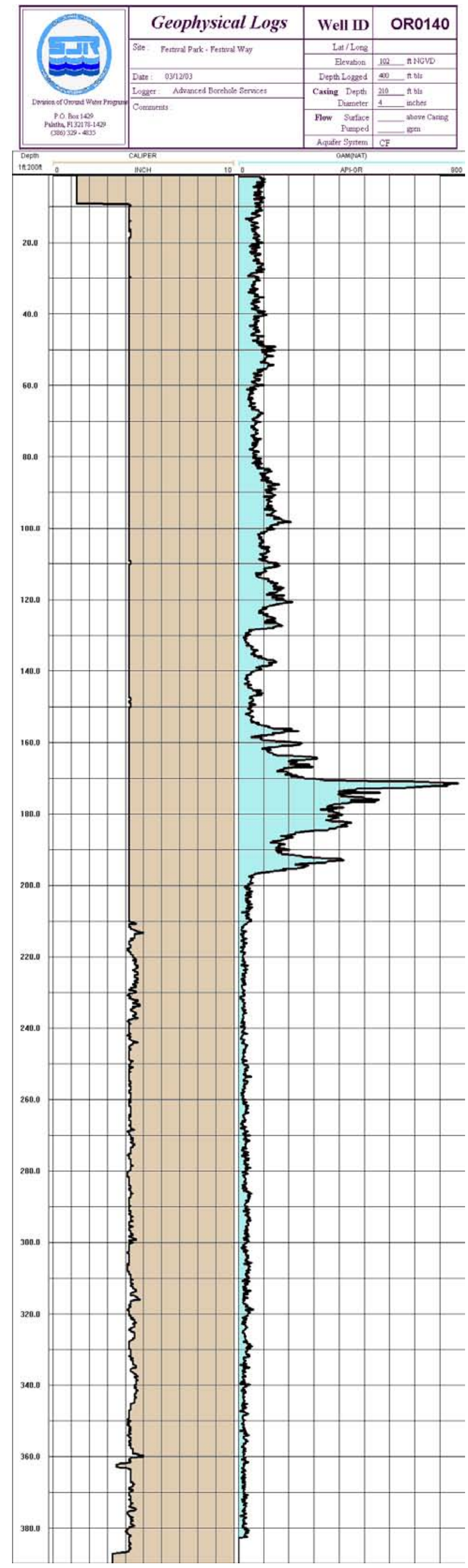
560.0
580.0


Geophysical Logs
Well ID
OR0140
Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835
Site : Festival Park - Festival Way
Date : 03/12/03
Logger : Advanced Borehole Services
Comments :
Lat / Long
Elevation 102 ft NGVD
Depth Logged 400 ft bls
Casing Depth 210 ft bls
Diameter 4 inches
Flow Surface above Casing
Pumped gpm
Aquifer System CF
Depth
1ft:200ft
CALIPER
0
INCH
10
GAM(NAT)
0
API-GR
900
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
360.0
380.0

CITY OF ALTAMONTE SPRINGS

Building/Life Safety Services

225 Newburyport Avenue, Altamonte Springs, FL 32701

Phone: 407-571-8433 Fax: 407-571-8445

RIGHT-OF-WAY UTILIZATION PERMIT

PERMIT #: PW03-0080 **Issued Date:** 09/25/2003

Address:

Location: WEST OF MT VERNON PKWY., EASEMENT BETWEEN OAK HILL DR. & BROADVIEW AVE.

Parcel #: Subdivision:

Project Name:

Work Description: INSTALLATION OF MONITORING WELL MW-1 - SEE ATTACHED APPLICATION FOR COMMENTS.

OWNER INFORMATION

CONTRACTOR INFORMATION
CH2MHILL
225 E ROBINSON ST SUITE 505
ORLANDO FL
32801-4321
407-423-0030 Cert #: CH2MHILL

CONTACT NAME: CH2MHILL 407-423-0030

PERMIT FEES

Permit................:	$0.00
Other Permit Fee......:	$0.00
Engineering Inspection:	$0.00
TOTAL FEES............:	**$0.00**

ALL FEES WAIVED - NO BALANCE DUE

I certify that all the foregoing information is accurate and that all work will be done in compliance with all applicable laws regarding construction and zoning. [ ] Owner/Agent [ ] Contractor

GARBRA J. BECKER

Please Print Name

Signature

BY NH / Tony Apfelbeck

Approved By

This Application Shall Be Subject To All City and State Regulations Now in Effect
24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION.
PLEASE CONTACT 407-571-8334 TO SCHEDULE
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

PL03-0080

SPRING LAKE ROAD

PW98-019

CITY OF ALTAMONTE SPRINGS
RIGHT OF WAY UTILIZATION PERMIT APPLICATION
PHONE: 407-571-8433 FAX: 407-571-8445

RECEIVED SEP 23 2003

JOB NAME: Lake Orienta Recharge Wells

JOB ADDRESS: West of Mt. Vernon Pkwy., Easement between Oak Hill Dr. & Broadview Ave.

APPLICANT'S FIRM NAME: CH2M HILL (on behalf of SJRWMD)

ADDRESS: 225 E. Robinson St., Suite 505, Orlando, FL 32801

RECEIVED SEP 23 2003 PUBLIC WORK ADMIN.

CONTACT NAME: Al Aikens / CH2M HILL 407-423-0030

DESCRIPTION OF WORK: Installation of Monitoring Well MW - 1 (see attached map)

SECTION: 23 TOWNSHIP: 215 RANGE: 30 E

NUMBER AND TYPE OF ROAD CROSSINGS:

✔ NONE ____ OPEN CUT (PAVED) ____ OPEN CUT (UNPAVED) ____ BORE/JACK

LETTER OF NOTIFICATION HAS BEEN SENT TO THE FOLLOWING AGENCIES ON DATE No, contractor is req'd. (INDICATE NAME OF AGENCY) to call Sunshine One Call 1-800-432-4770 prior to installation of wells

WATER ____ SEWER ____

ELECTRIC ____ GAS ____

TELEPHONE ____ OTHER ____

**24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION. PLEASE CONTACT 407-571-8834 TO SCHEDULE.
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

9/22/03
APPLICANT'S SIGNATURE - date

9/22/03
PUBLIC WORK'S SIGNATURE - date

* Fees waived 9/22/03

COMMENTS: The above is part of a joint project involving the city, SJRWMD, and to a lesser extent FDEP. Project Name: PW98-019 Lake Orienta Artificial Recharge Demonstration Project. The SJRWMD CONTRACTOR (to be named later) has been given the burden of locating utilities and has been instructed to install the monitoring wells in the R/W between sidewalk and back of curb without conflict of existing utilites.

PERMIT #___03/40_______

RIGHT-OF-WAY UTILIZATION PERMIT
CONDITIONS OF PERMIT

1.	O	Submit Maintenance of Traffic Plan (applicable if marked) for approval prior to start of construction.
2.	O	Submit construction schedule and estimated completion date.
3.	X	Restore and/or sod all disturbed areas within five (5) working days form the date of disturbance.
4.	X	No dirt, debris, or construction materials are to be piled or stored on the street side of the curb, or on the pavement if no curb exists.
5.	X	The contractor shall provide all necessary erosion control as required by the City, to prevent soil from washing into storm drains, water bodies, or swales.
6.	X	The Department of Public Works shall be notified 48 hours prior to the start of construction. The contractor shall notify the Site Inspector 48 hours prior to the start of construction. Phone (407) 571-8334.
7.	X	The permit is to remain on site during construction and restoration.
8.	X	The excavator is required to notify the pipeline or utility owner immediately if their work damages a pipeline or utility and to call 911 if the damage results in a release of natural gas or other hazardous substance or potentially endangers life, health, or property.

9/22/03
Date

Signed [signature]

48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW

CITY OF ALTAMONTE SPRINGS

Building/Life Safety Services
225 Newburyport Avenue, Altamonte Springs, FL 32701
Phone: 407-571-8433 Fax: 407-571-8445

RIGHT-OF-WAY UTILIZATION PERMIT

PERMIT #: PW03-0079 **Issued Date:** 09/25/2003
Address:
Location: BETWEEN 421 & 425 BARCLAY - LIFT STATION 8 SITE
Parcel #. Subdivision:
Project Name:
Work Description: INSTALLATION OF MONITORING WELL MW- 2 - SEE ATTACHED APPLICATION FOR COMMENTS.

OWNER INFORMATION

CONTRACTOR INFORMATION
CH2MHILL
225 E ROBINSON ST SUITE 505
ORLANDO FL
32801-4321
407-423-0030 Cert #: CH2MHILL

CONTACT NAME: CH2MHILL 407-423-0030

PERMIT FEES

```
Permit................:       $0.00
Other Permit Fee......:       $0.00

Engineering Inspection:       $0.00
TOTAL FEES............:       $0.00
ALL FEES WAIVED - NO BALANCE DUE
```

I certify that all the foregoing information is accurate and that all work will be done in compliance with all applicable laws regarding construction and zoning. [ ] Owner/Agent [ ] Contractor

GANDRA J. BECKER
Please Print Name

Signature

BJ WH | Tony Apfelbeck
Approved By

This Application Shall Be Subject To All City and State Regulations Now in Effect
24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION.
PLEASE CONTACT 407-571-8334 TO SCHEDULE
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

PL003-0079

DATE

I.D. NL

LOGGED IN

LIFT STATION 8 - BARCLAY AVE

PW98-019

CITY OF ALTAMONTE SPRINGS
RIGHT OF WAY UTILIZATION PERMIT APPLICATION

PHONE: 407-571-8433 FAX: 407-571-8435

RECEIVED SEP 23 2003

JOB NAME: Lake Orienta Recharge Wells

JOB ADDRESS: Between 421 & 425 Barclay - Lift Station 8 site

RECEIVED SEP 23 2003 PUBLIC WORK ADMIN.

APPLICANT'S FIRM NAME: CH2M HILL (on behalf of SJRWMD)

ADDRESS: 225 E. Robinson St., Suite 505, Orlando, FL 32801

CONTACT NAME: Al Aikens / CH2M HILL 407-423-0030

DESCRIPTION OF WORK: Installation of Monitoring Well MW - 2 (see attached map)

SECTION: 24 TOWNSHIP: 215 RANGE: 30 E

NUMBER AND TYPE OF ROAD CROSSINGS:

✓ NONE ____ OPEN CUT (PAVED) ____ OPEN CUT (UNPAVED) ____ BORE/JACK

LETTER OF NOTIFICATION HAS BEEN SENT TO THE FOLLOWING AGENCIES ON DATE No, contractor is req'd. (INDICATE NAME OF AGENCY) to call Sunshine One CAll 1-800-432-4770 prior to installation of wells

WATER ____ SEWER ____

ELECTRIC ____ GAS ____

TELEPHONE ____ OTHER ____

**24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION. PLEASE CONTACT 407-571-8334 TO SCHEDULE.

THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

9/22/03

APPLICANT'S SIGNATURE - date

9/22/03

PUBLIC WORK'S SIGNATURE - date

* fees waived [illegible] 9/22/03

COMMENTS: The above is part of a joint project involving the city, SJRWMD, and to a lesser extent FDEP. Project Name: PW98-019 Lake Orienta Artificial Recharge Demonstration Project. The SJRWMD contractor (to be named later) has been given the burden of locating utilities and has been instructed to install the monitoring wells in the R/W between sidewalk and back of curb without conflict of existing utilities.

PERMIT # 03/39

RIGHT-OF-WAY UTILIZATION PERMIT
CONDITIONS OF PERMIT

1. O Submit Maintenance of Traffic Plan (applicable if marked) for approval prior to start of construction.

2. O Submit construction schedule and estimated completion date.

3. X Restore and/or sod all disturbed areas within five (5) working days form the date of disturbance.

4. X No dirt, debris, or construction materials are to be piled or stored on the street side of the curb, or on the pavement if no curb exists.

5. X The contractor shall provide all necessary erosion control as required by the City, to prevent soil from washing into storm drains, water bodies, or swales.

6. X The Department of Public Works shall be notified 48 hours prior to the start of construction. The contractor shall notify the Site Inspector 48 hours prior to the start of construction. Phone (407) 571-8334.

7. X The permit is to remain on site during construction and restoration.

8. X The excavator is required to notify the pipeline or utility owner immediately if their work damages a pipeline or utility and to call 911 if the damage results in a release of natural gas or other hazardous substance or potentially endangers life, health, or property.

9/22/03
Date

Neil Gray
Signed

48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW

CITY OF ALTAMONTE SPRINGS

Building/Life Safety Services

225 Newburyport Avenue, Altamonte Springs, FL 32701

Phone: 407-571-8433 Fax: 407-571-8445

RIGHT-OF-WAY UTILIZATION PERMIT

PERMIT #: PW03-0077 **Issued Date: 09/25/2003**

Address:
Location: 432 BARCLAY (SE CORNER)
Parcel #: Subdivision:
Project Name:
Work Description: INSTALLATION OF MONITORING WELL MW - 3 - SEE ATTACHED APPLICATION FOR COMMENTS

OWNER INFORMATION

CONTRACTOR INFORMATION
CH2MHILL
225 E ROBINSON ST SUITE 505
ORLANDO FL
32801-4321
407-423-0030 Cert #: CH2MHILL

CONTACT NAME: CH2MHILL 407-423-0030

PERMIT FEES

Permit................:	$0.00
Other Permit Fee......:	$0.00
Engineering Inspection:	$0.00
TOTAL FEES............:	**$0.00**

ALL FEES WAIVED - NO BALANCE DUE

I certify that all the foregoing information is accurate and that all work will be done in compliance with all applicable laws regarding construction and zoning. [ ] Owner/Agent [ ] Contractor

SANDRA J. BECKER

Please Print Name

Signature

BINH/Tony Apfelbeck

Approved By

This Application Shall Be Subject To All City and State Regulations Now in Effect
24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION.
PLEASE CONTACT 407-571-8334 TO SCHEDULE
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

DA

PLO03 0077

RIVIERA DRIVE

PW 98 - 019

CITY OF ALTAMONTE SPRINGS

RIGHT OF WAY UTILIZATION PERMIT APPLICATION

PHONE: 407-571-8433 FAX: 407-571-8445

RECEIVED SEP 23 2003

JOB NAME: Lake Orienta Recharge Wells

JOB ADDRESS: 432 Barclay (SE corner)

APPLICANT'S FIRM NAME: CH2M HILL (on behalf of SJRWMD)

ADDRESS: 225 E. Robinson St., Suite 505, Orlando, FL 32801

RECEIVED SEP 23 2003 PUBLIC WORK ADMIN.

CONTACT NAME: Al Aikens / CH2M HILL 407-423-0030

DESCRIPTION OF WORK: Installation of Monitoring Well MW - 3 (see attached map)

SECTION: 24 TOWNSHIP: 21S RANGE: 30 E

NUMBER AND TYPE OF ROAD CROSSINGS:

✓ NONE ____ OPEN CUT (PAVED) ____ OPEN CUT (UNPAVED) ____ BORE/JACK

LETTER OF NOTIFICATION HAS BEEN SENT TO THE FOLLOWING AGENCIES ON DATE No, contractor is req'd. to call Sunshine One Call 1-800-432-4770 prior to installation of wells (INDICATE NAME OF AGENCY)

WATER ____ SEWER ____

ELECTRIC ____ GAS ____

TELEPHONE ____ OTHER ____

**24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION. PLEASE CONTACT 407-571-8334 TO SCHEDULE.

THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

9/22/03

APPLICANT'S SIGNATURE - date

9/22/03

PUBLIC WORK'S SIGNATURE - date

* Fees waived 9/21/03

COMMENTS: The above is part of a joint project involving the city, SJRWMD, and to a lesser extent FDEP. Project Name: PW98-019 Lake Orienta Artificial Recharge Demonstration Project. The SJRWMD contractor (to be named later) has been given the burden of locating utilities and has been instructed to install the monitoring wells in the R/W between sidewalk and back of curb without conflict of existing utilities.

PERMIT # 03/38

RIGHT-OF-WAY UTILIZATION PERMIT
CONDITIONS OF PERMIT

1.	O	Submit Maintenance of Traffic Plan (applicable if marked) for approval prior to start of construction.
2.	O	Submit construction schedule and estimated completion date.
3.	X	Restore and/or sod all disturbed areas within five (5) working days form the date of disturbance.
4.	X	No dirt, debris, or construction materials are to be piled or stored on the street side of the curb, or on the pavement if no curb exists.
5.	X	The contractor shall provide all necessary erosion control as required by the City, to prevent soil from washing into storm drains, water bodies, or swales.
6.	X	The Department of Public Works shall be notified 48 hours prior to the start of construction. The contractor shall notify the Site Inspector 48 hours prior to the start of construction. Phone (407) 571-8334.
7.	X	The permit is to remain on site during construction and restoration.
8.	X	The excavator is required to notify the pipeline or utility owner immediately if their work damages a pipeline or utility and to call 911 if the damage results in a release of natural gas or other hazardous substance or potentially endangers life, health, or property.

9/22/03
Date

[signature]
Signed

48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW

CITY OF ALTAMONTE SPRINGS

Building/Life Safety Services

225 Newburyport Avenue, Altamonte Springs, FL 32701

Phone: 407-571-8433 Fax: 407-571-8445

RIGHT-OF-WAY UTILIZATION PERMIT

PERMIT #: PW03-0078 **Issued Date: 09/25/2003**

Address:
Location: 514 BARCLAY AVE
Parcel #: Subdivision:
Project Name:
Work Description: INSTALLATION OF MONITORING WELL MW- 4 - SEE ATTACHED APPLICATION FOR COMMENTS.

OWNER INFORMATION

CONTRACTOR INFORMATION
CH2MHILL
225 E ROBINSON ST SUITE 505
ORLANDO FL
32801-4321
407-423-0030 Cert #: CH2MHILL

CONTACT NAME: CH2MHILL 407-423-0030

PERMIT FEES

Permit................:	$0.00
Other Permit Fee......:	$0.00
Engineering Inspection:	$0.00
TOTAL FEES............:	**$0.00**

ALL FEES WAIVED - NO BALANCE DUE

I certify that all the foregoing information is accurate and that all work will be done in compliance with all applicable laws regarding construction and zoning. [ ] Owner/Agent [ ] Contractor

GAMBRA J. Becker
Please Print Name

Signature

Binh / Tony Apfelbeck
Approved By

This Application Shall Be Subject To All City and State Regulations Now in Effect
24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION.
PLEASE CONTACT 407-571-8334 TO SCHEDULE
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

PL003 C078

DATE

I.D.

LOGGE

BARCLAY AVENUE

PW 98 - 019

CITY OF ALTAMONTE SPRINGS
RIGHT OF WAY UTILIZATION PERMIT APPLICATION
PHONE: 407-571-8433 FAX: 407-571-8445

RECEIVED SEP 23 2003

JOB NAME: Lake Orienta Recharge Wells

JOB ADDRESS: 514 Barclay Ave.

APPLICANT'S FIRM NAME: CH2M HILL (on behalf of SJRWMD)

ADDRESS: 225 E. Robinson St., Suite 505, Orlando, FL 32801

RECEIVED SEP 23 2003 PUBLIC WORK ADMIN.

CONTACT NAME: Al Aikens / CH2M HILL 407-423-0030

DESCRIPTION OF WORK: Installation of Monitoring Well MW - 4 (see attached map)

SECTION: 24 TOWNSHIP: 215 RANGE: 30 E

NUMBER AND TYPE OF ROAD CROSSINGS:

✔ NONE ____ OPEN CUT (PAVED) ____ OPEN CUT (UNPAVED) ____ BORE/JACK

LETTER OF NOTIFICATION HAS BEEN SENT TO THE FOLLOWING AGENCIES ON DATE No, contractor is req'd. (INDICATE NAME OF AGENCY) to call Sunshine One Call 1-800-432-4770 prior to installation of wells

WATER ____ SEWER ____

ELECTRIC ____ GAS ____

TELEPHONE ____ OTHER ____

**24 HOUR NOTICE IS REQUIRED PRIOR TO CONSTRUCTION/INSPECTION. PLEASE CONTACT 407-571-8334 TO SCHEDULE.
THIS PERMIT WILL EXPIRE FOUR (4) MONTHS AFTER DATE OF ISSUANCE

9/22/03
APPLICANT'S SIGNATURE - date

9/22/03
PUBLIC WORK'S SIGNATURE - date

* FEES' waived 9/22/03

COMMENTS: The above is part of a joint project involving the city, SJRWMD, and to a lesser extent FDEP. Project Name: PW98-019 Lake Orienta Artificial Recharge Demonstration Project. The SJRWMD contractor (to be named later) has been given the burden of locating utilities and has been instructed to install the monitoring wells in the R/W between sidewalk and back of curb without conflict of existing utilities.

PERMIT # 03/37

RIGHT-OF-WAY UTILIZATION PERMIT
CONDITIONS OF PERMIT

1. O Submit Maintenance of Traffic Plan (applicable if marked) for approval prior to start of construction.

2. O Submit construction schedule and estimated completion date.

3. X Restore and/or sod all disturbed areas within five (5) working days form the date of disturbance.

4. X No dirt, debris, or construction materials are to be piled or stored on the street side of the curb, or on the pavement if no curb exists.

5. X The contractor shall provide all necessary erosion control as required by the City, to prevent soil from washing into storm drains, water bodies, or swales.

6. X The Department of Public Works shall be notified 48 hours prior to the start of construction. The contractor shall notify the Site Inspector 48 hours prior to the start of construction. Phone (407) 571-8334.

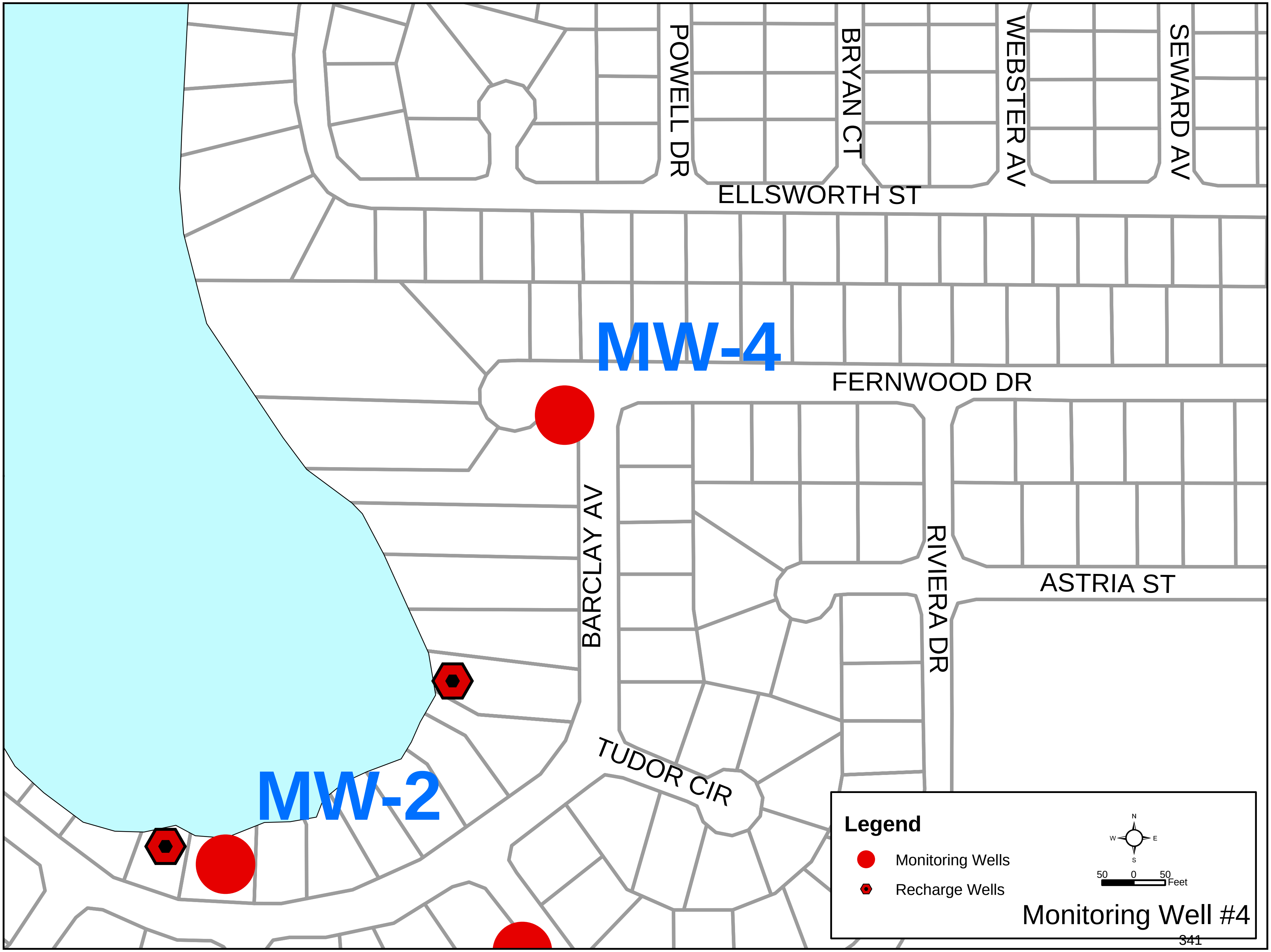
7. X The permit is to remain on site during construction and restoration.

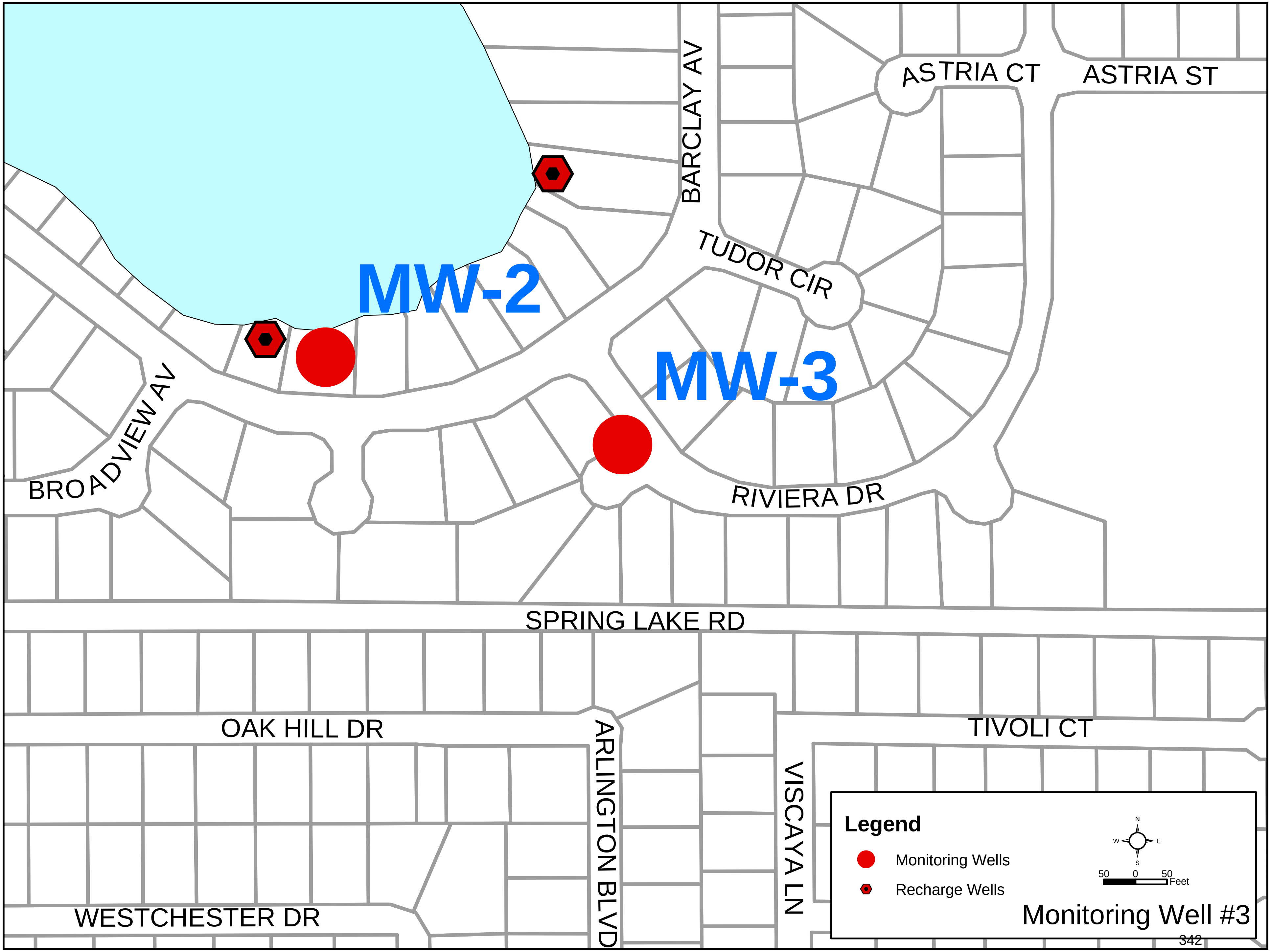
8. X The excavator is required to notify the pipeline or utility owner immediately if their work damages a pipeline or utility and to call 911 if the damage results in a release of natural gas or other hazardous substance or potentially endangers life, health, or property.

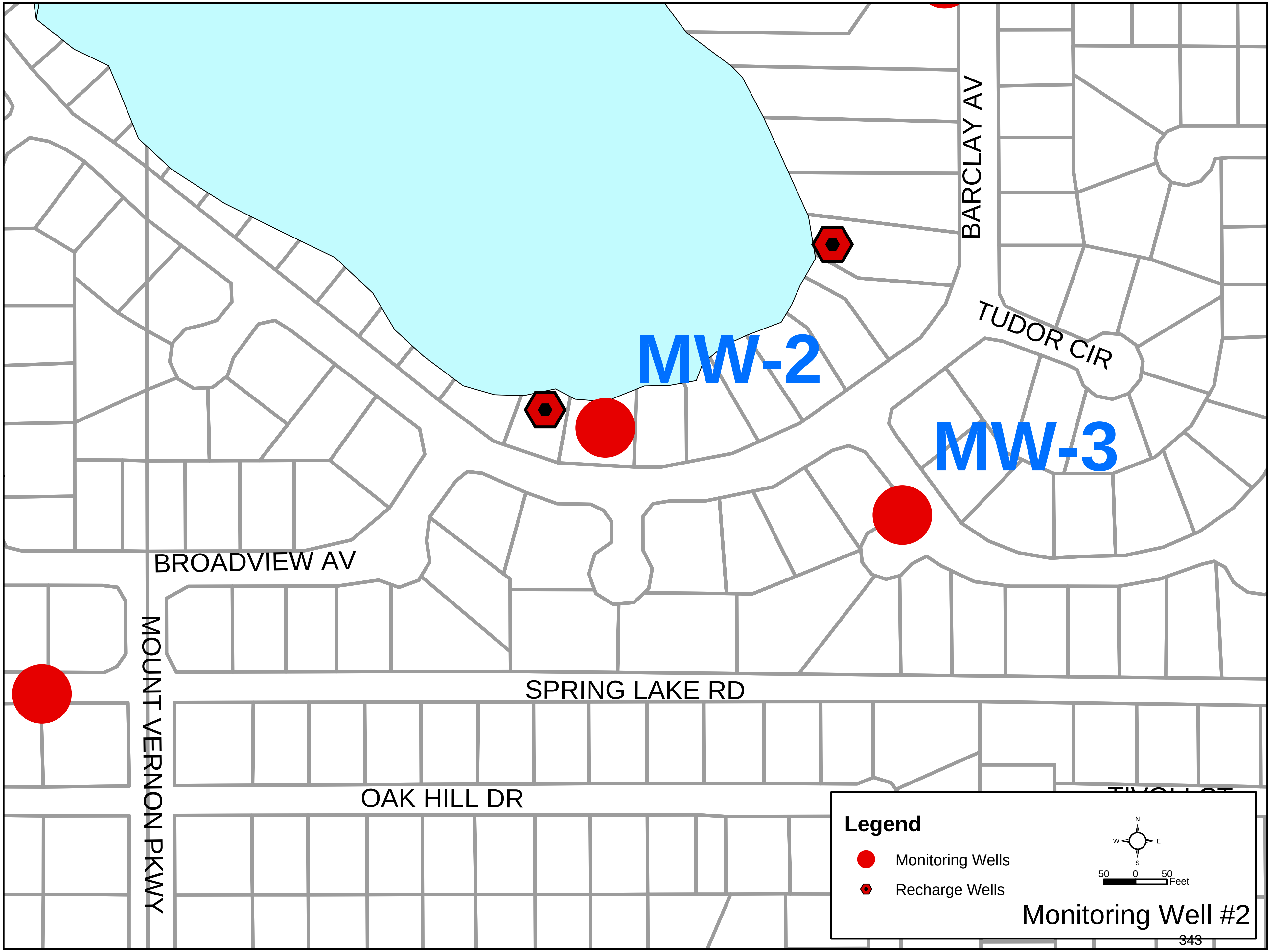
9/22/03
Date

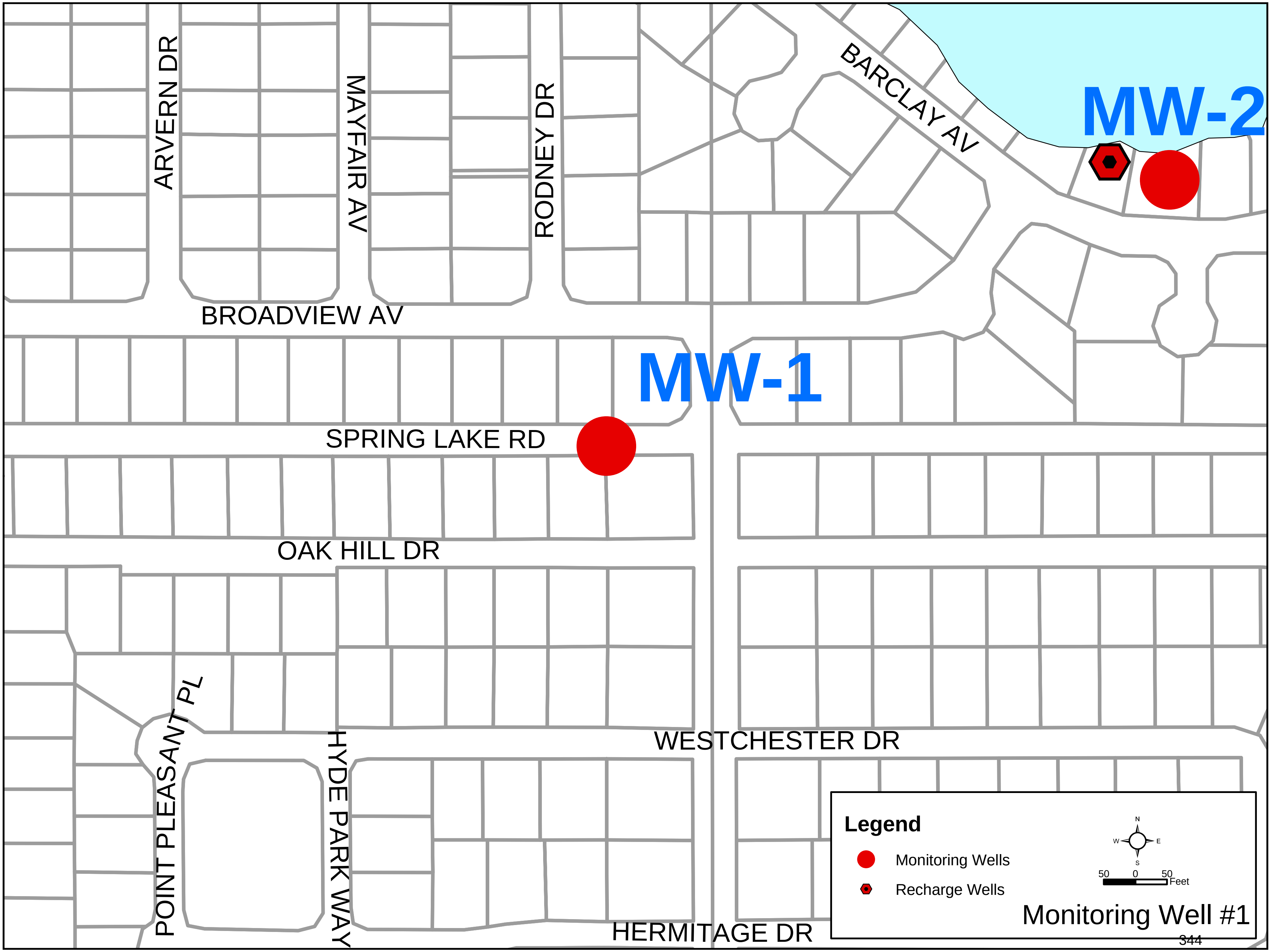
[signature]
Signed

48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW


POWELL DR
BRYAN CT
WEBSTER AV
SEWARD AV
ELLSWORTH ST
MW-4
FERNWOOD DR
BARCLAY AV
RIVIERA DR
ASTRIA ST
TUDOR CIR
MW-2
Legend
Monitoring Wells
Recharge Wells
N
W
E
S
50 0 50
Feet
Monitoring Well #4


MW-2
MW-3
ASTRIA CT
ASTRIA ST
BARCLAY AV
TUDOR CIR
BROADVIEW AV
RIVIERA DR
SPRING LAKE RD
OAK HILL DR
ARLINGTON BLVD
VISCAYA LN
TIVOLI CT
WESTCHESTER DR
Legend
Monitoring Wells
Recharge Wells
N
W
E
S
50
0
50
Feet
Monitoring Well #3
342


MW-2
MW-3
BARCLAY AV
TUDOR CIR
BROADVIEW AV
MOUNT VERNON PKWY
SPRING LAKE RD
OAK HILL DR
Legend
Monitoring Wells
Recharge Wells
N
W
E
S
50
0
50
Feet
Monitoring Well #2
343



MW-2
MW-1
ARVERN DR
MAYFAIR AV
RODNEY DR
BARCLAY AV
BROADVIEW AV
SPRING LAKE RD
OAK HILL DR
POINT PLEASANT PL
HYDE PARK WAY
WESTCHESTER DR
HERMITAGE DR
Legend
Monitoring Wells
Recharge Wells
N
W
E
S
50
0
50
Feet
Monitoring Well #1

Field Services
Construction
Preliminary Data
Lake Orienta
Seminole County, Florida

Aquifer System Monitor Wells:
Floridan S-0344
Floridan S-0345
Floridan S-0346
Floridan S-0347

SJRWMD Program No. 5111-04001

March 23, 2004

Division of Ground Water Programs
Department of Resource Management
St. Johns River Water Management District
Palatka, Florida

This report was generated for the Division of Ground Water Program's use.
All data, figures, tables and information are provisional.

General Information

Site: Lake Orienta

Access: City of Altamonte Springs

Service Request: Al Aikens, CH2MHill

Purpose: Install monitor wells as part of Central Florida Artificial Recharge Project. Wells will be used to help quantify the impact to groundwater quality from recharge wells.

Work:

Monitor Well/Testhole Construction:
Diversified Drilling Corporation, Inc.

Project Management:
CH2MHill

Geophysical Logging:
Advanced Borehole Services

Video Survey
Advanced Borehole Services

Report: Laura Nelms

Notes:

S-0344
01/09/04, Drilled to 82 ft bls using mud rotary drilling method.
01/12/04, Eight inch surface casing set @ 82 ft bls in dolostone confining unit.
01/13/04, Circulation loss @95 ft bls.
01/14/04, Four inch casing set 210 ft bls into limestone.
01/15/04, Well Mud Rotary drilled from 210 ft bls to approximately 290 ft bls. Circulation loss @ 235 ft bls. Well developed using rig pump at 100 gpm for 4 hours. Development water remained slightly cloudy. Water quality samples collected at total depth for field and Lab analysis. Well completed with below grade vault, 2'X 2'concrete pad.
02/25/04, Video survey . Borehole clear to TD.
-----------, Geophysical survey.

S-0345

01/05/04, Drilled to 65 ft bls using mud rotary drilling method.
01/06/04, Eight inch surface casing set @ 65 ft bls in dolomitic sand.
01/07/04, Four inch casing set 130 ft bls into limestone.
01/08/04, Well Mud Rotary drilled from 130 ft bls to approximately 320 ft bls. Circulation loss @ 190 ft bls ~30 % and @203 ft bls 100%.
01/12/04, Well completed with below grade vault, 2' X 2’ concrete pad.
01/15/04, Well developed using rig pump at 100 gpm for 4 hours. Development water remained slightly cloudy. Water quality samples collected at total depth for field and Lab analysis
02/25/04, Video survey conducted. Borehole filled in with cuttings from 292 ft bls to 320 ft bls. .
03/09/04, Well redeveloped to remove cuttings in borehole from 292 ft bls to 320 ft bls.
-----------, Video survey.
-----------, Geophysical survey.

S-0346

02/02/04, Drilled to 82 ft bls using mud rotary drilling method. Eight inch surface casing set @ 82 ft bls in dolomitic sand.
02/04/04, Four inch casing set 170 ft bls into limestone.
02/05/04, Well Mud Rotary drilled from 170 ft bls to approximately 290 ft bls. Circulation loss @ 230 ft bls ~90 %. Well developed using rig pump at 100 gpm for 3.5 hours. Development water remained slightly cloudy. Water quality samples collected at total depth for field and Lab analysis
02/06/04, Well completed with below grade vault, 2’X 2’ concrete pad.
02/25/04, Video survey conducted. Borehole turbid, low visibility 190 ft bls to 281 ft bls.
03/09/04, Well redeveloped to remove cuttings in borehole from 190 ft bls to 290 ft bls.
-----------, Video survey.
-----------, Geophysical survey.

S-0347

01/26/04, Drilled to 70 ft bls using mud rotary drilling method. Eight inch surface casing set @ 70 ft bls in sand, phosphate., dolostone .
01/28/04, Four inch casing set 160 ft bls into limestone.
01/29/04, Well Mud Rotary drilled from 160 ft bls to approximately 300 ft bls. Circulation loss @ 164 ft bls. Well completed with below grade vault, 2’X 2’ concrete pad.
02/05/04, Well developed using rig pump at 100 gpm for 5.5 hours. Development water remained slightly cloudy. Water quality samples collected at total depth for field and Lab analysis
02/25/04, Video survey conducted. Borehole turbid, low visibility 190 ft bls to 281 ft bls.
03/09/04, Well redeveloped to remove boulder @162 ft bls and cuttings in borehole to 300 ft bls.
-----------, Video survey.
-----------, Geophysical survey.

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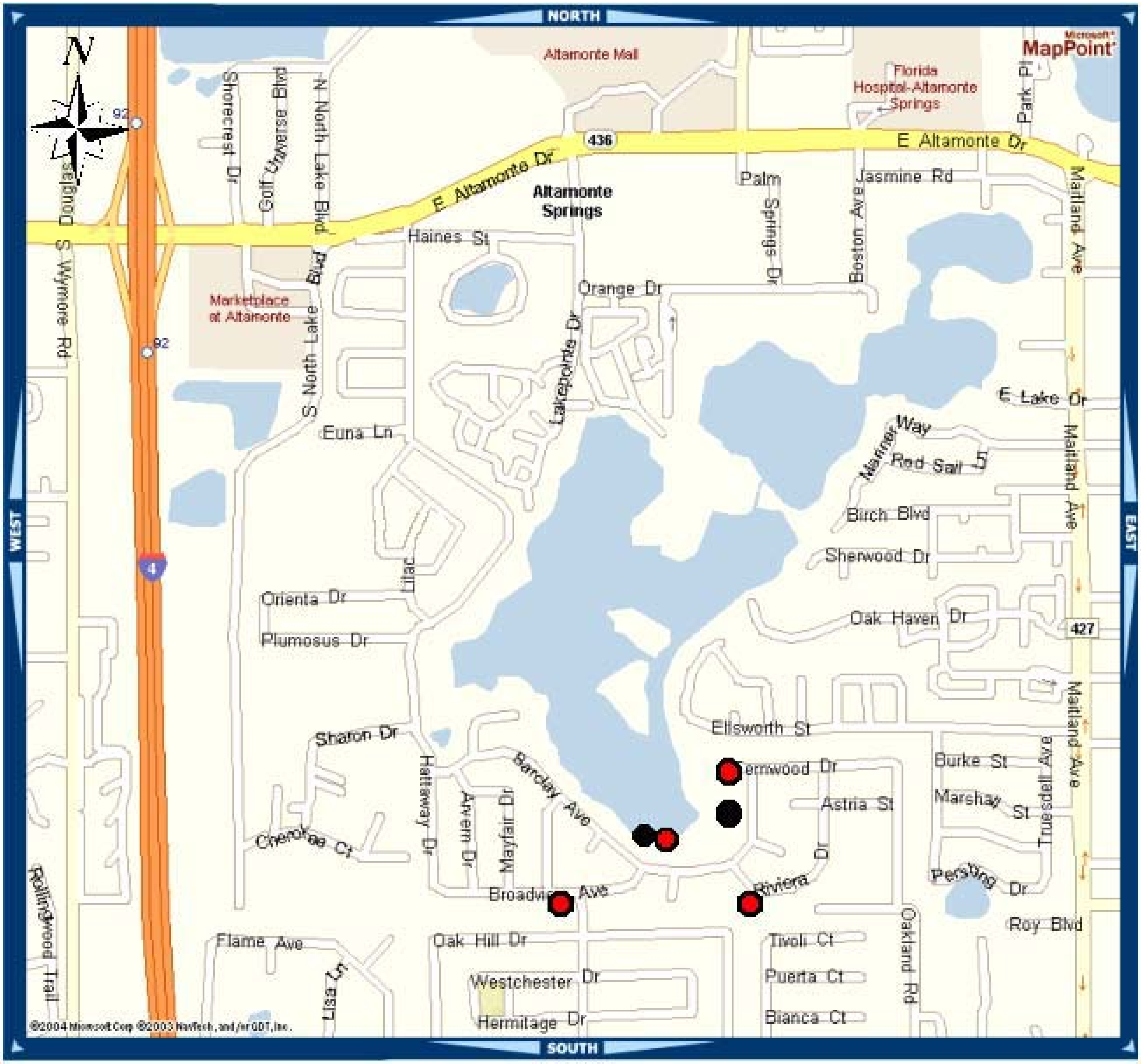
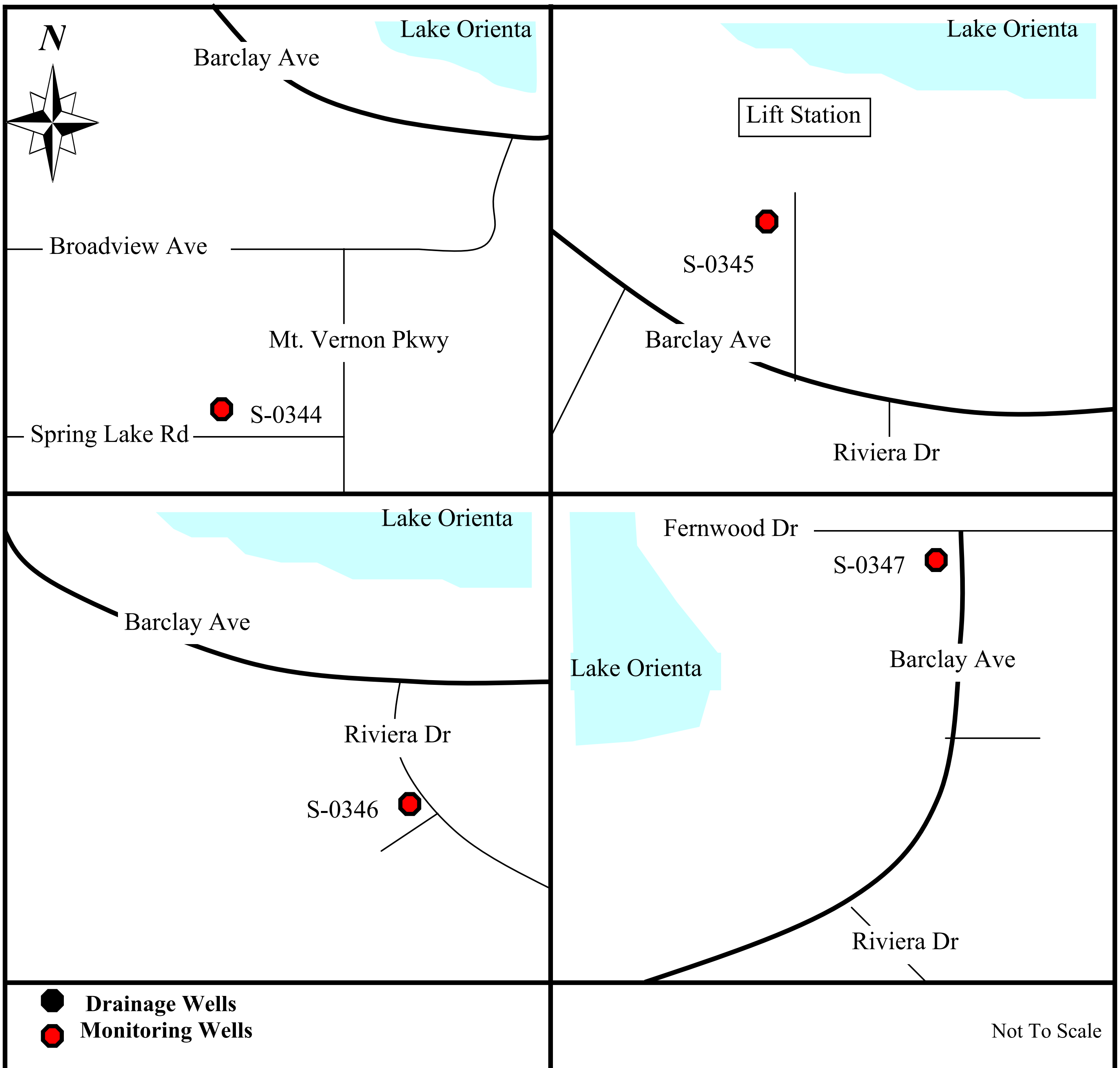


⬢ Drainage Wells
⬢ Monitoring Wells

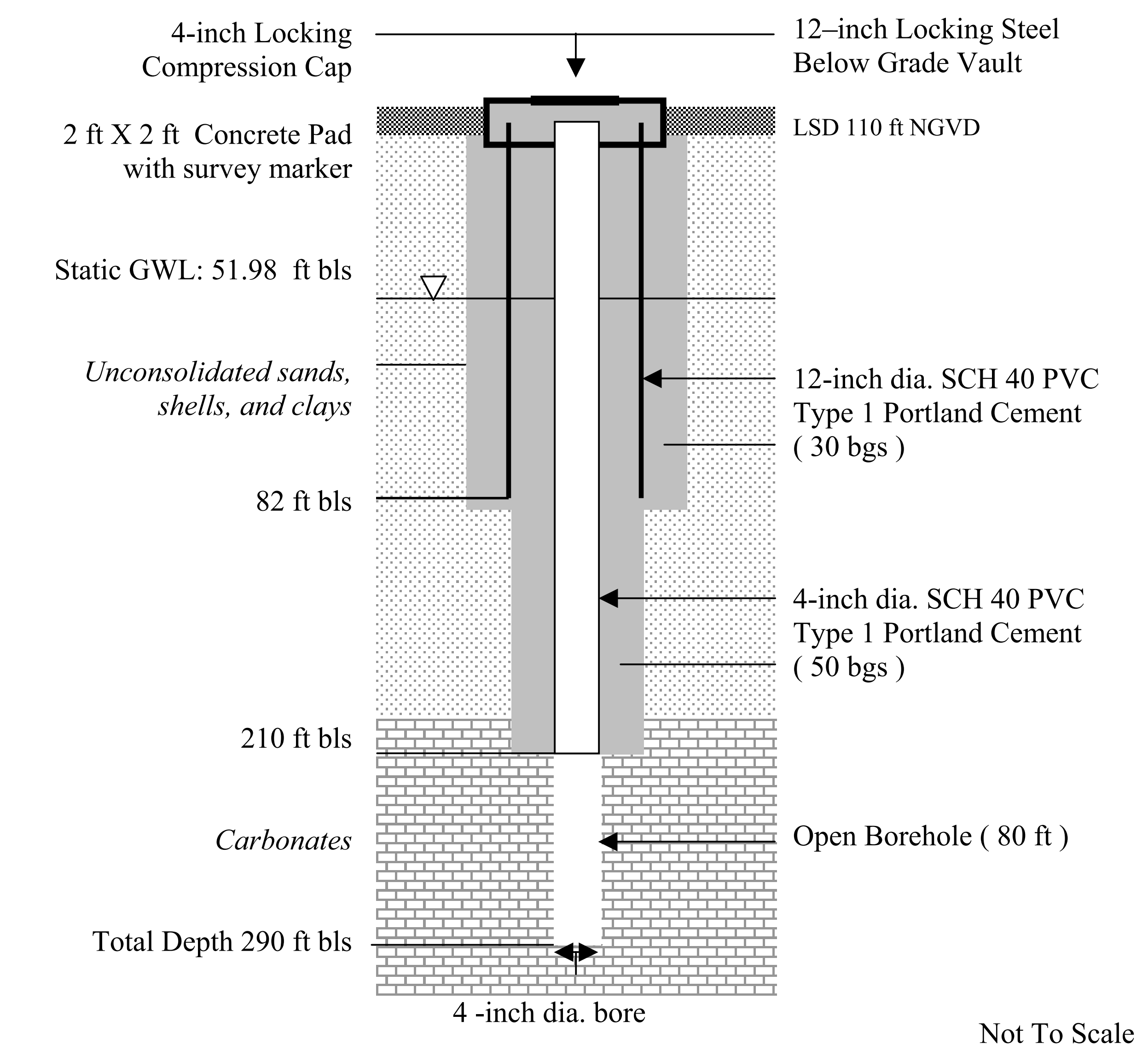
Sites:	Lake Orienta	**SJRWMD**	
TRS:	T21sR30eSec24		
Topo:	Casselberry		
Site Elevation	75 – 100 ft NGVD	**Figure 1.**	**Lake Orienta MW Sites**



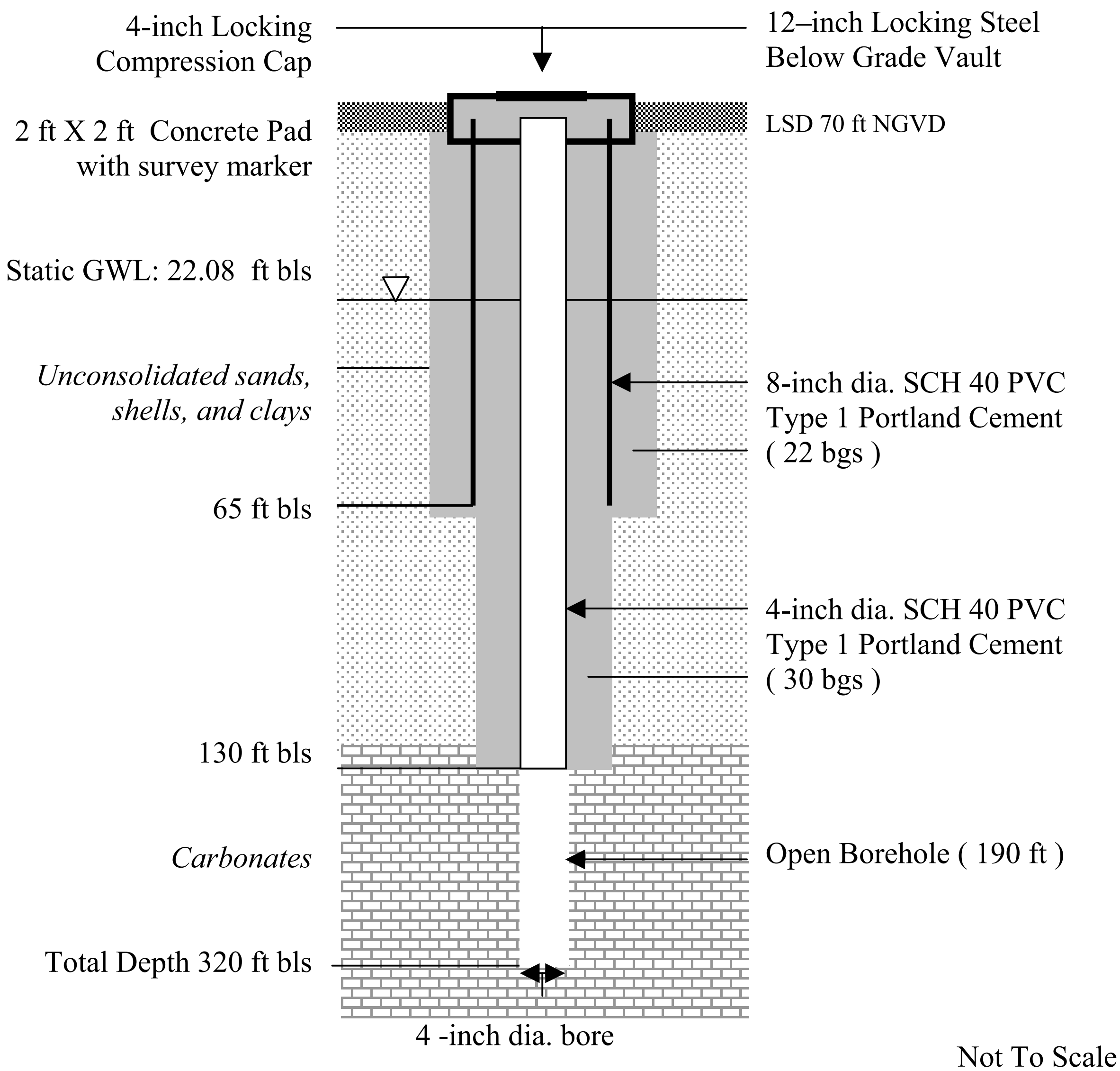
Site:	Lake Orienta	
TRS:	T21sR30eSec24	
Topo:	Casselberry	
Site Elevation:	75 – 100 ft NGVD	
GPSLat/Long:	Spring Lake Rd	283850/812243
	Lift Station	283855/812233
	Riviera Dr.	283853/812227
	Fernwood Dr.	283902/812226

SJRWMD

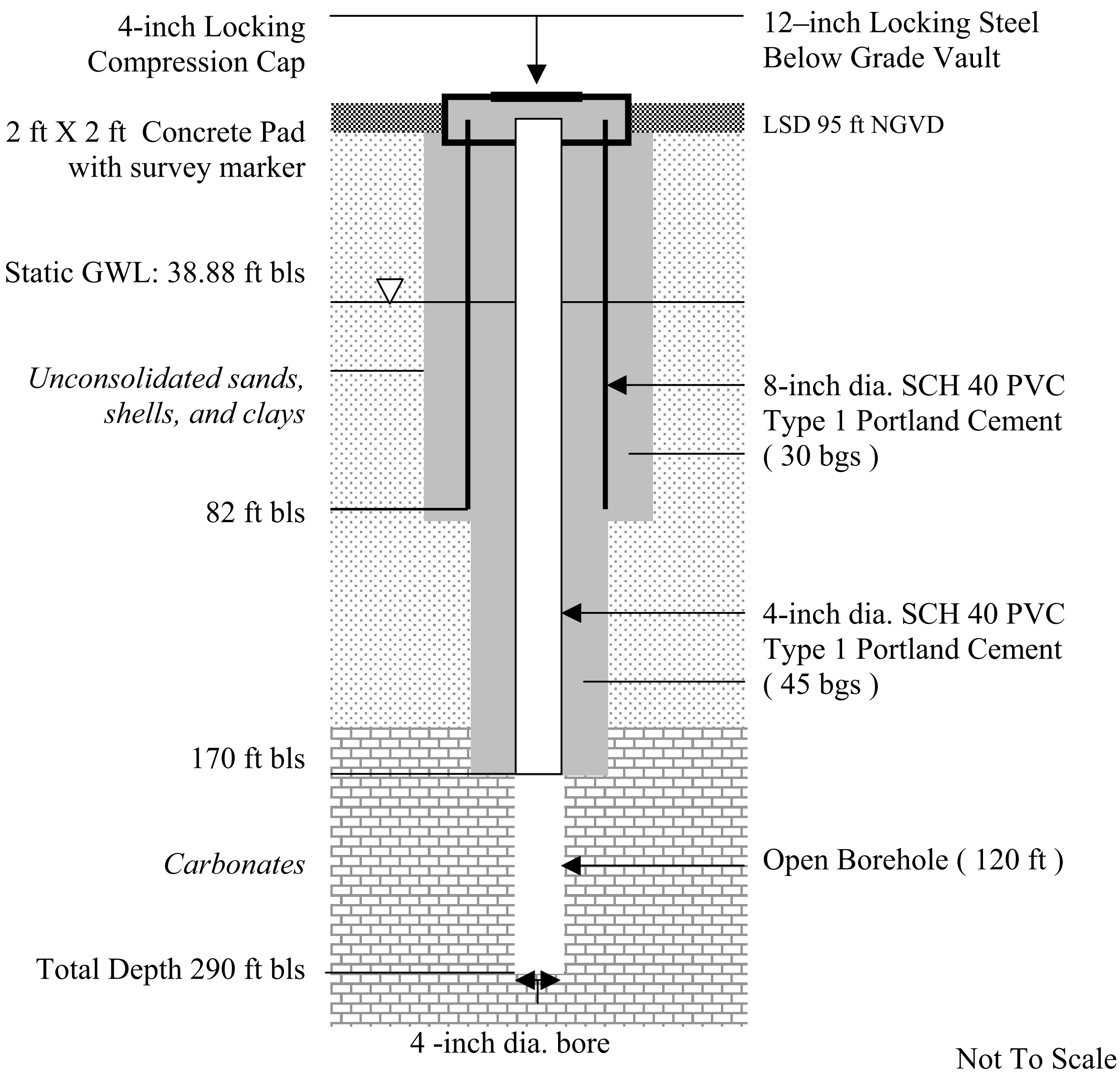
Figure 2. Monitoring Well Locations



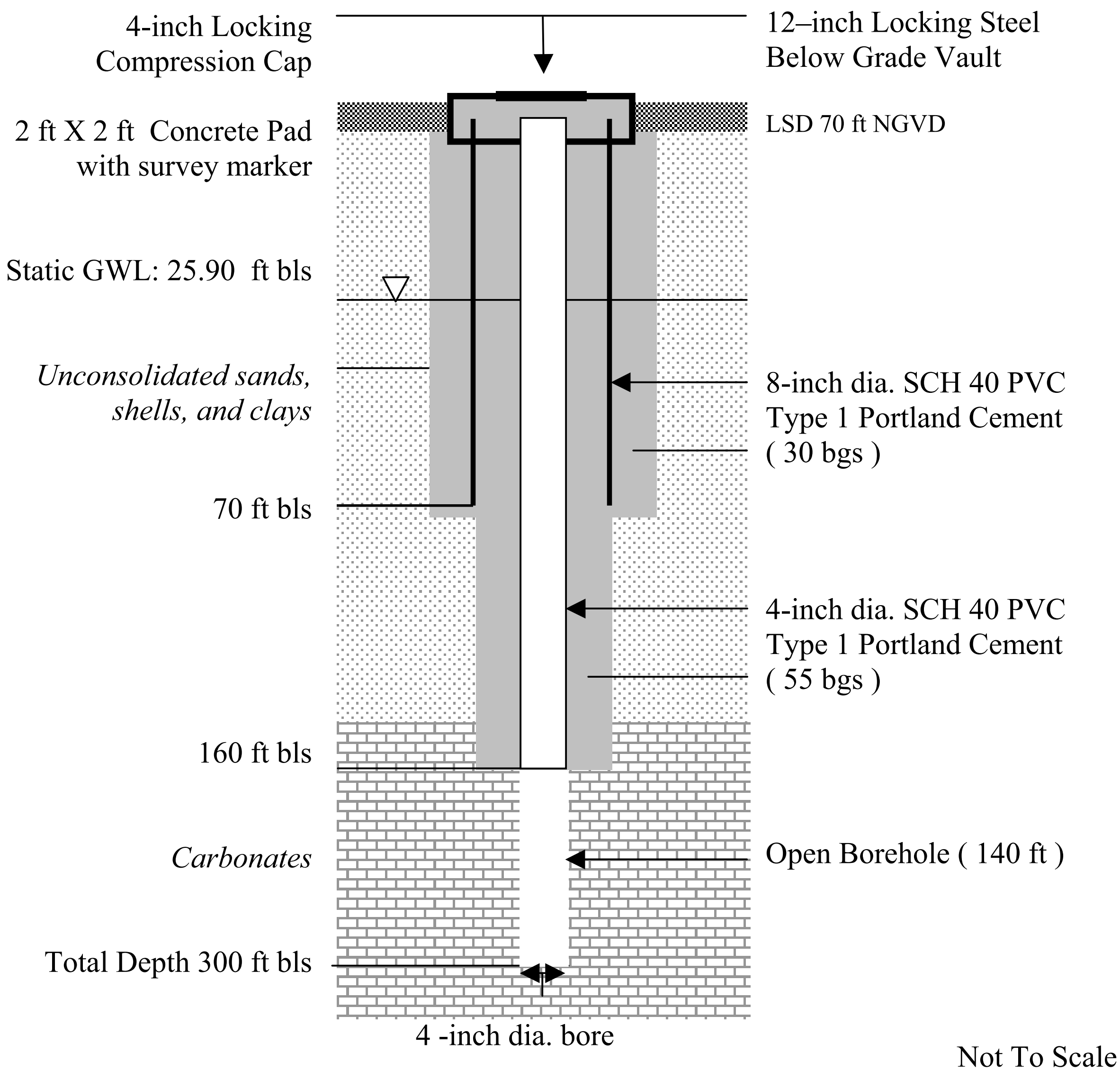
Site:	Spring Lake Rd	**SJRWMD**
GPS Lat/Long:	283850/812243	
Driller:	Diversified Drilling Corp.	**Figure 3. Floridan Monitor Well S-0344**
Well Completed:	01/15/03	



Site:	Lift Station	**SJRWMD**
GPS Lat/Long:	283855/812233	
Driller:	Diversified Drilling Corp.	**Figure 4. Floridan Monitor Well S-0345**
Well Completed:	01/15/04	



Site:	Riviera Drive	**SJRWMD**
GPS Lat/Long:	283853/812227	
Driller:	Diversified Drilling Corp.	**Figure 5. Floridan Monitor Well S-0346**
Well Completed:	02/05/04	



Site:	Fernwood Drive	**SJRWMD**
GPS Lat/Long:	283902/812226	
Driller:	Diversified Drilling Corp.	**Figure 6. Floridan Monitor Well S-0347**
Well Completed:	02/10/04	

Table 1. **Grout Data**

Site: Spring Lake Rd **Well ID:** S-0344

Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
01/09/04	82	A-6	-	-	Pilothole – 6-inch
01/12/04	82	A-12	30 bgs	P-94	Set 82 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/13/04	210	A-8	50 bgs	P-94	Set 210 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/15/04	-	-	2 bgs	Q-40	Hand mix grout for 2' x 2' concrete pad and complete grout around 12-inch manhole cover, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 2. **Grout Data**

Site: Lift Station **Well ID:** S-0345

Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
01/05/04	65	A-6	-	-	Pilothole – 6-inch
01/06/04	65	A-12	22	P-94	Set 65 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/07/04	130	A-8	30 bgs	P-94	Set 130 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/12/04	-	-	2 bgs	Q-40	Hand mix grout for 2' x 2' concrete pad and complete grout around 12-inch manhole cover, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 3. **Grout Data**

Site: Riviera Drive **Well ID:** S-0346

Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
02/02/04	82	A-6	-	-	Pilothole – 6-inch
02/02/04	82	A-12	30 bgs	P-94	Set 82 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
02/04/04	160	A-8	45 bgs	P-94	Set 170 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
02/06/04	-	-	2 bgs	Q-40	Hand mix grout for 2' x 2' concrete pad and complete grout around 12-inch manhole cover, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 4. **Grout Data**

Site: Fernwood Drive **Well ID:** S-0347

Data Collection: L Nelms

DATE	TAG DEPTH (ft)	ANNULUS/ BORE (inch)	QUANITY (yds/bags)	MATERIAL *	COMMENTS
01/26/04	70	A-6	-	-	Pilothole – 6-inch
01/26/04	70	A-12	30 bgs	P-94	Set 70 ft of 8-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/27/04	160	A-8	55 bgs	P-94	Set 160 ft of 4-inch SCH 40 PVC casing and pumped grout through 1-inch PVC tremie
01/29/04	-	-	2 bgs	Q-40	Hand mix grout for 2' x 2' concrete pad and complete grout around 12-inch manhole cover, set below grade vault

*P-94 = Type 1 Portland Cement *Q-40 = Quickrete 40 lbs

Table 5. **Drilling Data**

Site: Spring Lake Rd **Well ID:** S-0344

Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
01/09/04	0	82	Mud	6	65	76	
01/12/04	0	82	Mud	12	180	27	Set 8-inch Casing
01/13/04	80	90	Mud	8	31	19	
01/13/04	90	95	Mud	8	10	30	
01/13/04	95	100	Mud	Core	33	9	Circulation Loss
01/13/04	95	105	Mud	8	15	40	
01/13/04	105	110	Mud	8	-	-	
01/13/04	110	120	Mud	8	11	55	
01/13/04	120	130	Mud	Core	25	24	
01/13/04	130	132	Mud	8	7	103	
01/13/04	132	140	Mud	8	7	69	
01/13/04	140	150	Mud	8	16	38	
01/13/04	150	160	Mud	Core	20	30	
01/13/04	160	170	Mud	Core	13	46	
01/13/04	170	180	Mud	Core	20	30	
01/13/04	180	184	Mud	Core	-	-	
01/13/04	184	190	Mud	4	30	12	
01/13/04	190	200	Mud	Core	35	17	
01/14/04	195	205	Mud	Core	-	-	
01/14/04	205	210	Mud	Core	-	-	
01/14/04	145	210	Mud	8	130	30	Set 4-inch Casing
01/15/04	206	210	Mud	4	-	-	
01/15/04	210	220	Mud	4	3	200	
01/15/04	220	230	Mud	4	8	75	
01/15/04	230	240	Mud	4	12	50	
01/15/04	240	250	Mud	4	8	75	
01/15/04	250	260	Mud	4	7	85	
01/15/04	260	270	Mud	4	6	100	
01/15/04	270	280	Mud	4	5	120	
01/15/04	280	290	Mud	4	6	100	TD

Table 6. Drilling Data

Site: Lift Station **Well ID:** S-0345

Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
01/05/04	0	65	Mud	6	125	31	
01/06/04	0	65	Mud	12	85	46	Set 8-inch Casing
01/07/04	61	70	Mud	8	70	7.7	
01/07/04	70	80	Mud	8	25	24	
01/07/04	80	90	Mud	8	16	38	
01/07/04	90	100	Mud	8	17	35	
01/07/04	100	110	Mud	8	14	43	
01/07/04	110	120	Mud	8	18	33	
01/07/04	120	130	Mud	8	44	14	Set 4-inch Casing
01/08/04	125	140	Mud	4	18	50	
01/08/04	150	160	Mud	4	13	46	
01/08/04	160	170	Mud	4	5	120	
01/08/04	170	180	Mud	4	5	120	
01/08/04	190	200	Mud	4	23	26	
01/08/04	200	210	Mud	4	-	-	Circulation Loss
01/08/04	210	220	Mud	4	12	50	
01/08/04	220	230	Mud	4	4	150	
01/08/04	230	240	Mud	4	3	200	
01/08/04	240	250	Mud	4	4	150	
01/08/04	250	260	Mud	4	11	55	
01/08/04	260	270	Mud	4	7	86	
01/08/04	270	280	Mud	4	2	300	
01/08/04	280	290	Mud	4	4	150	
01/08/04	290	300	Mud	4	7	86	
01/08/04	300	310	Mud	4	3	200	
01/08/04	310	320	Mud	4	5	120	TD

Table 7. **Drilling Data**

Site: Riviera Drive **Well ID:** S-0346
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
02/02/04	0	30	Mud	6	20	90	
02/02/04	30	40	Mud	6	6	100	
02/02/04	40	50	Mud	6	8	75	
02/02/04	50	60	Mud	6	4	150	
02/02/04	60	70	Mud	6	7	86	
02/02/04	70	80	Mud	6	10	60	
02/02/04	80	82	Mud	6	11	11	
02/02/04	0	82	Mud	12	-	-	Set 8-inch Casing
02/03/04	82	90	Mud	8	53	9	
02/03/04	90	100	Mud	8	24	25	
02/03/04	100	110	Mud	8	55	11	
02/03/04	110	120	Mud	8	14	43	
02/03/04	120	130	Mud	8	23	26	
02/03/04	130	140	Mud	8	22	27	
02/03/04	140	150	Mud	8	23	26	
02/03/04	150	160	Mud	8	37	16	
02/03/04	160	170	Mud	Core	30	20	Set 4-inch Casing
02/05/04	170	180	Mud	4	8	75	
02/05/04	180	190	Mud	4	10	60	
02/05/04	190	200	Mud	4	8	75	
02/05/04	200	210	Mud	4	16	38	
02/05/04	210	220	Mud	4	9	67	
02/05/04	220	230	Mud	4	14	43	
02/05/04	230	240	Mud	4	10	60	
02/05/04	240	250	Mud	4	-	-	~10 % Circulation
02/05/04	250	260	Mud	4	9	67	
02/05/04	260	270	Mud	4	6	100	
02/05/04	270	280	Mud	4	7	86	
02/05/04	280	290	Mud	4	7	86	

Table 8. **Drilling Data**

Site: Fernwood Drive **Well ID:** S-0347
Data Collection: L Nelms

Date (yymmdd)	From (ft, bls)	To (ft, bls)	Method Mud/ Rev Air	Bit Size (inch)	Time (min)	Rate (ft/hr)	Comments
01/26/04	0	70	Mud	6	71	59	
01/26/04	0	70	Mud	12	52	81	Set 8-inch Casing
01/27/04	68	72	Mud	8	-	-	
01/27/04	72	80	Mud	8	18	27	
01/27/04	80	90	Mud	8	40	15	
01/27/04	90	100	Mud	8	35	17	
01/27/04	100	110	Mud	8	16	38	
01/27/04	110	120	Mud	8	19	32	
01/27/04	120	130	Mud	8	17	35	
01/27/04	130	140	Mud	8	23	26	
01/27/04	140	160	Mud	8	-	-	
01/27/04	160	164	Mud	Core	-	-	Set 4-inch Casing
01/29/04	157	167	Mud	4	-	-	Circulation Loss
01/29/04	167	170	Mud	4	-	-	
01/29/04	170	180	Mud	4	5	120	
01/29/04	180	190	Mud	4	5	120	
01/29/04	190	200	Mud	4	-	-	Sand caving into borehole
01/29/04	200	210	Mud	4	20	30	Circulation Loss
01/29/04	210	220	Mud	4	20	30	
01/29/04	220	230	Mud	4	7	86	
01/29/04	230	240	Mud	4	7	86	
01/29/04	240	250	Mud	4	7	86	
01/29/04	250	260	Mud	4	6	100	
01/29/04	260	270	Mud	4	9	67	
01/29/04	270	280	Mud	4	9	67	
01/29/04	280	290	Mud	4	9	67	
01/29/04	290	300	Mud	4	8	75	

Table 9. **Groundwater Levels**

Site: Lake Orienta
Data Collection: L Nelms

Static Water Levels					Borehole	
Well ID:	**Date/Time (yymmdd/hhmm)**	**Water Level (ft, bls)**	**Casing (ft, bls)**	**Diameter (inches)**	**Total Depth (ft, bls)**	**Open Hole (ft)**
S-0344	032403/1500	51.98	210	4	320	80
S-0345	031203/0710	22.08	130	4	290	190
S-0346	031803/0750	38.88	170	4	290	120
S-0347	020904/1520	25.90	160	4	300	140

Table 10. **Groundwater Quality / Development**

Site: Lake Orienta
Data Collection: L Nelms **Development Method:** Air

Well ID:	**Date (yymmdd/hhmm)**	**Rate (gpm)**	**∑Vol (gal)**	**Temp (Deg C)**	**PH**	**Cl (mg/l)**	**Specific Conductivity (us/cm)**
S-0344	011604/0940	150	36,000	20.1	7.6	7	300.1
S-0345	020404/1355	150	20,000	23.3	7.9	8	380.9
S-0346	020504/1700	100	13,400	23.3	8.2	5	267
S-0347	020504/0935	100	17,000	23.3	8.2	3	340

Table 11. **Laboratory Groundwater Quality**

Site: Lake Orienta

Well ID:	S-0344	S-0345	S-0346	S-0347
Sample Date	02/04/04	01/16/04	02/05/04	02/05/04
Casing Depth	210	130	160	170
Well Depth	290	320	300	290
Water Temp	20.1	23.3	23.3	23.3
Conductivity-Field	300.1	380.9	267.6	340.3
Conductivity	295	362	260	324
pH-Field	7.6	7.91	8.25	8.27
Alkalinity	141	145	120	154
Ca-T	65.9	95.4	82.2	83
Mg-T	5.49	7.94	7.07	4.96
Na-T	5.89	9.55	11.5	9.17
K-T	0.554	1.36	1.04	2.59
Cl	12.1	19.7	12.5	11.5
SO4	3.32	32.7	13.1	14.9
F	0.229	0.229	0.28	0.213
Si-T	6.36	3.9	6.84	7.28
Ba-T	8.63	6.98	7.64	23.7
Fe-T	740	327	163	1850
Sr-T	167	134	140	307
TDS	172	234	155	208

Lithologic Description

Site: Spring Lake Rd **Well/Testhole:** S-0344

Samples Described By: L. Nelms

From	To	Lithology
0	10	**Sand**, pale yellowish brown, fine-medium
10	20	**Sand**, medium yellowish brown, fine-medium
20	22	**Clay**, pale yellowish brown, soft
22	30	**Sand**, pale yellowish brown, fine-medium
30	40	**Sand**, pale yellowish brown, fine-medium, clay stringer mid rod
40	50	**Sand**, pale yellowish brown, fine-medium
50	60	**Sand**, medium yellowish brown/gray, fine-medium
60	70	**Shell bed,** yellowish brown/gray, fragments pale orange
70	82	**Shell bed,** yellowish brown/gray, large fragments, pale orange, ~25% phosphatic gravel, sand
82		**Sand**, dolomitic, phosphatic, clayey, shell
82	90	**Dolostone**, phosphatic, olive gray/ black, shell
95	100	**Dolostone,** clayey, phosphatic, olive gray, bottom of core has shell and gastropod molds
100	110	**Lost Circulation Zone**
110	120	**Dolostone,** clayey, phosphatic, olive gray
120	150	**Lost Circulation Zone**
150	160	**Dolostone**, pale gray, phosphatic, minor clay
160	170	**Sand,** lightly cemented, heavy minerals
170	180	Core barrel empty
180	195	Core barrel empty, lime mud, phosphate on end of barrel bit
195	205	**Lost Circulation Zone**
205	210	**Limestone**, very pale orange, fossiliferous
210	220	**Limestone**, very pale orange, fossiliferous
220	235	**Limestone**, very pale orange, fossiliferous
235	290	**Lost Circulation Zone**

Lithologic Description

Site: Lift Station **Well/Testhole:** S-0345

Samples Described By: L. Nelms

From	To	Lithology
0	10	**Sand**, dark/ moderateyellowish brown, organics, fine - medium
10	20	**Sand**, dark/ moderateyellowish brown, organics, fine - medium
20	30	**Sand**, moderateyellowish brown, fine - medium
30	40	**Sand**, moderateyellowish brown, fine - medium
40	50	**Sand**, clear/white, fine-coarse, phosphate, heavy minerals, b,lack,, limestone fragments very pale orange
50	60	**Sand**, clear/white, fine-coarse, phosphate, heavy minerals, black,, limestone fragments very pale orange
60	65	**Dolostone,** sandy, clayey, pale brown, phosphate, heavy minerals, b,lack,, limestone fragments very pale orange
65	70	**Dolostone** clayey, olive/ pale brown, phosphate
70	80	**Dolostone** clayey, olive/ pale brown, phosphate
80	90	**Dolostone** clayey, olive/ pale brown, phosphate
90	100	**Dolostone/** phosphate mix
100	110	**Dolostone/** phosphate mix
110	120	**Dolostone/** phosphate mix
120	130	**Limestone**, pale yellowish brown, fossiliferous
130	177	**Limestone**, very pale orange, fossiliferous, lepids
177	203	**Limestone**, very pale orange/ mottled gray, fossil molds
203	320	**Lost Circulation Zone**

*Lithologic samples will be sent to Florida Geological Survey for detailed description.

Lithologic Description

Site: Riviera Drive **Well/Testhole:** S-0346

Samples Described By: L. Nelms

From	To	Lithology
0	10	**Sand**, pale yellowish brown, fine-medium
10	40	**Sand**, dark yellowish brown/ black, heavy minerals, fine-medium
40	50	**Sand**, pale yellowish brown, fine-medium, heavy minerals, black
50	60	**Sand**, pale yellowish brown, fine-medium, heavy minerals, black
60	70	**Sand**, pale yellowish brown, fine-coarse, heavy minerals, black, phosphate gravel
70	80	**Sand**, phosphate gravel, pale yellowish brown, fine-very coarse, heavy minerals, black
80	82	**Sand**, Dolomitic, coarse pebble size, pale yellowish brown, large phosphatic gravel
82	100	**Dolostone**, pale yellowish brown, crystal growth indicates solution cavities, cuttings smaller, less phosphate
100	120	**Dolostone**, pale yellowish brown, clayey, sand, pebble size
120	140	**Dolostone**, conglomerate, pale yellowish brown/black/brown, clayey, phosphatic, sand
140	150	**Dolostone**, clayey, cuttings much finer, pale yellowish brown/ black, phosphatic gravel, sand
150	159	**Dolostone**, clayey, cuttings much finer, pale yellowish brown/ black, phosphatic gravel, sand
159	170	**Limestone**, very pale orange, fossiliferous
170	180	**Limestone**, very pale orange, fossil molds
180	200	**Limestone**, very pale orange, fossiliferous, micritic
200	220	**Limestone**,wafer shaped cuttings, drills harder, very pale orange, fossil molds
220	230	**Limestone**, drills softer, very pale orange, micritic
230	290	**No sample** 10% circulation

*Lithologic samples will be sent to Florida Geological Survey for detailed description.

Lithologic Description

Site: Fernwood Drive **Well/Testhole:** S-0347

Samples Described By: L. Nelms

From	To	Lithology
0	10	**Sand**, pale yellowish brown, fine
10	20	**Sand**, pale yellowish brown, fine
20	30	**Sand**, very pale orange/ yellowish brown, fine
30	40	**Sand**, light olive gray, fine, heavy minerals, some shell
40	50	**Sand**, light olive gray, fine, heavy minerals, some shell
50	60	**Sand**, phosphatic gravel, shell, olive gray
60	70	**Phosphate,** dolostone, some shell, sand, coarse pebble size
70	80	**Dolostone,** olive gray, phosphate, shell
80	90	**Clay,** olive gray, dolostone, phosphate, shell, sand, coarse pebble size
90	100	**Dolostone,** olive gray, phosphate
100	110	**Clay,** olive gray, phosphate, minor dolostone, white blebs of calcilutite
110	120	**Clay,** olive gray, phosphate, minor dolostone, white blebs of calcilutite
120	130	**Clay,** olive gray, phosphate, minor dolostone, sand, white blebs of calcilutite
130	142	**Clay,** olive gray, phosphate, minor dolostone, sand, white blebs of calcilutite
142	152	**Void**
160	164	**Limestone**, very pale orange, fossiliferous
164	300	**Lost Circulation Zone**

Table 9. **Video Logs**

Survey By: Advanced Borehole Services

Date	Well ID:	Survey Depth	Depth (ft bls)	Comments
02/25/04	S-0344	281 ft	51	Water Level 51 ft bls
			0 - 213	4-inch Casing some joints show staining/ grout/ growth
			227	Vuggy, some large
			236 - 249	Fractures, voids, some large
			256	Vertical fractures
			258	Ledge, vuggy
			273	Vertical fractures, ledge
02/25/04	S-0345	292 ft	20	Water Level 20 ft bls
			0 – 131	4-inch Casing some joints show staining/ grout/ growth
			142	Fractures, vugs
			144	Vertical fractures, ledge
			153 - 185	Lithology change, vuggy
			185 - 196	Fractures, deep, large
			203 – 225	Borehole round, Fracture @210, Bedding obvious @220
			229	Fractures
			230 - 264	Bedding planes obvious, minor vugs, Fracture @255
			265 - 292	Vuggy, no visibility below 275 ft bls
02/25/04	S-0346	281 ft	37.6	Water Level 37.6 ft bls
			0 - 171	4-inch Casing small black debris along casing wall
			174	vuggy
			190	Turbid, visibility very low
			281	TD
02/25/04	S-0347	162 ft	24.09	Water Level 24.09 ft bls
			0 - 161	4-inch Casing
			161.8	Boulder blocking borehole

Appendix A
Geophysical Logs

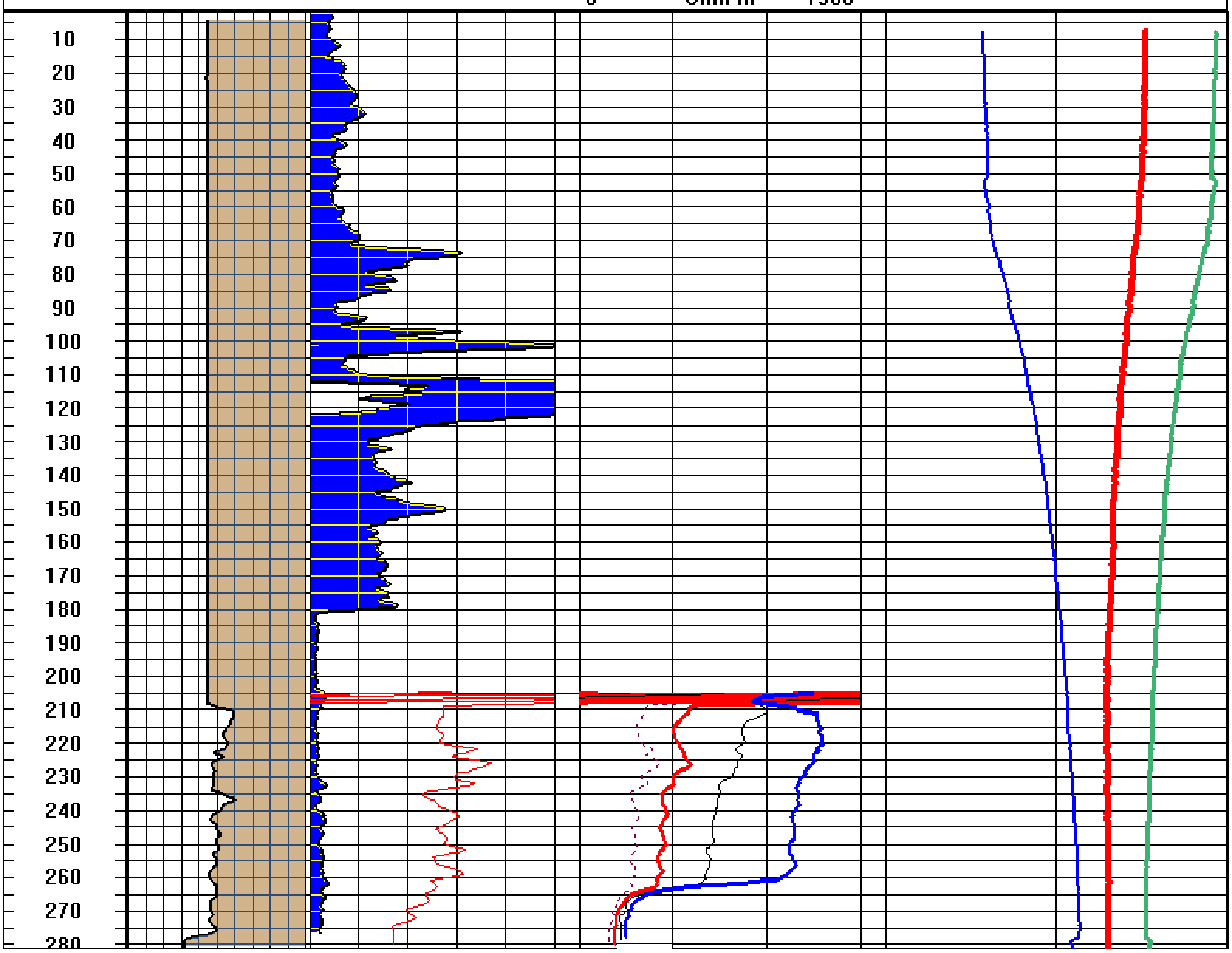
Geophysical Logs

Well ID **S-0344**

Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

Site :	Lake Orienta	Lat / Long	
		Elevation	______ ft NGVD
Date :	4/27/04	Depth Logged	281 ft bls
Logger :	J.Lombardi	**Casing** Depth	208 ft bls
Comments :		Diameter	4 inches
MW1		**Flow** Surface	______ above Casing
		Pumped	______ gpm
		Aquifer System	

Depth	Caliper	Gamma	R8	Fres
1ft:600ft	0 Inches 10	0 CPS 500	0 Ohm-m 1500	15 Ohm-m 35
		SPR	R16	Temp
		0 ohm 500	0 Ohm-m 1500	22 DegC 27
			R32	Cond.
			0 Ohm-m 1500	0 uS/cm 500
			R64	
			0 Ohm-m 1500	

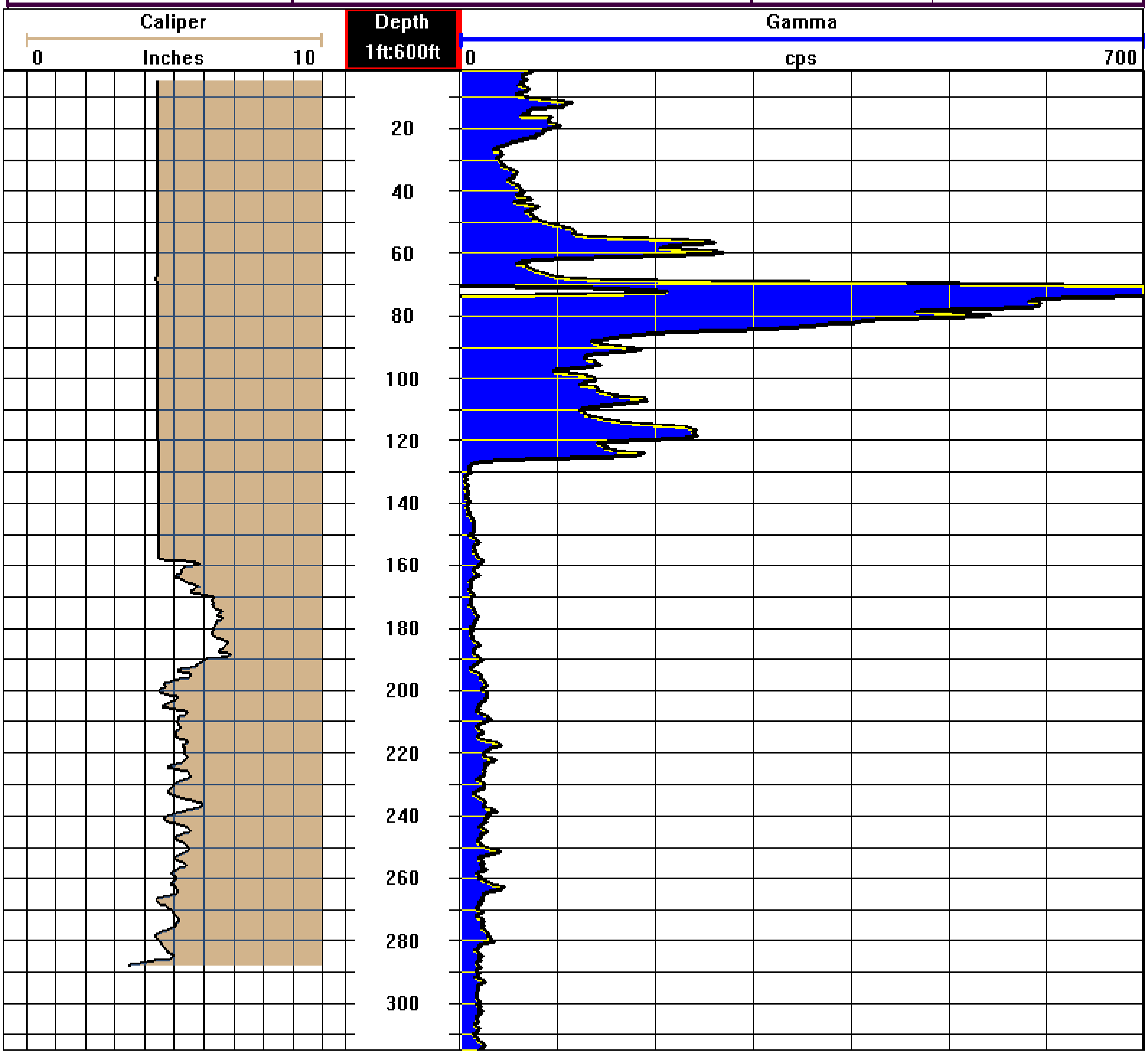


Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

Geophysical Logs

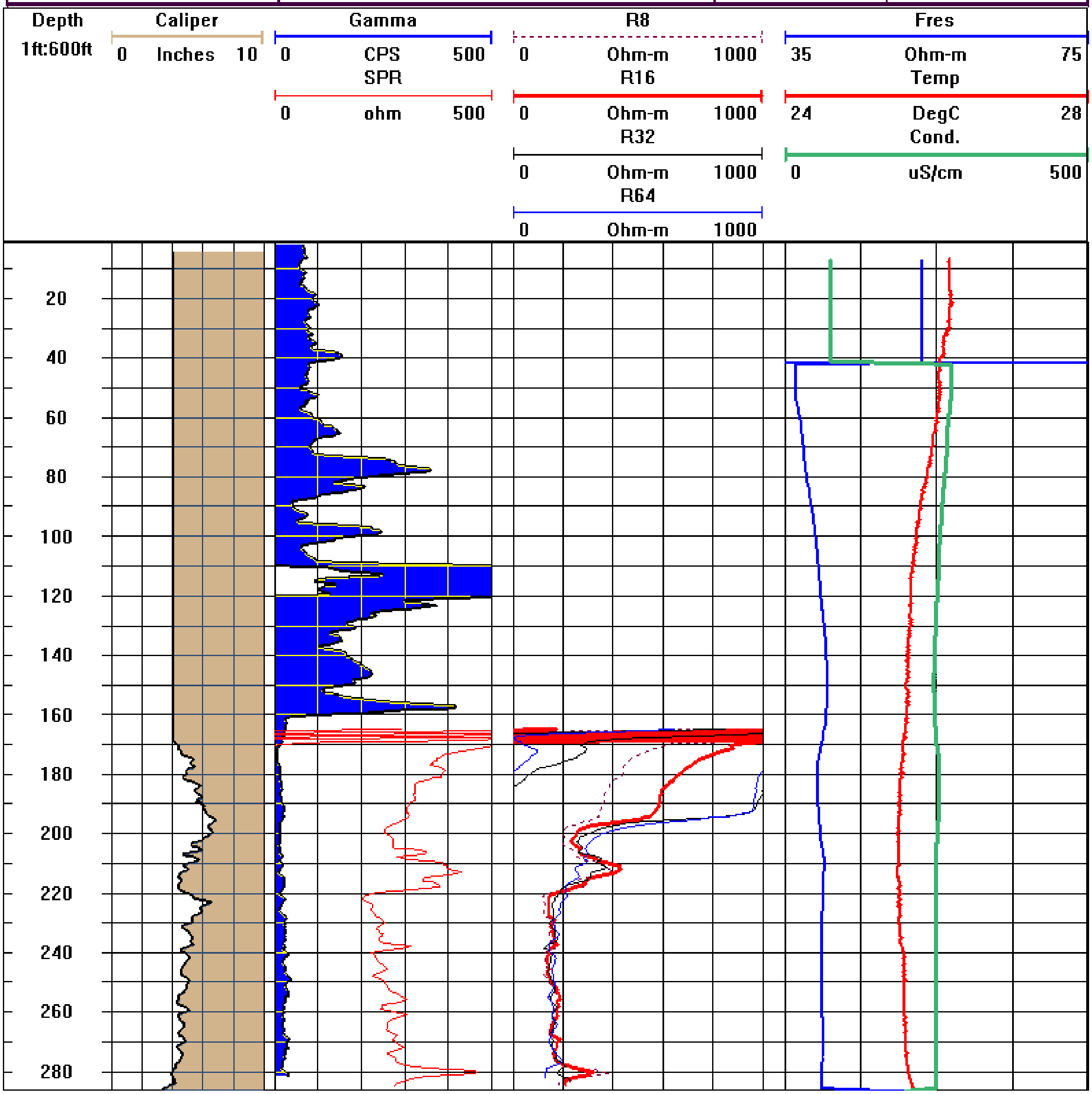
Well ID **S-0345**

Site :	Lake Orienta	Lat / Long	
		Elevation	______ ft NGVD
Date :	4/29/04	Depth Logged	315 ft bls
Logger :	J. Lombardie	**Casing** Depth	157 ft bls
Comments :		Diameter	4 inches
	MW2 on Barclay Ave. at lift station	**Flow** Surface	______ above Casing
		Pumped	______ gpm
		Aquifer System	Floridan



Geophysical Logs

Division of Ground Water Programs P.O. Box 1429 Palatka, Fl 32178-1429 (386) 329 - 4835	**Geophysical Logs**	**Well ID**	**S-0346**
	Site : Lake Orienta	Lat / Long	
		Elevation	_______ ft NGVD
	Date : 4/29/04	Depth Logged	286 ft bls
	Logger : J. Lombardie	**Casing** Depth	169 ft bls
	Comments :	Diameter	4 inches
	MW3 off riveras Drive	**Flow** Surface	_______ above Casing
		Pumped	_______ gpm
		Aquifer System	



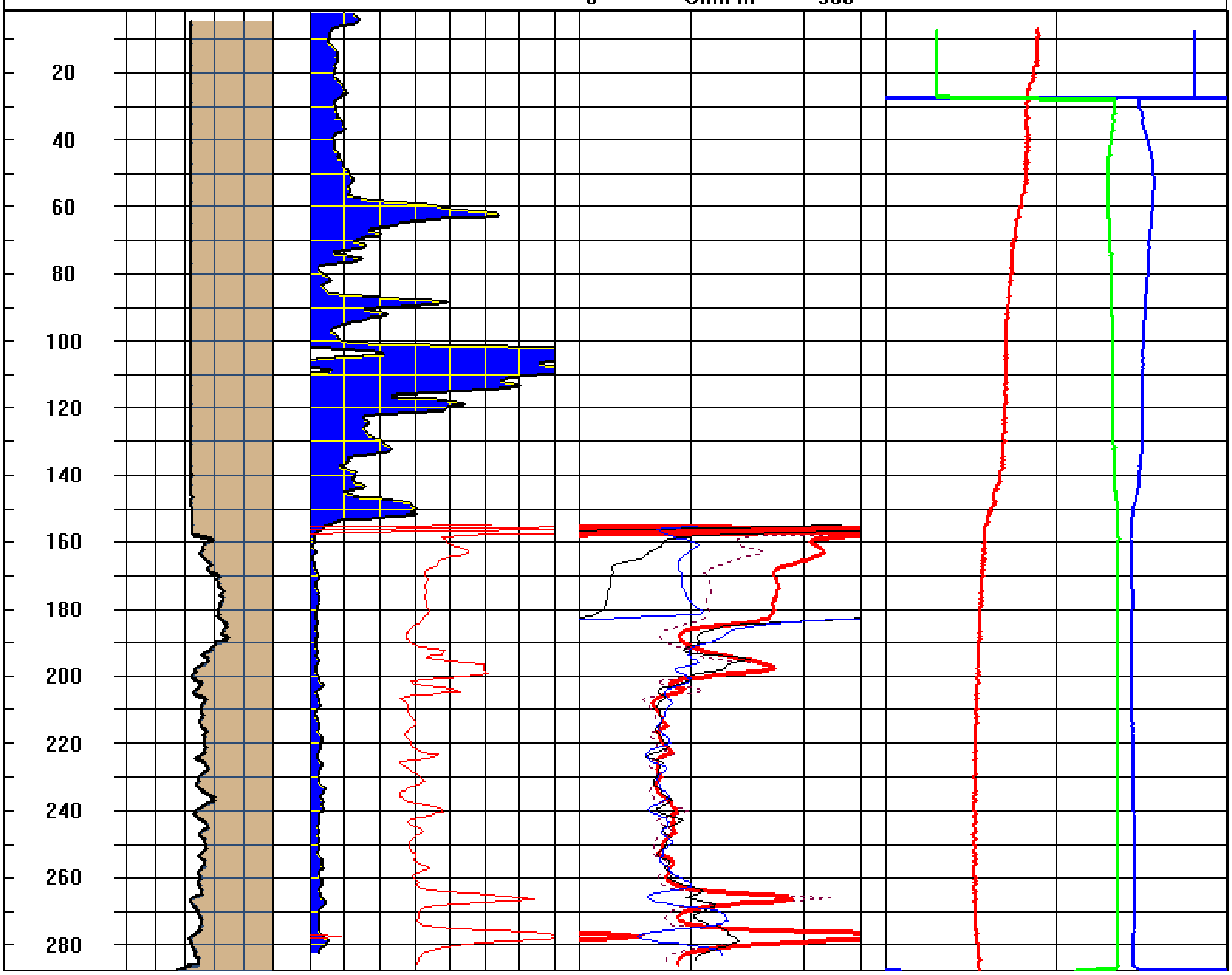
Geophysical Logs

Well ID **S-0347**

Division of Ground Water Programs
P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

Site :	Lake Orienta	Lat / Long	
		Elevation	______ ft NGVD
Date :	4/29/04	Depth Logged	287 ft bls
Logger :	J. Lombardie	**Casing** Depth	158 ft bls
Comments :		Diameter	4 inches
	MW4 - Barclay and Fernwood	**Flow** Surface	______ above Casing
		Pumped	______ gpm
		Aquifer System	

Depth	Caliper	Gamma	R8	Fres
1ft:600ft	0 Inches 10	0 CPS 700	0 Ohm-m 500	15 Ohm-m 35
		SPR	R16	Temp
		0 ohm 500	0 Ohm-m 500	24 DegC 29
			R32	Cond.
			0 Ohm-m 500	0 uS/cm 500
			R64	
			0 Ohm-m 500	

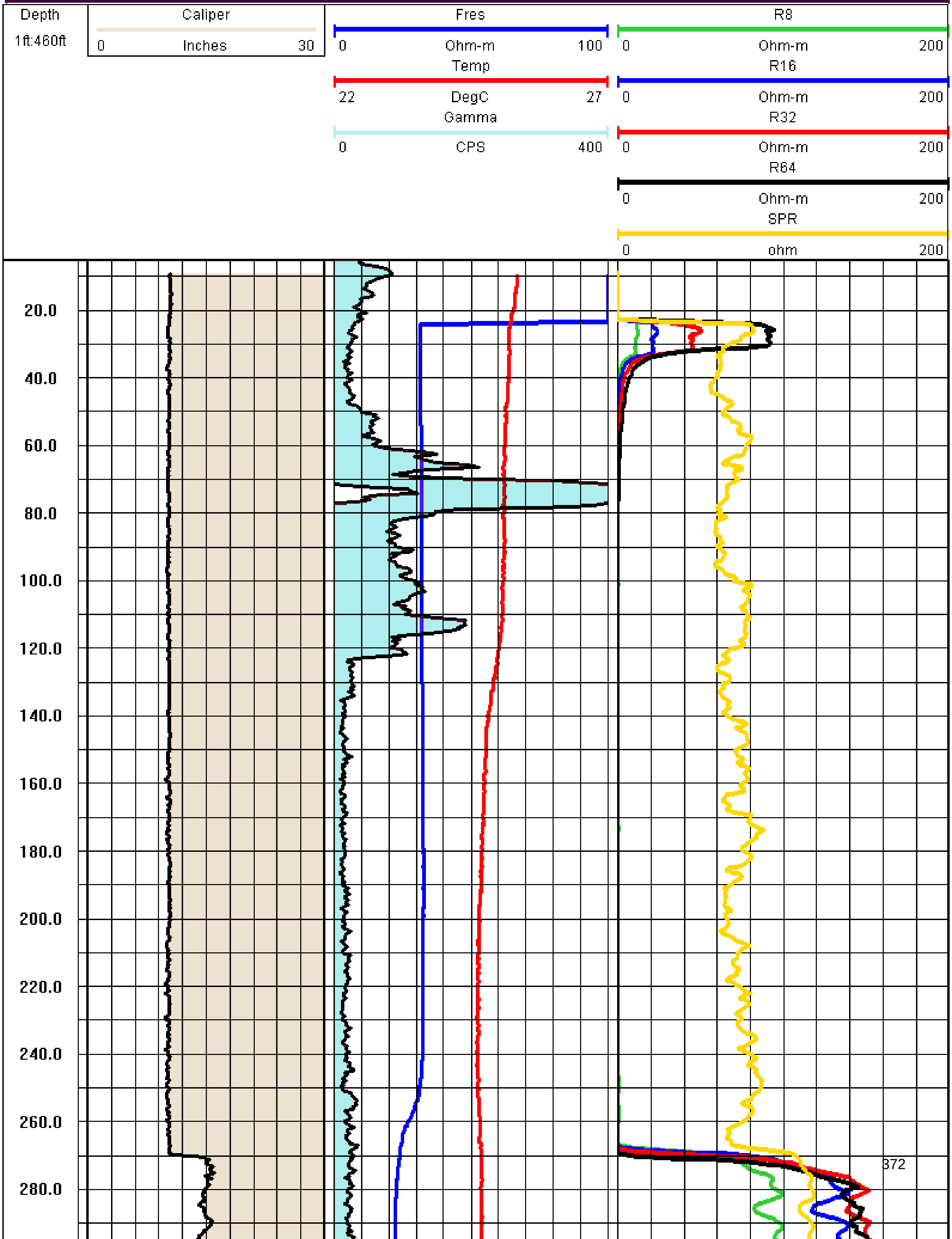


Division of Ground Water Programs

P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

on Lake Oneida

Date : 4/03/02	Elevation	61	ft NGVD
Logger : SJRWMD - S. dossat	Depth Logged	326	ft bls
Comments :	**Casing** Depth	270	ft bls
	Diameter	10	inches
	Flow Surface		above Casing
	Pumped		gpm
	Aquifer System	CF	



Division of Ground Water Programs

P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

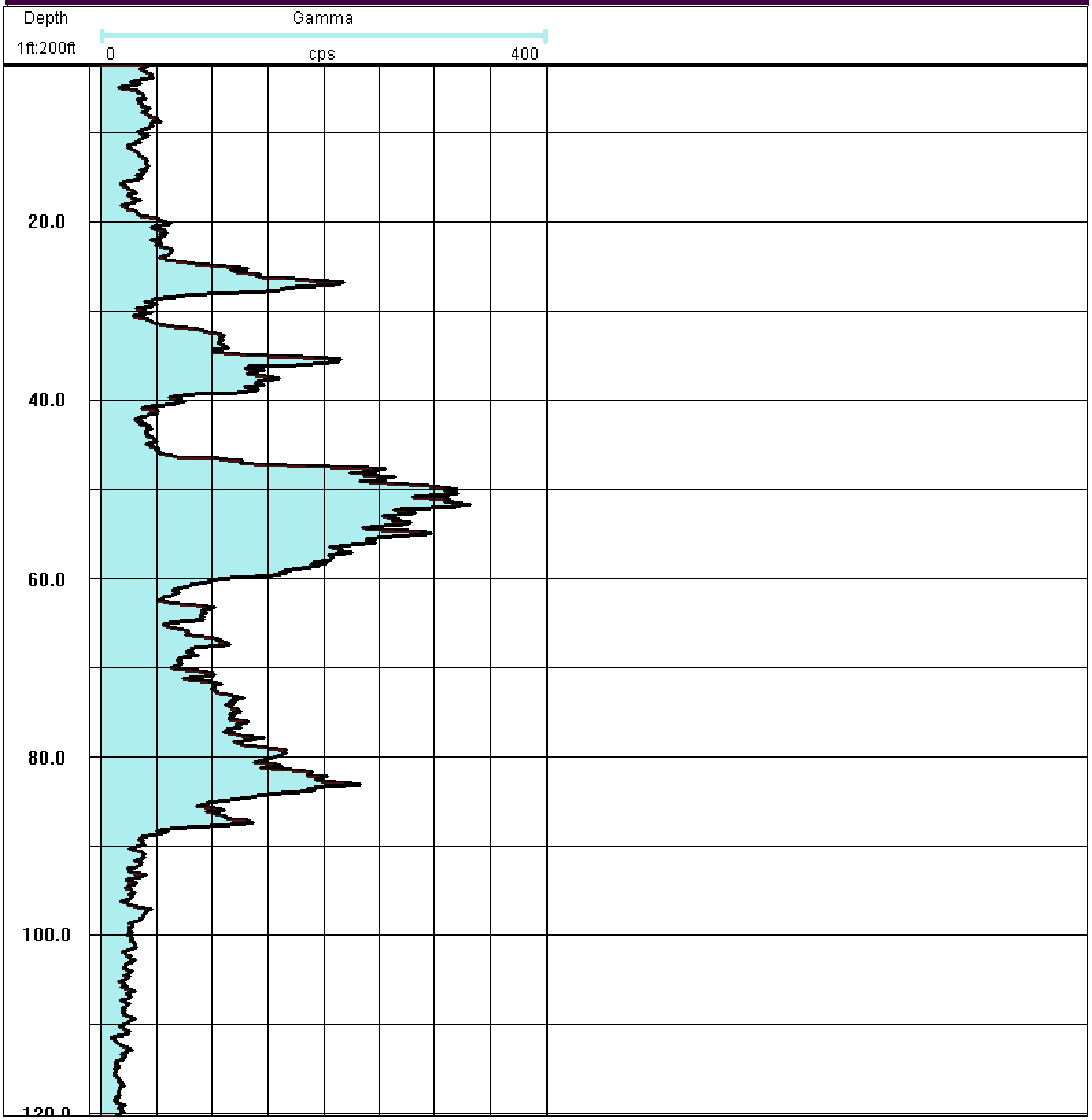
319 Barclay, Lake Orienta drainage well.

Date : 04/25/02

Logger : SJRWMD - S. Dossat

Comments :

Elevation		61 ft NGVD
Depth Logged		120 ft bls
Casing	Depth	ft bls
	Diameter	inches
Flow	Surface	above Casing
	Pumped	gpm
Aquifer System		

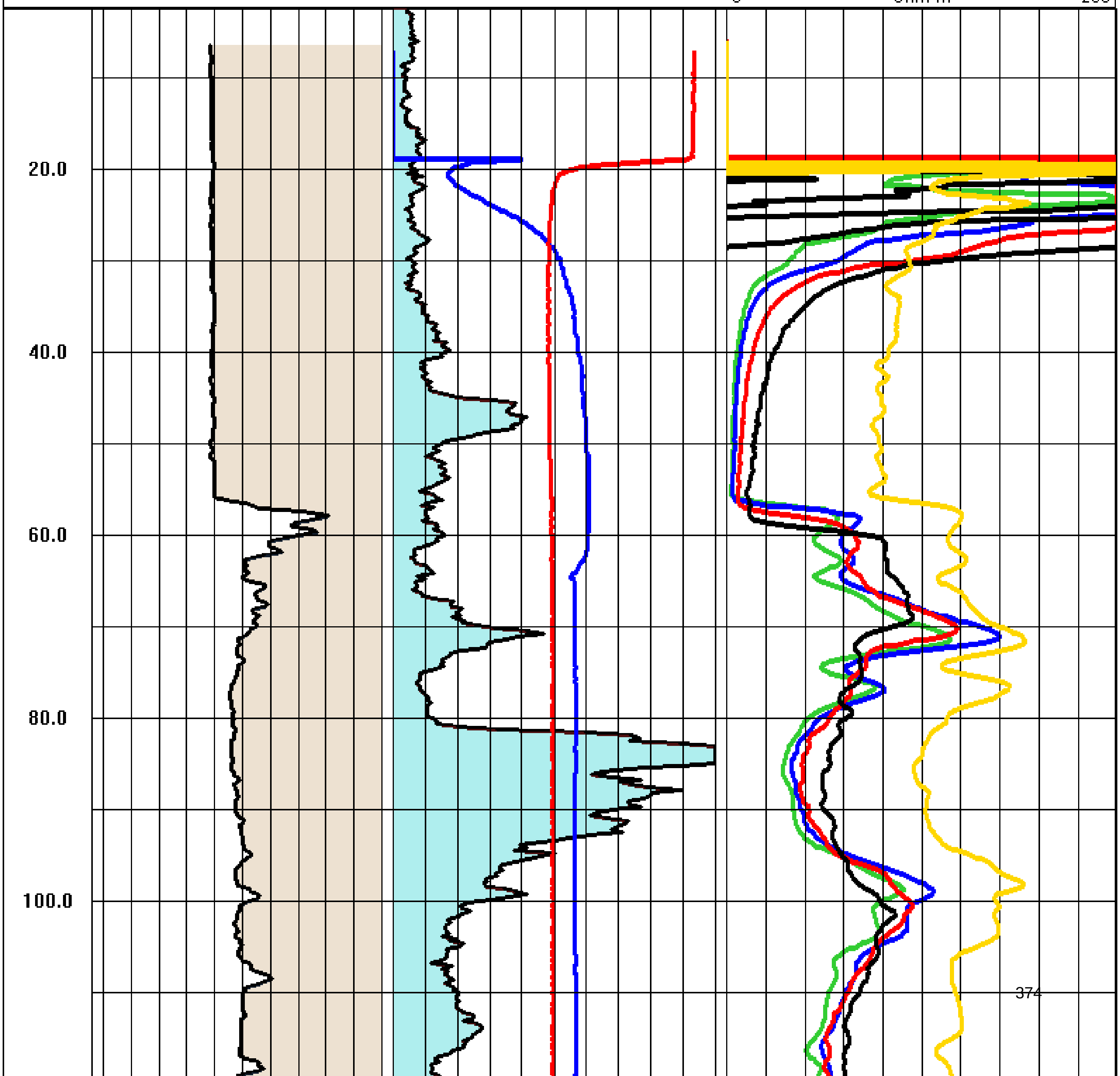


Division of Ground Water Programs

P.O. Box 1429
Palatka, Fl 32178-1429
(386) 329 - 4835

Date : 04/25/02	Elevation		ft NGVD
Logger : SJRWMD - S Dossat	Depth Logged		ft bls
Comments :	**Casing** Depth	56	ft bls
	Diameter	12	inches
	Flow Surface		above Casing
	Pumped		gpm
	Aquifer System		

Depth	Caliper	Gamma	SPR
1ft:200ft	0 Inches 30	0 CPS 1000	0 ohm 200
		Fres	R8
		0 Ohm-m 50	0 Ohm-m 200
		Temp	R16
		20 DegC 30	0 Ohm-m 200
			R32
			0 Ohm-m 200
			R64
			0 Ohm-m 200



Appendix E

Groundwater Tracer Test Laboratory Reports

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

May 19, 2003

RECEIVED
MAY 2 1 2003
CH2M Hill/ORL

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for background water samples shipped on May 13, 2003 Ozark Underground Laboratory (OUL) numbers M6626 and M6627.

Dear Mr. Aikens:

We have completed analysis of the background water samples received by the OUL on May 14, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for water samples
2. Sample Collection Data Sheet
3. Sample analysis graphs

f:\docs\coa\festival01.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park
Samples Collected by: Mike Burns
Date Samples Shipped: May 13, 2003
Date Samples Rec'd at OUL: May 14, 2003
Date Analyzed by OUL: May 14, 2003

Table 1. Results for background water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Collected	Fluorescein		Eosine		RWT	
			2003	Peak	Conc.	Peak	Conc.	Peak	Conc.
M6626	1	South Recharge	5/13 NT	ND		ND		ND	
M6627	2	North Recharge	5/13 NT	ND		ND		ND	

FOOTNOTES:

NT = No time given

ND = No dye detected

29296

~~PC&E Environmental~~
~~210 Park Road, Oviedo, FL 32765~~
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order:

Date: Page 1 of 1

COMPANY: Nodarse & Assoc.
ADDRESS: 1675 Lee Rd.
Winter Park, FL. 32789
SAMPLED BY: Mike Burns SIGN: [signature]
PHONE: 407-740-6110 FAX: 407-740-6112

ANALYSIS REQUESTED

#	SAMPLE ID	DATE/TIME	AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID	Dye Tracer	# of water vials rec'd by OUL	# of charcoal pack is rec'd by OUL	OUL Lab #	Number of Containers
1	South Recharge	5/13/03		✓				✓	1	0	M6626	1
2	North Recharge	↓		✓				✓	1	0	M6627	1
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												

PRESERVATION

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: ~~[signature]~~	~~11-26-02~~ 1623	1: MB	
2: [signature]	5/13/03	2: OUL - J. Arnold	5/14/03 1531
3:		3:	

PROJECT INFORMATION
PROJECT NAME: Festival Park / CH2M Hill
PROJECT #: W01-E-120-1
SITE ADDRESS: 225 E. Robinson St, Orlando, FL.
PROJECT MANAGER: Lydia Wing

SAMPLE RECEIPT
Total # of Containers
Chain of Custody Seals
Recv'd in Good Condition
PO #:

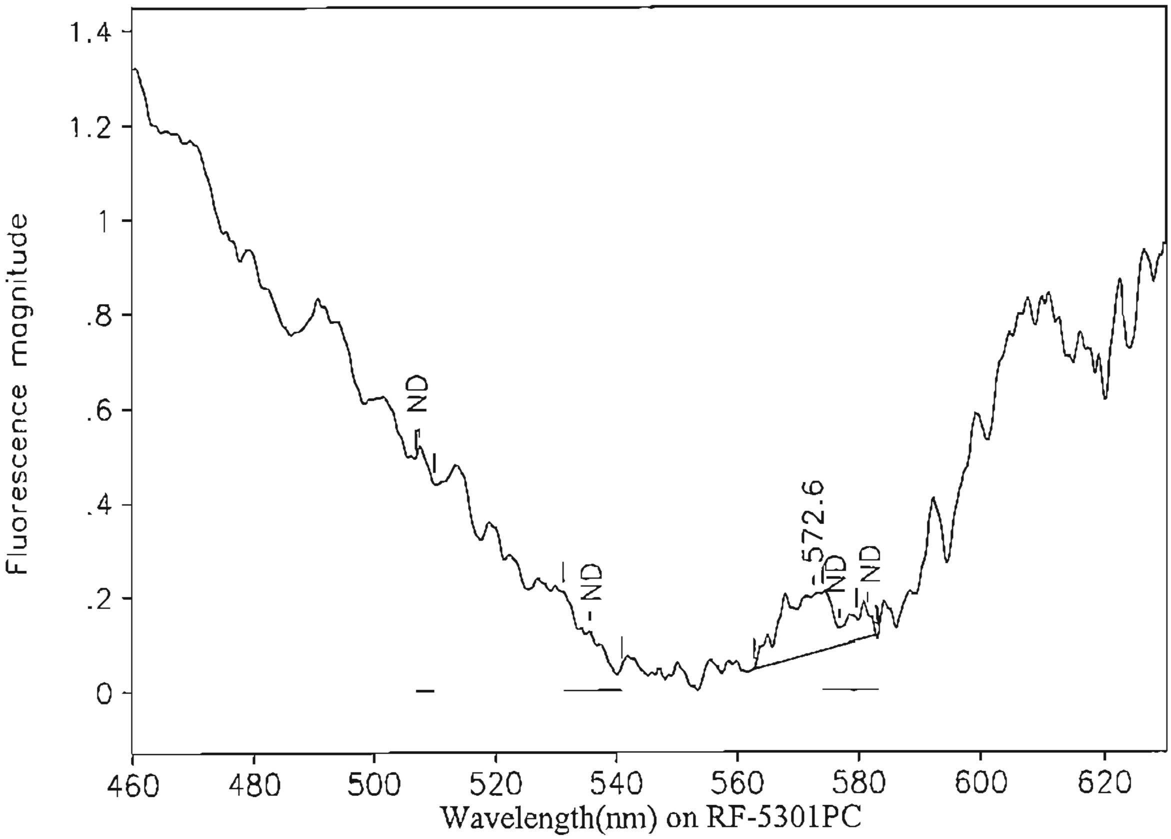
SPECIAL INSTRUCTIONS/COMMENTS:
Project 551 Analyzed 5/14/03 by MR

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE/CONTRACT #:

WHITE: Project File YELLOW: Laboratory PINK: Sampler

Ozark Underground Laboratory



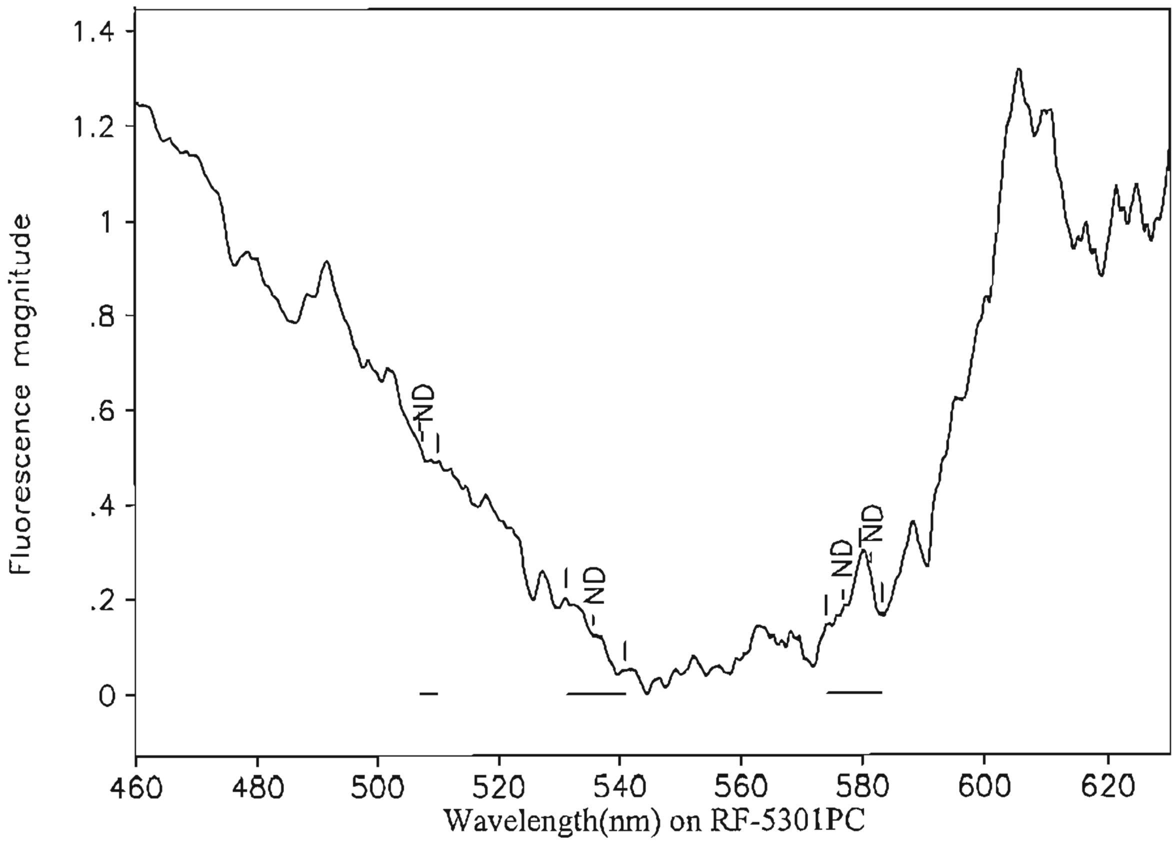
Station 1: South Recharge
OUL number: M6626
Matrix: Water
Collected: 05/13/03

Analyzed: 05/14/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.4	506.9	509.9	0.00	0.00	0.00	ND
535.6	531.2	540.9	0.00	0.00	0.00	ND
576.8	574.1	579.5	0.00	0.00	0.00	ND
581.4	579.7	583.2	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
572.6	562.8	582.8	0.12	1.53	0.08	~~0.018~~ ND

Ozark Underground Laboratory



Station 2: North Recharge
OUL number: M6627 Analyzed: 05/14/03
Matrix: Water
Collected: 05/13/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.4	506.9	509.9	0.00	0.00	0.00	ND
535.6	531.2	540.9	0.00	0.00	0.00	ND
576.8	574.1	579.5	0.00	0.00	0.00	ND
581.4	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

May 29, 2003

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for background charcoal samplers shipped on May 20, 2003
Ozark Underground Laboratory (OUL) numbers M6717 and M6727.

Dear Mr. Aikens:

We have completed analysis of the background charcoal samplers received by the OUL on May 21, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheet
3. Nodarse & Associates Chain-of-Custody
4. Discrepancy sheet
5. Sample analysis graphs

f:\docs\coa\festival02.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park
Samples Collected by: Mike Burns / Tiffany F.
Date Samples Shipped: May 20, 2003
Date Samples Rec'd at OUL: May 21, 2003
Date Analyzed by OUL: May 23, 2003

Table 1. Results for background charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected 2003	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.
M6717	1	South Recharge Well	NDT	5/20 NT	ND		ND	
M6718	2	North Recharge Well	NDT	5/20 NT	ND		ND	
M6719	3	MW-1 167'	NDT	5/20 NT	515.2 *	0.213	ND	
M6720	Laboratory Control Charcoal Blank							
M6721	4	MW-1 197'	NDT	5/20 NT	513.8 *	0.233	ND	
M6722	5	MW-2 195'	NDT	5/20 NT	ND		ND	
M6723	6	MW-2 225'	NDT	5/20 NT	517.2 *	0.215	ND	
M6724	7	MW-3 195'	NDT	5/20 NT	ND		ND	
M6725	8	MW-3 225'	NDT	5/20 NT	ND		ND	
M6726	9	MW-4 195'	NDT	5/20 NT	516.6 *	0.476	ND	
M6727	10	MW-4 225'	NDT	5/20 NT	516.4 *	0.549	ND	

FOOTNOTES:

NDT = No date or time given

NT = No time given

ND = No dye detected

* = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were the dye for background purposes.

OZARK UNDERGROUND LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park / CH2M Hill Week No: 2 Samples Collected By: M. Burns / Tiffiny F.
Samples Shipped By: M. Burns Samples Received By: M. Arnold
Date Samples Shipped: 5/20/03 Date Samples Received: 5/21/03 Time Samples Received: 13:00 Return Cooler? Yes ___ No ✓
Bill to: ___ Send Results to: ___
Analyze for: Fluorescein ✓ Eosine ✓ Rhodamine WT ___ Other ___ Ship cooler to: ___

OUL use only		Please indicate stations where dye was visible in the field — for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED 2003 DATE	PLACED 2003 TIME	COLLECTED 2003 DATE	COLLECTED 2003 TIME	# WATER REC'D
2	M6717	1	South Recharge Well			5/20		0
2	M6718	2	North Recharge Well			5/20		0
1	M6719	3	MW-1 167'			5/20		0
1	M6721	4	MW-1 197'			5/20		0
1	M6722	5	MW-2 195'			5/20		0
1	M6723	6	MW-2 225'			5/20		0
1	M6724	7	MW-3 195'			5/20		0
1	M6725	8	MW-3 225'			5/20		0
1	M6726	9	MW-4 195'			5/20		0
1	M6727	10	MW-4 225'			5/20		0

COMMENTS: Charcoal Blank - M6720

This sheet filled out by OUL staff? Yes X No ___ Charts for samples on this page proofed by OUL: mmw

Project 551 Analyzed 5/28/03 by NR
23ca

Page 1 of 1

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~~PC&B Environmental~~
~~210 Park R~~ ~~, Oviedo, FL 32765~~
407-359-7194 (FAX) 407-359-7197

Chain o. Custody

Work Order:
Date: 5/20/03 Page 1 of 1

COMPANY: Nodarse & Assoc.
ADDRESS: 1675 Lee Rd.
Winter Park, FL. 32789
SAMPLED BY: Mike Burns / Tiffiny Friedand SIGN: Mike B
PHONE: 407-740-6110 FAX: 407-740-6112

ANALYSIS REQUESTED: Tracer Dye
PRESERVATION: ICE

#	SAMPLE ID	DATE/TIME	MATRIX: AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID	Tracer Dye (ICE)	Number of Containers
1	mw-1 167' & 197'	5/20/03						✓	2
2	mw-2 195' & 225'	↓						✓	2
3	mw-3 195' & 225'	↓						✓	2
4	mw-4 195' & 225'	↓						✓	2
5	South Recharge Well	↓						✓	1
6	North Recharge Well	↓						✓	
7									
8									
9									
10									
11									
12									
13									

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Mike B	5/20/03	1: M. Armond / OVL	5/21/03 1300
2:		2:	
3:		3:	

PROJECT INFORMATION
PROJECT NAME: Festival Park / CH2M Hill
PROJECT #: WO1-E-120-1
SITE ADDRESS: Orlando Florida
PROJECT MANAGER: Lydia Wing

SAMPLE RECEIPT
Total # of Containers
Chain of Custody Seals
Recv'd In Good Condition
PO #:

SPECIAL INSTRUCTIONS/COMMENTS:

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE/CONTRACT #:

OVL Page 1 of 1

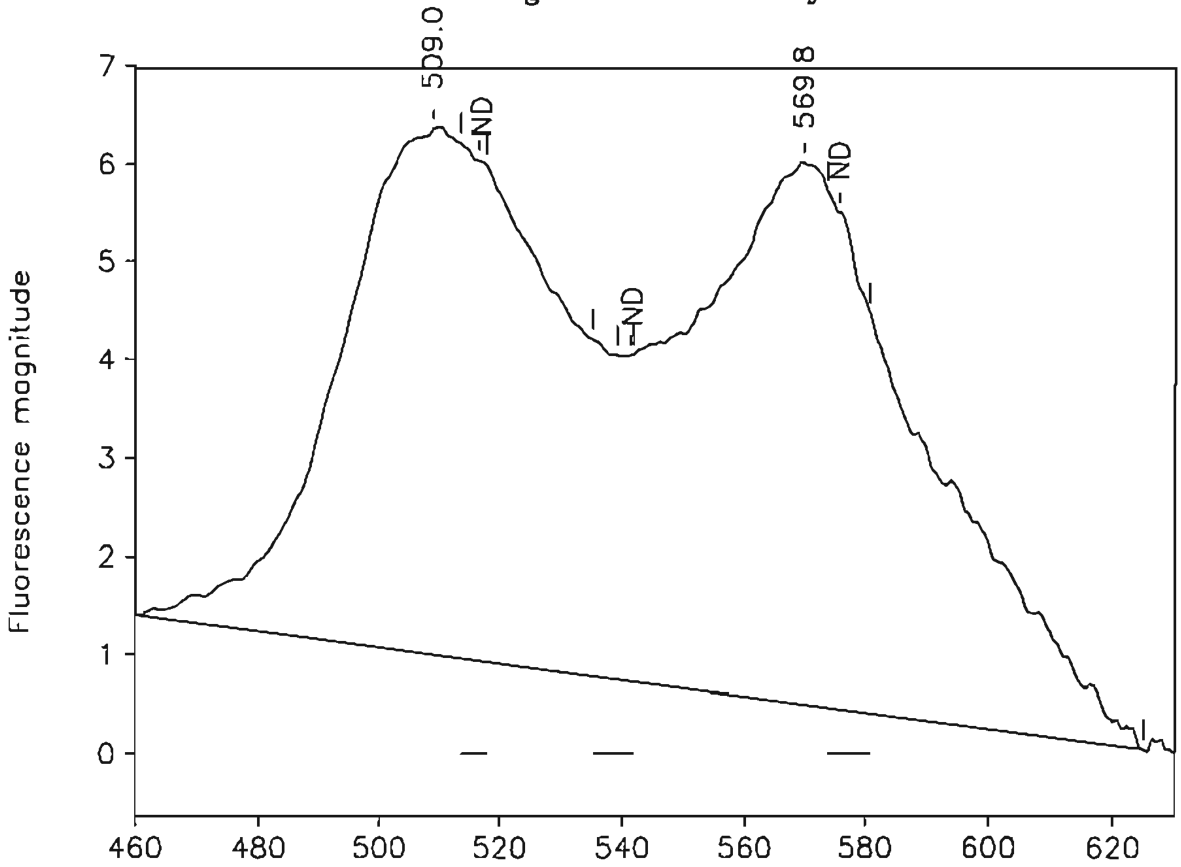
WHITE: Project File YELLOW: Laboratory PINK: Sampler

OZARK UNDERGROUND LABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED					Page 1 of 1
Company & Project Name: CH2M HILL / Festival Park				**Date Rec'd by OUL:** 5/21/03	**Wk #**
Lab #	**Sta #**	**Station Name**	**Date Pulled**	**Problem**	**Solution**
		MW-1 167'	5/20	MW-1 @ 167' & MW-1 @ 197'	OUL Staff filled out a
		MW-1 197'	5/20	were listed together on Same line	Standard OUL Sample
		MW-2 195'	5/20	MW-2@195' + MW-2@225' were	Collection Data sheet.
		MW-2 225'	5/20	listed together on Same line	Listing each Sample from
		MW-3 195'	5/20	MW-3@ 195' + MW-3@ 225' were	each depth separately,
		MW-3 225'	5/20	listed together on Same line.	So they Could be given
		MW-4 195'	5/20	MW-4@ 195' + MW-4@ 225' were	individual lab #'s
		MW-4 225'	5/20	listed together on Same line.	

Comments:

Ozark Underground Laboratory



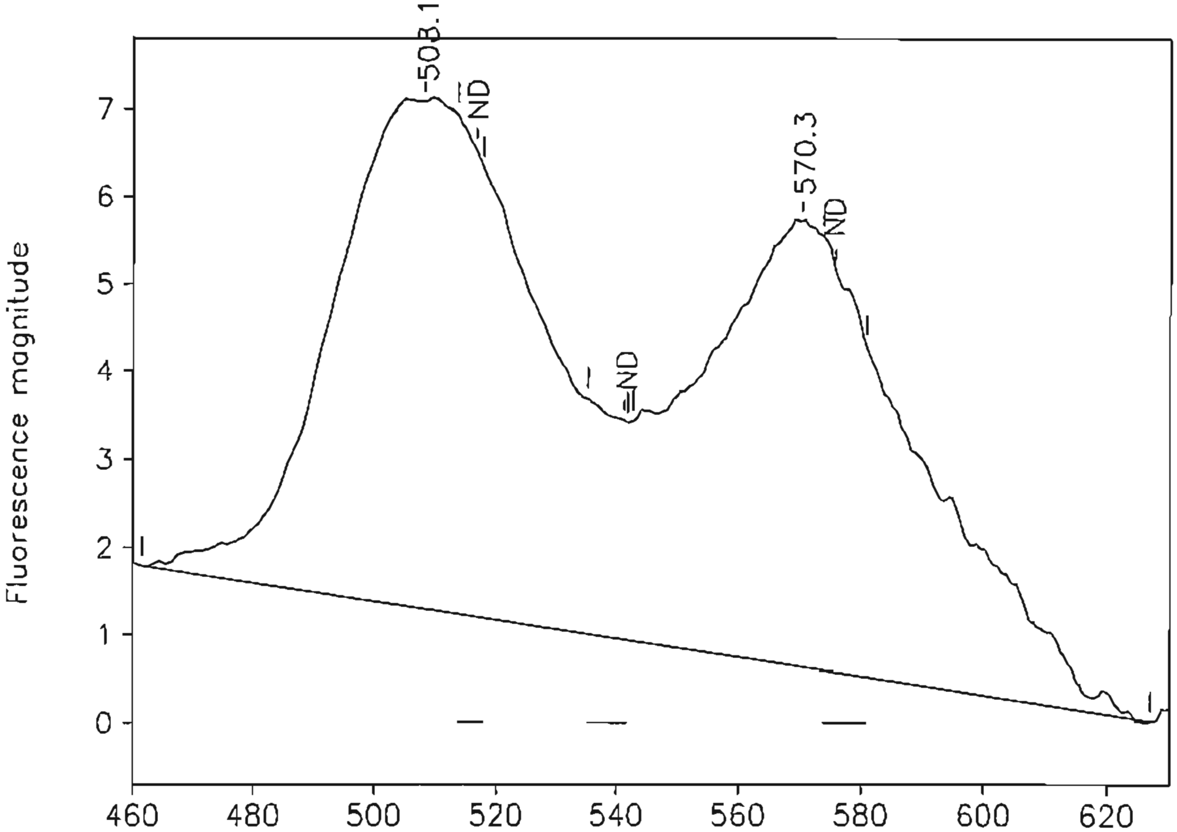
Station 1: South Recharge Well
OUL number: M6717
Matrix: Elutant
Placed: / /

Analyzed: 05/23/03
Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.8	539.1	625.0	5.52	258.27	0.02	~~37.7~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
509.0	460.4	539.1	5.35	228.95	0.02	~~5.43~~ ND

Ozark Underground Laboratory



Station 2: North Recharge Well
OUL number: M6718
Matrix: Elutant
Placed: / /

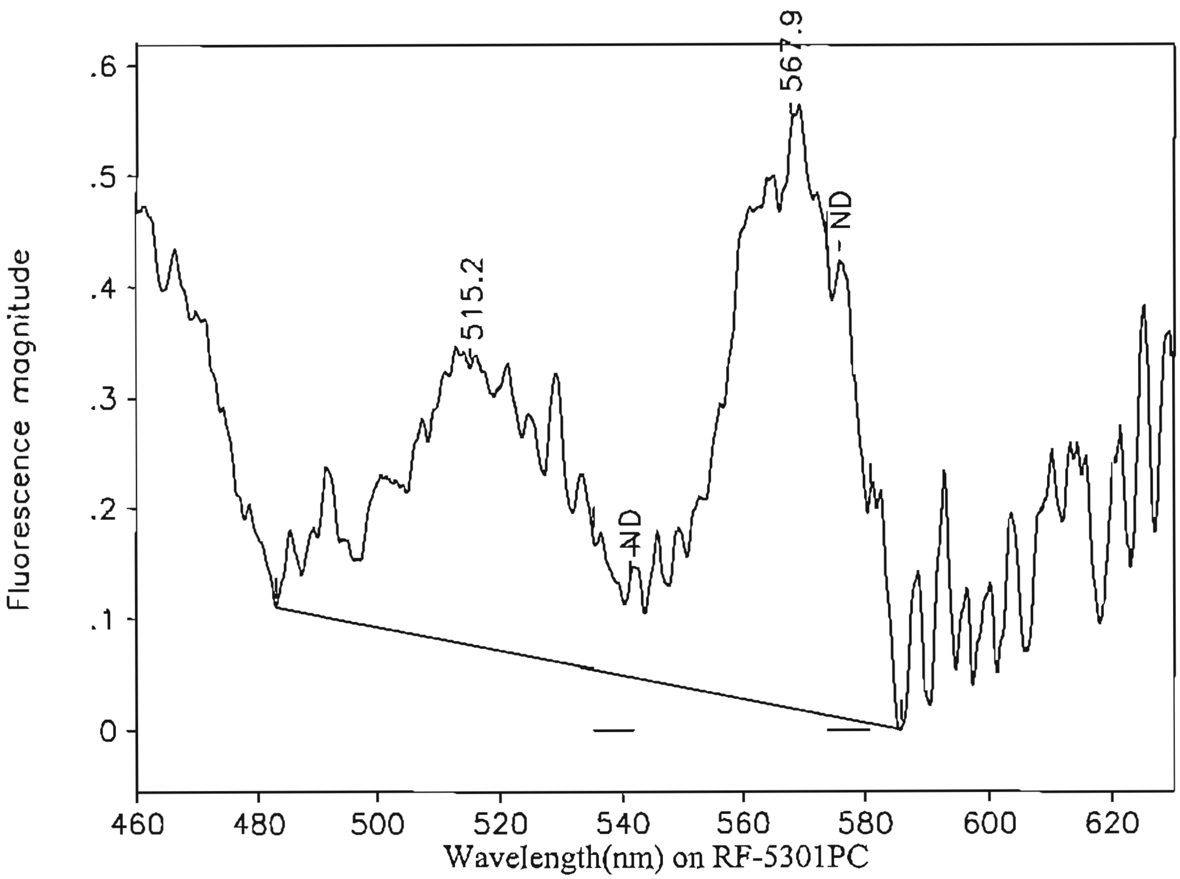
Analyzed: 05/23/03

Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.3	542.7	626.9	5.08	216.20	0.02	~~31.5~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
508.1	461.6	542.7	5.78	240.80	0.02	~~5.71~~ ND

Ozark Underground Laboratory



Station 3: MW-1 167'
OUL number: M6719
Matrix: Elutant
Placed: / /

Analyzed: 05/23/03

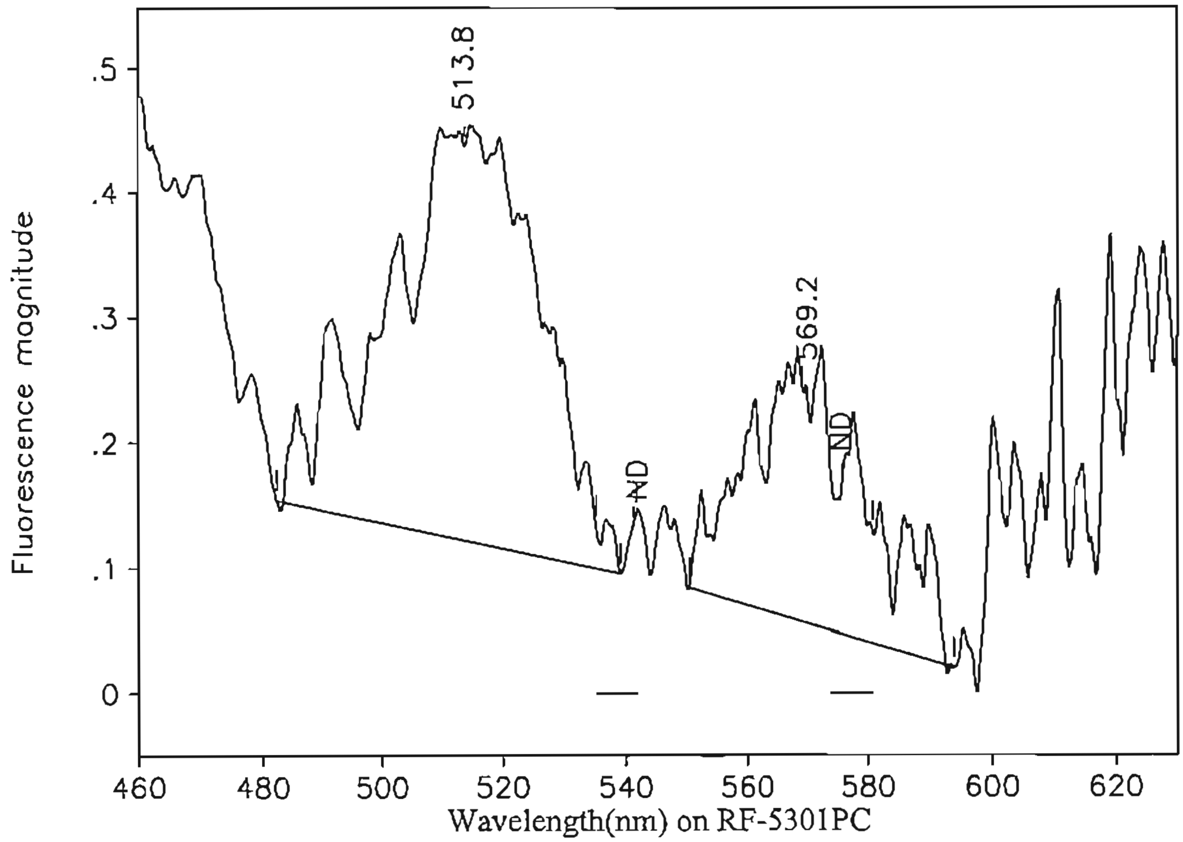
Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	483.0	542.0	0.25	9.00	0.03	0.213
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.9	542.0	585.8	0.53	12.72	0.04	~~1.86~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4: MW-1 197'
OUL number: M6721
Matrix: Elutant
Placed: / /

Analyzed: 05/23/03

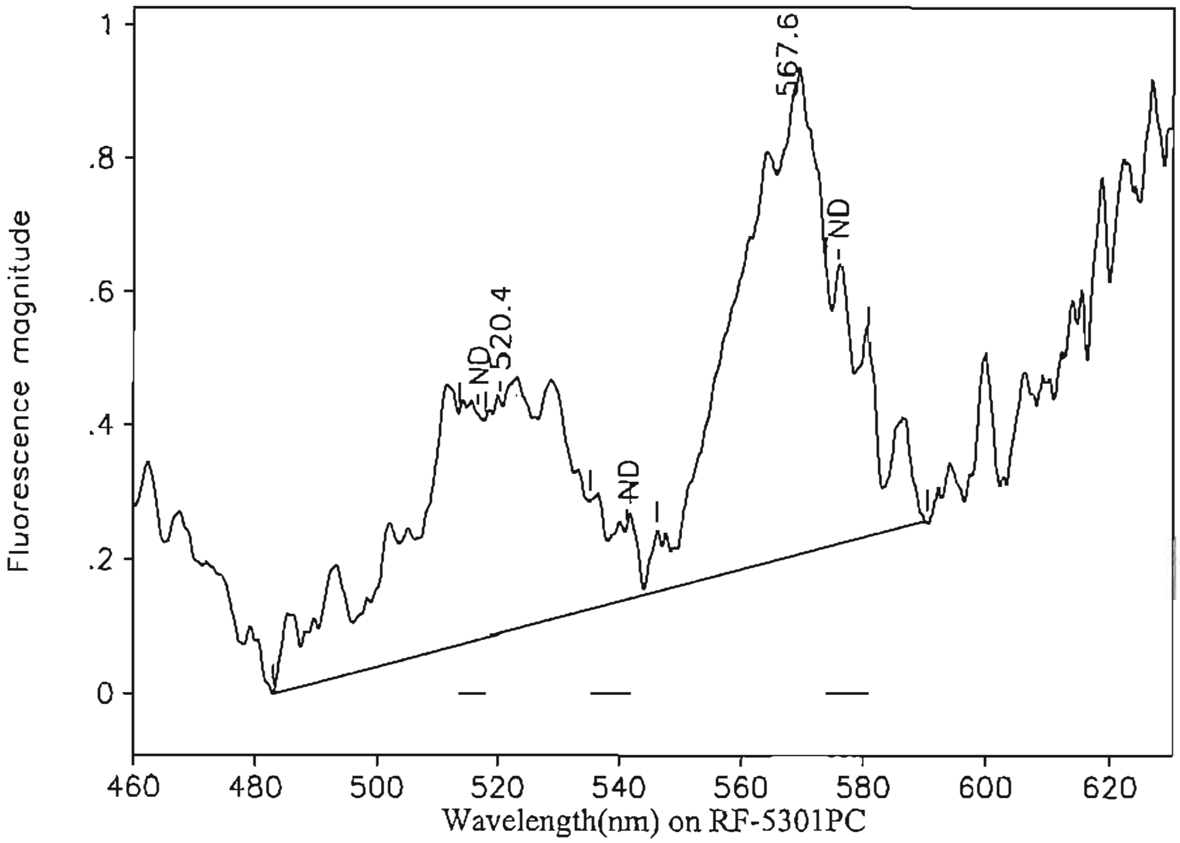
Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
513.8	482.4	539.2	0.32	9.82	0.03	0.233
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.2	550.4	593.8	0.19	4.84	0.04	~~0.706~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 5: MW-2 195'
OUL number: M6722
Matrix: Elutant
Placed: / /

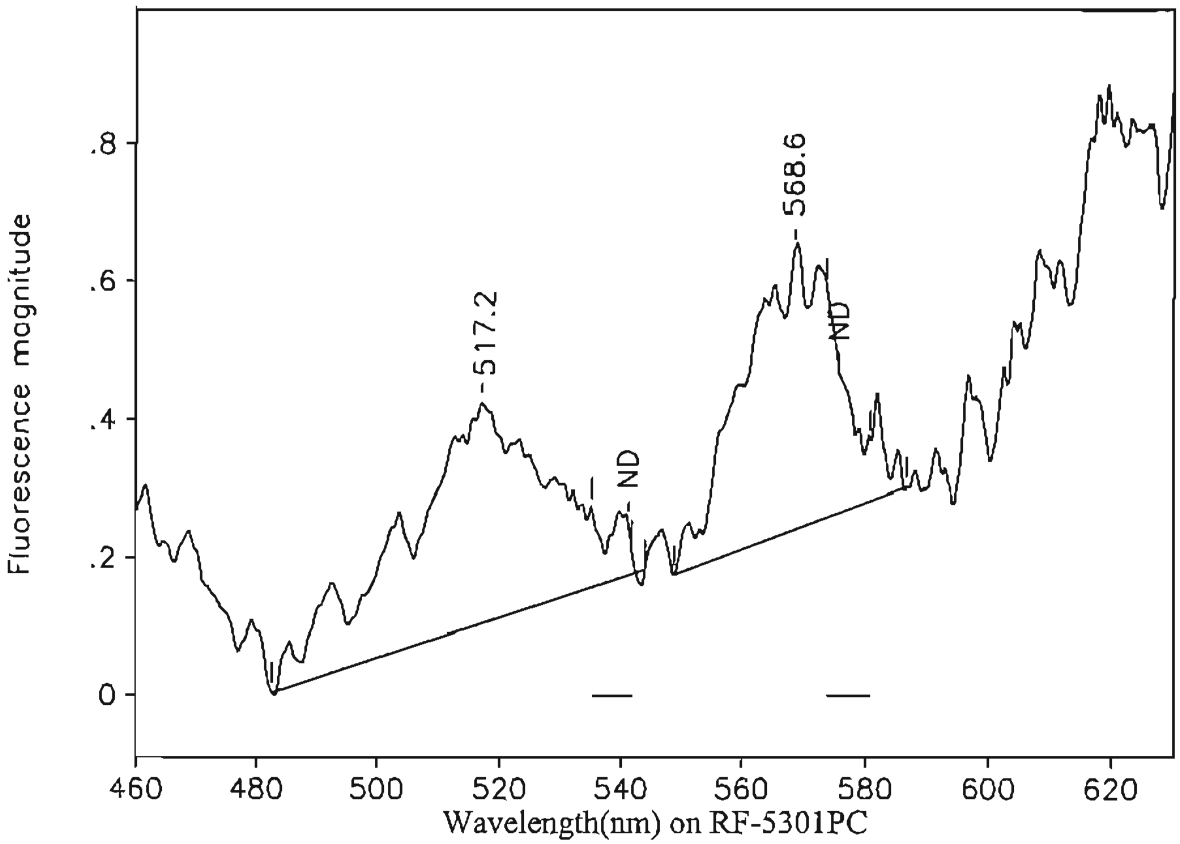
Analyzed: 05/23/03

Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.6	546.2	590.4	0.64	14.39	0.04	~~2.10~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.4	483.0	546.2	0.35	12.81	0.03	~~0.303~~ ND

Ozark Underground Laboratory



Station 6: MW-2 225'
OUL number: M6723
Matrix: Elutant
Placed: / /

Analyzed: 05/23/03

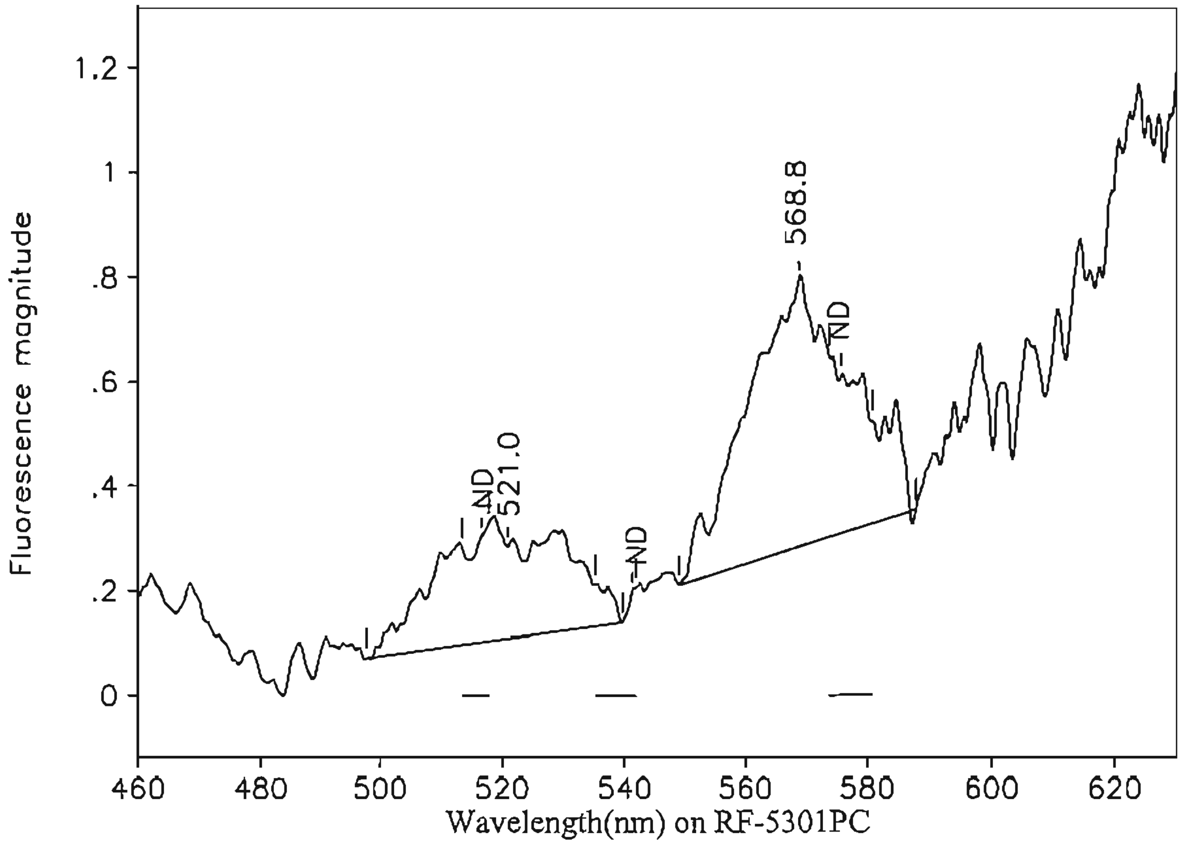
Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	482.6	544.0	0.32	9.06	0.04	0.215
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.6	548.8	586.6	0.41	7.40	0.06	~~1.08~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

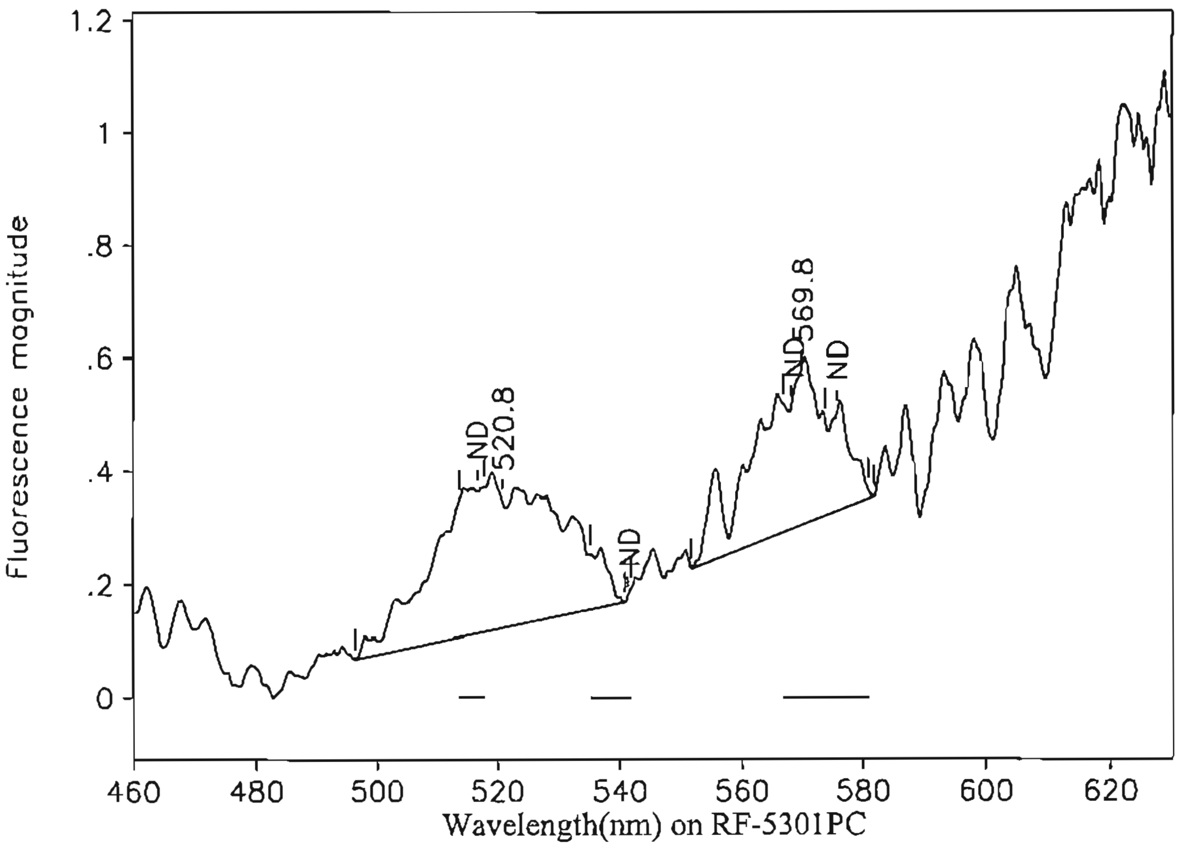


Station 7: MW-3 195'
OUL number: M6724 Analyzed: 05/23/03
Matrix: Elutant
Placed: / / Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.8	549.0	587.8	0.51	10.12	0.05	~~1.48~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.0	497.8	539.6	0.18	5.49	0.03	~~0.130~~ ND

Ozark Underground Laboratory



Station 8: MW-3 225'
OUL number: M6725
Matrix: Elutant
Placed: / /

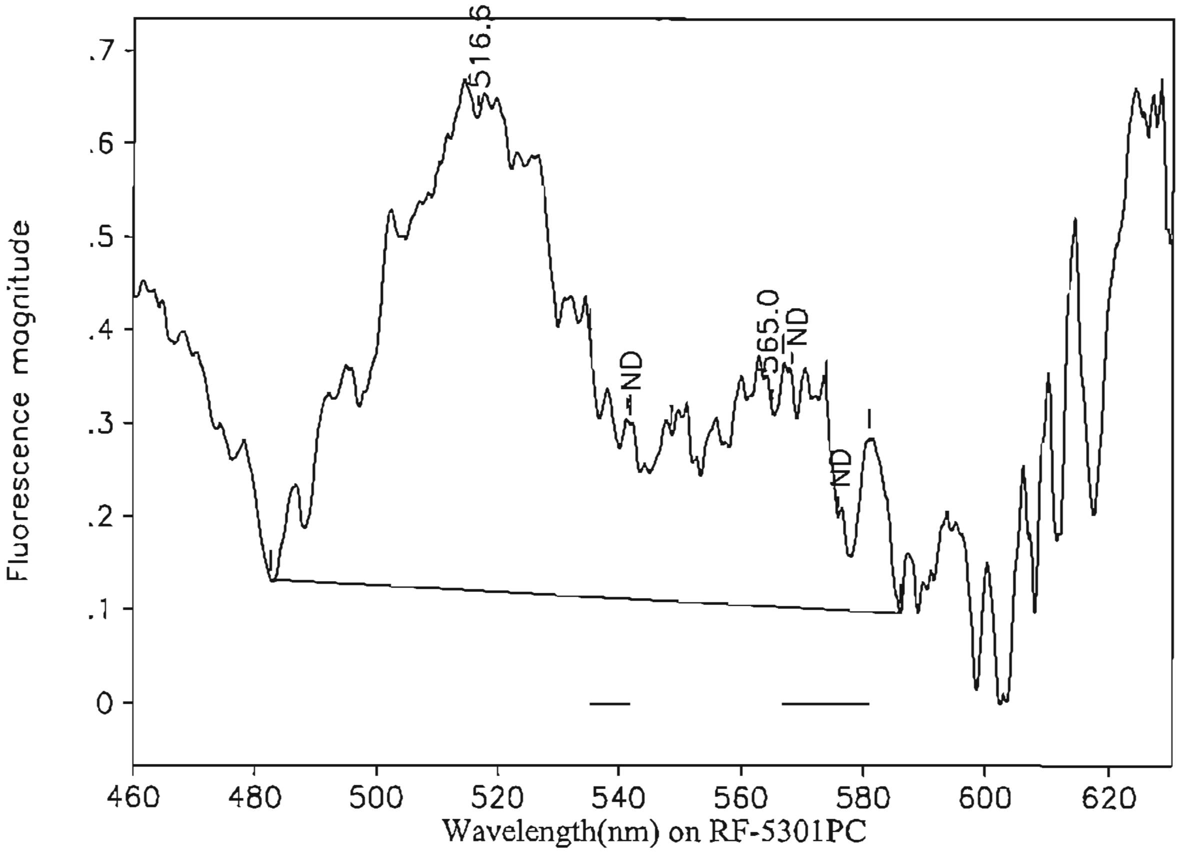
Analyzed: 05/23/03

Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.8	496.4	540.8	0.23	6.63	0.03	~~0.157~~ ND
569.8	551.6	581.8	0.27	4.32	0.06	~~0.630~~

Ozark Underground Laboratory



Station 9: MW-4 195'
OUL number: M6726
Matrix: Elutant
Placed: / /

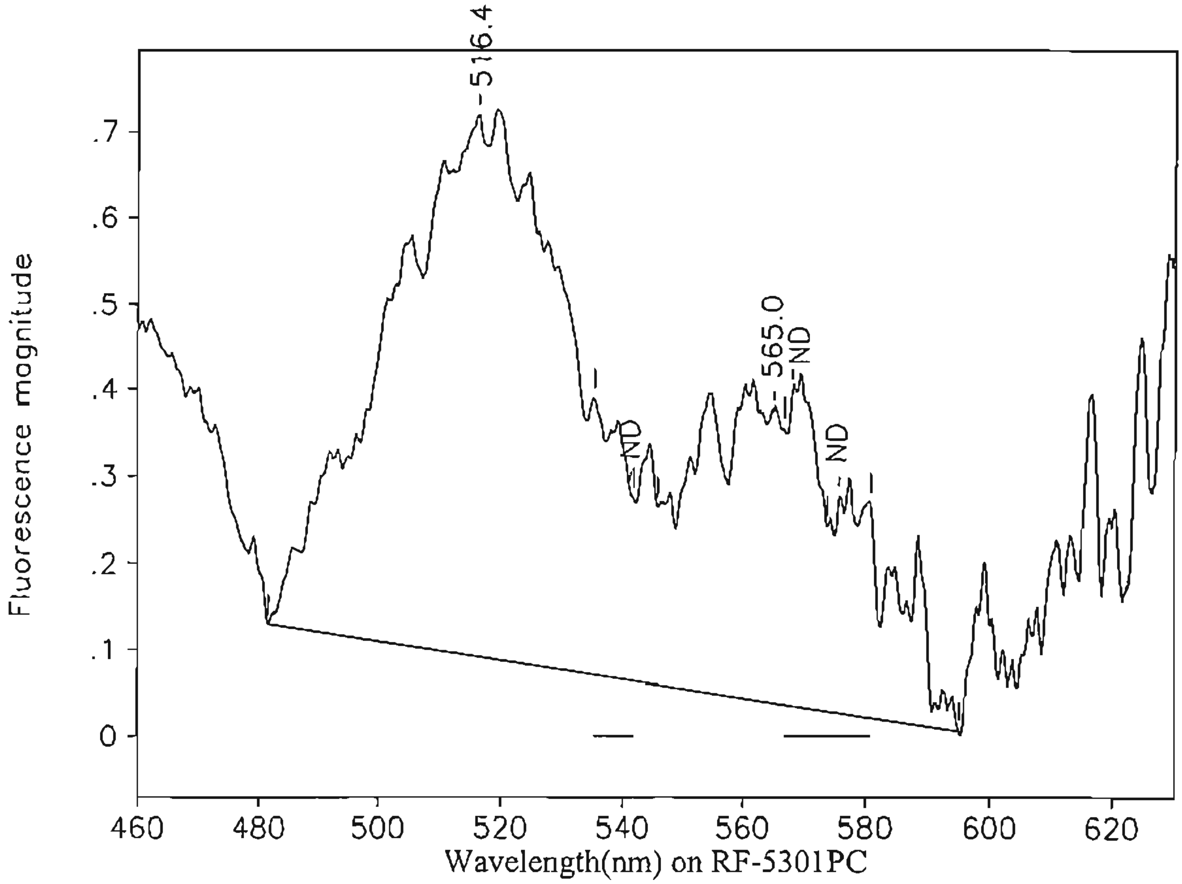
Analyzed: 05/23/03

Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	482.6	548.5	0.51	20.08	0.03	0.476
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
565.0	548.5	586.0	0.21	6.87	0.03	~~1.00~~

Ozark Underground Laboratory



Station 10: MW-4 225'
OUL number: M6727
Matrix: Elutant
Placed: / /

Analyzed: 05/23/03

Collected: 05/20/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	481.6	545.8	0.63	23.15	0.03	0.549
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
565.0	545.8	595.0	0.34	11.62	0.03	~~1.70~~

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

June 2, 2003

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for background charcoal samplers shipped on May 27, 2003
Ozark Underground Laboratory (OUL) numbers M6838 through M6847.

Dear Mr. Aikens:

We have completed analysis of the background charcoal samplers received by the OUL on May 28, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheet
3. Nodarse & Associates Chain-of-Custody
4. Discrepancy sheet
5. Sample analysis graphs

f:\docs\coa\festival03.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park
Samples Collected by: Mike Burns
Date Samples Shipped: May 27, 2003
Date Samples Rec'd at OUL: May 28, 2003
Date Analyzed by OUL: May 30, 2003

Table 1. Results for background charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine	
				2003	Peak	Conc.	Peak	Conc.
M6838	2	North Recharge Well	NDT	5/27 NT	ND		ND	
M6839	3	MW-1 @ 167'	NDT	5/27 NT	515.4 *	0.877	ND	
M6840	Laboratory Control Charcoal Blank							
M6841	4	MW-1 @ 197'	NDT	5/27 NT	514.2 *	0.533	ND	
M6842	5	MW-2 @ 195'	NDT	5/27 NT	517.0 *	0.345	ND	
M6843	6	MW-2 @ 225'	NDT	5/27 NT	517.4 *	0.352	ND	
M6844	7	MW-3 @ 195'	NDT	5/27 NT	ND		ND	
M6845	8	MW-3 @ 225'	NDT	5/27 NT	ND		ND	
M6846	9	MW-4 @ 195'	NDT	5/27 NT	516.2 *	0.350	ND	
M6847	10	MW-4 @ 225'	NDT	5/27 NT	516.4 *	0.842	ND	

FOOTNOTES:

NDT = No date or time given

NT = No time given

ND = No dye detected

* = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were the dye for background purposes.

~~PC&B Environmental~~
210 Park Rc.., Oviedo, FL 32765
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order: ______

Date: 5/27/03 Page 1 of 1

COMPANY: Ardaman & Assoc.
ADDRESS: 1675 Lee Rd.
Winter Park, FL 32789
SAMPLED BY: Mike Burns SIGN:
PHONE: 407-740-6110 FAX: 407-740-6112

ANALYSIS REQUESTED: Tracer Dye

#	SAMPLE ID	DATE/TIME	MATRIX: AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID	Tracer Dye	PRESERVATION	Number of Containers
								ICE		
1	mw-1 @ ~~187'~~/187'	5/27/03						✓		2
2	mw-2 @ 195'/225'							✓		2
3	mw-3 @ 195'/225'							✓		2
4	mw-4 @ 195'/225'							✓		2
5	North Recharge well							✓		1
6										
7										
8										
9										
10										
11										
12										
13										

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	5/27/03	1: Margaret Ridinger	5/28/03 1230
2:		2:	
3:		3:	

PROJECT INFORMATION
PROJECT NAME: Festival Park / CH2M Hill
PROJECT #: WOI-E-120-1
SITE ADDRESS: Orlando, FL
PROJECT MANAGER: Cydan Dias / AC Akud

SAMPLE RECEIPT
Total # of Containers
Chain of Custody Seals
Recv'd In Good Condition
PO #:

SPECIAL INSTRUCTIONS/COMMENTS:

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE/CONTRACT #:

398

WHITE: Project File YELLOW: Laboratory PINK: Sampler

OZARK UNDERGRO[illegible] LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park / CH2M Hill Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Samples Received By: M. Ridenger - OUL

Date Samples Shipped: 5/27/03 Date Samples Received: 5/28/03 Time Samples Received: 12:30 Return Cooler? Yes ____ No ✓

Bill to: Send Results to:

Analyze for: Fluorescein ✓ Eosine ✓ Rhodamine WT ____ Other ____ Ship cooler to:

OUL use only		Please indicate stations where dye was visible in the field for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED 2003 DATE	COLLECTED TIME	# WATER REC'D
0		1	South Recharge Well NO Sample rec'd			—		0
1	M6838	2	North Recharge Well	NDT		5/27	NT	0
1	M6839	3	MW-1@167'			5/27		0
1	M6841	4	MW-1@197'			5/27		0
1	M6842	5	MW-2@195'			5/27		0
1	M6843	6	MW-2@225'			5/27		0
1	M6844	7	MW-3@195'			5/27		0
1	M6845	8	MW-3@225'			5/27		0
1	M6846	9	MW-4@195'			5/27		0
1	M6847	10	MW-4@225'			5/27		0

COMMENTS: Charcoal Blank = M6840 NT = no time given NDT = no date or time given

This sheet filled out by OUL staff? Yes X No ____ Charts for samples on this page proofed by OUL: [illegible]

Project 551 Analyzed 5/30/03 by WC

Page 1 of 1

f:\shared\forms\coc.doc, Rev. 8/99

OZARK UNDERGRO[illegible]ND LABORATORY, INC.

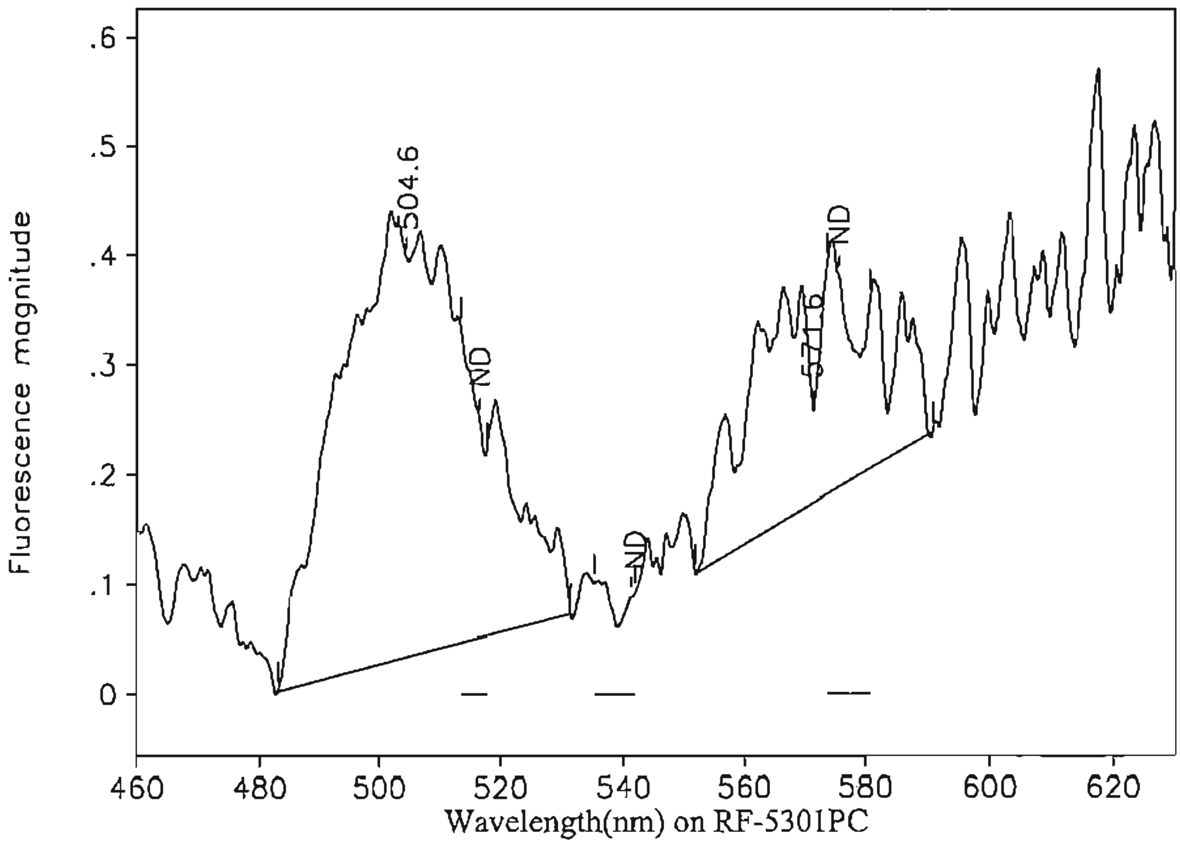
DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: Nodarse & Assoc / Festival Park   Date Rec'd by OUL: 5/28/03   Wk # ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
		MW-1 167'	5/27	MW-1 @ 167' & MW-1 @ 197'	OUL Staff filled out a
		MW-1 197'	5/27	were listed together on same line	Standard OUL Sample
		MW-2 195'	5/27	MW-2 @ 195' & MW-2 @ 225' were	Collection Data Sheet,
		MW-2 225'	5/27	listed together on same line	listing each sample from
		MW-3 195'	5/27	MW-3 195' & MW-3 @ 225' were	each depth separately,
		MW-3 225'	5/27	listed together on same line	So they could be given
		MW-4 195'	5/27	MW-4 @ 195' & MW-4 @ 225'	individual lab #s
		MW-4 225'	5/27	were listed together on	
				same line.	

Comments: no times & dates placed or times collected were given on COC rec'd with samples. no times collected written on packets.

Ozark Underground Laboratory



Station 2: North Recharge Well
OUL number: M6838
Matrix: Elutant
Placed: / /

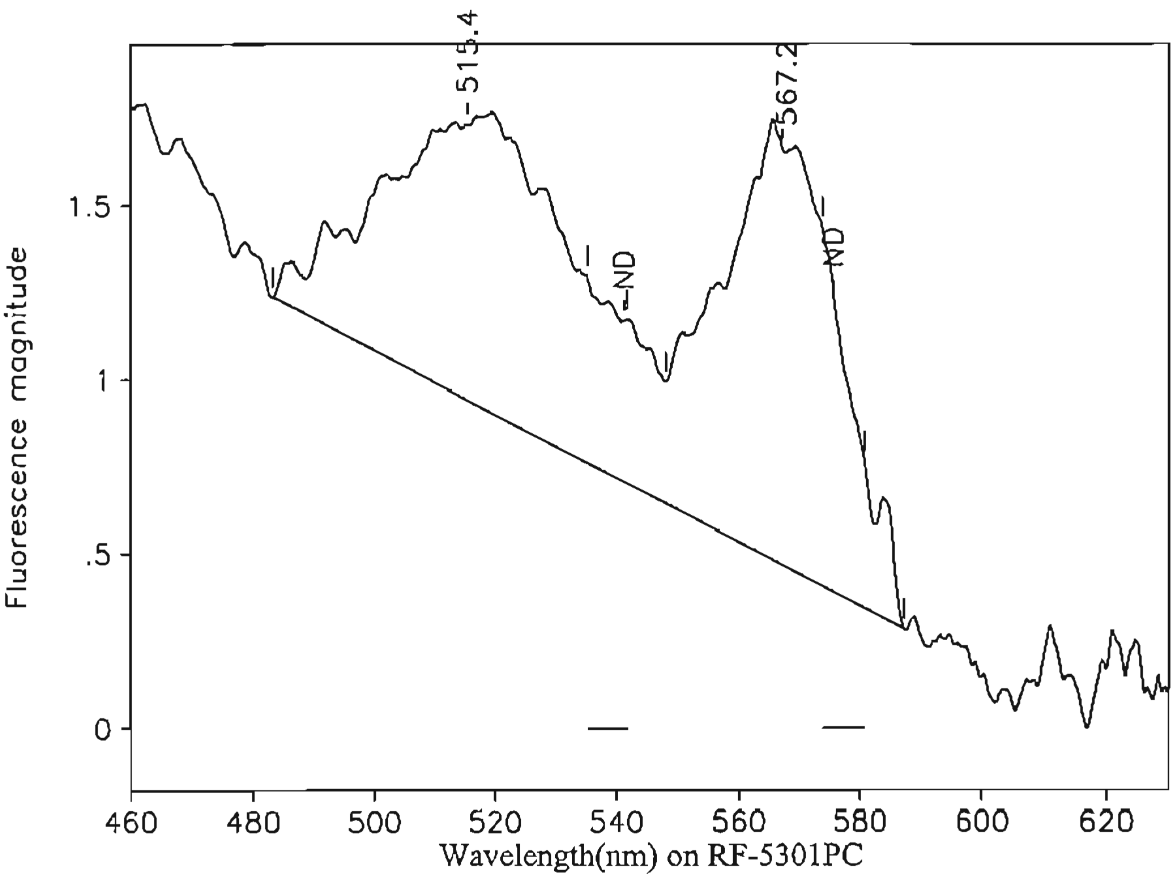
Analyzed: 05/30/03

Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
571.6	551.8	590.8	0.08	4.85	0.02	~~0.795~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
504.6	483.0	531.4	0.36	10.84	0.03	~~0.282~~ ND

Ozark Underground Laboratory



Station 3: MW-1 167'
OUL number: M6839
Matrix: Elutant
Placed: / /

Analyzed: 05/30/03

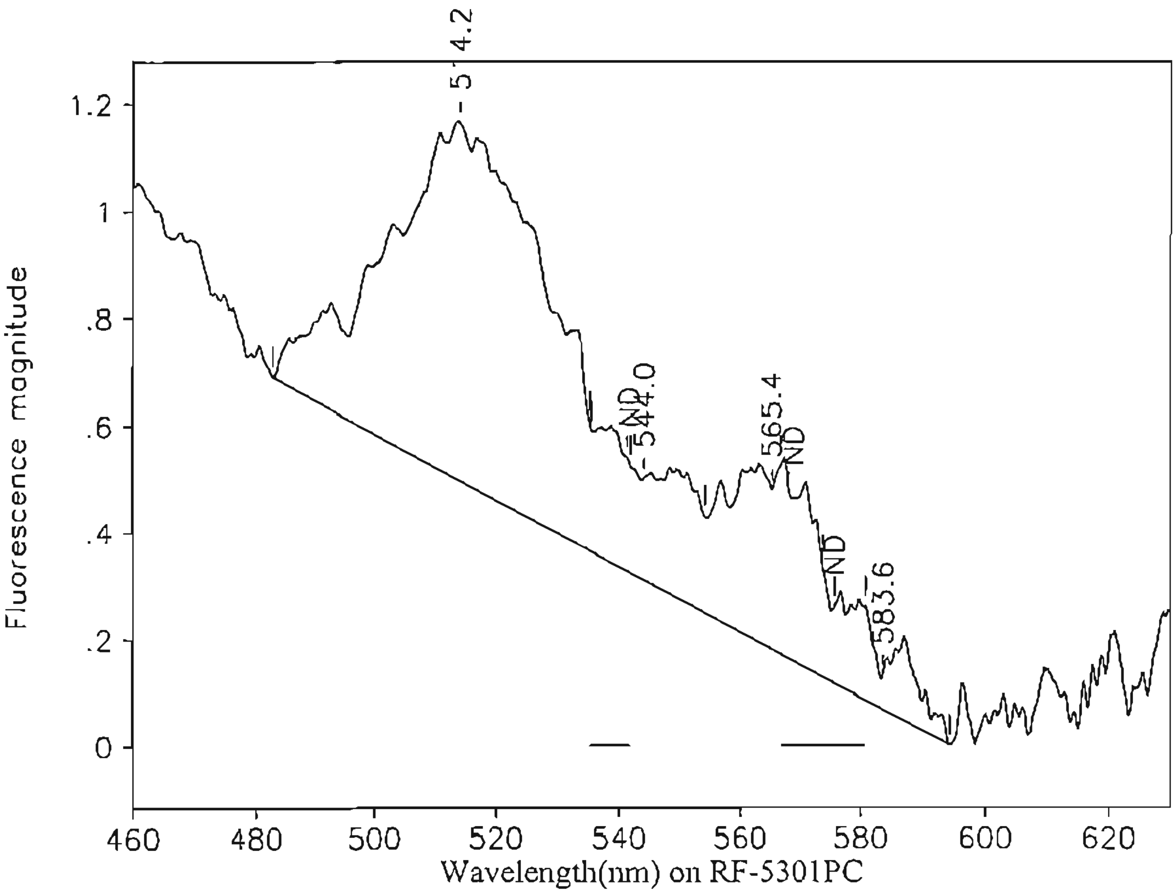
Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	483.2	548.0	0.79	33.70	0.02	0.877 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.2	548.0	587.2	1.20	29.35	0.04	~~4.81~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4: MW-1 197'
OUL number: M6841
Matrix: Elutant
Placed: / /

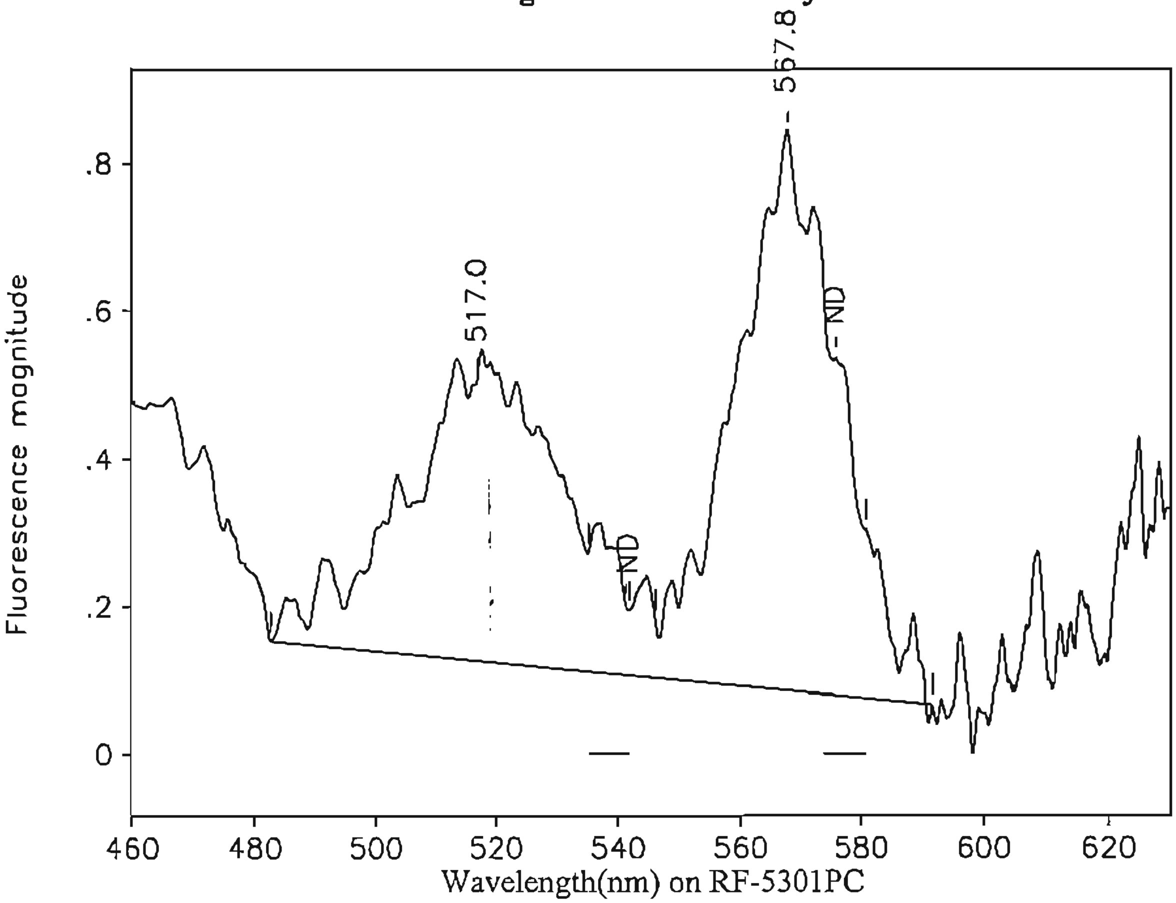
Analyzed: 05/30/03

Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	482.8	535.5	0.67	20.49	0.03	0.533 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
544.0	535.5	554.1	0.19	4.07	0.05	~~0.202~~ ND
565.4	554.1	575.8	0.30	6.03	0.05	~~0.988~~
583.6	575.8	594.2	0.06	2.01	0.03	~~0.168~~

Ozark Underground Laboratory



Station 5: MW-2 195'
OUL number: M6842
Matrix: Elutant
Placed: / /

Analyzed: 05/30/03

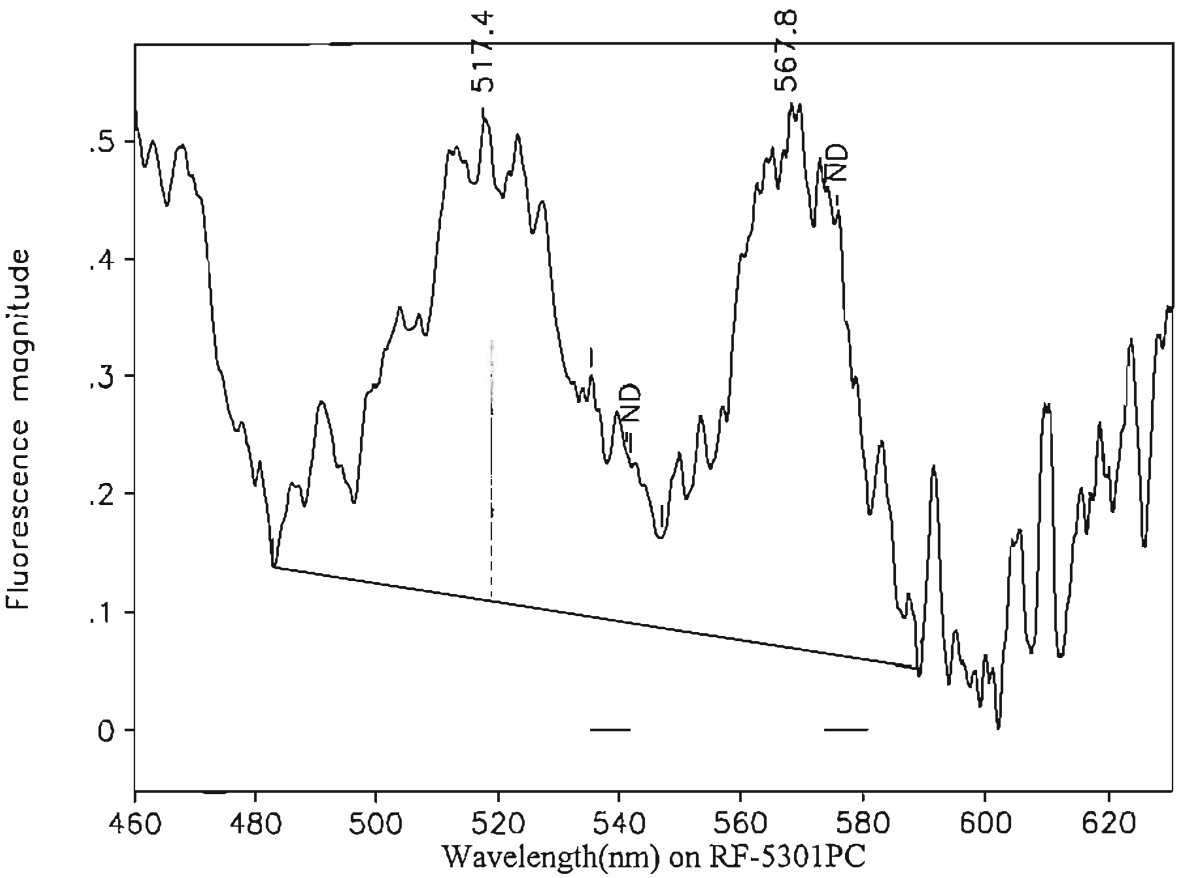
Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	482.6	546.1	0.38	13.28	0.03	0.345 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.8	546.1	591.6	0.76	15.29	0.05	~~2.50~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 6: MW-2 225'
OUL number: M6843
Matrix: Elutant
Placed: / /

Analyzed: 05/30/03

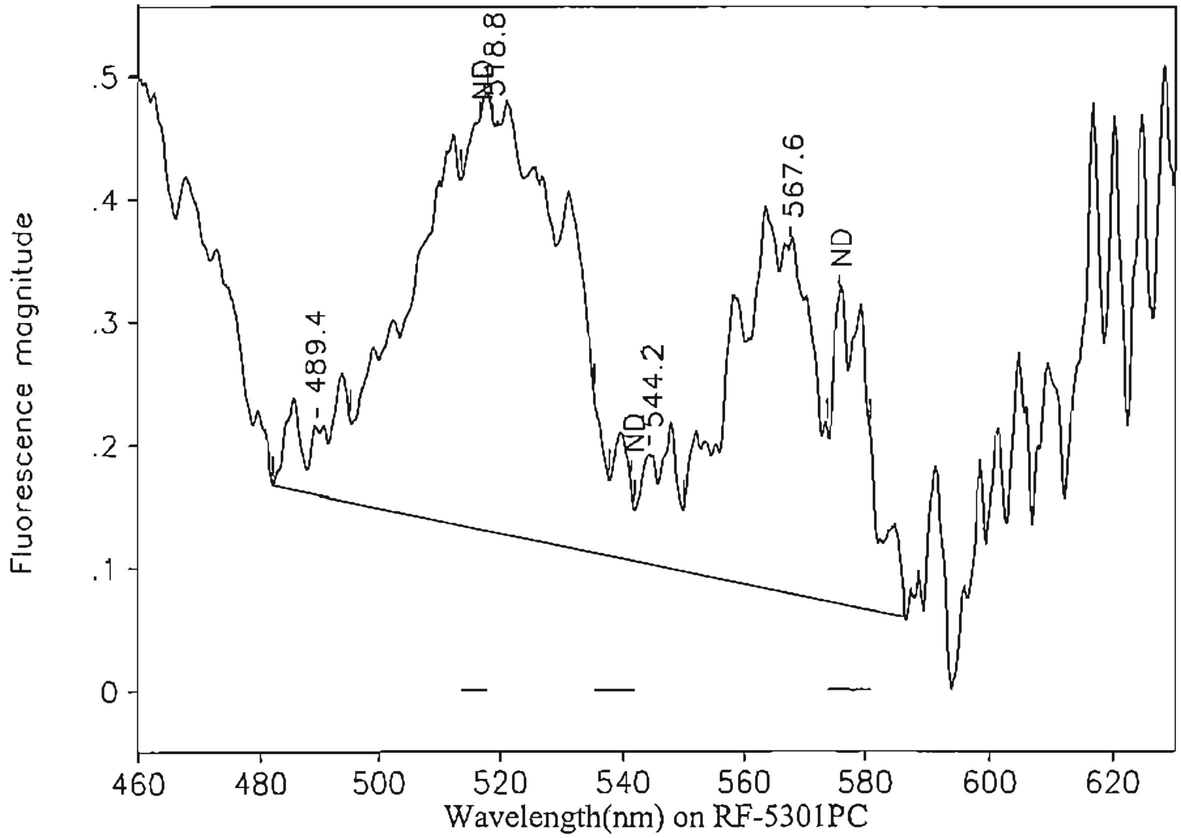
Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	483.0	547.1	0.40	13.54	0.03	0.352 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.8	547.1	589.4	0.44	10.47	0.04	~~1.72~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 7: MW-3 195'
OUL number: M6844
Matrix: Elutant
Placed: / /

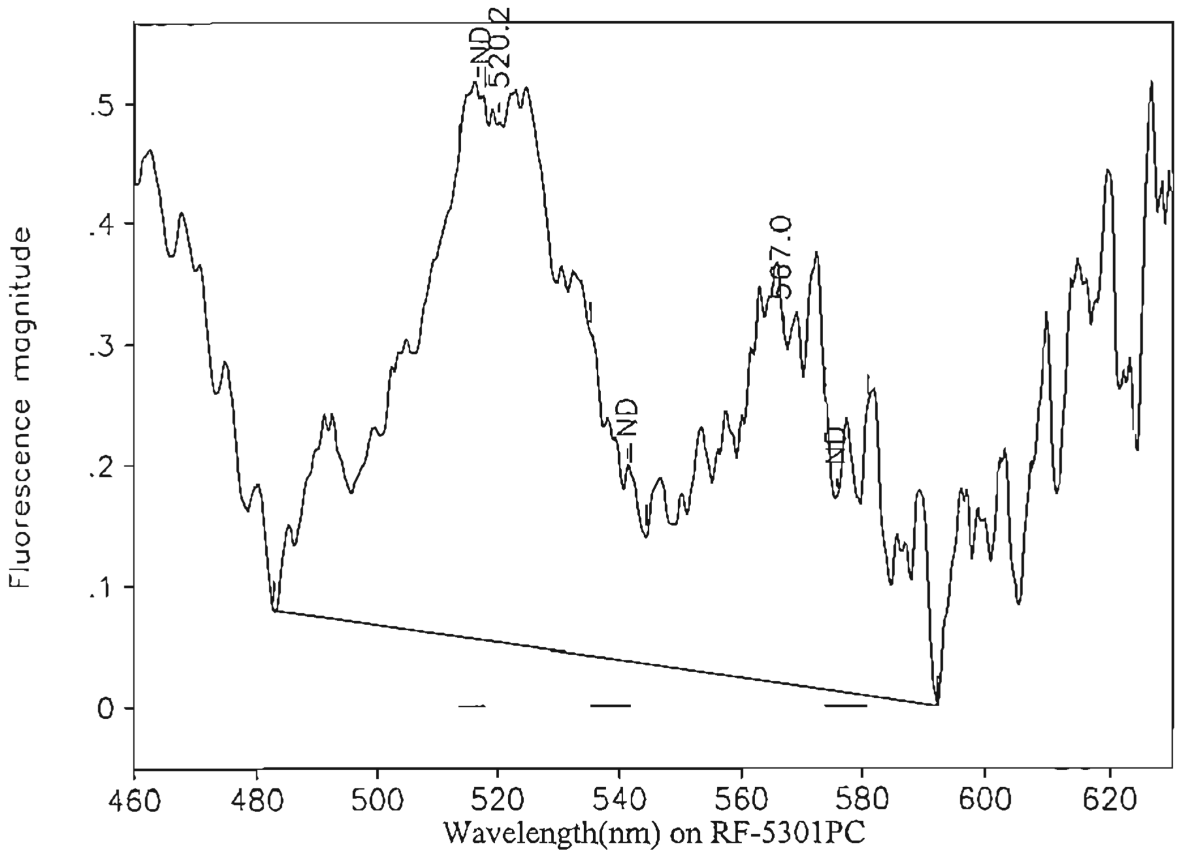
Analyzed: 05/30/03

Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.6	549.9	586.4	0.28	6.55	0.04	~~1.07~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
489.4	482.0	495.2	0.06	0.67	0.09	0.000
518.8	495.2	537.7	0.33	9.89	0.03	~~0.257~~ ND
544.2	537.7	549.9	0.09	0.95	0.09	~~0.047~~ ND

Ozark Underground Laboratory



Station 8: MW-3 225'
OUL number: M6845
Matrix: Elutant
Placed: / /

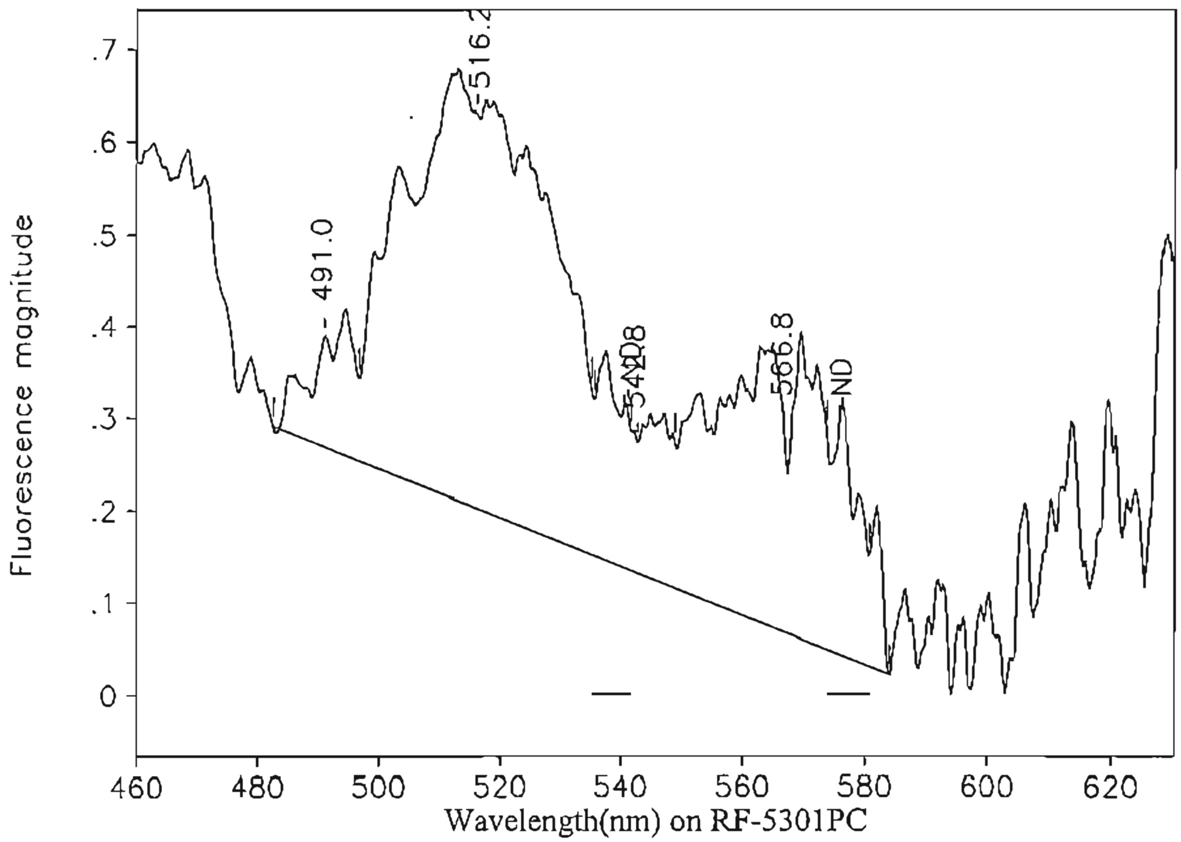
Analyzed: 05/30/03

Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.0	544.3	592.2	0.29	9.60	0.03	~~1.57~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.2	482.8	544.3	0.43	15.71	0.03	~~0.409~~ ND

Ozark Underground Laboratory



Station 9: MW-4 195'
OUL number: M6846
Matrix: Elutant
Placed: / /

Analyzed: 05/30/03

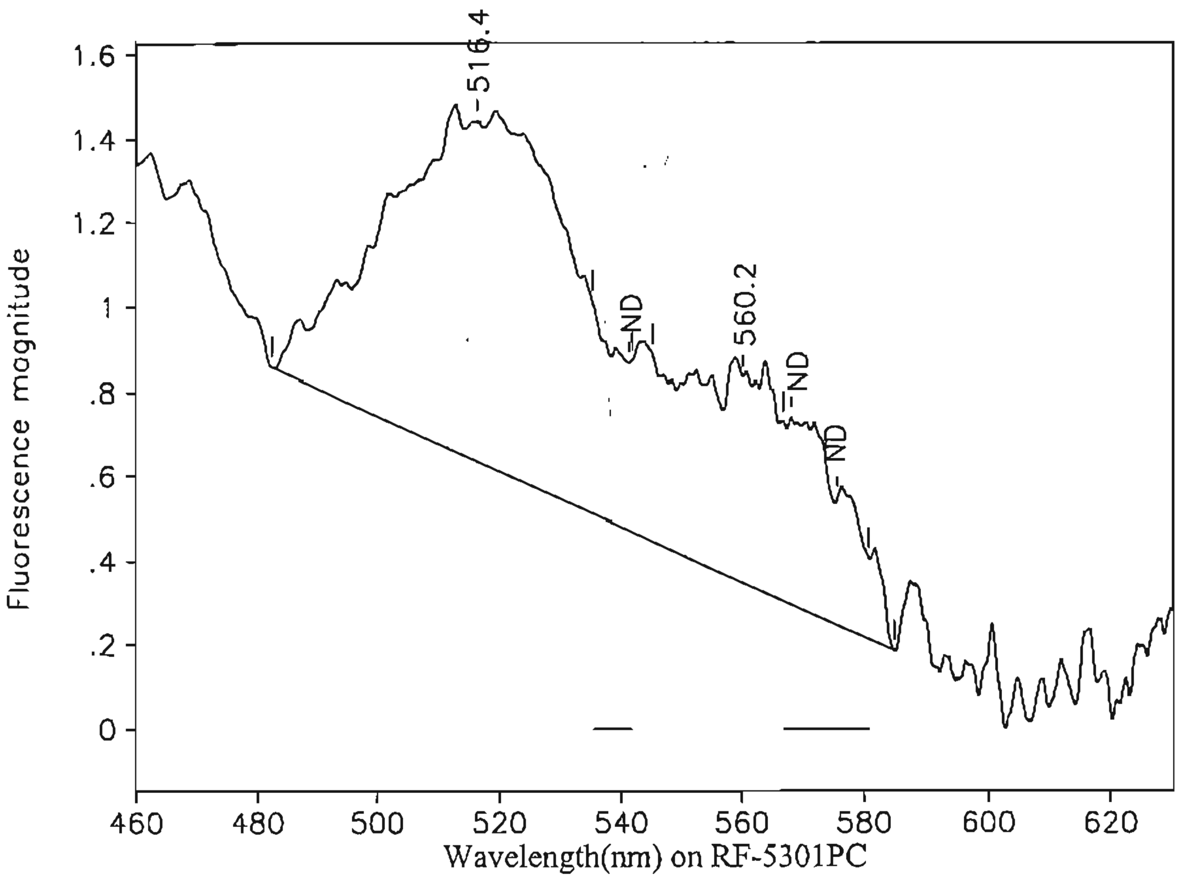
Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	496.8	535.7	0.43	13.44	0.03	0.350 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
566.8	549.0	584.0	0.22	7.72	0.03	~~1.27~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
491.0	482.6	496.8	0.12	1.10	0.11	0.000
542.8	535.7	549.0	0.14	2.33	0.06	~~0.116~~ ND

MW

Ozark Underground Laboratory



Station 10: MW-4 225'
OUL number: M6847
Matrix: Elutant
Placed: / /

Analyzed: 05/30/03
Collected: 05/27/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	482.4	545.2	0.81	32.35	0.03	0.842 *
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
560.2	545.2	584.8	0.49	15.29	0.03	~~0.398~~

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

June 27, 2003

CERTIFICATE OF ANALYSIS

RECEIVED
JUL 0 1 2003
CH2M Hill/ORL

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for charcoal samplers shipped on June 13, 2003
Ozark Underground Laboratory (OUL) numbers M7330 through M7358.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on June 17, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheets
3. Field Sample Log and Chain-of-Custody Record
4. Discrepancy sheet
5. Sample analysis graphs

f:\docs\coa\festival04.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park – Project CH2MHill 177652
Date Samples Shipped: June 13, 2003
Date Samples Rec'd at OUL: June 17, 2003
Date Analyzed by OUL: June 20, 2003

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected 2003	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.
M7330	11	MW-1 @ 130'	NDT	6/13 1110	514.7	98.5	ND	
M7331	12	MW-1 @ 140'	NDT	6/13 1110	514.7	89.7	ND	
M7332	13	MW-1 @ 150'	NDT	6/13 1110	514.8	121	ND	
M7333	14	MW-1 @ 160'	NDT	6/13 1110	514.9	192	ND	
M7334	15	MW-1 @ 170'	NDT	6/13 1110	514.7	192	ND	
M7335	16	MW-1 @ 180'	NDT	6/13 1110	514.7	207	ND	
M7336	17	MW-1 @ 190'	NDT	6/13 1110	514.9	206	ND	
M7337	18	MW-2 @ 190'	NDT	6/13 1020	517.3	4.28	ND	
M7338	19	MW-2 @ 200'	NDT	6/13 1020	517.0	1.41	ND	
M7339	20	MW-2 @ 210'	NDT	6/13 1020	517.4	1.54	ND	
M7340	Laboratory Control Charcoal Blank							
M7341	21	MW-2 @ 220'	NDT	6/13 1020	516.4	1.10	ND	
M7342	22	MW-2 @ 230'	NDT	6/13 1020	517.4	1.17	ND	
M7343	23	MW-2 @ 240'	NDT	6/13 1020	517.6	1.22	ND	
M7344	24	MW-2 @ 250'	NDT	6/13 1020	516.6	0.809	ND	
M7345	25	MW-3 @ 190'	NDT	6/13 0950	ND		ND	
M7346	26	MW-3 @ 200'	NDT	6/13 0950	ND		ND	
M7347	27	MW-3 @ 210'	NDT	6/13 0950	ND		ND	
M7348	28	MW-3 @ 220'	NDT	6/13 0950	ND		ND	
M7349	29	MW-3 @ 230'	NDT	6/13 0950	ND		ND	
M7350	30	MW-3 @ 240'	NDT	6/13 0950	ND		ND	
M7351	31	MW-4 @ 190'	NDT	6/13 1140	ND		ND	
M7352	32	MW-4 @ 200'	NDT	6/13 1140	ND		ND	
M7353	33	MW-4 @ 210'	NDT	6/13 1140	ND		ND	
M7354	34	MW-4 @ 220'	NDT	6/13 1140	ND		ND	
M7355	35	MW-4 @ 230'	NDT	6/13 1140	ND		ND	
M7356	36	MW-4 @ 240'	NDT	6/13 1140	ND		ND	
M7357	37	MW-4 @ 250'	NDT	6/13 1140	ND		ND	
M7358	38	MW-3 @ 230'	NDT	6/13 0950	ND		ND	

<u>**FOOTNOTES:**</u> NDT = No date or time given; ND = No dye detected

OZARK UNDERGRO[illegible]D LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park - 177652 **Week No:** **Samples Collected By:**

Samples Shipped By: **Samples Received By:** Margaret Ridinger - OUL

Date Samples Shipped: 6/13/03 **Date Samples Received:** 6/17/03 **Time Samples Received:** 13 : 15 **Return Cooler? Yes** ___ **No** ___

Bill to: CH2MHill **Send Results to:** CH2MHill, Alan Aikens, 225 E. Robinson St, Ste 505, Orlando, FL 32801

Analyze for: Fluorescein ✓ **Eosine** ✓ **Rhodamine WT** ___ **Other** ___ **Ship cooler to:**

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED 2003 DATE	COLLECTED TIME	# WATER REC'D
1	M7330	11	MW-1 @ 130'	NDT		6/13	1110	0
1	M7331	12	MW-1 @ 140'	NDT		6/13	1110	0
1	M7332	13	MW-1 @ 150'	NDT		6/13	1110	0
1	M7333	14	MW-1 @ 160'	NDT		6/13	1110	0
1	M7334	15	MW-1 @ 170'	NDT		6/13	1110	0
1	M7335	16	MW-1 @ 180'	NDT		6/13	1110	0
1	M7336	17	MW-1 @ 190'	NDT		6/13	1110	0
1	M7337	18	MW-2 @ 190'	NDT		6/13	1020	0
1	M7338	19	MW-2 @ 200'	NDT		6/13	1020	0
1	M7339	20	MW-2 @ 210'	NDT		6/13	1020	0
1	M7341	21	MW-2 @ 220'	NDT		6/13	1020	0
1	M7342	22	MW-2 @ 230'	NDT		6/13	1020	0
1	M7343	23	MW-2 @ 240'	NDT		6/13	1020	0
1	M7344	24	MW-2 @ 250'	NDT		6/13	1020	0

COMMENTS: Charcoal Blank M7340 NDT = no date or time given

This sheet filled out by OUL staff? Yes X **No** ___ **Charts for samples on this page proofed by OUL:** [illegible]

Project 551 Analyzed 6/20/03 by MC Page 1 of 2

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OZARK UNDERGRO D LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park - 177652 **Week No:** ______ **Samples Collected By:** ______

Samples Shipped By: ______ **Samples Received By:** Margaret Ridinger - OUL

Date Samples Shipped: 6/13/03 **Date Samples Received:** 6/17/03 **Time Samples Received:** 13:15 **Return Cooler? Yes** ____ **No** ____

Bill to: CH2MHill **Send Results to:** CH2MHill

Analyze for: Fluorescein ✓ **Eosine** ✓ **Rhodamine WT** ____ **Other** ____ **Ship cooler to:** ______

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M7345	25	MW-3 @ 190'	NDT		6/13	0950	0
1	M7346	26	MW-3 @ 200'	NDT		6/13	0950	0
1	M7347	27	MW-3 @ 210'	NDT		6/13	0950	0
1	M7348	28	MW-3 @ 220'	NDT		6/13	0950	0
1	M7349	29	MW-3 @ 230'	NDT		6/13	0950	0
1	M7350	30	MW-3 @ 240'	NDT		6/13	0950	0
1	M7351	31	MW-4 @ 190'	NDT		6/13	1140	0
1	M7352	32	MW-4 @ 200'	NDT		6/13	1140	0
1	M7353	33	MW-4 @ 210'	NDT		6/13	1140	0
1	M7354	34	MW-4 @ 220'	NDT		6/13	1140	0
1	M7355	35	MW-4 @ 230'	NDT		6/13	1140	0
1	M7356	36	MW-4 @ 240	NDT		6/13	1140	0
1	M7357	37	MW-4 @ 250	NDT		6/13	1140	0
1	M7358	38	MW3 @ 230' 2nd whirl-pak labeled @ 230'	NDT		6/13	0950	0

COMMENTS: ______

This sheet filled out by OUL staff? Yes X **No** ______ **Charts for samples on this page proofed by OUL:** [signature]

Analyzed 6/20/03 by [illegible]

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FIELD SAMPLE LOG AND CHAIN OF CUSTODY RECORD

PROJECT NO. CH2M Hill 177652
SITE NAME: Festival Park
STREET ADDRESS: (Al Aikens – Project Manager)

Well # (~~LAB CONTROL NO.~~)	SAMPLE IDENTIFICATION / DESCRIPTION	DATE	TIME	COMP.	GRAB	WATER	SOIL	OTHER	Tracer Dye							
MW-3 @	190' 210' 230' 200' 220' 240'	6/13/03	950 am	x					x							
MW-2 @	190' 210 230' 200 220' 240' 250'	6/13/03	1020 am		x				x							
MW-1 @	130' 150' 170' 190' 140' 160' 180'	6/13/03	1110		x				x							
MW-4 @	190' 210' 230' 200' 220' 240' 250'	6/13/03	1140		x				x							

REQUESTED ANALYSIS

	SIGNATURE	DATE	TIME
KIT RELINQUISHED	[signature]	6/13/03	2pm
KIT RECIEVED			
SAMPLE COLLECTION			
LAB ACCEPTANCE	Margaret Ridinger	6/17/03	1315

ADDITIONAL REMARKS

If any questions; Call Lydia Wing @ 407 740 6110 or Al Aikens (CH2MHill) @ 407 423 0030

Charts for samples on this page prepared by Ca/ou

BOTTORF Associates Inc.
CONSULTING ENGINEERS–ANALYTICAL LABORATORY 6725 EDGEWATER COMMERCE PARKWAY, ORLANDO, FLORIDA 32810 PHONE: (407) 298-0846 FAX: (407) 299-7053

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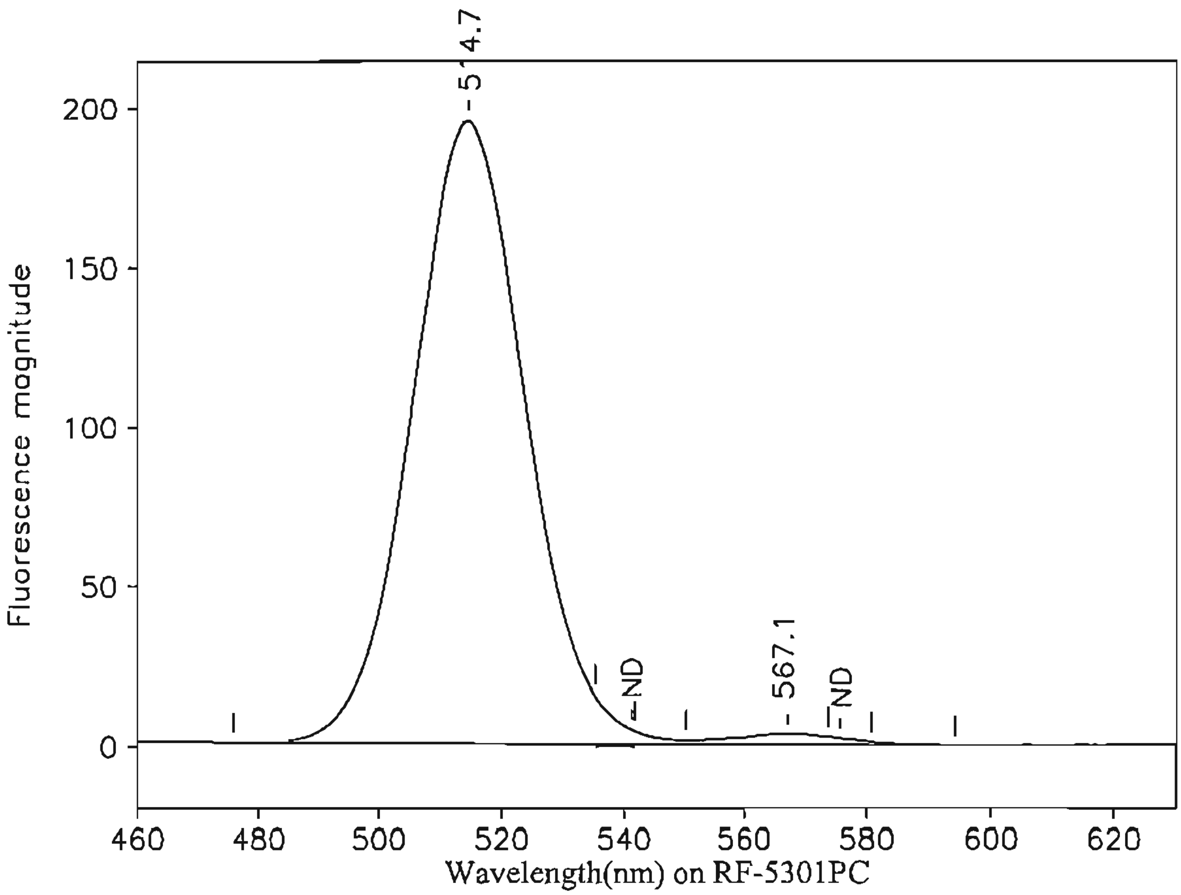
DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: CH2M Hill / Festival Park **Date Rec'd by OUL:** 6/17/03 **Wk #** ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
		MW-3	6/13	Rec'd 2 whirl-pak bags	
				labeled MW-3 @ 230	
				The CH2MHill COC indicates	
				there were 6 packets	
				sent for Station MW-3	
				OUL rec'd 7 packets.	

Comments:

Ozark Underground Laboratory



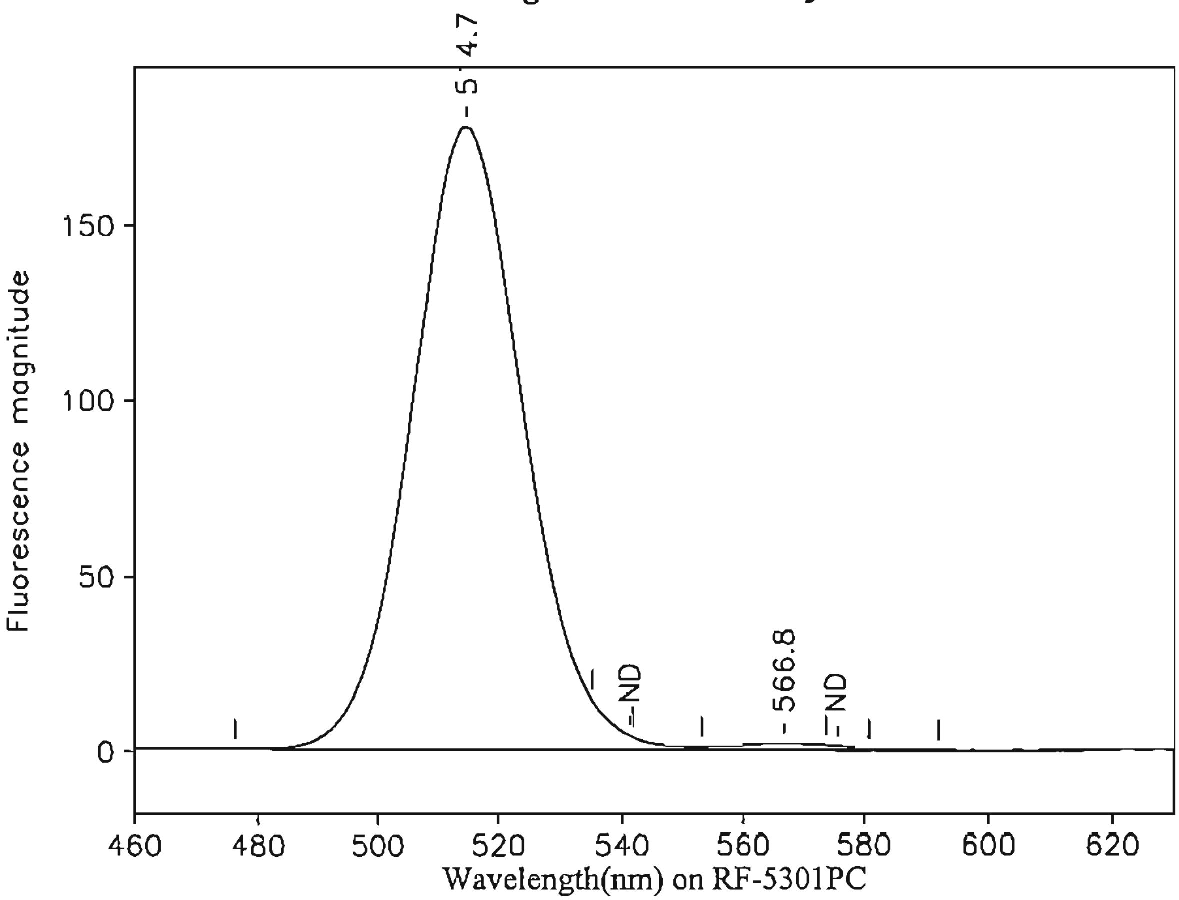
Station 11: MW-1 @ 130'
OUL number: M7330 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	475.8	550.3	195.46	4,191.85	0.05	98.5
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.1	550.3	594.1	3.47	80.99	0.04	~~15.3~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



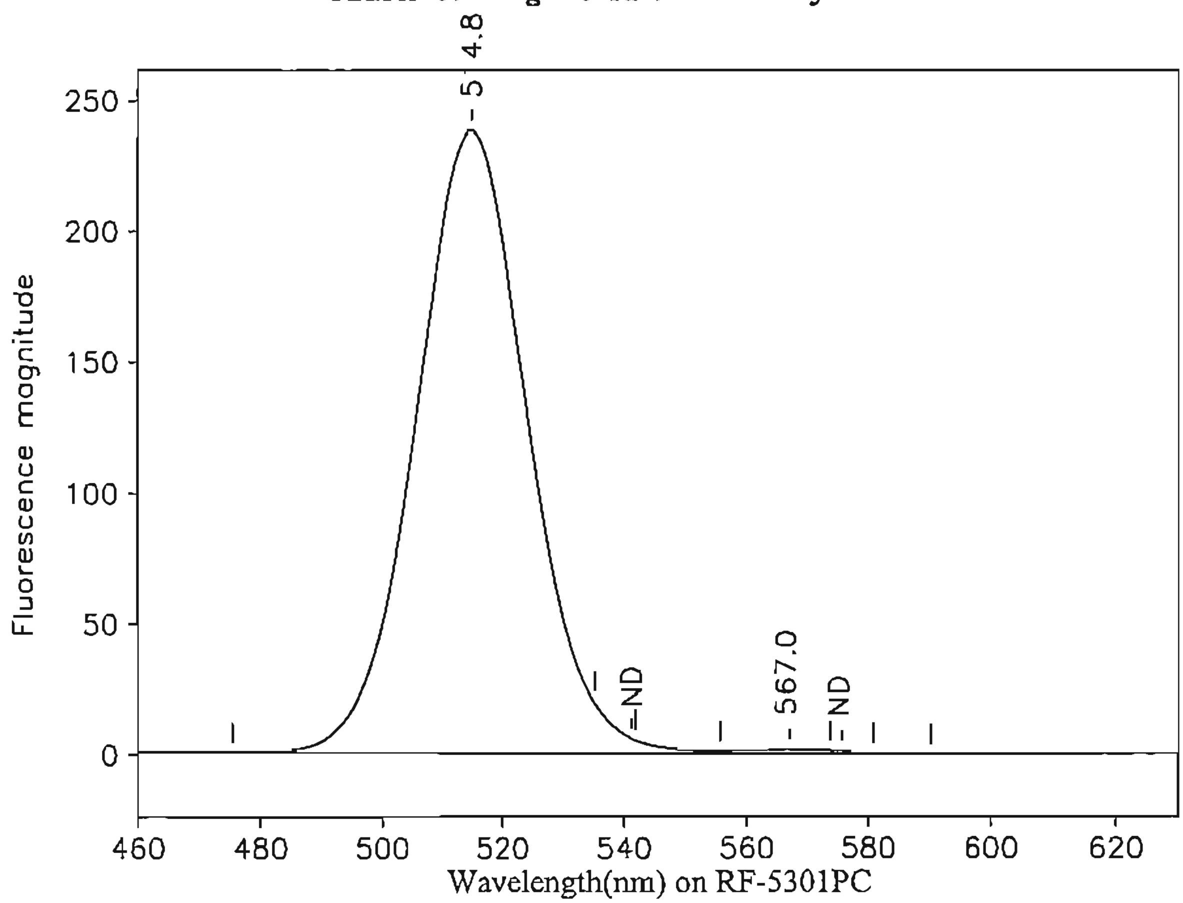
Station 12: MW-1 @ 140'
OUL number: M7331 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	476.2	553.1	177.58	3,817.55	0.05	89.7
541.3	535.2	541.8	0.00	0.00	0.00	ND
566.8	553.1	592.0	1.91	39.89	0.05	~~7.56~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 13: MW-1 @ 150'
OUL number: M7332
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

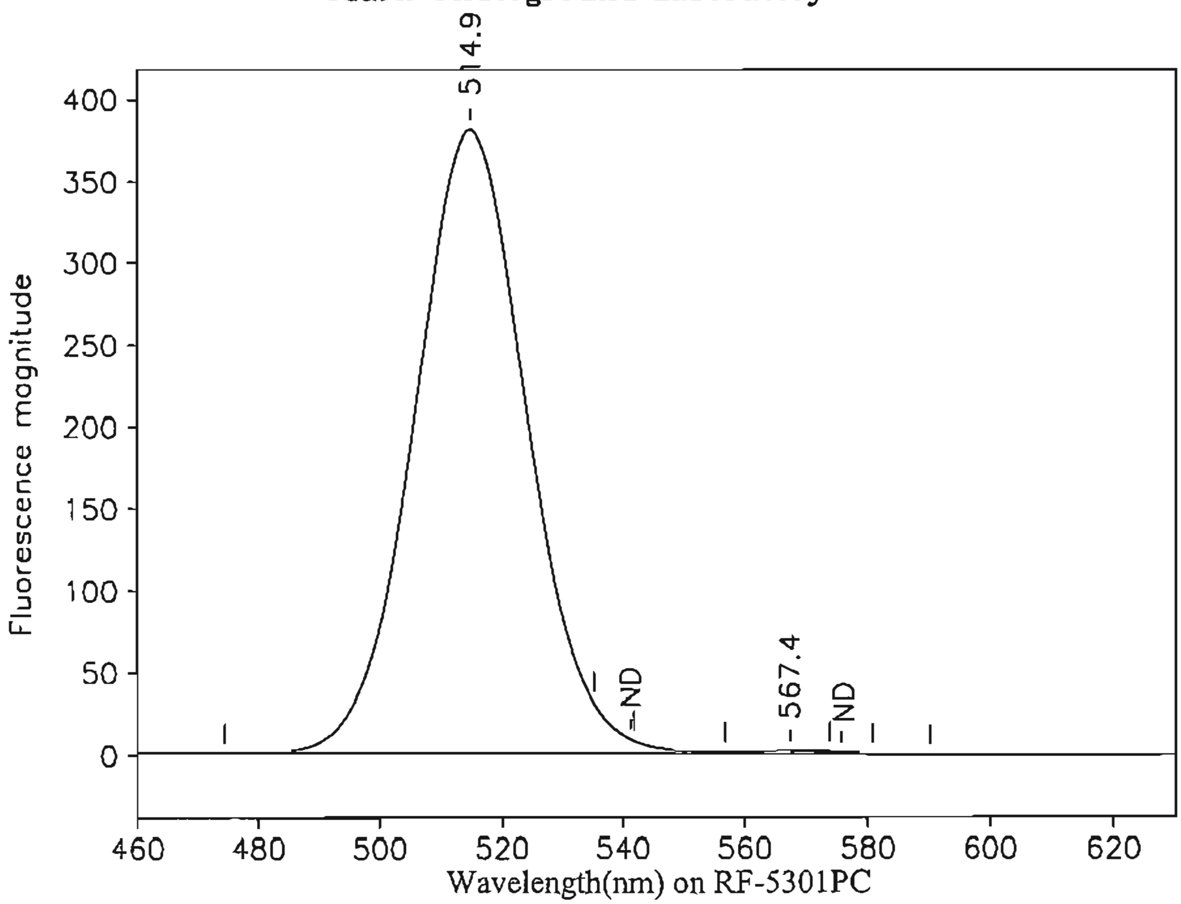
Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	475.5	555.5	238.12	5,153.59	0.05	121
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.0	555.6	590.2	1.69	35.57	0.05	~~6.74~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 14: MW-1 @ 160'
OUL number: M7333
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

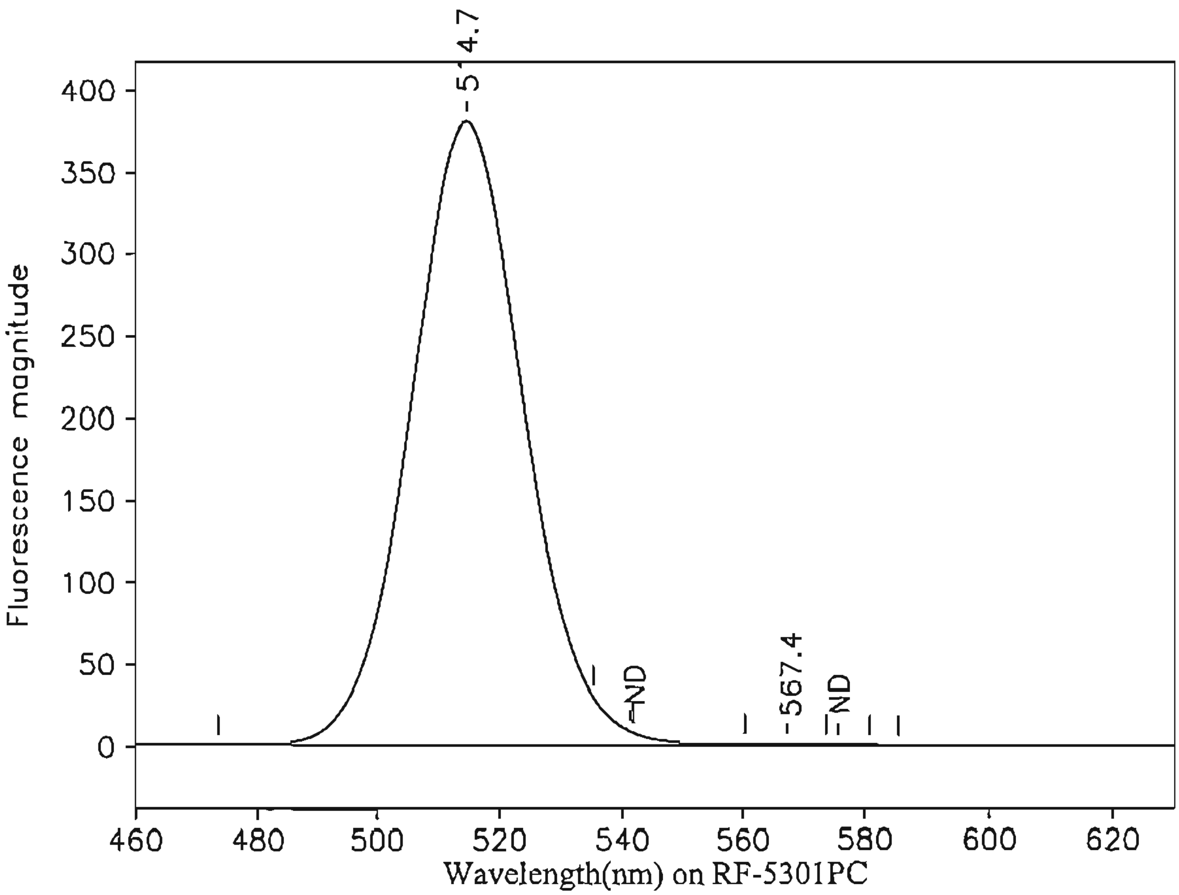
Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.9	474.4	556.8	380.59	8,186.46	0.05	192
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.4	556.8	590.0	2.39	45.69	0.05	~~8.66~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



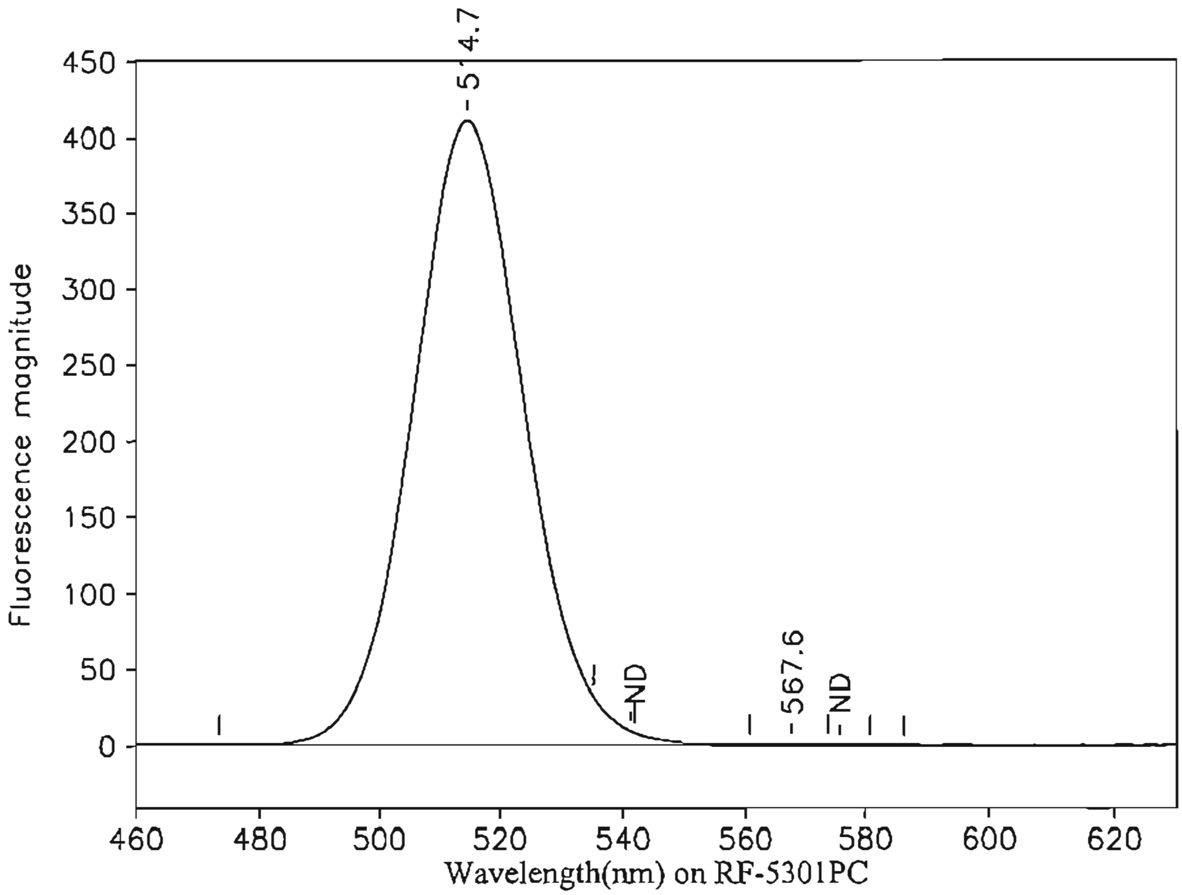
Station 15: MW-1 @ 170'
OUL number: M7334 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	473.5	560.3	379.89	8,164.92	0.05	192
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.4	560.3	585.4	1.22	21.01	0.06	~~3.98~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 16: MW-1 @ 180'
OUL number: M7335 — Analyzed: 06/20/03
Matrix: Elutant
Placed: / / — Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	473.5	560.7	410.95	8,821.59	0.05	207
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.6	560.8	586.2	1.10	19.02	0.06	~~3.60~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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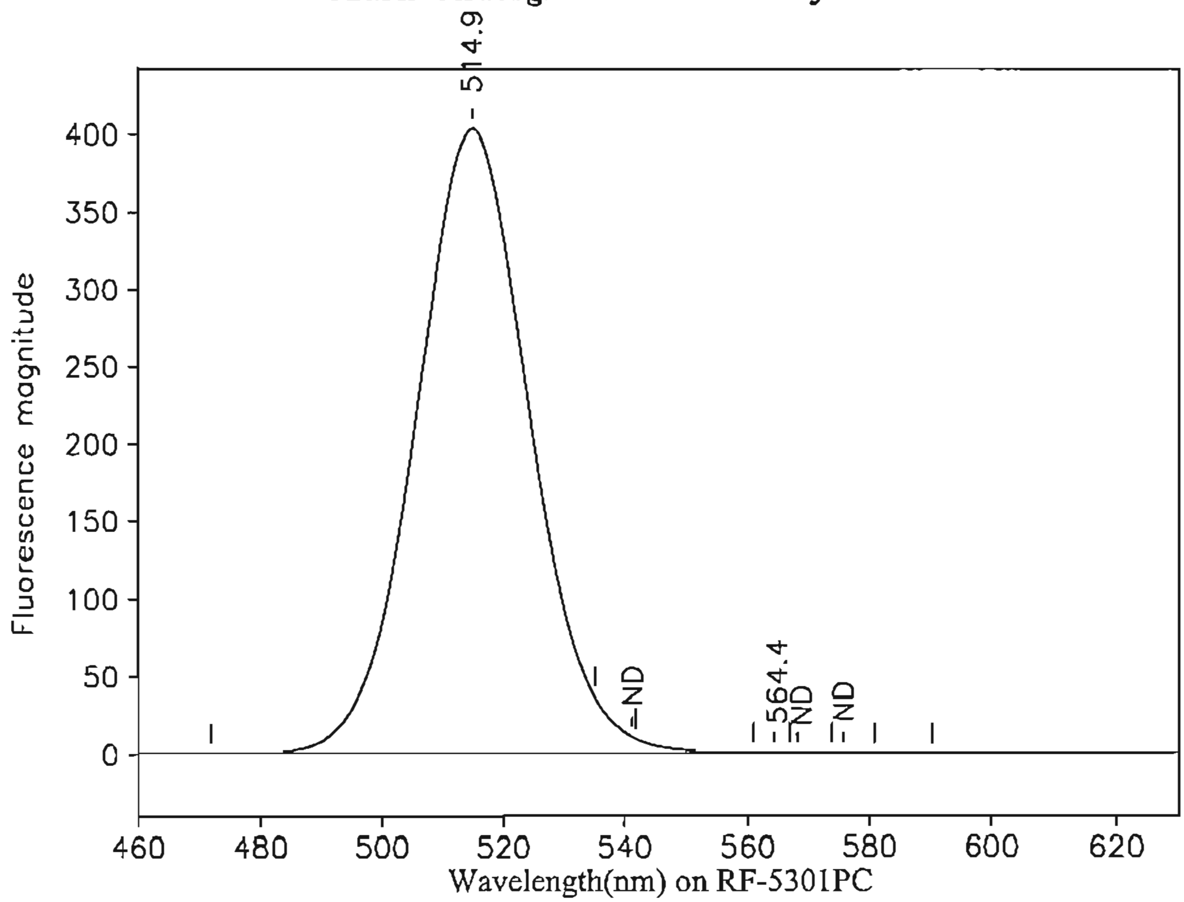

Station 17: MW-1 @ 190'
OUL number: M7336
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

Collected: 06/13/03 1110

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.9	472.0	560.9	402.82	8,786.58	0.05	206
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
564.4	560.9	590.2	1.12	19.77	0.06	~~3.75~~

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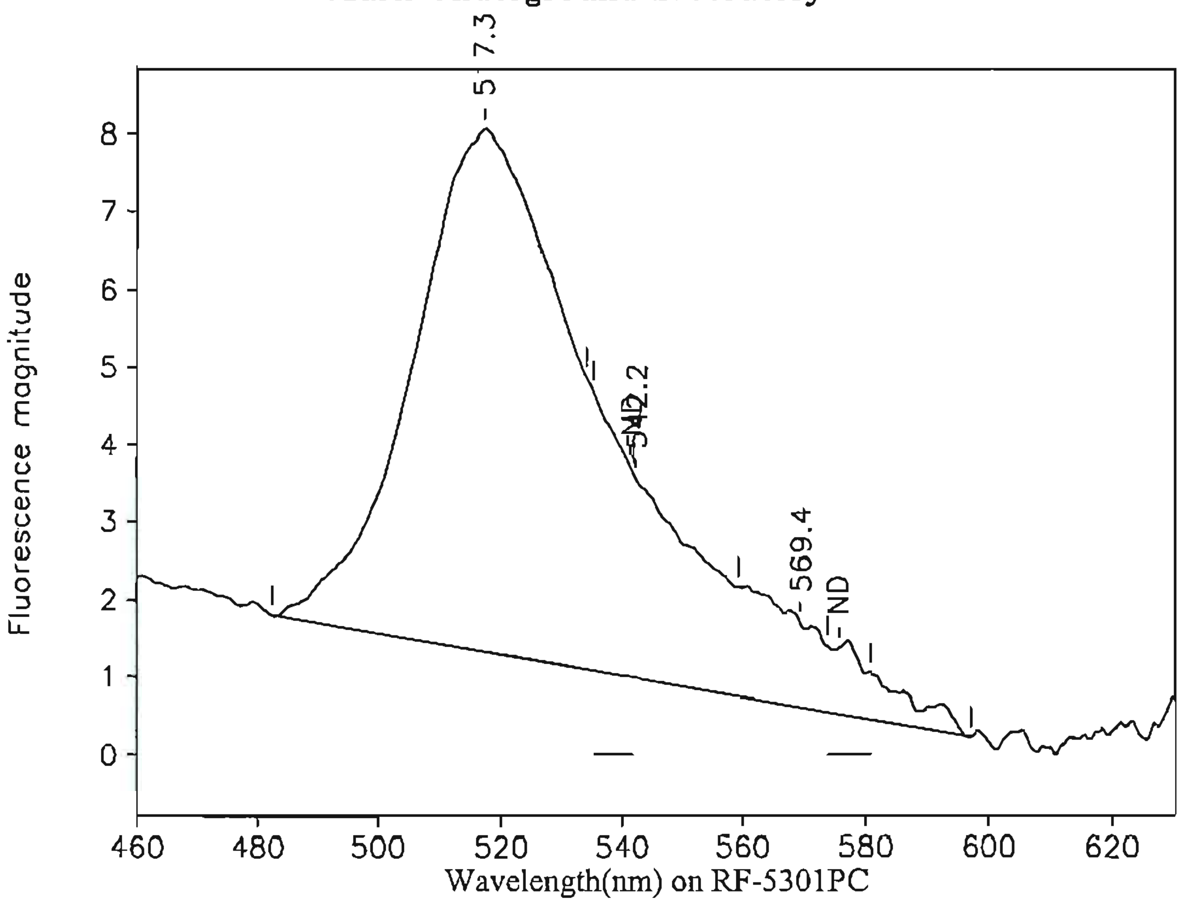

Station 18: MW-2 @ 190'
OUL number: M7337
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.3	482.4	534.0	6.74	182.19	0.04	4.28
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.4	559.3	597.0	1.11	28.68	0.04	~~5.43~~ ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.2	534.0	559.3	2.59	59.30	0.04	~~2.97~~

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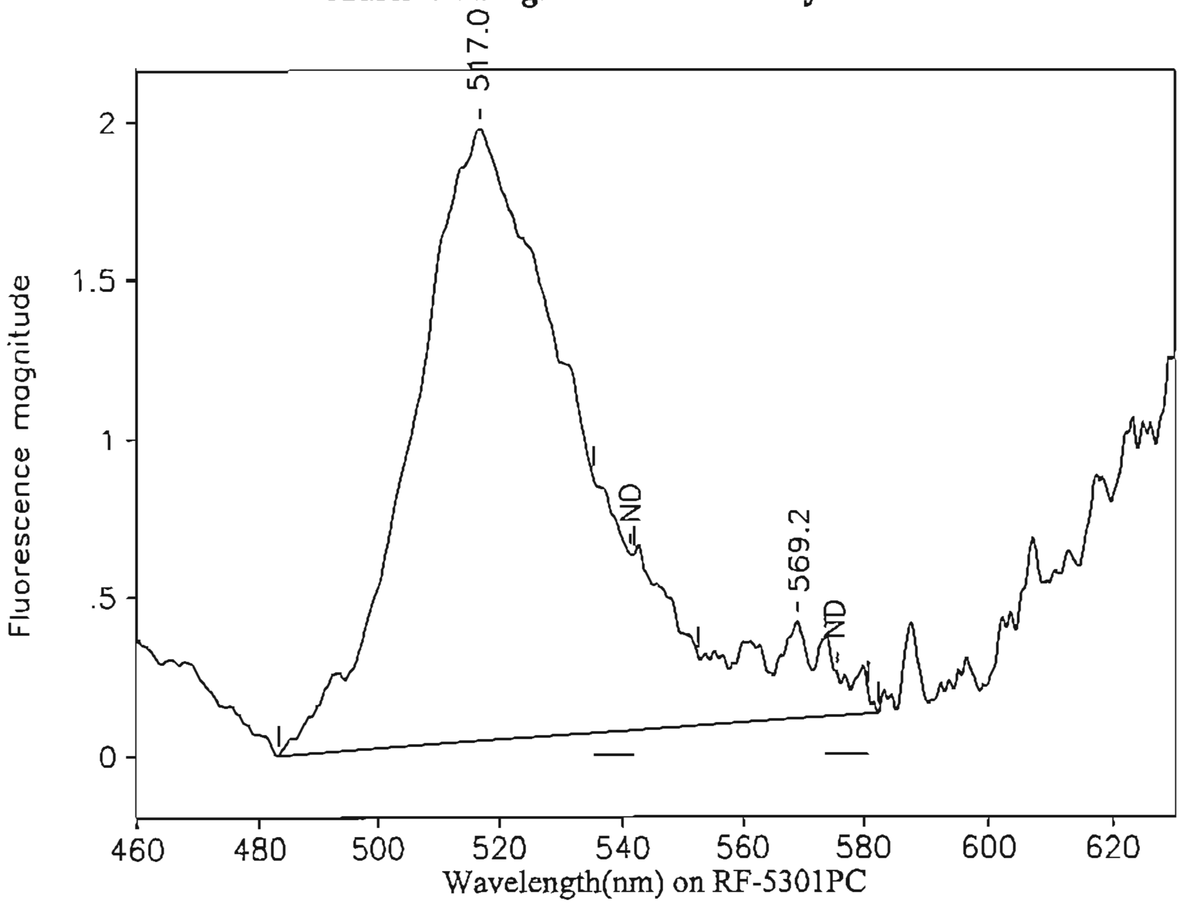

Station 19: MW-2 @ 200'
OUL number: M7338
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	483.2	552.6	1.93	60.03	0.03	1.41
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.2	552.6	582.4	0.30	5.45	0.06	~~1.03~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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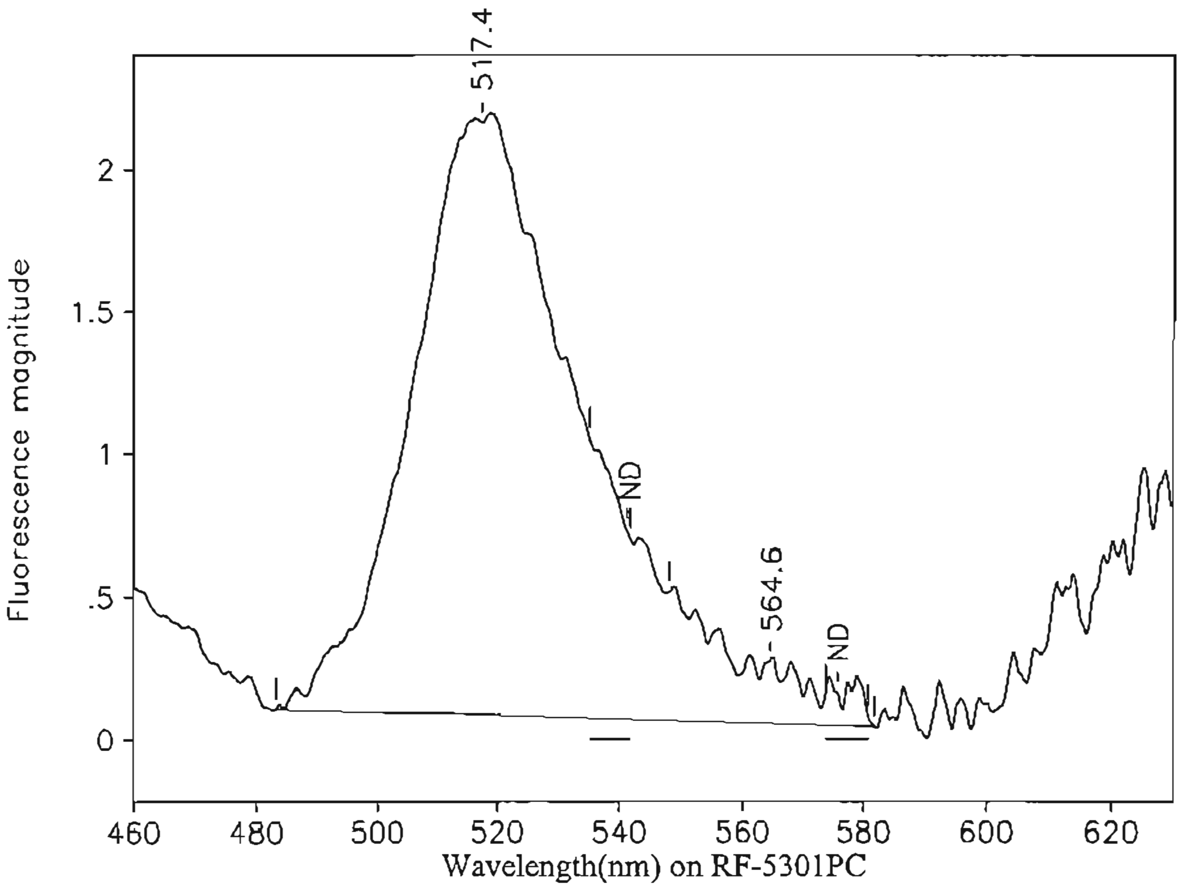

Station 20: MW-2 @ 210 '
OUL number: M7339 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	483.2	548.1	2.07	65.72	0.03	1.54
541.3	535.2	541.8	0.00	0.00	0.00	ND
564.6	548.1	581.8	0.22	7.02	0.03	~~1.33~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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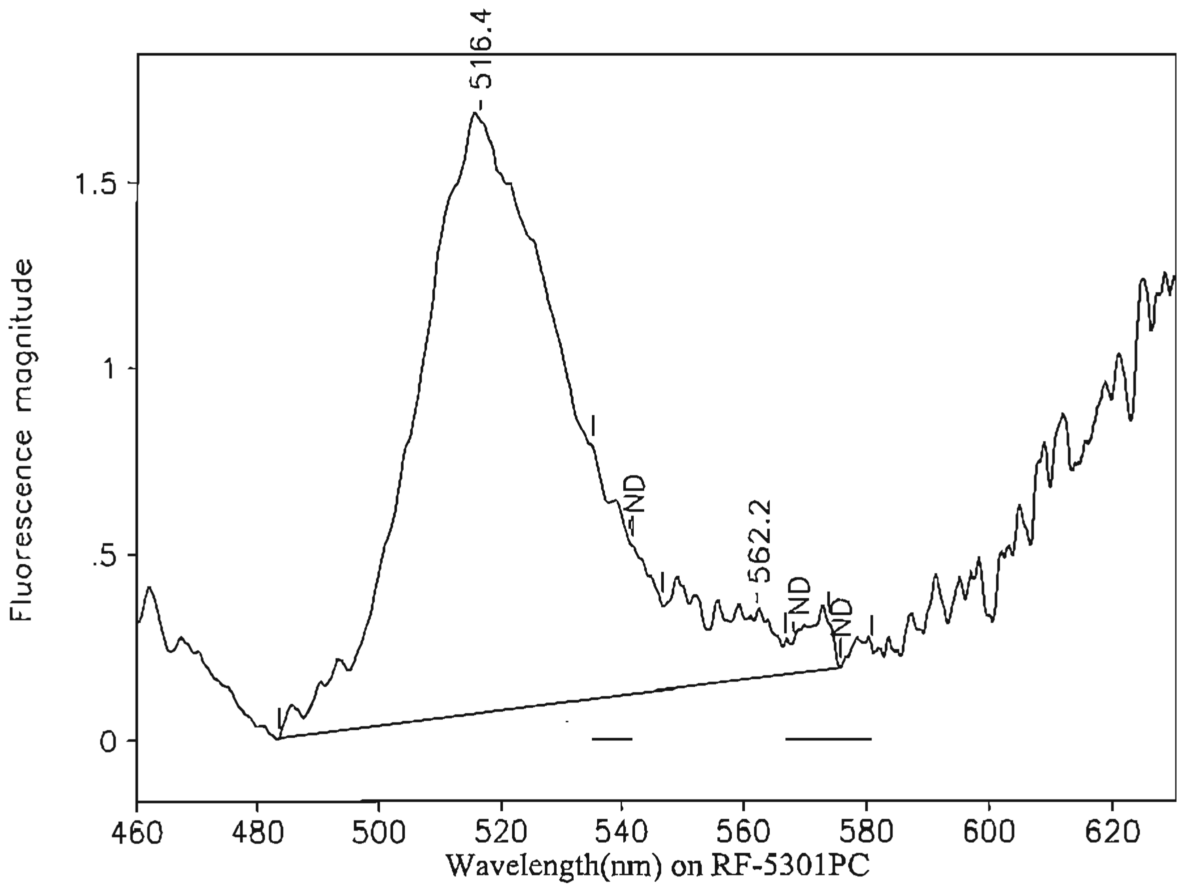

Station 21: MW-2 @ 220'
OUL number: M7341 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	483.6	546.7	1.59	46.90	0.03	1.10
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
562.2	546.7	575.8	0.18	4.80	0.04	~~0.909~~

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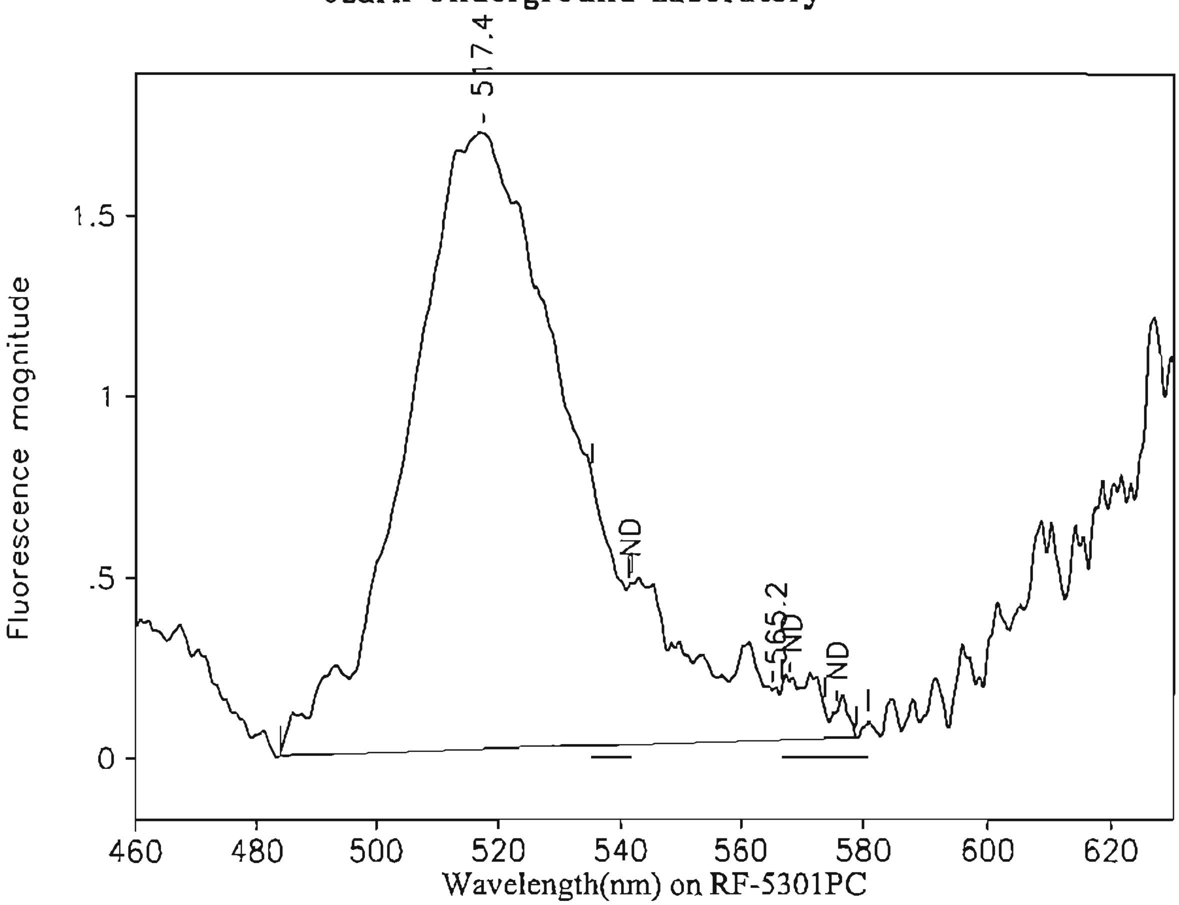

Station 22: MW-2 @ 230'
OUL number: M7342
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	483.8	541.3	1.70	49.84	0.03	1.17
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
565.2	541.3	578.8	0.13	8.09	0.02	~~1.53~~

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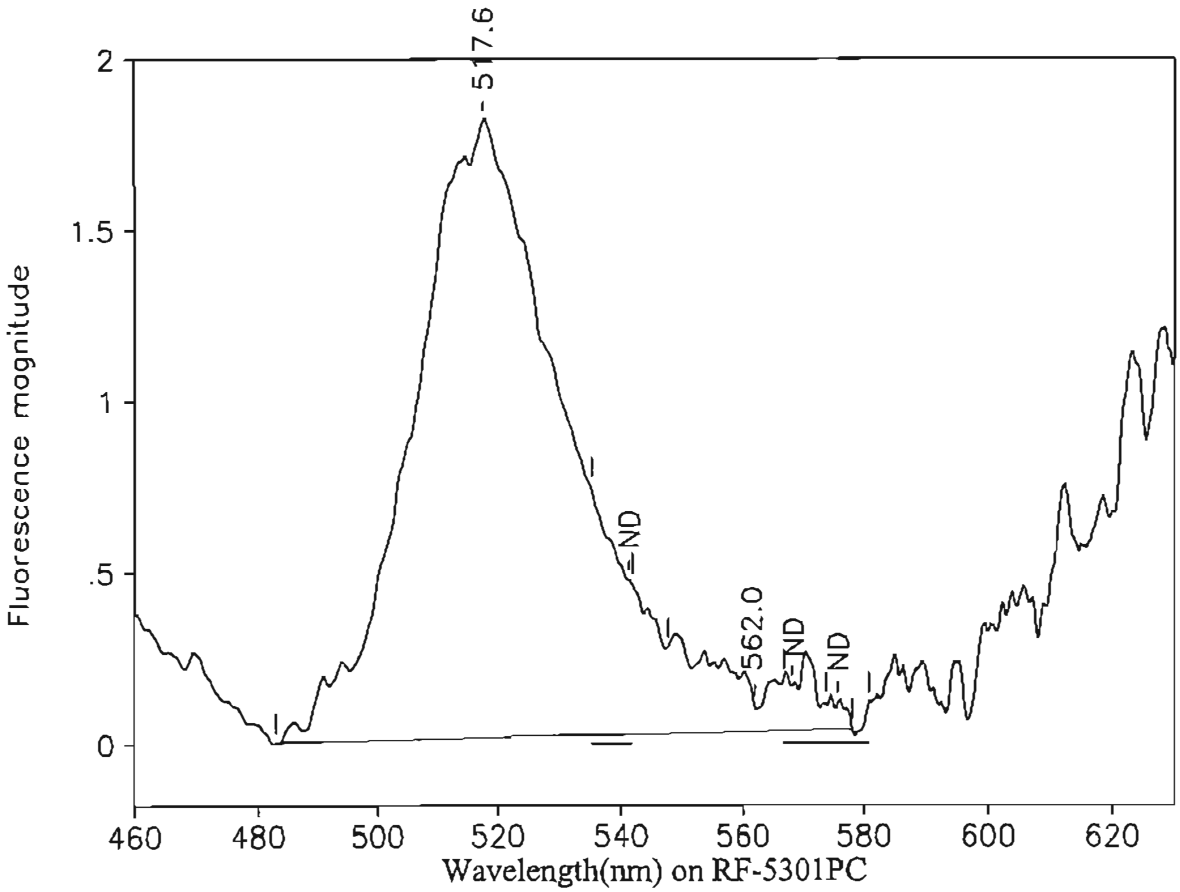


Station 23: MW-2 @ 240'
OUL number: M7343
Matrix: Elutant
Placed: / /

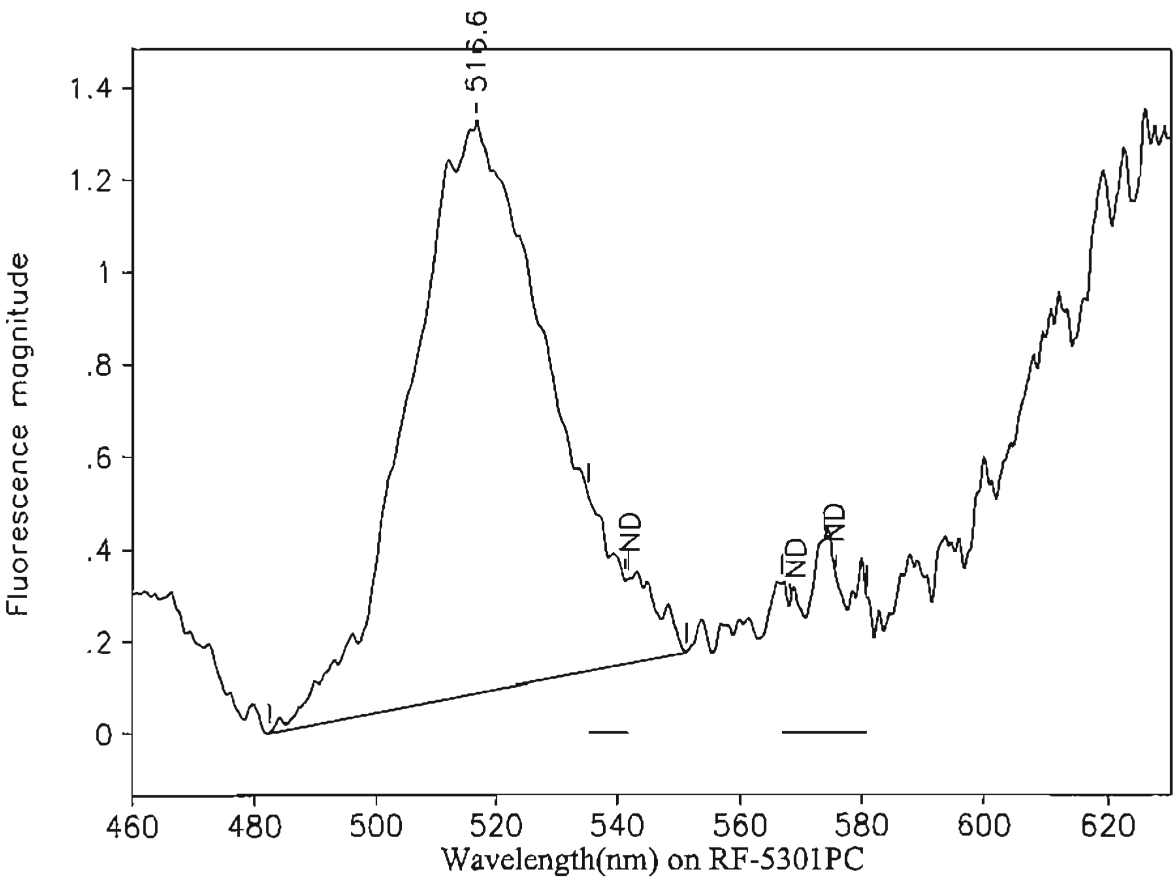
Analyzed: 06/20/03

Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	483.0	547.7	1.80	52.03	0.03	1.22
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
562.0	547.7	578.2	0.07	4.74	0.01	~~0.897~~

Ozark Underground Laboratory



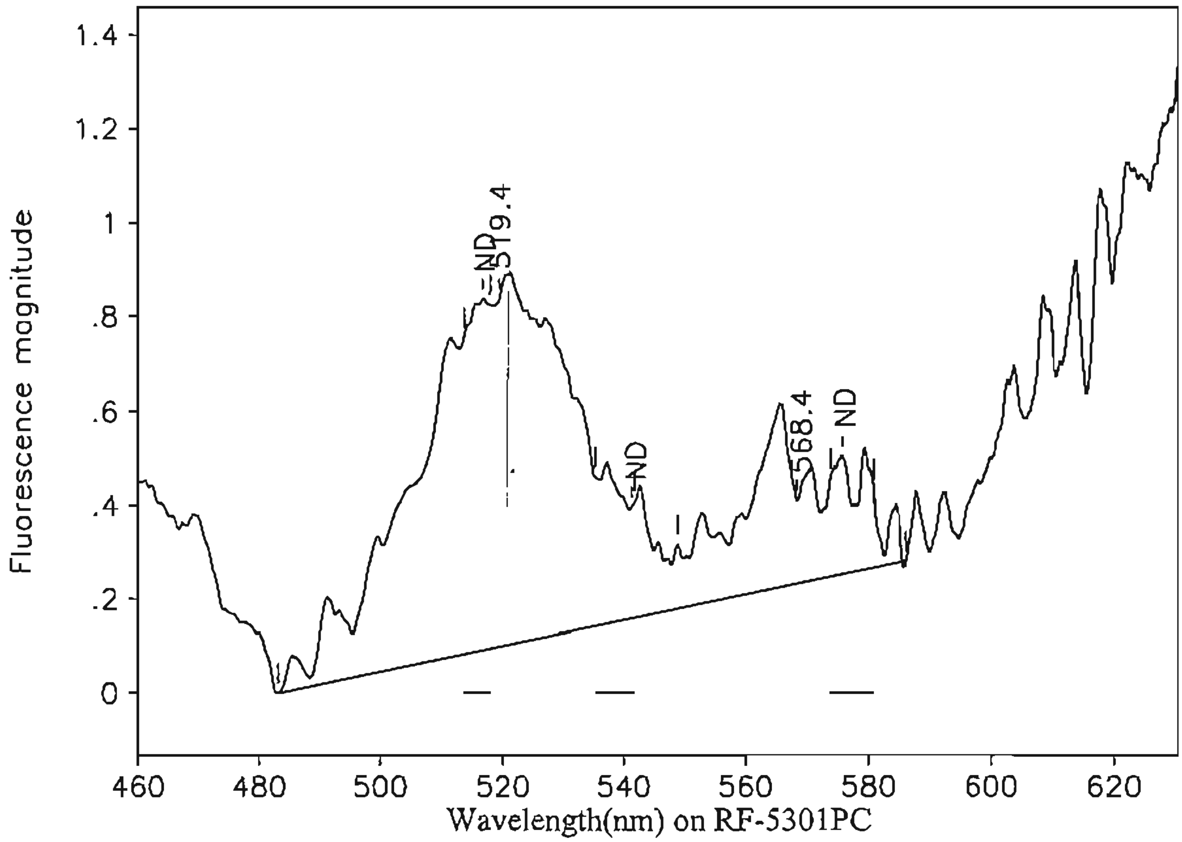
Station 24: MW-2 @ 250'
OUL number: M7344 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1020

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	482.4	551.2	1.23	34.41	0.04	0.809
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 25: MW-3 @ 190'
OUL number: M7345
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

Collected: 06/13/03 0950

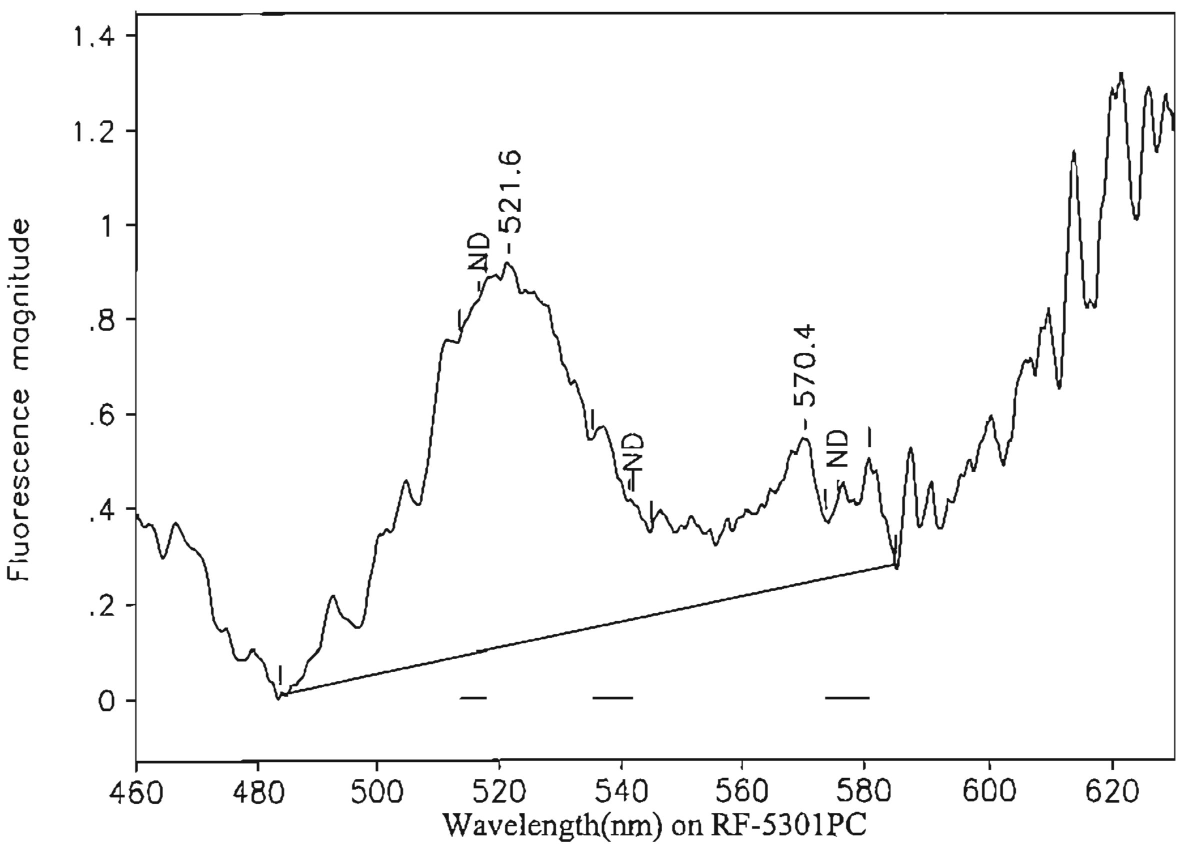
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.4	548.8	586.0	0.18	6.75	0.03	~~1.28~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

519.4	483.2	548.8	0.74	25.34	0.03	~~0.595~~ ND

Ozark Underground Laboratory



Station 26: MW-3 @ 200'
OUL number: M7346
Matrix: Elutant
Placed: / /

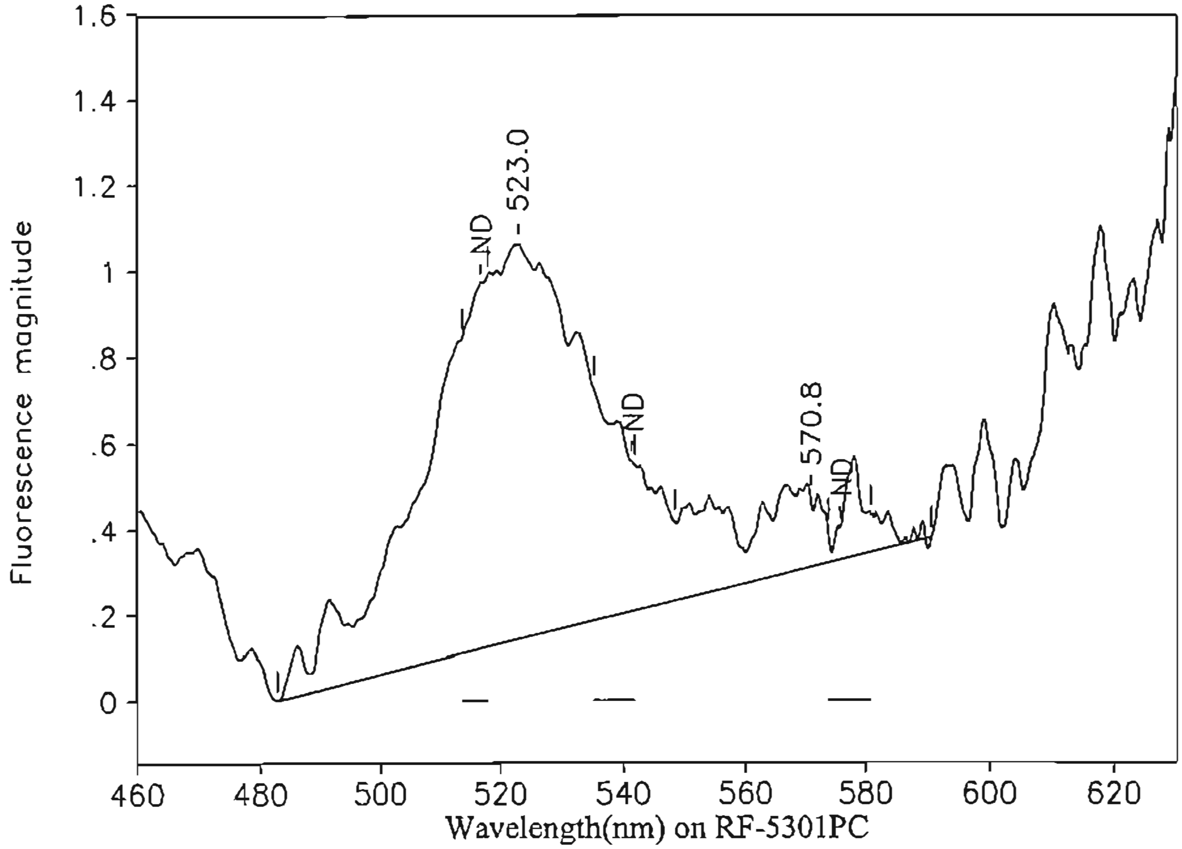
Analyzed: 06/20/03

Collected: 06/13/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.4	544.9	585.0	0.30	7.21	0.04	~~1.37~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.6	483.8	544.9	0.81	25.24	0.03	~~0.593~~ ND

Ozark Underground Laboratory



Station 27: MW-3 @ 210'
OUL number: M7347
Matrix: Elutant
Placed: / /

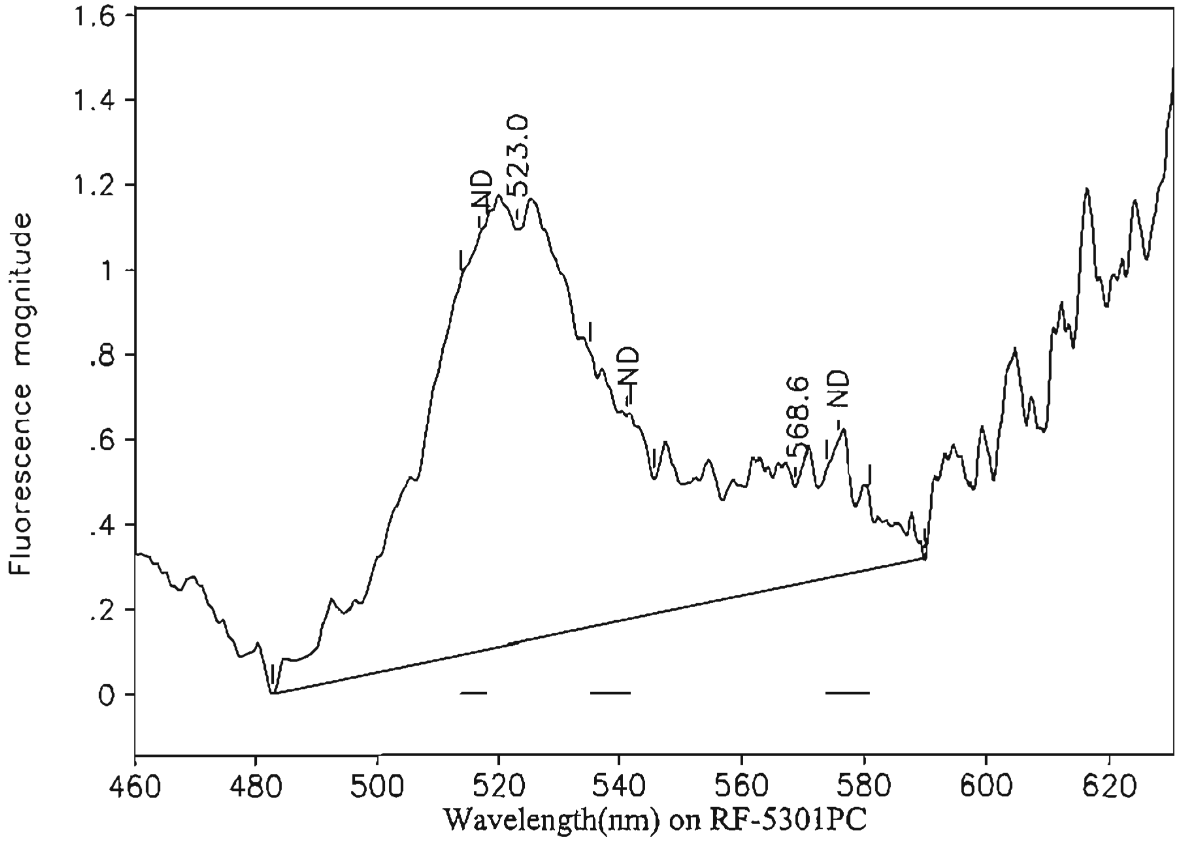
Analyzed: 06/20/03

Collected: 06/13/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.8	548.3	590.6	0.17	5.36	0.03	~~1.01~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
523.0	482.8	548.3	0.92	30.41	0.03	~~0.715~~ ND

Ozark Underground Laboratory



Station 28: MW-3 @ 220'
OUL number: M7348 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 0950

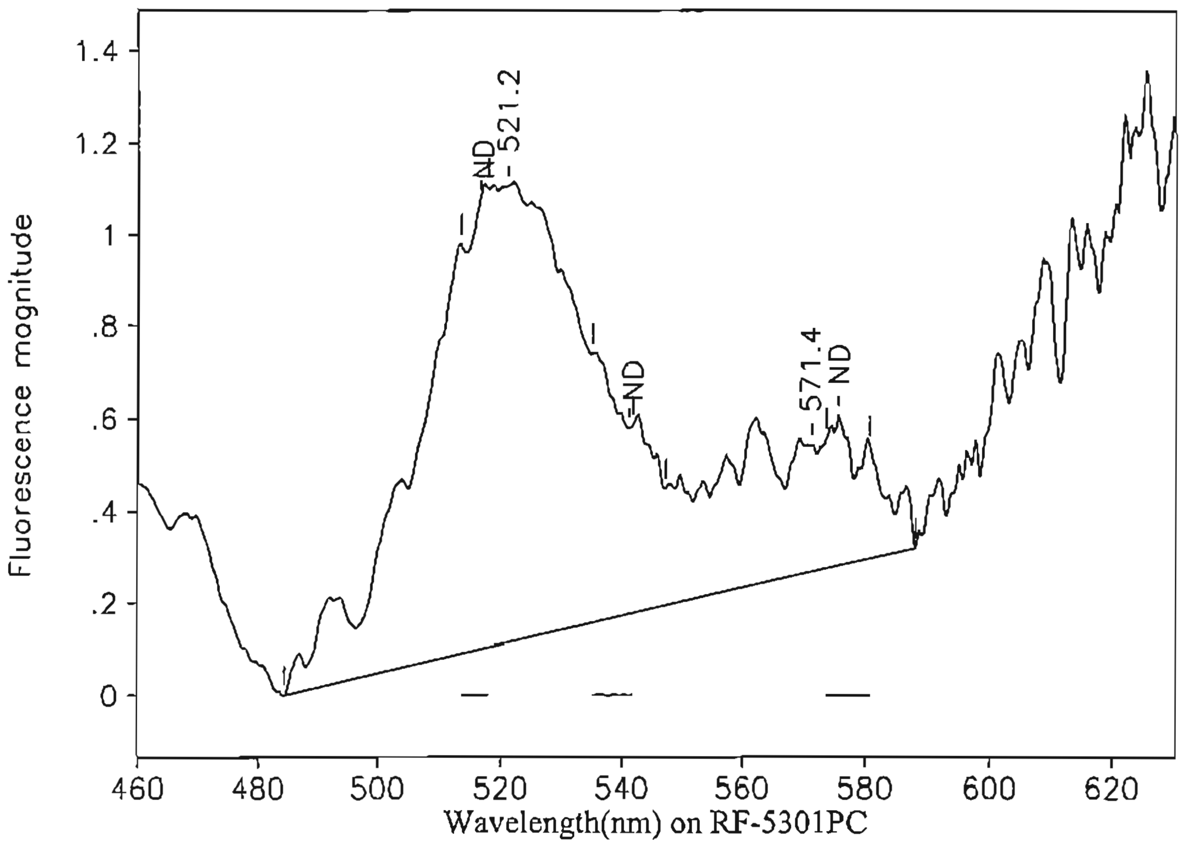
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.6	545.7	589.8	0.23	10.64	0.02	~~2.02~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

523.0	482.8	545.7	0.97	34.70	0.03	~~0.815~~ ND

Ozark Underground Laboratory



Station 29: MW-3 @ 230'
OUL number: M7349
Matrix: Elutant
Placed: / /

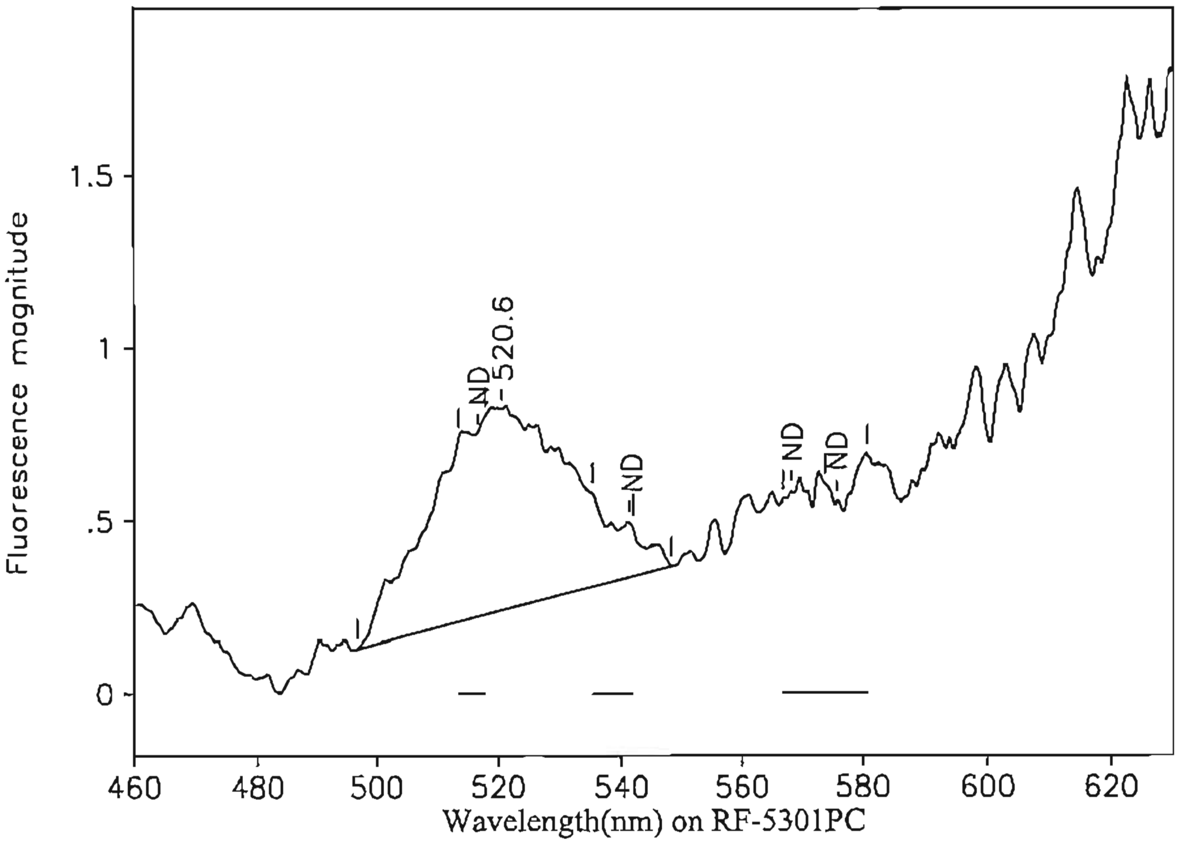
Analyzed: 06/20/03

Collected: 06/13/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
571.4	547.3	588.0	0.27	9.59	0.03	~~1.82~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.2	484.4	547.3	0.99	33.15	0.03	~~0.779~~ ND

Ozark Underground Laboratory



Station 30: MW-3 @ 240'
OUL number: M7350
Matrix: Elutant
Placed: / /

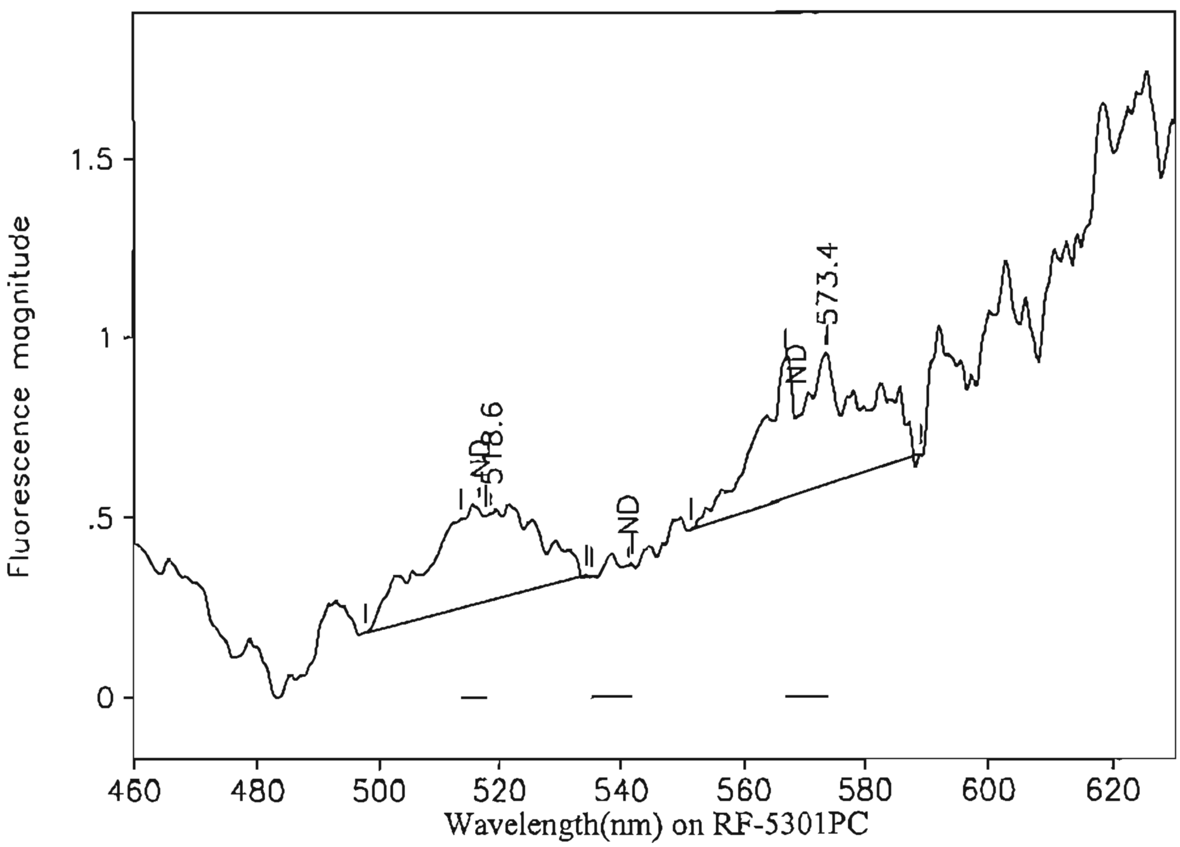
Analyzed: 06/20/03

Collected: 06/13/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.6	496.8	548.2	0.58	16.04	0.04	~~0.377~~ ND

Ozark Underground Laboratory

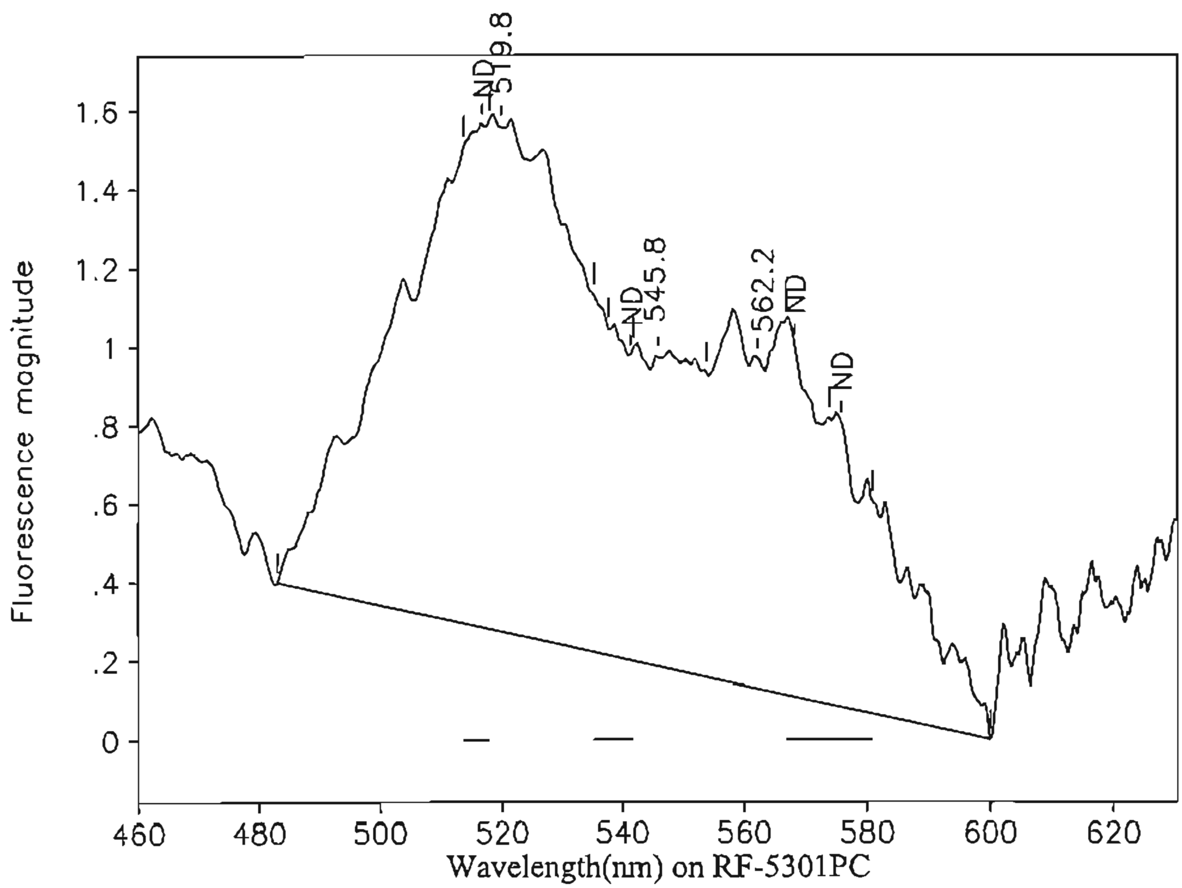


Station 31: MW-4 @ 190'
OUL number: M7351 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
573.4	551.4	589.0	0.36	6.65	0.05	~~0.557~~
Peaks close to the normal range of tracer dyes:						
518.6	497.8	534.4	0.24	5.68	0.04	~~0.133~~ ND

Ozark Underground Laboratory



Station 32: MW-4 @ 200'
OUL number: M7352
Matrix: Elutant
Placed: / /

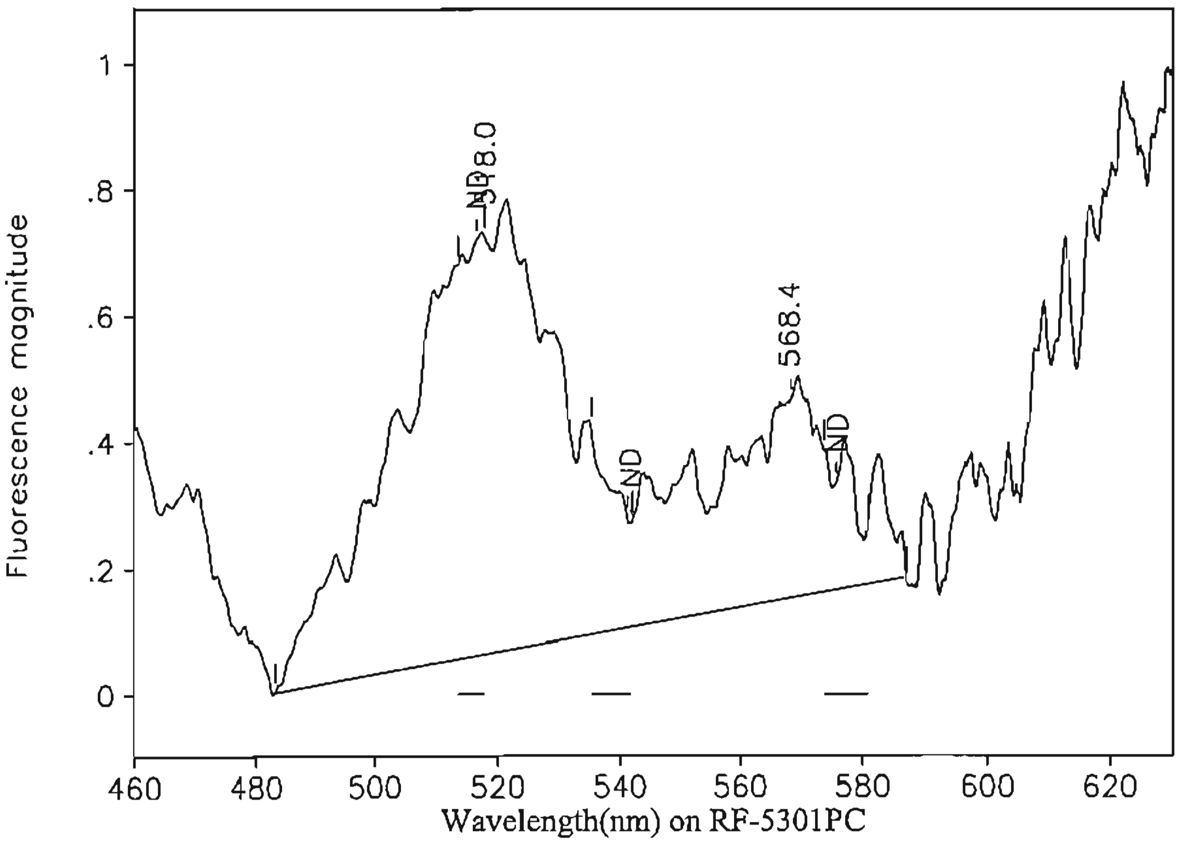
Analyzed: 06/20/03

Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.8	483.0	537.6	1.29	45.43	0.03	~~1.07~~ ND
545.8	537.6	553.8	0.79	12.98	0.06	~~0.000~~
562.2	553.8	600.0	0.84	26.62	0.03	~~5.04~~

Ozark Underground Laboratory



Station 33: MW-4 @ 210'
OUL number: M7353
Matrix: Elutant
Placed: / /

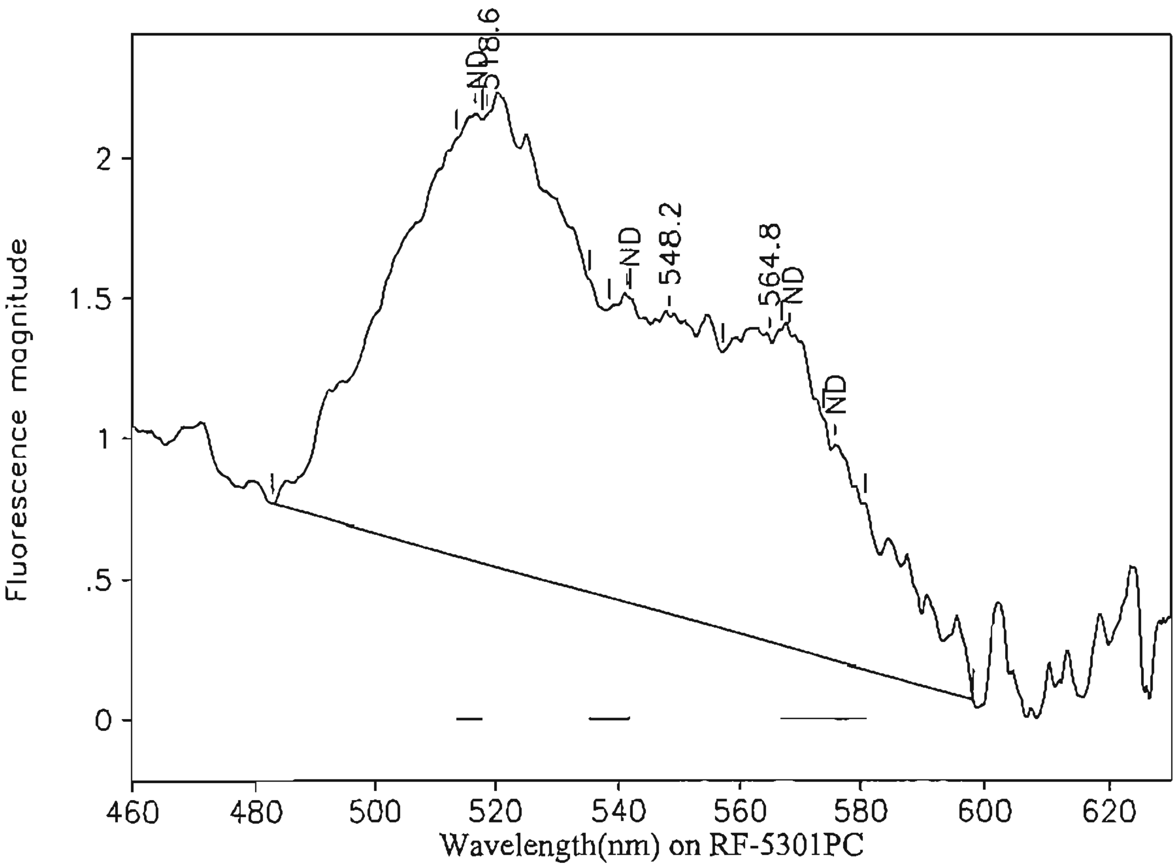
Analyzed: 06/20/03

Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.4	542.1	587.0	0.31	9.45	0.03	~~1.79~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	483.2	542.1	0.66	22.04	0.03	~~0.518~~ ND

Ozark Underground Laboratory



Station 34: MW-4 @ 220'
OUL number: M7354
Matrix: Elutant
Placed: / /

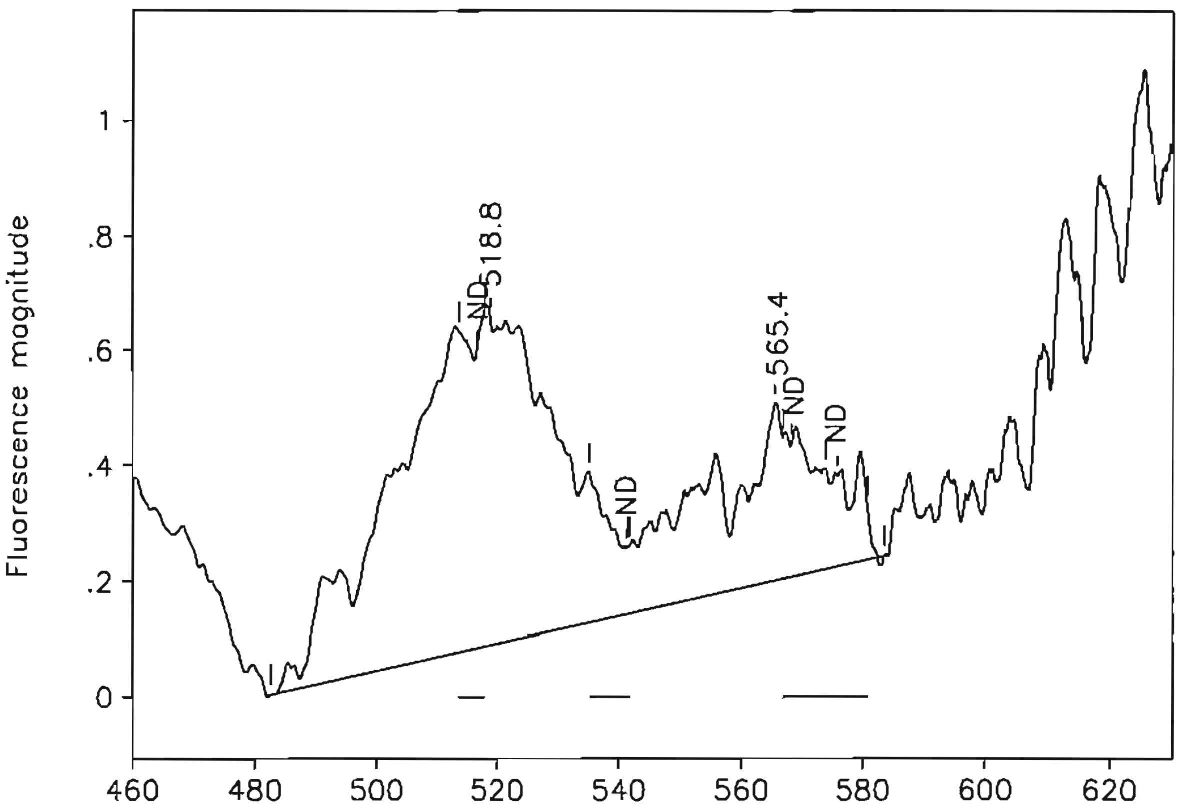
Analyzed: 06/20/03

Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.6	482.8	538.5	1.60	56.97	0.03	~~1.34~~ ND
548.2	538.5	557.2	1.06	19.75	0.05	~~0.988~~
564.8	557.2	598.2	1.08	28.39	0.04	~~5.38~~

Ozark Underground Laboratory



Station 35: MW-4 @ 230'
OUL number: M7355
Matrix: Elutant
Placed: / /

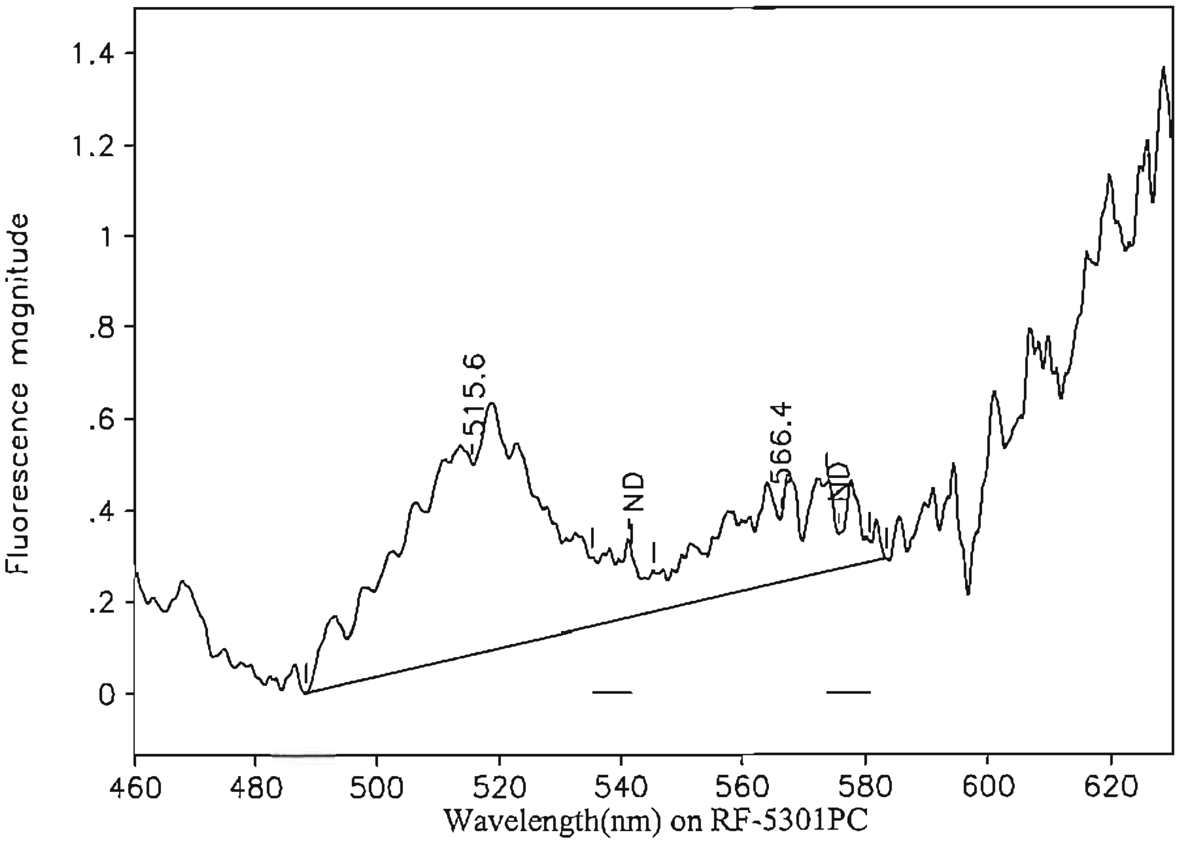
Analyzed: 06/20/03

Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.8	482.6	541.6	0.57	18.31	0.03	~~0.430~~ ND
565.4	541.6	583.6	0.31	6.88	0.05	~~1.30~~

Ozark Underground Laboratory



Station 36: MW-4 @ 240'
OUL number: M7356
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03

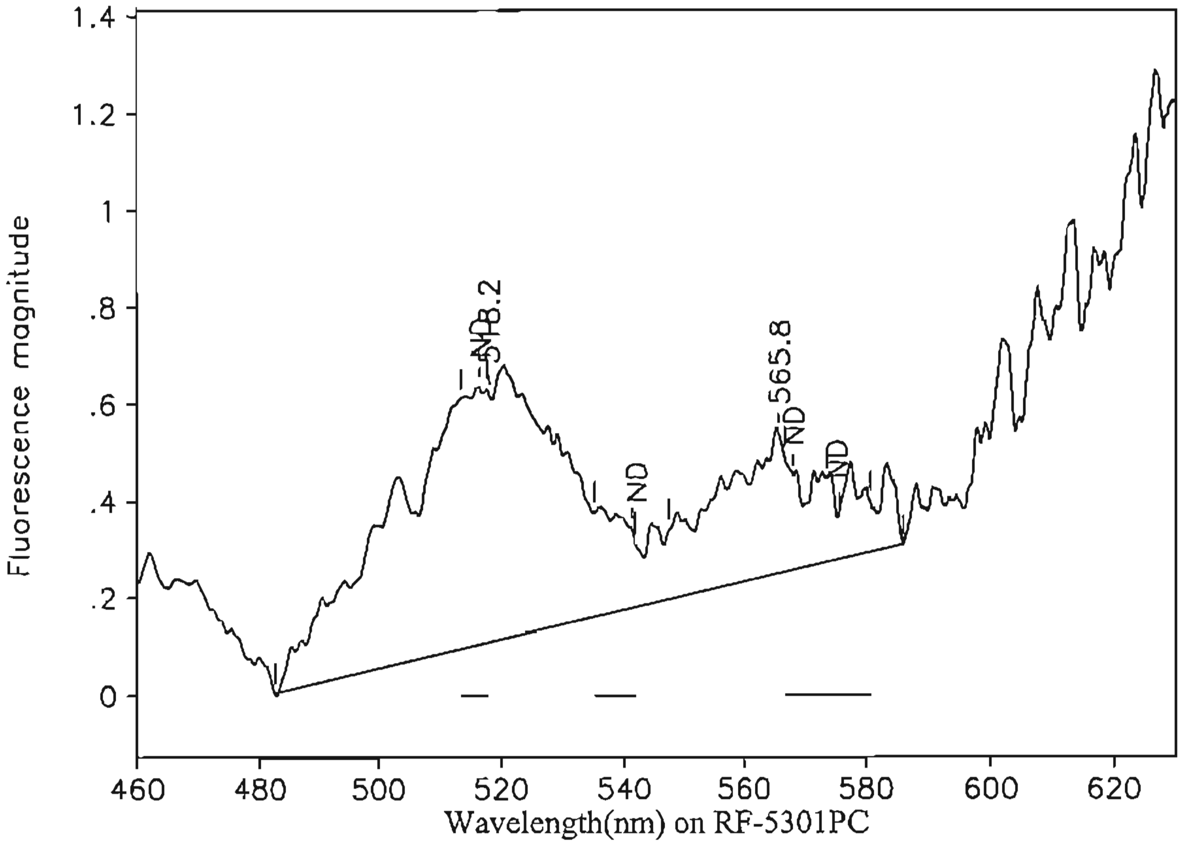
Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	488.4	545.5	0.41	14.89	0.03	~~0.350~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
566.4	545.5	583.4	0.14	4.97	0.03	~~0.942~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



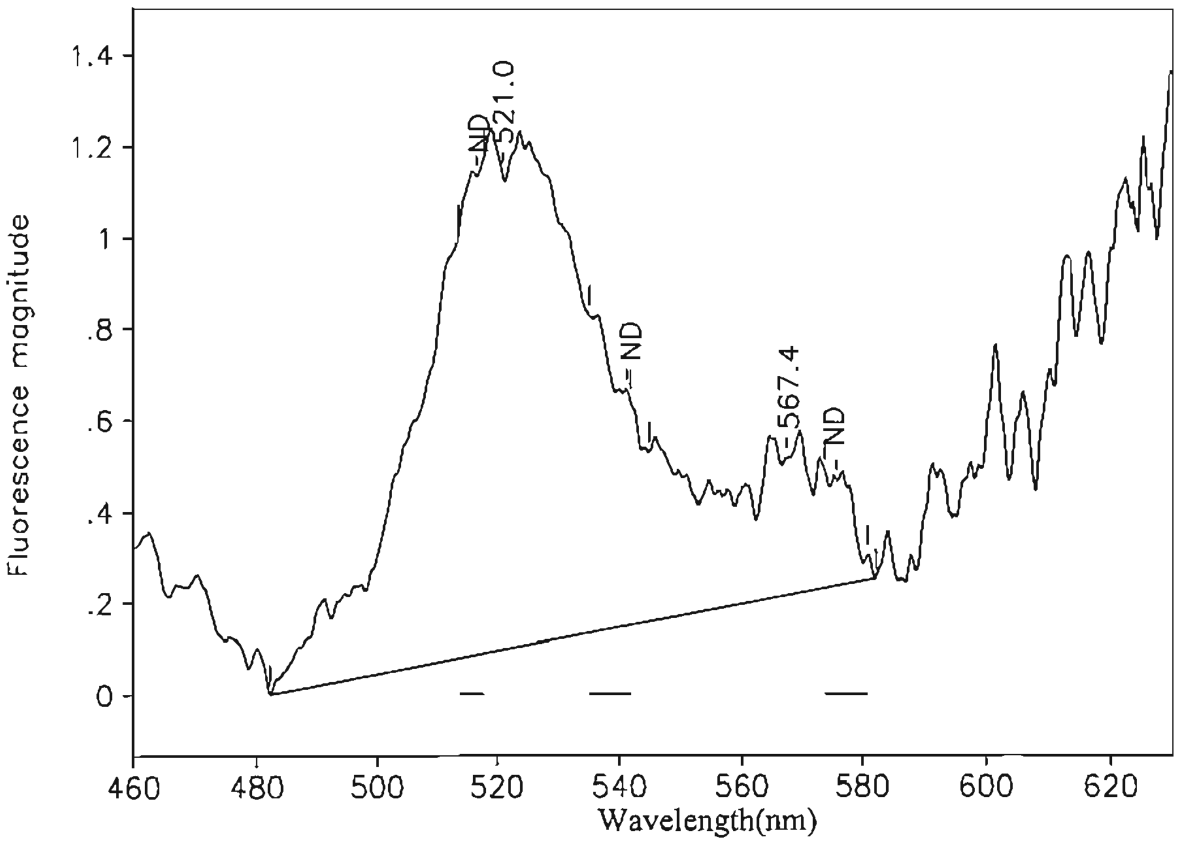
Station 37: MW-4 @ 250'
OUL number: M7357
Matrix: Elutant
Placed: / /

Analyzed: 06/20/03
Collected: 06/13/03 1140

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	482.6	547.5	0.51	19.25	0.03	~~0.452~~ ND
565.8	547.5	586.0	0.29	6.60	0.04	~~1.25~~

Ozark Underground Laboratory



Station 29: MW-3 @ 230'
OUL number: M7358 Analyzed: 06/20/03
Matrix: Elutant
Placed: / / Collected: 06/13/03 0950
Comment: 2nd whirl-pak labeled MW-3 @ 230'

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.4	544.8	582.2	0.30	9.58	0.03	1.81
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.0	482.2	544.8	1.04	37.11	0.03	0.872

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

July 25, 2003

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for charcoal samplers shipped on July 14, 2003
Ozark Underground Laboratory (OUL) numbers M7839 through M7868.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on July 15, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheets
3. Nodarse & Assoc. Chain-of-Custody Record
4. Discrepancy sheet
5. Sample analysis graphs

f:\docs\coa\festival05.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park – Project CH2MHill 177652
Samples Collected By: Mike Burns
Date Samples Shipped: July 14, 2003
Date Samples Rec'd at OUL: July 15, 2003
Date Analyzed by OUL: July 17, 2003

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine	
				2003	Peak	Conc.	Peak	Conc.
M7839	39	MW-1 @ 149'	NDT	7/14 1045	515.3	310	ND	
M7840	Laboratory Control Charcoal Blank							
M7841	40	MW-1 @ 159'	NDT	7/14 1045	515.5	291	ND	
M7842	41	MW-1 @ 169	NDT	7/14 1045	515.4	314	ND	
M7843	42	MW-1 @179'	NDT	7/14 1045	515.3	384	ND	
M7844	43	MW-1 @ 189'	NDT	7/14 1045	515.3	375	ND	
M7845	44	MW-1 @ 199'	NDT	7/14 1045	515.3	484	ND	
M7846	45	MW-1 @ 209'	NDT	7/14 1045	515.4	513	ND	
M7847	18	MW-2 @ 190'	NDT	7/14 1030	517.6	4.89	ND	
M7848	19	MW-2 @ 200'	NDT	7/14 1030	517.4	2.55	ND	
M7849	20	MW-2 @ 210'	NDT	7/14 1030	517.7	2.23	ND	
M7850	21	MW-2 @ 220'	NDT	7/14 1030	517.6	1.28	ND	
M7851	22	MW-2 @ 230'	NDT	7/14 1030	517.6	1.42	ND	
M7852	23	MW-2 @ 240'	NDT	7/14 1030	516.9	0.989	ND	
M7853	24	MW-2 @ 250'	NDT	7/14 1030	518.6 *	0.700	ND	
M7854	25	MW-3 @ 190'	NDT	7/14 0950	ND		ND	
M7855	26	MW-3 @ 200'	NDT	7/14 0950	ND		ND	
M7856	27	MW-3 @ 210'	NDT	7/14 0950	ND		ND	
M7857	28	MW-3 @ 220'	NDT	7/14 0950	ND		ND	
M7858	29	MW-3 @ 230'	NDT	7/14 0950	ND		ND	
M7859	30	MW-3 @ 240'	NDT	7/14 0950	ND		ND	
M7860	Laboratory Control Charcoal Blank							
M7861	46	MW-3 @ 250'	NDT	7/14 0950	ND		ND	
M7862	31	MW-4 @ 190'	NDT	7/14 1115	ND		ND	
M7863	32	MW-4 @ 200'	NDT	7/14 1115	ND		ND	
M7864	33	MW-4 @ 210'	NDT	7/14 1115	ND		ND	
M7865	34	MW-4 @ 220'	NDT	7/14 1115	ND		ND	
M7866	35	MW-4 @ 230'	NDT	7/14 1115	ND		ND	
M7867	36	MW-4 @ 240'	NDT	7/14 1115	ND		ND	
M7868	35	MW-4 @ 230'	NDT	7/14 1115	ND		ND	

(Footnotes on next page)

FOOTNOTES:

NDT = No date or time given

ND = No dye detected

* = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated for background purposes as though it were the dye.

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park Week No: Samples Collected By: Mike Burns

Samples Shipped By: Samples Received By: M. Arnold - OUL

Date Samples Shipped: 7/14/03 Date Samples Received: 7/15/03 Time Samples Received: 13:30 Return Cooler? Yes ___ No ✓

Bill to: Send Results to:

Analyze for: Fluorescein ✓ Eosine ✓ Rhodamine WT ___ Other ___ Ship cooler to:

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED 2003 DATE	COLLECTED TIME	# WATER REC'D
1	M7839	39	MW-1 @ 149'			7/14	1045	0
1	M7841	40	MW-1 @ 159'			7/14	1045	0
1	M7842	41	MW-1 @ 169'			7/14	1045	0
1	M7843	42	MW-1 @ 179'			7/14	1045	0
1	M7844	43	MW-1 @ 189'			7/14	1045	0
1	M7845	44	MW-1 @ 199'			7/14	1045	0
1	M7846	45	MW-1 @ 209'			7/14	1045	0
1	M7847	18	MW-2 @ 190'			7/14	1030	0
1	M7848	19	MW-2 @ 200'			7/14	1030	0
1	M7849	20	MW-2 @ 210'			7/14	1030	0
1	M7850	21	MW-2 @ 220			7/14	1030	0
1	M7851	22	MW-2 @ 230			7/14	1030	0
1	M7852	23	MW-2 @ 240			7/14	1030	0
1	M7853	24	MW-2 @ 250			7/14	1030	0

COMMENTS: Unless otherwise noted, all water samples were collected at the date and time listed in the "collected" column. Charcoal Blank M7840

This sheet filled out by OUL staff? Yes ✓ No ___ Charts for samples on this page proofed by OUL: [signature]

Project 551 Analyzed 7/17/03 by me OUL

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park Week No: ______ Samples Collected By: Mike Burns

Samples Shipped By: ______ Samples Received By: M. Arnold - OUL

Date Samples Shipped: 7/14/03 Date Samples Received: 7/15/03 Time Samples Received: 13:30 Return Cooler? Yes ____ No ✓

Bill to: ______ Send Results to: ______

Analyze for: Fluorescein ✓ Eosine ✓ Rhodamine WT ____ Other ____ Ship cooler to: ______

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M7854	25	MW-3 @ 190'			7/14	0950	0
1	M7855	26	MW-3 @ 200'			7/14	0950	0
1	M7856	27	MW-3 @ 210'			7/14	0950	0
1	M7857	28	MW-3 @ 220'			7/14	0950	0
1	M7858	29	MW-3 @ 230'			7/14	0950	0
1	M7859	30	MW-3 @ 240'			7/14	0950	0
1	M7861	46	MW-3 @ 250'			7/14	0950	0
1	M7862	31	MW-4 @ 190'			7/14	1115	0
1	M7863	32	MW-4 @ 200'			7/14	1115	0
1	M7864	33	MW-4 @ 210			7/14	1115	0
1	M7865	34	MW-4 @ 220			7/14	1115	0
1	M7866	35	MW-4 @ 230			7/14	1115	0
1	M7867	36	MW-4 @ 240			7/14	1115	0
1	M7868	35	MW-4 @ 230			7/14	1115	0

COMMENTS: Unless otherwise noted, all water samples were collected at the date and time listed in the "collected" column. Charcoal Blank M7860

This sheet filled out by OUL staff? Yes ✓ No ______ Charts for samples on this page proofed by OUL: [illegible]

Analyzed 7/17/03 by MR

OUL Page 2 of 2

448

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PC&E Environmental
1572 Aley Lane
Protem, Missouri 65733
30367
~~210 Park Road~~, Oviedo, FL 32765
~~407-359-7194~~ (FAX) 407-359-7197

Chain of Custody

Work Order:

Date: Page 1 of 1

COMPANY: Nodarse & Assoc.

ADDRESS: 1675 Lee Rd.
Winter Park, FL. 32789

SAMPLED BY: Mike Burns SIGN: [signature]

PHONE: 407-740-6110 FAX:

ANALYSIS REQUESTED: Tracer Dye

PRESERVATION: ICE

#	SAMPLE ID	DATE/TIME		MATRIX: AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID	Tracer Dye (ICE)	Number of Containers
1	mw-1 149', 154'-209'	7/14/03	1045						✓	7
2	mw-2 190' thru 250'	↓	1030						✓	7
3	mw-3 190' thru 250'	↓	0950						✓	7
4	mw-4 190' thru 250'	↓	1115						✓	7
5										
6										
7										
8										
9										
10										
11										
12										
13										

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: [signature]	7/14/03	1: Marty Arnold - OUL	7/15/03 1330
2:		2:	
3:		3:	

PROJECT INFORMATION

PROJECT NAME: Festival Park

PROJECT #: W01-E-120-1

SITE ADDRESS: Orlando, FL.

PROJECT MANAGER: Lydia Wing / Al Akens

SAMPLE RECEIPT

Total # of Containers	
Chain of Custody Seals	
Recv'd in Good Condition	
PO #:	

SPECIAL INSTRUCTIONS/COMMENTS: Submitted for CH2M Hill

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE/CONTRACT #:

449

OUL Page 1 of 1

WHITE: Project File YELLOW: Laboratory PINK: Sampler

OZARK UNDERGROUND LABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: CH2MHill - Festival Park **Date Rec'd by OUL:** 7-15-03 **Wk #:** ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
M7866		MW-4	7/14	Rec'd 2 whirl-pak bags	will analyze both
M7868				labeled MW-4 @ 230'	Packets
		MW-5 @ 250'	7/14	Chain-of-custody	
				indicates there should	
				be a sample for this	
				stn but it was	
				not rec'd. at OUL	

Comments:

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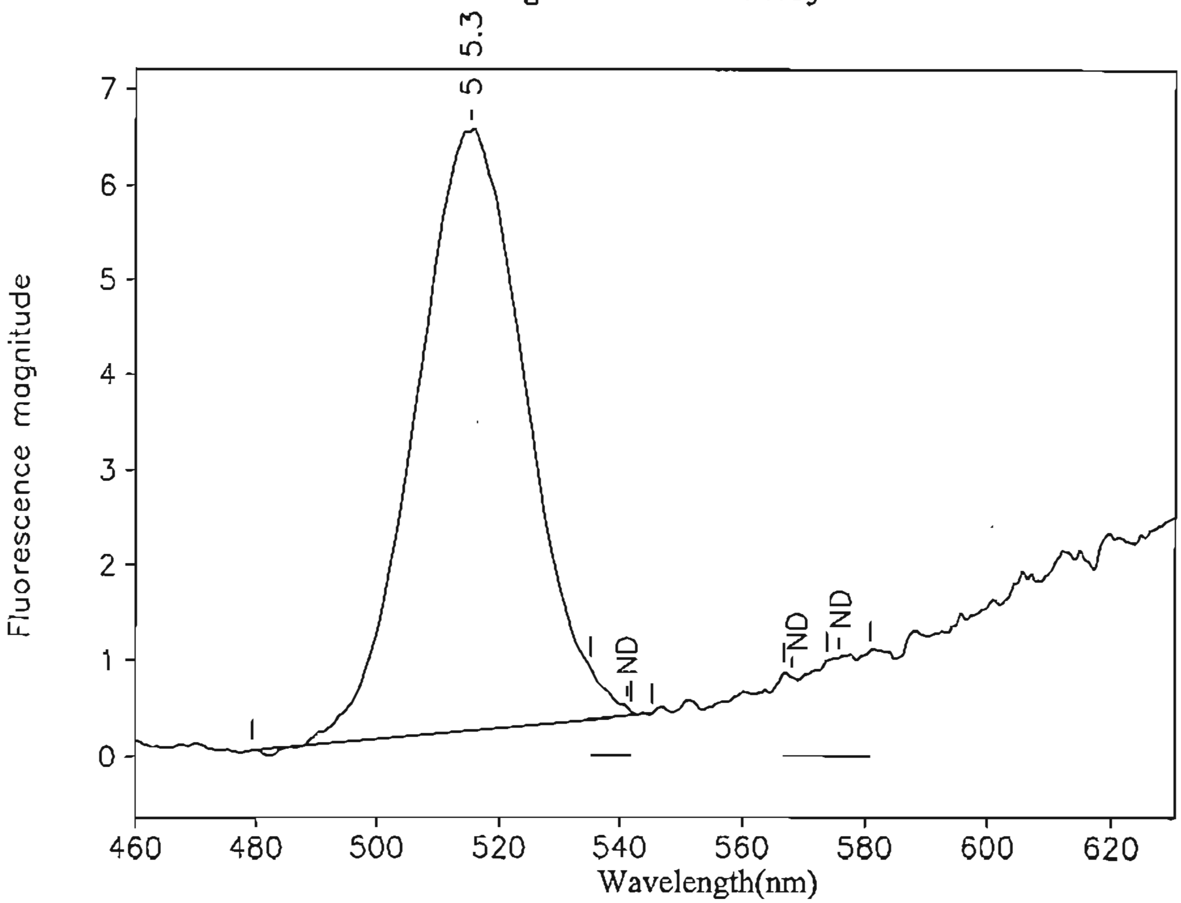

Station 39: MW-1 @ 149'
OUL number: M7839
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 07/17/03

Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	479.5	545.3	6.29	132.59	0.05	310
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Nr

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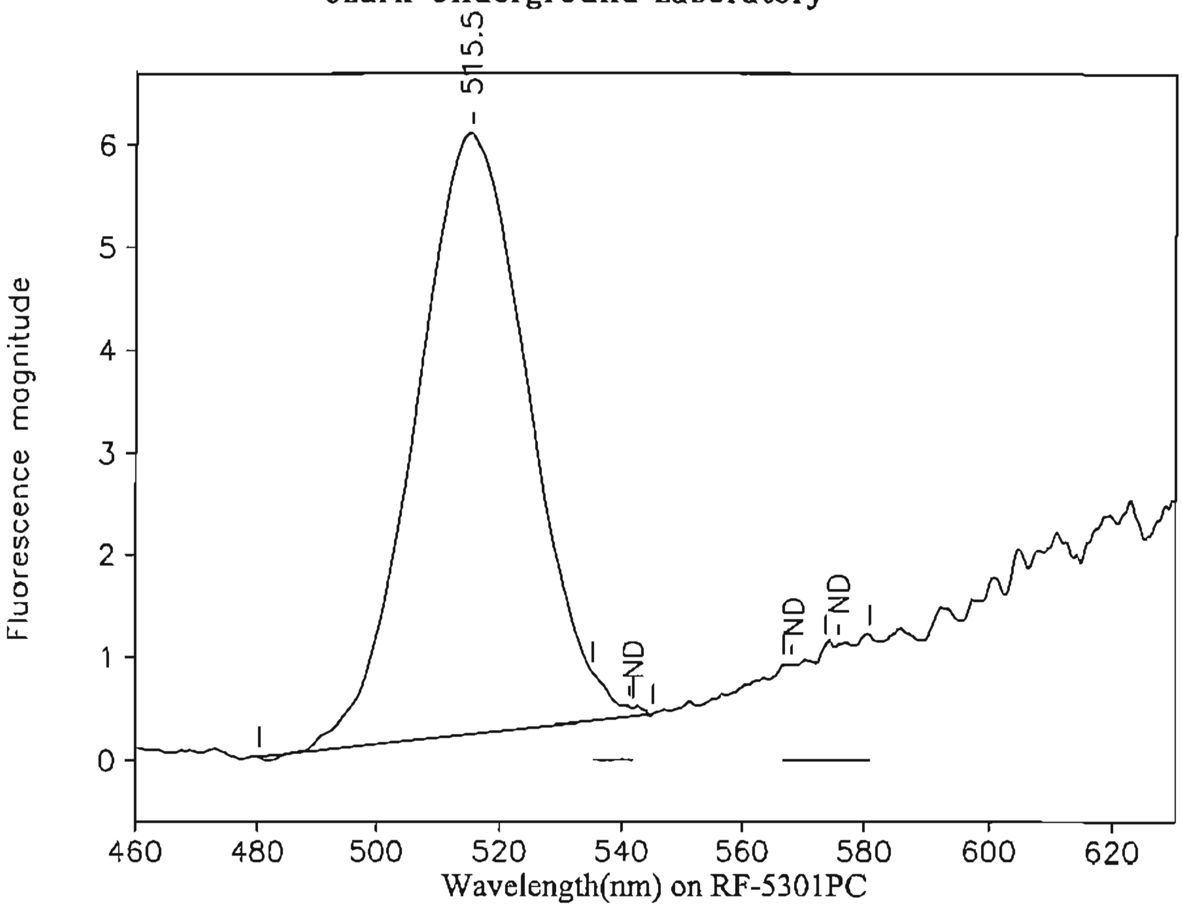


Station 40: MW-1 @ 159'
OUL number: M7841
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 07/17/03

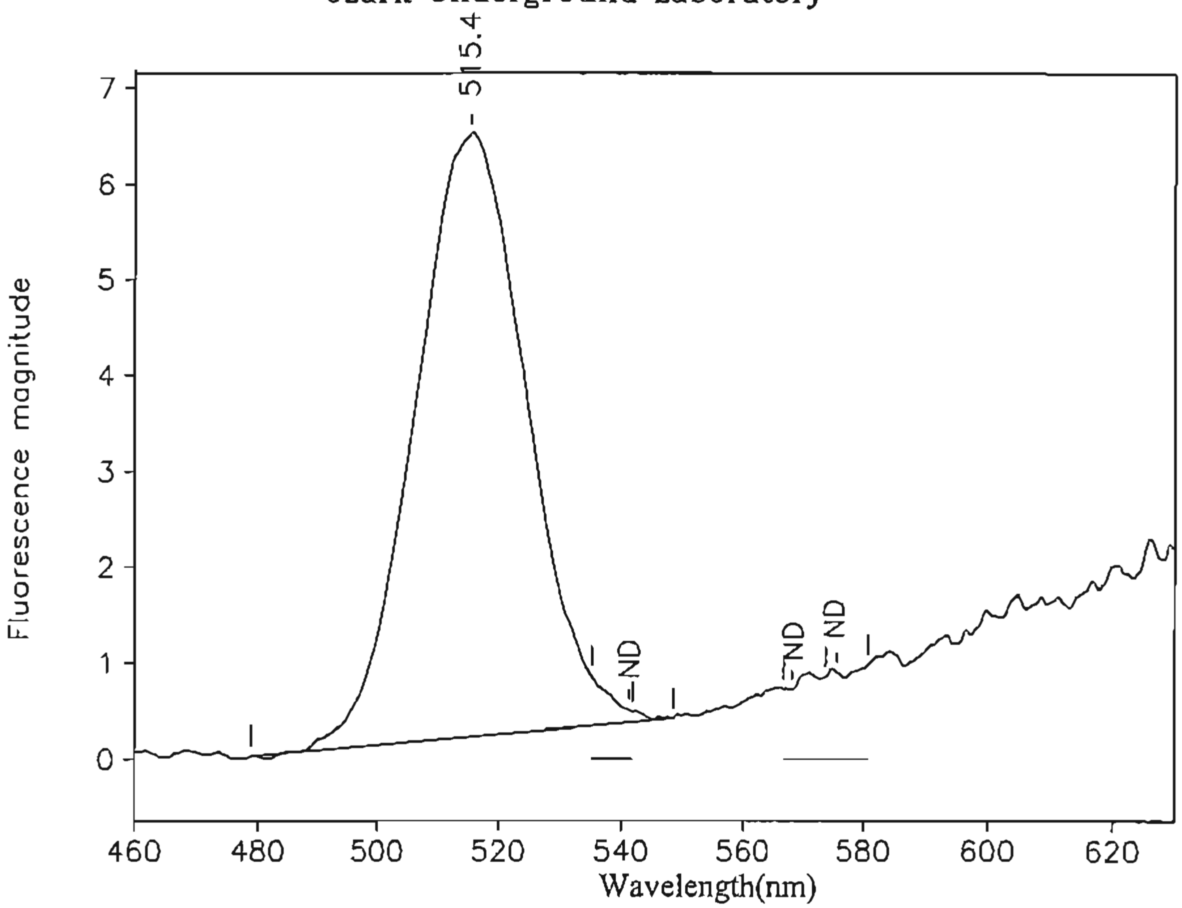
Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.5	480.3	545.1	5.86	124.18	0.05	291
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 41: MW-1 @ 169'	Diluted: 1 to 100
OUL number: M7842	Analyzed: 07/17/03
Matrix: Elutant	
Placed: / /	Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	478.9	548.4	6.28	134.12	0.05	314
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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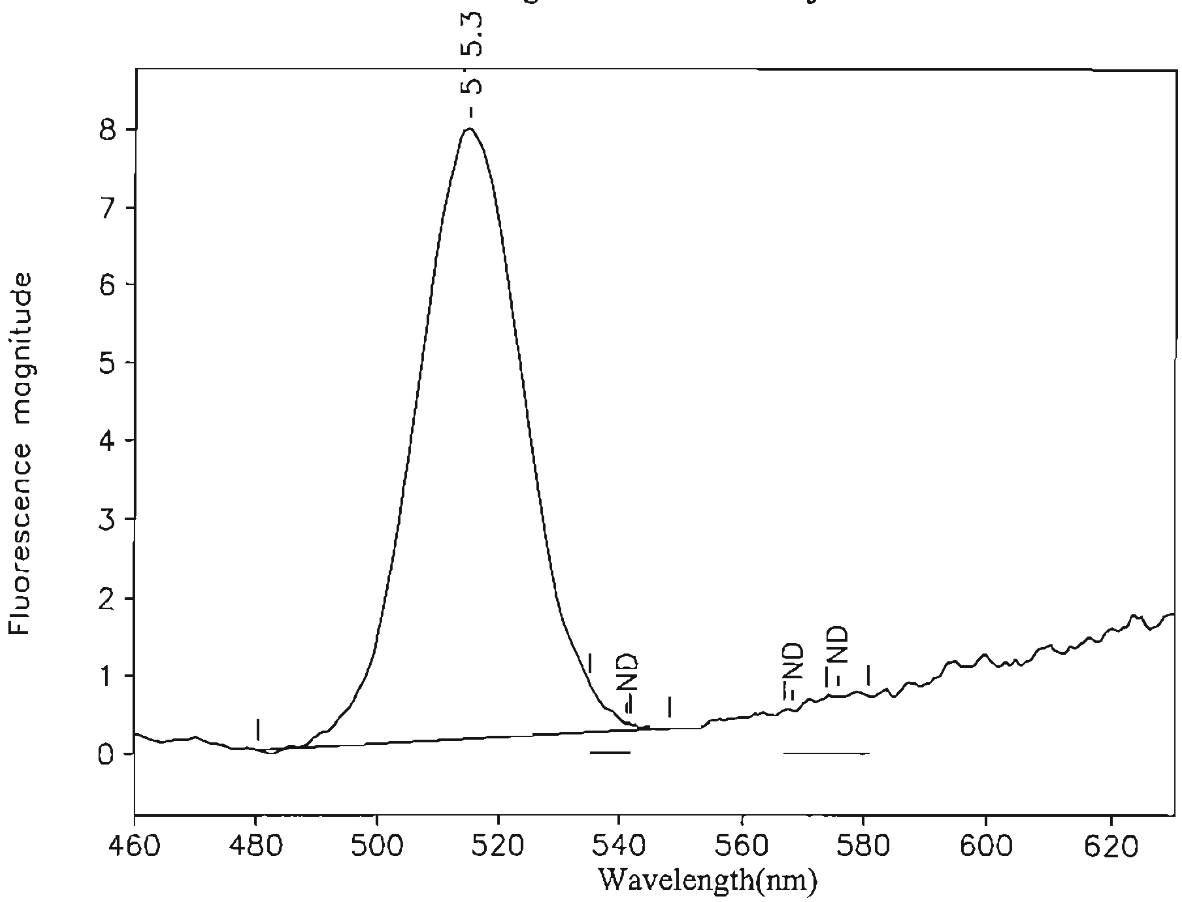

Station 42: MW-1 @ 179'	Diluted: 1 to 100
OUL number: M7843	Analyzed: 07/17/03
Matrix: Elutant	
Placed: / /	Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	480.4	548.1	7.82	164.13	0.05	384
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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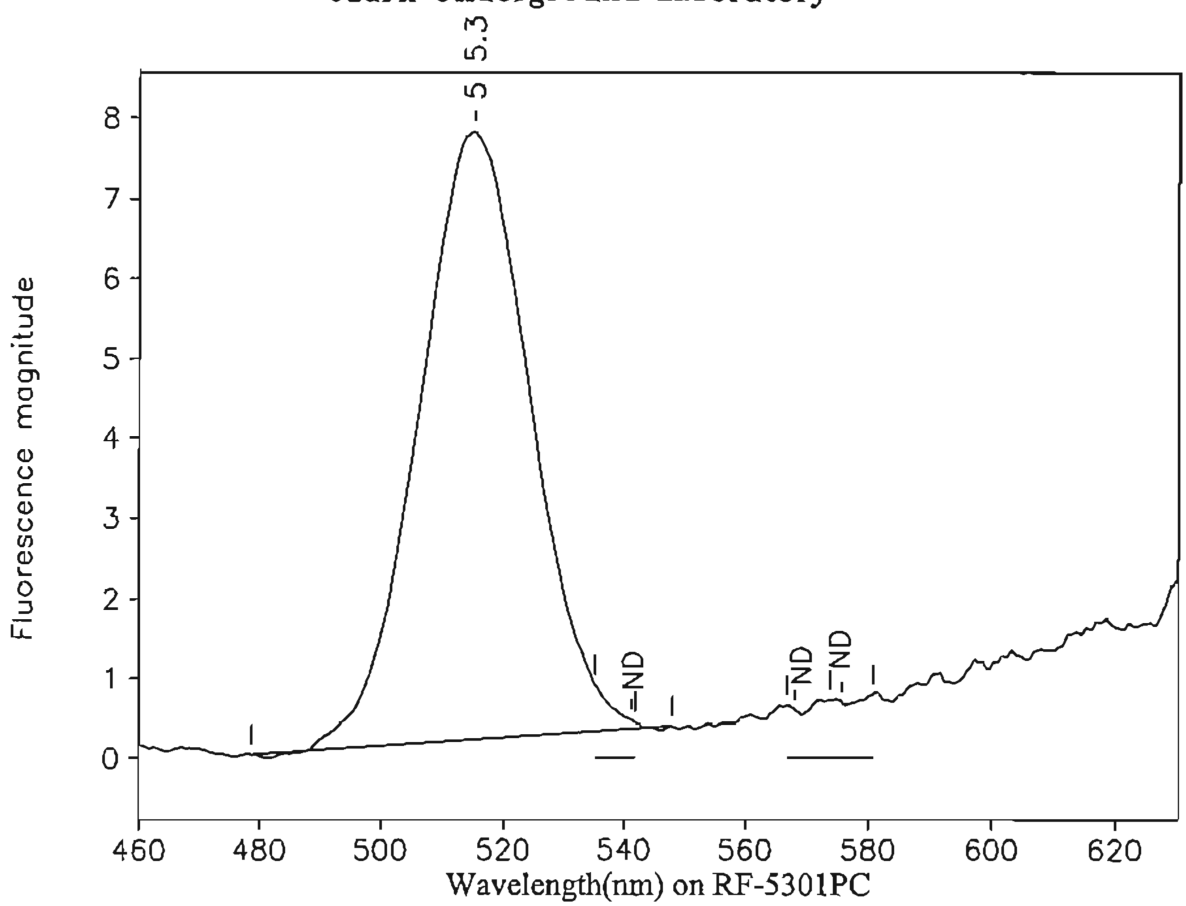


Station 43: MW-1 @ 189'
OUL number: M7844
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 07/17/03

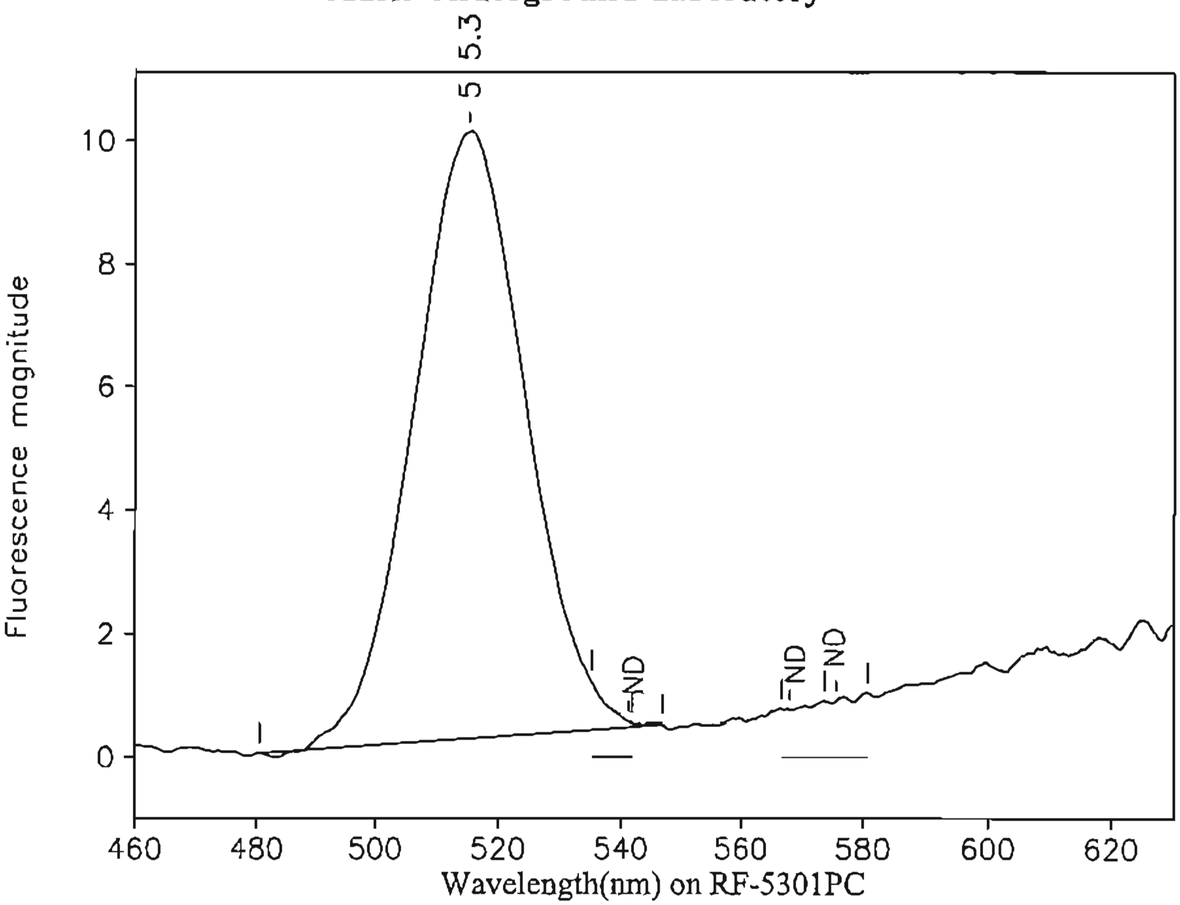
Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	478.7	548.0	7.60	160.23	0.05	375
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 44: MW-1 @ 199'
OUL number: M7845
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 07/17/03

Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	480.5	546.9	9.83	206.65	0.05	484
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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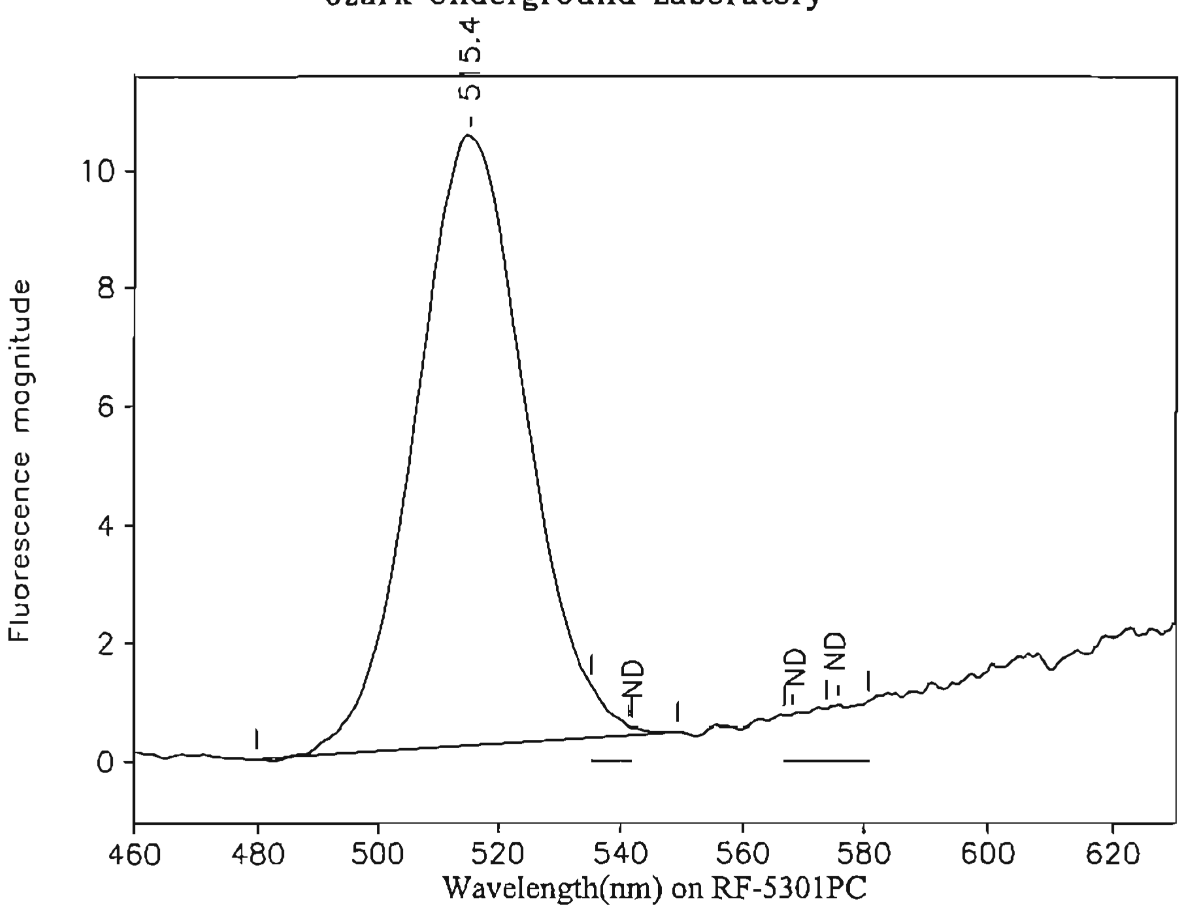

Station 45: MW-1 @ 209'
OUL number: M7846
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 07/17/03

Collected: 07/14/03 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	479.7	549.2	10.30	219.17	0.05	513
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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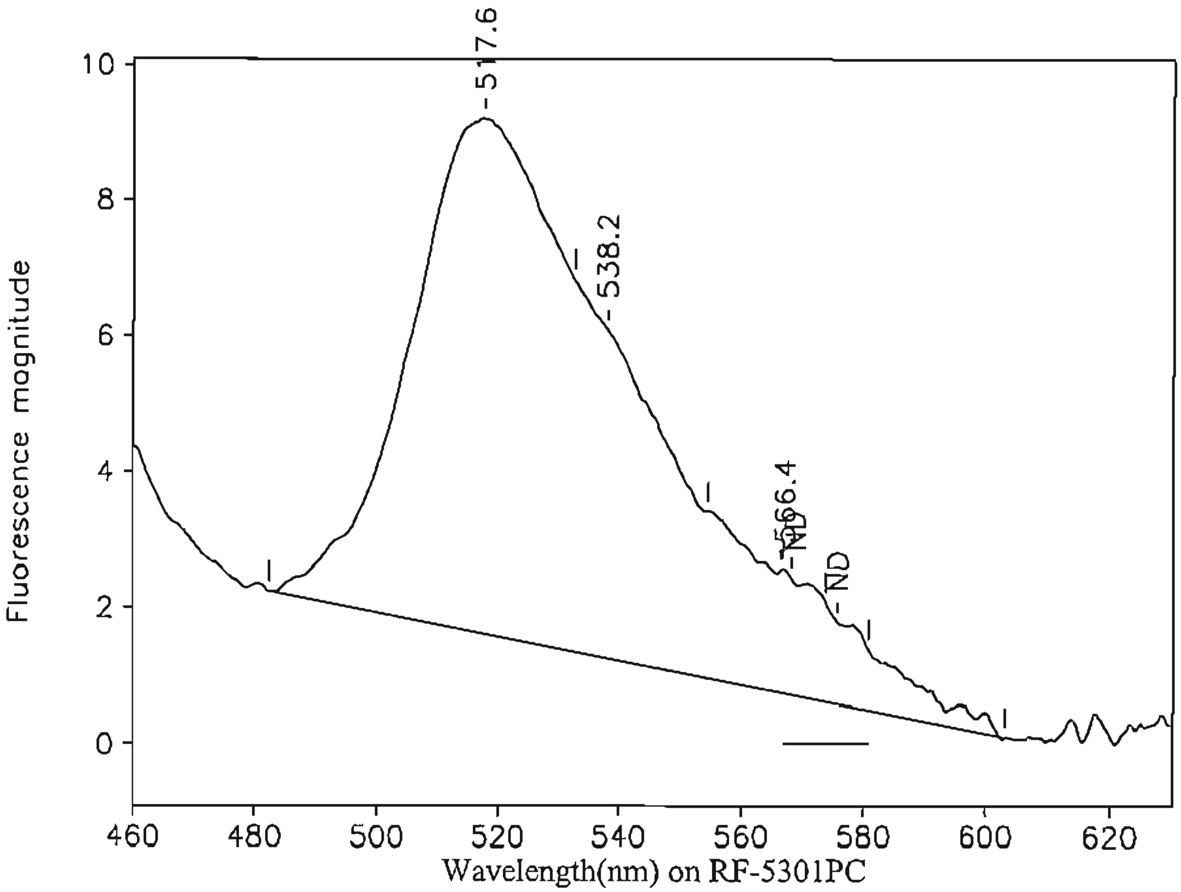

Station 18: MW-2 @ 190'
OUL number: M7847
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	482.4	532.7	7.59	209.14	0.04	4.89
538.2	532.7	554.6	4.85	87.64	0.06	~~4.28~~ ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
566.4	554.6	603.2	1.81	54.99	0.03	~~8.16~~

m

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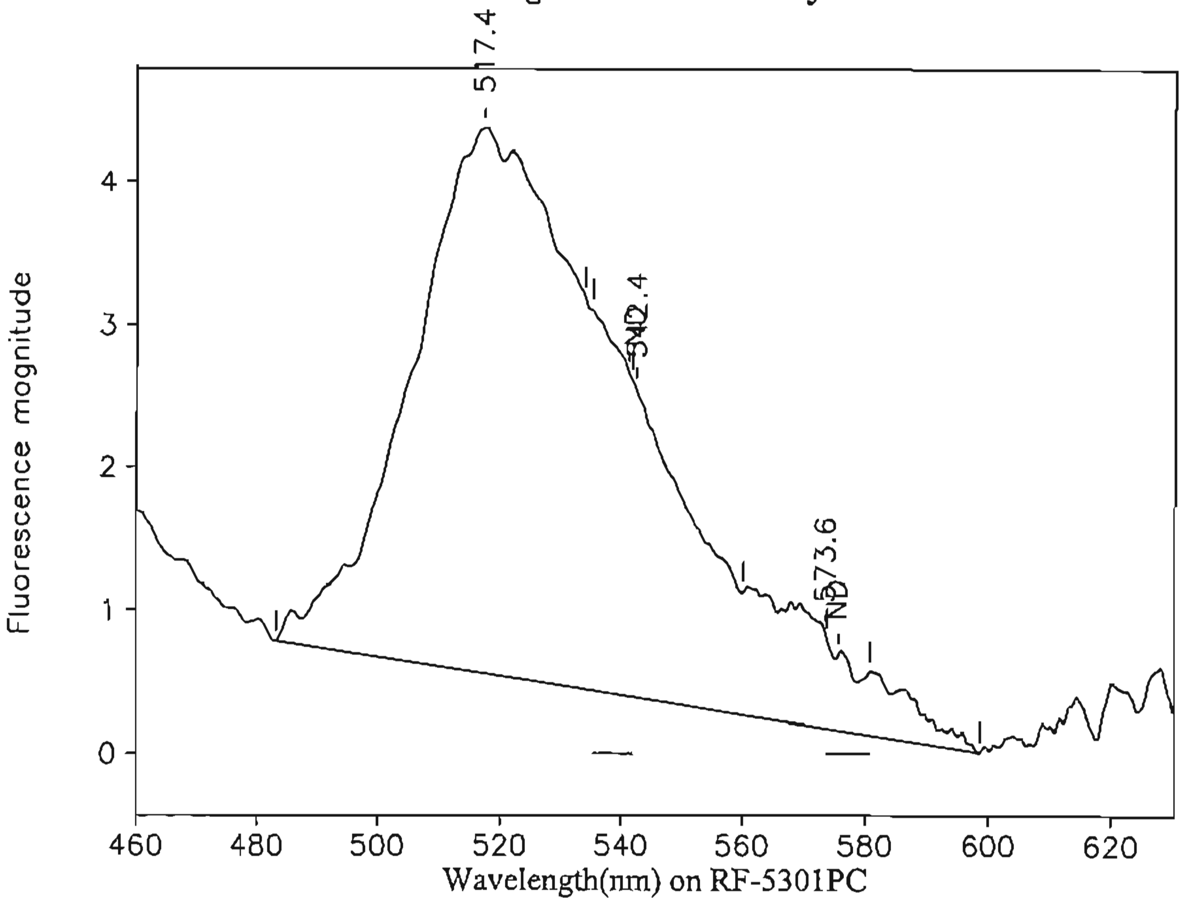

Station 19: MW-2 @ 200'
OUL number: M7848
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	483.2	534.0	3.82	109.01	0.04	2.55
541.3	535.2	541.8	0.00	0.00	0.00	ND
573.6	560.2	598.6	0.66	18.34	0.04	~~2.72~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.4	534.0	560.2	2.17	46.24	0.05	~~2.26~~ ND

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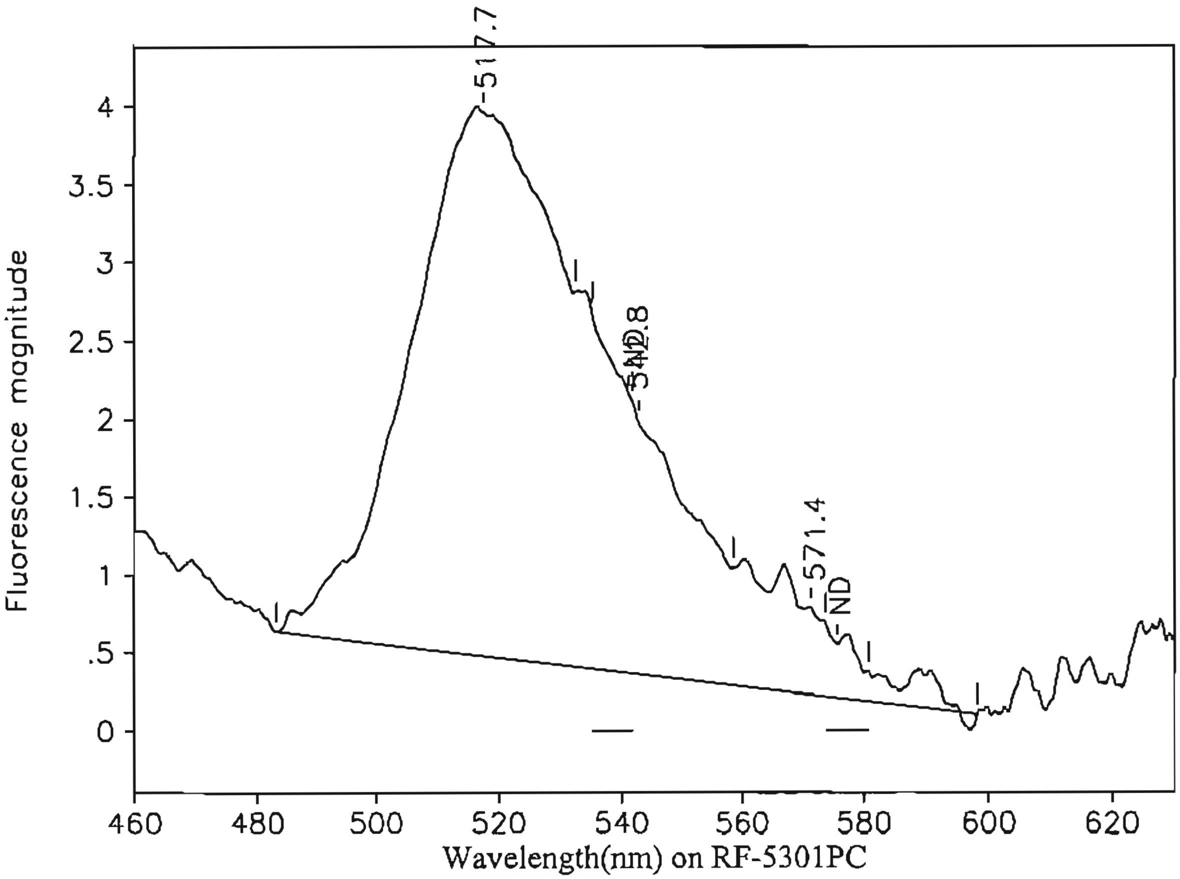

Station 20: MW-2 @ 210'
OUL number: M7849
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.7	483.2	532.6	3.49	95.08	0.04	2.23
541.3	535.2	541.8	0.00	0.00	0.00	ND
571.4	558.5	598.2	0.56	14.49	0.04	~~2.15~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.8	532.6	558.5	1.63	39.71	0.04	~~1.94~~ ND

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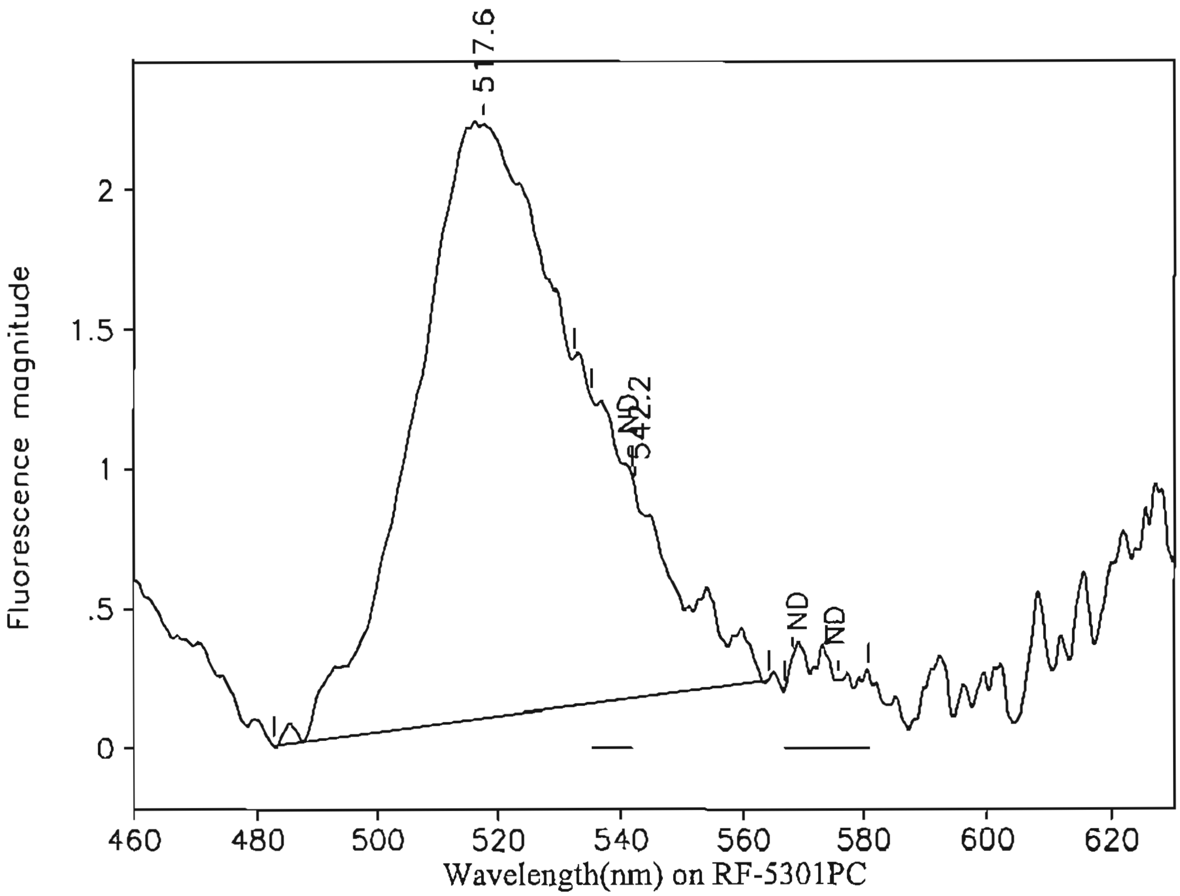

Station 21: MW-2 @ 220'
OUL number: M7850 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	482.6	532.4	2.12	54.77	0.04	1.28
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.2	532.4	564.2	0.76	17.06	0.04	~~0.833~~ ND

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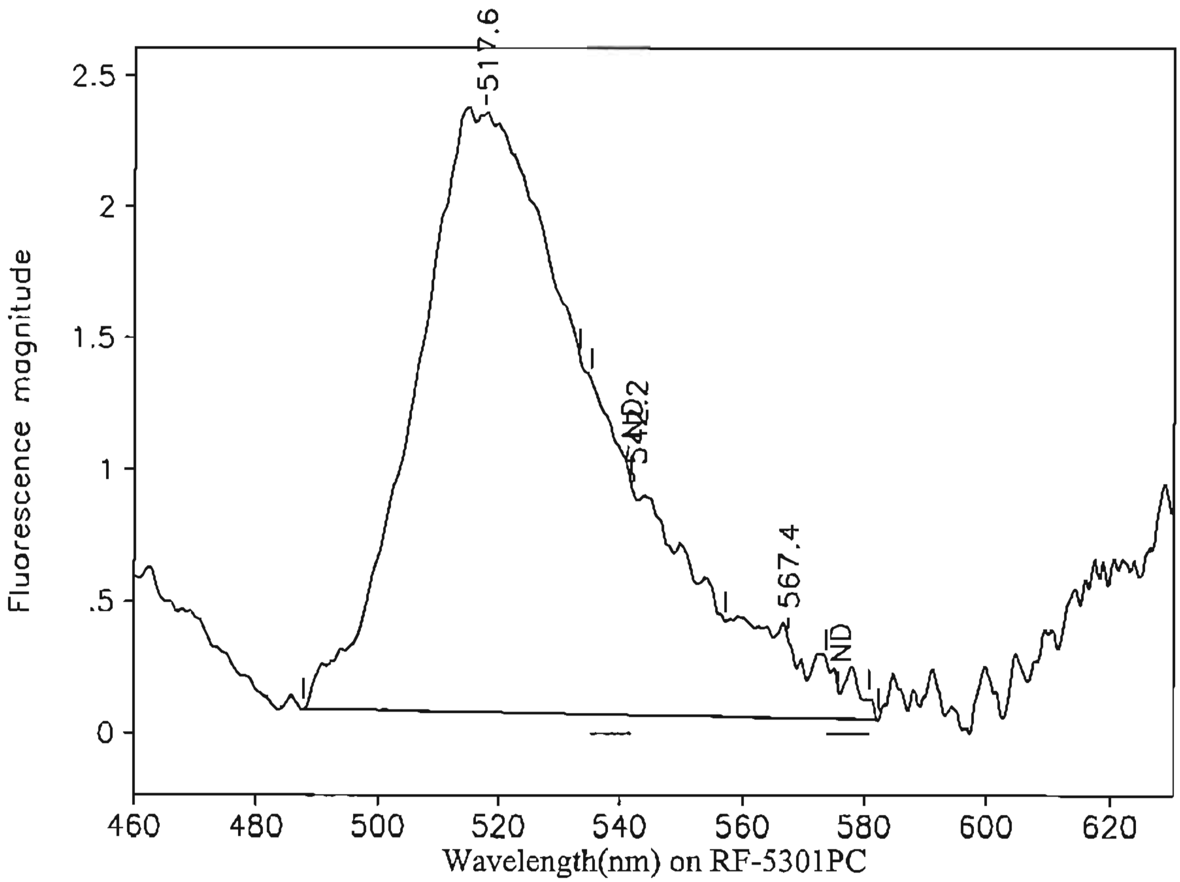

Station 22: MW-2 @ 230'
OUL number: M7851
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03
Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	487.8	533.4	2.27	60.70	0.04	1.42
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.4	557.3	582.4	0.30	5.97	0.05	~~0.885~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.2	533.4	557.3	0.85	19.51	0.04	~~0.952~~ ND

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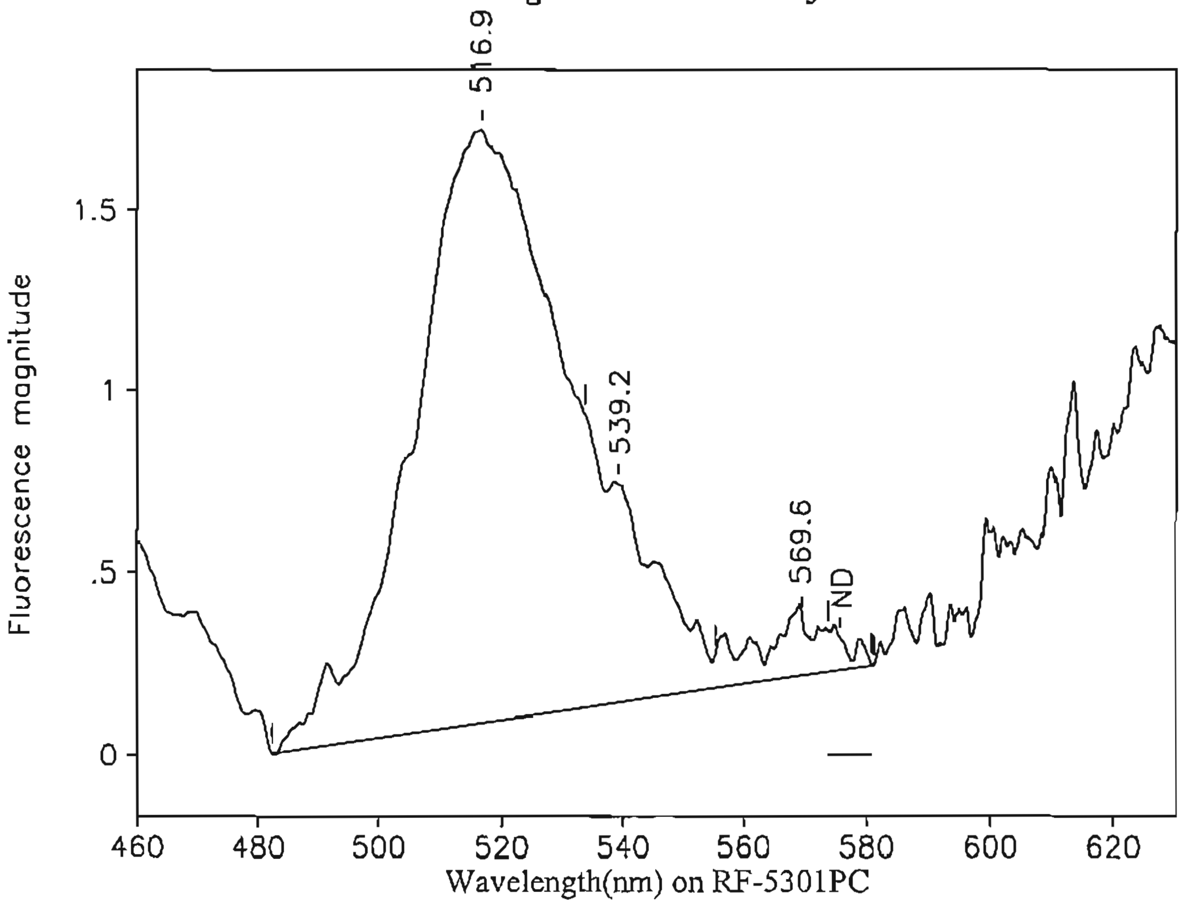

Station 23: MW-2 @ 240'
OUL number: M7852
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.9	482.4	533.6	1.63	42.25	0.04	0.989
539.2	533.6	555.4	0.60	8.79	0.07	~~0.429~~ ND
569.6	555.4	581.2	0.16	2.54	0.06	~~0.377~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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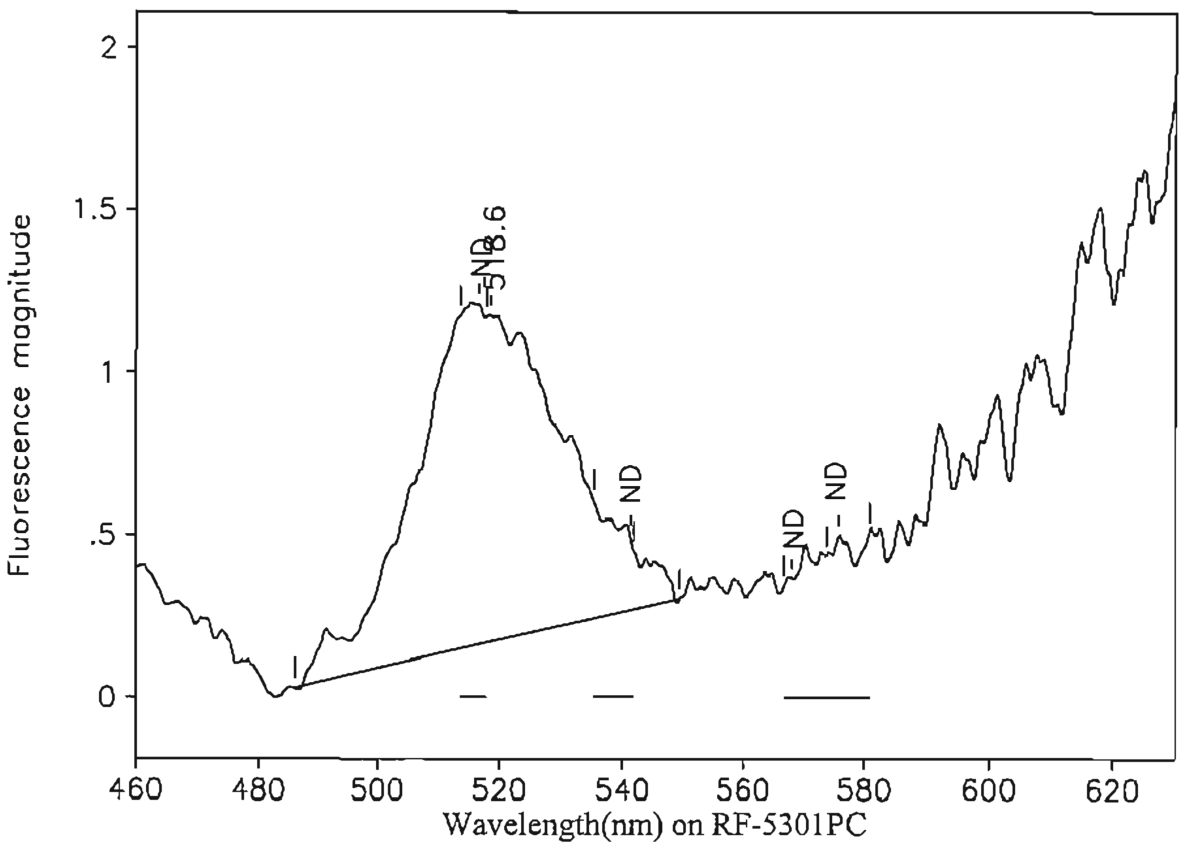

Station 24: MW-2 @ 250'
OUL number: M7853
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.6	486.0	549.4	1.01	29.92	0.03	0.700 *

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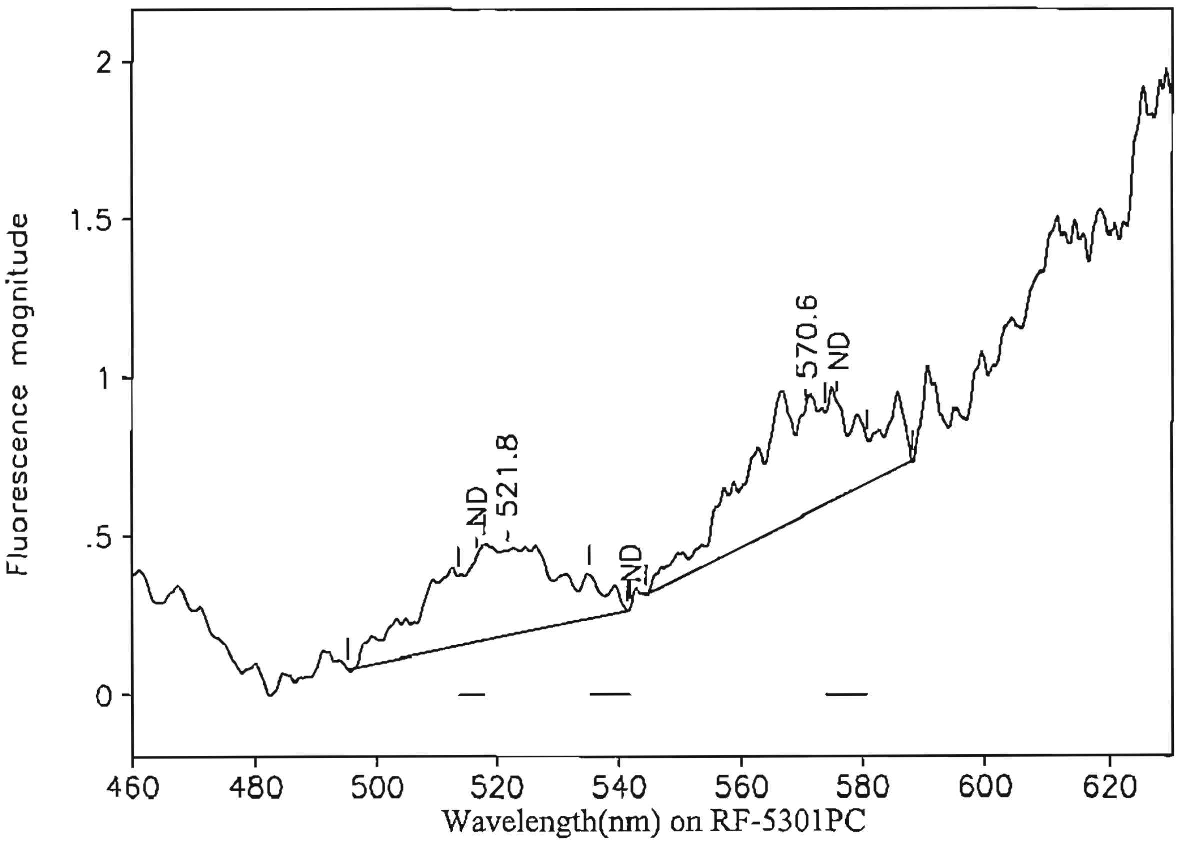

Station 25: MW-3 @ 190'
OUL number: M7854 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.6	544.4	588.2	0.33	8.52	0.04	~~1.26~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.8	495.2	541.4	0.27	7.51	0.04	~~0.176~~ ND

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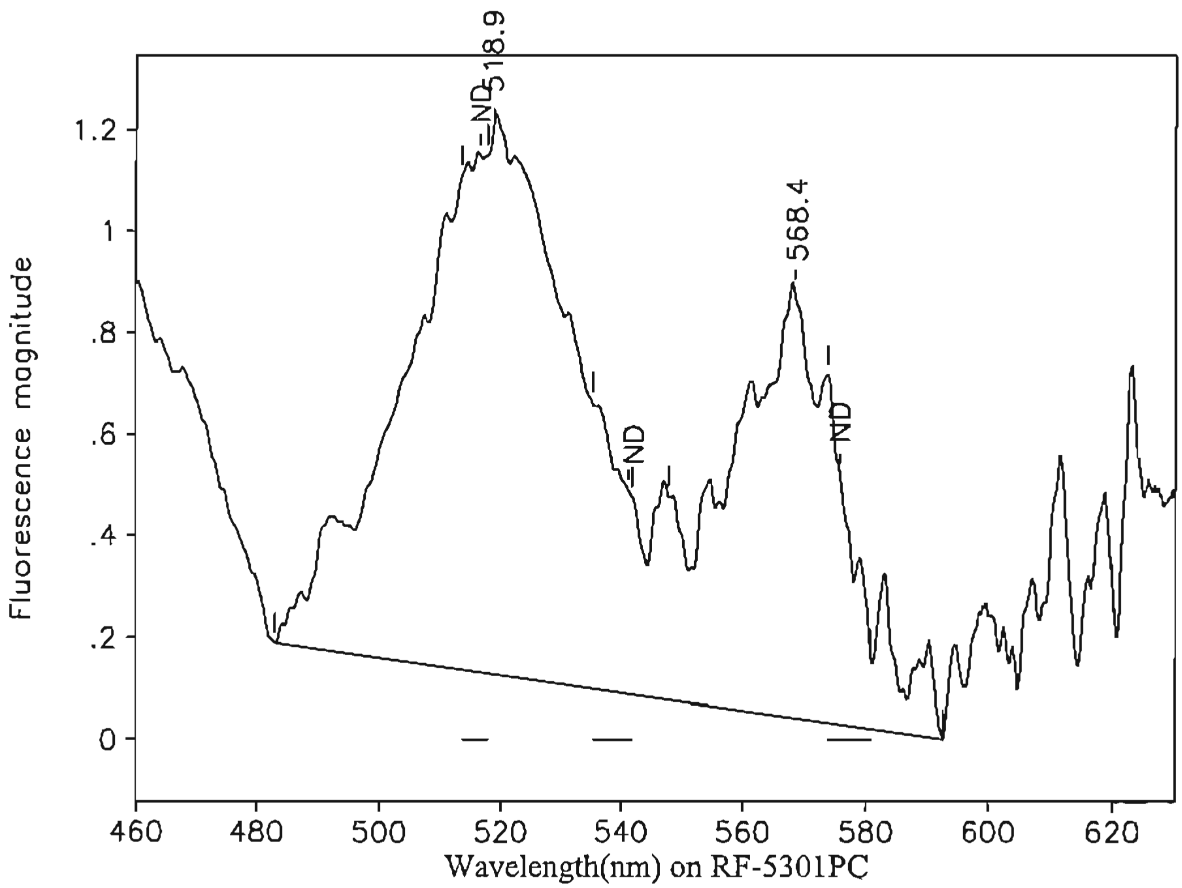

Station 26: MW-3 @ 200'
OUL number: M7855 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.4	547.9	592.6	0.84	18.85	0.04	~~2.80~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.9	483.0	547.9	1.08	37.23	0.03	~~0.871~~ ND

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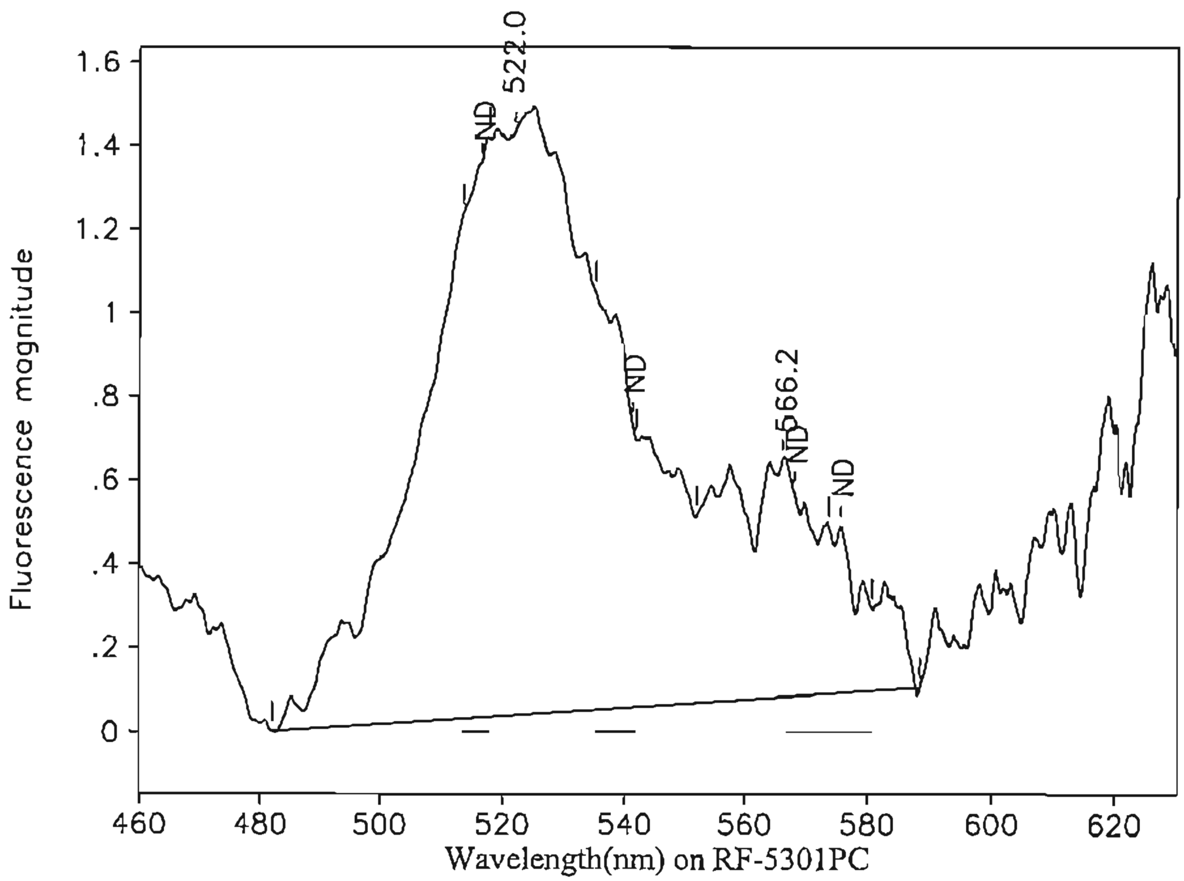

Station 27: MW-3 @ 210'
OUL number: M7856
Matrix: Elutant
Placed: / /

Analyzed: 07/17/03

Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.0	482.0	552.0	1.39	52.41	0.03	~~1.23~~ ND
566.2	552.0	588.4	0.57	13.66	0.04	~~2.03~~

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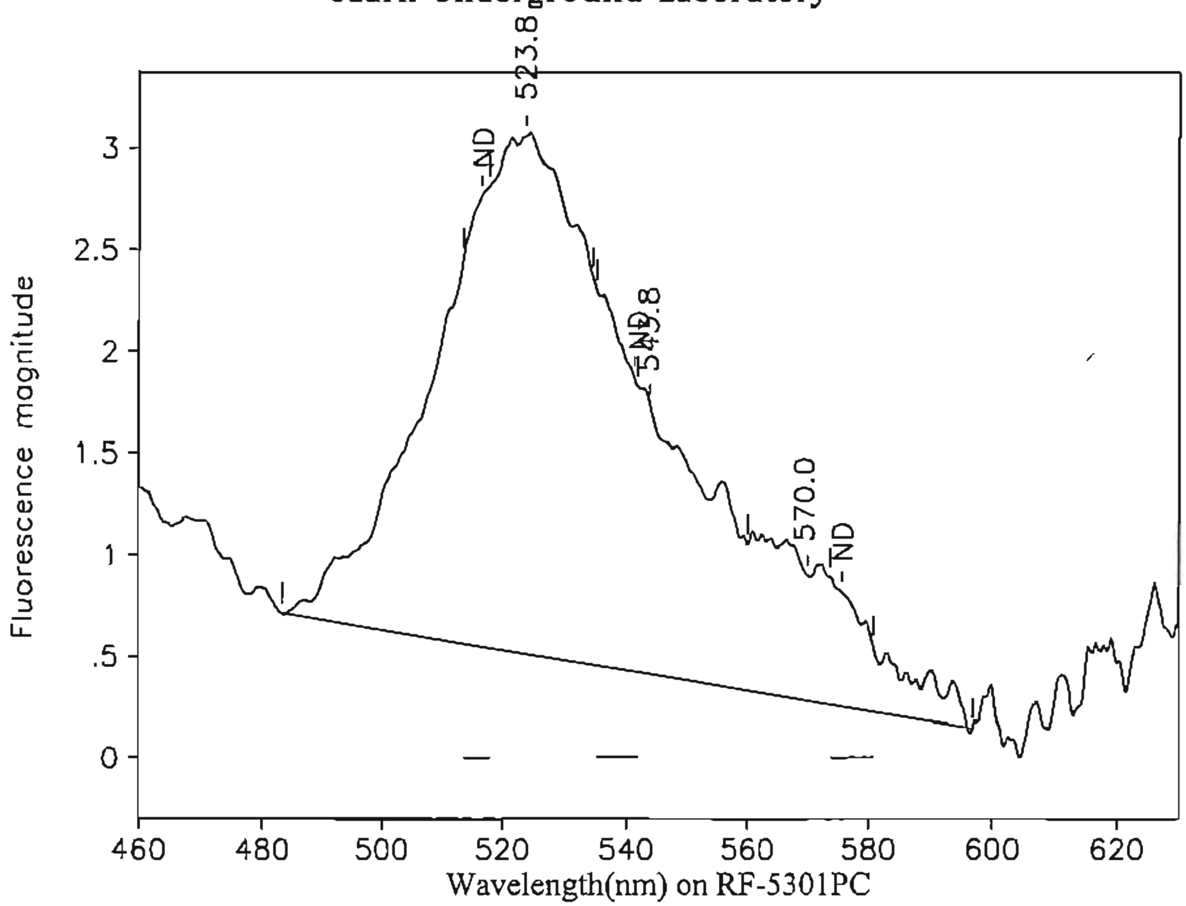

Station 28: MW-3 @ 220'
OUL number: M7857 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.0	560.0	596.8	0.62	16.51	0.04	~~2.45~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
523.8	483.2	534.6	2.55	68.89	0.04	~~1.61~~ ND
543.8	534.6	560.0	1.33	31.43	0.04	~~1.53~~ ND

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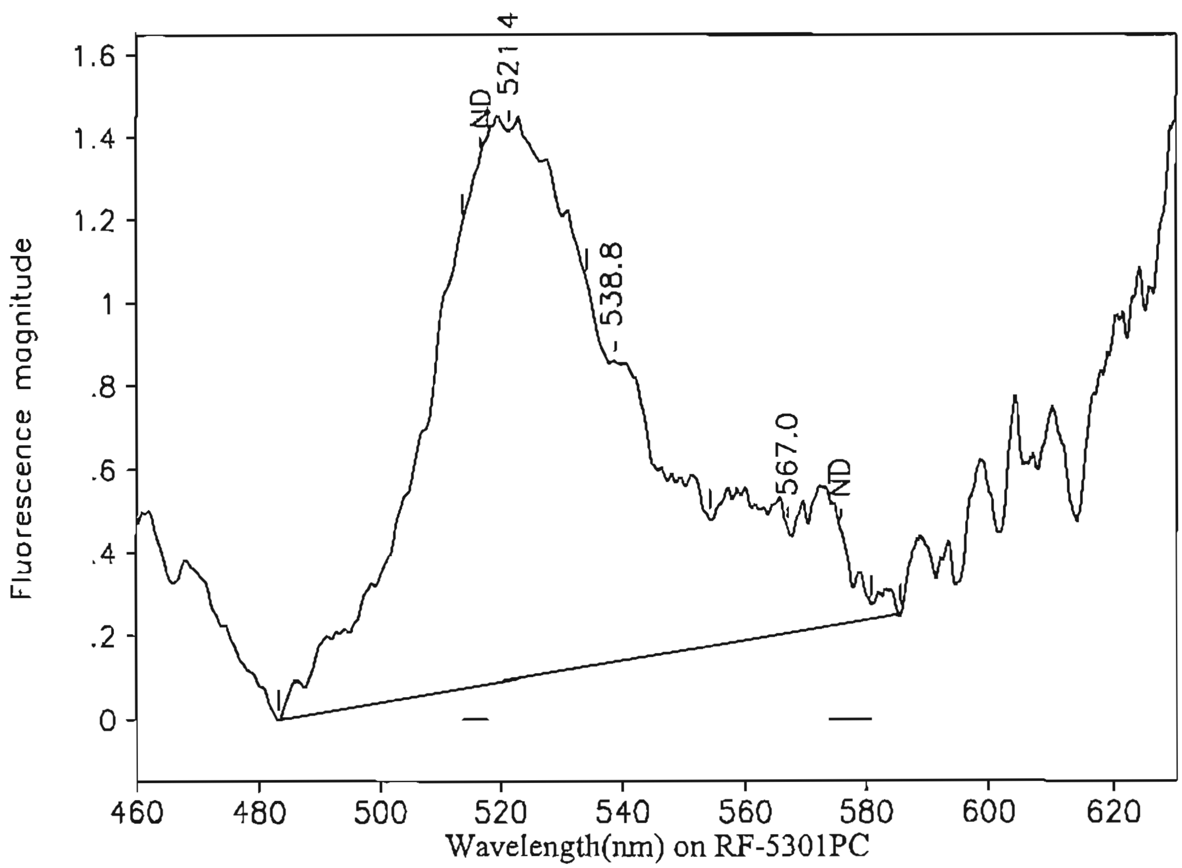

Station 29: MW-3 @ 230'
OUL number: M7858 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
538.8	534.2	554.2	0.72	11.45	0.06	~~0.559~~ ND
567.0	554.2	585.6	0.25	7.54	0.03	~~1.12~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.4	483.2	534.2	1.32	36.96	0.04	~~0.865~~ ND

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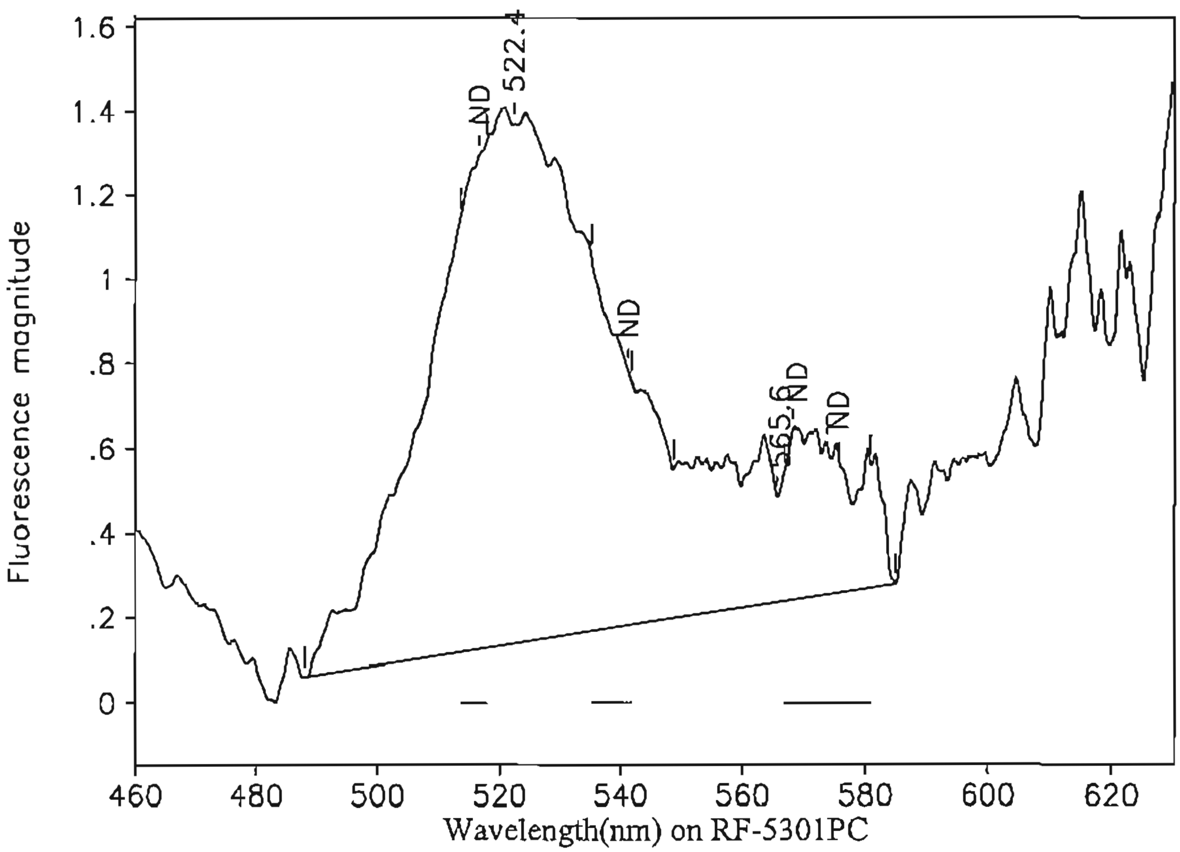

Station 30: MW-3 @ 240'
OUL number: M7859 — Analyzed: 07/17/03
Matrix: Elutant
Placed: / / — Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.4	488.0	548.7	1.23	42.75	0.03	~~1.00~~ ND
565.6	548.7	584.8	0.25	11.40	0.02	~~1.69~~

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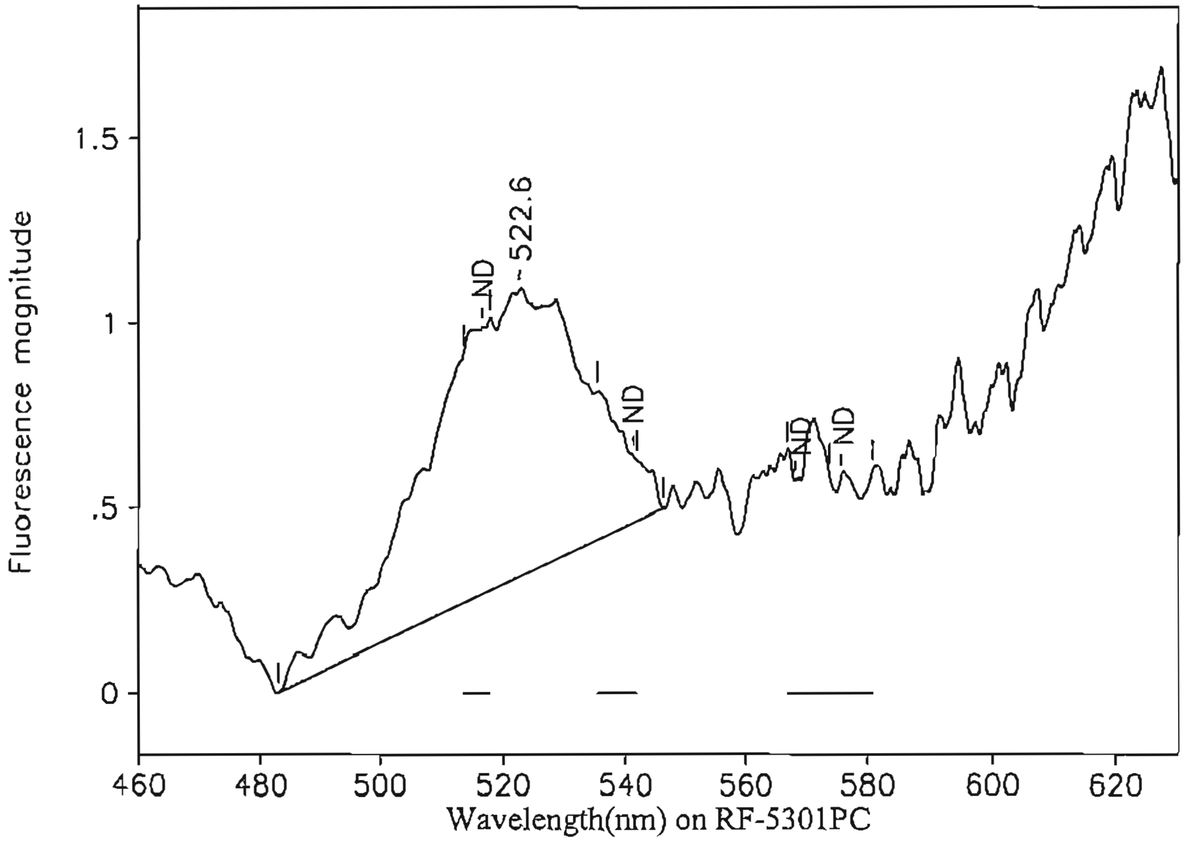
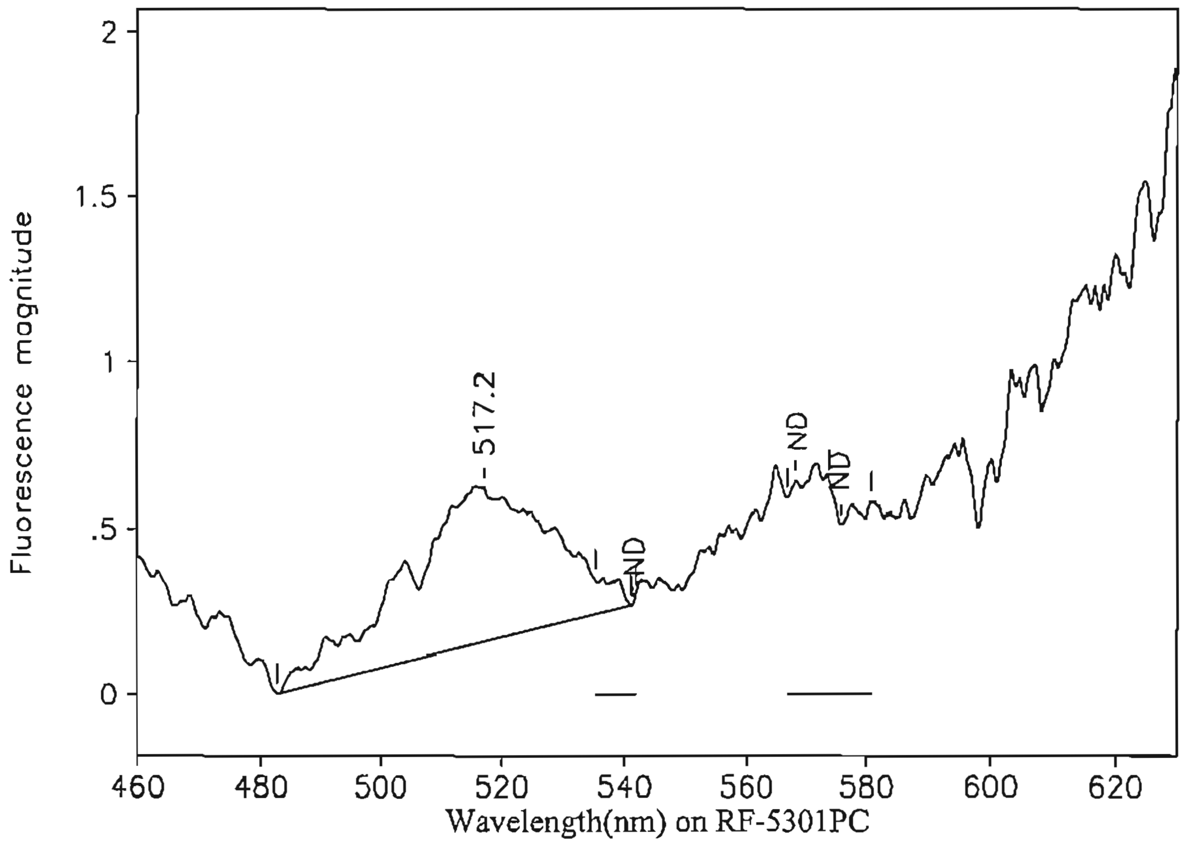


Station 46: MW-3 @ 250'
OUL number: M7861 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.6	483.0	546.2	0.78	24.00	0.03	~~0.562~~ ND

Ozark Underground Laboratory



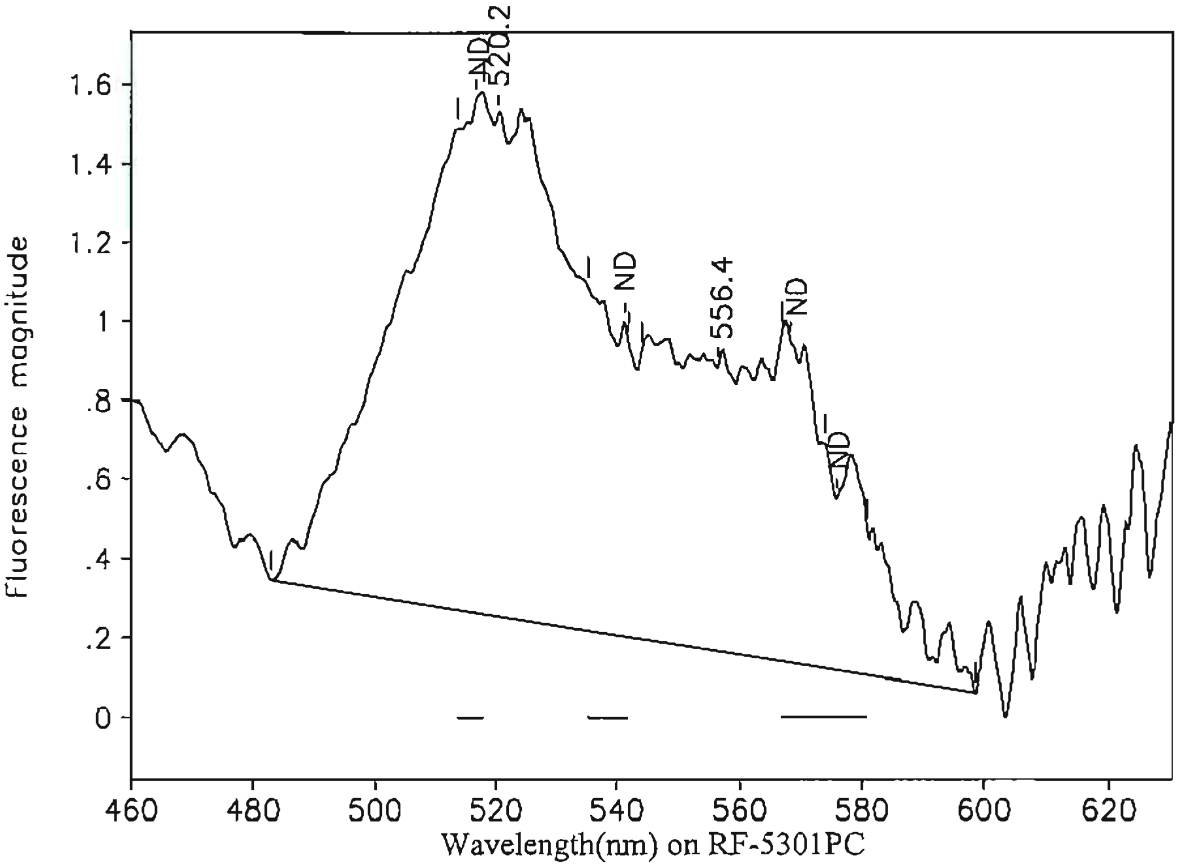
Station 31: MW-4 @ 190'
OUL number: M7862 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	482.6	541.0	0.46	13.32	0.03	~~0.312~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

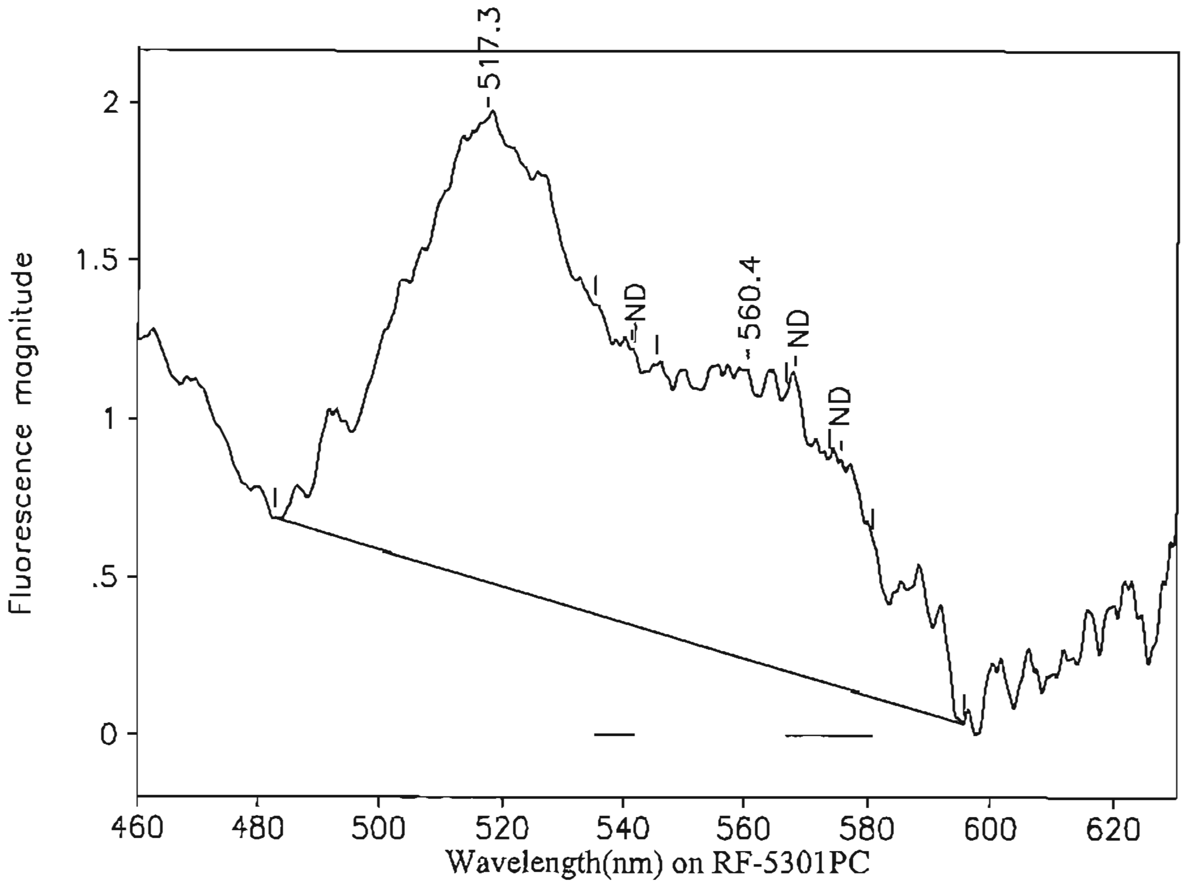


Station 32: MW-4 @ 200'
OUL number: M7863 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.2	483.0	544.0	1.27	48.33	0.03	~~1.13~~ ND
556.4	544.0	598.6	0.72	28.30	0.03	~~4.20~~

Ozark Underground Laboratory



Station 33: MW-4 @ 210'
OUL number: M7864
Matrix: Elutant
Placed: / /

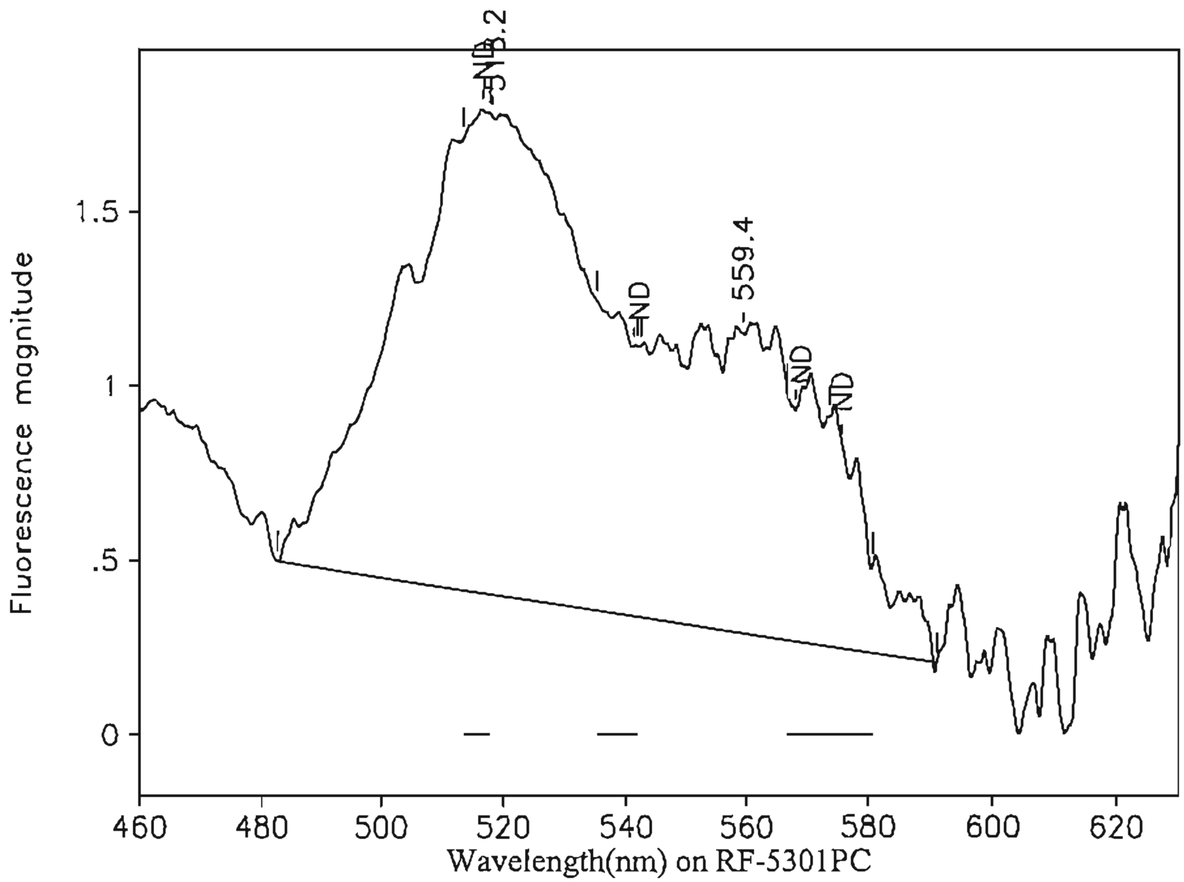
Analyzed: 07/17/03

Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.3	482.8	545.5	1.47	55.27	0.03	~~1.29~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
560.4	545.5	595.6	0.92	33.39	0.03	~~0.781~~

Ozark Underground Laboratory

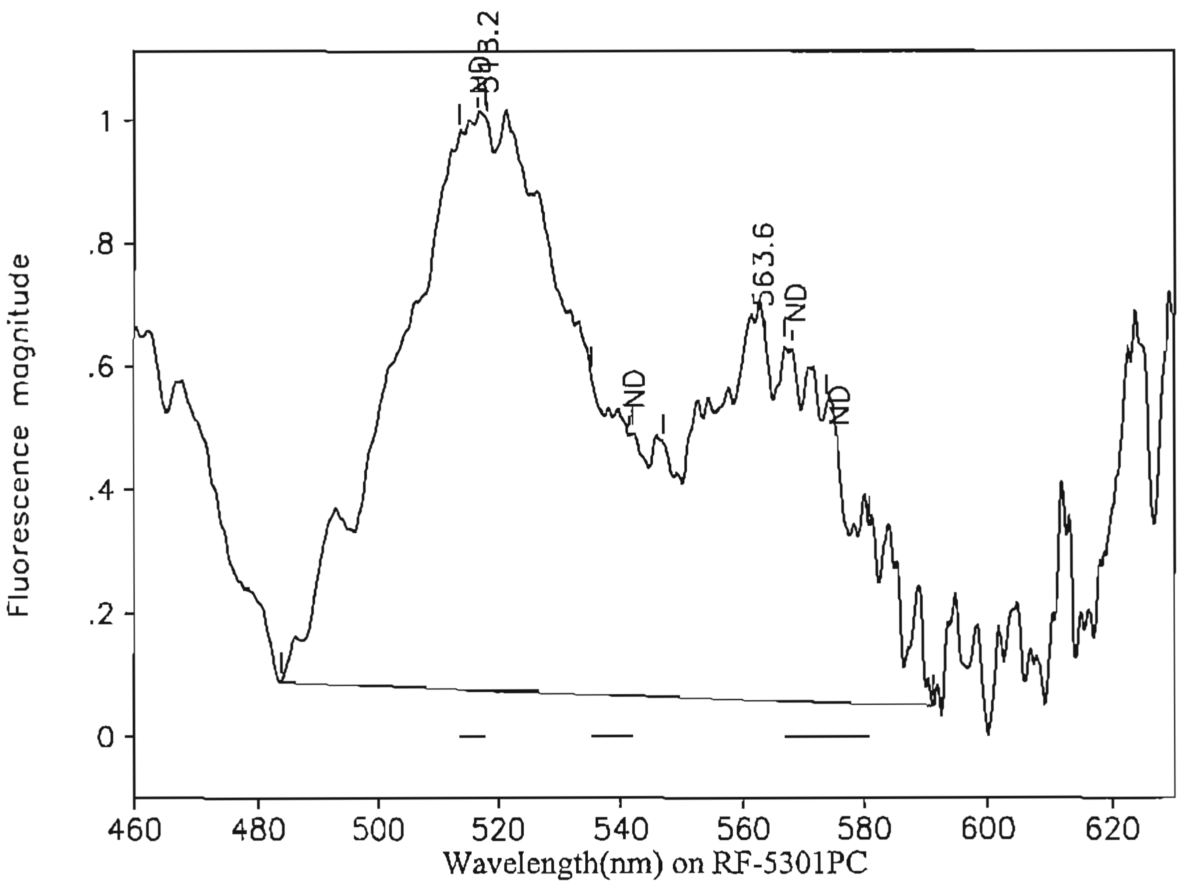


Station 34: MW-4 @ 220'
OUL number: M7865 Analyzed: 07/17/03
Matrix: Elutant
Placed: / / Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	482.6	542.4	1.38	51.08	0.03	~~1.20~~ ND
559.4	542.4	591.0	0.87	30.19	0.03	~~4.48~~

Ozark Underground Laboratory



Station 35: MW-4 @ 230'
OUL number: M7866
Matrix: Elutant
Placed: / /

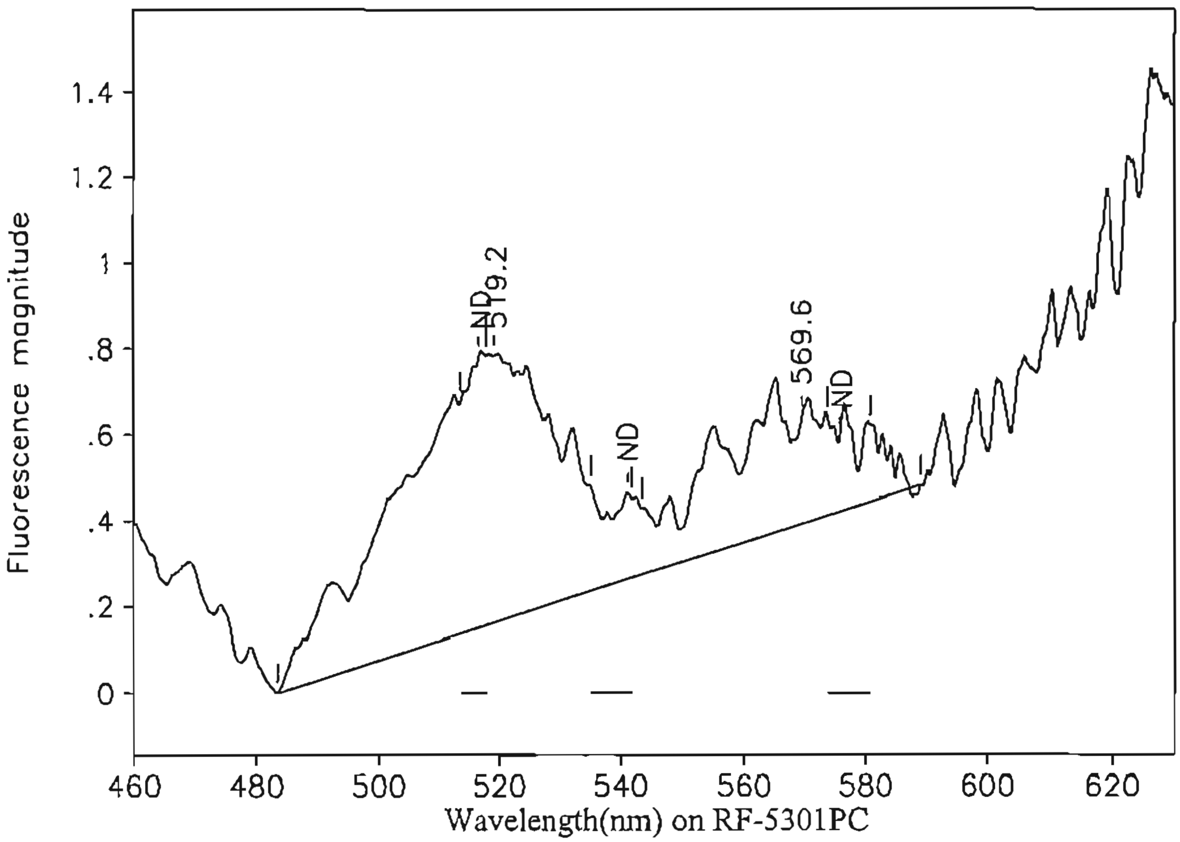
Analyzed: 07/17/03

Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	483.8	546.8	0.92	34.50	0.03	~~0.807~~ ND
563.6	546.8	591.2	0.58	17.63	0.03	~~2.61~~

Ozark Underground Laboratory



Station 36: MW-4 @ 240'
OUL number: M7867
Matrix: Elutant
Placed: / /

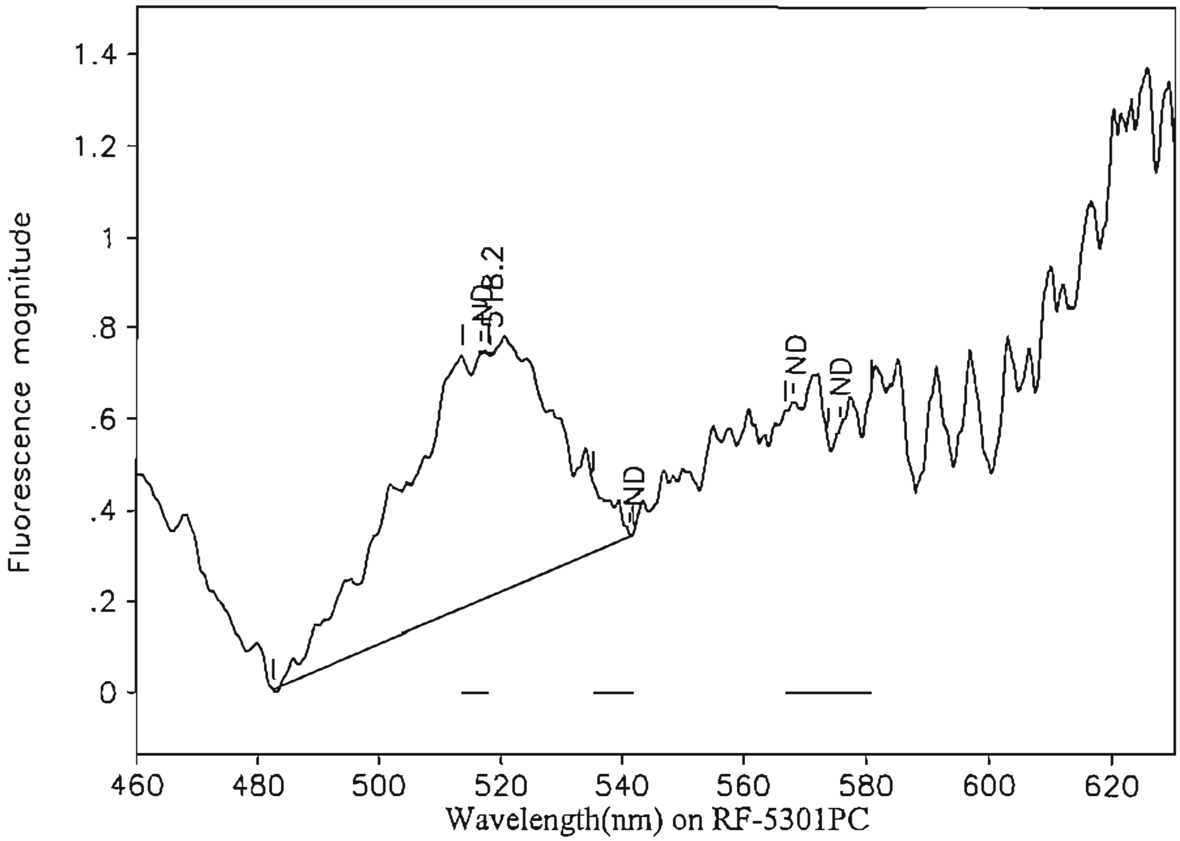
Analyzed: 07/17/03

Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.6	543.6	589.2	0.25	8.16	0.03	~~1.21~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.2	483.4	543.6	0.62	20.85	0.03	~~0.488~~ ND

Ozark Underground Laboratory



Station 35: MW-4 @ 230'
OUL number: M7868
Analyzed: 07/17/03
Matrix: Elutant
Placed: / /
Collected: 07/14/03 1115

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	482.6	541.8	0.53	16.59	0.03	~~0.388~~ ND

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 1, 2003

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for charcoal samplers shipped on July 29, 2003
Ozark Underground Laboratory (OUL) numbers M8074 through M8103.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on July 30, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheets
3. Nodarse & Assoc. Chain-of-Custody Record
4. Discrepancy sheet
5. Sample analysis graphs

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Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park – Project CH2MHill 177652
Samples Collected By: Lydia Wing/Mike Burns
Date Samples Shipped: July 29, 2003
Date Samples Rec'd at OUL: July 30, 2003
Date Analyzed by OUL: August 1, 2003

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected 2003	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.
M8074	39	MW-1 @ 149'	NDT	7/29 1042	515.4	945	ND	
M8075	40	MW-1 @ 159'	NDT	7/29 1042	515.4	1200	ND	
M8076	41	MW-1 @ 169'	NDT	7/29 1042	515.4	1160	ND	
M8077	42	MW-1 @ 179'	NDT	7/29 1042	515.6	1090	ND	
M8078	43	MW-1 @ 189'	NDT	7/29 1042	514.3	171	ND	
M8079	44	MW-1 @ 199'	NDT	7/29 1042	514.3	182	ND	
M8080	Laboratory Control Charcoal Blank							
M8081	45	MW-1 @ 209'	NDT	7/29 1042	514.3	147	ND	
M8082	18	MW-2 @ 190'	NDT	7/29 0944	517.0	3.74	ND	
M8083	19	MW-2 @ 200'	NDT	7/29 0944	516.9	1.70	ND	
M8084	20	MW-2 @ 210'	NDT	7/29 0944	517.1	1.42	ND	
M8085	21	MW-2 @ 220'	NDT	7/29 0944	517.0	1.43	ND	
M8086	22	MW-2 @ 230'	NDT	7/29 0944	516.9	1.16	ND	
M8087	23	MW-2 @ 240'	NDT	7/29 0944	515.4	1.43	ND	
M8088	24	MW-2 @ 250'	NDT	7/29 0944	516.0	1.17	ND	
M8089	25	MW-3 @ 190'	NDT	7/29 1016	ND		ND	
M8090	26	MW-3 @ 200'	NDT	7/29 1016	ND		ND	
M8091	27	MW-3 @ 210'	NDT	7/29 1016	ND		ND	
M8092	28	MW-3 @ 220'	NDT	7/29 1016	ND		ND	
M8093	29	MW-3 @ 230'	NDT	7/29 1016	ND		ND	
M8094	30	MW-3 @ 240'	NDT	7/29 1016	ND		ND	
M8095	46	MW-3 @ 250'	NDT	7/29 1016	ND		ND	
M8096	31	MW-4 @ 190'	NDT	7/29 1111	ND		ND	
M8097	32	MW-4 @ 200'	NDT	7/29 1111	ND		ND	
M8098	33	MW-4 @ 210'	NDT	7/29 1111	ND		ND	
M8099	34	MW-4 @ 220'	NDT	7/29 1111	ND		ND	
M8100	Laboratory Control Charcoal Blank							
M8101	35	MW-4 @ 230'	NDT	7/29 1111	ND		ND	
M8102	36	MW-4 @ 240'	NDT	7/29 1111	ND		ND	
M8103	37	MW-4 @ 250'	NDT	7/29 1111	ND		ND	

FOOTNOTES: NDT = No date or time given; ND = No dye detected

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill **Week No:** ______ **Samples Collected By:** Lydia Wing/Mike Burn

Samples Shipped By : Mike Burns **Samples Received By:** John Arnold

Date Samples Shipped: 07/ 29 / 03 **Date Samples Received:** 07/ 30/ 03 **Time Samples Received:** 12:30 **Return Cooler? Yes :** ____ **No:** X

Bill to: ______ **Send Results to:** Al Akens with CH2M Hill

Analyze for: Fluorescein : X **Eosine:** X **Rhodamine WT** ____ **Other** ____ **Ship cooler to:** ______

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
				DATE	TIME	DATE	TIME	
1	M8074	39	MW-1 @ 149'			7/29/03	1042	0
1	M8075	40	MW-1 @ 159'			7/29/03	1042	0
1	M8076	41	MW-1 @ 169'			7/29/03	1042	0
1	M8077	42	MW-1 @ 179'			7/29/03	1042	0
1	M8078	43	MW-1 @ 189'			7/29/03	1042	0
1	M8079	44	MW-1 @ 199'			7/29/03	1042	0
1	M8081	45	MW-1 @ 209'			7/29/03	1042	0
1	M8082	18	MW-2 @ 190'			7/29/03	0944	0
1	M8083	19	MW-2 @ 200'			7/29/03	0944	0
1	M8084	20	MW-2 @ 210'			7/29/03	0944	0
1	M8085	21	MW-2 @ 220'			7/29/03	0944	0
1	M8086	22	MW-2 @ 230'			7/29/03	0944	0
1	M8087	23	MW-2 @ 240'			7/29/03	0944	0
1	M8088	24	MW-2 @ 250'			7/29/03	0944	0

COMMENTS: Charcoal Blank M8080

This sheet filled out by OUL staff? Yes X **No** ____ **Charts for samples on this page proofed by OUL:** [signature] 481

Project 551 Analyzed 8/1/03 by we

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill Week No: Samples Collected By: Lydia Wing/Mike Burn

Samples Shipped By : Mike Burns Samples Received By: John Arnold

Date Samples Shipped: 07/ 29 / 03 Date Samples Received: 07/ 30/ 03 Time Samples Received: 12:30 Return Cooler? Yes : No: X

Bill to: Send Results to: Al Akens with CH2M Hill

Analyze for: Fluorescein : X Eosine: X Rhodamine WT Other Ship cooler to:

OUL use only		Please indicate stations where dye was visible in the field *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M8089	25	MW-3 @ 190'			7/29/03	1016	0
1	M8090	26	MW-3 @ 200'			7/29/03	1016	0
1	M8091	27	MW-3 @ 210'			7/29/03	1016	0
1	M8092	28	MW-3 @ 220'			7/29/03	1016	0
1	M8093	29	MW-3 @ 230'			7/29/03	1016	0
1	M8094	30	MW-3 @ 240'			7/29/03	1016	0
1	M8095	46	MW-3 @ 250'			7/29/03	1016	0
1	M8096	31	MW-4 @ 190'			7/29/03	1111	0
1	M8097	32	MW-4 @ 200'			7/29/03	1111	0
1	M8098	33	MW-4 @ 210'			7/29/03	1111	0
1	M8099	34	MW-4 @ 220'			7/29/03	1111	0
1	M8101	35	MW-4 @ 230'			7/29/03	1111	0
1	M8102	36	MW-4 @ 240'			7/29/03	1111	0
1	M8103	37	MW-4 @ 250'			7/29/03	1111	0

COMMENTS: Charcoal Blamk M8100

This sheet filled out by OUL staff? Yes X No Charts for samples on this page proofed by OUL: [signature]

Analyzed 8/1/03 by ac

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OZARK UNDERGROUND LABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: Nodarse / Festival Park - Citizen Hill **Date Rec'd by OUL:** 7/29/03 **Wk #** ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
		① MW-1	7/29	Rec'd 7 samples for each	OUL Staff filled out
		② MW-2	7/29	of the 4 Stations. Each	a Sample Collection data
		③ MW-3	7/29	group of 7 were @ different	Sheet. Listing each Sample
		④ MW-4	7/29	depths. On COC rec'd w/	separtly. Used information
				samples the 7 samples	from Ziploc bags and COC
				were grouped together	to fill in information on
				EX MW-1 / 149' thru 209'	data sheet.

Comments:

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Ozark Underground Laboratory

363

PC&E Environmental

210 Park Road, Oviedo, FL 32765
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order: ____

Date: 7/29/03 Page 1 of 1

COMPANY: Nodarse & Assoc.

ADDRESS: 1675 Lee Rd.
Orlando, FL. 32789

SAMPLED BY: Mike Burns SIGN:

PHONE: 407-740-6110 FAX: 407-740-6112

ANALYSIS REQUESTED: Tracer Dye

PRESERVATION: Ice

#	SAMPLE ID	DATE/TIME	AIR	WATER	SLUDGE	SOIL/SOLID	ORG LIQUID	Tracer Dye (Ice)	Number of Containers
1	MW-1/149' Thru 209'	7/29/03 1042						✓	7
2	MW-2/190' Thru 250'	0944						✓	7
3	MW-3/190' Thru 250'	1016						✓	7
4	MW-4/ 190' Thru 250'	1111						✓	7
5									
6									
7									
8									
9									
10									
11									
12									
13									

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	7/29/03 1300	1: J. Arnold (OUL)	7/30/03 12:30
2:		2:	
3:		3:	

PROJECT INFORMATION

PROJECT NAME: Festival Park

PROJECT #: W01-E-120-1

SITE ADDRESS: Orlando, FL.

PROJECT MANAGER: Lydia Wing

SAMPLE RECEIPT

Total # of Containers

Chain of Custody Seals

Recv'd in Good Condition

PO #:

SPECIAL INSTRUCTIONS/COMMENTS:
Send result data to Al Akens with CH2M Hill.

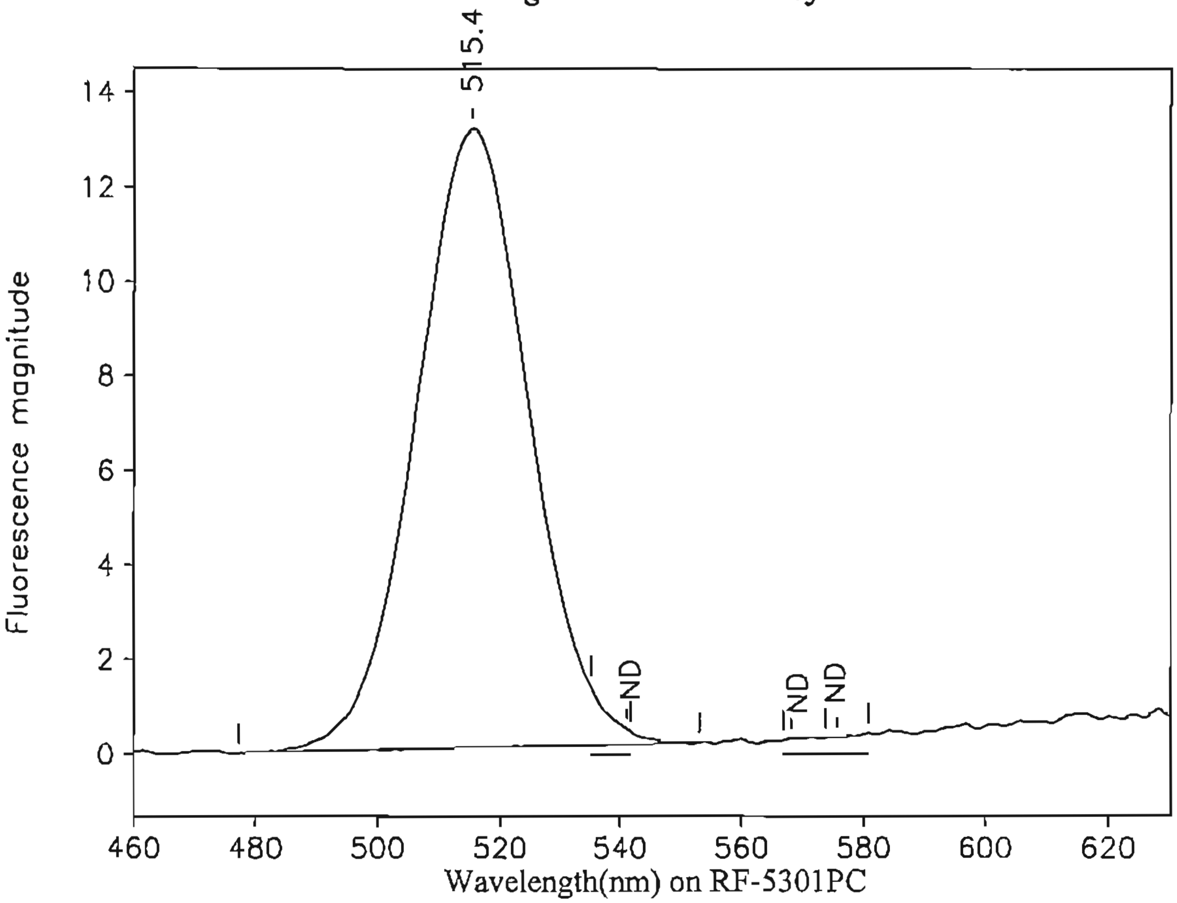
INVOICE TO:
(IF DIFFERENT FROM ABOVE)

QUOTE/CONTRACT #:

484

WHITE: Project File YELLOW: Laboratory PINK: Sampler

Ozark Underground Laboratory



Station 39: MW-1 @ 149'
OUL number: M8074
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/01/03

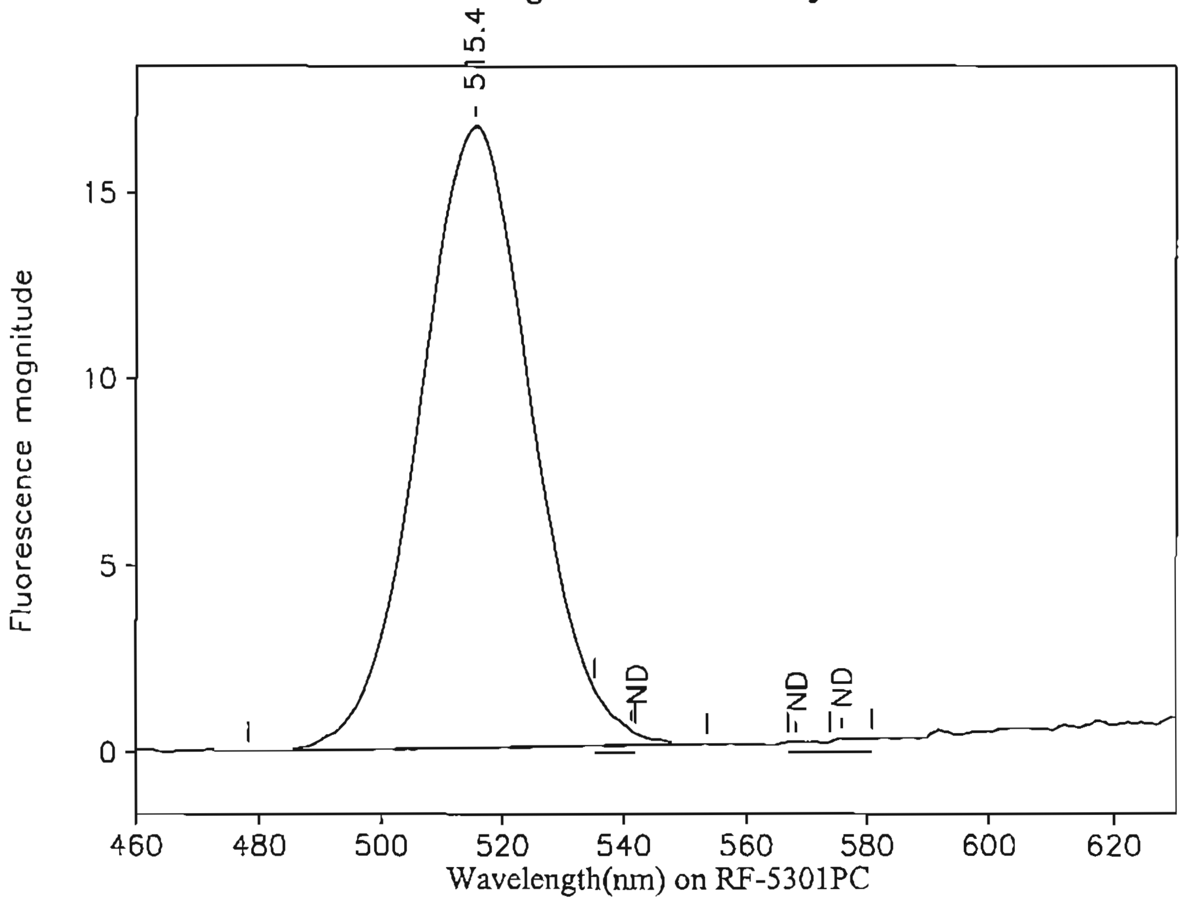
Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	477.3	553.1	13.08	282.47	0.05	945
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 40: MW-1 @ 159'
OUL number: M8075
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/01/03

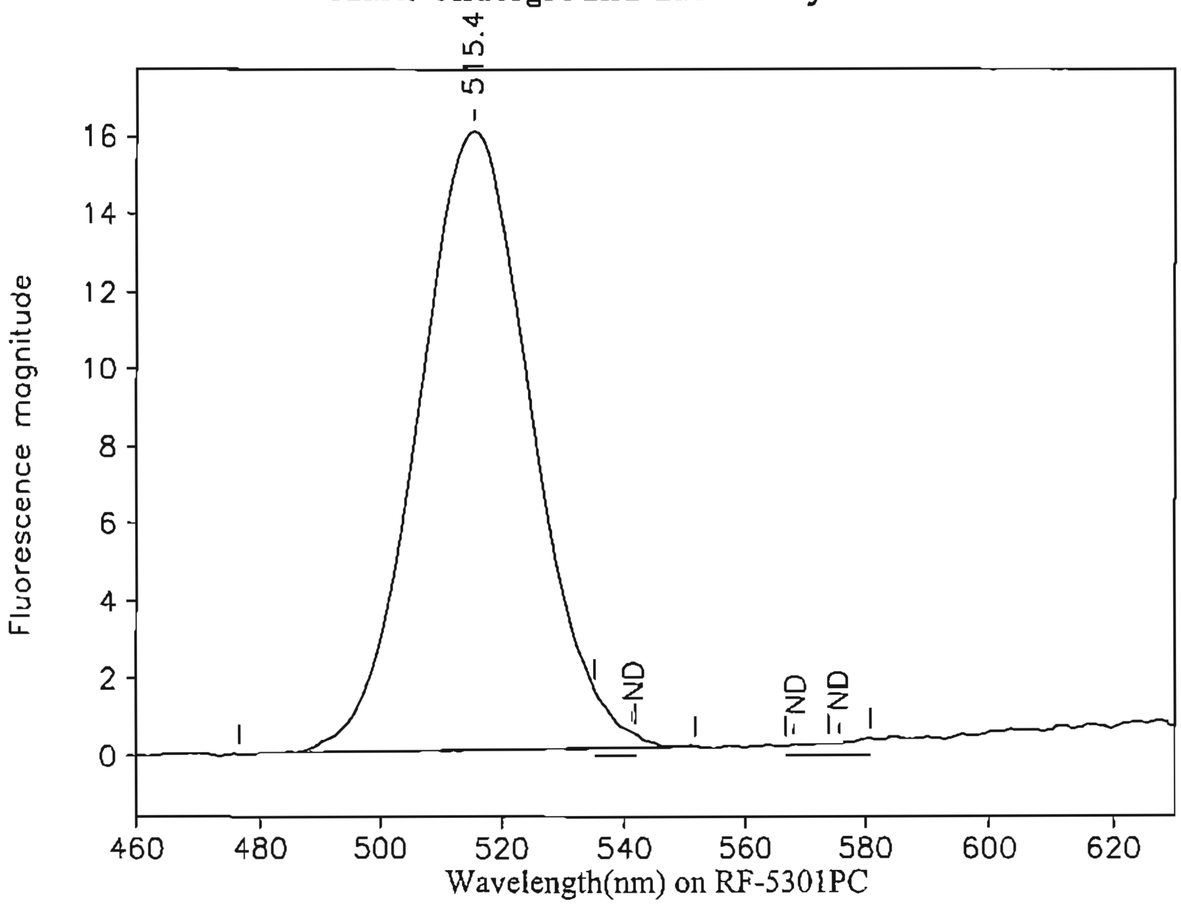
Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	478.3	553.5	16.66	359.55	0.05	1,200
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 41: MW-1 @ 169'
OUL number: M8076
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/01/03

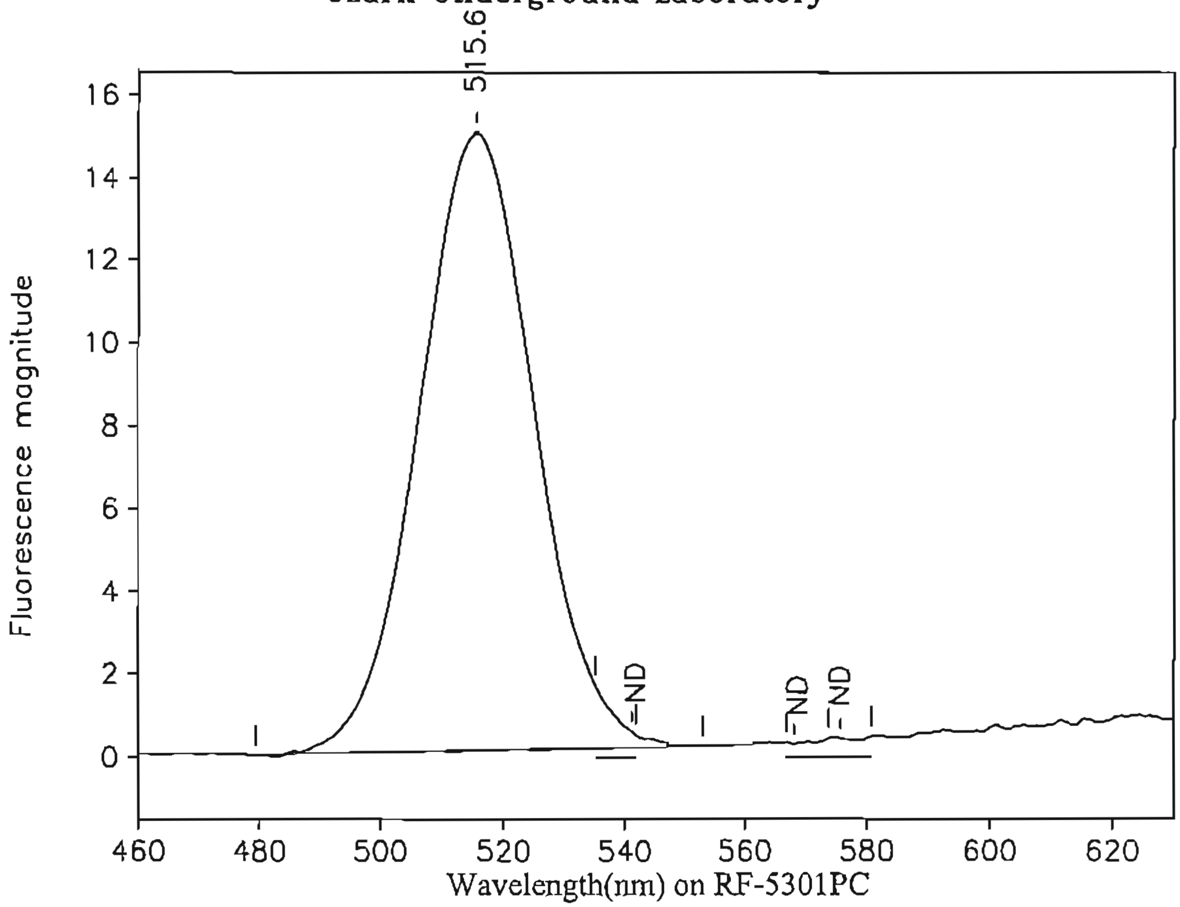
Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	476.6	551.6	16.03	345.68	0.05	1,160
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 42: MW-1 @ 179'
OUL number: M8077
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/01/03

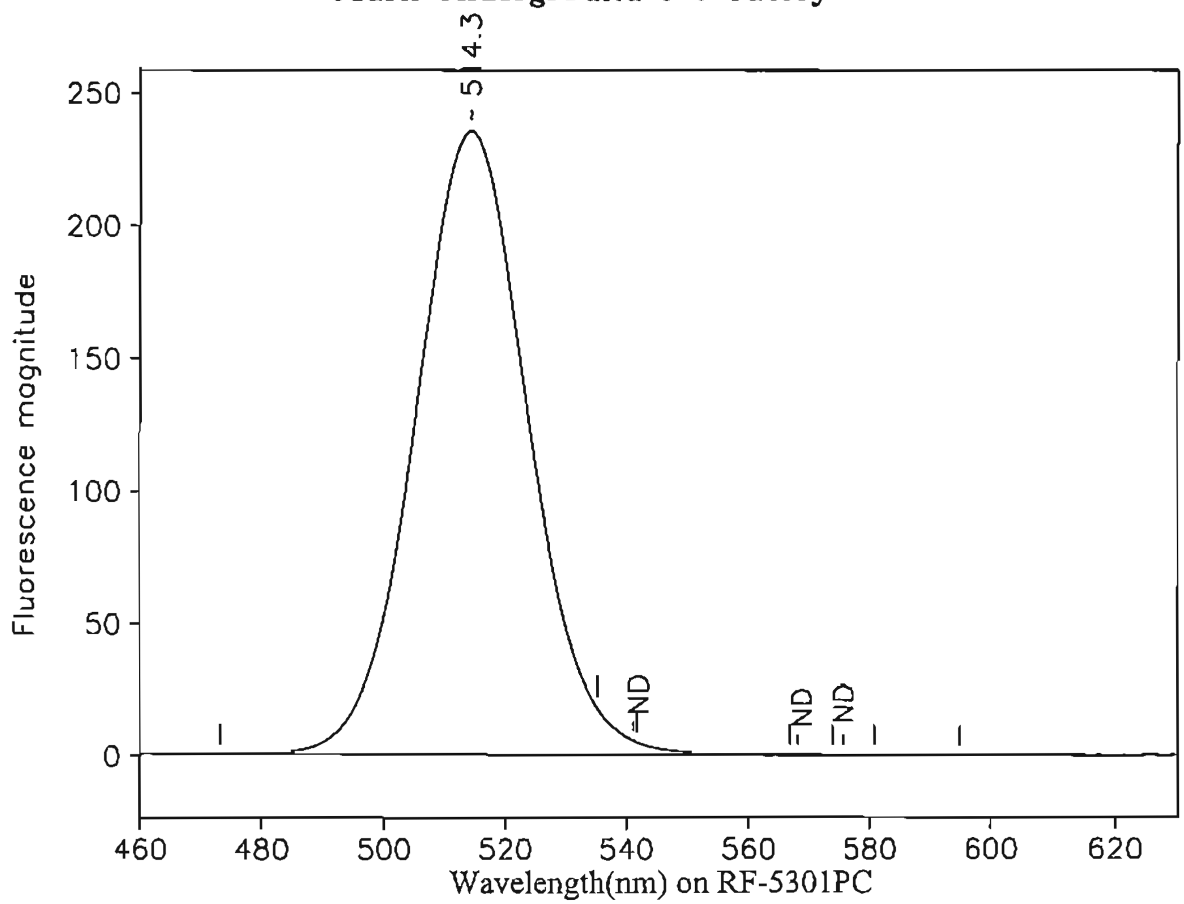
Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	479.4	553.1	14.95	325.28	0.05	1,090
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



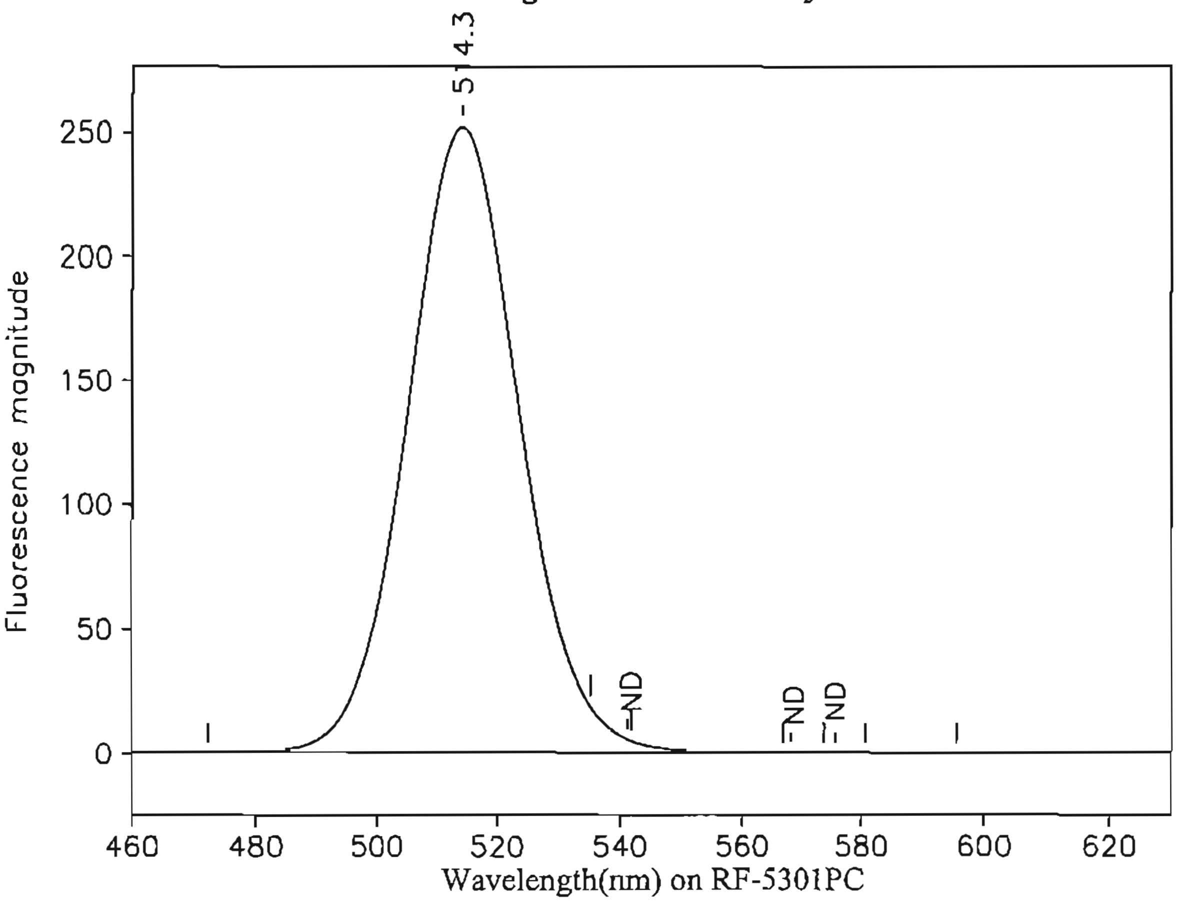
Station 43: MW-1 @ 189'
OUL number: M8078 — Analyzed: 08/01/03
Matrix: Elutant
Placed: / / — Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.3	473.3	594.9	235.80	5,104.63	0.05	171
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



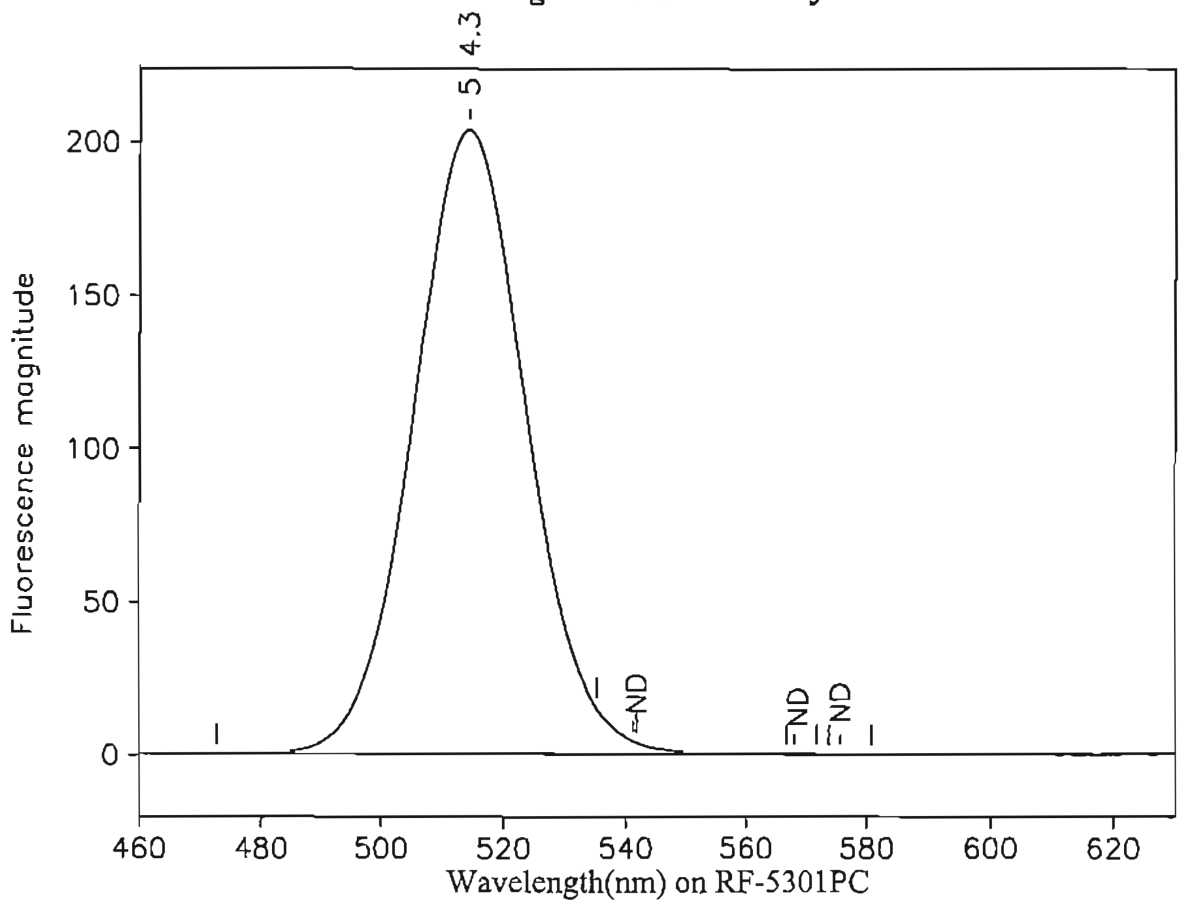
Station 44: MW-1 @ 199'
OUL number: M8079 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.3	472.4	595.5	252.00	5,447.20	0.05	182
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



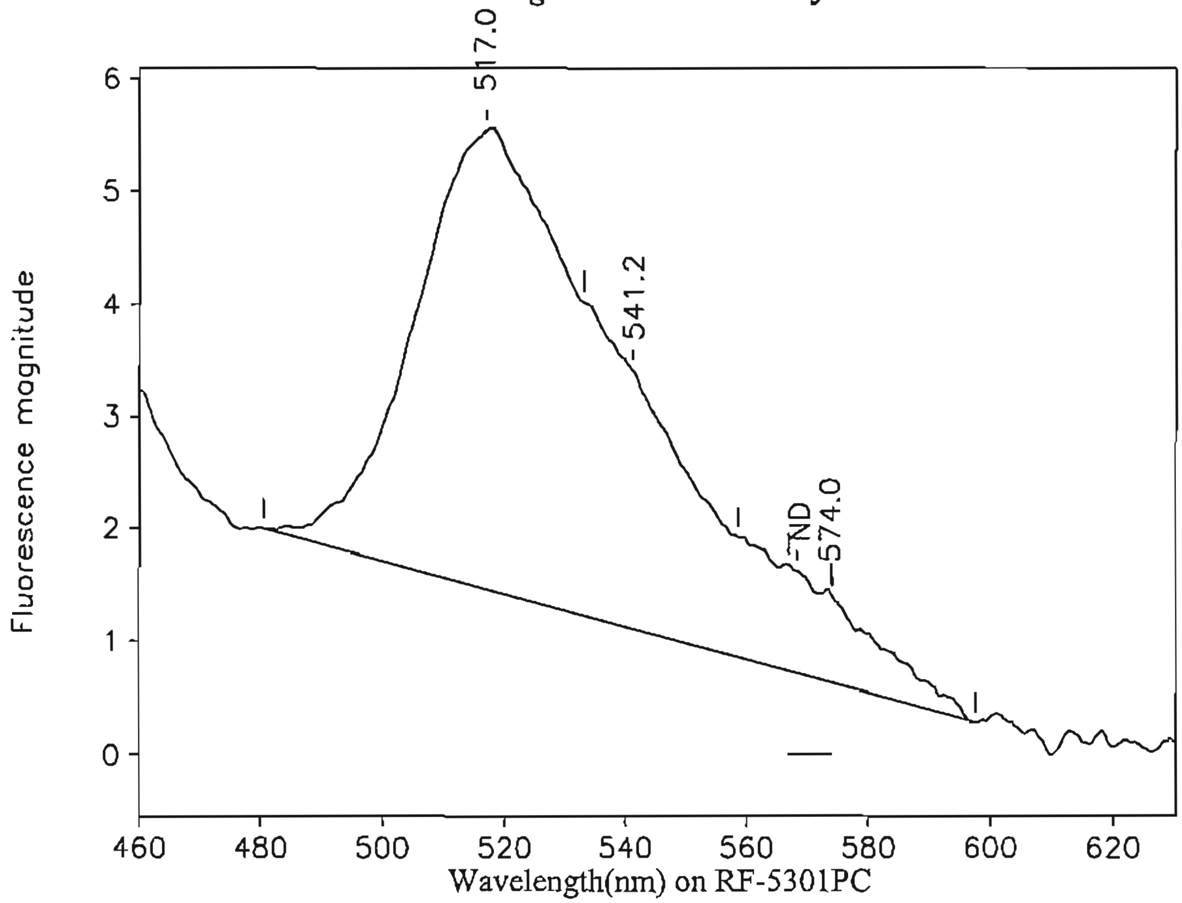
Station 45: MW-1 @ 209'
OUL number: M8081 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1042

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.3	472.7	571.8	203.77	4,379.98	0.05	147
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 18: MW-2 @ 190'
OUL number: M8082
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

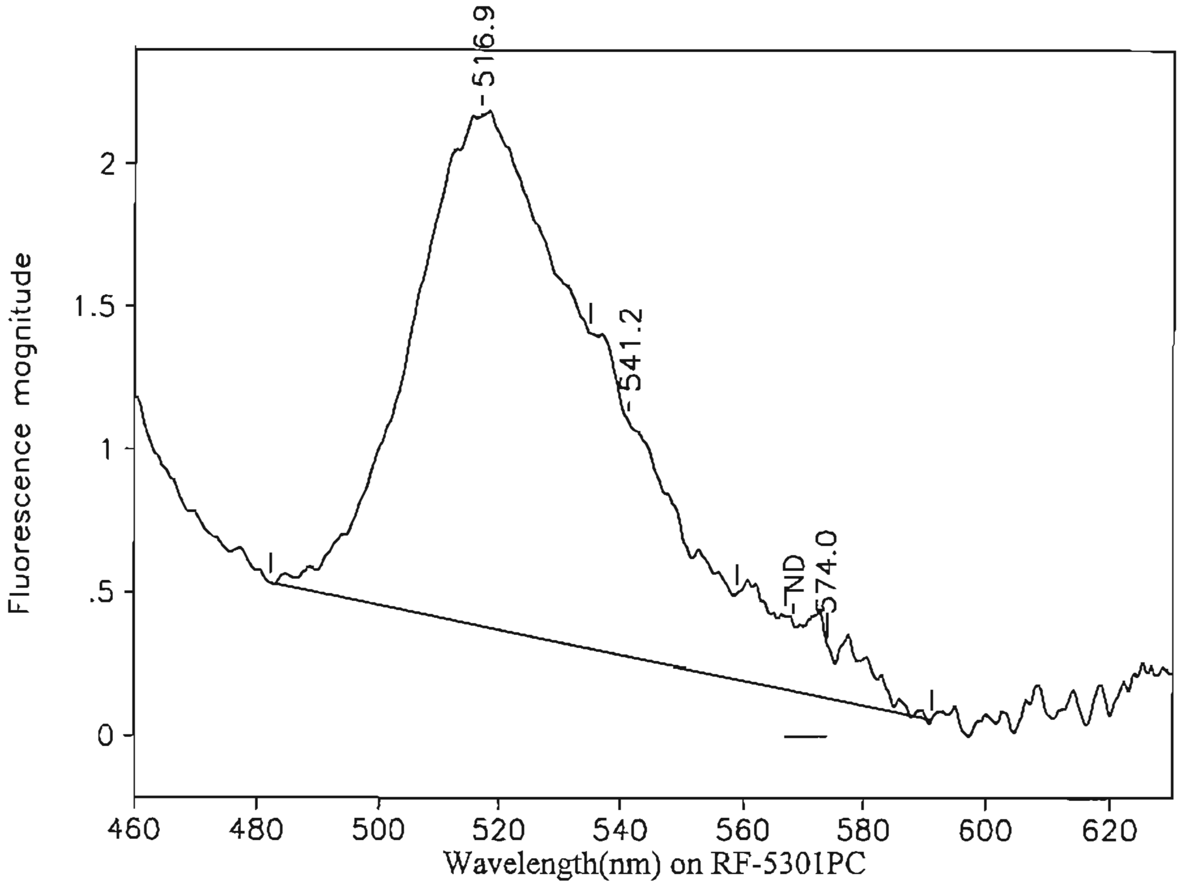
Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	480.4	533.0	4.08	111.65	0.04	3.74
541.2	533.0	558.6	2.30	48.66	0.05	~~3.33~~
568.2	566.8	573.8	0.00	0.00	0.00	ND
574.0	558.6	597.6	0.77	22.33	0.03	~~2.78~~

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 19: MW-2 @ 200'
OUL number: M8083
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

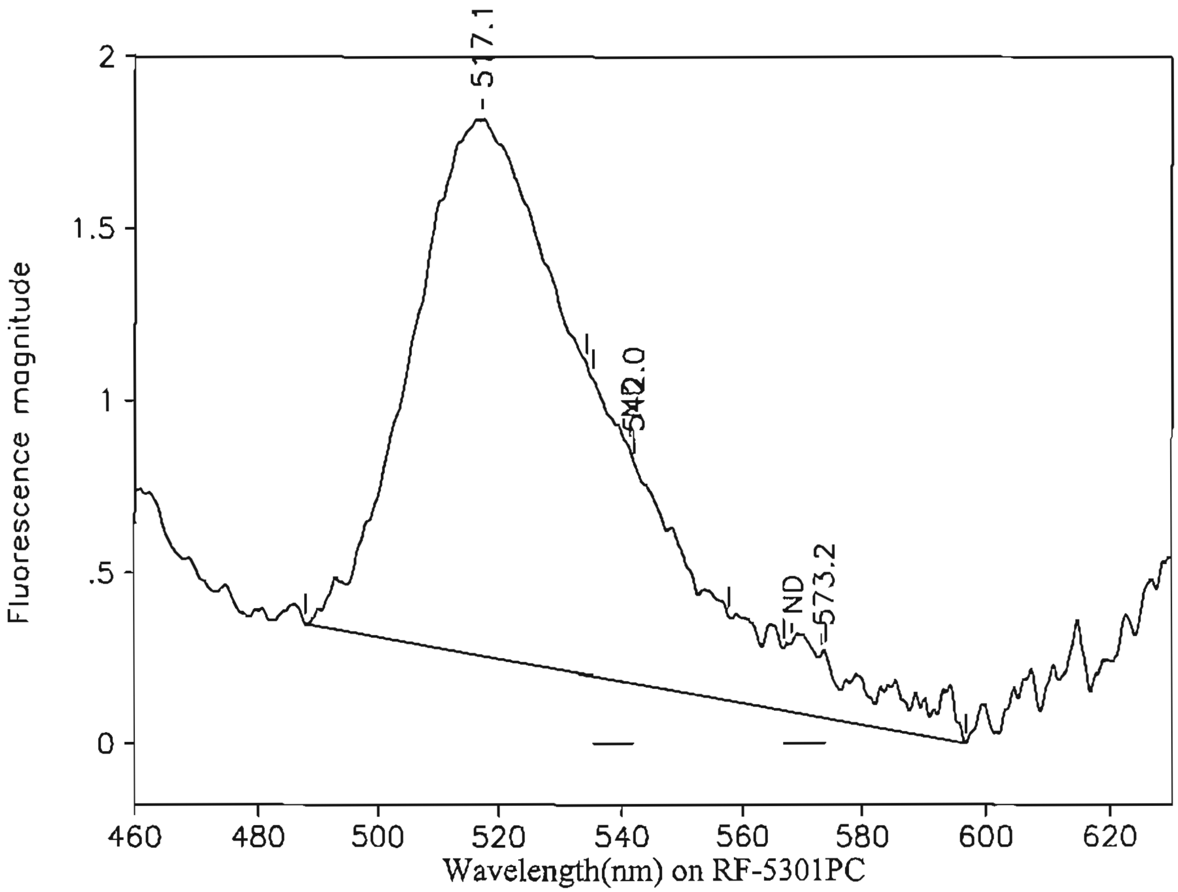
Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.9	482.2	534.9	1.79	50.74	0.04	1.70
541.2	534.9	558.9	0.82	15.69	0.05	~~1.08~~
568.2	566.8	573.8	0.00	0.00	0.00	ND
574.0	558.9	591.2	0.18	5.80	0.03	~~0.721~~

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 20: MW-2 @ 210'
OUL number: M8084 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.1	487.8	534.2	1.56	42.28	0.04	1.42
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
573.2	557.6	596.8	0.18	6.02	0.03	~~0.748~~
Peaks close to the normal range of tracer dyes:						
542.0	534.2	557.6	0.64	12.65	0.05	~~0.867~~

MW

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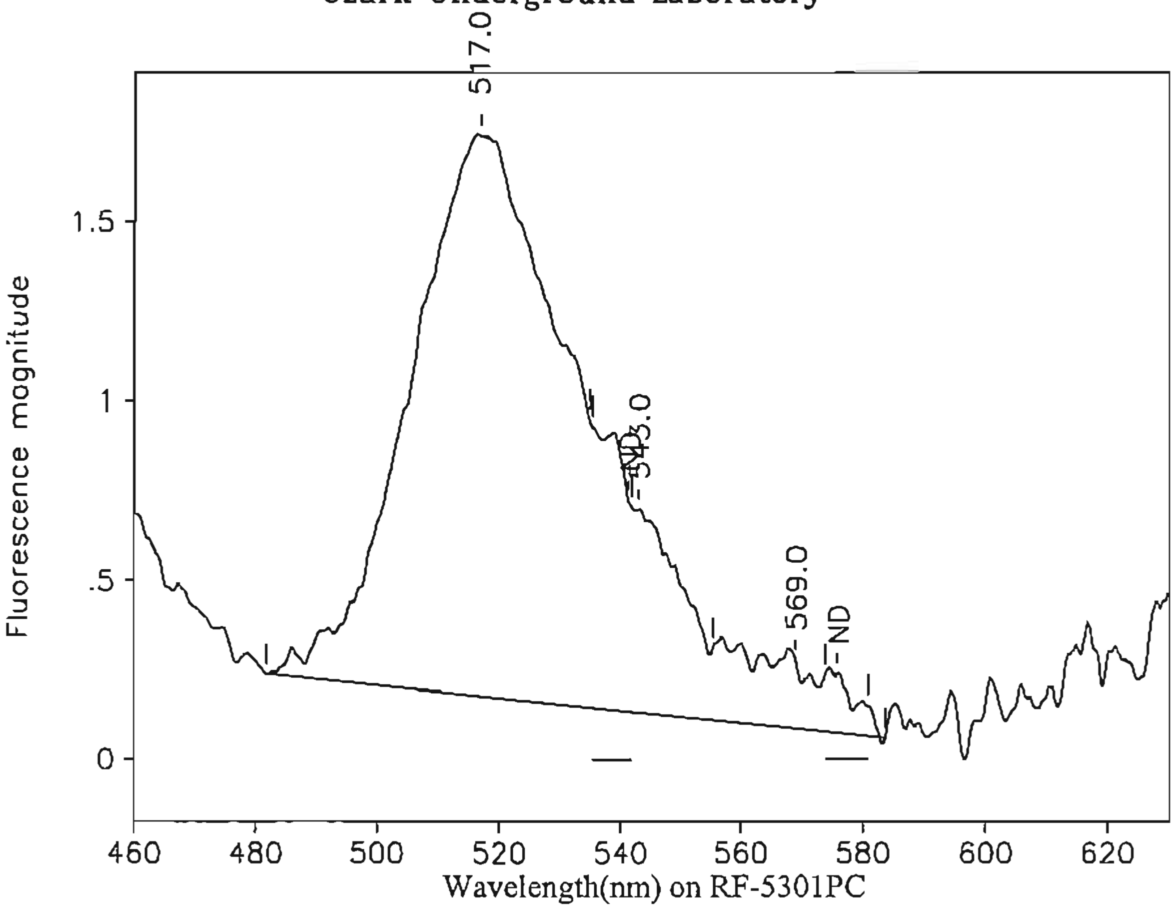
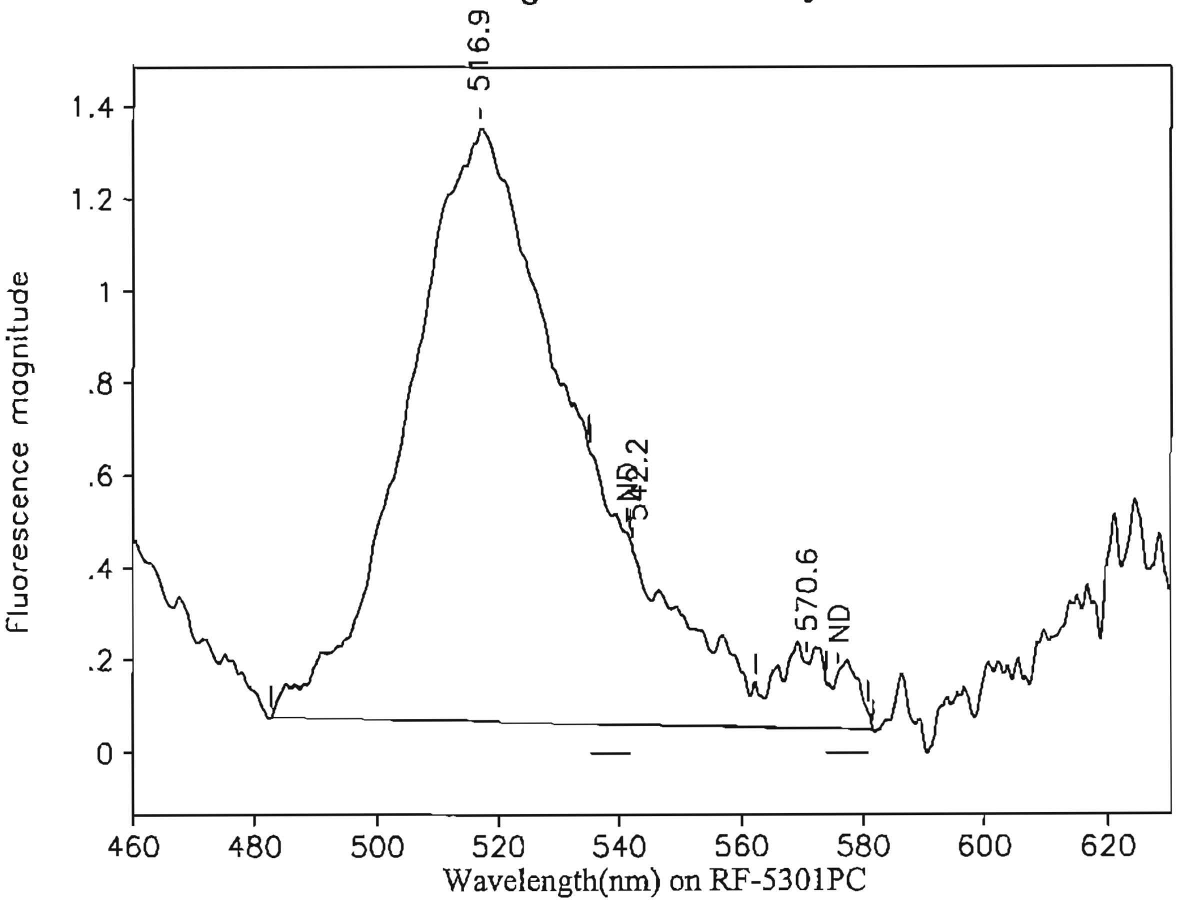


Station 21: MW-2 @ 220'
OUL number: M8085 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	481.8	534.8	1.57	42.85	0.04	1.43
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.0	555.4	583.6	0.19	4.28	0.04	~~0.965~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
543.0	534.8	555.4	0.57	10.76	0.05	~~0.738~~

Ozark Underground Laboratory



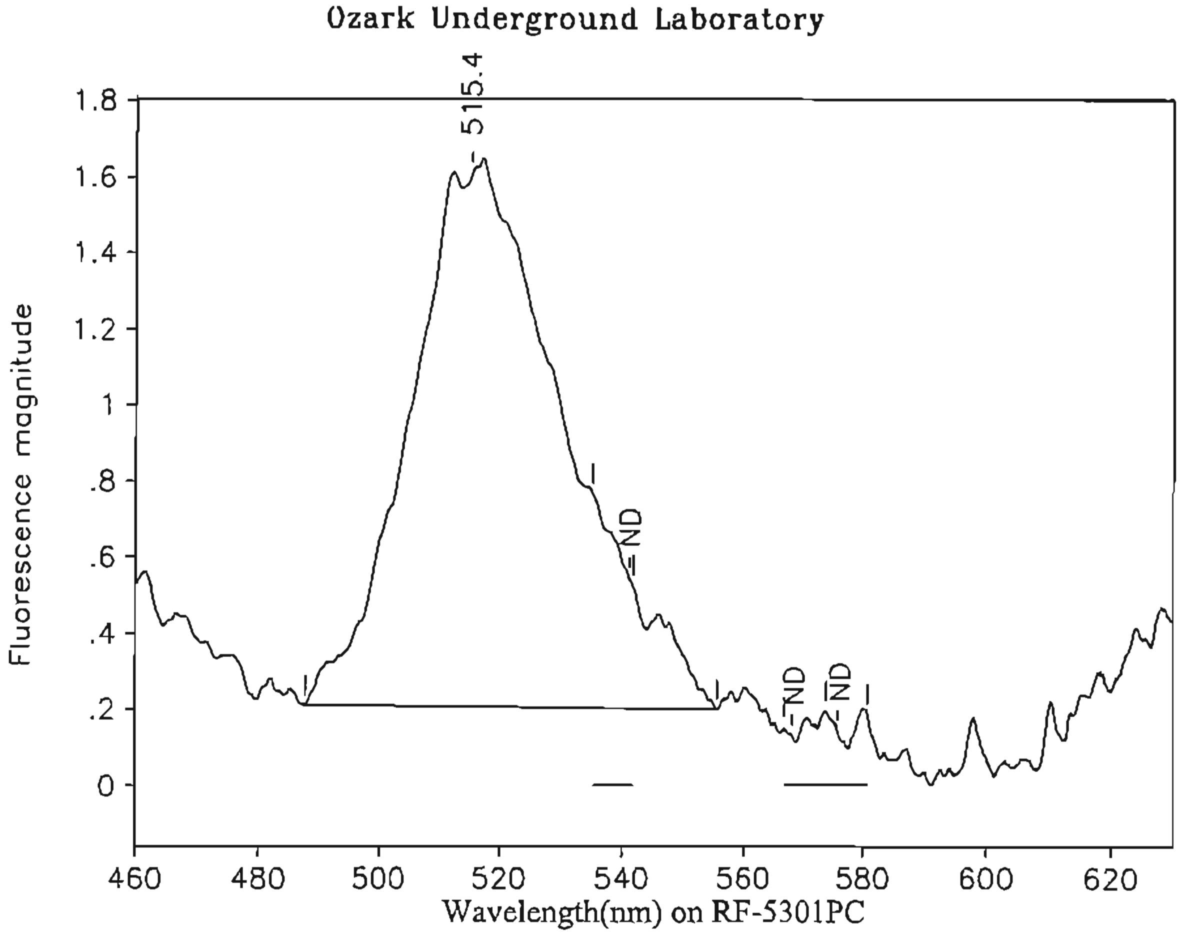
Station 22: MW-2 @ 230'
OUL number: M8086
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.9	482.8	534.9	1.29	34.70	0.04	1.16
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.6	562.4	581.6	0.14	2.25	0.06	~~0.506~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
542.2	534.9	562.4	0.38	7.92	0.05	~~0.543~~



Station 23: MW-2 @ 240'
OUL number: M8087
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

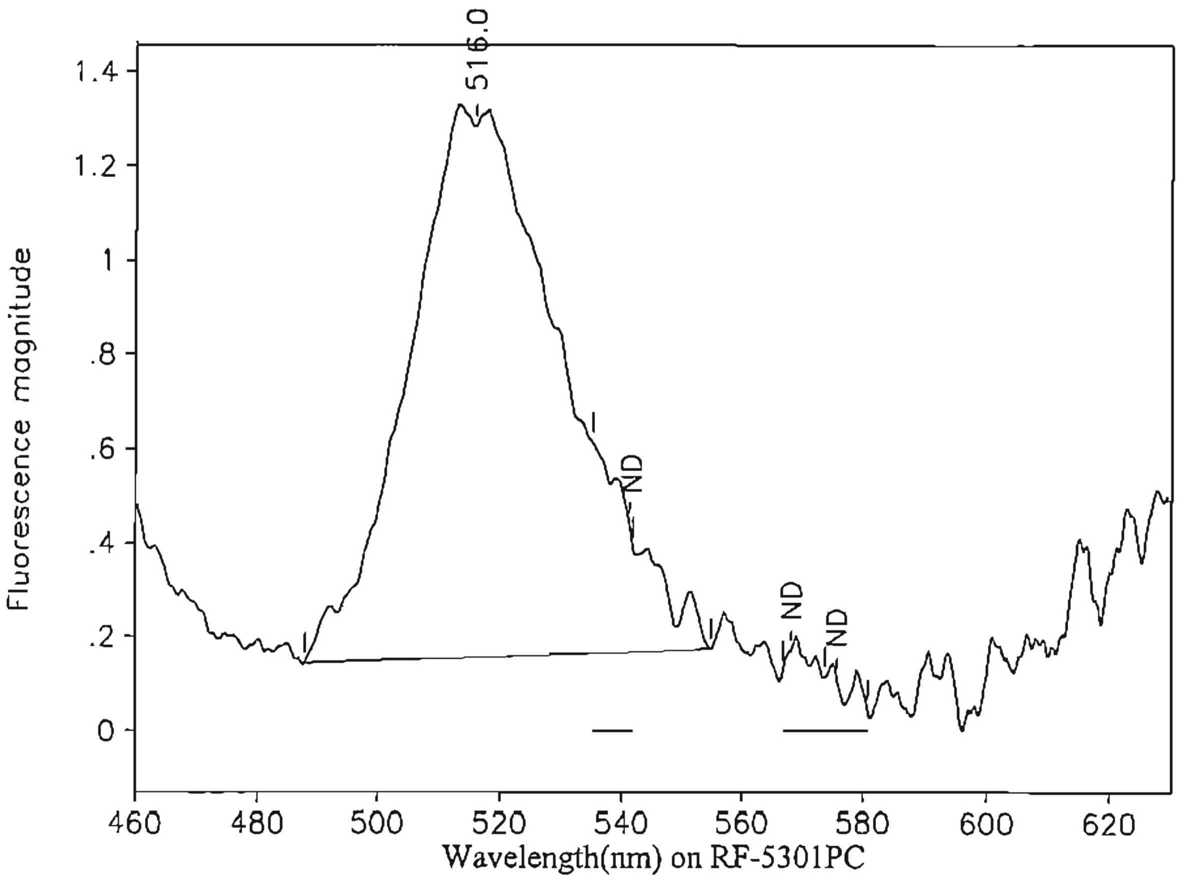
Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	487.6	555.6	1.41	42.62	0.03	1.43
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 24: MW-2 @ 250'
OUL number: M8088
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

Collected: 07/29/03 0944

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	487.8	554.8	1.13	34.86	0.03	1.17
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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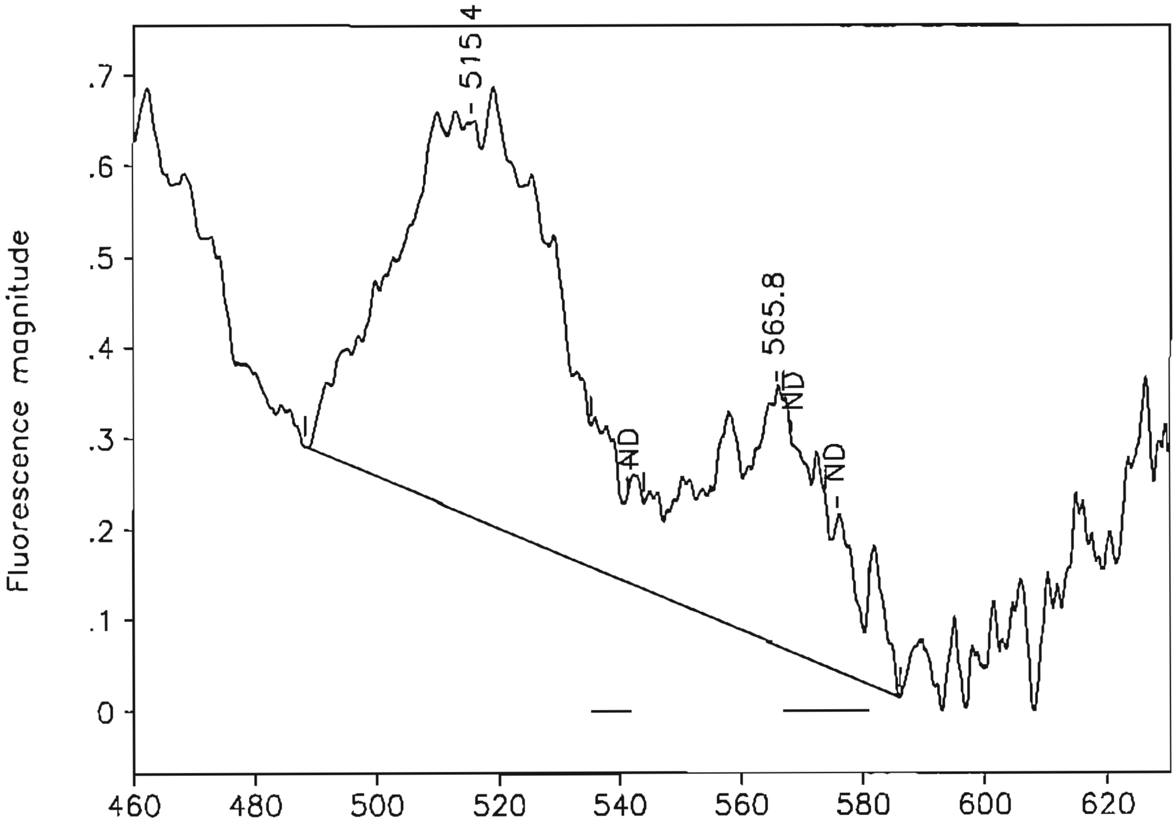


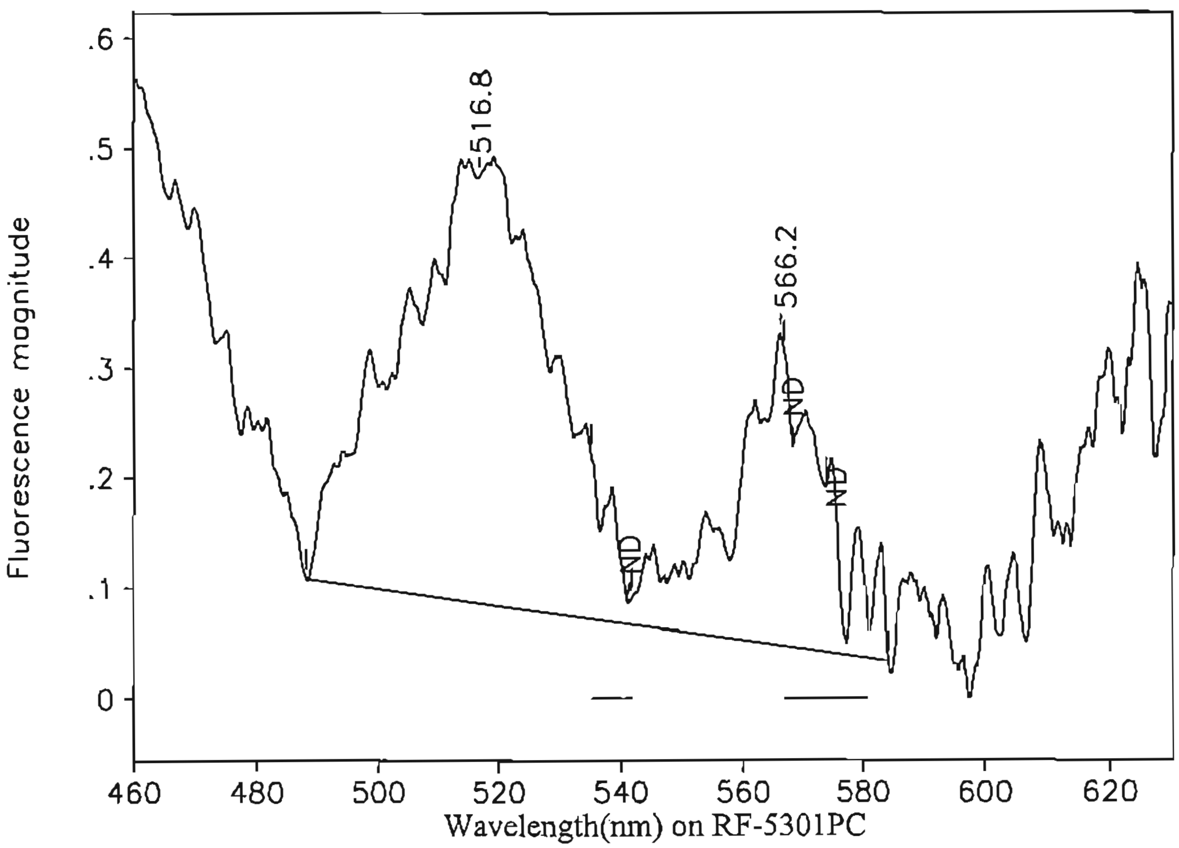
Station 25: MW-3 @ 190'
OUL number: M8089
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03
Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	488.2	544.0	0.43	14.57	0.03	~~0.488~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
565.8	544.0	586.0	0.28	6.72	0.04	~~1.51~~

Ozark Underground Laboratory



Station 26: MW-3 @ 200'
OUL number: M8090
Matrix: Elutant
Placed: / /

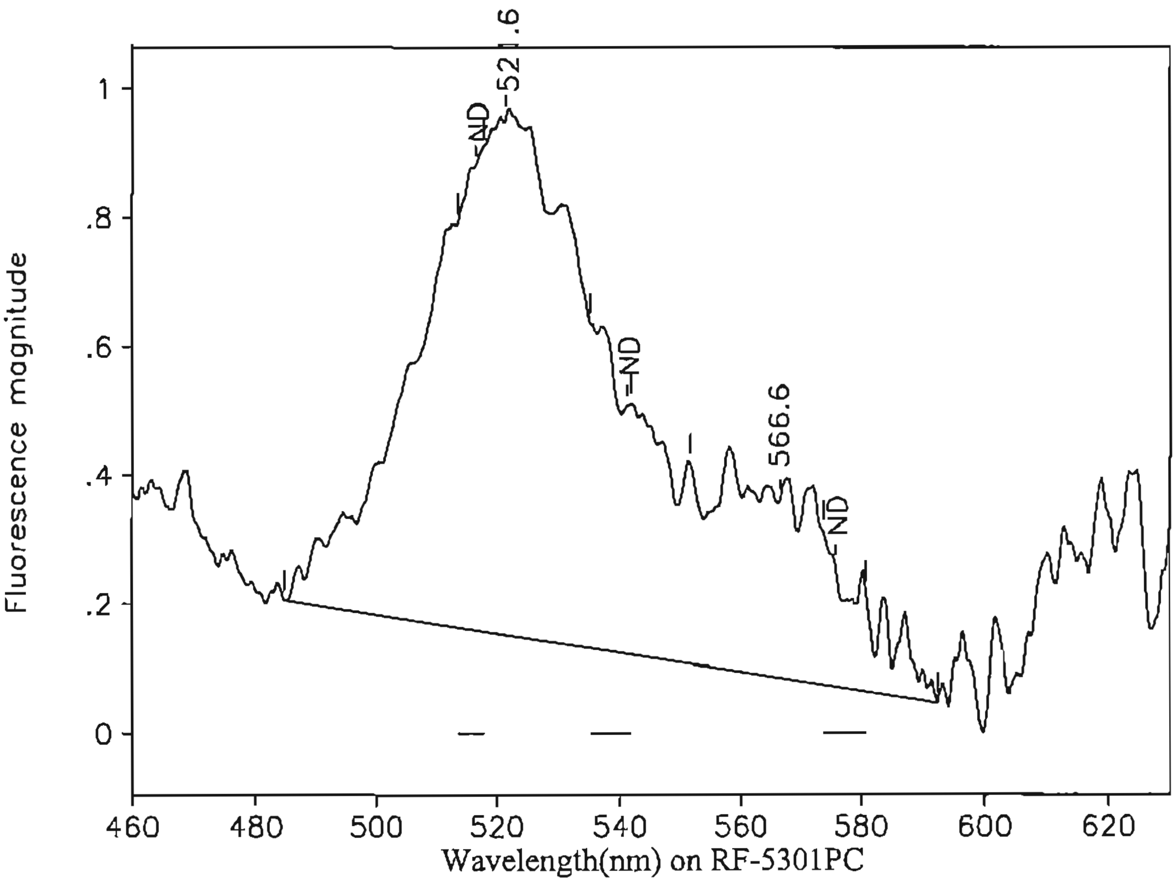
Analyzed: 08/01/03

Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	488.2	541.6	0.39	12.10	0.03	~~0.405~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
566.2	541.6	584.2	0.28	5.05	0.06	~~1.14~~

Ozark Underground Laboratory

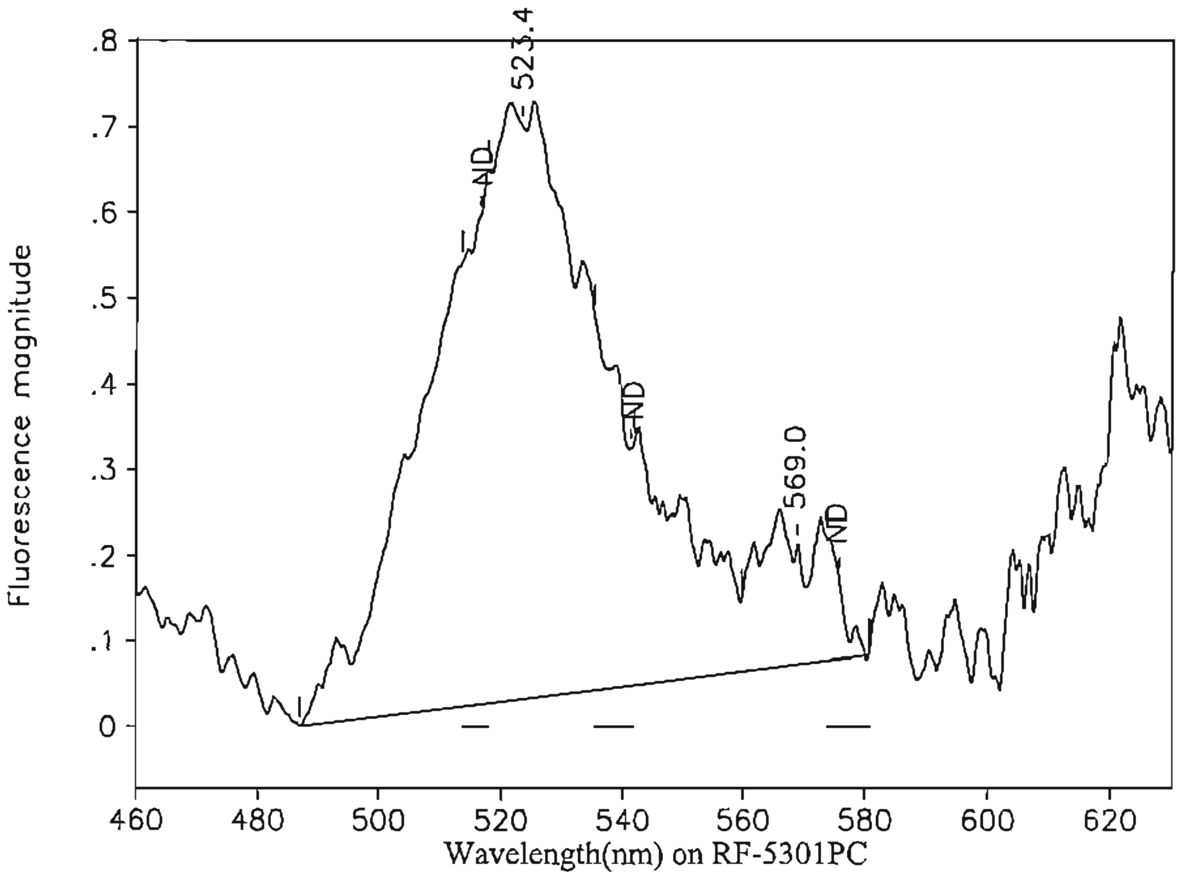


Station 27: MW-3 @ 210'
OUL number: M8091 — Analyzed: 08/01/03
Matrix: Elutant
Placed: / / — Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
566.6	551.7	592.4	0.28	8.19	0.03	~~1.85~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.6	484.6	551.7	0.81	29.15	0.03	~~0.976~~ ND

Ozark Underground Laboratory



Station 28: MW-3 @ 220'
OUL number: M8092
Matrix: Elutant
Placed: / /

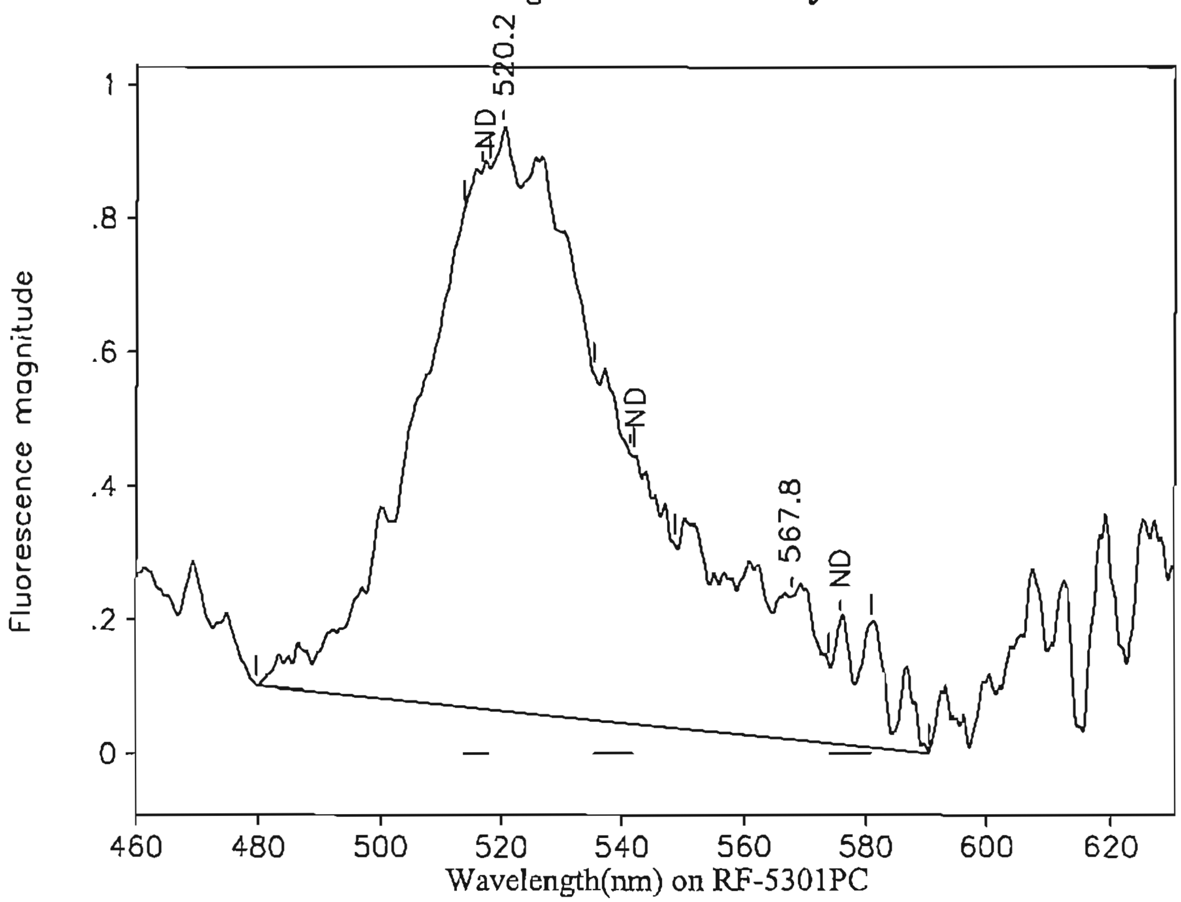
Analyzed: 08/01/03

Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
569.0	559.8	580.6	0.14	2.30	0.06	~~0.518~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
523.4	487.0	559.8	0.67	24.15	0.03	~~0.808~~ ND

Ozark Underground Laboratory

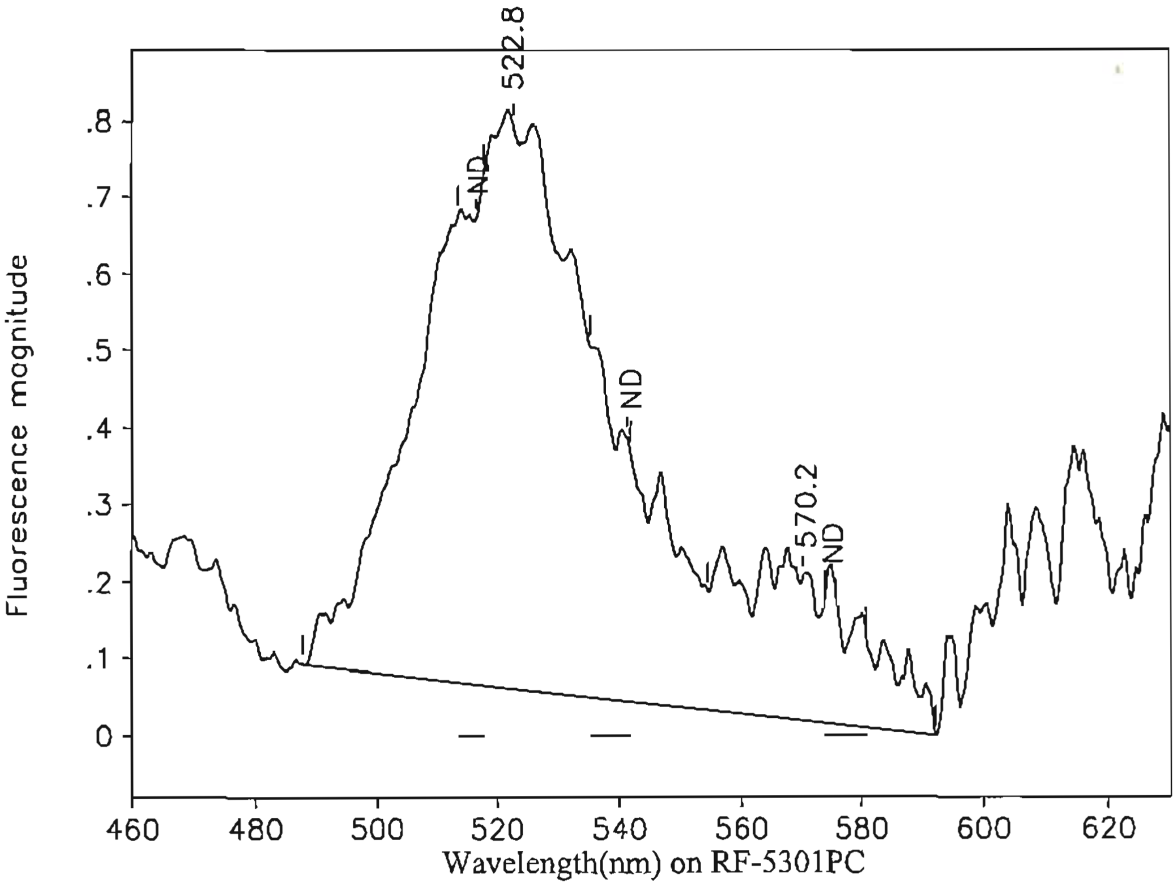


Station 29: MW-3 @ 230'
OUL number: M8093 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.8	548.6	590.4	0.21	7.58	0.03	~~1.71~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.2	479.8	548.6	0.87	30.14	0.03	~~1.01~~ ND

Ozark Underground Laboratory

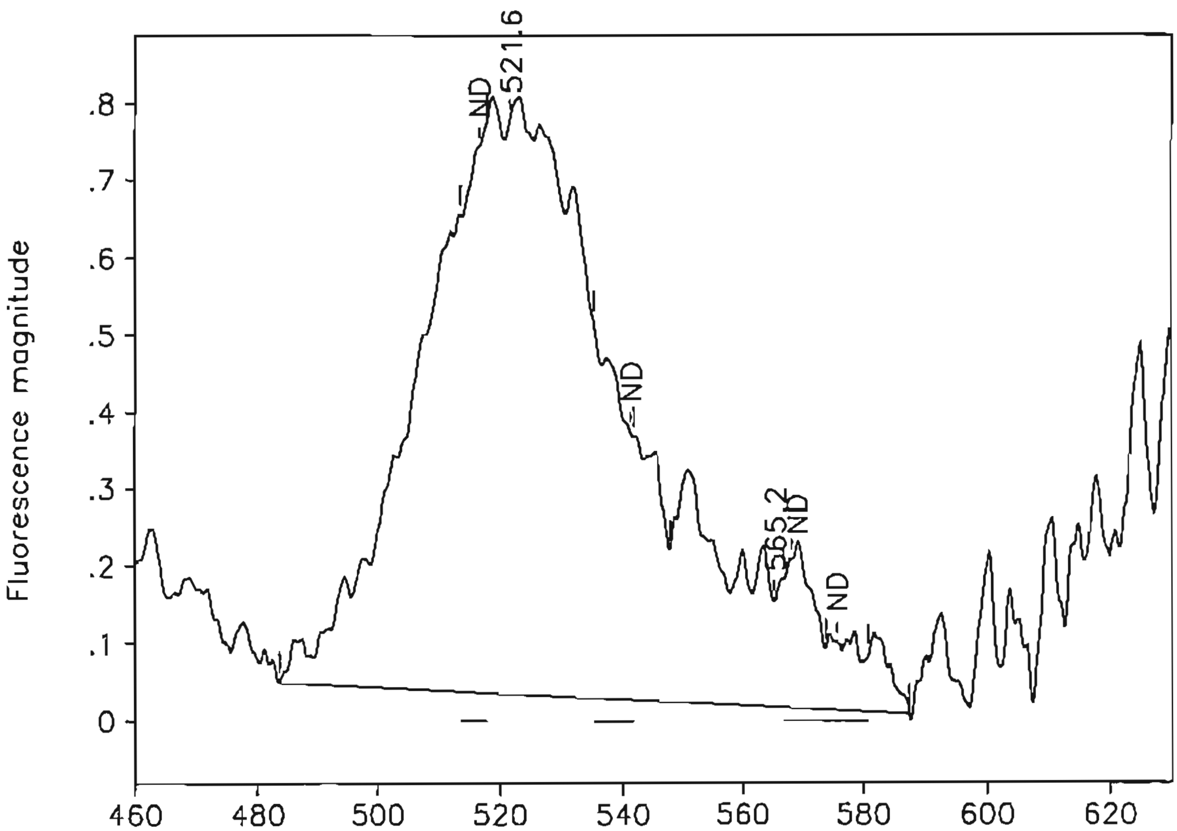


Station 30: MW-3 @ 240'
OUL number: M8094 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1016

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
570.2	554.5	592.2	0.19	5.37	0.04	~~1.21~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.8	487.6	554.5	0.73	26.05	0.03	~~0.872~~ ND

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

Station 46: MW-3 @ 250'
OUL number: M8095
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

Collected: 07/29/03 1016

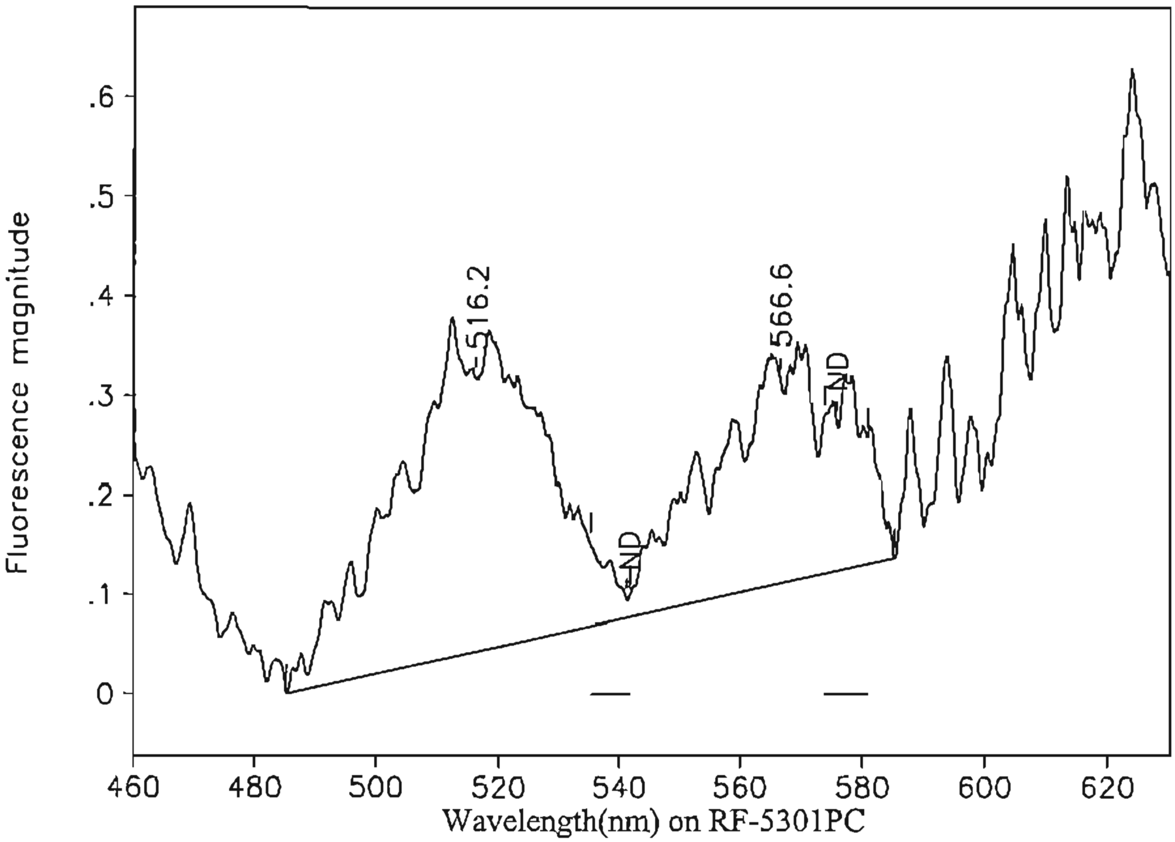
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
521.6	483.6	547.8	0.75	26.59	0.03	~~0.890~~ ND
565.2	547.8	587.4	0.14	5.93	0.02	~~1.33~~

Ozark Underground Laboratory



Station 31: MW-4 @ 190'
OUL number: M8096
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03

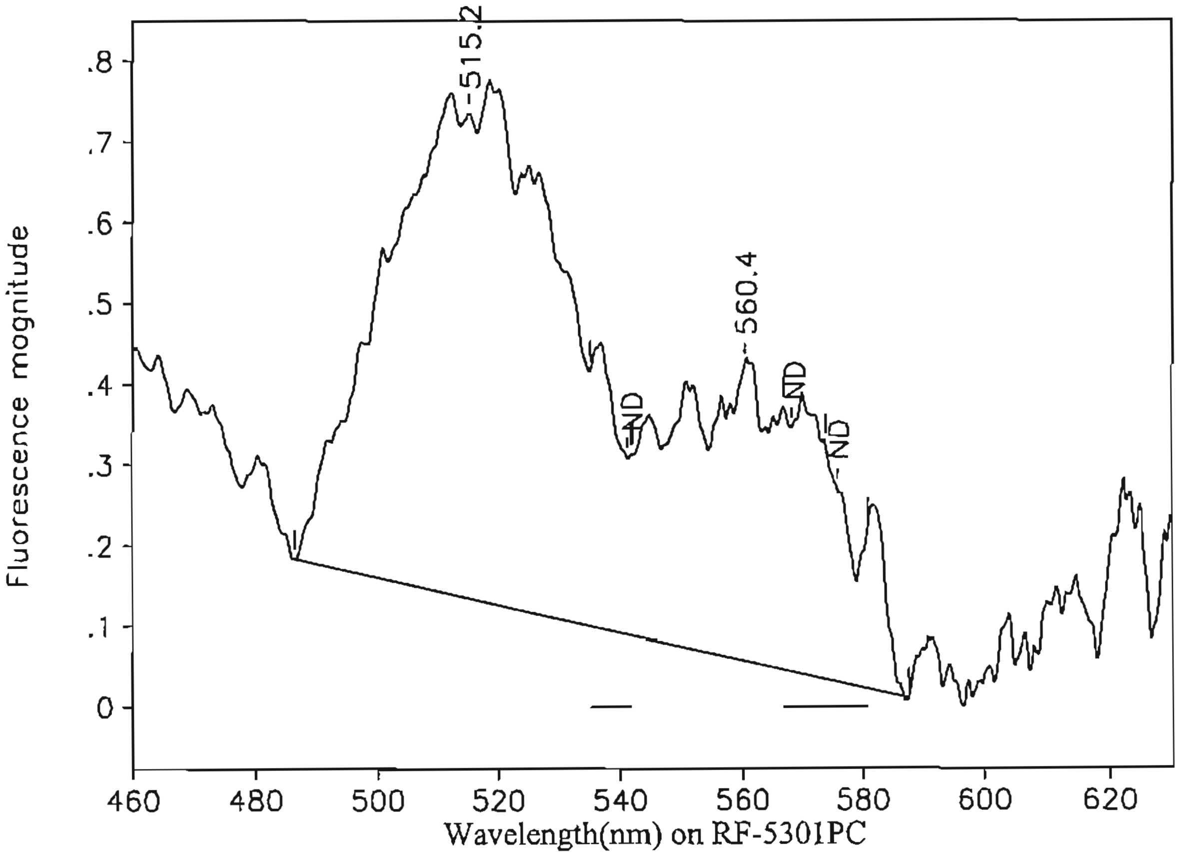
Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	485.2	541.7	0.28	9.19	0.03	~~0.308~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
566.6	541.7	585.2	0.21	5.95	0.04	~~1.34~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 32: MW-4 @ 200'
OUL number: M8097
Matrix: Elutant
Placed: / /

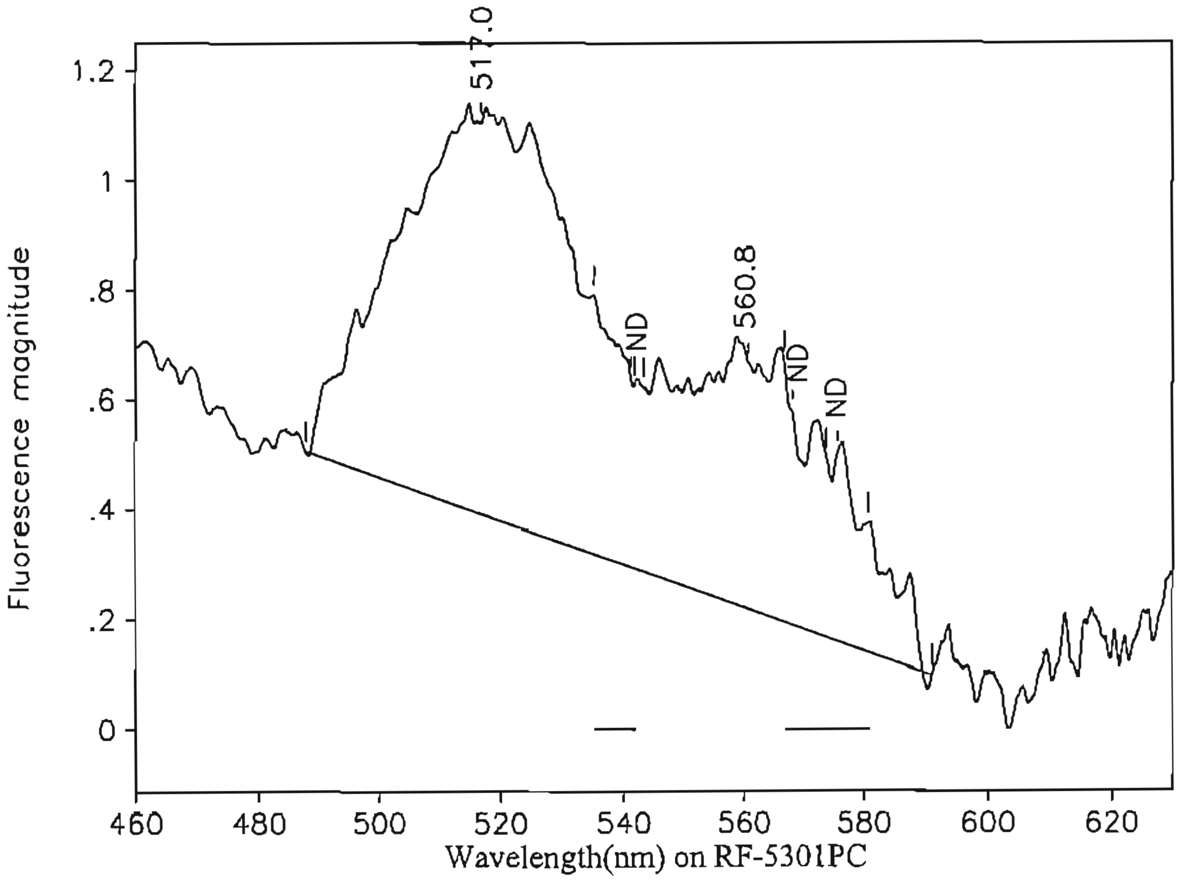
Analyzed: 08/01/03

Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	486.4	542.1	0.60	22.44	0.03	~~0.751~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
560.4	542.1	587.6	0.37	11.68	0.03	~~2.63~~

Ozark Underground Laboratory



Station 33: MW-4 @ 210'
OUL number: M8098
Matrix: Elutant
Placed: / /

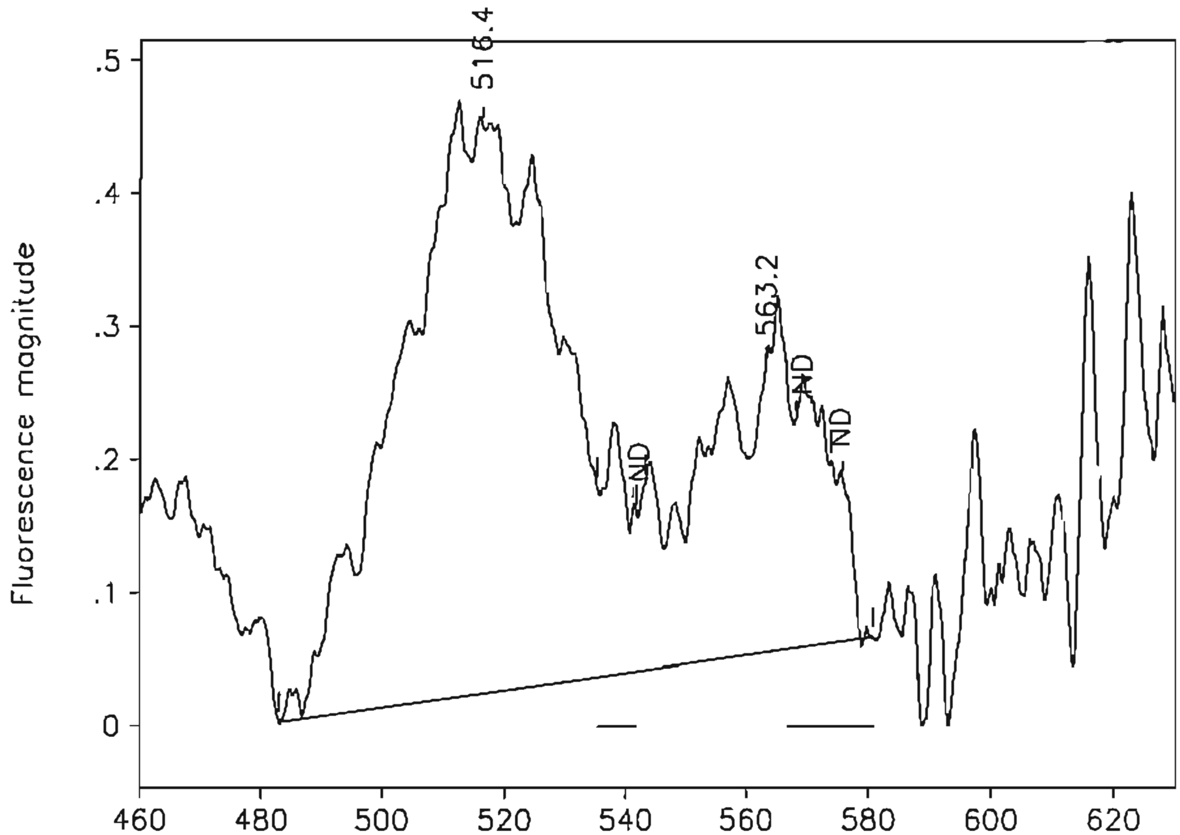
Analyzed: 08/01/03

Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	487.8	543.3	0.71	26.92	0.03	~~0.901~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
560.8	543.3	591.0	0.45	15.27	0.03	~~3.44~~

Ozark Underground Laboratory

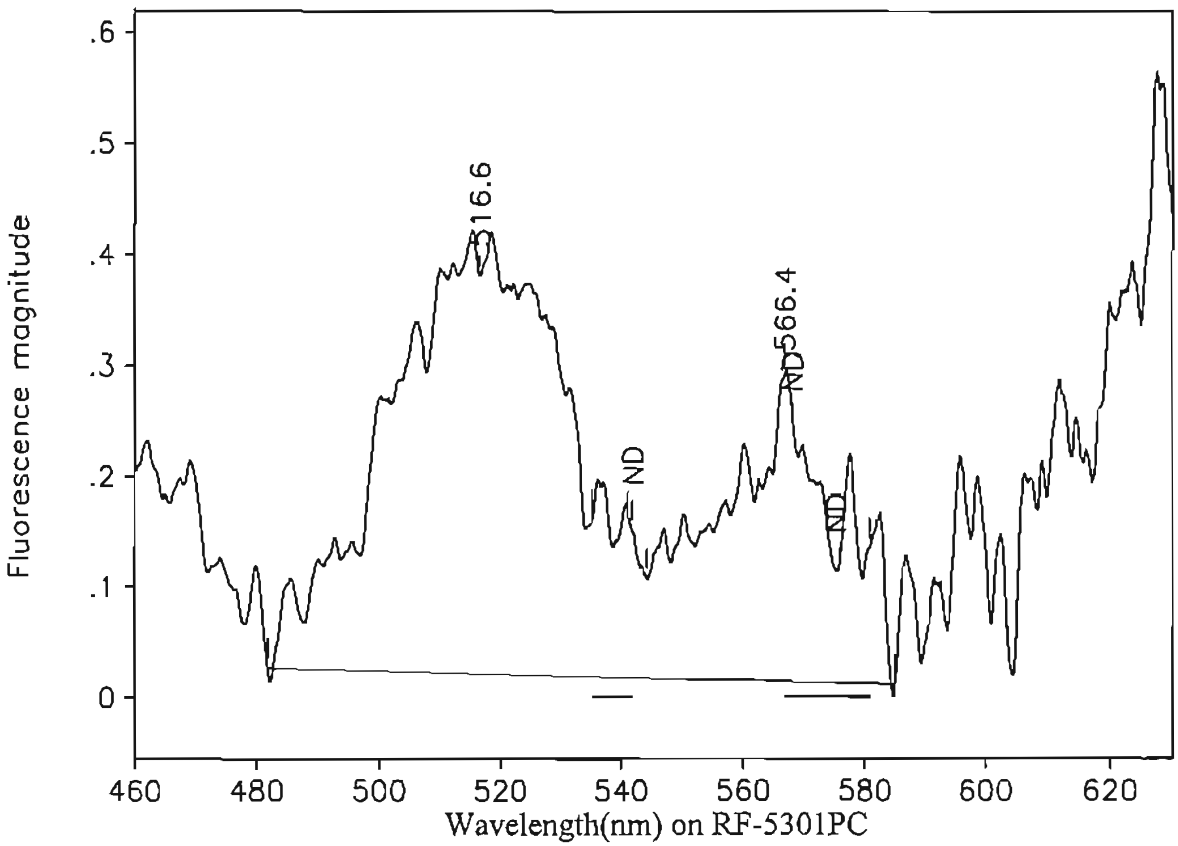


Station 34: MW-4 @ 220'
OUL number: M8099 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	483.0	543.2	0.43	13.99	0.03	~~0.468~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
563.2	543.2	580.8	0.21	5.56	0.04	~~1.25~~

Ozark Underground Laboratory



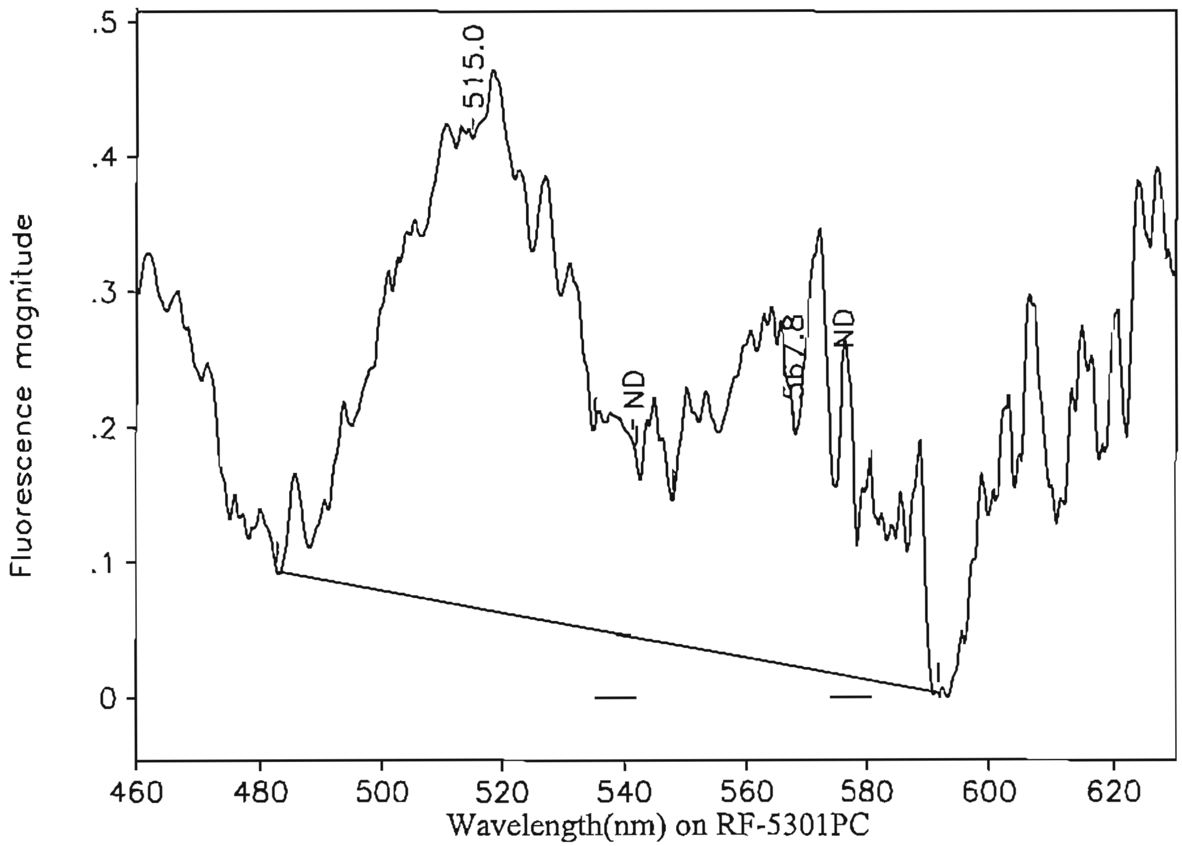
Station 35: MW-4 @ 230'
OUL number: M8101
Matrix: Elutant
Placed: / /

Analyzed: 08/01/03
Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	481.8	544.2	0.36	13.93	0.03	~~0.466~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
566.4	544.2	585.0	0.27	6.27	0.04	~~1.41~~

Ozark Underground Laboratory



Station 36: MW-4 @ 240'
OUL number: M8102
Matrix: Elutant
Placed: / /

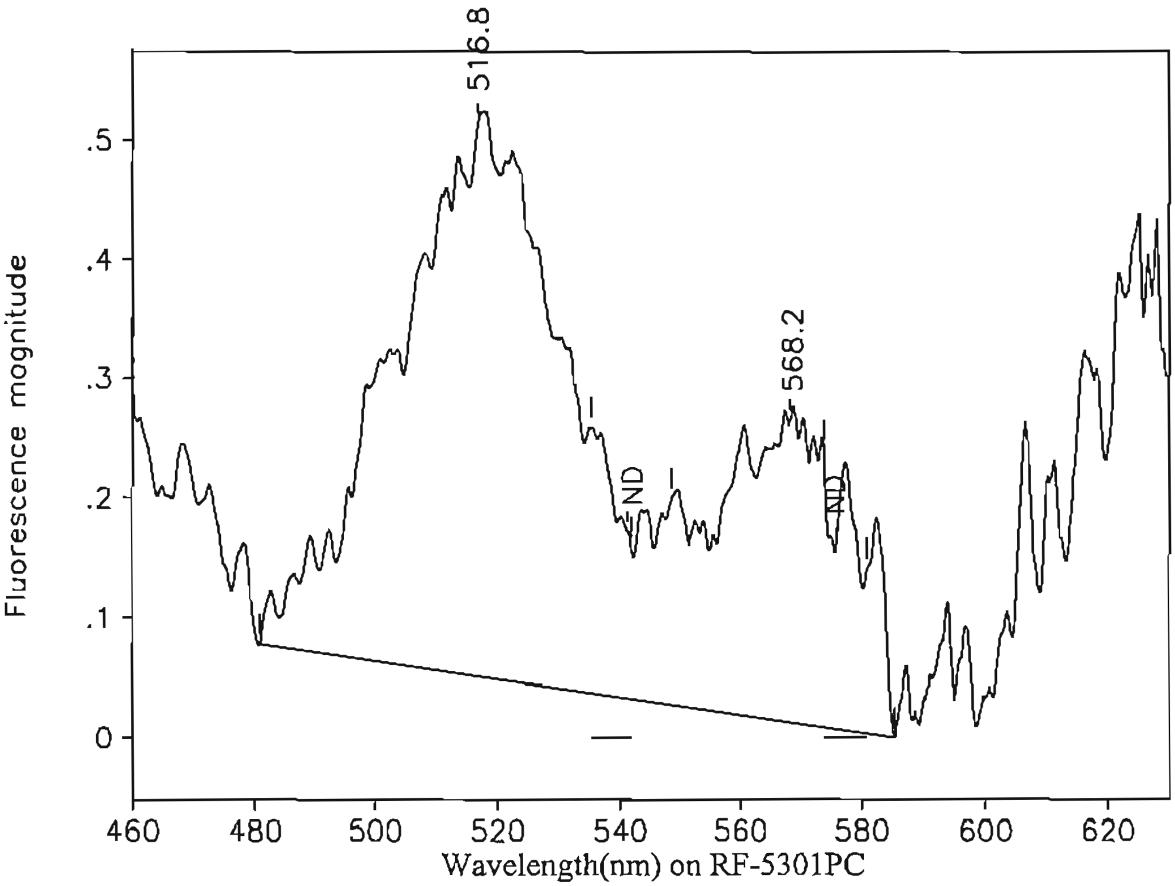
Analyzed: 08/01/03
Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	482.6	547.8	0.35	13.96	0.03	~~0.467~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
567.8	547.8	591.8	0.17	7.88	0.02	~~1.78~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 37: MW-4 @ 250'
OUL number: M8103 Analyzed: 08/01/03
Matrix: Elutant
Placed: / / Collected: 07/29/03 1111

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	480.8	548.6	0.46	16.27	0.03	~~0.545~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	548.6	585.2	0.25	6.84	0.04	~~1.54~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 18, 2003

RECEIVED
AUG 2 1 2003
CH2M Hill/ORL

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for charcoal samplers shipped on August 11, 2003
Ozark Underground Laboratory (OUL) numbers M8227 through M8255.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on August 12, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheets
3. Nodarse & Assoc. Chain-of-Custody Record
4. Sample analysis graphs

f:\docs\coa\festival07.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park – Project CH2MHill 177652
Samples Collected By: Mike Burns
Date Samples Shipped: August 11, 2003
Date Samples Rec'd at OUL: August 12, 2003
Date Analyzed by OUL: August 14, 2003

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine	
				2003	Peak	Conc.	Peak	Conc.
M8227	39	MW-1 @ 149'	NDT	8/11 1015	515.1	641	ND	
M8228	40	MW-1 @ 159'	NDT	8/11 1015	515.1	681	ND	
M8229	41	MW-1 @ 169'	NDT	8/11 1015	515.1	1050	ND	
M8230	42	MW-1 @ 179'	NDT	8/11 1015	515	687	ND	
M8231	43	MW-1 @ 189'	NDT	8/11 1015	514.7	127	ND	
M8232	44	MW-1 @ 199'	NDT	8/11 1015	514.6	162	ND	
M8233	45	MW-1 @ 209'	NDT	8/11 1015	514.7	174	ND	
M8234	18	MW-2 @ 190'	NDT	8/11 0910	517.6	3.09	536.4 **	4.93
M8235	19	MW-2 @ 200'	NDT	8/11 0910	517.7	1.23	ND	
M8236	20	MW-2 @ 210'	NDT	8/11 0910	517.8	1.35	ND	
M8237	21	MW-2 @ 220'	NDT	8/11 0910	516.7	1.12	ND	
M8238	22	MW-2 @ 230'	NDT	8/11 0910	516.8	1.07	ND	
M8239	23	MW-2 @ 240'	NDT	8/11 0910	516.5	0.789	ND	
M8240	Laboratory control charcoal blank							
M8241	24	MW-2 @ 250'	NDT	8/11 0910	516.6	0.756	ND	
M8242	25	MW-3 @ 190'	NDT	8/11 0945	ND		ND	
M8243	26	MW-3 @ 200'	NDT	8/11 0945	ND		ND	
M8244	27	MW-3 @ 210'	NDT	8/11 0945	ND		ND	
M8245	28	MW-3 @ 220'	NDT	8/11 0945	ND		ND	
M8246	29	MW-3 @ 230'	NDT	8/11 0945	ND		ND	
M8247	30	MW-3 @ 240'	NDT	8/11 0945	ND		ND	
M8248	46	MW-3 @ 250'	NDT	8/11 0945	ND		ND	
M8249	31	MW-4 @ 190'	NDT	8/11 1050	ND		ND	
M8250	32	MW-4 @ 200'	NDT	8/11 1050	ND		ND	
M8251	33	MW-4 @ 210'	NDT	8/11 1050	ND		ND	
M8252	34	MW-4 @ 220'	NDT	8/11 1050	ND		ND	
M8253	35	MW-4 @ 230'	NDT	8/11 1050	ND		ND	
M8254	36	MW-4 @ 240'	NDT	8/11 1050	ND		ND	
M8255	37	MW-4 @ 250'	NDT	8/11 1050	ND		ND	

Footnotes on next page

FOOTNOTES:

NDT = No date or time given

ND = No dye detected

** = a fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were dye.

OZARK UNDERGROUND LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill Week No: Samples Collected By: ~~Lydia Wing~~ Ca/Mike Burns

Samples Shipped By : Mike Burns Samples Received By: John Arnold

Date Samples Shipped: 08/ 11 / 03 Date Samples Received: 08/ 12/ 03 Time Samples Received: 13:10 Return Cooler? Yes : No: X

Bill to: Send Results to: Al Akens with CH2M Hill

Analyze for: Fluorescein : X Eosine: X Rhodamine WT Other Ship cooler to:

OUL use only			***Please indicate stations where dye was visible in the field*** *for field technician use - use black ink only*					OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
				DATE	TIME	DATE	TIME	
1	M8227	39	MW-1 @ 149'			8-11-03	1015	0
1	M8228	40	MW-1 @ 159'			8-11-03	1015	0
1	M8229	41	MW-1 @ 169'			8-11-03	1015	0
1	M8230	42	MW-1 @ 179'			8-11-03	1015	0
1	M8231	43	MW-1 @ 189'			8-11-03	1015	0
1	M8232	44	MW-1 @ 199'			8-11-03	1015	0
1	M8233	45	MW-1 @ 209'			8-11-03	1015	0
1	M8234	18	MW-2 @ 190'			8-11-03	0910	0
1	M8235	19	MW-2 @ 200'			8-11-03	0910	0
1	M8236	20	MW-2 @ 210'			8-11-03	0910	0
1	M8237	21	MW-2 @ 220'			8-11-03	0910	0
1	M8238	22	MW-2 @ 230'			8-11-03	0910	0
1	M8239	23	MW-2 @ 240'			8-11-03	0910	0
1	M8241	24	MW-2 @ 250'			8-11-03	0910	0

COMMENTS: Charcoal Blank M8240

This sheet filled out by OUL staff? Yes X No Charts for samples on this page proofed by OUL: Ca

516

Project 551 Analyzed 8/14/03 by WR

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OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill Week No: Samples Collected By: Lydia Wing/Mike Burns

Samples Shipped By : Mike Burns Samples Received By: John Arnold

Date Samples Shipped: 08/ 11 / 03 Date Samples Received: 18/ 12/ 03 Time Samples Received: 13:10 Return Cooler? Yes : No: X

Bill to: Send Results to: Al Akens with CH2M Hill

Analyze for: Fluorescein : X Eosine: X Rhodamine WT Other Ship cooler to:

OUL use only		Please indicate stations where dye was visible in the field *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M8242	25	MW-3 @ 190'			8-11-03	0945	0
1	M8243	26	MW-3 @ 200'			8-11-03	0945	0
1	M8244	27	MW-3 @ 210'			8-11-03	0945	0
1	M8245	28	MW-3 @ 220'			8-11-03	0945	0
1	M8246	29	MW-3 @ 230'			8-11-03	0945	0
1	M8247	30	MW-3 @ 240'			8-11-03	0945	0
1	M8248	46	MW-3 @ 250'			8-11-03	0945	0
1	M8249	31	MW-4 @ 190'			8-11-03	1050	0
1	M8250	32	MW-4 @ 200'			8-11-03	1050	0
1	M8251	33	MW-4 @ 210'			8-11-03	1050	0
1	M8252	34	MW-4 @ 220'			8-11-03	1050	0
1	M8253	35	MW-4 @ 230'			8-11-03	1050	0
1	M8254	36	MW-4 @ 240'			8-11-03	1050	0
1	M8255	37	MW-4 @ 250'			8-11-03	1050	0

COMMENTS:

This sheet filled out by OUL staff? Yes X No Charts for samples on this page proofed by OUL:

analyzed 8/14/03 by ur

517

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Ozark Undergrd 238

~~PC&B Environmental~~
210 Park Road, Oviedo, FL 32765
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order: ______

Date: ______ Page ____ of ____

COMPANY: Nodarse & Assoc.
ADDRESS: 1675 Lee Rd.
Winter Park, FL. 32789
SAMPLED BY: Mike Burns SIGN: Mike Burns
PHONE: 407-740-6110 FAX:

ANALYSIS REQUESTED: Tracer Dye

#	SAMPLE ID	DATE/TIME	MATRIX: AIR	WATER	SLUDGE	SOL/SOLID	ORG. LIQUID	Tracer Dye	PRESERVATION	Number of Containers
1	mw-1 149'-209'	8/11/03 1015						✓		7
2	mw-2 190'-250'	0910						✓		7
3	mw-3 190'-250'	0945						✓		7
4	mw-4 190'-250'	1050						✓		7
5										
6										
7										
8										
9										
10										
11										
12										
13										

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Mike Burns	8/11/03	1: J. Arnold	8/12/03 1310
2:		2:	
3:		3:	

PROJECT INFORMATION

PROJECT NAME: Festival Park
PROJECT #: W01-E-120-1
SITE ADDRESS: Orlando, FL.
PROJECT MANAGER: Lydia Wing / AL Akens

SAMPLE RECEIPT

Total # of Containers	
Chain of Custody Seals	
Recv'd in Good Condition	
PO #:	

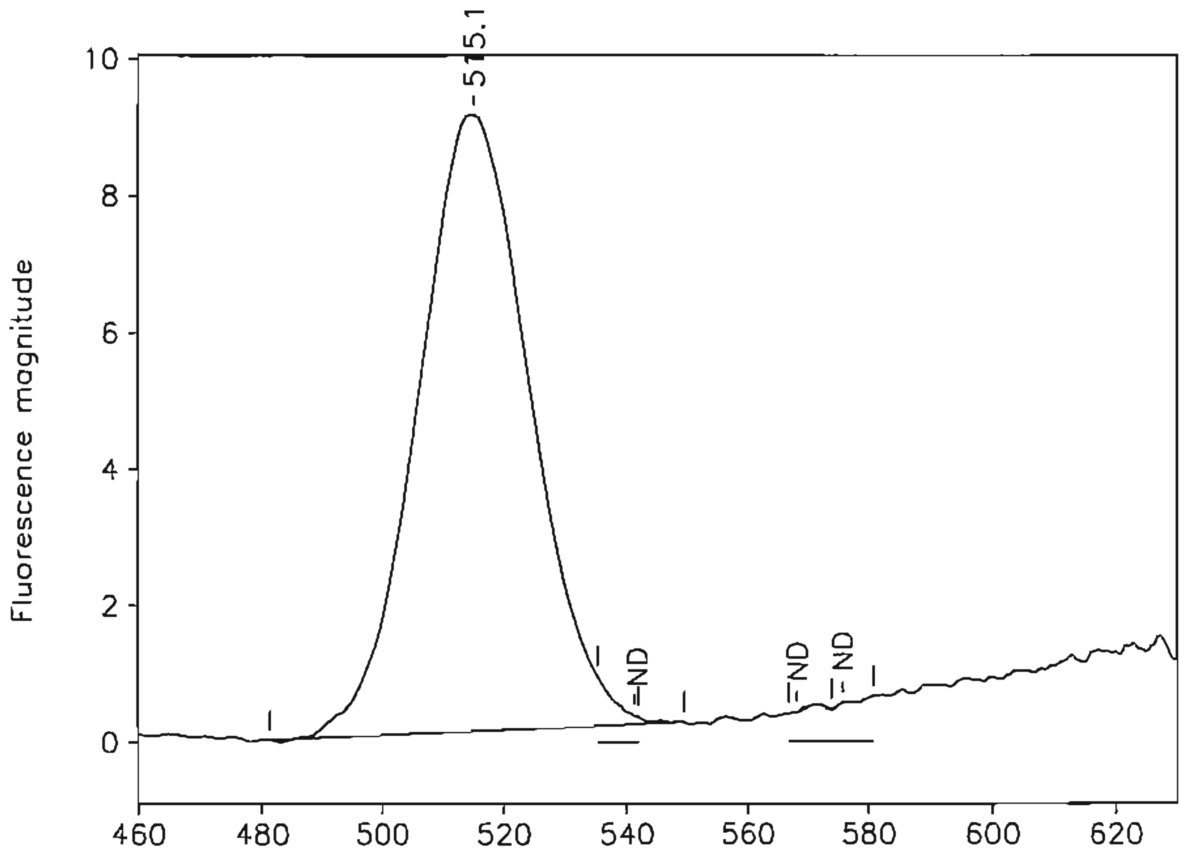
SPECIAL INSTRUCTIONS/COMMENTS: Please send results to AL Akens CH_2M Hill

INVOICE TO: (IF DIFFERENT FROM ABOVE)

518

QUOTE/CONTRACT #:

Ozark Underground Laboratory



Station 39: MW-1 @ 149'
OUL number: M8227
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/14/03

Collected: 08/11/03 1015

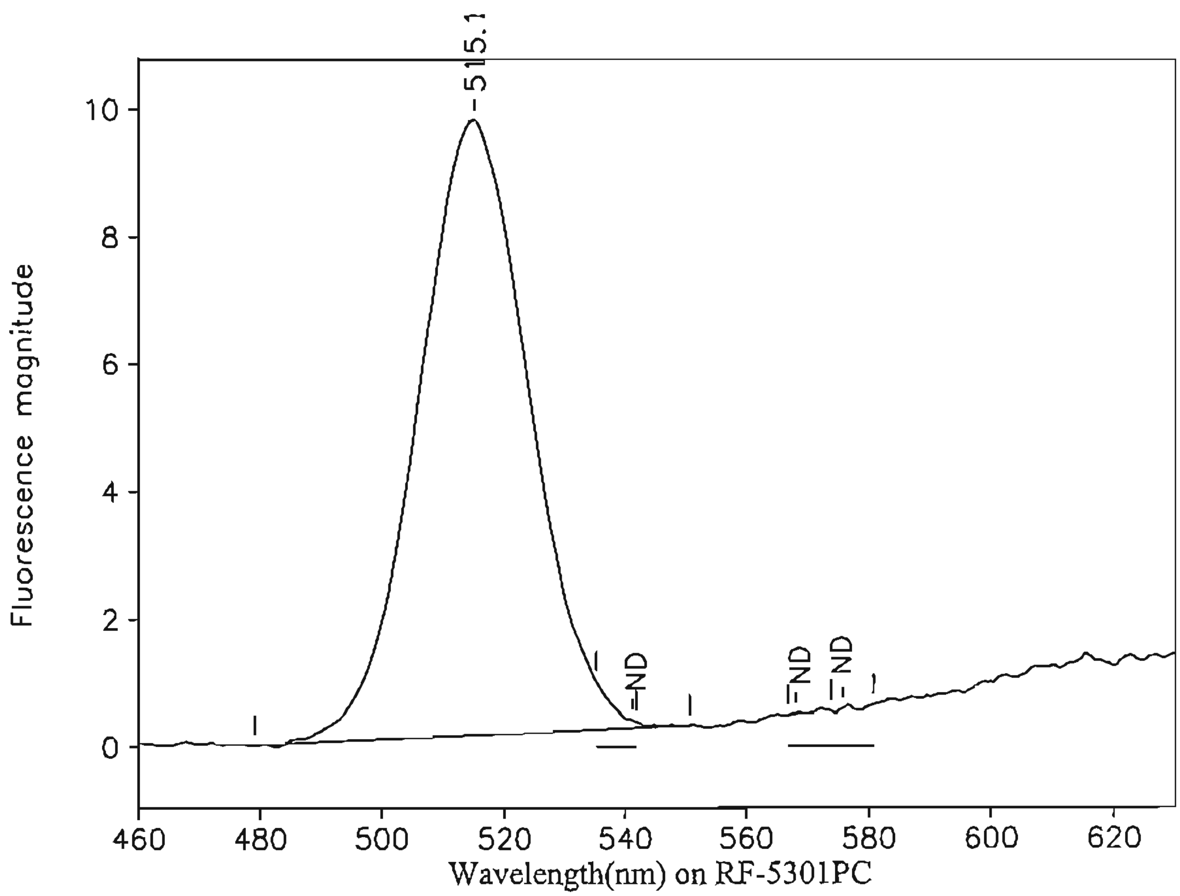
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.1	481.3	549.4	9.00	191.64	0.05	641
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Ca

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 40: MW-1 @ 159'
OUL number: M8228
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/14/03

Collected: 08/11/03 1015

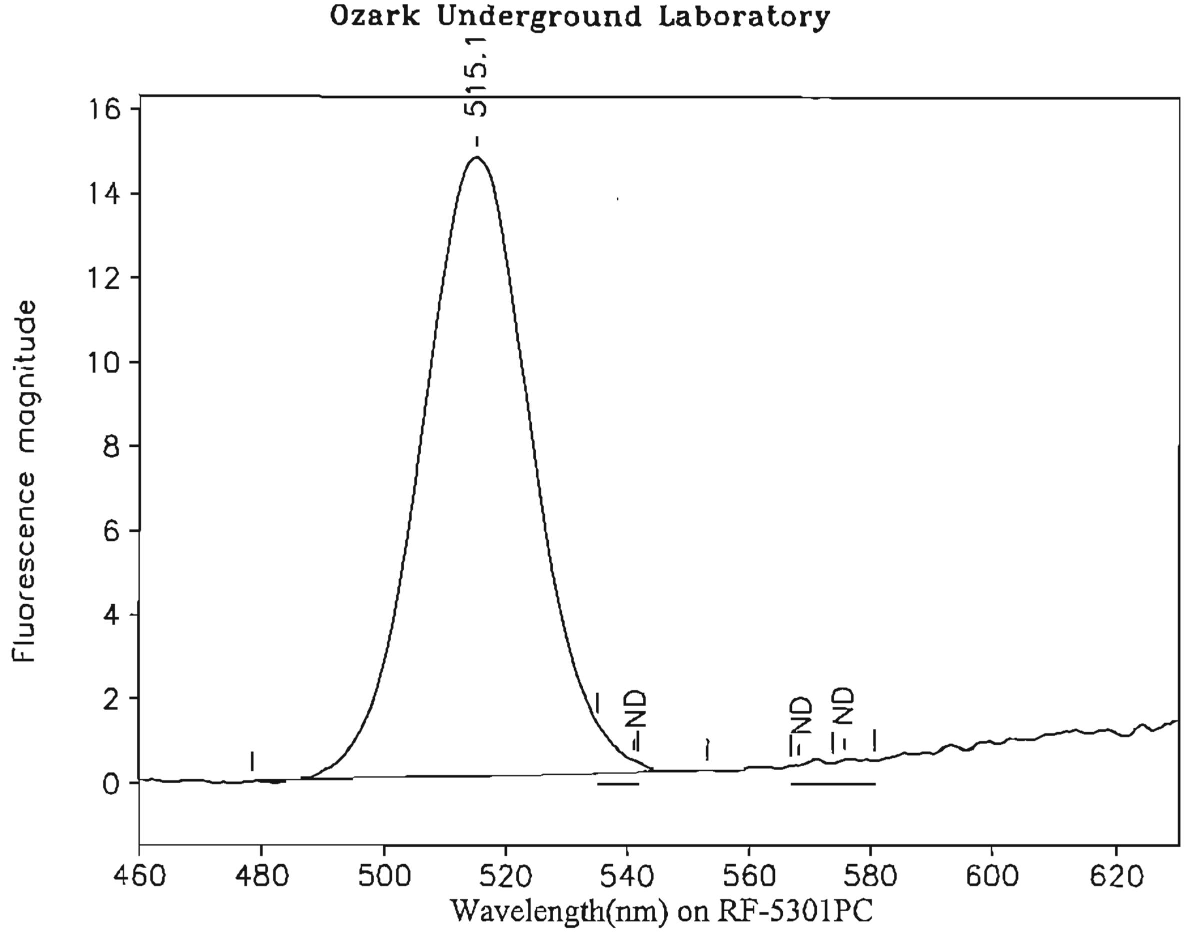
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.1	479.1	550.7	9.65	203.60	0.05	681
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 41: MW-1 @ 169'
OUL number: M8229
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/14/03

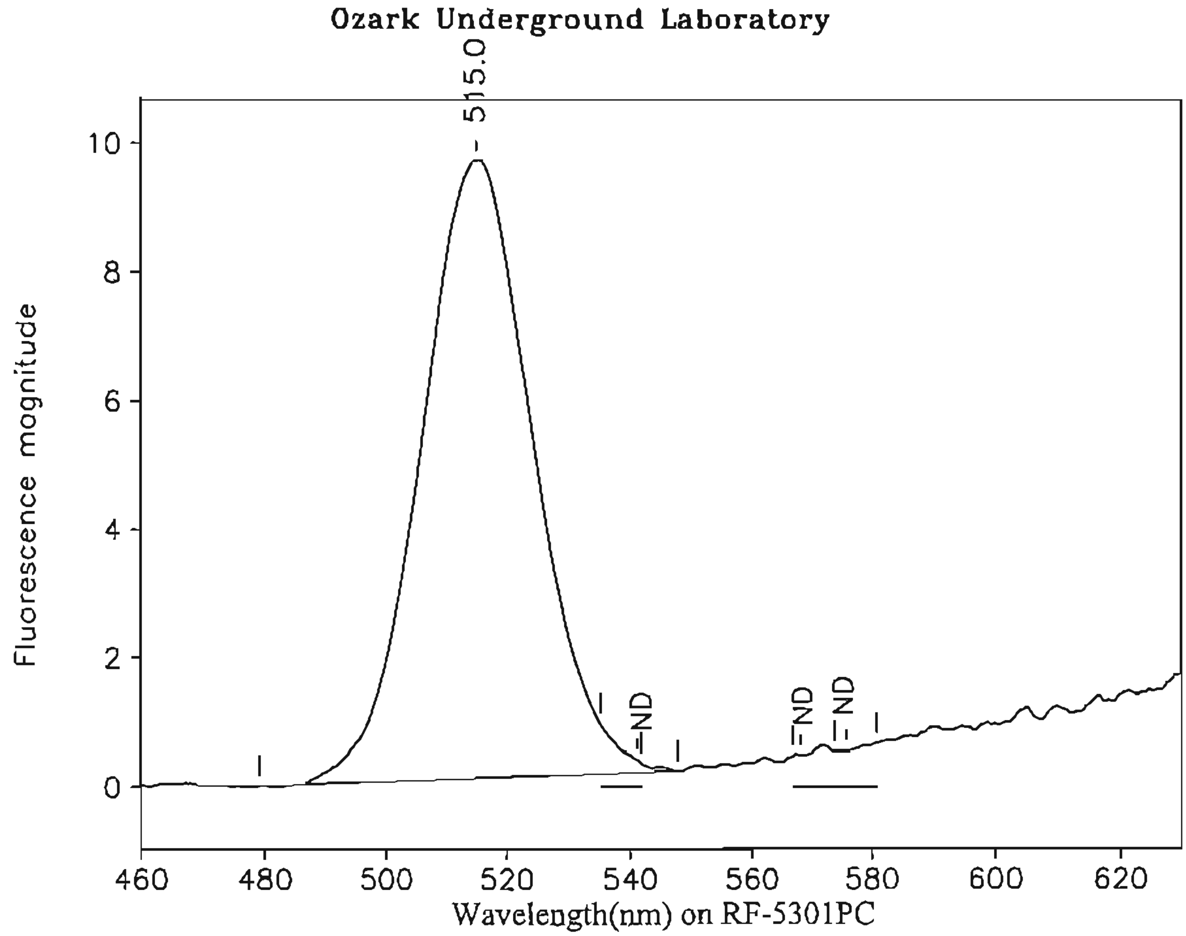
Collected: 08/11/03 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.1	478.6	553.2	14.69	313.00	0.05	1,050
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Ch

Peaks close to the normal range of tracer dyes:



Station 42: MW-1 @ 179'
OUL number: M8230
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/14/03

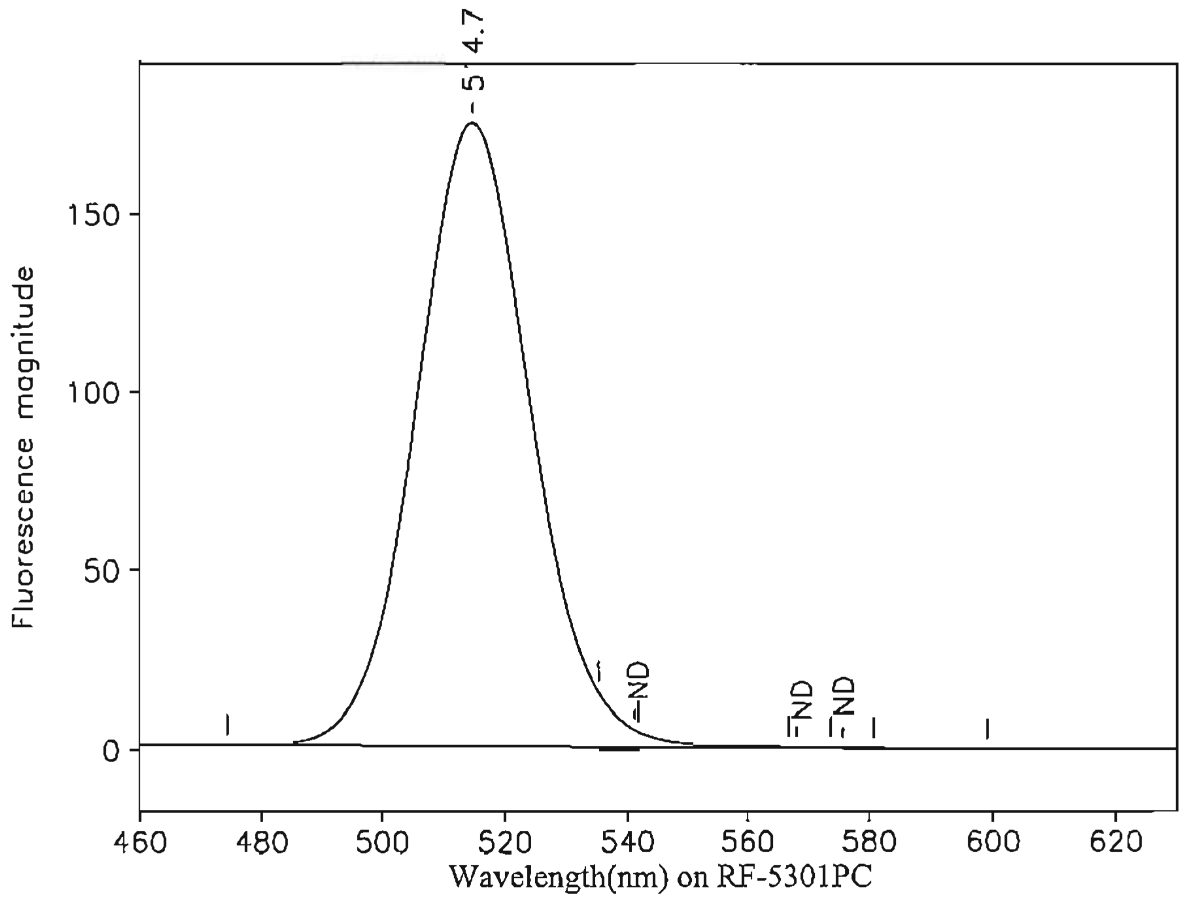
Collected: 08/11/03 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	479.1	547.7	9.59	205.44	0.05	687
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



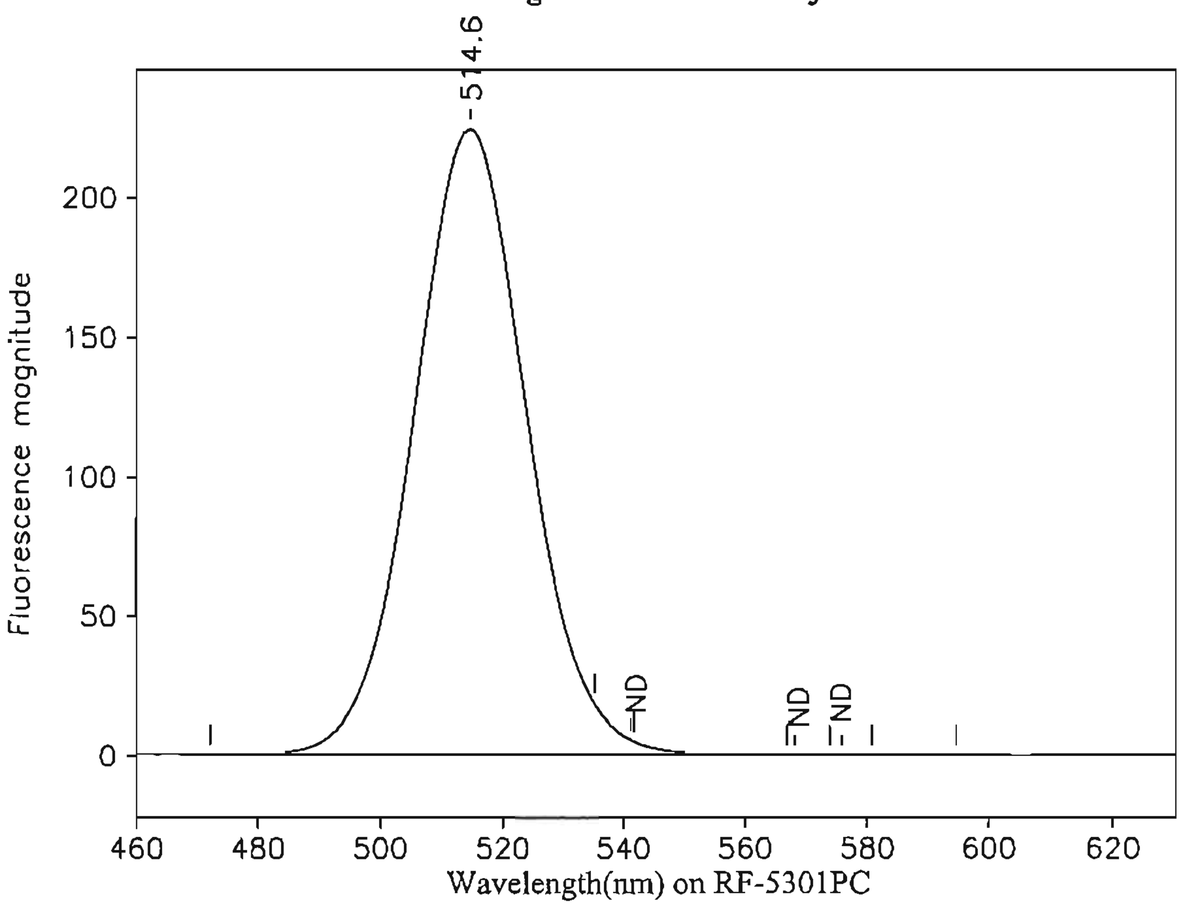
Station 43: MW-1 @ 189'
OUL number: M8231 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	474.2	599.0	174.69	3,812.64	0.05	127
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 44: MW-1 @ 199'
OUL number: M8232 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 1015

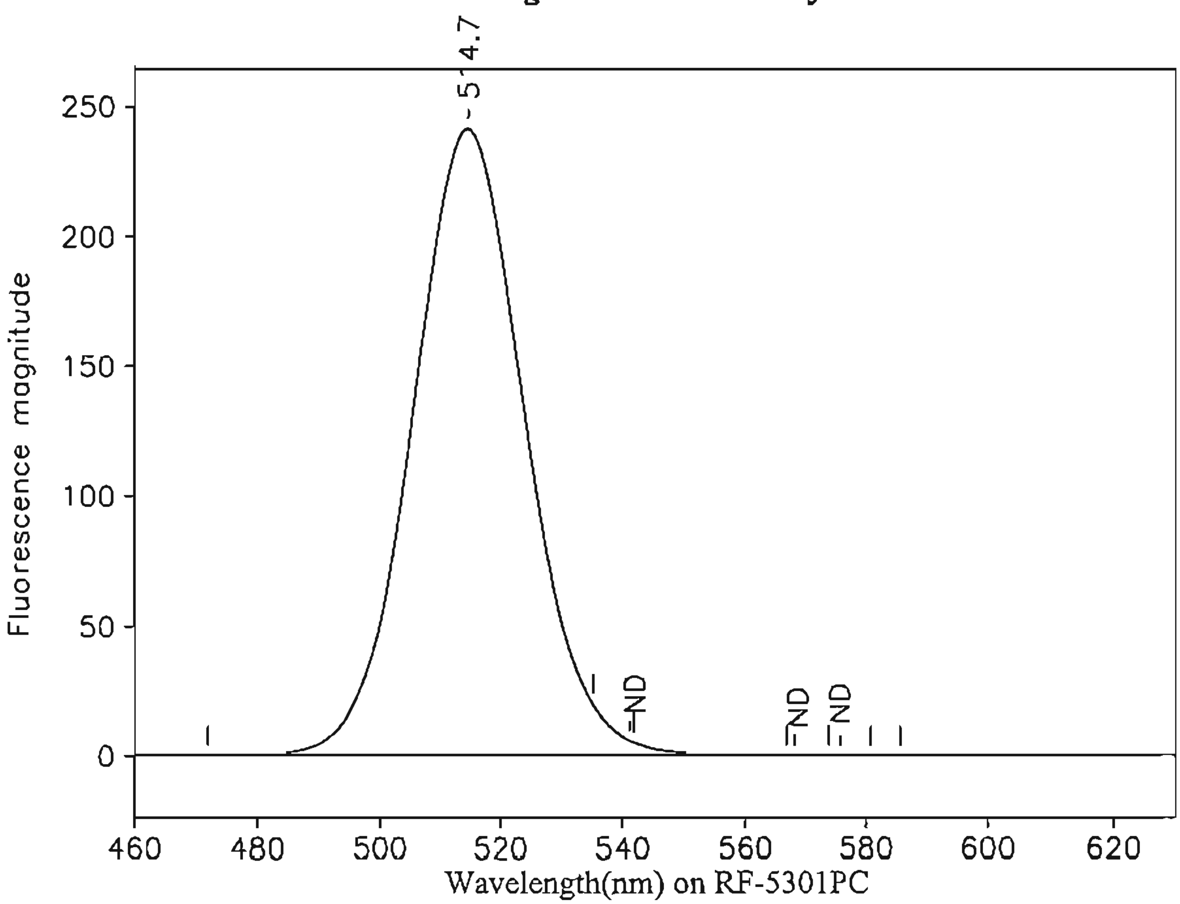
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.6	472.2	594.6	223.97	4,846.64	0.05	162
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Cn

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 45: MW-1 @ 209'
OUL number: M8233
Matrix: Elutant
Placed: / /

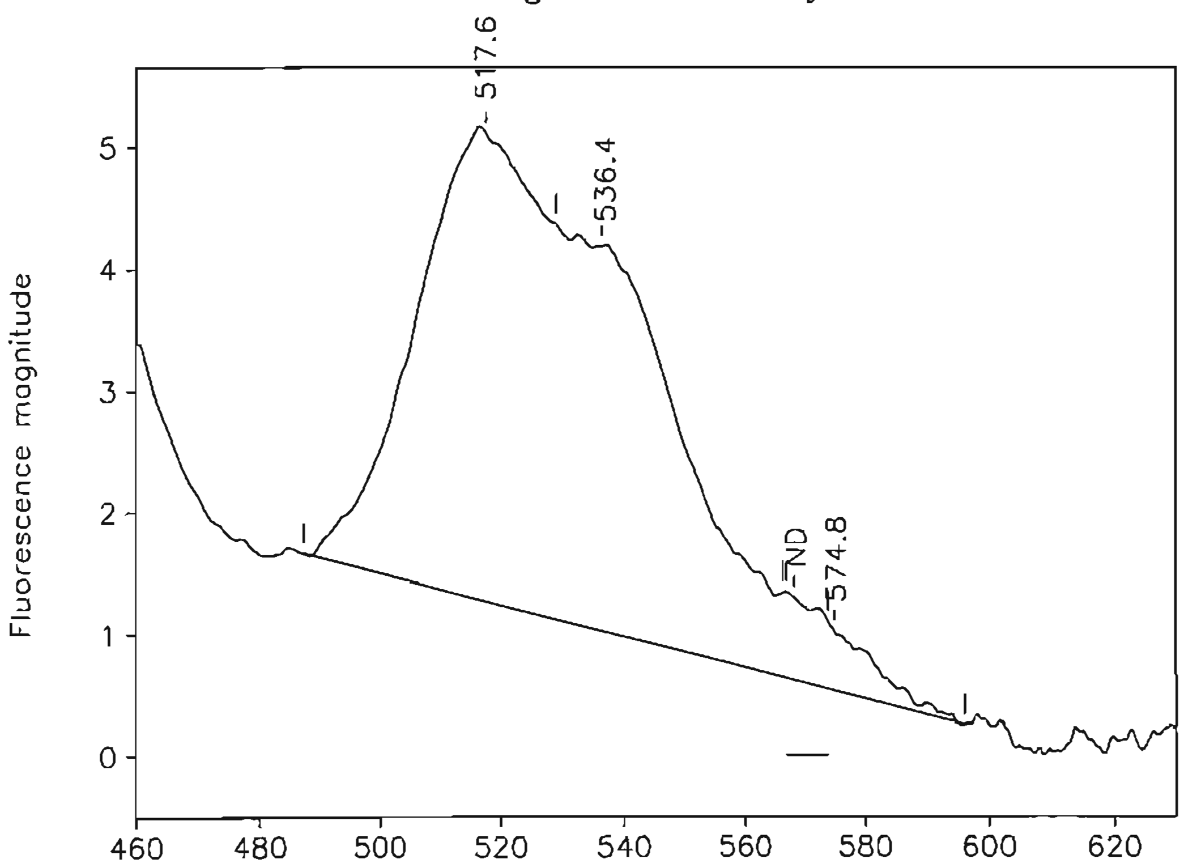
Analyzed: 08/14/03
Collected: 08/11/03 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	472.1	585.6	241.28	5,217.88	0.05	174
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 18: MW-2 @ 190'
OUL number: M8234
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03

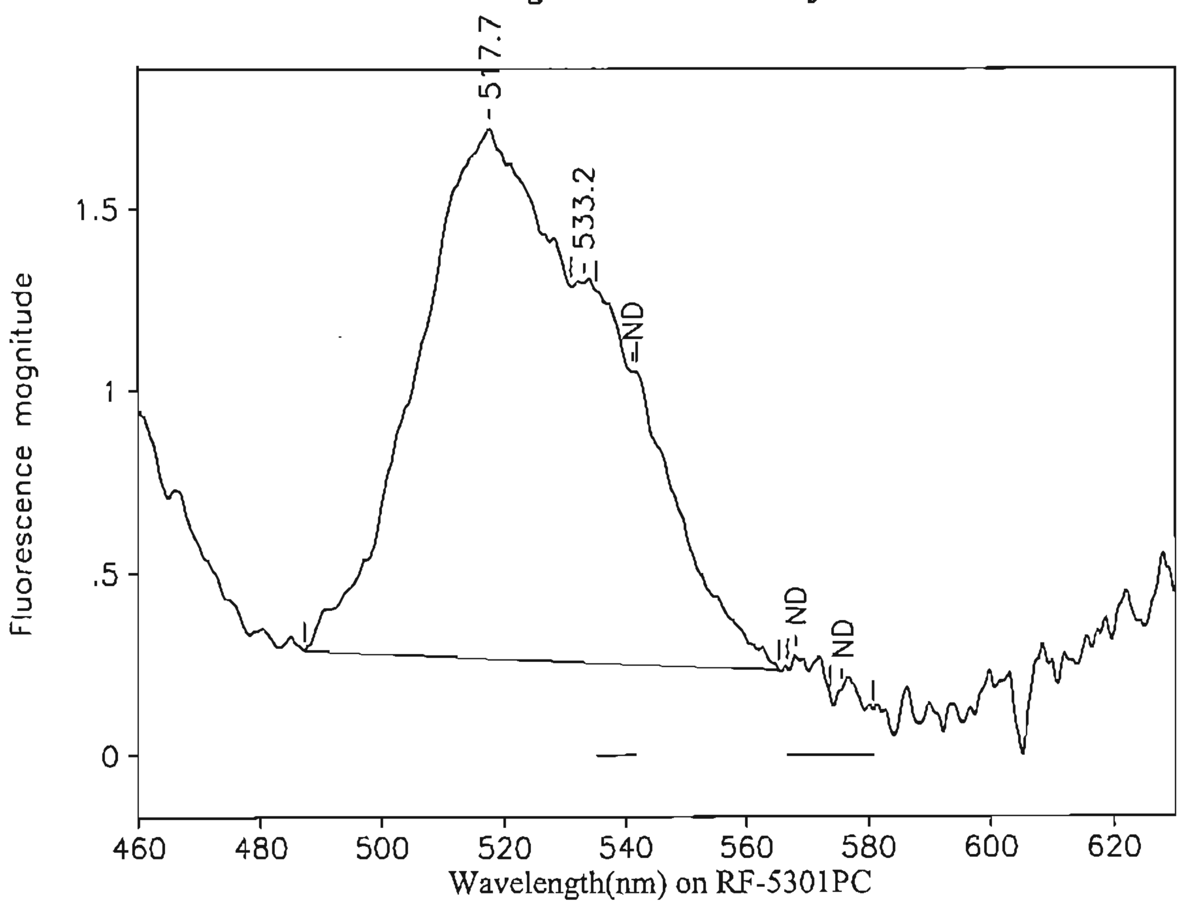
Collected: 08/11/03 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	487.2	529.0	3.85	92.43	0.04	3.09
536.4	529.0	566.3	3.13	76.07	0.04	4.93
568.1	566.8	573.8	0.00	0.00	0.00	ND
574.8	566.3	596.0	0.50	9.82	0.05	0.997

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 19: MW-2 @ 200'
OUL number: M8235
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03

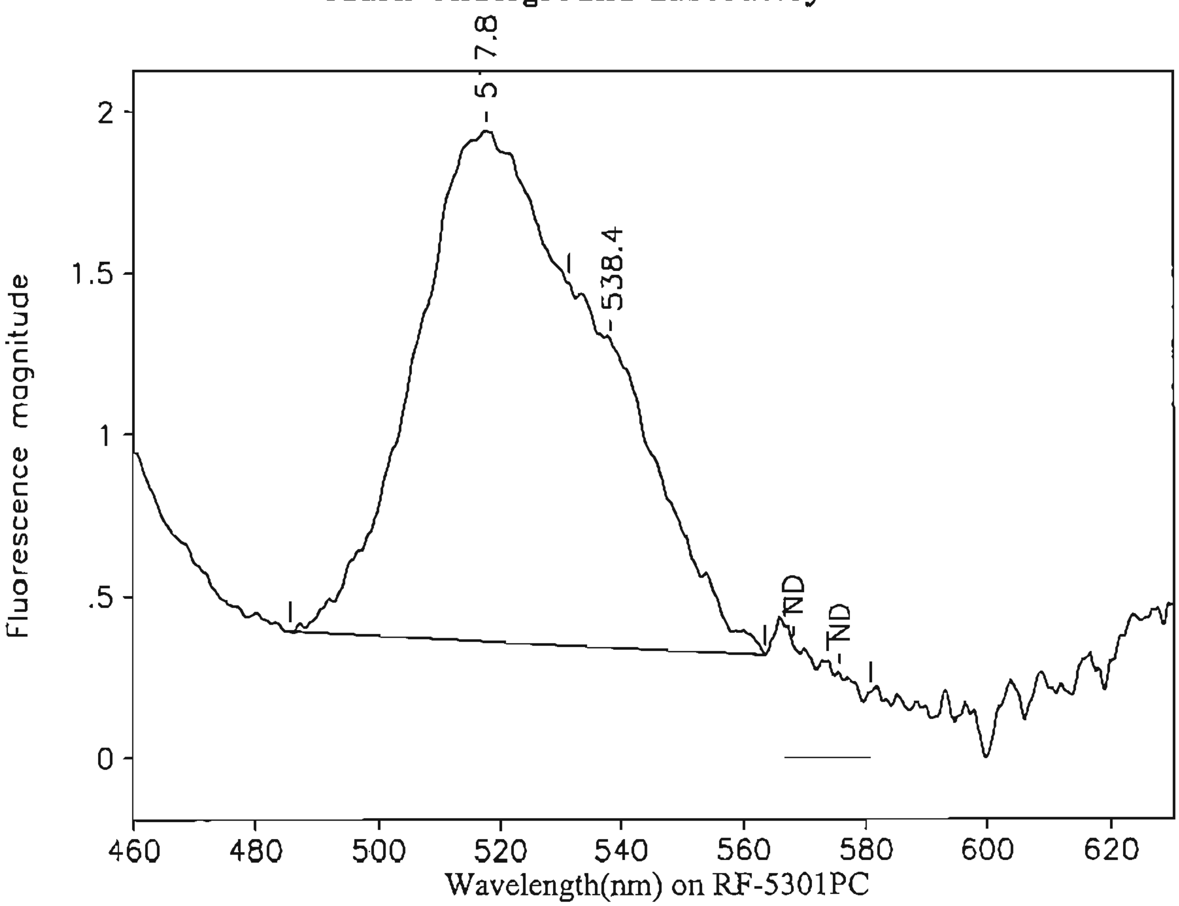
Collected: 08/11/03 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.7	487.2	531.0	1.45	36.72	0.04	1.23
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
533.2	531.0	565.4	1.04	17.56	0.06	~~1.14~~ ND

Ch

Ozark Underground Laboratory



Station 20: MW-2 @ 210'
OUL number: M8236
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03

Collected: 08/11/03 0910

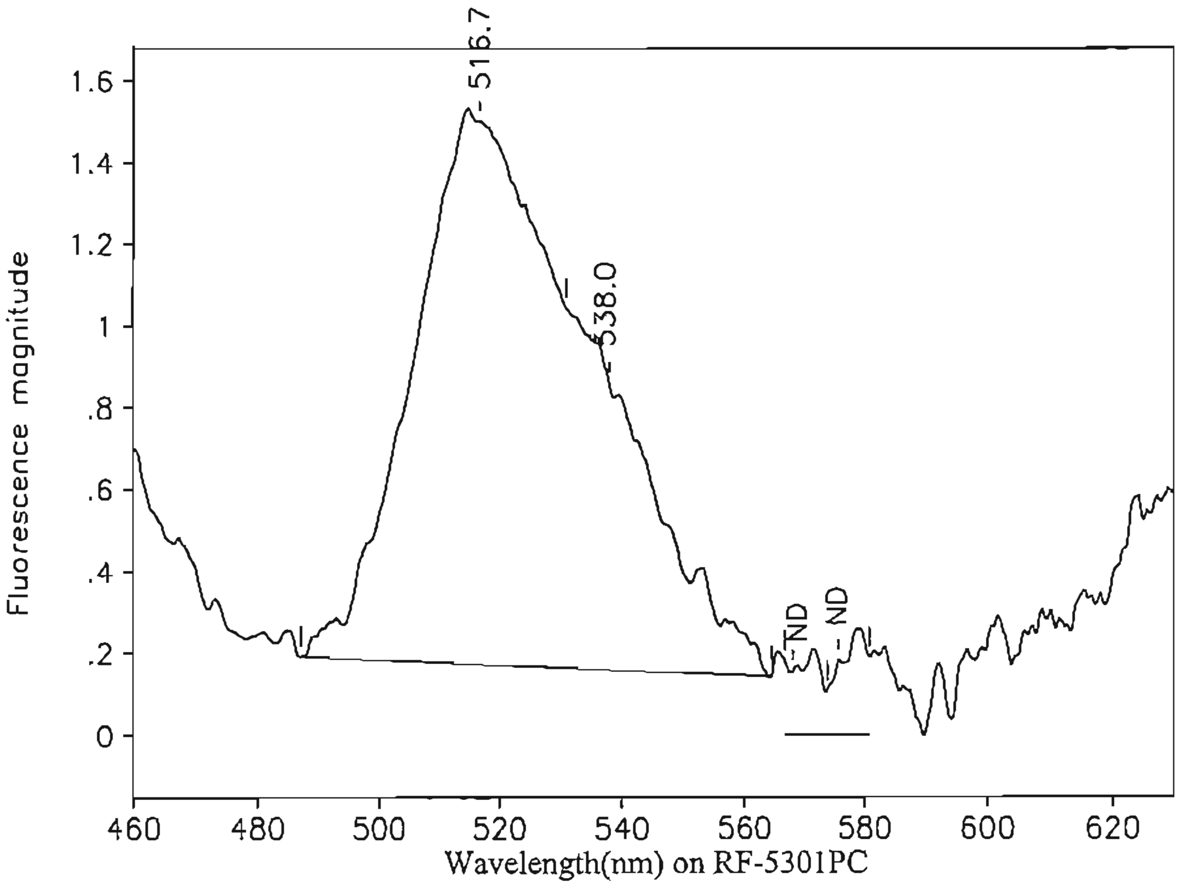
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	485.8	531.5	1.58	40.30	0.04	1.35
538.4	531.5	563.6	0.95	17.01	0.06	~~1.10~~ NR
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Ch

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 21: MW-2 @ 220'
OUL number: M8237
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03

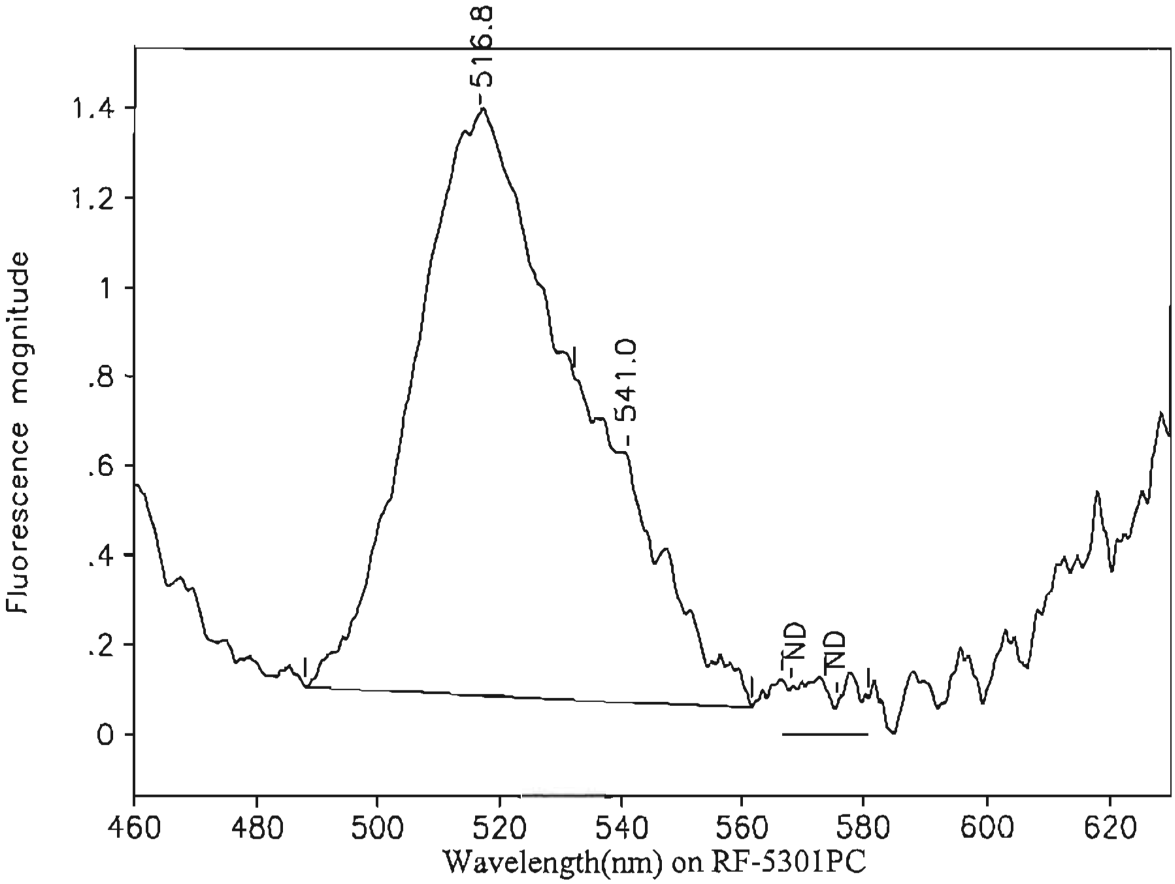
Collected: 08/11/03 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	487.0	531.0	1.33	33.41	0.04	1.12
538.0	531.0	564.6	0.70	13.73	0.05	~~0.890~~ ND Cw
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 22: MW-2 @ 230'
OUL number: M8238
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03

Collected: 08/11/03 0910

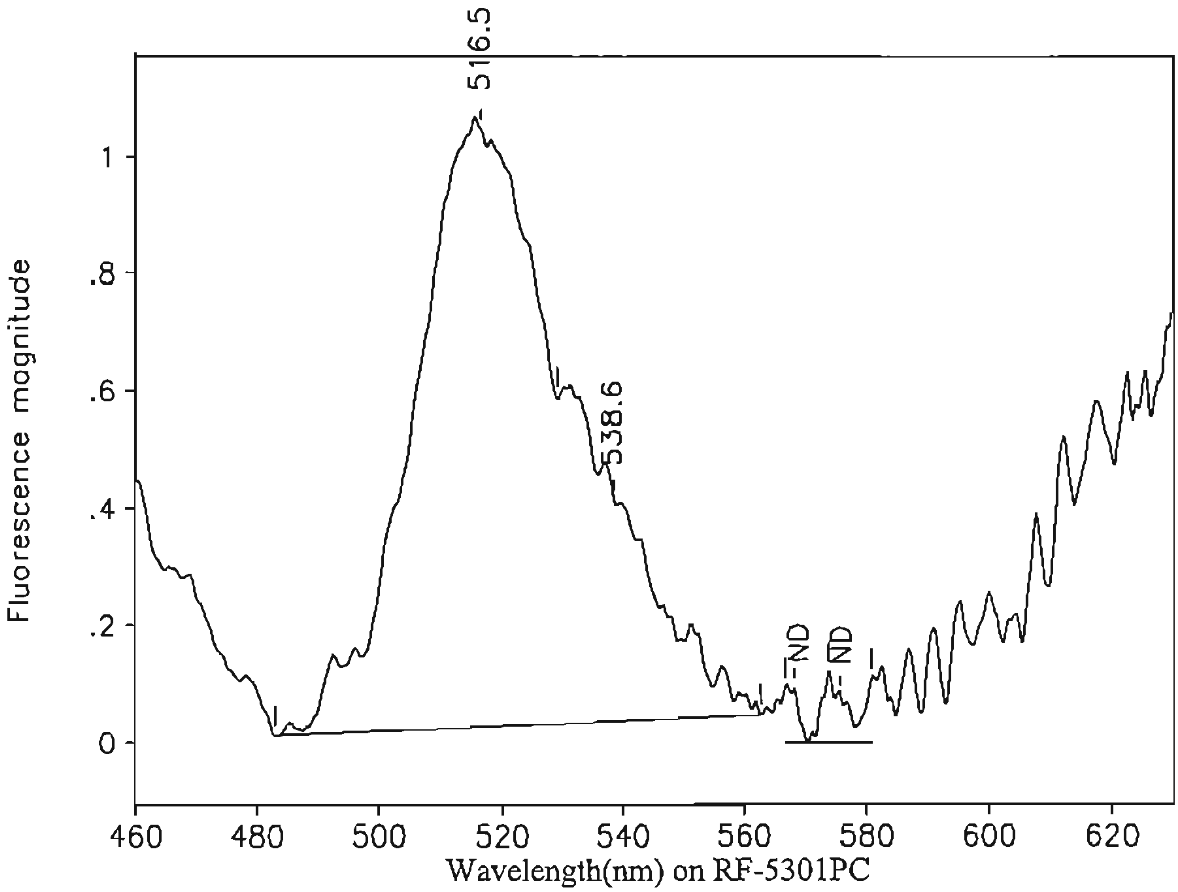
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	488.0	532.2	1.30	32.06	0.04	1.07
541.0	532.2	561.6	0.55	10.05	0.05	~~0.651~~ ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

CL

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



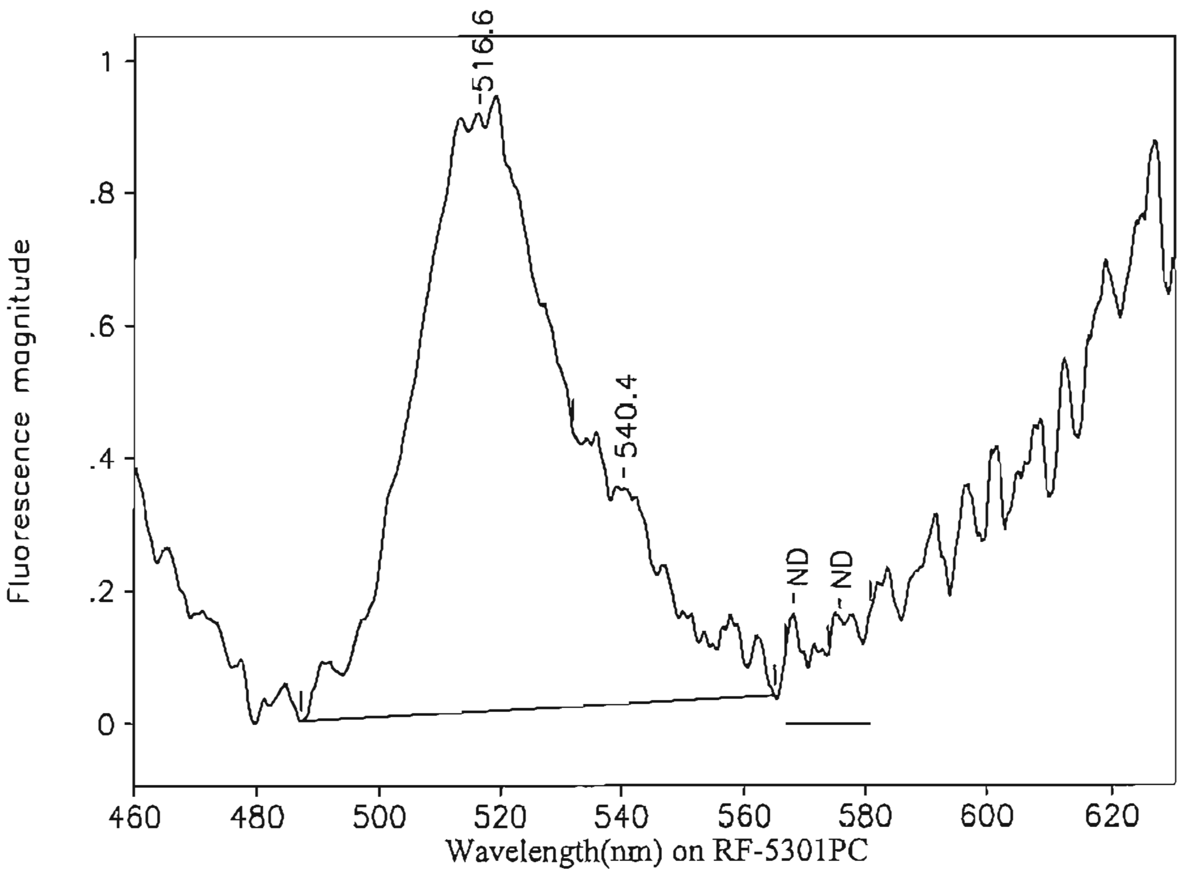
Station 23: MW-2 @ 240'
OUL number: M8239 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	483.0	529.1	1.02	23.59	0.04	0.789
538.6	529.1	562.8	0.38	8.63	0.04	~~0.559~~ ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



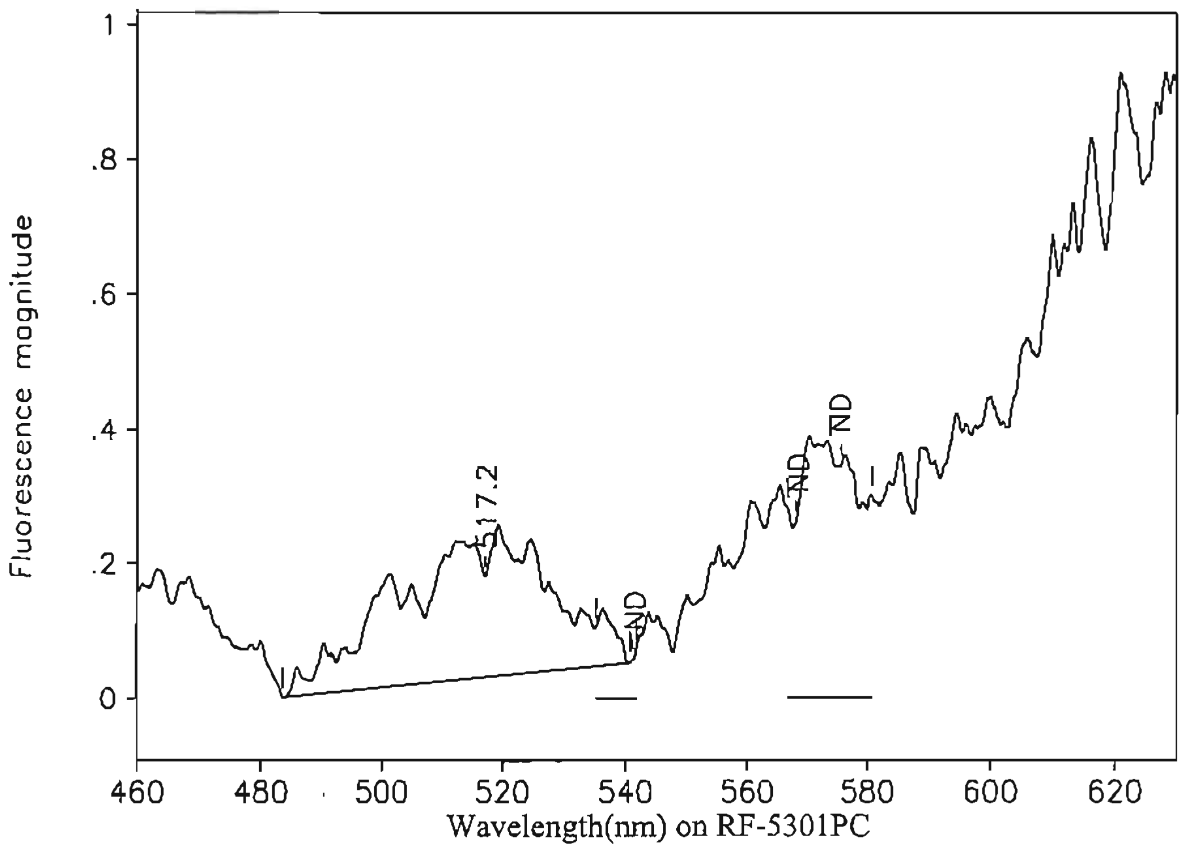
Station 24: MW-2 @ 250'
OUL number: M8241 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	487.2	532.0	0.90	22.62	0.04	0.756
540.4	532.0	565.0	0.33	6.60	0.05	~~0.428~~ ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 25: MW-3 @ 190'
OUL number: M8242
Matrix: Elutant
Placed: / /

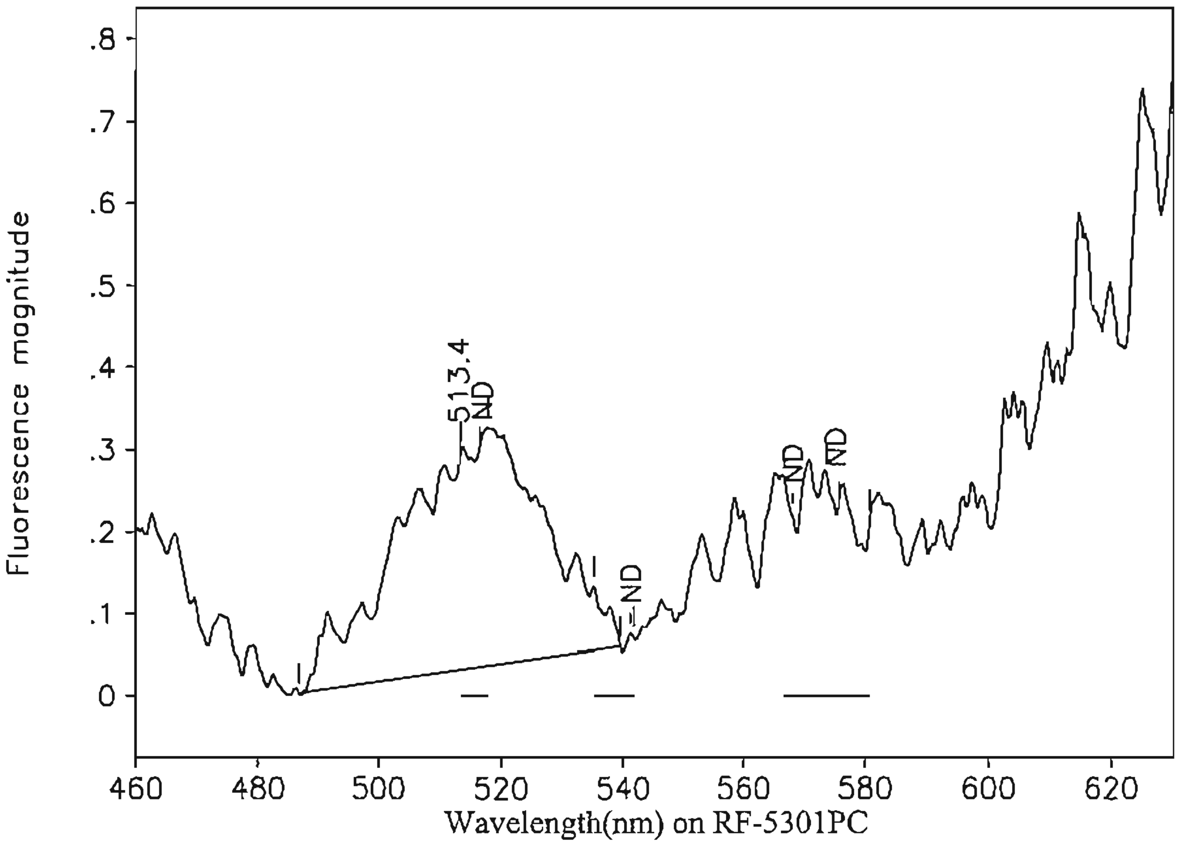
Analyzed: 08/14/03
Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	483.6	540.8	0.15	6.44	0.02	~~0.215~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

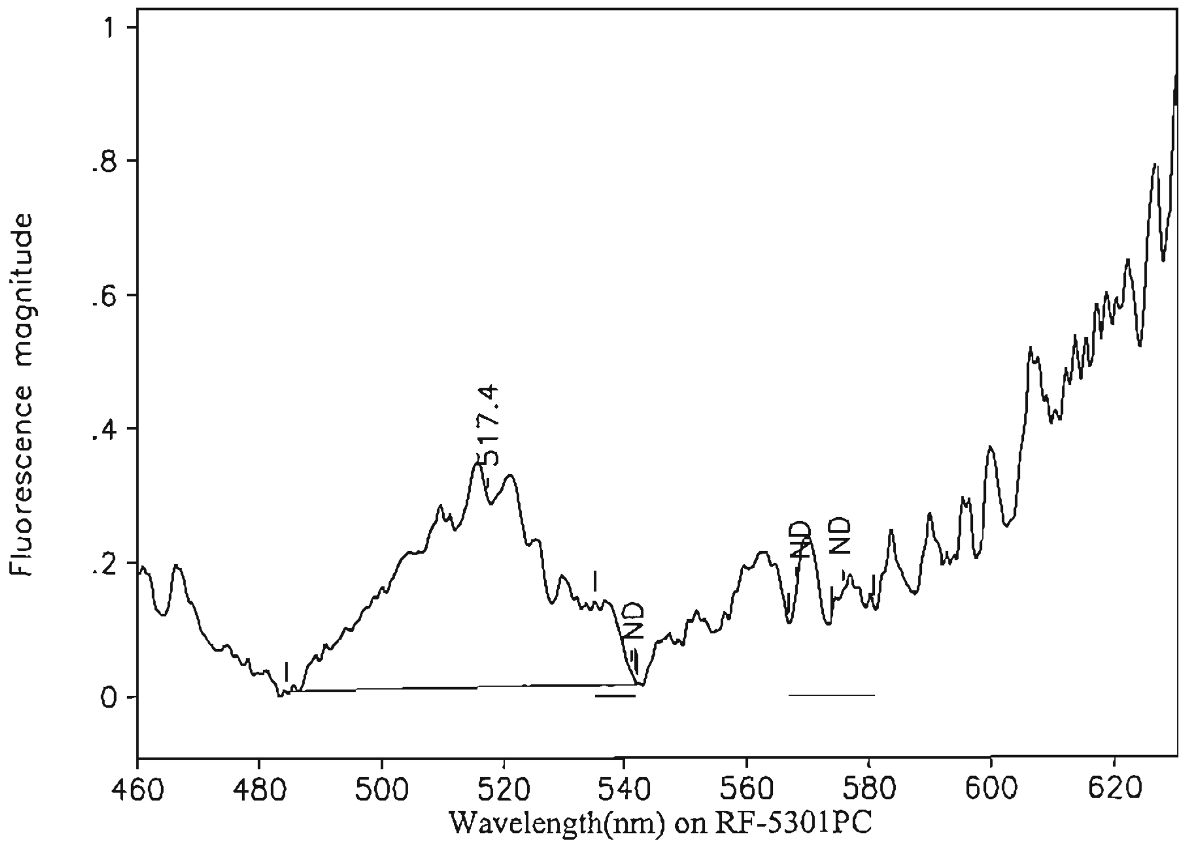


Station 26: MW-3 @ 200'
OUL number: M8243 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
513.4	486.8	539.6	0.26	7.98	0.03	~~0.267~~ ND

Ozark Underground Laboratory



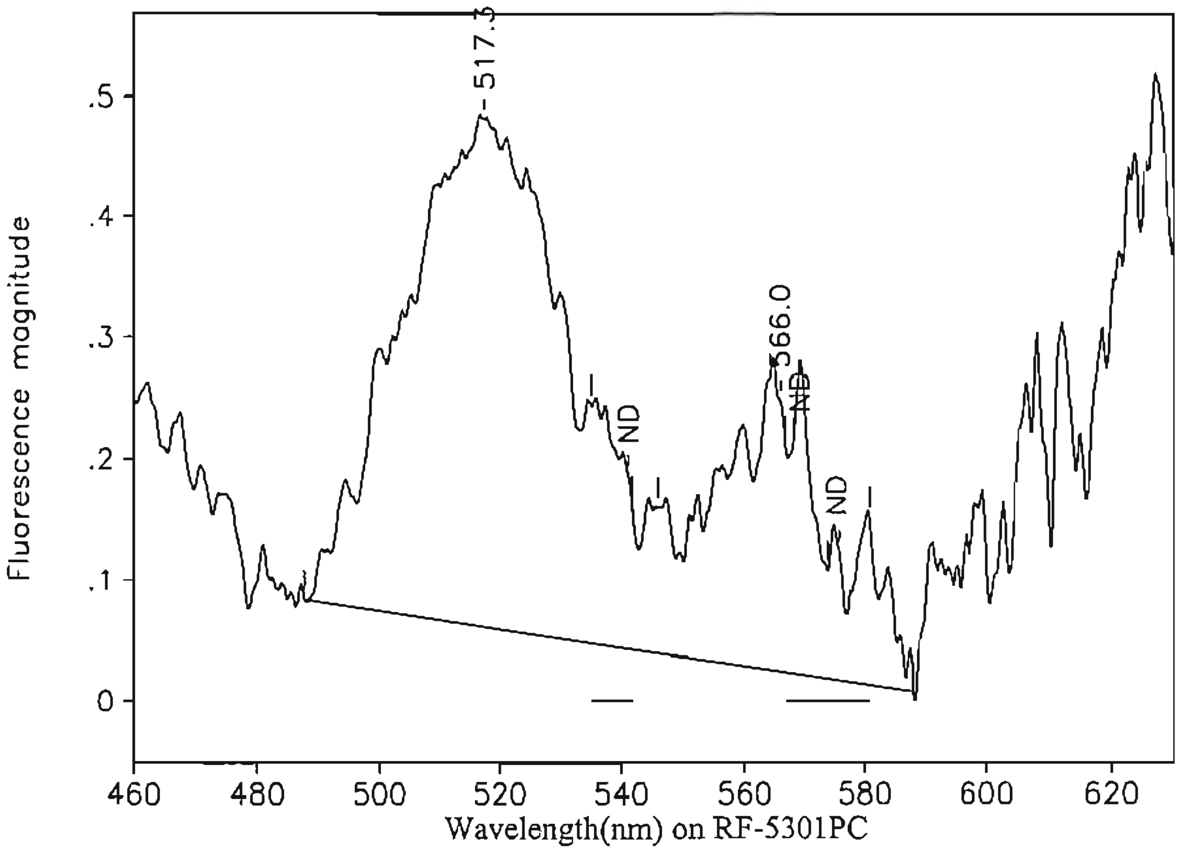
Station 27: MW-3 @ 210'
OUL number: M8244 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	484.4	542.2	0.28	9.33	0.03	~~0.312~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 28: MW-3 @ 220'
OUL number: M8245
Matrix: Elutant
Placed: / /

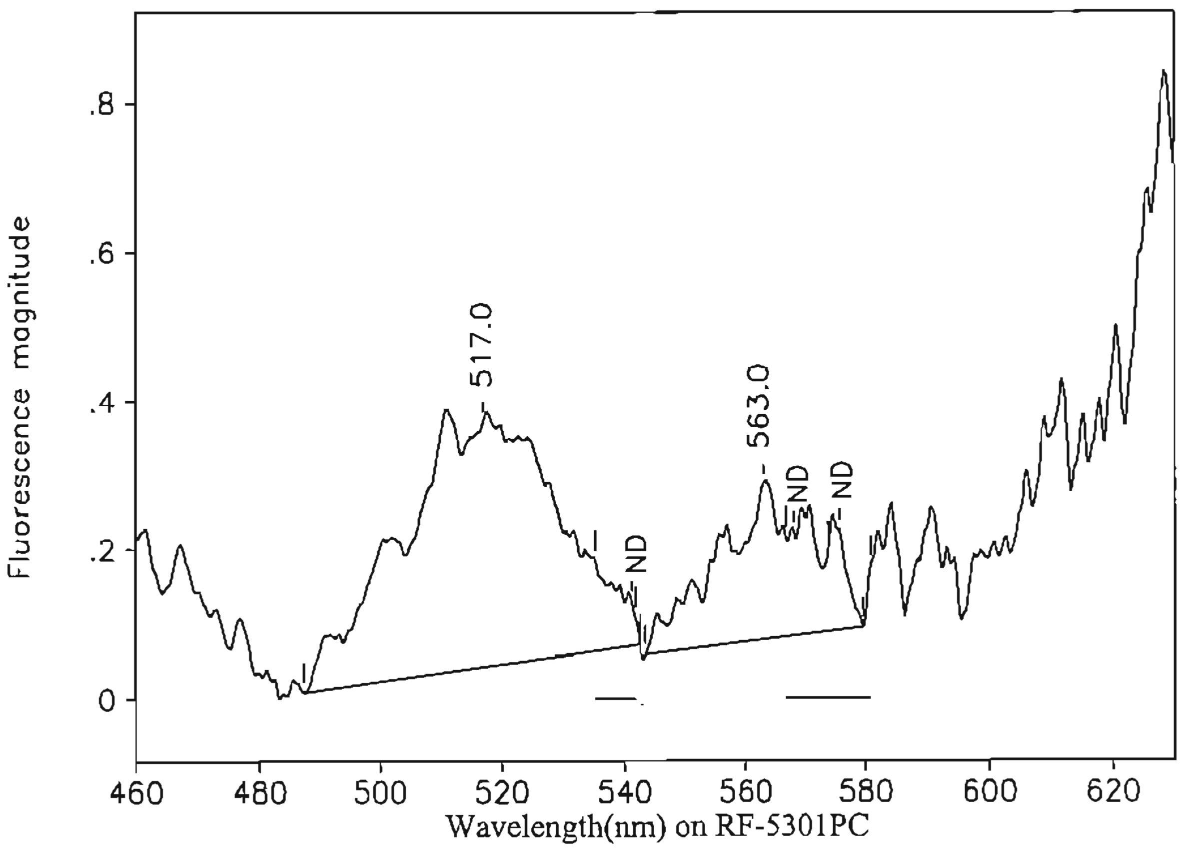
Analyzed: 08/14/03

Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.3	487.6	546.0	0.42	13.92	0.03	~~0.465~~ ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
566.0	546.0	588.0	0.22	5.61	0.04	~~1.03~~ ND

Ozark Underground Laboratory

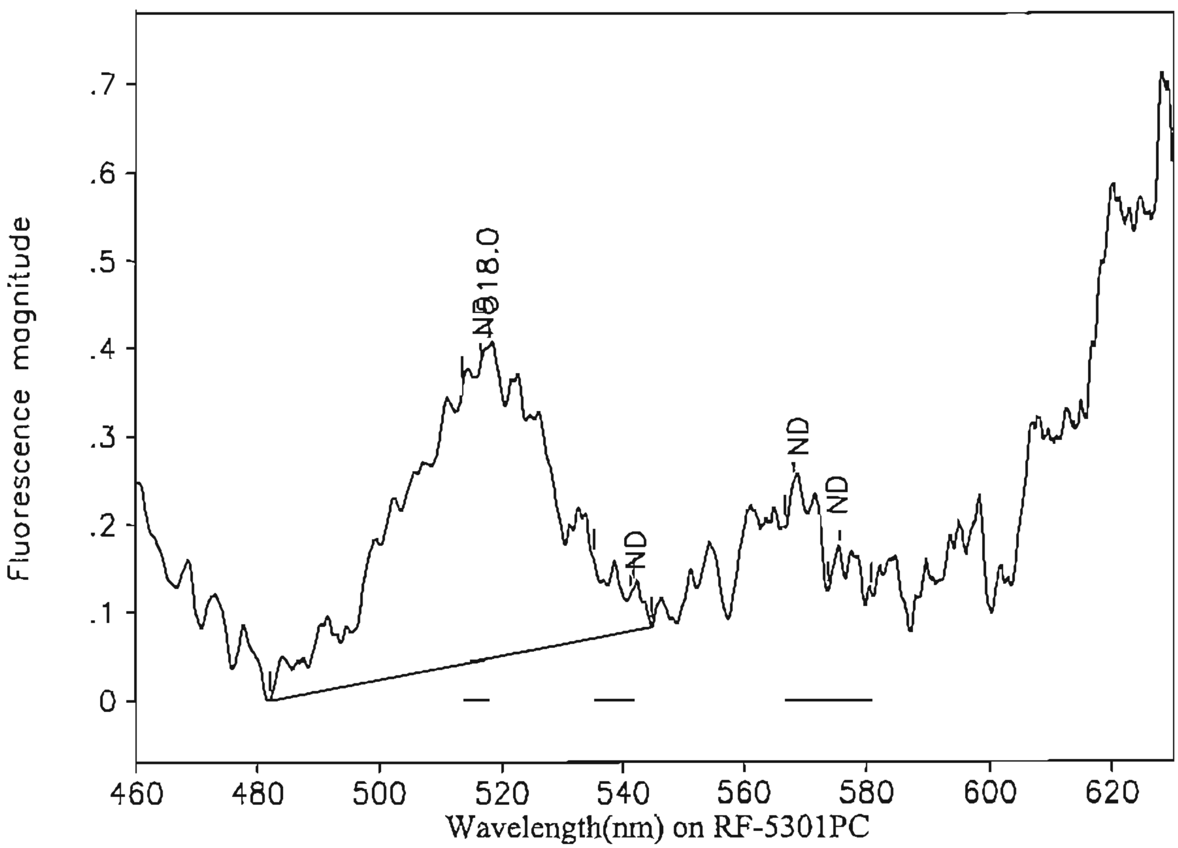


Station 29: MW-3 @ 230'
OUL number: M8246 — Analyzed: 08/14/03
Matrix: Elutant
Placed: / / — Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	487.2	542.6	0.33	10.30	0.03	~~0.344~~ ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
563.0	543.4	579.6	0.21	3.95	0.05	~~0.723~~ ND

Ozark Underground Laboratory



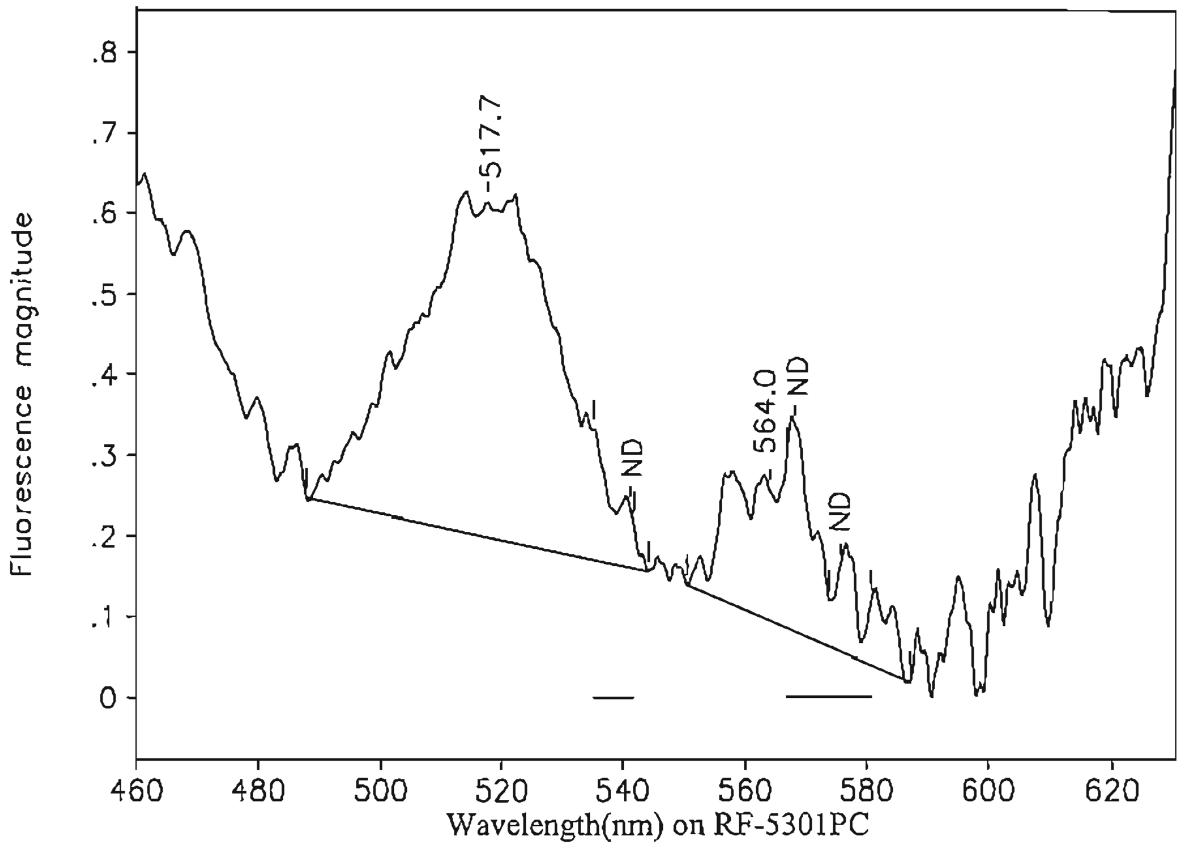
Station 30: MW-3 @ 240'
OUL number: M8247
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03
Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	482.0	544.8	0.35	10.17	0.03	~~0.340~~ ND

Ozark Underground Laboratory



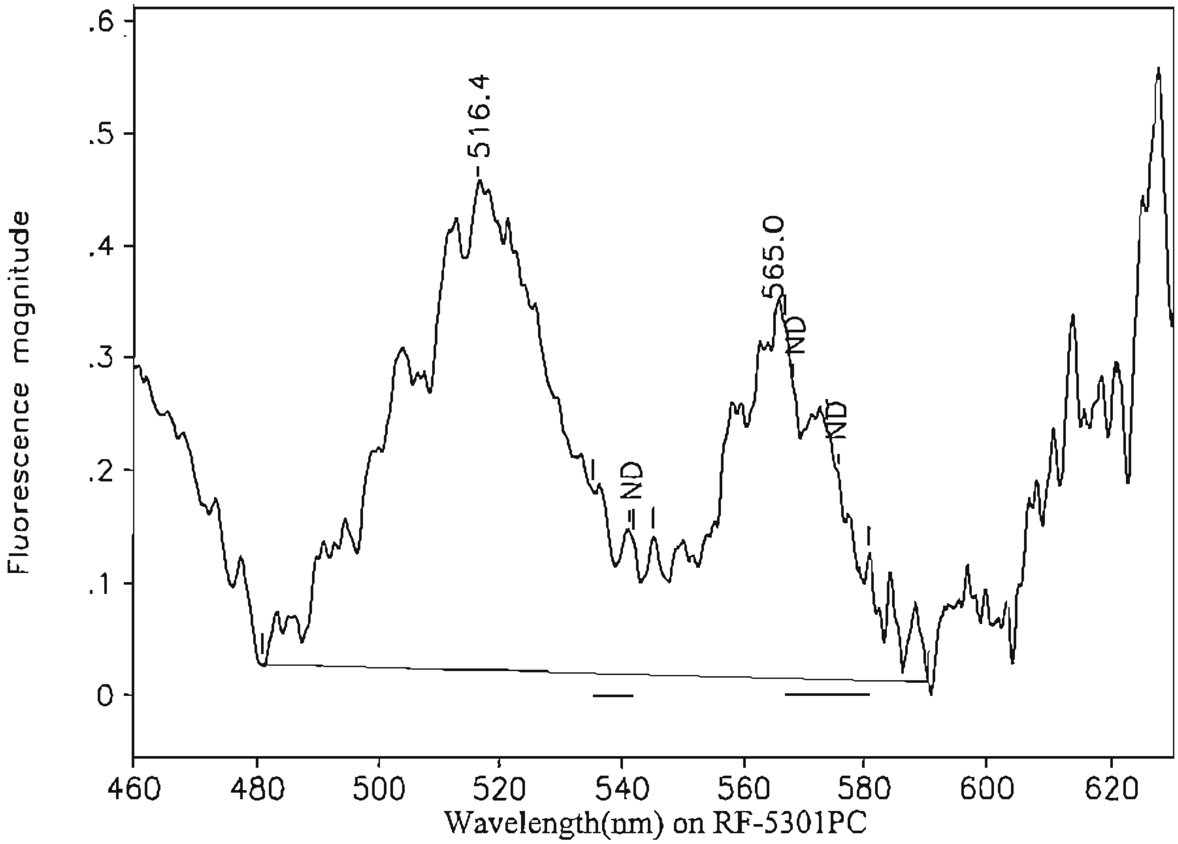
Station 46: MW-3 @ 250'
OUL number: M8248
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03
Collected: 08/11/03 0945

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.7	487.8	544.2	0.42	12.29	0.03	~~0.411~~ ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
564.0	550.6	587.2	0.16	4.02	0.04	~~0.735~~ ND

Ozark Underground Laboratory

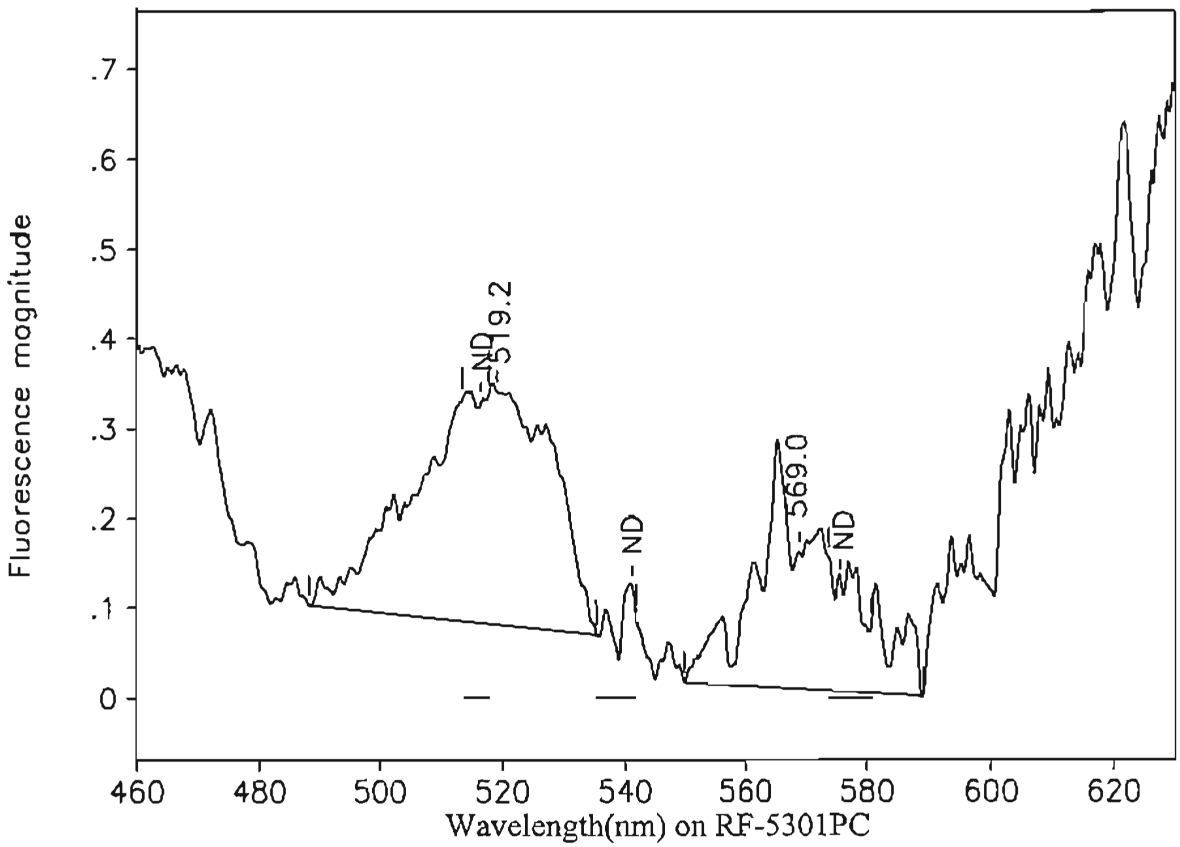


Station 31: MW-4 @ 190'
OUL number: M8249 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	480.8	545.1	0.43	13.56	0.03	~~0.453~~ ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
565.0	545.1	590.6	0.31	7.25	0.04	~~1.33~~ ND

Ozark Underground Laboratory

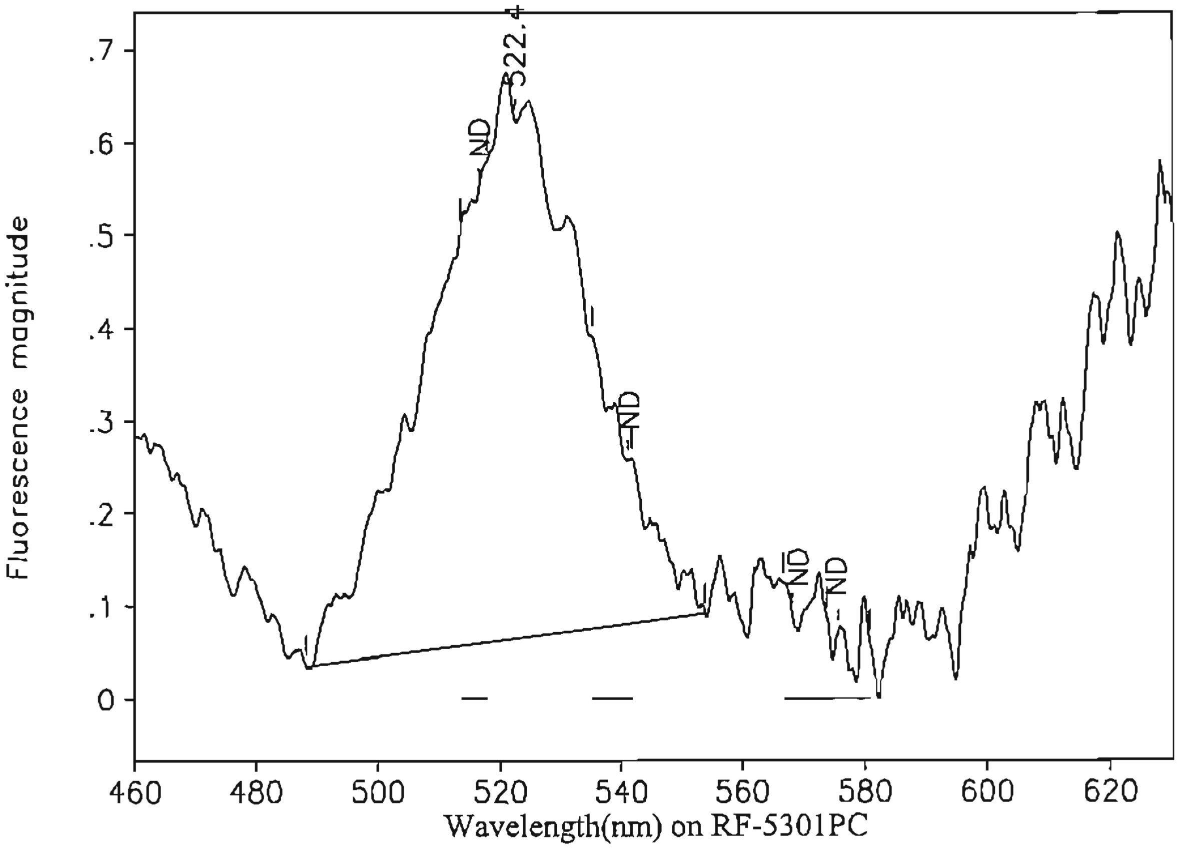


Station 32: MW-4 @ 200'
OUL number: M8250
Analyzed: 08/14/03
Matrix: Elutant
Placed: / /
Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
569.0	549.8	589.0	0.15	4.01	0.04	~~0.733~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.2	488.2	535.4	0.26	6.86	0.04	~~0.229~~

Ozark Underground Laboratory



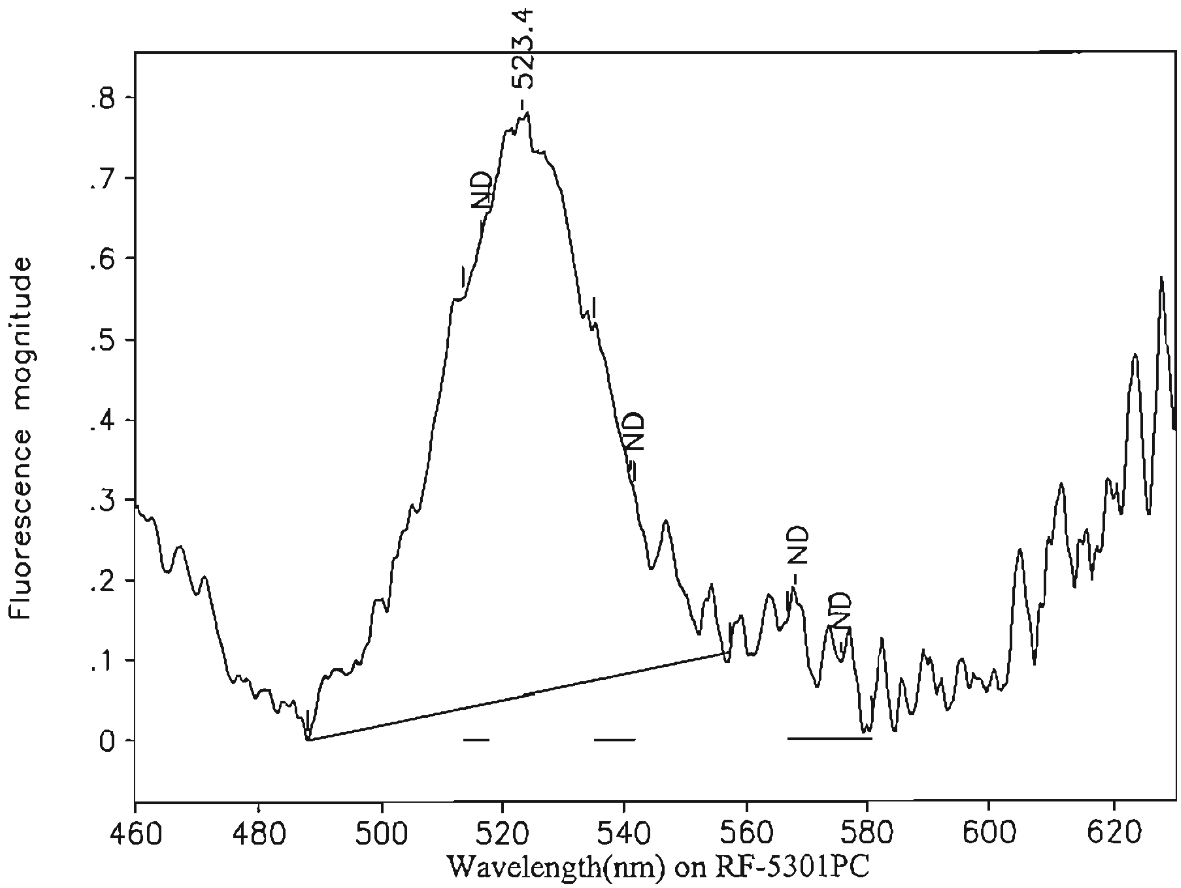
Station 33: MW-4 @ 210'
OUL number: M8251
Matrix: Elutant
Placed: / /

Analyzed: 08/14/03
Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.4	488.4	554.0	0.56	18.08	0.03	~~0.604~~ .100

Ozark Underground Laboratory



Station 34: MW-4 @ 220'
OUL number: M8252
Matrix: Elutant
Placed: / /

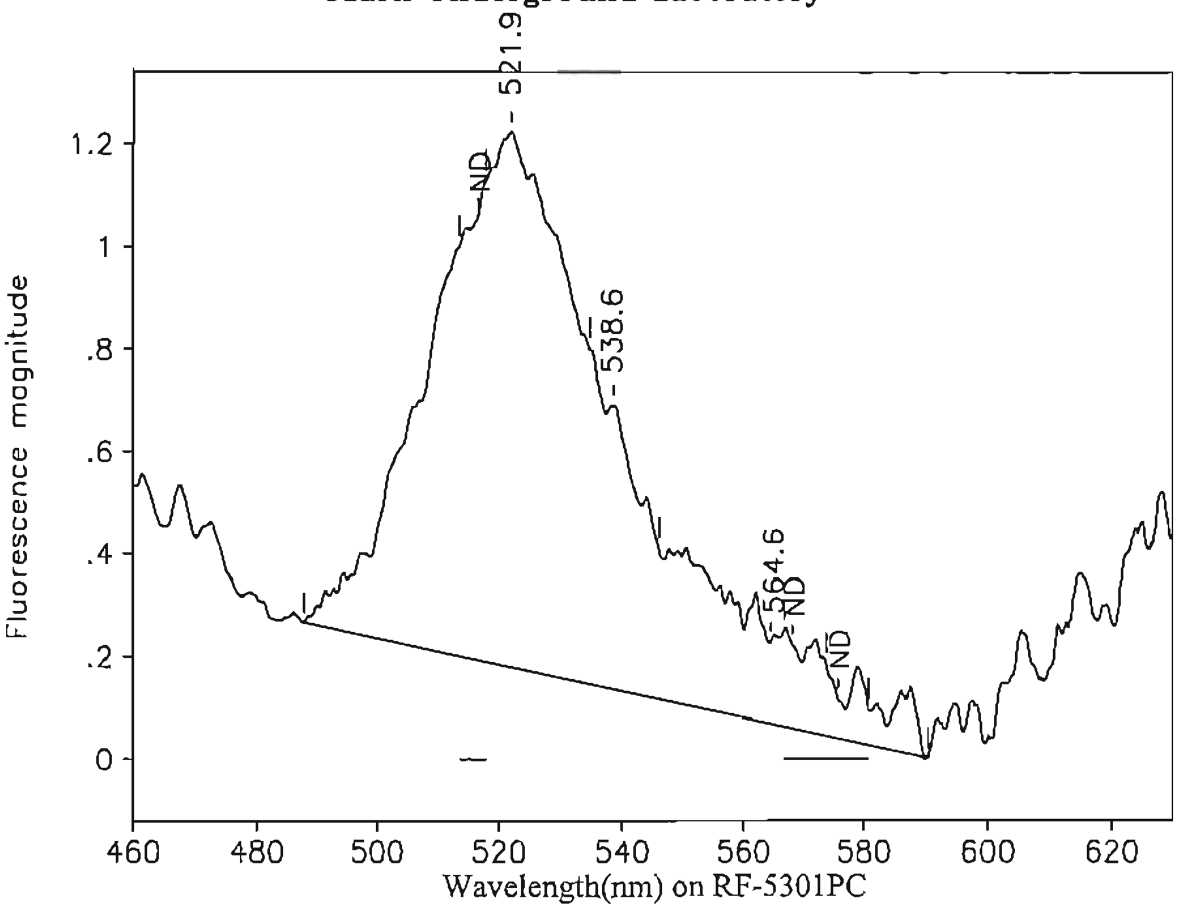
Analyzed: 08/14/03

Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
523.4	488.0	557.4	0.72	22.31	0.03	~~0.746~~ ND

Ozark Underground Laboratory



Station 35: MW-4 @ 230'
OUL number: M8253 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
538.6	534.7	546.1	0.55	5.49	0.10	~~0.356~~ ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.9	487.8	534.7	1.05	26.82	0.04	~~0.897~~ ND
564.6	546.1	590.4	0.16	7.54	0.02	~~1.38~~ ND

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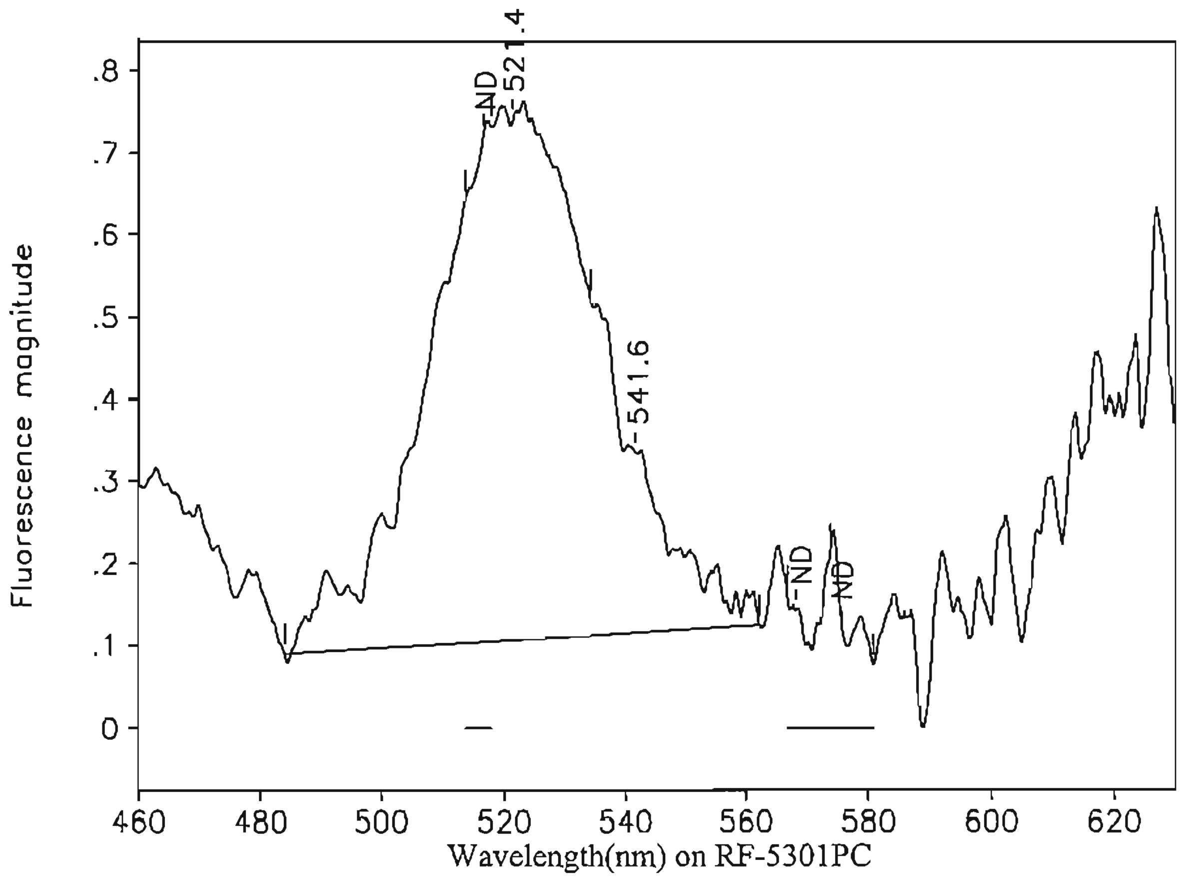


Station 36: MW-4 @ 240'
OUL number: M8254
Matrix: Elutant
Placed: / /

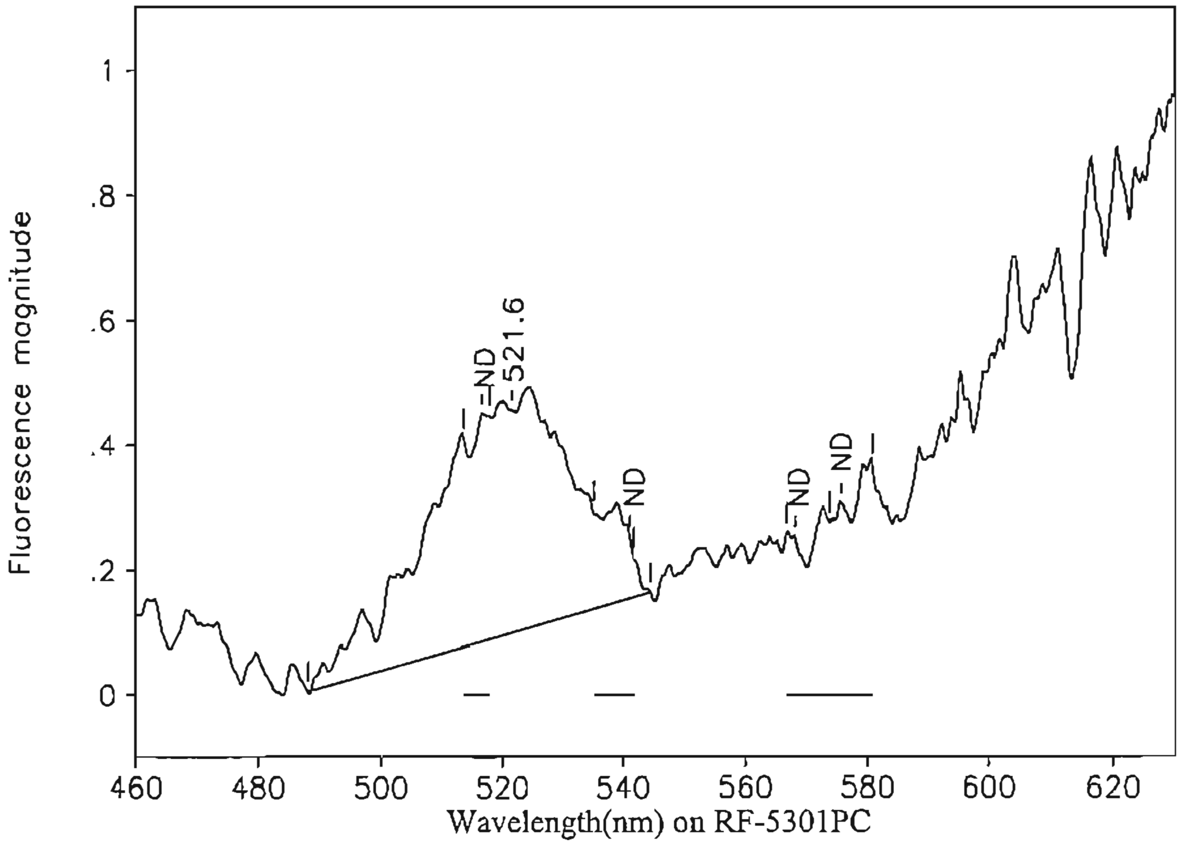
Analyzed: 08/14/03

Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.6	534.3	562.2	0.22	4.16	0.05	~~0.270~~ ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.4	484.0	534.2	0.64	17.47	0.04	~~0.584~~ ND

Ozark Underground Laboratory



Station 37: MW-4 @ 250'
OUL number: M8255 Analyzed: 08/14/03
Matrix: Elutant
Placed: / / Collected: 08/11/03 1050

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.3	535.2	541.8	0.00	0.00	0.00	ND
568.2	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
521.6	488.2	544.6	0.36	11.10	0.03	0.371

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

September 5, 2003

RECEIVED
SEP - 8 2003
CH2M Hill/ORL

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

Re: Festival Park - Dye analysis results for charcoal samplers shipped on August 25, 2003
Ozark Underground Laboratory (OUL) numbers M8457 through M8486.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on August 26, 2003. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and eosine dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. OUL Sample Collection Data Sheets
3. Nodarse & Assoc. Chain-of-Custody Record
4. Sample analysis graphs

f:\docs\coa\festival08.doc

Ozark Underground Laboratory, Inc. for CH2MHill

Project: Festival Park – Project CH2MHill 177652
Samples Collected By: Mike Burns
Date Samples Shipped: August 25, 2003
Date Samples Rec'd at OUL: August 26, 2003
Date Analyzed by OUL: August 29, 2003

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and eosine dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn #	Sample Identification	Date/Time Placed	Date/Time Collected 2003	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.
M8457	39	MW-1 @ 149'	NDT	8/25/03	515.4	494	ND	
M8458	40	MW-1 @ 159'	NDT	8/25/03	515.5	577	ND	
M8459	41	MW-1 @ 169'	NDT	8/25/03	515.5	527	ND	
M8460	Laboratory control charcoal blank							
M8461	42	MW-1 @ 179'	NDT	8/25/03	515.4	497	ND	
M8462	43	MW-1 @ 189'	NDT	8/25/03	515.0	121	ND	
M8463	44	MW-1 @ 199'	NDT	8/25/03	514.5	144	ND	
M8464	45	MW-1 @ 209'	NDT	8/25/03	514.9	216	ND	
M8465	18	MW-2 @ 190'	NDT	8/25/03	517.4	3.53	536.6 **	5.18
M8466	19	MW-2 @ 200'	NDT	8/25/03	516.4	1.17	536.6 **	1.32
M8467	20	MW-2 @ 210'	NDT	8/25/03	516.4	1.42	ND	
M8468	21	MW-2 @ 220'	NDT	8/25/03	517.2	0.749	ND	
M8469	22	MW-2 @ 230'	NDT	8/25/03	517.4	0.737	ND	
M8470	23	MW-2 @ 240'	NDT	8/25/03	516.8	0.908	ND	
M8471	24	MW-2 @ 250'	NDT	8/25/03	ND		ND	
M8472	25	MW-3 @ 190'	NDT	8/25/03	ND		ND	
M8473	26	MW-3 @ 200'	NDT	8/25/03	ND		ND	
M8474	27	MW-3 @ 210'	NDT	8/25/03	ND		ND	
M8475	28	MW-3 @ 220'	NDT	8/25/03	ND		ND	
M8476	29	MW-3 @ 230'	NDT	8/25/03	ND		ND	
M8477	30	MW-3 @ 240'	NDT	8/25/03	ND		ND	
M8478	46	MW-3 @ 250'	NDT	8/25/03	ND		ND	
M8479	31	MW-4 @ 190'	NDT	8/25/03	ND		ND	
M8480	Laboratory control charcoal blank							
M8481	32	MW-4 @ 200'	NDT	8/25/03	ND		ND	
M8482	33	MW-4 @ 210'	NDT	8/25/03	ND		ND	
M8483	34	MW-4 @ 220'	NDT	8/25/03	ND		ND	
M8484	35	MW-4 @ 230'	NDT	8/25/03	ND		ND	
M8485	36	MW-4 @ 240'	NDT	8/25/03	ND		ND	
M8486	37	MW-4 @ 250'	NDT	8/25/03	ND		ND	

(Footnotes on next page)

FOOTNOTES:

NDT = No date or time given

ND = No dye detected

** = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were dye.

OZARK UNDERGROUND LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill Week No: Samples Collected By: Mike Burns

Samples Shipped By : Mike Burns Samples Received By: Julie Stearman

Date Samples Shipped: 08/ 25 / 03 Date Samples Received: 08/ 26/ 03 Time Samples Received: 1230 Return Cooler? Yes : No: X

Bill to: Send Results to: Al Akens with CH2M Hill

Analyze for: Fluorescein : X Eosine: X Rhodamine WT Other Ship cooler to:

OUL use only		***Please indicate stations where dye was visible in the field*** *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M8457	39	MW-1 @ 149'			8/25/03		0
1	M8458	40	MW-1 @ 159'			8/25/03		0
1	M8459	41	MW-1 @ 169'			8/25/03		0
1	M5461	42	MW-1 @ 179'			8/25/03		0
1	M8462	43	MW-1 @ 189'			8/25/03		0
1	M8463	44	MW-1 @ 199'			8/25/03		0
1	M8464	45	MW-1 @ 209'			8/25/03		0
1	M8465	18	MW-2 @ 190'			8/25/03		0
1	M8466	19	MW-2 @ 200'			8/25/03		0
1	M8467	20	MW-2 @ 210'			8/25/03		0
1	M8468	21	MW-2 @ 220'			8/25/03		0
1	M8469	22	MW-2 @ 230'			8/25/03		0
1	M8470	23	MW-2 @ 240'			8/25/03		0
1	M8471	24	MW-2 @ 250'			8/25/03		0

COMMENTS: Charcoal Blank = M8460

This sheet filled out by OUL staff? Yes X No Charts for samples on this page proofed by OUL: Cl

550

Project 551 Analyzed 8/29/03 by mma

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Festival Park/CH2M Hill Week No: Samples Collected By: Mike Burns

Samples Shipped By : Mike Burns Samples Received By: Julie Stearman

Date Samples Shipped: 08/ 25 / 03 Date Samples Received: 08/ 26/ 03 Time Samples Received: 1230 Return Cooler? Yes : No: X

Bill to: Send Results to: Al Akens with CH2M Hill

Analyze for: Fluorescein : X Eosine: X Rhodamine WT Other Ship cooler to:

OUL use only		Please indicate stations where dye was visible in the field for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	M8472	25	MW-3 @ 190'			8/25/03		0
1	M8473	26	MW-3 @ 200'			8/25/03		0
1	M8474	27	MW-3 @ 210'			8/25/03		0
1	M8475	28	MW-3 @ 220'			8/25/03		0
1	M8476	29	MW-3 @ 230'			8/25/03		0
1	M8477	30	MW-3 @ 240'			8/25/03		0
1	M8478	46	MW-3 @ 250'			8/25/03		0
1	M8479	31	MW-4 @ 190'			8/25/03		0
1	M8481	32	MW-4 @ 200'			8/25/03		0
1	M8482	33	MW-4 @ 210'			8/25/03		0
1	M8483	34	MW-4 @ 220'			8/25/03		0
1	M8484	35	MW-4 @ 230'			8/25/03		0
1	M8485	36	MW-4 @ 240'			8/25/03		0
1	M8486	37	MW-4 @ 250'			8/25/03		0

COMMENTS: Charcoal Blank = M8480

This sheet filled out by OUL staff? Yes X No Charts for samples on this page proofed by OUL: Ch

551

Analyzed 8/29/03 by mma

f:\shared\forms\coc.doc, Rev. 8/99

32944

~~PG&E Environmental~~
~~240 Park Road, Oviedo, FL 32765~~
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order:

Date: 8/25/03 Page 1 of 1

COMPANY: Nodarse & Assoc.
ADDRESS: 1675 Lee Rd.
Winter Park, FL.
SAMPLED BY: Mike Burns SIGN: Mike Burns
PHONE: 407-740-6110 FAX: 407-740-6112

ANALYSIS REQUESTED: Trace Dye

#	SAMPLE ID	DATE/TIME	AIR	WATER	SLUDGE	SOIL/SOLID	ORG LIQUID	Trace Dye	Number of Containers
1	mw-1 149'-209'	8/25/03						✓	7
2	mw-2 190'-250'	↓						✓	7
3	mw-3 190'-250'	↓						✓	7
4	mw-4 190'-250'	↓						✓	7
5									
6									
7									
8									
9									
10									
11									
12									
13									

PRESERVATION

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Mike Burns	8/25/03	1: Jo Stammoni	1230 8/26/03
2:		2:	
3:		3:	

PROJECT INFORMATION
PROJECT NAME: Festival Park
PROJECT #: W01-E-120-1
SITE ADDRESS: Orlando, FL.
PROJECT MANAGER: Lydia Wing / AL Akens CH2M

SAMPLE RECEIPT
Total # of Containers
Chain of Custody Seals
Recv'd in Good Condition
PO #:

INVOICE TO:
(IF DIFFERENT FROM ABOVE)

SPECIAL INSTRUCTIONS/COMMENTS:
Please send results to AL Akens with CH2M Hill

QUOTE/CONTRACT #:

552.

WHITE: Project File YELLOW: Laboratory PINK: Sampler

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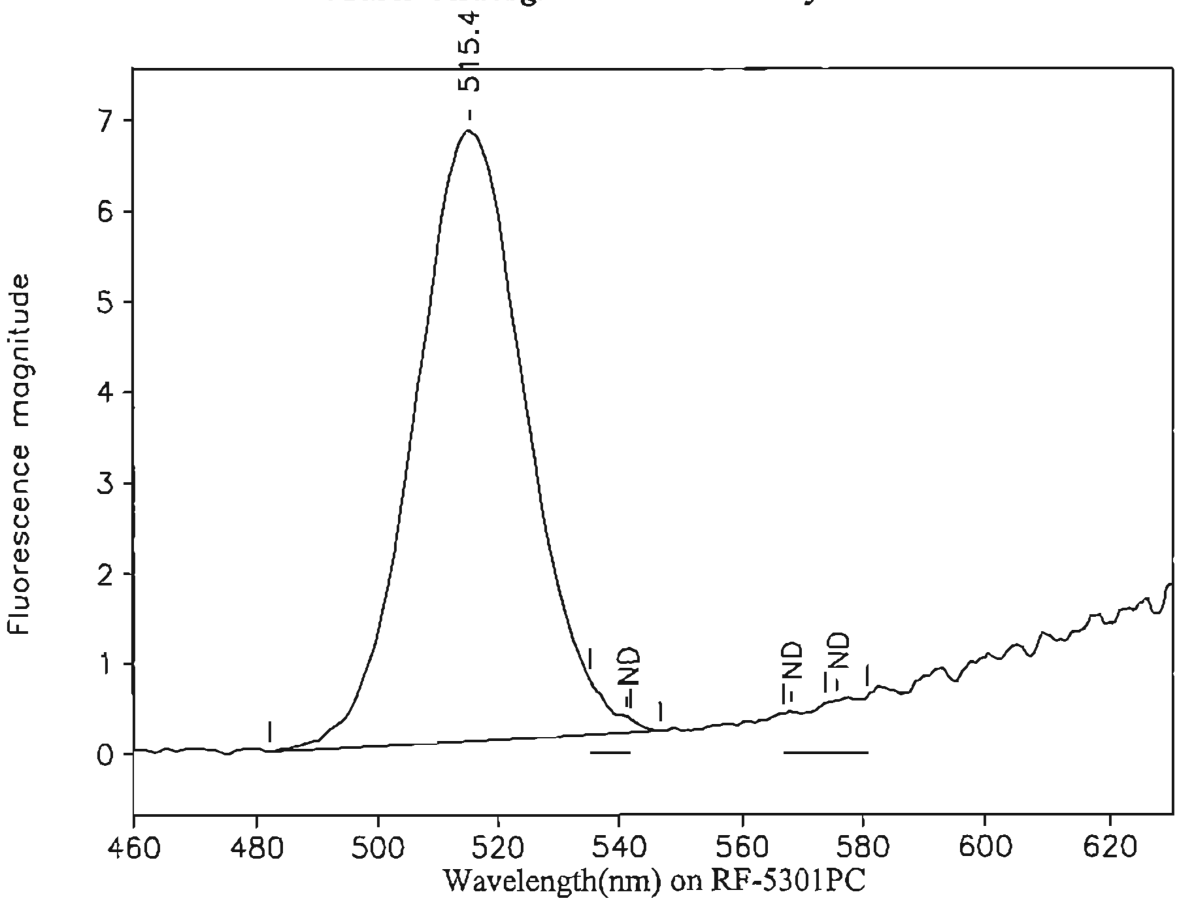

Station 39: MW-1 @ 149'
OUL number: M8457
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	482.2	546.6	6.75	145.99	0.05	494
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ch

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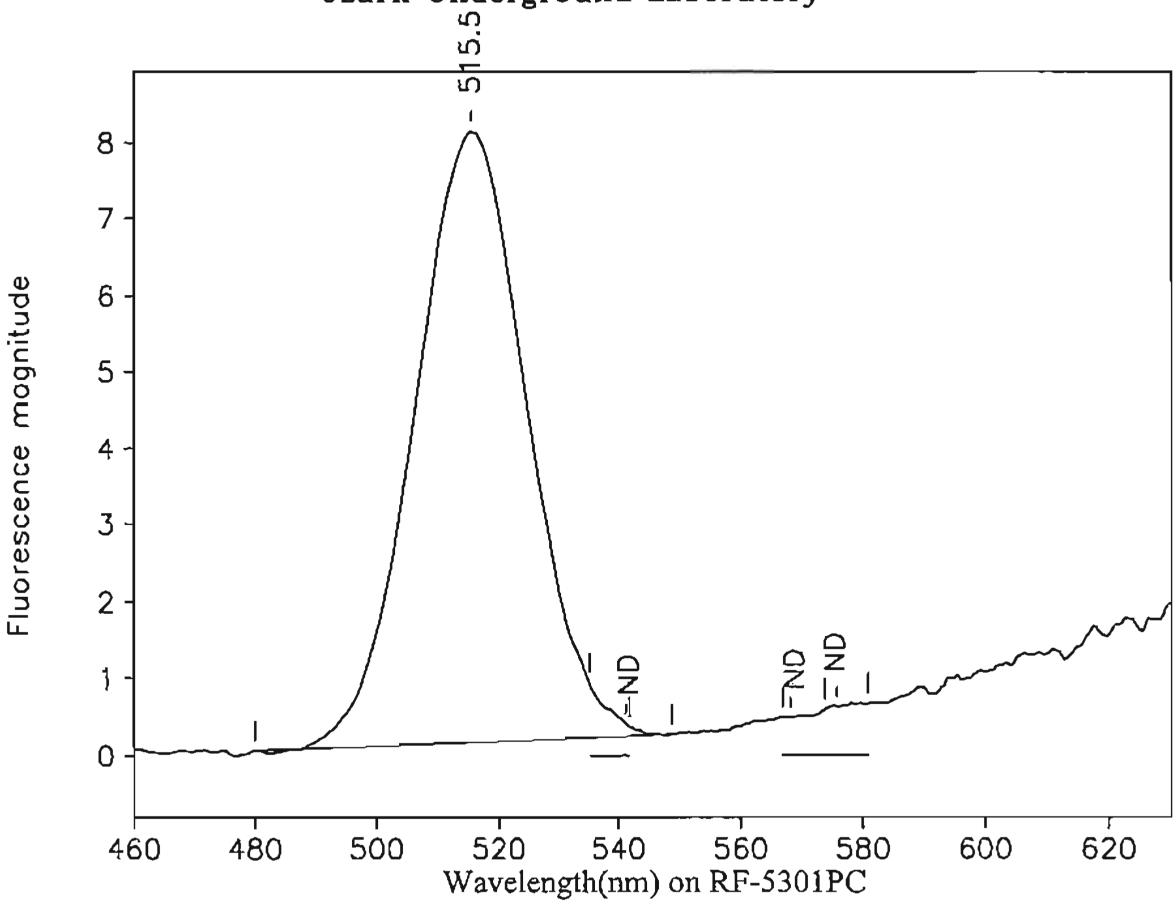

Station 40: MW-1 @ 159'
OUL number: M8458
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.5	480.0	548.8	7.97	170.34	0.05	577
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ca

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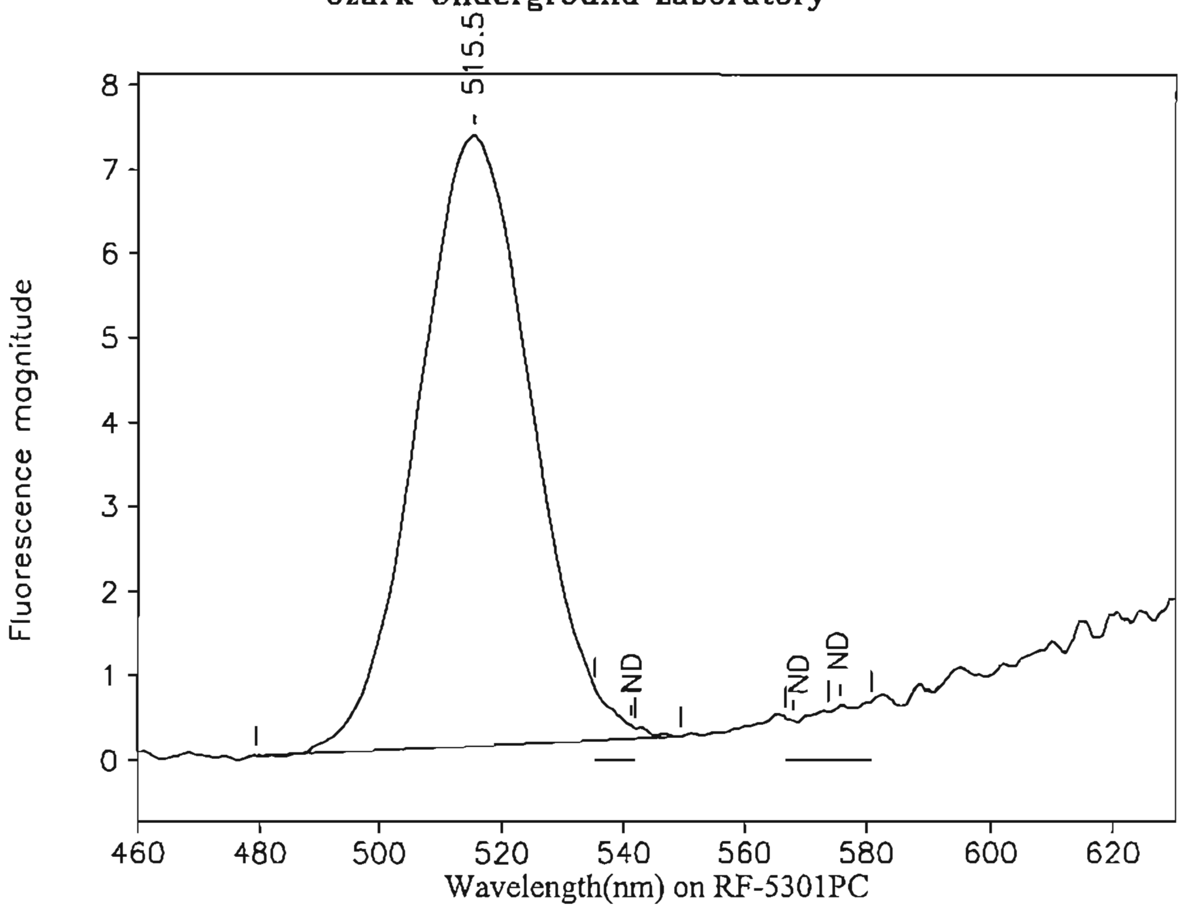

Station 41: MW-1 @ 169'
OUL number: M8459
Matrix: Elutant
Placed: / /

Diluted: 1 to 100
Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.5	479.4	549.4	7.24	155.67	0.05	527
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

en

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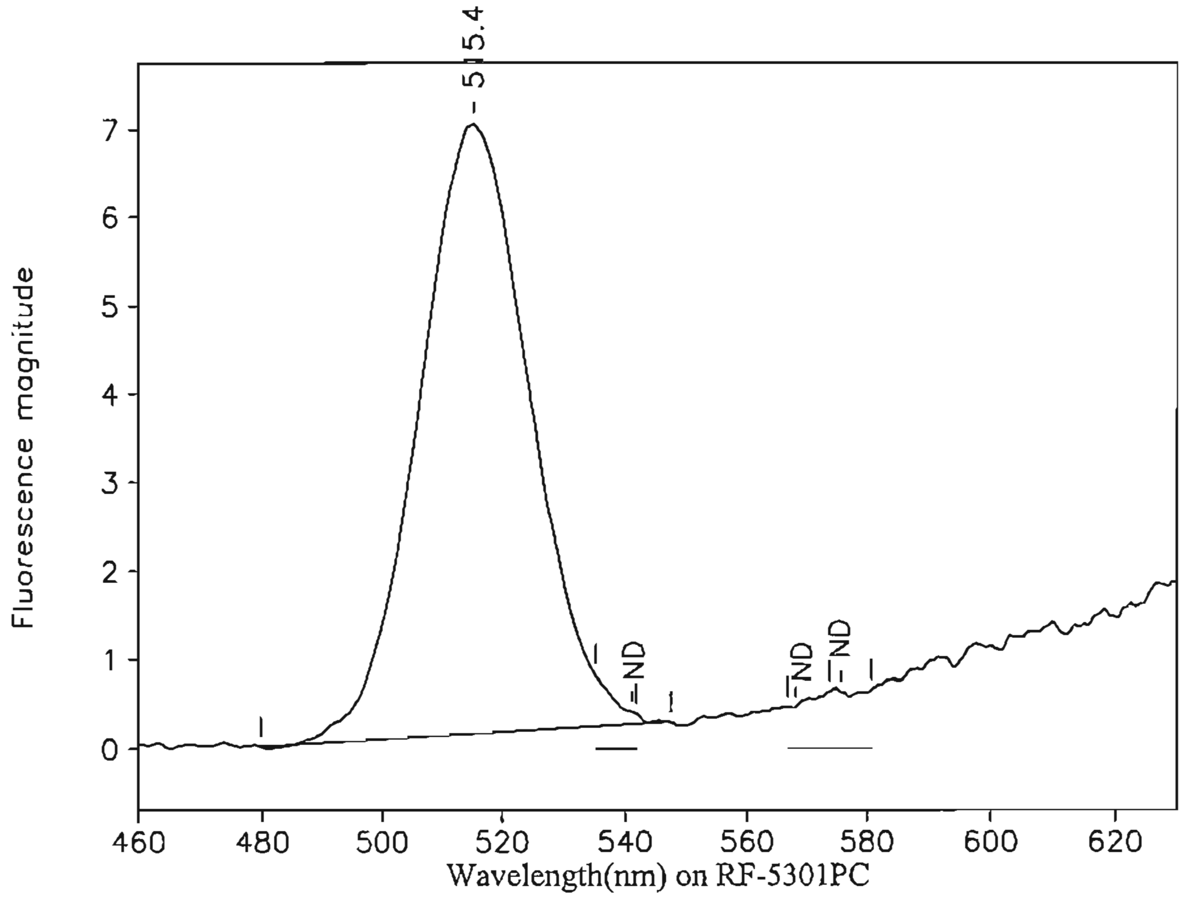

Station 42: MW-1 @ 179'	Diluted: 1 to 100
OUL number: M8461	Analyzed: 08/29/03
Matrix: Elutant	
Placed: / /	Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	479.7	547.3	6.90	146.99	0.05	497
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ca

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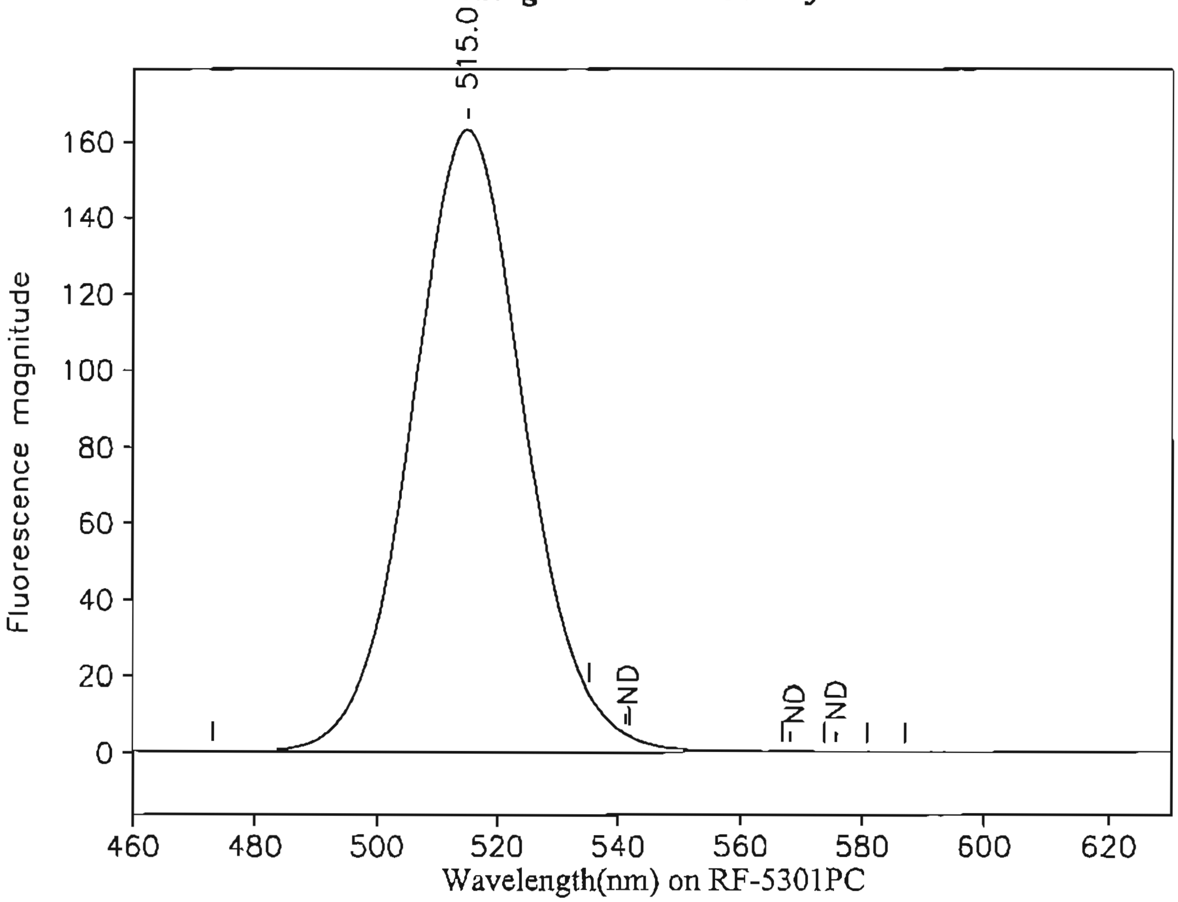

Station 43: MW-1 @ 189'
OUL number: M8462 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	473.2	586.9	163.12	3,579.53	0.05	121
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Cr

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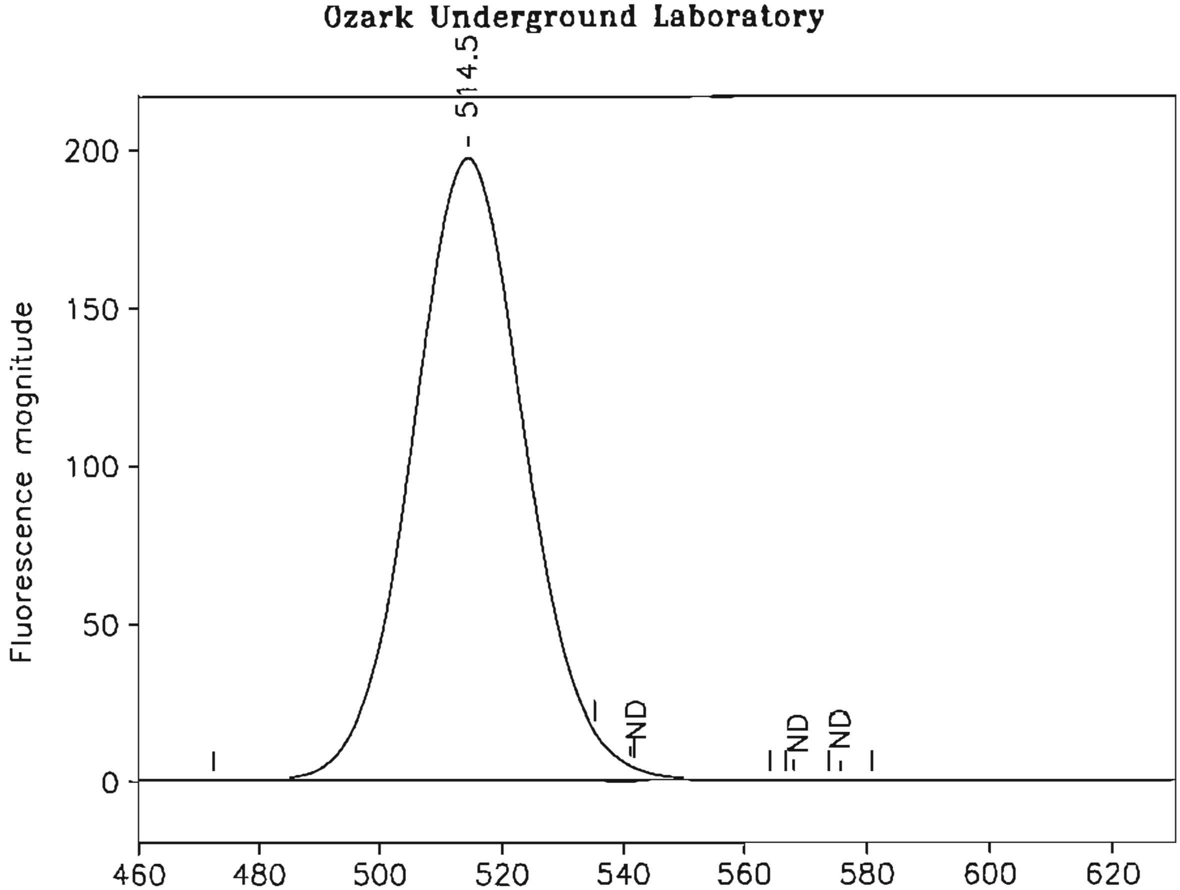

Station 44: MW-1 @ 199'
OUL number: M8463 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.5	472.5	564.1	197.54	4,264.16	0.05	144
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

C✓

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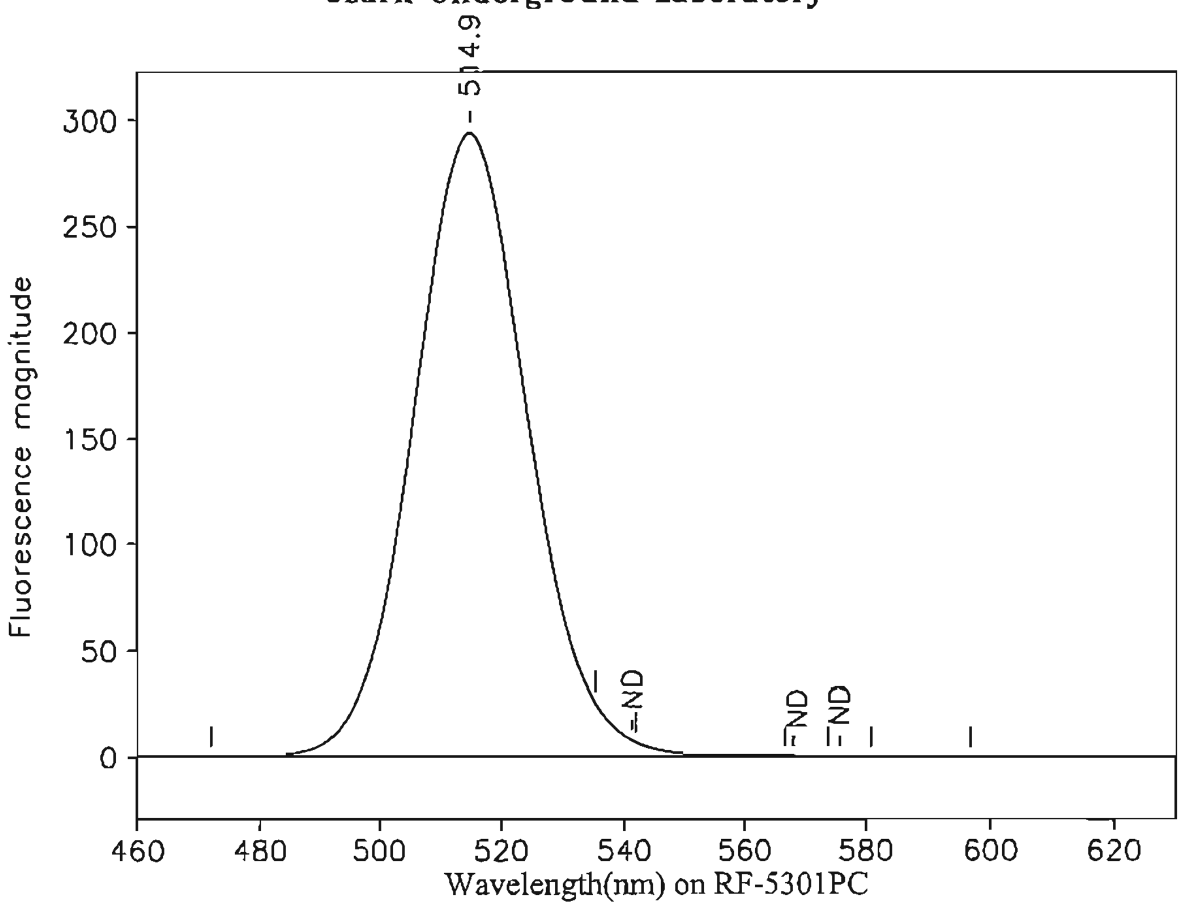

Station 45: MW-1 @ 209'
OUL number: M8464
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03
Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.9	471.9	596.7	294.04	6,390.26	0.05	216
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

CL

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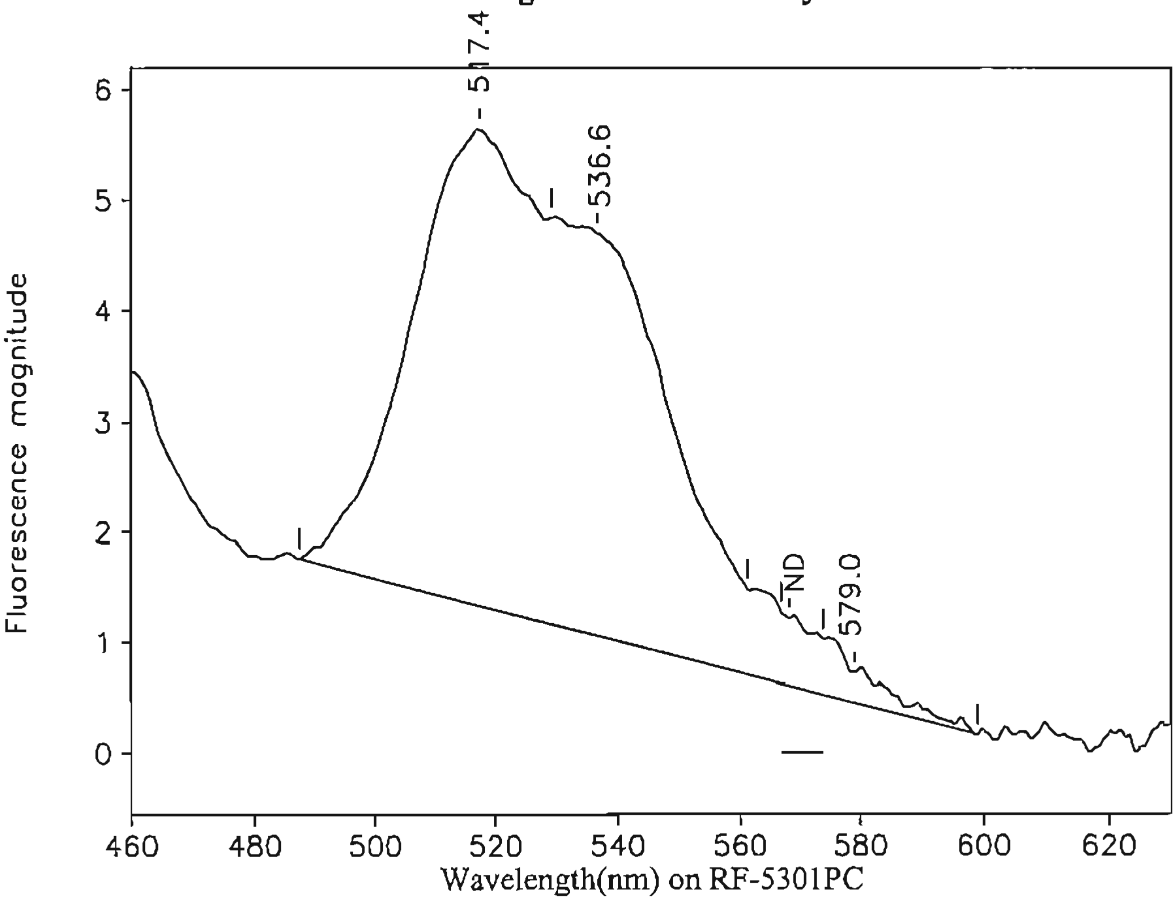

Station 18: MW-2 @ 190'
OUL number: M8465 | Analyzed: 08/29/03
Matrix: Elutant
Placed: / / | Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	487.4	529.3	4.31	104.18	0.04	3.53
536.6	529.3	561.2	3.64	81.54	0.04	5.18 **
568.1	566.8	573.8	0.00	0.00	0.00	ND
579.0	561.2	599.0	0.27	13.38	0.02	~~1.32~~

Peaks close to the normal range of tracer dyes:

Ca

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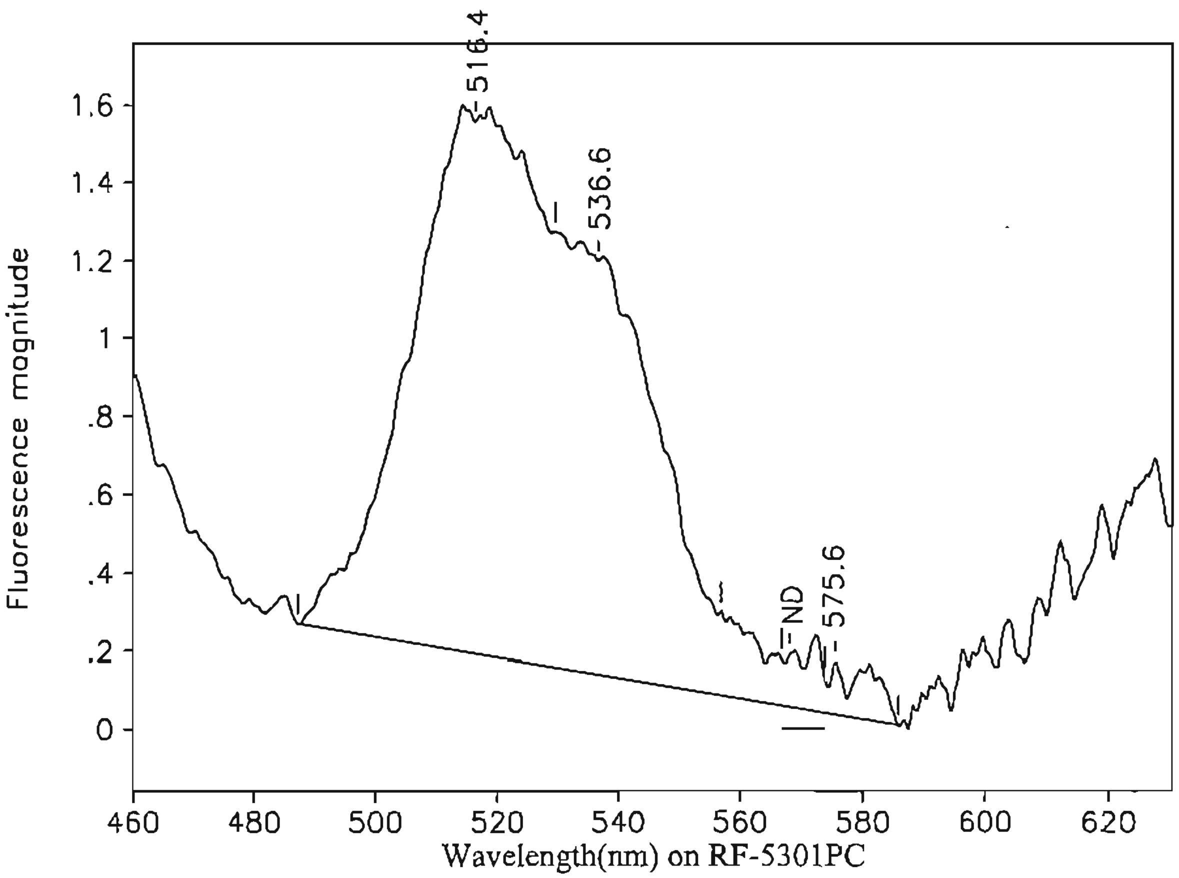

Station 19: MW-2 @ 200'
OUL number: M8466 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	487.2	529.5	1.37	34.48	0.04	1.17
536.6	529.5	556.9	1.06	20.85	0.05	1.32 **
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.6	556.9	585.8	0.13	3.65	0.04	0.359

Peaks close to the normal range of tracer dyes:

Ca

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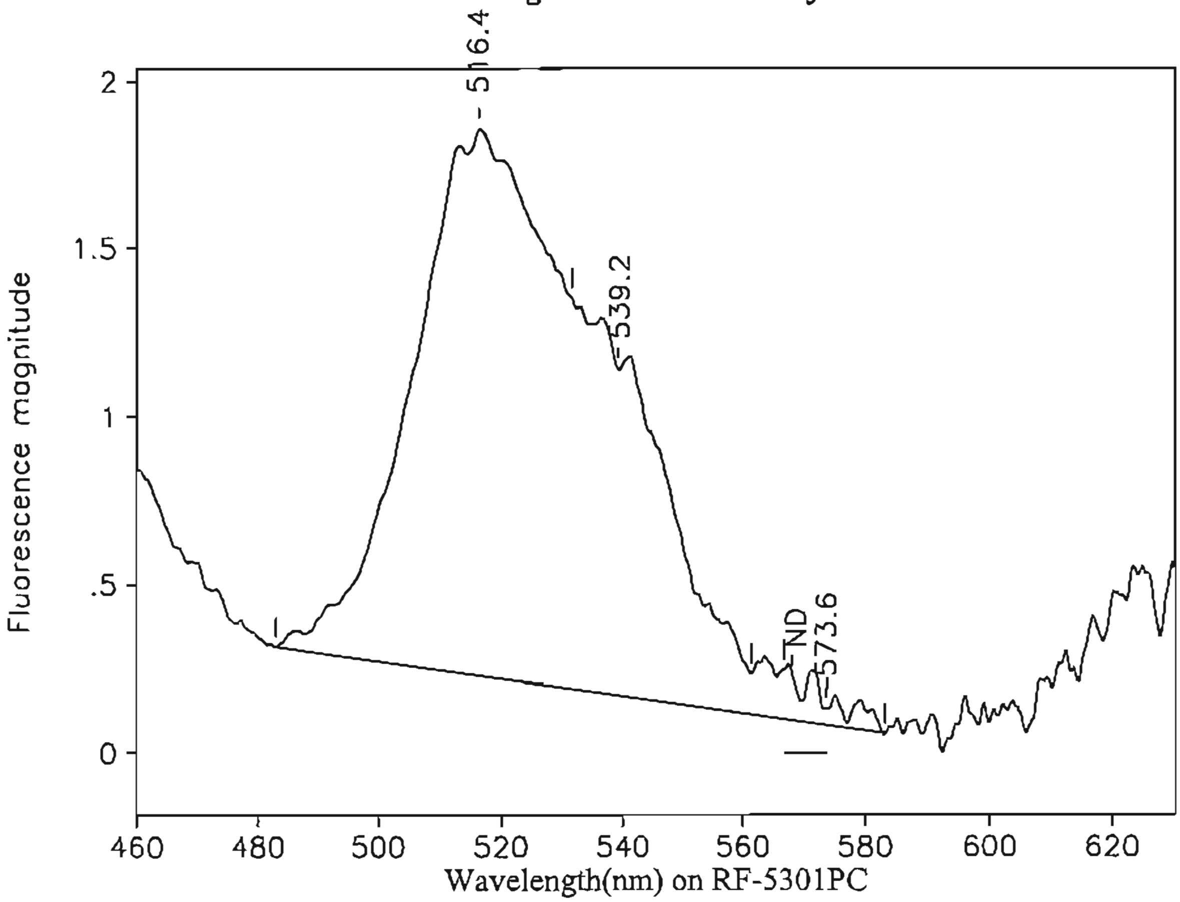

Station 20: MW-2 @ 210'
OUL number: M8467 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	483.0	531.5	1.63	41.99	0.04	1.42
539.2	531.5	561.4	0.97	20.27	0.05	~~1.29~~
568.1	566.8	573.8	0.00	0.00	0.00	ND
573.6	561.4	583.2	0.05	2.09	0.02	~~0.205~~

Peaks close to the normal range of tracer dyes:

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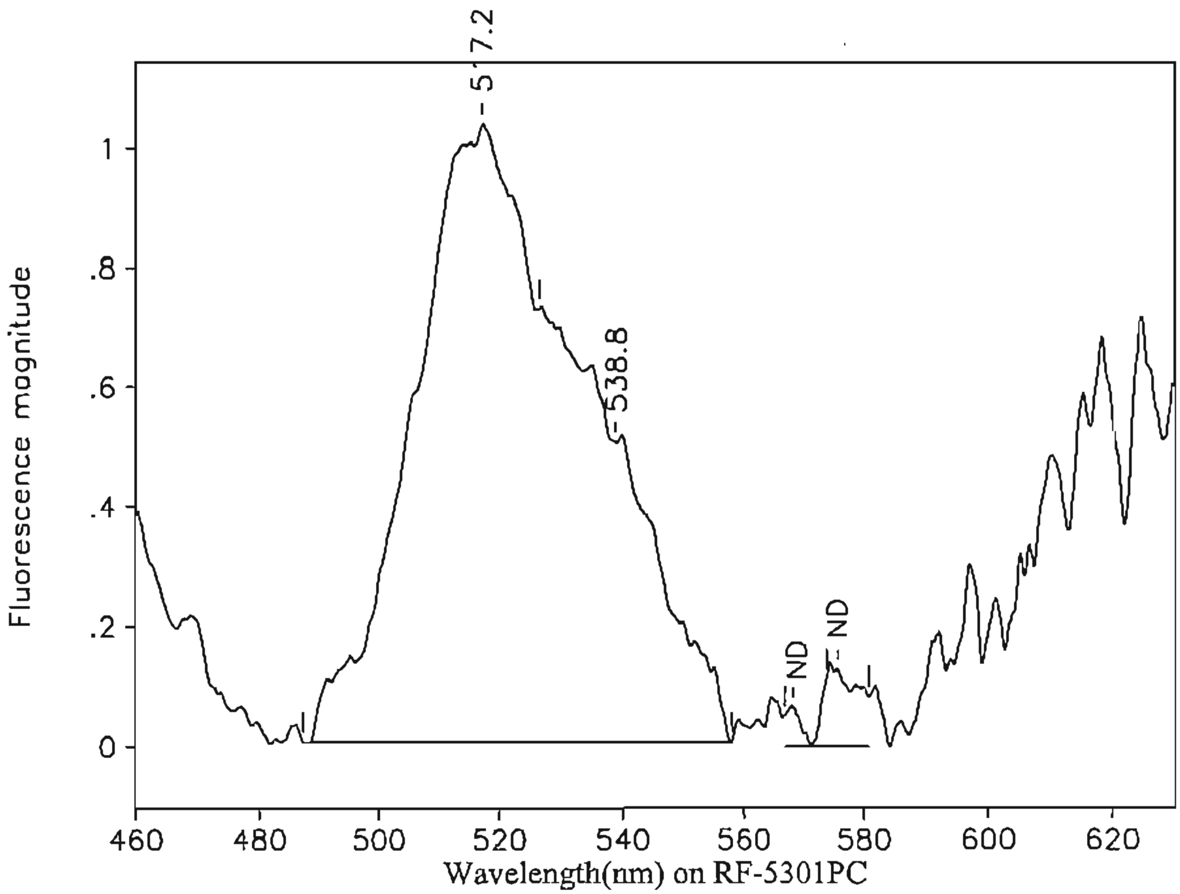

Station 21: MW-2 @ 220'
OUL number: M8468
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	487.2	526.6	1.03	22.13	0.05	0.749
538.8	526.6	558.0	0.50	12.66	0.04	~~0.804~~
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Cw

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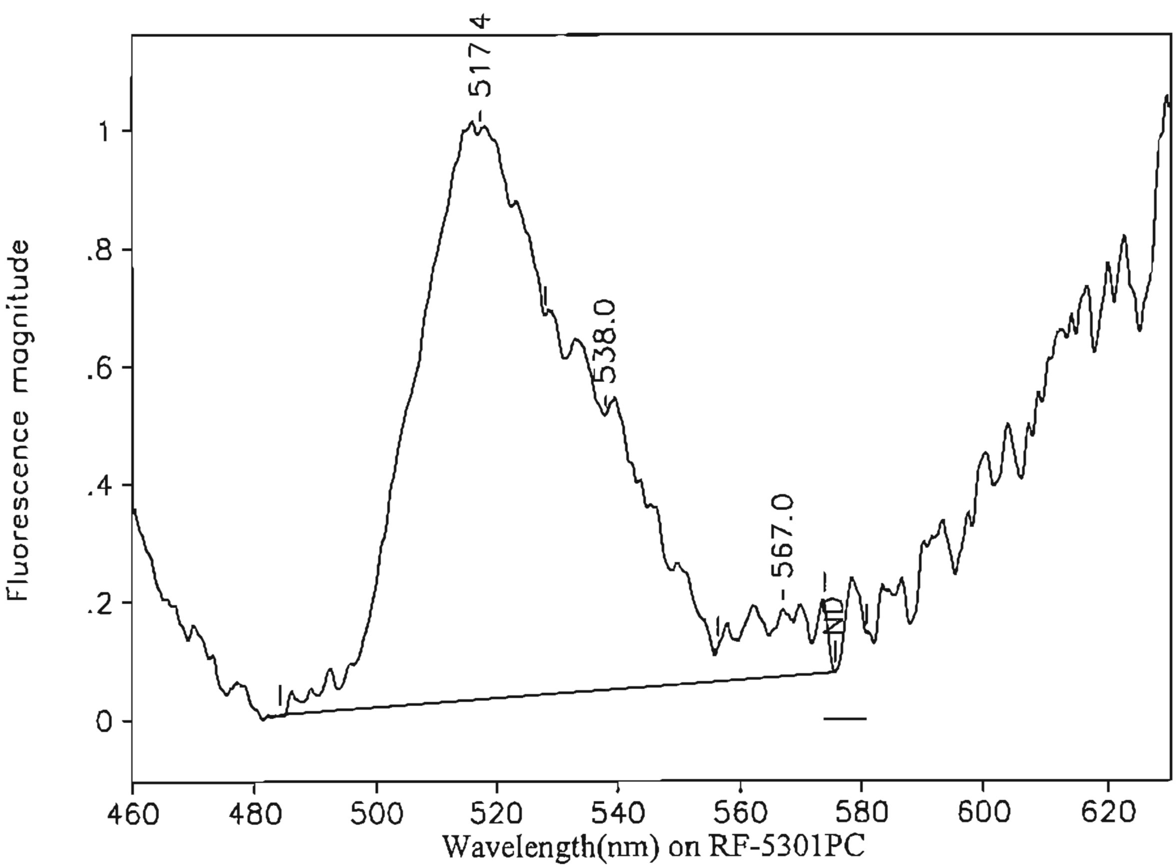

Station 22: MW-2 @ 230'
OUL number: M8469
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03
Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	484.2	528.3	0.97	21.79	0.04	0.737
538.0	528.3	556.4	0.47	10.53	0.04	~~0.669~~
567.0	556.4	575.6	0.11	1.67	0.07	~~0.300~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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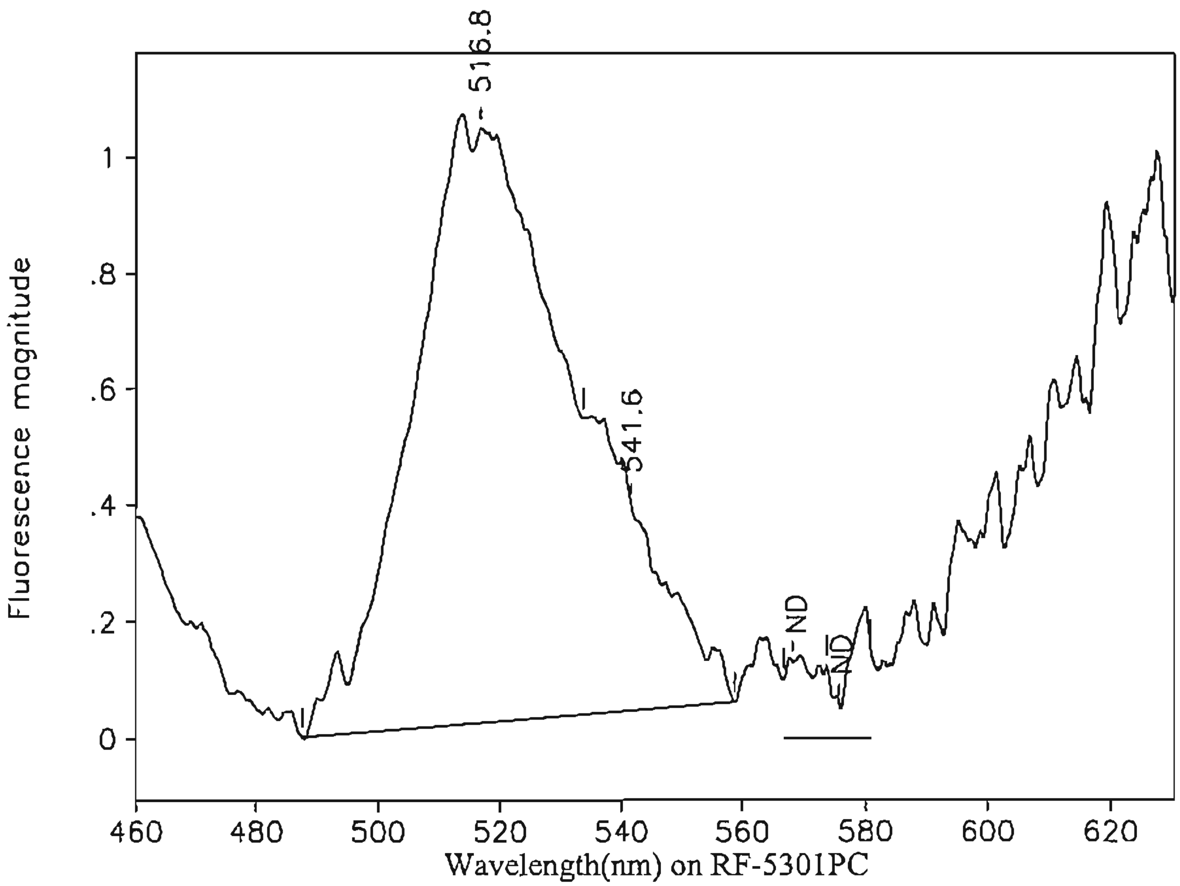

Station 23: MW-2 @ 240'
OUL number: M8470
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03
Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	487.6	533.6	1.02	26.82	0.04	0.908
541.6	533.6	558.8	0.35	6.68	0.05	~~0.424~~
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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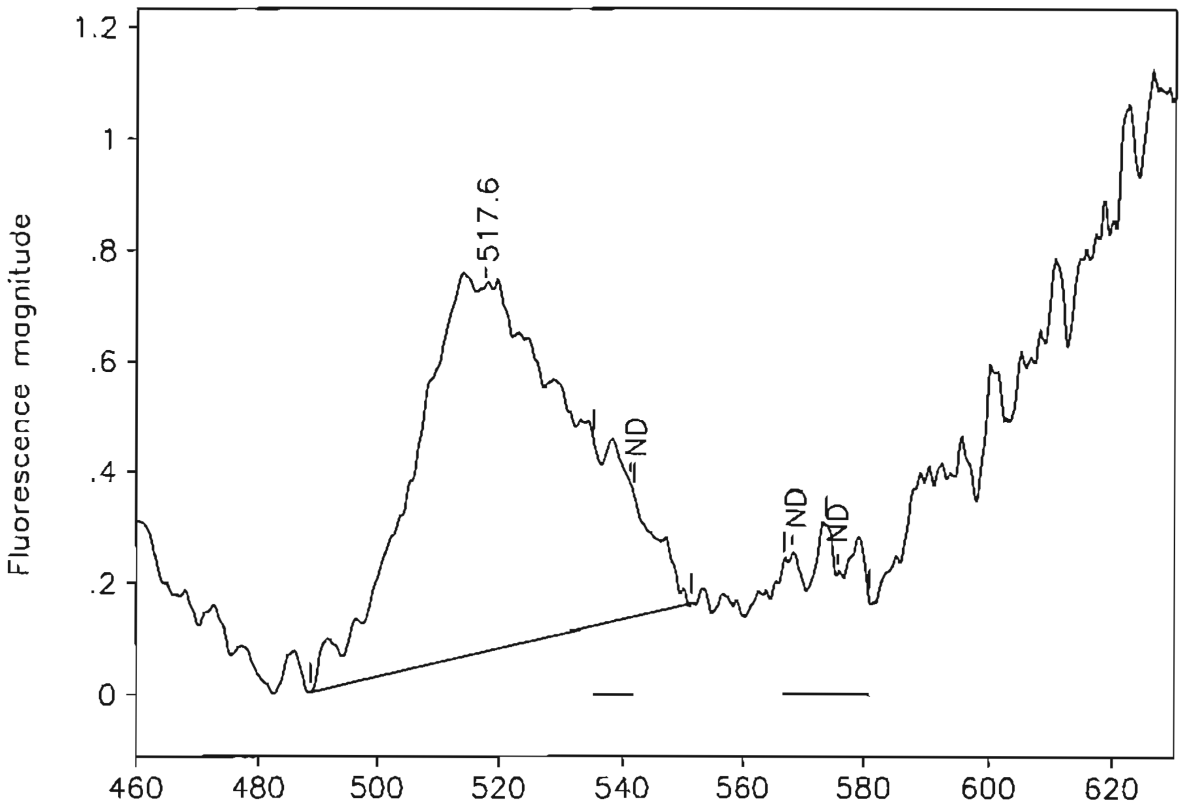

Station 24: MW-2 @ 250'
OUL number: M8471
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	488.6	551.4	0.65	21.01	0.03	~~0.711~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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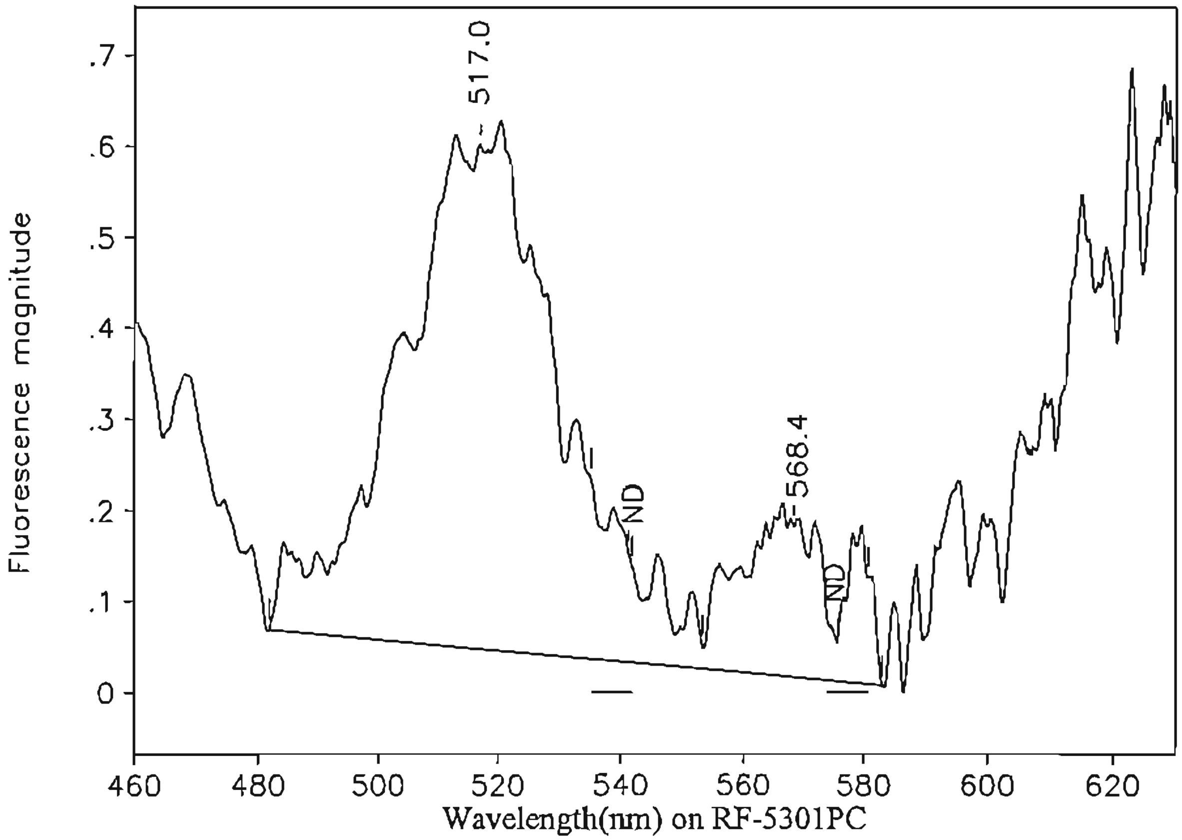

Station 25: MW-3 @ 190'
OUL number: M8472
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03
Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	481.8	553.2	0.55	18.01	0.03	~~0.610~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.4	553.2	583.0	0.17	3.64	0.05	~~0.656~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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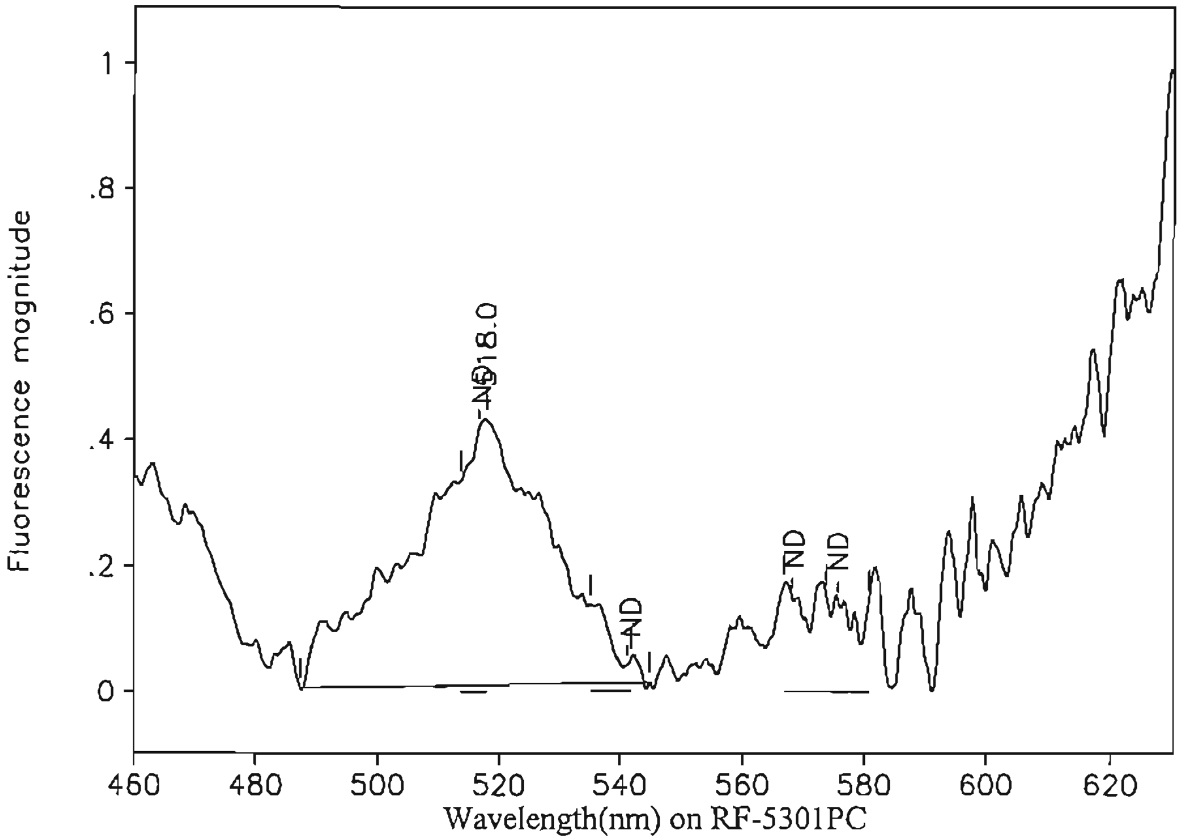


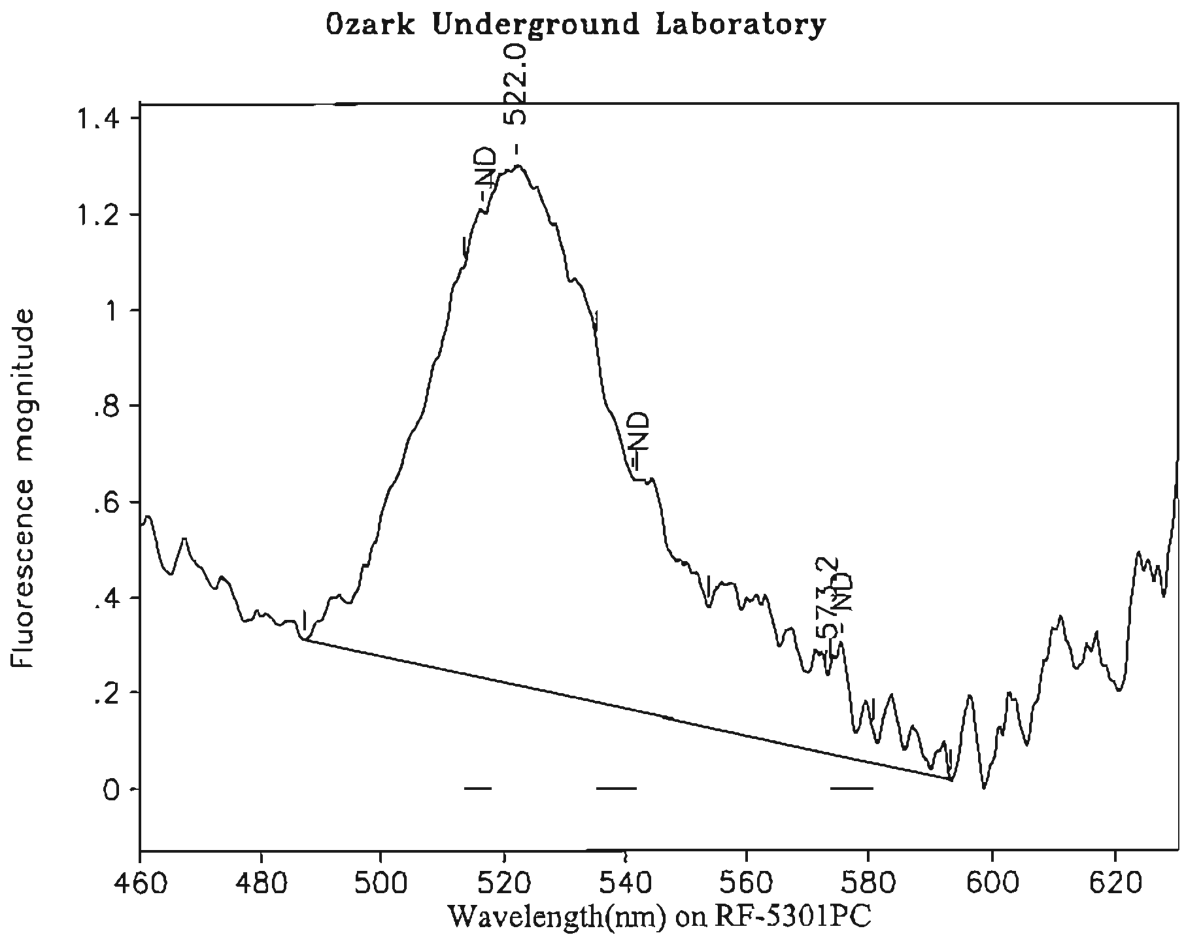
Station 26: MW-3 @ 200'
OUL number: M8473
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	487.4	544.8	0.42	11.41	0.04	0.386



Station 27: MW-3 @ 210'
OUL number: M8474 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
573.2	553.8	593.2	0.17	6.84	0.02	1.23
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.0	487.2	553.8	1.09	38.51	0.03	1.30

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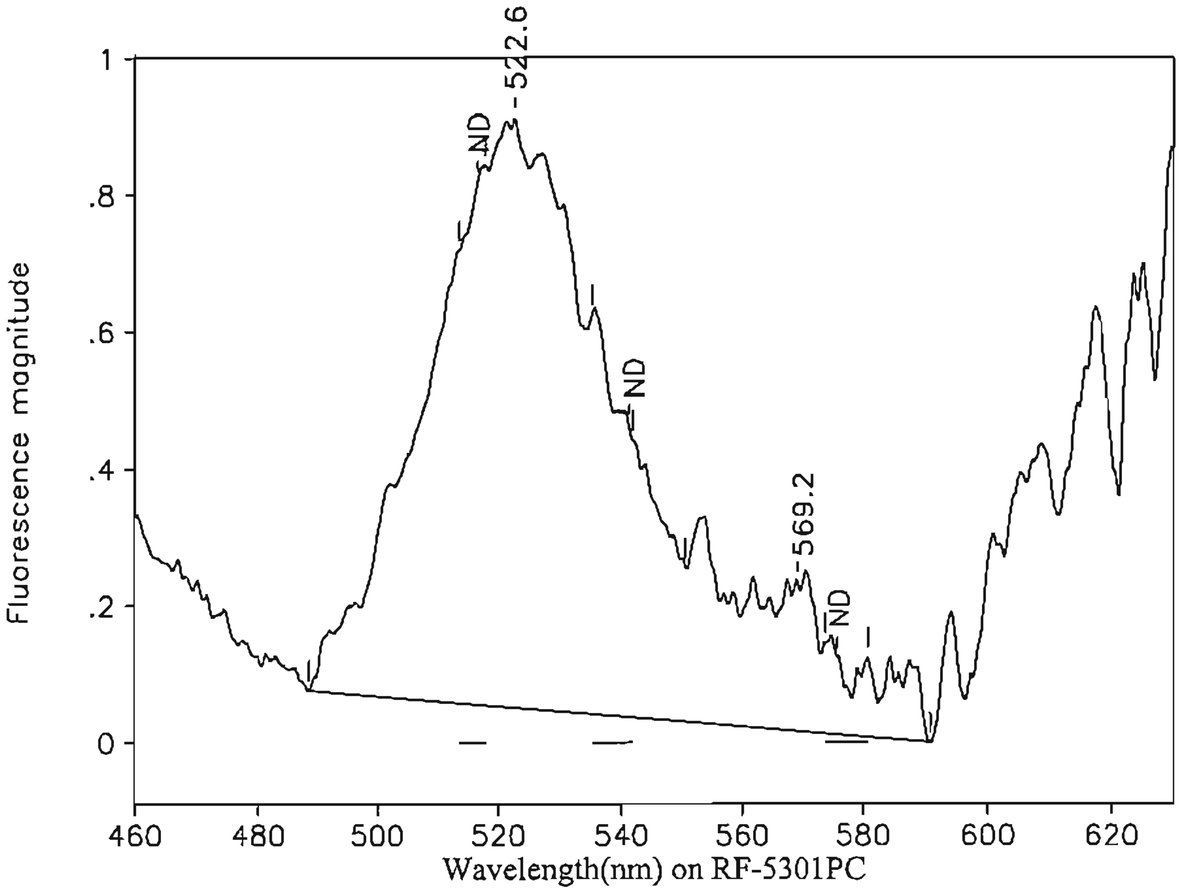

Station 28: MW-3 @ 220'
OUL number: M8475 | Analyzed: 08/29/03
Matrix: Elutant
Placed: / / | Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
569.2	550.5	590.8	0.22	6.30	0.03	1.14
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.6	488.4	550.5	0.86	29.26	0.03	0.990

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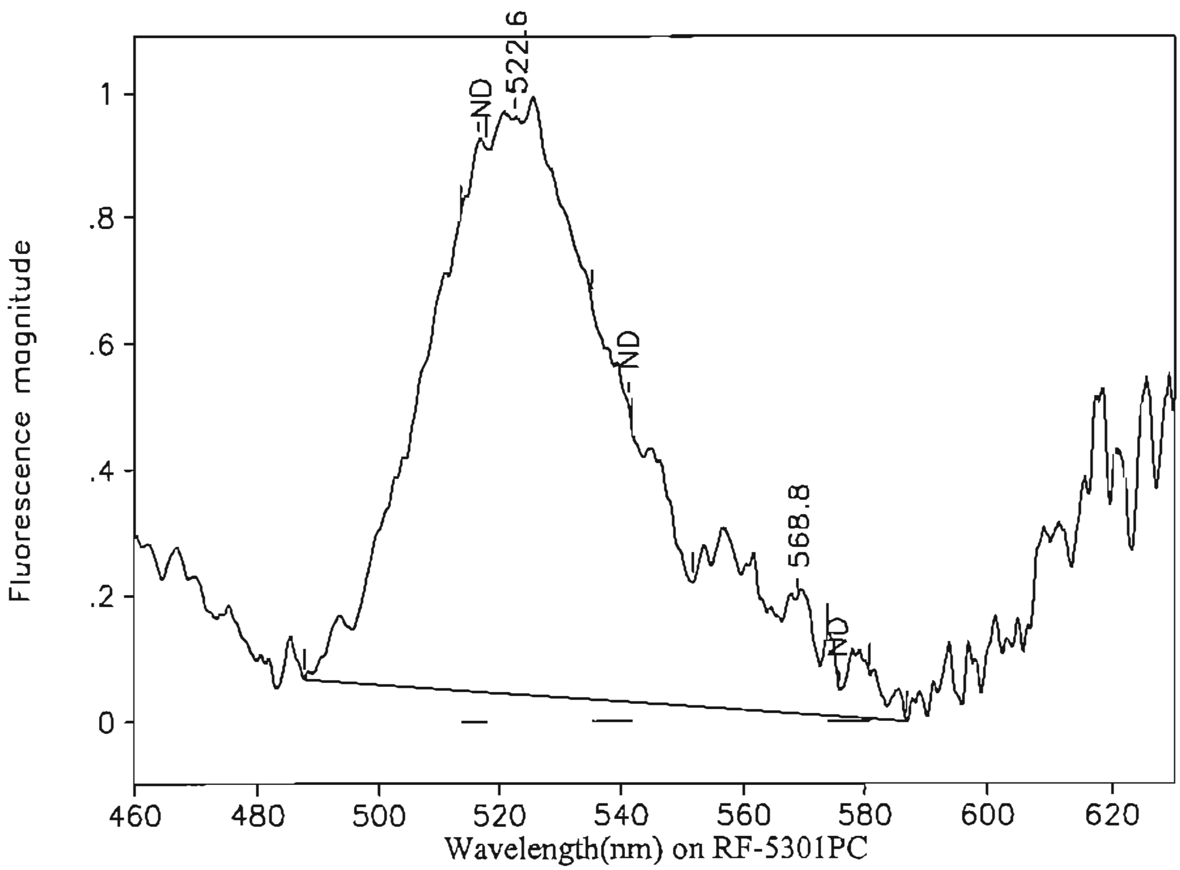

Station 29: MW-3 @ 230'
OUL number: M8476 — Analyzed: 08/29/03
Matrix: Elutant
Placed: / / — Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.8	551.7	586.8	0.18	5.28	0.03	0.952
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.6	487.6	551.7	0.92	32.79	0.03	1.11

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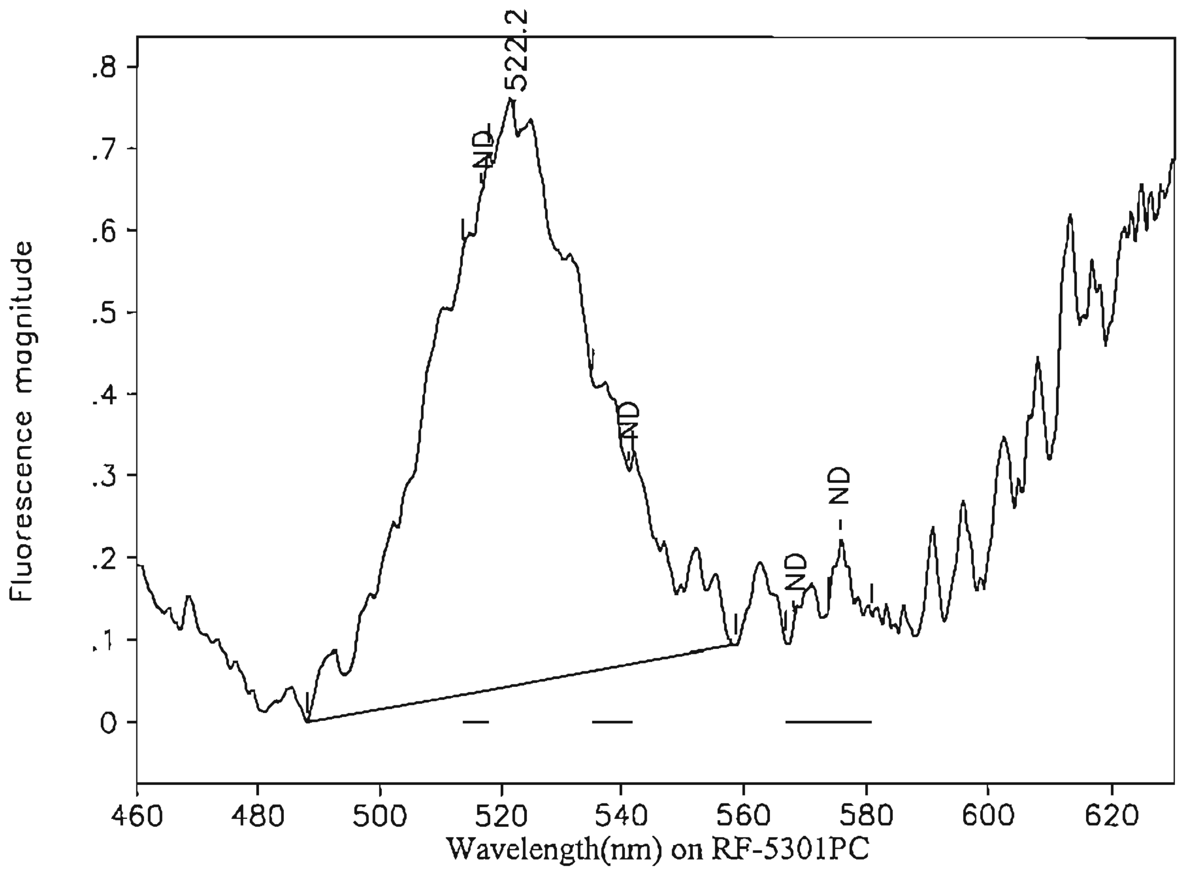

Station 30: MW-3 @ 240'
OUL number: M8477 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.2	488.0	558.8	0.69	22.37	0.03	0.757

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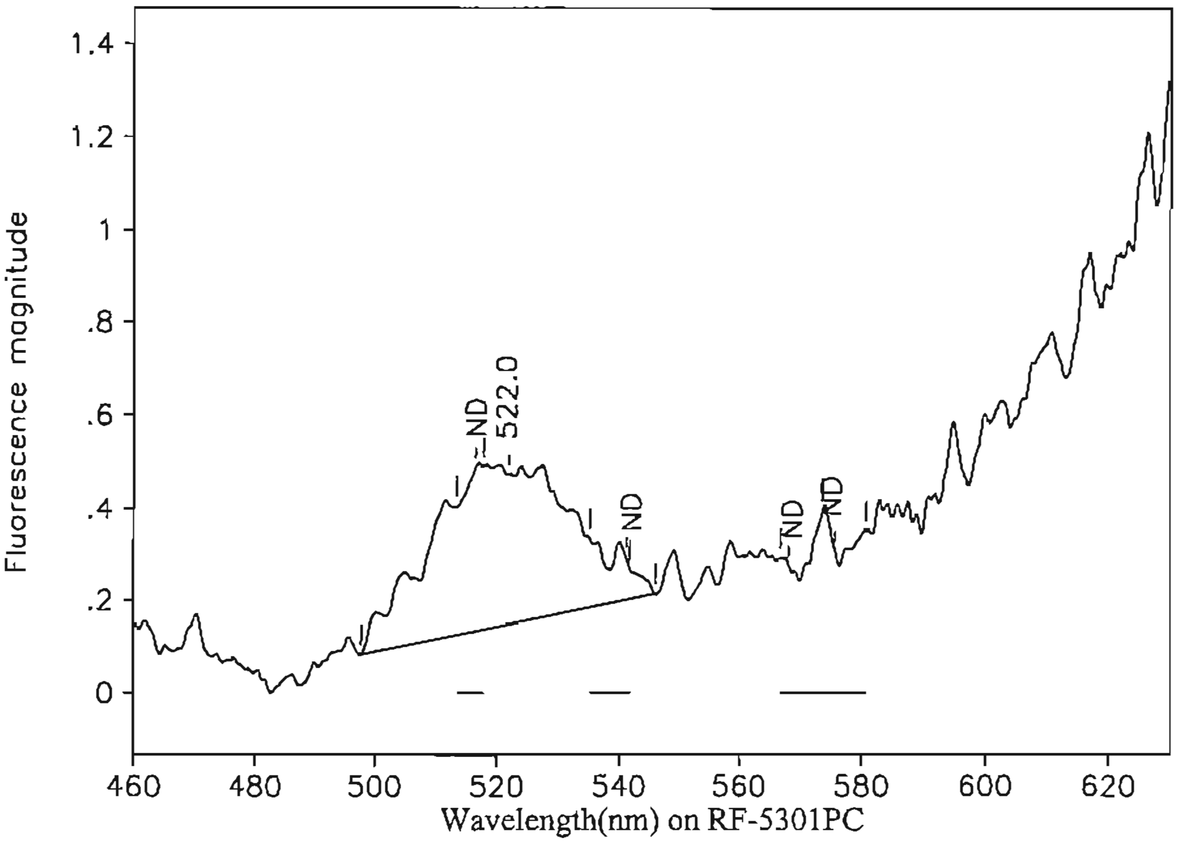

Station 46: MW-3 @ 250'
OUL number: M8478 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	513.6	517.9	0.00	0.00	0.00	ND
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
522.0	497.8	546.0	0.32	9.61	0.03	0.325

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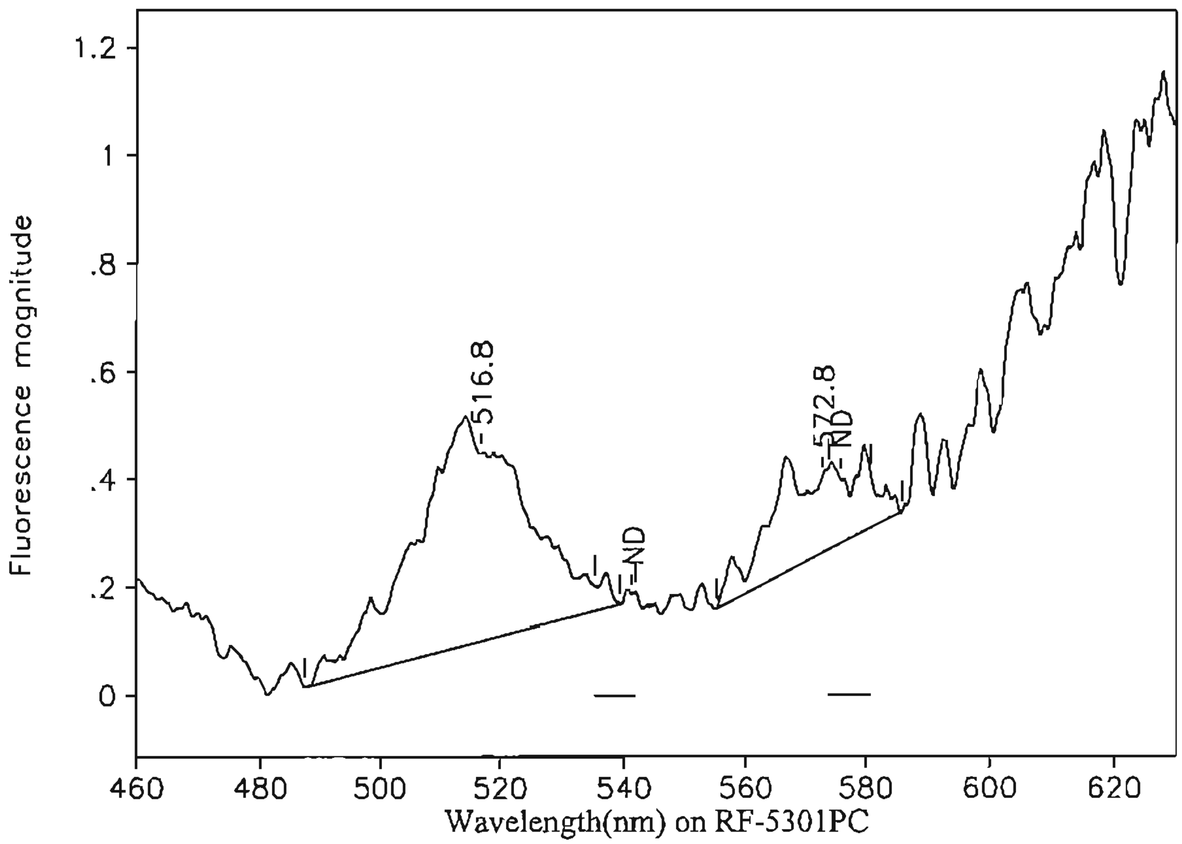

Station 31: MW-4 @ 190'
OUL number: M8479
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03
Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	487.2	539.4	0.35	9.14	0.04	~~0.309~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
572.8	555.2	585.8	0.14	3.01	0.05	~~0.542~~
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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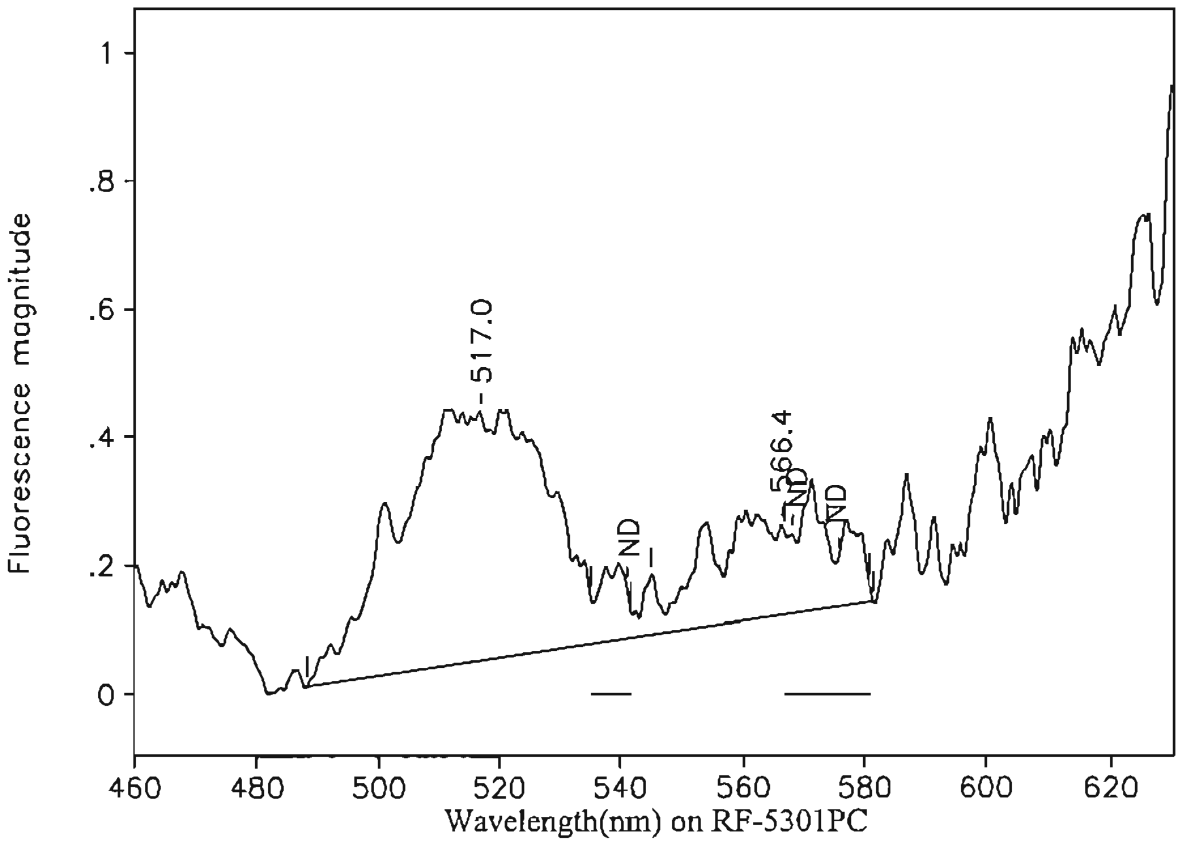
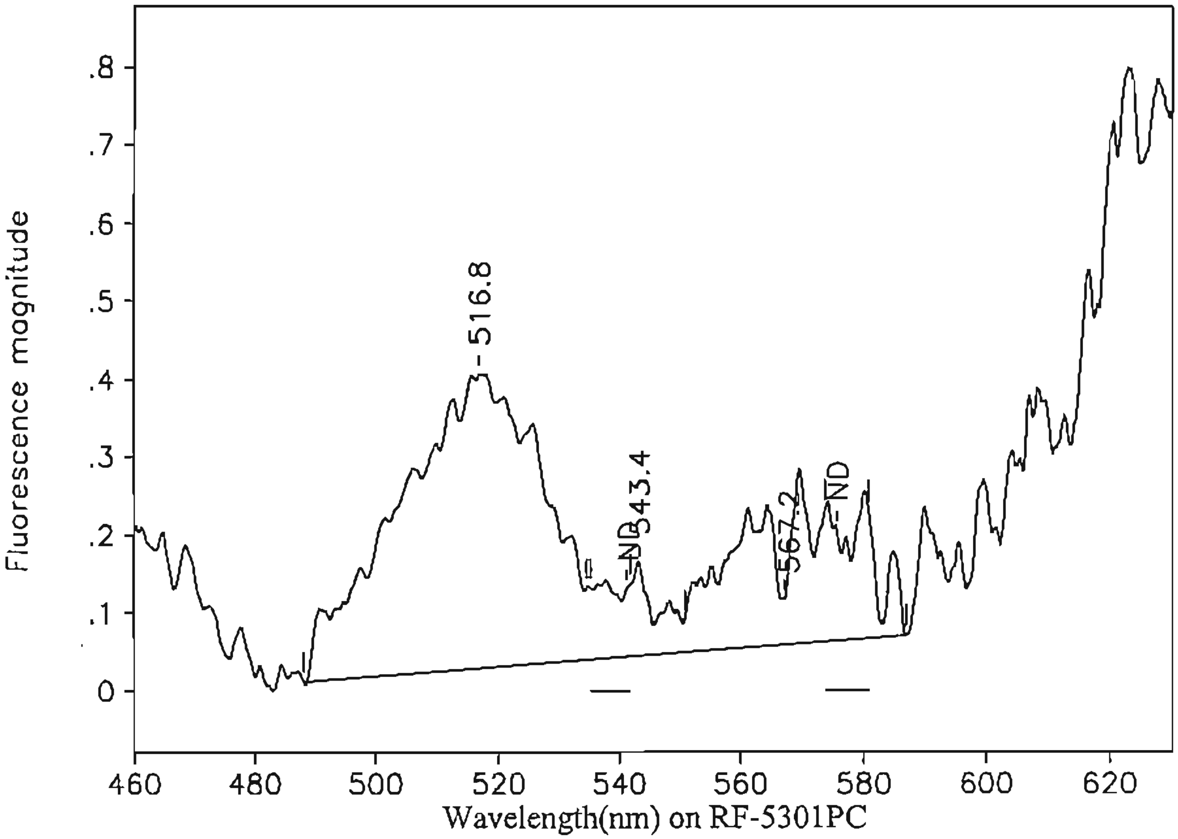


Station 32: MW-4 @ 200'
OUL number: M8481 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	488.2	545.1	0.38	12.18	0.03	~~0.412~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
566.4	545.1	581.4	0.14	4.05	0.03	~~0.730~~

Ozark Underground Laboratory

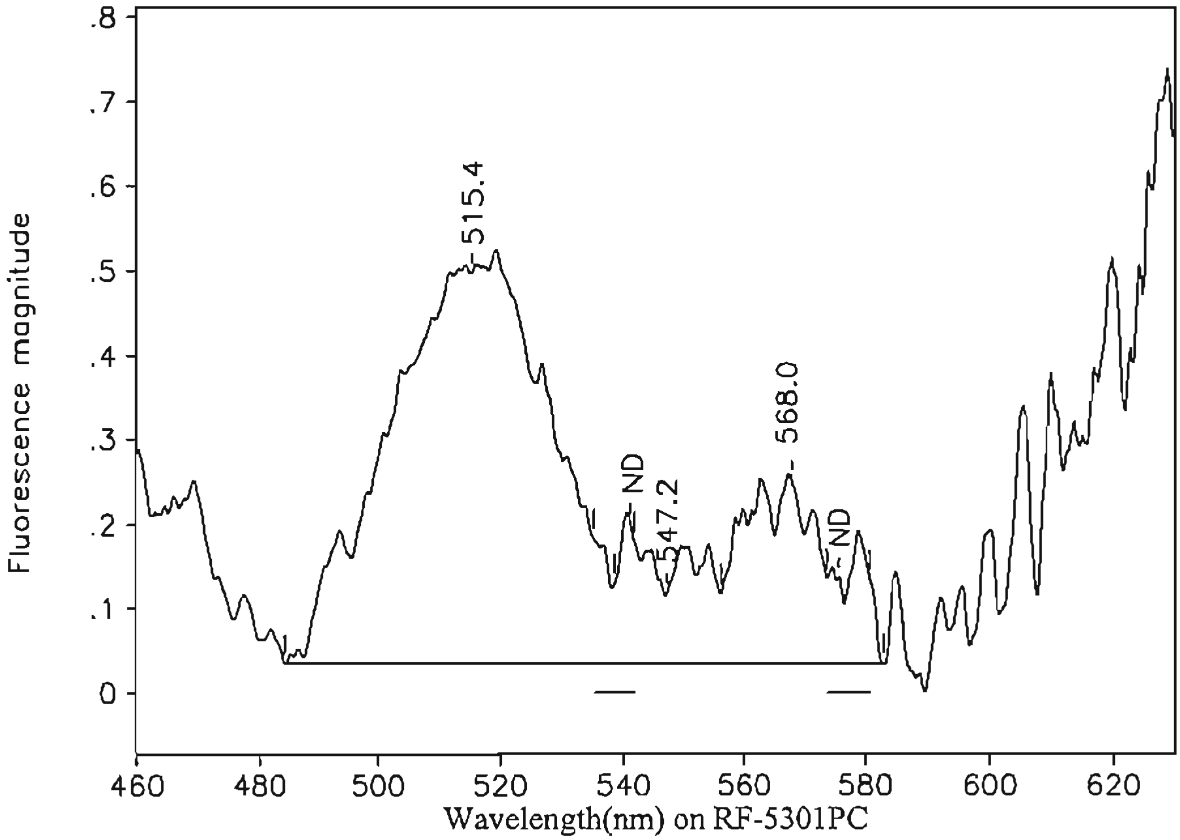


Station 33: MW-4 @ 210'
OUL number: M8482 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	488.2	534.6	0.38	10.33	0.04	~~0.350~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
567.2	550.9	586.8	0.06	4.29	0.01	~~0.774~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
543.4	534.6	550.9	0.12	1.24	0.10	~~0.079~~

Ozark Underground Laboratory

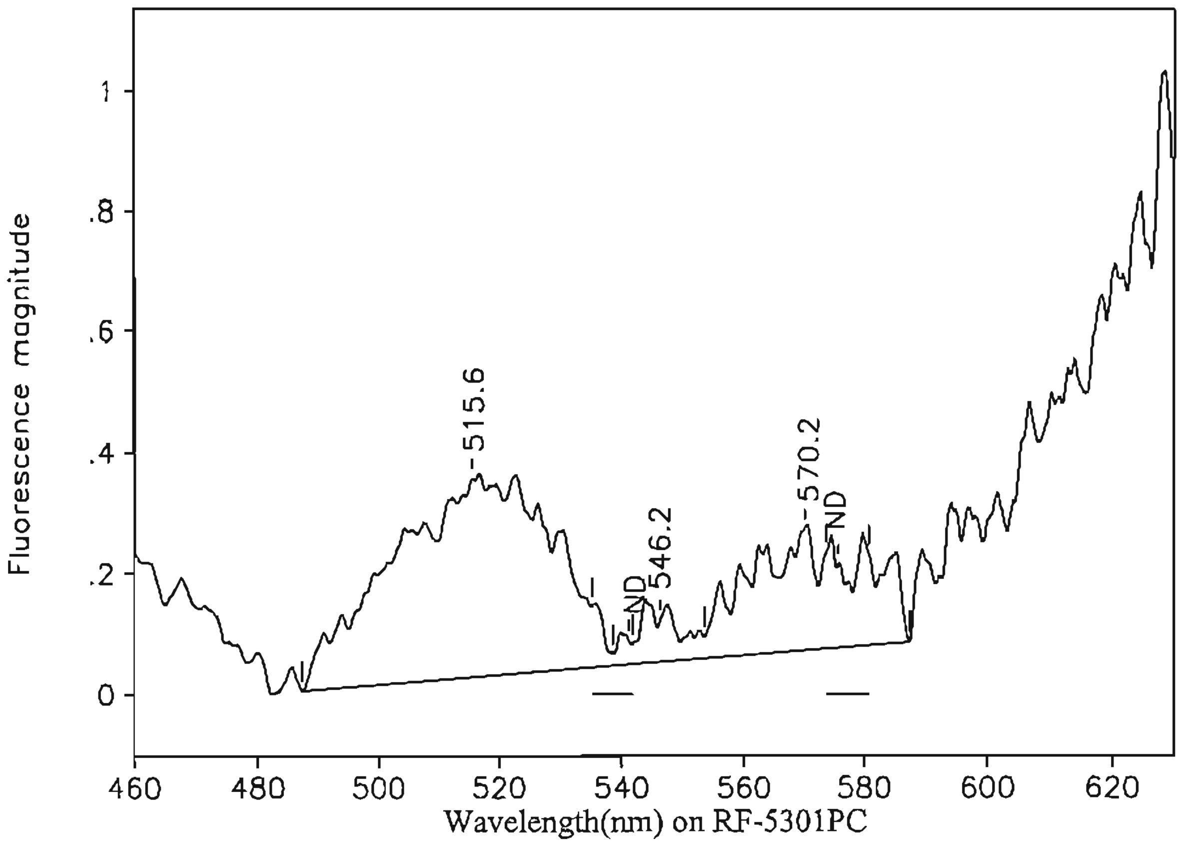


Station 34: MW-4 @ 220'
OUL number: M8483 — Analyzed: 08/29/03
Matrix: Elutant
Placed: / / — Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	484.2	538.5	0.46	14.91	0.03	~~0.505~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.0	556.2	583.0	0.22	3.91	0.06	~~0.704~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
547.2	538.5	556.2	0.08	2.18	0.04	~~0.139~~

Ozark Underground Laboratory



Station 35: MW-4 @ 230'
OUL number: M8484
Matrix: Elutant
Placed: / /

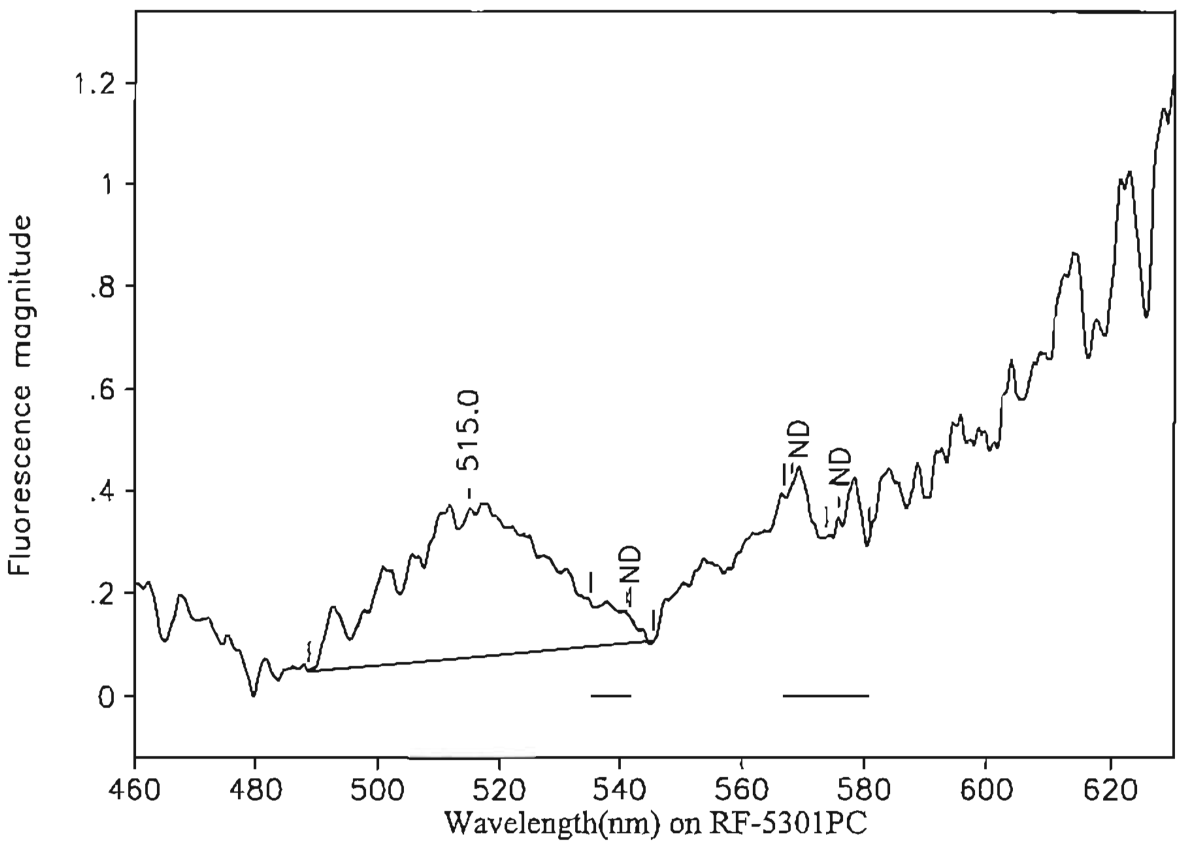
Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	487.2	538.6	0.33	10.41	0.03	~~0.352~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
570.2	553.5	587.4	0.20	4.36	0.05	~~0.786~~
575.8	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
546.2	538.6	553.5	0.07	0.83	0.08	~~0.053~~

Ozark Underground Laboratory



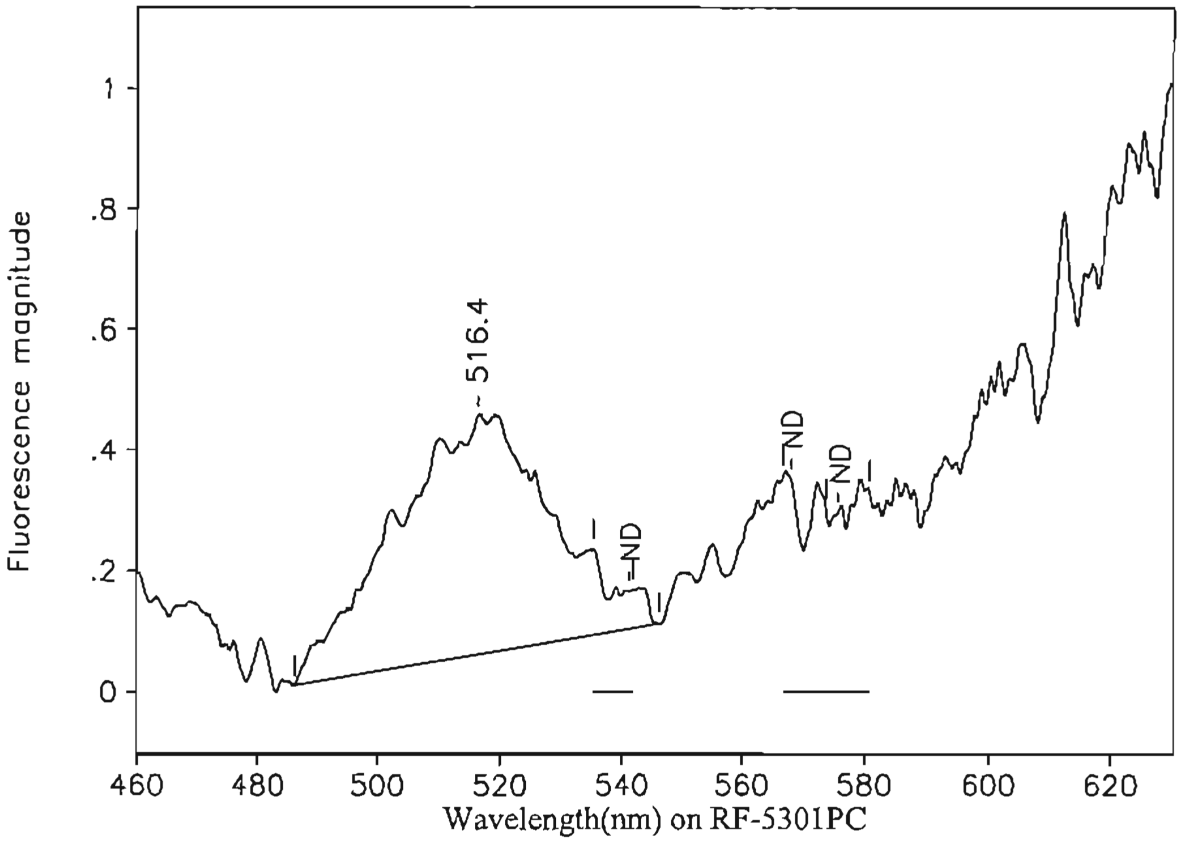
Station 36: MW-4 @ 240'
OUL number: M8485 Analyzed: 08/29/03
Matrix: Elutant
Placed: / / Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	488.8	545.6	0.29	8.91	0.03	~~0.301~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 37: MW-4 @ 250'
OUL number: M8486
Matrix: Elutant
Placed: / /

Analyzed: 08/29/03

Collected: 08/25/03

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	486.2	546.2	0.39	11.85	0.03	~~0.401~~
541.2	535.2	541.8	0.00	0.00	0.00	ND
568.1	566.8	573.8	0.00	0.00	0.00	ND
575.8	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 19, 2004

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for background water samples shipped August 11, 2004
Ozark Underground Laboratory (OUL) numbers N4990 through N4994.

Dear Mr. Aikens:

We have completed analysis of the background water samples received by the OUL on August 12, 2004. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for water samples
2. Sample Collection Data Sheet
3. Letter from Nodarse & Assoc., Inc.
4. Discrepancy sheet
5. Sample analysis graphs

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Ozark Underground Laboratory for
CH2MHill

Project: Lake Orienta
Date Samples Shipped: August 11, 2004
Date Samples Rec'd at OUL: August 12, 2004
Date Analyzed by OUL: August 17, 2004

Table 1. Results for background water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	OUL Stn. #	Station Name	Date/Time Placed	Date/Time Collected 2004	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N4990	1-WA	MW-1	Water	8/11 NT	ND		ND		ND	
N4991	2-WA	MW-2	Water	8/11 NT	ND		ND		ND	
N4992	3-WA	MW-3	Water	8/11 NT	ND		ND		ND	
N4993	4-WA	MW-4	Water	8/11 NT	ND		ND		ND	
N4994	Lake	Lake	Water	8/11 0935	ND		ND		575.0 *	0.116

FOOTNOTES:

ND = No dye detected

* = A fluorescence peak is present that is in the normally acceptable wavelength range for this dye and has been calculated as though it were dye for background purposes.

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Ontario Week No: BG Samples Collected By: Nodarse & Assoc.

Samples Shipped By: Nodarse Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 8/11/04 Date Samples Received: 8/12/04 Time Samples Received: 12:35 Return Cooler? Yes ____ No ✓

Bill to: ____ Send Results to: Al Aikens - CH2MHill

Analyze for: Fluorescein ✓ Eosine ✓ Rhodamine WT ✓ Other ____ Ship cooler to: ____

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
				DATE	TIME	DATE	TIME	
0	W4990	1-WA	MW-1			8/11		2
0	W4991	2-WA	MW-2			8/11		2
0	W4992	3-WA	MW-3			8/11		2
0	W4993	4-WA	MW-4			8/11		2
0	W4994	Lake	Lake			8/11	0935	2

COMMENTS: Unless otherwise noted, all water samples were collected at the date and time listed in the "collected" column.

This sheet filled out by OUL staff? Yes ✓ No ____ Charts for samples on this page proofed by OUL: mma

583

Project 62i Analyzed 8/17/04 OUL Page 1 of 1

Dye

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OZARK UNDERGRC ₍D LABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED					Page 1 of 1
Company & Project Name: CH2MHill- Lake Orienta				Date Rec'd by OUL: 8-12-04	Wk #
Lab #	Sta #	Station Name	Date Pulled	Problem	Solution

Comments: Ice placed in styrofoam cooler with samples + then cooler placed in box. Box and COC (letter) very wet when delivered to OUL. Please use blue ice. Did not receive a Sample Collection Data Sheet w/ 8 Samples M Arnold OUL Staff fill out SCDS using information written on samples.

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rev. 12/28/99

1675 Lee Road
Winter Park, FL 32789

Phone: 407.740.6110
Fax: 407.740.6112
nodarse@nodarse.com

Samples rec'd @ OUL
on 8-12-04 1235
by Marty Arnold
OUL page 1 of 1

NODARSE & ASSOCIATES, INC.
Geotechnical, Environmental Consulting & Materials Engineering

Enclosed water samples
for Tracer Test

Project: Lake Orienta
Client: Al Aikens CH_2M Hill

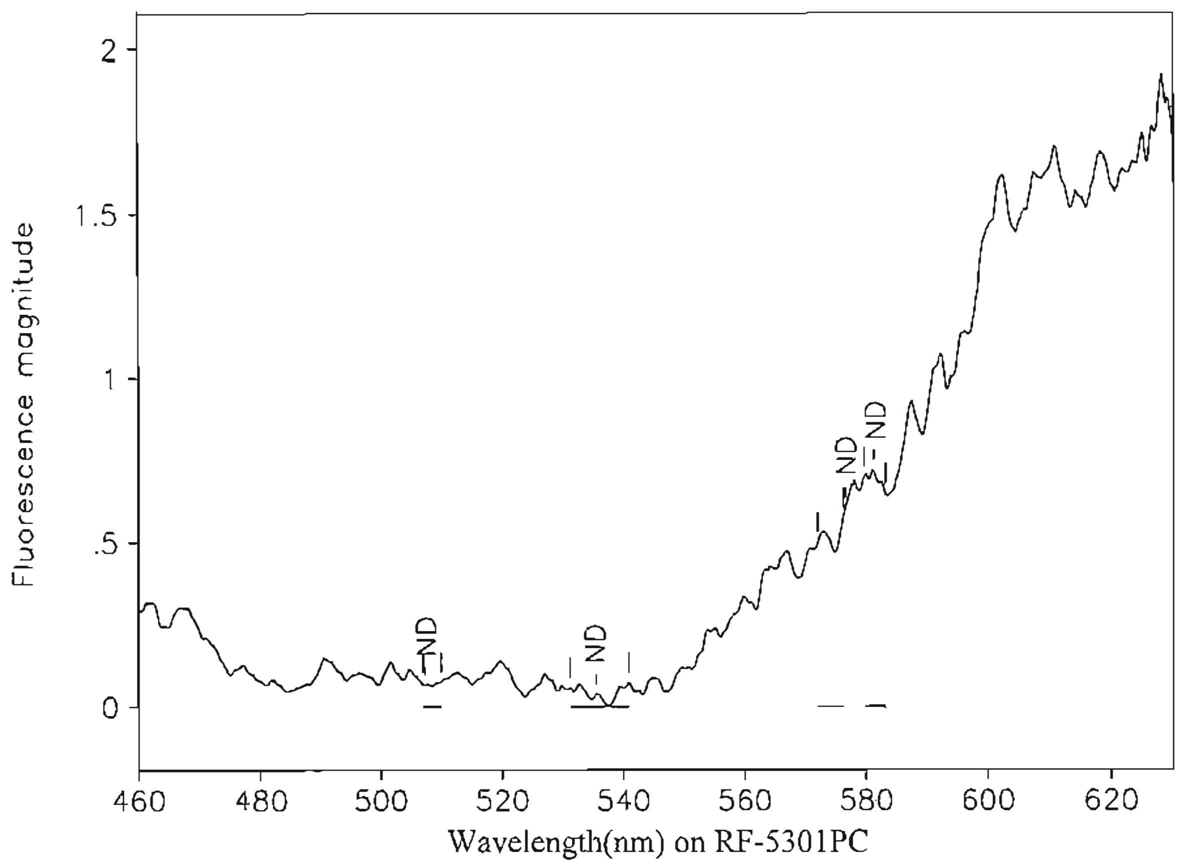
mw-1
mw-2
mw-3
mw-4
Lake Location

Please call Lydia Wing
407 740 6110 work
407 509 3429 cell

Thanks

all samples collected on 8/11/04 per Jda

Ozark Underground Laboratory



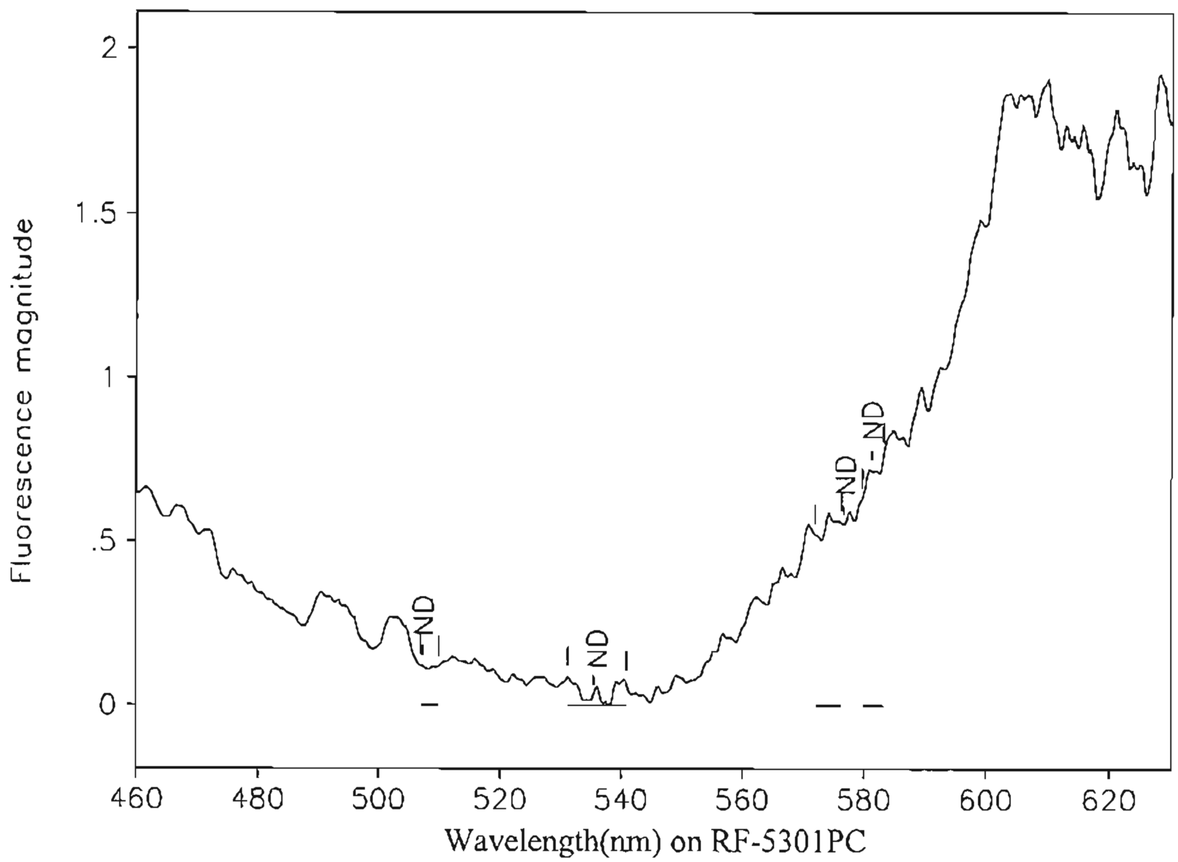
Station 1-WA: MW-1 - Water
OUL number: N4990 Analyzed: 08/17/04
Matrix: Water
Collected: 08/11/04

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
535.5	531.2	540.9	0.00	0.00	0.00	ND
576.7	572.0	576.3	0.00	0.00	0.00	ND
581.3	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



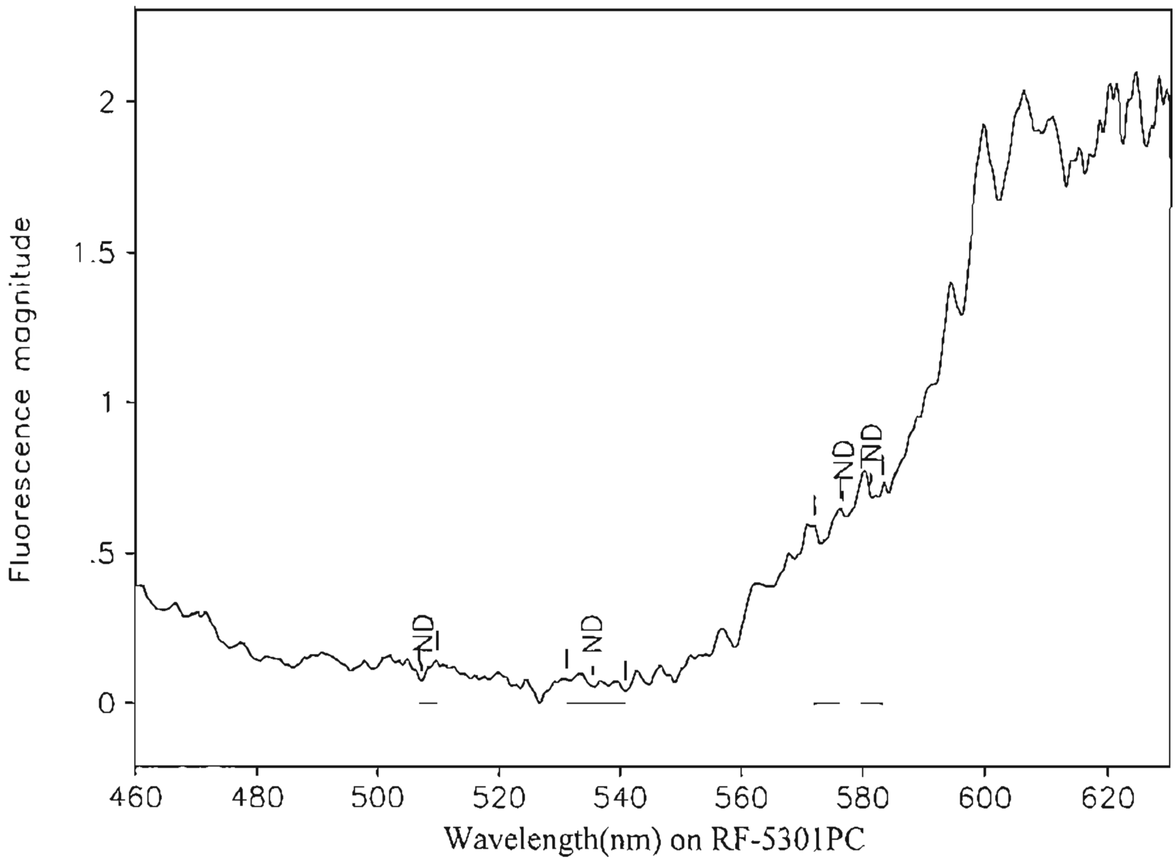
Station 2-WA: MW-2 - Water
OUL number: N4991 Analyzed: 08/17/04
Matrix: Water
Collected: 08/11/04

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
535.5	531.2	540.9	0.00	0.00	0.00	ND
576.7	572.0	576.3	0.00	0.00	0.00	ND
581.3	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



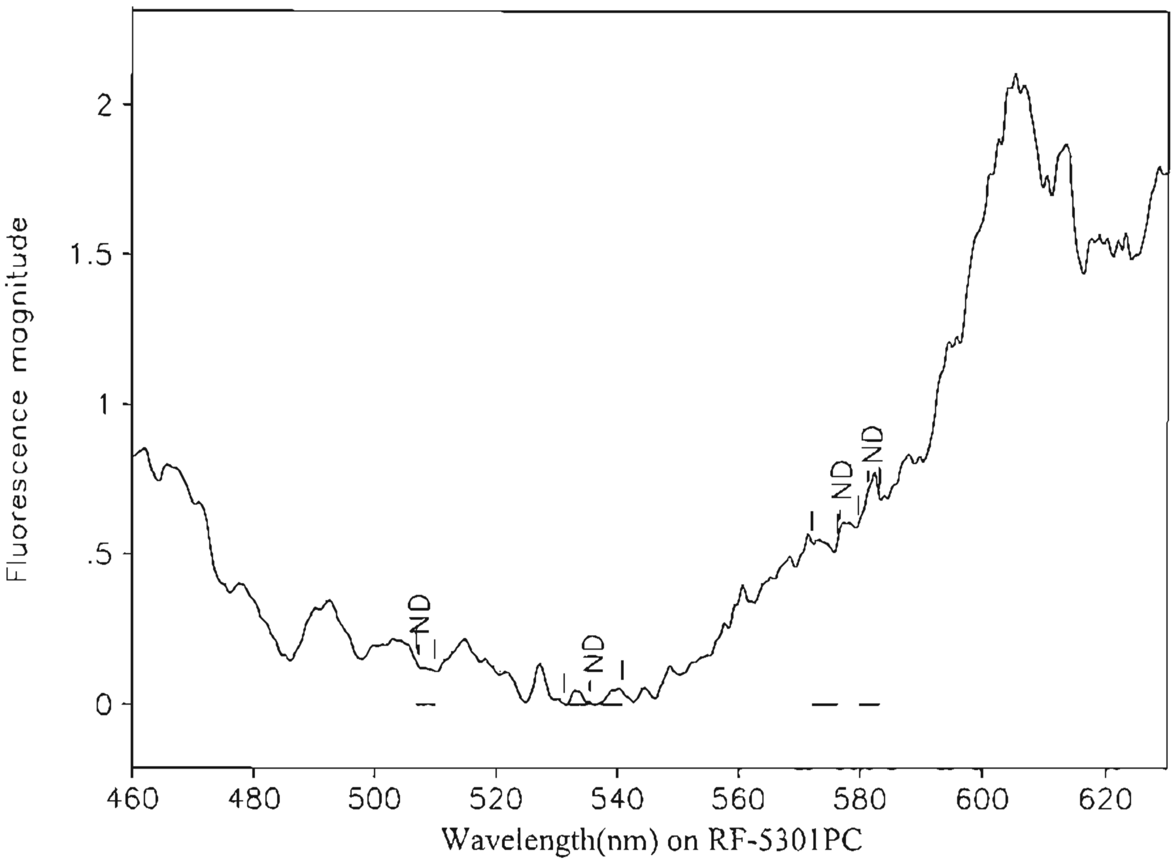
Station 3-WA: MW-3 - Water
OUL number: N4992 Analyzed: 08/17/04
Matrix: Water
Collected: 08/11/04

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
535.5	531.2	540.9	0.00	0.00	0.00	ND
576.7	572.0	576.3	0.00	0.00	0.00	ND
581.3	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



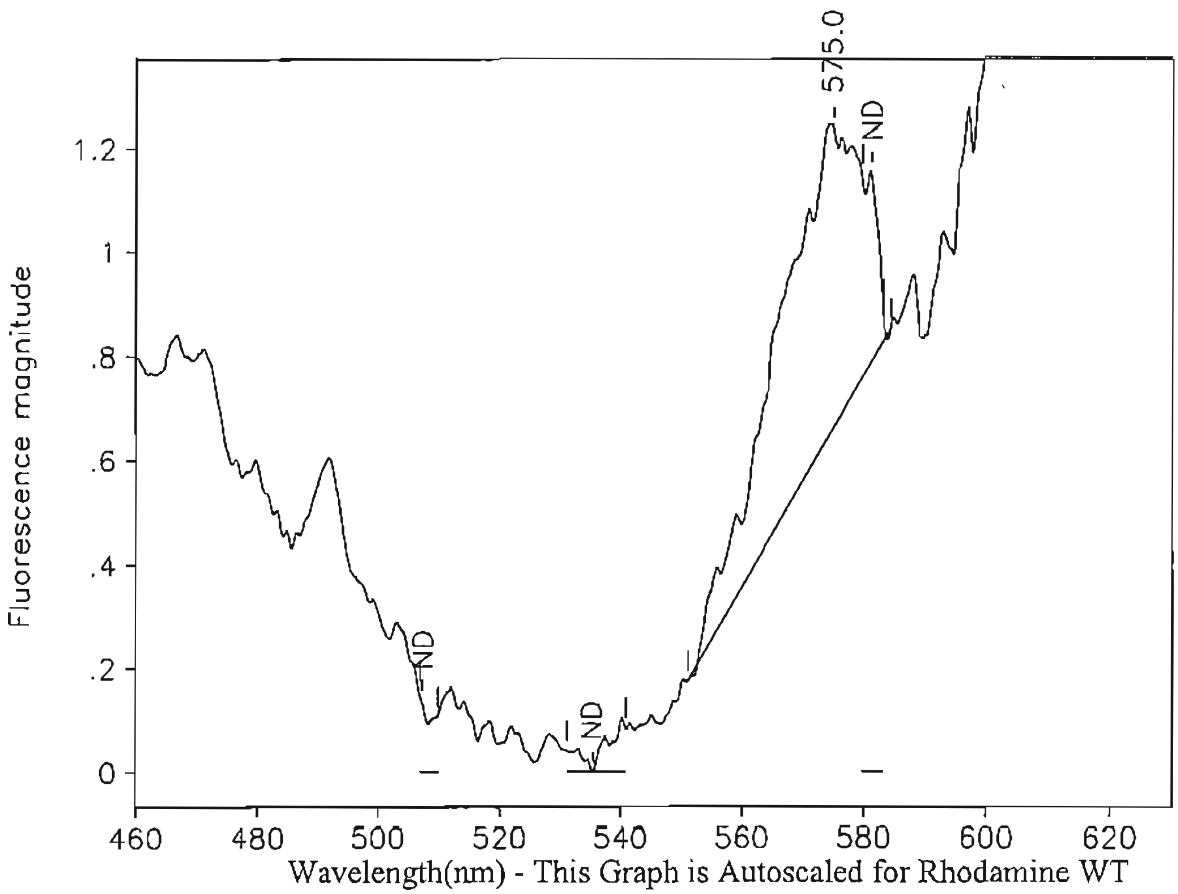
Station 4-WA: MW-4 - Water
OUL number: N4993 Analyzed: 08/17/04
Matrix: Water
Collected: 08/11/04

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
535.5	531.2	540.9	0.00	0.00	0.00	ND
576.7	572.0	576.3	0.00	0.00	0.00	ND
581.3	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station Lake: Lake
OUL number: N4994 Analyzed: 08/17/04
Matrix: Water
Collected: 08/11/04 0935

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
535.5	531.2	540.9	0.00	0.00	0.00	ND
575.0	551.2	584.4	0.58	9.83	0.06	0.116
581.3	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 31, 2004

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal samplers shipped August 24, 2004
Ozark Underground Laboratory (OUL) numbers N5174 through N5184.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on August 25, 2004. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures: 1. Table 1. Analysis results for charcoal samplers
2. Sample Collection Data Sheet
3. Sample analysis graphs

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Ozark Underground Laboratory for
CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: August 24, 2004
Date Samples Rec'd at OUL: August 25, 2004
Date Analyzed by OUL: August 26, 2004

Table 1. Results for background charcoal samplers analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	Station #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine		RWT	
			2004	2004	Peak	Conc.	Peak	Conc.	Peak	Conc.
N5174	Lake1	1.6' depth above Lake bottom	8/11 0900	8/24 0905	514.2 *	0.649	ND		569.8 *	9.23
N5175	Lake2	2.6' depth above Lake bottom	8/11 0900	8/24 0905	515.4 *	0.655	ND		570.4 *	7.96
N5176	1-215	MW-1 - 215 ft	8/11 1230	8/24 1135	511.8 *	0.443	ND		ND	
N5177	1-240	MW-1 - 240 ft	8/11 1230	8/24 1135	515.6 *	0.502	ND		ND	
N5178	2-135	MW-2 - 135 ft	8/11 1030	8/24 0755	513.4 *	0.387	ND		ND	
N5179	2-170	MW-2 - 170 ft	8/11 1030	8/24 0755	514.8 *	0.401	ND		ND	
N5180	Laboratory Control Charcoal Blank									
N5181	3-175	MW-3 - 175 ft	8/11 1345	8/24 1030	515.0 *	0.521	ND		ND	
N5182	3-210	MW-3 - 210 ft	8/11 1345	8/24 1030	515.2 *	0.468	ND		ND	
N5183	4-165	MW-4 - 165 ft	8/11 1130	8/24 0930	514.4 *	0.602	ND		ND	
N5184	4-200	MW-4 - 200 ft	8/11 1130	8/24 0930	515.8 *	0.709	ND		ND	

FOOTNOTES:

ND = No dye detected

* = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were dye for background purposes.

OZARK UNDERGRO D LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** One **Samples Collected By:** Mike Burns
Samples Shipped By: Nodarse & Associates **Samples Received By:** M. Ridinger - OUL
Date Samples Shipped: 8/24/04 **Date Samples Received:** 8/25/04 **Time Samples Received:** 12:50 **Return Cooler? Yes** X **No**
Bill to: CH2MHill **Send Results to:** Al Aikens with CH2MHill
Analyze for: Fluorescein X Eosine X Rhodamine WT X Other **Ship cooler to:** Ozark Underground Labs

OUL use only		Please indicate stations where dye was visible in the field for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
0		Lake	Lake (Water sample)	8/11/04		8/24/04	0910	1
1	N5174	Lake 1	Carbon at 1.6' depth above Lake bottom		0900		0905	0
1	N5175	Lake 2	Carbpn at 2.6' depth above Lake bottom		0900		0905	0
1	N5176	1-215	MW-1 – 215 ft		1230		1135	0
1	N5177	1-240	MW-1 – 240 ft		1230		1135	0
0		1-WA	MW-1 – Water Sample				1201	1
1	N5178	2-135	MW-2 – 135 ft		1030		0755	0
1	N5179	2-170	MW-2 – 170 ft		1030		0755	0
0		2-WA	MW-2 – Water Sample				0833	1
1	N5181	3-175	MW-3 – 175 ft		1345		1030	0
1	N5182	3-210	MW-3 – 210 ft		1345		1030	0
0		3-WA	MW-3 – Water Sample				1058	1
1	N5183	4-165	MW-4 – 165 ft		1130		0930	0
1	N5184	4-200	MW-4 – 200 ft		1130		0930	0
0		4-WA	MW-4 – Water Sample				0957	1

COMMENTS: Please note that the water sample collected from the Lake may be contaminated with raw sewage from a sewage line break on 8/21/04!!!!!!

This sheet filled out by OUL staff? Yes **No** ✓ **Charts for samples on this page proofed by OUL:**

Charcoal Blank N5180

Project 621 Analyzed 8/26/04 by MR

Page ____ of ____

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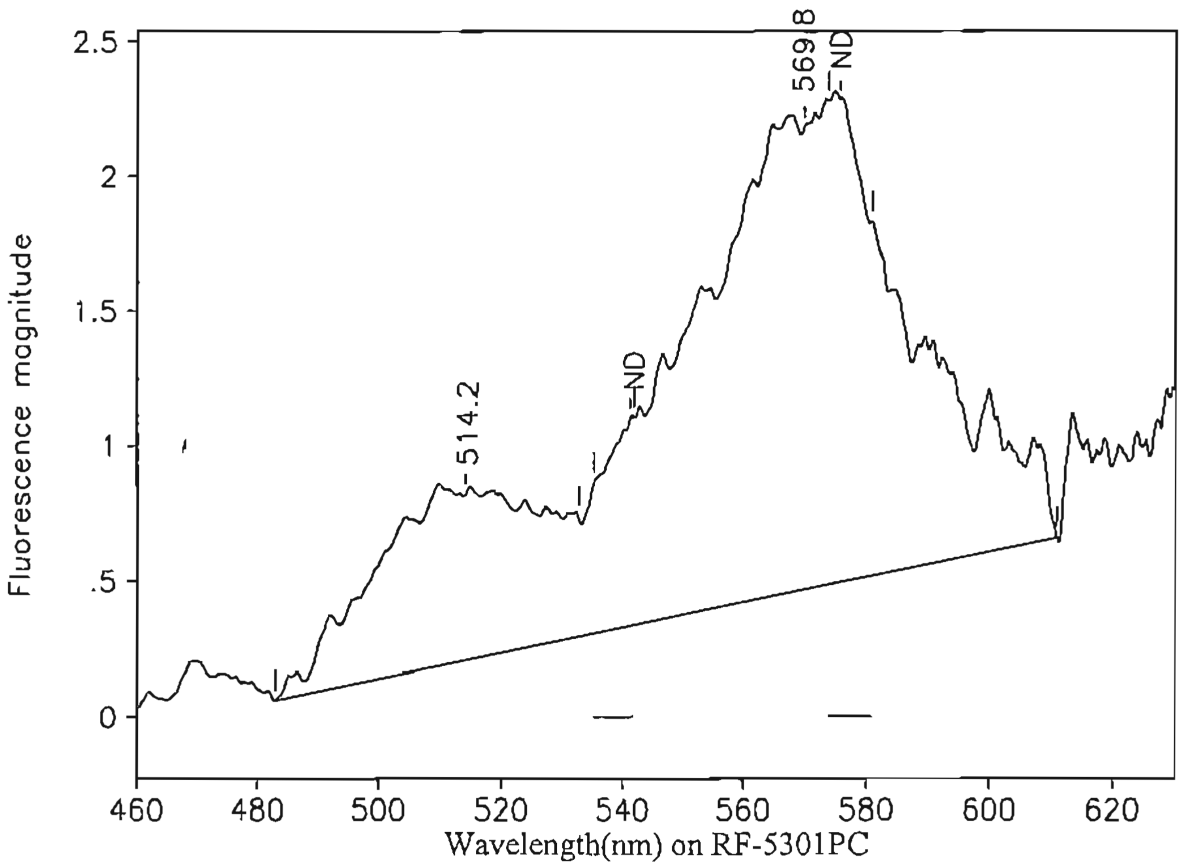
18/1 Rec'd by OUL

Ozark Underground Laboratory



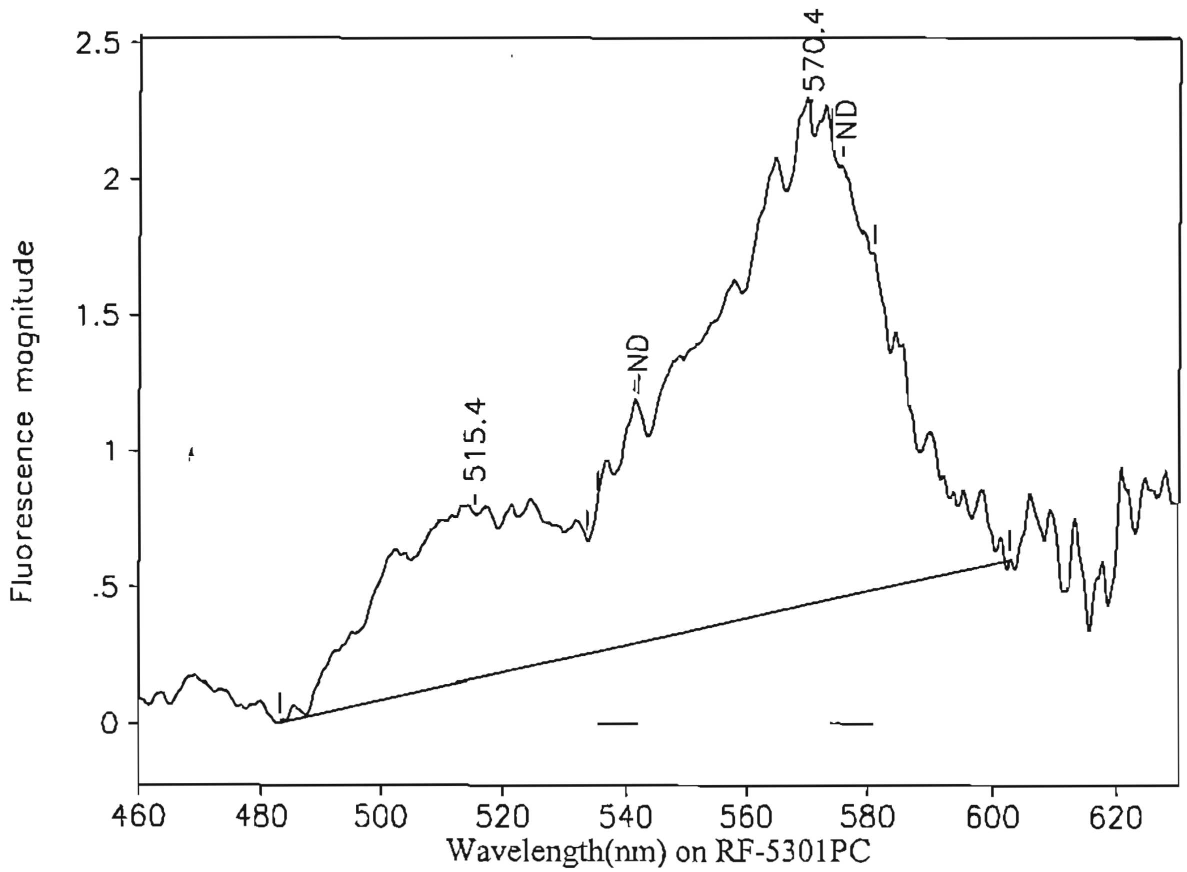
Station Lake1: 1.6' depth above Lake bottom
OUL number: N5174 Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 0900 Collected: 08/24/04 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	483.0	532.7	0.62	21.42	0.03	0.649
541.1	535.2	541.8	0.00	0.00	0.00	ND
569.8	532.7	611.0	1.71	78.06	0.02	9.23
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



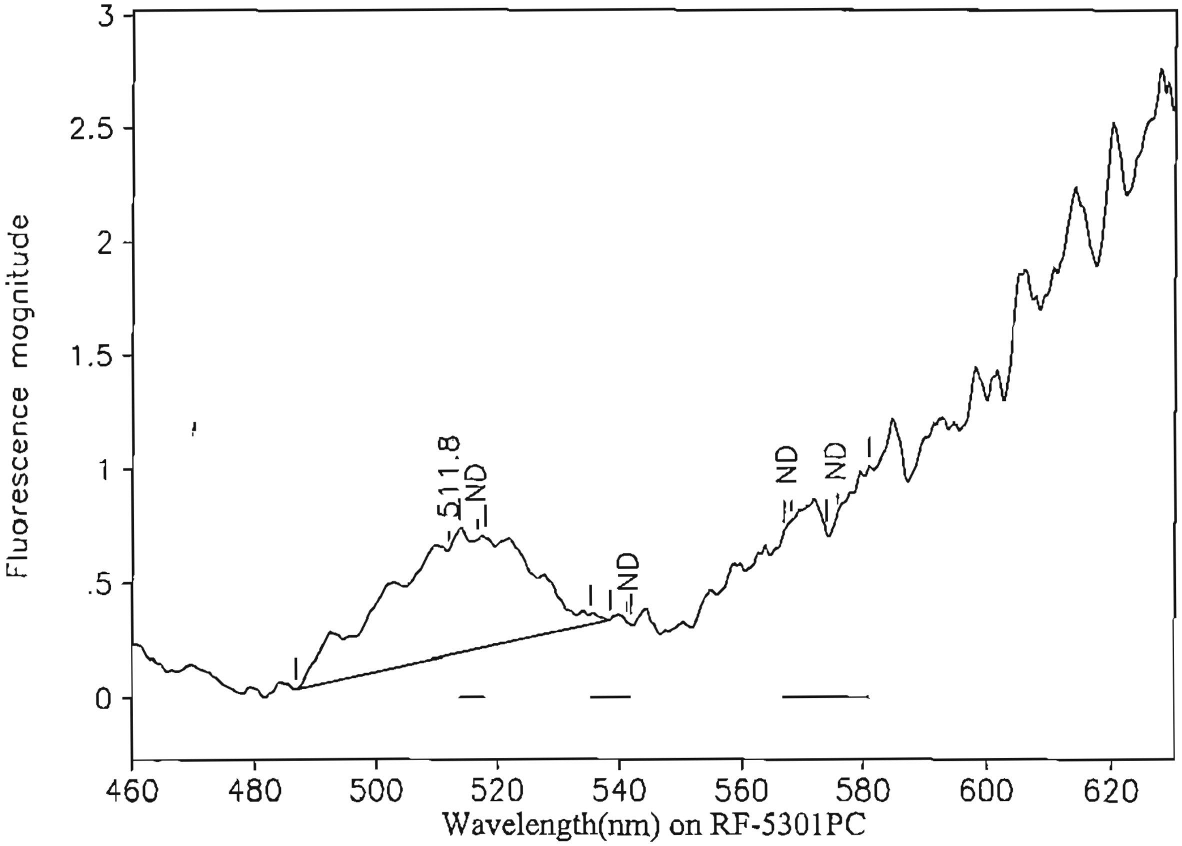
Station Lake2: 2.6' depth above Lake bottom
OUL number: N5175 Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 0900 Collected: 08/24/04 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	483.0	533.5	0.60	21.60	0.03	0.655 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
570.4	533.5	602.6	1.78	67.31	0.03	7.96 *
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-215: MW-1 - 215 ft
OUL number: N5176
Matrix: Elutant
Placed: 08/11/04 1230

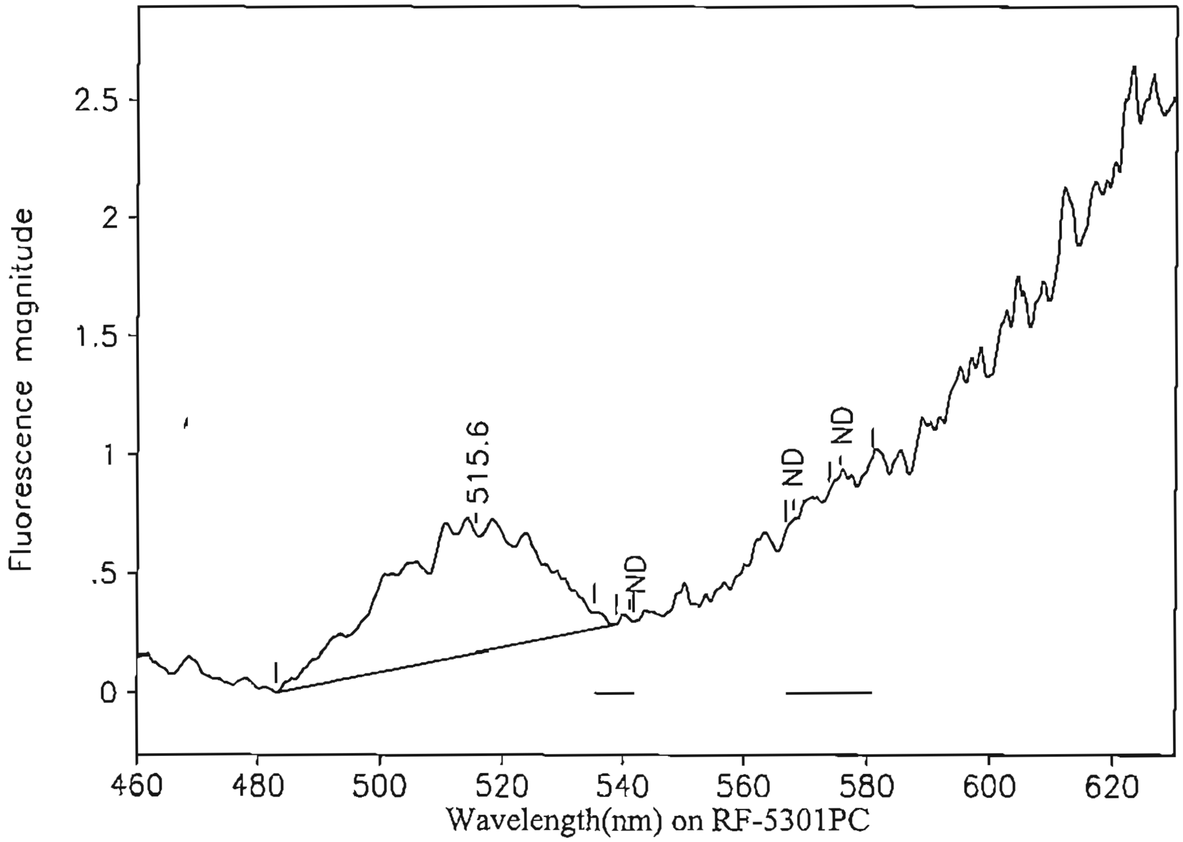
Analyzed: 08/26/04

Collected: 08/24/04 1135

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
511.8	486.6	538.4	0.46	14.61	0.03	0.443 *

Ozark Underground Laboratory



Station 1-240: MW-1 - 240 ft
OUL number: N5177
Matrix: Elutant
Placed: 08/11/04 1230

Analyzed: 08/26/04

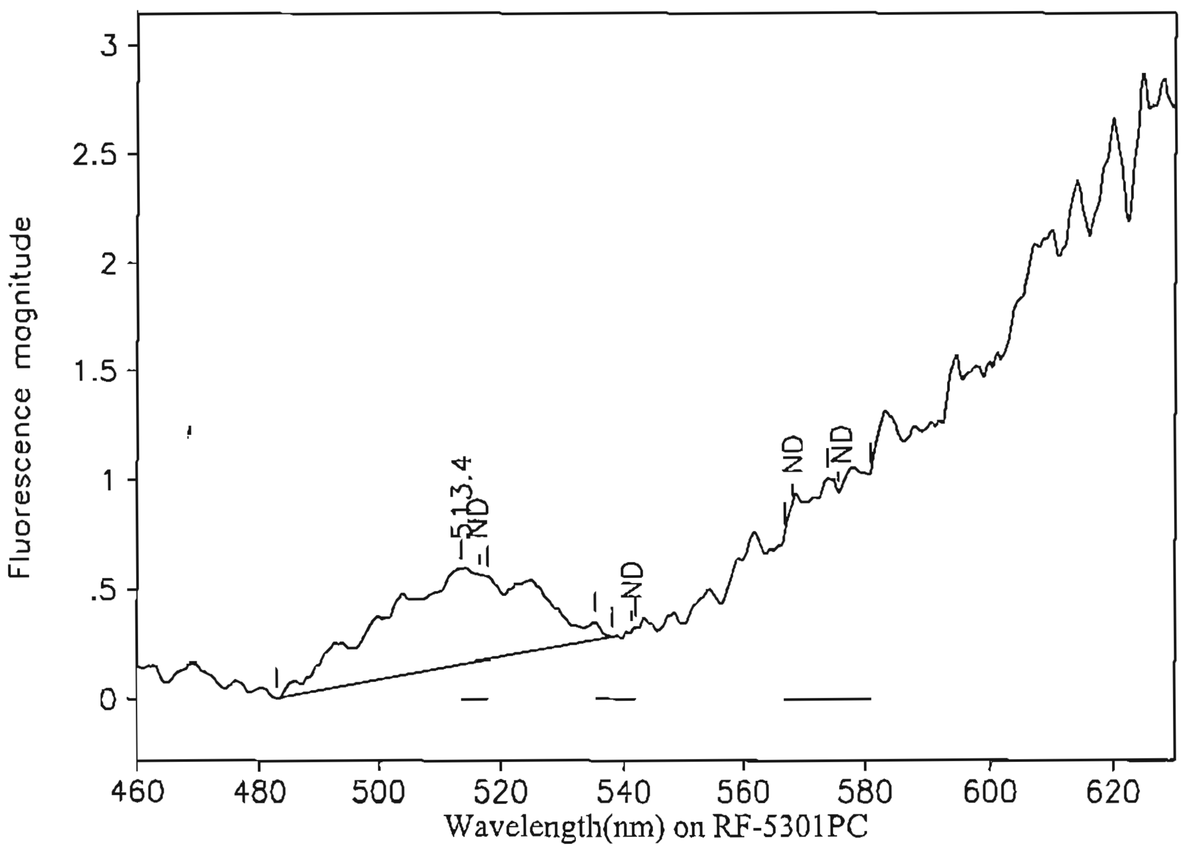
Collected: 08/24/04 1135

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	483.0	538.8	0.50	16.56	0.03	0.502 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

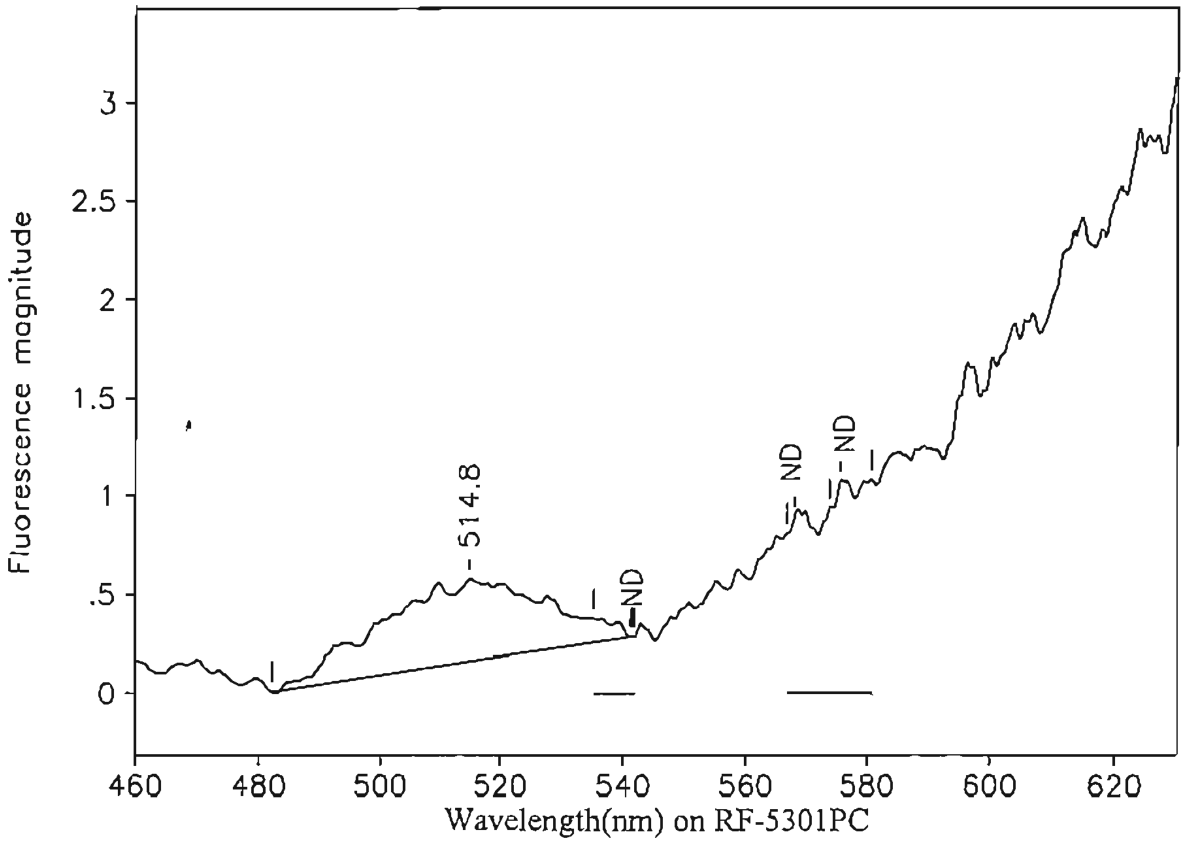


Station 2-135: MW-2 - 135 ft
OUL number: N5178 Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 1030 Collected: 08/24/04 0755

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
513.4	482.8	538.0	0.44	12.78	0.03	0.387 *

Ozark Underground Laboratory



Station 2-170: MW-2 - 170 ft
OUL number: N5179
Matrix: Elutant
Placed: 08/11/04 1030

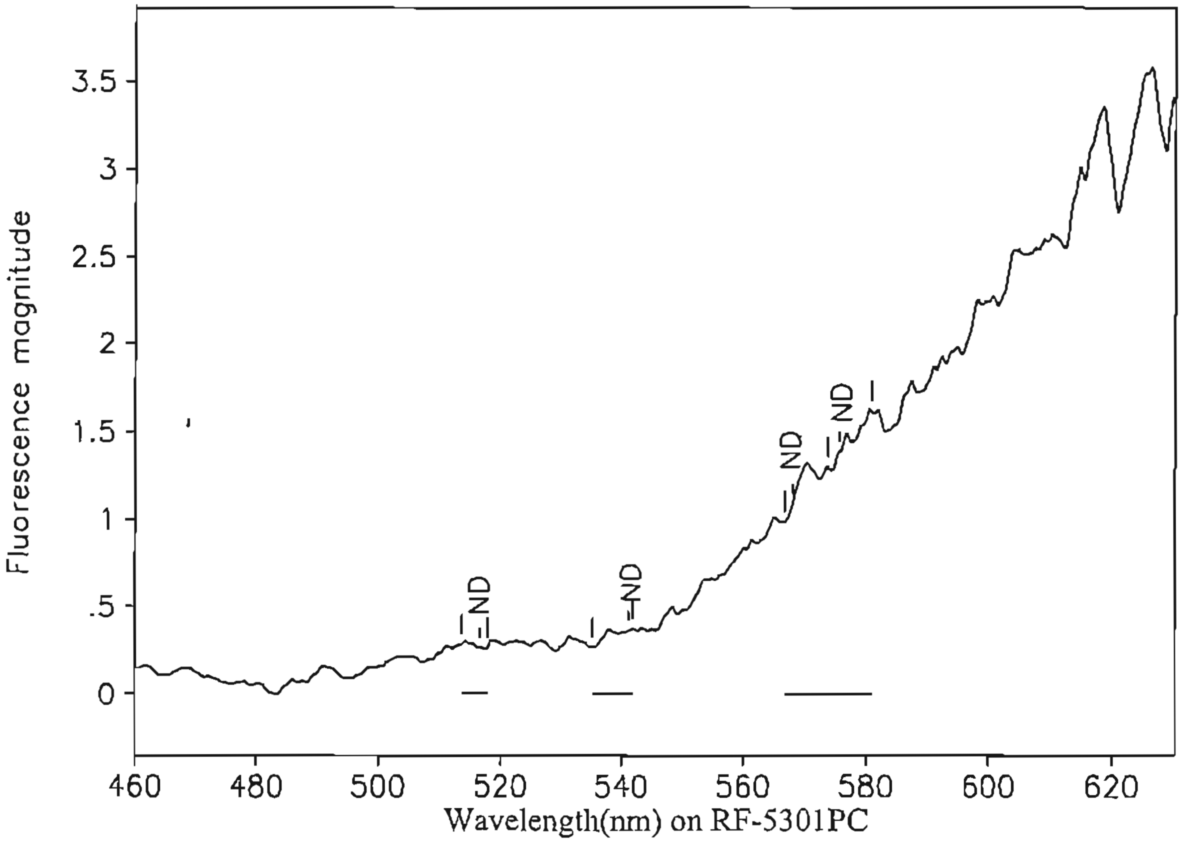
Analyzed: 08/26/04
Collected: 08/24/04 0755

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	482.2	541.4	0.42	13.22	0.03	0.401 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2: Blank
OUL number: N5180
Matrix: Elutant
Placed: 08/26/04 1550

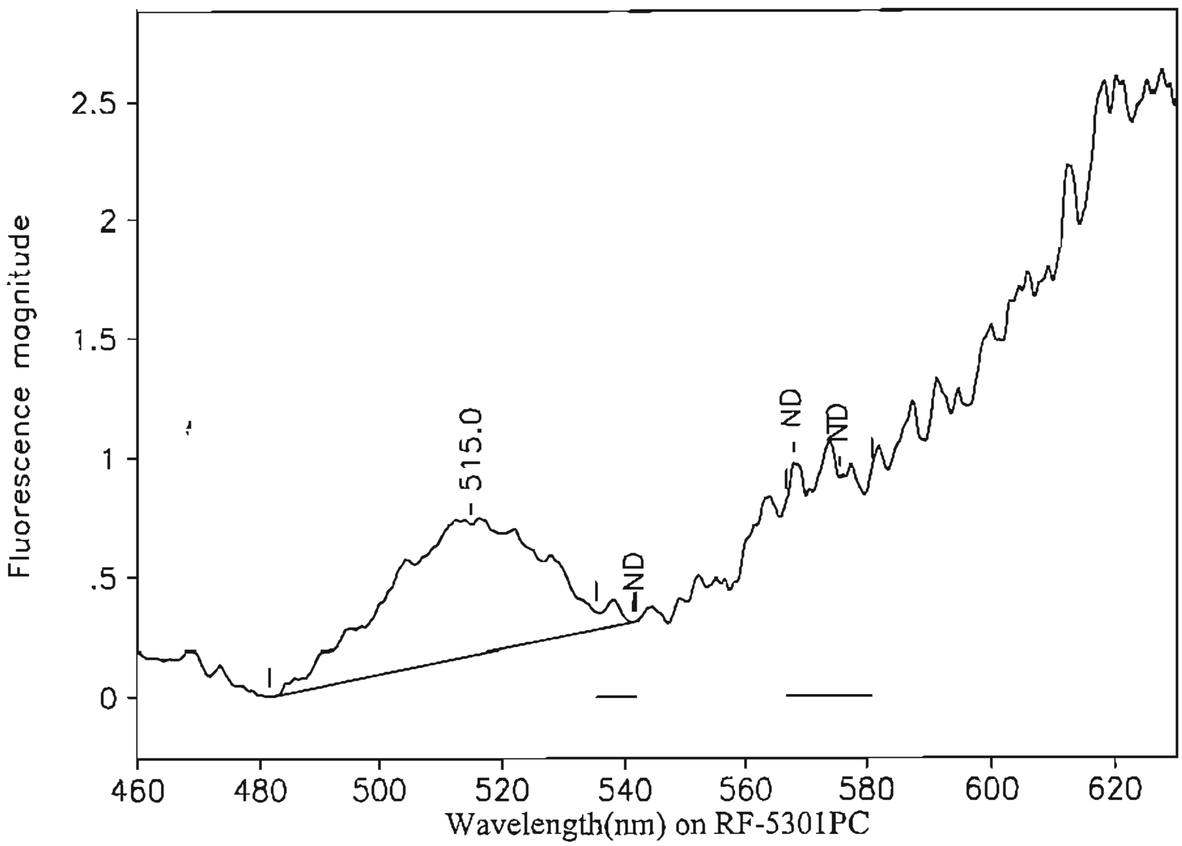
Analyzed: 08/26/04
Collected: 08/26/04 1550

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



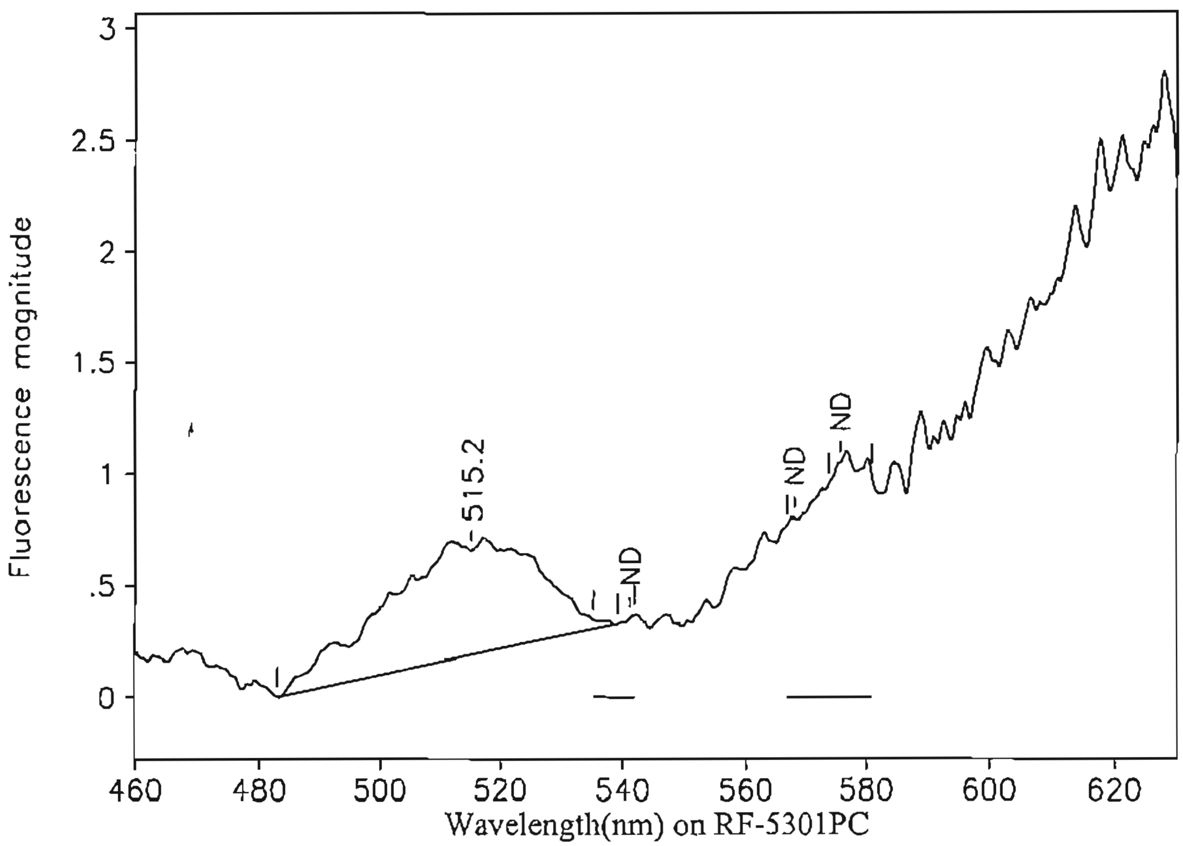
Station 3-175: MW-3 - 175 ft
OUL number: N5181 — Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 1345 — Collected: 08/24/04 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	481.6	541.4	0.55	17.21	0.03	0.521 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



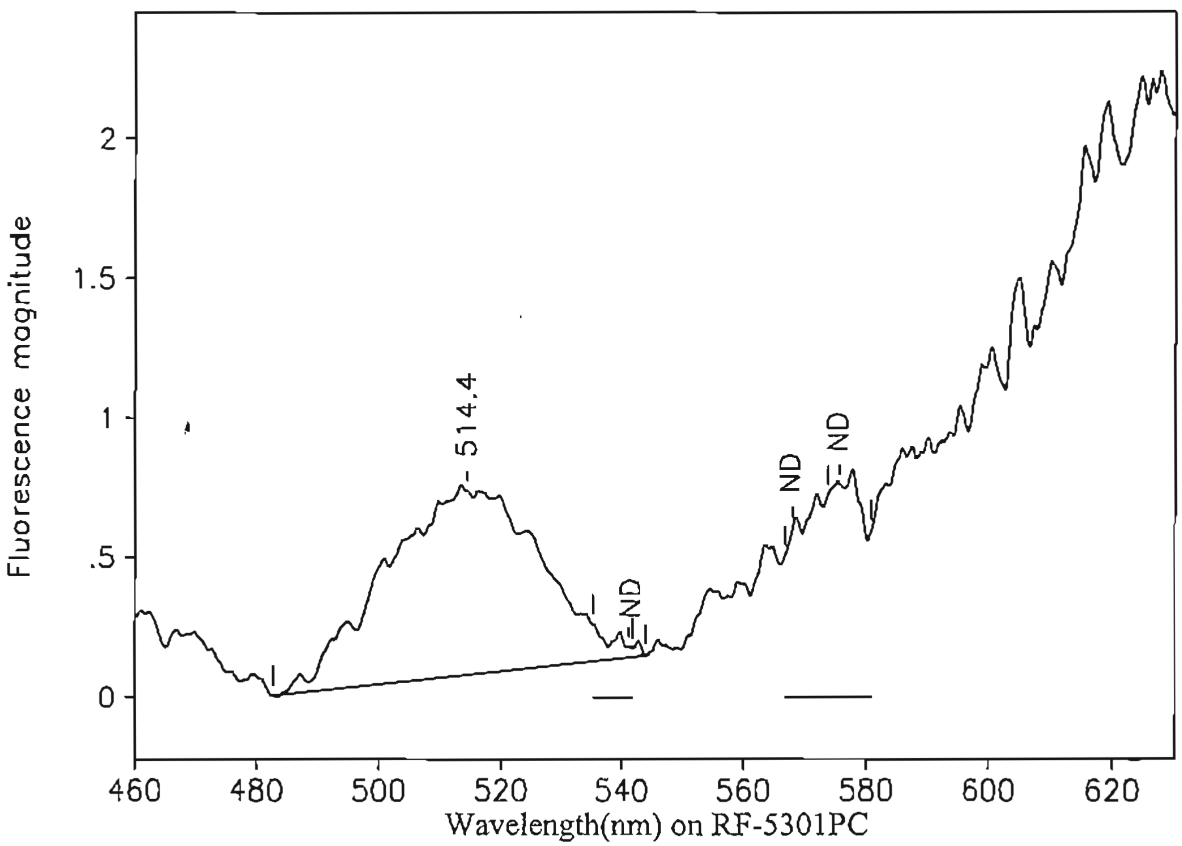
Station 3-210: MW-3 - 210 ft
OUL number: N5182 — Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 1345 — Collected: 08/24/04 1030

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	483.0	539.2	0.47	15.44	0.03	0.468 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



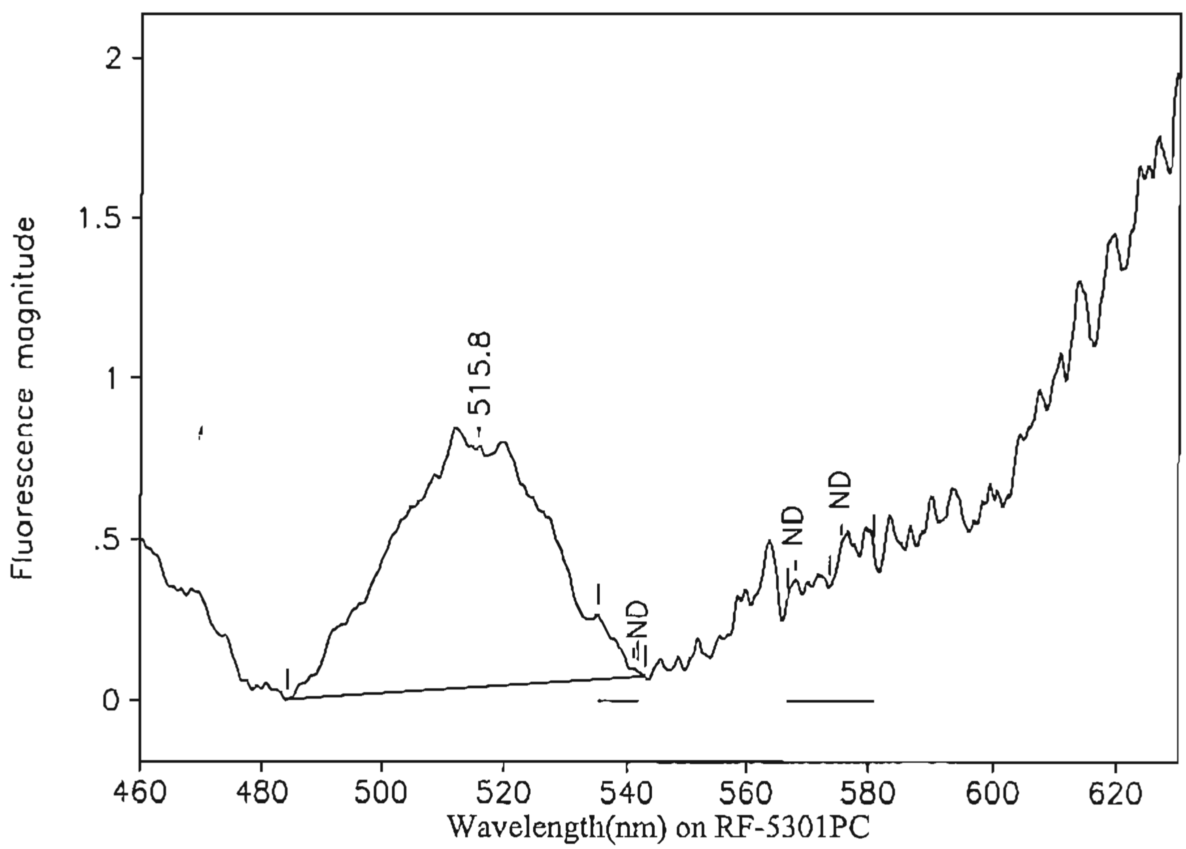
Station 4-165: MW-4 - 165 ft
OUL number: N5183 Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 1130 Collected: 08/24/04 0930

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.4	482.8	544.0	0.66	19.85	0.03	0.602 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-200: MW-4 - 200 ft
OUL number: N5184 Analyzed: 08/26/04
Matrix: Elutant
Placed: 08/11/04 1130 Collected: 08/24/04 0930

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.2	543.0	0.75	23.41	0.03	0.709
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

September 14, 2004

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal samplers shipped September 7, 2004
Ozark Underground Laboratory (OUL) numbers N5389 through N5398.

Dear Mr. Aikens:

We have completed analysis of the charcoal samplers received by the OUL on September 8, 2004. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal samplers
2. Sample Collection Data Sheet
3. Discrepancy sheet
4. Sample analysis graphs

f:\docs\coa\LakeOrienta03.doc

Ozark Underground Laboratory for
CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: September 7, 2004
Date Samples Rec'd at OUL: September 8, 2004
Date Analyzed by OUL: September 10, 2004

Table 1. Results for background charcoal samplers analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N5389	1-215	MW-1 - 215 ft	8/24 1230	9/7 1150	515.4 *	0.550	ND		ND	
N5390	1-240	MW-1 - 240 ft	8/24 1230	9/7 1151	516.2 *	0.621	ND		ND	
N5391	2-135	MW-2 - 135 ft	8/24 0820	9/7 0936	514.8 *	0.447	ND		ND	
N5392	2-170	MW-2 - 170 ft	8/24 0820	9/7 0937	516.4 *	0.410	ND		ND	
N5393	3-175	MW-3 - 175 ft	8/24 1105	9/7 1310	517.0 *	0.807	ND		ND	
N5394	3-210	MW-3 - 210 ft	8/24 1105	9/7 1311	513.8 *	0.385	ND		ND	
N5395	4-165	MW-4 - 165 ft	8/24 1005	9/7 1052	513.8 *	0.797	ND		ND	
N5396	4-200	MW-4 - 200 ft	8/24 1005	9/7 1053	515.4 *	0.949	ND		ND	
N5397	Lake1	1.6' depth above Lake bottom	8/24 NT	9/7 1032	514.4 *	0.811	ND		569.8 *	10.3
N5398	Lake2	3.4' depth above Lake bottom	8/24 NT	9/7 1032	514.0 *	0.599	ND		571.3 *	8.07

FOOTNOTES:

ND = No dye detected

NT = No time given

* = A fluorescence peak is present that does not meet all the criteria for a positive dye result but has been calculated as though it were dye for background purposes.

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 6 Samples Collected By: Mike Burns

Samples Shipped By: Nodarse & Assoc. Samples Received By: J. Stearman

Date Samples Shipped: 9/7/04 Date Samples Received: 9/8/04 Time Samples Received: 11:35 Return Cooler? Yes ✓ No ___ and freeze packs

Bill to: ______ Send Results to: ______

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ______ Ship cooler to: Nodarse & Assoc. 1675 Lee Rd. Winter Park, FL 32789

Please indicate stations where dye was visible in the field

for field technician use - use black ink only

# CHAR REC'D (OUL use only)	LAB NUMBER Charcoal (OUL use only)	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D (OUL use only)
1	N5389	1-215	MW-1 – 215 ft	8/24/04	1230	9/7/04	1150	0
1	N5390	1-240	MW-1 – 240 ft		1230		1151	0
0		1-WA	MW-1 – Water Sample				1223	1
1	N5391	2-135	MW-2 – 135 ft		0820		0936	0
1	N5392	2-170	MW-2 – 170 ft		0820		0937	0
0		2-WA	MW-2 – Water Sample				1010	1
1	N5393	3-175	MW-3 – 175 ft		1105		1310	0
1	N5394	3-210	MW-3 – 210 ft		1105		1311	0
0		3-WA	MW-3 – Water Sample				1336	1
1	N5395	4-165	MW-4 – 165 ft		1005		1052	0
1	N5396	4-200	MW-4 – 200 ft		105		1053	0
0		4-WA	MW-4 – Water Sample				1128	1
1	N5397	Lake 1	Lake Sample 1.6' off Bottom				1032	0
1	N5398	Lake 2	Lake Sample 3.4' off bottom				1032	0
0		Lake	Lake Sample Water				1035	1

COMMENTS: ______

This sheet filled out by OUL staff? Yes ______ No ✓ Charts for samples on this page proofed by OUL: mma

607

Project 621 analyzed 9/10/04 by [illegible] Page 1 of 1 (OUL)

OZARK UNDERGRO_ _ND LABORATORY, INC.

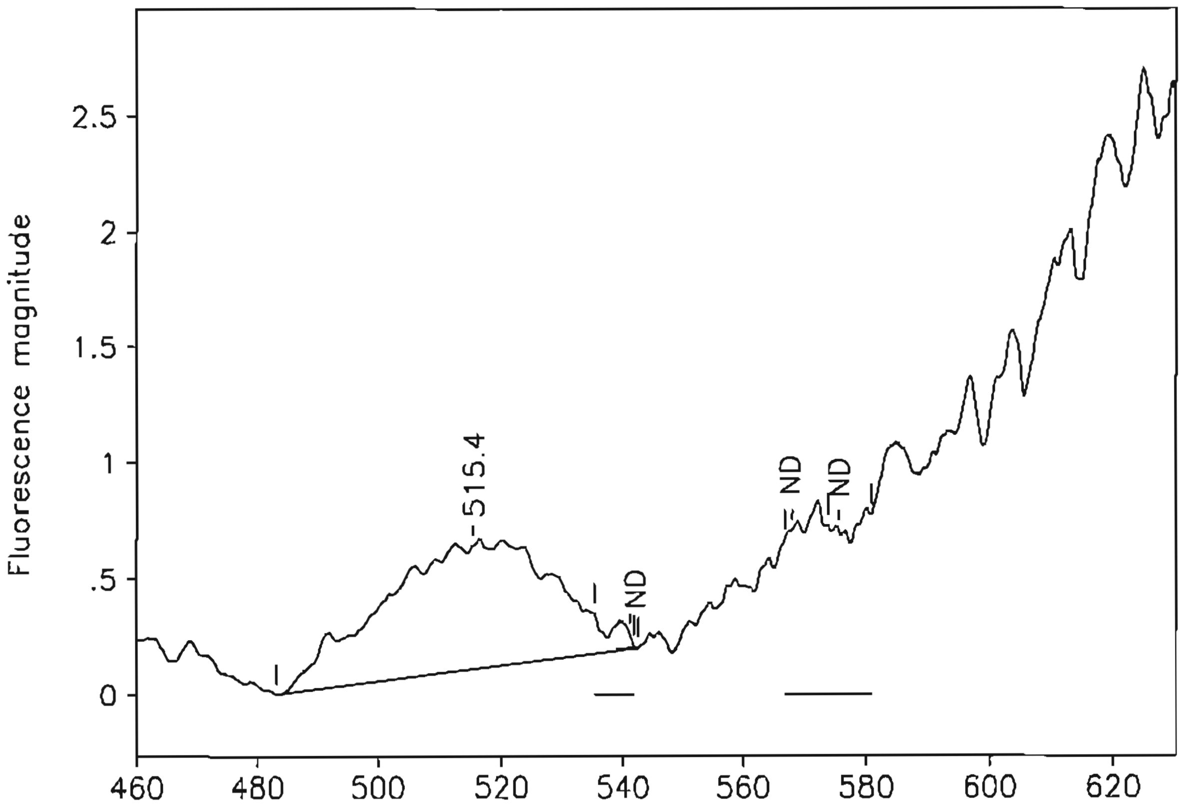
DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: CH2M Hill Lake Orienta   Date Rec'd by OUL: 9/8/04   Wk # ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
N5394	3-210	MW-3 - 210 Ft	9/7	whirl-pak has depth as 275'	J. Arnold said to use station as it appears on COC and he will check w/ M. Burns
N5396	4-200	MW4 - 200 Ft	9/7	whirl-pak has depth as 285'	Confirmed w/ Lydia Wing 9/14/04 AA (use COC data)

Comments:

Ozark Underground Laboratory



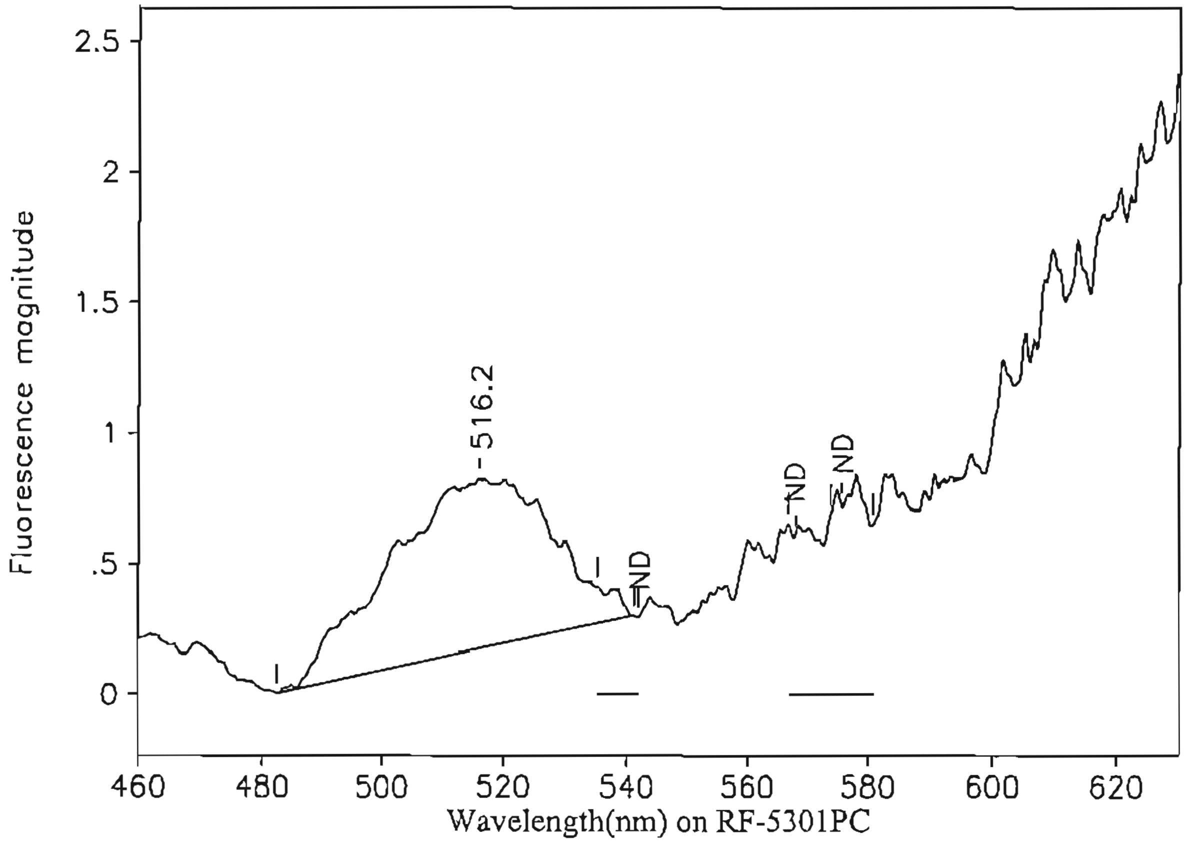
Station 1-215: MW-1 - 215 ft
OUL number: N5389 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 1230 Collected: 09/07/04 1150

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	483.2	542.6	0.53	18.13	0.03	0.550 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-240: MW-1 - 240 ft
OUL number: N5390
Matrix: Elutant
Placed: 08/24/04 1230

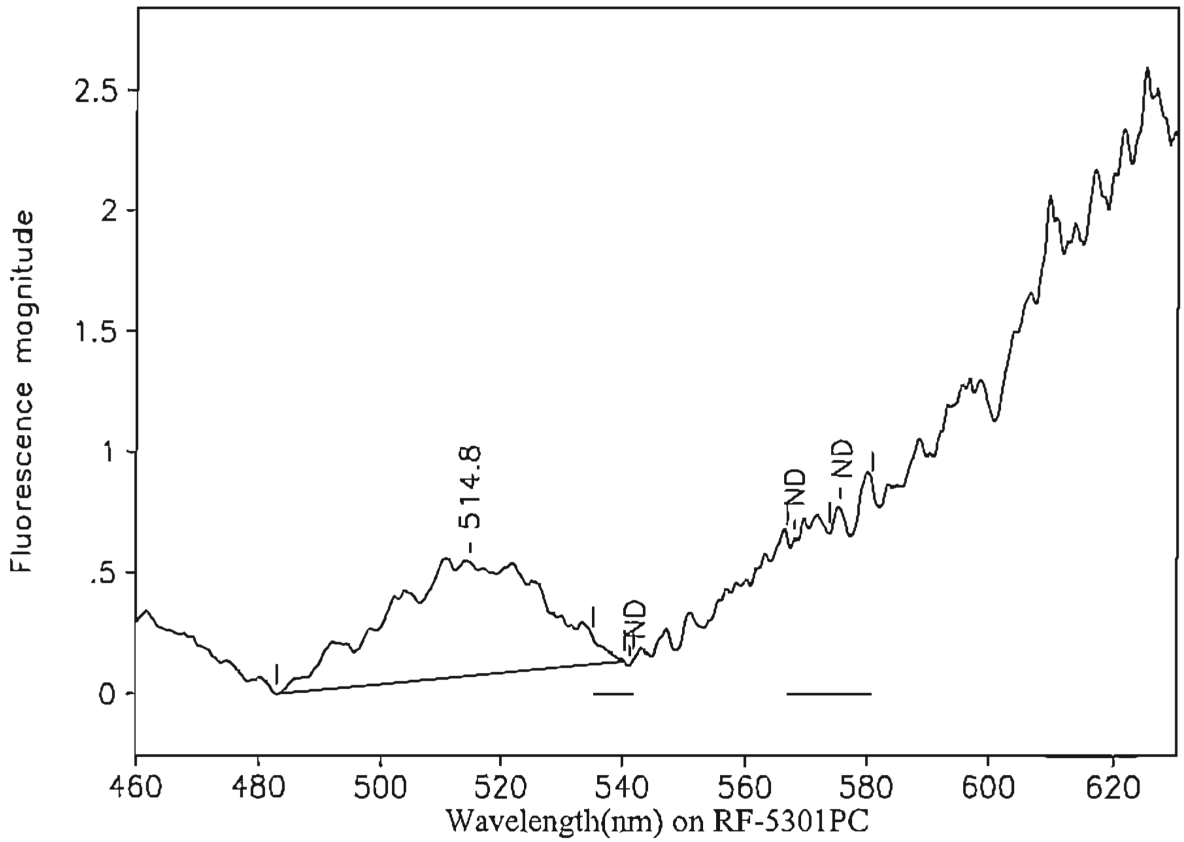
Analyzed: 09/10/04
Collected: 09/07/04 1151

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	482.4	541.2	0.65	20.46	0.03	0.621 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



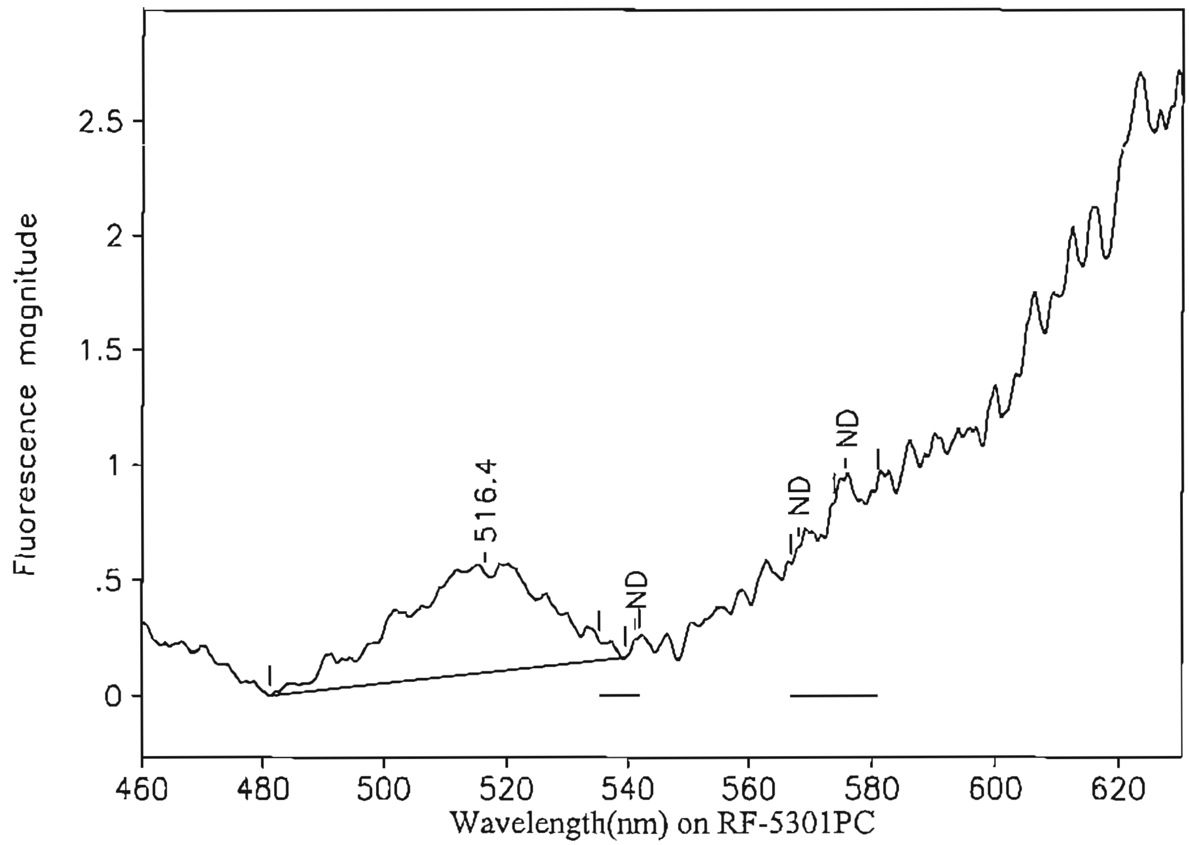
Station 2-135: MW-2 - 135 ft
OUL number: N5391 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 0820 Collected: 09/07/04 0936

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	483.0	540.4	0.47	14.74	0.03	0.447 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



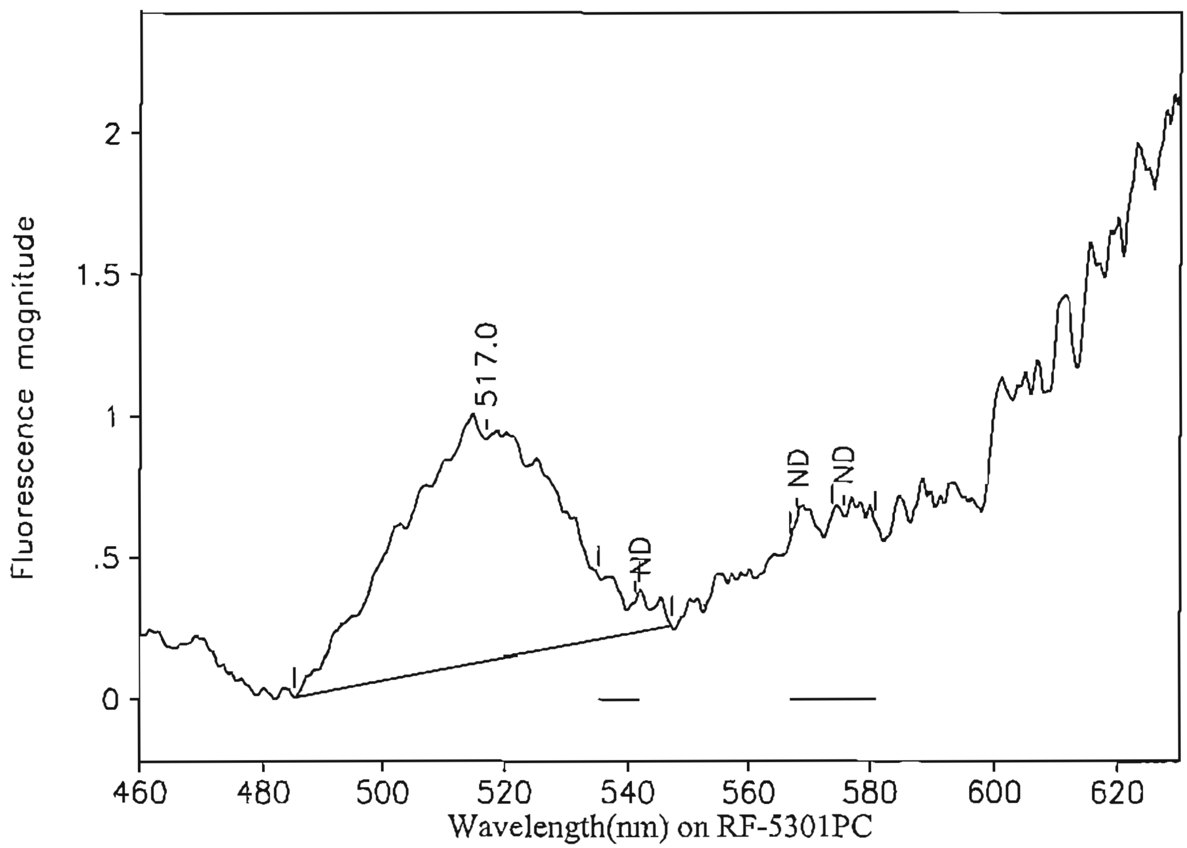
Station 2-170: MW-2 - 170 ft
OUL number: N5392 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 0820 Collected: 09/07/04 0937

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	481.2	539.6	0.43	13.53	0.03	0.410 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



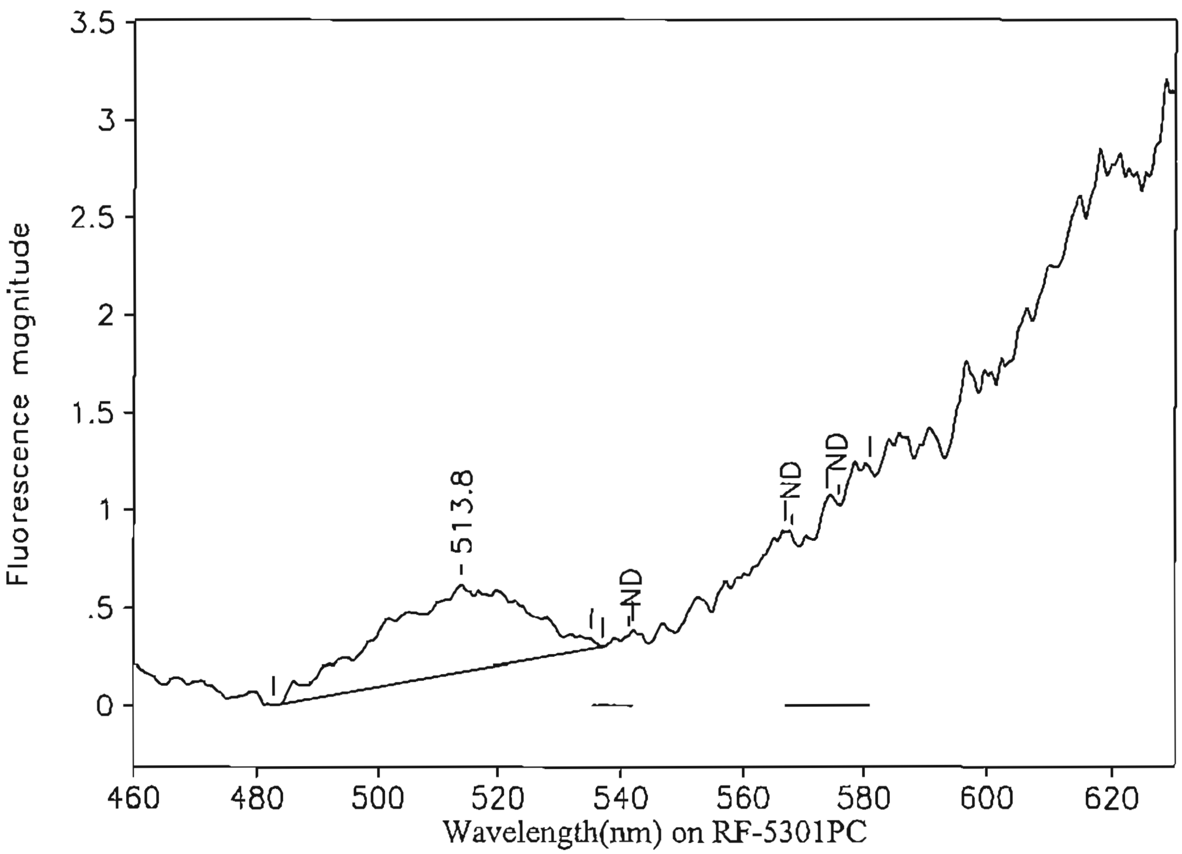
Station 3-175: MW-3 - 175 ft
OUL number: N5393
Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 1105
Collected: 09/07/04 1310

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	485.2	547.2	0.78	26.59	0.03	0.807 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



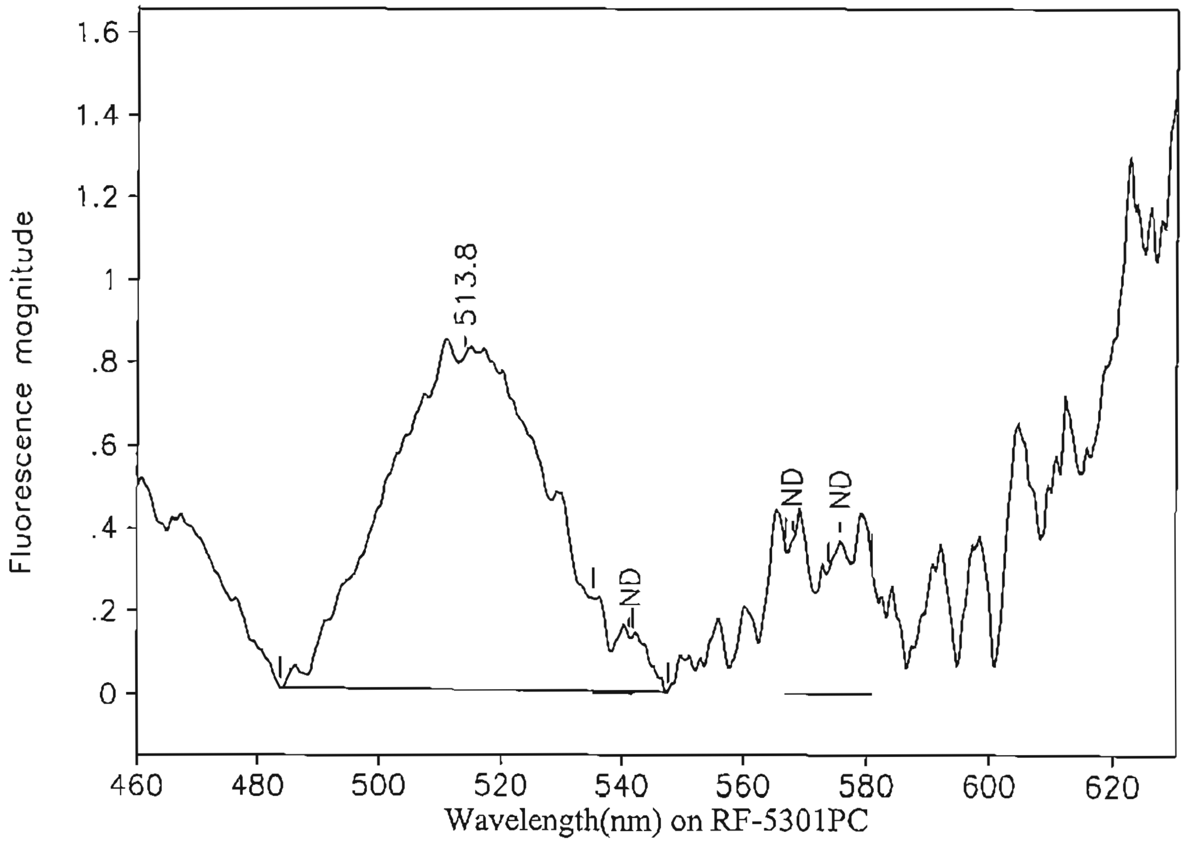
Station 3-210: MW-3 - 210 ft
OUL number: N5394 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 1105 Collected: 09/07/04 1311

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
513.8	482.6	537.0	0.45	12.68	0.04	0.385 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-165: MW-4 - 165 ft
OUL number: N5395
Matrix: Elutant
Placed: 08/24/04 1005

Analyzed: 09/10/04

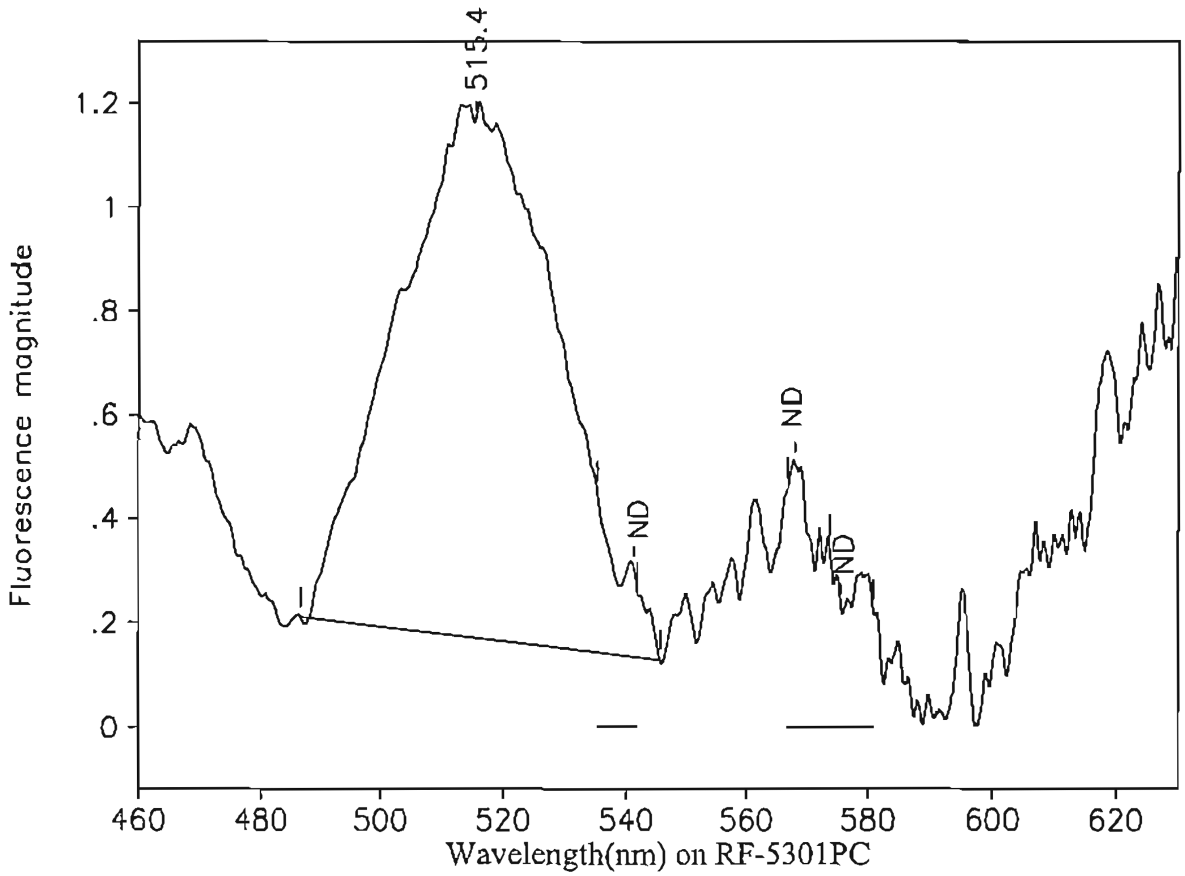
Collected: 09/07/04 1052

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
513.8	483.8	547.6	0.80	26.26	0.03	0.797 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-200: MW-4 - 200 ft
OUL number: N5396
Matrix: Elutant
Placed: 08/24/04 1005

Analyzed: 09/10/04

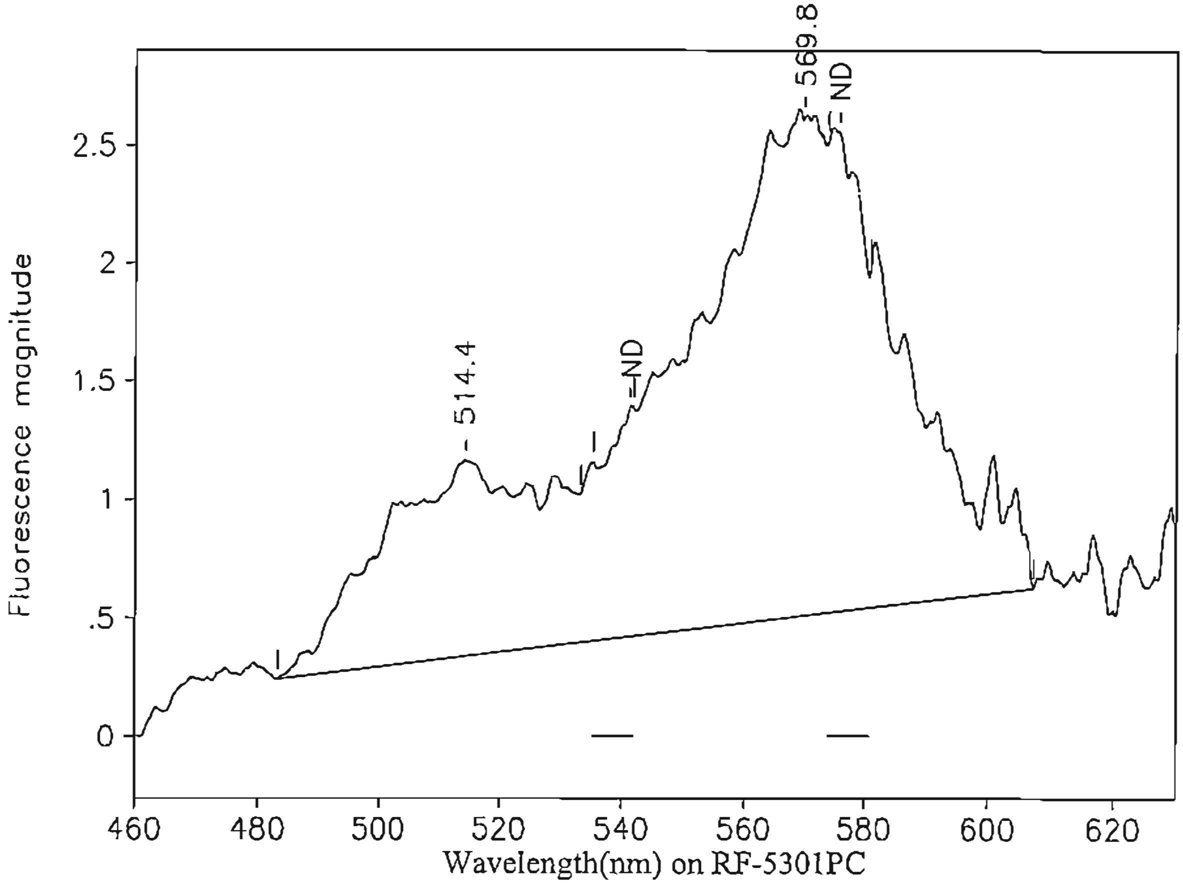
Collected: 09/07/04 1053

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	486.6	545.6	1.00	31.30	0.03	0.949 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
568.0	566.8	573.8	0.00	0.00	0.00	ND
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



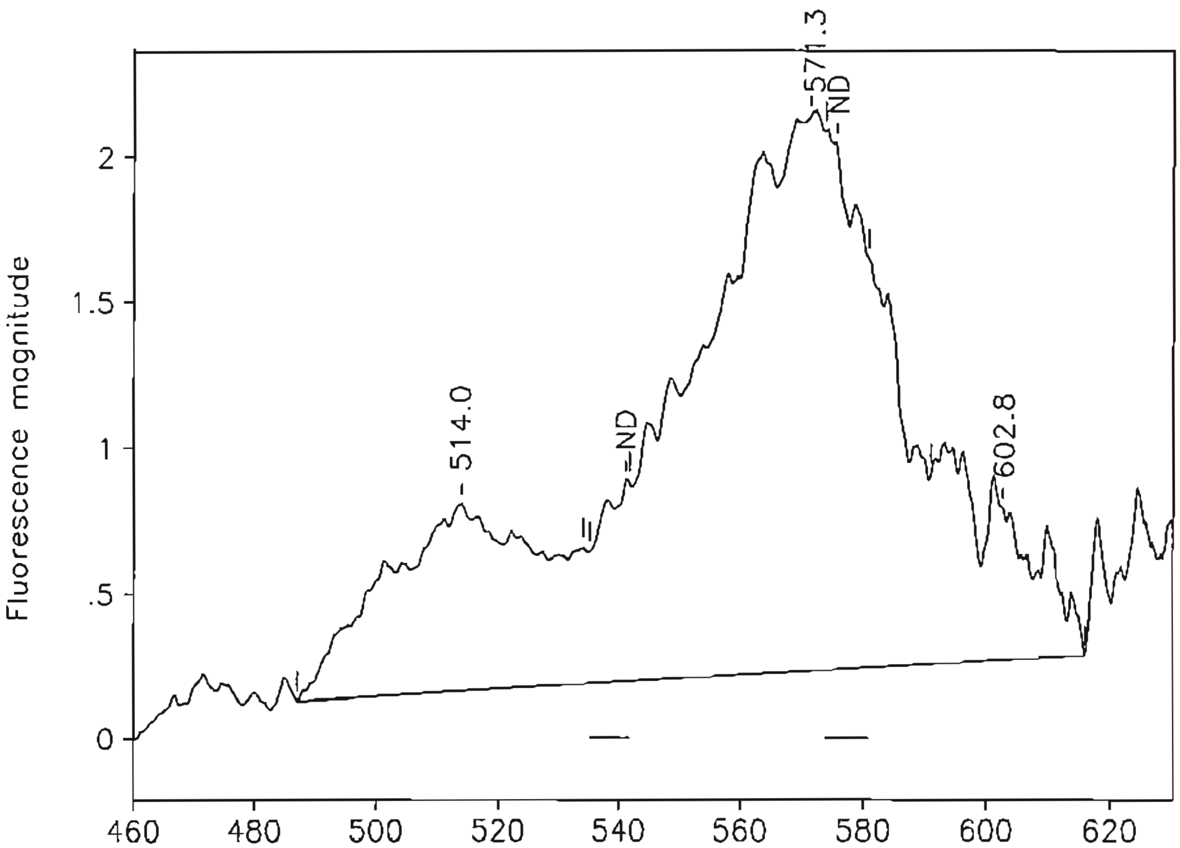
Station Lake1: 1.6' depth above Lake bottom
OUL number: N5397 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 Collected: 09/07/04 1032

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.4	483.2	533.2	0.83	26.75	0.03	0.811 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
569.8	533.3	607.2	2.11	87.93	0.02	10.3 *
575.7	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station Lake2: 3.4' depth above Lake bottom
OUL number: N5398 Analyzed: 09/10/04
Matrix: Elutant
Placed: 08/24/04 Collected: 09/07/04 1032

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.0	487.0	534.1	0.64	19.73	0.03	0.599 *
541.1	535.2	541.8	0.00	0.00	0.00	ND
571.3	534.1	590.9	1.90	68.99	0.03	8.07 *
575.7	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
602.8	590.9	616.0	0.52	11.21	0.05	0.000

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

December 7, 2004

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped December 2, 2004
Ozark Underground Laboratory (OUL) numbers N7424 through N7465 and N7471.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on December 3, 2004. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

f:\docs\coa\LakeOrienta04.doc

Ozark Underground Laboratory for
CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: December 2, 2004
Date Samples Rec'd at OUL: December 3, 2004
Date Analyzed by OUL: December 6 and 7, 2004

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N7424	1-215	MW-1 - 215 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7425	1-225	MW-1 - 225 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7426	1-235	MW-1 - 235 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7427	1-245	MW-1 - 245 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7428	1-255	MW-1 - 255 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7429	1-265	MW-1 - 265 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7430	1-275	MW-1 -275 ft	11/17 1345	12/2 1100	ND		ND		ND	
N7431	1-285	MW-1 - 285 ft	11/17 1345	12/2 1135	ND		ND		ND	
N7432	2-135	MW-2 - 135 ft	11/17 1400	12/2 1200	ND		542.1	1,290	ND	
N7433	2-150	MW-2 - 150 ft	11/17 1400	12/2 1200	ND		541.9	2,550	ND	
N7434	2-165	MW-2 - 165 ft	11/17 1400	12/2 1200	ND		541.9	2,040	ND	
N7435	2-180	MW-2 - 180 ft	11/17 1400	12/2 1200	ND		541.9	2,580	ND	
N7436	2-195	MW-2 - 195 ft	11/17 1400	12/2 1200	ND		541.9	5,240	ND	
N7437	2-210	MW-2 - 210 ft	11/17 1400	12/2 1200	ND		541.9	5,950	ND	
N7438	2-225	MW-2 - 225 ft	11/17 1400	12/2 1200	ND		541.8	2,920	ND	
N7439	2-240	MW-2 - 240 ft	11/17 1400	12/2 1200	ND		541.9	3,670	ND	
N7440	Laboratory Control Charcoal Blank									
N7441	2-255	MW-2 - 255 ft	11/17 1400	12/2 1200	ND		541.8	2,470	ND	
(Footnotes at end of Table)										(continued)

Ozark Underground Laboratory for CH2MHill

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N7442	2-270	MW-2 - 270 ft	11/17 1400	12/2 1200	ND		541.9	5,340	ND	
N7443	2-285	MW-2 - 285 ft	11/17 1400	12/2 1200	ND		541.1	25.8	ND	
N7444	2-300	MW-2 - 300 ft	11/17 1400	12/2 1200	ND		540.9	26.8	ND	
N7445	3-175	MW-3 - 175 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7446	3-185	MW-3 - 185 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7447	3-195	MW-3 - 195 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7448	3-205	MW-3 - 205 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7449	3-215	MW-3 - 215 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7450	3-225	MW-3 - 225 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7451	3-235	MW-3 - 235 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7452	3-245	MW-3 - 245 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7453	3-255	MW-3 - 255 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7454	3-265	MW-3 - 265 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7455	3-275	MW-3 - 275 ft	11/17 1330	12/2 1010	ND		ND		ND	
N7456	4-165	MW-4 - 165 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7457	4-180	MW-4 - 180 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7458	4-195	MW-4 - 195 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7459	4-210	MW-4 - 210 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7460	Laboratory Control Charcoal Blank									
N7461	4-225	MW-4 - 225 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7462	4-240	MW-4 - 240 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7463	4-255	MW-4 - 255 ft	11/17 1310	12/2 0850	ND		ND		ND	
(Footnotes at end of Table)										(continued)

Ozark Underground Laboratory for
CH2MHill

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.	RWT Peak	RWT Conc.
(continued)										
N7464	4-270	MW-4 - 270 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7465	4-285	MW-4 - 285 ft	11/17 1310	12/2 0850	ND		ND		ND	
N7471	2-WA	MW-2 - Water	Water	12/2 1200	ND		534.3	8.18	ND	

FOOTNOTES:

ND = No dye detected

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 2 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 12/02/04 **Date Samples Received:** 12/3/04 **Time Samples Received:** 12:30 **Return Cooler? Yes** ✓ **No** ___

Bill to: ___ **Send Results to:** ___

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ___ **Ship cooler to:** Nodarse & Assoc.

Please indicate stations where dye was visible in the field
for field technician use - use black ink only

OUL use only				PLACED		COLLECTED		OUL use only
# CHAR REC'D	LAB NUMBER charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	DATE	TIME	DATE	TIME	# WATER REC'D
1	N7424	1-215	MW-1 – 215 ft	11/17/04	~~1100~~ 1345	12/2/04	1100	0
1	N7425	1-225	MW-1 – 225 ft					0
1	N7426	1-235	MW-1 – 235 ft					0
1	N7427	1-245	MW-1 – 245 ft					0
1	N7428	1-255	MW-1 – 255 ft					0
1	N7429	1-265	MW-1 – 265 ft					0
1	N7430	1-275	MW-1 – 275 ft					0
1	N7431	1-285	MW-1 – 285 ft				1135	1
0		1-WA	MW-1 – Water Sample					

COMMENTS: ___

This sheet filled out by OUL staff? Yes ___ **No** ✓ **Charts for samples on this page proofed by OUL:** mmw 623

Project 621 Analyzed 12/6/04 by MR Page 1 of 4

OZARK UNDERGROUND LABORATORY, INC.

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 2 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 12/02/04 **Date Samples Received:** 12/3/04 **Time Samples Received:** 12:30 **Return Cooler? Yes** ✓ **No** ____

Bill to: ____ **Send Results to:** ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ **Ship cooler to:** Nodarse & Assoc.

Please indicate stations where dye was visible in the field
for field technician use - use black ink only

OUL use only				PLACED		COLLECTED		OUL use only
# CHAR REC'D	LAB NUMBER charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	DATE	TIME	DATE	TIME	# WATER REC'D
1	N7432	2-135	MW-2 – 135 ft	11/17/04	1400	12/2/04	1200	0
1	N7433	2-150	MW-2 – 150 ft					0
1	N7434	2-165	MW-2 – 165 ft					0
1	N7435	2-180	MW-2 – 180 ft					0
1	N7436	2-195	MW-2 – 195 ft					0
1	N7437	2-210	MW-2 – 210 ft					0
1	N7438	2-225	MW-2 – 225 ft					0
1	N7439	2-240	MW-2 – 240 ft					0
1	N7441	2-255	MW-2 – 255 ft					0
1	N7442	2-270	MW-2 – 270 ft					0
1	N7443	2-285	MW-2 – 285 ft					1
1	N7444	2-300	MW-2 – 300 ft					
0		2-WA	MW-2 – Water Sample					

COMMENTS: Charcoal Blank N7440

This sheet filled out by OUL staff? Yes ____ **No** ✓ **Charts for samples on this page proofed by OUL:** mma

624

Analyzed 12/7/04 by UK

Page 2 of 4 OUL page 2 of 4 f:\shared\forms\coc2.doc, Rev. 4/12/04

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 2 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 12/02/04 **Date Samples Received:** 12/3/04 **Time Samples Received:** 12:30 **Return Cooler? Yes** ✓ **No** ____

Bill to: ____ **Send Results to:** ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ **Ship cooler to:** Nodarse & Assoc.

Please indicate stations where dye was visible in the field
for field technician use - use black ink only

OUL use only				PLACED		COLLECTED		OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	DATE	TIME	DATE	TIME	# WATER REC'D
1	N7445	3-175	MW-3 – 175 ft	11/17/04	1330	12/2/04	1010	0
1	N7446	3-185	MW-3 – 185 ft					0
1	N7447	3-195	MW-3 – 195 ft					0
1	N7448	3-205	MW-3 – 205 ft					0
1	N7449	3-215	MW-3 – 215 ft					0
1	N7450	3-225	MW-3 – 225 ft					0
1	N7451	3-235	MW-3 – 235 ft					0
1	N7452	3-245	MW-3 – 245 ft					0
1	N7453	3-255	MW-3 – 255 ft					0
1	N7454	3-265	MW-3 – 265 ft					0
1	N7455	3-275	MW-3 – 275 ft					0
0		3-WA	MW-3 – Water Sample			12/2/04	1040	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ **No** ✓ **Charts for samples on this page proofed by OUL:** mma

625

Analyzed 12/7/04 [illegible]

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1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 2 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 12/02/04 **Date Samples Received:** 12/3/04 **Time Samples Received:** 12:30 **Return Cooler? Yes** ✓ **No**

Bill to: **Send Results to:**

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other **Ship cooler to:** Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7456	4-165	MW-4 – 165 ft	11/17/04	1310	12/2/04	0850	0
1	N7457	4-180	MW-4 – 180 ft					0
1	N7458	4-195	MW-4 – 195 ft					0
1	N7459	4-210	MW-4 – 210 ft					0
1	N7461	4-225	MW-4 – 225 ft					0
1	N7462	4-240	MW-4 – 240 ft					0
1	N7463	4-255	MW-4 – 255 ft					0
1	N7464	4-270	MW-4 – 270 ft					0
1	N7465	4-285	MW-4 – 285 ft					0
0		4-WA	MW-4 – Water Sample			12/2/04	0935	1

COMMENTS: Charcoal Blank N7460

This sheet filled out by OUL staff? Yes ______ **No** ✓ **Charts for samples on this page proofed by OUL:** [signature]

Analyzed 12/7/04 by [illegible]

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1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 2 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 12/02/04 **Date Samples Received:** 12/3/04 **Time Samples Received:** 12:30 **Return Cooler? Yes** ✓ **No** ____

Bill to: ____ **Send Results to:** ____

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ____ **Ship cooler to:** Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
	Water			DATE	TIME	DATE	TIME	
1		2-135	MW-2 – 135 ft	11/17/04	1400	12/2/04	1200	Ø
1		2-150	MW-2 – 150 ft					Ø
1		2-165	MW-2 – 165 ft					Ø
1		2-180	MW-2 – 180 ft					Ø
1		2-195	MW-2 – 195 ft					Ø
1		2-210	MW-2 – 210 ft					Ø
1		3-225	MW-2 – 225 ft					Ø
1		2-240	MW-2 – 240 ft					Ø
1		2-255	MW-2 – 255 ft					Ø
1		2-270	MW-2 – 270 ft					Ø
1		2-285	MW-2 – 285 ft					Ø
1		2-300	MW-2 – 300 ft					Ø
Ø	N7471	2-WA	MW-2 – Water Sample					1

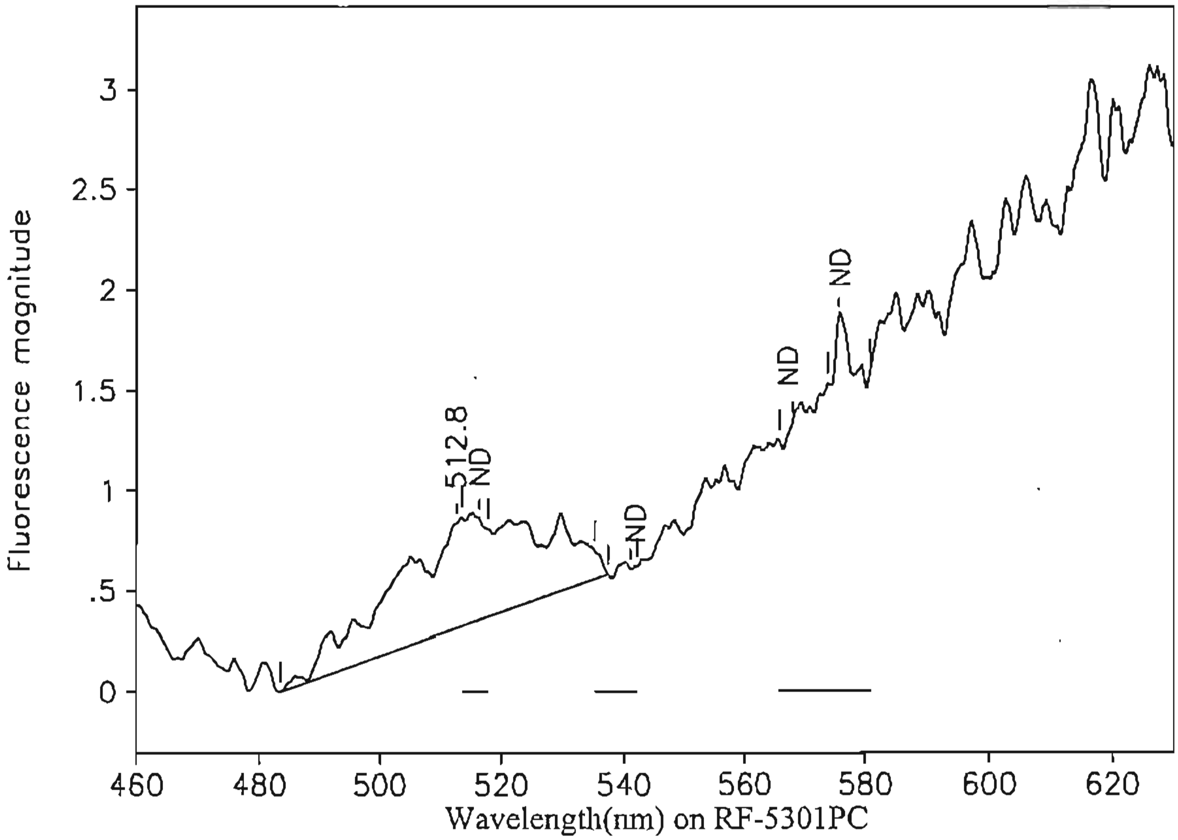
COMMENTS: ____

627

This sheet filled out by OUL staff? Yes ____ **No** ✓ **Charts for samples on this page proofed by OUL:** [illegible]

Project 621 Analyzed 12/7/04 by mw Page 2 of 4 OUL page 2 of 4

Ozark Underground Laboratory



Station 1-215: MW-1 - 215 ft
OUL number: N7424
Matrix: Elutant
Placed: 11/17/04 1345

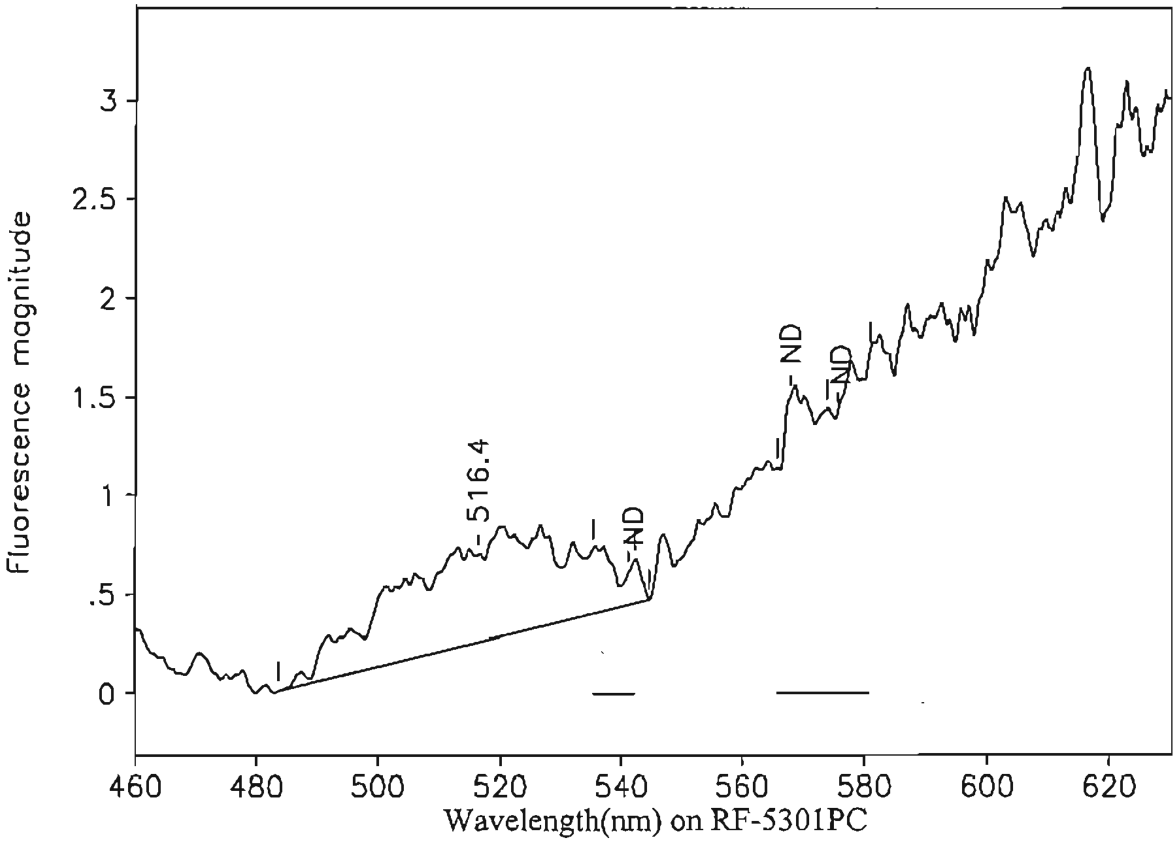
Analyzed: 12/06/04

Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
512.8	483.4	537.4	0.52	15.26	0.03	~~0.444~~

Ozark Underground Laboratory



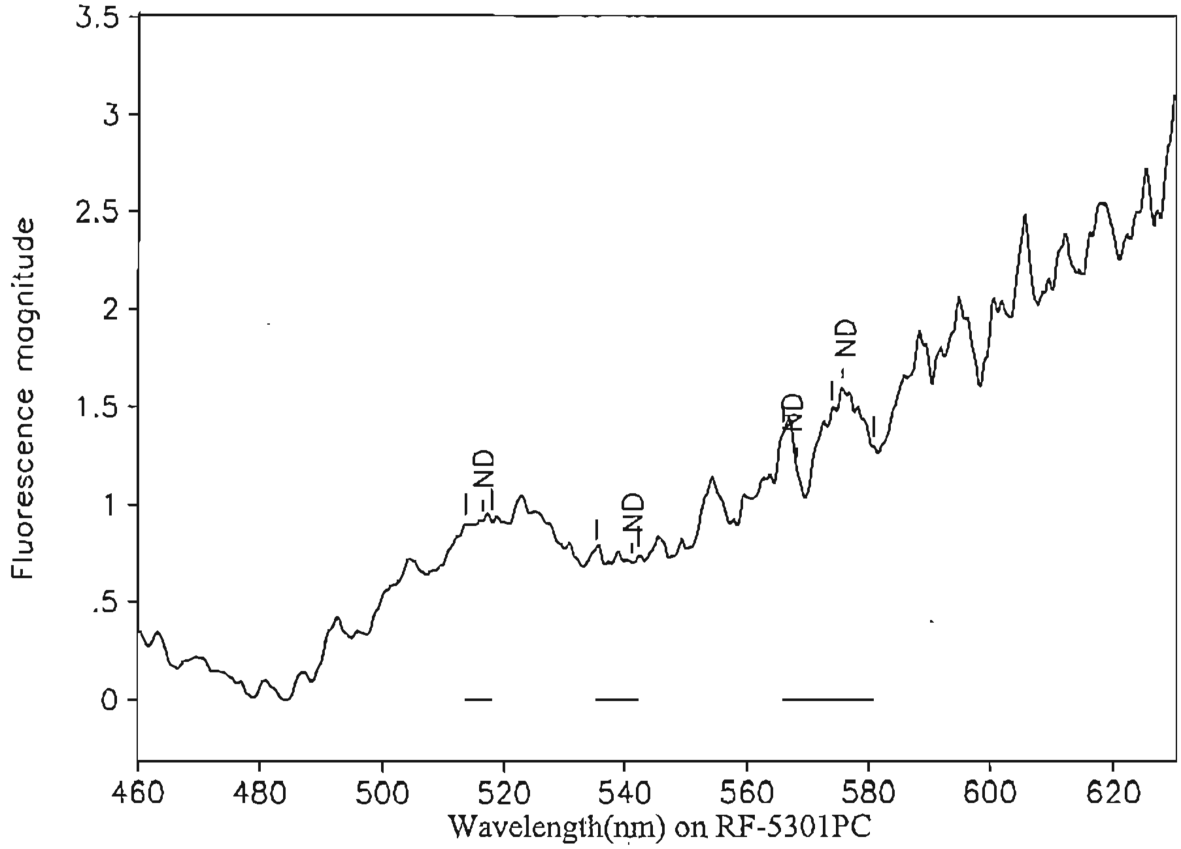
Station 1-225: MW-1 - 225 ft
OUL number: N7425 Analyzed: 12/06/04
Matrix: Elutant
Placed: 11/17/04 1345 Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	483.6	544.6	0.44	18.65	0.02	~~0.543~~
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



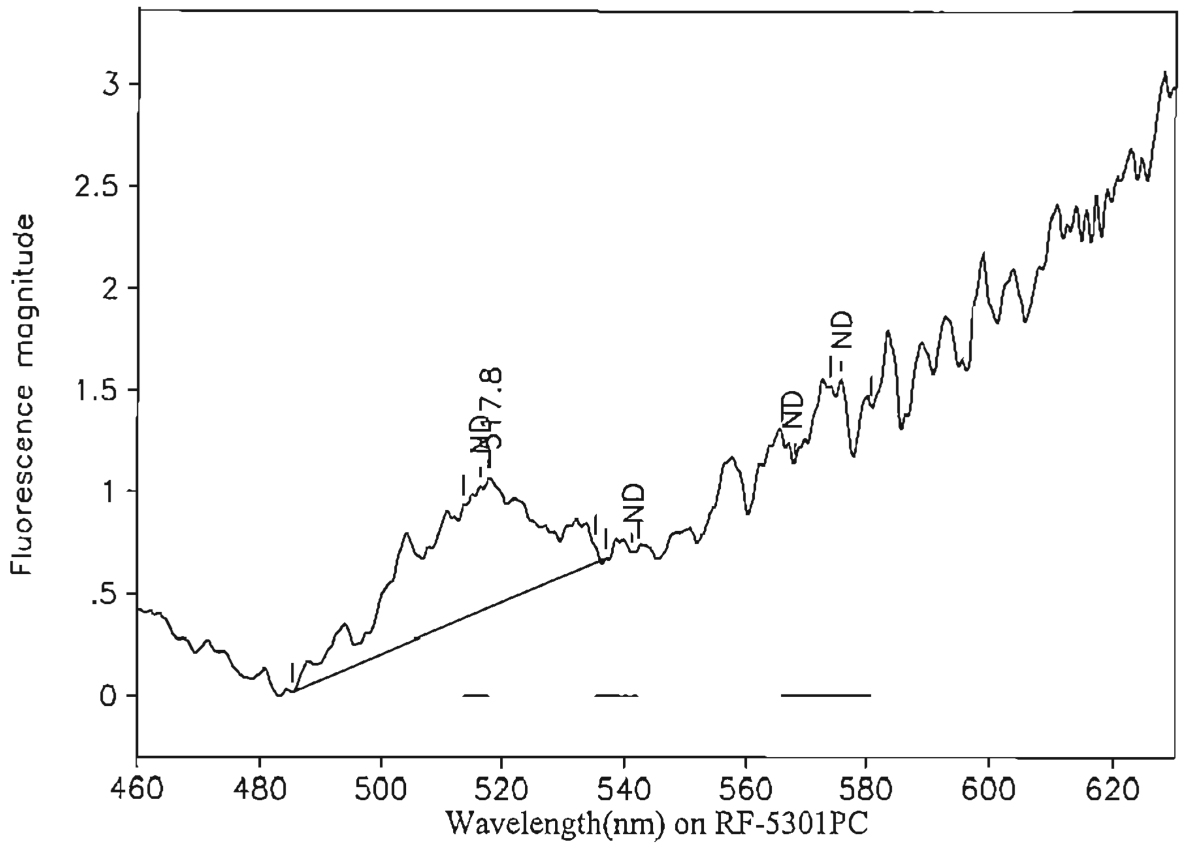
Station 1-235: MW-1 - 235 ft
OUL number: N7426 Analyzed: 12/06/04
Matrix: Elutant
Placed: 11/17/04 1345 Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



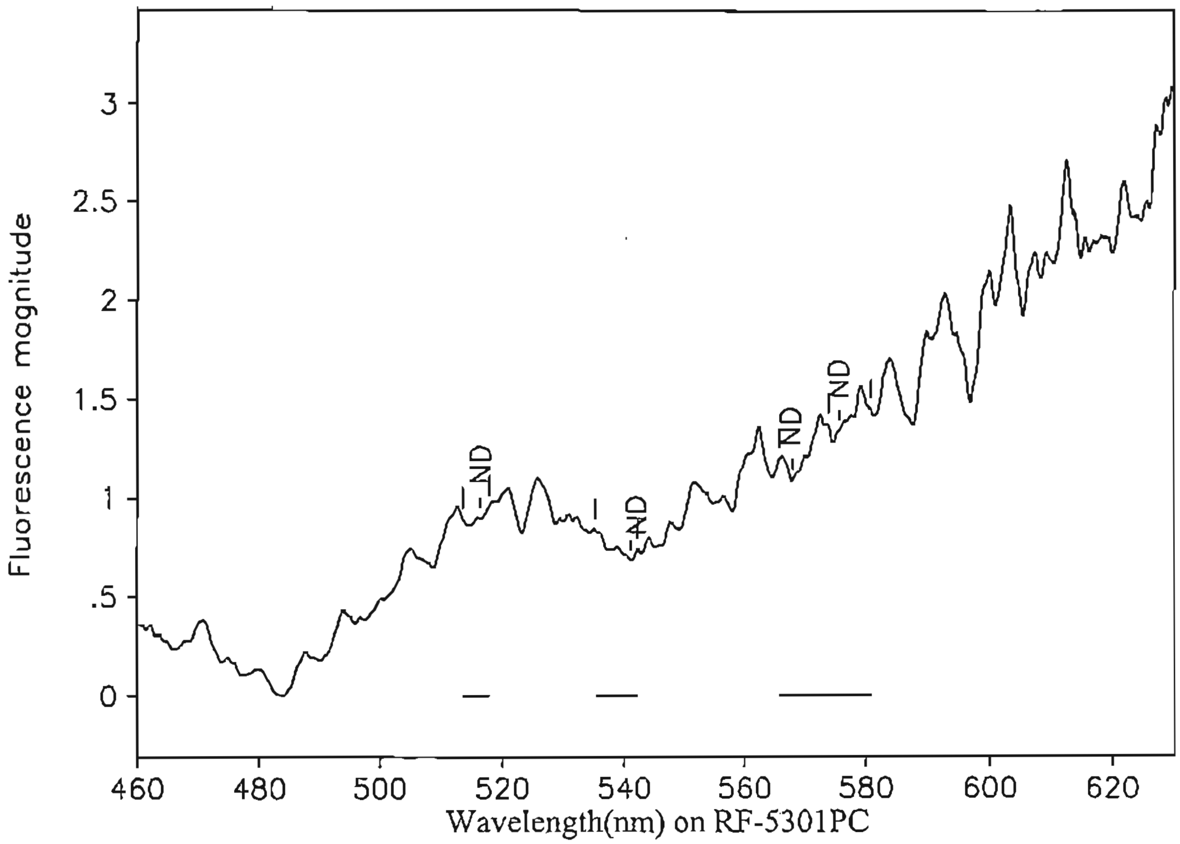
Station 1-245: MW-1 - 245 ft
OUL number: N7427
Matrix: Elutant
Placed: 11/17/04 1345

Analyzed: 12/06/04
Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
517.8	485.2	537.0	0.64	16.44	0.04	~~0.478~~

Ozark Underground Laboratory



Station 1-255: MW-1 - 255 ft
OUL number: N7428
Matrix: Elutant
Placed: 11/17/04 1345

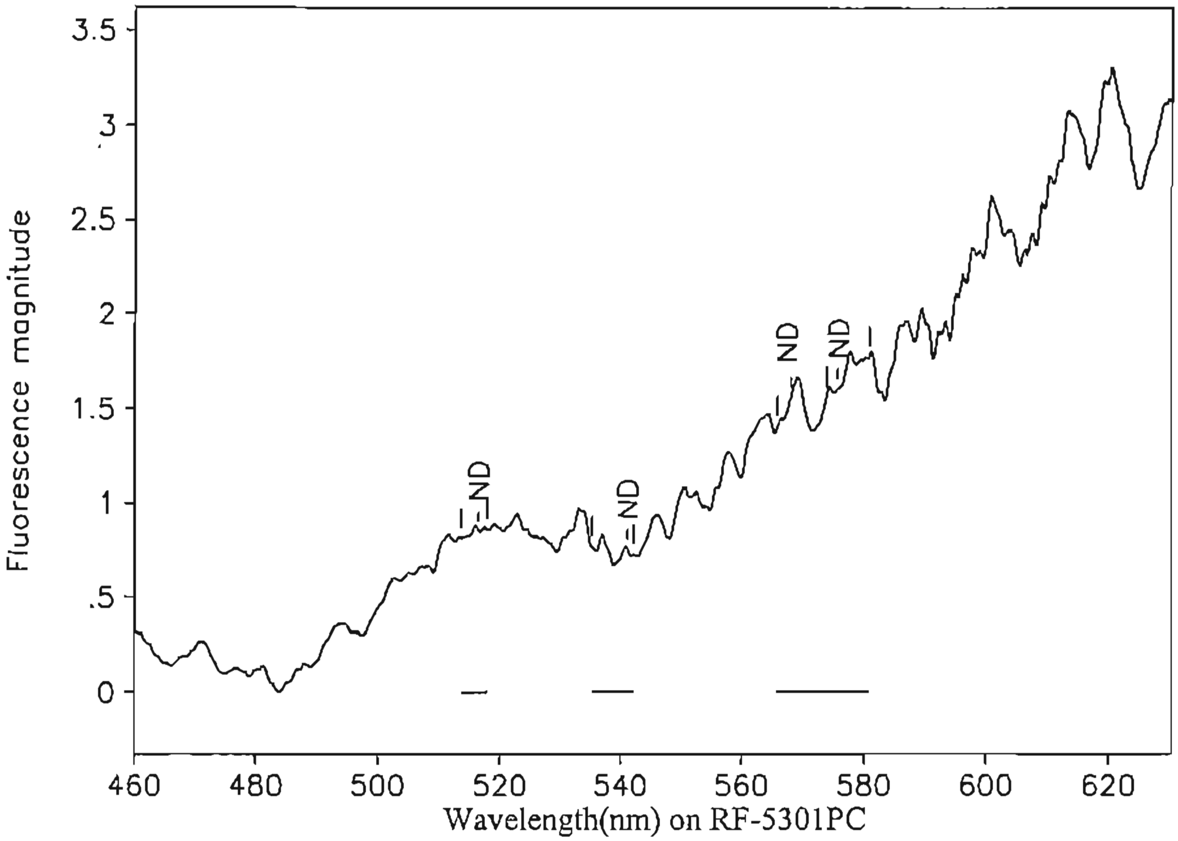
Analyzed: 12/06/04
Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



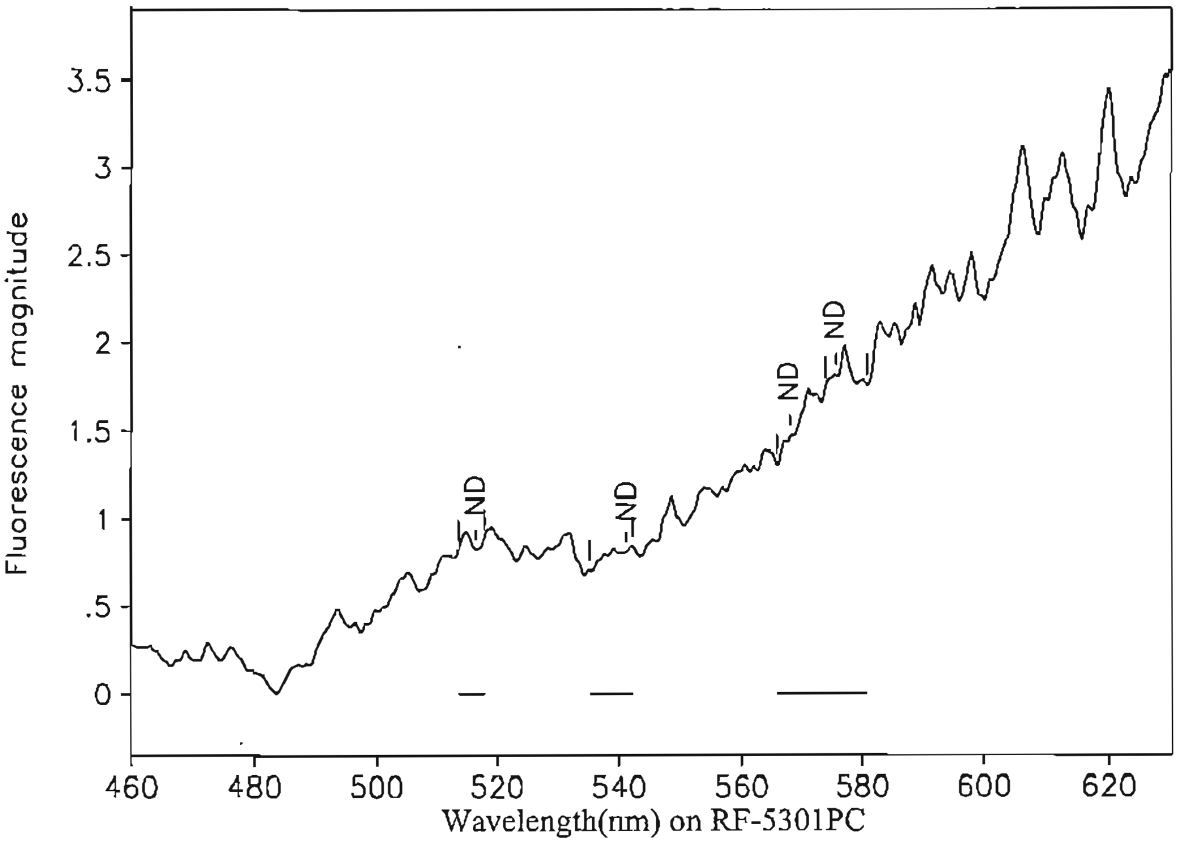
Station 1-265: MW-1 - 265 ft
OUL number: N7429 Analyzed: 12/06/04
Matrix: Elutant
Placed: 11/17/04 1345 Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-275: MW-1 -275 ft
OUL number: N7430
Matrix: Elutant
Placed: 11/17/04 1345

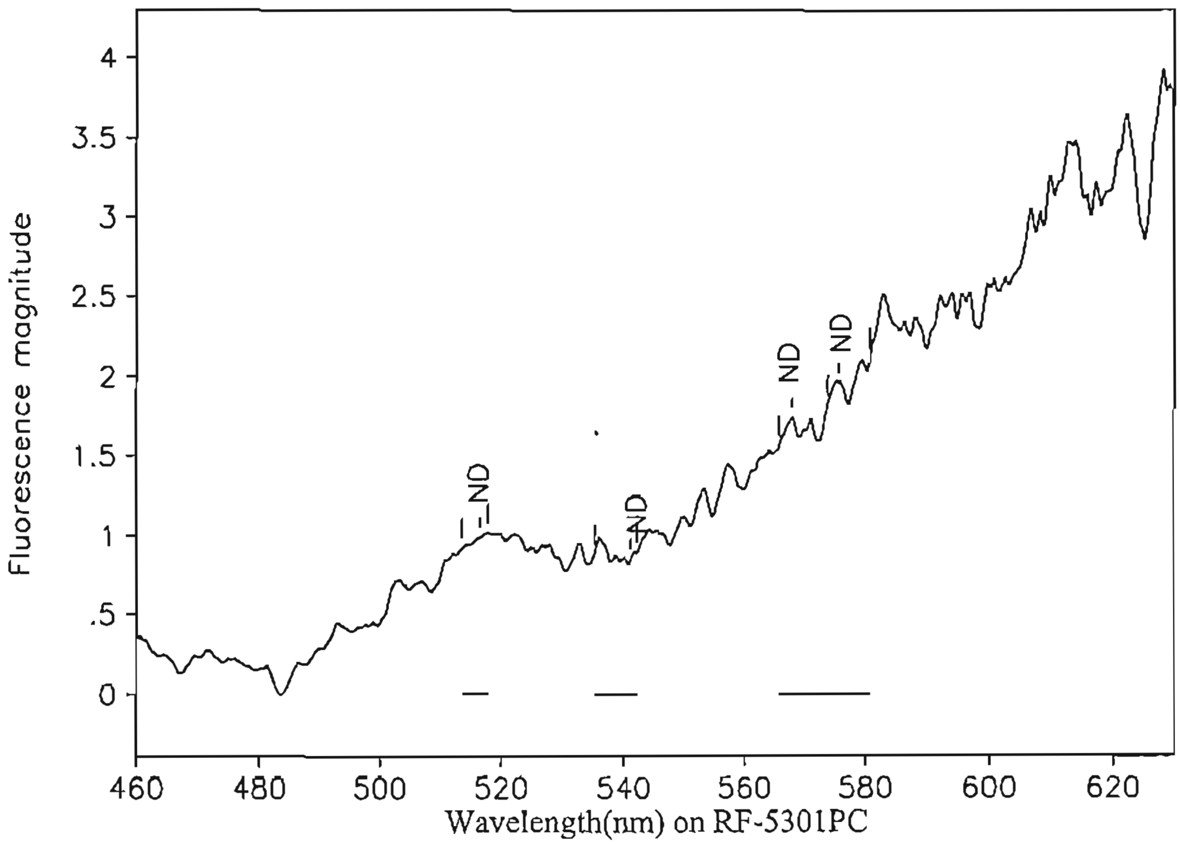
Analyzed: 12/06/04
Collected: 12/02/04 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-285: MW-1 - 285 ft
OUL number: N7431
Matrix: Elutant
Placed: 11/17/04 1345

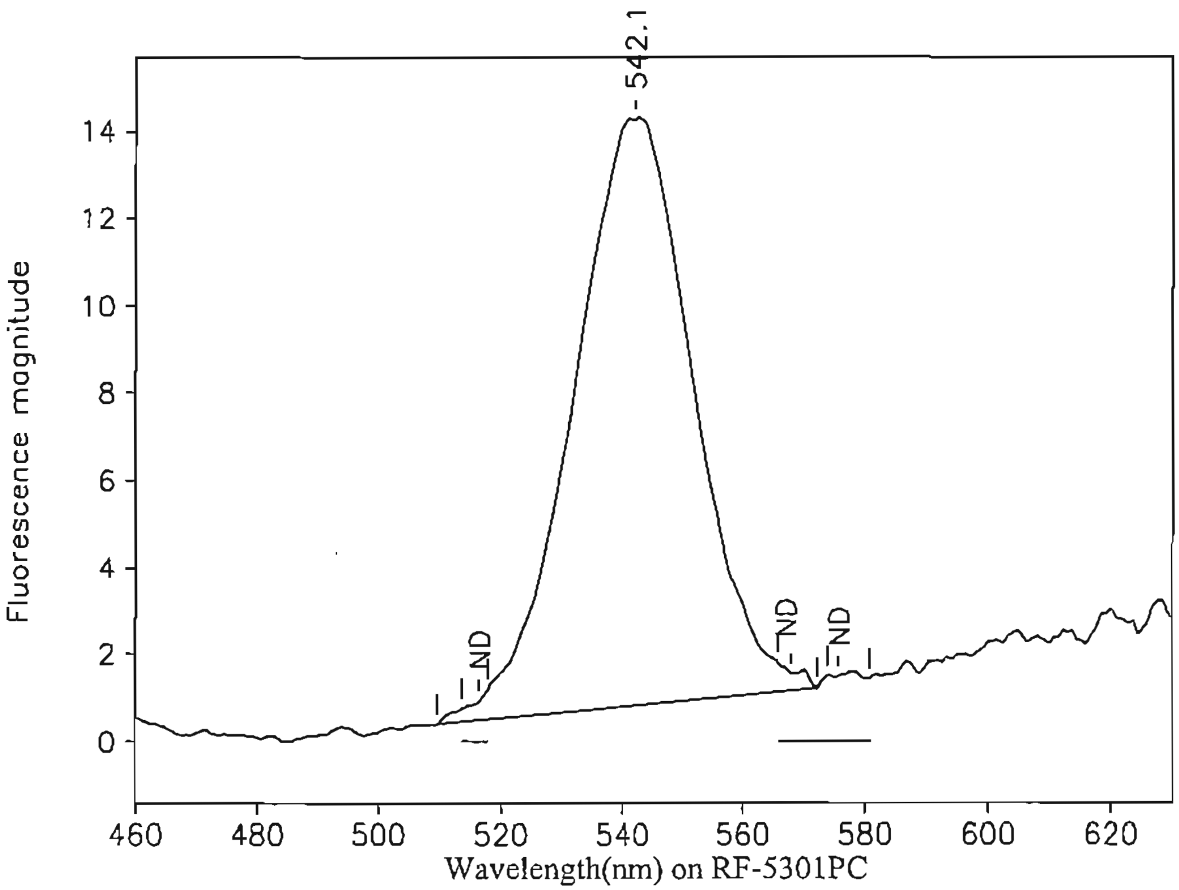
Analyzed: 12/06/04
Collected: 12/02/04 1135

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-135: MW-2 - 135 ft
OUL number: N7432
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

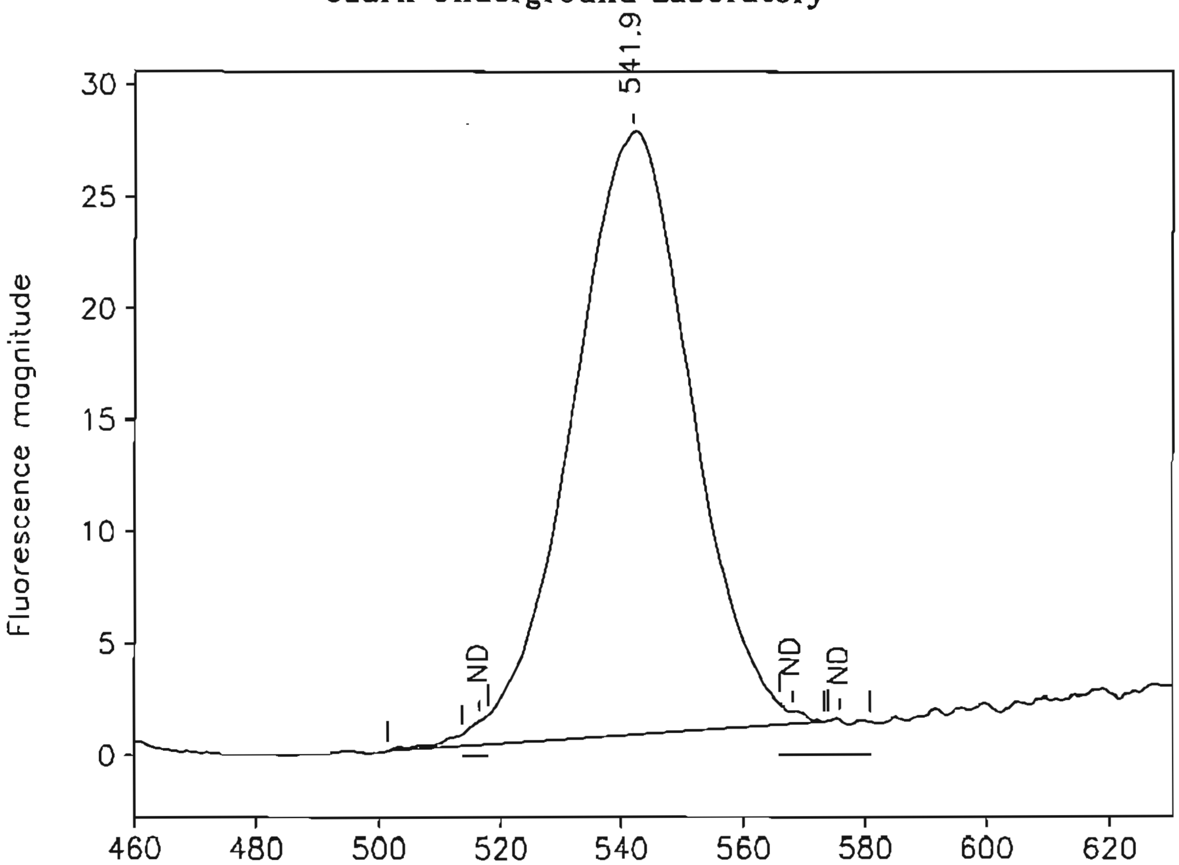
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
542.1	509.6	572.2	13.43	311.76	0.04	1,290
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-150: MW-2 - 150 ft
OUL number: N7433
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

Collected: 12/02/04 1200

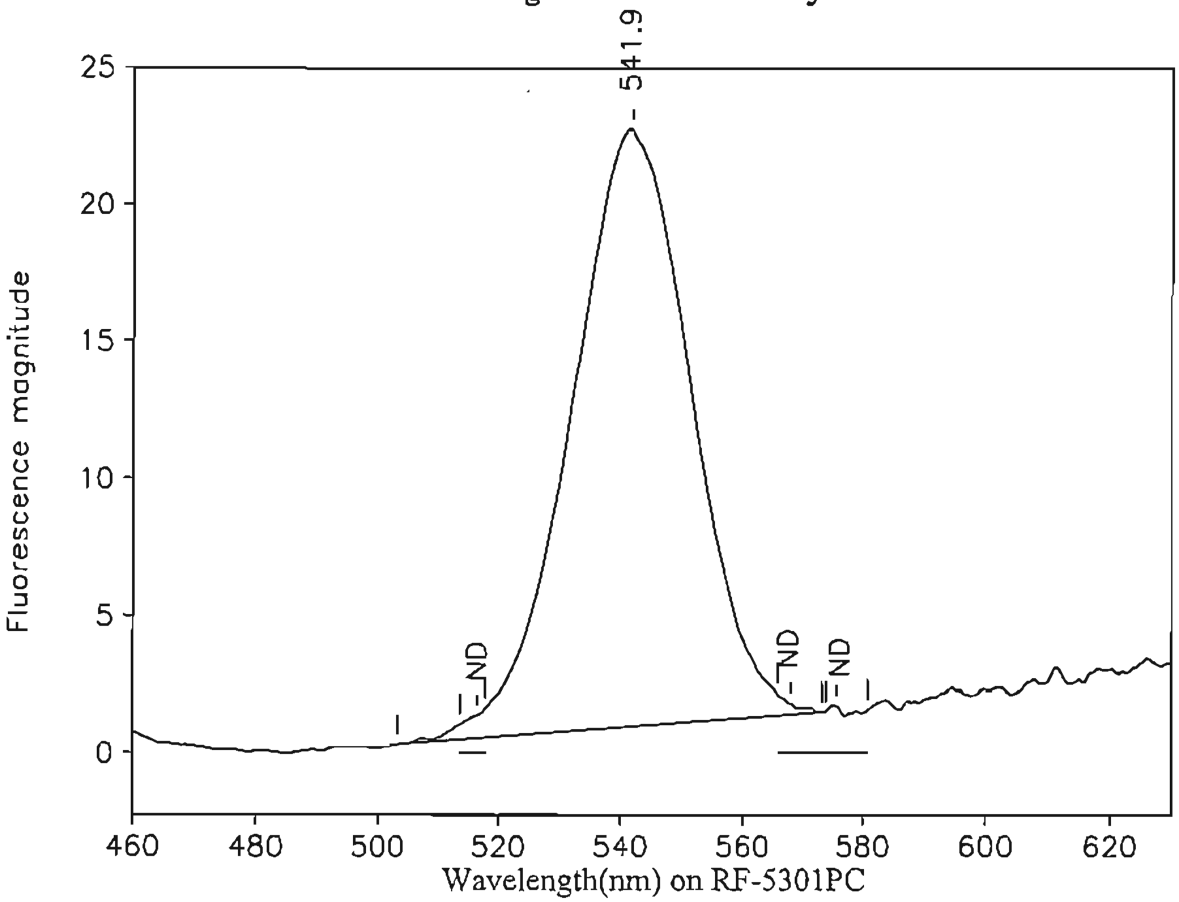
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	501.4	573.2	26.88	618.05	0.04	2,550
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NW

Ozark Underground Laboratory



Station 2-165: MW-2 - 165 ft
OUL number: N7434
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

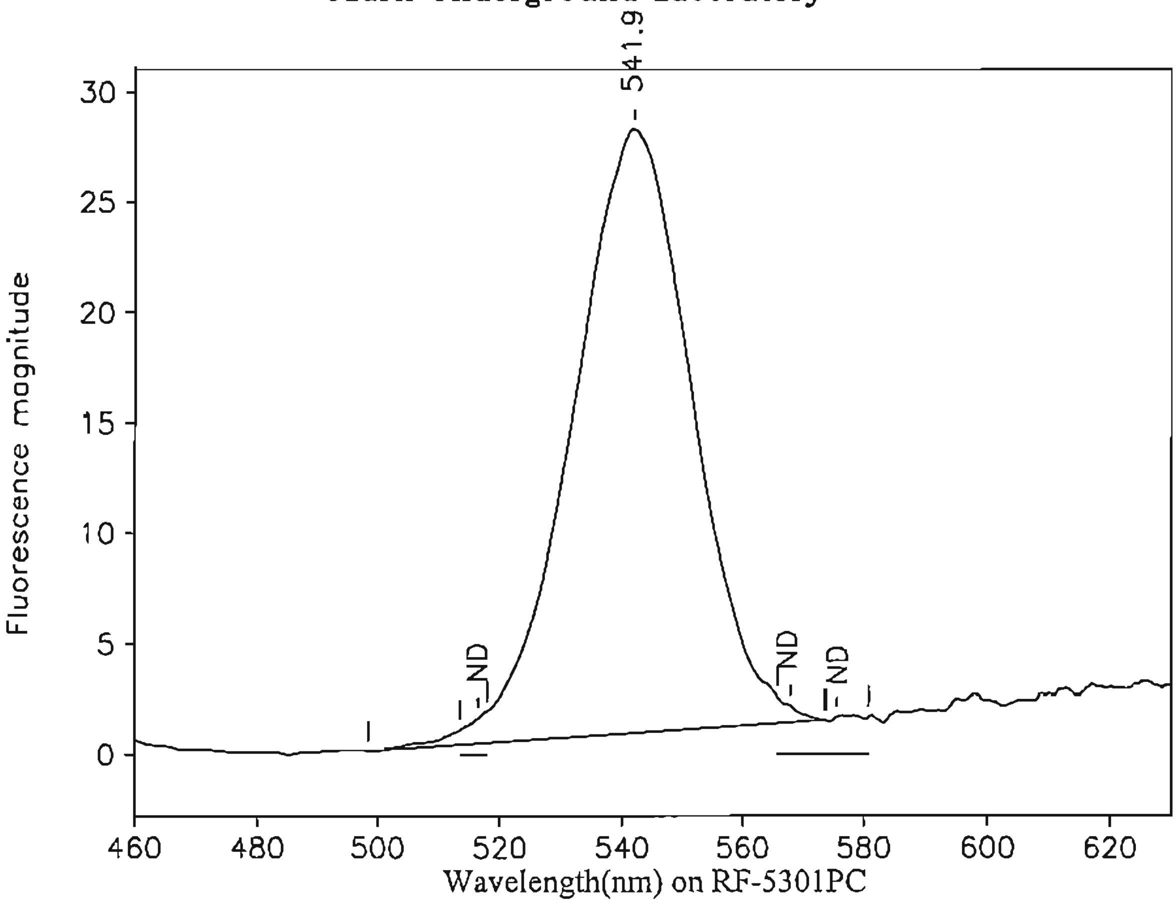
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	503.2	573.2	21.76	495.12	0.04	2,040
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-180: MW-2 - 180 ft
OUL number: N7435
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

Collected: 12/02/04 1200

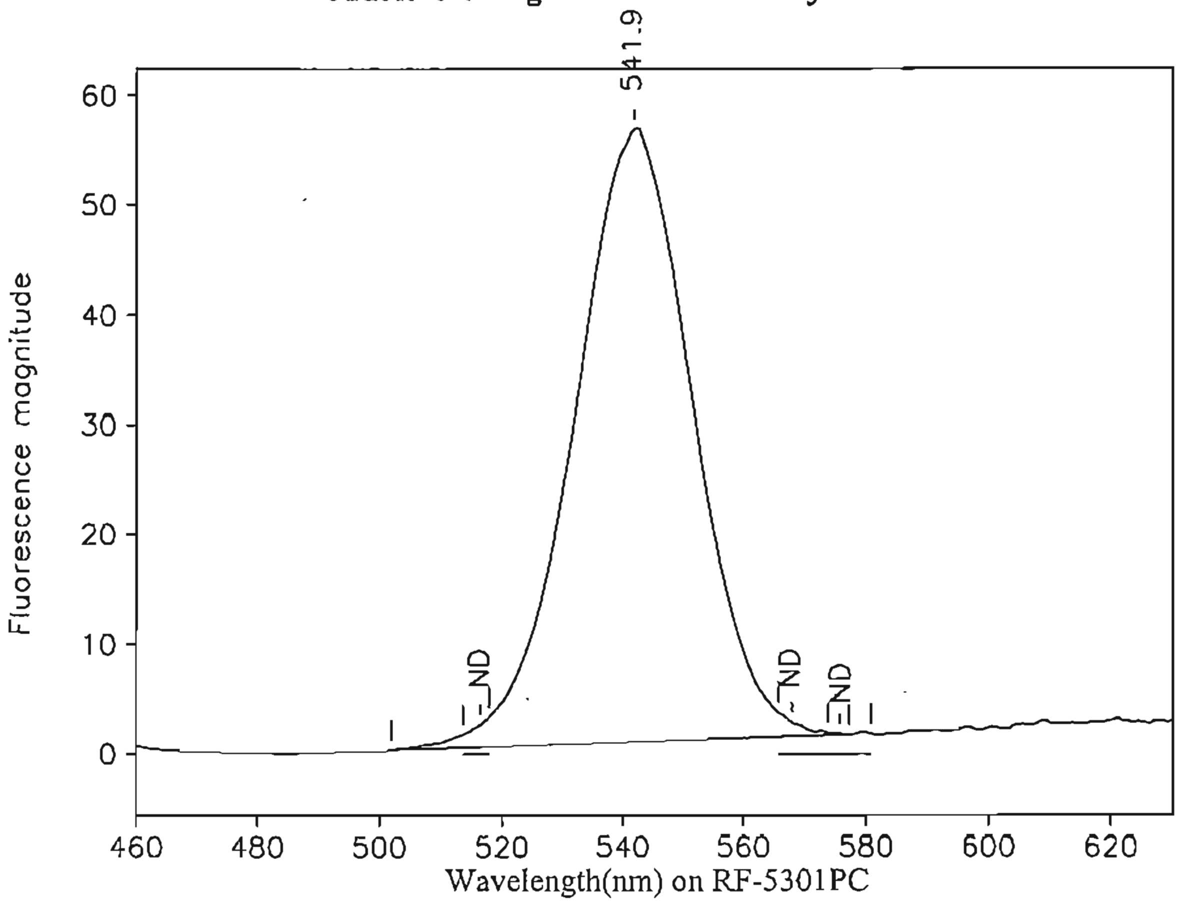
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	498.4	573.6	27.31	625.94	0.04	2,580
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

nr

Ozark Underground Laboratory



Station 2-195: MW-2 - 195 ft
OUL number: N7436
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

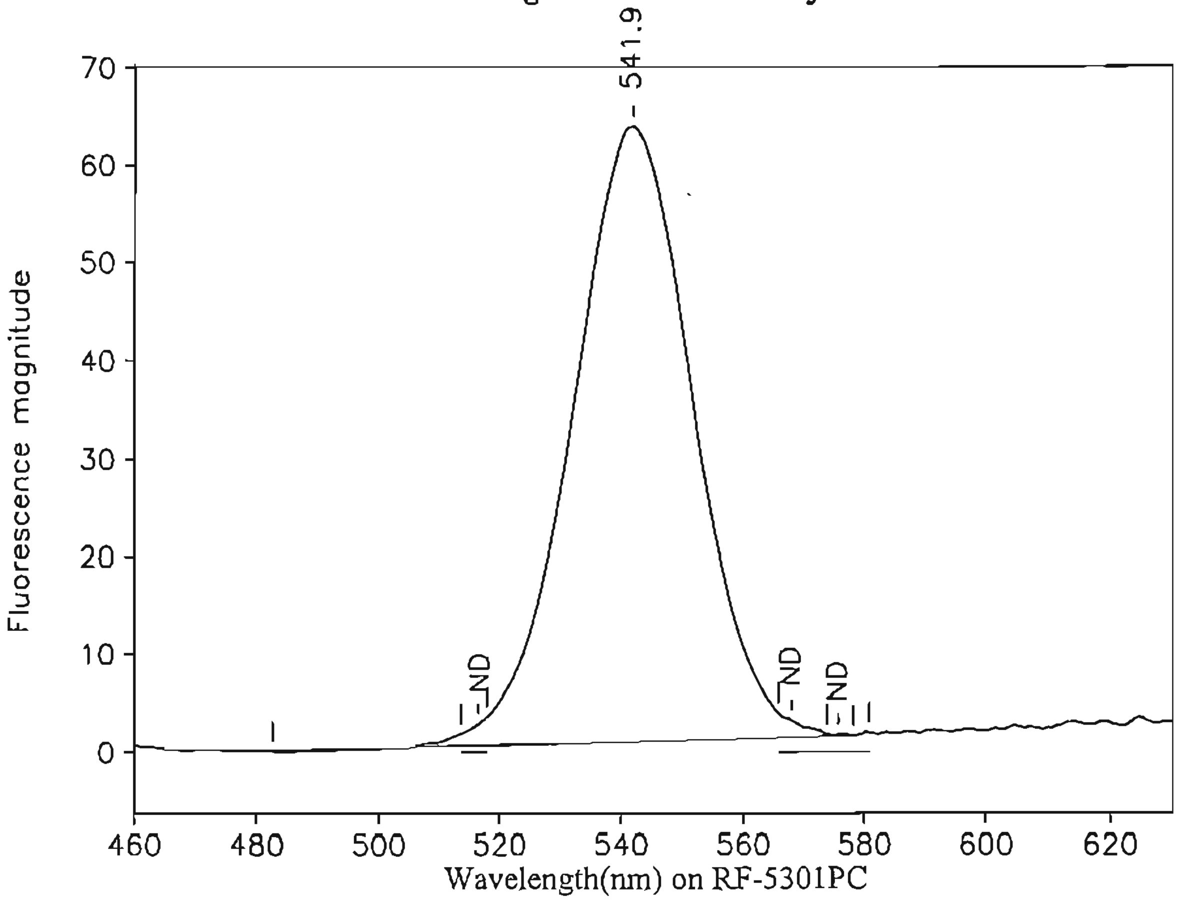
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	502.0	577.2	55.65	1,271.35	0.04	5,240
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-210: MW-2 - 210 ft
OUL number: N7437
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

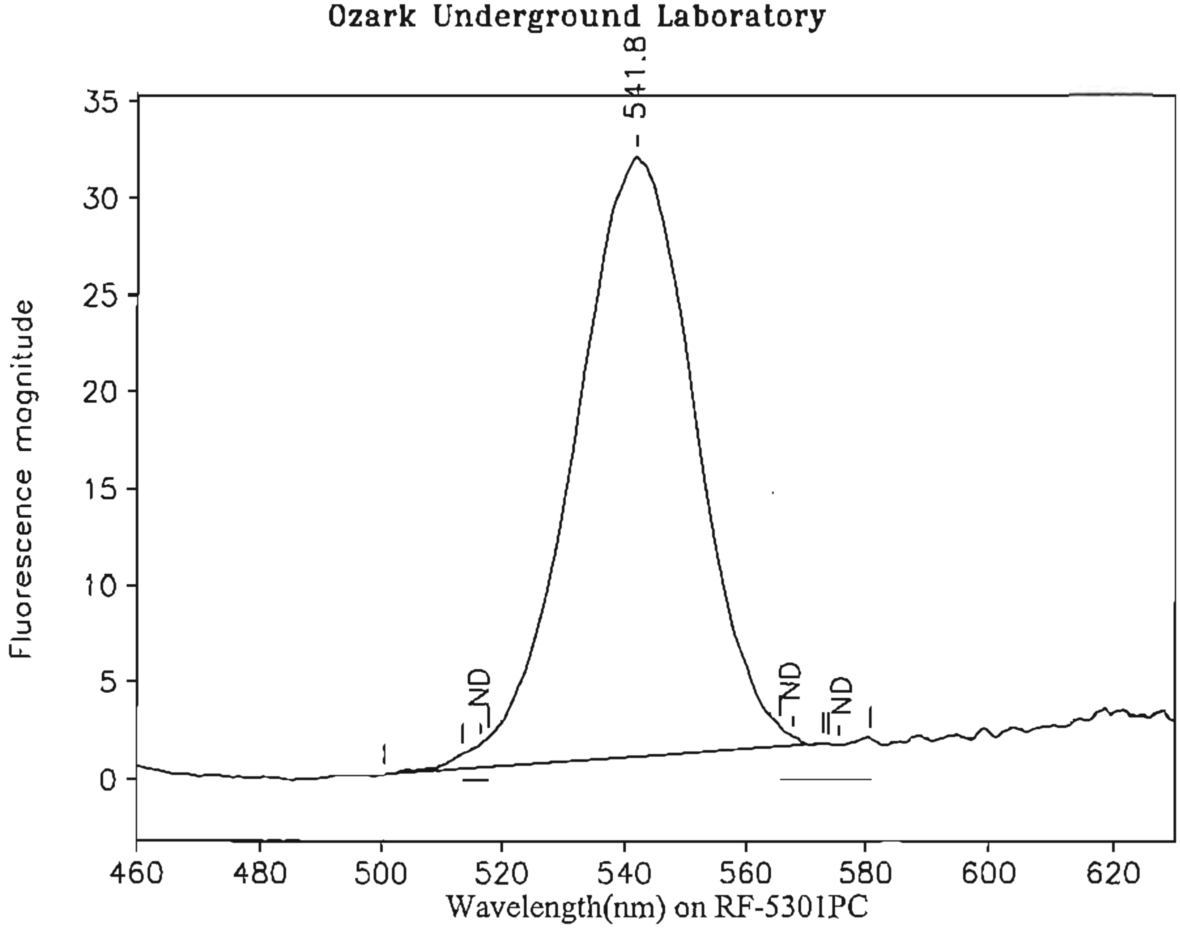
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	482.6	578.1	62.86	1,441.77	0.04	5,950
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-225: MW-2 - 225 ft
OUL number: N7438
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

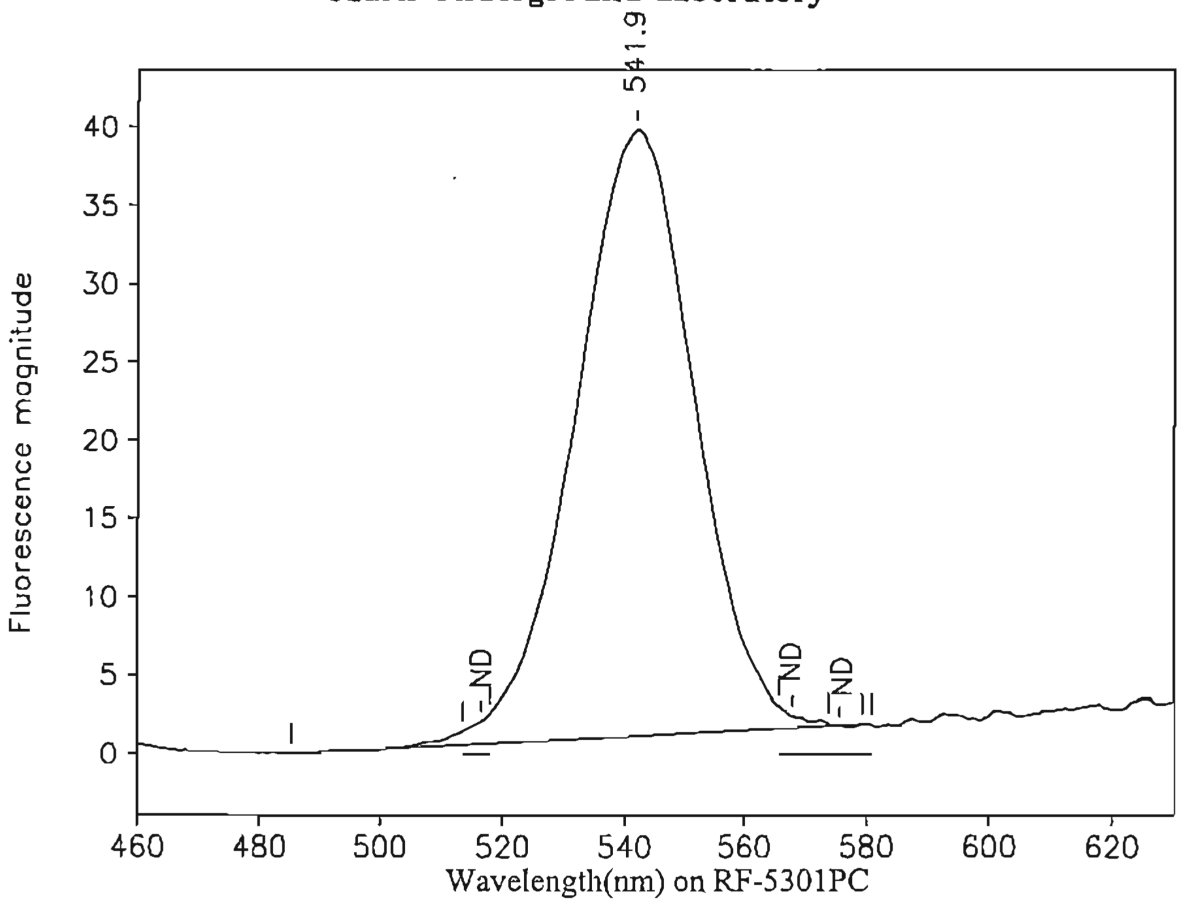
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.8	500.6	573.0	31.03	709.07	0.04	2,920
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N7439
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

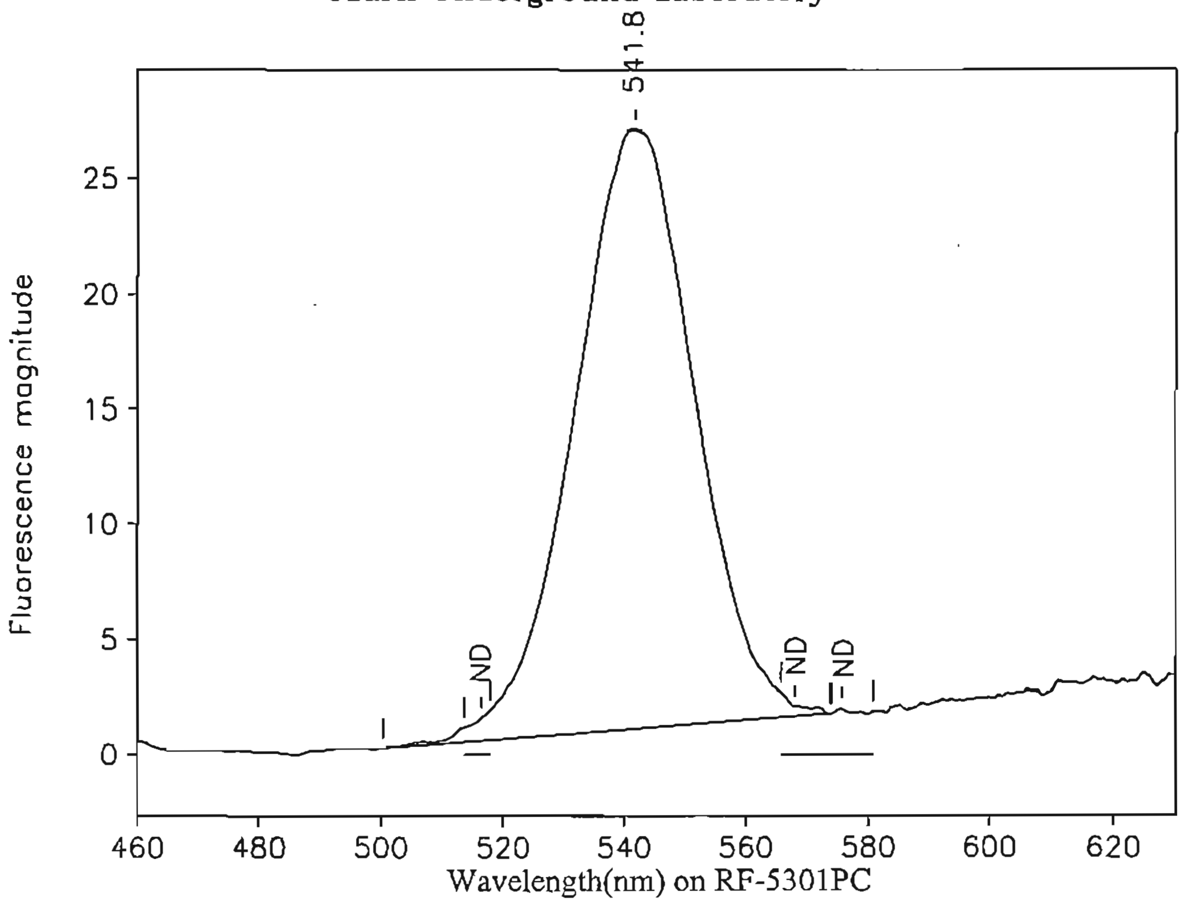
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	485.3	579.2	38.66	890.38	0.04	3,670
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N7441
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

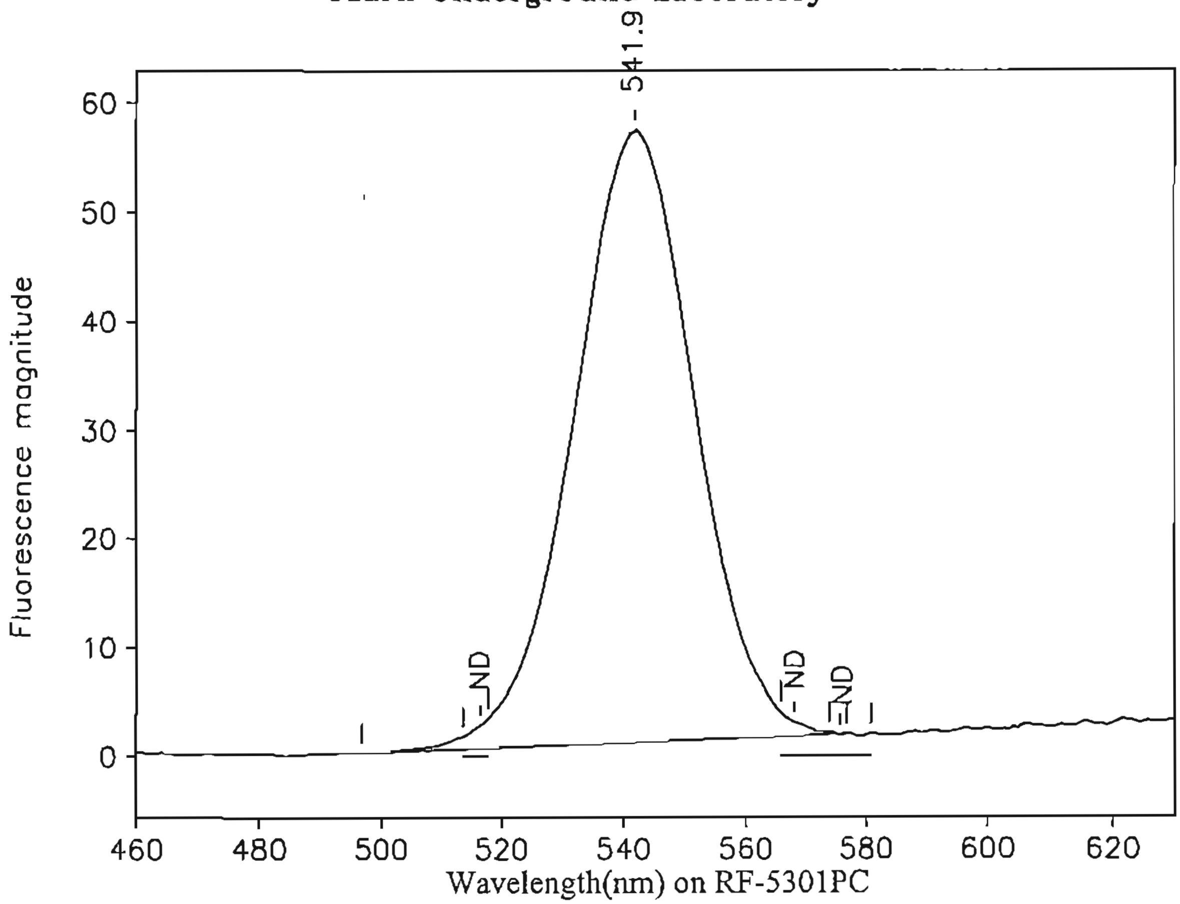
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.8	500.4	574.0	25.97	599.63	0.04	2,470
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-270: MW-2 - 270 ft
OUL number: N7442
Matrix: Elutant
Placed: 11/17/04 1400

Diluted: 1 to 100
Analyzed: 12/07/04

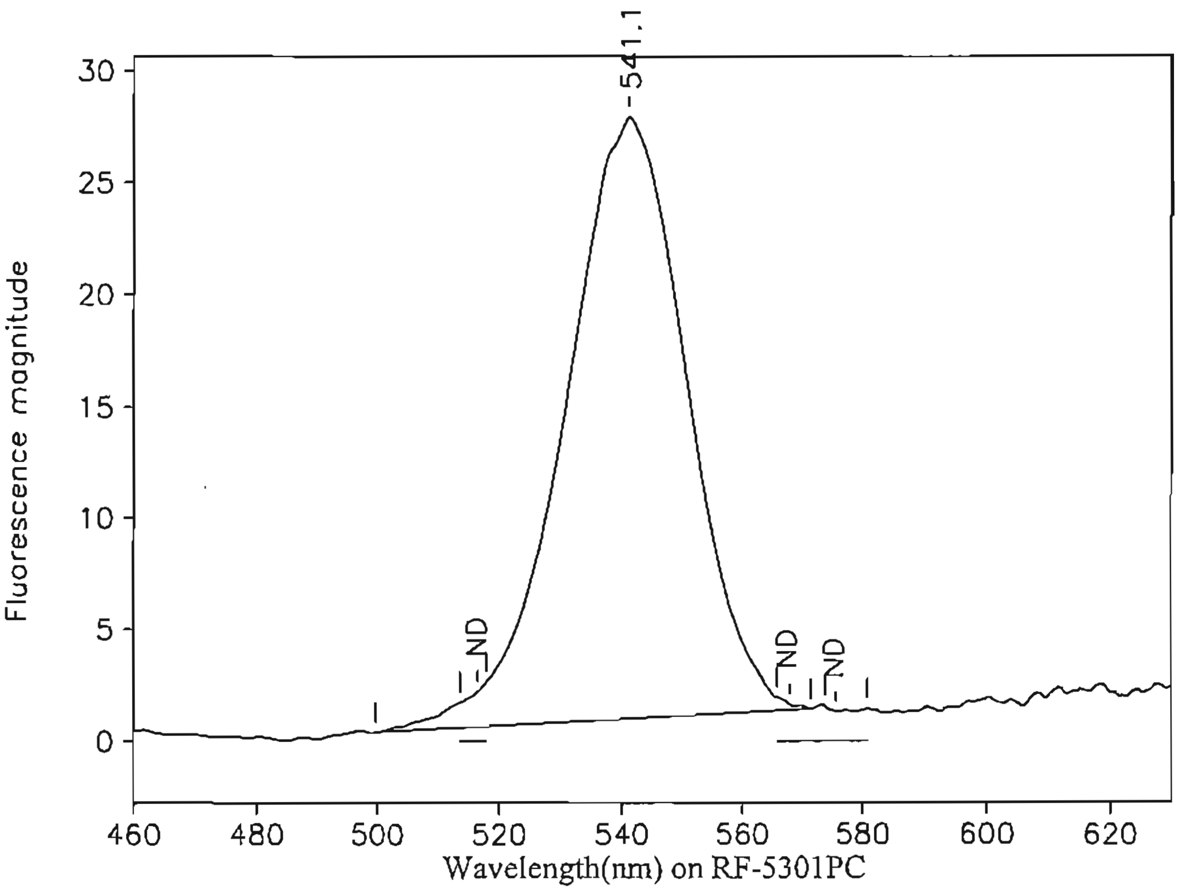
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.9	496.8	576.8	56.23	1,294.67	0.04	5,340
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-285: MW-2 - 285 ft
OUL number: N7443
Matrix: Elutant
Placed: 11/17/04 1400

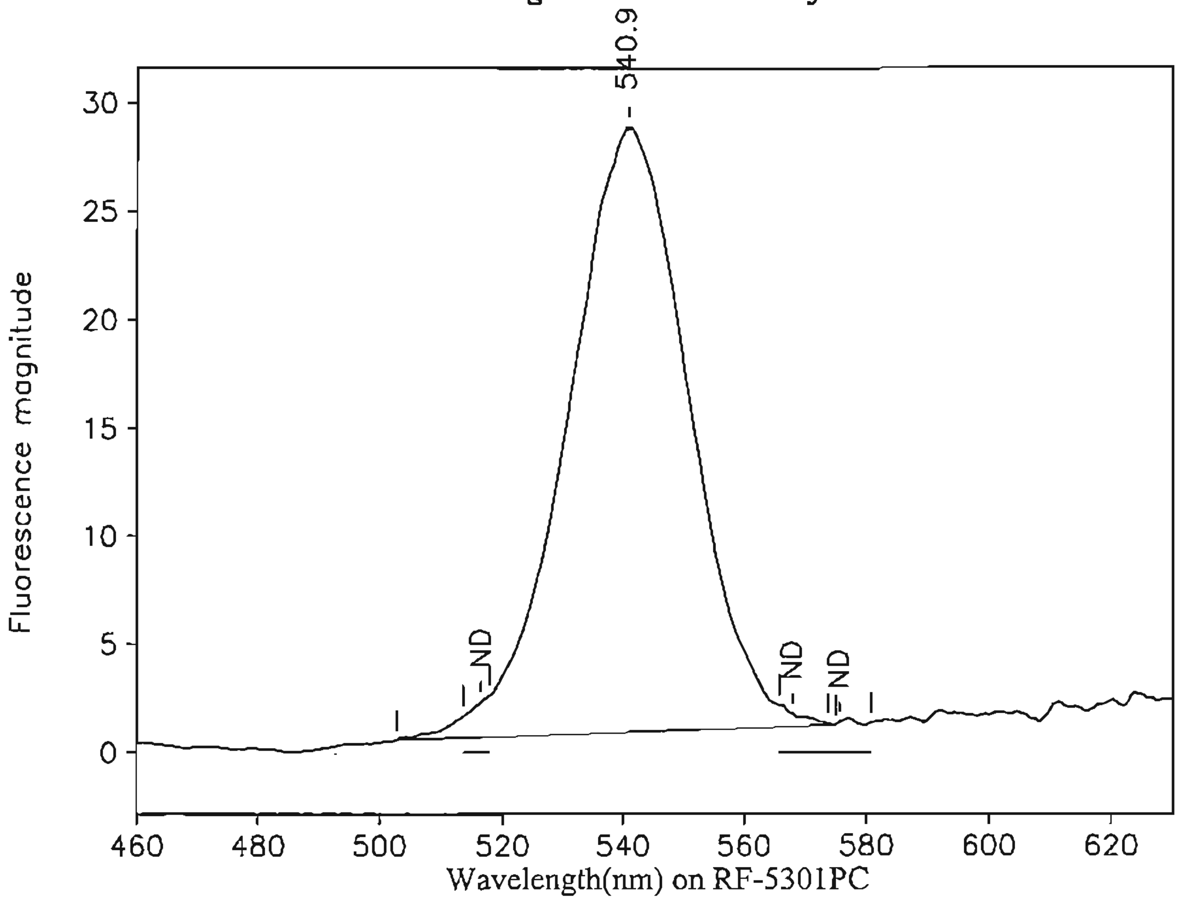
Analyzed: 12/07/04
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	499.8	571.4	26.93	625.48	0.04	25.8
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-300: MW-2 - 300 ft
OUL number: N7444
Matrix: Elutant
Placed: 11/17/04 1400

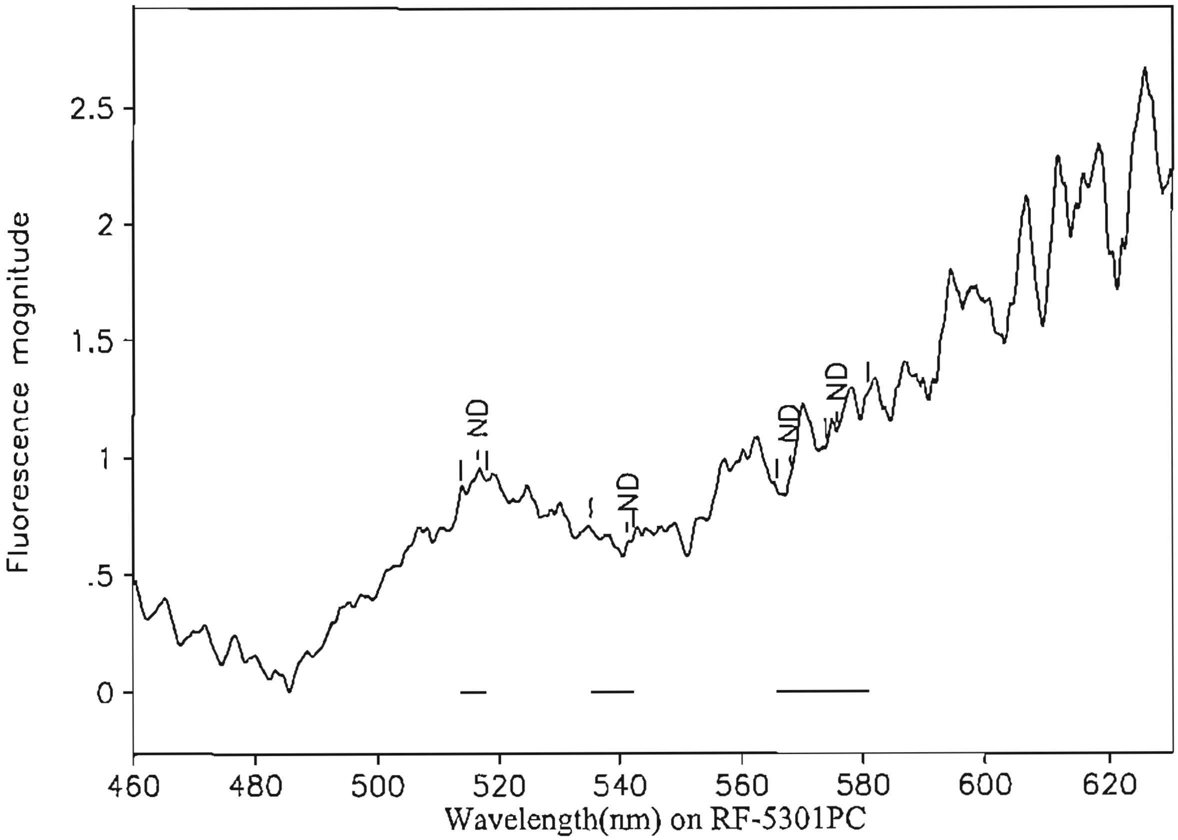
Analyzed: 12/07/04
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	502.8	575.0	27.93	650.77	0.04	26.8
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



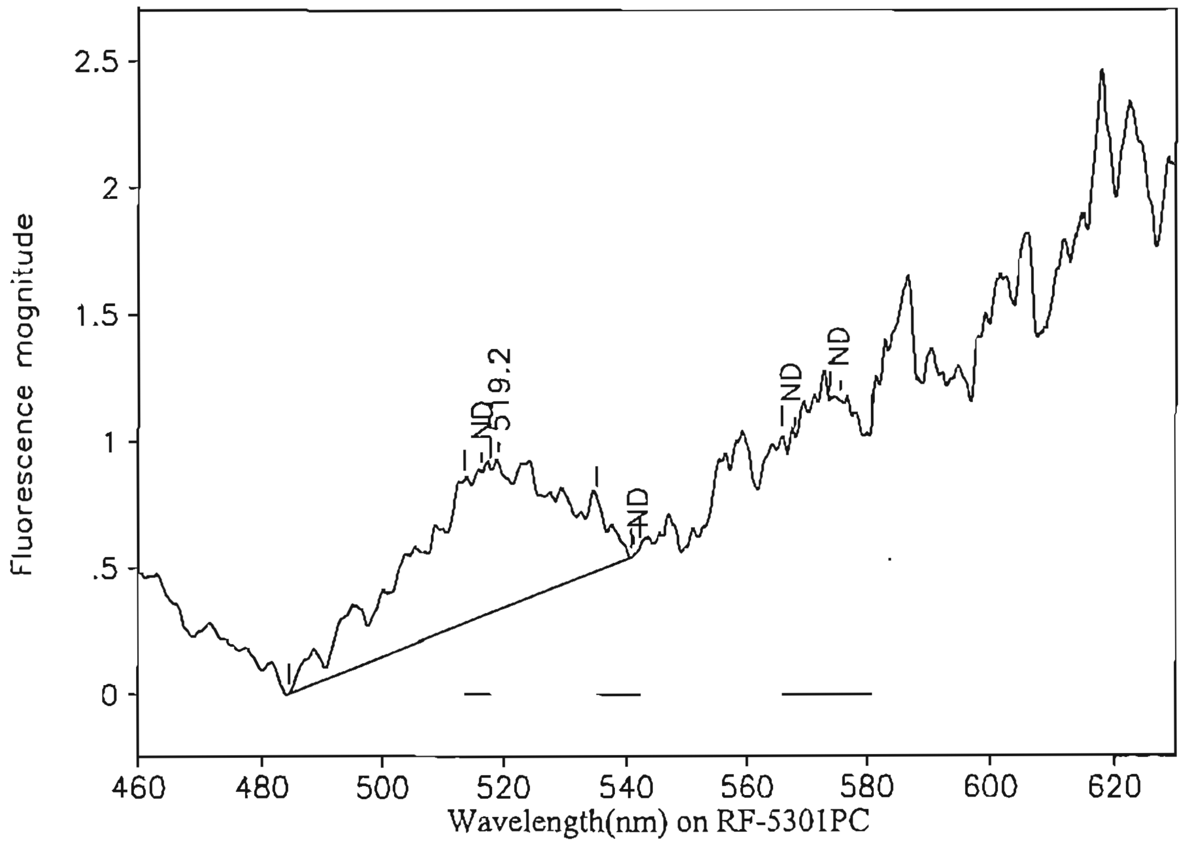
Station 3-175: MW-3 - 175 ft
OUL number: N7445 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



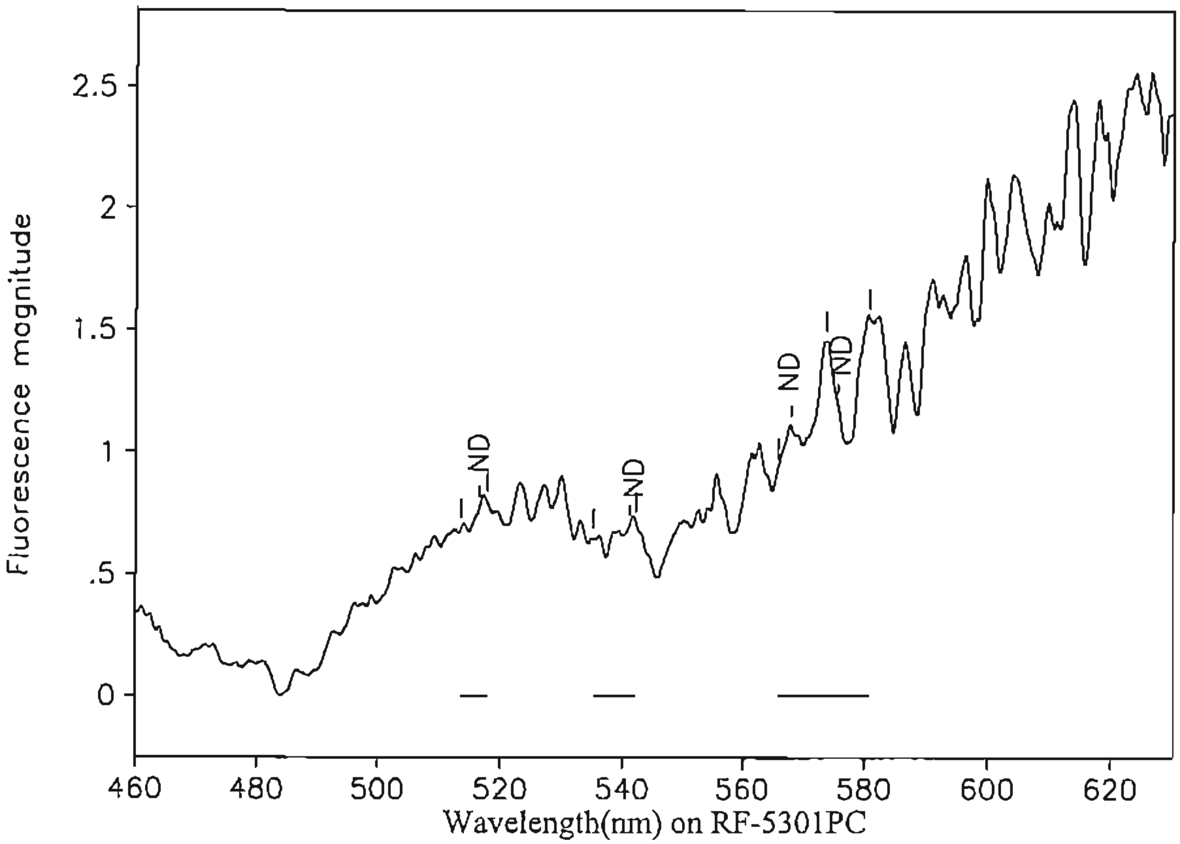
Station 3-185: MW-3 - 185 ft
OUL number: N7446
Matrix: Elutant
Placed: 11/17/04 1330

Analyzed: 12/07/04
Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.2	484.4	540.8	0.58	17.69	0.03	~~0.514~~

Ozark Underground Laboratory



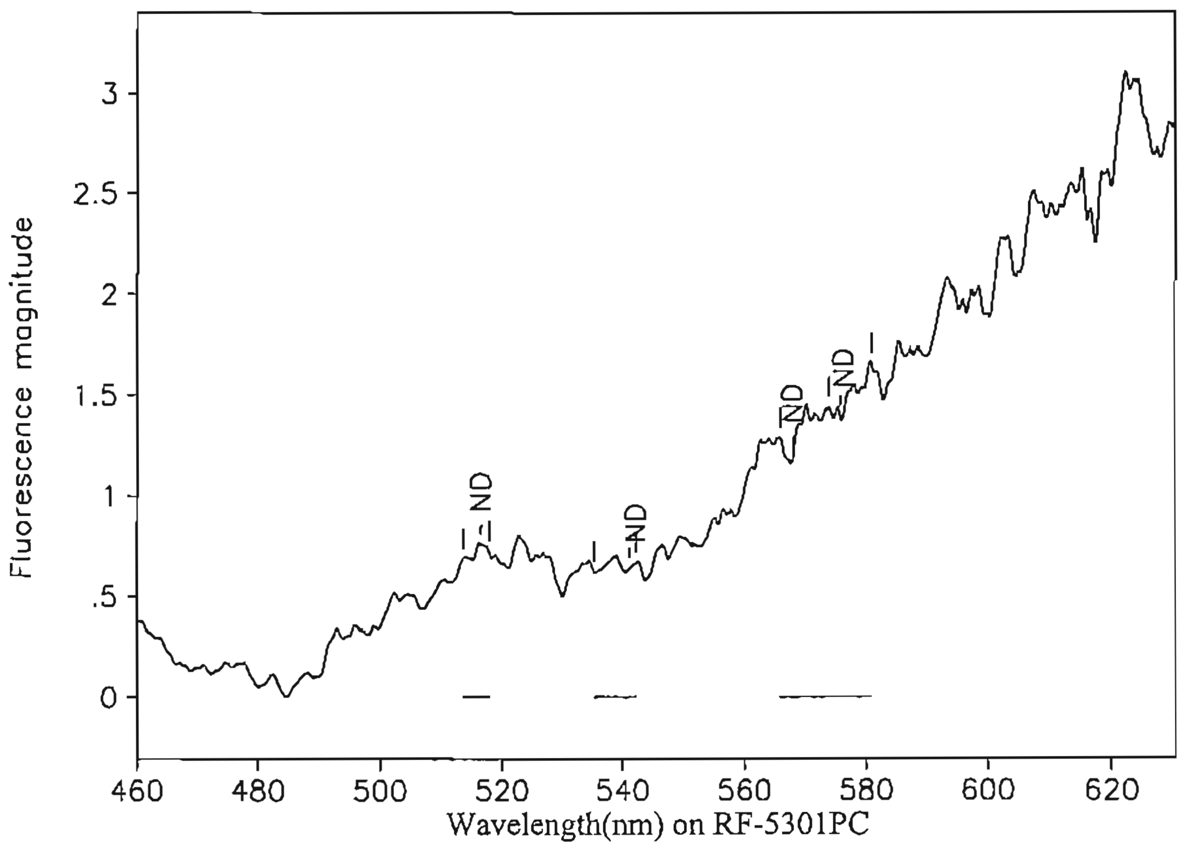
Station 3-195: MW-3 - 195 ft
OUL number: N7447 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



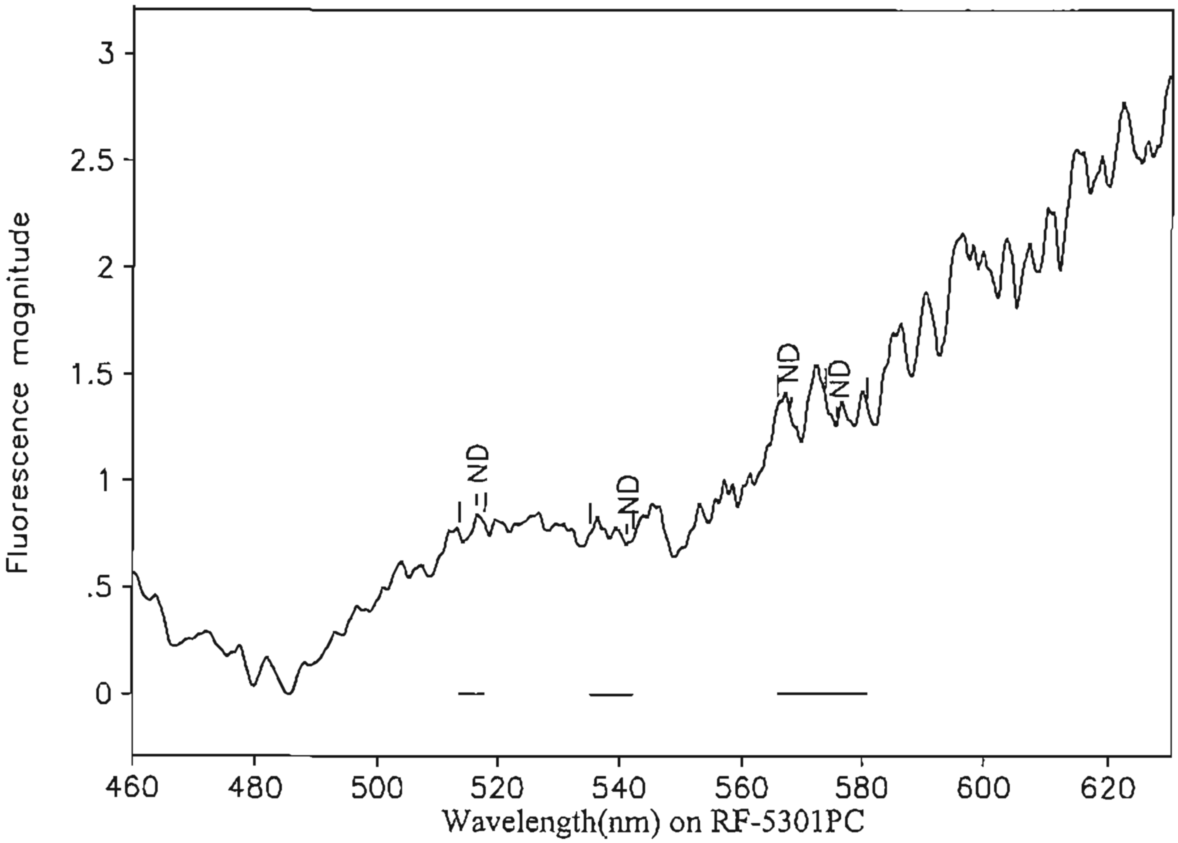
Station 3-205: MW-3 - 205 ft
OUL number: N7448 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



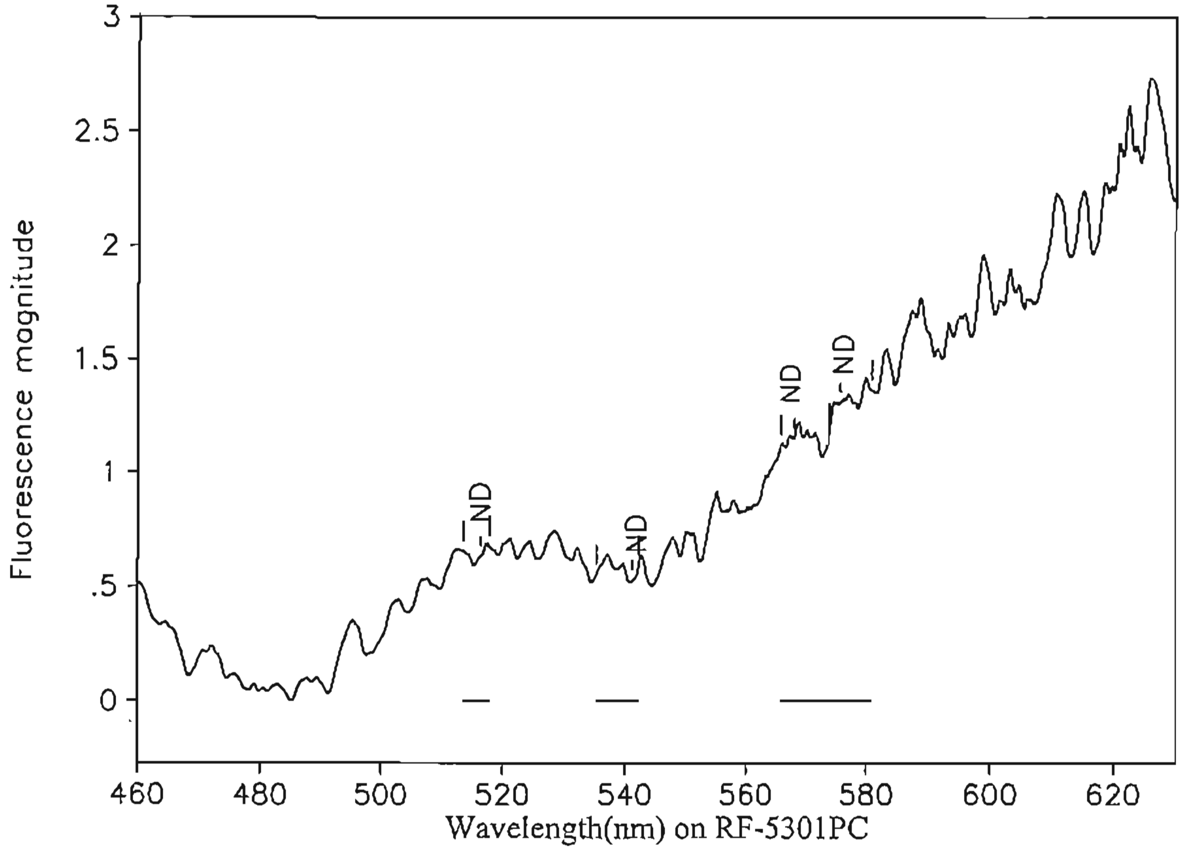
Station 3-215: MW-3 - 215 ft
OUL number: N7449 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N7450
Matrix: Elutant
Placed: 11/17/04 1330

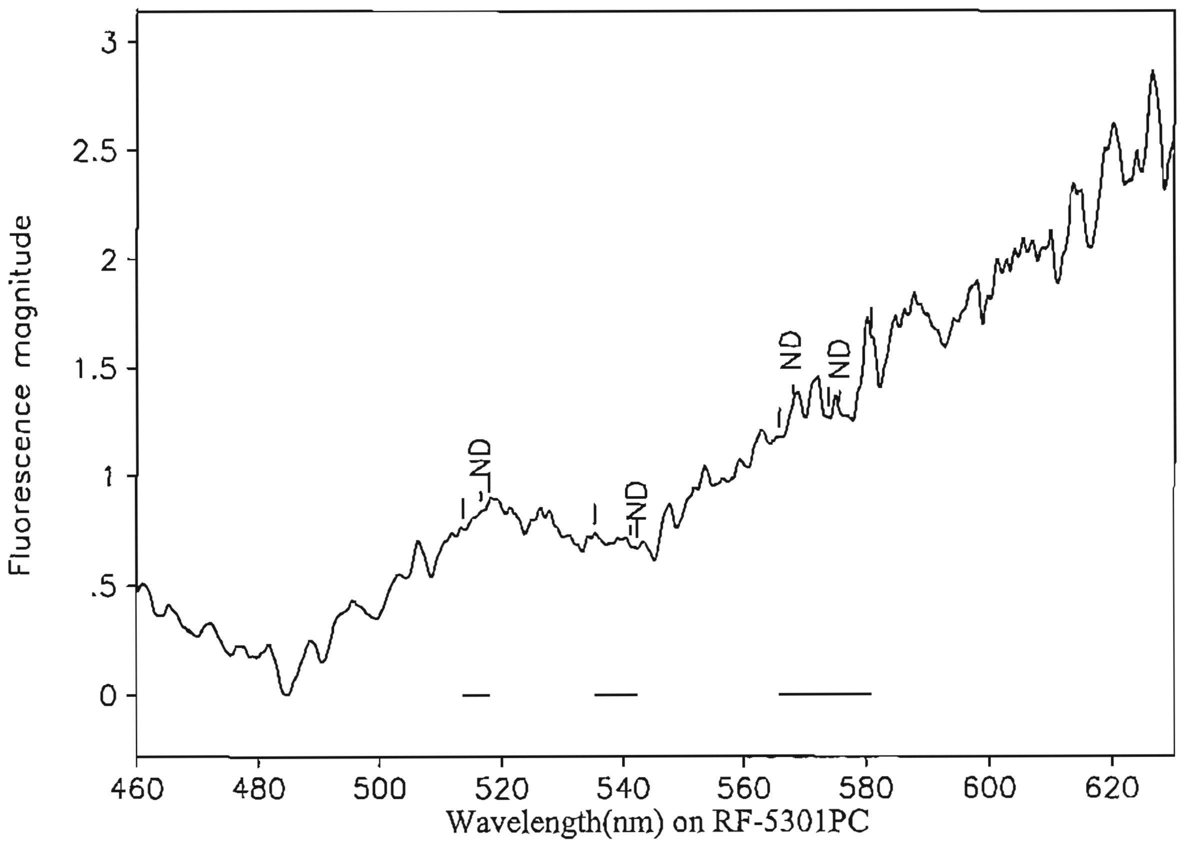
Analyzed: 12/07/04
Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



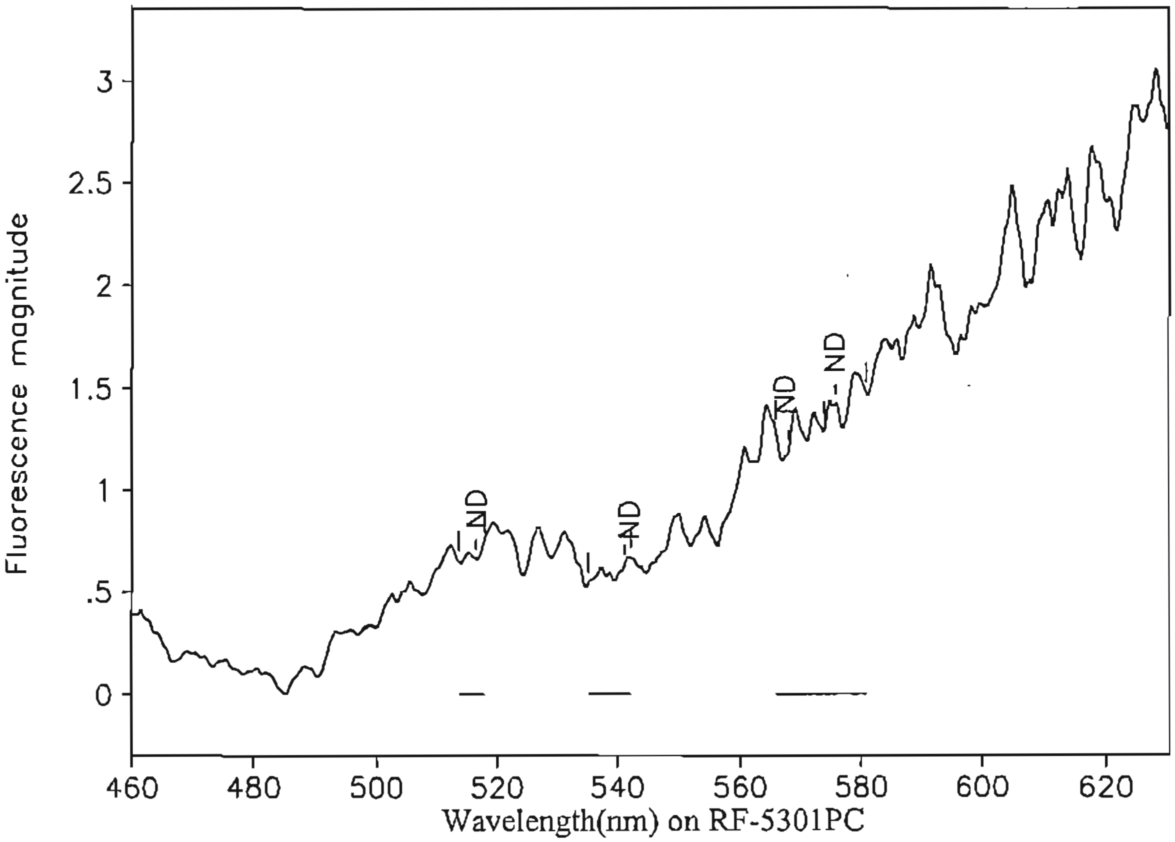
Station 3-235: MW-3 - 235 ft
OUL number: N7451 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



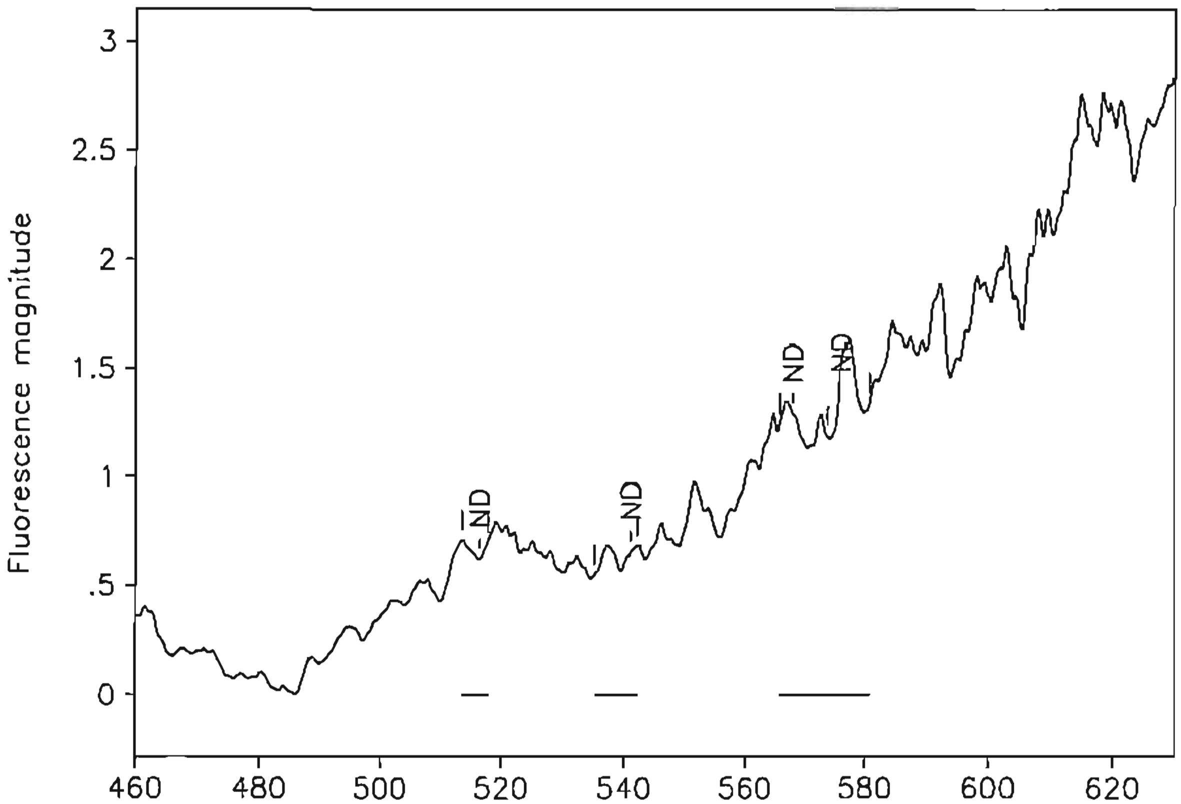
Station 3-245: MW-3 - 245 ft
OUL number: N7452 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



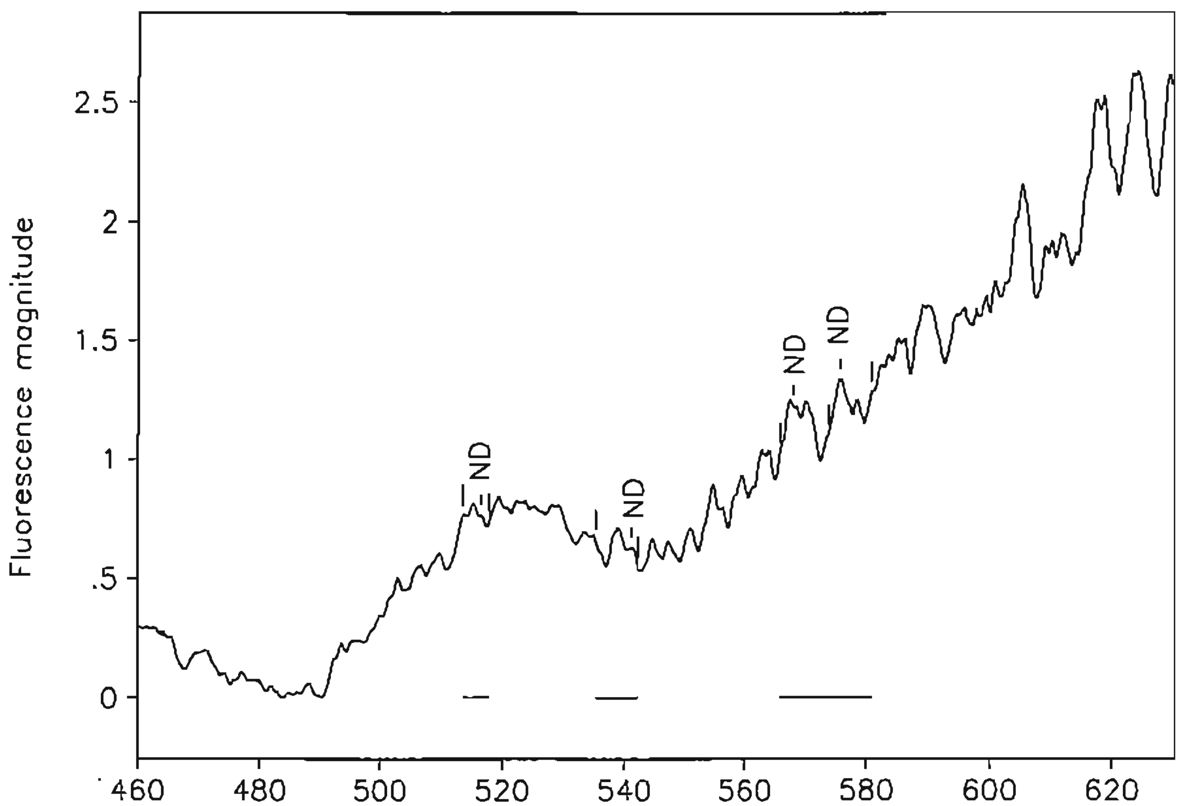
Station 3-255: MW-3 - 255 ft
OUL number: N7453
Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330
Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

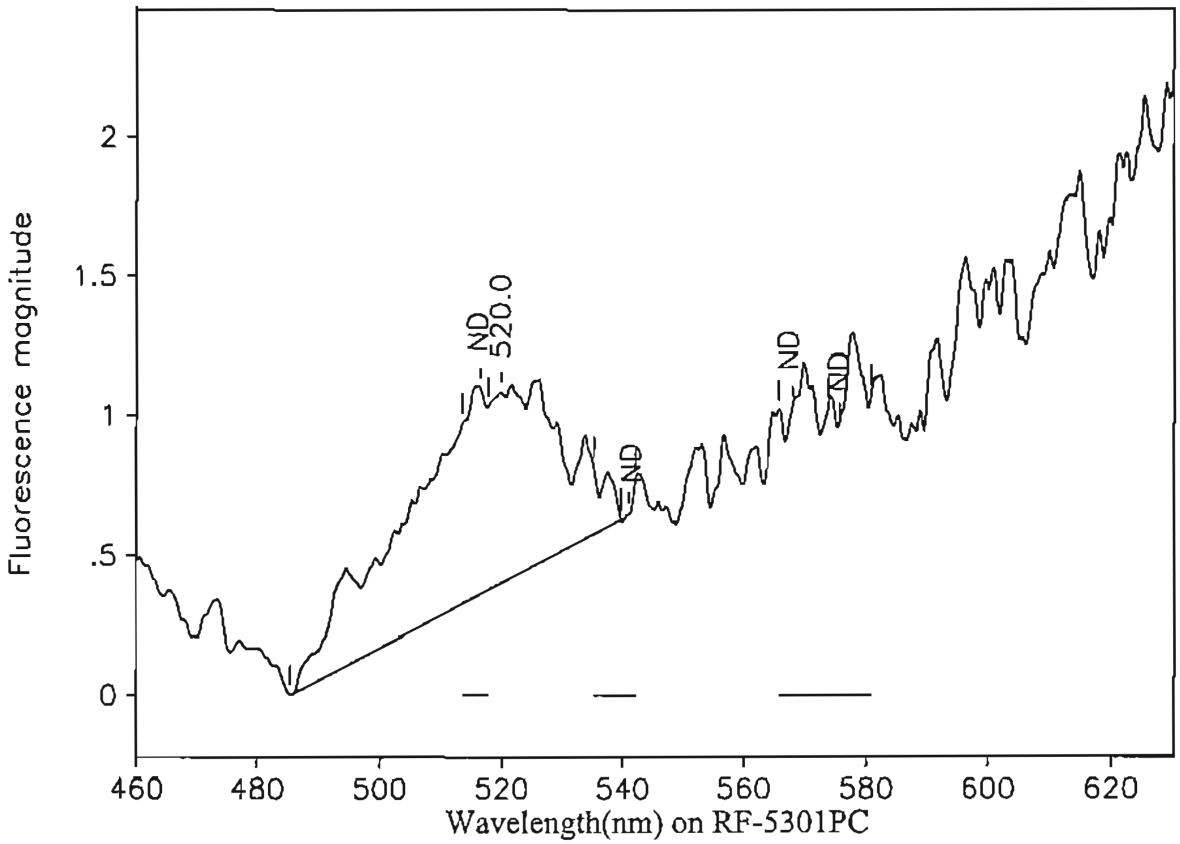
Station 3-265: MW-3 - 265 ft
OUL number: N7454 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1330 Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



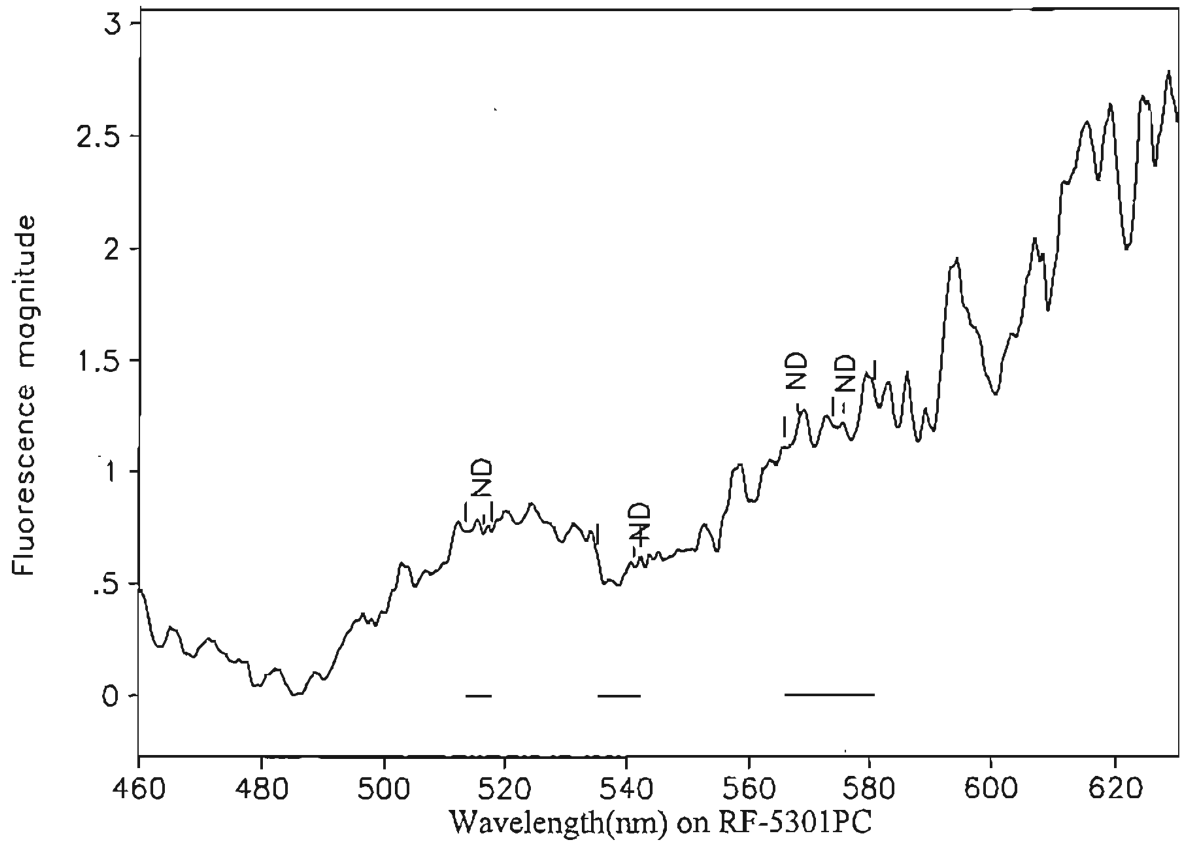
Station 3-275: MW-3 - 275 ft
OUL number: N7455
Matrix: Elutant
Placed: 11/17/04 1330

Analyzed: 12/07/04
Collected: 12/02/04 1010

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.0	485.4	539.8	0.68	21.76	0.03	~~0.631~~

Ozark Underground Laboratory



Station 4-165: MW-4 - 165 ft
OUL number: N7456
Matrix: Elutant
Placed: 11/17/04 1310

Analyzed: 12/07/04

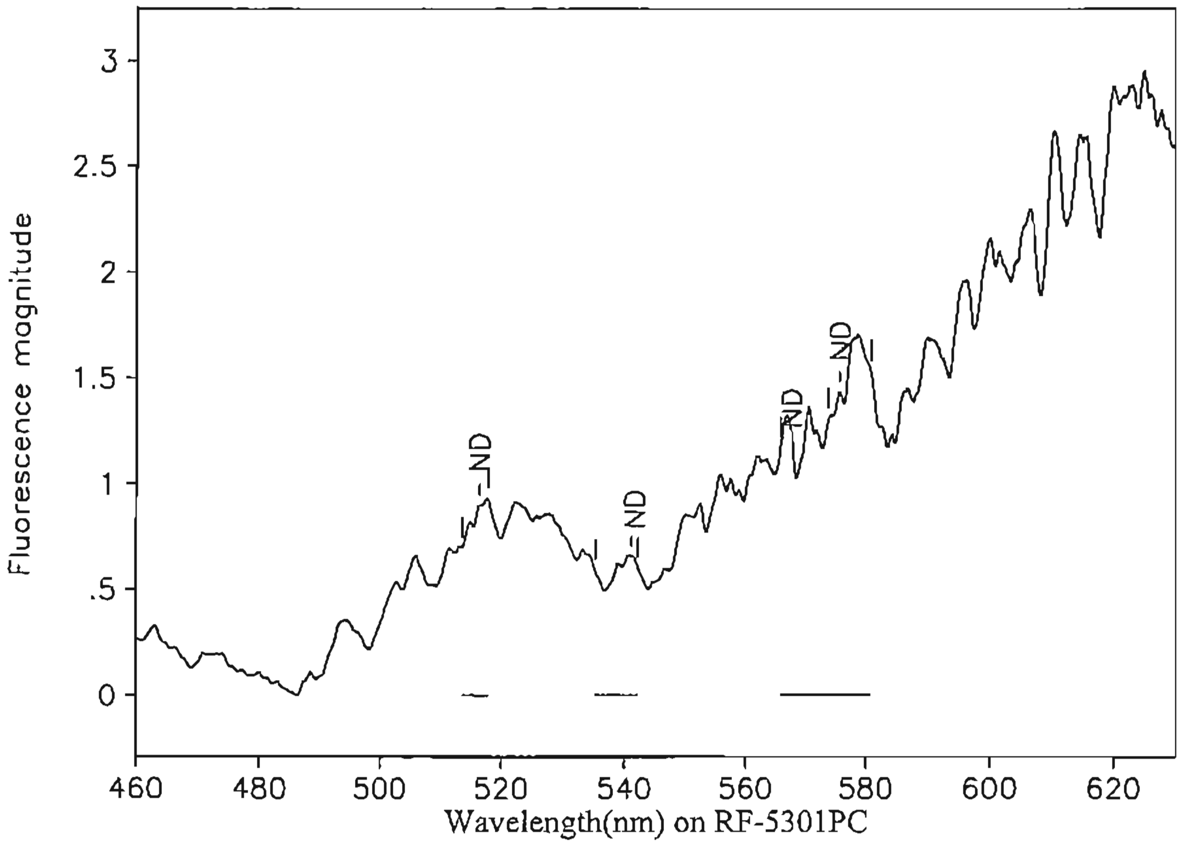
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



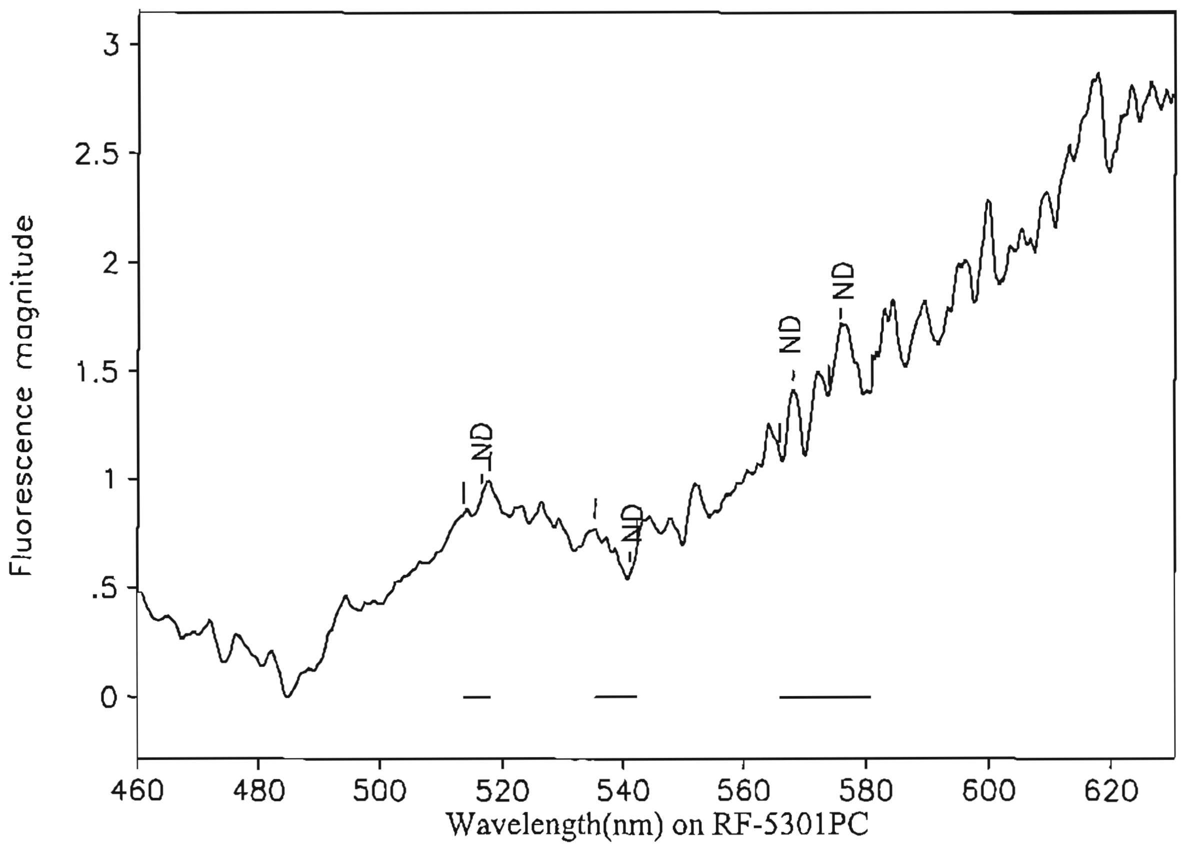
Station 4-180: MW-4 - 180 ft
OUL number: N7457 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1310 Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



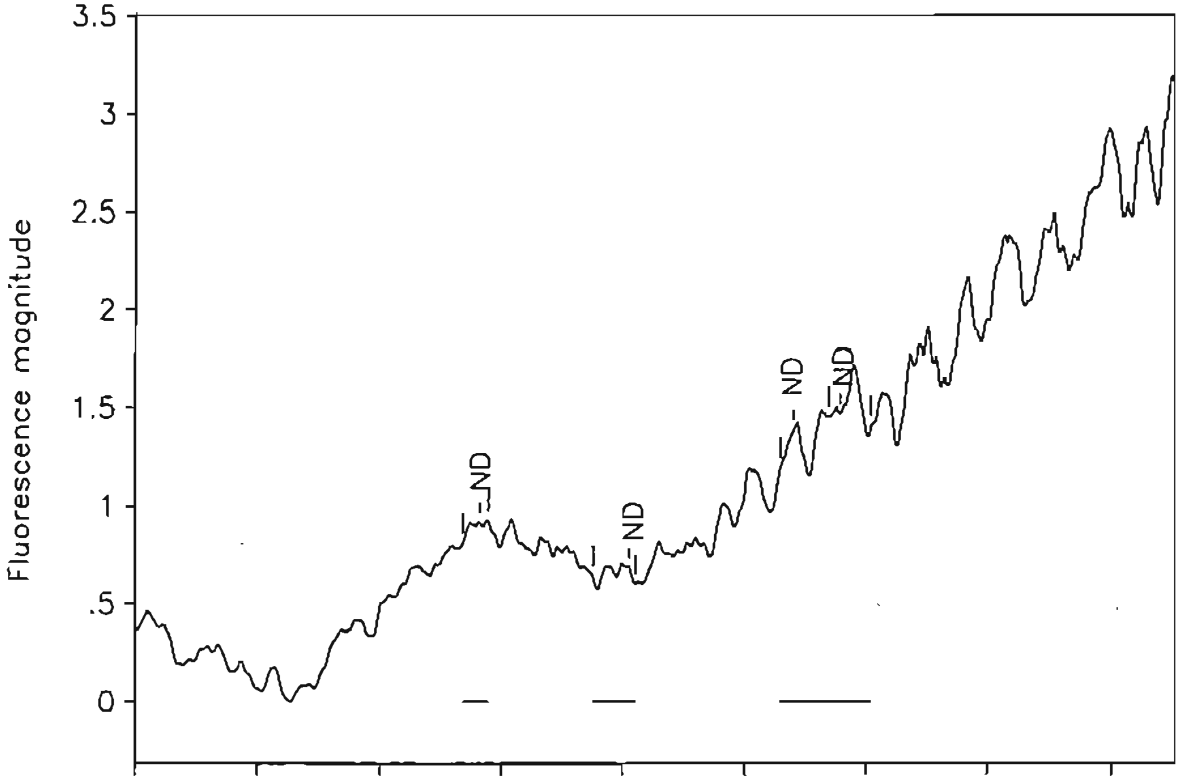
Station 4-195: MW-4 - 195 ft
OUL number: N7458 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1310 Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



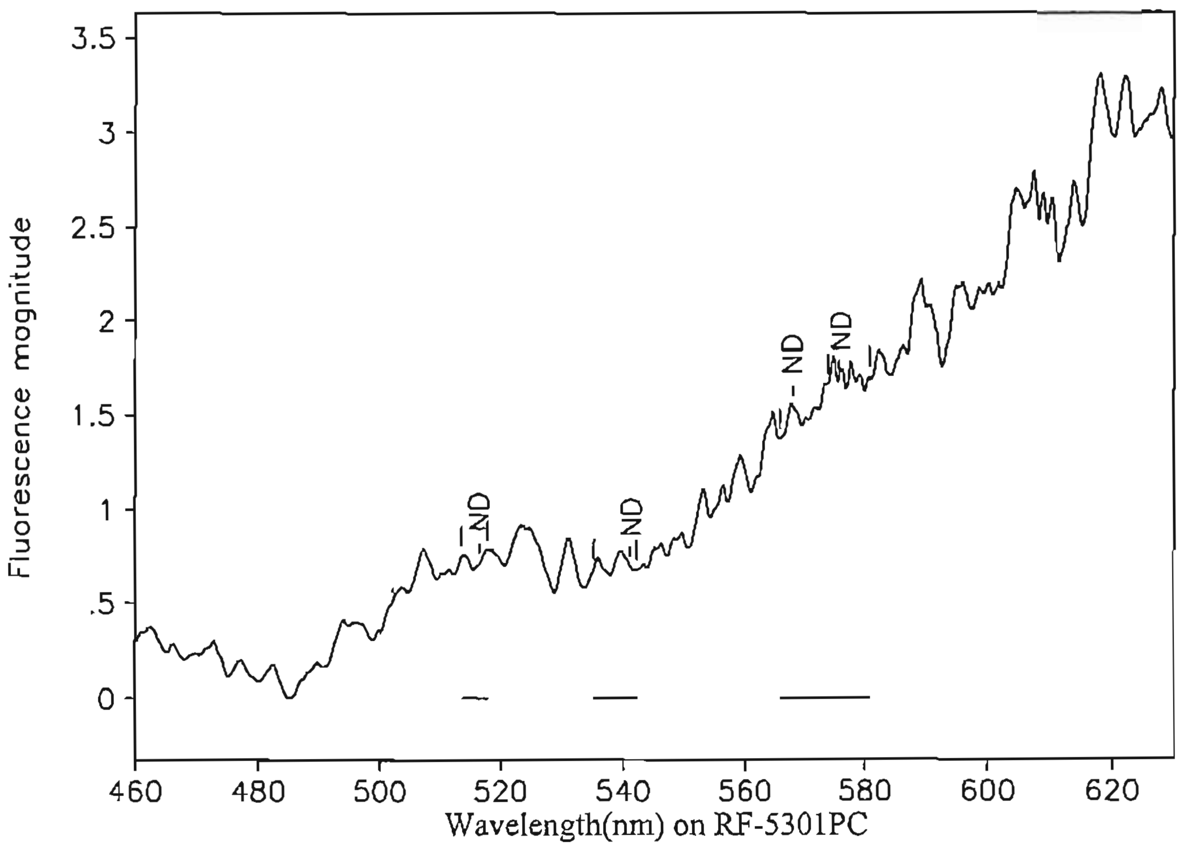
Station 4-210: MW-4 - 210 ft
OUL number: N7459 Analyzed: 12/07/04
Matrix: Elutant
Placed: 11/17/04 1310 Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-225: MW-4 - 225 ft
OUL number: N7461
Matrix: Elutant
Placed: 11/17/04 1310

Analyzed: 12/07/04

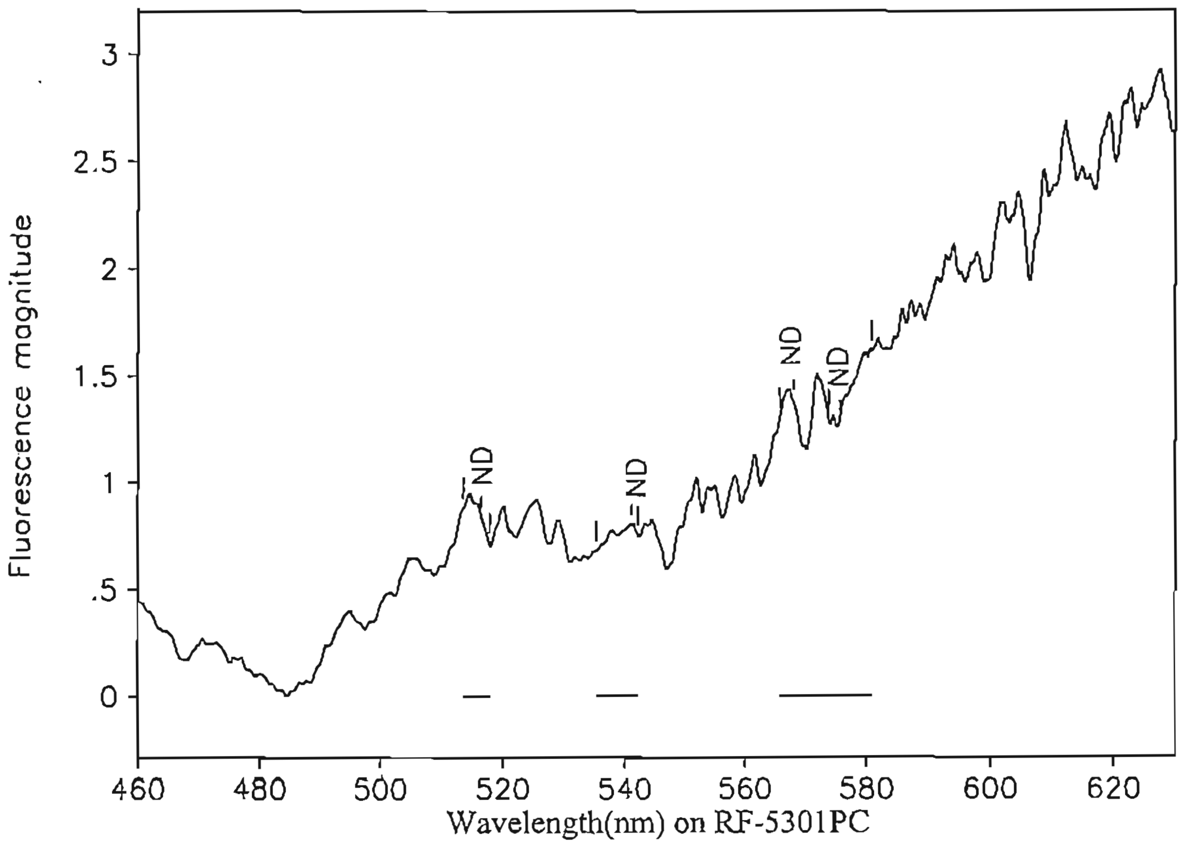
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-240: MW-4 - 240 ft
OUL number: N7462
Matrix: Elutant
Placed: 11/17/04 1310

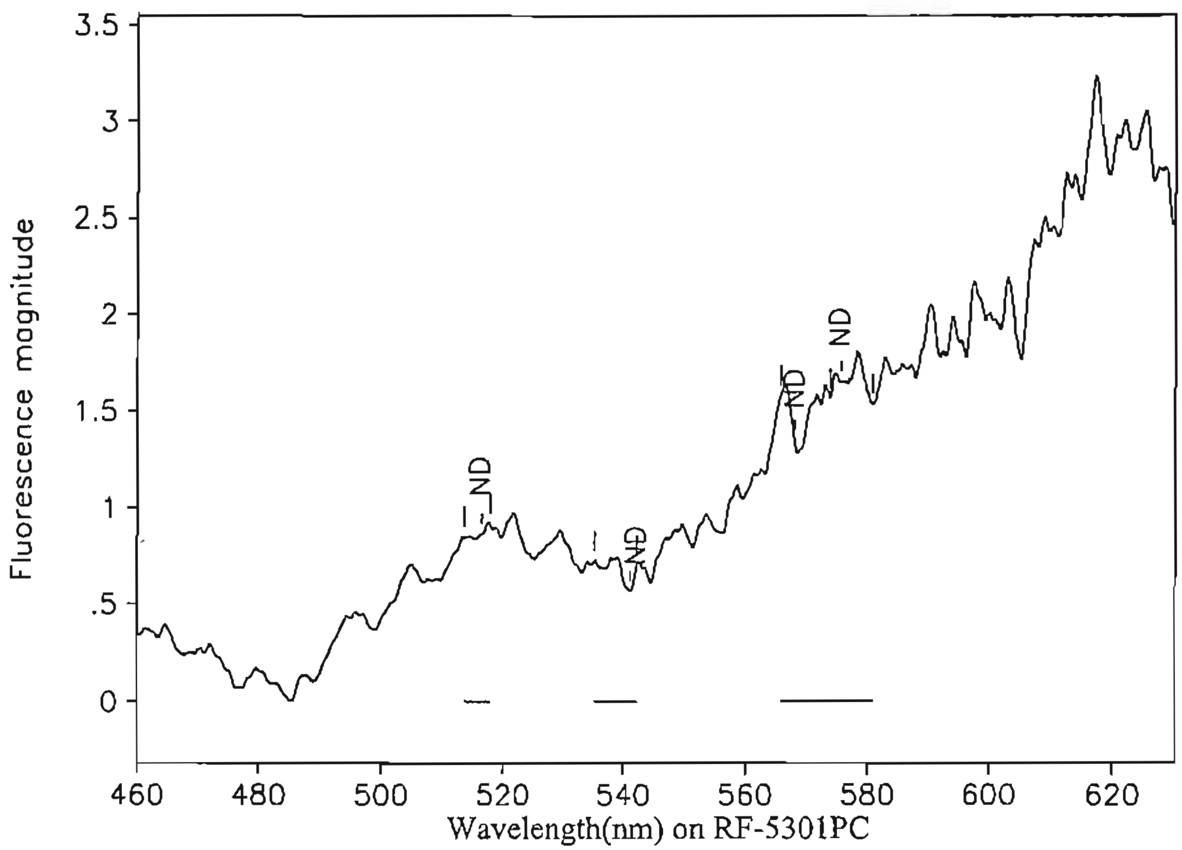
Analyzed: 12/07/04
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-255: MW-4 - 255 ft
OUL number: N7463
Matrix: Elutant
Placed: 11/17/04 1310

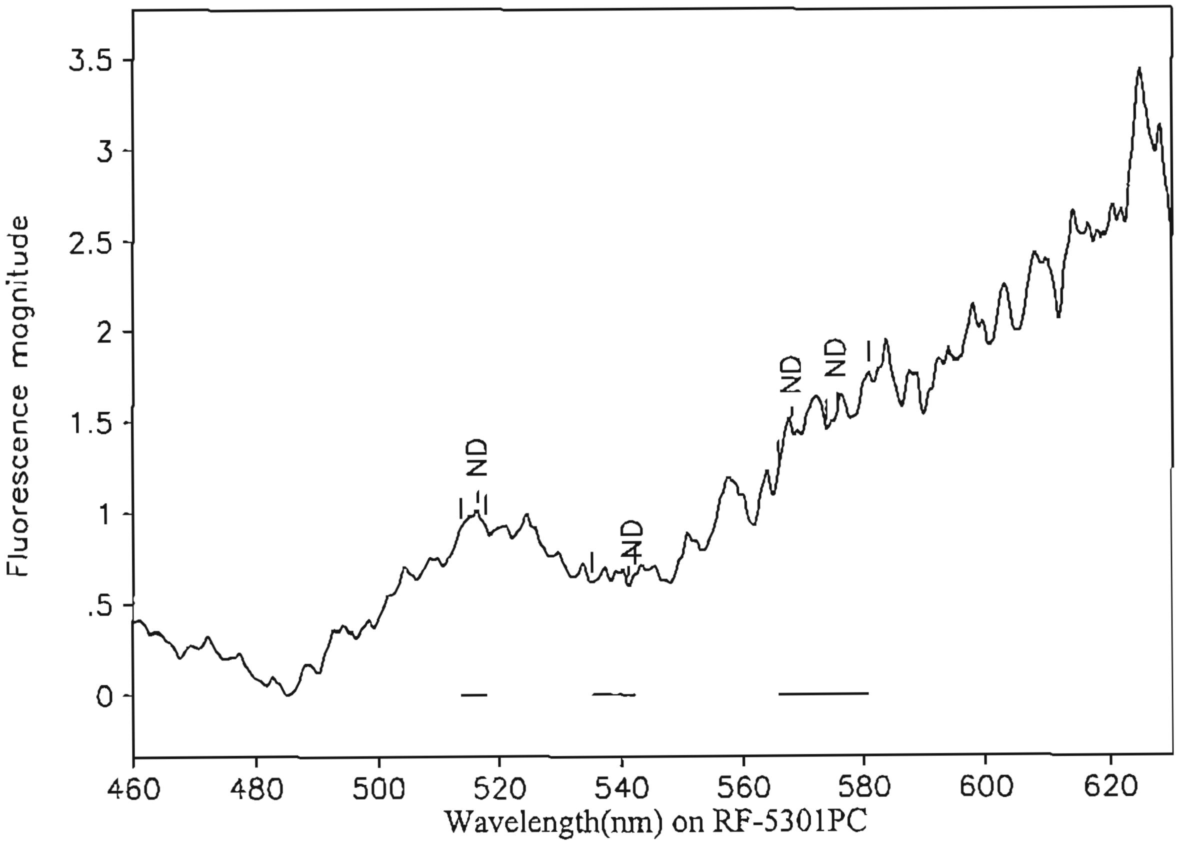
Analyzed: 12/07/04
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-270: MW-4 - 270 ft
OUL number: N7464
Matrix: Elutant
Placed: 11/17/04 1310

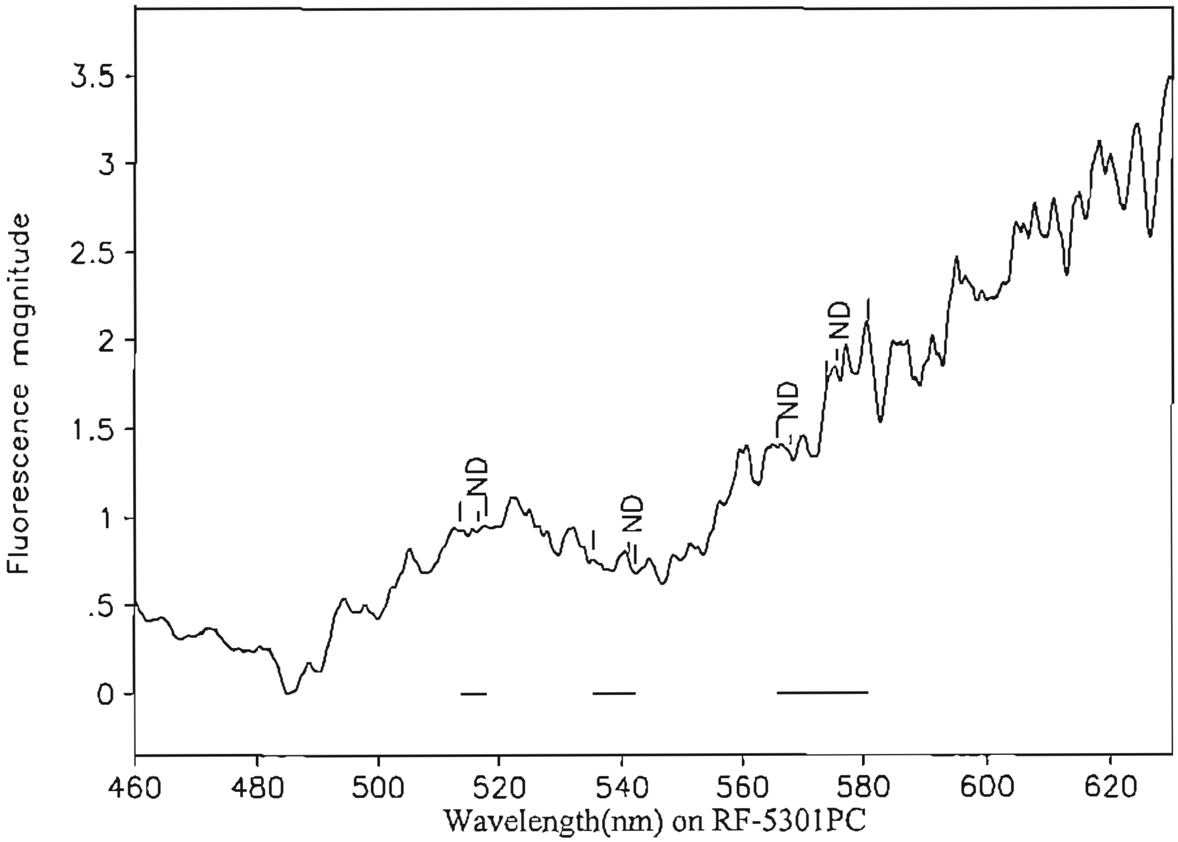
Analyzed: 12/07/04
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-285: MW-4 - 285 ft
OUL number: N7465
Matrix: Elutant
Placed: 11/17/04 1310

Analyzed: 12/07/04

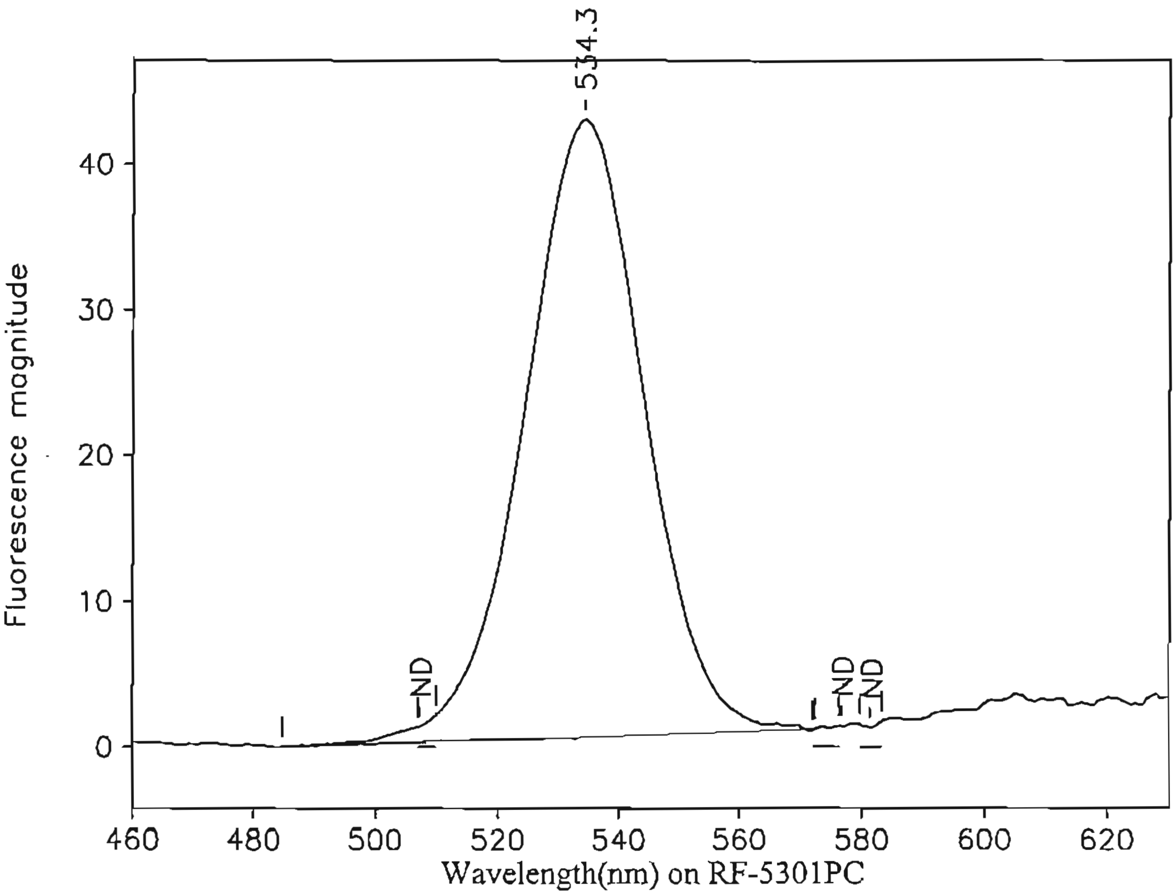
Collected: 12/02/04 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N7471 Analyzed: 12/07/04
Matrix: Water
Collected: 12/02/04 1200

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
534.3	484.7	572.3	42.27	972.50	0.04	8.18
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

December 23, 2004

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped December 16, 2004
Ozark Underground Laboratory (OUL) numbers N7669 through N7710 and N7721.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on December 17, 2004. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Discrepancy sheet
4. Sample analysis graphs

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Ozark Underground Laboratory for
CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: December 16, 2004
Date Samples Rec'd at OUL: December 17, 2004
Date Analyzed by OUL: December 21, 2004

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.	RWT Peak	RWT Conc.
N7669	1-215	MW-1 - 215 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7670	1-225	MW-1 - 225 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7671	1-235	MW-1 - 235 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7672	1-245	MW-1 - 245 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7673	1-255	MW-1 - 255 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7674	1-265	MW-1 - 265 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7675	1-275	MW-1 -275 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7676	1-285	MW-1 - 285 ft	12/2 1100	12/16 1000	ND		ND		ND	
N7677	2-135	MW-2 - 135 ft	12/2 1200	12/16 1105	ND		541.7	2,000	ND	
N7678	2-150	MW-2 - 150 ft	12/2 1200	12/16 1105	ND		541.5	3,880	ND	
N7679	2-165	MW-2 - 165 ft	12/2 1200	12/16 1105	ND		541.5	6,060	ND	
N7680	Laboratory Control Charcoal Blank									
N7681	2-180	MW-2 - 180 ft	12/2 1200	12/16 1105	ND		541.6	6,270	ND	
N7682	2-195	MW-2 - 195 ft	12/2 1200	12/16 1105	ND		541.7	6,040	ND	
N7683	2-210	MW-2 - 210 ft	12/2 1200	12/16 1105	ND		541.5	7,640	ND	
N7684	2-225	MW-2 - 225 ft	12/2 1200	12/16 1105	ND		541.5	5,660	ND	
N7685	2-240	MW-2 - 240 ft	12/2 1200	12/16 1105	ND		541.5	7,480	ND	
N7686	2-255	MW-2 - 255 ft	12/2 1200	12/16 1105	ND		541.5	5,330	ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory for CH2MHill

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2004	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.	RWT Peak	RWT Conc.
(continued)										
N7687	2-270	MW-2 - 270 ft	12/2 1200	12/16 1105	ND		541.5	2,450	ND	
N7688	2-285	MW-2 - 285 ft	12/2 1200	12/16 1105	ND		541.0	123	ND	
N7689	2-300	MW-2 - 300 ft	12/2 1200	12/16 1105	ND		541.1	92.0	ND	
N7690	3-175	MW-3 - 175 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7691	3-185	MW-3 - 185 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7692	3-195	MW-3 - 195 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7693	3-205	MW-3 - 205 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7694	3-215	MW-3 - 215 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7695	3-225	MW-3 - 225 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7696	3-235	MW-3 - 235 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7697	3-245	MW-3 - 245 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7698	3-255	MW-3 - 255 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7699	3-265	MW-3 - 265 ft	12/2 1010	12/16 0910	ND		ND		ND	
N7700	Laboratory Control Charcoal Blank									
N7701	3-275	MW-3 - 275 ft	12/2 1010	12/16 0930	ND		ND		ND	
N7702	4-165	MW-4 - 165 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7703	4-180	MW-4 - 180 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7704	4-195	MW-4 - 195 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7705	4-210	MW-4 - 210 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7706	4-225	MW-4 - 225 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7707	4-240	MW-4 - 240 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7708	4-255	MW-4 - 255 ft	12/2 0850	12/16 0815	ND		ND		ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory for
CH2MHill

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine		RWT	
			2004	2004	Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N7709	4-270	MW-4 - 270 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7710	4-285	MW-4 - 285 ft	12/2 0850	12/16 0815	ND		ND		ND	
N7721	2-WA	MW-2 - Water	**Water**	12/16 1130	ND		534.4	30.3	ND	

FOOTNOTES:

ND = No dye detected

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Fed X Samples Received By: J. Arnold

Date Samples Shipped: 12/16/04 Date Samples Received: 12/17/04 Time Samples Received: 13:00 Return Cooler? Yes ✓ No

Bill to: Send Results to:

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ______ Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N76669	1-215	MW-1 – 215 ft	12/2/04	1100	12/16/04	1000	0
1	N76670	1-225	MW-1 – 225 ft					0
1	N76671	1-235	MW-1 – 235 ft					0
1	N76672	1-245	MW-1 – 245 ft					0
1	N76673	1-255	MW-1 – 255 ft					0
1	N76674	1-265	MW-1 – 265 ft					0
1	N76675	1-275	MW-1 – 275 ft					0
1	N76676	1-285	MW-1 – 285 ft					0
0		1-WA	MW-1 – Water Sample				1030	1

COMMENTS:

This sheet filled out by OUL staff? Yes ______ No ✓ Charts for samples on this page proofed by OUL: mma

Project 621 Analyzed 12/21/04 by MR Page 1 of 4 OUL 1 of 4

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OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: 12/16/04 Date Samples Received: 12/17/04 Time Samples Received: 13:00 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: ____

OUL use only		Please indicate stations where dye was visible in the field *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7677	2-135	MW-2 – 135 ft	12/2/04	1200	12/16/04	1105	0
1	N7678	2-150	MW-2 – 150 ft					0
1	N7679	2-165	MW-2 – 165 ft					0
1	N7681	2-180	MW-2 – 180 ft					0
1	N7682	2-195	MW-2 – 195 ft					0
1	N7683	2-210	MW-2 – 210 ft					0
1	N7684	~~2-225~~ 2-225	MW-2 – 225 ft					0
1	N7685	2-240	MW-2 – 240 ft					0
1	N7686	2-255	MW-2 – 255 ft					0
1	N7687	2-270	MW-2 – 270 ft					0
1	N7688	2-285	MW-2 – 285 ft					0
1	N7689	2-300	MW-2 – 300 ft					0
0	—	2-WA	MW-2 – Water Sample				1130	1

COMMENTS: Charcoal Blank N7680

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: [signature] 674

Analyzed 12/21/04 by [initials] Page 2 of 4 OUL 2 of 4 f:\shared\forms\coc2.doc, Rev. 4/12/04

OZARK UNDERGROUN_ LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Mike burns Samples Received By: J. Arnold

Date Samples Shipped: __/__/__ Date Samples Received: 12/17/04 Time Samples Received: 13:00 Return Cooler? Yes ✓ No ___

Bill to: ___ Send Results to: ___

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ___ Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7690	3-175	MW-3 – 175 ft *	11/2/04	1010	12/16/04	0910	0
1	N7691	3-185	MW-3 – 185 ft					0
1	N7692	3-195	MW-3 – 195 ft					0
1	N7693	3-205	MW-3 – 205 ft					0
1	N7694	3-215	MW-3 – 215 ft					0
1	N7695	3-225	MW-3 – 225 ft					0
1	N7696	3-235	MW-3 – 235 ft					0
1	N7697	3-245	MW-3 – 245 ft					0
1	N7698	3-255	MW-3 – 255 ft					0
1	N7699	3-265	MW-3 – 265 ft					0
1	N7701	3-275	MW-3 – 275 ft				0930	1
0	—	3-WA	MW-3 – Water Sample					

COMMENTS: Charcoal Blank N7700 * See discrepancy sheet. - mma

This sheet filled out by OUL staff? Yes ___ No — Charts for samples on this page proofed by OUL: mma

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: 12/16/04 Date Samples Received: 12/17/04 Time Samples Received: 13:00 Return Cooler? Yes ✓ No

Bill to: Send Results to:

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to:

OUL use only		Please indicate stations where dye was visible in the field *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1		2-135	MW-2 – 135 ft	12/2/04	1200	12/16/04	1105	0
1		2-150	MW-2 – 150 ft					0
1		2-165	MW-2 – 165 ft					0
1		2-180	MW-2 – 180 ft					0
1		2-195	MW-2 – 195 ft					0
1		2-210	MW-2 – 210 ft					0
1		3-225	MW-2 – 225 ft					0
1		2-240	MW-2 – 240 ft					0
1		2-255	MW-2 – 255 ft					0
1		2-270	MW-2 – 270 ft					0
1		2-285	MW-2 – 285 ft					0
1		2-300	MW-2 – 300 ft					0
0	N7721	2-WA	MW-2 – Water Sample				1130	1

COMMENTS:

This sheet filled out by OUL staff? Yes No ✓ Charts for samples on this page proofed by OUL: [signature]

Analyzed 12/21/04 by [initials] Page 2 of 4 OUL 2 of 4

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 3 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: / / Date Samples Received: 12/17/04 Time Samples Received: 13 00 Return Cooler? Yes ✓ No

Bill to: Send Results to:

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
				DATE	TIME	DATE	TIME	
1	N7702	4-165	MW-4 – 165 ft	12/2/04	0850	12/16/04	0815	0
1	N7703	4-180	MW-4 – 180 ft					0
1	N7704	4-195	MW-4 – 195 ft					0
1	N7705	4-210	MW-4 – 210 ft					0
1	N7706	4-225	MW-4 – 225 ft					0
1	N7707	4-240	MW-4 – 240 ft					0
1	N7708	4-255	MW-4 – 255 ft					0
1	N7709	4-270	MW-4 – 270 ft					0
1	N7710	4-285	MW-4 – 285 ft					0
0		4-WA	MW-5 – Water Sample				0835	1

COMMENTS:

This sheet filled out by OUL staff? Yes No ✓ Charts for samples on this page proofed by OUL: mmd 677

Analyzed 12/21/04 by WR OUL 4 of 4

f:\shared\forms\coc2.doc, Rev. 4/12/04

OZARK UNDERGROU[illegible] LABORATORY, INC.

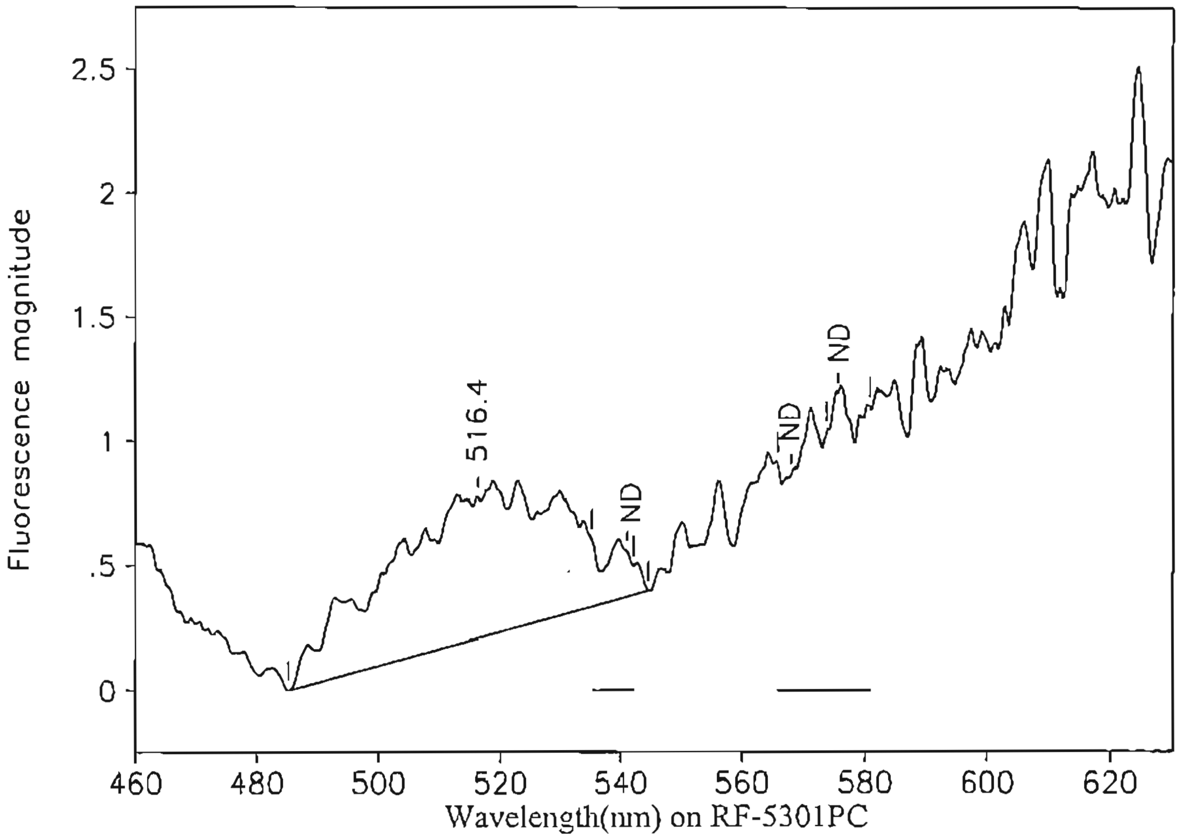
DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

Company & Project Name: CH2M Hill /Lake Ontario **Date Rec'd by OUL:** 12/17/04 **Wk #** ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
	MW-3	all depths	12/16	COC indicates placed date as 11/2/04.	12/2/04 was last collected date. Will use 12/2 as placed date. [illegible]

Comments:

Ozark Underground Laboratory



Station 1-215: MW-1 - 215 ft
OUL number: N7669
Matrix: Elutant
Placed: 12/02/04 1100

Analyzed: 12/21/04

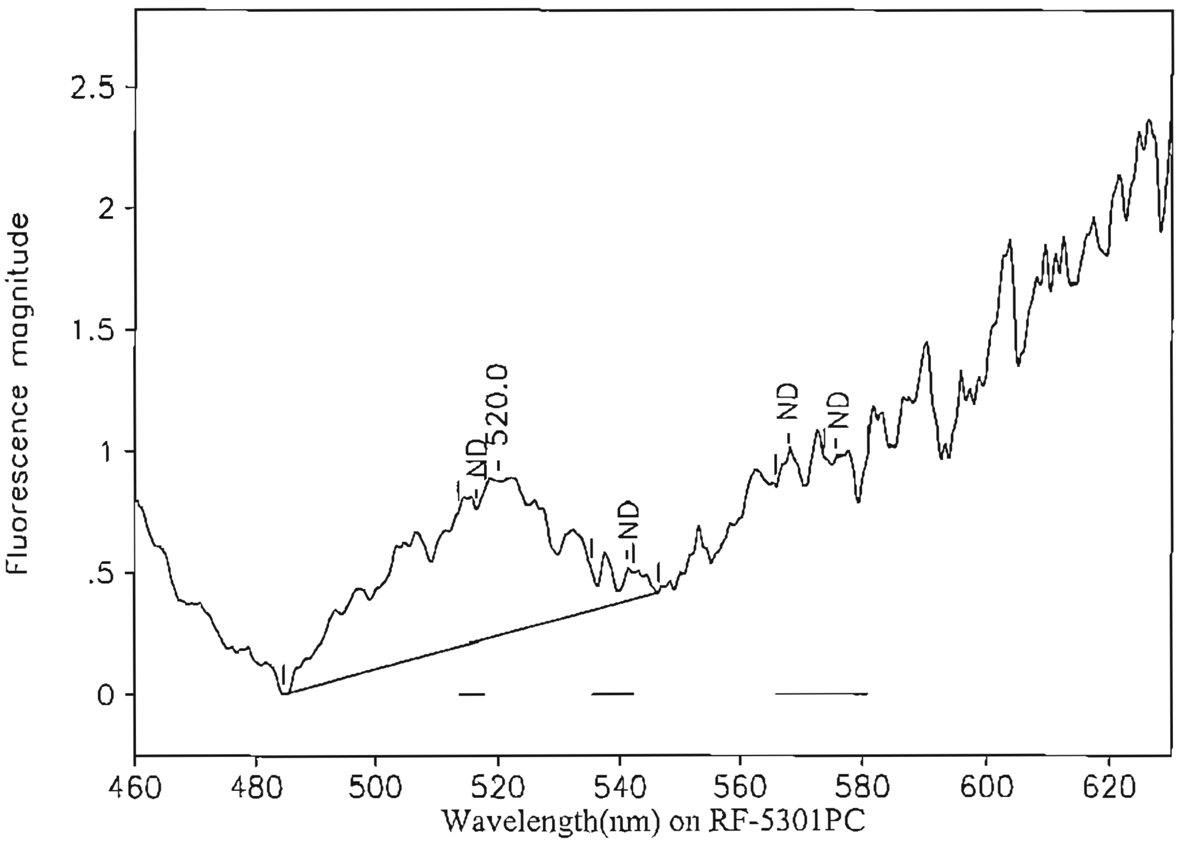
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	485.2	544.6	0.57	21.38	0.03	~~0.608~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

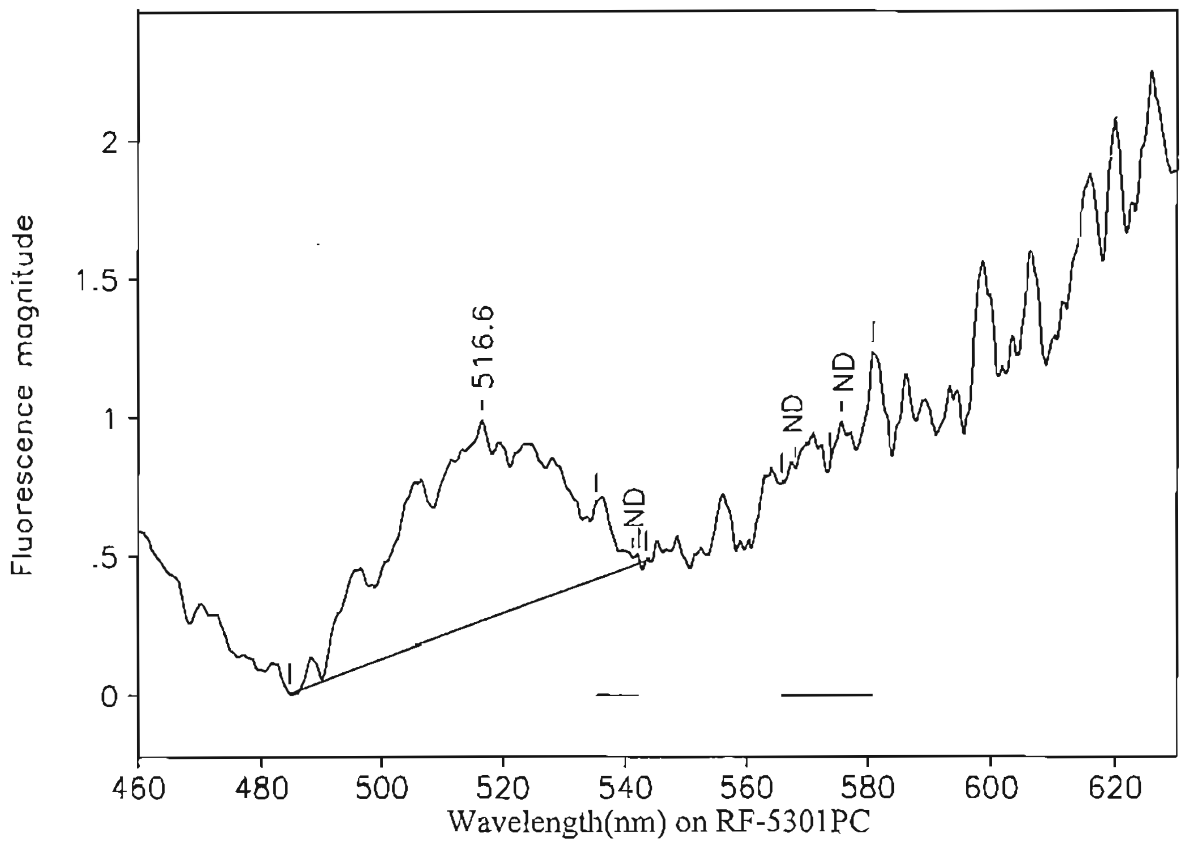


Station 1-225: MW-1 - 225 ft
OUL number: N7670
Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1100
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
520.0	484.6	546.4	0.64	21.10	0.03	~~0.600~~

Ozark Underground Laboratory



Station I-235: MW-1 - 235 ft
OUL number: N7671
Matrix: Elutant
Placed: 12/02/04 1100

Analyzed: 12/21/04

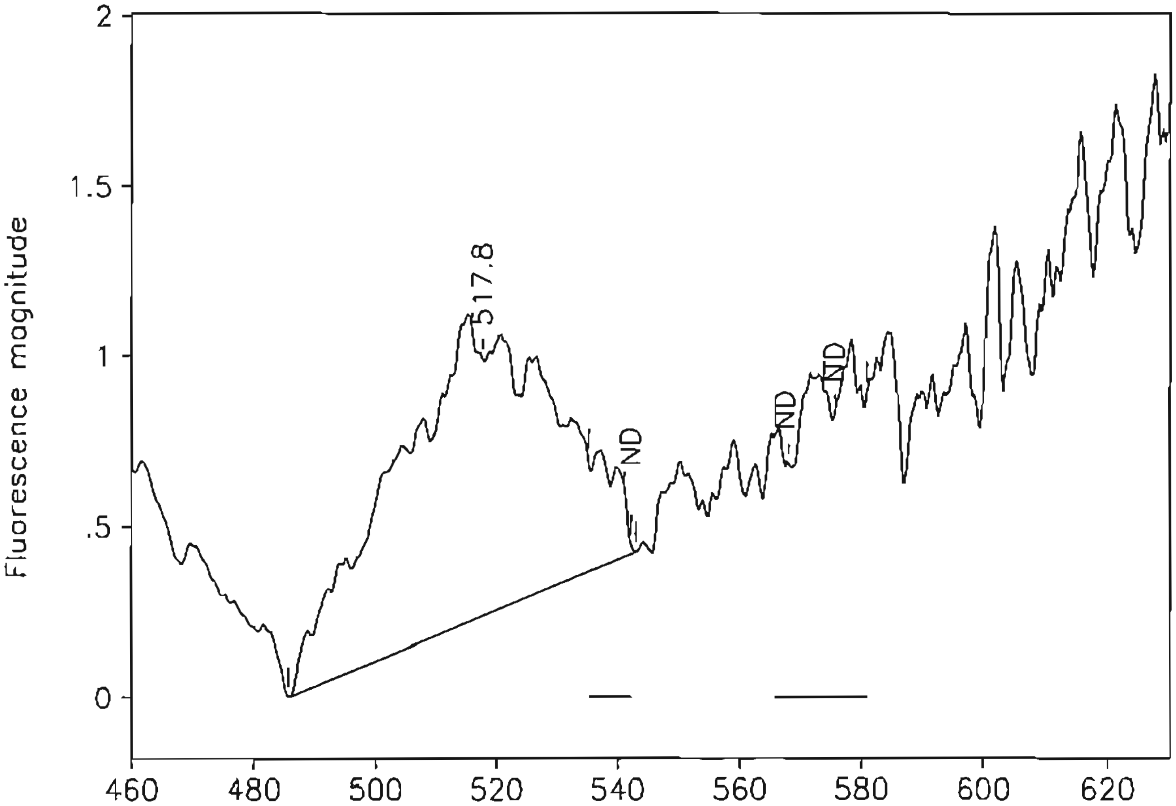
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	484.6	543.4	0.73	21.49	0.03	~~0.611~~
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-245: MW-1 - 245 ft
OUL number: N7672
Matrix: Elutant
Placed: 12/02/04 1100

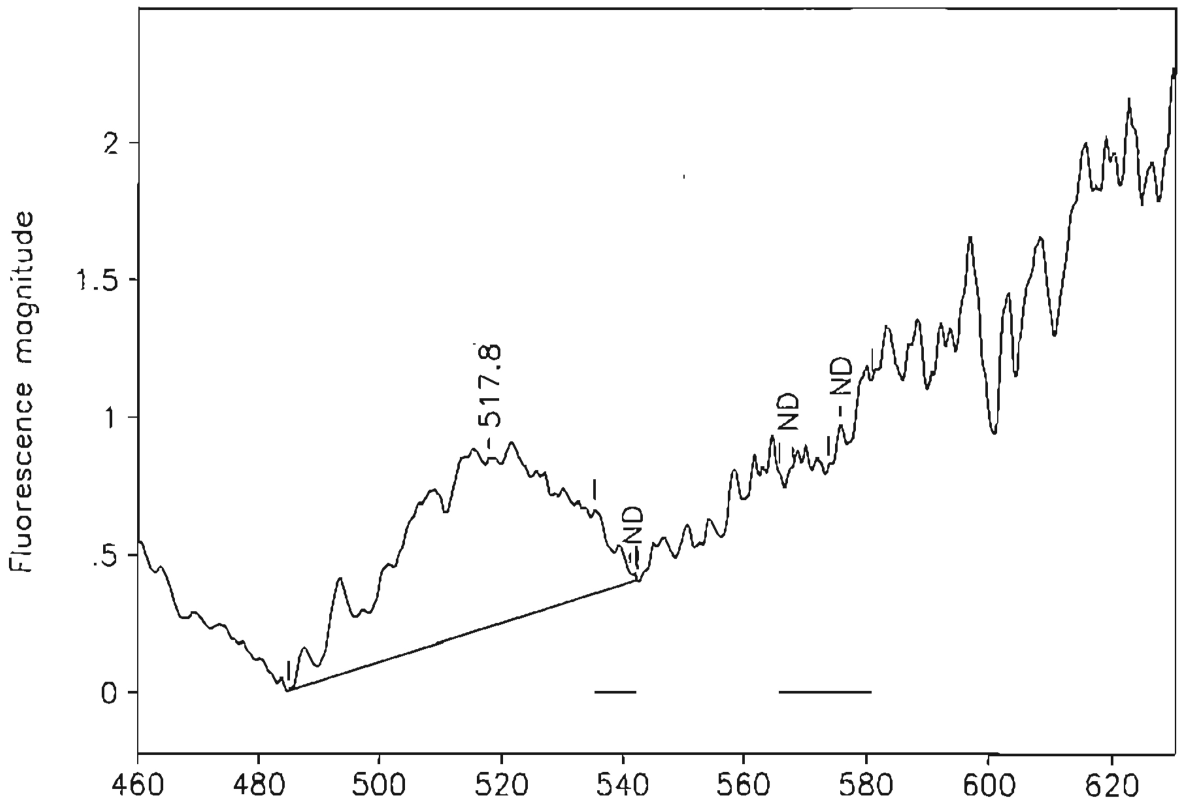
Analyzed: 12/21/04
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	485.6	543.0	0.75	27.80	0.03	~~0.790~~
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-255: MW-1 - 255 ft
OUL number: N7673
Matrix: Elutant
Placed: 12/02/04 1100

Analyzed: 12/21/04

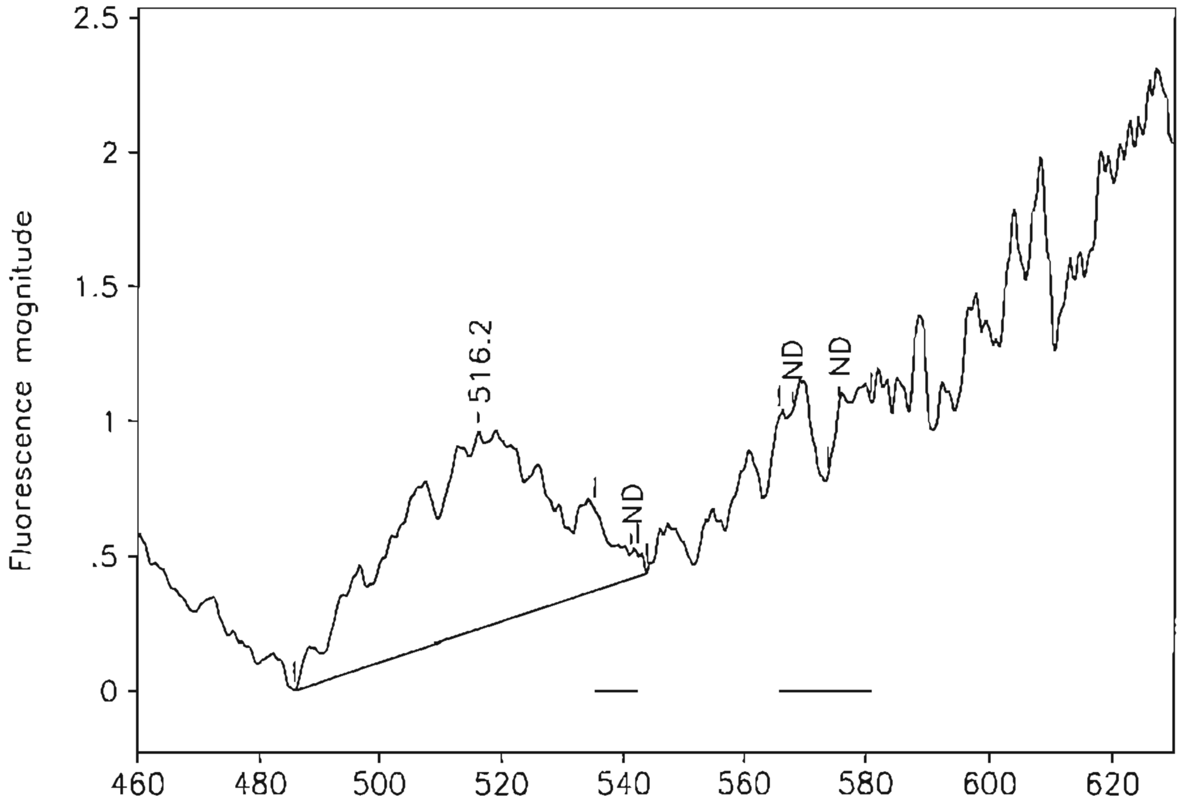
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	485.0	542.4	0.61	20.86	0.03	~~0.593~~
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

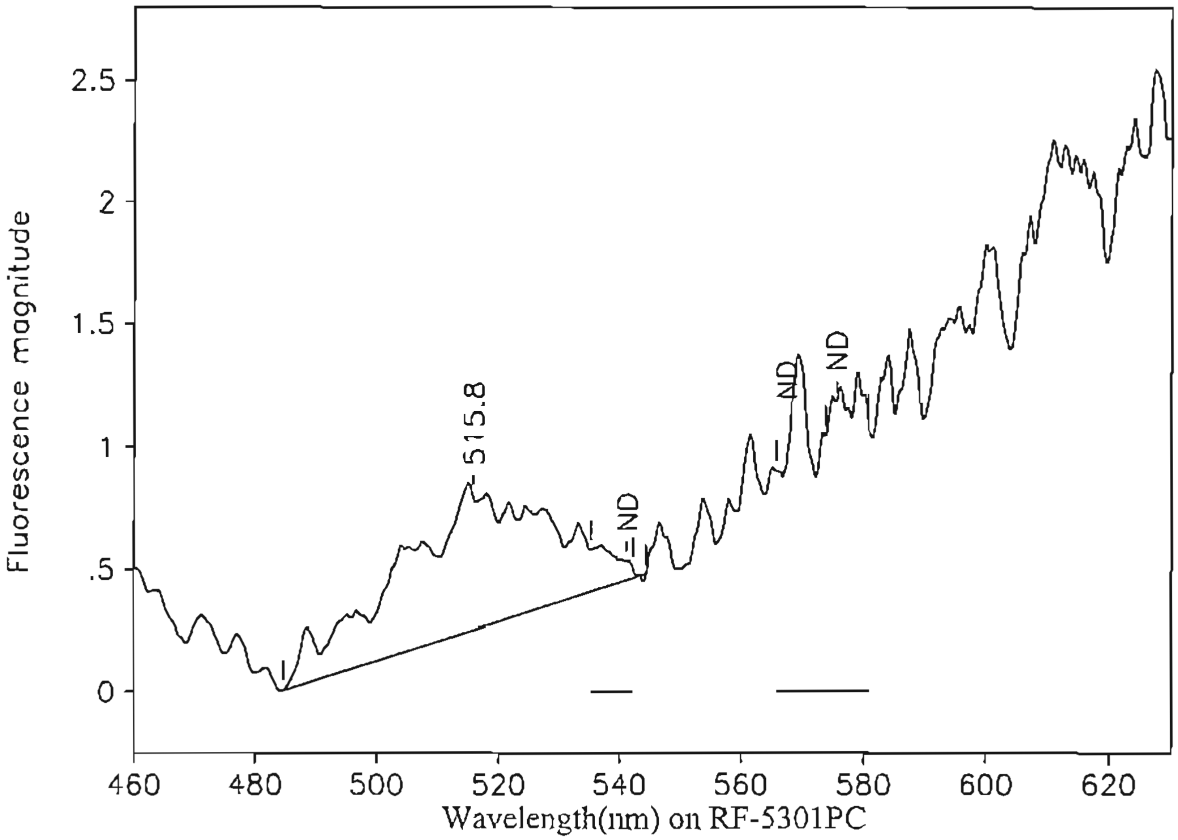
Station 1-265: MW-1 - 265 ft
OUL number: N7674 — Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1100 — Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	485.8	543.8	0.73	22.49	0.03	~~0.639~~
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-275: MW-1 -275 ft
OUL number: N7675
Matrix: Elutant
Placed: 12/02/04 1100

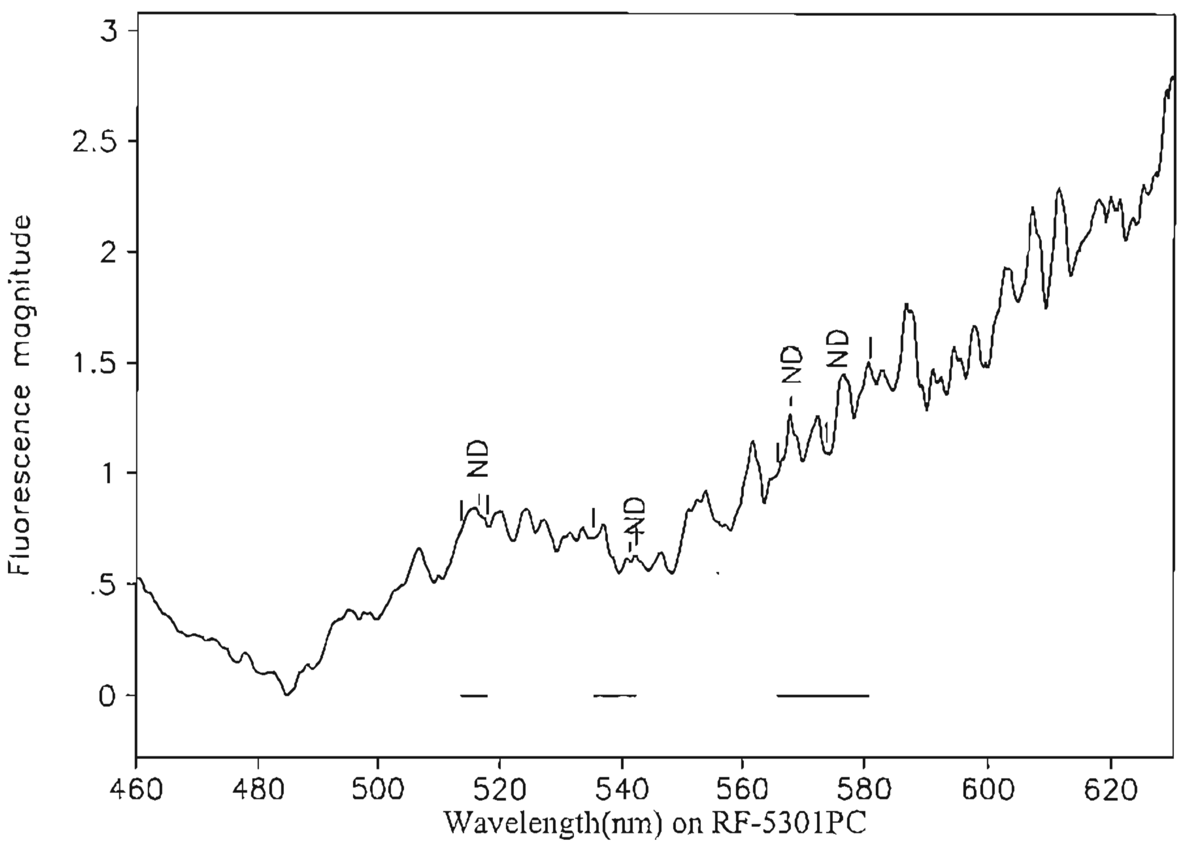
Analyzed: 12/21/04
Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.6	544.4	0.55	17.21	0.03	0.489
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



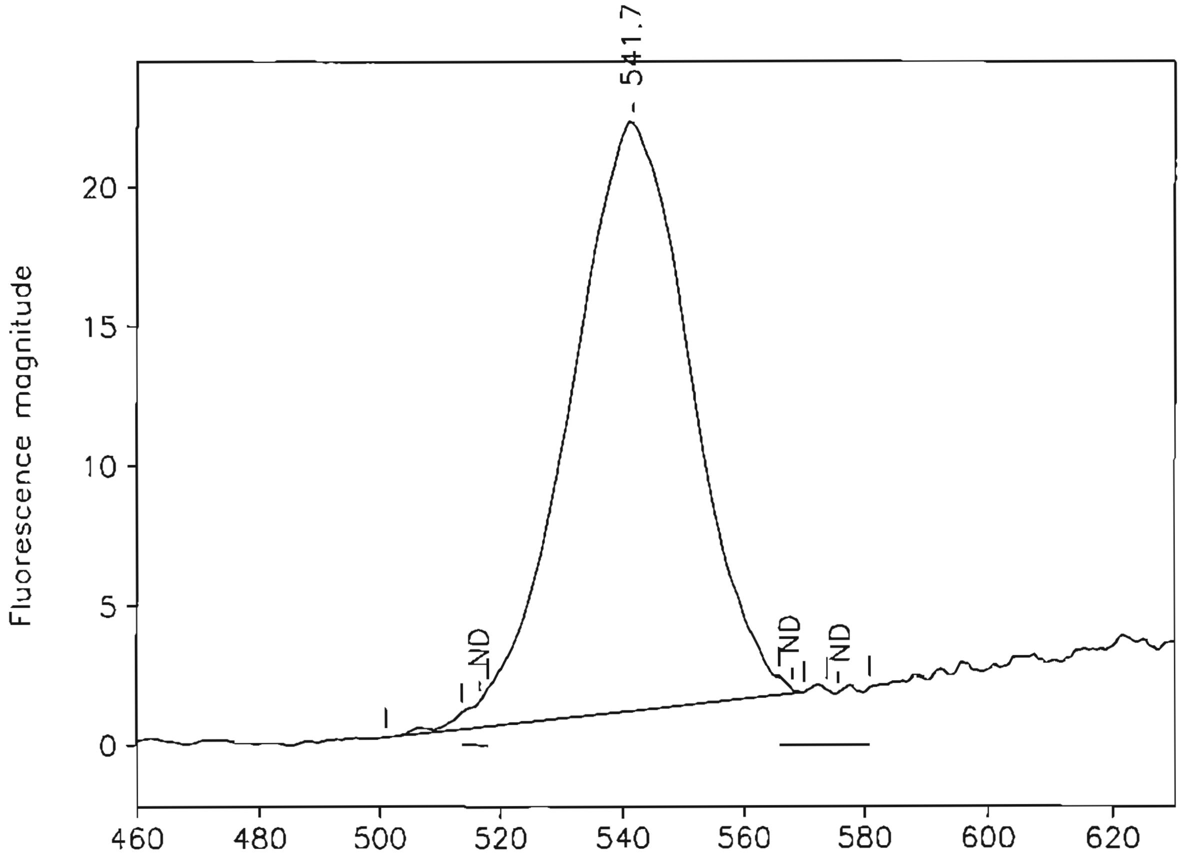
Station 1-285: MW-1 - 285 ft
OUL number: N7676 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1100 Collected: 12/16/04 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-135: MW-2 - 135 ft
OUL number: N7677
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.7	501.0	570.0	21.06	485.92	0.04	2,000
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NV

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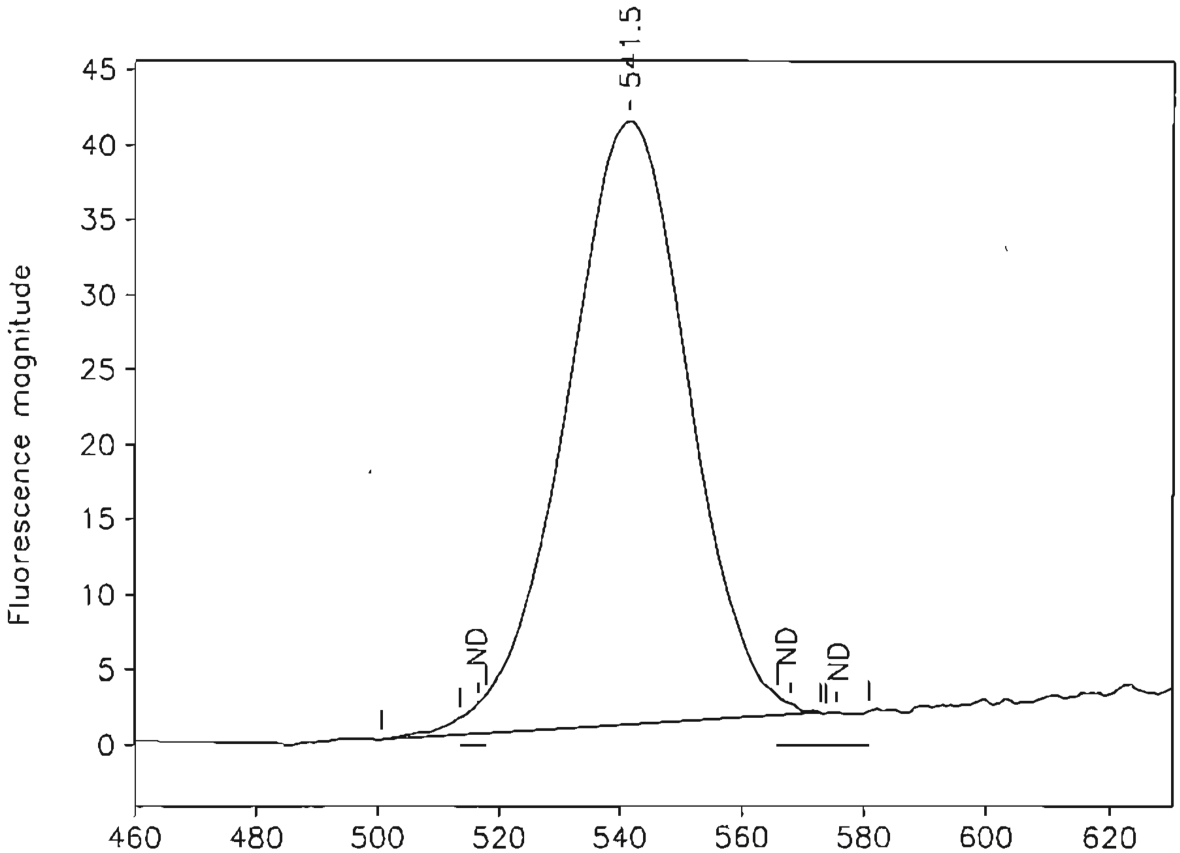


Station 2-150: MW-2 - 150 ft
OUL number: N7678
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

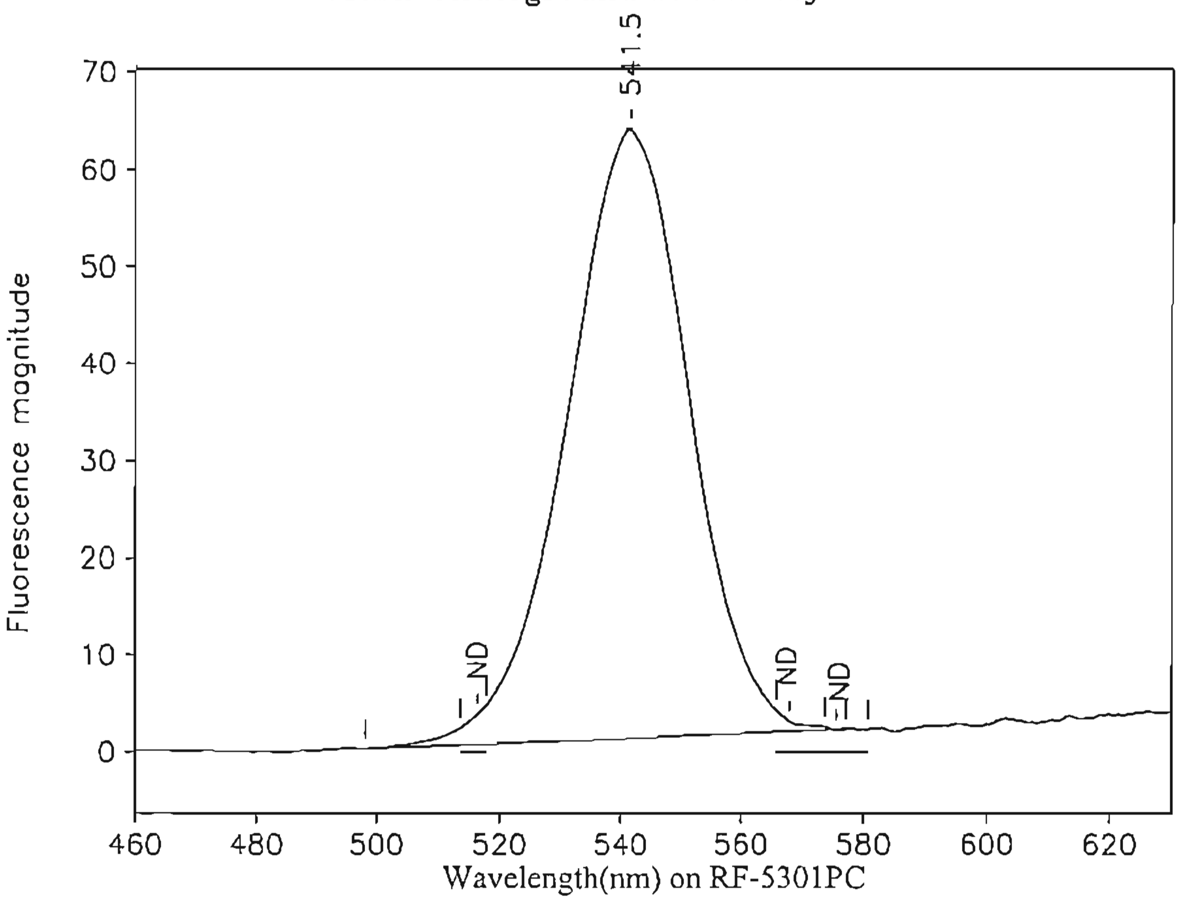
Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	500.6	573.0	40.22	943.50	0.04	3,880
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-165: MW-2 - 165 ft
OUL number: N7679
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	498.2	577.2	62.70	1,475.72	0.04	6,060
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

M

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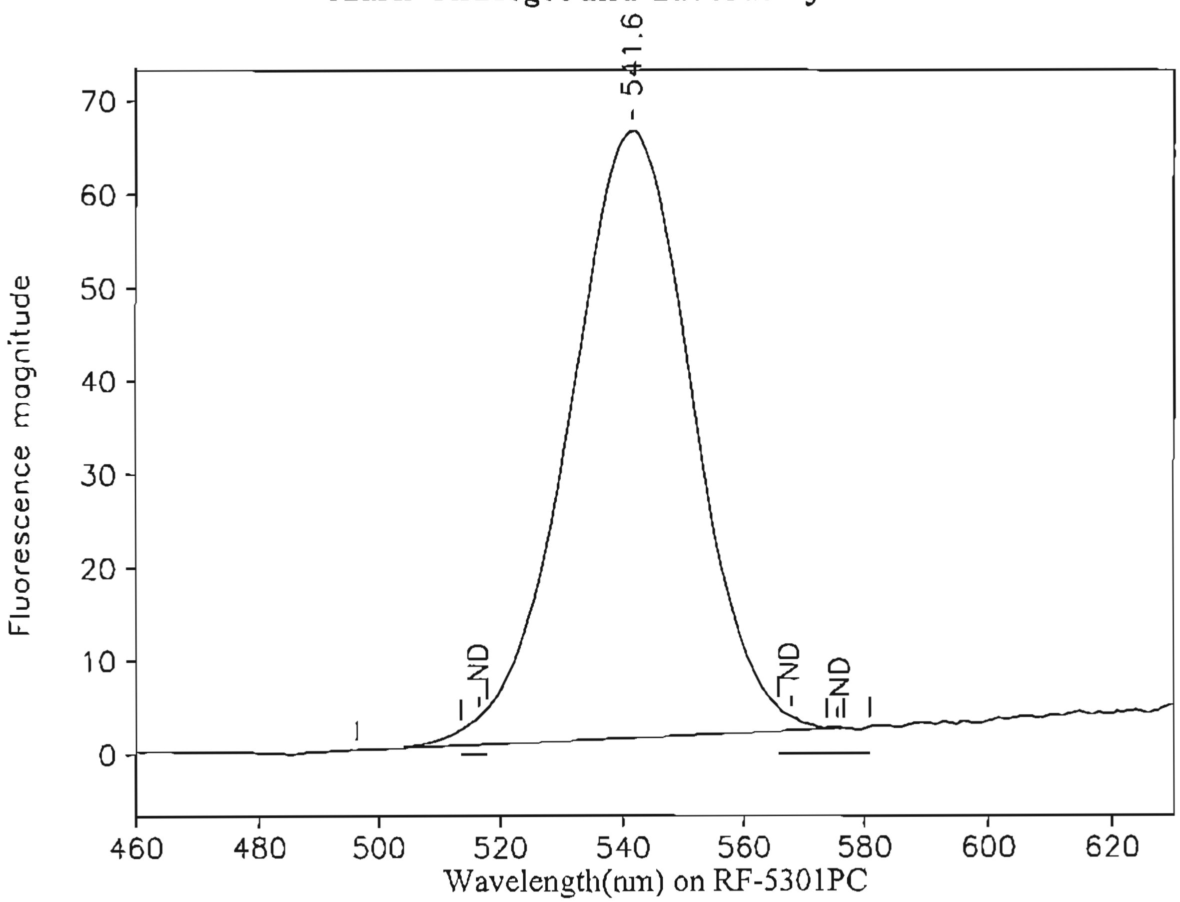


Station 2-180: MW-2 - 180 ft
OUL number: N7681
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

Collected: 12/16/04 1105

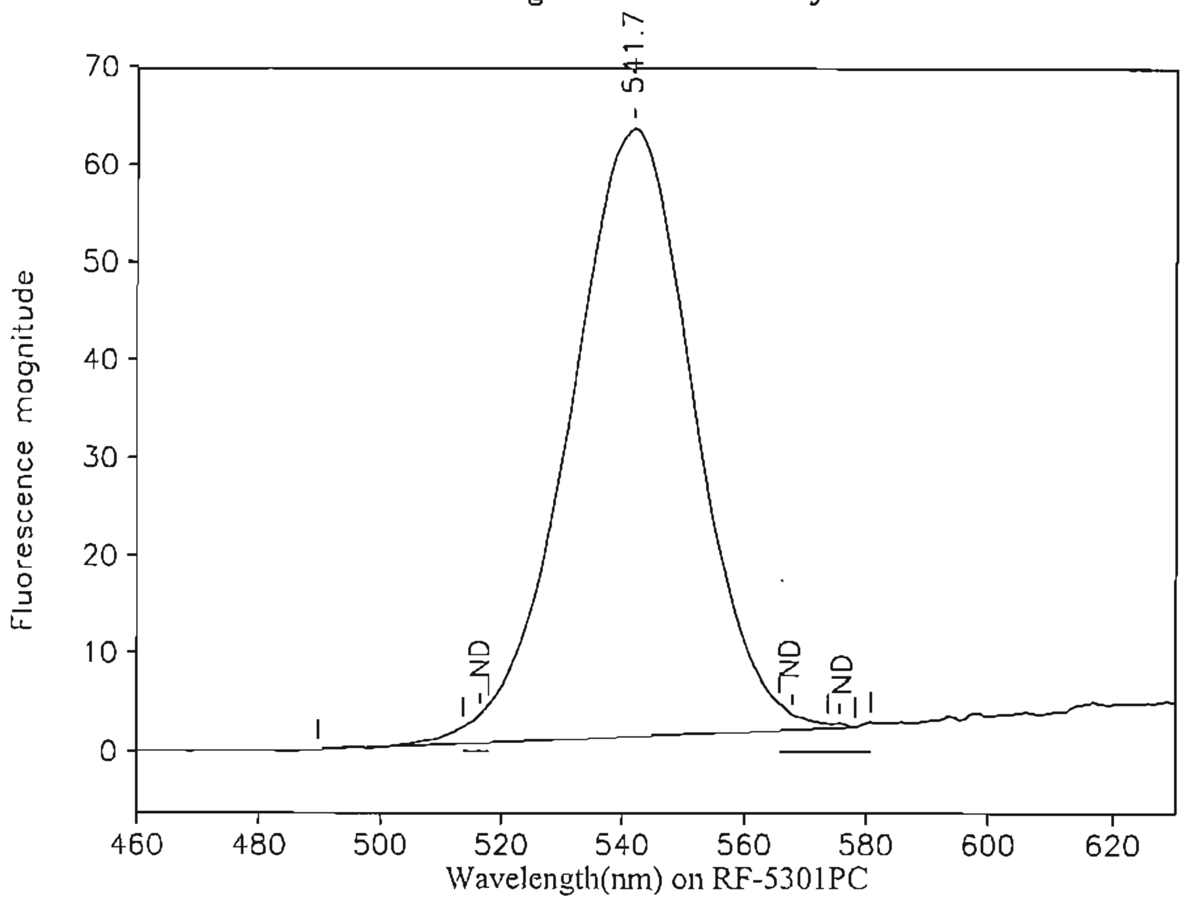
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.6	496.4	576.6	65.07	1,525.35	0.04	6,270
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NV

Ozark Underground Laboratory



Station 2-195: MW-2 - 195 ft
OUL number: N7682
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

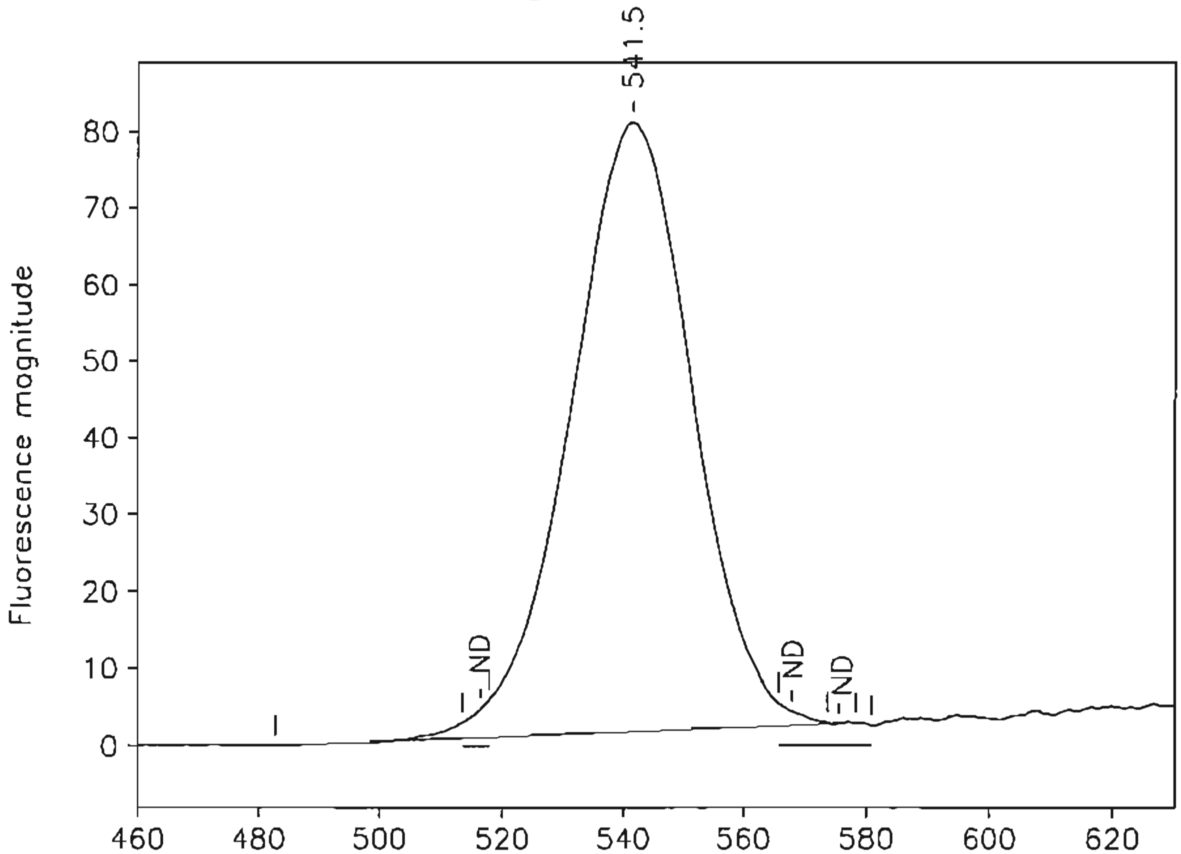
Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.7	489.6	578.2	62.12	1,469.95	0.04	6,040
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-210: MW-2 - 210 ft
OUL number: N7683
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

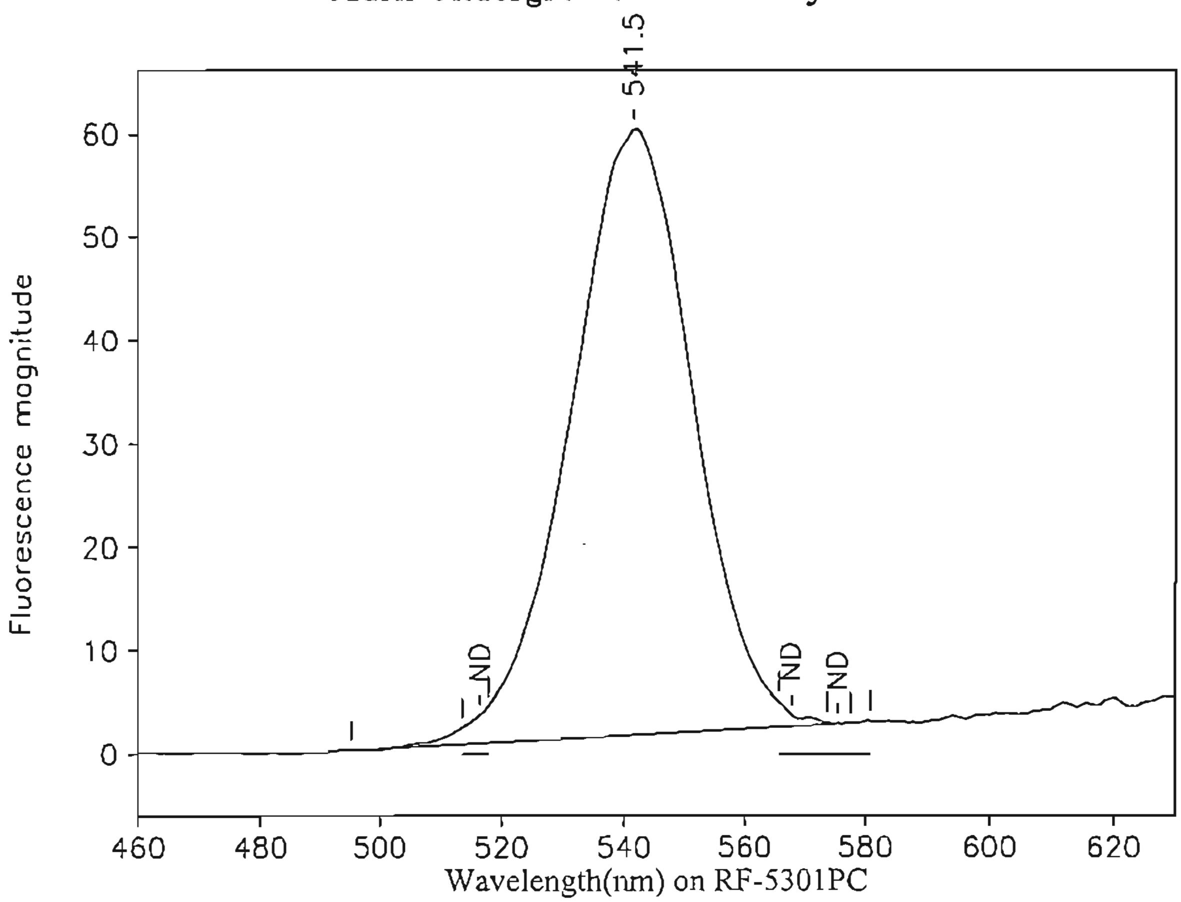
Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	482.7	578.3	79.28	1,860.04	0.04	7,640
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



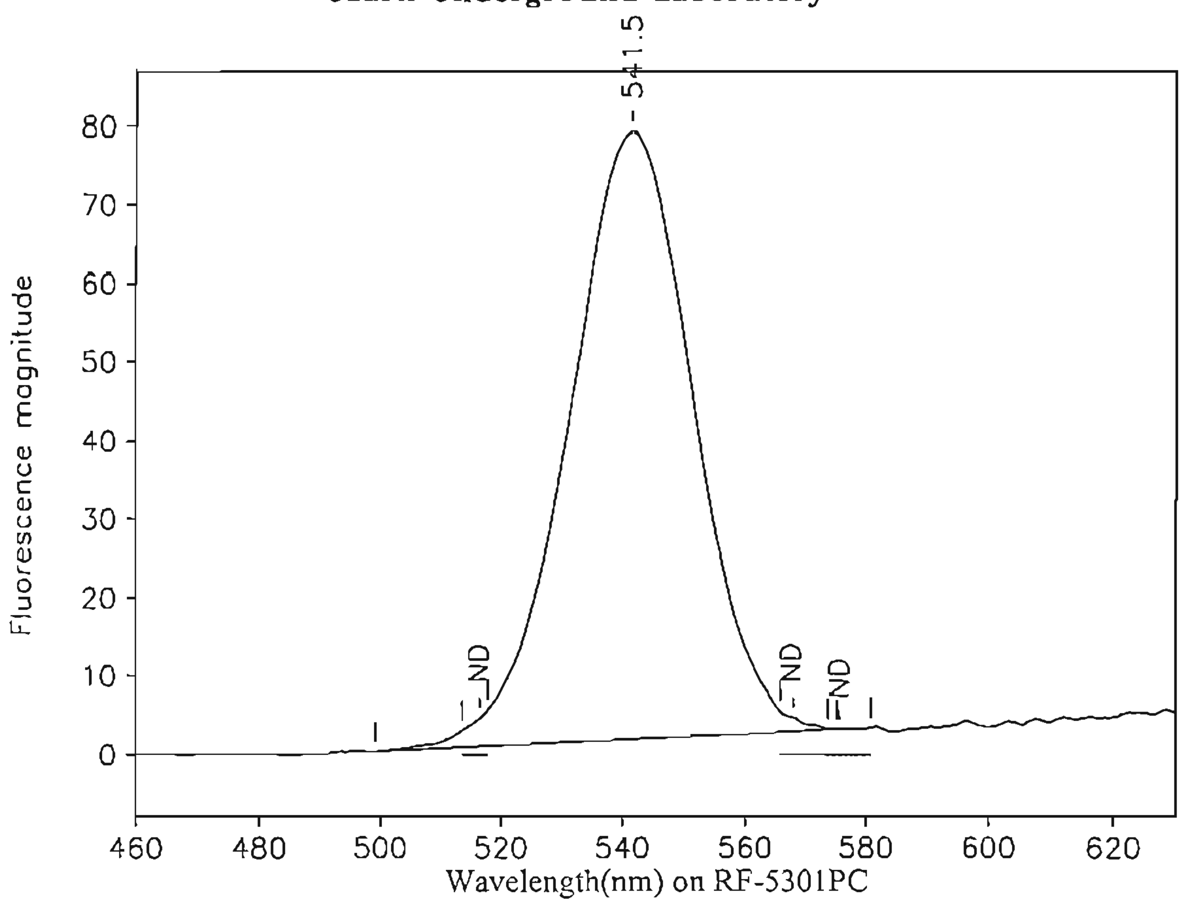
Station 2-225: MW-2 - 225 ft	Diluted: 1 to 100
OUL number: N7684	Analyzed: 12/21/04
Matrix: Elutant	
Placed: 12/02/04 1200	Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	495.2	577.6	58.52	1,376.96	0.04	5,660
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N7685
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

Collected: 12/16/04 1105

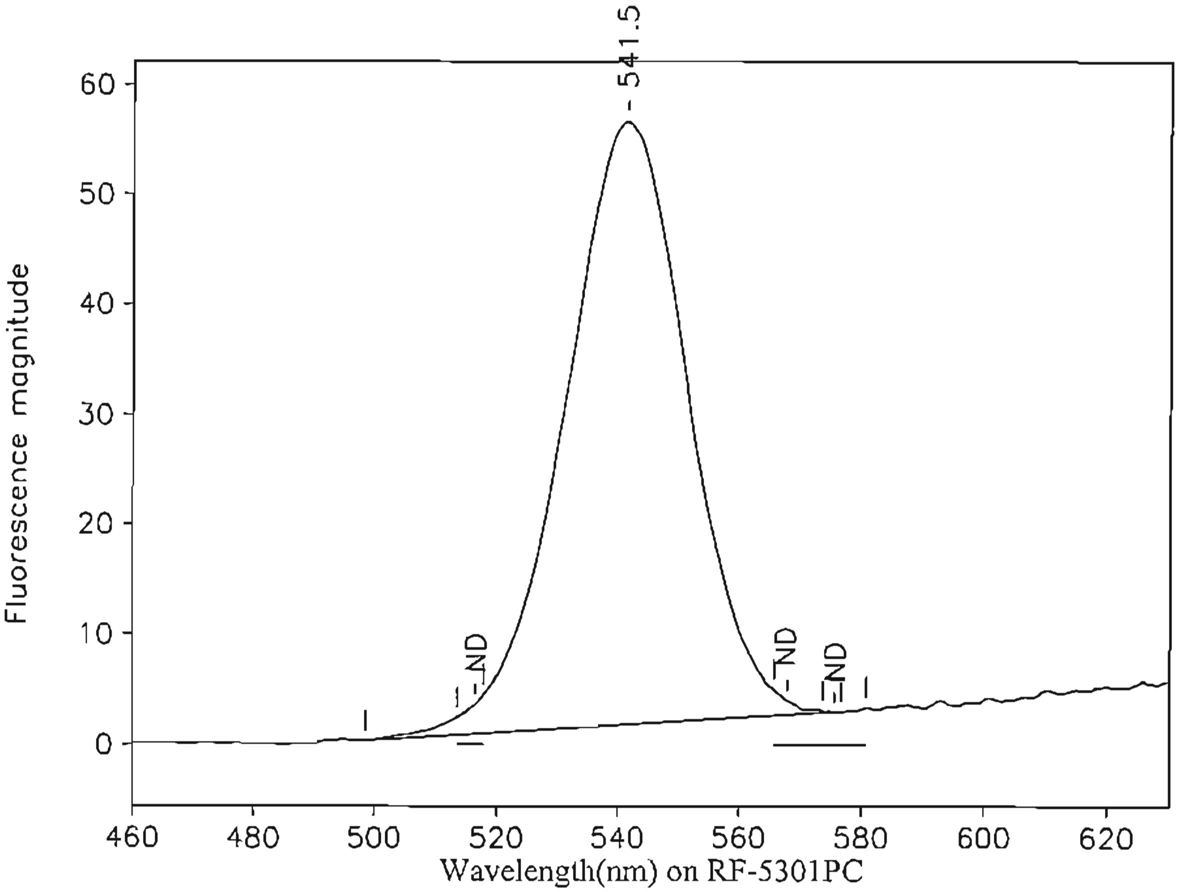
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	499.2	575.2	77.28	1,819.98	0.04	7,480
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

M

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N7686
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

Collected: 12/16/04 1105

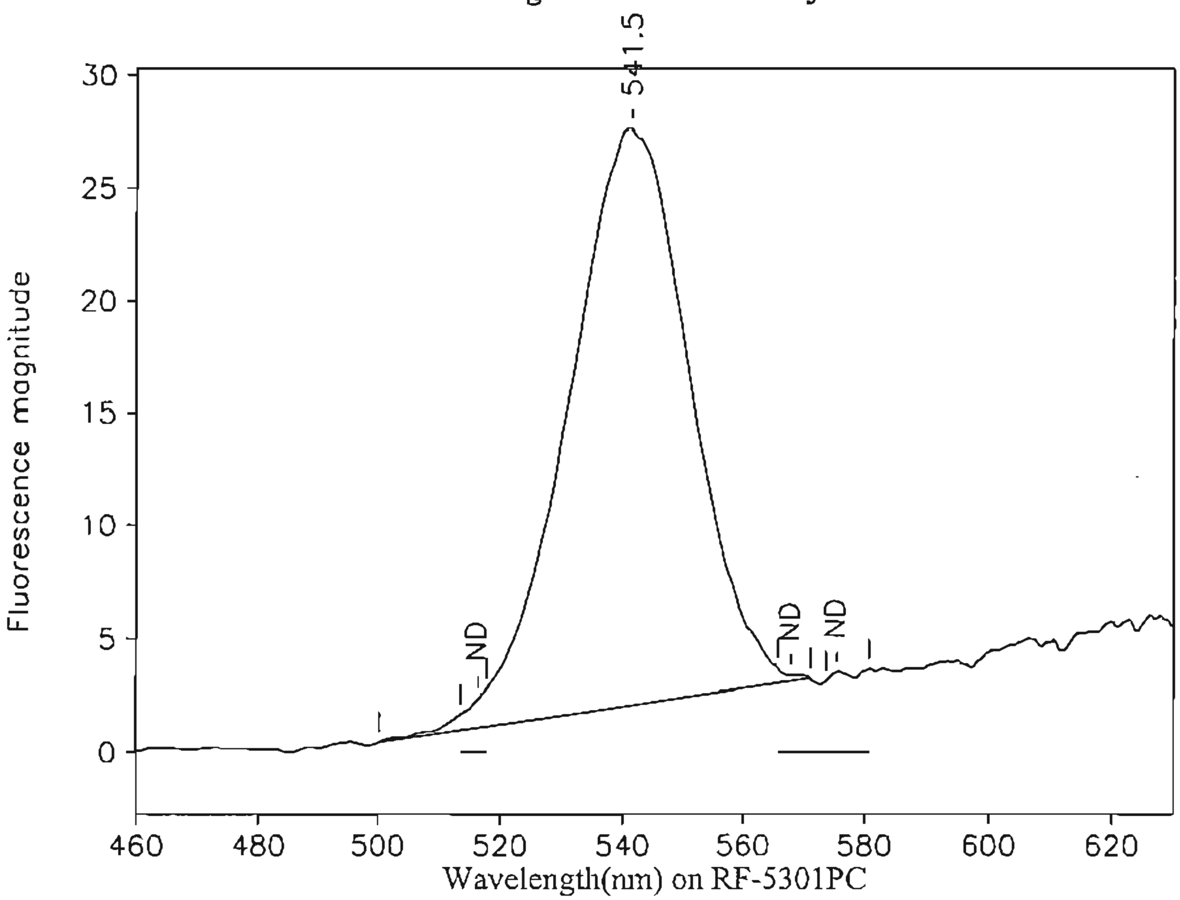
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	498.6	576.8	54.83	1,297.85	0.04	5,330
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NW

Ozark Underground Laboratory



Station 2-270: MW-2 - 270 ft
OUL number: N7687
Matrix: Elutant
Placed: 12/02/04 1200

Diluted: 1 to 100
Analyzed: 12/21/04

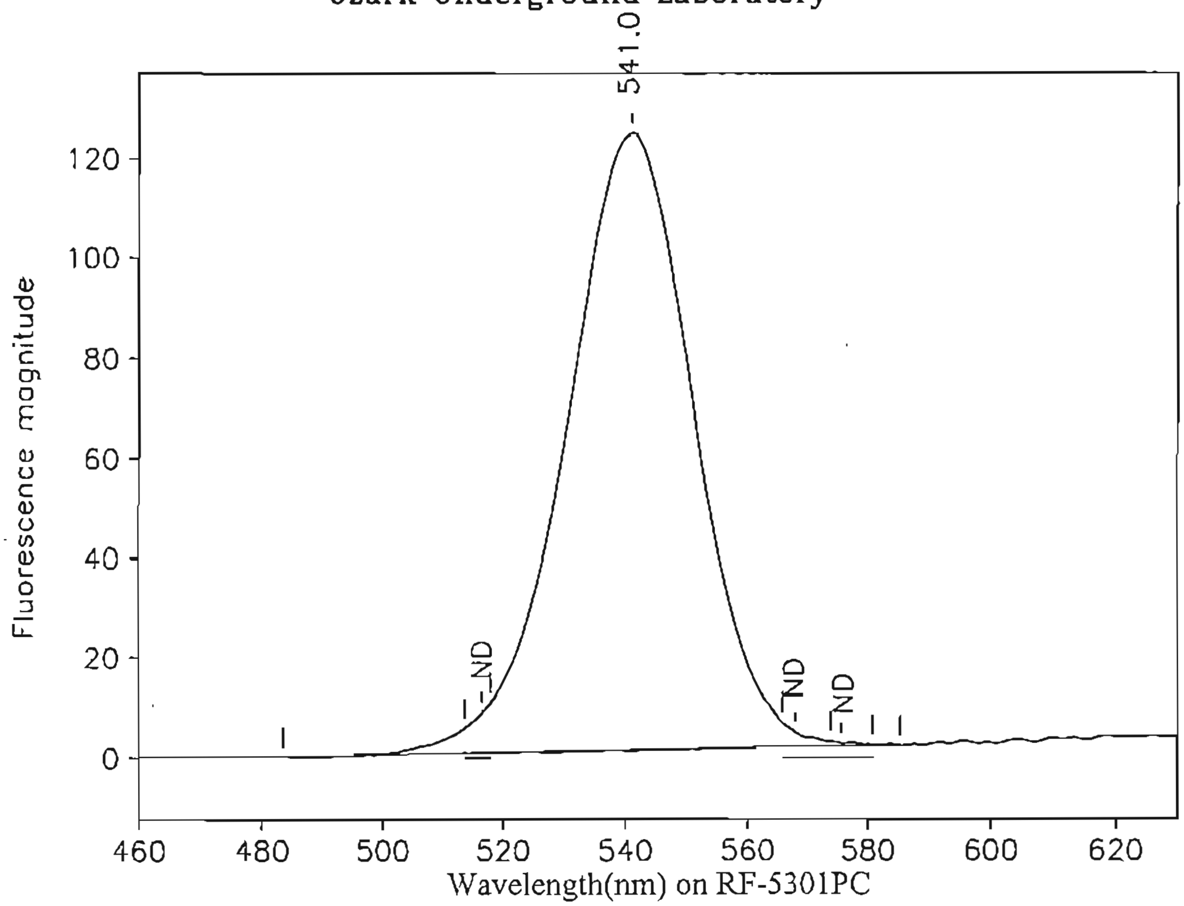
Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.5	500.2	571.2	25.57	596.23	0.04	2,450
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-285: MW-2 - 285 ft
OUL number: N7688
Matrix: Elutant
Placed: 12/02/04 1200

Analyzed: 12/21/04

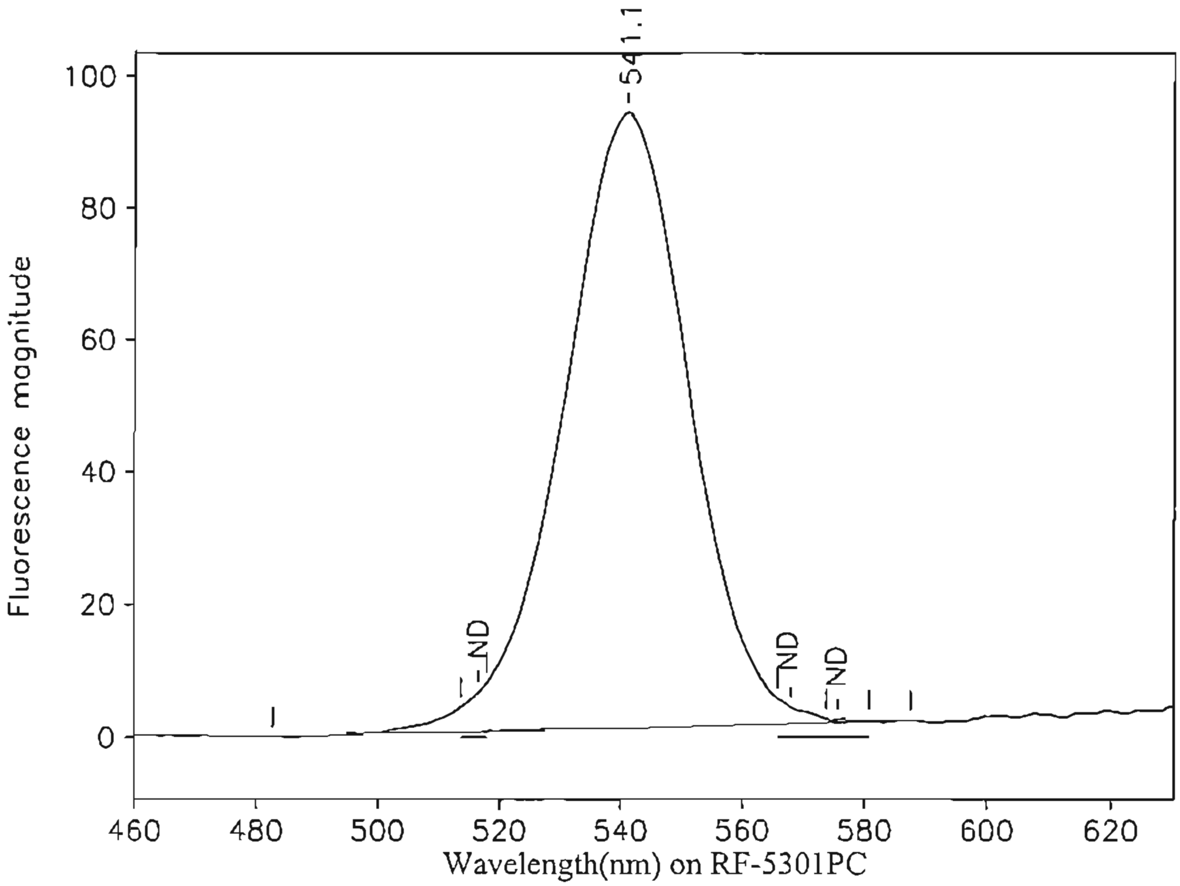
Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.0	483.4	585.2	123.51	2,988.28	0.04	123
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



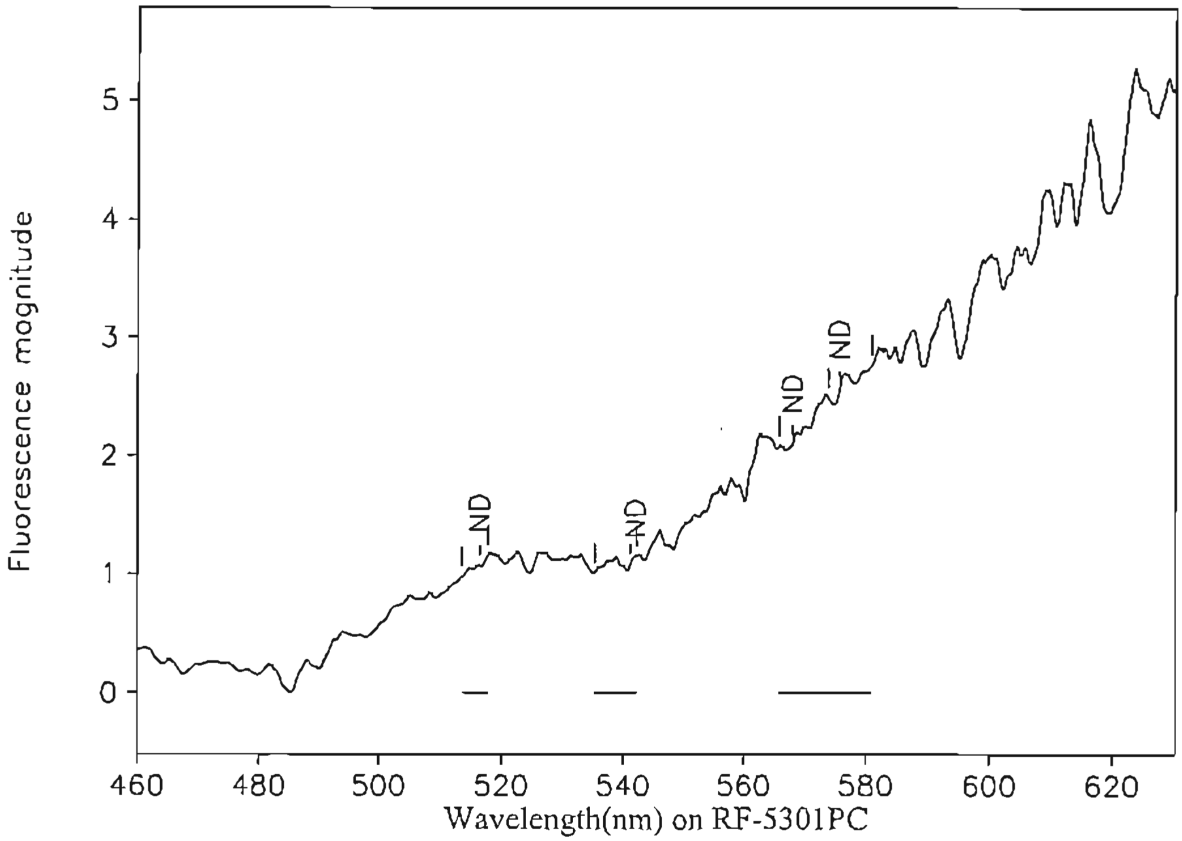
Station 2-300: MW-2 - 300 ft
OUL number: N7689 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1200 Collected: 12/16/04 1105

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	482.7	587.4	92.95	2,238.58	0.04	92.0
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-175: MW-3 - 175 ft
OUL number: N7690
Matrix: Elutant
Placed: 12/02/04 1010

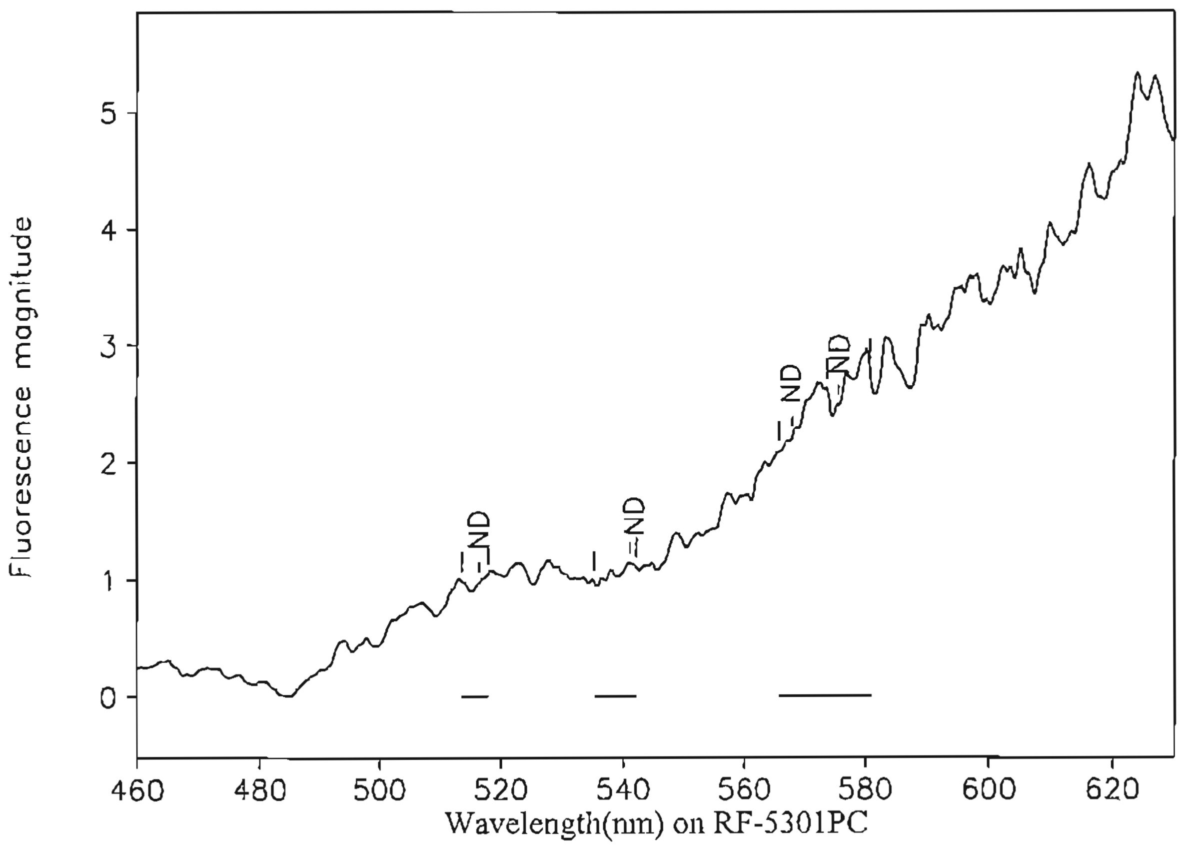
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



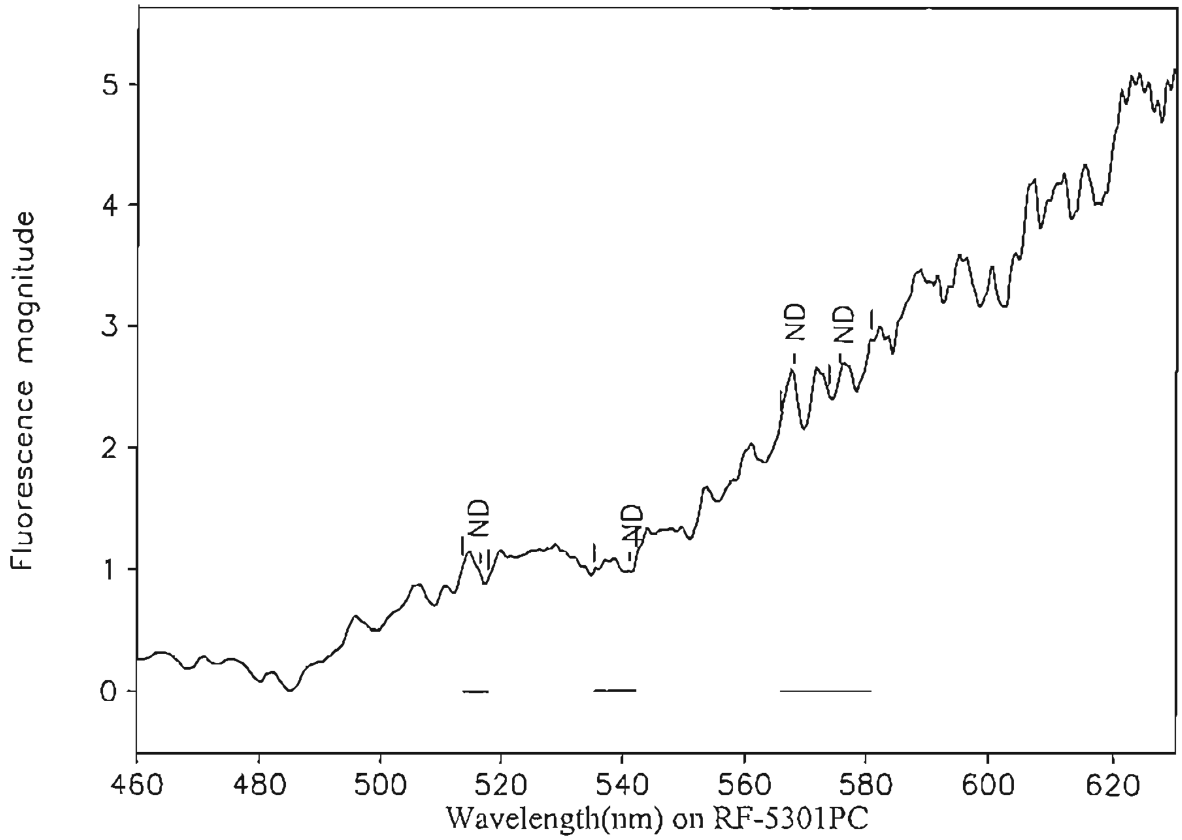
Station 3-185: MW-3 - 185 ft
OUL number: N7691
Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1010
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-195: MW-3 - 195 ft
OUL number: N7692
Matrix: Elutant
Placed: 12/02/04 1010

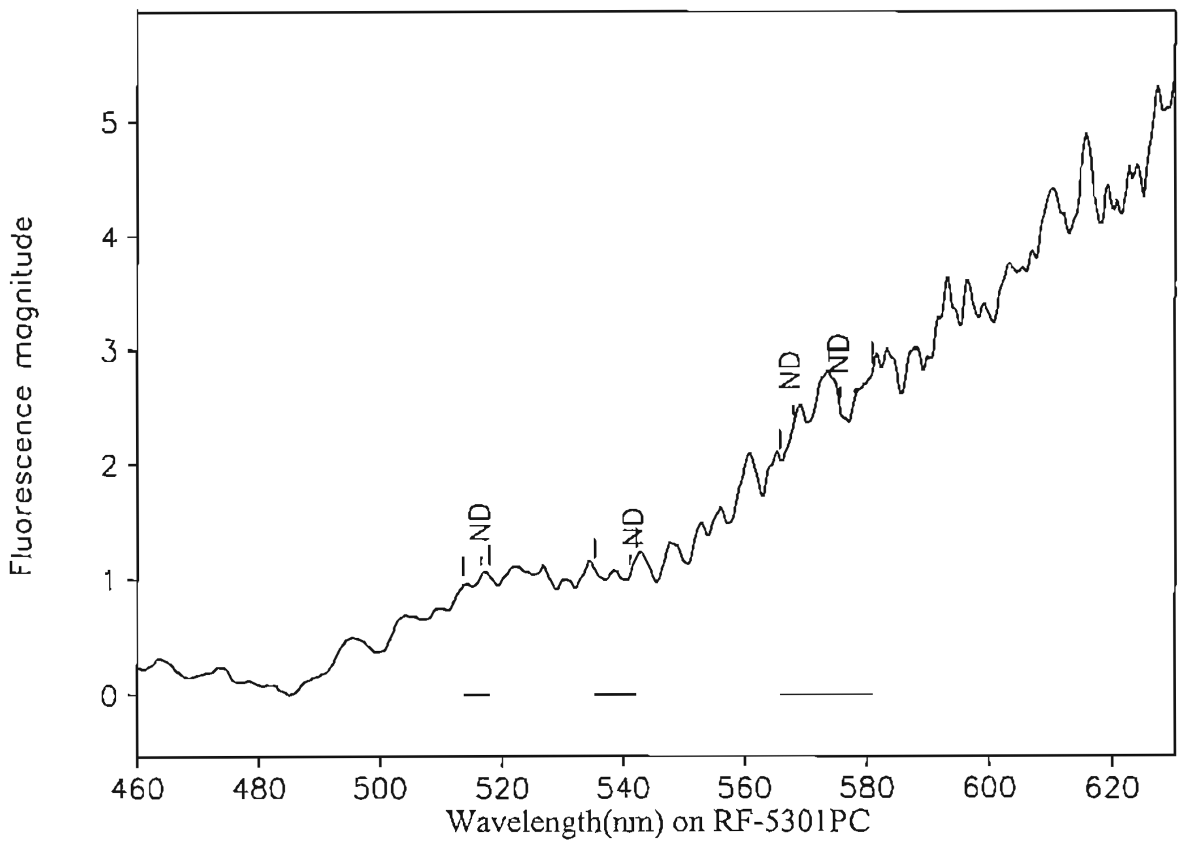
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-205: MW-3 - 205 ft
OUL number: N7693
Matrix: Elutant
Placed: 12/02/04 1010

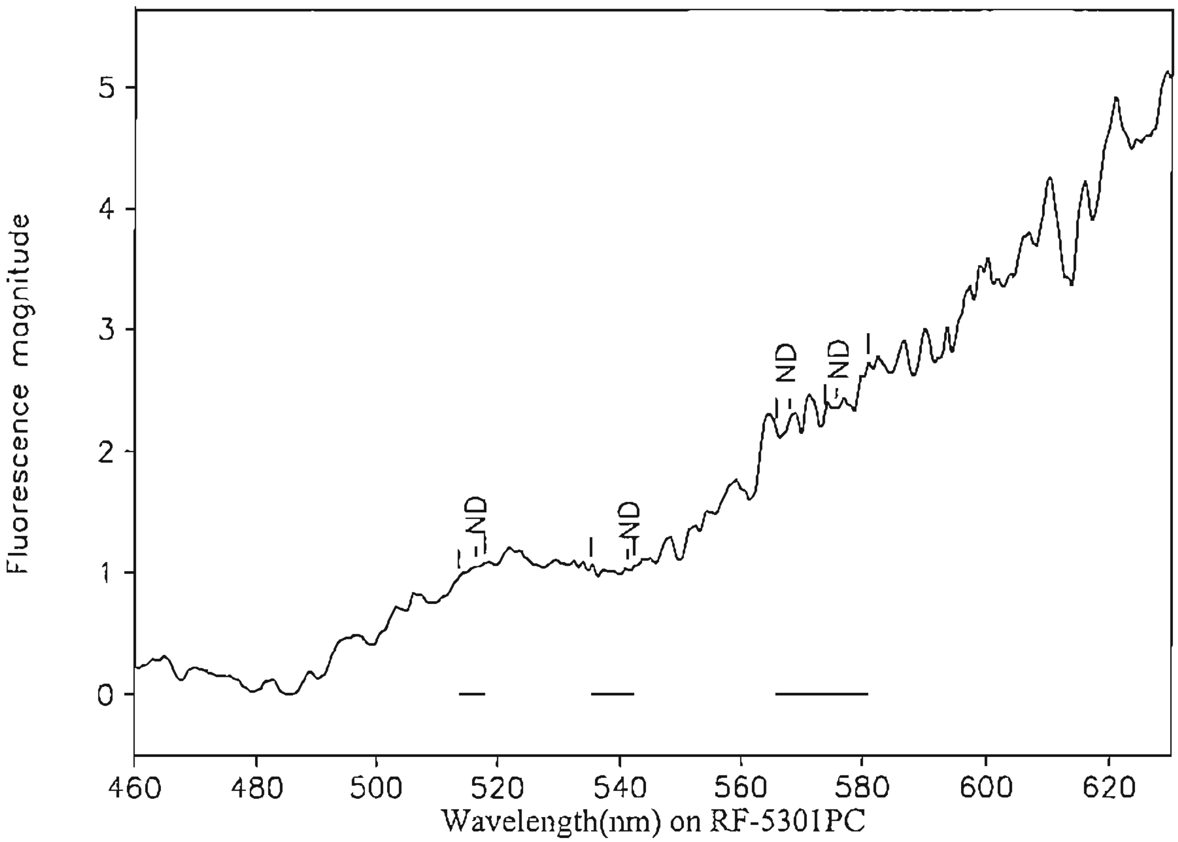
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-215: MW-3 - 215 ft
OUL number: N7694
Matrix: Elutant
Placed: 12/02/04 1010

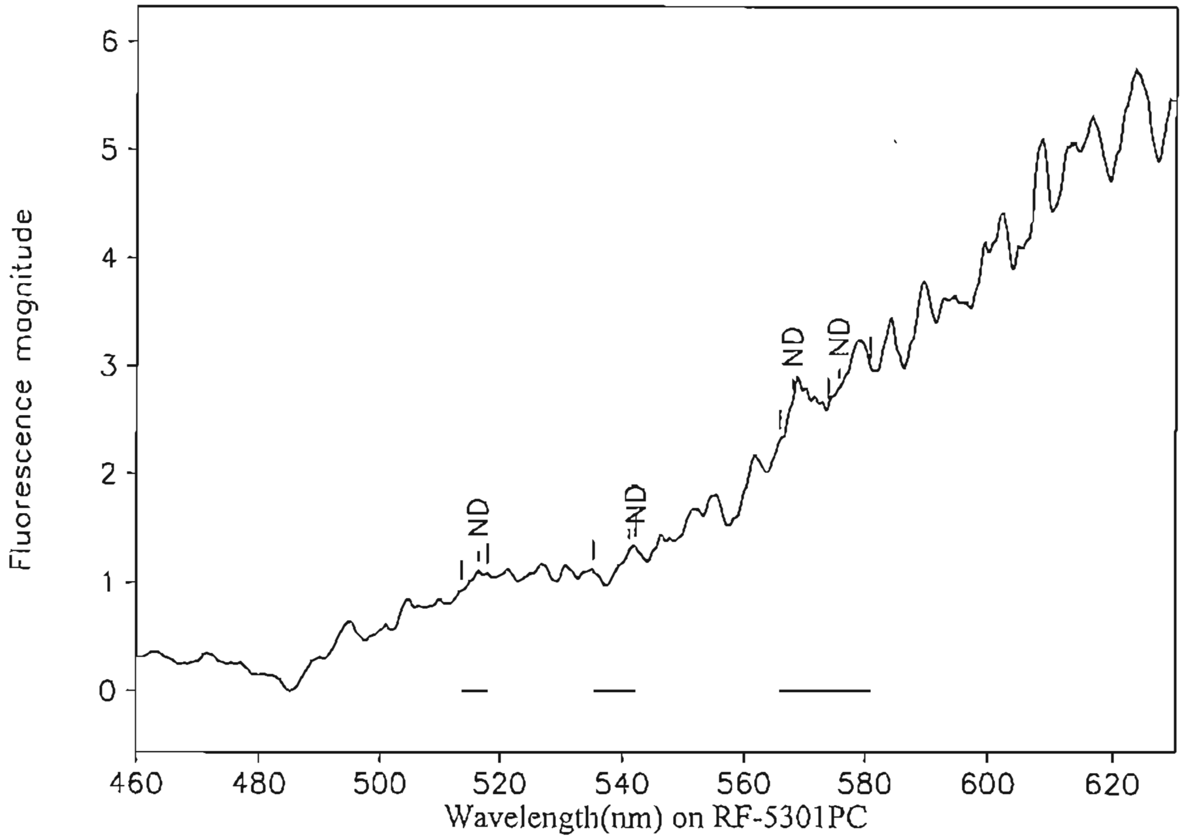
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N7695
Matrix: Elutant
Placed: 12/02/04 1010

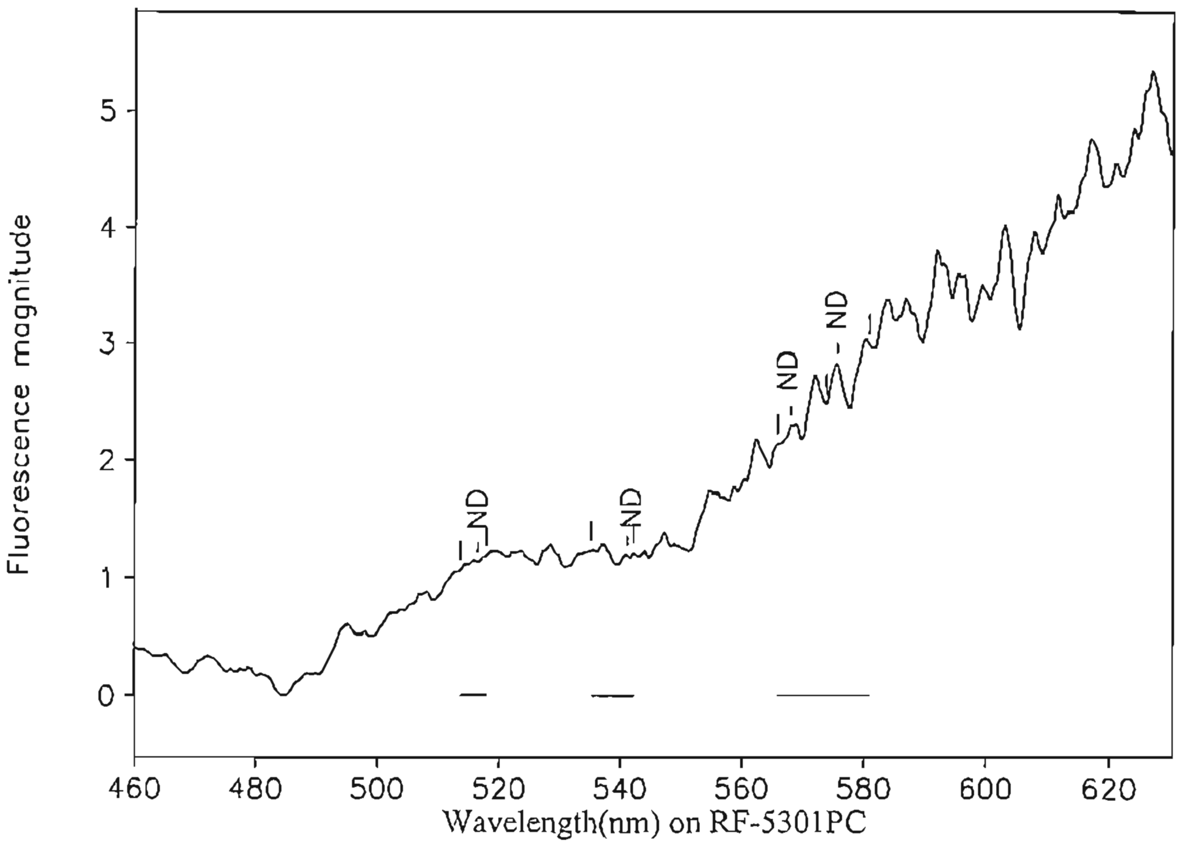
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



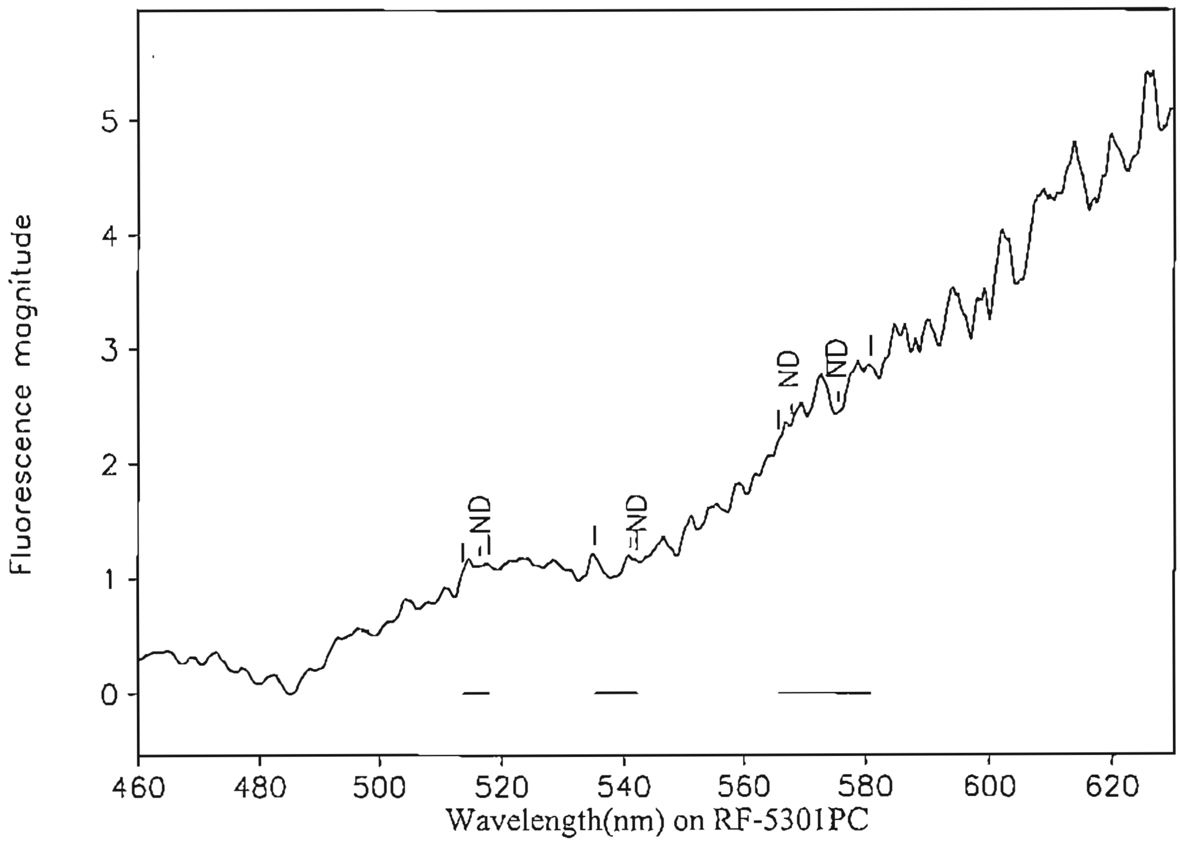
Station 3-235: MW-3 - 235 ft
OUL number: N7696 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1010 Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-245: MW-3 - 245 ft
OUL number: N7697
Matrix: Elutant
Placed: 12/02/04 1010

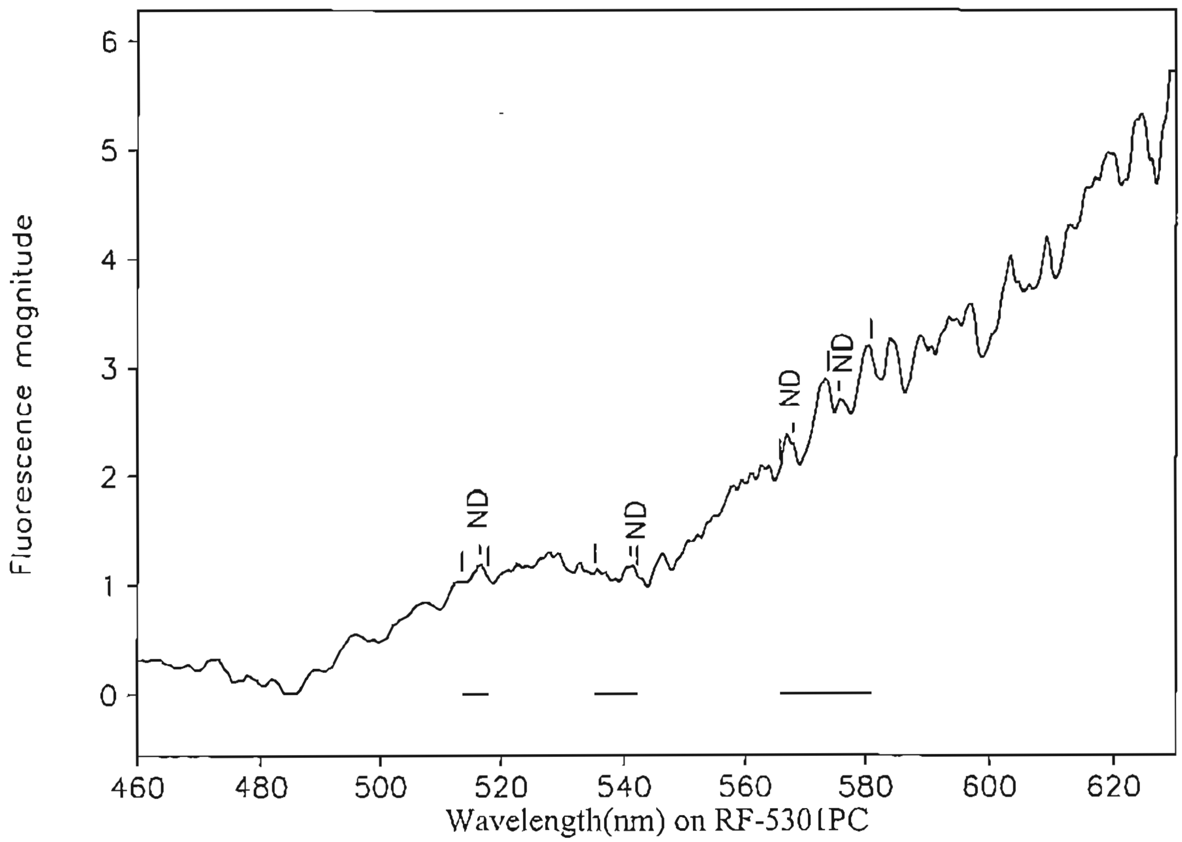
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



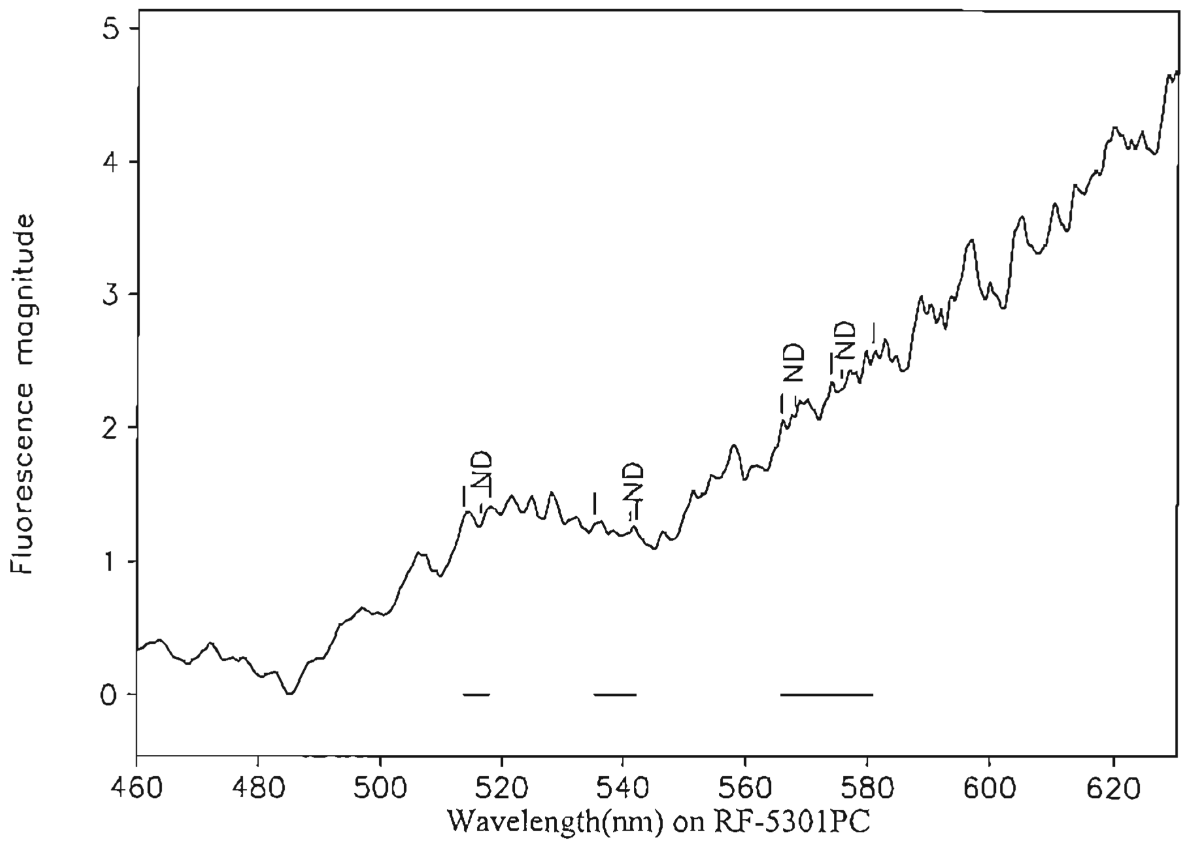
Station 3-255: MW-3 - 255 ft
OUL number: N7698 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 1010 Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-265: MW-3 - 265 ft
OUL number: N7699
Matrix: Elutant
Placed: 12/02/04 1010

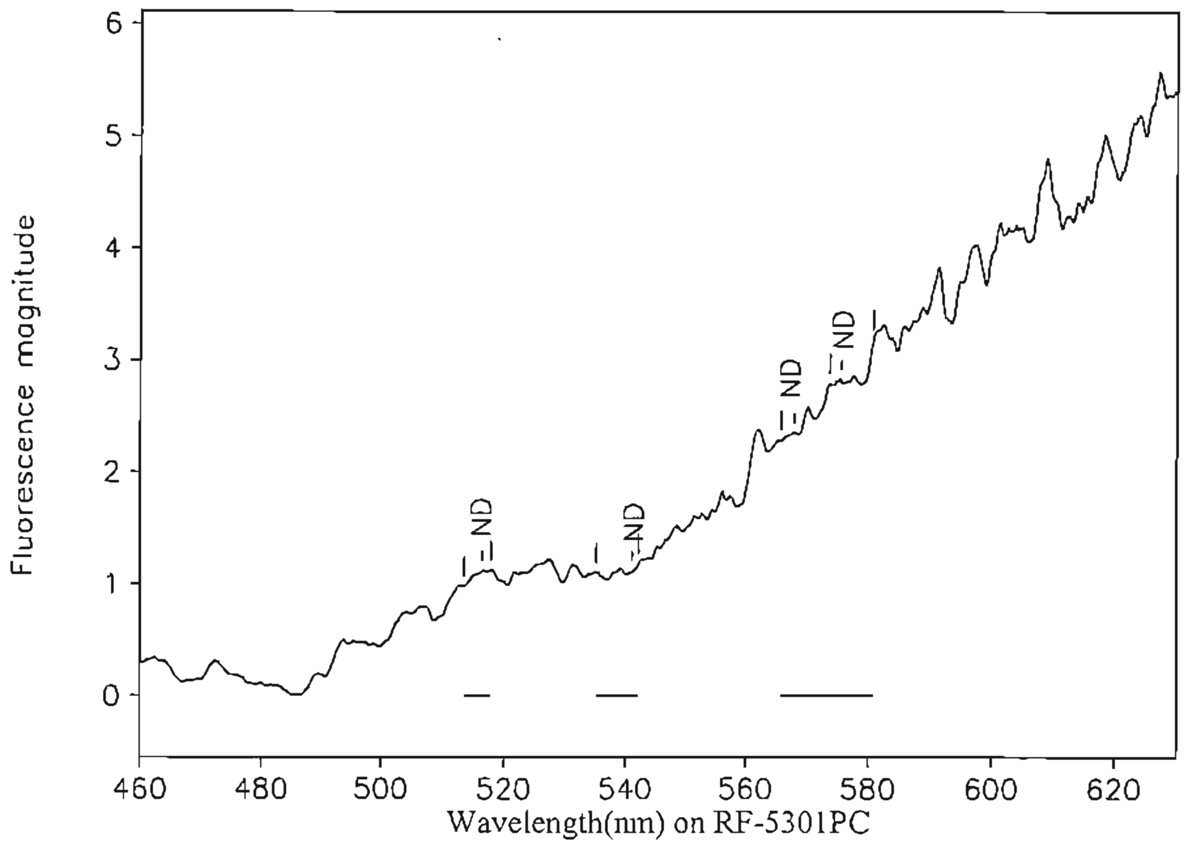
Analyzed: 12/21/04
Collected: 12/16/04 0910

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-275: MW-3 - 275 ft
OUL number: N7701
Matrix: Elutant
Placed: 12/02/04 1010

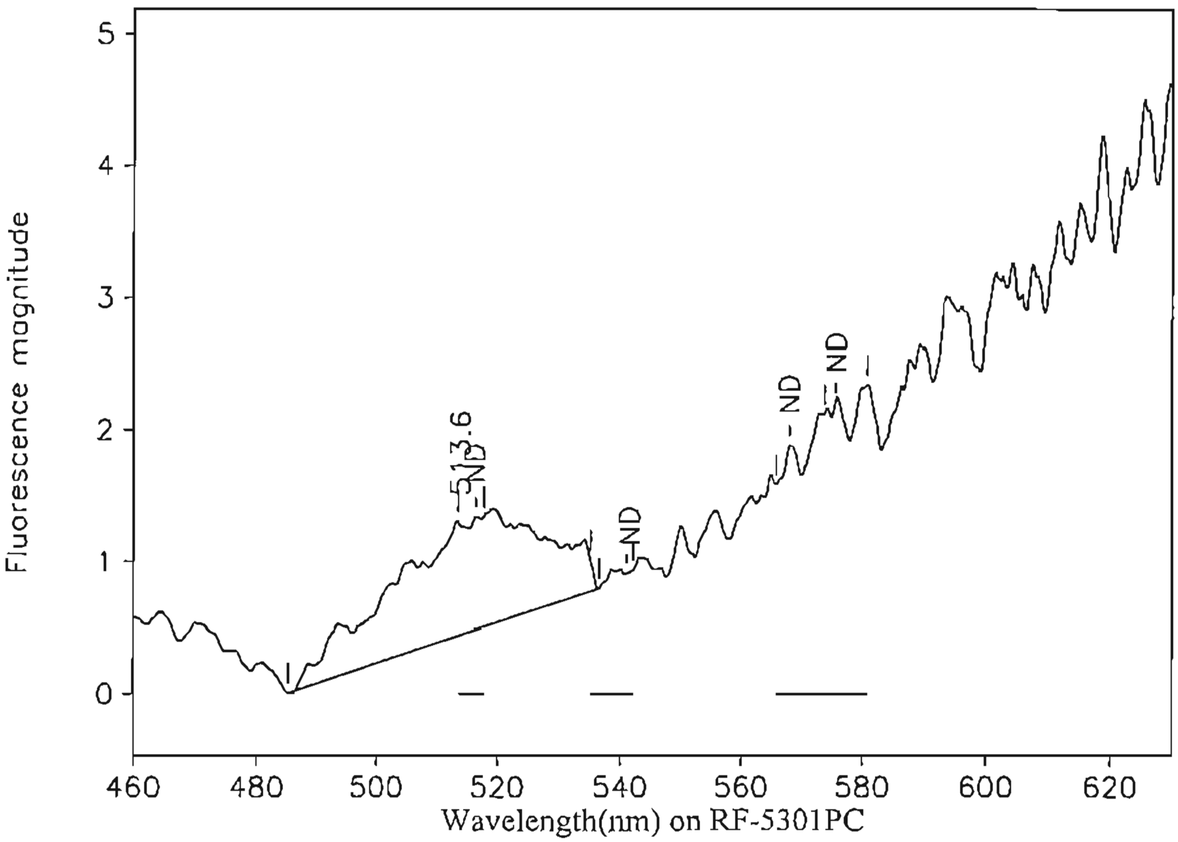
Analyzed: 12/21/04
Collected: 12/16/04 0930

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-165: MW-4 - 165 ft
OUL number: N7702
Matrix: Elutant
Placed: 12/02/04 0850

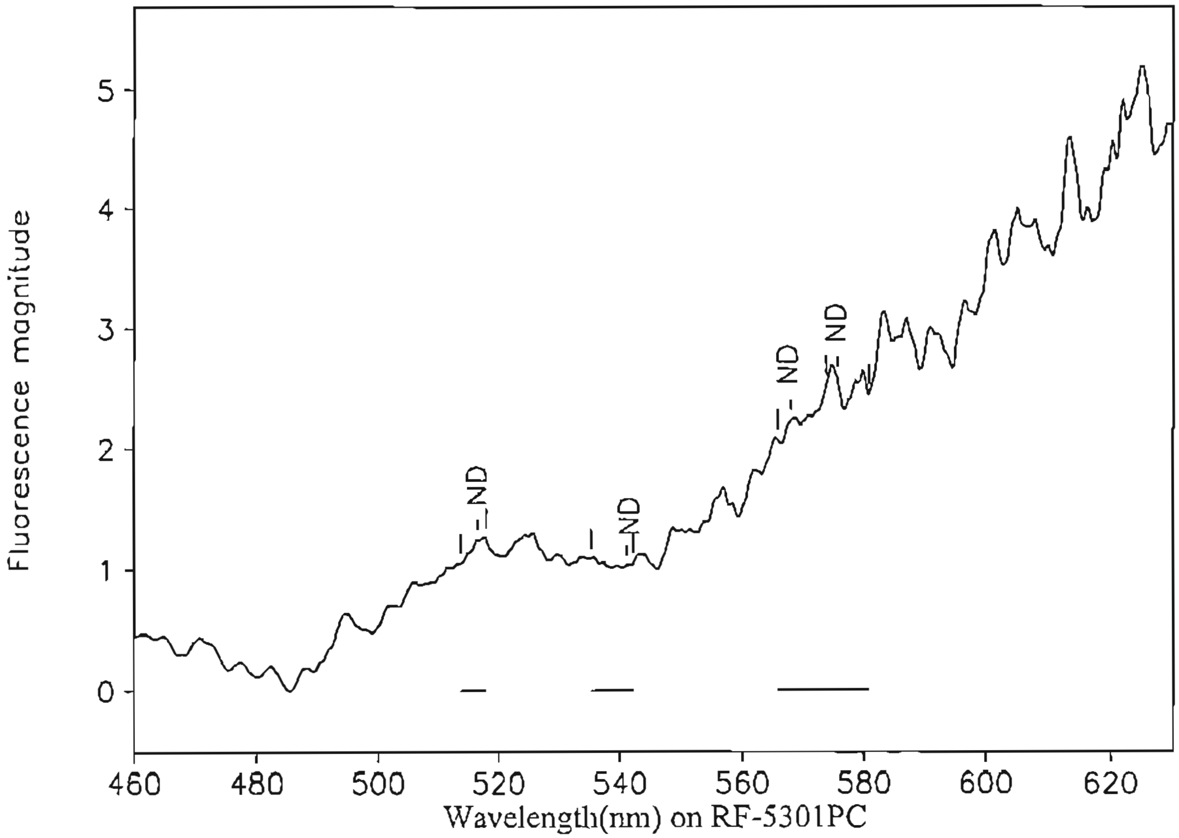
Analyzed: 12/21/04

Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
513.6	485.2	536.6	0.86	25.82	0.03	~~0.734~~

Ozark Underground Laboratory



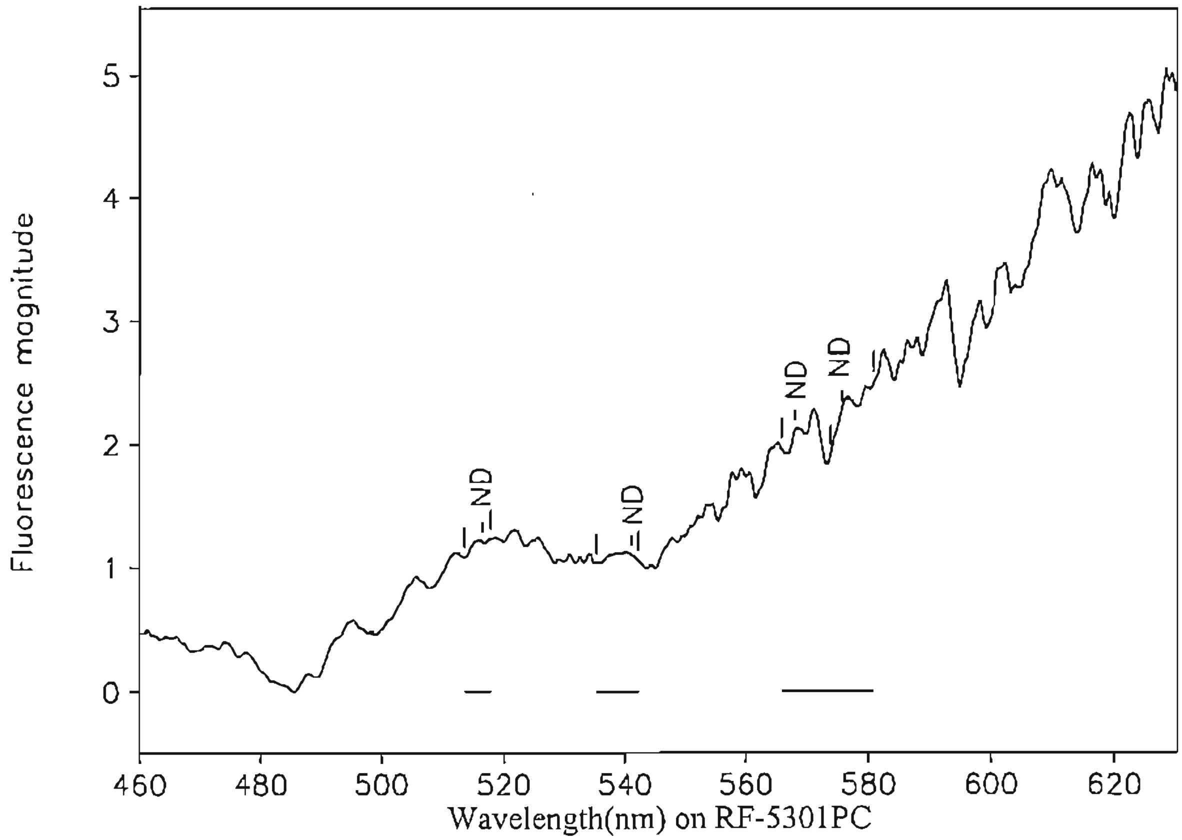
Station 4-180: MW-4 - 180 ft
OUL number: N7703 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 0850 Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-195: MW-4 - 195 ft
OUL number: N7704
Matrix: Elutant
Placed: 12/02/04 0850

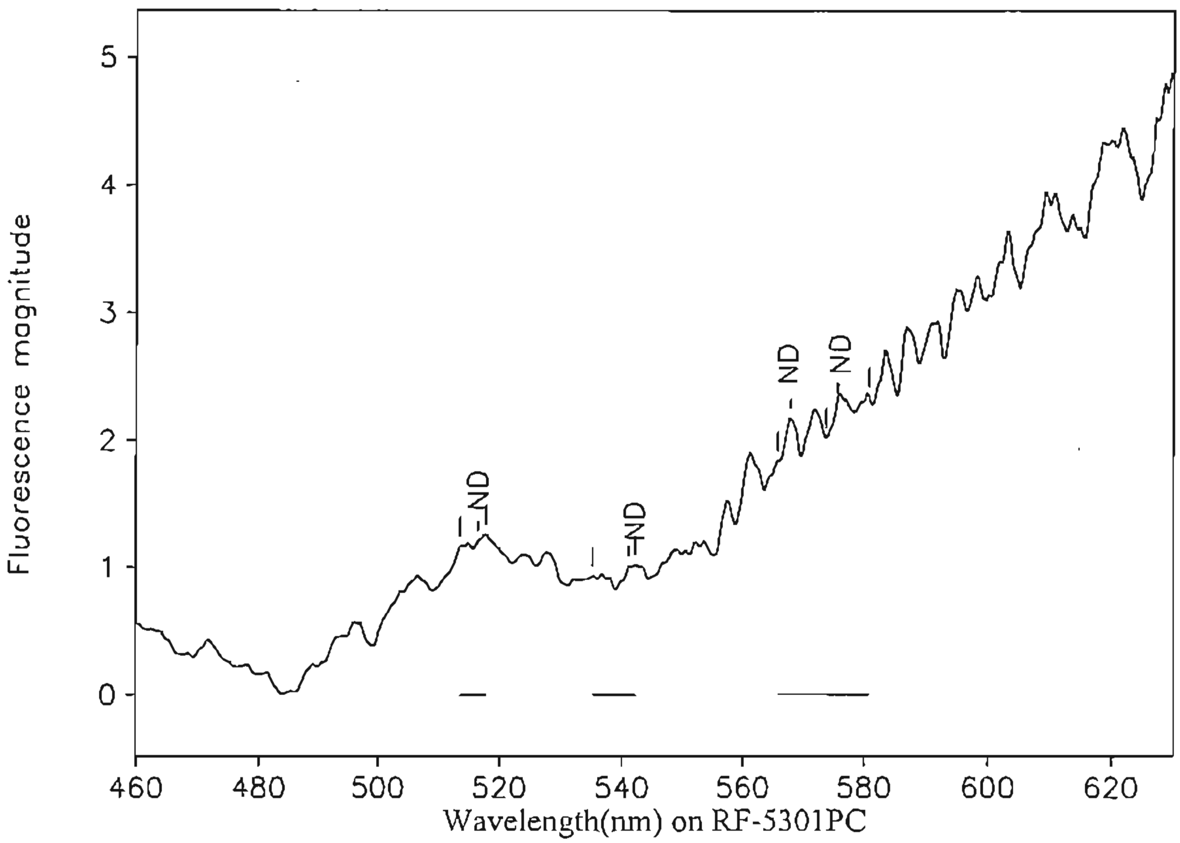
Analyzed: 12/21/04
Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-210: MW-4 - 210 ft
OUL number: N7705
Matrix: Elutant
Placed: 12/02/04 0850

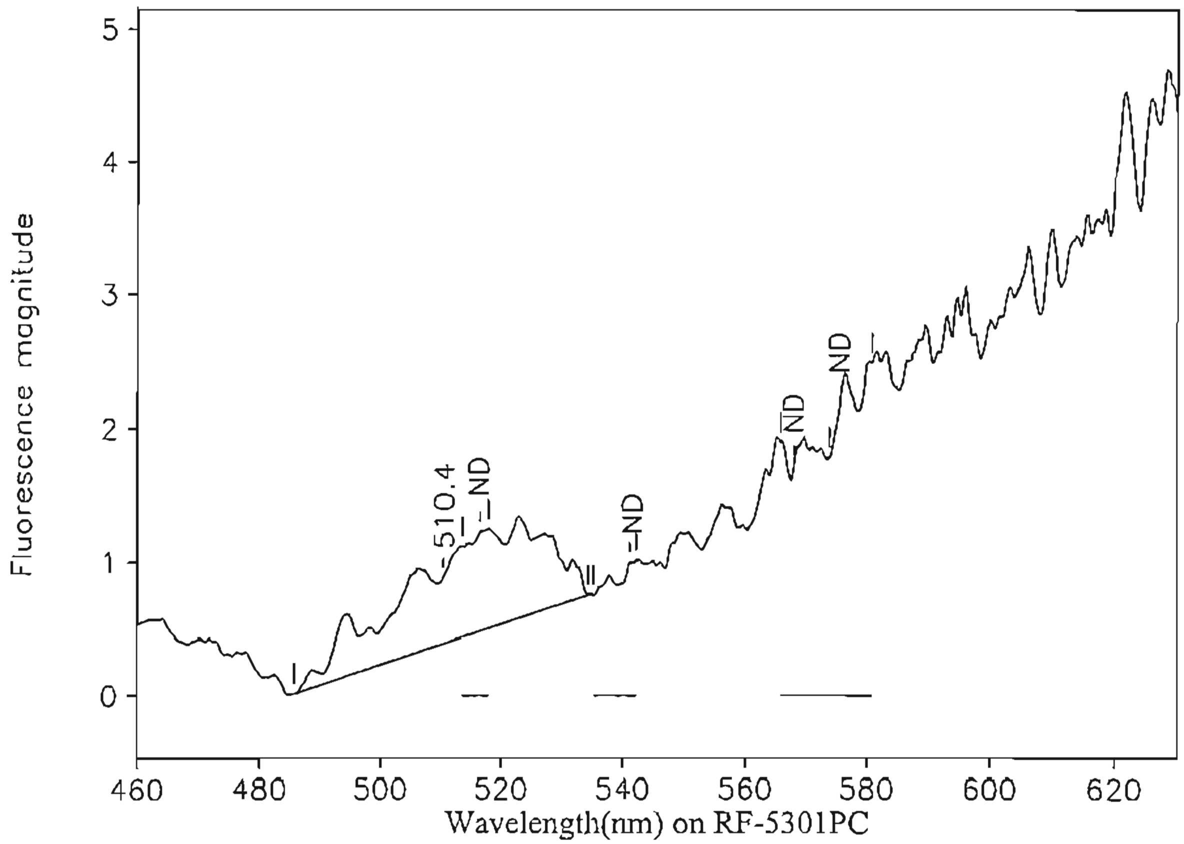
Analyzed: 12/21/04
Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory

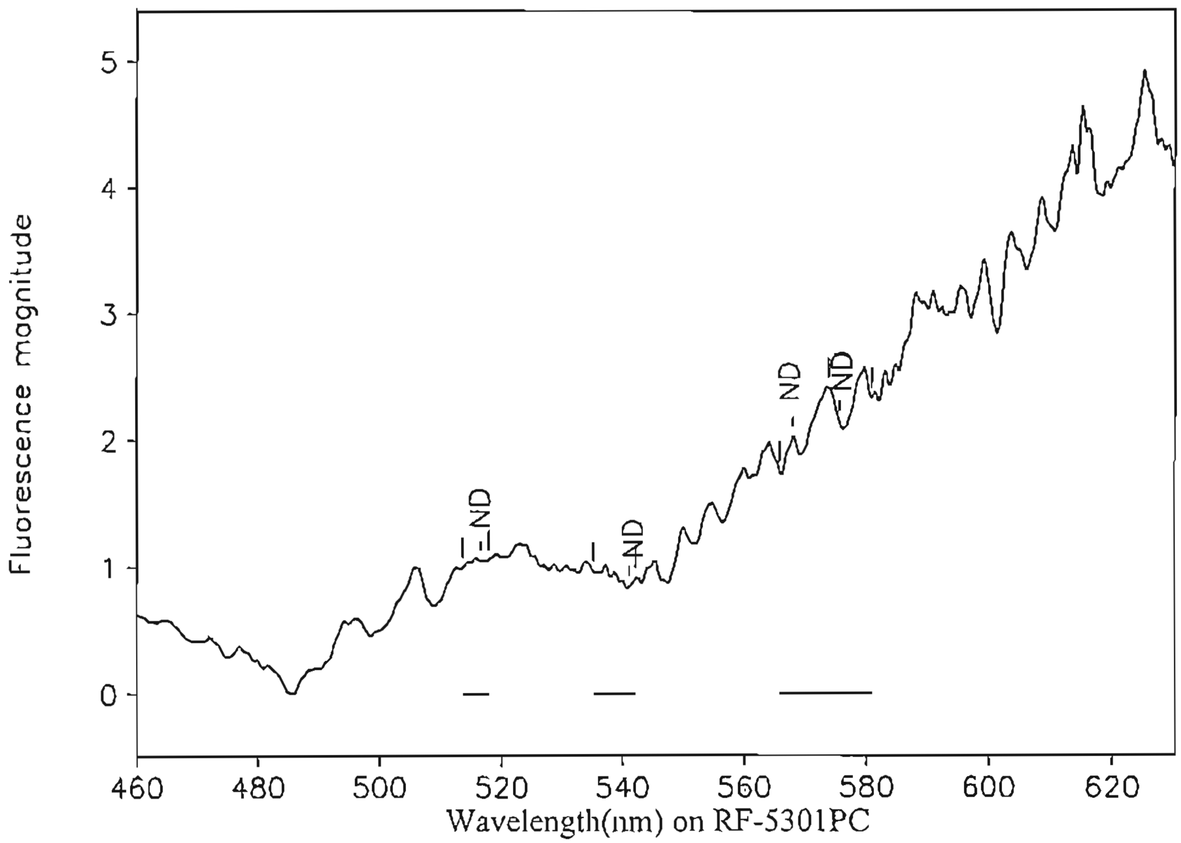


Station 4-225: MW-4 - 225 ft
OUL number: N7706
Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 0850
Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
510.4	485.6	534.4	0.49	21.32	0.02	0.000

Ozark Underground Laboratory



Station 4-240: MW-4 - 240 ft
OUL number: N7707
Matrix: Elutant
Placed: 12/02/04 0850

Analyzed: 12/21/04

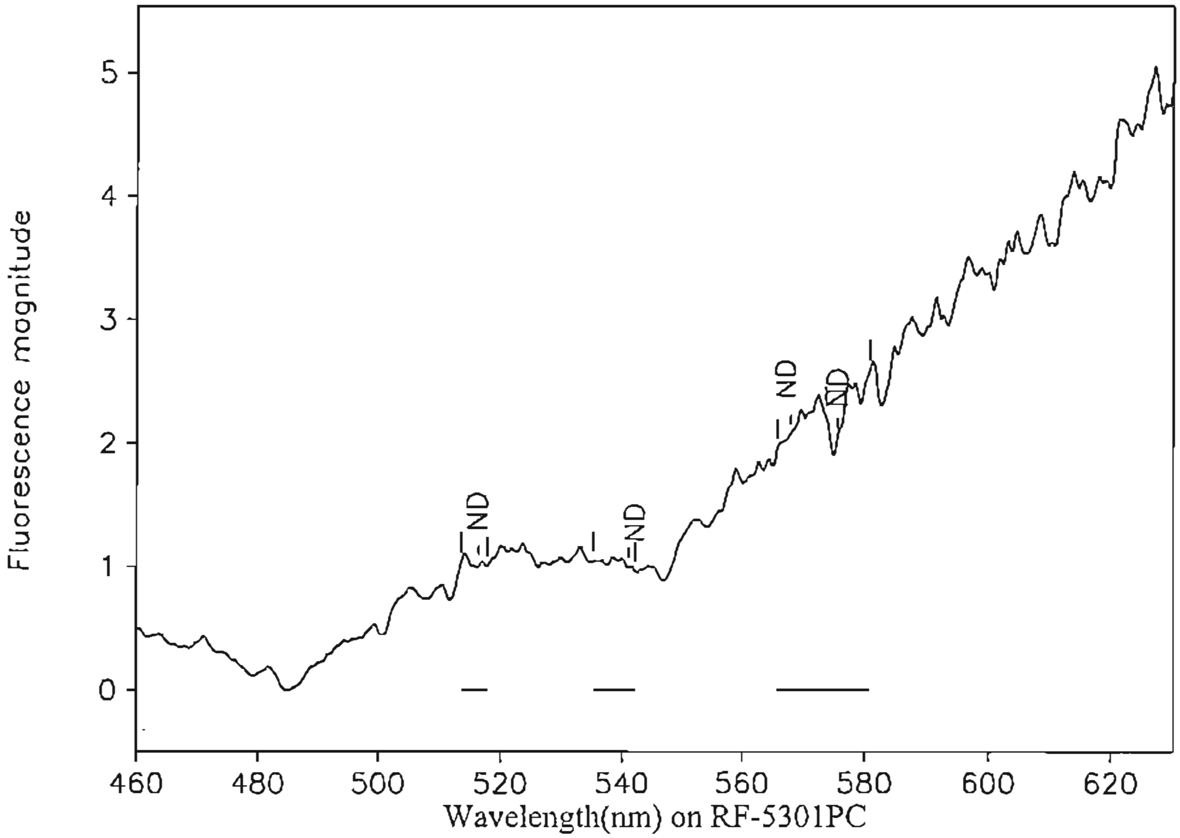
Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



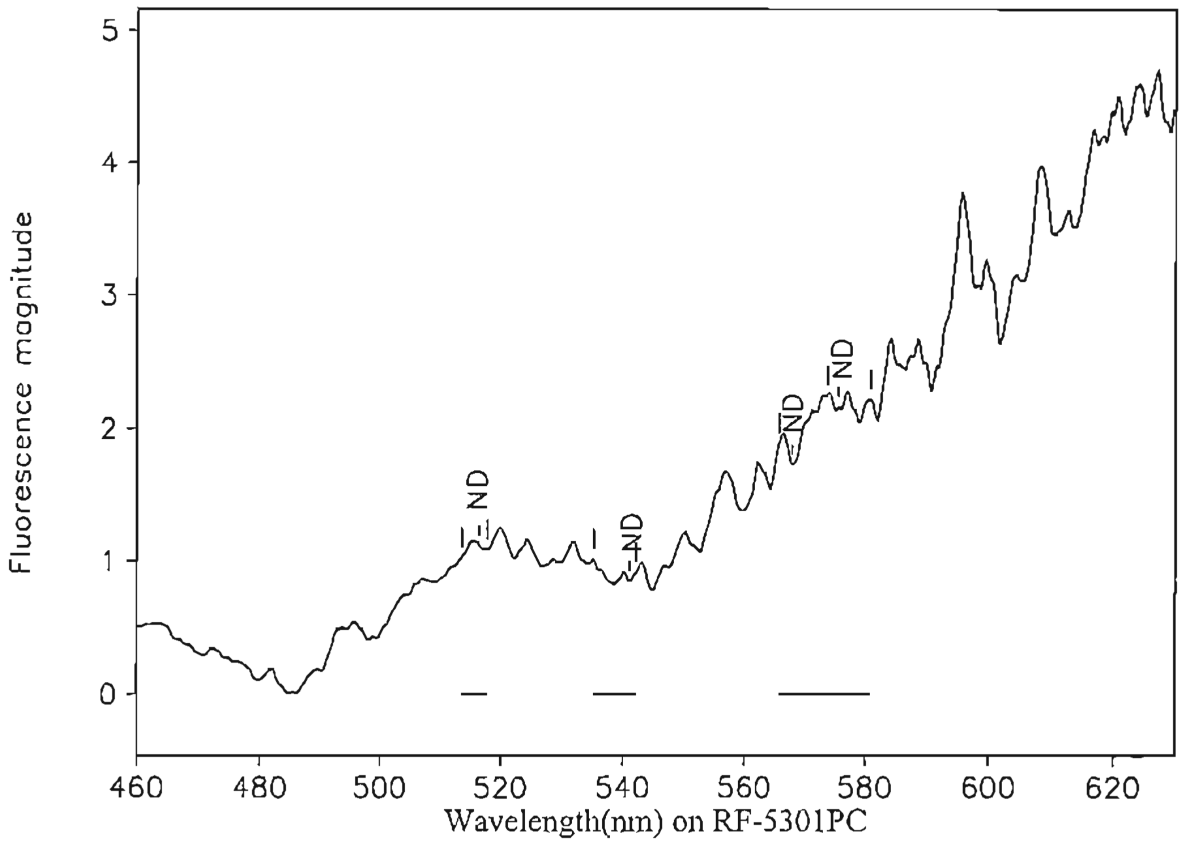
Station 4-255: MW-4 - 255 ft
OUL number: N7708 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 0850 Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-270: MW-4 - 270 ft
OUL number: N7709
Matrix: Elutant
Placed: 12/02/04 0850

Analyzed: 12/21/04

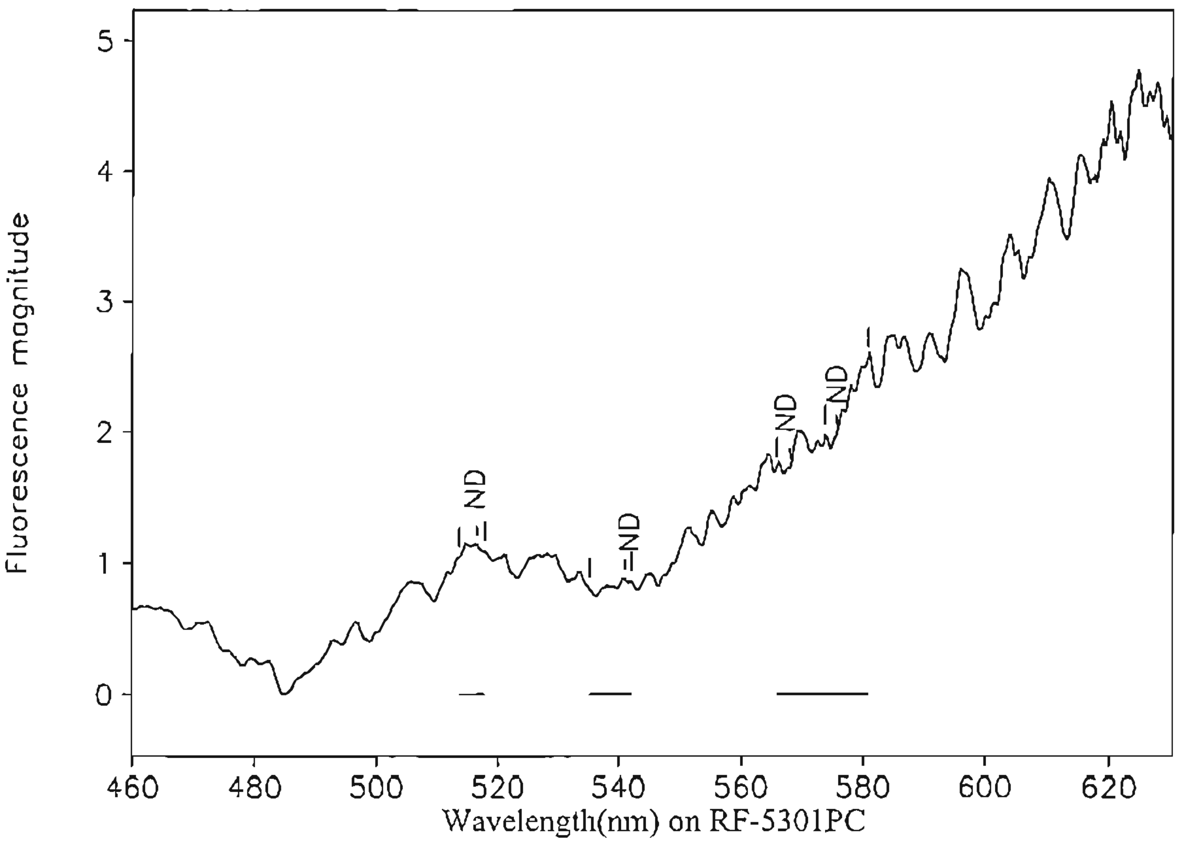
Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



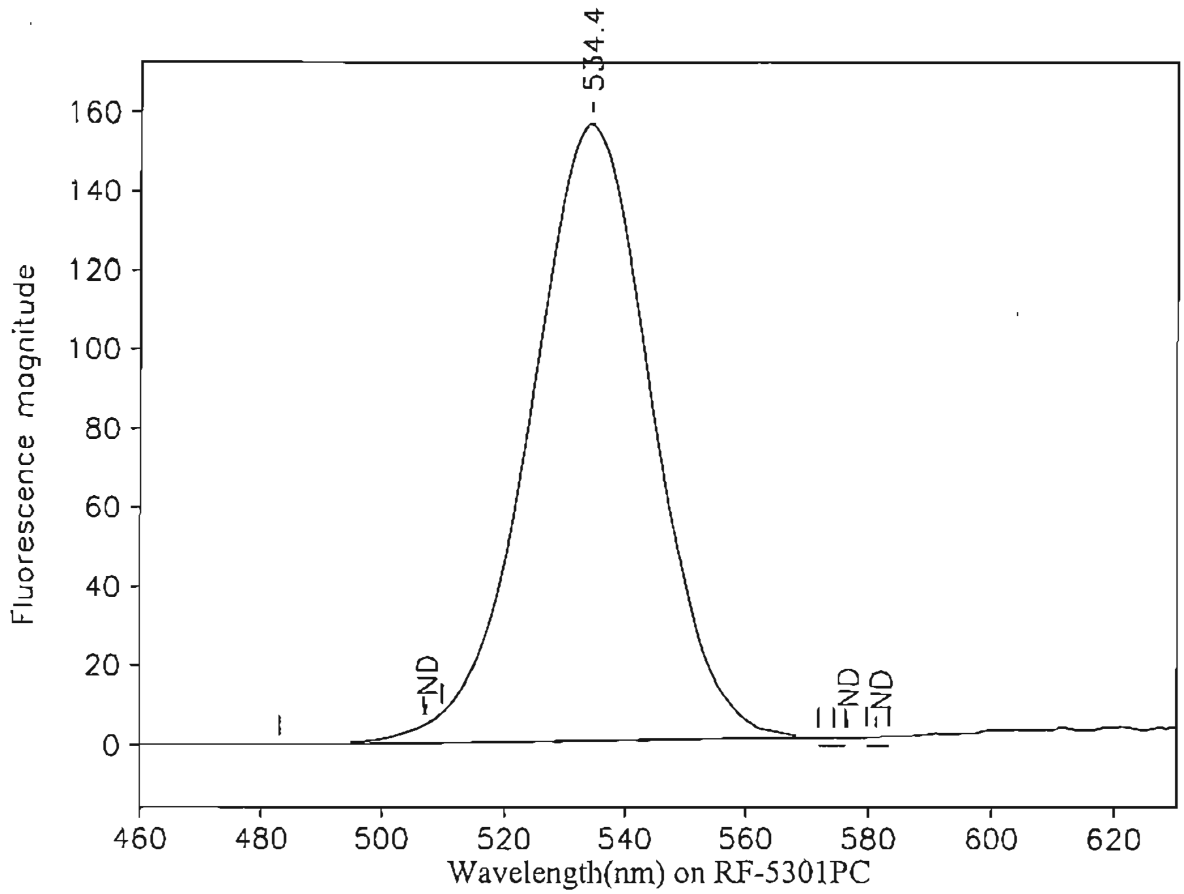
Station 4-285: MW-4 - 285 ft
OUL number: N7710 Analyzed: 12/21/04
Matrix: Elutant
Placed: 12/02/04 0850 Collected: 12/16/04 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N7721 Analyzed: 12/21/04
Matrix: Water
Collected: 12/16/04 1130

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
534.4	483.0	574.4	156.33	3,654.39	0.04	30.3
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

January 13, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped January 10, 2005
Ozark Underground Laboratory (OUL) numbers N7943 through N7984 and N7990.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on January 11, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Discrepancy sheet
4. Sample analysis graphs

f:\docs\coa\LakeOrienta06.doc

Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: January 10, 2005
Date Samples Rec'd at OUL: January 11, 2005
Date Analyzed by OUL: January 13, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N7943	1-215	MW-1 - 215 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7944	1-225	MW-1 - 225 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7945	1-235	MW-1 - 235 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7946	1-245	MW-1 - 245 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7947	1-255	MW-1 - 255 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7948	1-265	MW-1 - 265 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7949	1-275	MW-1 -275 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7950	1-285	MW-1 - 285 ft	12/16 1040	1/7 0915	ND		ND		ND	
N7951	2-135	MW-2 - 135 ft	12/16 1140	1/7 0950	ND		540.9	856	ND	
N7952	2-150	MW-2 - 150 ft	12/16 1140	1/7 0950	ND		540.7	1,910	ND	
N7953	2-165	MW-2 - 165 ft	12/16 1140	1/7 0950	ND		540.6	1,420	ND	
N7954	2-180	MW-2 - 180 ft	12/16 1140	1/7 0950	ND		540.9	2,660	ND	
N7955	2-195	MW-2 - 195 ft	12/16 1140	1/7 0950	ND		540.7	1,920	ND	
N7956	2-210	MW-2 - 210 ft	12/16 1140	1/7 0950	ND		540.9	3,390	ND	
N7957	2-225	MW-2 - 225 ft	12/16 1140	1/7 0950	ND		540.9	3,640	ND	
N7958	2-240	MW-2 - 240 ft	12/16 1140	1/7 0950	ND		540.9	7,330	ND	
N7959	2-255	MW-2 - 255 ft	12/16 1140	1/7 0950	ND		541.1	6,150	ND	
N7960	Laboratory Control Charcoal Blank									
N7961	2-270	MW-2 - 270 ft	12/16 1140	1/7 0950	ND		541.0	6,630	ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory for CH2MHill

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		Eosine		RWT	
			2004	2005	Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N7962	2-285	MW-2 - 285 ft	12/16 1140	1/7 0950	ND		540.9	304	ND	
N7963	2-300	MW-2 - 300 ft	12/16 1140	1/7 0950	ND		540.6	79.3	ND	
N7964	3-175	MW-3 - 175 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7965	3-185	MW-3 - 185 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7966	3-195	MW-3 - 195 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7967	3-205	MW-3 - 205 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7968	3-215	MW-3 - 215 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7969	3-225	MW-3 - 225 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7970	3-235	MW-3 - 235 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7971	3-245	MW-3 - 245 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7972	3-255	MW-3 - 255 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7973	3-265	MW-3 - 265 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7974	3-275	MW-3 - 275 ft	12/16 0910	1/7 0840	ND		ND		ND	
N7975	4-165	MW-4 - 165 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7976	4-180	MW-4 - 180 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7977	4-195	MW-4 - 195 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7978	4-210	MW-4 - 210 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7979	4-225	MW-4 - 225 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7980	Laboratory Control Charcoal Blank									
N7981	4-240	MW-4 - 240 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7982	4-255	MW-4 - 255 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7983	4-270	MW-4 - 270 ft	12/16 0815	1/7 0805	ND		ND		ND	
N7984	4-285	MW-4 - 285 ft	12/16 0815	1/7 0805	ND		ND		ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory for CH2MHill

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2004	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N7990	2-WA	MW-2 - Water	**Water**	1/7 1005	ND		534.2	30.0	ND	

FOOTNOTES:

ND = No dye detected

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** ______ **Samples Collected By:** Mike Burns

Samples Shipped By: fe **Samples Received By:** Marty Arnold OUL

Date Samples Shipped: 1/10/05 **Date Samples Received:** 1/11/05 **Time Samples Received:** 12:45 **Return Cooler? Yes** — **No** ______

Bill to: ______ **Send Results to:** CH2m Hill

Analyze for: Fluorescein X **Eosine** X **Rhodamine WT** X **Other** ______ **Ship cooler to:** Nodarse

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7943	1-215	MW-1 – 215 ft	12/16/04	1040	1/7/05	0915	0
1	N7944	1-225	MW-1 – 225 ft					0
1	N7945	1-235	MW-1 – 235 ft					0
1	N7946	1-245	MW-1 – 245 ft					0
1	N7947	1-255	MW-1 – 255 ft					0
1	N7948	1-265	MW-1 – 265 ft					0
1	N7949	1-275	MW-1 – 275 ft					0
1	N7950	1-285	MW-1 – 285 ft					0
0		1-WA	MW-1 – Water Sample				1000	1

COMMENTS: ______

This sheet filled out by OUL staff? Yes ______ **No** — **Charts for samples on this page proofed by OUL:** mms

724

Project 621 analyzed 1/13/05 by mr

Page 1 of 4

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OUL page 1 of 4

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 4 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 1/10/05 Date Samples Received: 1/11/05 Time Samples Received: 12:45 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7951	2-135	MW-2 – 135 ft	12/16/04	1140	1/7/05	0950	0
1	N7952	2-150	MW-2 – 150 ft					0
1	N7953	2-165	MW-2 – 165 ft					0
1	N7954	2-180	MW-2 – 180 ft					0
1	N7955	2-195	MW-2 – 195 ft					0
1	N7956	2-210	MW-2 – 210 ft					0
1	N7957	2-225	MW-2 – 225 ft					0
1	N7958	2-240	MW-2 – 240 ft					0
1	N7959	2-255	MW-2 – 255 ft					0
1	N7961	2-270	MW-2 – 270 ft					0
1	N7962	2-285	MW-2 – 285 ft					0
1	N7963	2-300	MW-2 – 300 ft					0
0		2-WA	MW-2 – Water Sample				1005	1

COMMENTS: Charcoal Blank N7960

This sheet filled out by OUL staff? Yes No — Charts for samples on this page proofed by OUL: [illegible] 725

Analyzed 1/13/05 by [illegible]

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OUL Page 2 of 4

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 4 Samples Collected By: Mike Burns

Samples Shipped By: mike Burns Samples Received By: Marty Aurich

Date Samples Shipped: 1/10/05 Date Samples Received: 1/11/05 Time Samples Received: 12:45 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nodarse

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7964	3-175	MW-3 – 175 ft	12/16/04	0910	1/7/05	0840	0
1	N7965	3-185	MW-3 – 185 ft					0
1	N7966	3-195	MW-3 – 195 ft					0
1	N7967	3-205	MW-3 – 205 ft					0
1	N7968	3-215	MW-3 – 215 ft					0
1	N7969	3-225	MW-3 – 225 ft					0
1	N7970	3-235	MW-3 – 235 ft					0
1	N7971	3-245	MW-3 – 245 ft					0
1	N7972	3-255	MW-3 – 255 ft					0
1	N7973	3-265	MW-3 – 265 ft					0
1	N7974	3-275	MW-3 – 275 ft					0
0		3-WA	MW-3 – Water Sample				0850	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: mma

726

analyzed 1/13/05 by LR

Page 3 of 4

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OUL page 3 of 4

OZARK UNDERGROUND LABORATORY, INC.

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 4 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Trinity Armored - OUL

Date Samples Shipped: 1/10/05 Date Samples Received: 1/11/05 Time Samples Received: 12:45 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nodarse & Assoc

OUL use only		Please indicate stations where dye was visible in the field *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N7975	4-165	MW-4 – 165 ft	12/16/04	0815	1/7/05	0805	0
1	N7976	4-180	MW-4 – 180 ft					0
1	N7977	4-195	MW-4 – 195 ft					0
1	N7978	4-210	MW-4 – 210 ft					0
1	N7979	4-225	MW-4 – 225 ft					0
1	N7981	4-240	MW-4 – 240 ft					0
1	N7982	4-255	MW-4 – 255 ft					0
1	N7983	4-270	MW-4 – 270 ft					0
1	N7984	4-285	MW-4 – 285 ft					0
0		4-WA	MW-5 – Water Sample				0815	1

COMMENTS: Charcoal Blank N7980

This sheet filled out by OUL staff? Yes ____ No – Charts for samples on this page proofed by OUL: [illegible] 1/27

Analyzed 1/13/05 by we

Page 4 of 4

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1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 4 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 1/10/05 Date Samples Received: 1/11/05 Time Samples Received: 12:45 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ____ Ship cooler to: Hodgson & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1		2-135	MW-2 – 135 ft	12/16/04	1140	1/7/05	0950	0
1		2-150	MW-2 – 150 ft					0
1		2-165	MW-2 – 165 ft					0
1		2-180	MW-2 – 180 ft					0
1		2-195	MW-2 – 195 ft					0
1		2-210	MW-2 – 210 ft					0
1		3-225	MW-2 – 225 ft					0
1		2-240	MW-2 – 240 ft					0
1		2-255	MW-2 – 255 ft					0
1		2-270	MW-2 – 270 ft					0
1		2-285	MW-2 – 285 ft					0
1		2-300	MW-2 – 300 ft					0
0	W7990	2-WA	MW-2 – Water Sample				1005	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: [signature]

Analyzed 1/13/05 by UR

728

OZARK UNDERGROUNI ABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 1 of 1

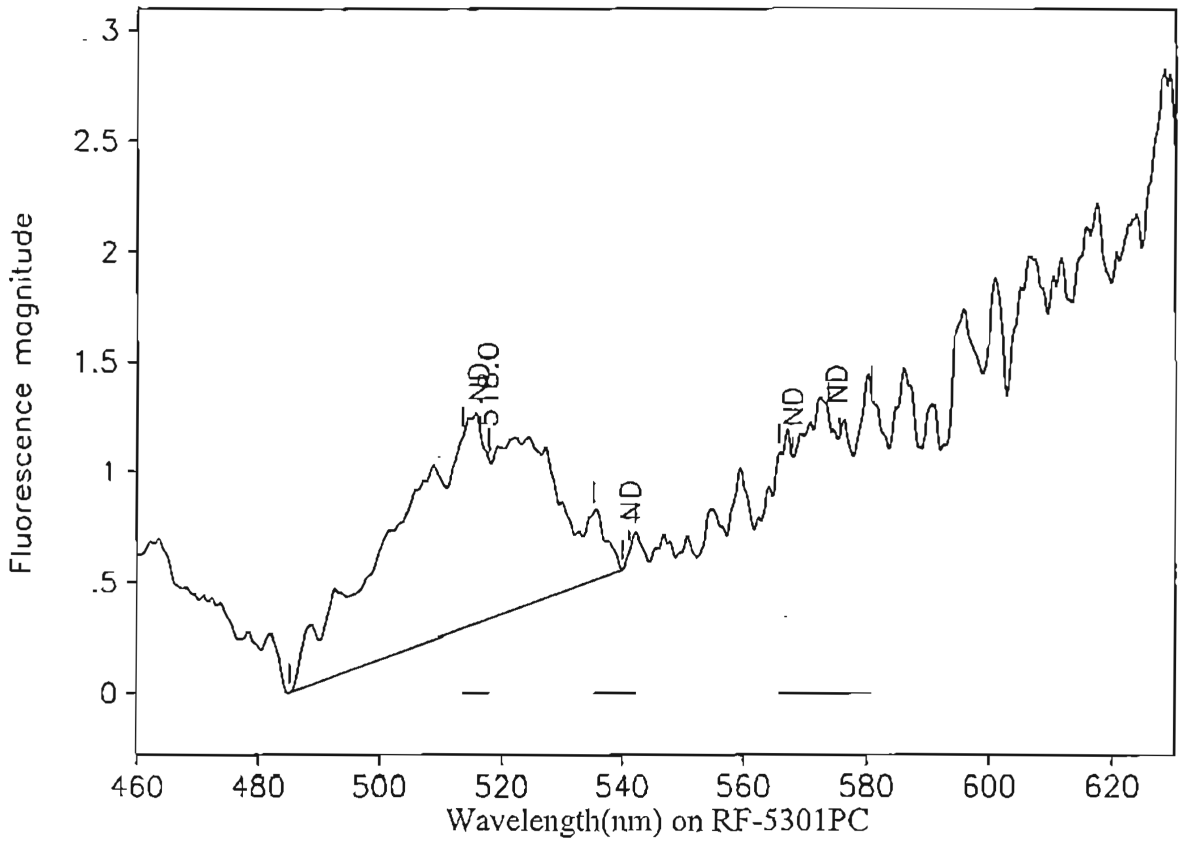
Company & Project Name: CH2MHill- Lake Orienta Date Rec'd by OUL: 1-11-05 Wk #

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
N7957	2-225	MW-2 -225 ft	1/7/05	Stn # on COC is given as 3-225.	Used 2-225 mma

Comments:

729

Ozark Underground Laboratory



Station 1-215: MW-1 - 215 ft
OUL number: N7943
Matrix: Elutant
Placed: 12/16/04 1040

Analyzed: 01/13/05

Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	485.2	540.0	0.71	27.77	0.03	~~0.703~~ ND

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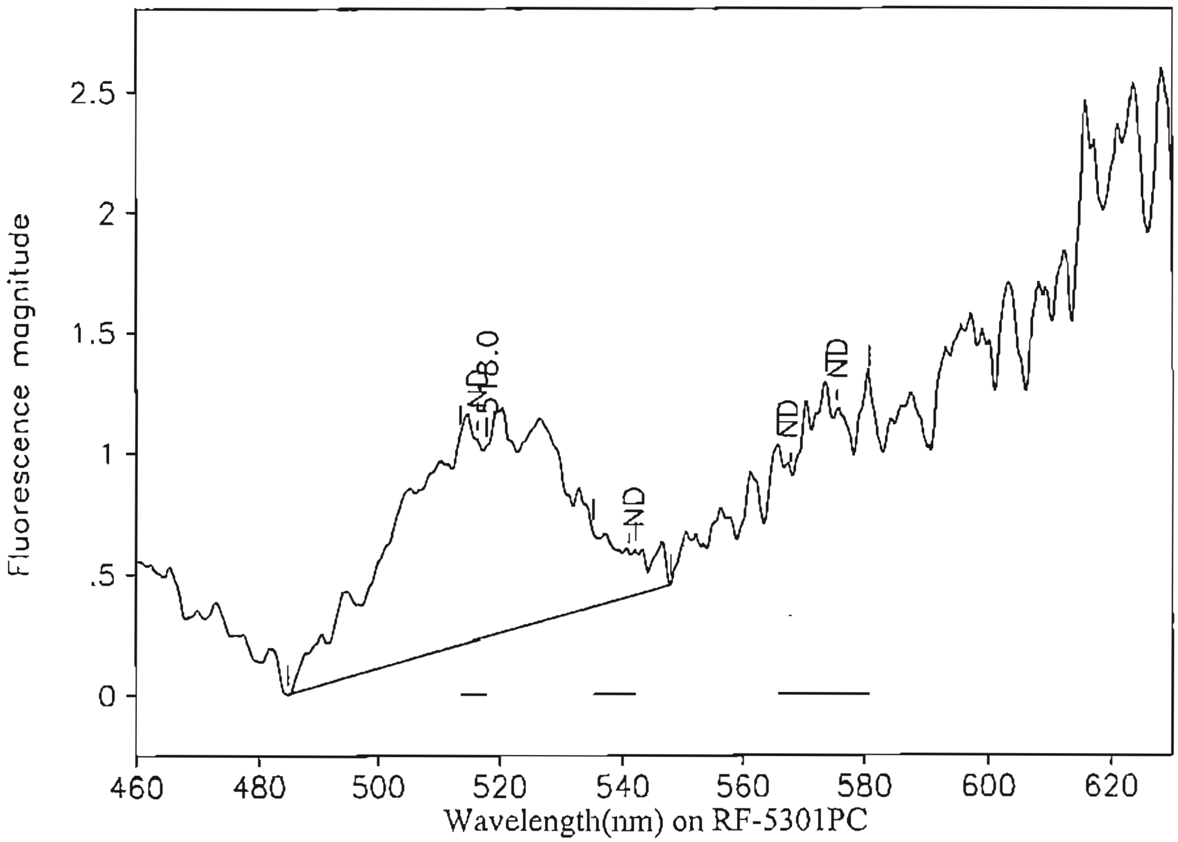


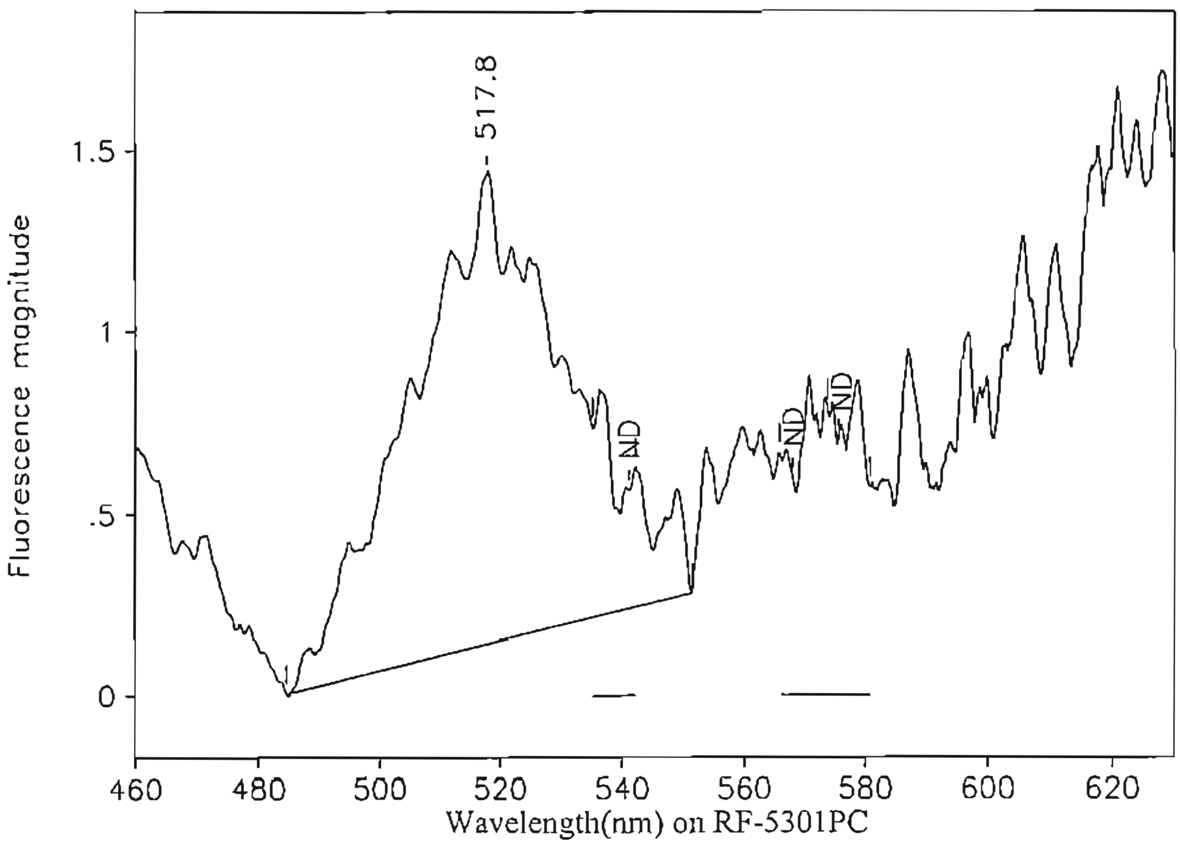
Station 1-225: MW-1 - 225 ft
OUL number: N7944
Matrix: Elutant
Placed: 12/16/04 1040

Analyzed: 01/13/05
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	484.8	548.0	0.79	30.81	0.03	~~0.779~~ ND

Ozark Underground Laboratory



Station 1-235: MW-1 - 235 ft
OUL number: N7945
Matrix: Elutant
Placed: 12/16/04 1040

Analyzed: 01/13/05

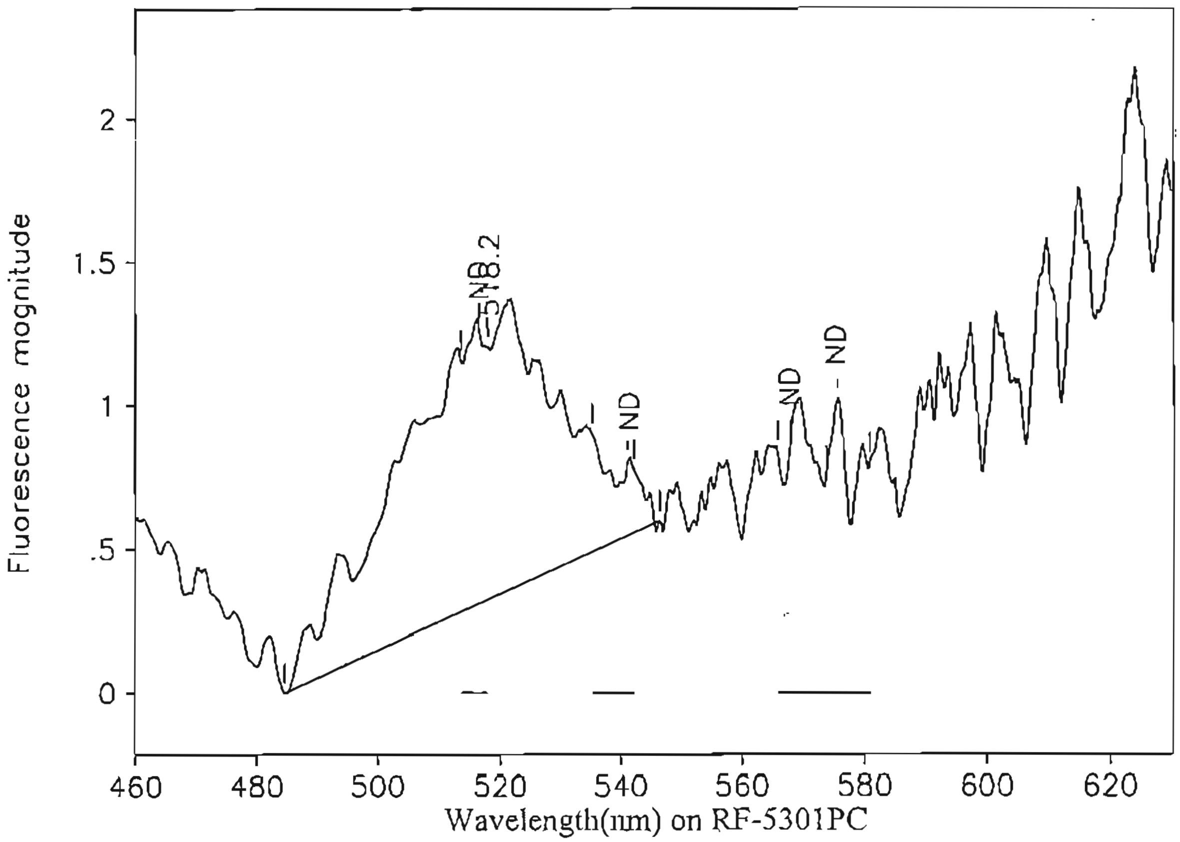
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	484.6	551.4	1.29	39.53	0.03	~~1.00~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-245: MW-1 - 245 ft
OUL number: N7946
Matrix: Elutant
Placed: 12/16/04 1040

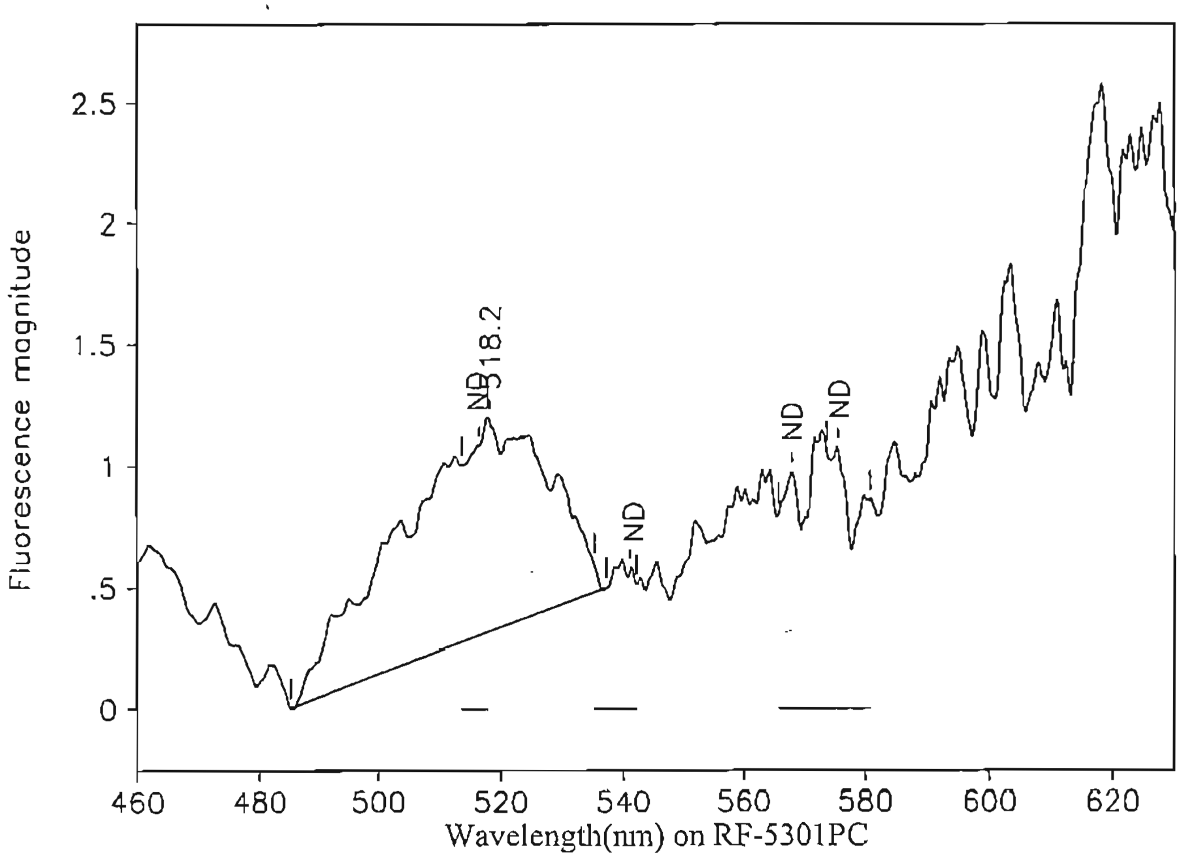
Analyzed: 01/13/05

Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	484.6	546.4	0.87	31.47	0.03	~~0.796~~ ND

Ozark Underground Laboratory



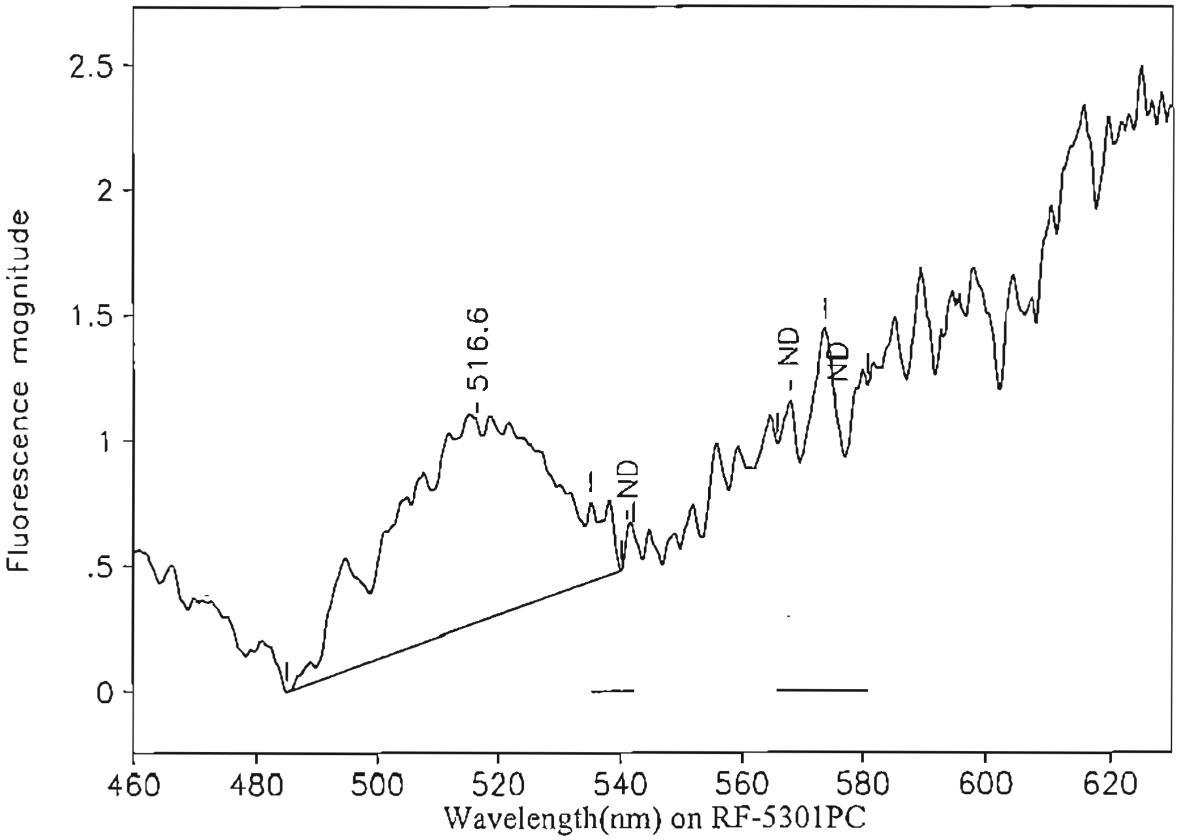
Station 1-255: MW-1 - 255 ft
OUL number: N7947
Matrix: Elutant
Placed: 12/16/04 1040

Analyzed: 01/13/05
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.2	485.2	537.2	0.88	25.44	0.03	~~0.644~~ ND

Ozark Underground Laboratory



Station 1-265: MW-1 - 265 ft
OUL number: N7948
Matrix: Elutant
Placed: 12/16/04 1040

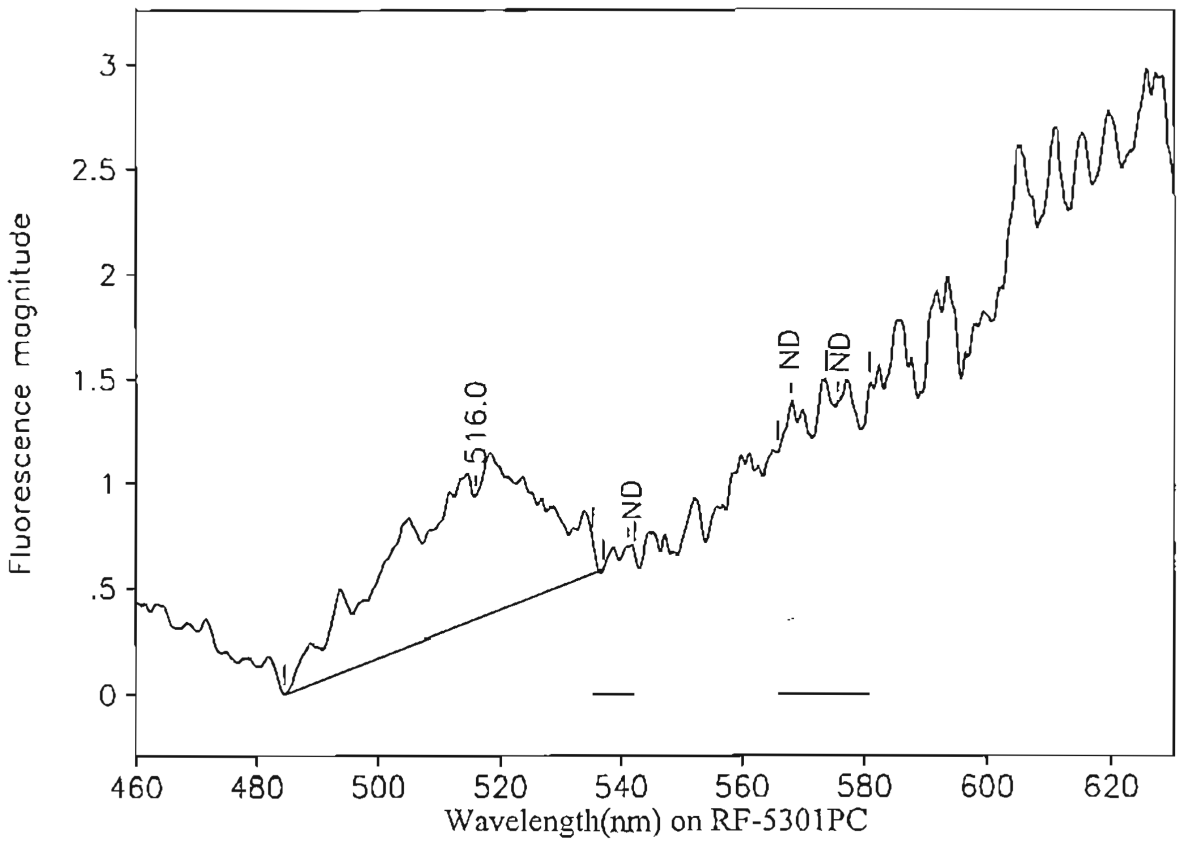
Analyzed: 01/13/05
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	485.0	540.2	0.80	25.76	0.03	~~0.652~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-275: MW-1 -275 ft
OUL number: N7949
Matrix: Elutant
Placed: 12/16/04 1040

Analyzed: 01/13/05

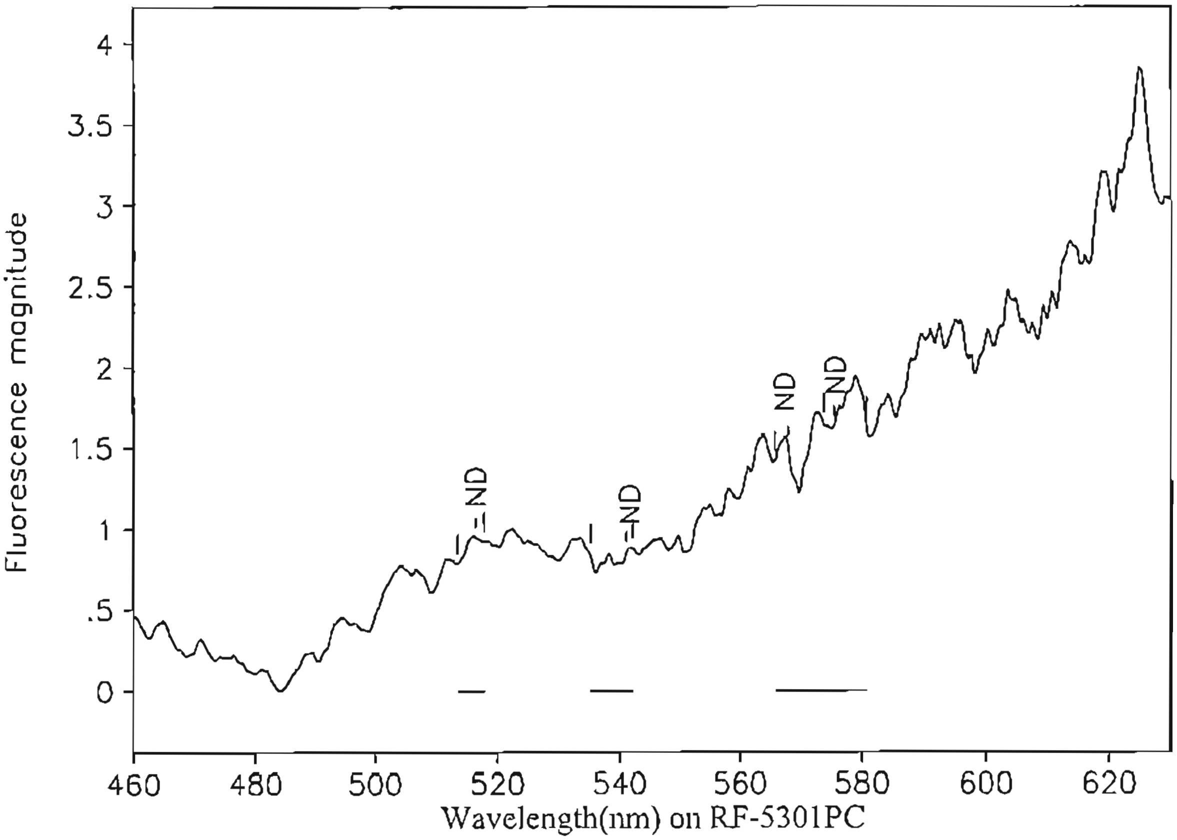
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	484.6	537.0	0.59	21.56	0.03	~~0.545~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-285: MW-1 - 285 ft
OUL number: N7950
Matrix: Elutant
Placed: 12/16/04 1040

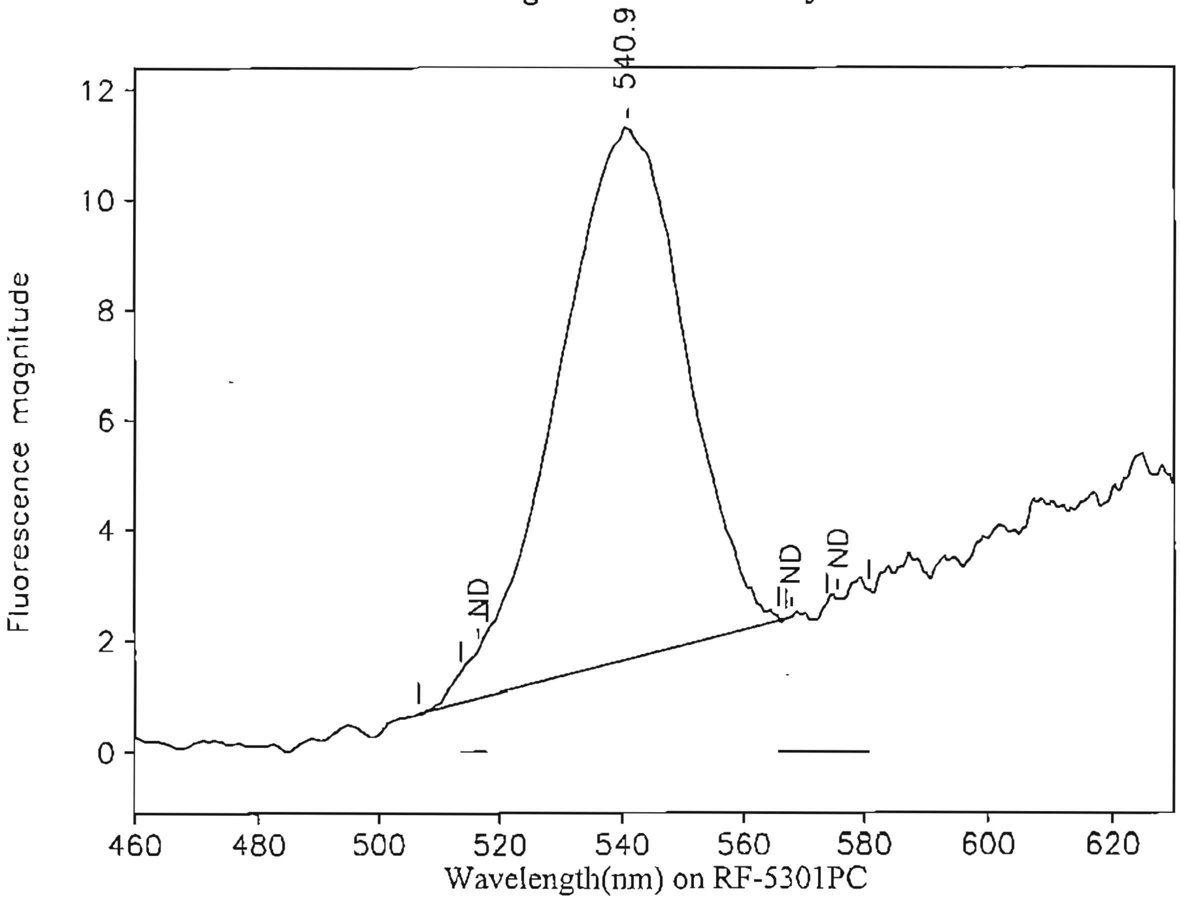
Analyzed: 01/13/05
Collected: 01/07/05 0915

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-135: MW-2 - 135 ft
OUL number: N7951
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	506.6	567.0	9.63	234.12	0.04	856
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

nr

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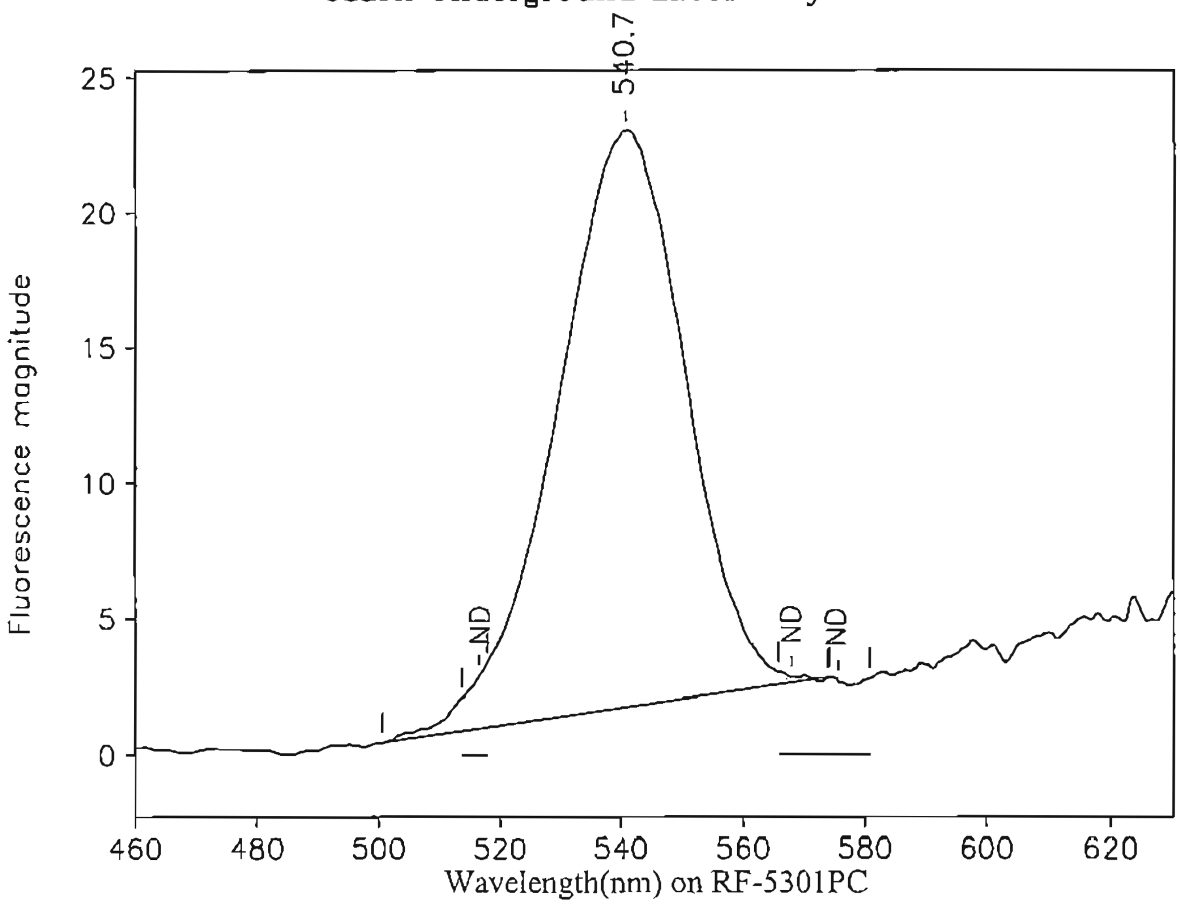


Station 2-150: MW-2 - 150 ft
OUL number: N7952
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

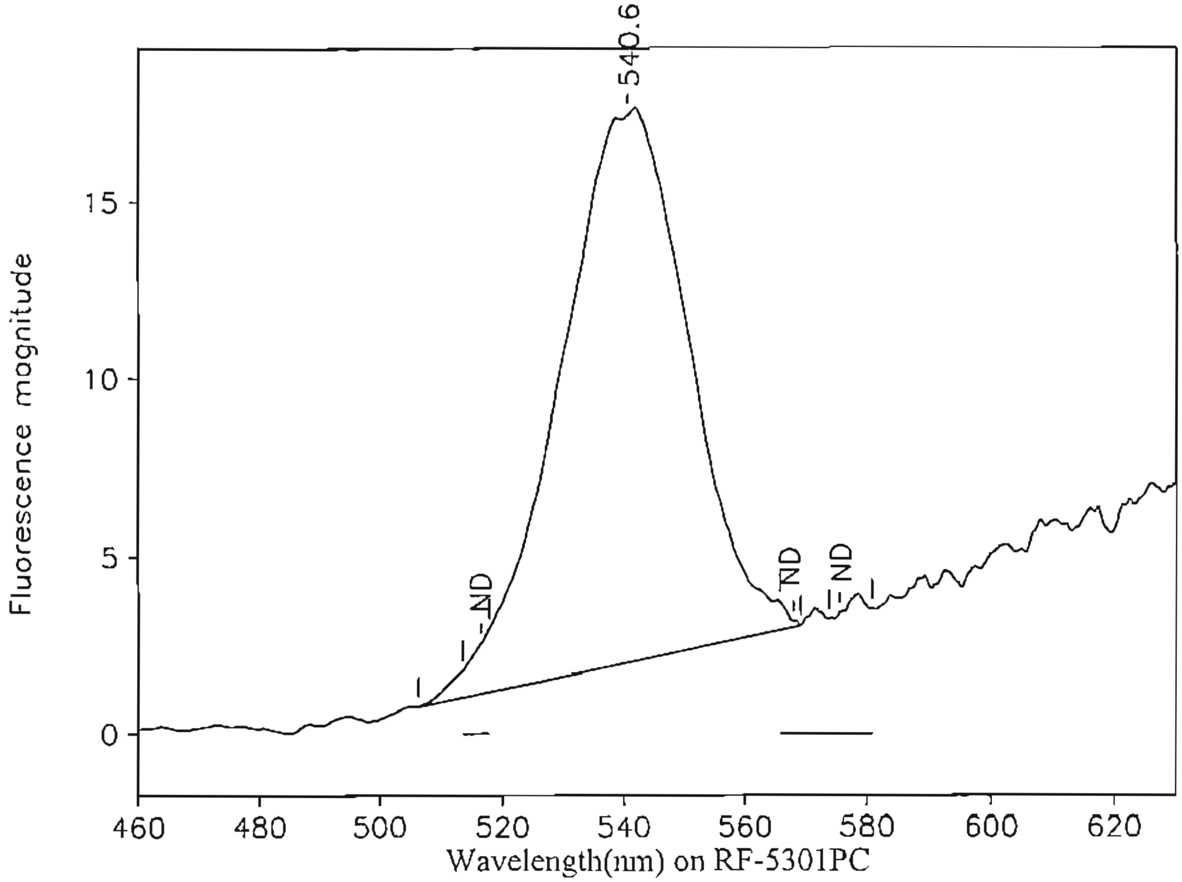
Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.7	500.6	574.2	21.28	521.32	0.04	1,910
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-165: MW-2 - 165 ft
OUL number: N7953
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

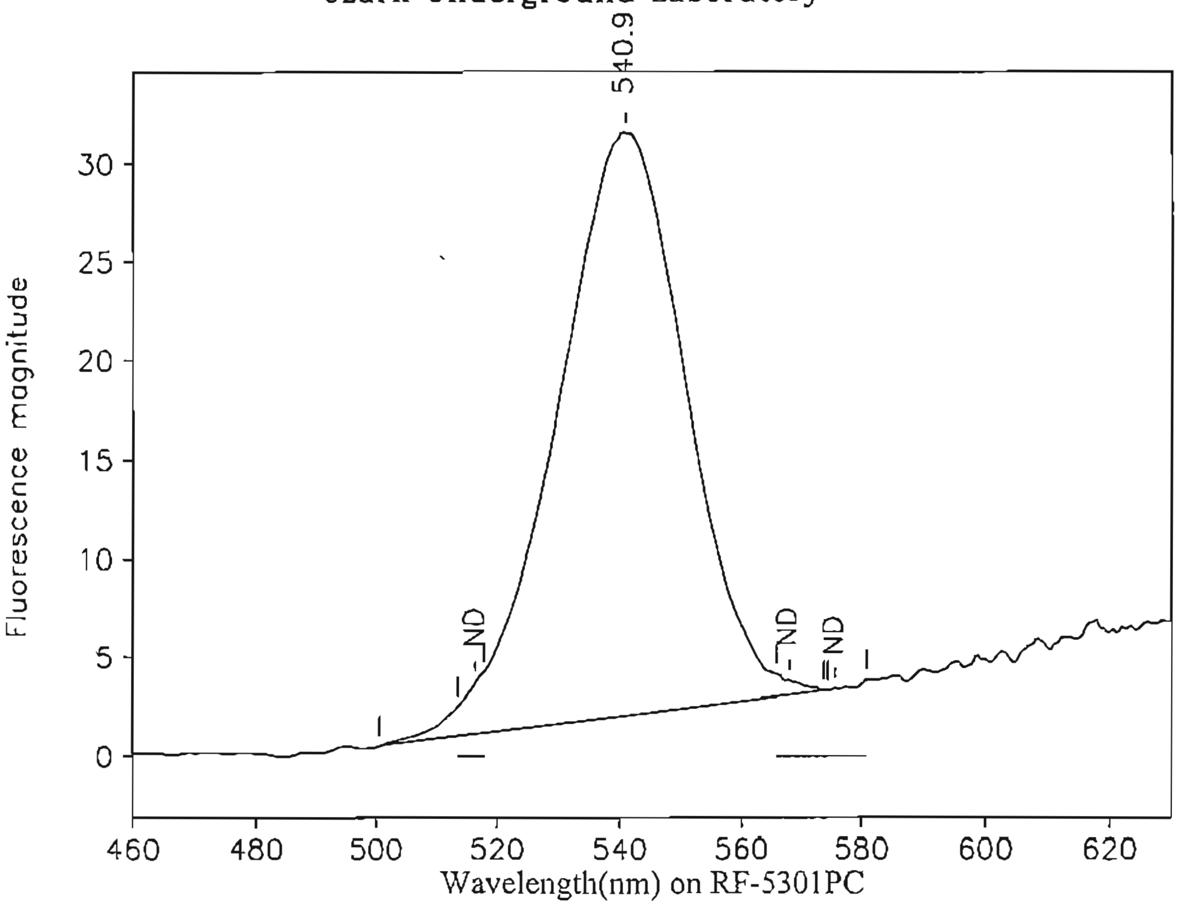
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.6	506.4	569.2	15.45	387.65	0.04	1,420
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

mr

Ozark Underground Laboratory



Station 2-180: MW-2 - 180 ft
OUL number: N7954
Matrix: Elutant
Placed: 12/16/04 1140

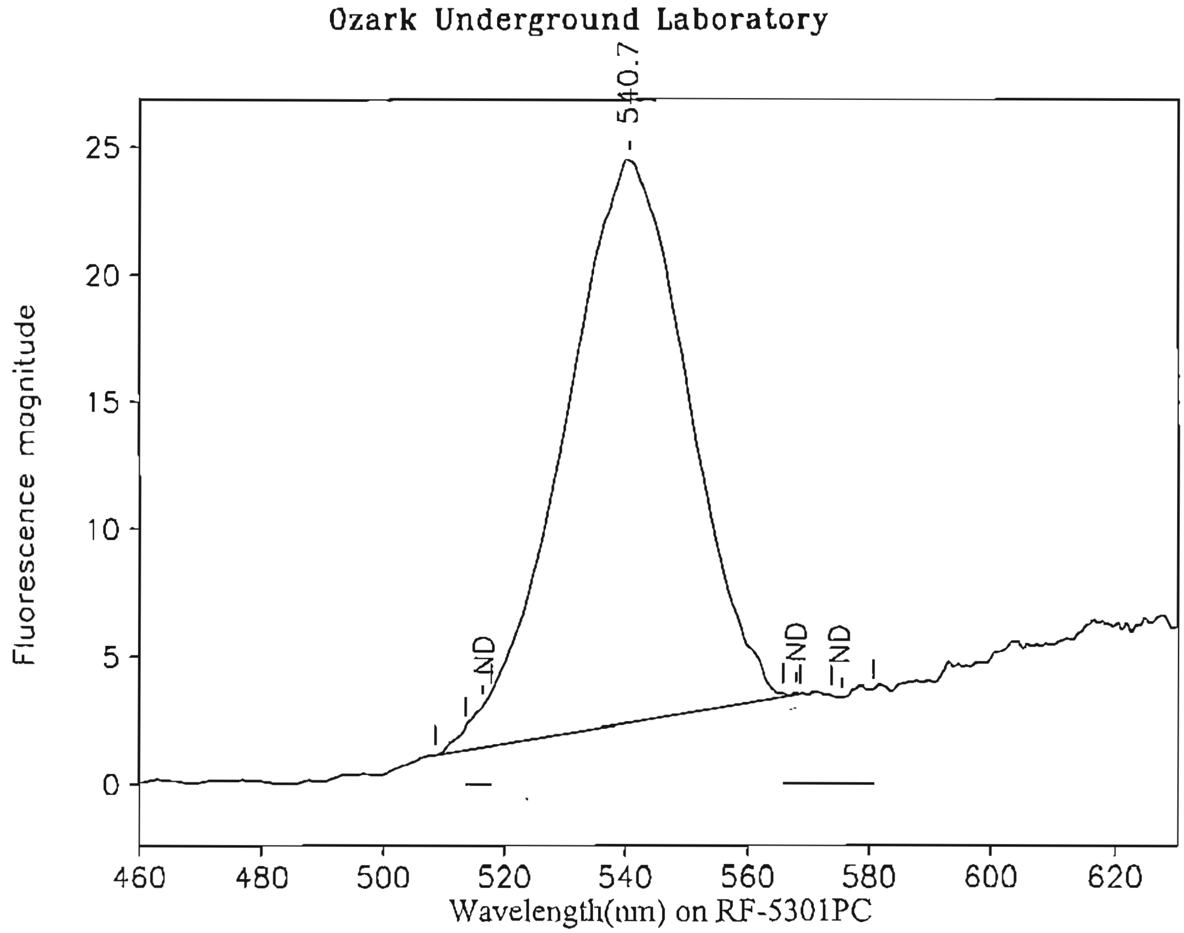
Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	500.6	574.4	29.49	727.49	0.04	2,660
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 2-195: MW-2 - 195 ft
OUL number: N7955
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

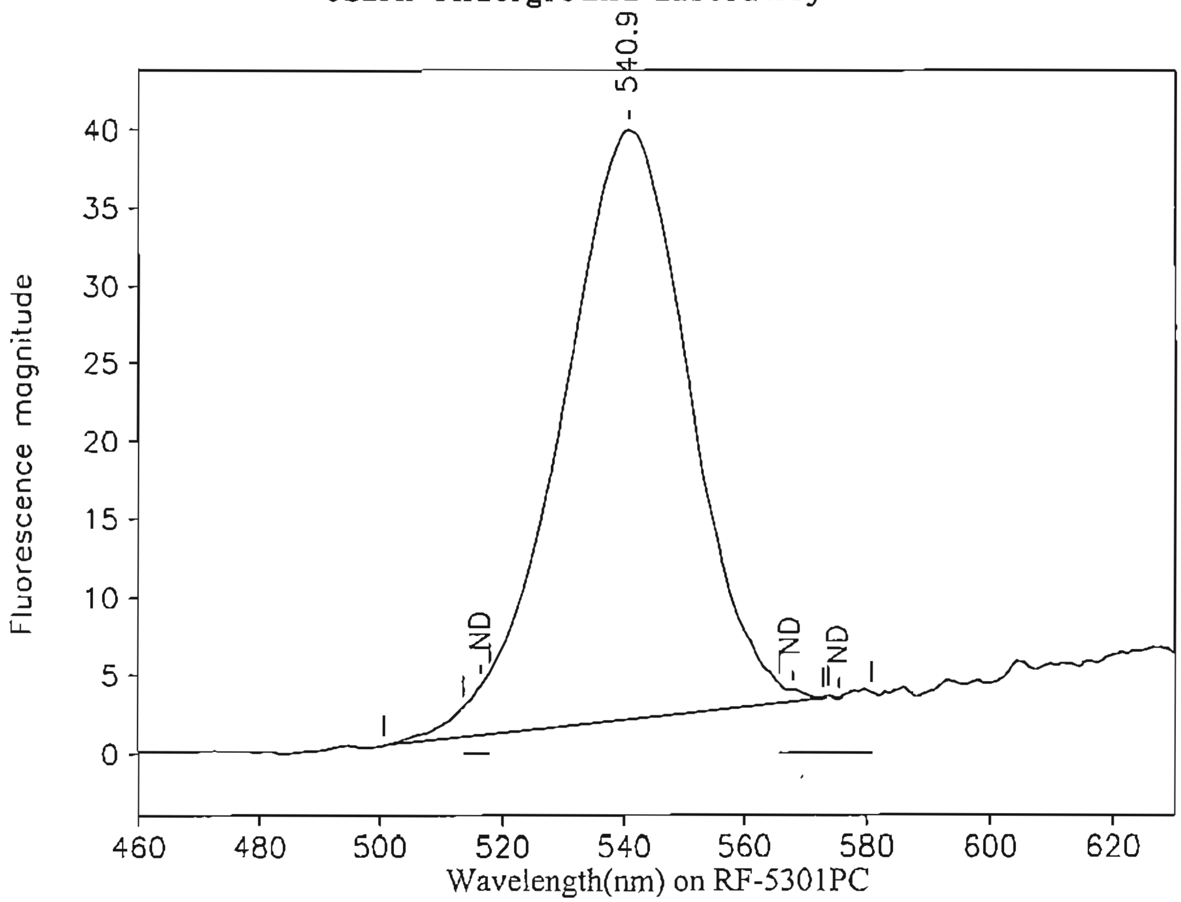
Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.7	508.6	568.6	22.07	524.05	0.04	1,920
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-210: MW-2 - 210 ft
OUL number: N7956
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

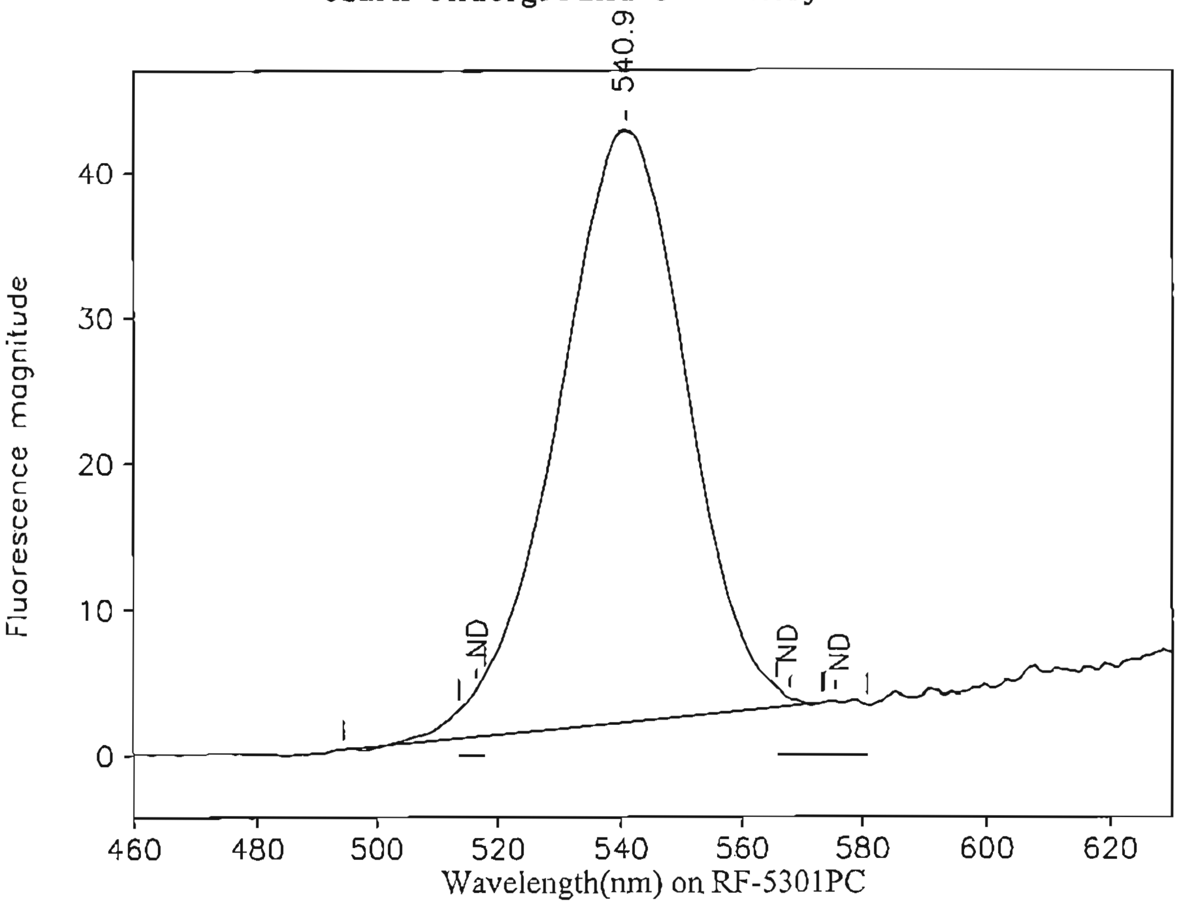
Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	500.6	573.0	37.75	926.54	0.04	3,390
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-225: MW-2 - 225 ft
OUL number: N7957
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

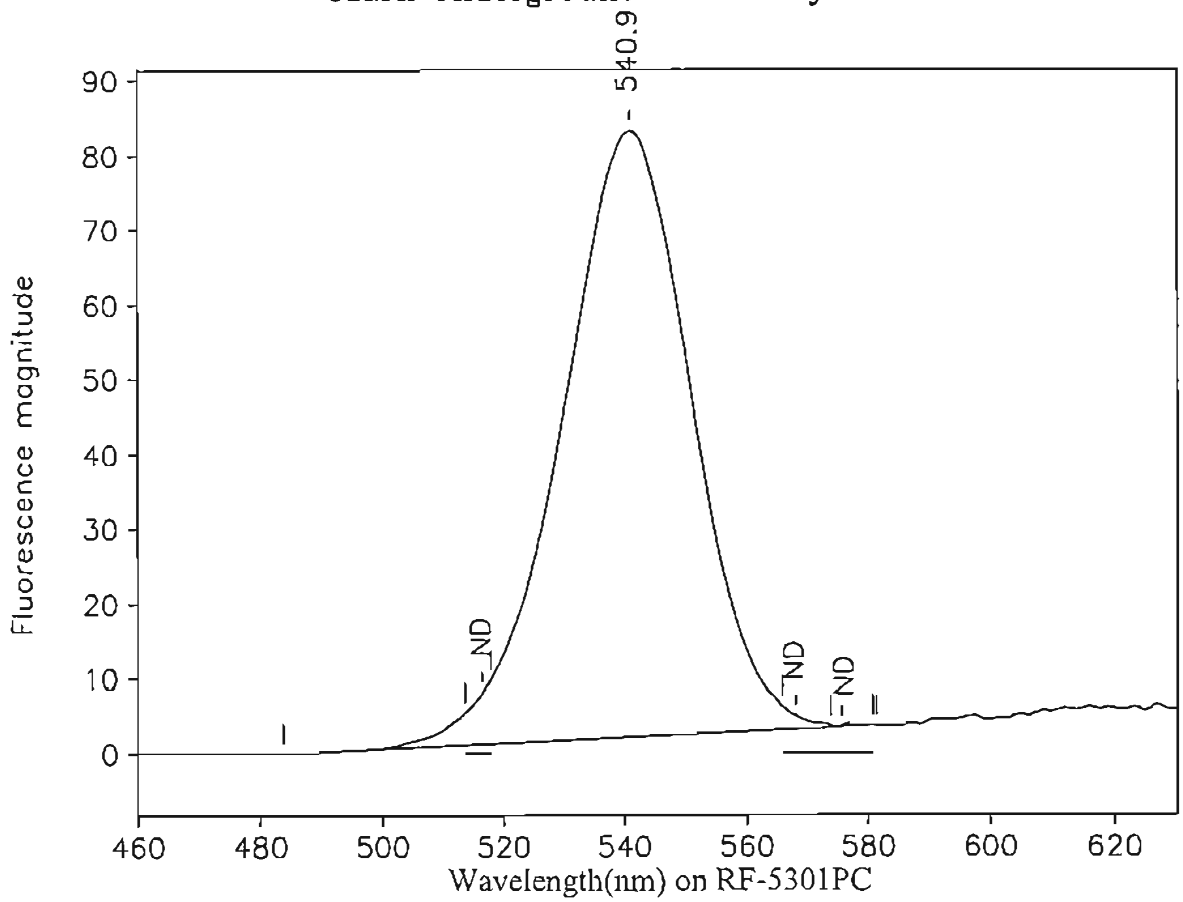
Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	494.4	573.4	40.53	996.24	0.04	3,640
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N7958
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

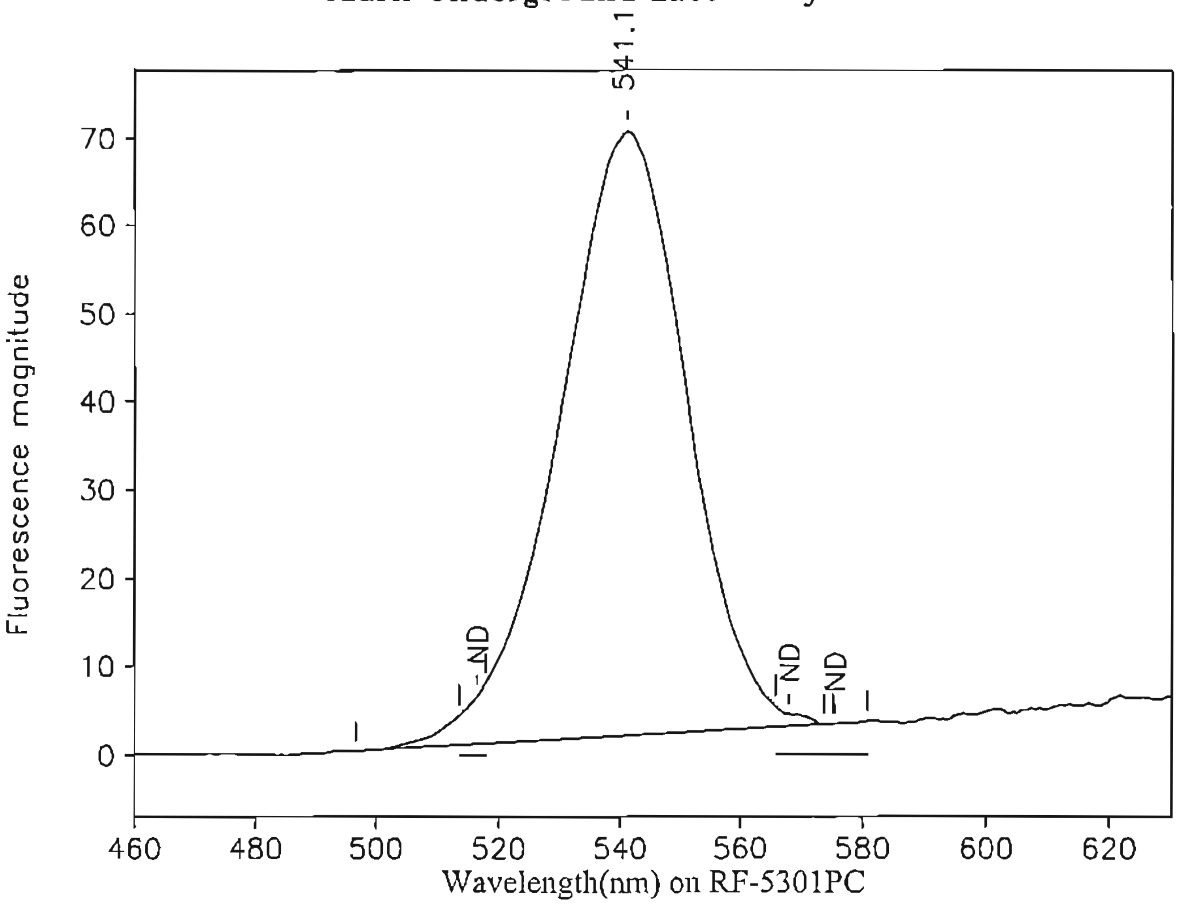
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	483.7	581.3	81.09	2,006.00	0.04	7,330
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NW

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N7959
Matrix: Elutant
Placed: 12/16/04 1140

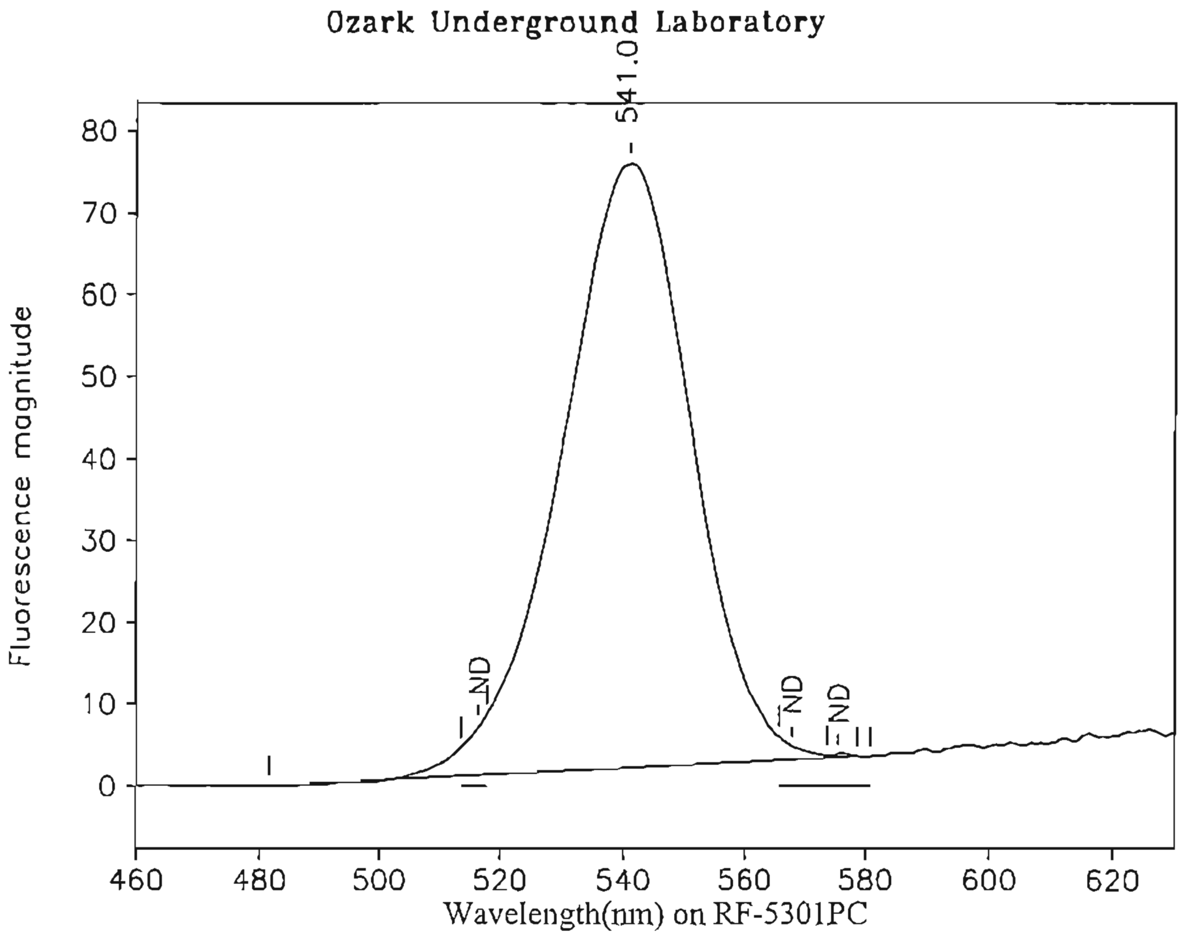
Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	496.6	575.2	68.56	1,683.12	0.04	6,150
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 2-270: MW-2 - 270 ft
OUL number: N7961
Matrix: Elutant
Placed: 12/16/04 1140

Diluted: 1 to 100
Analyzed: 01/13/05

Collected: 01/07/05 0950

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.0	481.5	578.6	73.80	1,813.00	0.04	6,630
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

mr

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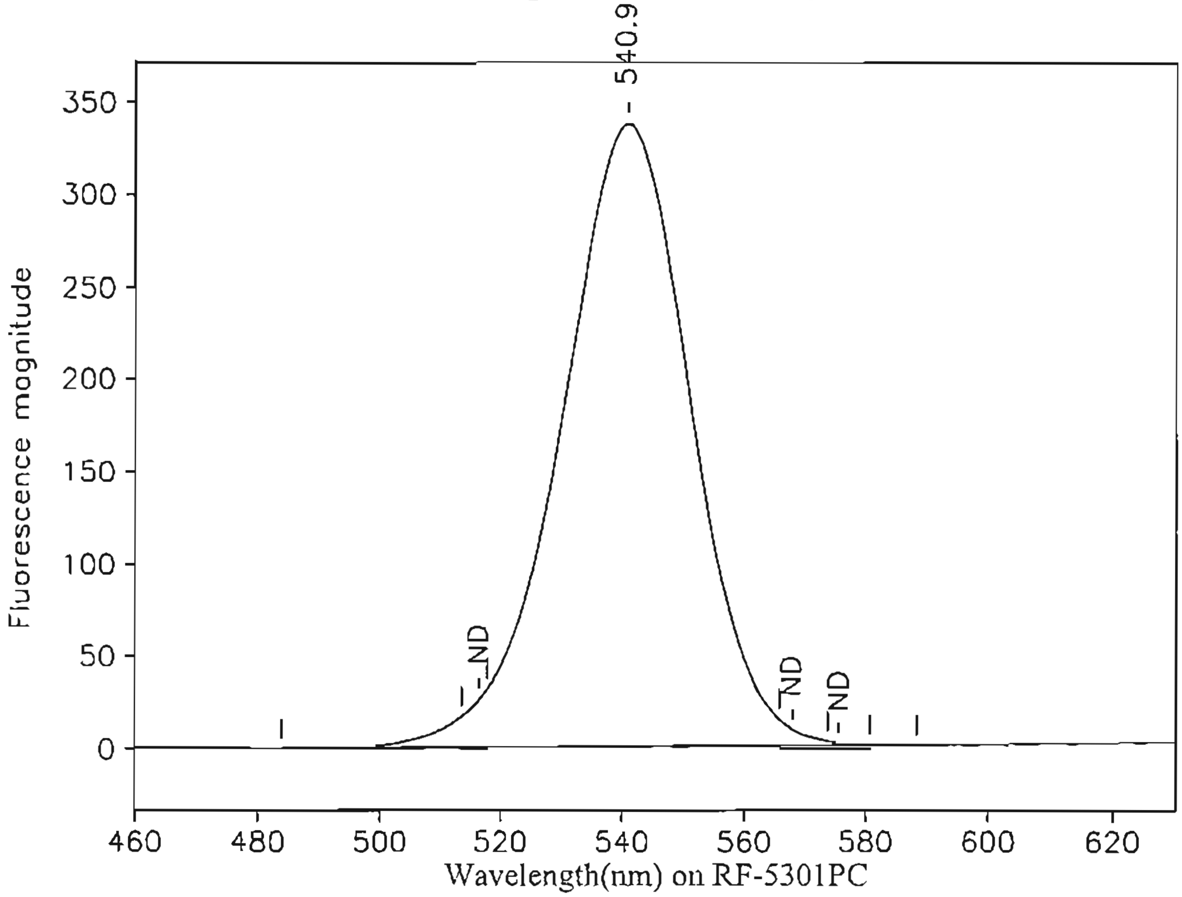


Station 2-285: MW-2 - 285 ft
OUL number: N7962 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 1140 Collected: 01/07/05 0950

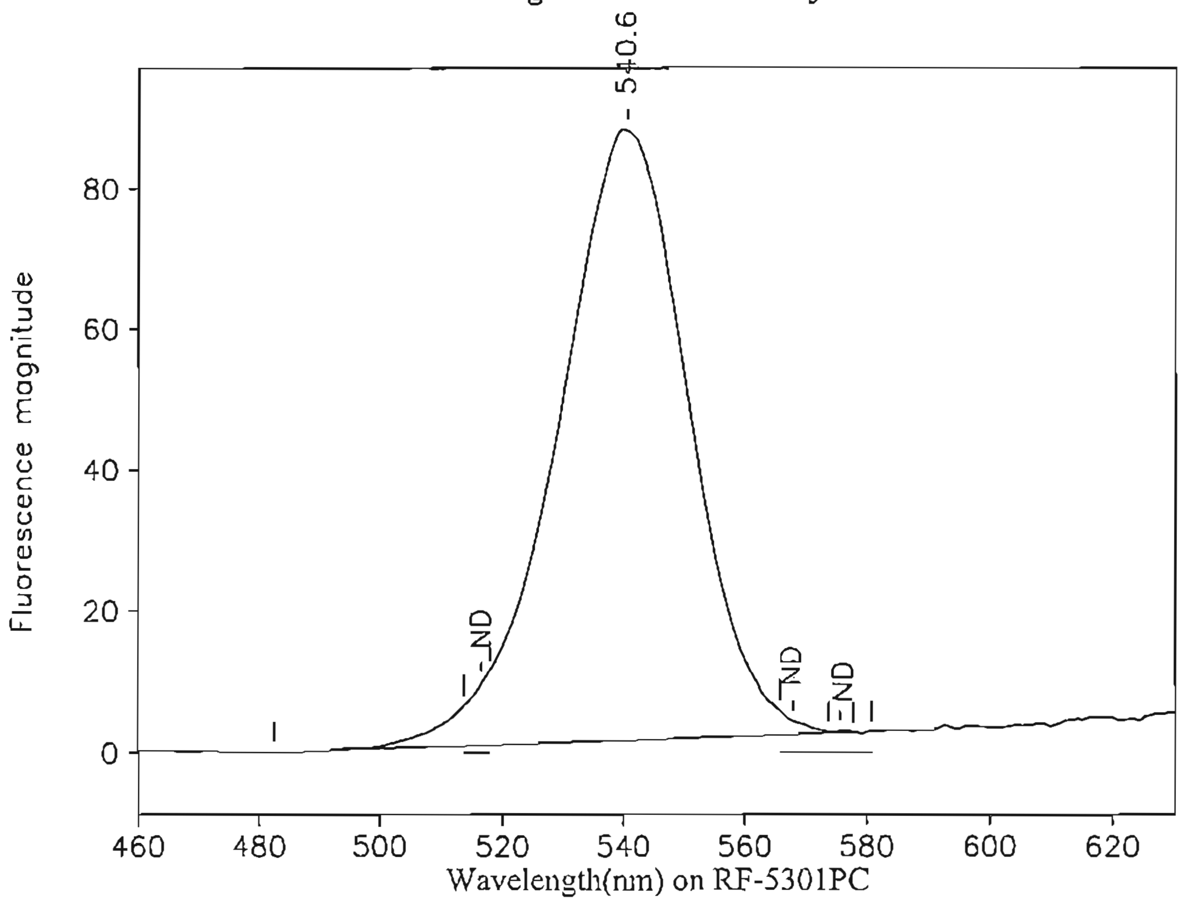
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.9	483.9	588.4	337.57	8,311.44	0.04	304
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NW

Ozark Underground Laboratory



Station 2-300: MW-2 - 300 ft
OUL number: N7963 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 1140 Collected: 01/07/05 0950

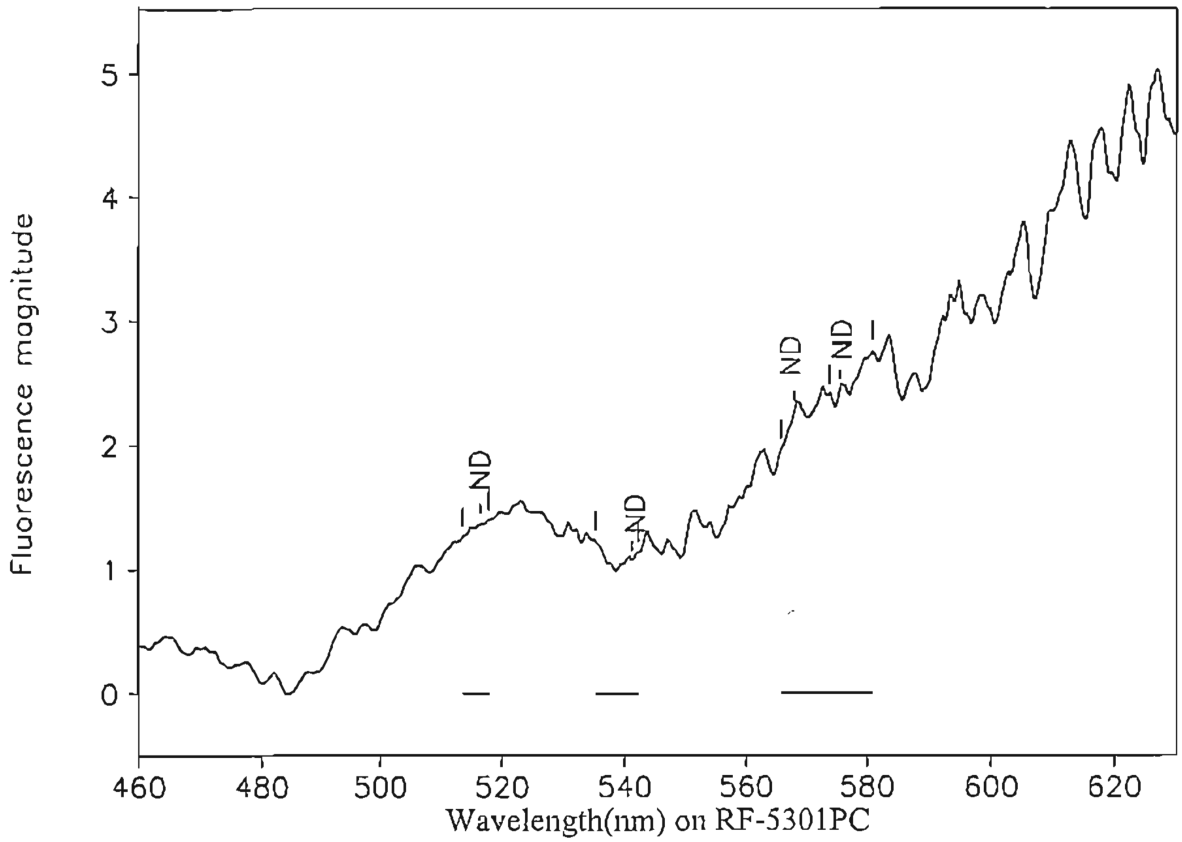
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.6	482.5	577.8	86.63	2,169.04	0.04	79.3
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

MV

Ozark Underground Laboratory



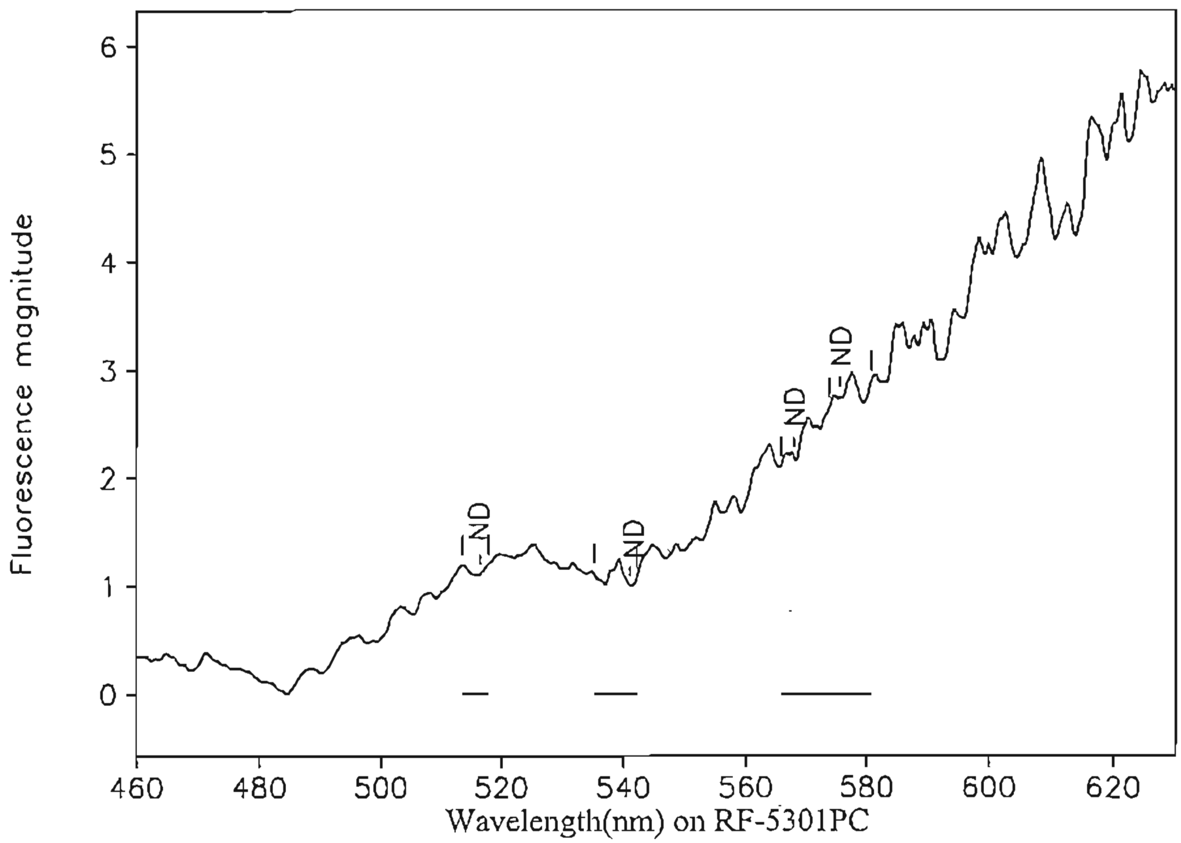
Station 3-175: MW-3 - 175 ft
OUL number: N7964 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0910 Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



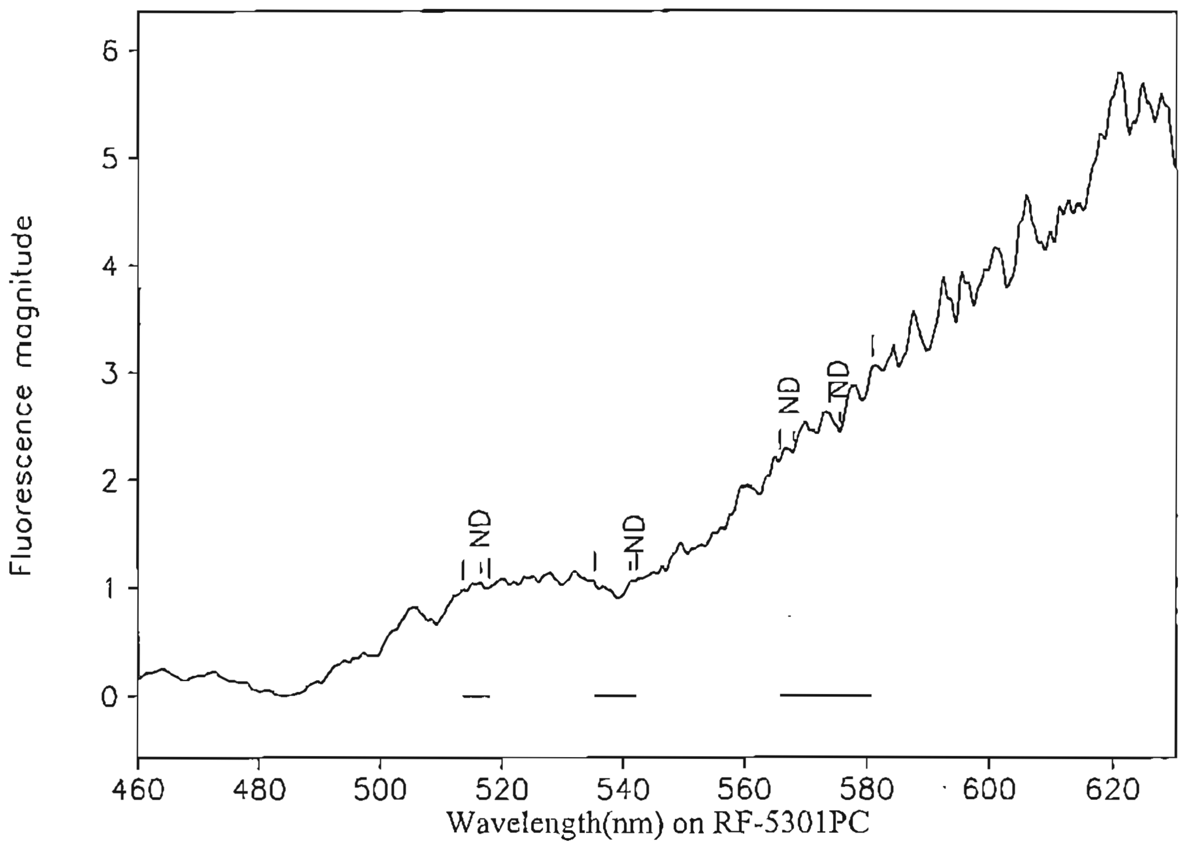
Station 3-185: MW-3 - 185 ft
OUL number: N7965 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0910 Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



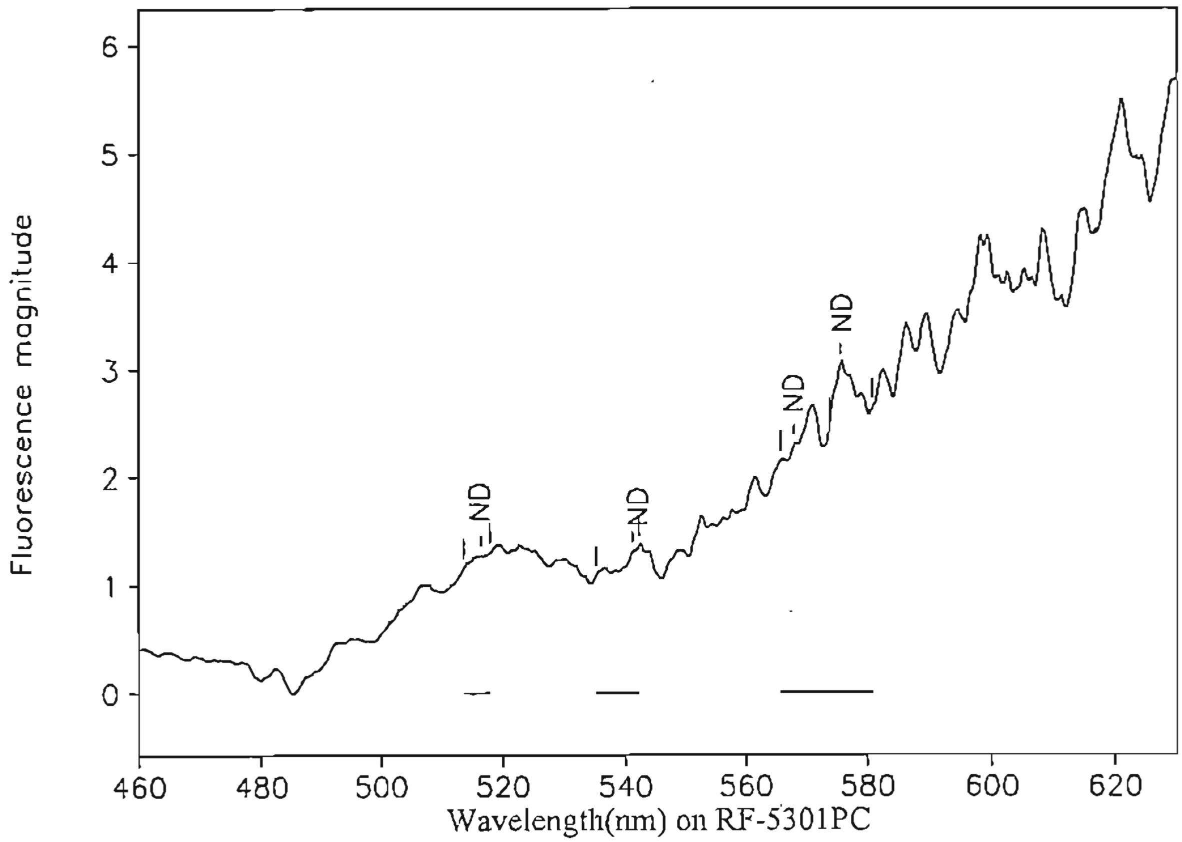
Station 3-195: MW-3 - 195 ft
OUL number: N7966 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0910 Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-205: MW-3 - 205 ft
OUL number: N7967
Matrix: Elutant
Placed: 12/16/04 0910

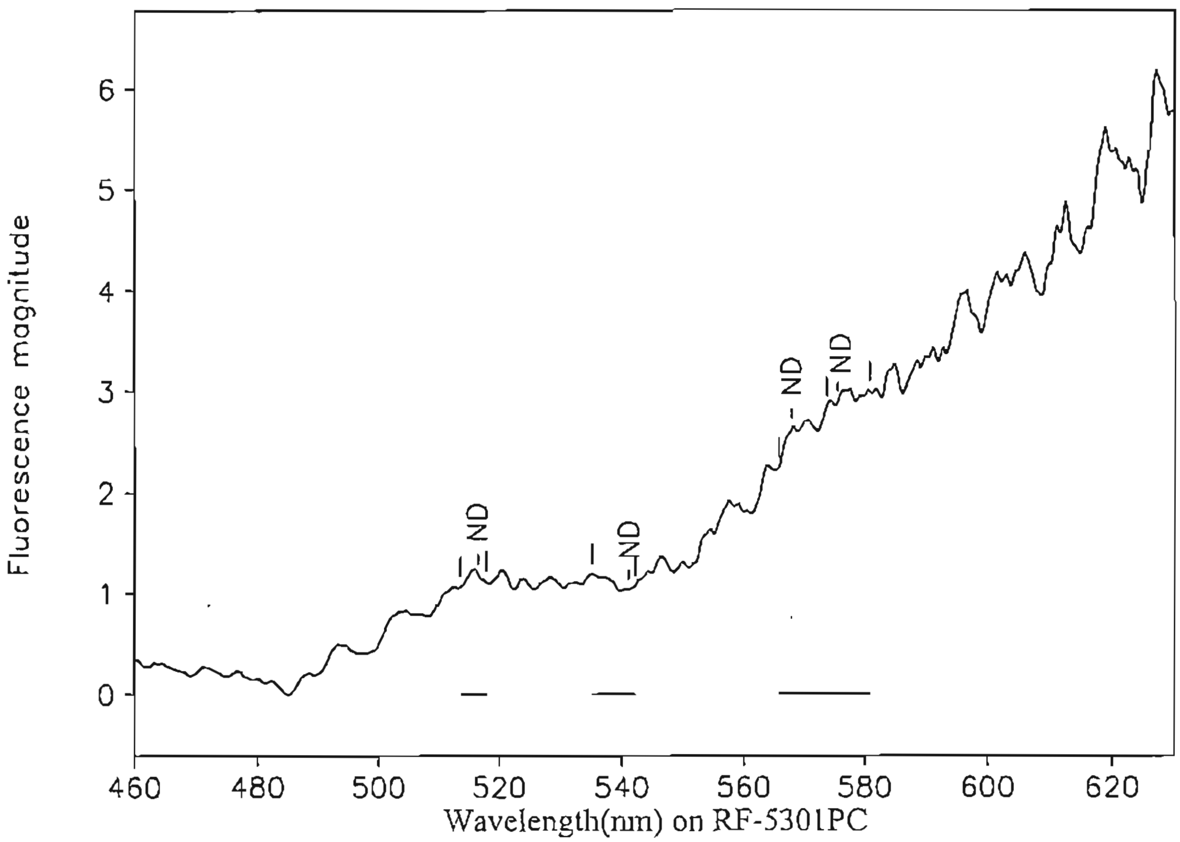
Analyzed: 01/13/05
Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-215: MW-3 - 215 ft
OUL number: N7968
Matrix: Elutant
Placed: 12/16/04 0910

Analyzed: 01/13/05

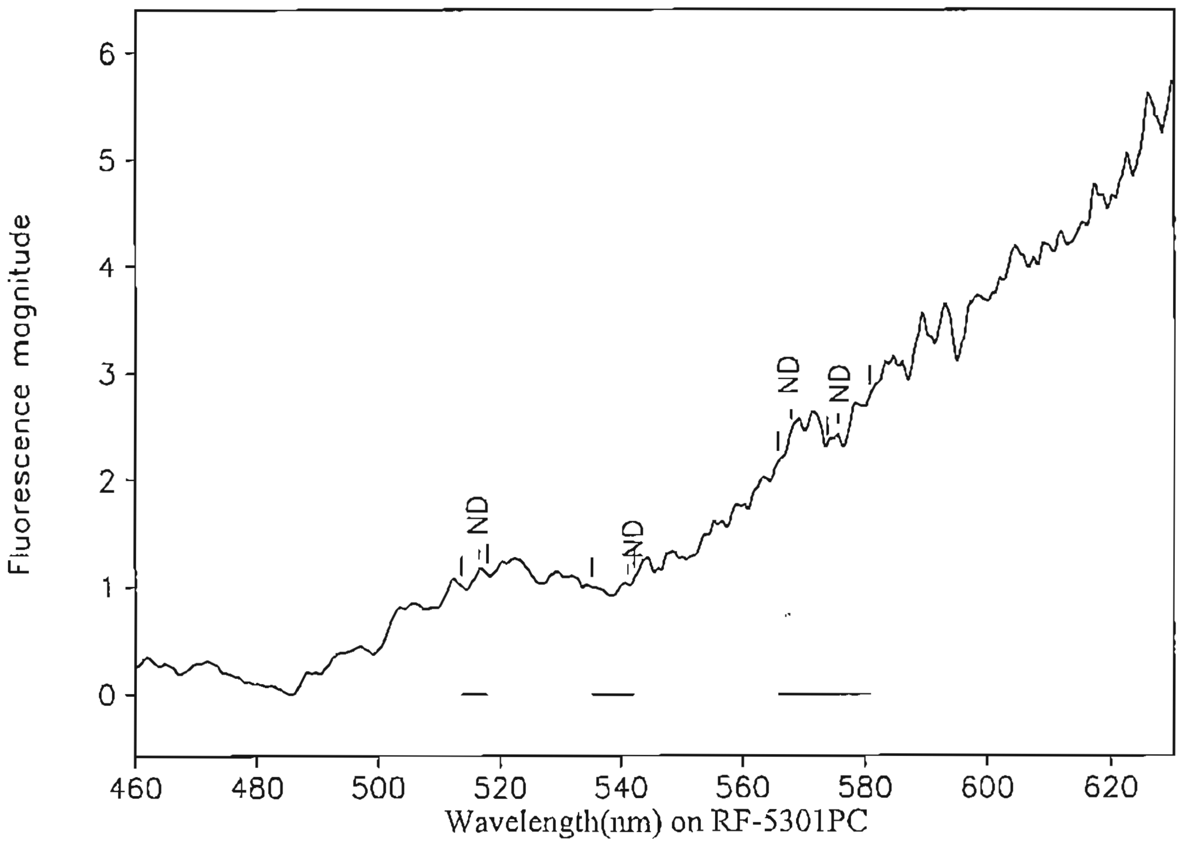
Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N7969
Matrix: Elutant
Placed: 12/16/04 0910

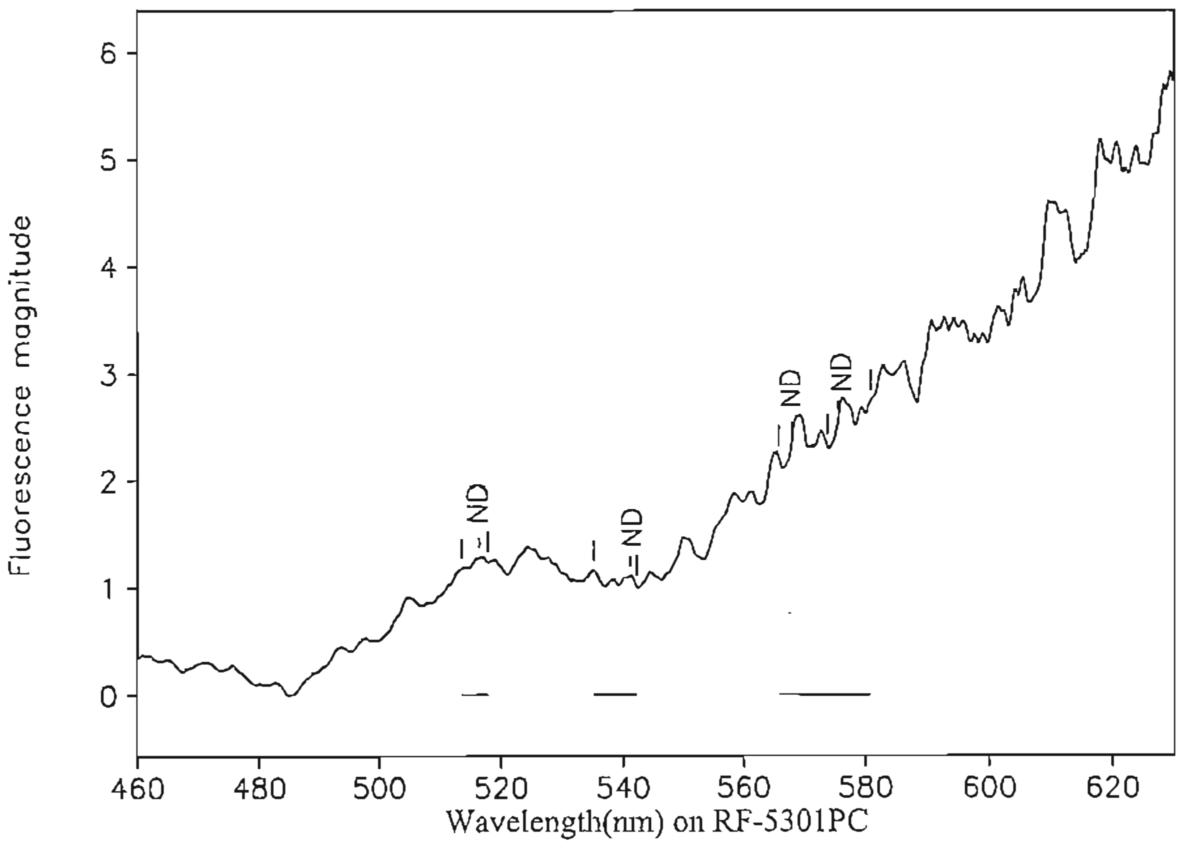
Analyzed: 01/13/05
Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-235: MW-3 - 235 ft
OUL number: N7970
Matrix: Elutant
Placed: 12/16/04 0910

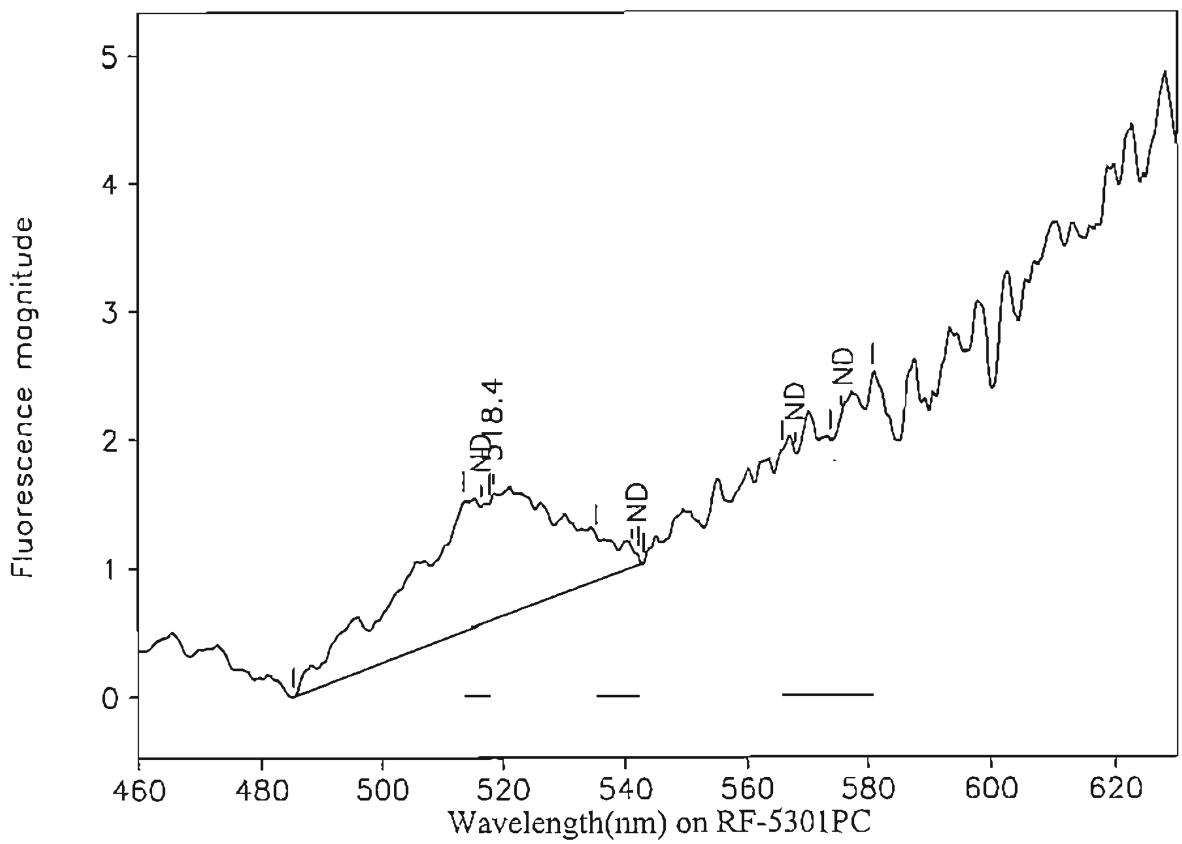
Analyzed: 01/13/05
Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-245: MW-3 - 245 ft
OUL number: N7971
Matrix: Elutant
Placed: 12/16/04 0910

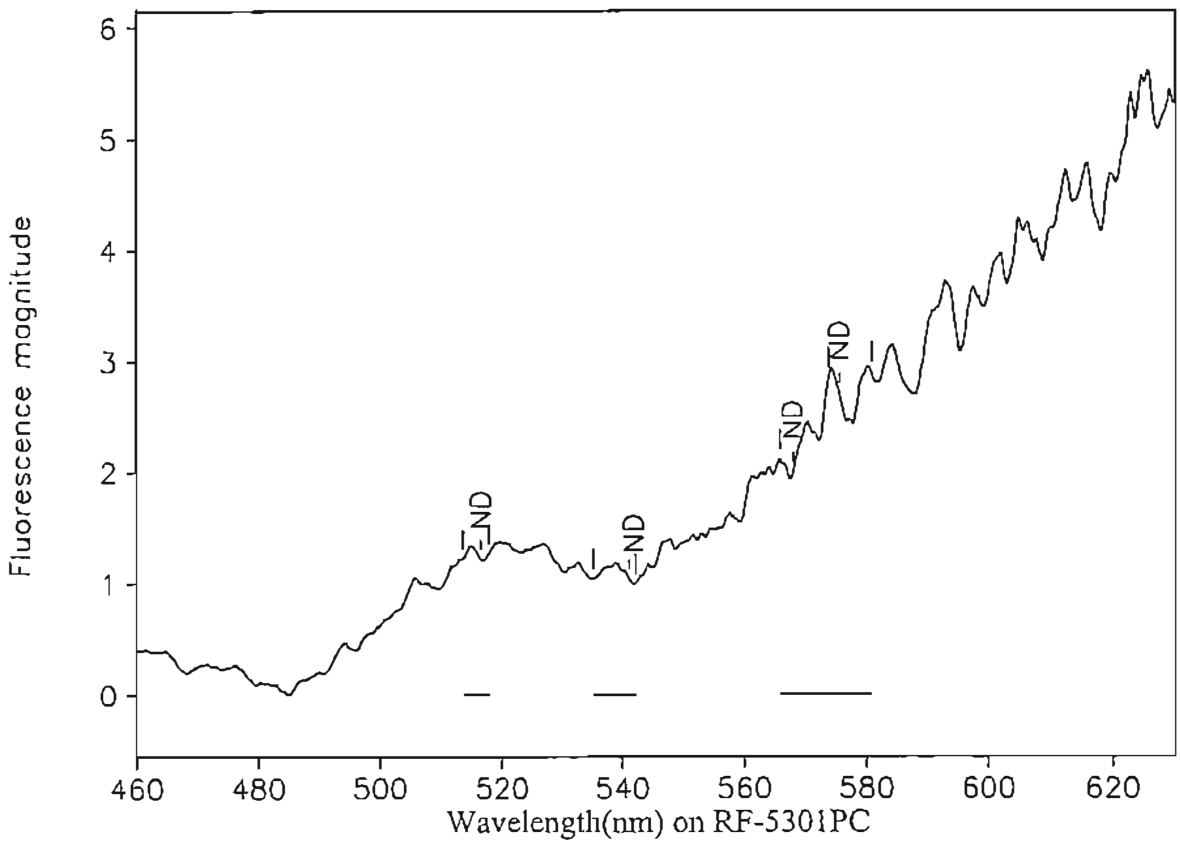
Analyzed: 01/13/05

Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.4	485.2	543.0	0.97	30.73	0.03	~~0.777~~ ND

Ozark Underground Laboratory



Station 3-255: MW-3 - 255 ft
OUL number: N7972
Matrix: Elutant
Placed: 12/16/04 0910

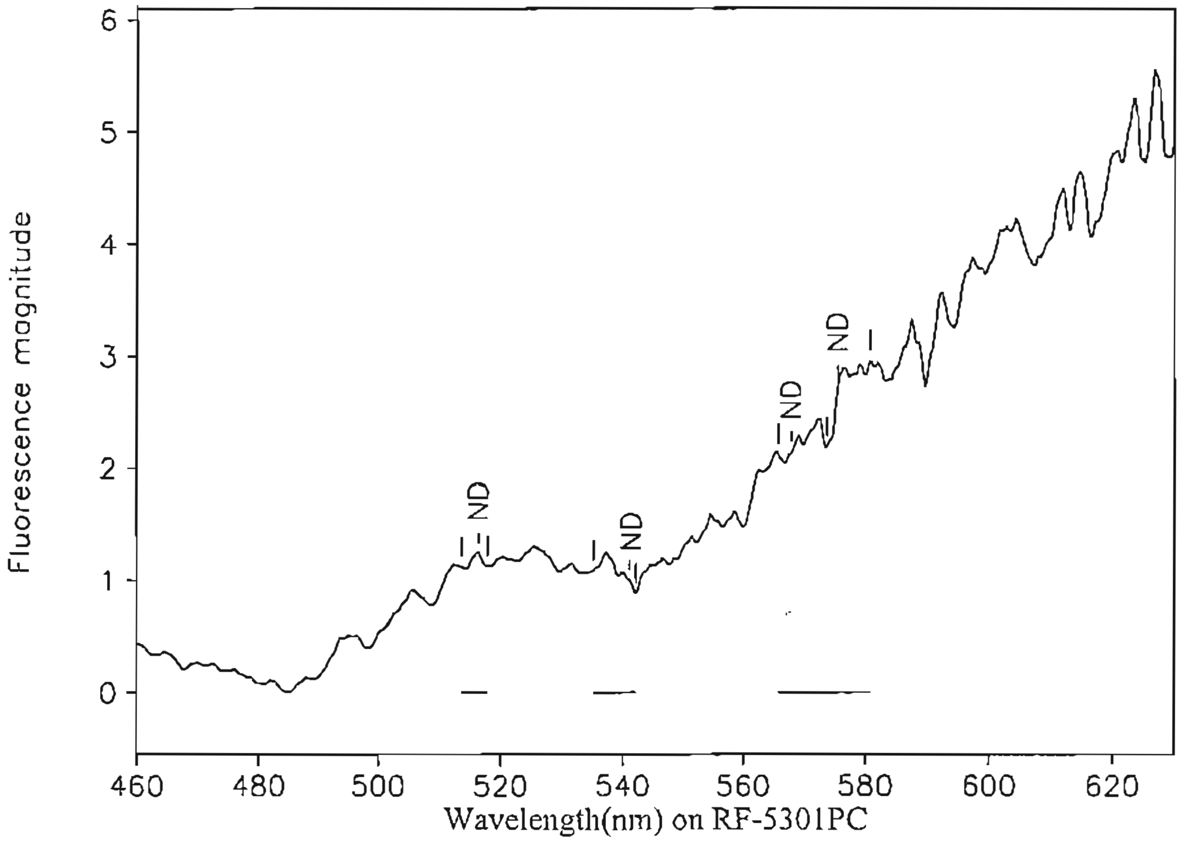
Analyzed: 01/13/05
Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



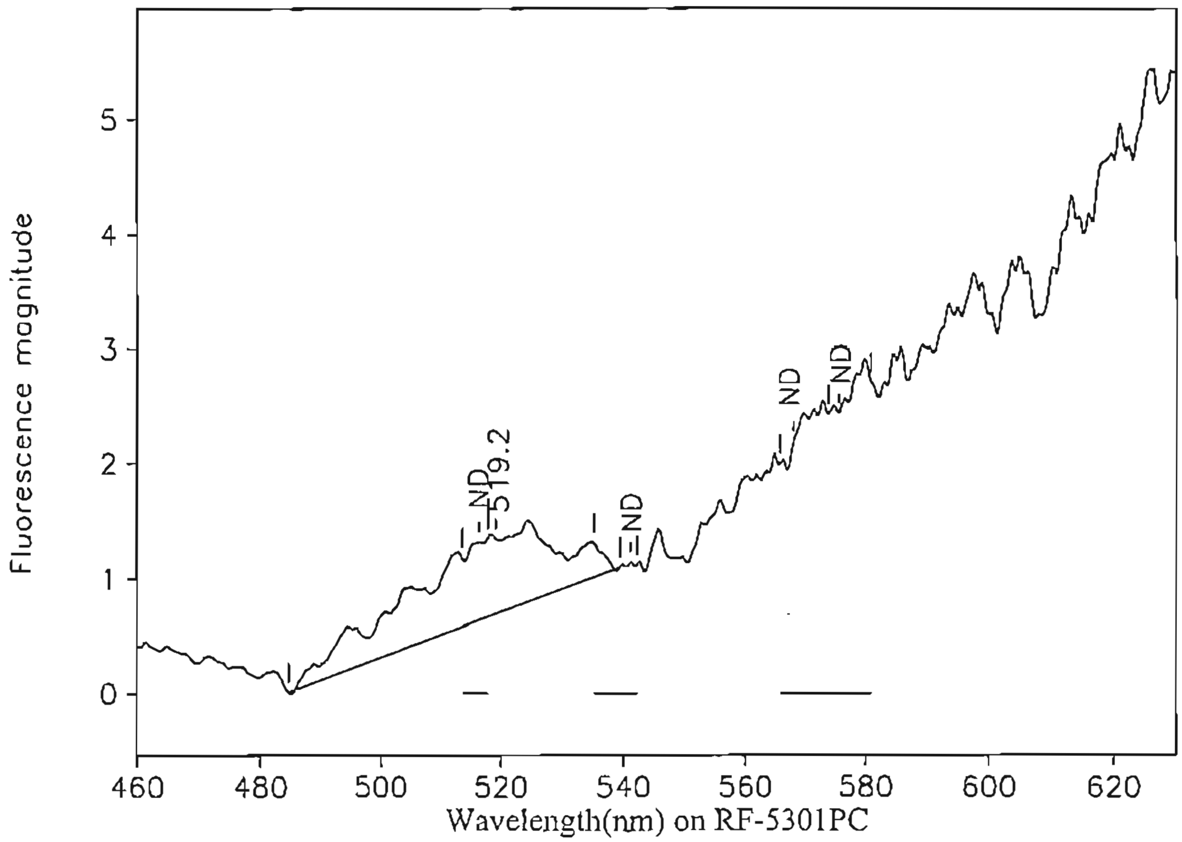
Station 3-265: MW-3 - 265 ft
OUL number: N7973 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0910 Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-275: MW-3 - 275 ft
OUL number: N7974 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0910 Collected: 01/07/05 0840

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.2	484.6	539.4	0.65	21.09	0.03	0.534

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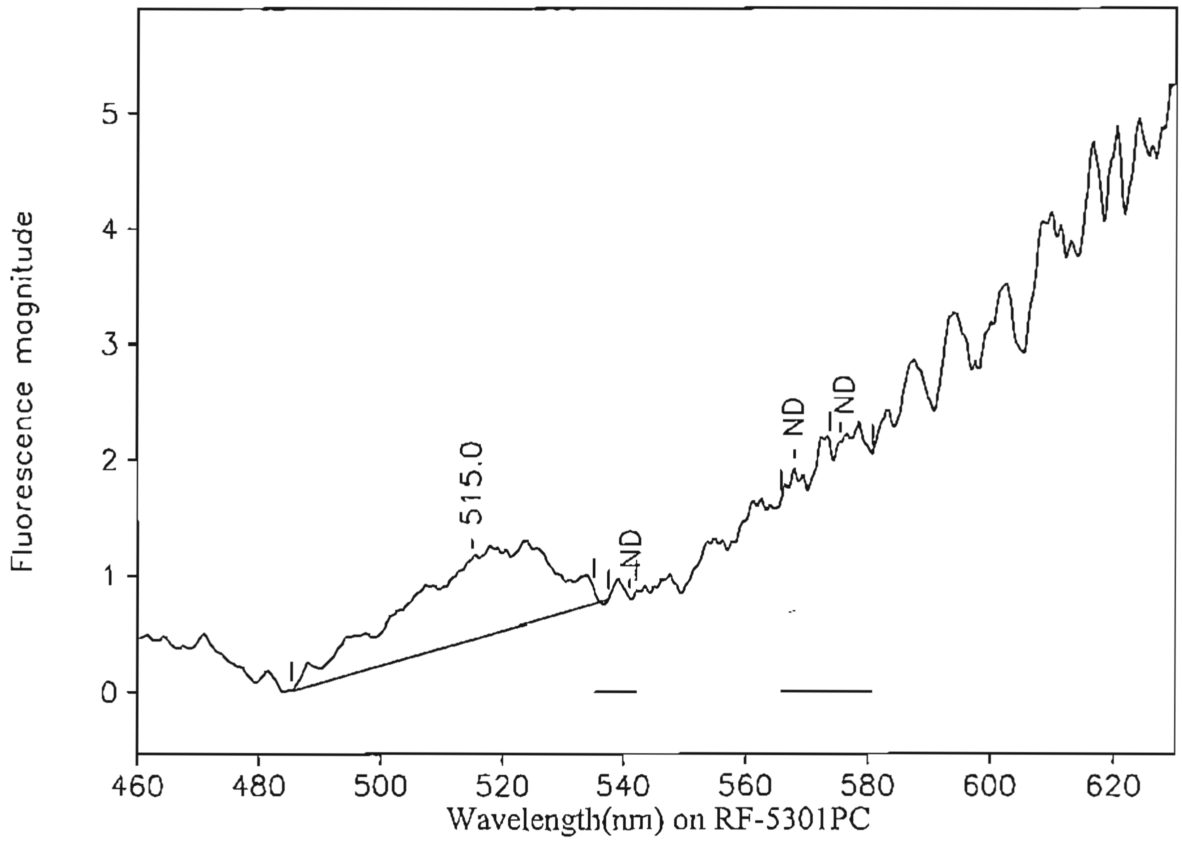

Station 4-165: MW-4 - 165 ft
OUL number: N7975
Matrix: Elutant
Placed: 12/16/04 0815

Analyzed: 01/13/05
Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.0	485.4	537.6	0.69	21.39	0.03	~~0.541~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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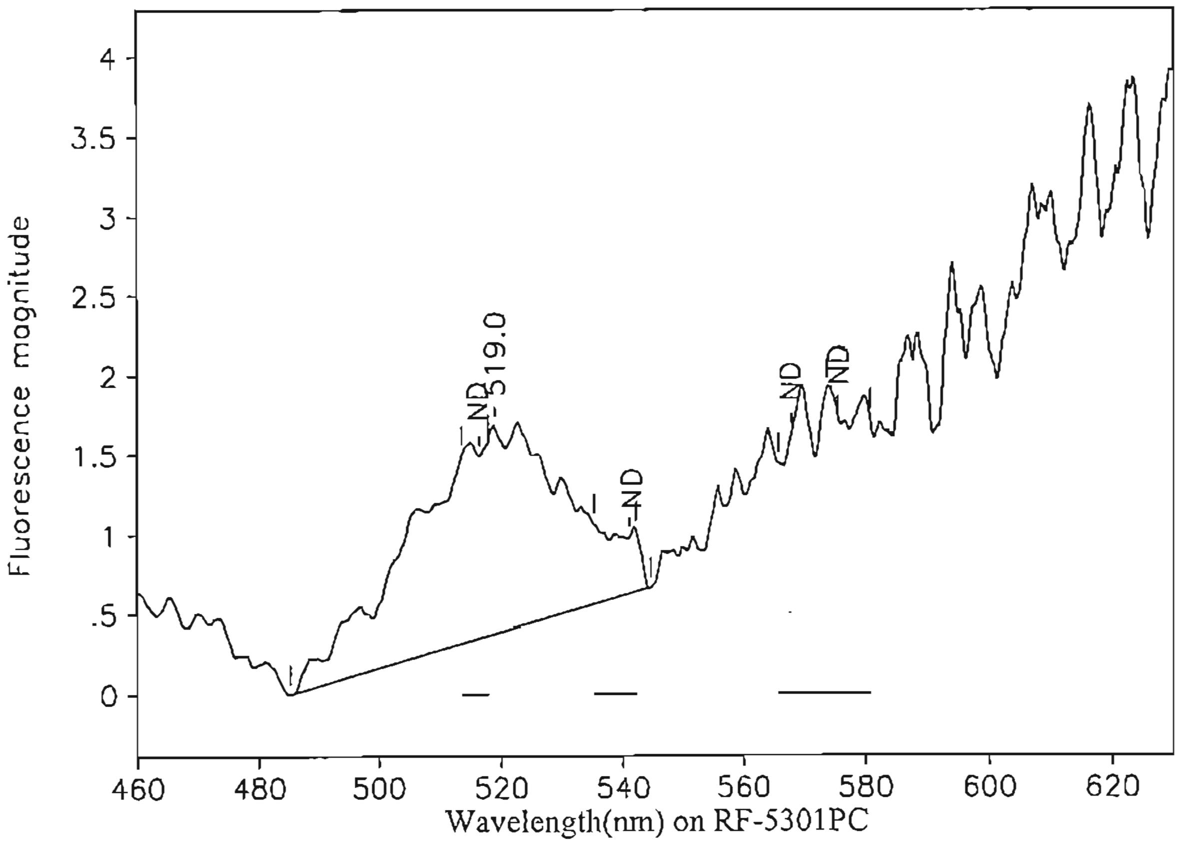


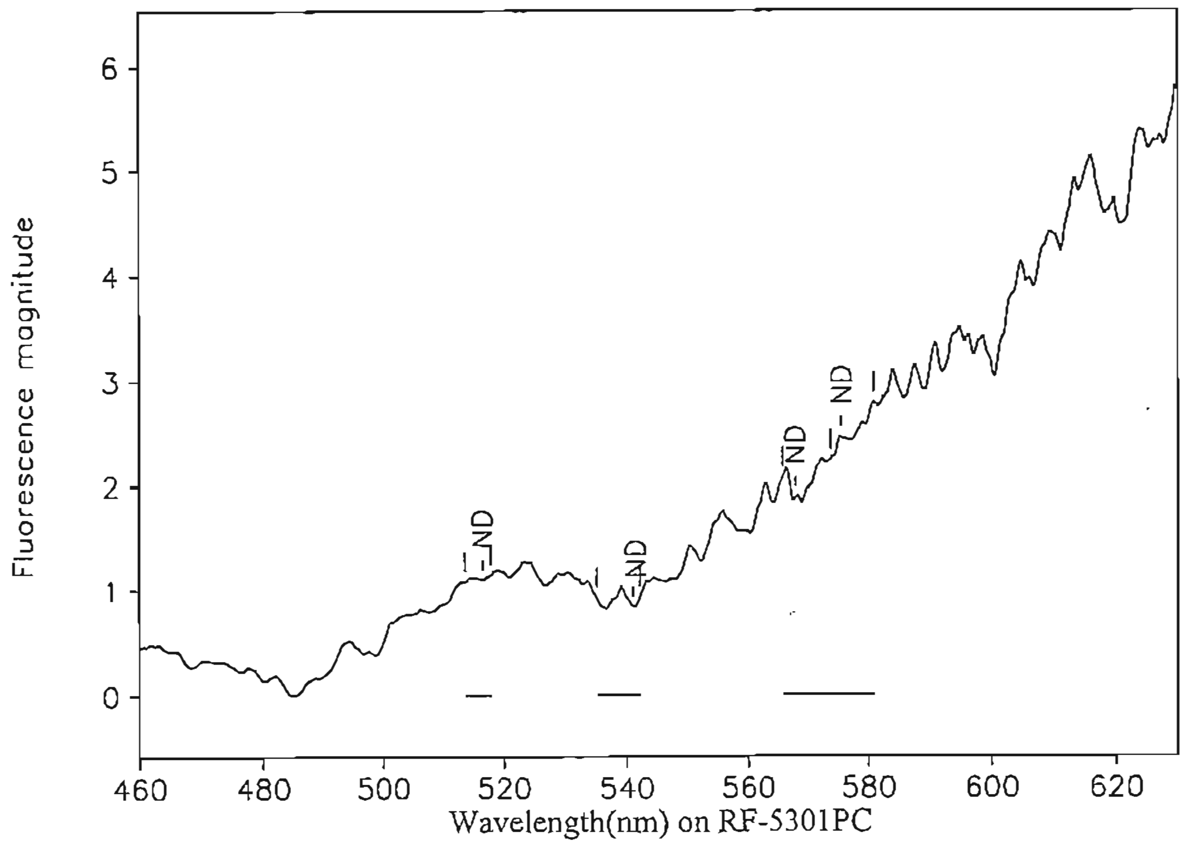
Station 4-180: MW-4 - 180 ft
OUL number: N7976
Matrix: Elutant
Placed: 12/16/04 0815

Analyzed: 01/13/05
Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.0	485.2	544.6	1.30	39.70	0.03	~~1.00~~ ND

Ozark Underground Laboratory



Station 4-195: MW-4 - 195 ft
OUL number: N7977
Matrix: Elutant
Placed: 12/16/04 0815

Analyzed: 01/13/05

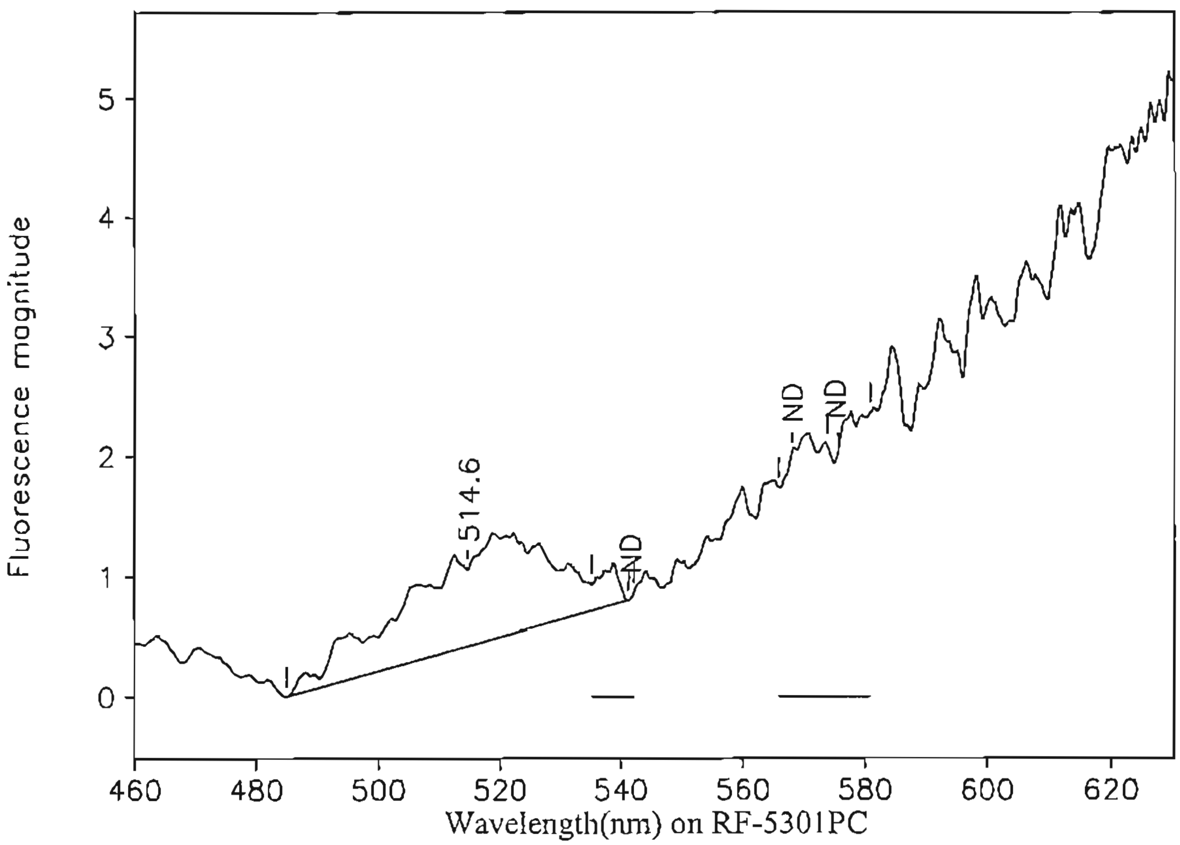
Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-210: MW-4 - 210 ft
OUL number: N7978
Matrix: Elutant
Placed: 12/16/04 0815

Analyzed: 01/13/05

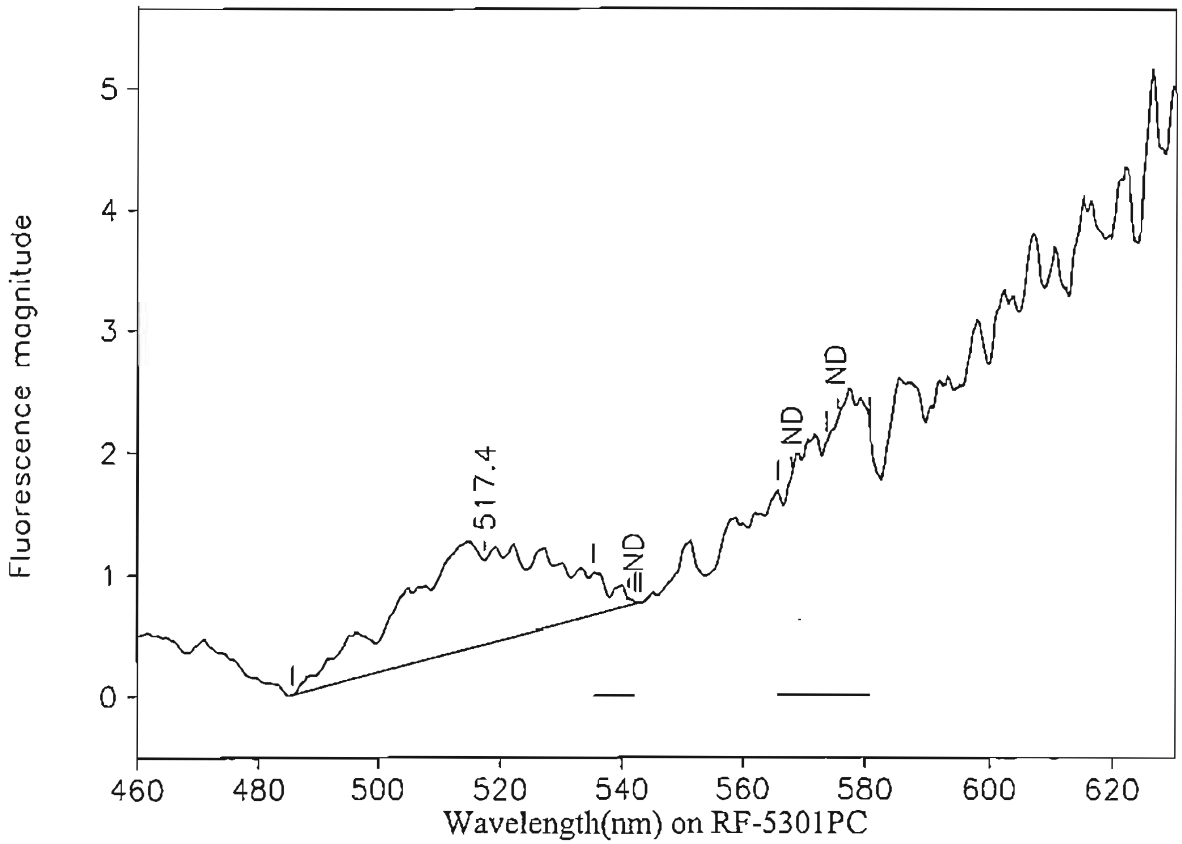
Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.6	485.0	541.4	0.64	25.60	0.03	~~0.648~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-225: MW-4 - 225 ft
OUL number: N7979 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0815 Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	485.6	543.0	0.69	25.56	0.03	0.647
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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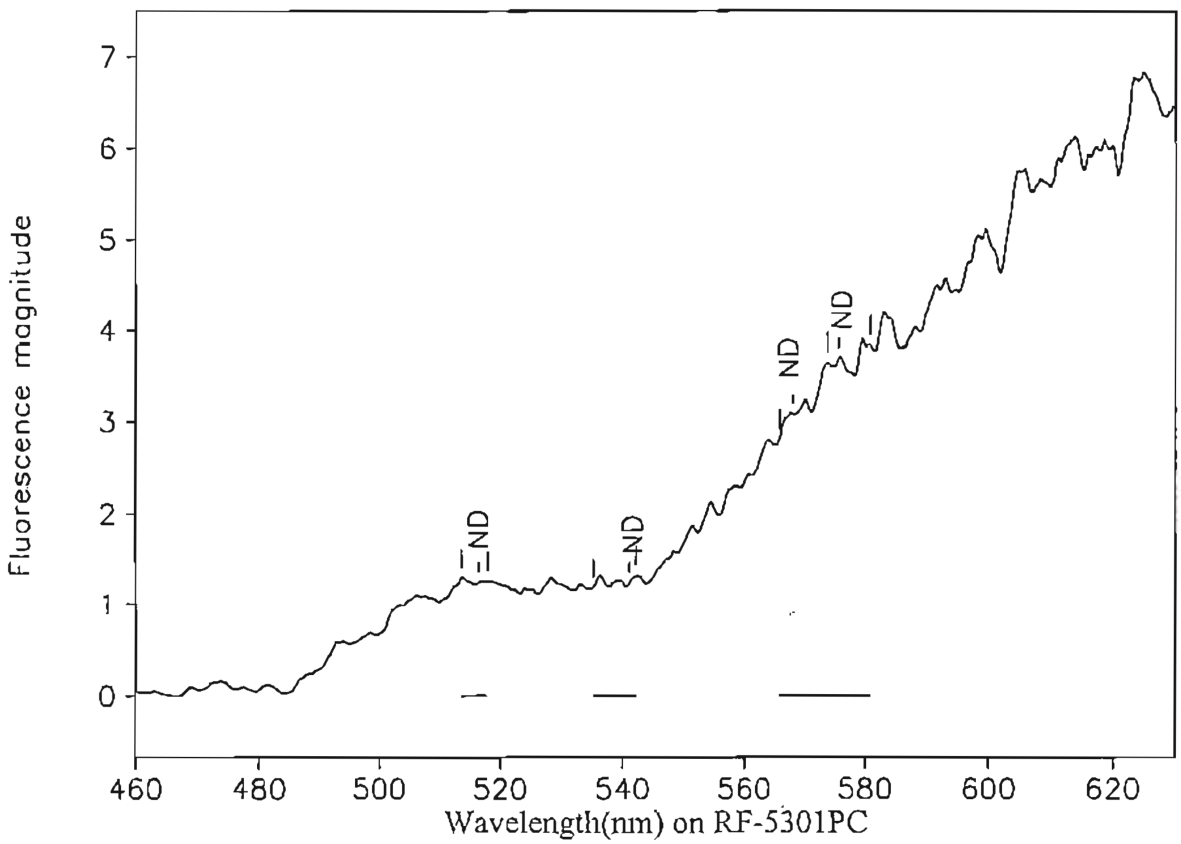


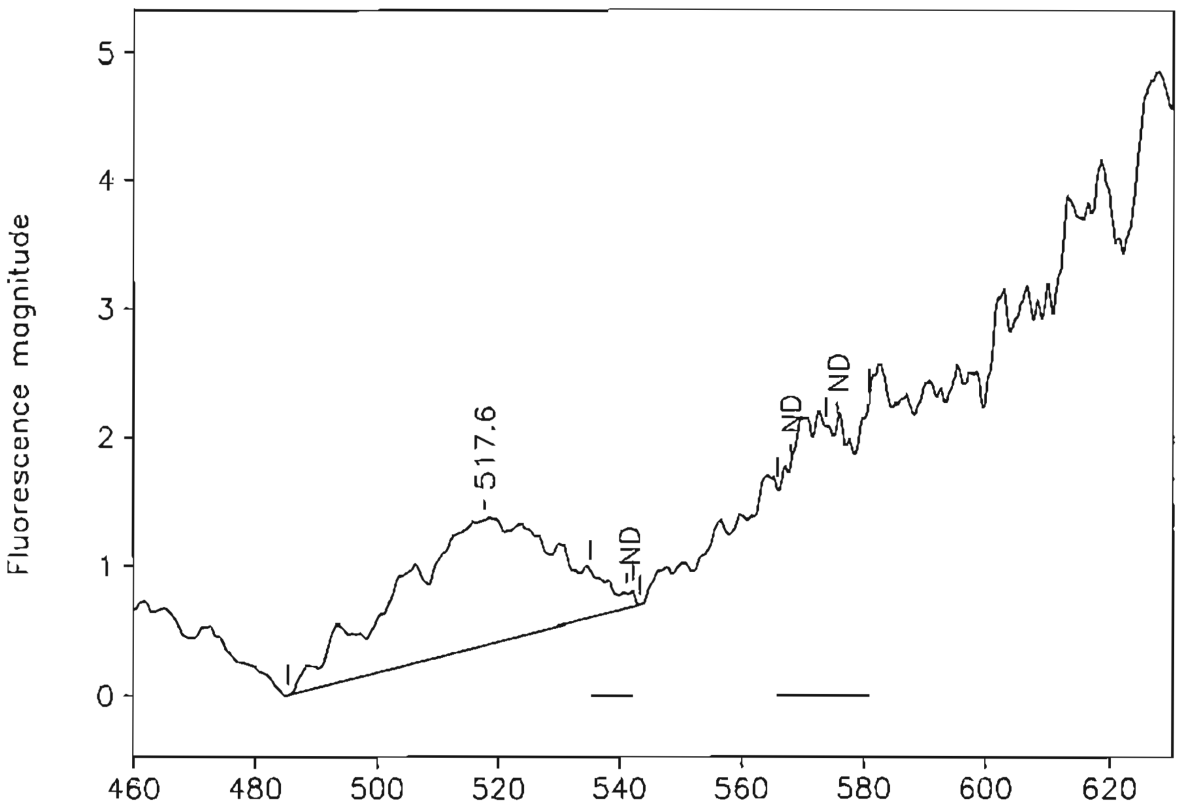
Station 2: Blank
OUL number: N7980 Analyzed: 01/13/05
Matrix: Elutant
Placed: 01/13/05 1424 Collected: 01/13/05 1424

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



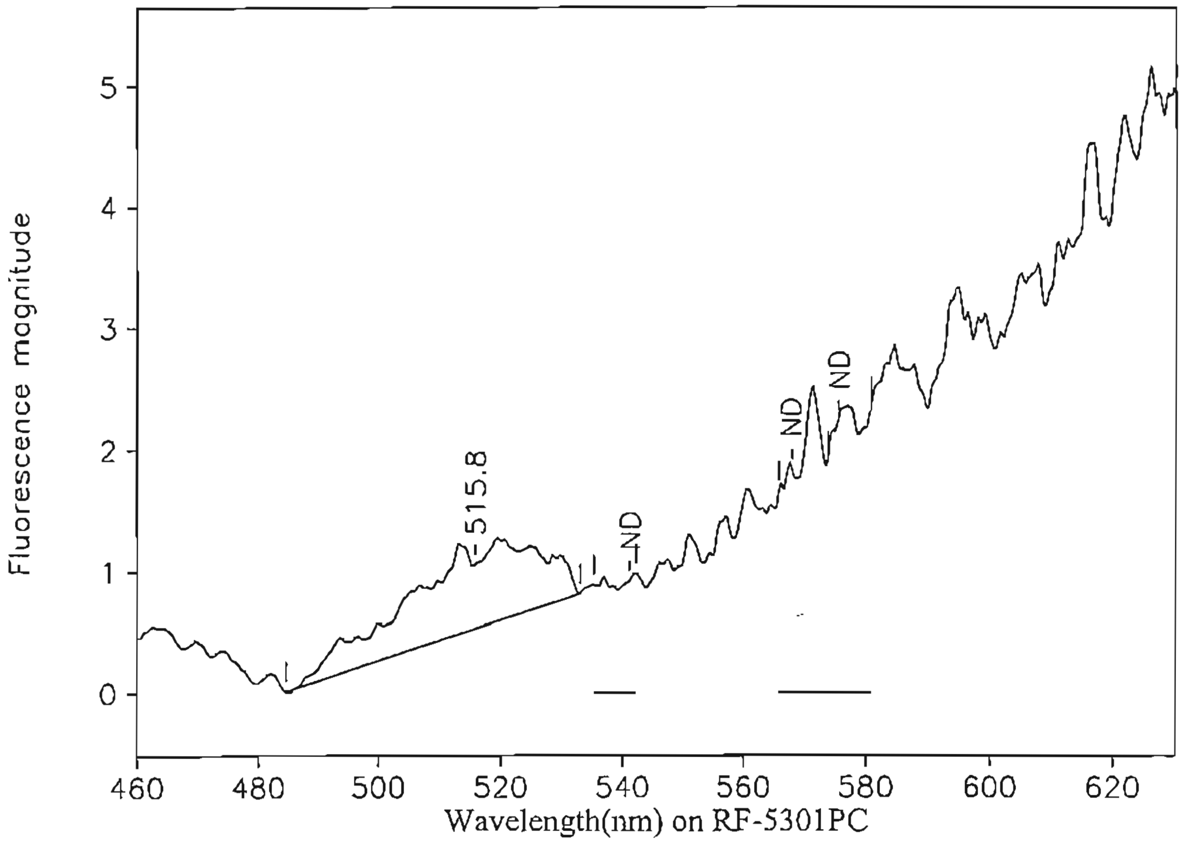
Station 4-240: MW-4 - 240 ft
OUL number: N7981 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0815 Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	485.4	543.4	0.97	30.72	0.03	~~0.777~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



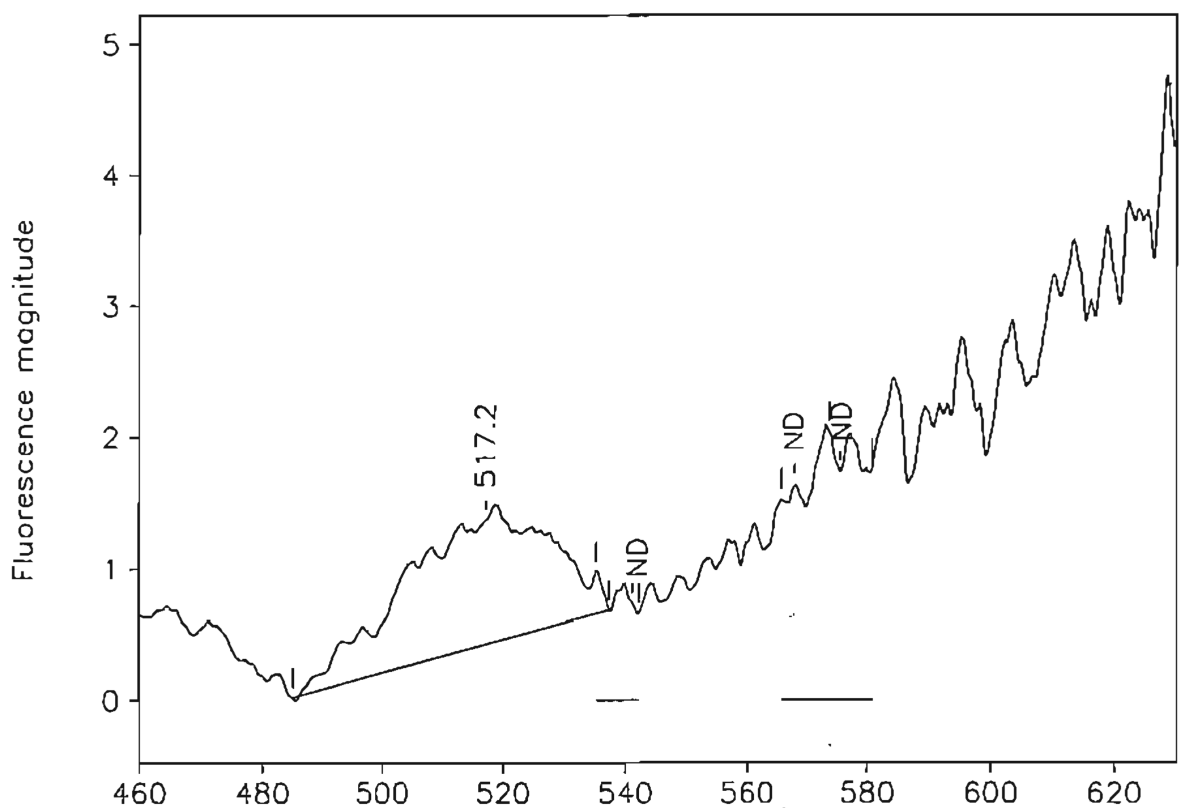
Station 4-255: MW-4 - 255 ft
OUL number: N7982
Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0815
Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.6	533.0	0.53	17.87	0.03	~~0.452~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



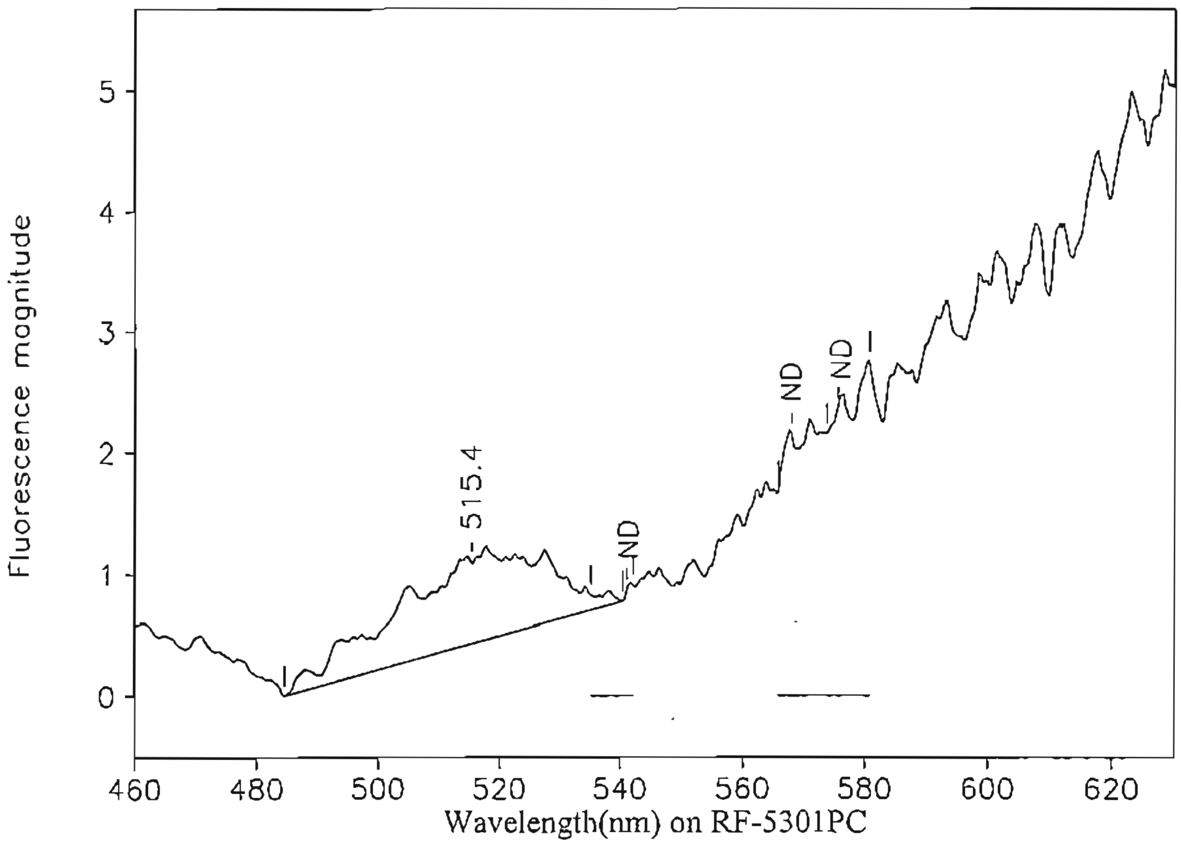
Station 4-270: MW-4 - 270 ft
OUL number: N7983 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0815 Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	485.0	537.4	0.95	29.20	0.03	~~0.739~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



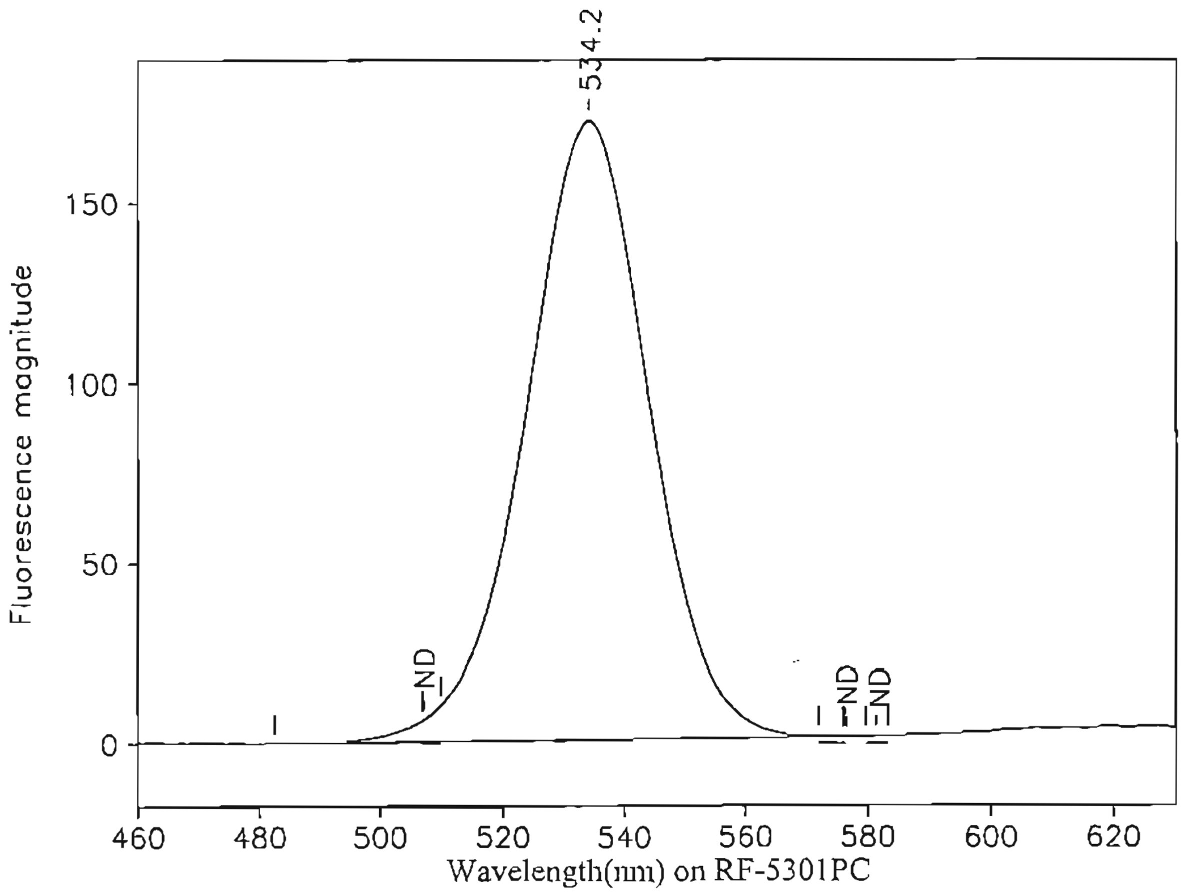
Station 4-285: MW-4 - 285 ft
OUL number: N7984 Analyzed: 01/13/05
Matrix: Elutant
Placed: 12/16/04 0815 Collected: 01/07/05 0805

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	484.6	540.4	0.67	21.86	0.03	0.553
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N7990
Analyzed: 01/13/05
Matrix: Water
Collected: 01/07/05 1005

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
534.2	482.6	575.9	172.15	4,074.53	0.04	30.0
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark
UNDERGROUND
LABORATORY

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

January 25, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped January 20, 2005
Ozark Underground Laboratory (OUL) numbers N8127 through N8168 and N8264.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on January 21, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures: 1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Discrepancy sheets
4. Sample analysis graphs

F:\docs\coa\LakeOrienta07.doc

Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: January 20, 2005
Date Samples Rec'd at OUL: January 21, 2005
Date Analyzed by OUL: January 24 and 25, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N8127	1-215	MW-1 - 215 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8128	1-225	MW-1 - 225 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8129	1-235	MW-1 - 235 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8130	1-245	MW-1 - 245 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8131	1-255	MW-1 - 255 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8132	1-265	MW-1 - 265 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8133	1-275	MW-1 -275 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8134	1-285	MW-1 - 285 ft	1/7 0930	1/20 0900	ND		ND		ND	
N8135	2-135	MW-2 - 135 ft	1/7 1005	1/20 0925	ND		539.6	325	ND	
N8136	2-150	MW-2 - 150 ft	1/7 1005	1/20 0925	ND		539.7	430	ND	
N8137	2-165	MW-2 - 165 ft	1/7 1005	1/20 0925	ND		539.7	369	ND	
N8138	2-180	MW-2 - 180 ft	1/7 1005	1/20 0925	ND		539.6	702	ND	
N8139	2-195	MW-2 - 195 ft	1/7 1005	1/20 0925	ND		539.6	546	ND	
N8140	Laboratory Control Charcoal Blank									
N8141	2-210	MW-2 - 210 ft	1/7 1005	1/20 0925	ND		540.1	1,090	ND	
N8142	2-225	MW-2 - 225 ft	1/7 1005	1/20 0925	ND		539.9	1,670	ND	
N8143	2-240	MW-2 - 240 ft	1/7 1005	1/20 0925	ND		540.1	1,270	ND	
N8144	2-255	MW-2 - 255 ft	1/7 1005	1/20 0925	ND		540.1	1,510	ND	
N8145	2-270	MW-2 - 270 ft	1/7 1005	1/20 0925	ND		540.0	1,810	ND	
N8146	2-285	MW-2 - 285 ft	1/7 1005	1/20 0925	ND		539.9	205	ND	

(Footnotes at end of Table)

(continued)

Ozark Underground Laboratory for CH2MHill

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N8147	2-300	MW-2 - 300 ft	1/7 1005	1/20 0925	ND		540.2	69.5	ND	
N8148	3-175	MW-3 - 175 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8149	3-185	MW-3 - 185 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8150	3-195	MW-3 - 195 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8151	3-205	MW-3 - 205 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8152	3-215	MW-3 - 215 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8153	3-225	MW-3 - 225 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8154	3-235	MW-3 - 235 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8155	3-245	MW-3 - 245 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8156	3-255	MW-3 - 255 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8157	3-265	MW-3 - 265 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8158	3-275	MW-3 - 275 ft	1/7 0900	1/20 0830	ND		ND		ND	
N8159	4-165	MW-4 - 165 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8160	Laboratory Control Charcoal Blank									
N8161	4-180	MW-4 - 180 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8162	4-195	MW-4 - 195 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8163	4-210	MW-4 - 210 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8164	4-225	MW-4 - 225 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8165	4-240	MW-4 - 240 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8166	4-255	MW-4 - 255 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8167	4-270	MW-4 - 270 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8168	4-285	MW-4 - 285 ft	1/7 0825	1/20 0745	ND		ND		ND	
N8264	2-WA	MW-2 - Water	Water	1/20 0940	ND		534.0	28.9	ND	

FOOTNOTES:

ND = No dye detected

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 5 Samples Collected By: Mike B

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: __/__/__ Date Samples Received: 1/21/05 Time Samples Received: 11:30 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nalence & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8127	1-215	MW-1 – 215 ft	1/7/05	0930	1/20/05	0900	0
1	N8128	1-225	MW-1 – 225 ft					0
1	N8129	1-235	MW-1 – 235 ft					0
1	N8130	1-245	MW-1 – 245 ft					0
1	N8131	1-255	MW-1 – 255 ft					0
1	N8132	1-265	MW-1 – 265 ft					0
1	N8133	1-275	MW-1 – 275 ft					0
1	N8134	1-285	MW-1 – 285 ft					0
0		1-WA	MW-1 – Water Sample				0910	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: mma

Project 621 analyzed 1/24/05 by wc

Page ___ of ___ OUL 2 of 4

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 5 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: __/__/__ Date Samples Received: 1/21/05 Time Samples Received: 11:30 Return Cooler? Yes ✓ No ___

Bill to: ___ Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ___ Ship cooler to: Nodarse & Assoc.

OUL use only		Please indicate stations where dye was visible in the field for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8135	2-135	MW-2 – 135 ft	1/7/05	1005	1/20/05	0925	0
1	N8136	2-150	MW-2 – 150 ft	|	|	|	|	0
1	N8137	2-165	MW-2 – 165 ft	|	|	|	|	0
1	N8138	2-180	MW-2 – 180 ft * see discrepancy sheet	|	|	|	|	0
1	N8139	2-195	MW-2 – 195 ft	|	|	|	|	0
1	N8141	2-210	MW-2 – 210 ft	|	|	|	|	0
1	N8142	~~2-3~~-225	MW-2 – 225 ft	|	|	|	|	0
1	N8143	2-240	MW-2 – 240 ft	|	|	|	|	0
1	N8144	2-255	MW-2 – 255 ft	|	|	|	|	0
1	N8145	2-270	MW-2 – 270 ft	|	|	|	|	0
1	N8146	2-285	MW-2 – 285 ft	|	|	|	|	0
1	N8147	2-300	MW-2 – 300 ft			|	0940	0
0		2-WA	MW-2 – Water Sample					1

COMMENTS: N8140 = charcoal blank

This sheet filled out by OUL staff? Yes ___ No ✓ Charts for samples on this page proofed by OUL: [illegible]

776

analyzed 1/24/05 [illegible] Page ___ of ___ OUL 1 of 4

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 5 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** J. Arnold

Date Samples Shipped: __/__/__ **Date Samples Received:** 1/21/05 **Time Samples Received:** 11:30 **Return Cooler? Yes** ✓ **No** ___

Bill to: ___ **Send Results to:** CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ___ **Ship cooler to:** Nielson ? Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8148	3-175	MW-3 – 175 ft	1/7/05	0900	1/20/05	0830	0
1	N8149	3-185	MW-3 – 185 ft					0
1	N8150	3-195	MW-3 – 195 ft					0
1	N8151	3-205	MW-3 – 205 ft					0
1	N8152	3-215	MW-3 – 215 ft					0
1	N8153	3-225	MW-3 – 225 ft					0
1	N8154	3-235	MW-3 – 235 ft					0
1	N8155	3-245	MW-3 – 245 ft					0
1	N8156	3-255	MW-3 – 255 ft					0
1	N8157	3-265	MW-3 – 265 ft					0
1	N8158	3-275	MW-3 – 275 ft					0
0		3-WA	MW-3 – Water Sample				0840	1

COMMENTS: ___

This sheet filled out by OUL staff? Yes ___ **No** ✓ **Charts for samples on this page proofed by OUL:** mma 777

Analyzed 1/24/05 by [illegible] OUL 3 of 4

Page ___ of ___

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 5 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** J Arnold

Date Samples Shipped: _/_/_ **Date Samples Received:** 1/21/05 **Time Samples Received:** 11:30 **Return Cooler? Yes** ✓ **No** __

Bill to: __ **Send Results to:** CH2MHill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other __ **Ship cooler to:** Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8159	4-165	MW-4 – 165 ft	1/7/05	0825	1/20/05	0745	0
1	N8161	4-180	MW-4 – 180 ft	|	|	|	|	0
1	N8162	4-195	MW-4 – 195 ft	|	|	|	|	0
1	N8163	4-210	MW-4 – 210 ft	|	|	|	|	0
1	N8164	4-225	MW-4 – 225 ft	|	|	|	|	0
1	N8165	4-240	MW-4 – 240 ft	|	|	|	|	0
1	N8166	4-255	MW-4 – 255 ft	|	|	|	|	0
1	N8167	4-270	MW-4 – 270 ft	|	|	|	|	0
1	N8168	4-285	MW-4 – 285 ft	|	|	|	|	0
0	/	4-WA	MW-5 – Water Sample			|	0800	1

COMMENTS: N8160 = charcoal blank

This sheet filled out by OUL staff? Yes __ **No** ✓ **Charts for samples on this page proofed by OUL:** __

778

Analyzed 1/24/05 by ME and 1/25/05

Page __ of __ OUL 4 of 4

OZARK UNDERGROUND LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2MHill Week No: 5 Samples Collected By: Mike Burns
Samples Shipped By Mike Burns Samples Received By J. Arnold
Date Samples Shipped: __/__/__ Date Samples Received: 1/21/05 Time Samples Received: 11:30 Return Cooler? Yes ✓ No___
Bill to: ____ Send Results to: CH2MHill
Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ____ Ship cooler to: Nodarse & Assoc

Please indicate stations where dye was visible in the field
for field technician use - use black ink only

LAB NUMBER	water STATION NUMBER 1-4 Numbers	STATION NAME	COLLECTED DATE	COLLECTED TIME	OUL use only # WATER REC'D
	1-WA	MW-1- Water Sample	1-20-5	0910	1
NB264	2-WA	MW-2- Water Sample	1-20-5	0940	1
	3-WA	MW-3- Water Sample	1-20-5	0840	1
	4-WA	MW-4- Water Sample * see discrepancy sheet	1-20-5	0800	1

COMMENTS: Chart for sample on this page proofed by mma/OUL

This sheet filled out by OUL - ca

analyzed 1/24/05 by WR

Page 1 of 1 ca

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OZARK UNDERGROUND LABORATORY, INC.

DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED					Page 1 of 2
Company & Project Name: CH2MHill/Lake Oricuta				Date Rec'd by OUL: 1/21/05	Wk #
Lab #	**Sta #**	**Station Name**	**Date Pulled**	**Problem**	**Solution**
N8138	MW2	180'	1/20/05	A whirl pac bag in with all the MW2's was labelled MW1 - 180 ft. Since we didn't receive a bag labeled MW2 - 180 ft, but the COC indicates there should be one, OUL will analyze as MW2.	Analyze as MW2-180'
	4-WA	MW-4		Vial labeled MW-4, COC lists it as 4-WA, MW5 water	Analyze as MW4 water
N8142		MW-2 - 225 ft	1/20/05	COC indicates station number is 3-225.	Analyzed as 2-225.
N8264	2-WA	MW-2 - Water Sample	1/20/05	no date or time collected on COC or time collected on vial.	Used last date & time recorded on COC which is 1/20/05 0940.

Comments: No times written on bags or vials. Times on COC only.

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OZARK UNDERGROUND LABORATORY, INC.

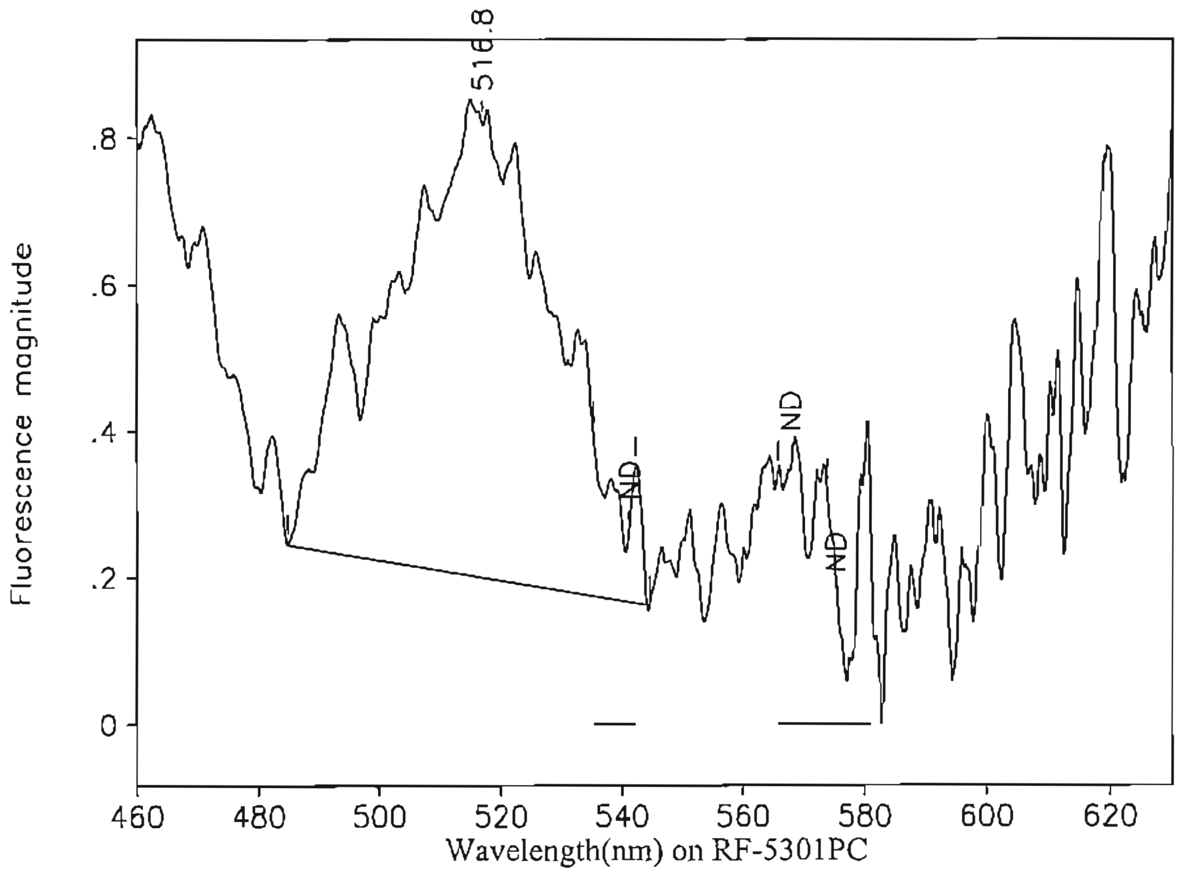
DISCREPANCIES BETWEEN CHAIN-OF-CUSTODY SHEETS AND ACTUAL SAMPLES RECEIVED Page 2 of 2

Company & Project Name: CH2MHill / Lake Orienta **Date Rec'd by OUL:** 1-21-05 **Wk #** ______

Lab #	Sta #	Station Name	Date Pulled	Problem	Solution
N8147	2-300	MW-2-300ft	1/20/05	COC indicates time collected as 0940. Believe this time is when water collected.	Used 0925 for time collected, i.e. same as other samplers on stringer.

Comments:

Ozark Underground Laboratory



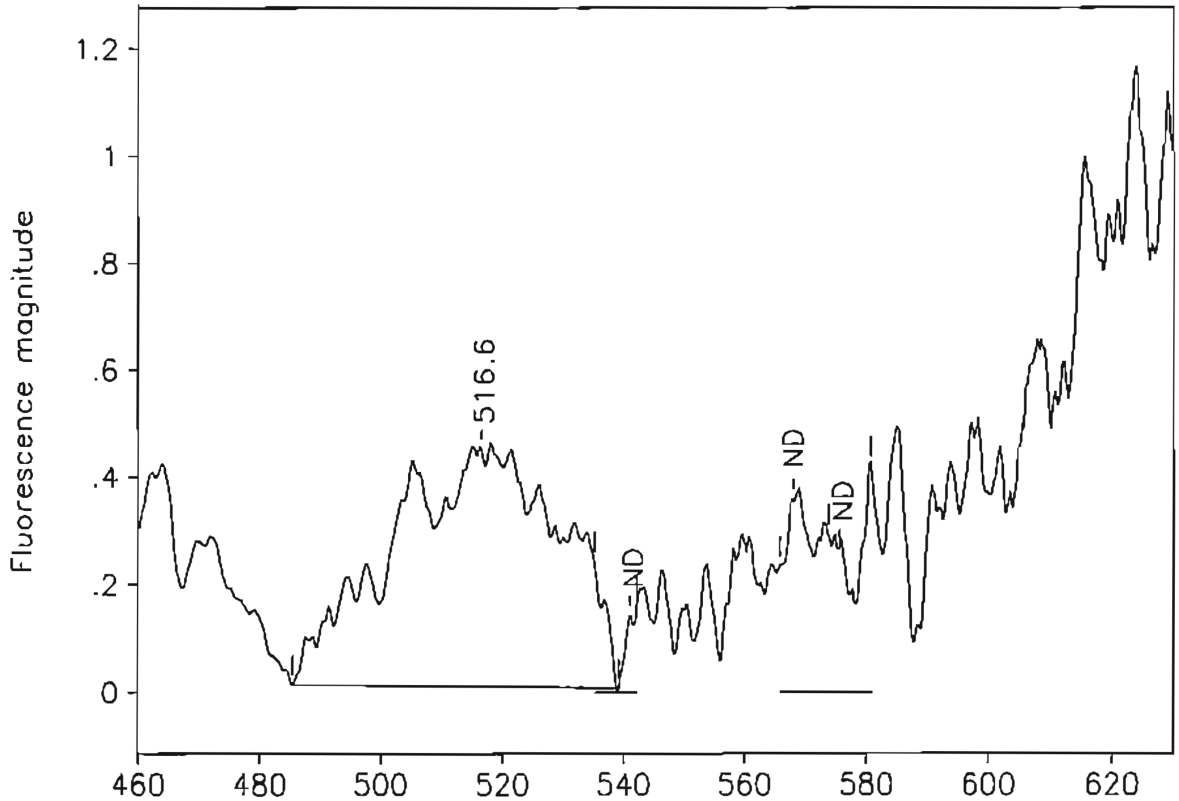
Station 1-215: MW-1 - 215 ft
OUL number: N8127 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0930 Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	484.8	544.6	0.62	20.62	0.03	~~0.485~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-225: MW-1 - 225 ft
OUL number: N8128
Matrix: Elutant
Placed: 01/07/05 0930

Analyzed: 01/24/05

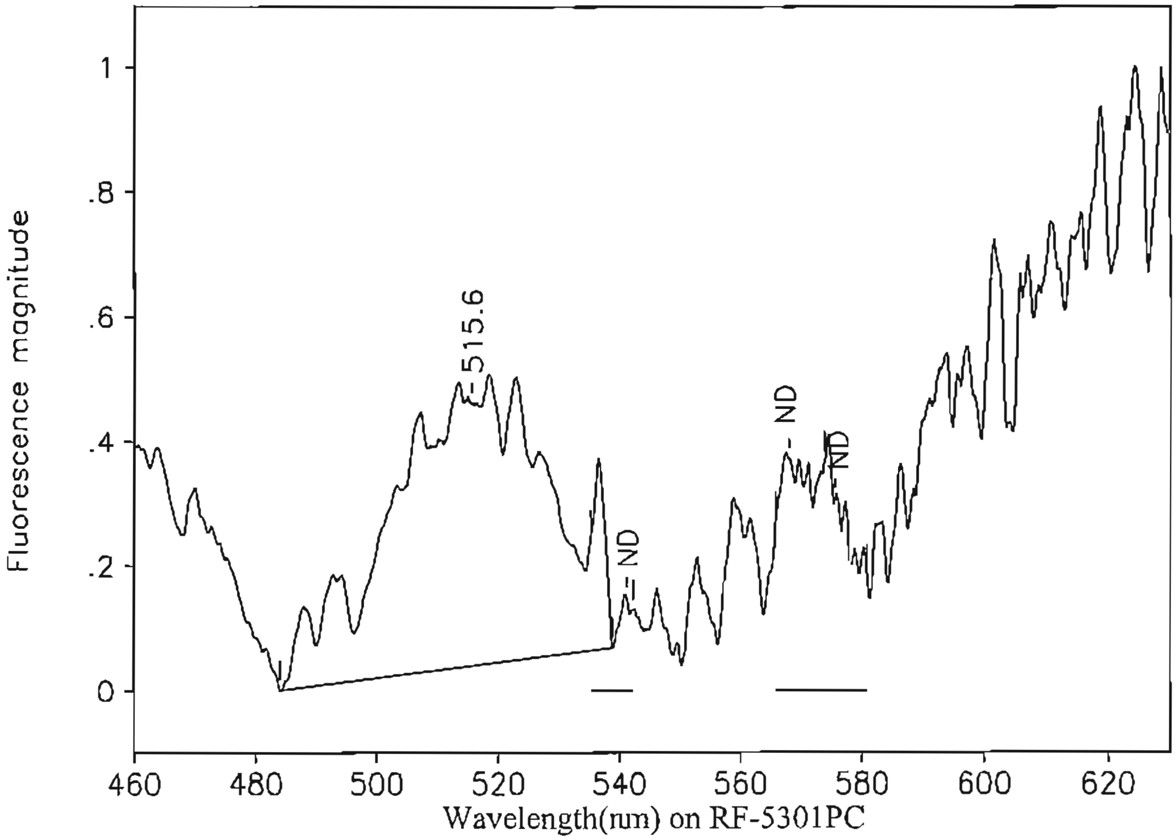
Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	485.4	539.2	0.44	14.58	0.03	~~0.343~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



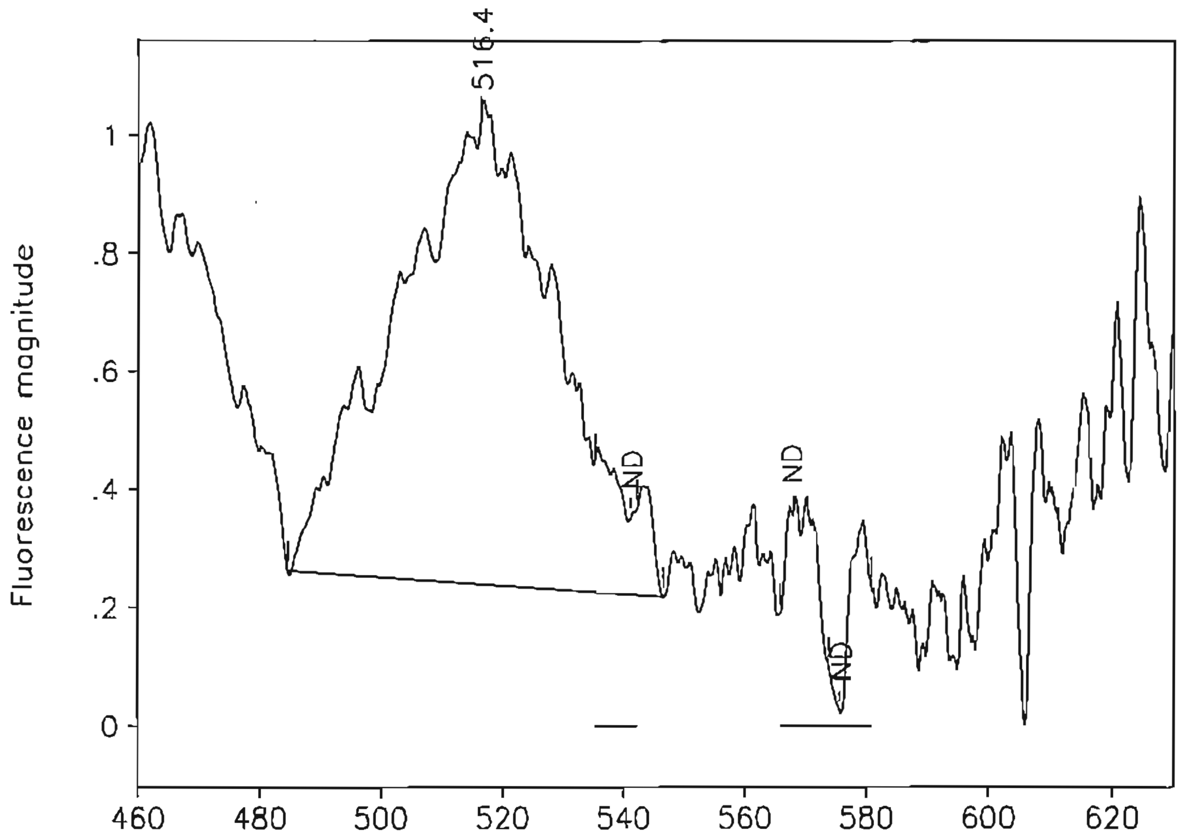
Station 1-235: MW-1 - 235 ft
OUL number: N8129 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0930 Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	484.0	538.8	0.42	14.20	0.03	~~0.334~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



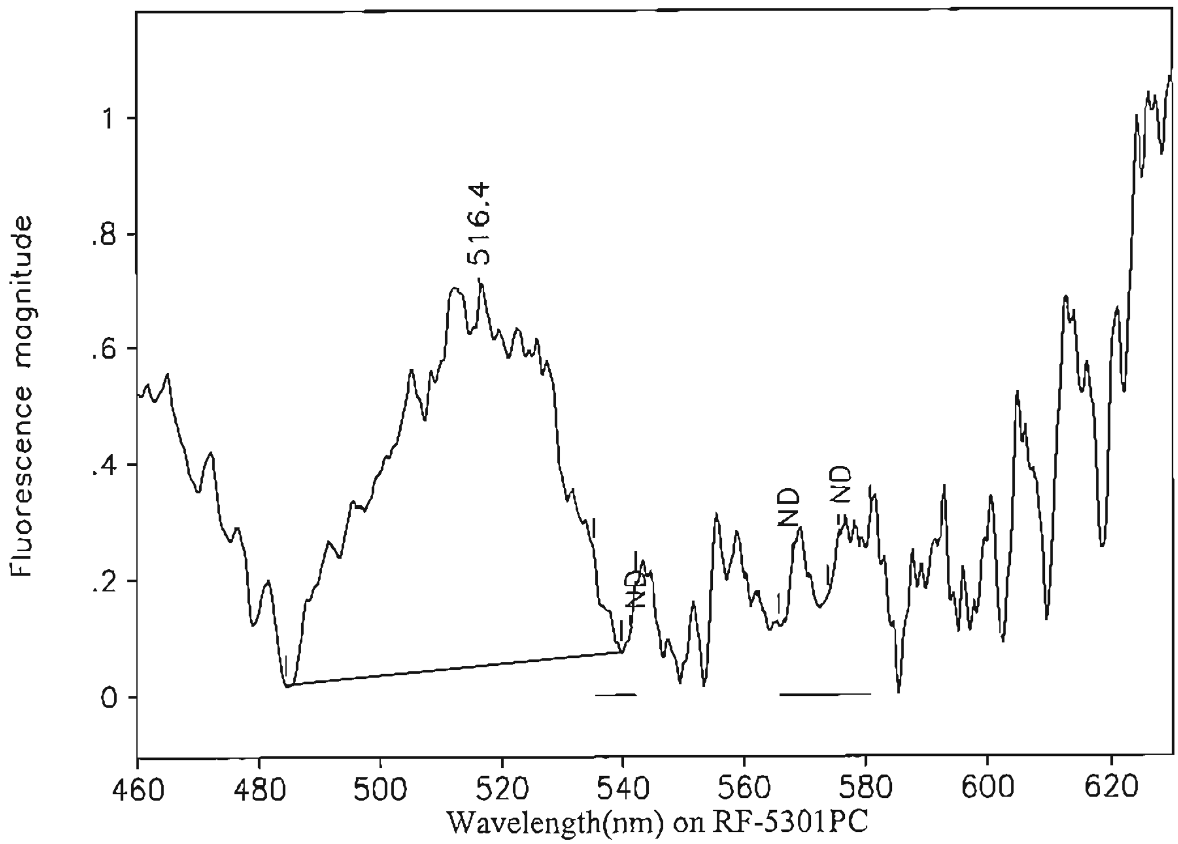
Station 1-245: MW-1 - 245 ft
OUL number: N8130 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0930 Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.6	546.6	0.79	24.71	0.03	~~0.581~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-255: MW-1 - 255 ft
OUL number: N8131
Matrix: Elutant
Placed: 01/07/05 0930

Analyzed: 01/24/05

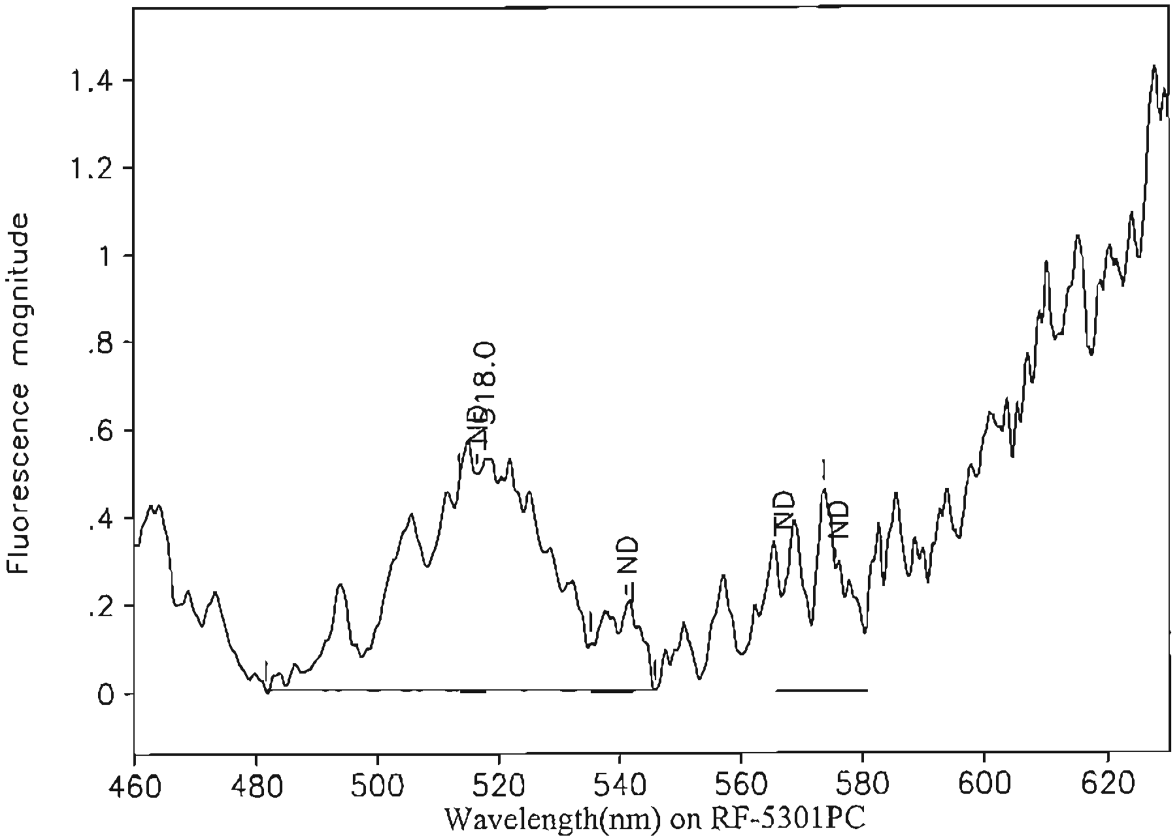
Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.4	539.8	0.63	20.36	0.03	~~0.478~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-265: MW-1 - 265 ft
OUL number: N8132
Matrix: Elutant
Placed: 01/07/05 0930

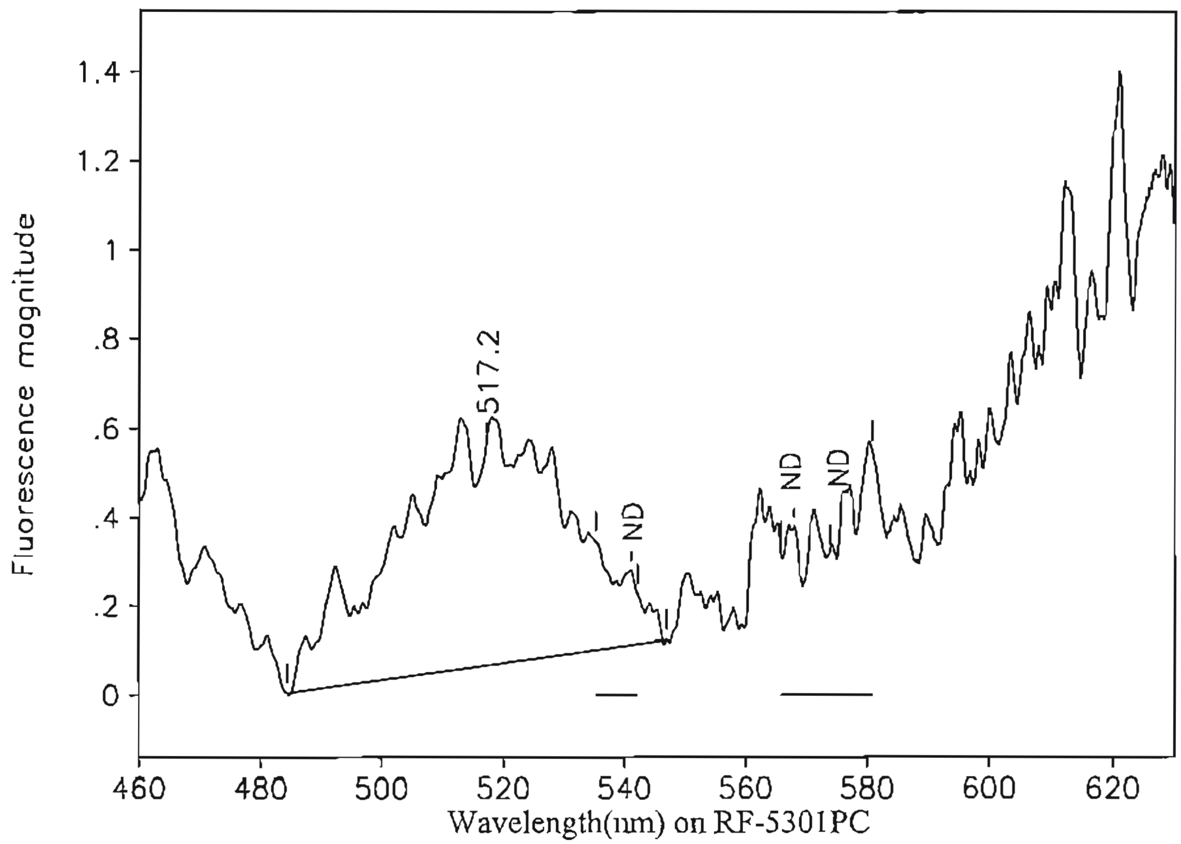
Analyzed: 01/24/05

Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	481.6	545.8	0.53	15.99	0.03	~~0.376~~ ND

Ozark Underground Laboratory



Station 1-275: MW-1 -275 ft
OUL number: N8133
Matrix: Elutant
Placed: 01/07/05 0930

Analyzed: 01/24/05

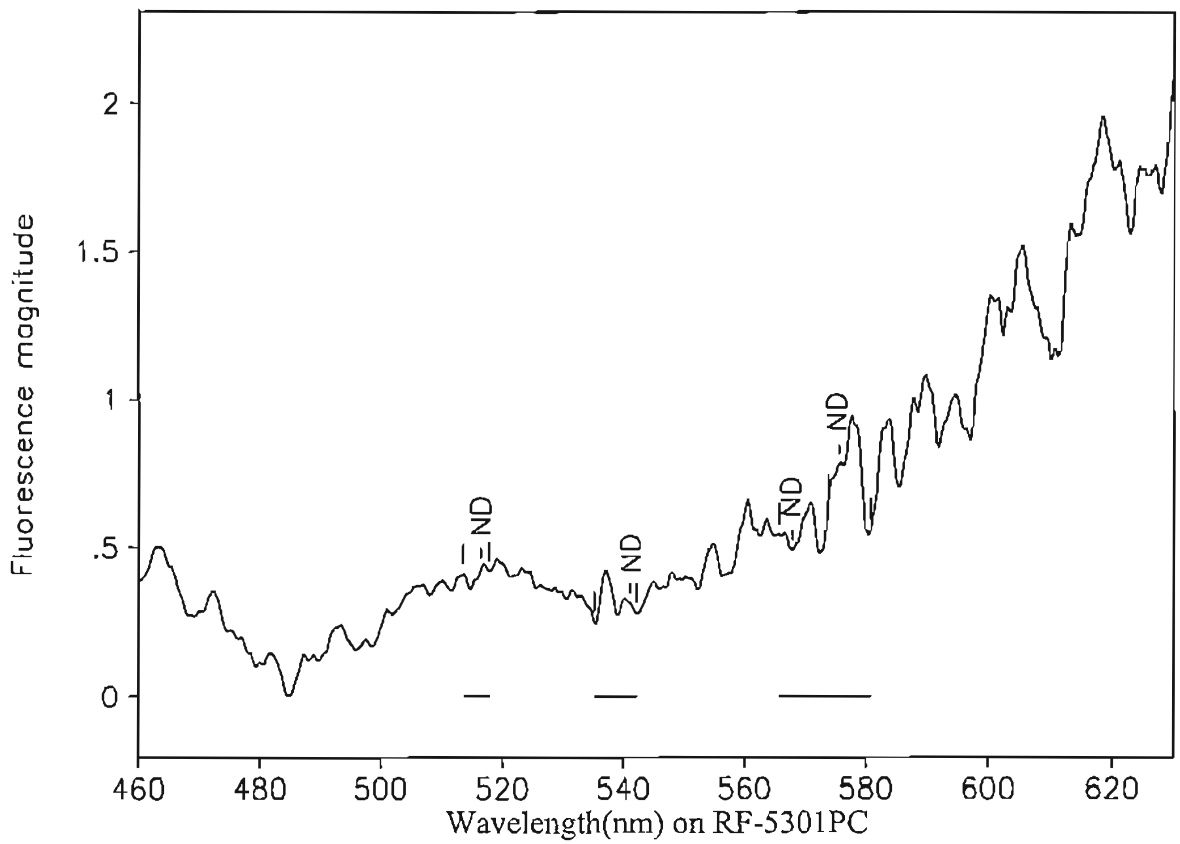
Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	484.4	547.0	0.50	18.18	0.03	~~0.427~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



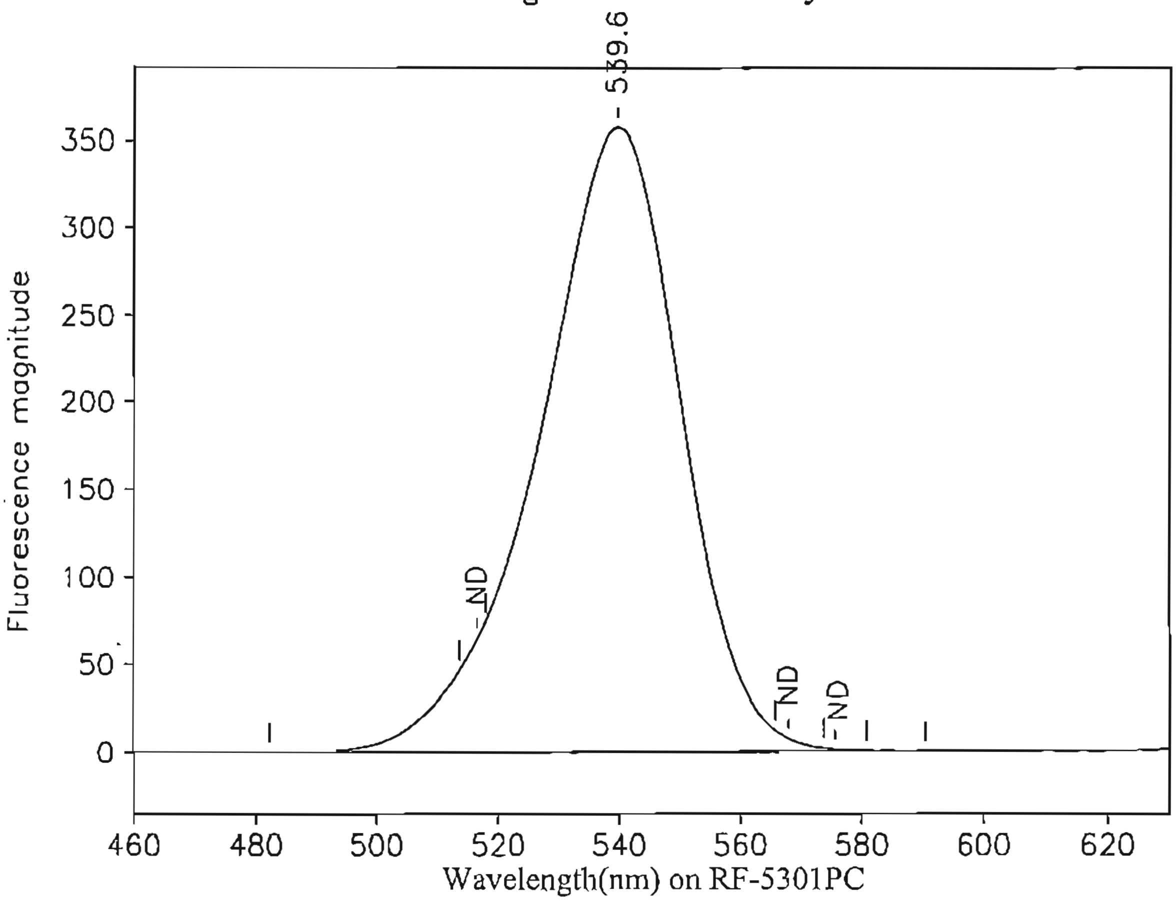
Station 1-285: MW-1 - 285 ft
OUL number: N8134 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0930 Collected: 01/20/05 0900

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



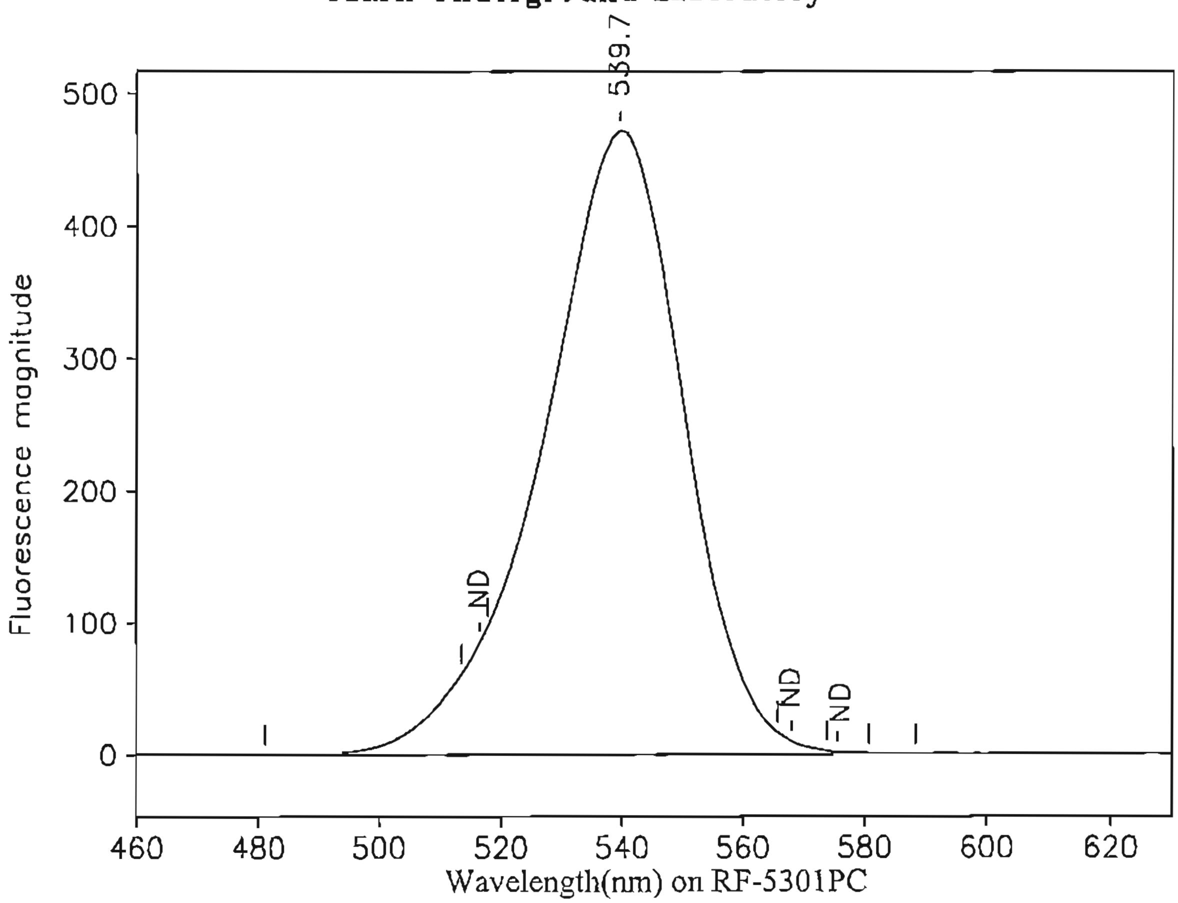
Station 2-135: MW-2 - 135 ft
OUL number: N8135 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 1005 Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.6	482.3	590.4	356.83	9,692.76	0.04	325
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-150: MW-2 - 150 ft
OUL number: N8136
Matrix: Elutant
Placed: 01/07/05 1005

Analyzed: 01/24/05

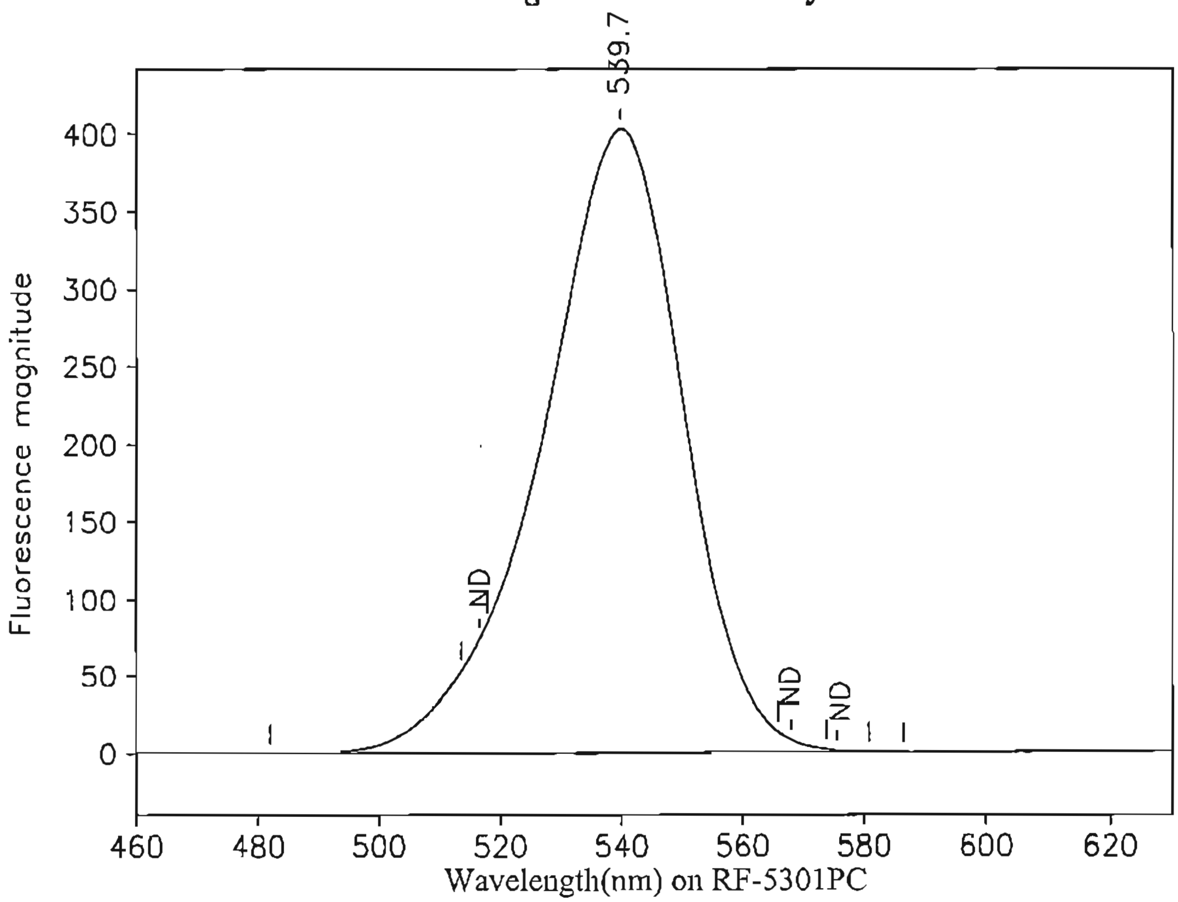
Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.7	481.2	588.3	471.46	12,797.00	0.04	430
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



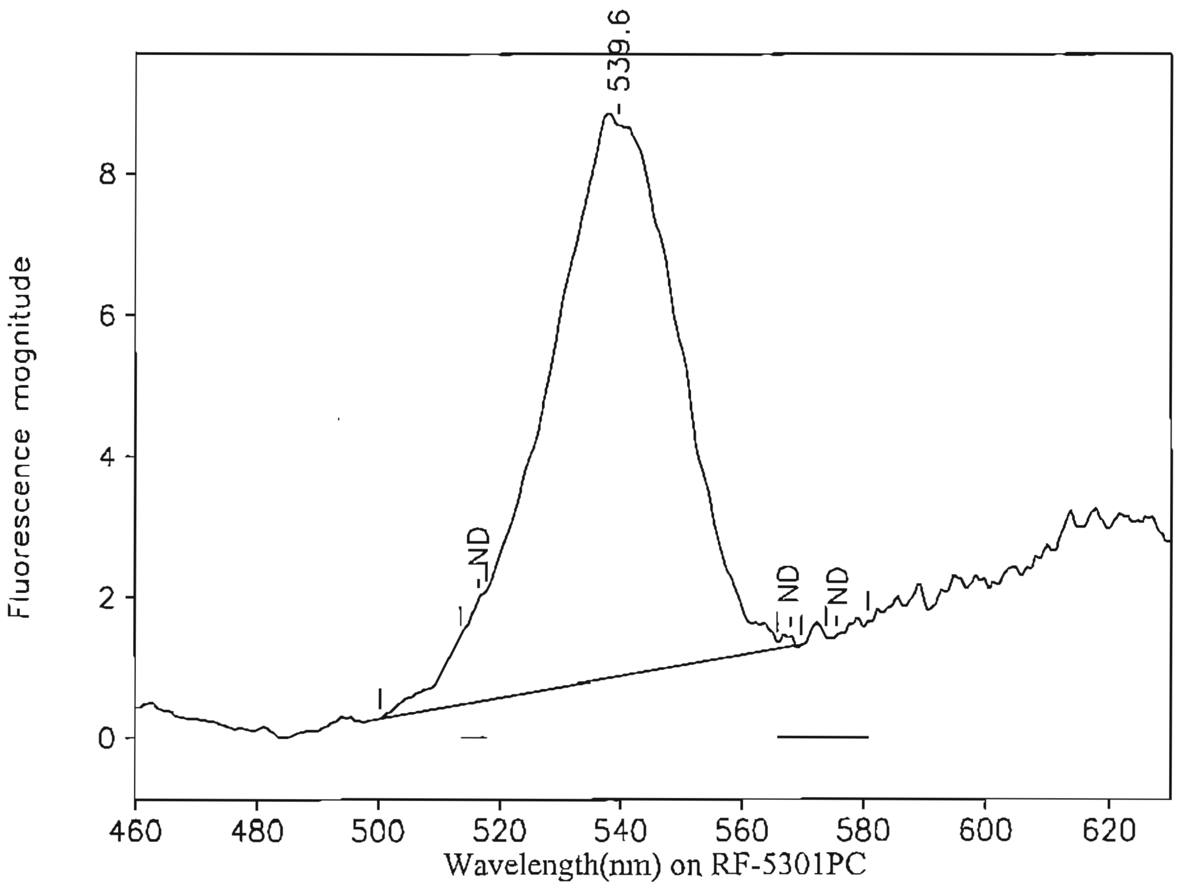
Station 2-165: MW-2 - 165 ft
OUL number: N8137 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 1005 Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.7	482.0	586.5	403.12	10,975.40	0.04	369
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-180: MW-2 - 180 ft
OUL number: N8138
Matrix: Elutant
Placed: 01/07/05 1005

Diluted: 1 to 100
Analyzed: 01/24/05

Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.6	500.4	569.8	7.83	209.11	0.04	702
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

nr

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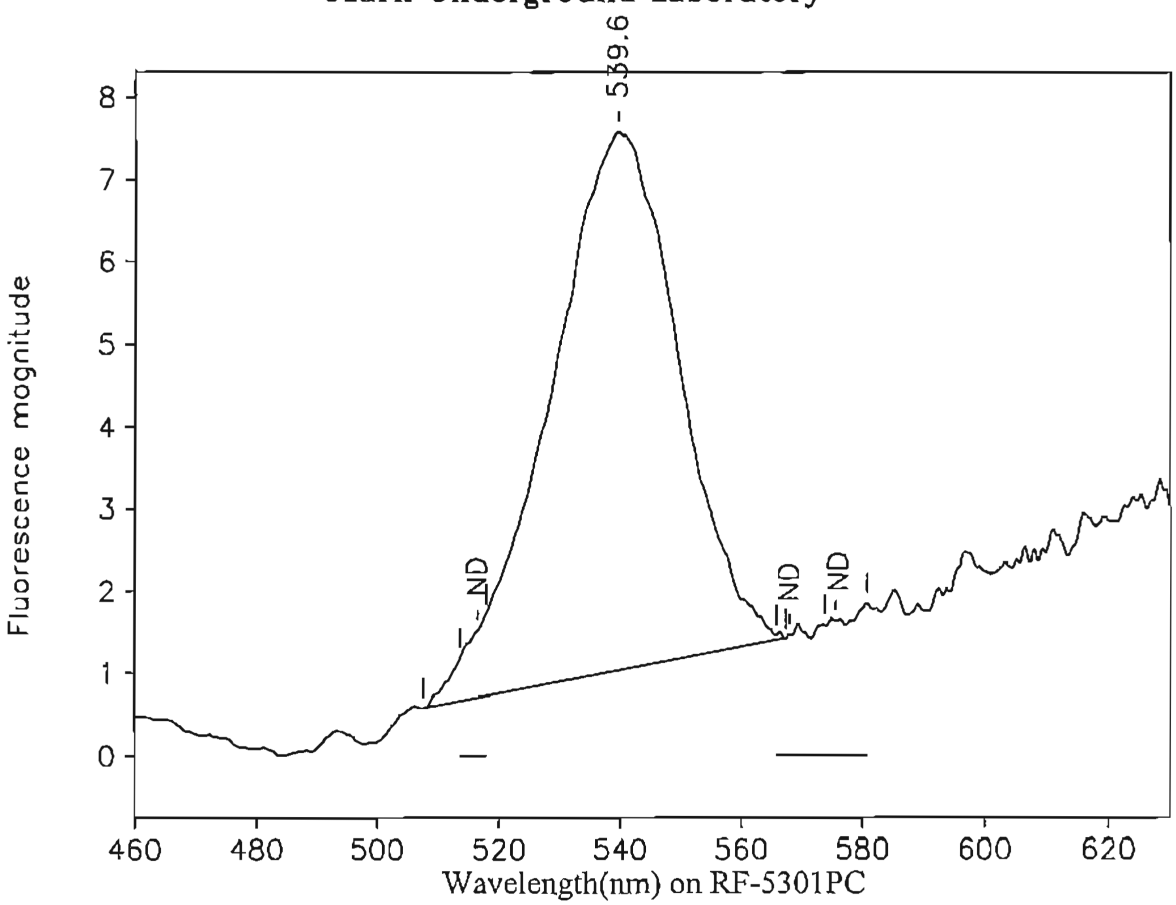

Station 2-195: MW-2 - 195 ft	Diluted: 1 to 100
OUL number: N8139	Analyzed: 01/24/05
Matrix: Elutant	
Placed: 01/07/05 1005	Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.6	507.6	567.4	6.55	162.55	0.04	546
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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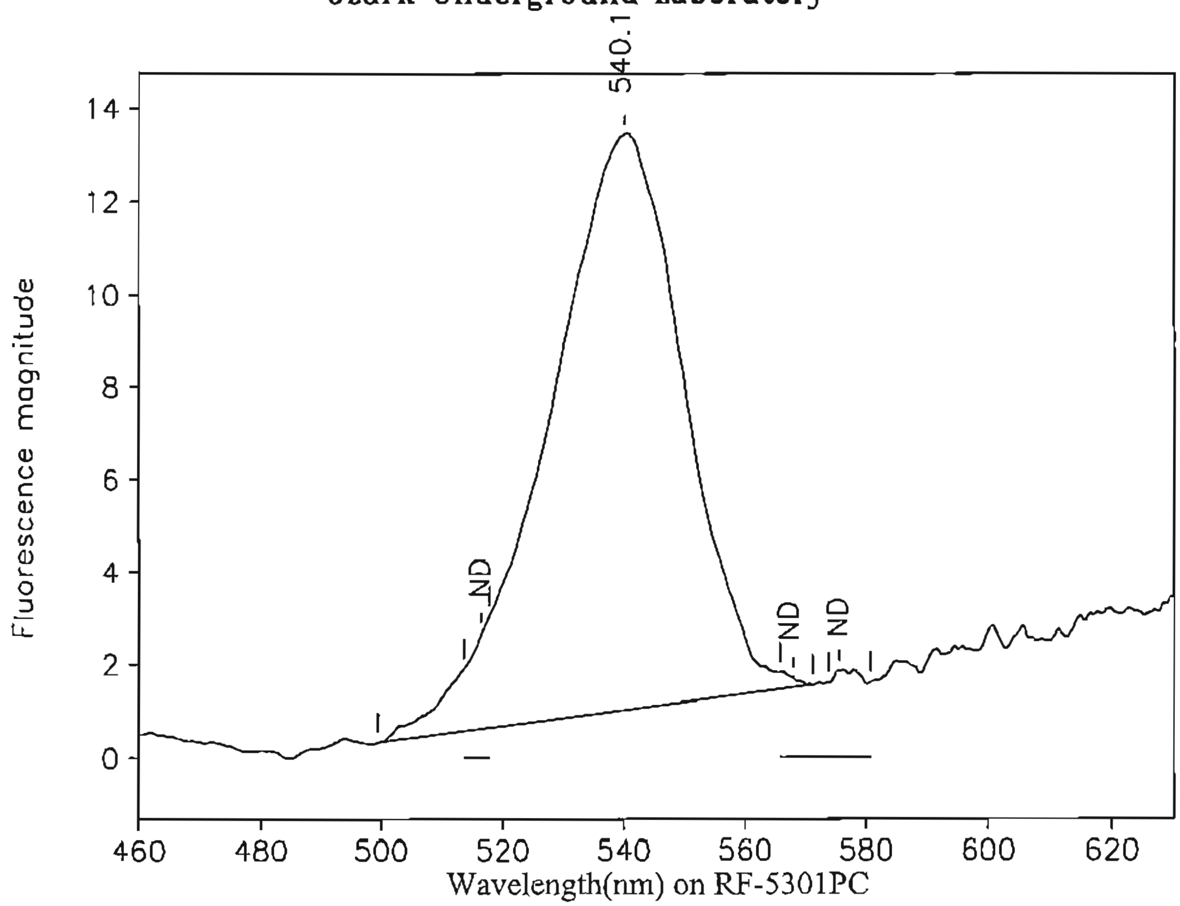

Station 2-210: MW-2 - 210 ft
OUL number: N8141
Matrix: Elutant
Placed: 01/07/05 1005

Diluted: 1 to 100
Analyzed: 01/24/05

Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.1	499.4	571.2	12.40	323.84	0.04	1,090
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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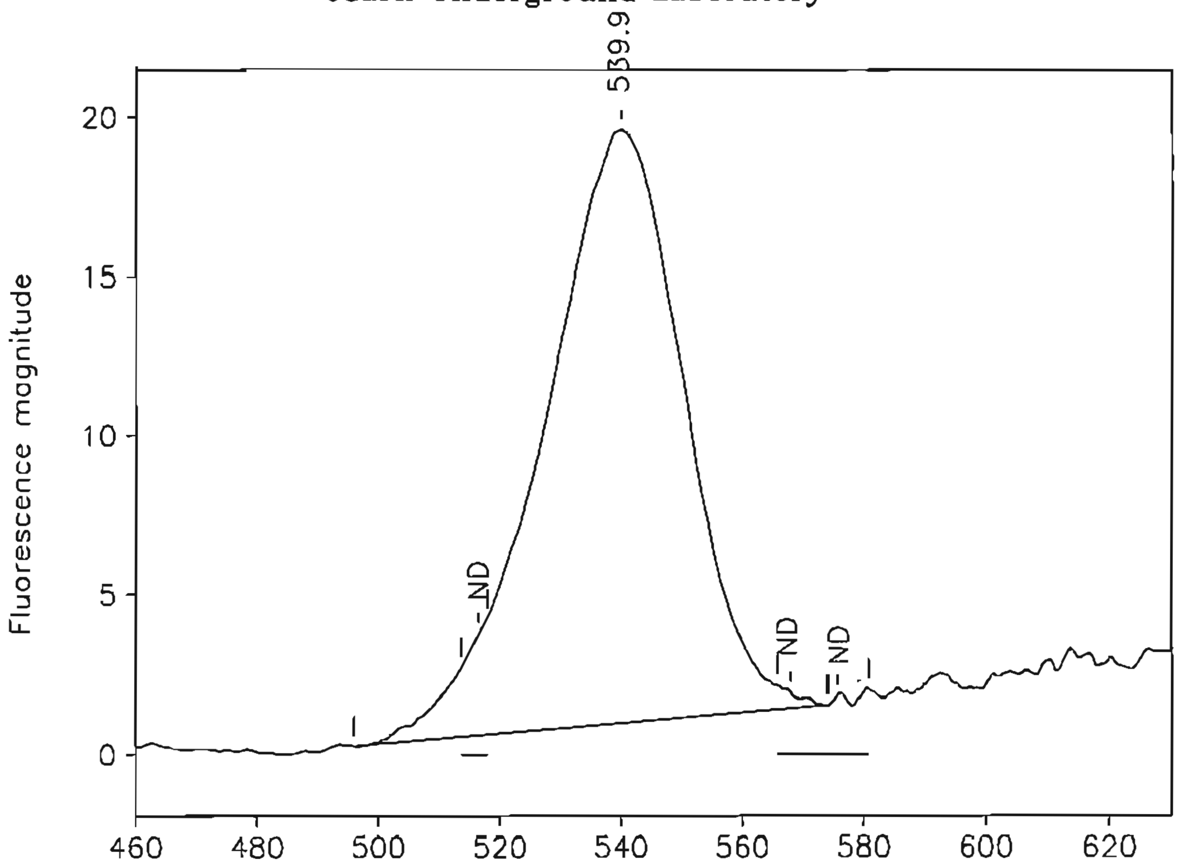


Station 2-225: MW-2 - 225 ft
OUL number: N8142
Matrix: Elutant
Placed: 01/07/05 1005

Diluted: 1 to 100
Analyzed: 01/24/05

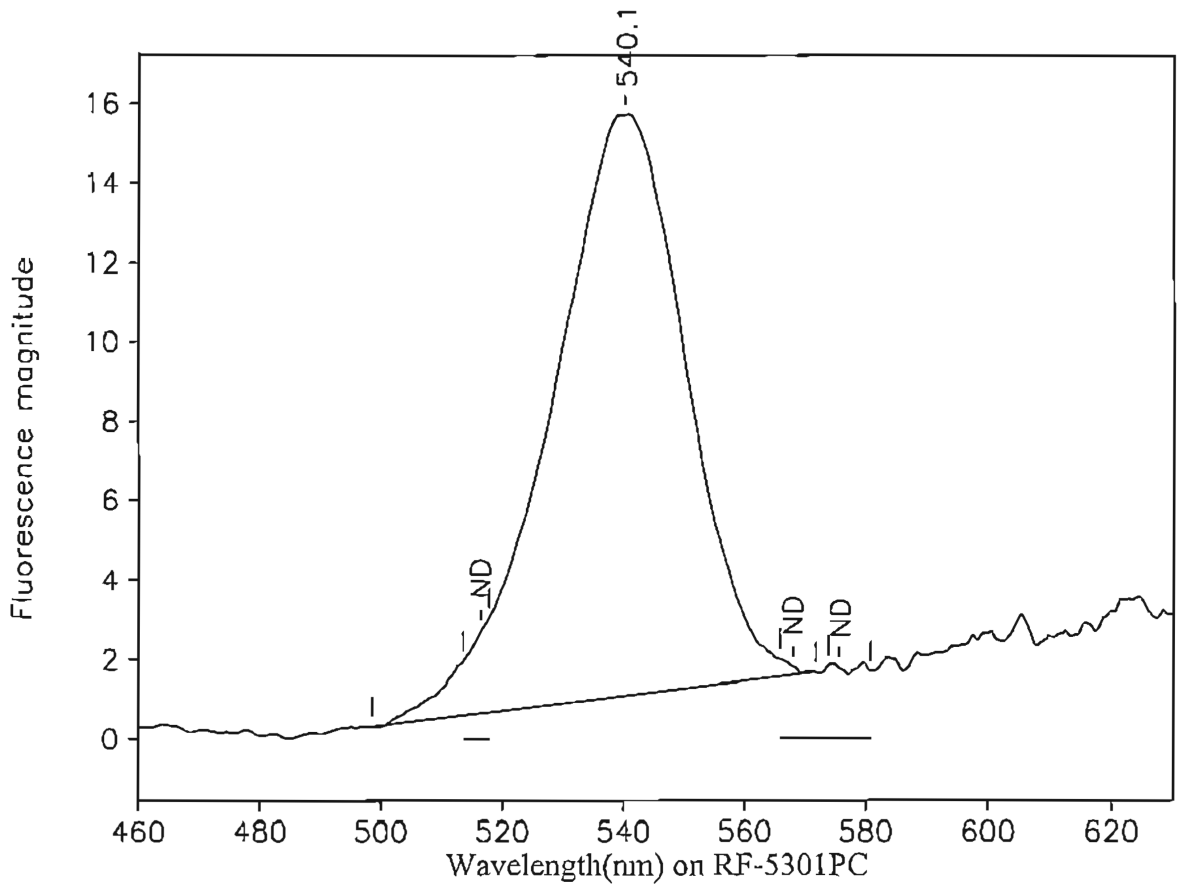
Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.9	496.0	574.2	18.64	497.42	0.04	1,670
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



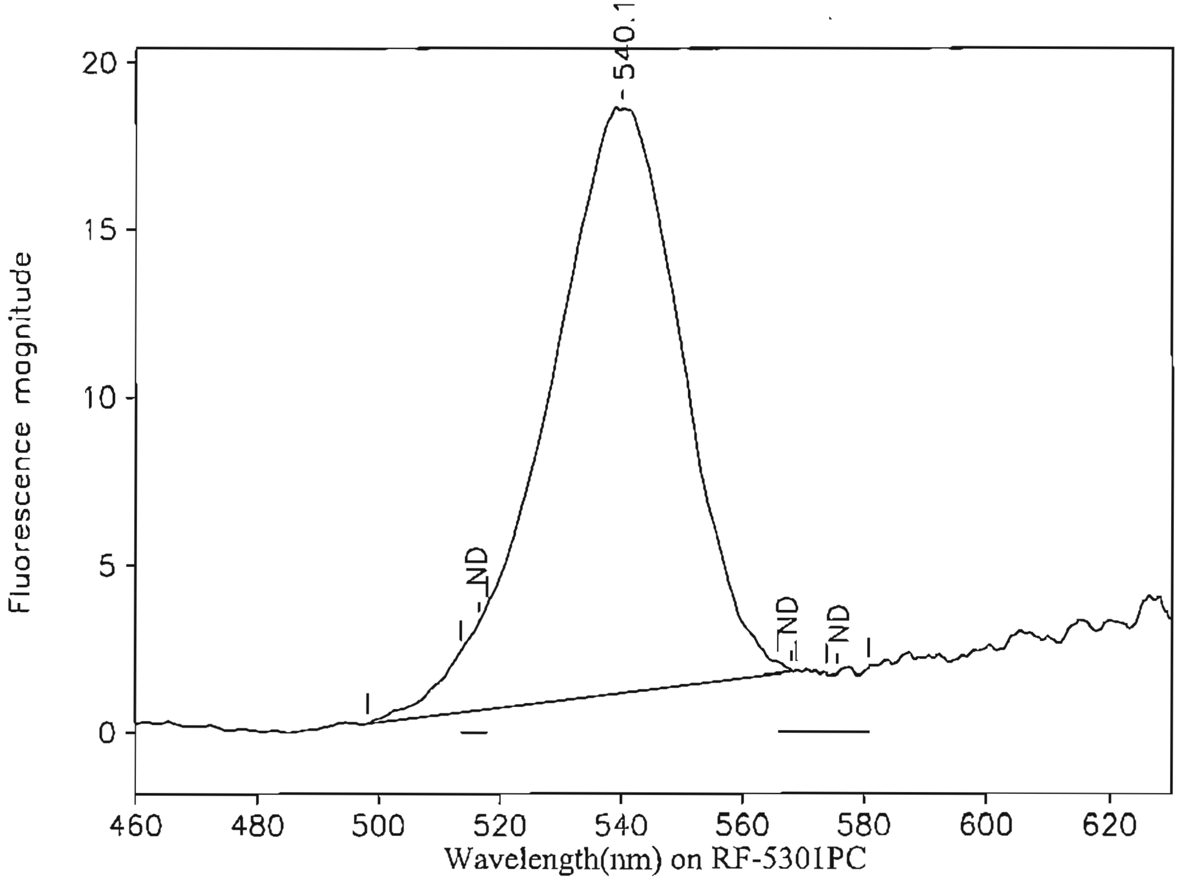
Station 2-240: MW-2 - 240 ft	Diluted: 1 to 100
OUL number: N8143	Analyzed: 01/24/05
Matrix: Elutant	
Placed: 01/07/05 1005	Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.1	498.6	571.8	14.62	377.34	0.04	1,270
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N8144
Matrix: Elutant
Placed: 01/07/05 1005

Diluted: 1 to 100
Analyzed: 01/24/05

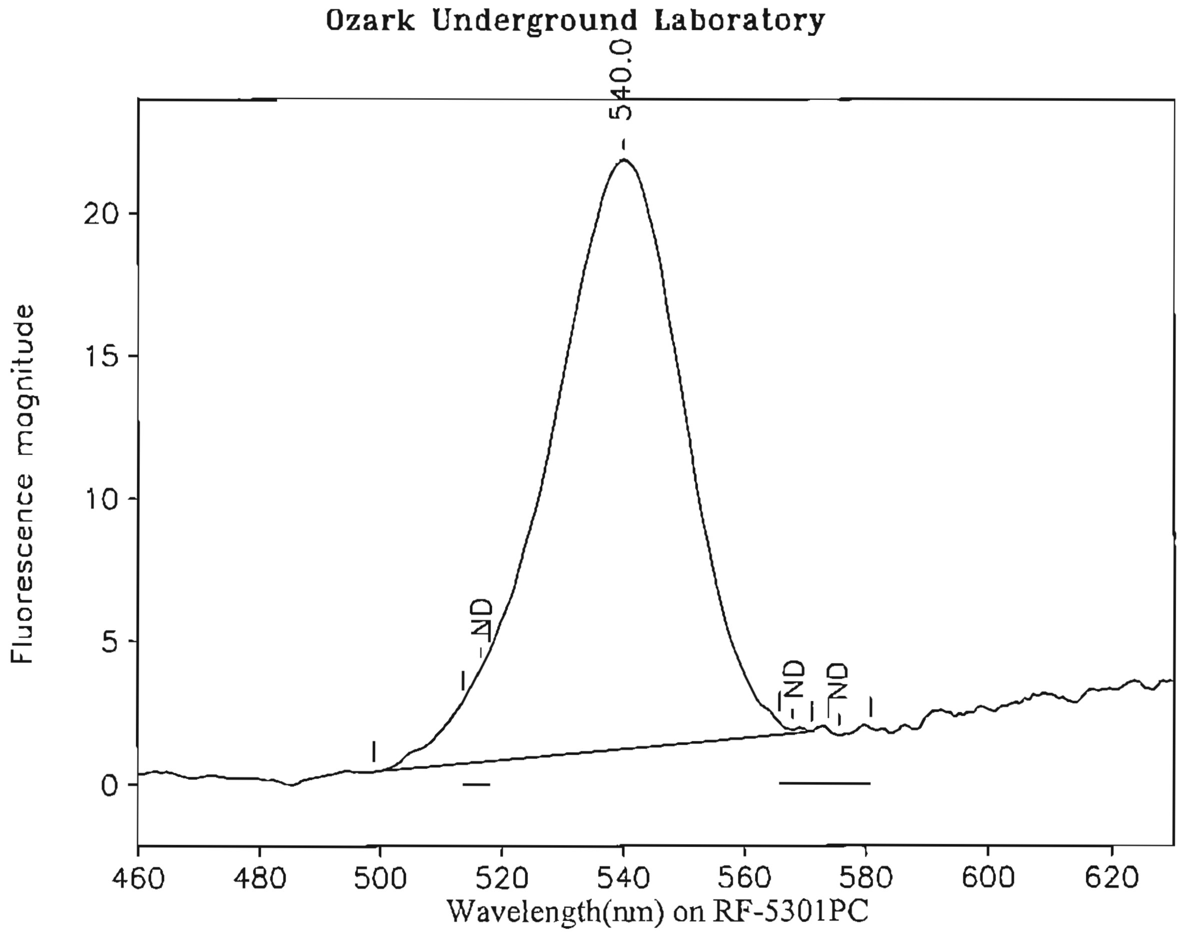
Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.1	498.2	568.8	17.40	450.71	0.04	1,510
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NW



Station 2-270: MW-2 - 270 ft
OUL number: N8145
Matrix: Elutant
Placed: 01/07/05 1005

Diluted: 1 to 100
Analyzed: 01/24/05

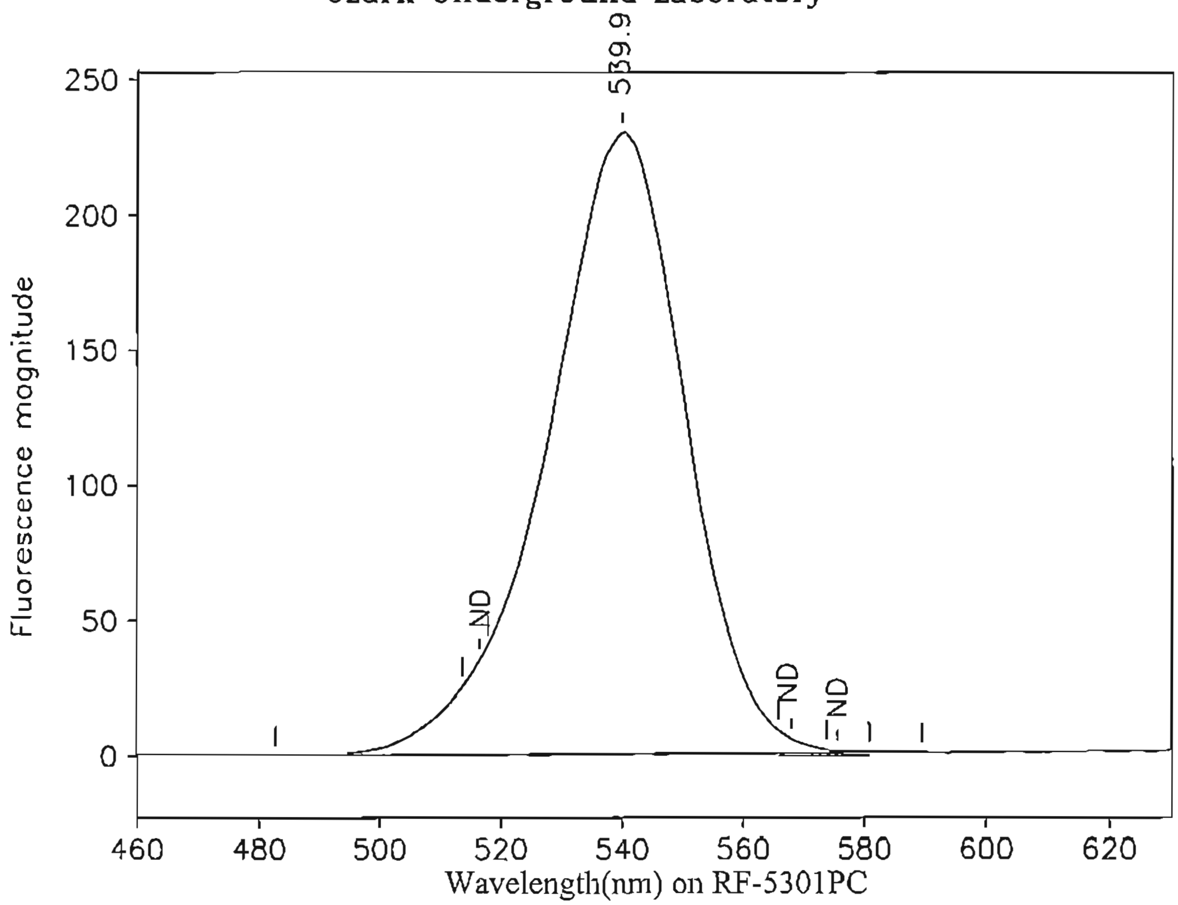
Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.0	499.0	571.0	20.64	540.19	0.04	1,810
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



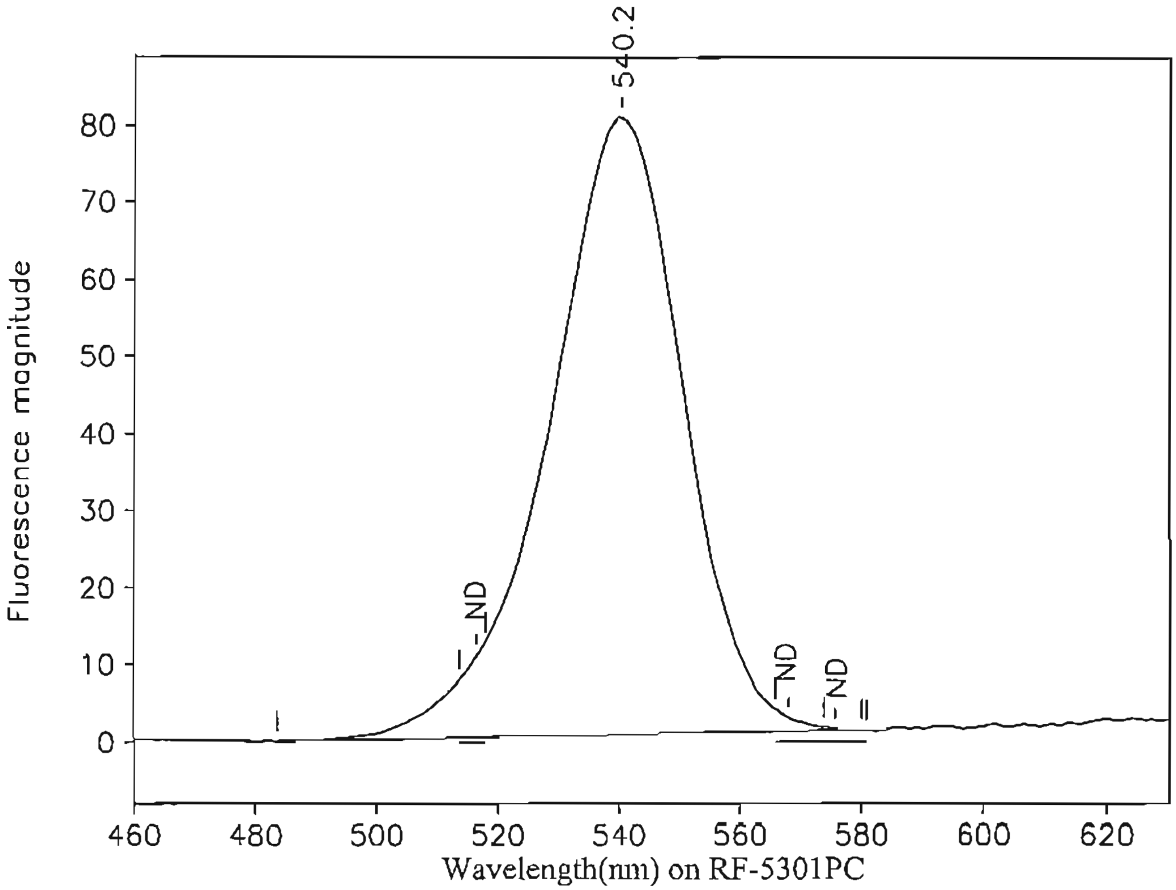
Station 2-285: MW-2 - 285 ft
OUL number: N8146 — Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 1005 — Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.9	482.7	589.4	229.78	6,105.69	0.04	205
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



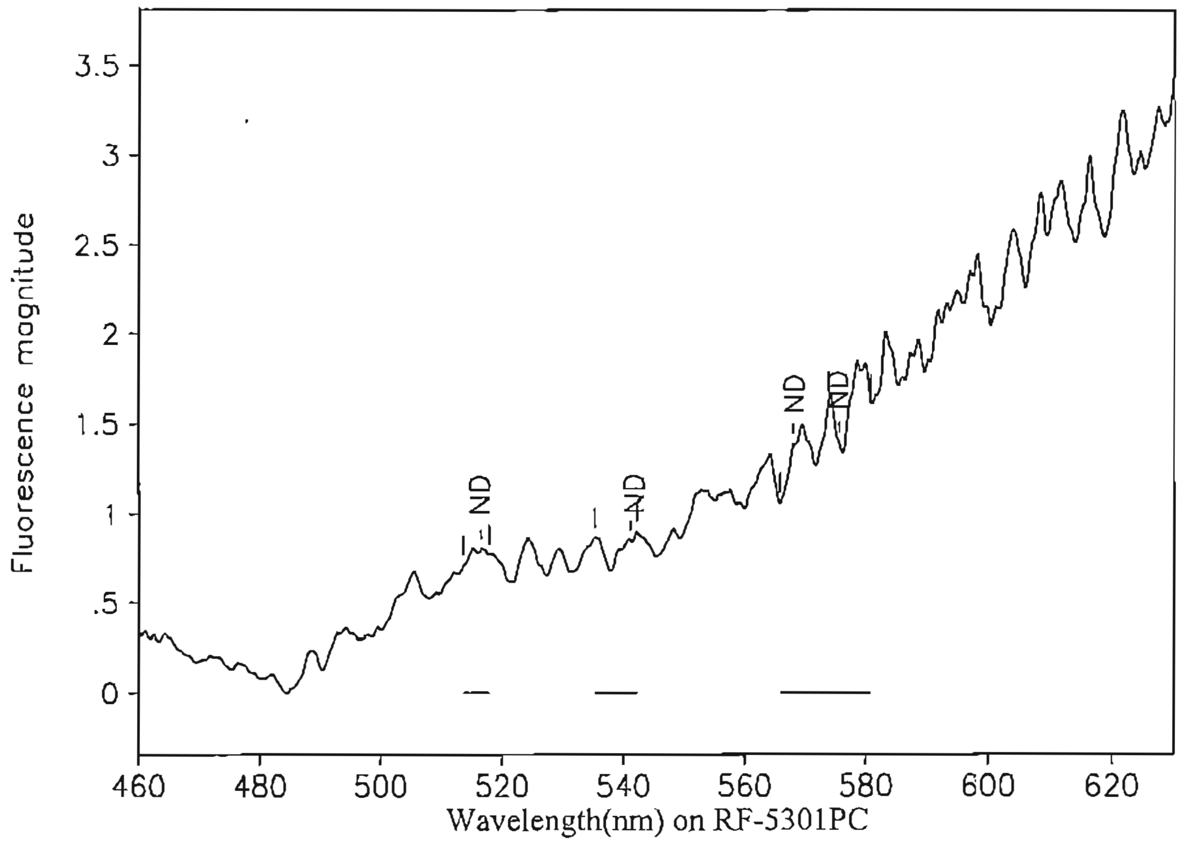
Station 2-300: MW-2 - 300 ft
OUL number: N8147 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 1005 Collected: 01/20/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
540.2	483.5	580.0	79.96	2,069.55	0.04	69.5
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-175: MW-3 - 175 ft
OUL number: N8148
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

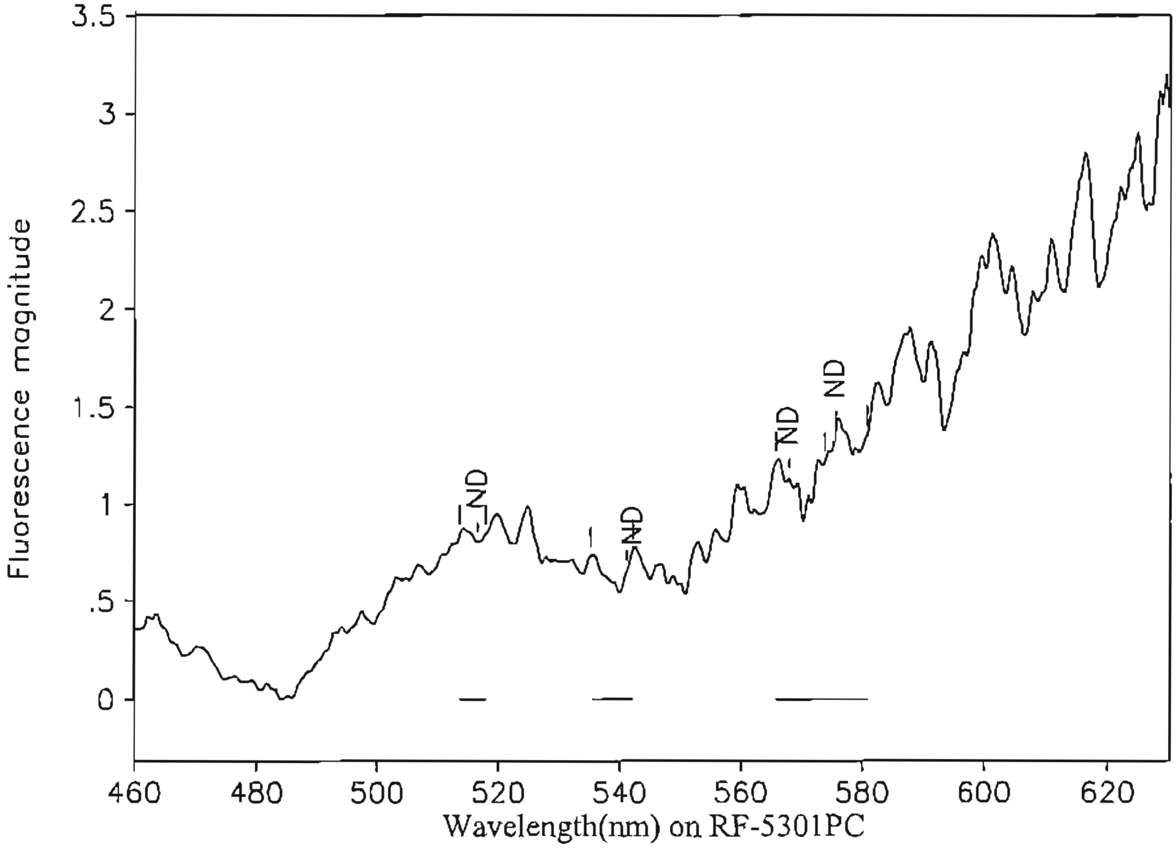
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-185: MW-3 - 185 ft
OUL number: N8149
Matrix: Elutant
Placed: 01/07/05 0900

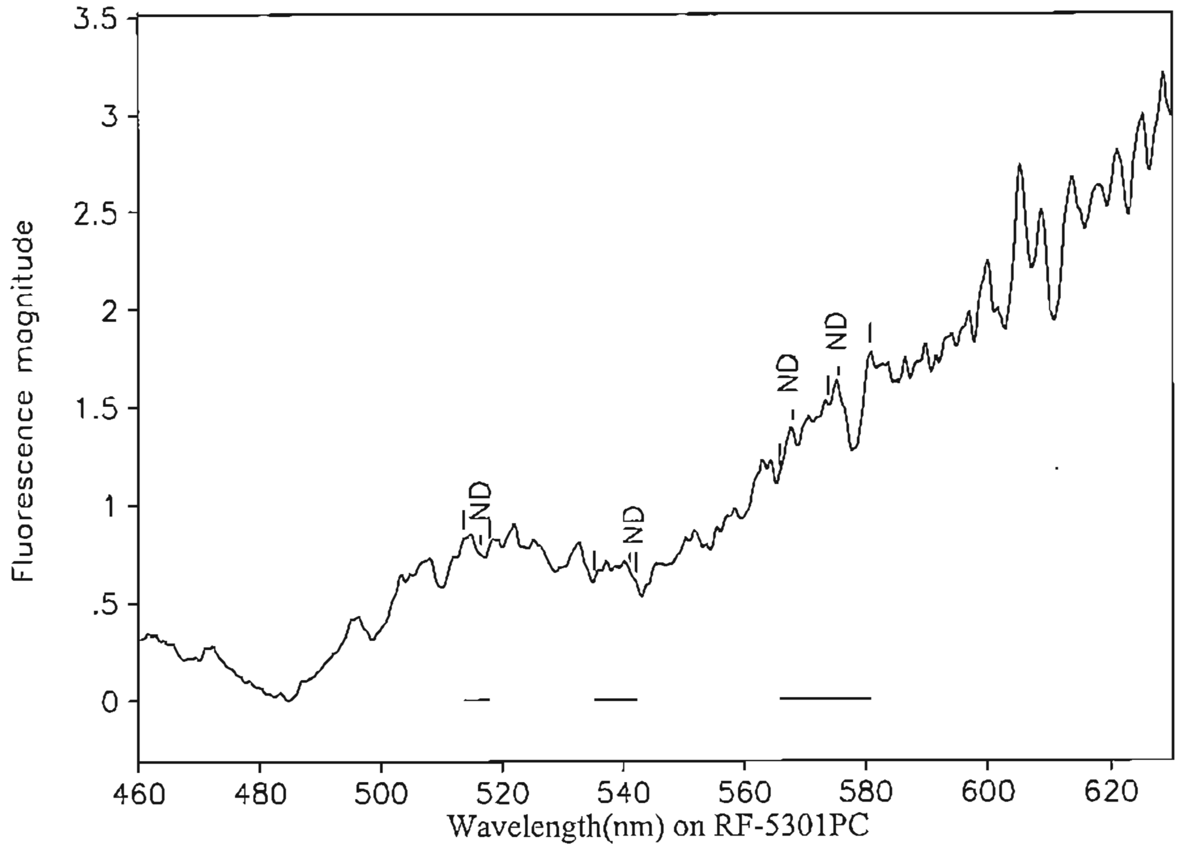
Analyzed: 01/24/05
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-195: MW-3 - 195 ft
OUL number: N8150
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

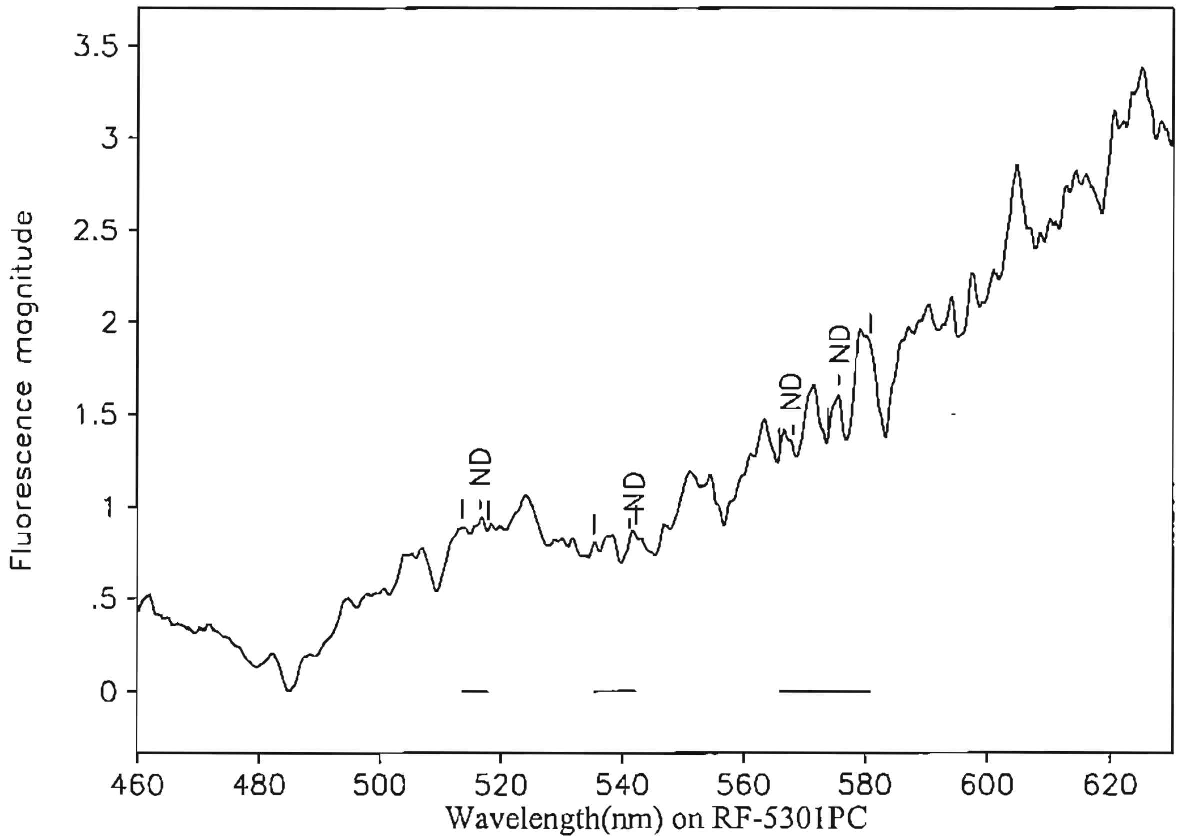
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



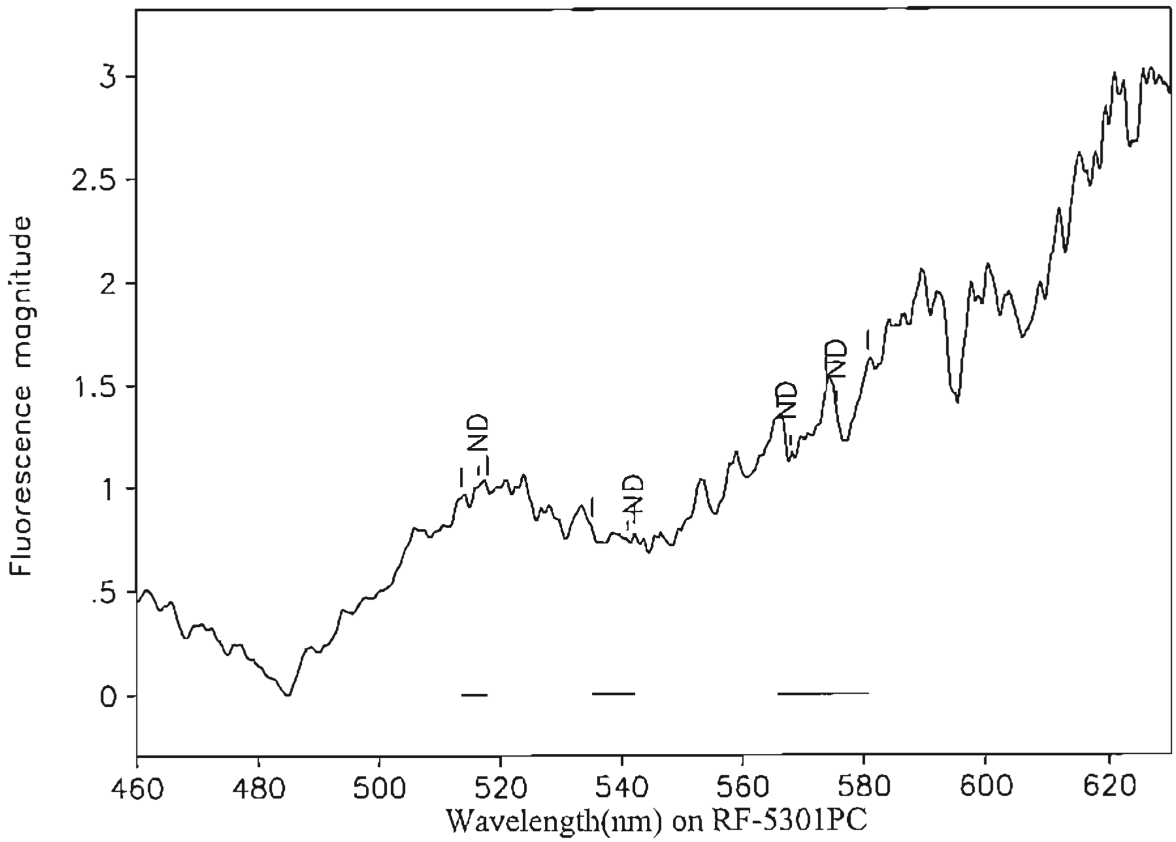
Station 3-205: MW-3 - 205 ft
OUL number: N8151 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0900 Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-215: MW-3 - 215 ft
OUL number: N8152
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

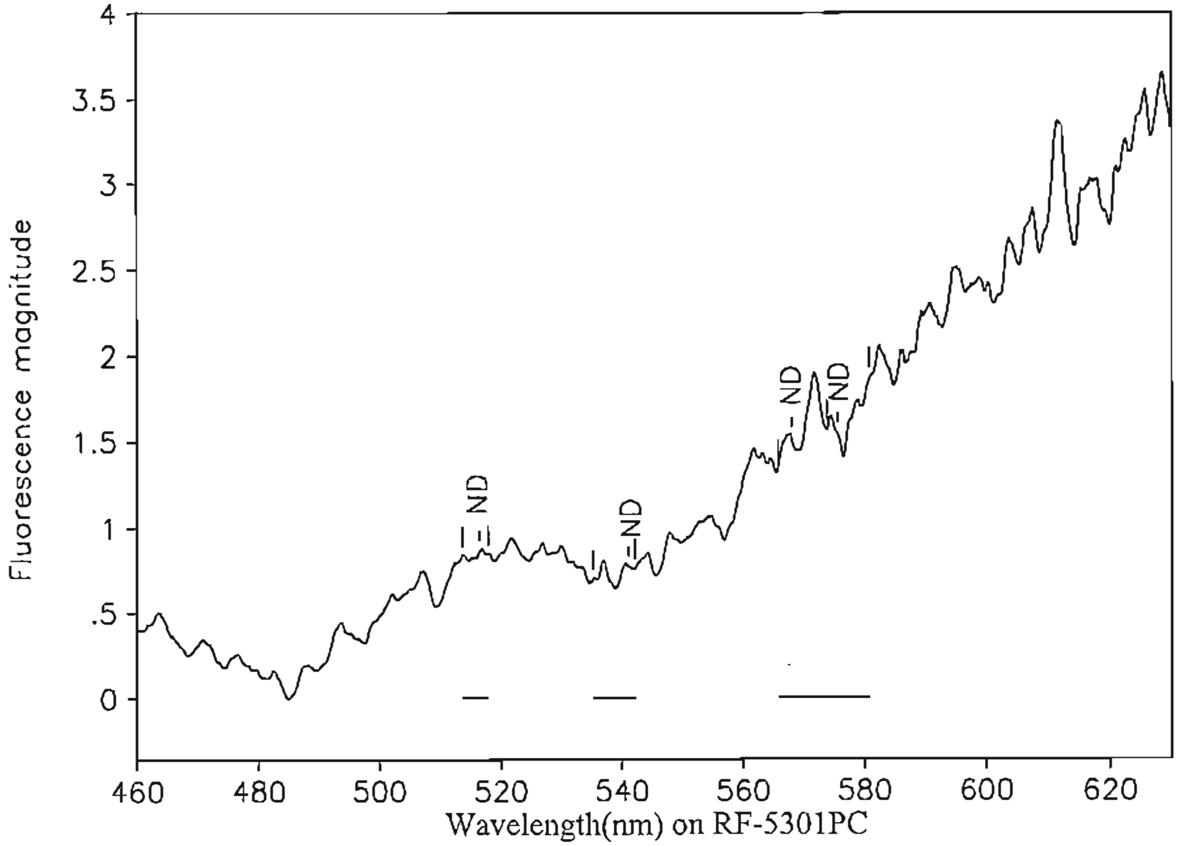
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N8153
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

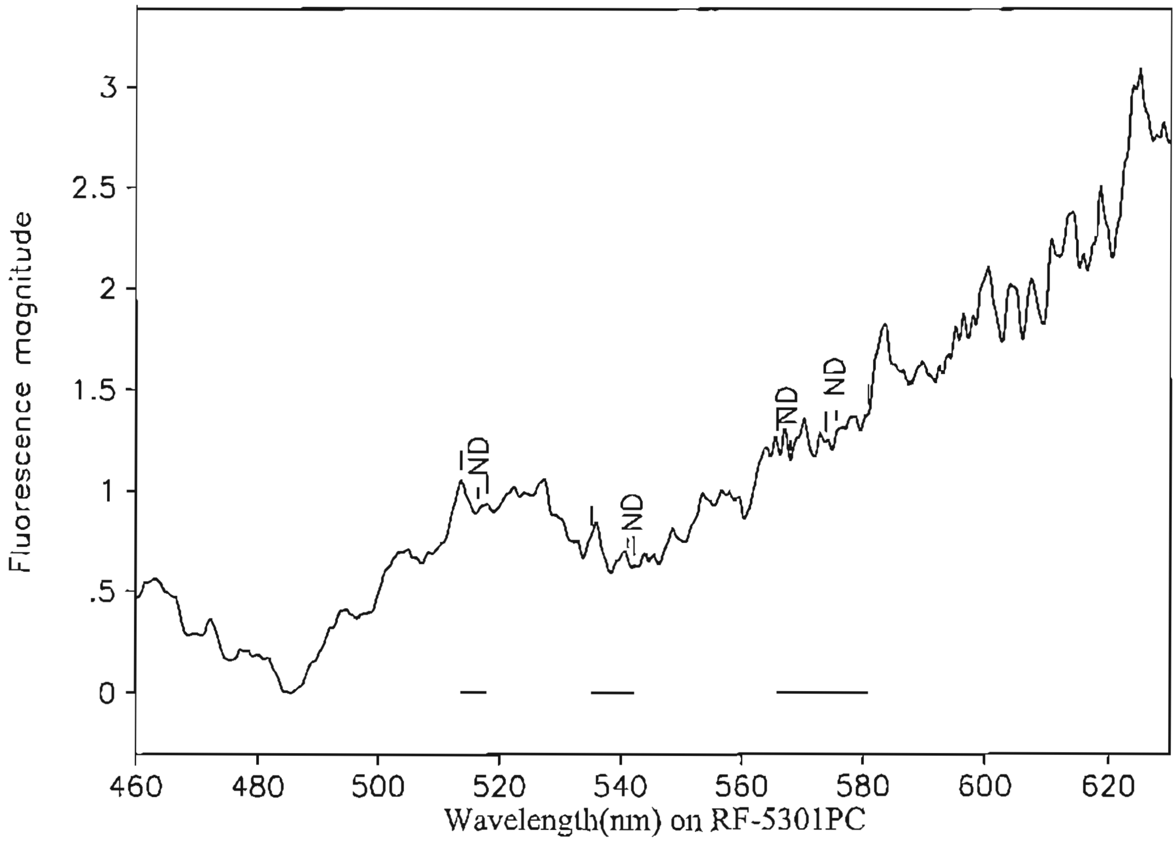
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



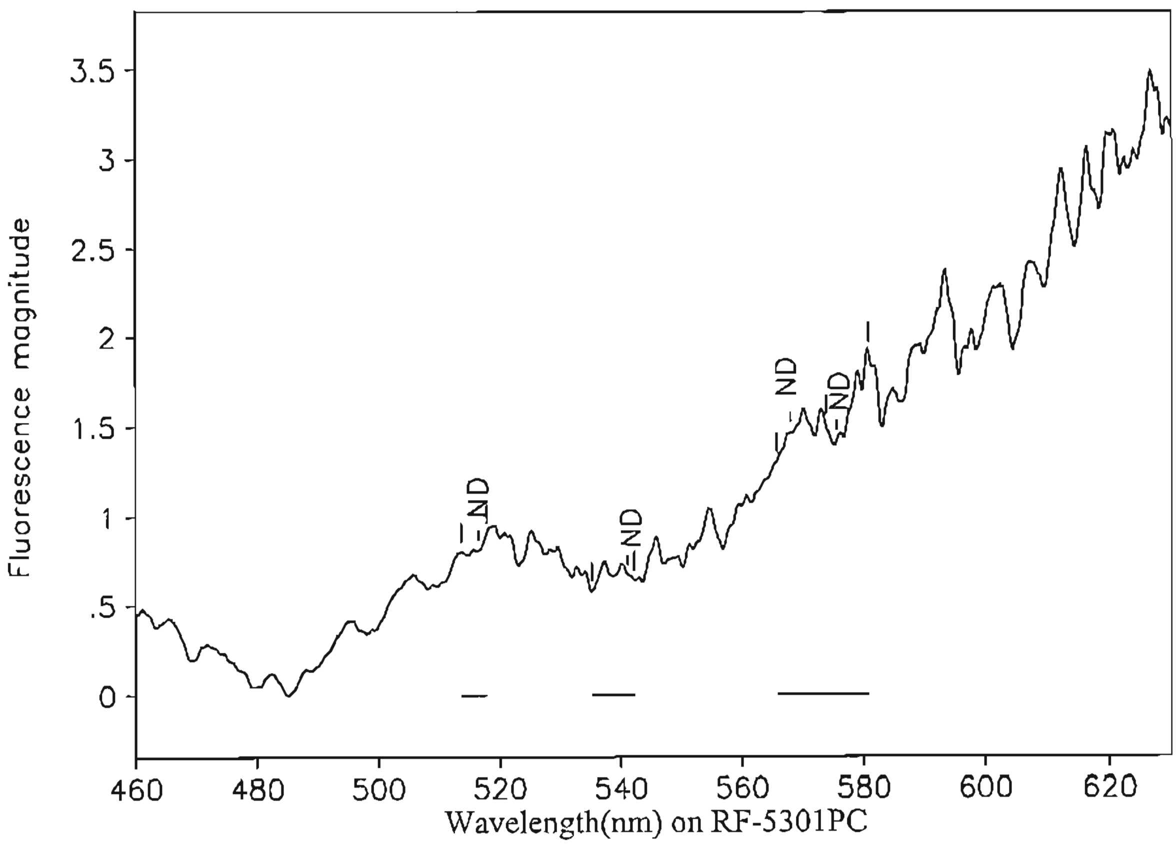
Station 3-235: MW-3 - 235 ft
OUL number: N8154 — Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0900 — Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-245: MW-3 - 245 ft
OUL number: N8155
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

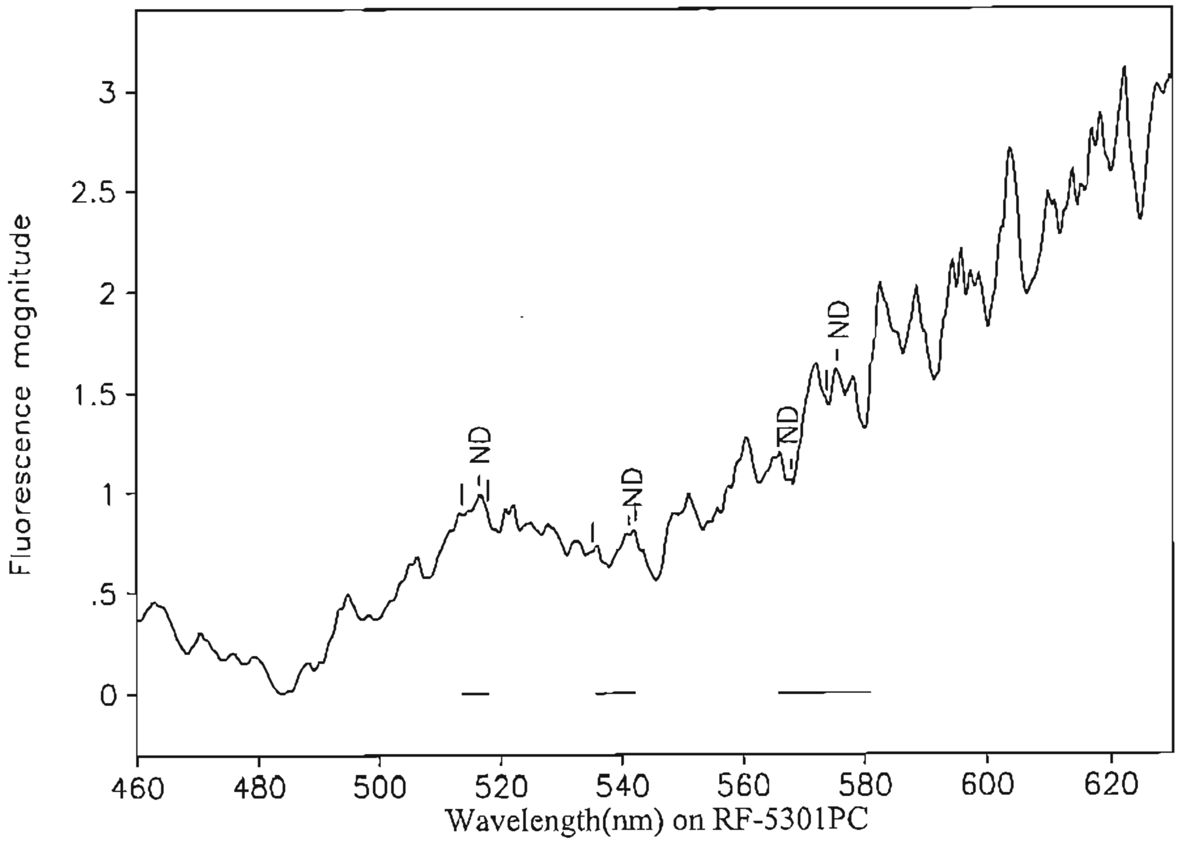
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-255: MW-3 - 255 ft
OUL number: N8156
Matrix: Elutant
Placed: 01/07/05 0900

Analyzed: 01/24/05

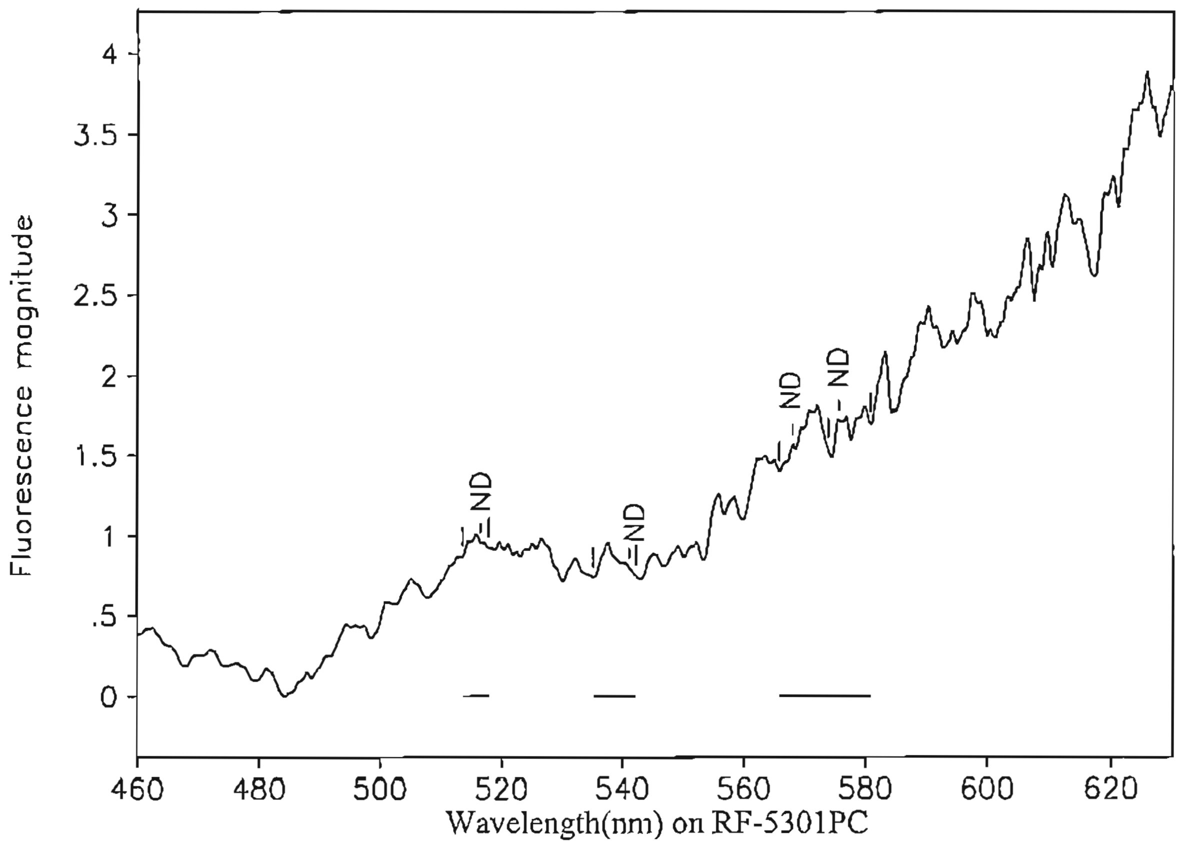
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



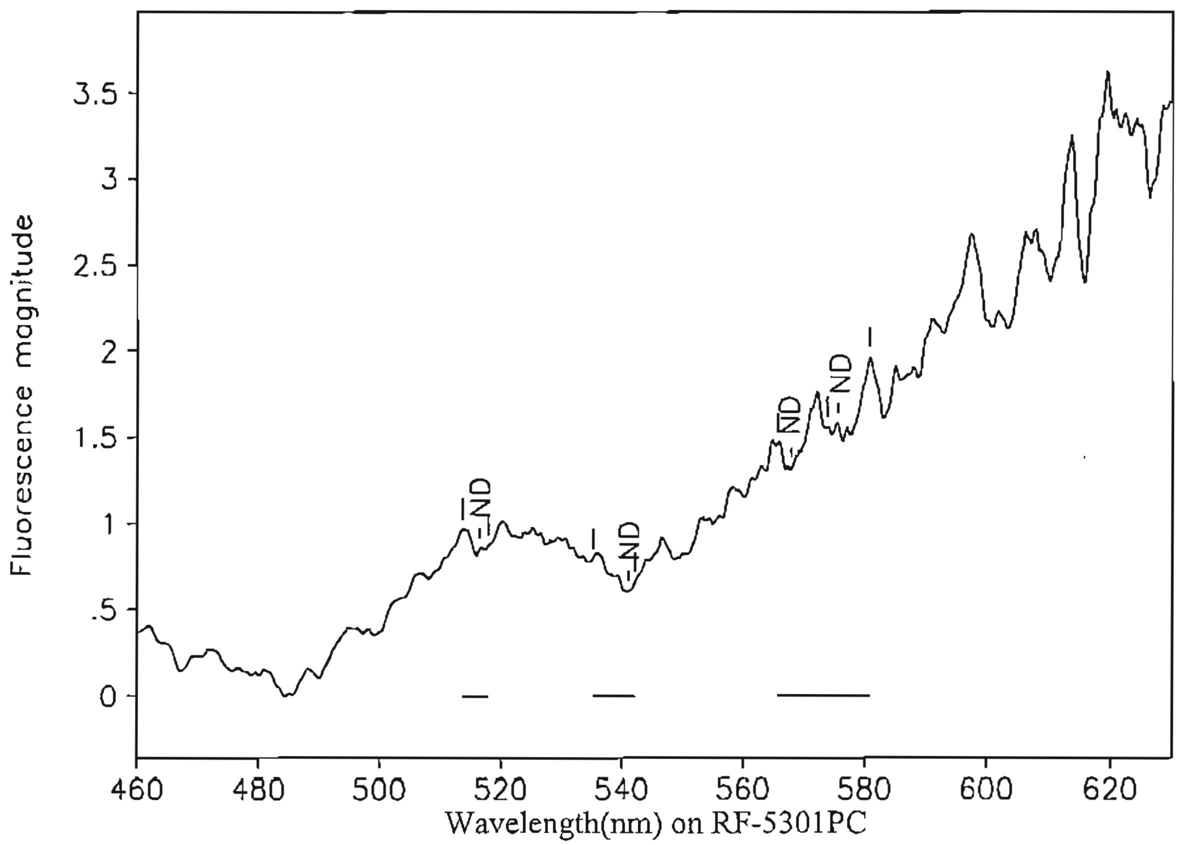
Station 3-265: MW-3 - 265 ft
OUL number: N8157 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0900 Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-275: MW-3 - 275 ft
OUL number: N8158
Matrix: Elutant
Placed: 01/07/05 0900

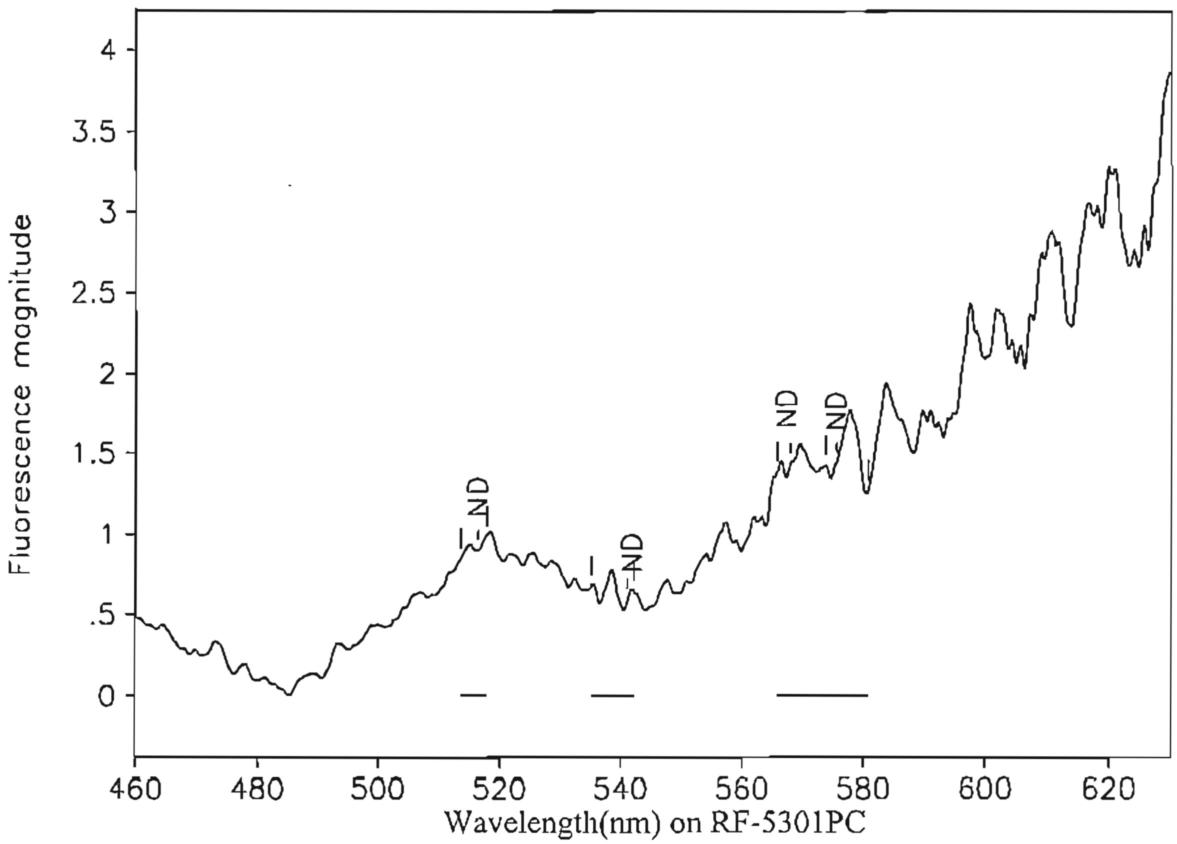
Analyzed: 01/24/05
Collected: 01/20/05 0830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-165: MW-4 - 165 ft
OUL number: N8159
Matrix: Elutant
Placed: 01/07/05 0825

Analyzed: 01/24/05

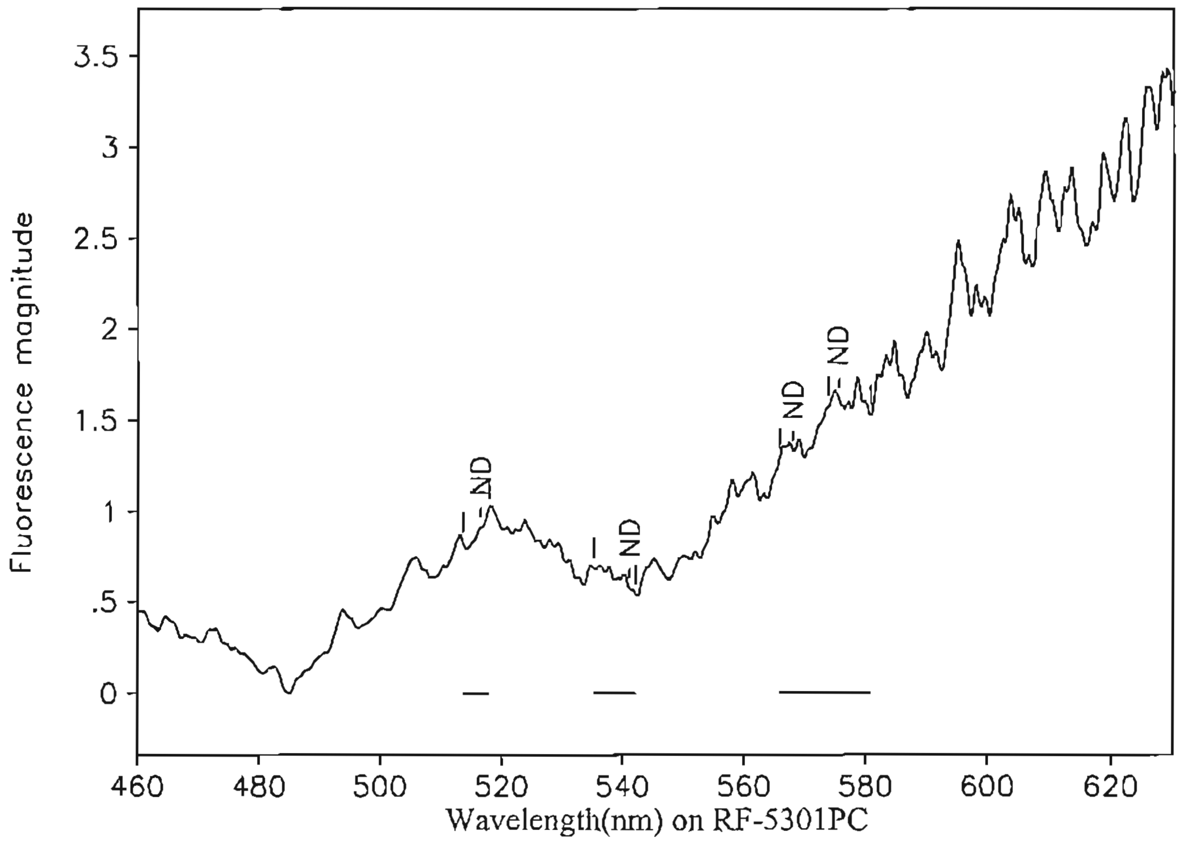
Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-180: MW-4 - 180 ft
OUL number: N8161
Matrix: Elutant
Placed: 01/07/05 0825

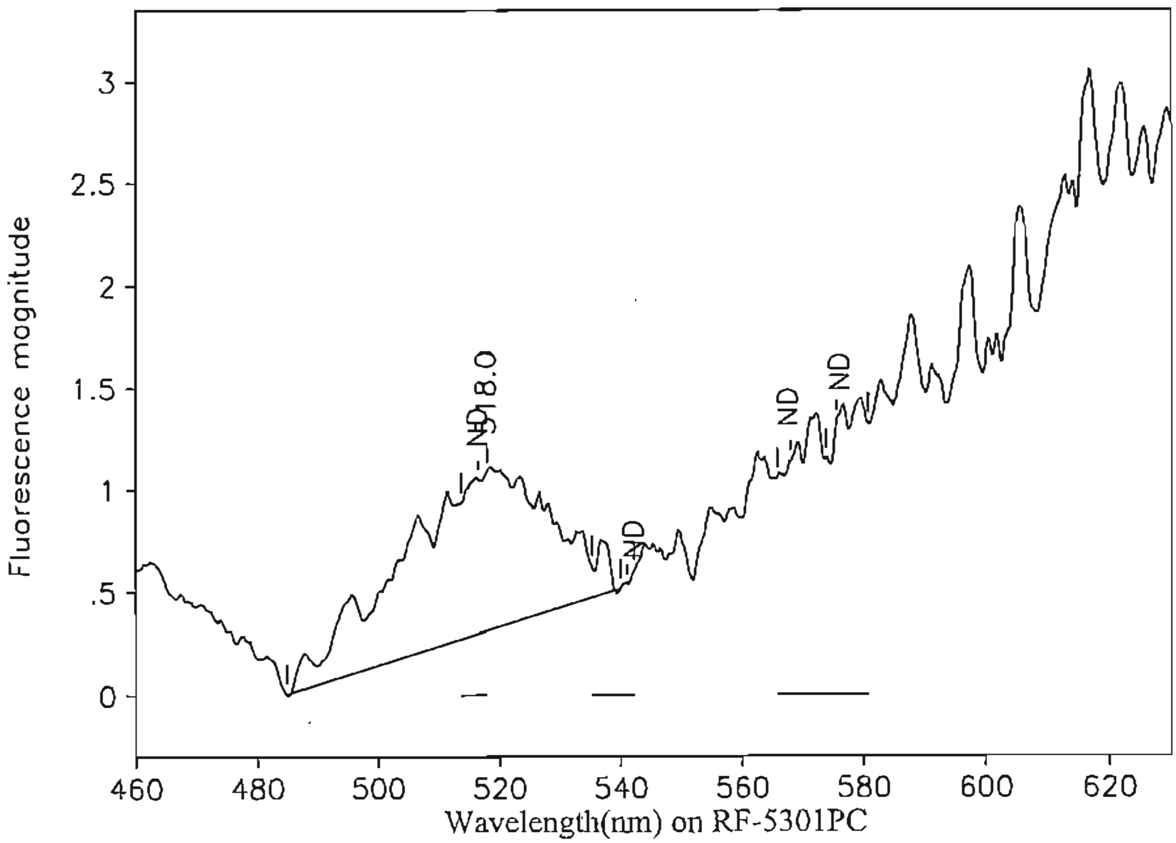
Analyzed: 01/24/05
Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-195: MW-4 - 195 ft
OUL number: N8162
Matrix: Elutant
Placed: 01/07/05 0825

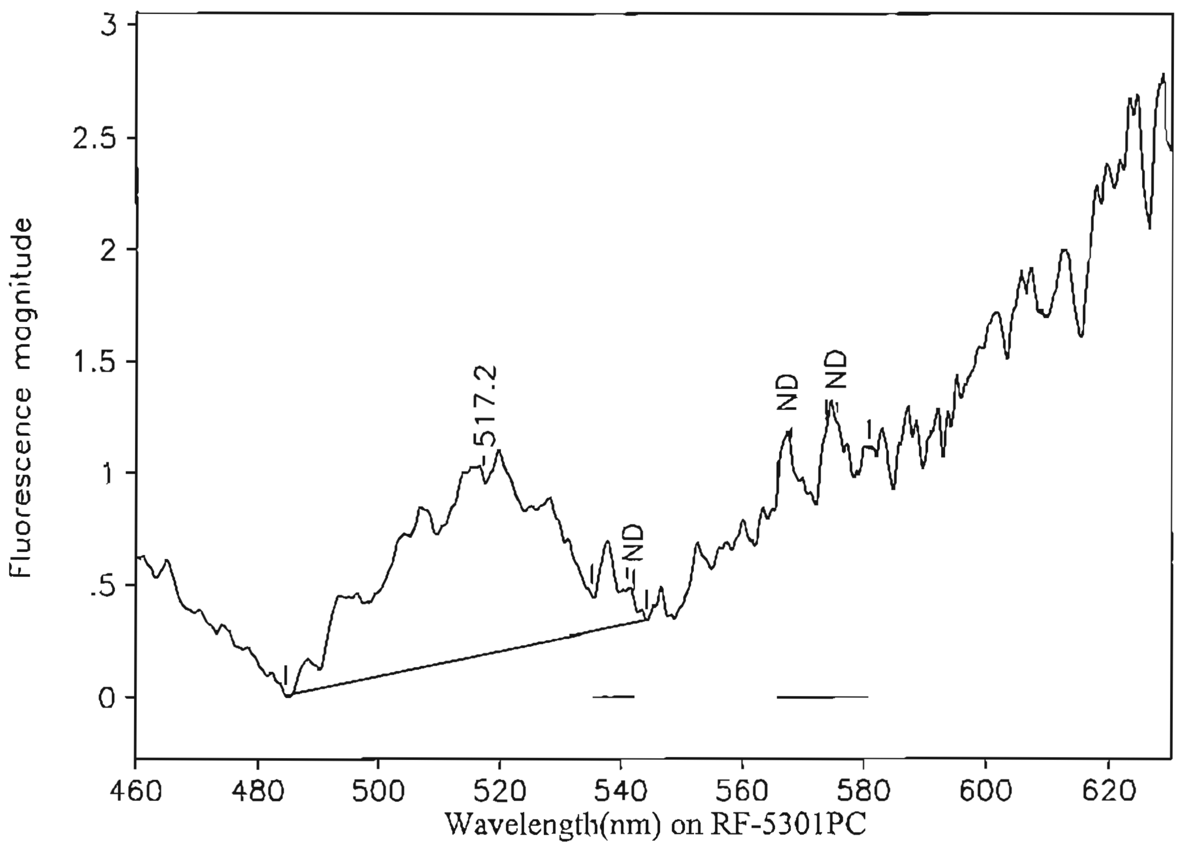
Analyzed: 01/24/05

Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.0	484.8	540.0	0.79	23.56	0.03	~~0.554~~ ND

Ozark Underground Laboratory



Station 4-210: MW-4 - 210 ft
OUL number: N8163
Matrix: Elutant
Placed: 01/07/05 0825

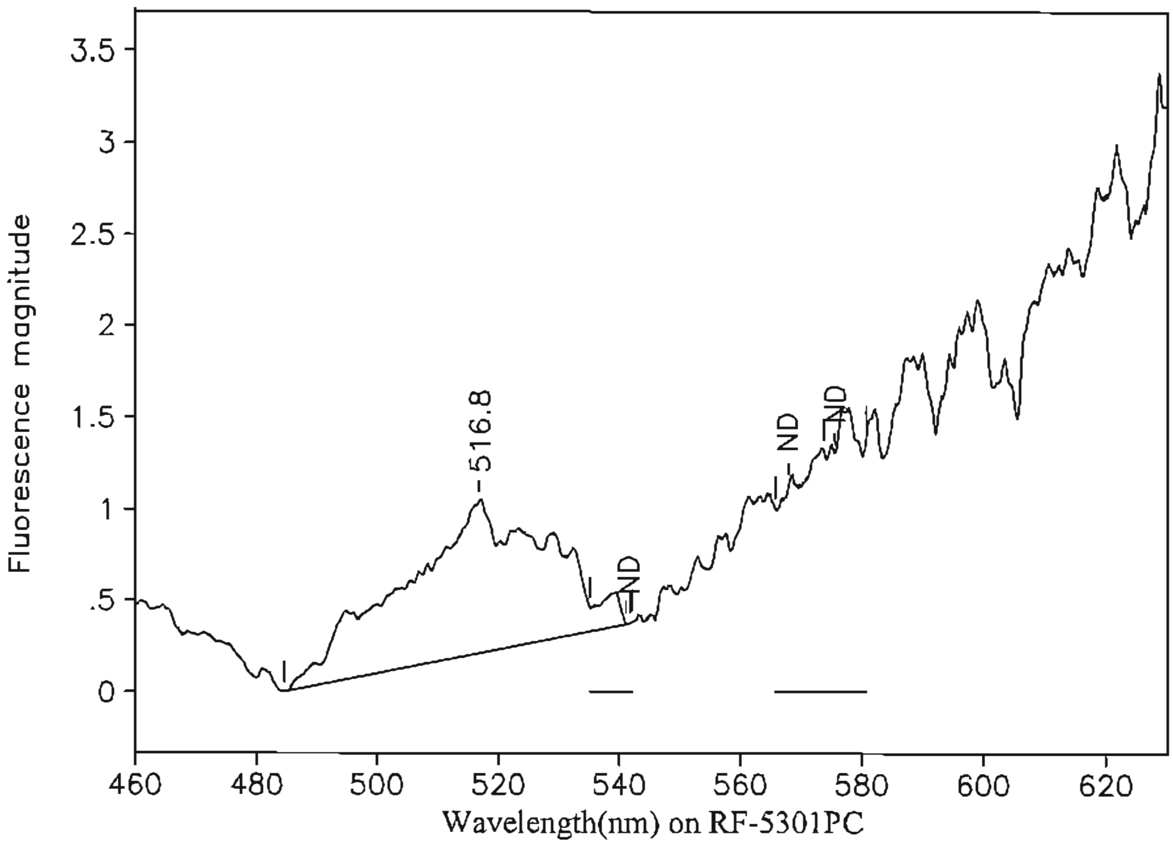
Analyzed: 01/24/05
Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	484.6	544.2	0.80	27.10	0.03	~~0.637~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



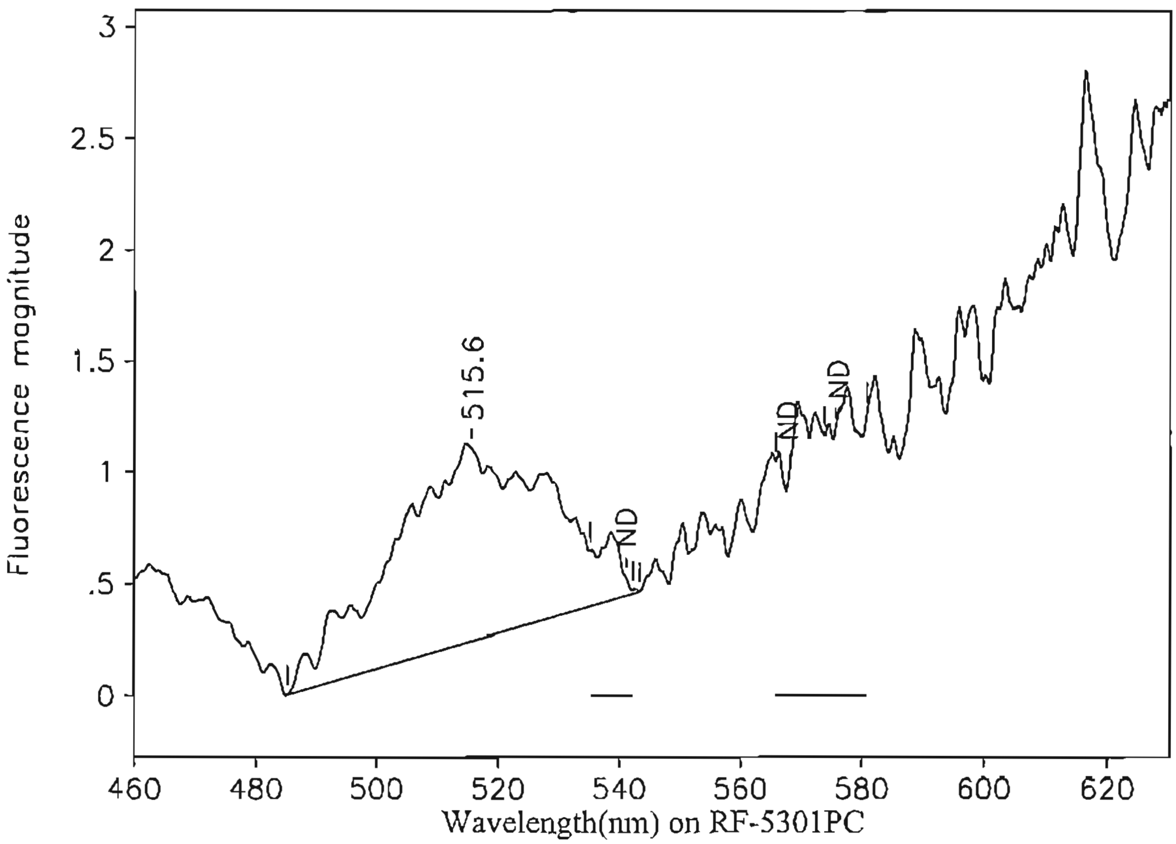
Station 4-225: MW-4 - 225 ft
OUL number: N8164 | Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0825 | Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	484.6	541.8	0.83	23.03	0.04	~~0.541~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-240: MW-4 - 240 ft
OUL number: N8165
Matrix: Elutant
Placed: 01/07/05 0825

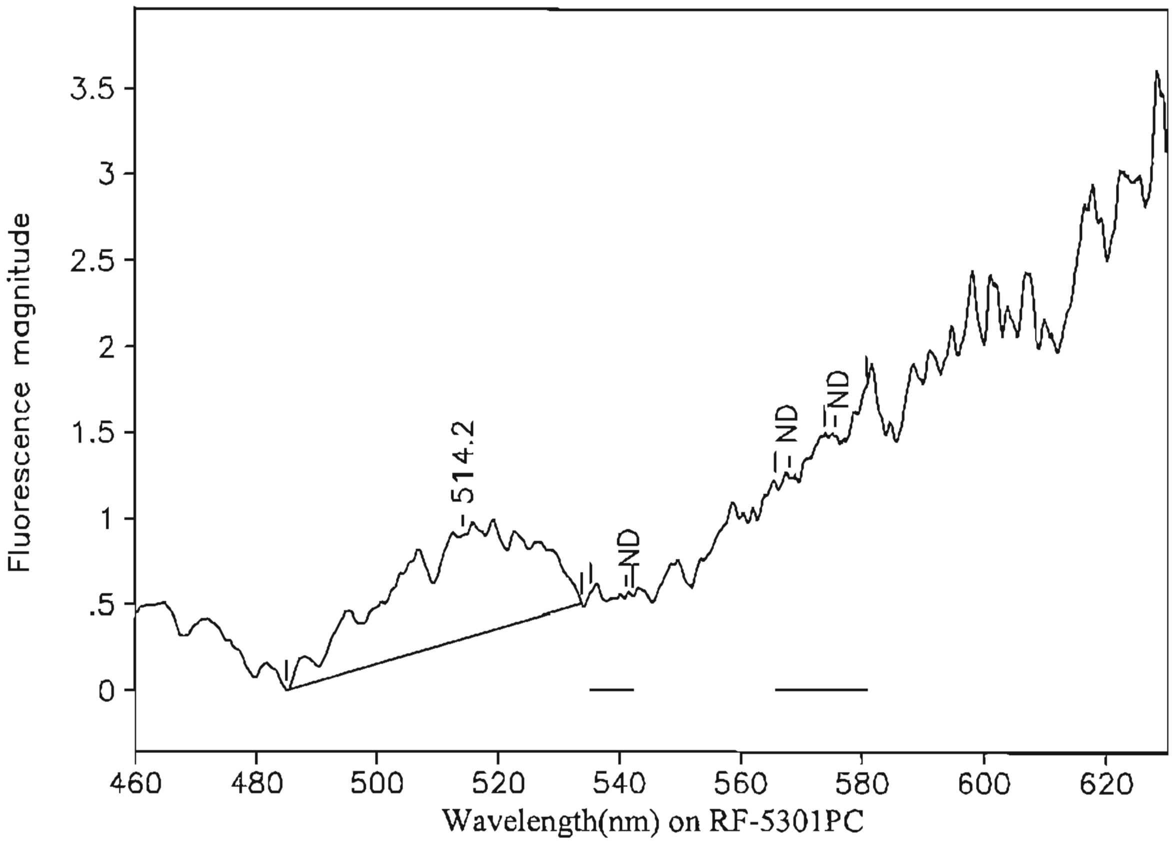
Analyzed: 01/24/05
Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	485.2	543.4	0.86	26.76	0.03	~~0.629~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



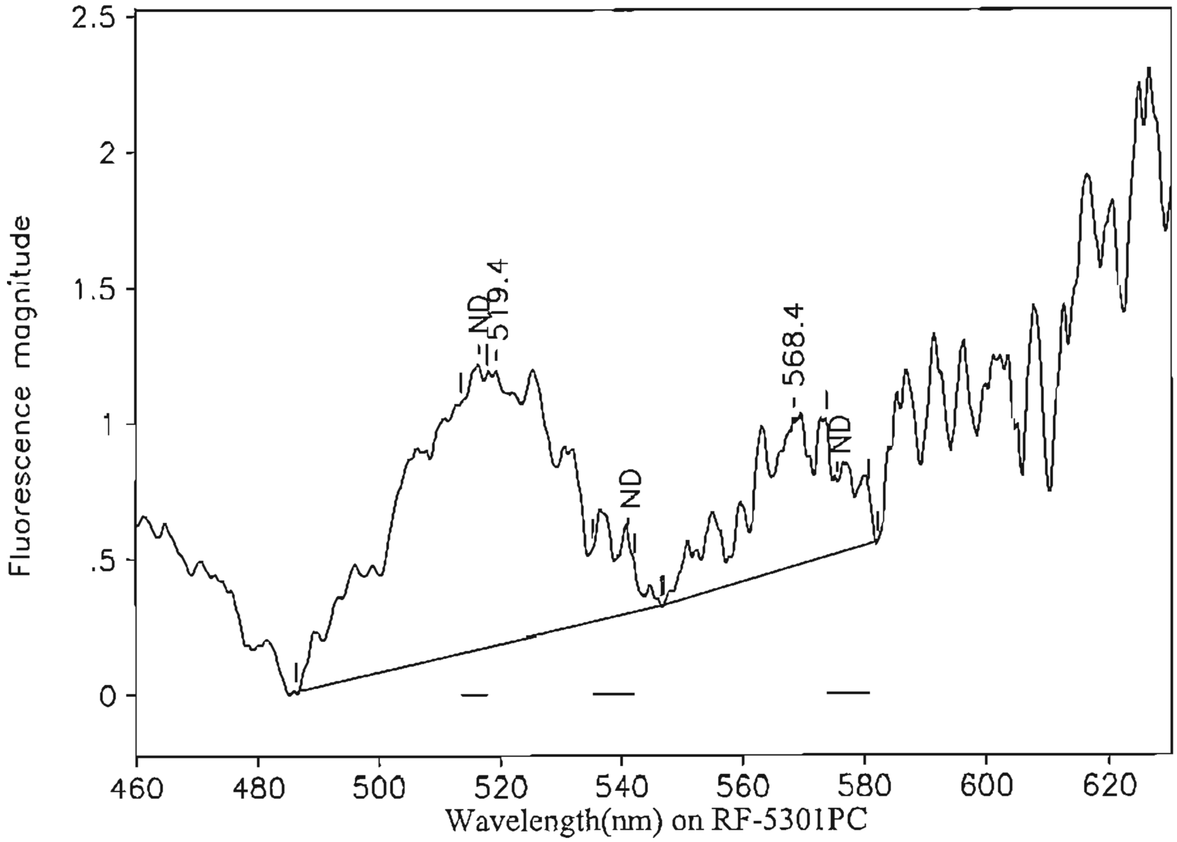
Station 4-255: MW-4 - 255 ft
OUL number: N8166 Analyzed: 01/24/05
Matrix: Elutant
Placed: 01/07/05 0825 Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	485.0	533.8	0.60	18.44	0.03	~~0.433~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-270: MW-4 - 270 ft
OUL number: N8167
Matrix: Elutant
Placed: 01/07/05 0825

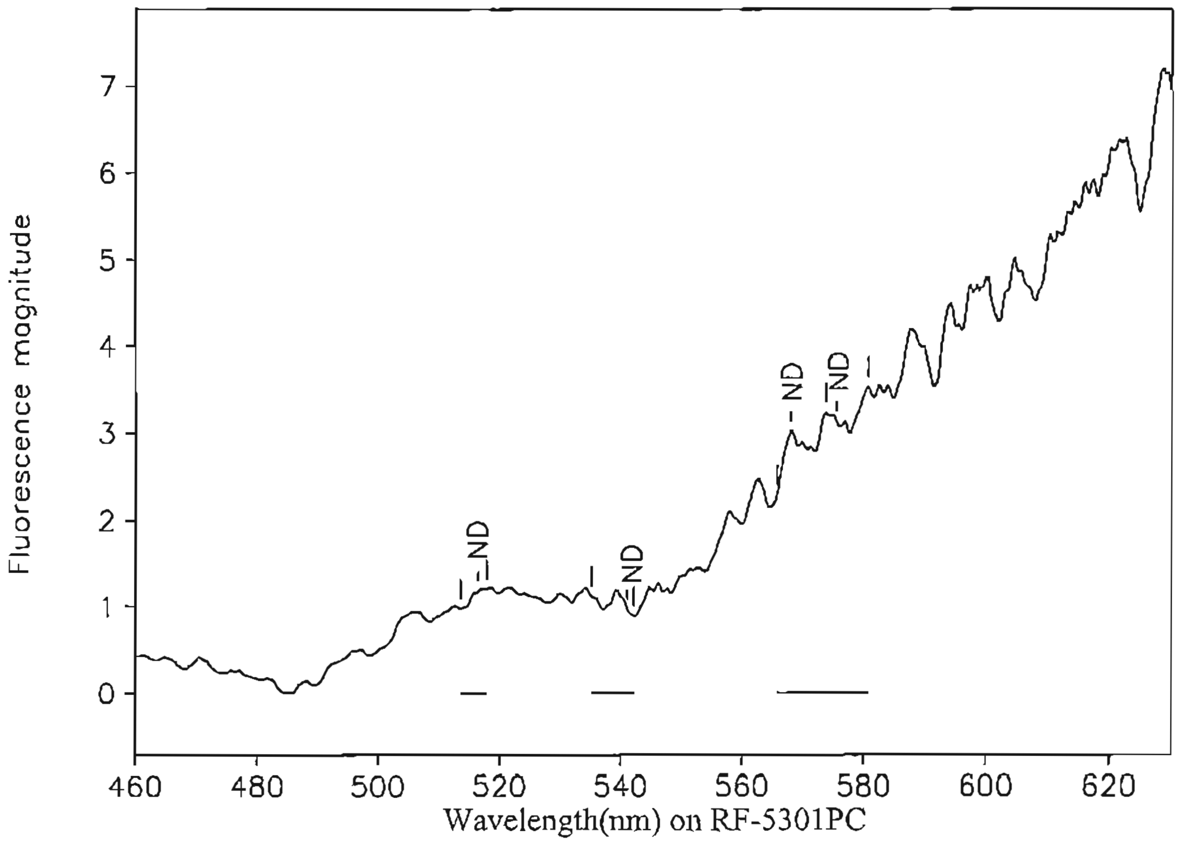
Analyzed: 01/24/05

Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.4	547.0	582.2	0.55	9.76	0.06	~~1.14~~ ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
519.4	486.2	546.6	1.01	33.25	0.03	~~0.78T~~ ND

Ozark Underground Laboratory



Station 4-285: MW-4 - 285 ft
OUL number: N8168
Matrix: Elutant
Placed: 01/07/05 0825

Analyzed: 01/25/05

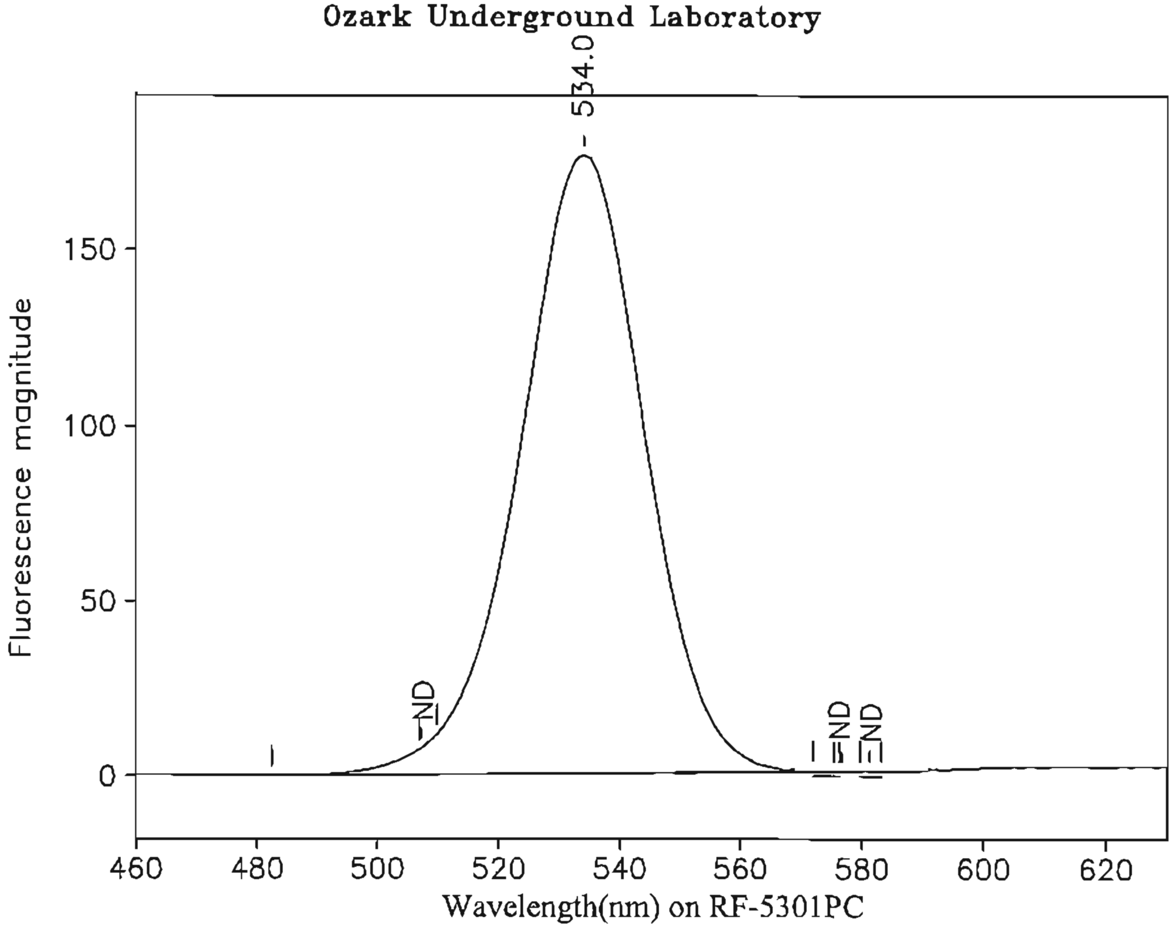
Collected: 01/20/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N8264 Analyzed: 01/24/05
Matrix: Water
Collected: 01/20/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
534.0	482.4	575.4	176.35	4,243.51	0.04	28.9
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

mw

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

February 11, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped February 3, 2005
Ozark Underground Laboratory (OUL) numbers N8364 through N8405 and N8423.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on February 4, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

f:\docs\coa\LakeOrienta08.doc

Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: February 3, 2005
Date Samples Rec'd at OUL: February 4, 2005
Date Analyzed by OUL: February 8, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N8364	1-215	MW-1 - 215 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8365	1-225	MW-1 - 225 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8366	1-235	MW-1 - 235 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8367	1-245	MW-1 - 245 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8368	1-255	MW-1 - 255 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8369	1-265	MW-1 - 265 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8370	1-275	MW-1 - 275 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8371	1-285	MW-1 - 285 ft	1/20 0915	2/3 0925	ND		ND		ND	
N8372	2-135	MW-2 - 135 ft	1/20 0925	2/3 1000	ND (1)		538.9	339	ND	
N8373	2-150	MW-2 - 150 ft	1/20 0925	2/3 1000	ND (1)		538.9	656	ND	
N8374	2-165	MW-2 - 165 ft	1/20 0925	2/3 1000	ND (1)		538.5	341	ND	
N8375	2-180	MW-2 - 180 ft	1/20 0925	2/3 1000	ND (1)		539.3	597	ND	
N8376	2-195	MW-2 - 195 ft	1/20 0925	2/3 1000	ND (1)		539.2	1,510	ND	
N8377	2-210	MW-2 - 210 ft	1/20 0925	2/3 1000	ND (1)		539.5	1,200	ND	
N8378	2-225	MW-2 - 225 ft	1/20 0925	2/3 1000	ND (1)		539.5	1,840	ND	
N8379	2-240	MW-2 - 240 ft	1/20 0925	2/3 1000	ND (1)		539.3	821	ND	
N8380	Laboratory Control Charcoal Blank									
N8381	2-255	MW-2 - 255 ft	1/20 0925	2/3 1000	ND (1)		539.0	1,040	ND	
N8382	2-270	MW-2 - 270 ft	1/20 0925	2/3 1000	ND (1)		539.5	955	ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory for CH2MHill

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N8383	2-285	MW-2 - 285 ft	1/20 0925	2/3 1000	ND (1)		539.5	259	ND	
N8384	2-300	MW-2 - 300 ft	1/20 0925	2/3 1000	ND (1)		539.5	58.1	ND	
N8385	3-175	MW-3 - 175 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8386	3-185	MW-3 - 185 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8387	3-195	MW-3 - 195 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8388	3-205	MW-3 - 205 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8389	3-215	MW-3 - 215 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8390	3-225	MW-3 - 225 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8391	3-235	MW-3 - 235 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8392	3-245	MW-3 - 245 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8393	3-255	MW-3 - 255 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8394	3-265	MW-3 - 265 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8395	3-275	MW-3 - 275 ft	1/20 0830	2/3 0850	ND		ND		ND	
N8396	4-165	MW-4 - 165 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8397	4-180	MW-4 - 180 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8398	4-195	MW-4 - 195 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8399	4-210	MW-4 - 210 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8400	Laboratory Control Charcoal Blank									
N8401	4-225	MW-4 - 225 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8402	4-240	MW-4 - 240 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8403	4-255	MW-4 - 255 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8404	4-270	MW-4 - 270 ft	1/20 0745	2/3 0810	ND		ND		ND	
N8405	4-285	MW-4 - 285 ft	1/20 0745	2/3 0810	ND		ND		ND	
(Footnotes at end of Table)										(continued)

Ozark Underground Laboratory for CH2MHill

Table 1. **Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes.** Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Peak	Fluorescein Conc.	Eosine Peak	Eosine Conc.	RWT Peak	RWT Conc.
(continued)										
N8423	2-WA	MW-2 - Water	Water	2/3 1015	ND		534.0	25.6	ND	

FOOTNOTES:

ND = No dye detected

(1) = An eosine peak is present which is asymmetrical and skewed towards the lower wavelenths.
This type of peak could mask the presence of fluorescein dye.

OZARK UNDERGROU. LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 6 Samples Collected By: Mike Burns
Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL
Date Samples Shipped: 2/3/05 Date Samples Received: 2/4/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No
Bill to: Send Results to: CH2M Hill
Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8364	1-215	MW-1 – 215 ft	1/20/05	0915	2/3/05	0925	0
1	N8365	1-225	MW-1 – 225 ft					0
1	N8366	1-235	MW-1 – 235 ft					0
1	N8367	1-245	MW-1 – 245 ft					0
1	N8368	1-255	MW-1 – 255 ft					0
1	N8369	1-265	MW-1 – 265 ft					0
1	N8370	1-275	MW-1 – 275 ft					0
1	N8371	1-285	MW-1 – 285 ft					0
0		1-WA	MW-1 – Water Sample				0940	1

COMMENTS:

This sheet filled out by OUL staff? Yes No ✓ Charts for samples on this page proofed by OUL: mma

Project 621 Analyzed 2/8/05 by OUL Page 1 of 4

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 6 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 2/3/05 Date Samples Received: 2/4/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nodarse

Please indicate stations where dye was visible in the field
for field technician use - use black ink only

OUL use only # CHAR REC'D	OUL use only LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	OUL use only # WATER REC'D
1	N8372	2-135	MW-2 – 135 ft	1/20/05	0925	2/3/05	1000	0
1	N8373	2-150	MW-2 – 150 ft					0
1	N8374	2-165	MW-2 – 165 ft					0
1	N8375	2-180	MW-2 – 180 ft					0
1	N8376	2-195	MW-2 – 195 ft					0
1	N8377	2-210	MW-2 – 210 ft					0
1	N8378	2-225	MW-2 – 225 ft					0
1	N8379	2-240	MW-2 – 240 ft					0
1	N8381	2-255	MW-2 – 255 ft					0
1	N8382	2-270	MW-2 – 270 ft					0
1	N8383	2-285	MW-2 – 285 ft					0
1	N8384	2-300	MW-2 – 300 ft					0
0		2-WA	MW-2 – Water Sample				1015	1

COMMENTS: Charcoal Blank N8380

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: mma 828

Analyzed 2/8/05 by [illegible]

OZARK UNDERGROU..D LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 6 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 2/3/05 Date Samples Received: 2/4/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No ____

Bill to: ____ Send Results to: ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nodarse

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8385	3-175	MW-3 – 175 ft	1/20/05	0830	2/3/05	0850	0
1	N8386	3-185	MW-3 – 185 ft					0
1	N8387	3-195	MW-3 – 195 ft					0
1	N8388	3-205	MW-3 – 205 ft					0
1	N8389	3-215	MW-3 – 215 ft					0
1	N8390	3-225	MW-3 – 225 ft					0
1	N8391	3-235	MW-3 – 235 ft					0
1	N8392	3-245	MW-3 – 245 ft					0
1	N8393	3-255	MW-3 – 255 ft					0
1	N8394	3-265	MW-3 – 265 ft					0
1	N8395	3-275	MW-3 – 275 ft					0
0		3-WA	MW-3 – Water Sample				0910	

COMMENTS: ____

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829

Analyzed 2/8/05 by MK

OZARK UNDERGROU. LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 6 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 2/3/05 Date Samples Received: 2/4/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2 M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8396	4-165	MW-4 – 165 ft	1/20/05	0745	2/3/05	0810	
1	N8397	4-180	MW-4 – 180 ft					
1	N8398	4-195	MW-4 – 195 ft					
1	N8399	4-210	MW-4 – 210 ft					
1	N8401	4-225	MW-4 – 225 ft					
1	N8402	4-240	MW-4 – 240 ft					
1	N8403	4-255	MW-4 – 255 ft					
1	N8404	4-270	MW-4 – 270 ft					
1	N8405	4-285	MW-4 – 285 ft					
0		4-WA	MW-5 – Water Sample				0830	1

COMMENTS: Charcoal Blank N8400

This sheet filled out by OUL staff? Yes No ✓ Charts for samples on this page proofed by OUL: [illegible]

830

Analyzed 2/8/05 by [illegible]

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2M Hill) Week No: 6 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: M. Arnold

Date Samples Shipped: 2/3/05 Date Samples Received: 2/4/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No ___

Bill to: ___ Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ___ Ship cooler to: Nodarse & Assoc.

water only

Please indicate stations where dye was visible in the field

for field technician use - use black ink only

LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	COLLECTED 2005 DATE	TIME	OUL use only # WATER REC'D
	1-WA	MW-1 - Water Sample	2/3	0940	1
N8423	2-WA	MW-2 - Water Sample	2/3	1015	1
	3-WA	MW-3 - Water Sample	2/3	0910	1
	4-WA	MW-4 - Water Sample	2/3	0830	1

COMMENTS: Chart for sample on this page printed by Anna / OUL 831

This Sheet filled out by OUL Staff mk

Page 1 of 1 Analyzed 2/8/05 by mc

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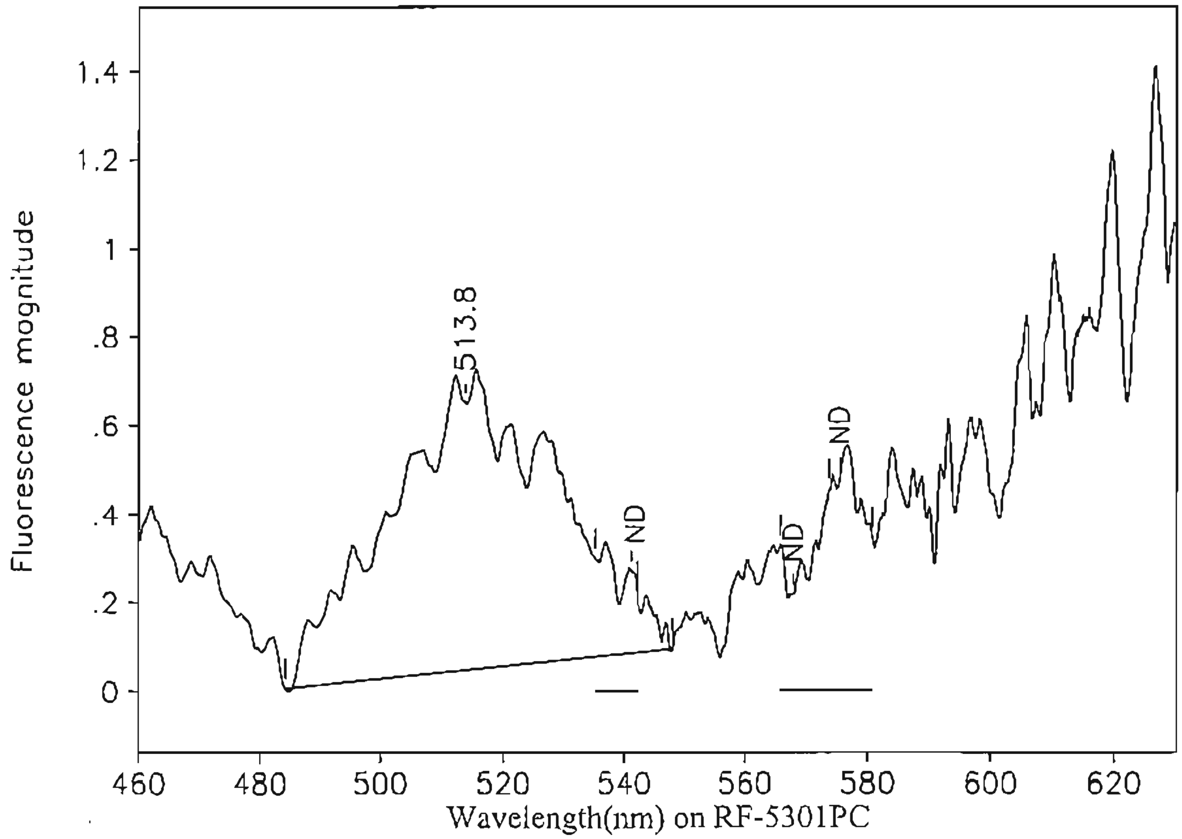
Ozark Underground Laboratory



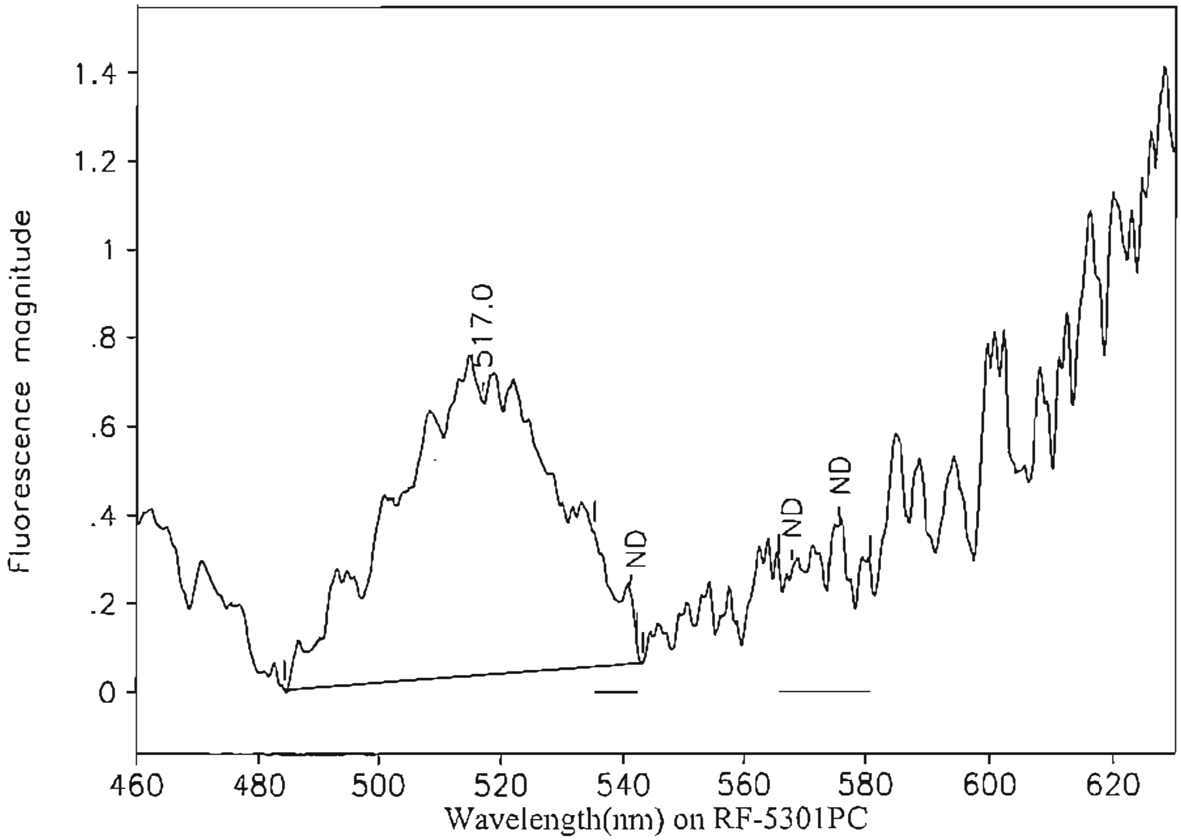
Station 1-215: MW-1 - 215 ft
OUL number: N8364 — Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 — Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
513.8	484.2	548.0	0.60	21.30	0.03	~~0.481~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



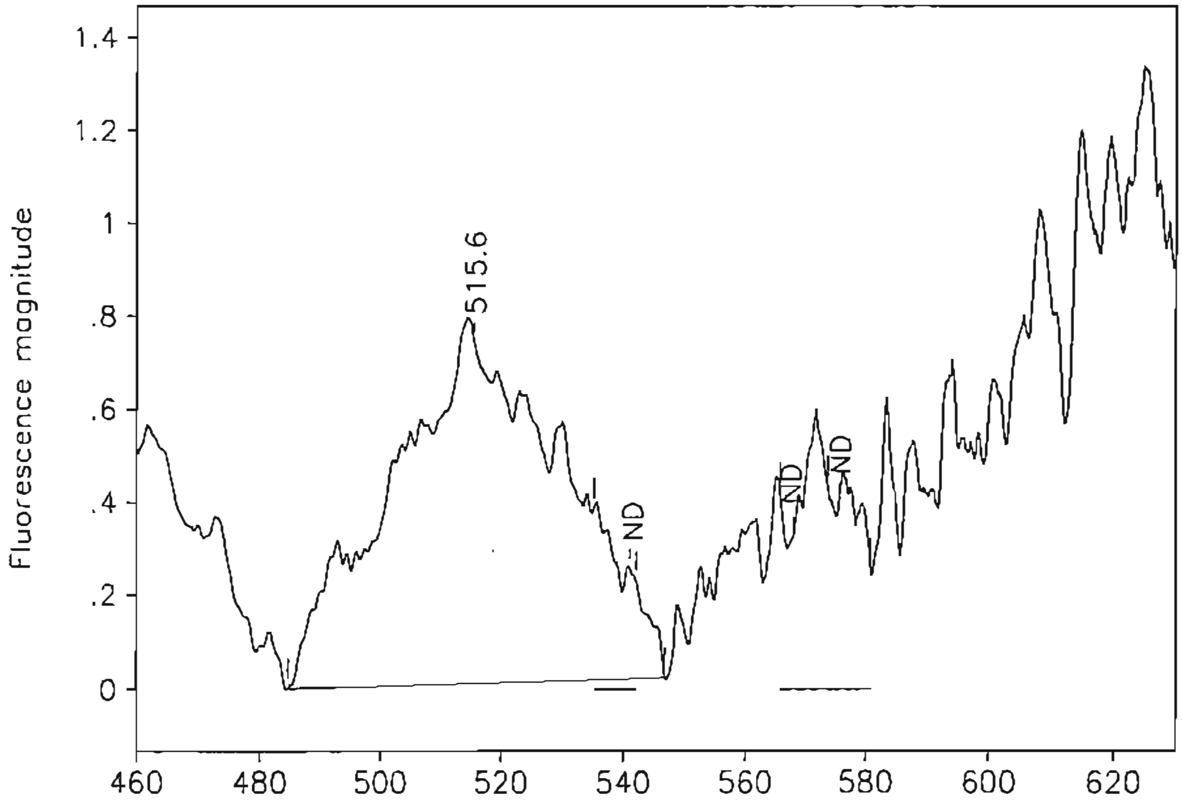
Station 1-225: MW-1 - 225 ft
OUL number: N8365 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	484.2	543.2	0.62	22.20	0.03	~~0.501~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



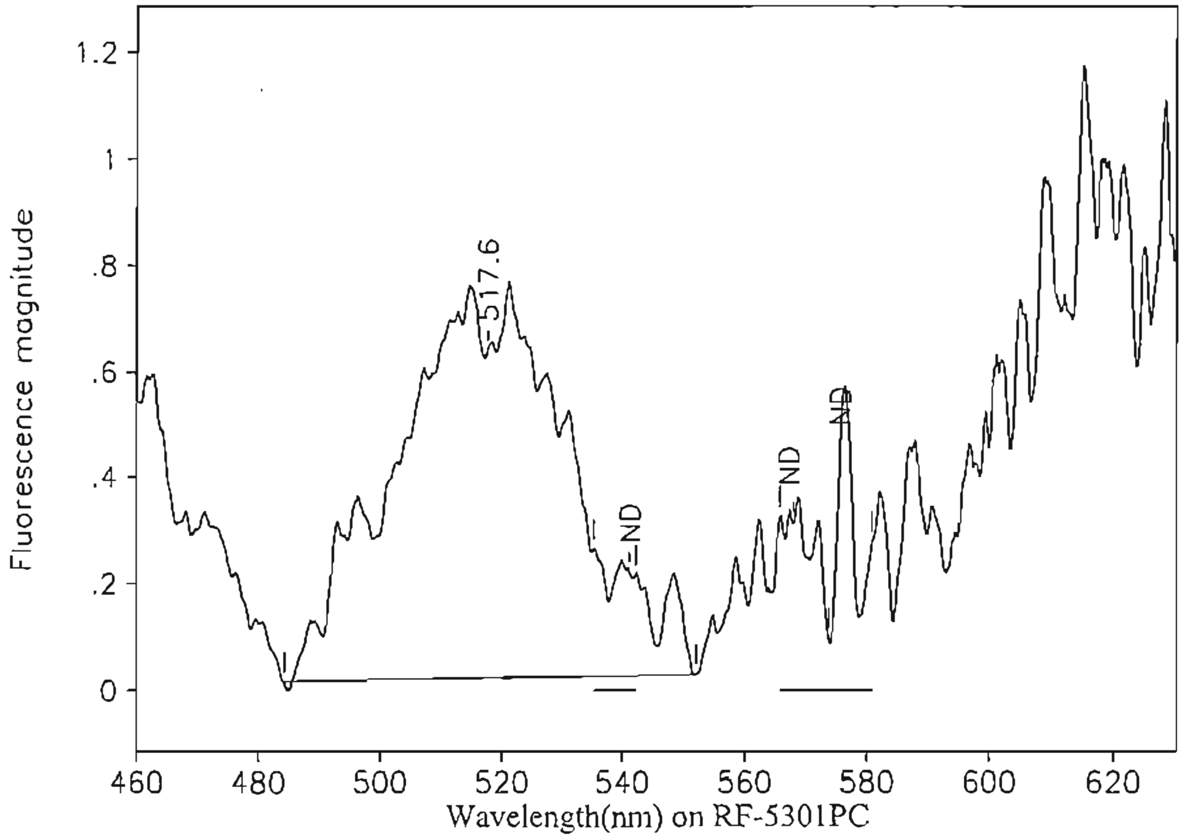
Station 1-235: MW-1 - 235 ft
OUL number: N8366 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	484.6	546.8	0.73	25.34	0.03	~~0.572~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



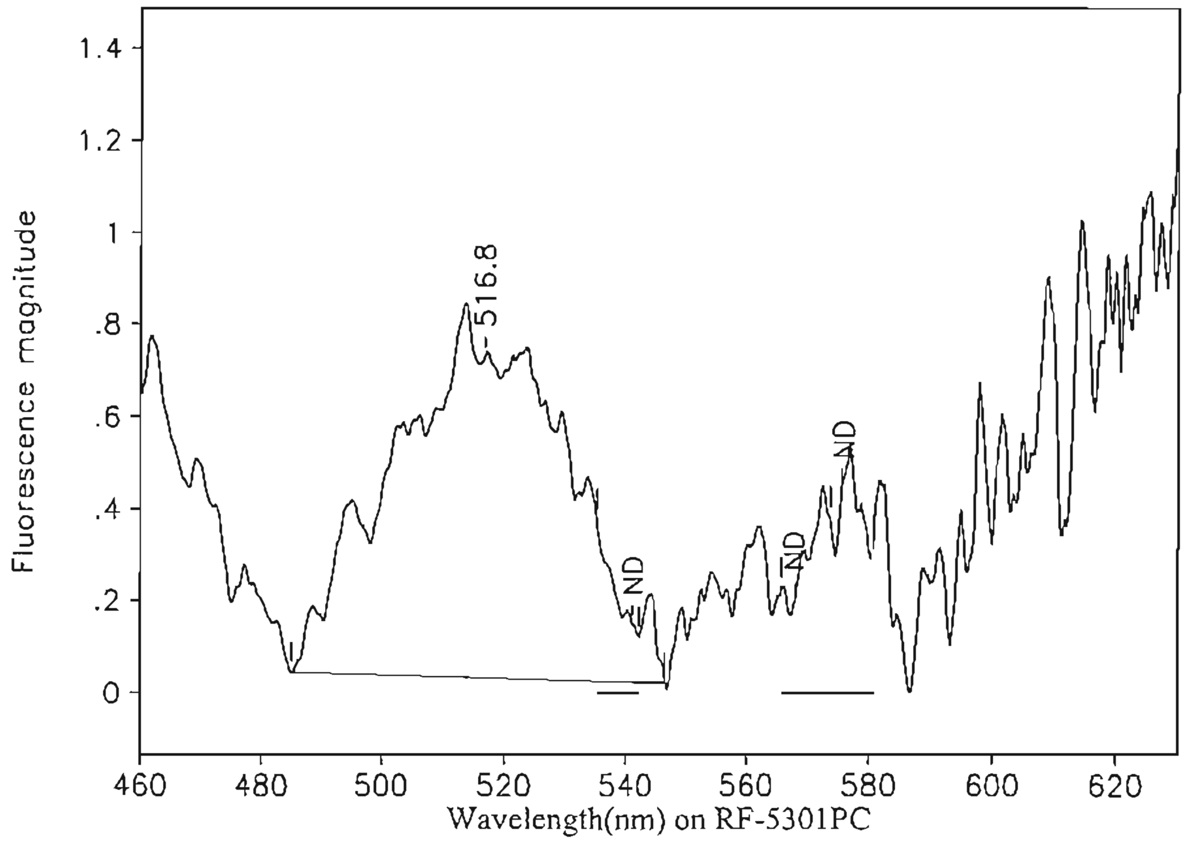
Station 1-245: MW-1 - 245 ft
OUL number: N8367 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	484.2	552.2	0.61	24.71	0.02	~~0.558~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-255: MW-1 - 255 ft
OUL number: N8368
Matrix: Elutant
Placed: 01/20/05 0915

Analyzed: 02/08/05

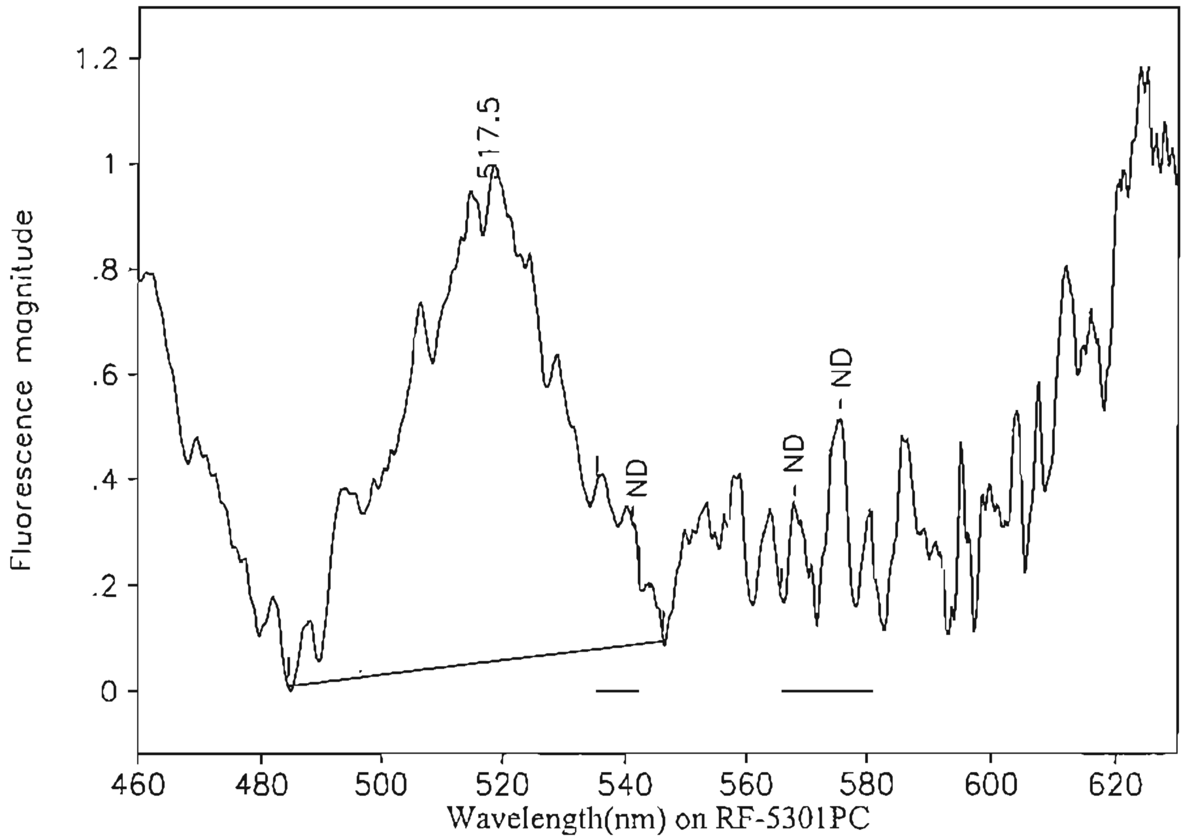
Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	485.0	546.6	0.69	26.02	0.03	~~0.587~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



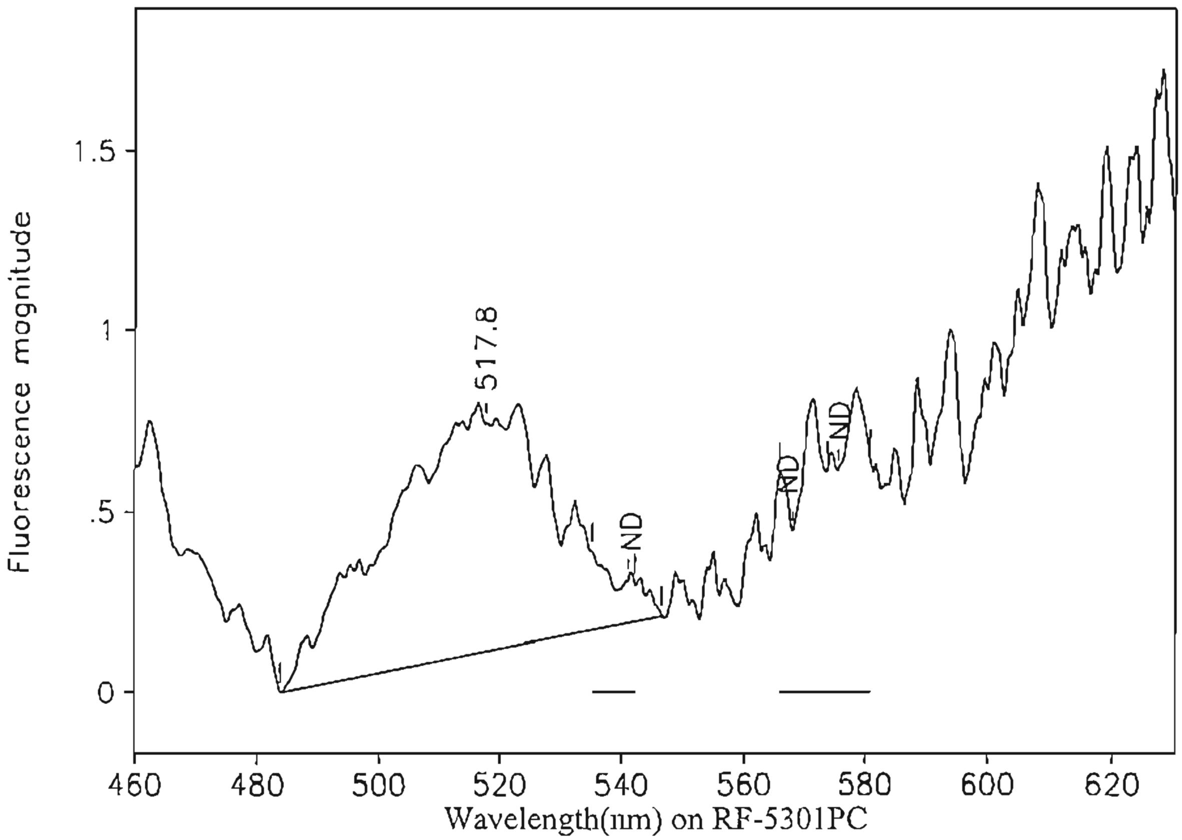
Station 1-265: MW-1 - 265 ft
OUL number: N8369 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.5	484.4	546.2	0.86	27.83	0.03	~~0.628~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-275: MW-1 -275 ft
OUL number: N8370
Matrix: Elutant
Placed: 01/20/05 0915

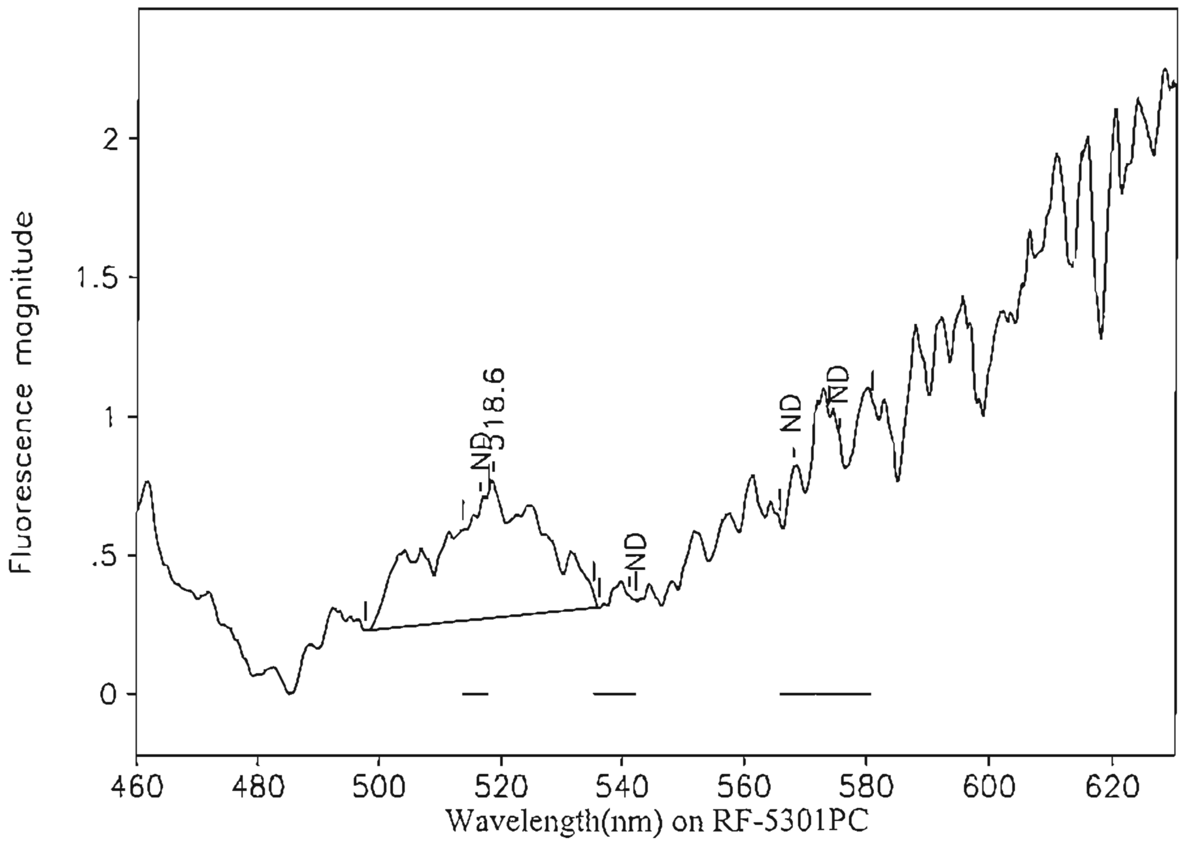
Analyzed: 02/08/05
Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	483.8	546.6	0.63	22.42	0.03	~~0.506~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-285: MW-1 - 285 ft
OUL number: N8371 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0915 Collected: 02/03/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.6	497.8	536.2	0.49	9.99	0.05	~~0.225~~ ND

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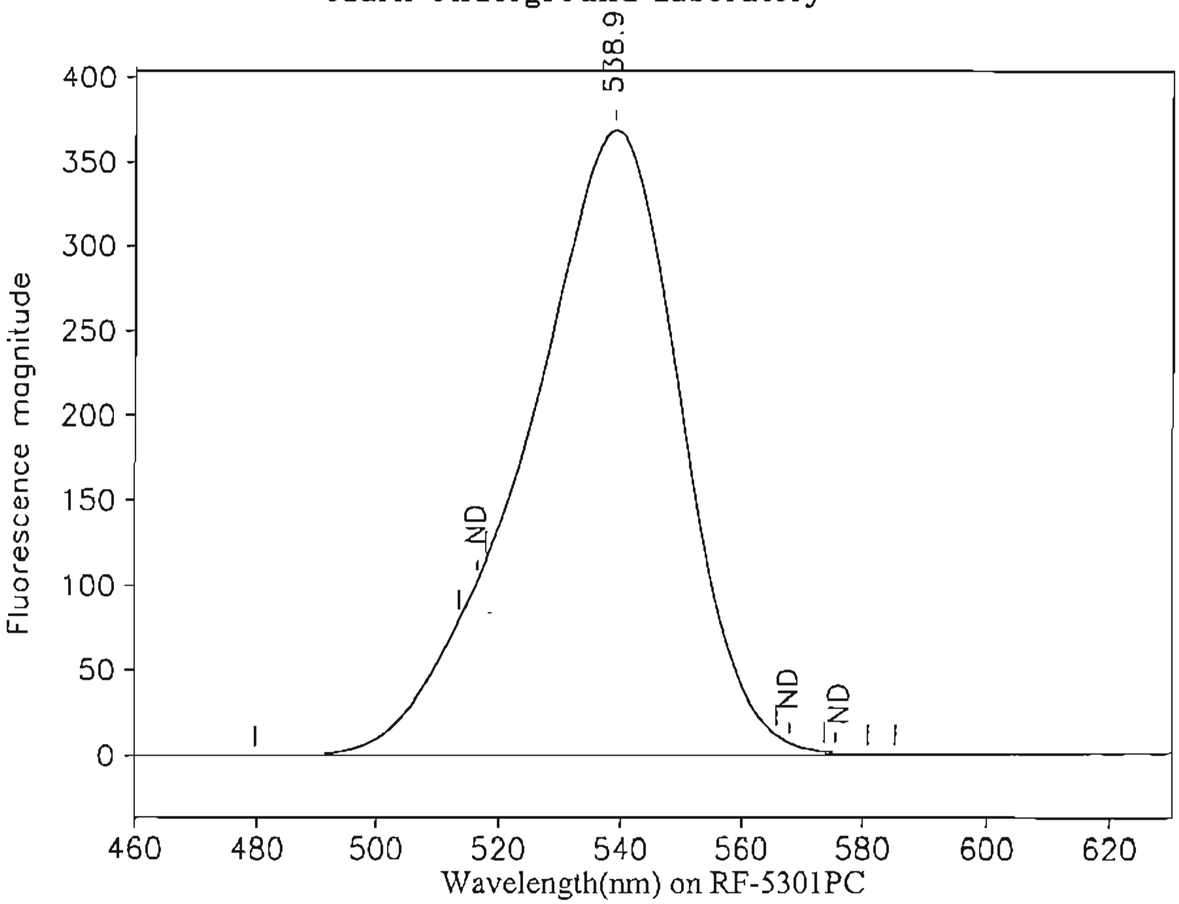

Station 2-135: MW-2 - 135 ft
OUL number: N8372 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0925 Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
538.9	479.7	585.1	368.16	10,826.80	0.03	339
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Nr

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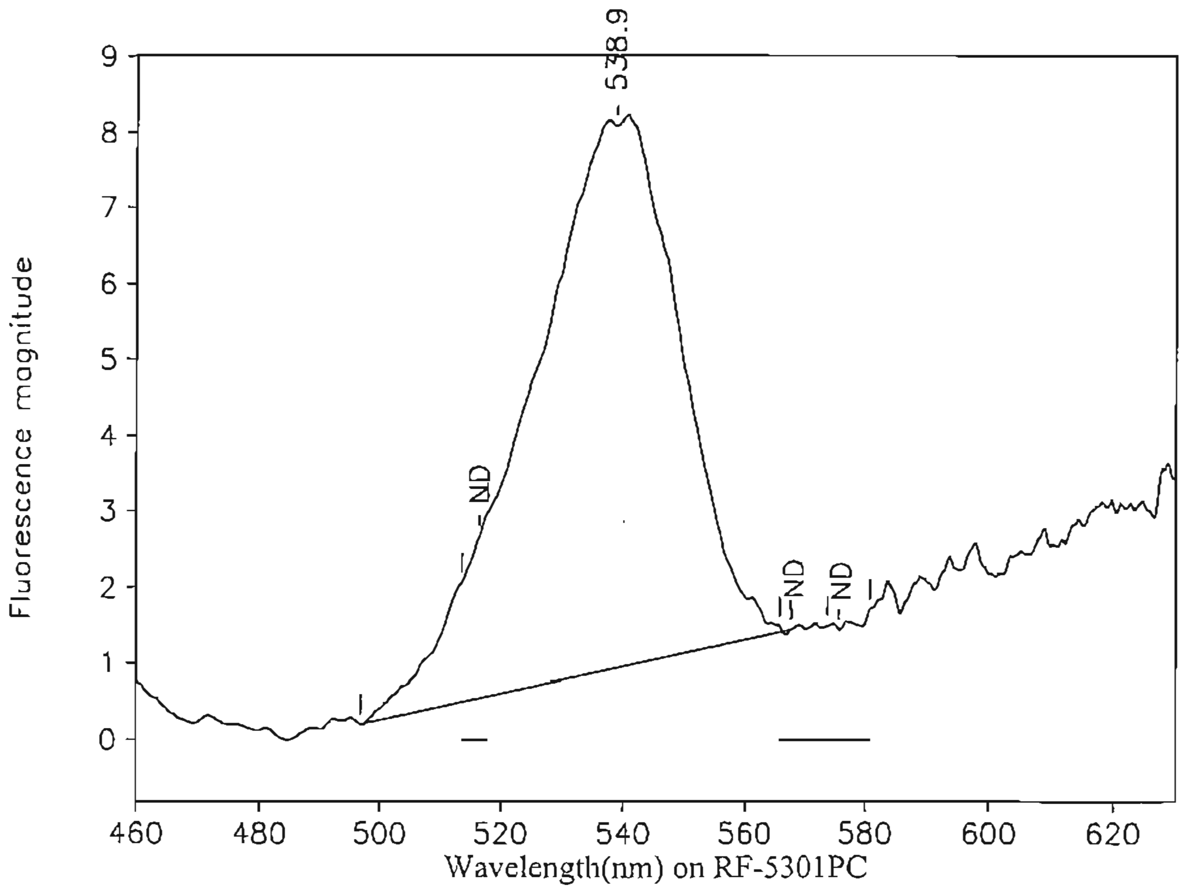


Station 2-150: MW-2 - 150 ft
OUL number: N8373
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

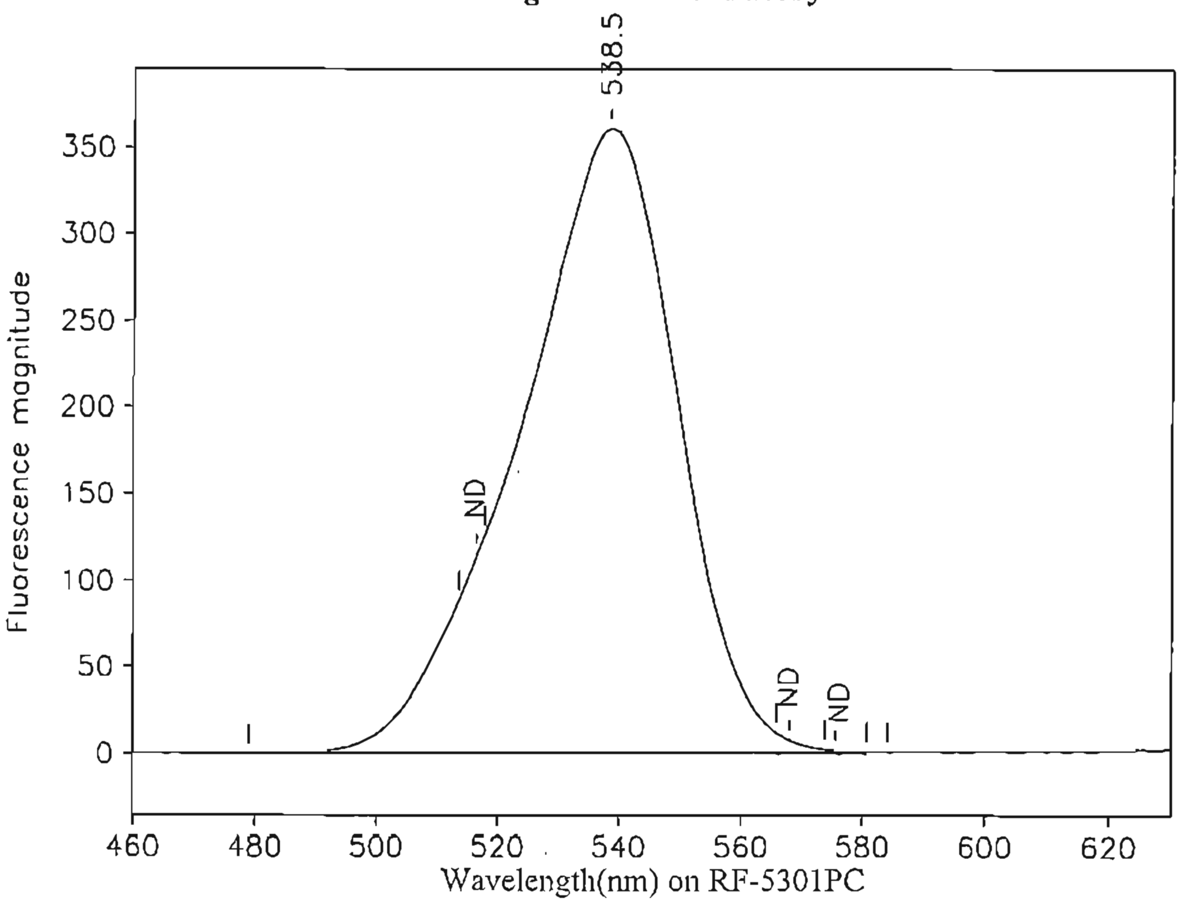
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
538.9	496.8	567.6	7.15	209.37	0.03	656
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-165: MW-2 - 165 ft
OUL number: N8374
Matrix: Elutant
Placed: 01/20/05 0925

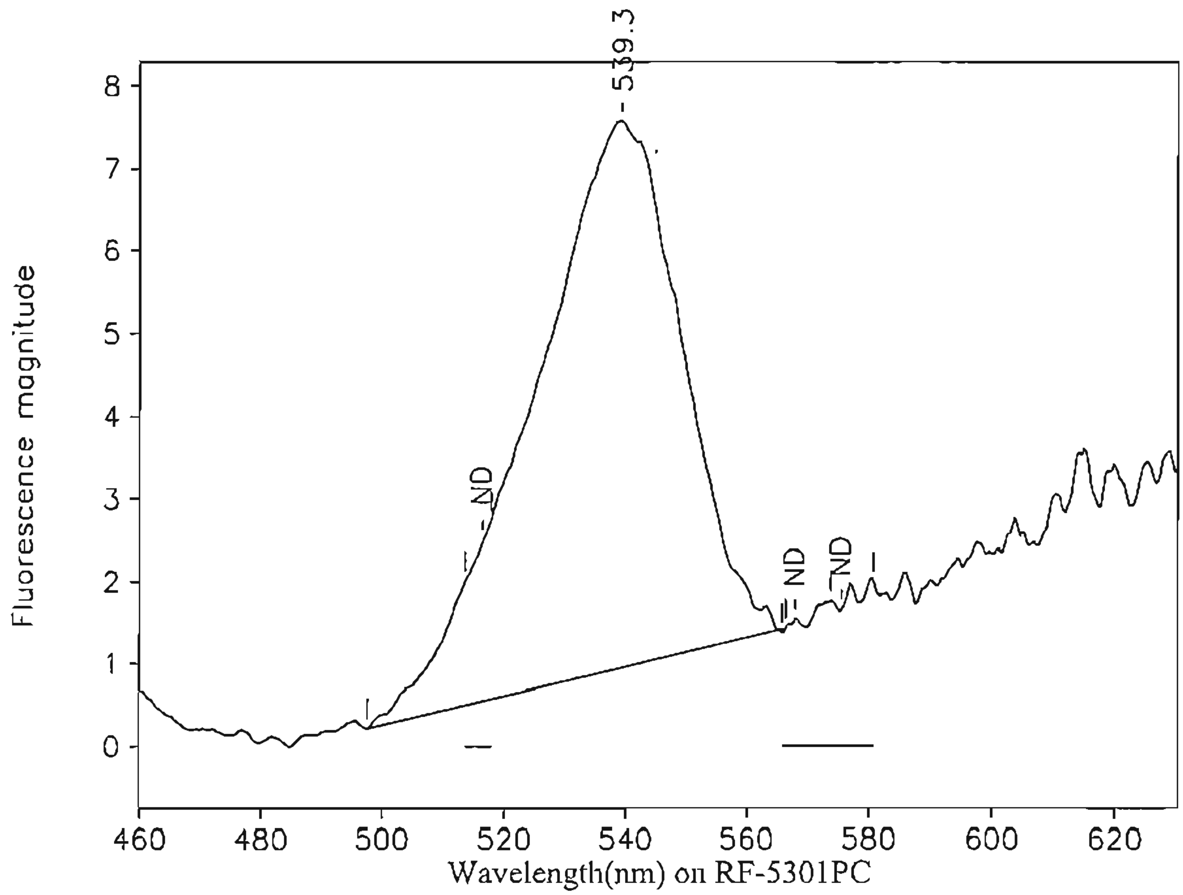
Analyzed: 02/08/05
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
538.5	479.1	584.1	359.76	10,868.80	0.03	341
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-180: MW-2 - 180 ft
OUL number: N8375
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

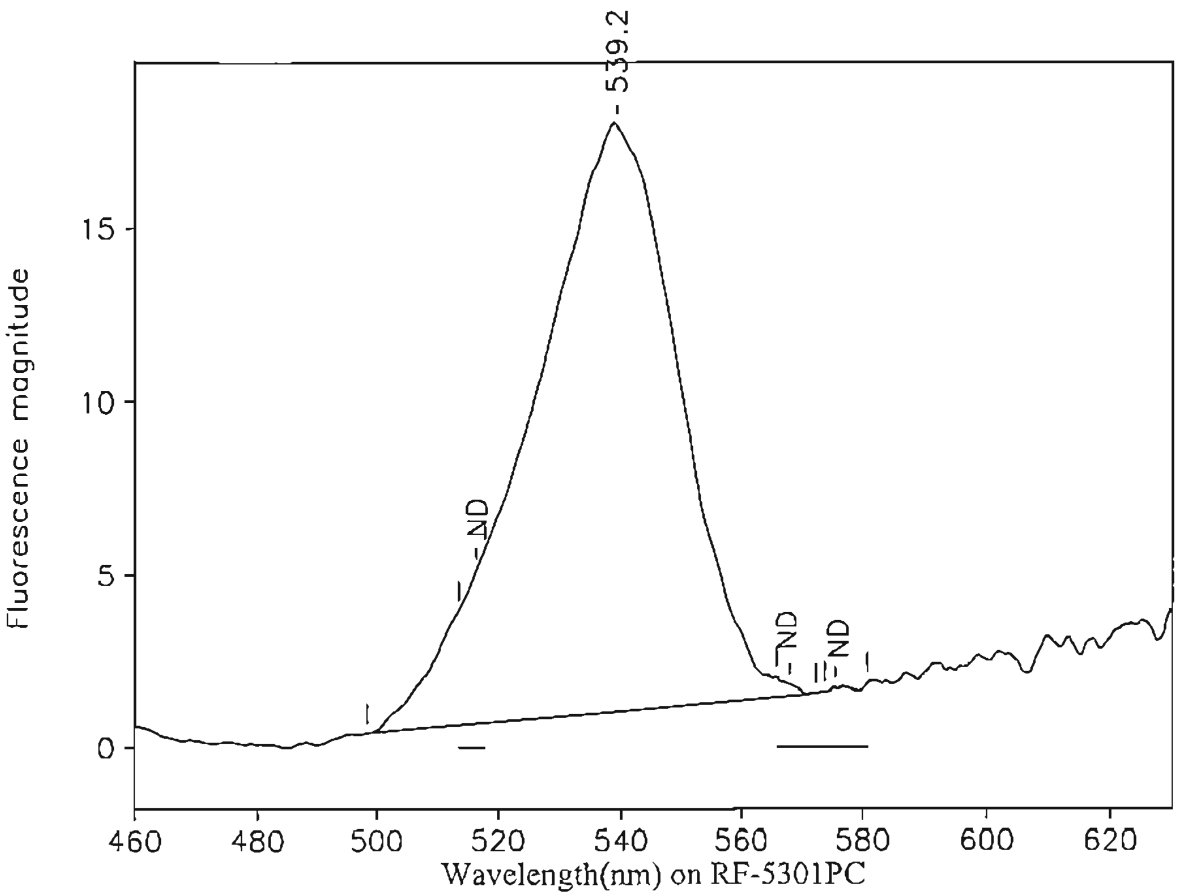
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
539.3	497.6	566.4	6.61	190.42	0.03	597
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-195: MW-2 - 195 ft
OUL number: N8376
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

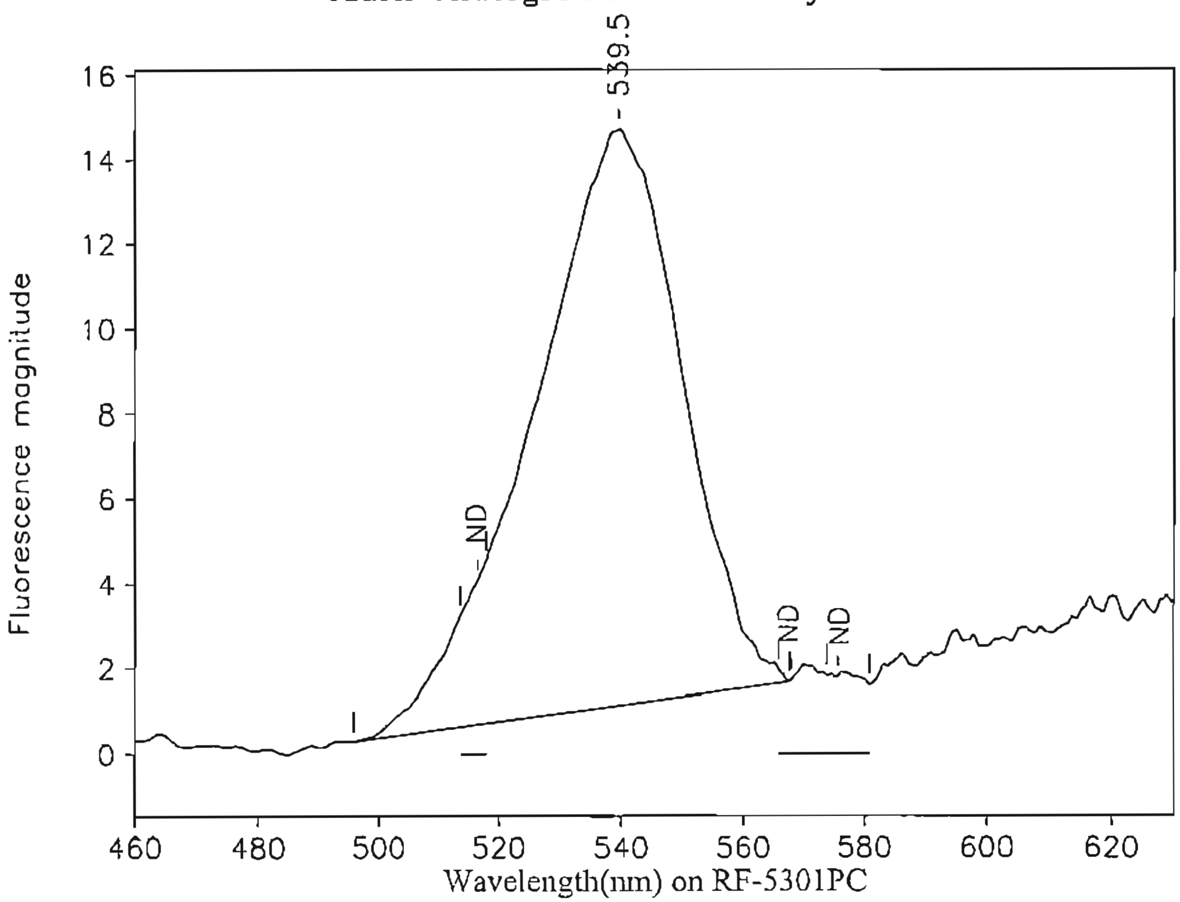
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.2	498.4	572.4	16.93	480.48	0.04	1,510
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-210: MW-2 - 210 ft
OUL number: N8377
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

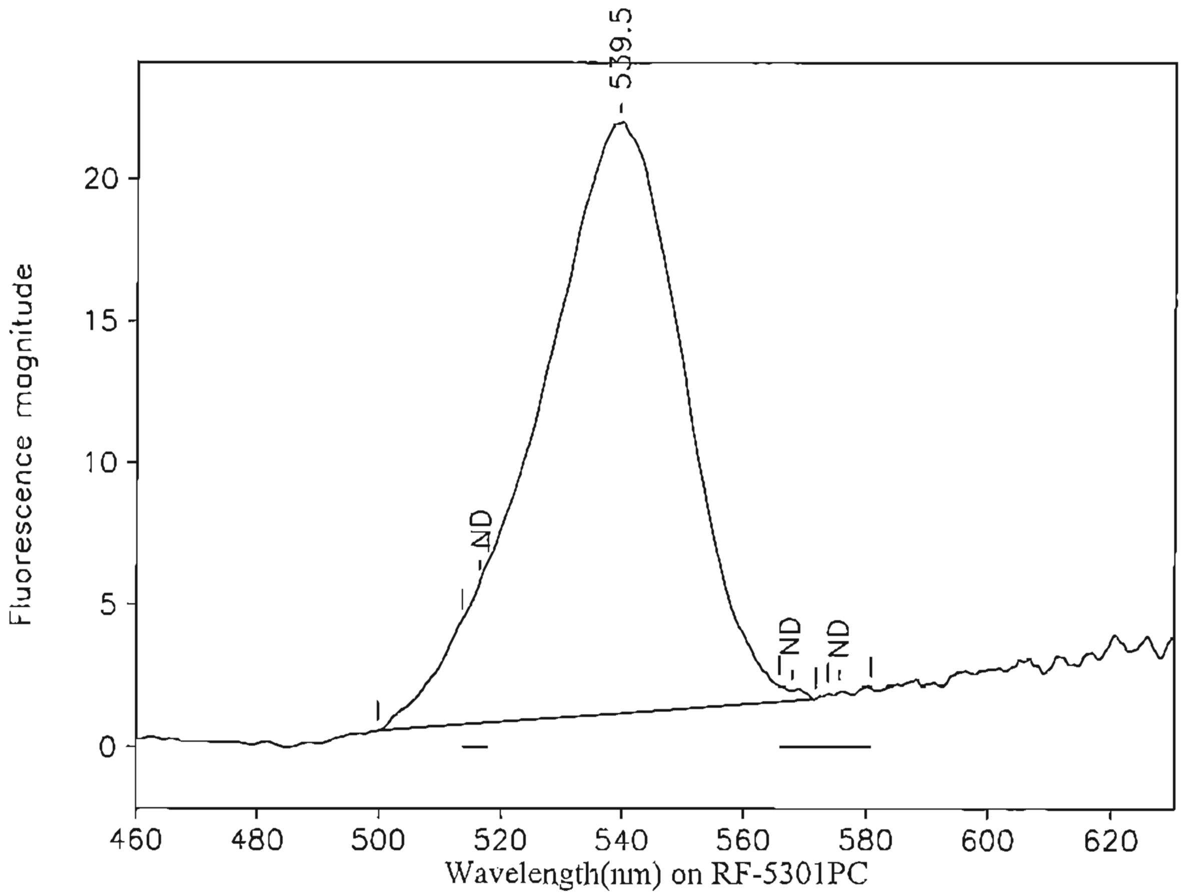
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (i)
539.5	495.8	567.6	13.58	384.24	0.04	1,200
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-225: MW-2 - 225 ft
OUL number: N8378
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

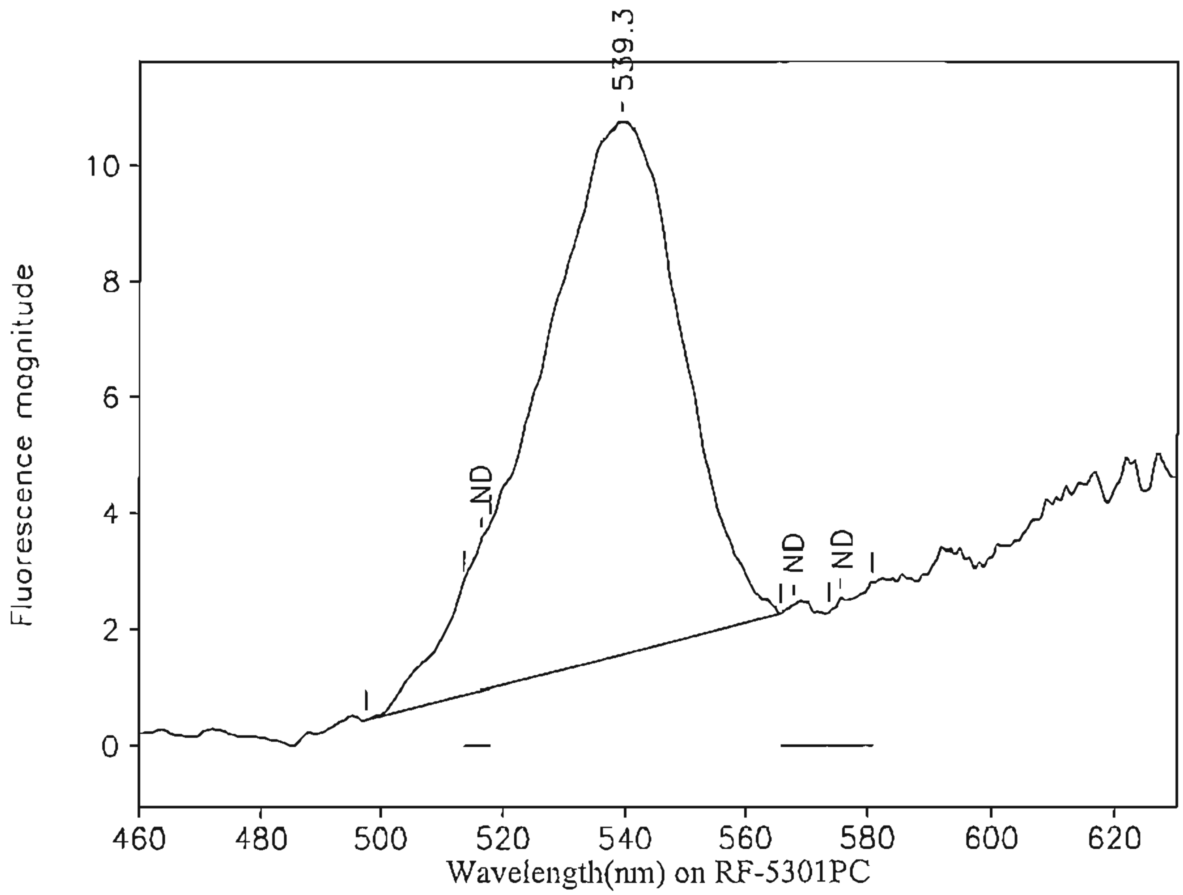
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.5	499.8	571.8	20.76	586.37	0.04	1,840
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N8379
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

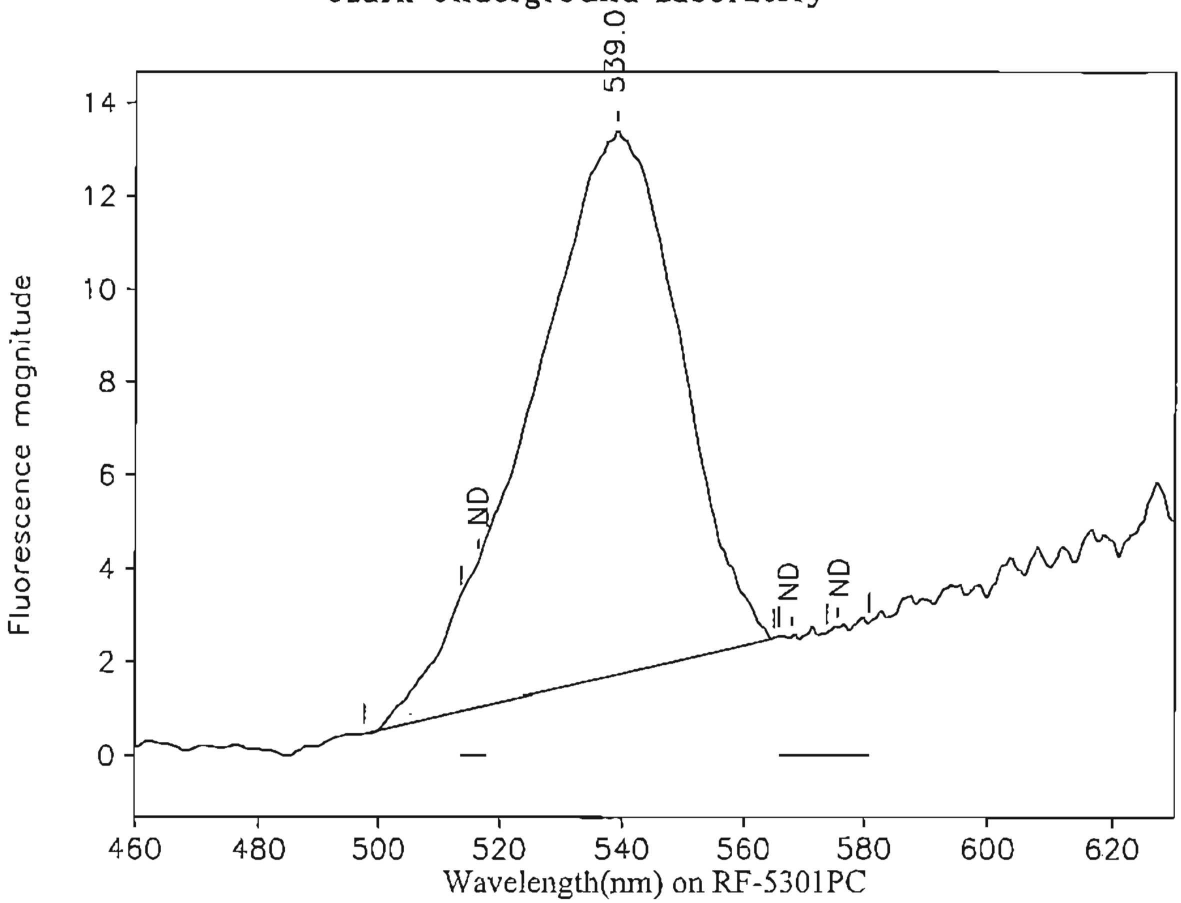
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1?
539.3	497.6	565.8	9.18	261.83	0.04	821
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N8381
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

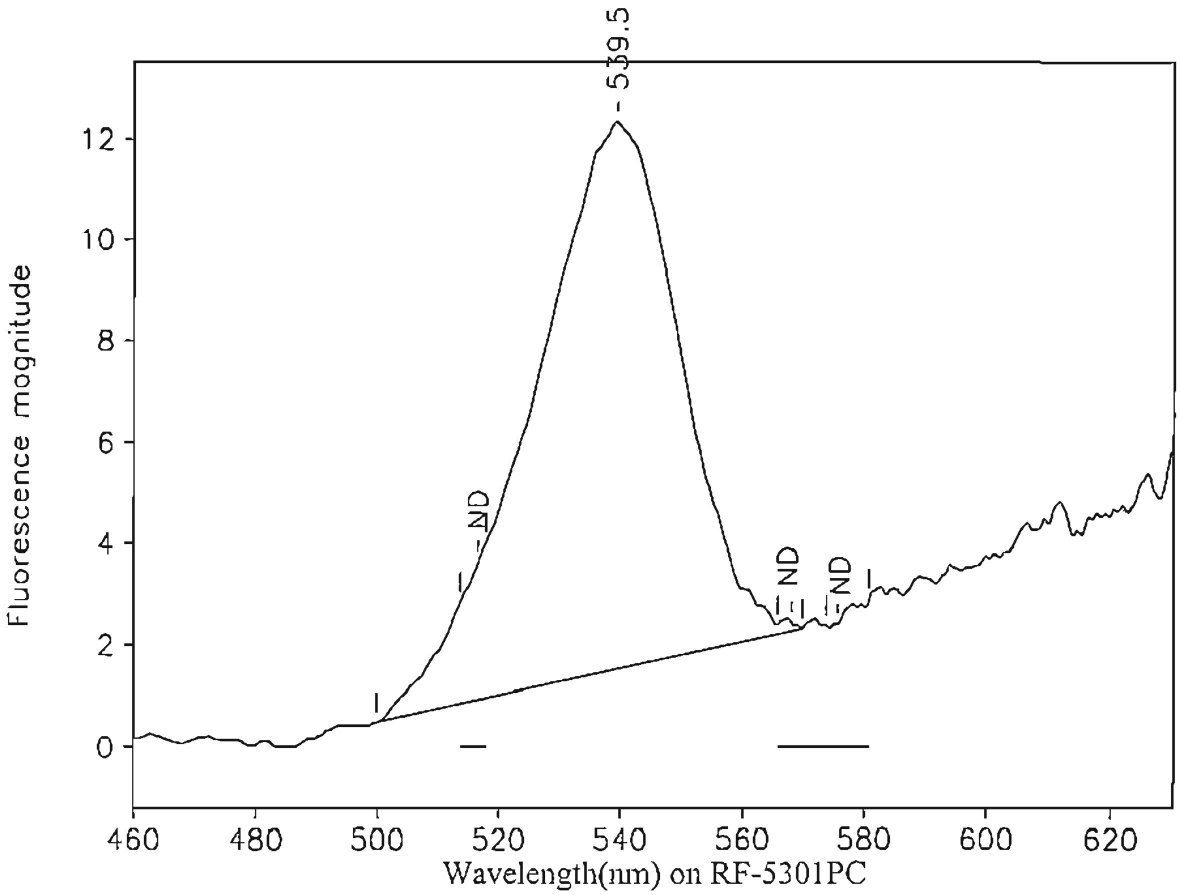
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.0	497.6	565.0	11.66	331.45	0.04	1,040
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-270: MW-2 - 270 ft
OUL number: N8382
Matrix: Elutant
Placed: 01/20/05 0925

Diluted: 1 to 100
Analyzed: 02/08/05

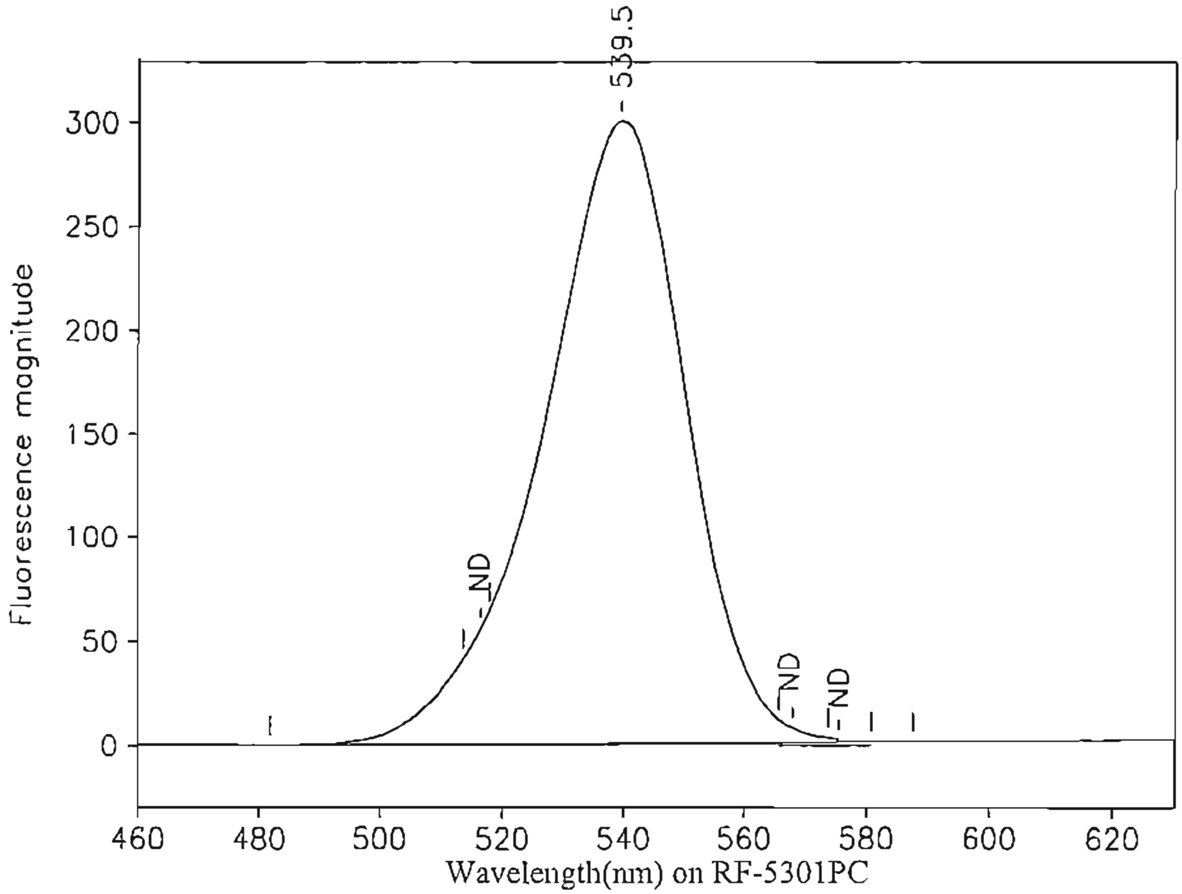
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.5	499.8	569.8	10.81	304.51	0.04	955
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



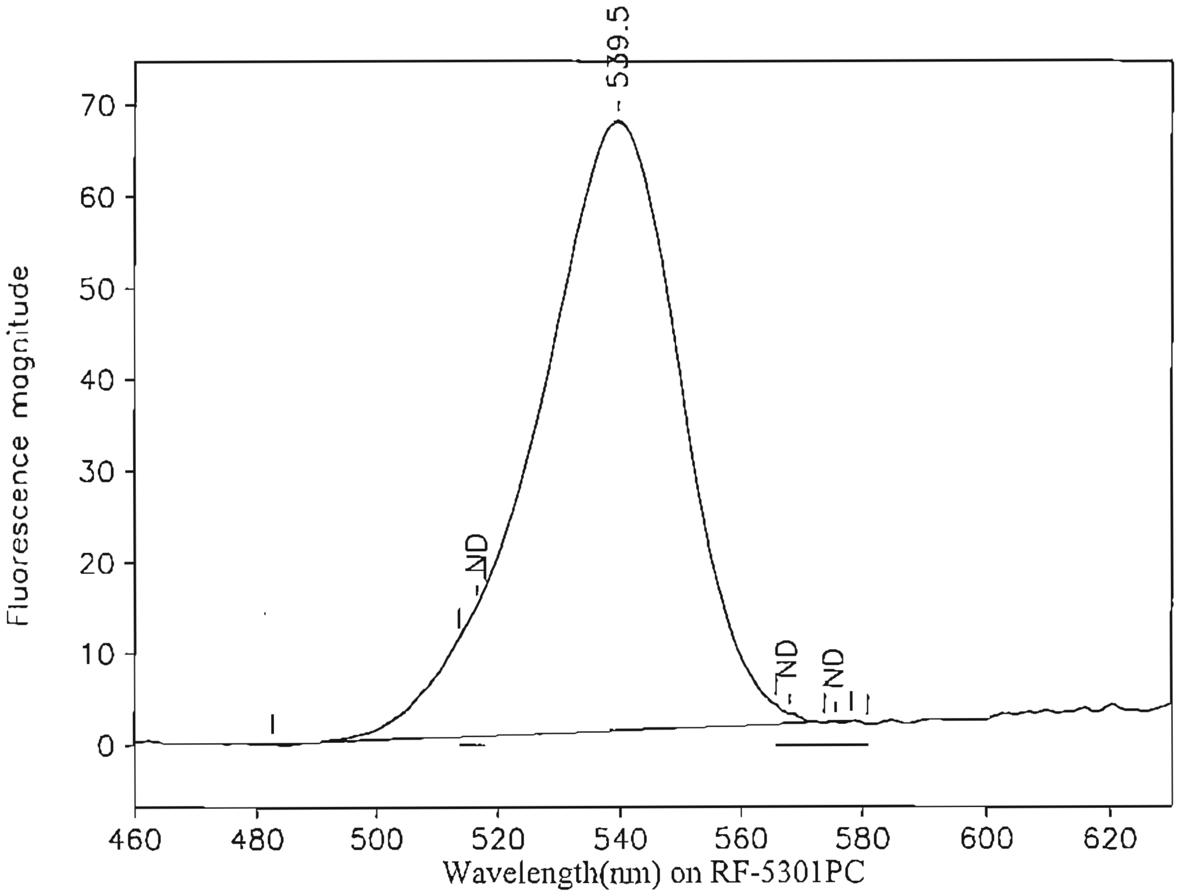
Station 2-285: MW-2 - 285 ft
OUL number: N8383 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0925 Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.5	481.8	587.5	299.91	8,257.51	0.04	259
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-300: MW-2 - 300 ft
OUL number: N8384
Matrix: Elutant
Placed: 01/20/05 0925

Analyzed: 02/08/05

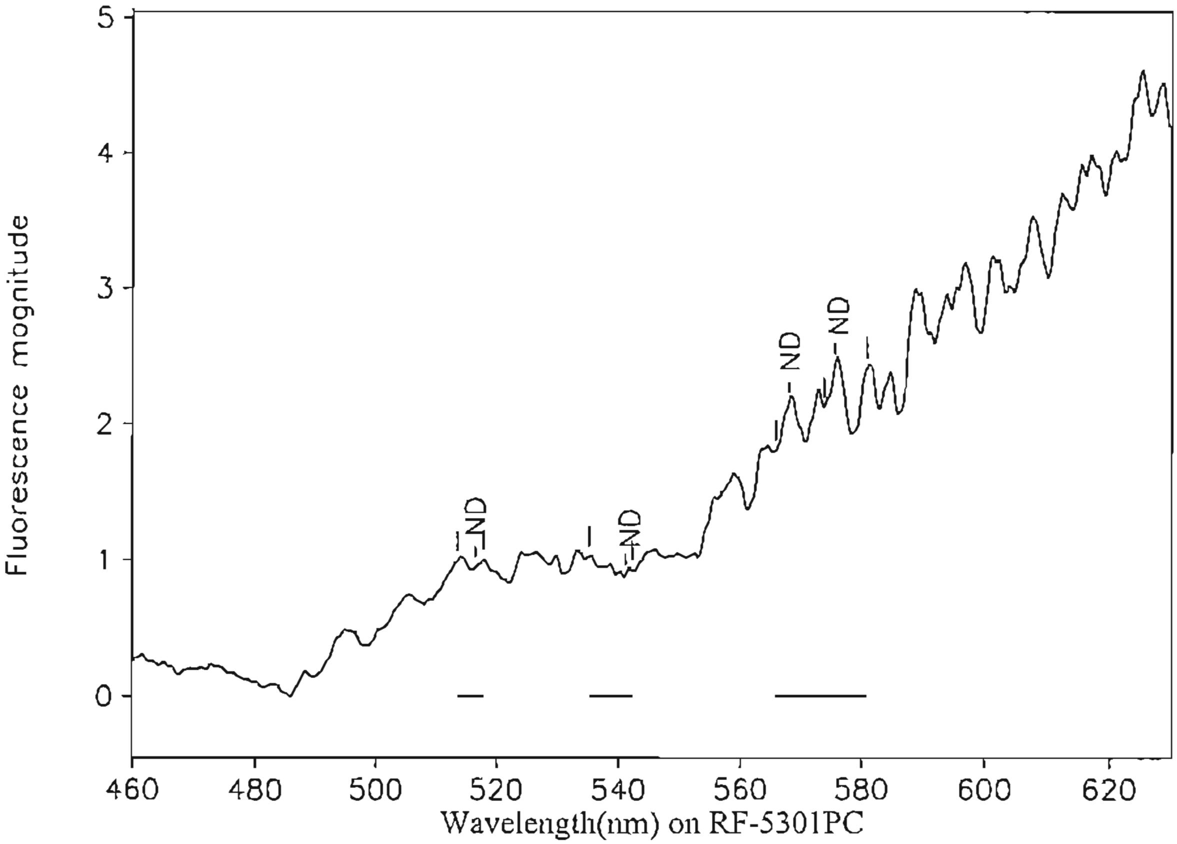
Collected: 02/03/05 1000

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND (1)
539.5	482.5	578.0	66.63	1,854.39	0.04	58.1
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



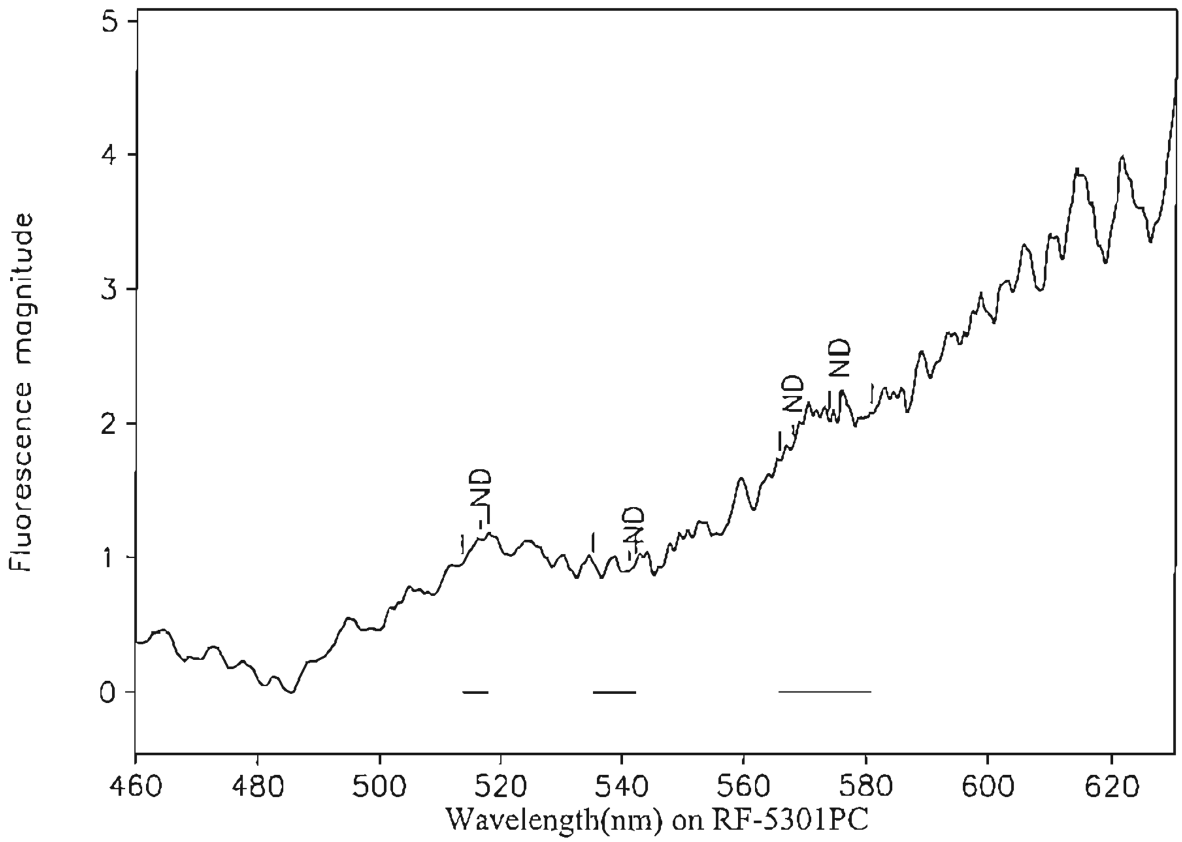
Station 3-175: MW-3 - 175 ft
OUL number: N8385 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0830 Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-185: MW-3 - 185 ft
OUL number: N8386
Matrix: Elutant
Placed: 01/20/05 0830

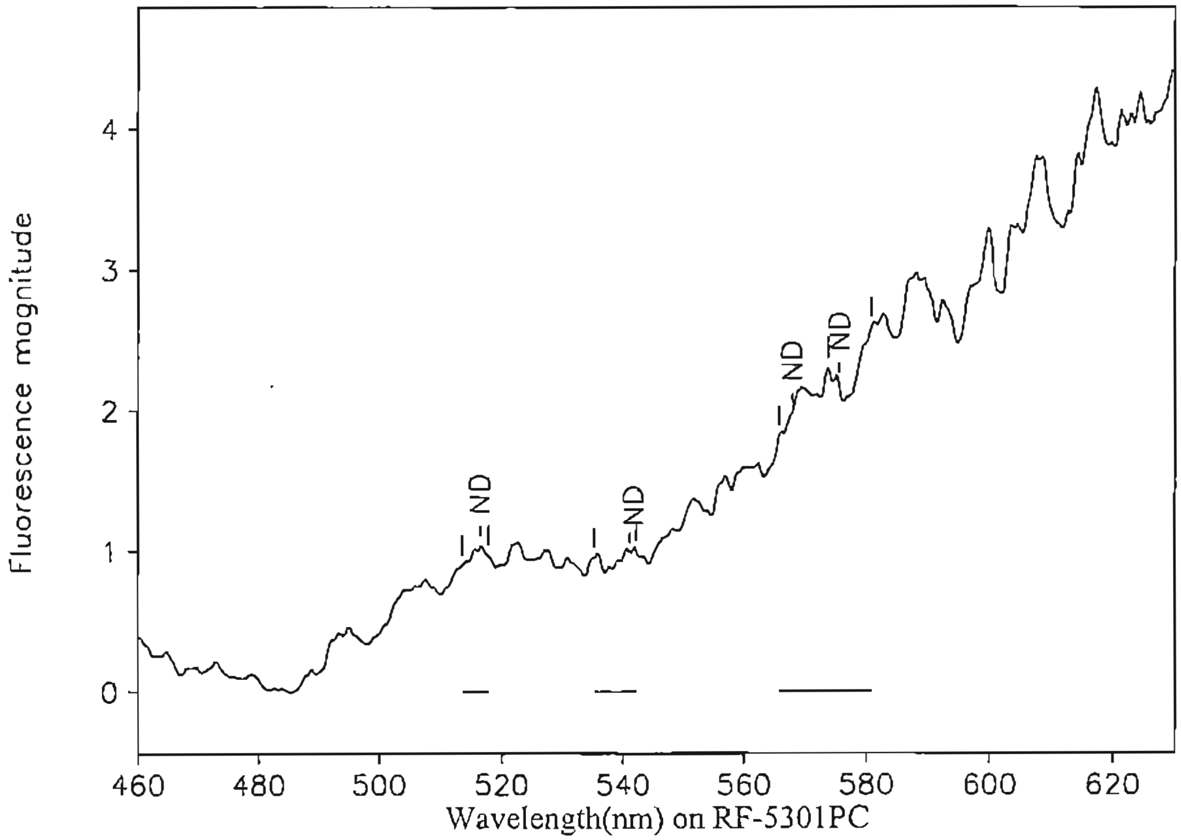
Analyzed: 02/08/05
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-195: MW-3 - 195 ft
OUL number: N8387
Matrix: Elutant
Placed: 01/20/05 0830

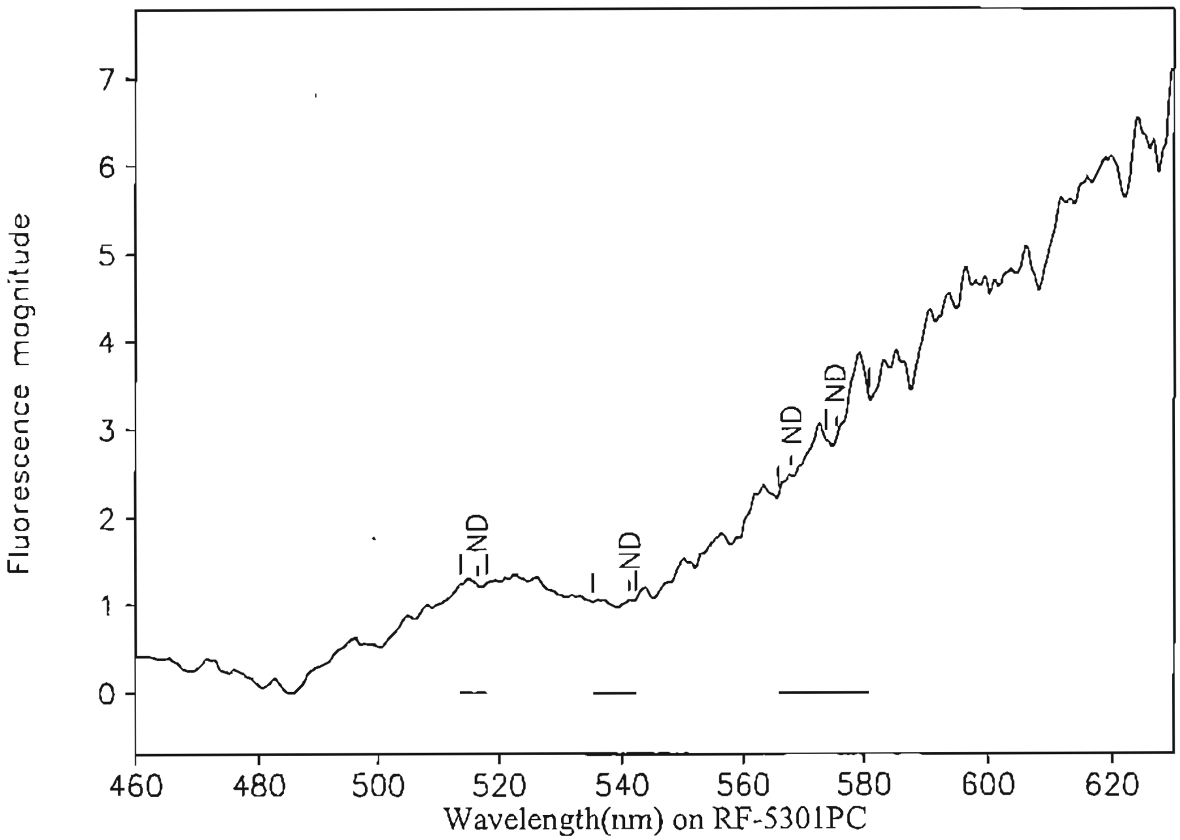
Analyzed: 02/08/05
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-205: MW-3 - 205 ft
OUL number: N8388
Matrix: Elutant
Placed: 01/20/05 0830

Analyzed: 02/08/05

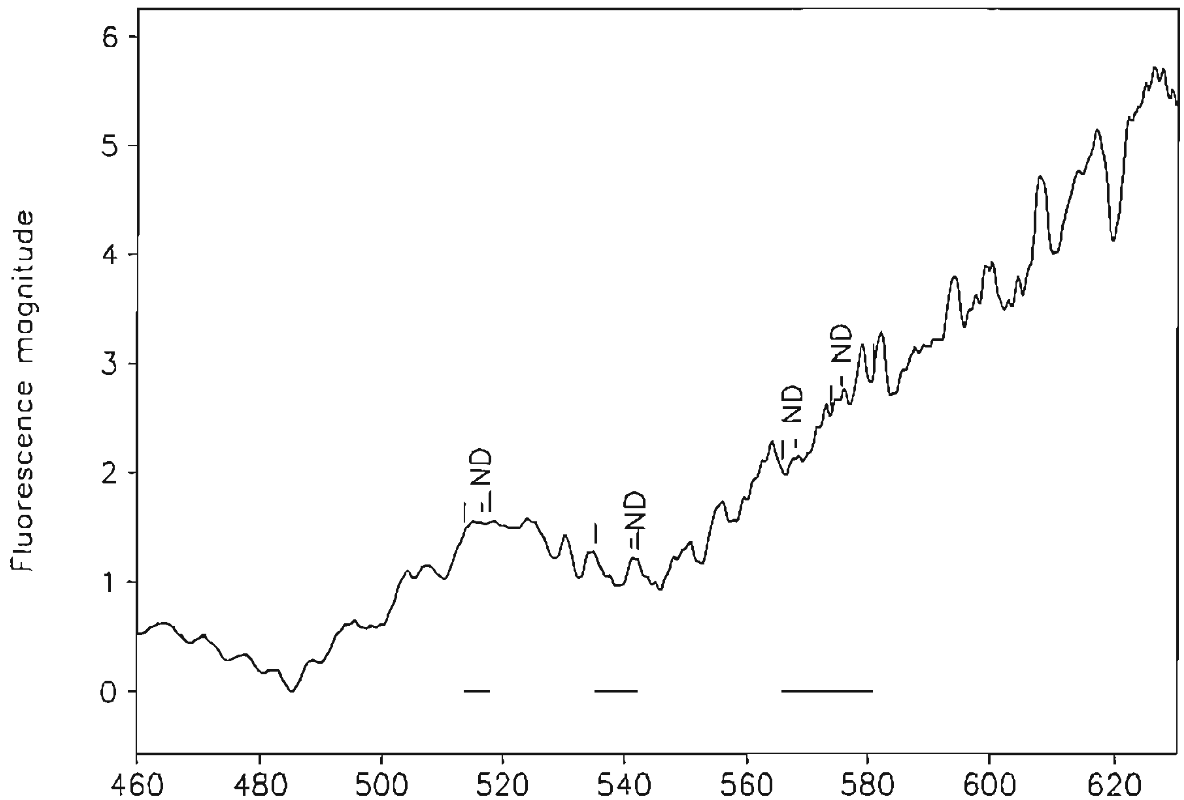
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

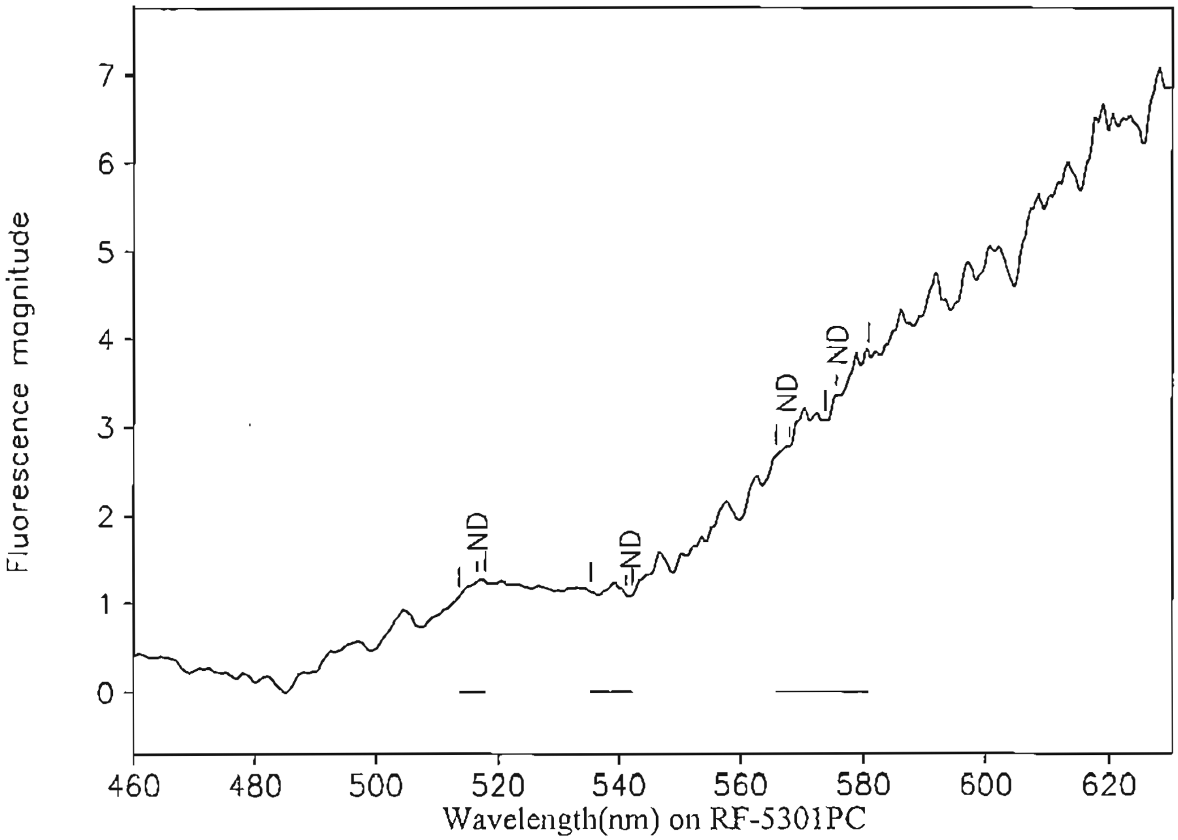
Station 3-215: MW-3 - 215 ft
OUL number: N8389 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0830 Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N8390
Matrix: Elutant
Placed: 01/20/05 0830

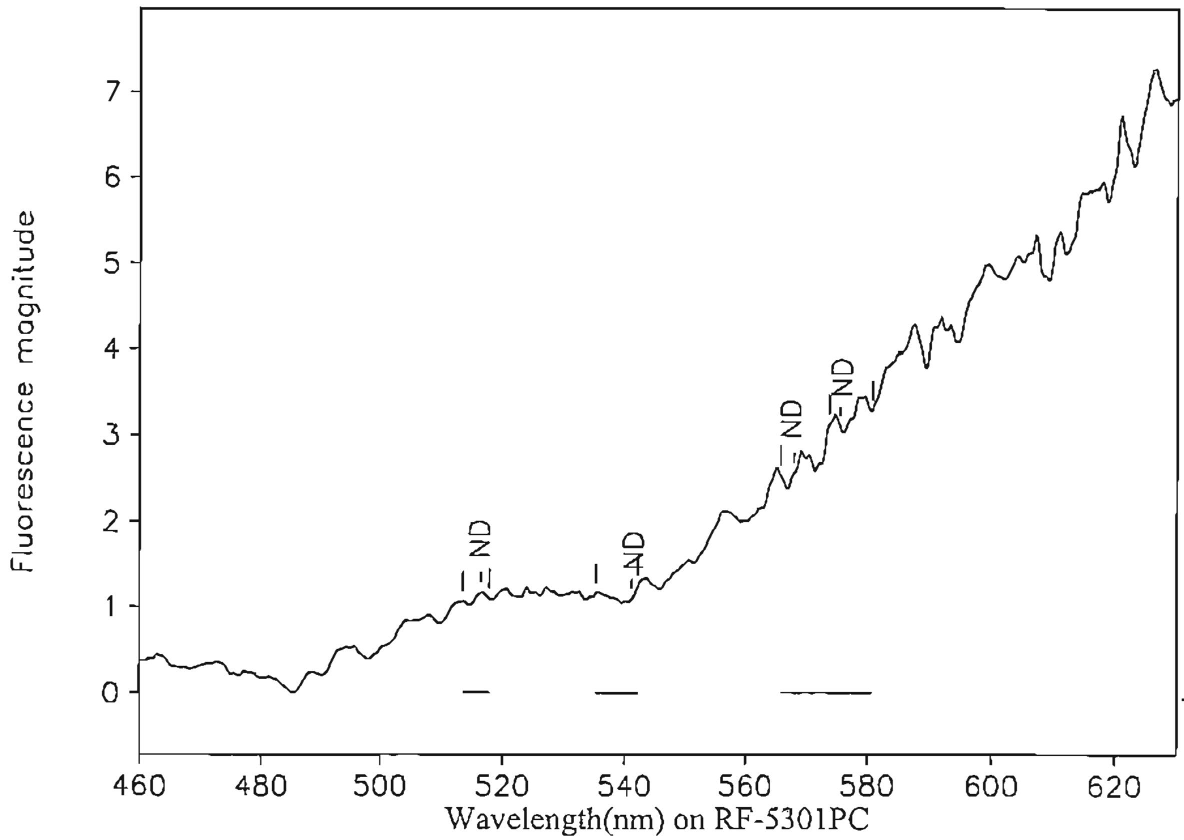
Analyzed: 02/08/05
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-235: MW-3 - 235 ft
OUL number: N8391
Matrix: Elutant
Placed: 01/20/05 0830

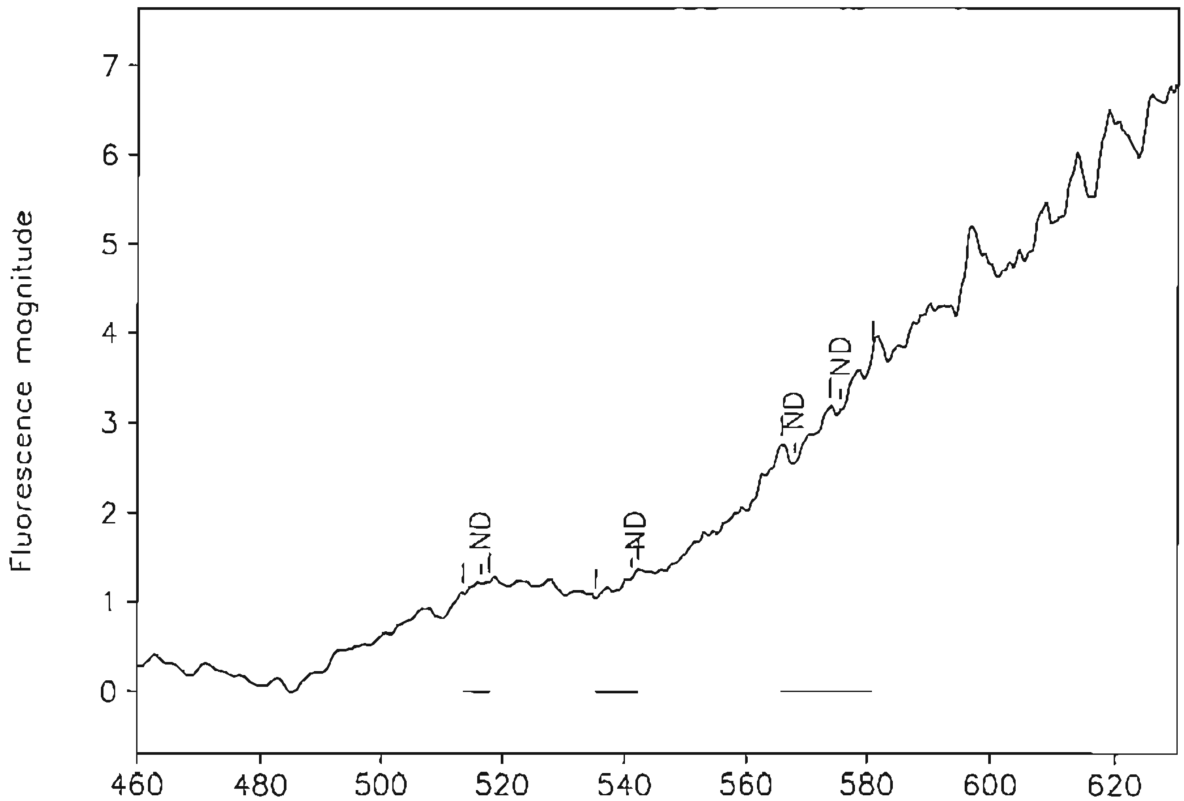
Analyzed: 02/08/05
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

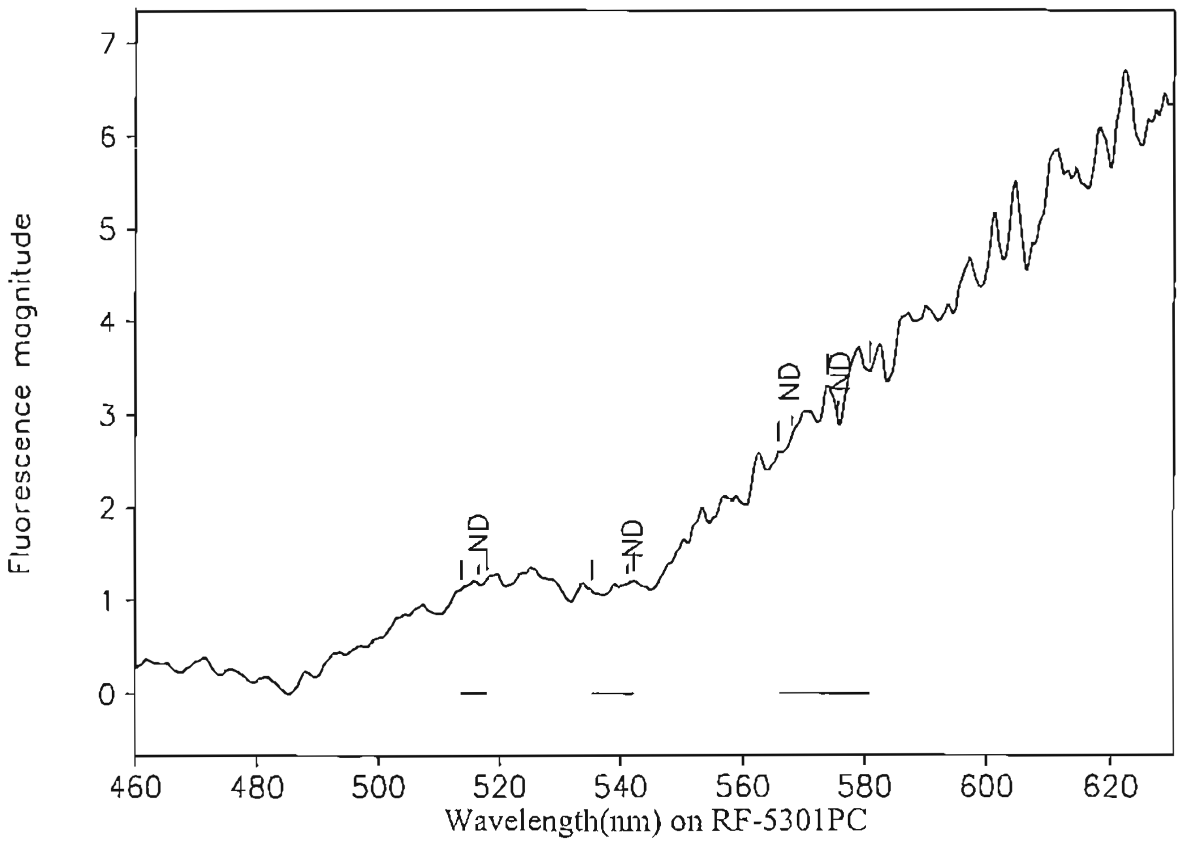
Station 3-245: MW-3 - 245 ft
OUL number: N8392 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0830 Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



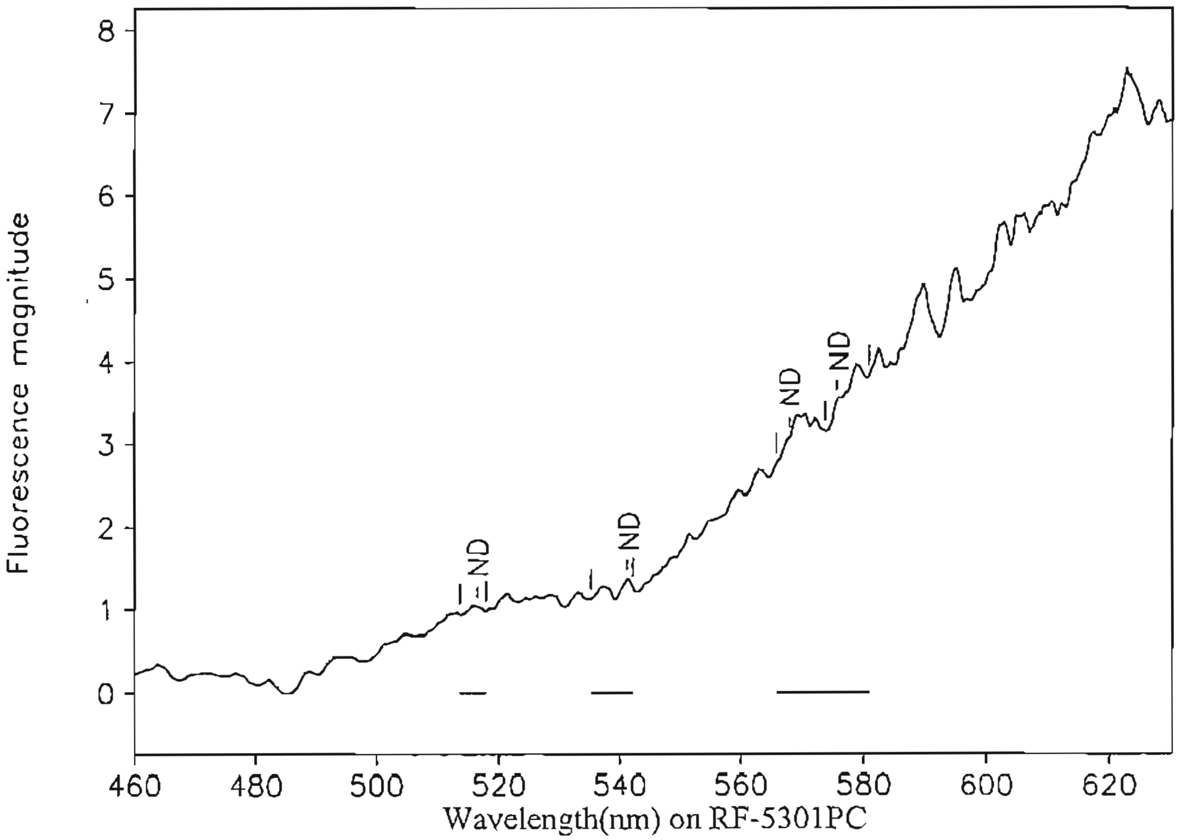
Station 3-255: MW-3 - 255 ft
OUL number: N8393 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0830 Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-265: MW-3 - 265 ft
OUL number: N8394
Matrix: Elutant
Placed: 01/20/05 0830

Analyzed: 02/08/05

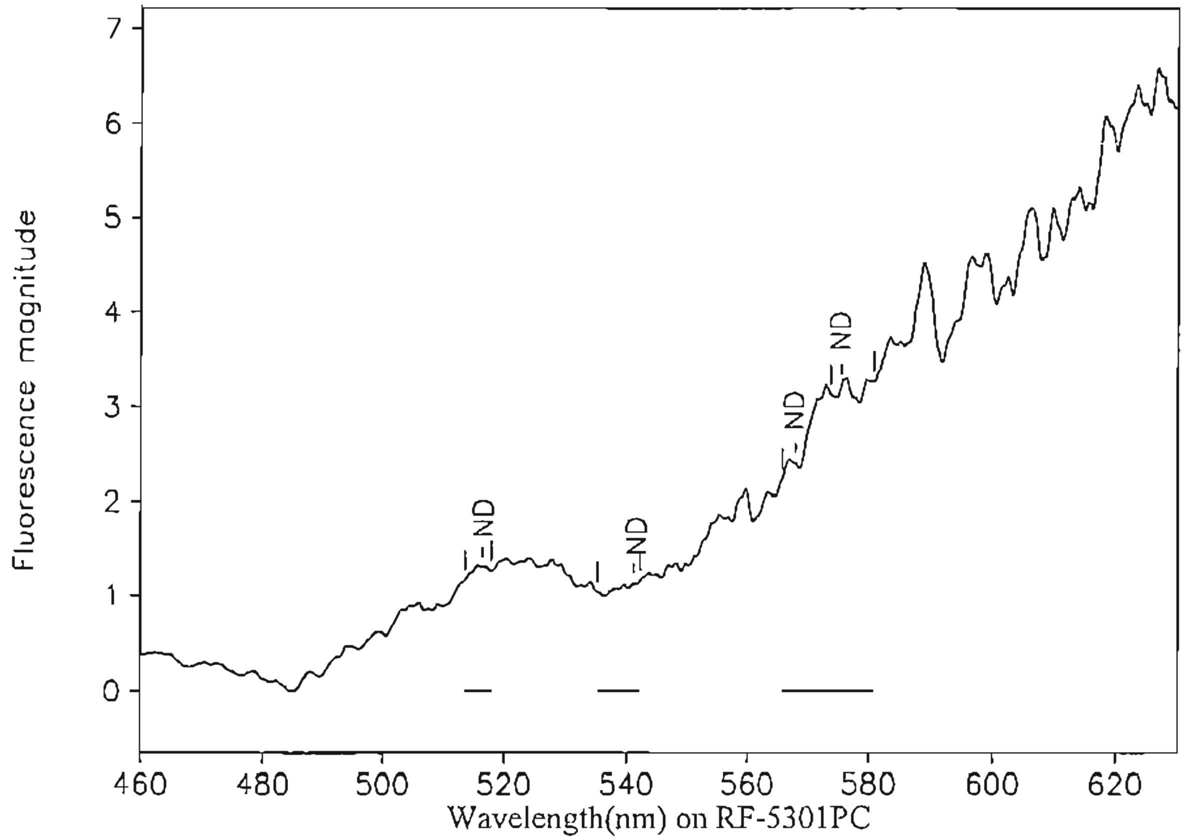
Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



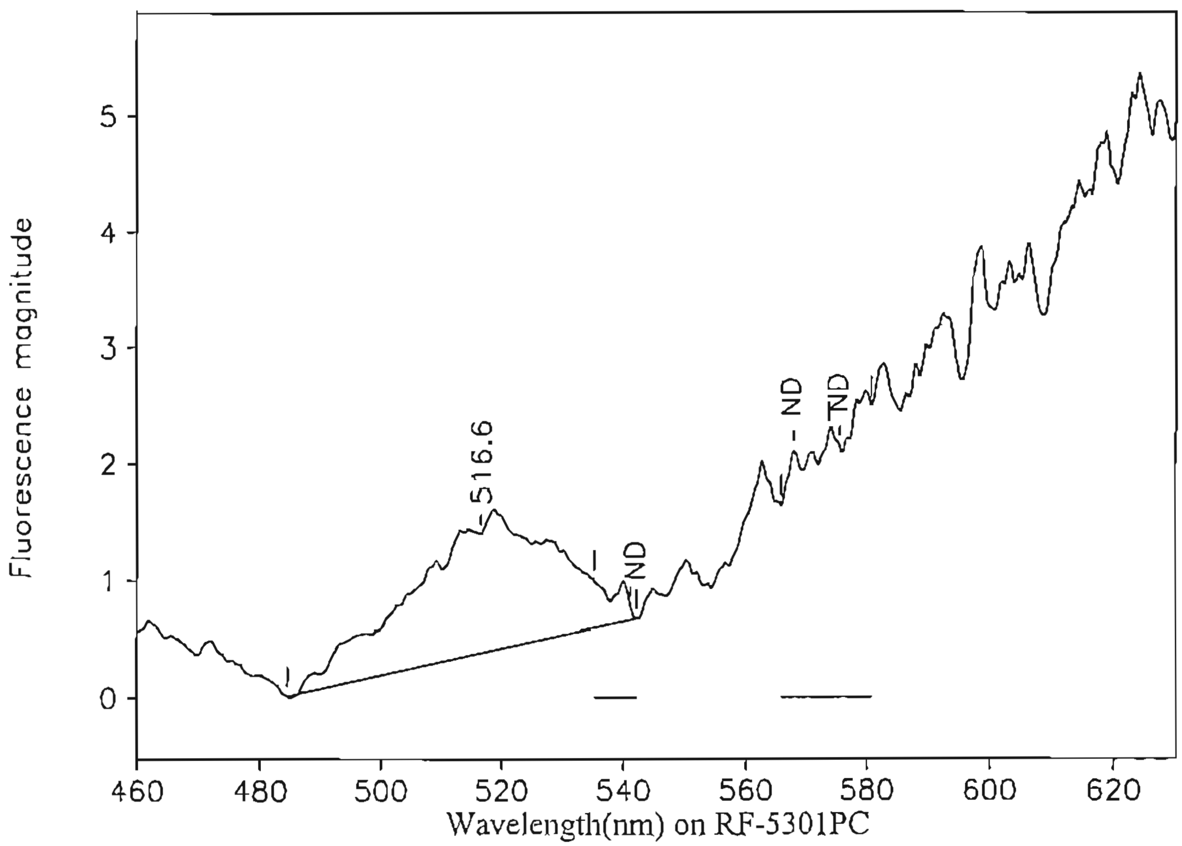
Station 3-275: MW-3 - 275 ft
OUL number: N8395 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0830 Collected: 02/03/05 0850

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-165: MW-4 - 165 ft
OUL number: N8396
Matrix: Elutant
Placed: 01/20/05 0745

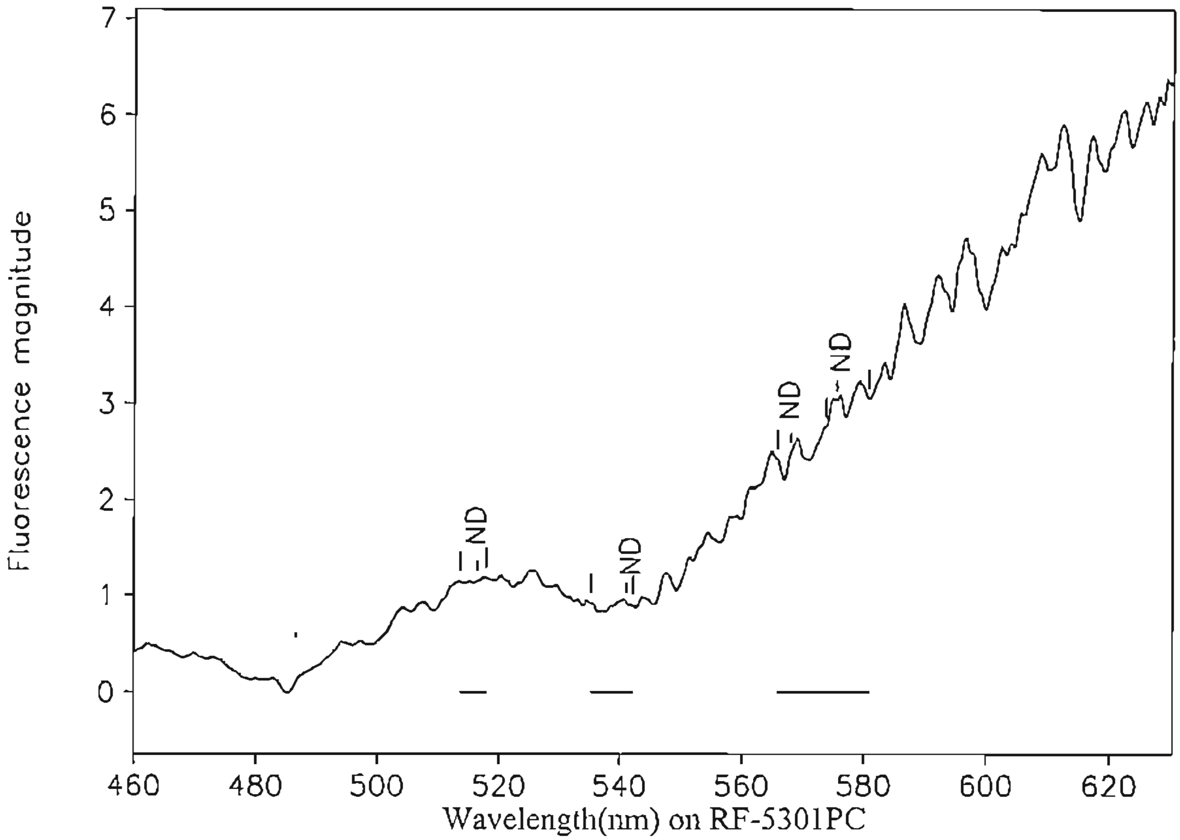
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.6	484.4	542.2	1.02	34.26	0.03	~~0.773~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-180: MW-4 - 180 ft
OUL number: N8397
Matrix: Elutant
Placed: 01/20/05 0745

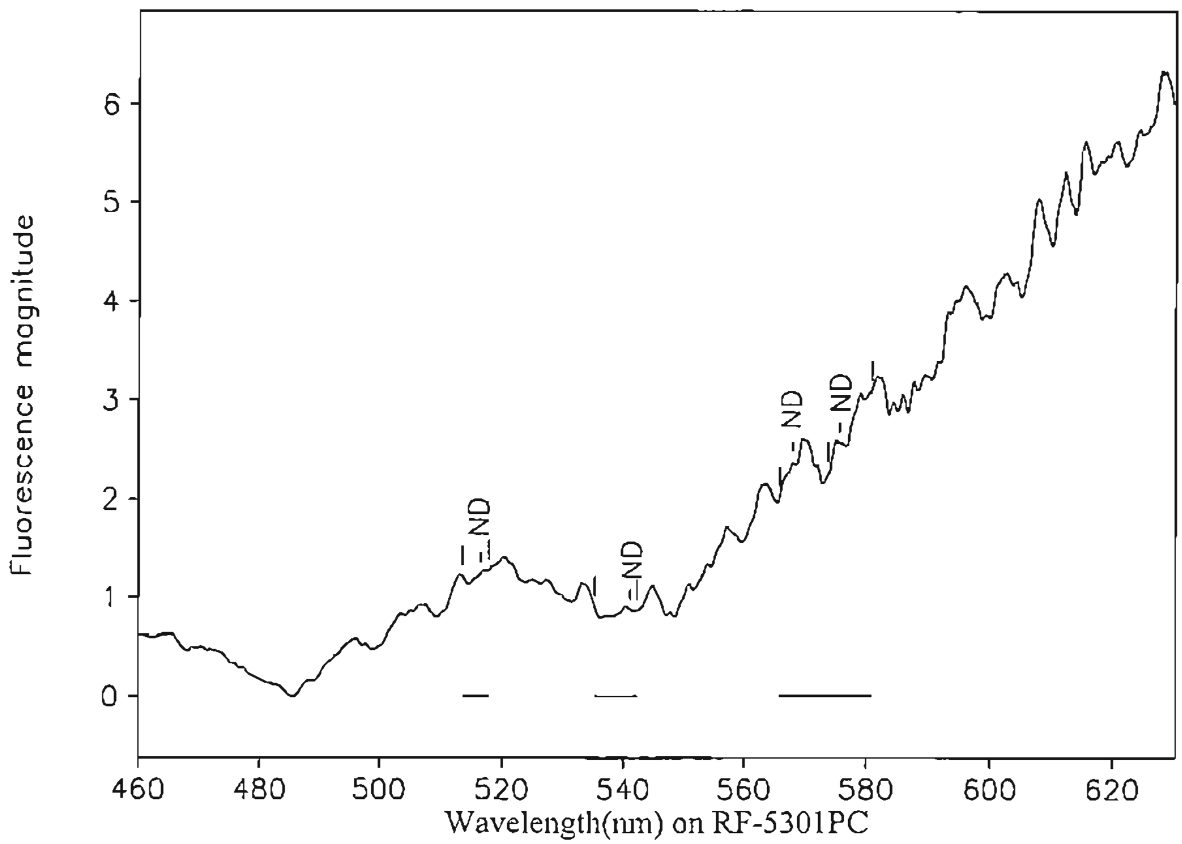
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-195: MW-4 - 195 ft
OUL number: N8398
Matrix: Elutant
Placed: 01/20/05 0745

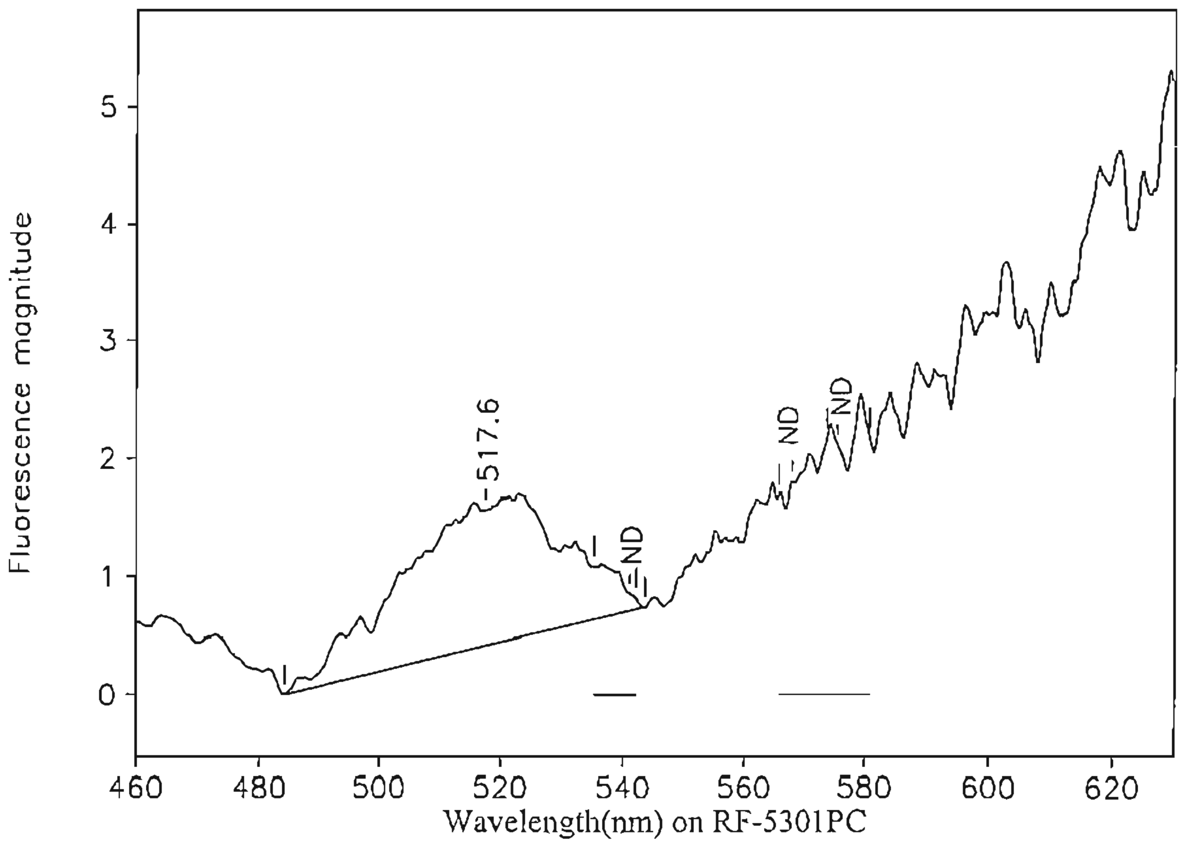
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-210: MW-4 - 210 ft
OUL number: N8399
Matrix: Elutant
Placed: 01/20/05 0745

Analyzed: 02/08/05

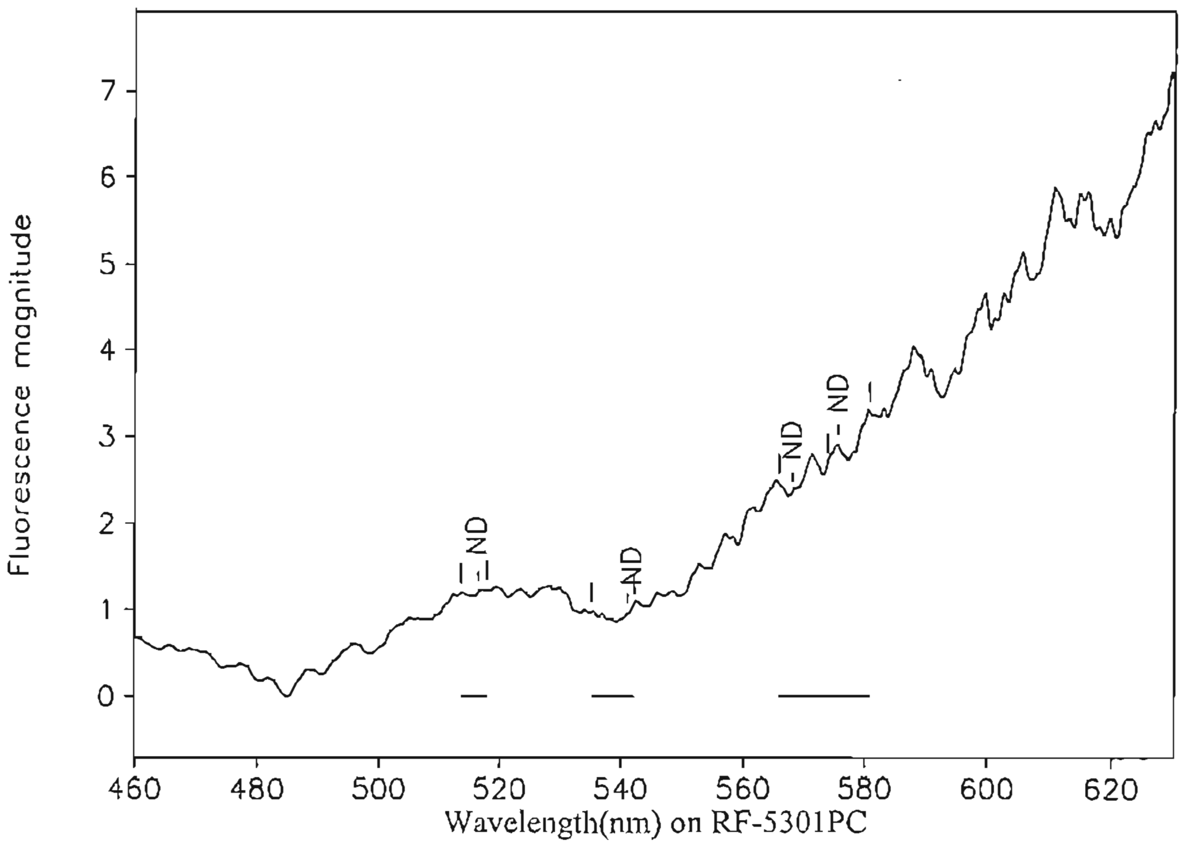
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	484.2	543.6	1.15	38.92	0.03	~~0.878~~ ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



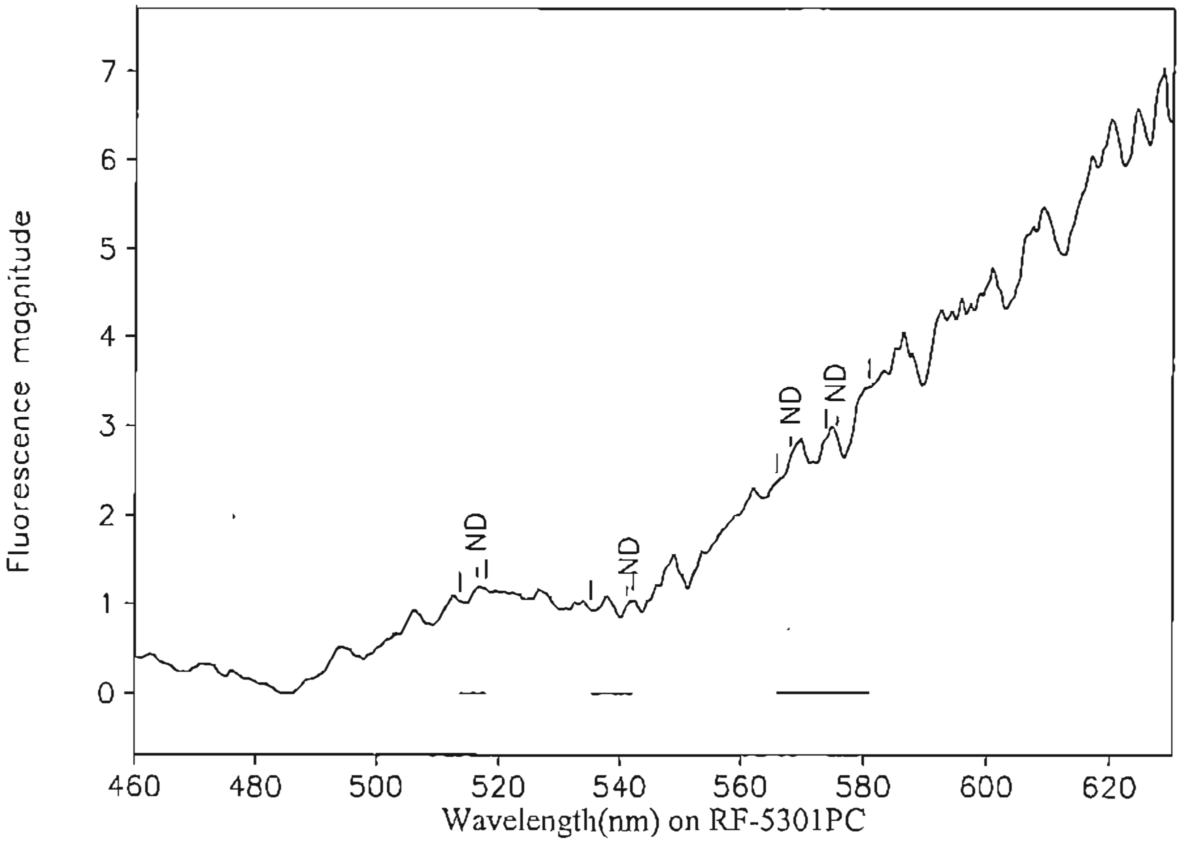
Station 4-225: MW-4 - 225 ft
OUL number: N8401 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0745 Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-240: MW-4 - 240 ft
OUL number: N8402
Matrix: Elutant
Placed: 01/20/05 0745

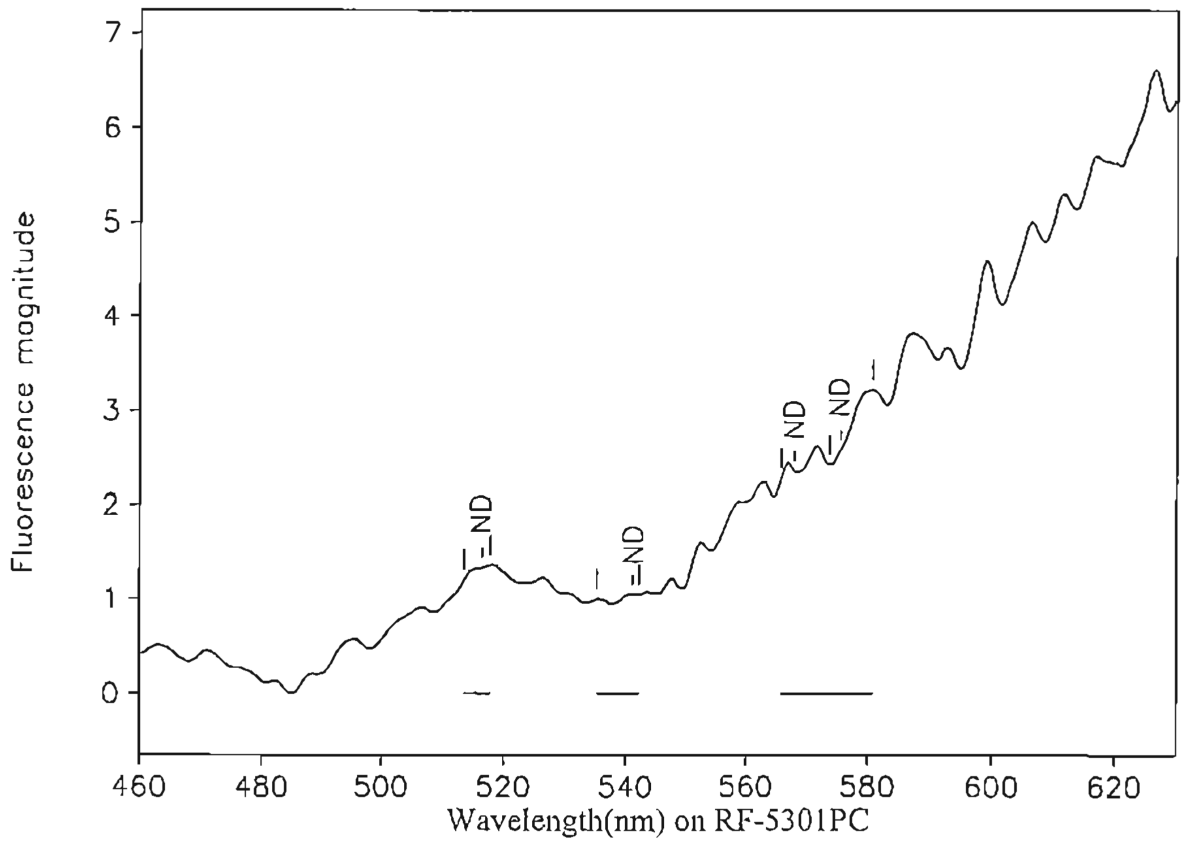
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-255: MW-4 - 255 ft
OUL number: N8403
Matrix: Elutant
Placed: 01/20/05 0745

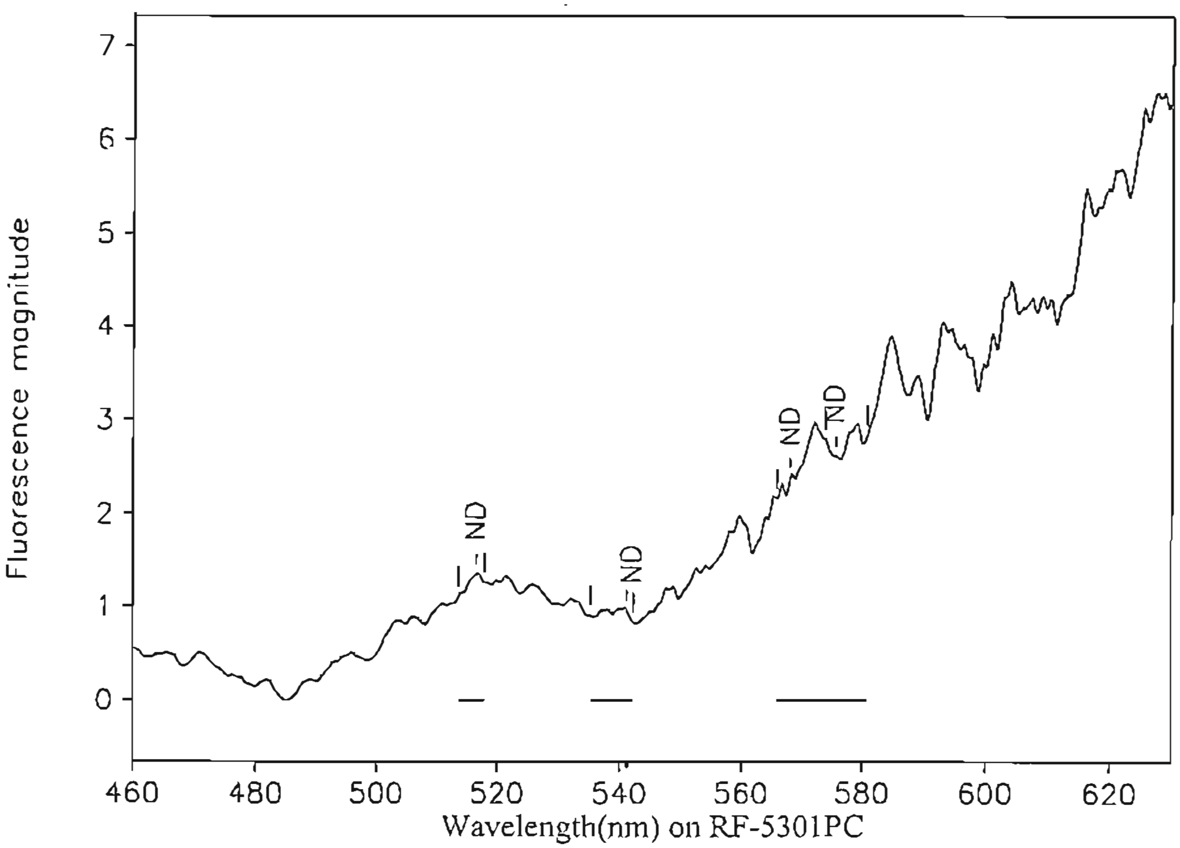
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-270: MW-4 - 270 ft
OUL number: N8404
Matrix: Elutant
Placed: 01/20/05 0745

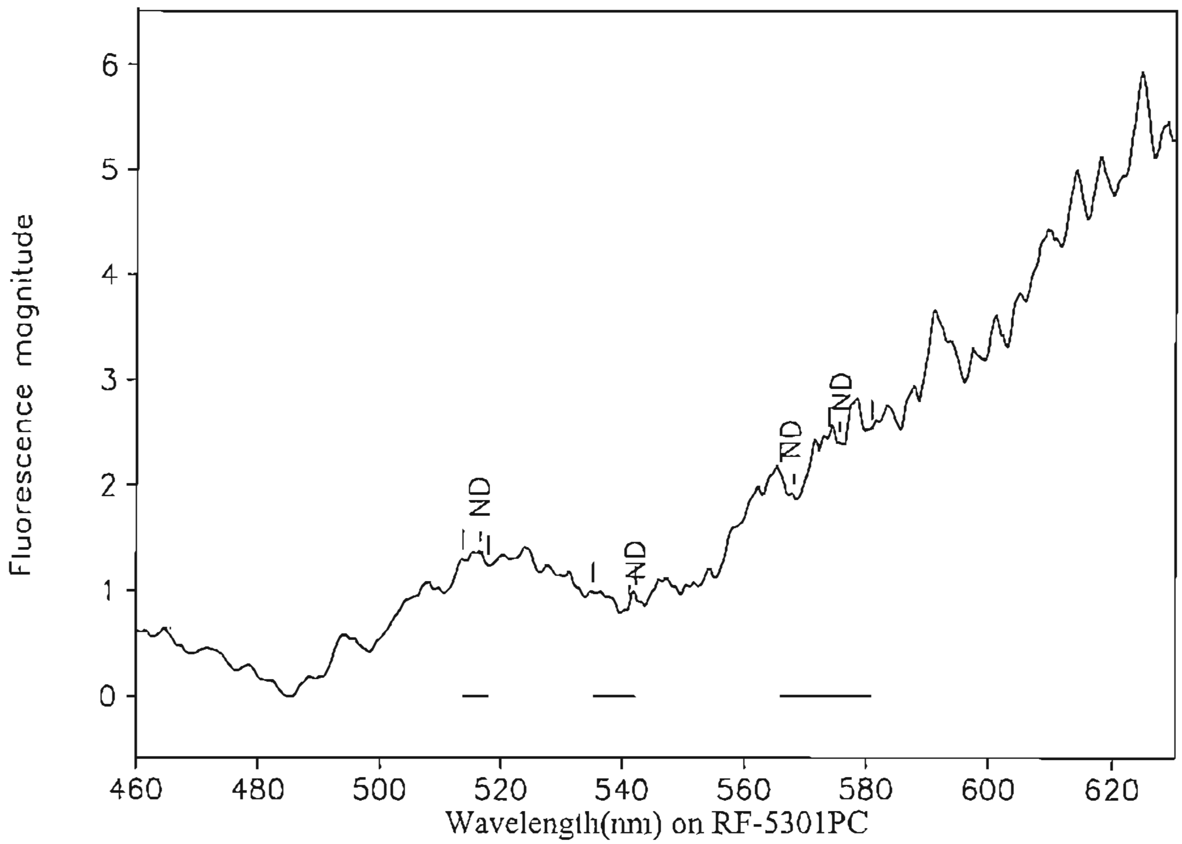
Analyzed: 02/08/05
Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



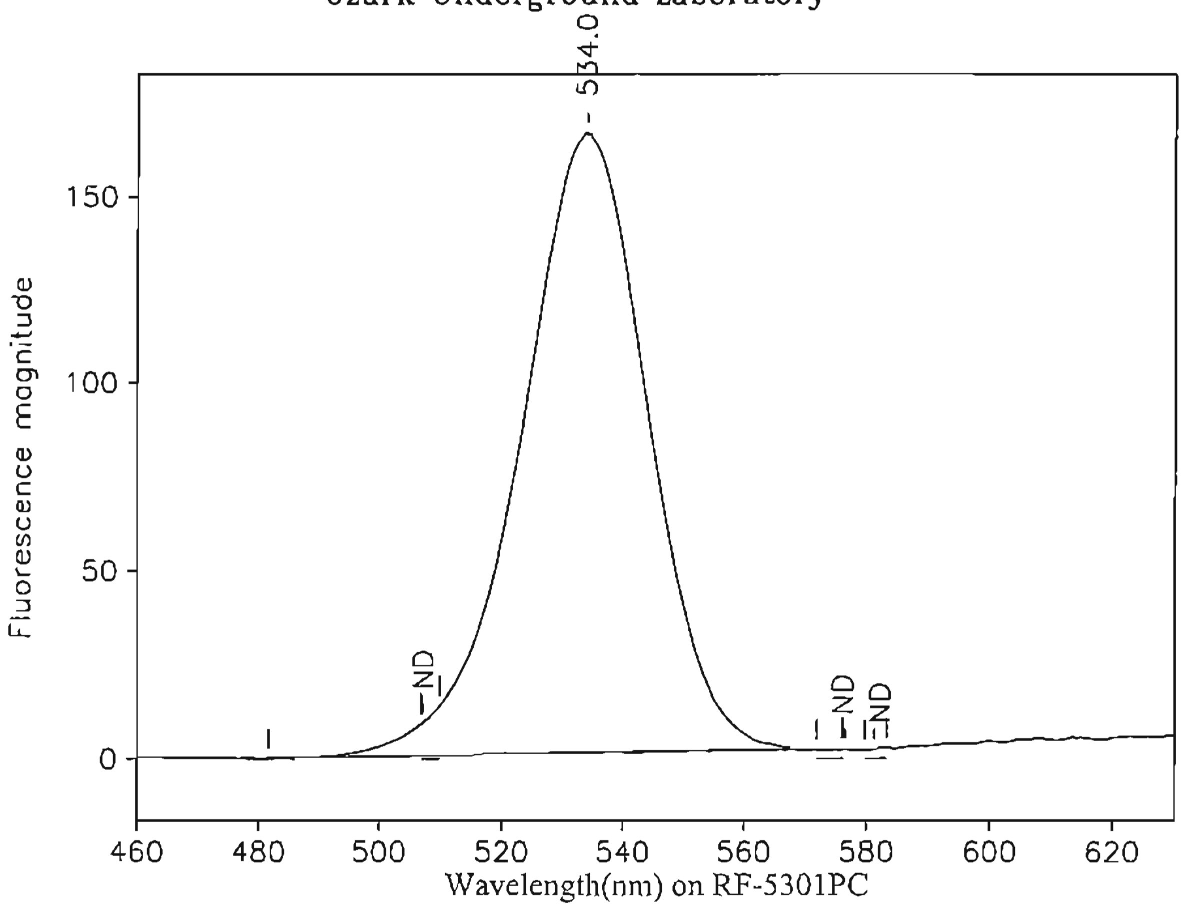
Station 4-285: MW-4 - 285 ft
OUL number: N8405 Analyzed: 02/08/05
Matrix: Elutant
Placed: 01/20/05 0745 Collected: 02/03/05 0810

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N8423 Analyzed: 02/08/05
Matrix: Water
Collected: 02/03/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
534.0	481.7	576.0	165.18	4,002.66	0.04	25.6
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

NV

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

February 25, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped February 17, 2005
Ozark Underground Laboratory (OUL) numbers N8650 through N8691 and N8773.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on February 18, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

f:\docs\coa\LakeOrienta09.doc

Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: February 17, 2005
Date Samples Rec'd at OUL: February 18, 2005
Date Analyzed by OUL: February 23, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N8650	1-215	MW-1 - 215 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8651	1-225	MW-1 - 225 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8652	1-235	MW-1 - 235 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8653	1-245	MW-1 - 245 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8654	1-255	MW-1 - 255 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8655	1-265	MW-1 - 265 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8656	1-275	MW-1 -275 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8657	1-285	MW-1 - 285 ft	2/3 0945	2/17 1015	ND		ND		ND	
N8658	2-135	MW-2 - 135 ft	2/3 1020	2/17 1045	ND		537.7 (1)	349	ND	
N8659	2-150	MW-2 - 150 ft	2/3 1020	2/17 1045	ND		537.3 (1)	316	ND	
N8660	Laboratory control charcoal blank									
N8661	2-165	MW-2 - 165 ft	2/3 1020	2/17 1045	ND		537.7 (1)	373	ND	
N8662	2-180	MW-2 - 180 ft	2/3 1020	2/17 1045	ND		537.9 (1)	613	ND	
N8663	2-195	MW-2 - 195 ft	2/3 1020	2/17 1045	ND		538.4 (1)	980	ND	
N8664	2-210	MW-2 - 210 ft	2/3 1020	2/17 1045	ND		537.8 (1)	1,310	ND	
N8665	2-225	MW-2 - 225 ft	2/3 1020	2/17 1045	ND		538.7 (1)	607	ND	
N8666	2-240	MW-2 - 240 ft	2/3 1020	2/17 1045	ND		538.0 (1)	569	ND	
N8667	2-255	MW-2 - 255 ft	2/3 1020	2/17 1045	ND		538.3 (1)	1,020	ND	
N8668	2-270	MW-2 - 270 ft	2/3 1020	2/17 1045	ND		538.1 (1)	1,430	ND	

Footnotes at end of table (continued)

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N8669	2-285	MW-2 - 285 ft	2/3 1020	2/17 1045	ND		538.5 (1)	271	ND	
N8670	2-300	MW-2 - 300 ft	2/3 1020	2/17 1045	ND		538.8 (1)	96.7	ND	
N8671	3-175	MW-3 - 175 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8672	3-185	MW-3 - 185 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8673	3-195	MW-3 - 195 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8674	3-205	MW-3 - 205 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8675	3-215	MW-3 - 215 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8676	3-225	MW-3 - 225 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8677	3-235	MW-3 - 235 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8678	3-245	MW-3 - 245 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8679	3-255	MW-3 - 255 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8680	Laboratory control charcoal blank									
N8681	3-265	MW-3 - 265 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8682	3-275	MW-3 - 275 ft	2/3 0915	2/17 0940	ND		ND		ND	
N8683	4-165	MW-4 - 165 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8684	4-180	MW-4 - 180 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8685	4-195	MW-4 - 195 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8686	4-210	MW-4 - 210 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8687	4-225	MW-4 - 225 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8688	4-240	MW-4 - 240 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8689	4-255	MW-4 - 255 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8690	4-270	MW-4 - 270 ft	2/3 0835	2/17 0905	ND		ND		ND	
N8691	4-285	MW-4 - 285 ft	2/3 0835	2/17 0905	ND		ND		ND	

Footnotes at end of table (continued)

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.										
OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
(continued)										
N8773	2-WA	MW-2 - Water	Water	2/17 1100	ND		533.7	26.1	ND	

FOOTNOTES:

ND = No dye detected

(1) = An eosine peak is present which is asymmetrical and skewed towards the lower wavelenths. This type of peak could mask the presence of fluorescein dye.

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 7 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 2/17/05 Date Samples Received: 2/18/05 Time Samples Received: 11:15 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse & Assoc.

OUL use only Charcoal		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		COLLECTED		# WATER REC'D
				DATE	TIME	DATE	TIME	
1	N8650	1-215	MW-1 – 215 ft	2/3/05	0945	2/17/05	1015	Ø
1	N8651	1-225	MW-1 – 225 ft					Ø
1	N8652	1-235	MW-1 – 235 ft					Ø
1	N8653	1-245	MW-1 – 245 ft					Ø
1	N8654	1-255	MW-1 – 255 ft					Ø
1	N8655	1-265	MW-1 – 265 ft					Ø
1	N8656	1-275	MW-1 – 275 ft					Ø
1	N8657	1-285	MW-1 – 285 ft					Ø
Ø		1-WA	MW-1 – Water Sample				1030	1

COMMENTS:

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Project 621 - Analyzed 2/23/05 by M. Arnold OUL Page 1 of 4

OZARK UNDERGROUND LABORATORY, INC.

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 7 **Samples Collected By:** Mike Burns
Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL
Date Samples Shipped: 2/17/05 **Date Samples Received:** 2/18/05 **Time Samples Received:** 11:15 **Return Cooler? Yes** ✓ **No**
Bill to: **Send Results to:** CH2M Hill
Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ______ **Ship cooler to:** Nodarse

OUL use only Charcoal		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8658	2-135	MW-2 – 135 ft	2/3/05	1020	2/17/05	1045	Ø
1	N8659	2-150	MW-2 – 150 ft					Ø
1	N8661	2-165	MW-2 – 165 ft					Ø
1	N8662	2-180	MW-2 – 180 ft					Ø
1	N8663	2-195	MW-2 – 195 ft					Ø
1	N8664	2-210	MW-2 – 210 ft					Ø
1	N8665	2-225	MW-2 – 225 ft					Ø
1	N8666	2-240	MW-2 – 240 ft					Ø
1	N8667	2-255	MW-2 – 255 ft					Ø
1	N8668	2-270	MW-2 – 270 ft					Ø
1	N8669	2-285	MW-2 – 285 ft					Ø
1	N8670	2-300	MW-2 – 300 ft					Ø
Ø		2-WA	MW-2 – Water Sample				1100	1

COMMENTS: N8660 = Charcoal Blank

878

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Analyzed 2-23-05 by M. Arnold OUL Page 2 of 4

OZARK UNDERGROUND LABORATORY, INC.

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 7 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: / / **Date Samples Received:** 2/18/05 **Time Samples Received:** 11:15 **Return Cooler? Yes** ✓ **No**

Bill to: **Send Results to:** CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other **Ship cooler to:** Nodarse

OUL use only Charcoal # CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME (*Please indicate stations where dye was visible in the field* — *for field technician use - use black ink only*)	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	OUL use only # WATER REC'D
1	N8671	3-175	MW-3 – 175 ft	2/3/05	0915	2/17/05	0940	Ø
1	N8672	3-185	MW-3 – 185 ft					Ø
1	N8673	3-195	MW-3 – 195 ft					Ø
1	N8674	3-205	MW-3 – 205 ft					Ø
1	N8675	3-215	MW-3 – 215 ft					Ø
1	N8676	3-225	MW-3 – 225 ft					Ø
1	N8677	3-235	MW-3 – 235 ft					Ø
1	N8678	3-245	MW-3 – 245 ft					Ø
1	N8679	3-255	MW-3 – 255 ft					Ø
1	N8681	3-265	MW-3 – 265 ft					Ø
1	N8682	3-275	MW-3 – 275 ft					Ø
Ø		3-WA	MW-3 – Water Sample				0950	1

COMMENTS: N8680 = Charcoal Blank

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 7 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: / / Date Samples Received: 2/18/05 Time Samples Received: 11:15 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse

OUL use only Charcoal		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1	N8683	4-165	MW-4 – 165 ft	2/3/05	0835	2/17/05	0905	Ø
1	N8684	4-180	MW-4 – 180 ft					Ø
1	N8685	4-195	MW-4 – 195 ft					Ø
1	N8686	4-210	MW-4 – 210 ft					Ø
1	N8687	4-225	MW-4 – 225 ft					Ø
1	N8688	4-240	MW-4 – 240 ft					Ø
1	N8689	4-255	MW-4 – 255 ft					Ø
1	N8690	4-270	MW-4 – 270 ft					Ø
1	N8691	4-285	MW-4 – 285 ft					Ø
Ø		4-WA	MW-5 – Water Sample				0915	1

COMMENTS:

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Analyzed 2/23/05 by M. Arnold

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SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 7 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 2/17/05 Date Samples Received: 2/18/05 Time Samples Received: 11:15 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2M Hill

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse

OUL use only Water		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
1		2-135	MW-2 – 135 ft	2/3/05	1020	2/17/05	1045	Ø
1		2-150	MW-2 – 150 ft					Ø
1		2-165	MW-2 – 165 ft					Ø
1		2-180	MW-2 – 180 ft					Ø
1		2-195	MW-2 – 195 ft					Ø
1		2-210	MW-2 – 210 ft					Ø
1		3-225	MW-2 – 225 ft					Ø
1		2-240	MW-2 – 240 ft					Ø
1		2-255	MW-2 – 255 ft					Ø
1		2-270	MW-2 – 270 ft					Ø
1		2-285	MW-2 – 285 ft					Ø
1		2-300	MW-2 – 300 ft					Ø
Ø	N8773	2-WA	MW-2 – Water Sample				1100	1

COMMENTS:

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881

Project 621 - Analyzed 2-23-05 by M. Arnold OUL

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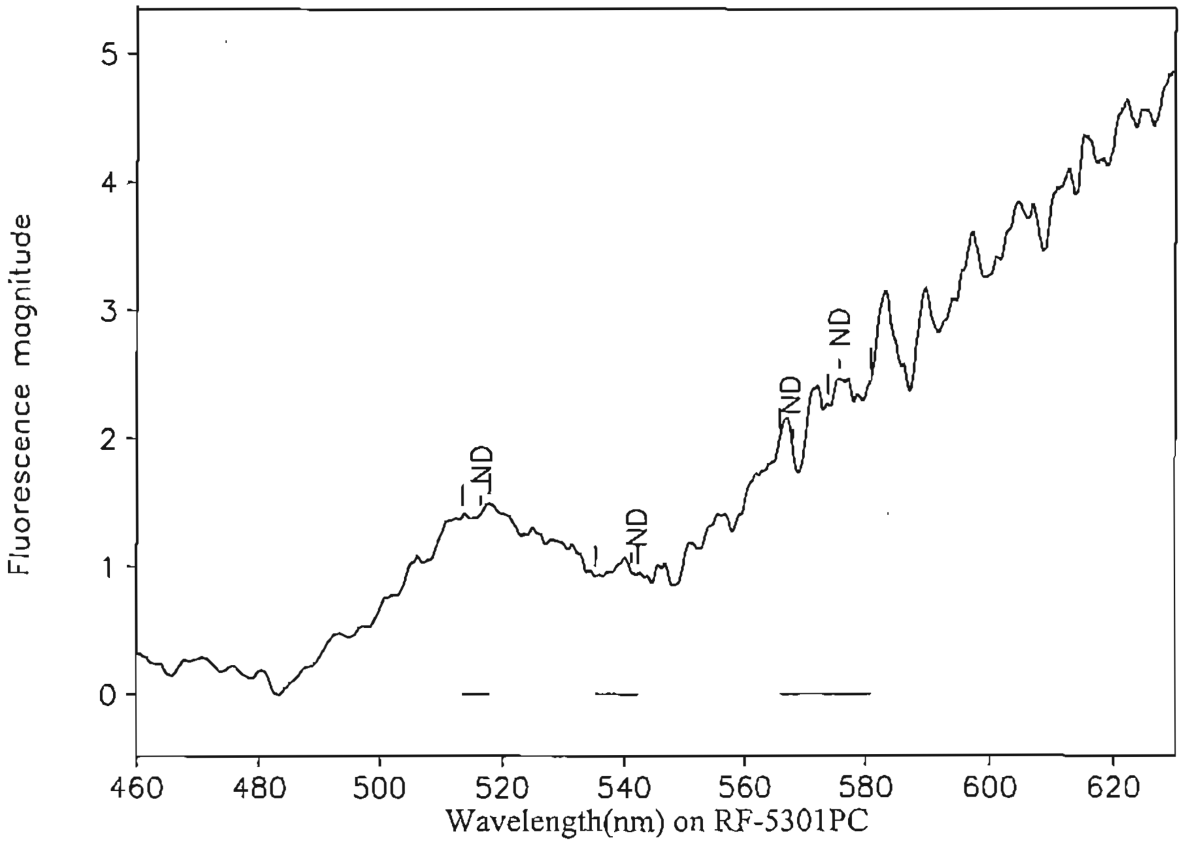

Station 1-215: MW-1 - 215 ft
OUL number: N8650
Matrix: Elutant
Placed: 02/03/05 0945

Analyzed: 02/23/05

Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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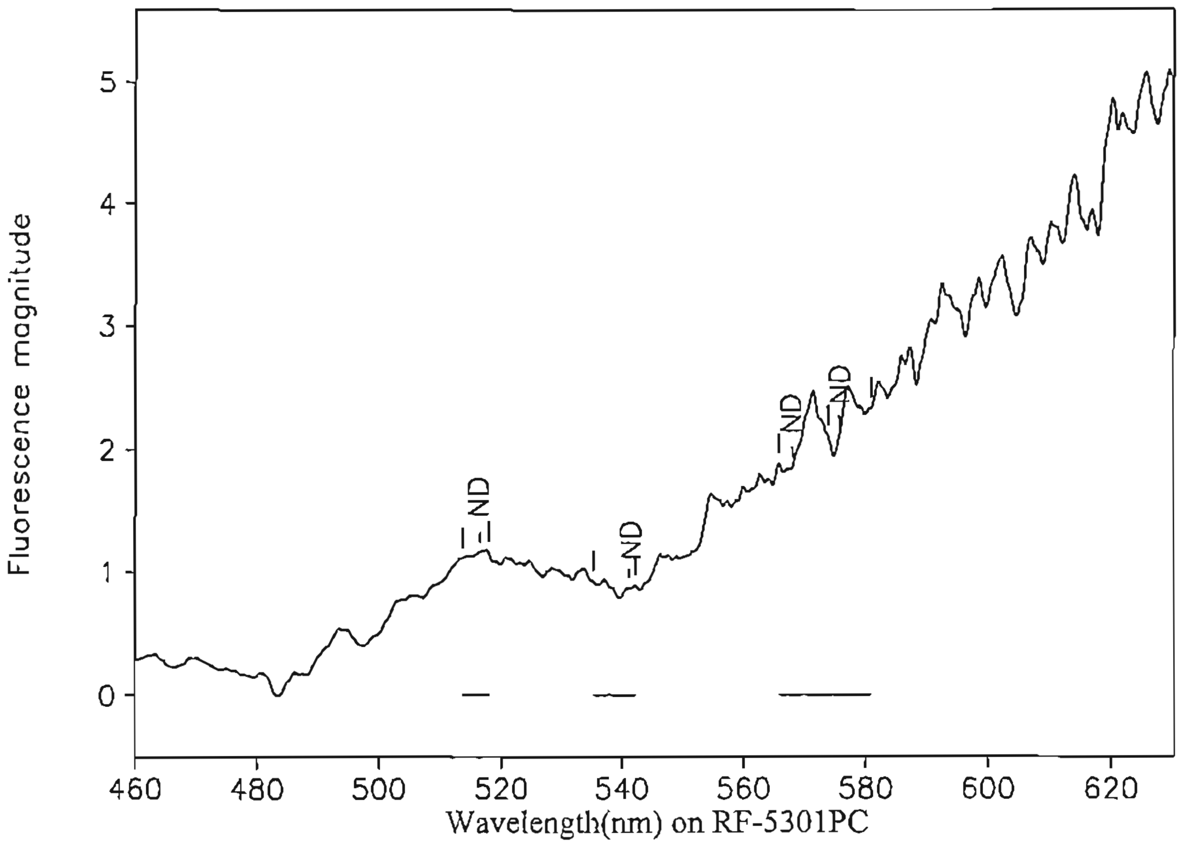

Station 1-225: MW-1 - 225 ft
OUL number: N8651 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0945 Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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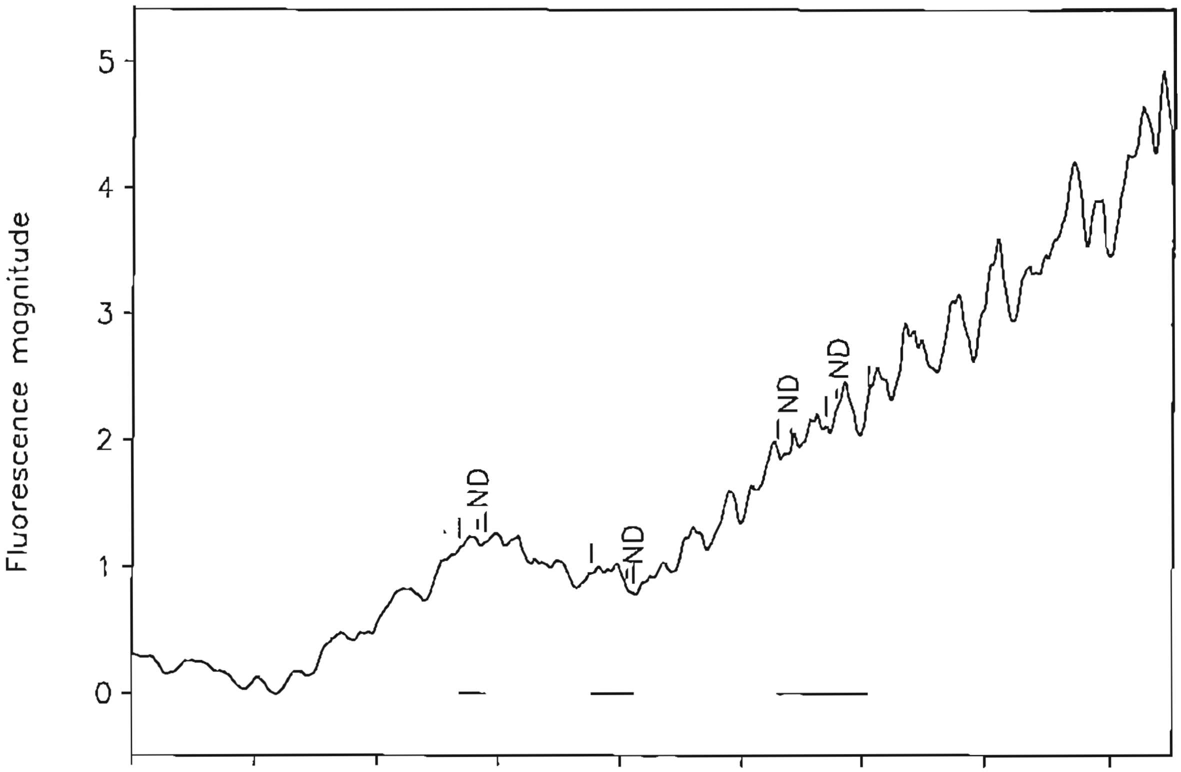


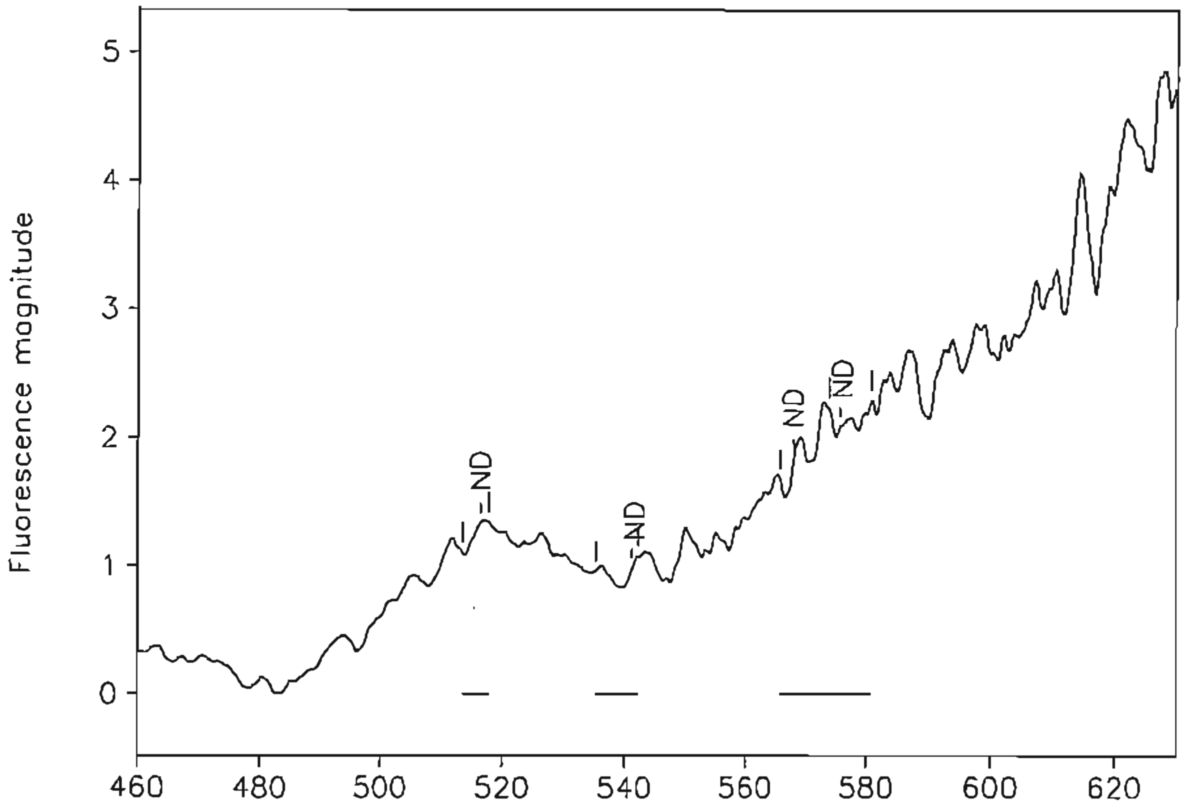
Station 1-235: MW-1 - 235 ft
OUL number: N8652 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0945 Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



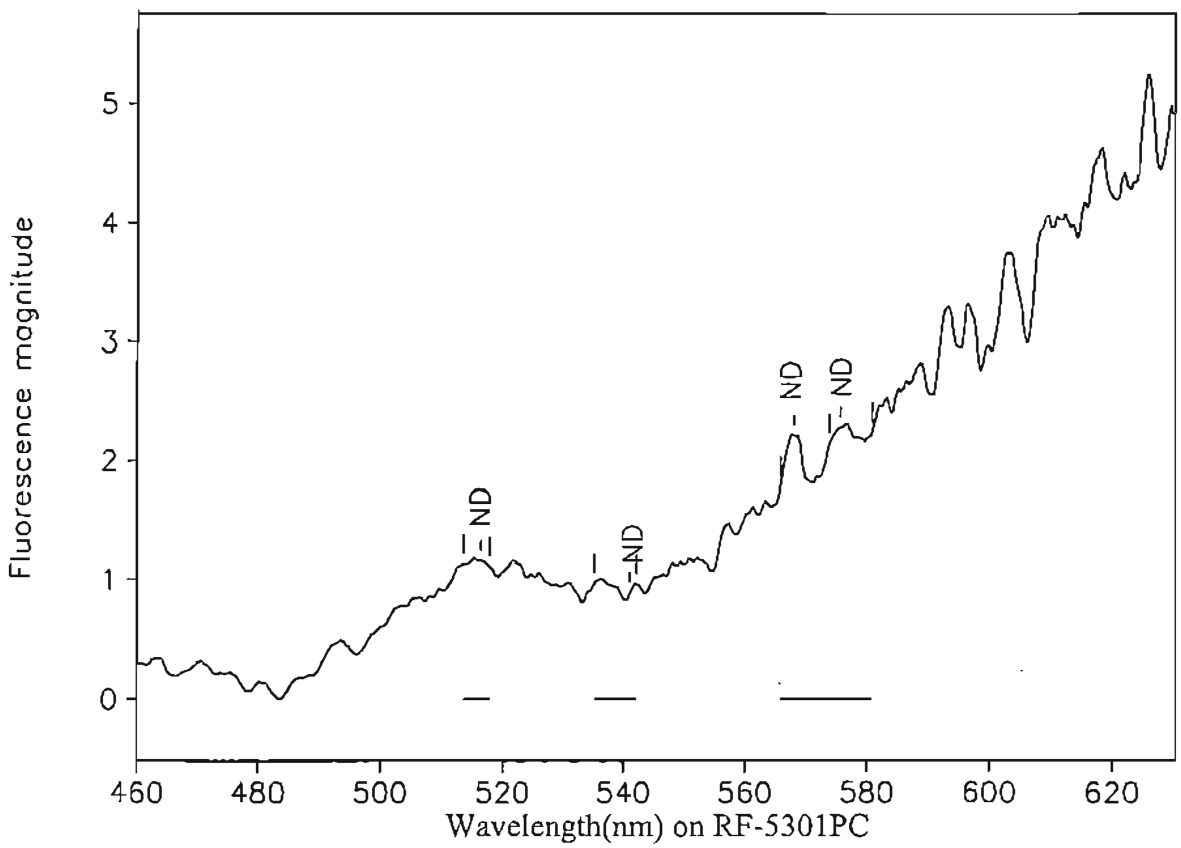
Station 1-245: MW-1 - 245 ft
OUL number: N8653 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0945 Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



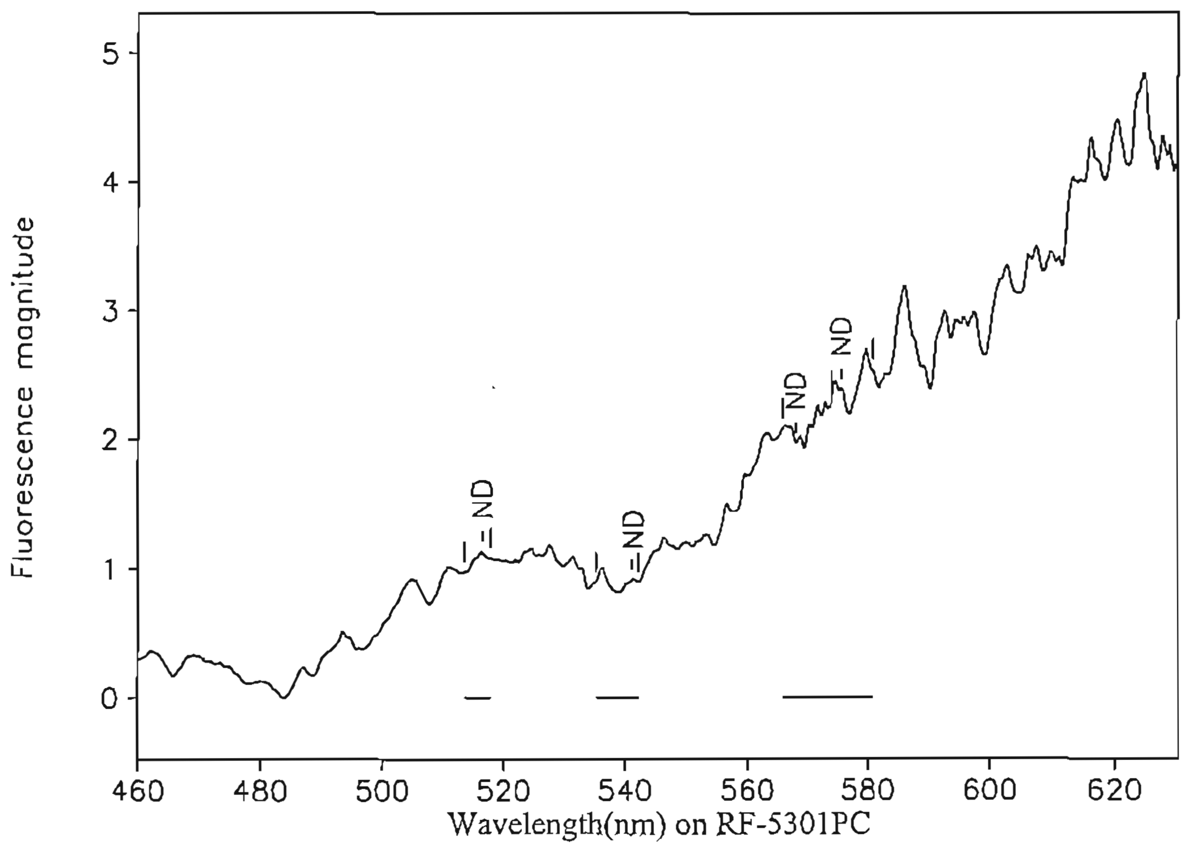
Station 1-255: MW-1 - 255 ft
OUL number: N8654 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0945 Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 1-265: MW-1 - 265 ft
OUL number: N8655
Matrix: Elutant
Placed: 02/03/05 0945

Analyzed: 02/23/05

Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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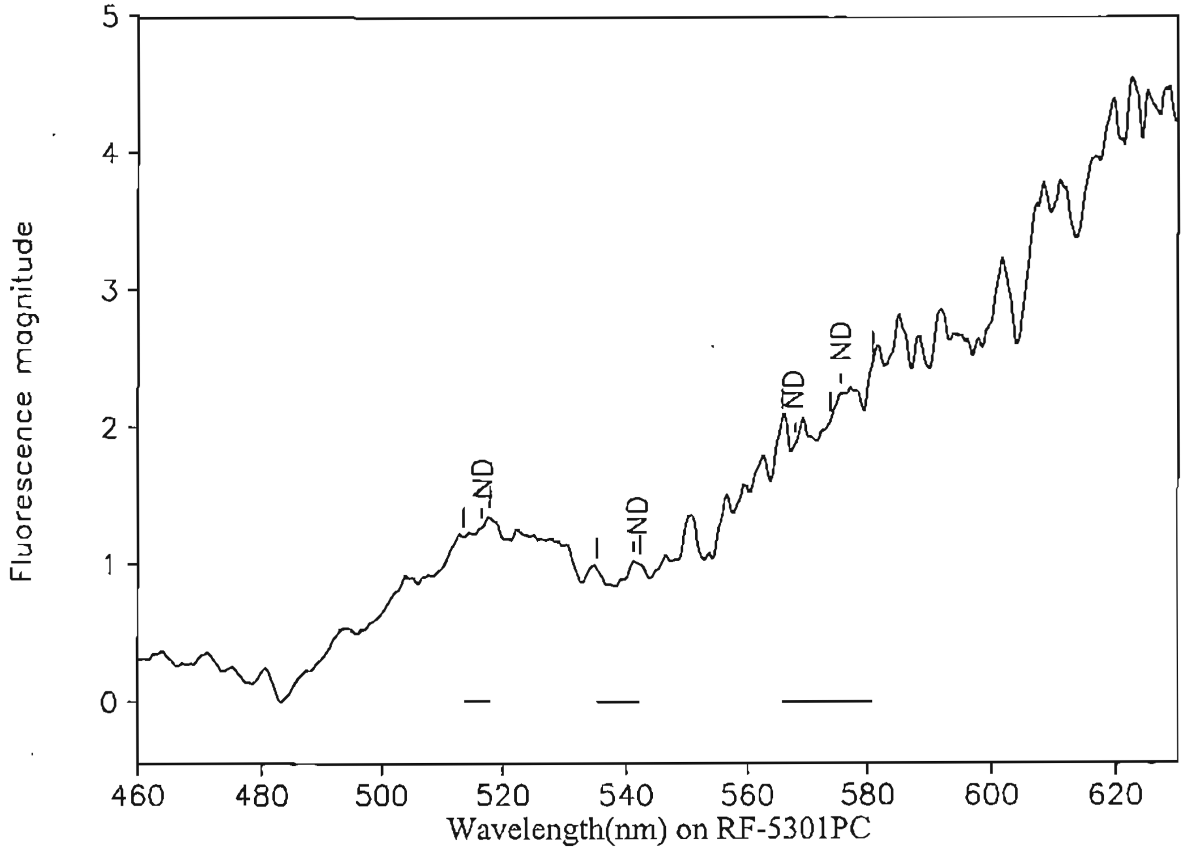

Station 1-275: MW-1 -275 ft
OUL number: N8656 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0945 Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

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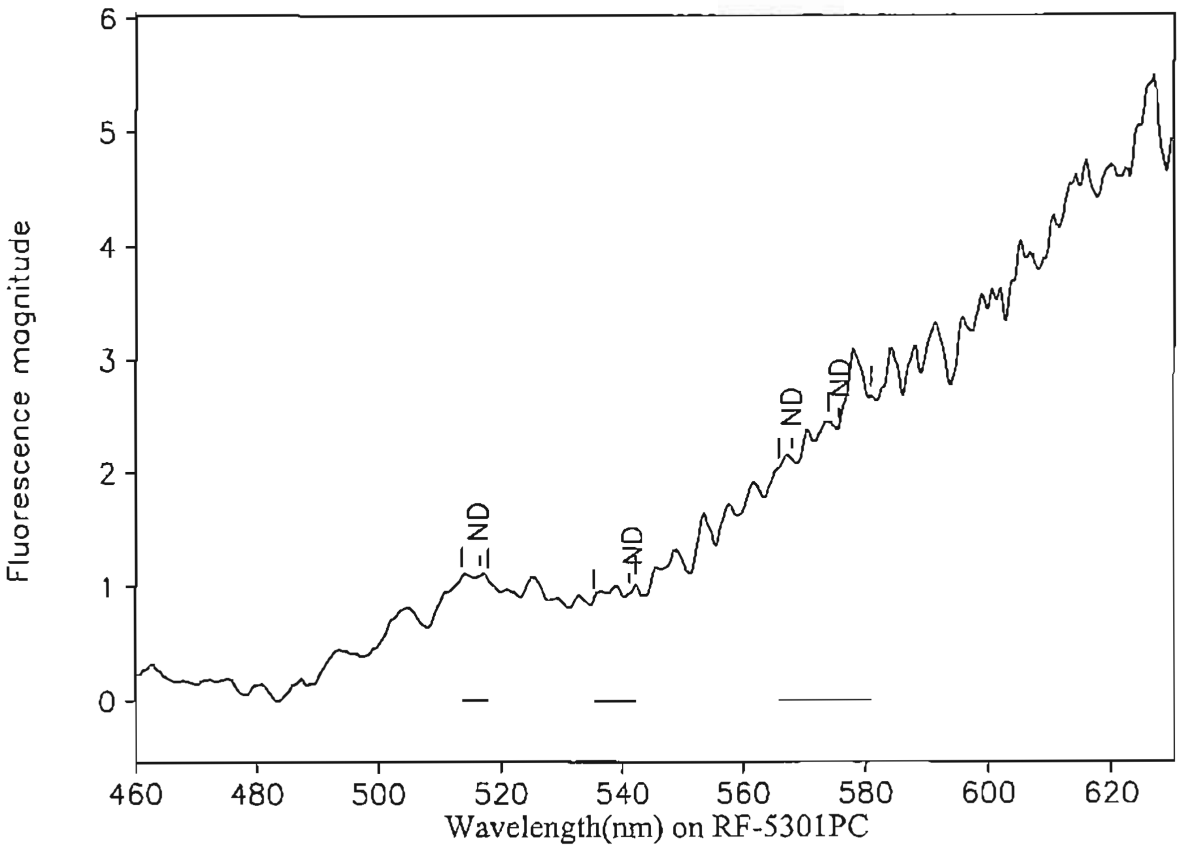


Station 1-285: MW-1 - 285 ft
OUL number: N8657
Matrix: Elutant
Placed: 02/03/05 0945

Analyzed: 02/23/05

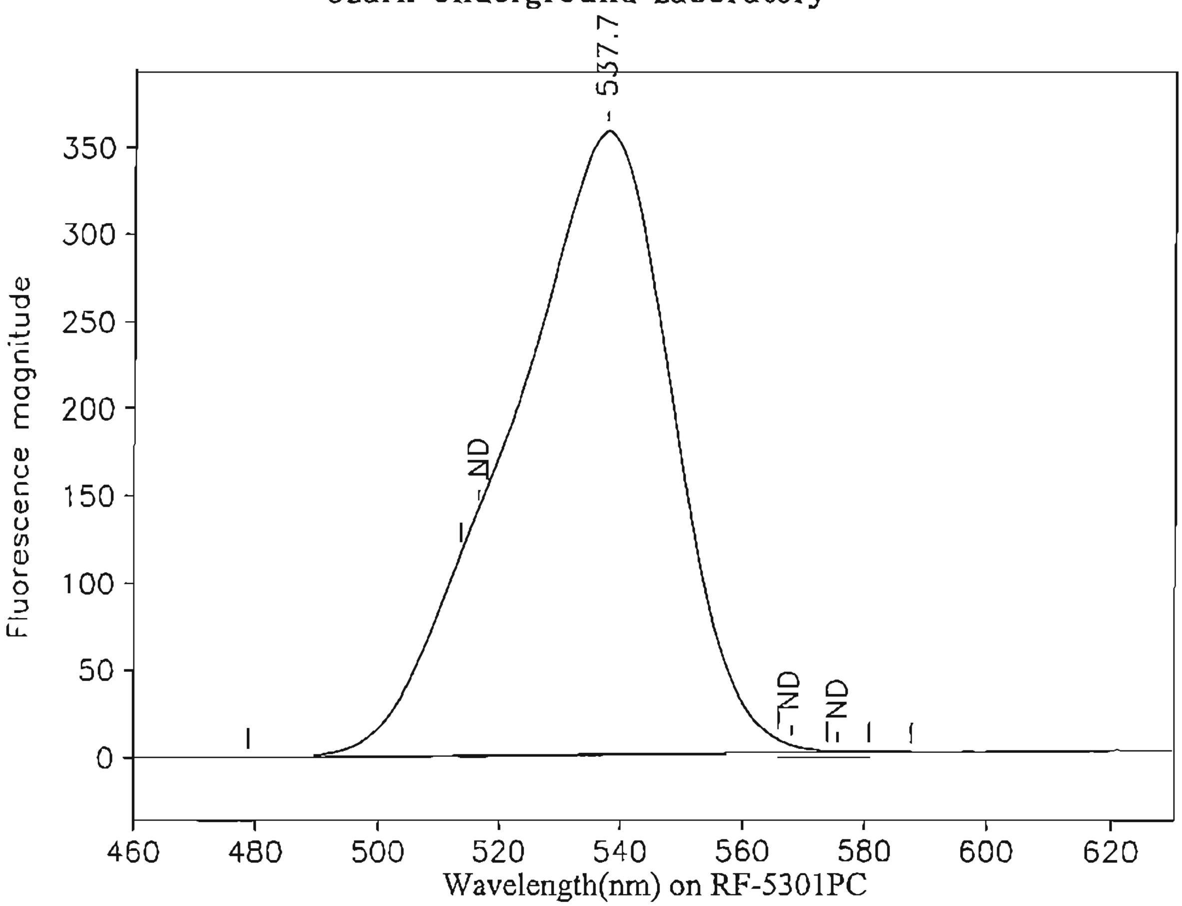
Collected: 02/17/05 1015

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



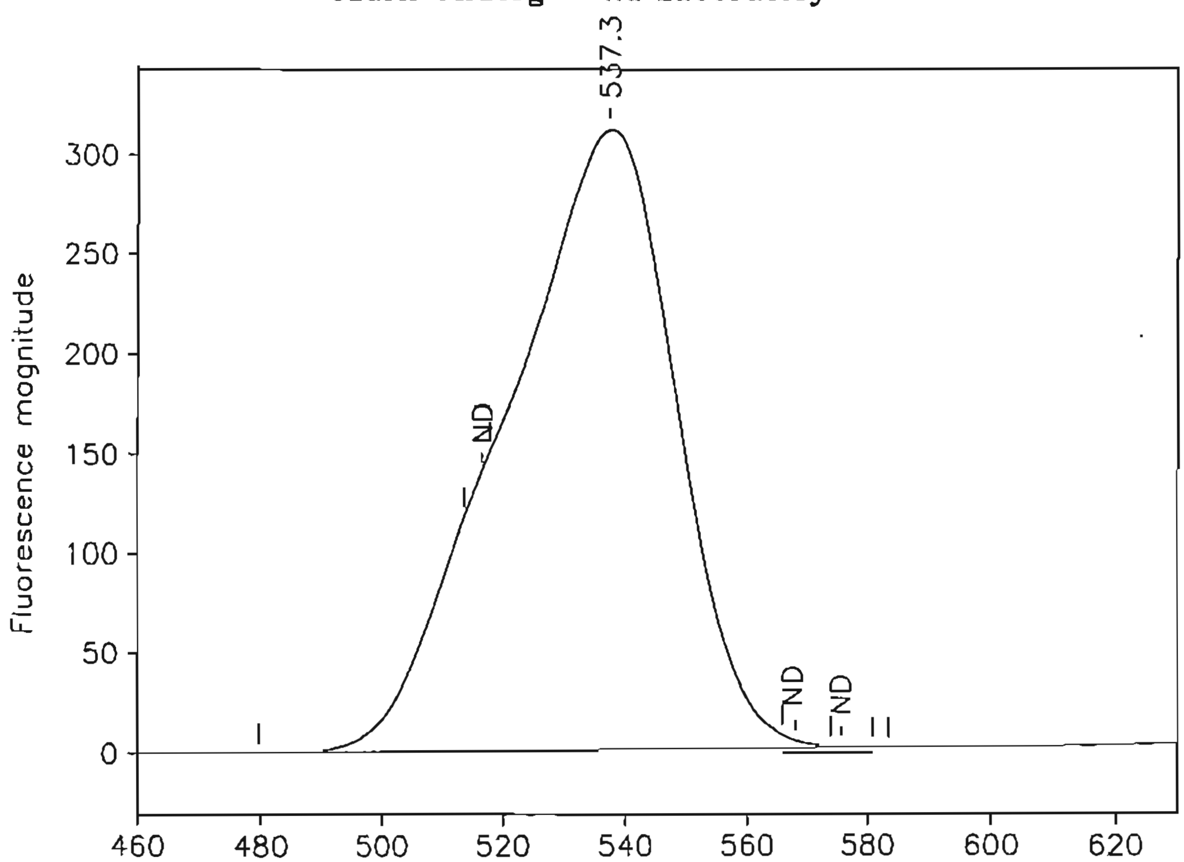
Station 2-135: MW-2 - 135 ft
OUL number: N8658 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 1020 Collected: 02/17/05 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
537.7	478.9	587.6	357.64	11,096.40	0.03	349
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-150: MW-2 - 150 ft
OUL number: N8659
Matrix: Elutant
Placed: 02/03/05 1020

Analyzed: 02/23/05
Collected: 02/17/05 1045

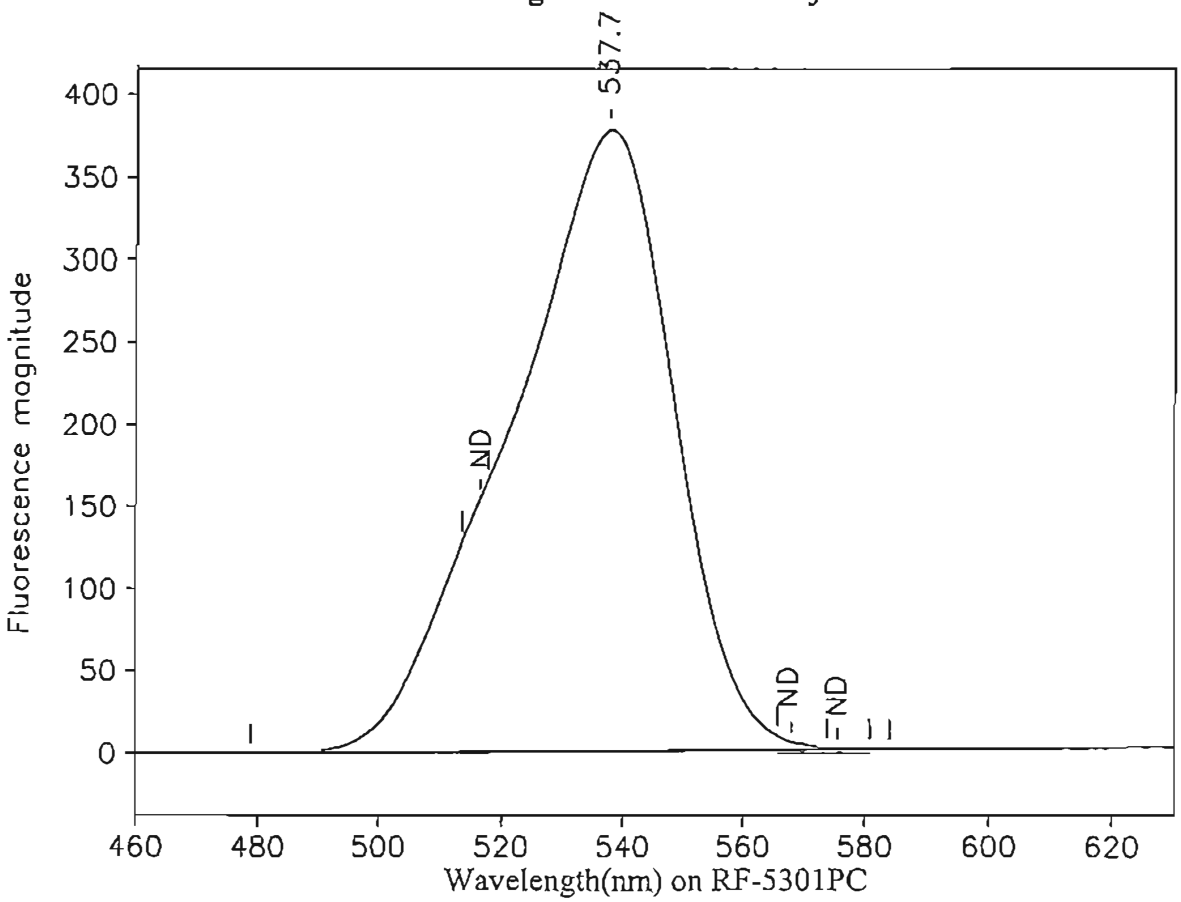
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
537.3	479.6	583.5	311.24	10,039.70	0.03	316
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Ch

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-165: MW-2 - 165 ft
OUL number: N8661 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 1020 Collected: 02/17/05 1045

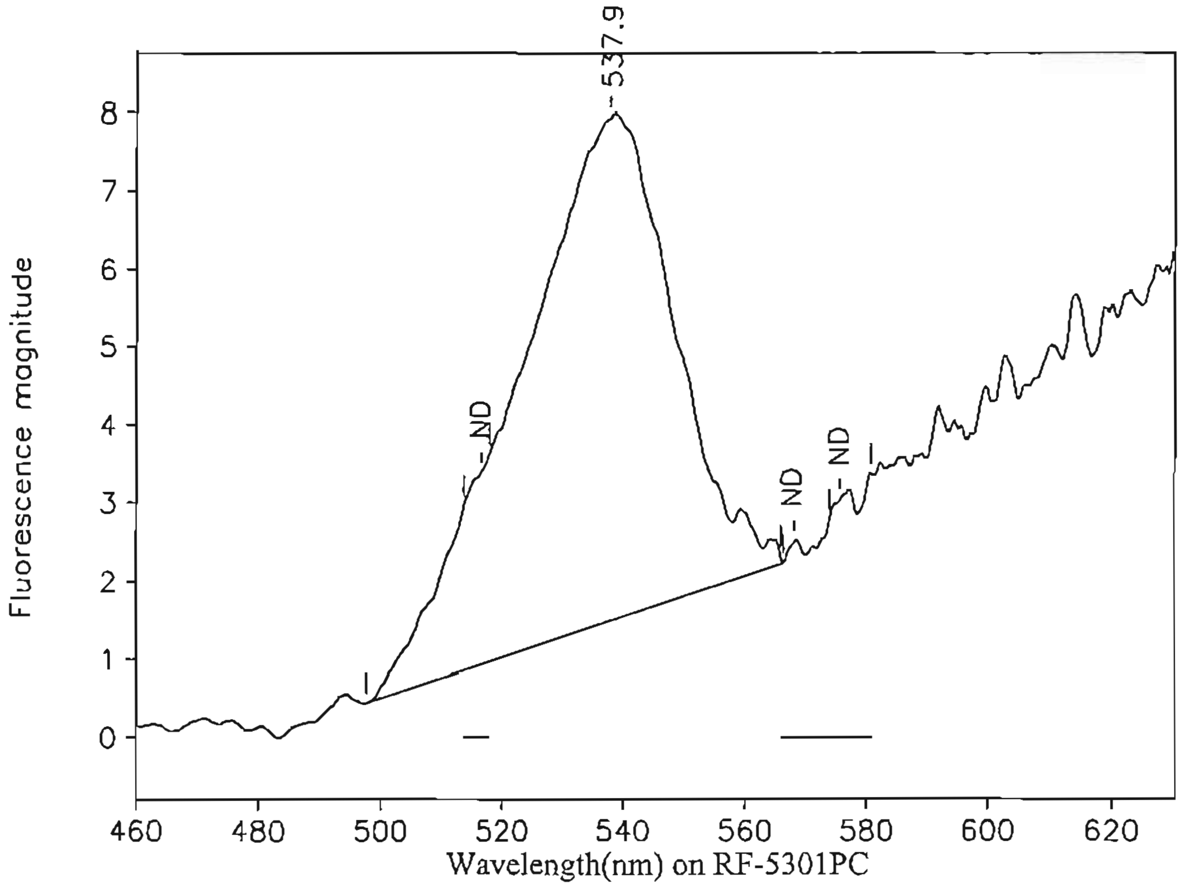
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
537.7	478.9	583.9	378.16	11,852.00	0.03	373
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-180: MW-2 - 180 ft	Diluted: 1 to 100
OUL number: N8662	Analyzed: 02/23/05
Matrix: Elutant	
Placed: 02/03/05 1020	Collected: 02/17/05 1045

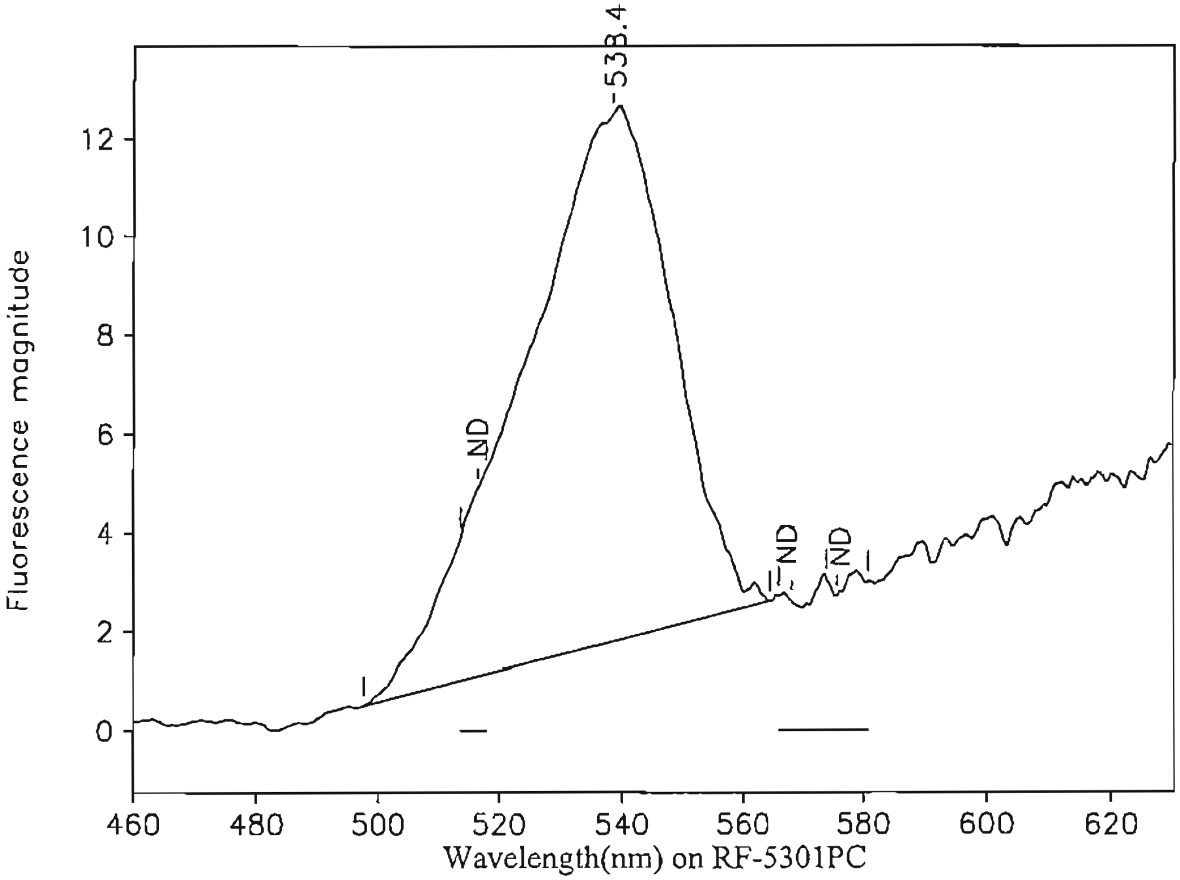
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
537.9	497.6	566.2	6.46	195.05	0.03	613
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Ca

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-195: MW-2 - 195 ft
OUL number: N8663
Matrix: Elutant
Placed: 02/03/05 1020

Diluted: 1 to 100
Analyzed: 02/23/05

Collected: 02/17/05 1045

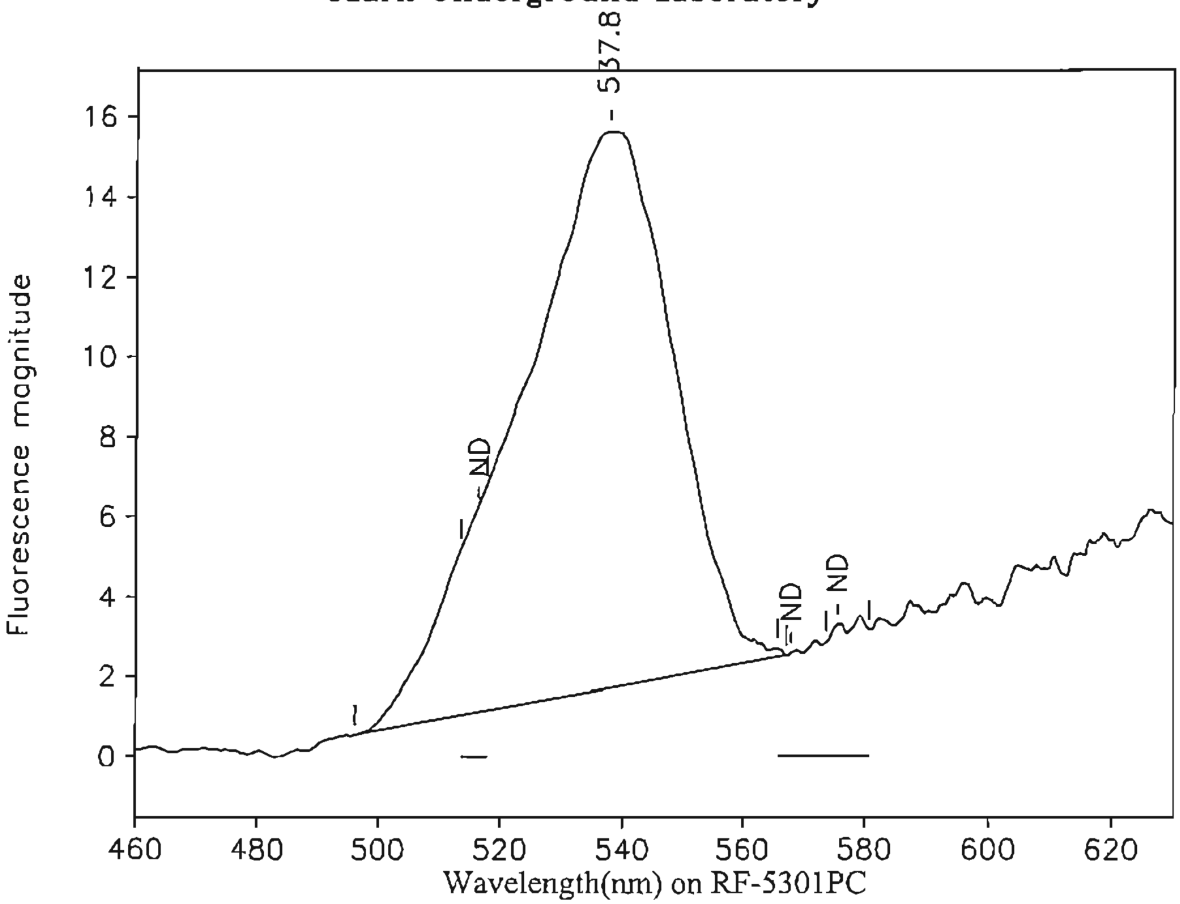
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.4	497.6	564.4	10.71	311.65	0.03	980
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-210: MW-2 - 210 ft
OUL number: N8664
Matrix: Elutant
Placed: 02/03/05 1020

Diluted: 1 to 100
Analyzed: 02/23/05

Collected: 02/17/05 1045

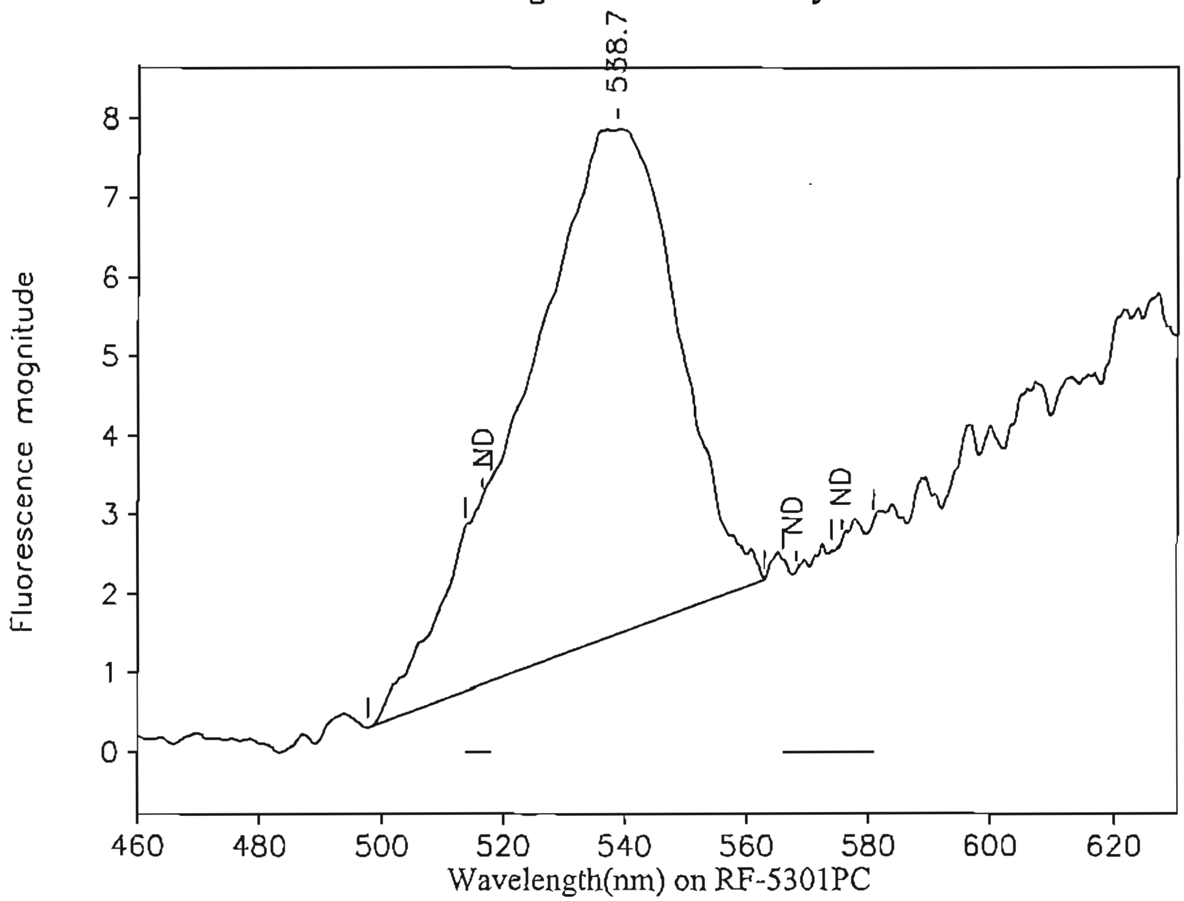
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
537.8	496.2	567.2	13.96	416.05	0.03	1,310
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-225: MW-2 - 225 ft
OUL number: N8665
Matrix: Elutant
Placed: 02/03/05 1020

Diluted: 1 to 100
Analyzed: 02/23/05

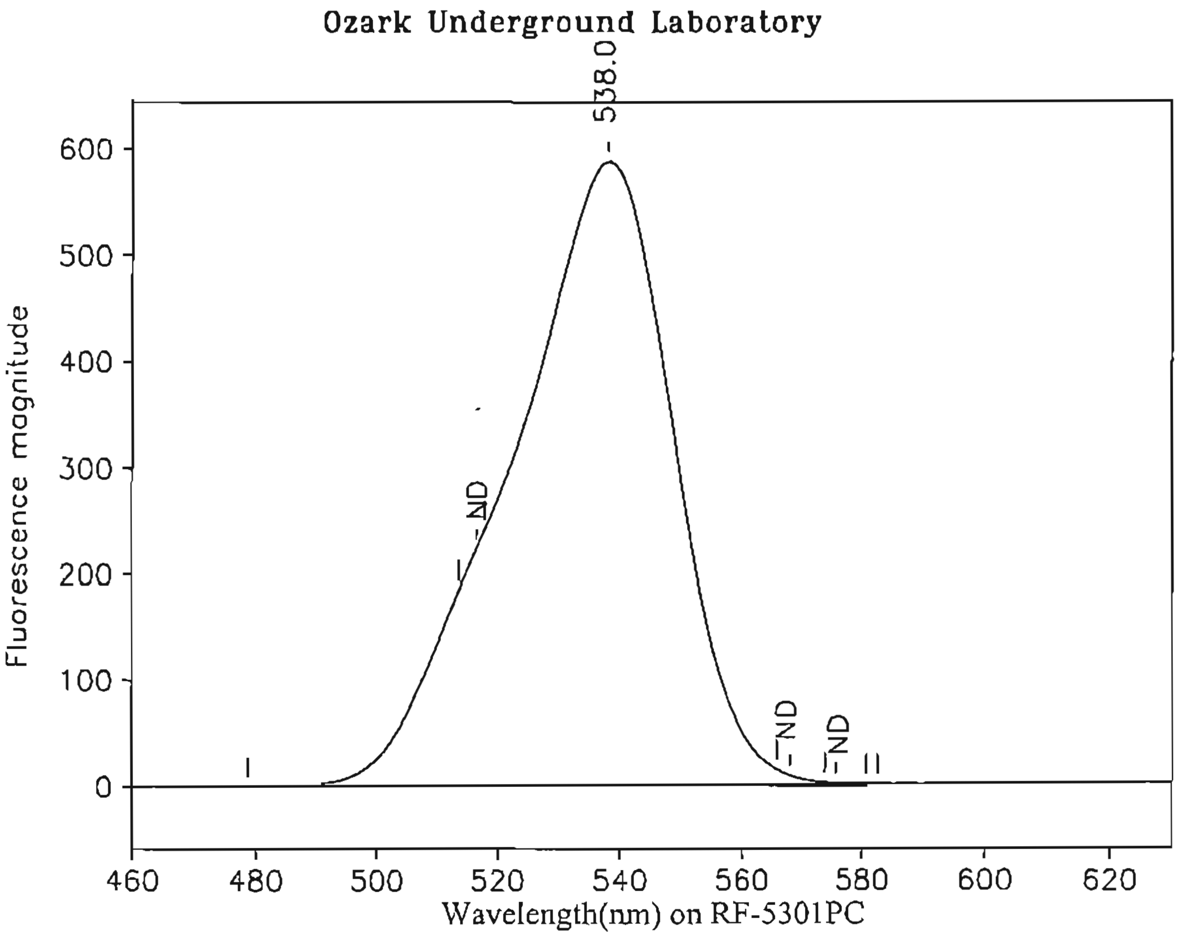
Collected: 02/17/05 1045

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.7	497.6	562.8	6.39	192.92	0.03	607
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:



Station 2-240: MW-2 - 240 ft
OUL number: N8666
Matrix: Elutant
Placed: 02/03/05 1020

Analyzed: 02/23/05
Collected: 02/17/05 1045

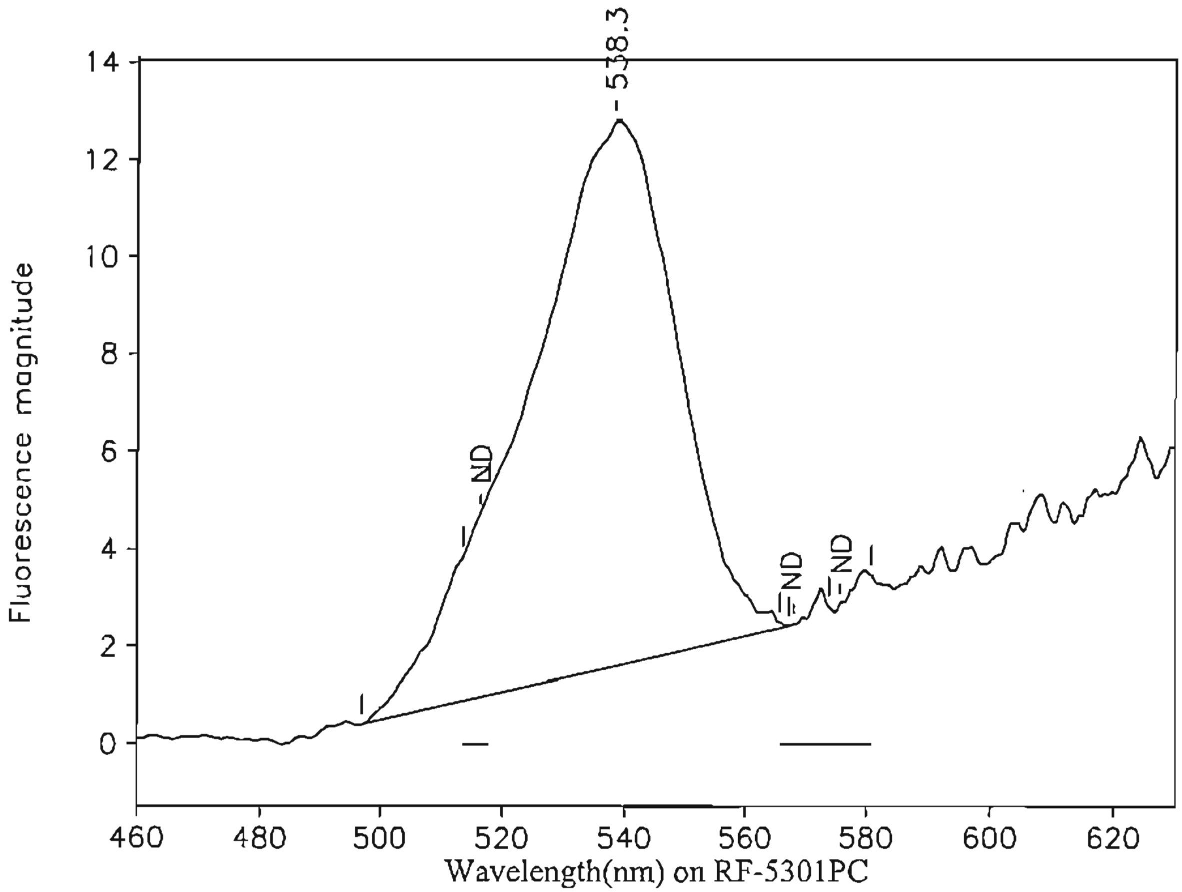
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.0	478.7	582.5	587.53	18,098.90	0.03	569
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Cu

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N8667
Matrix: Elutant
Placed: 02/03/05 1020

Diluted: 1 to 100
Analyzed: 02/23/05

Collected: 02/17/05 1045

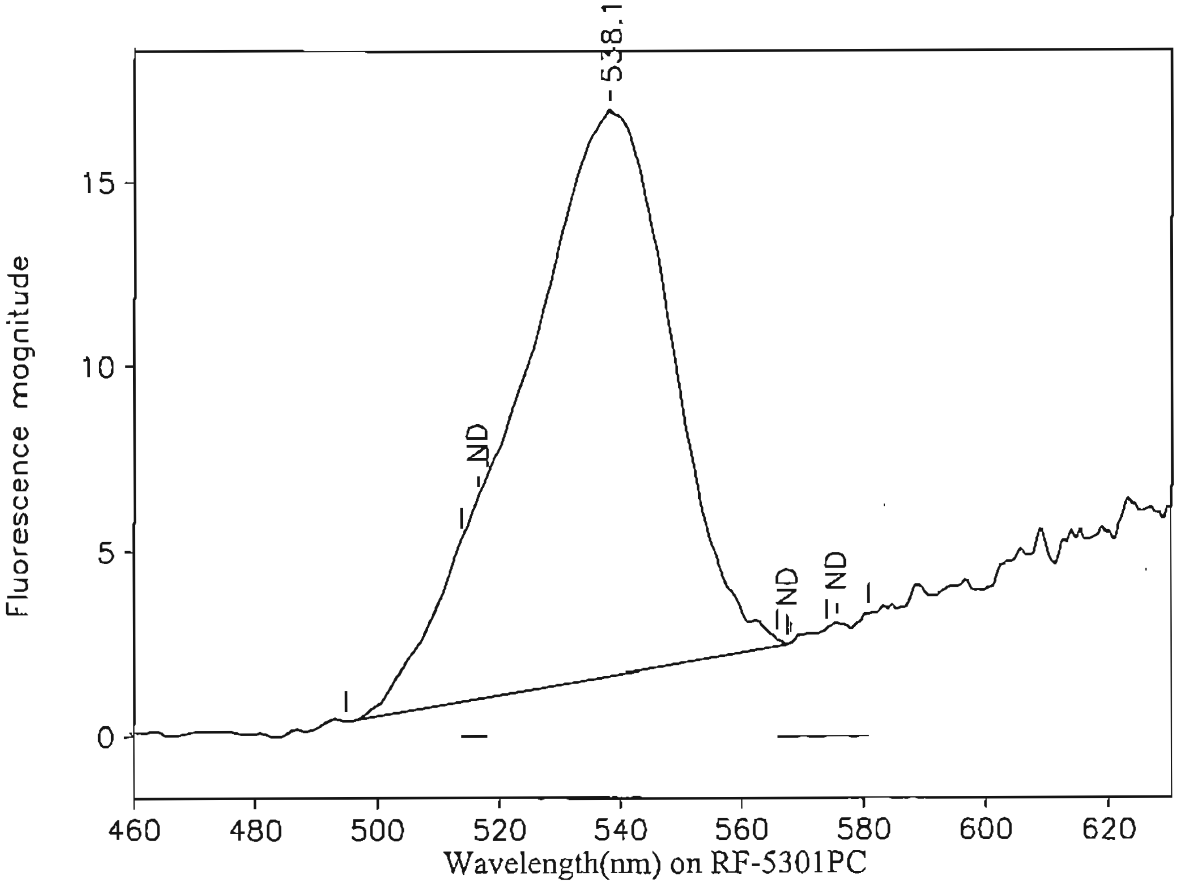
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.3	497.0	567.2	11.21	325.87	0.03	1,020
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Ca

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-270: MW-2 - 270 ft
OUL number: N8668
Matrix: Elutant
Placed: 02/03/05 1020

Diluted: 1 to 100
Analyzed: 02/23/05

Collected: 02/17/05 1045

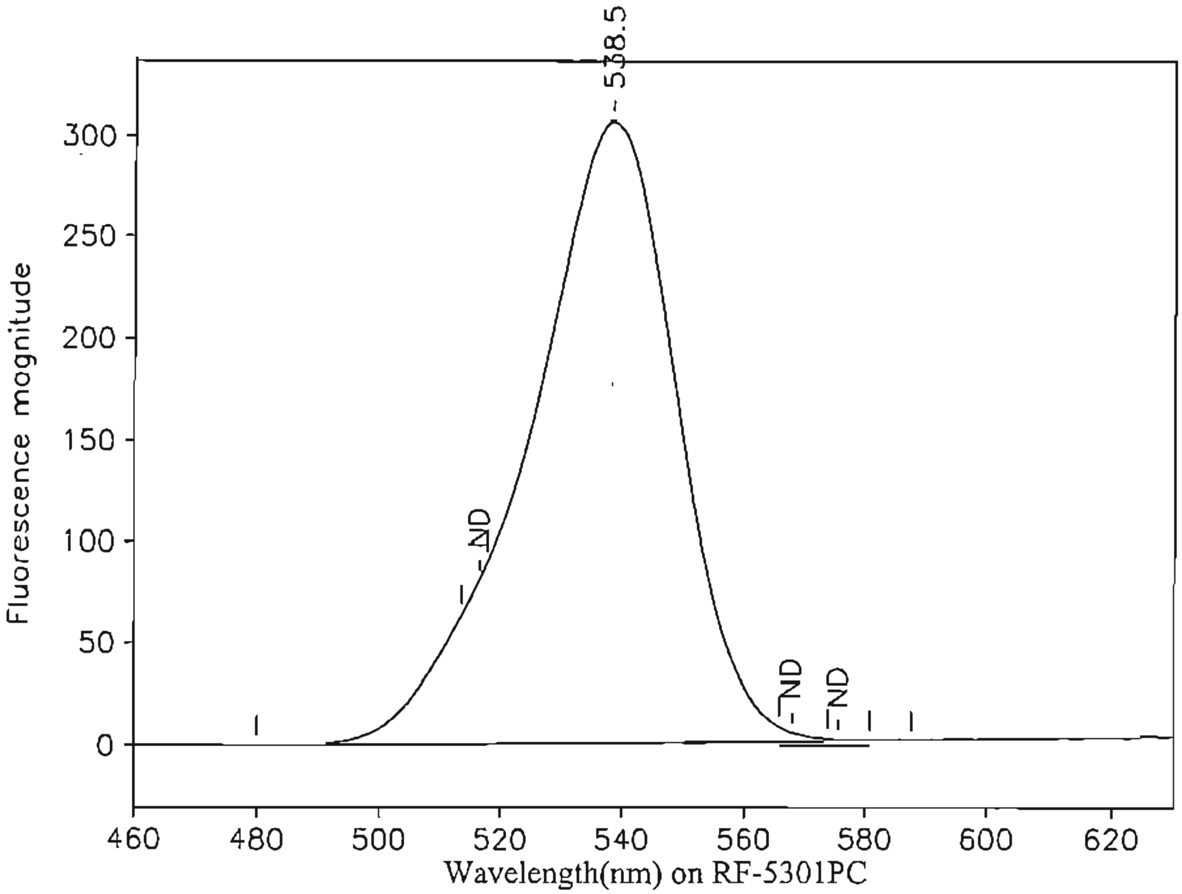
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.1	494.8	567.4	15.31	453.63	0.03	1,430
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Ca

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-285: MW-2 - 285 ft
OUL number: N8669 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 1020 Collected: 02/17/05 1045

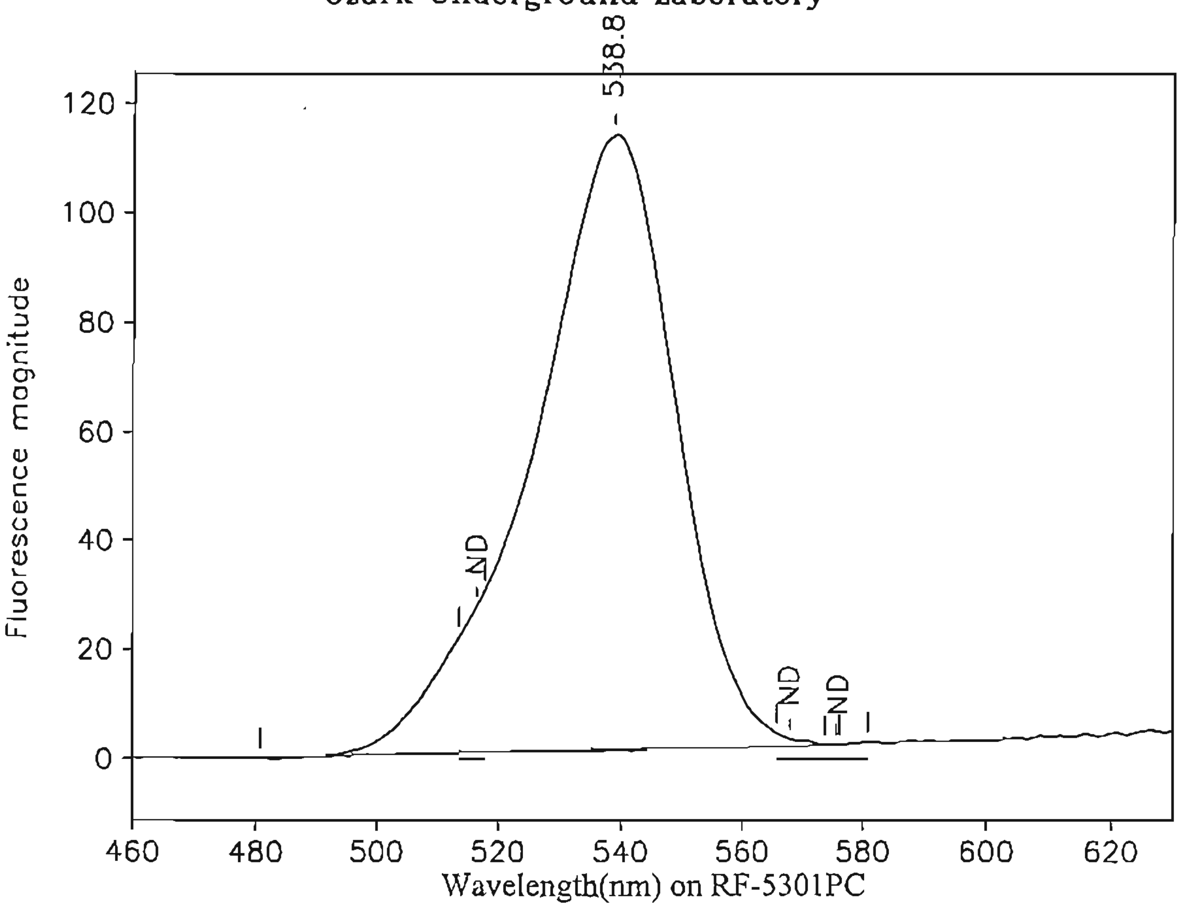
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.5	480.0	587.6	306.12	8,628.78	0.04	271
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cu

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-300: MW-2 - 300 ft
OUL number: N8670
Matrix: Elutant
Placed: 02/03/05 1020

Analyzed: 02/23/05

Collected: 02/17/05 1045

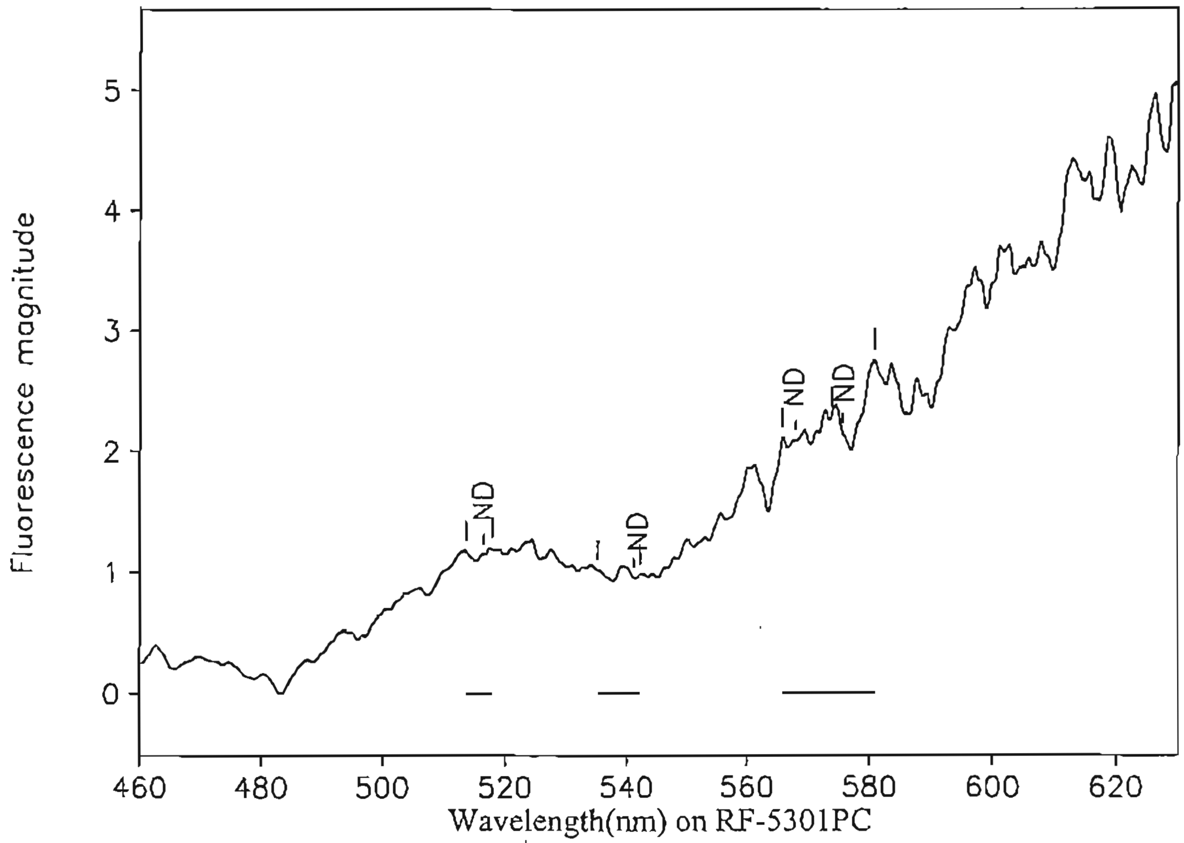
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
538.8	480.7	576.1	112.78	3,075.98	0.04	96.7
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Cw

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-175: MW-3 - 175 ft
OUL number: N8671
Matrix: Elutant
Placed: 02/03/05 0915

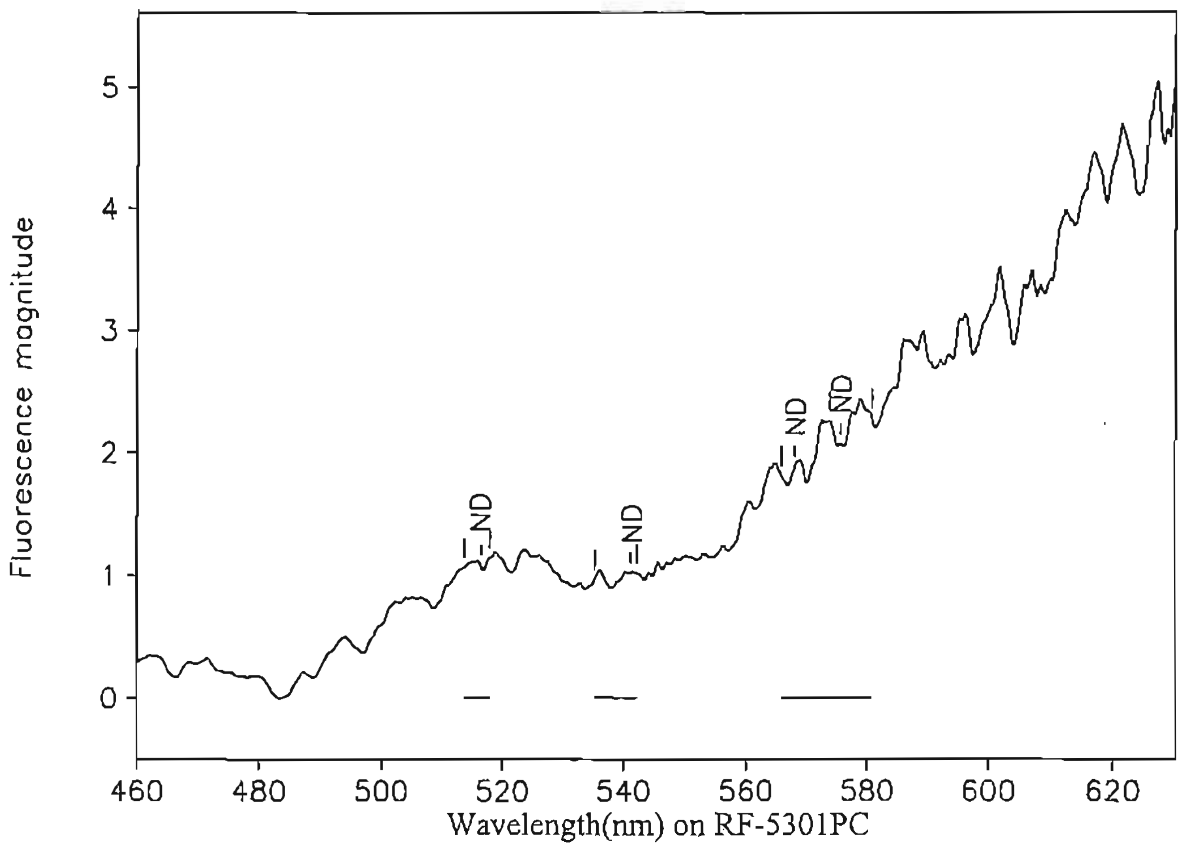
Analyzed: 02/23/05
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



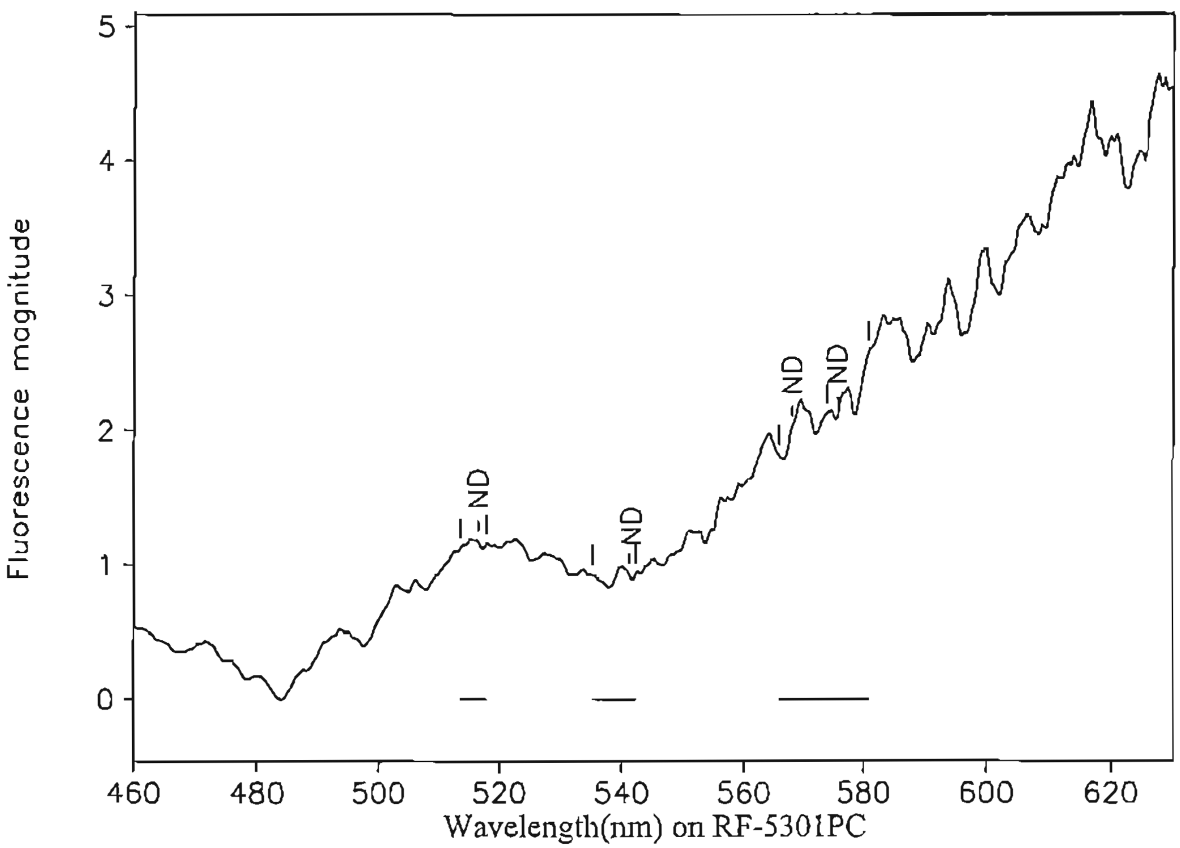
Station 3-185: MW-3 - 185 ft
OUL number: N8672 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0915 Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



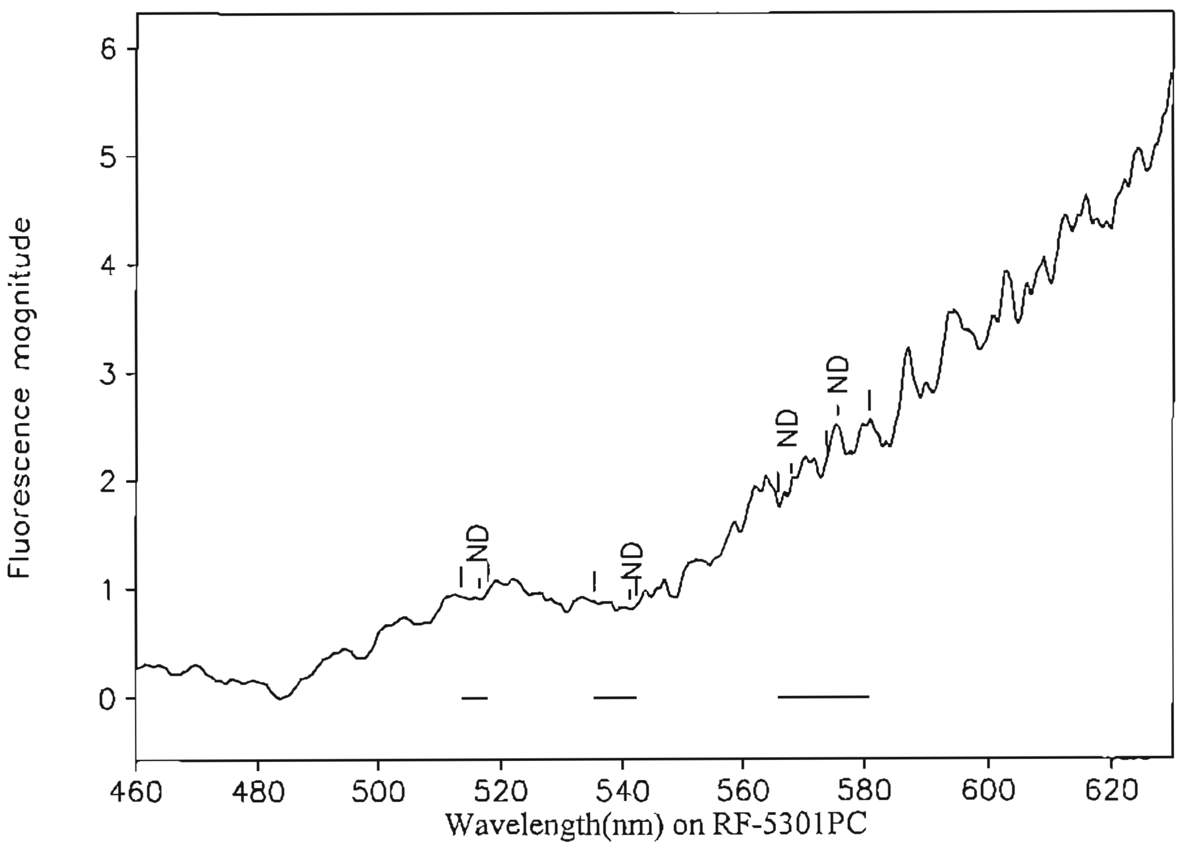
Station 3-195: MW-3 - 195 ft
OUL number: N8673 — Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0915 — Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-205: MW-3 - 205 ft
OUL number: N8674
Matrix: Elutant
Placed: 02/03/05 0915

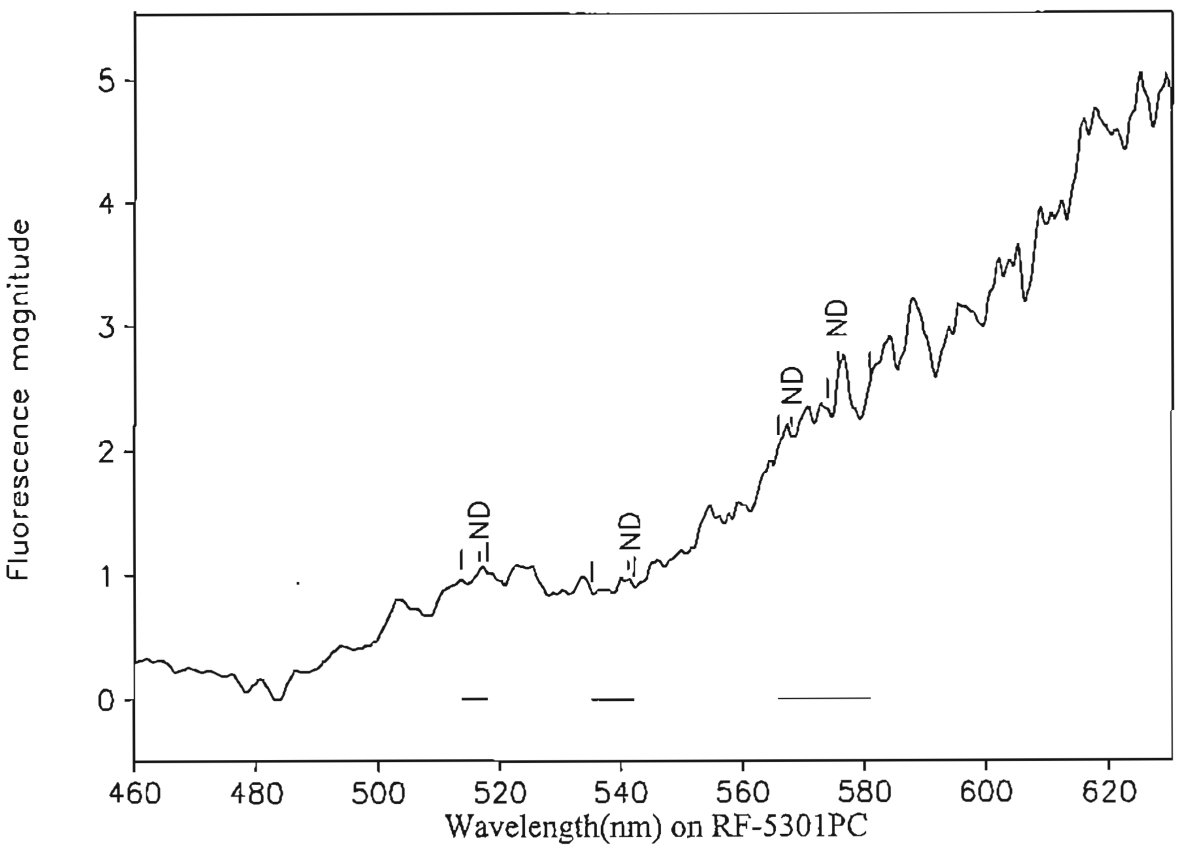
Analyzed: 02/23/05
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-215: MW-3 - 215 ft
OUL number: N8675
Matrix: Elutant
Placed: 02/03/05 0915

Analyzed: 02/23/05

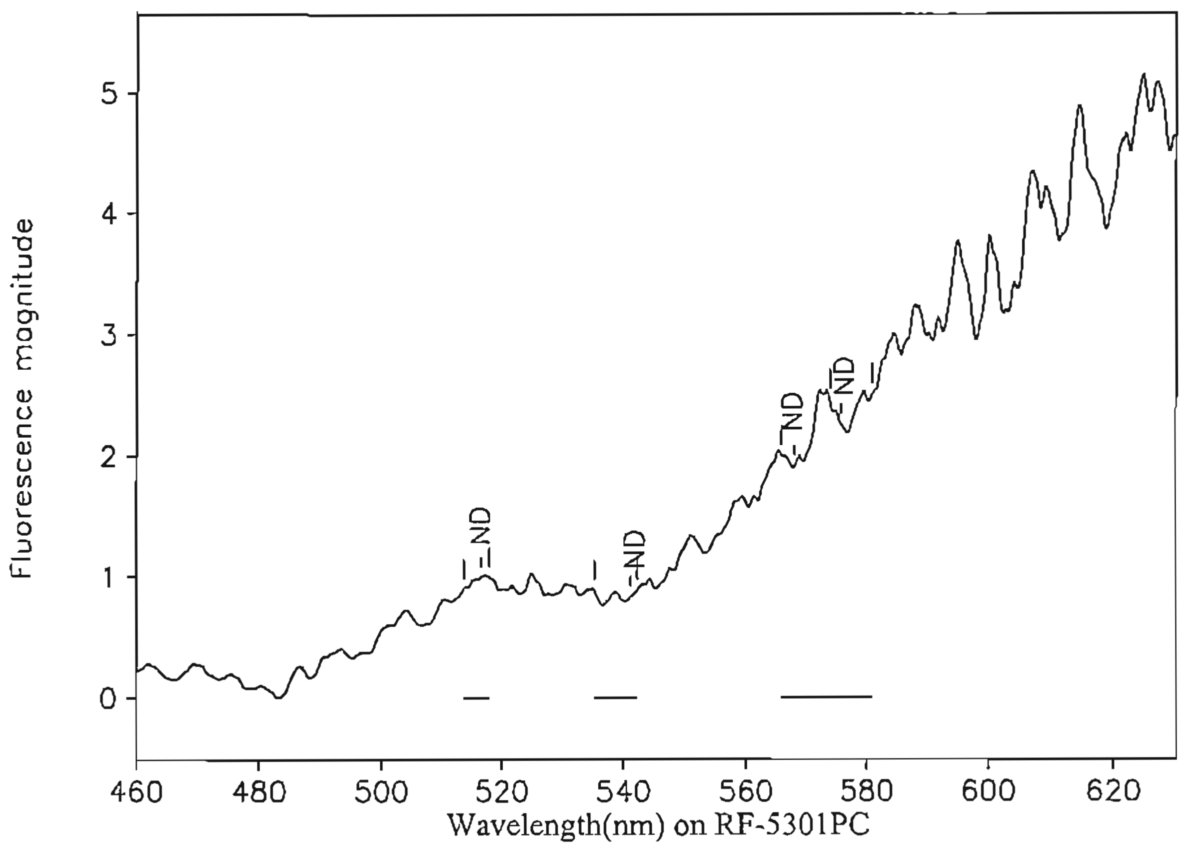
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-225: MW-3 - 225 ft
OUL number: N8676
Matrix: Elutant
Placed: 02/03/05 0915

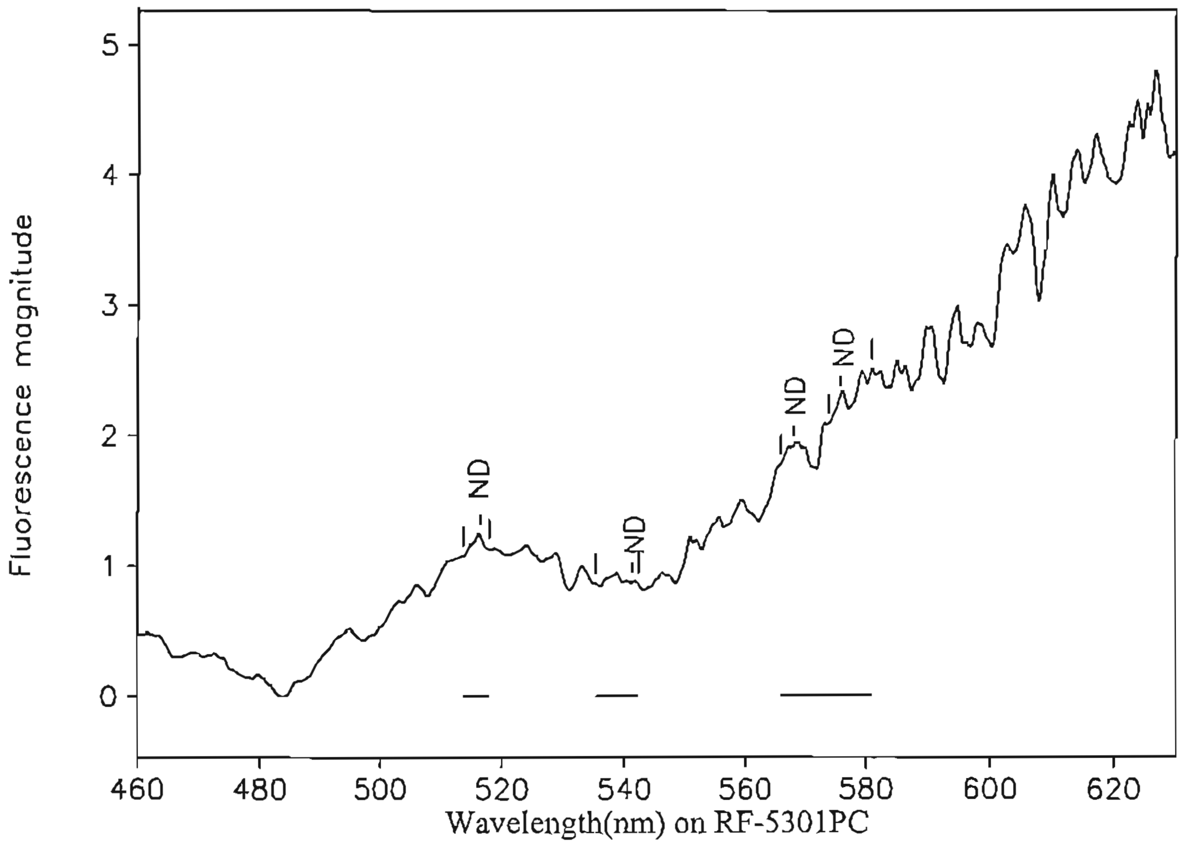
Analyzed: 02/23/05
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-235: MW-3 - 235 ft
OUL number: N8677
Matrix: Elutant
Placed: 02/03/05 0915

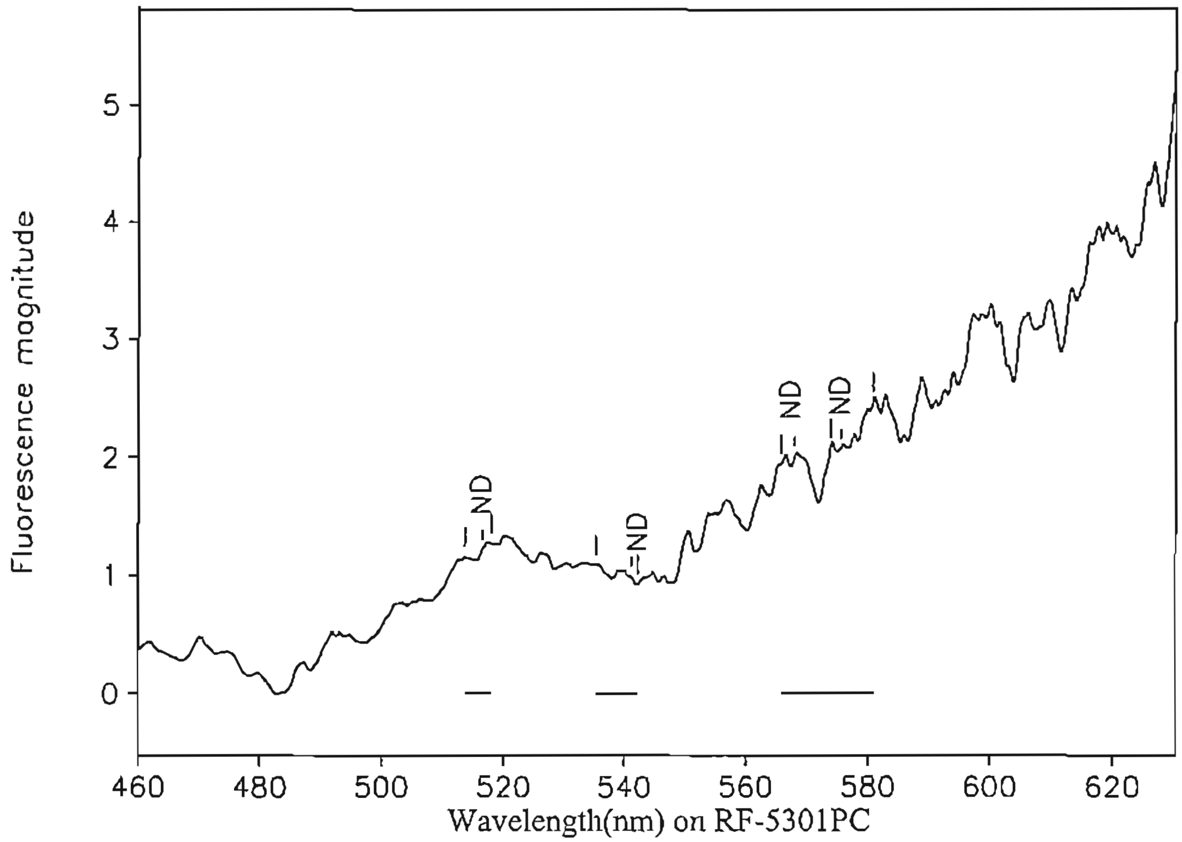
Analyzed: 02/23/05
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



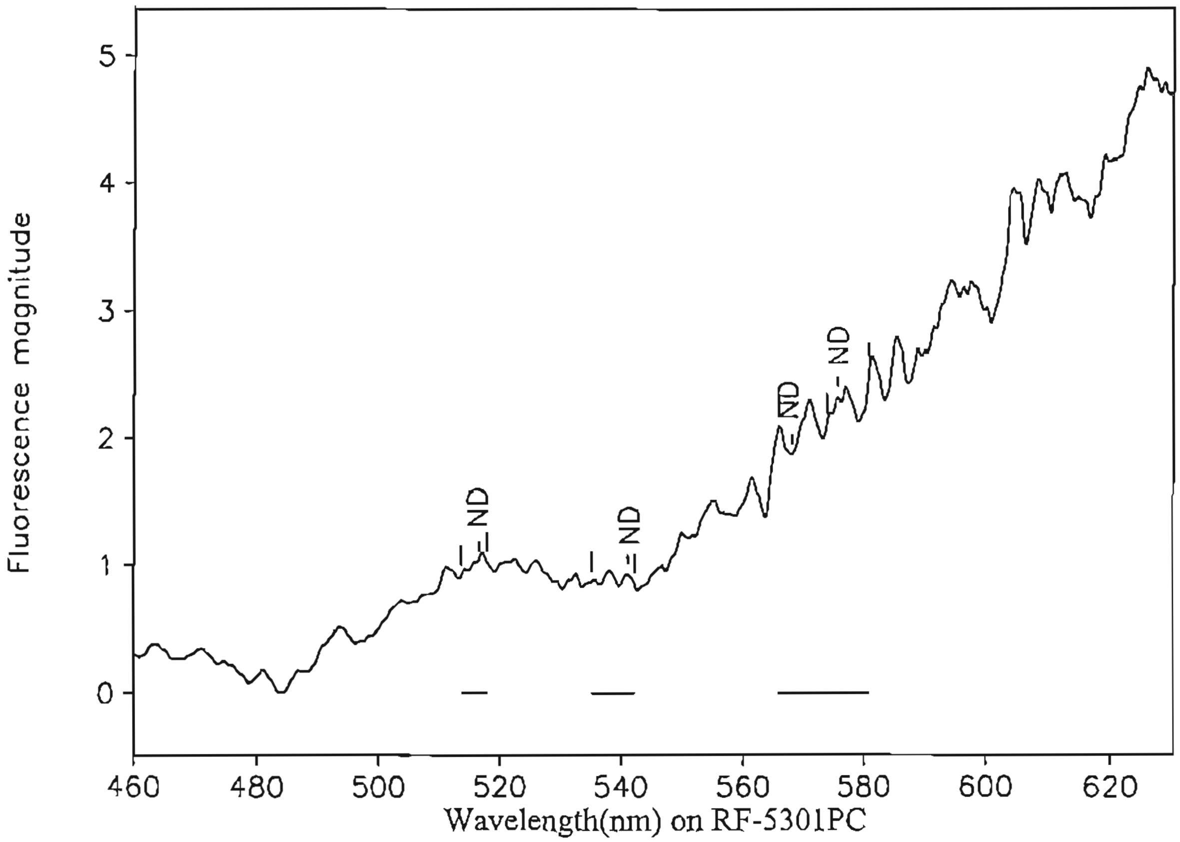
Station 3-245: MW-3 - 245 ft
OUL number: N8678 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0915 Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-255: MW-3 - 255 ft
OUL number: N8679
Matrix: Elutant
Placed: 02/03/05 0915

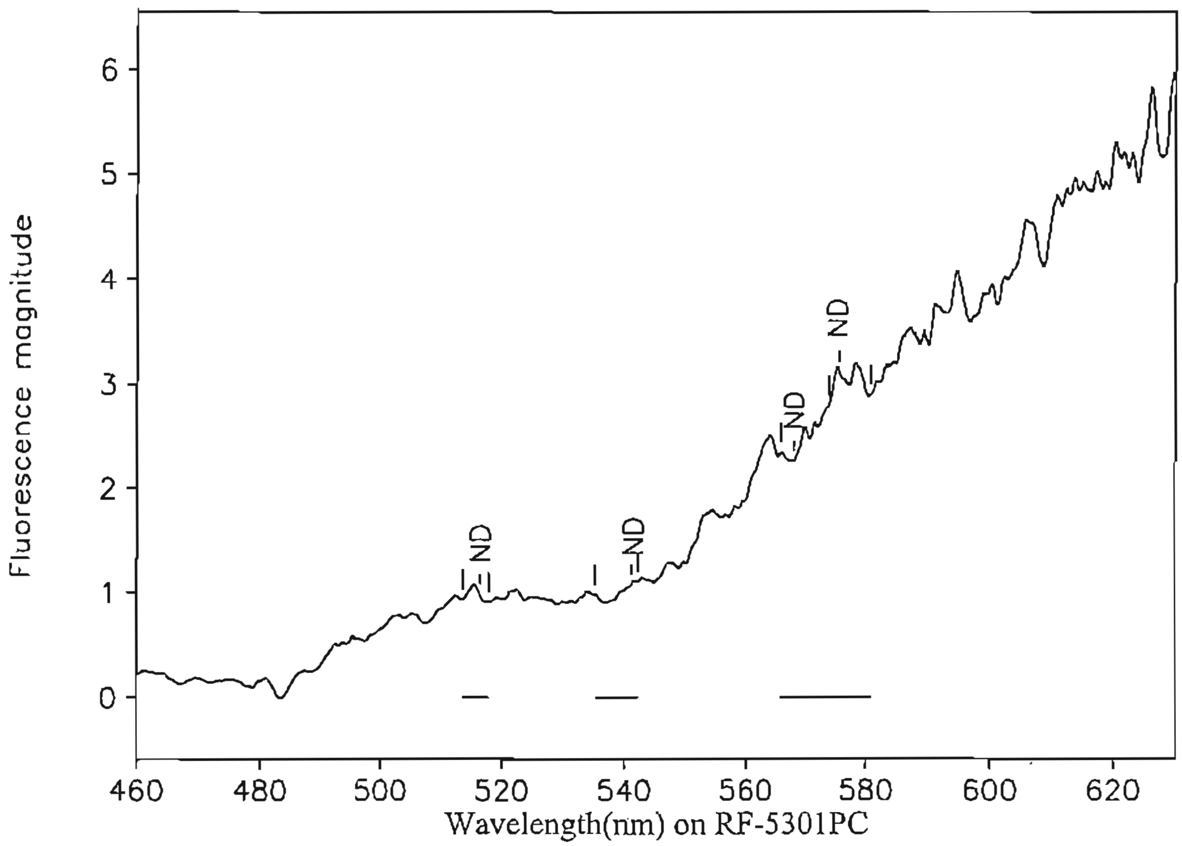
Analyzed: 02/23/05
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2: Blank
OUL number: N8680
Matrix: Elutant
Placed: 02/23/05 1705

Analyzed: 02/23/05

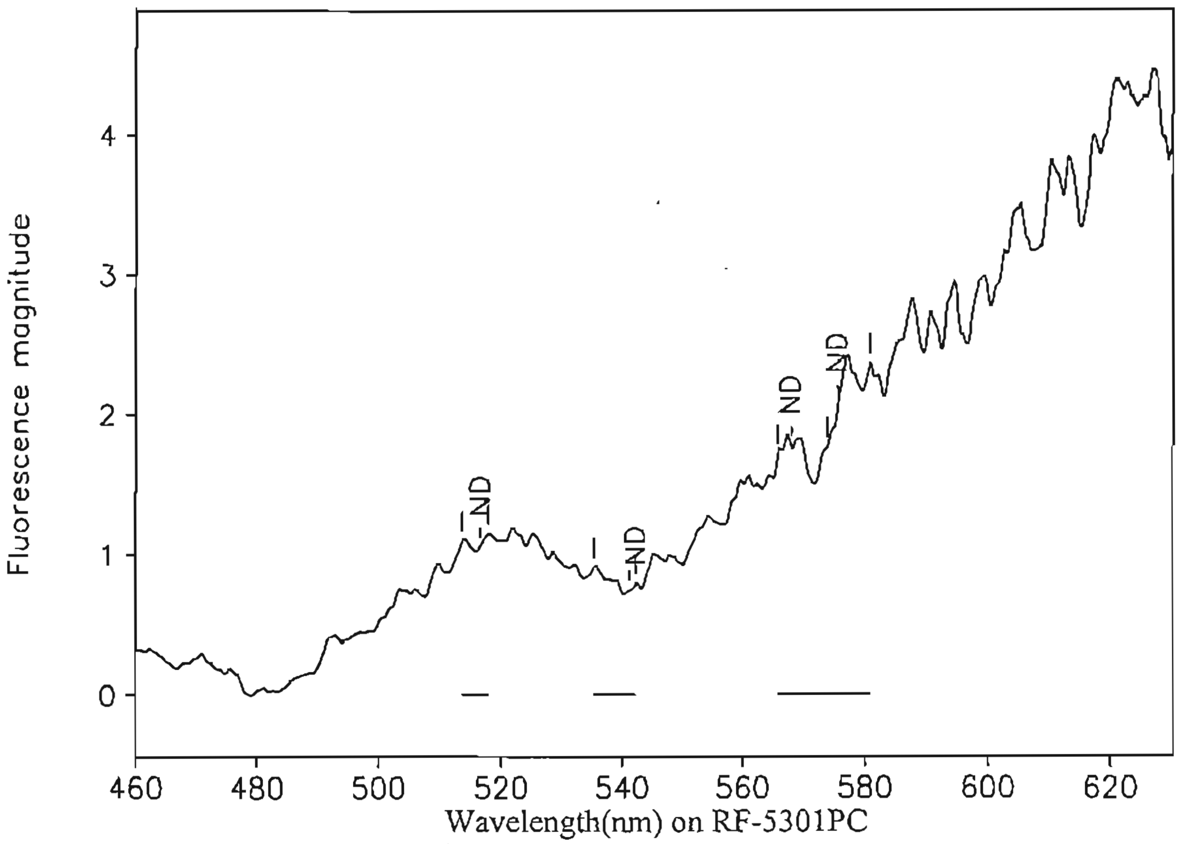
Collected: 02/23/05 1706

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-265: MW-3 - 265 ft
OUL number: N8681
Matrix: Elutant
Placed: 02/03/05 0915

Analyzed: 02/23/05

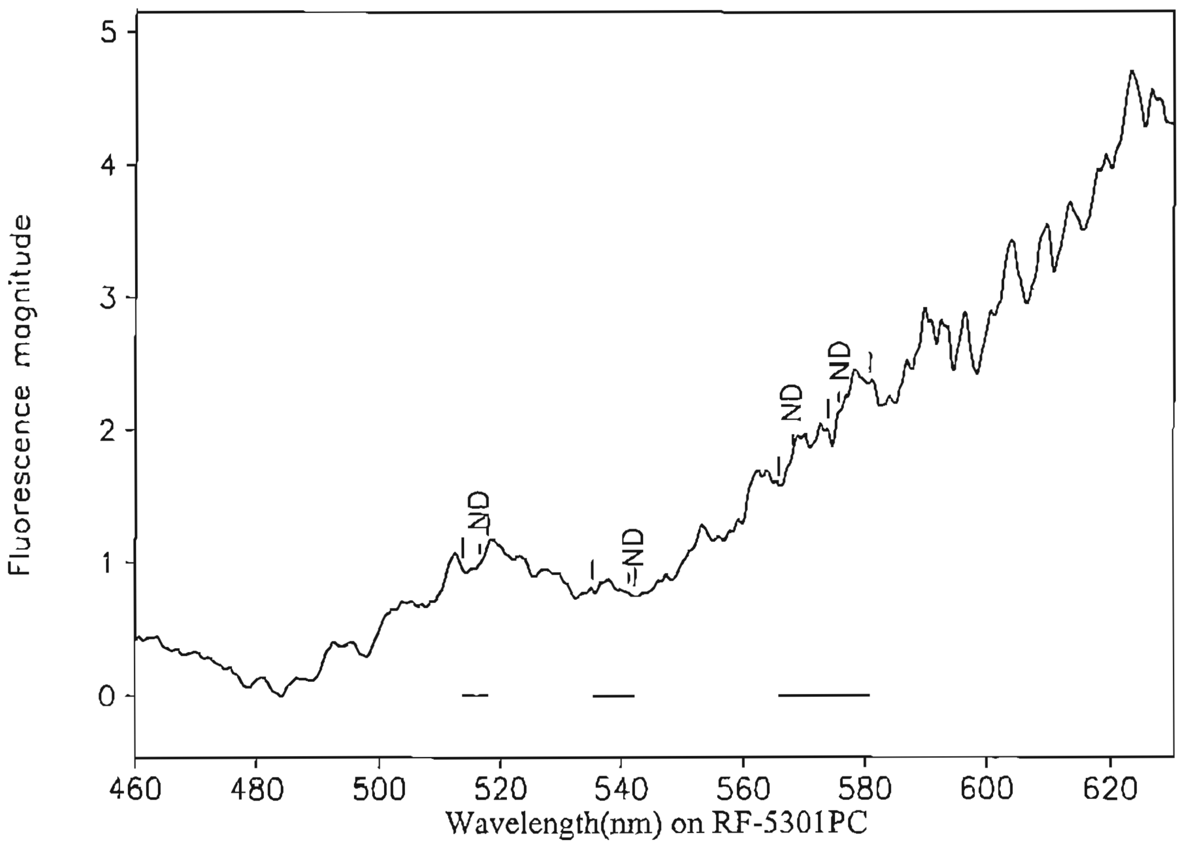
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 3-275: MW-3 - 275 ft
OUL number: N8682
Matrix: Elutant
Placed: 02/03/05 0915

Analyzed: 02/23/05

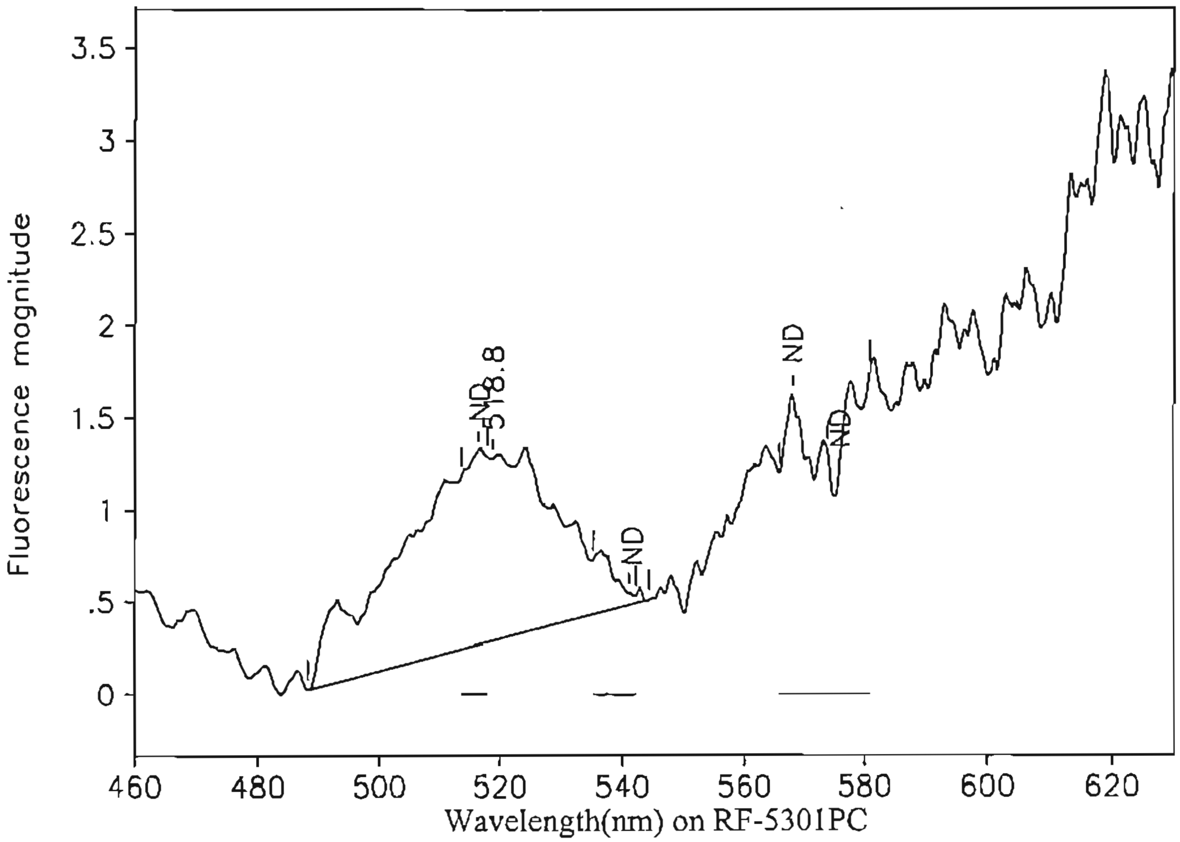
Collected: 02/17/05 0940

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



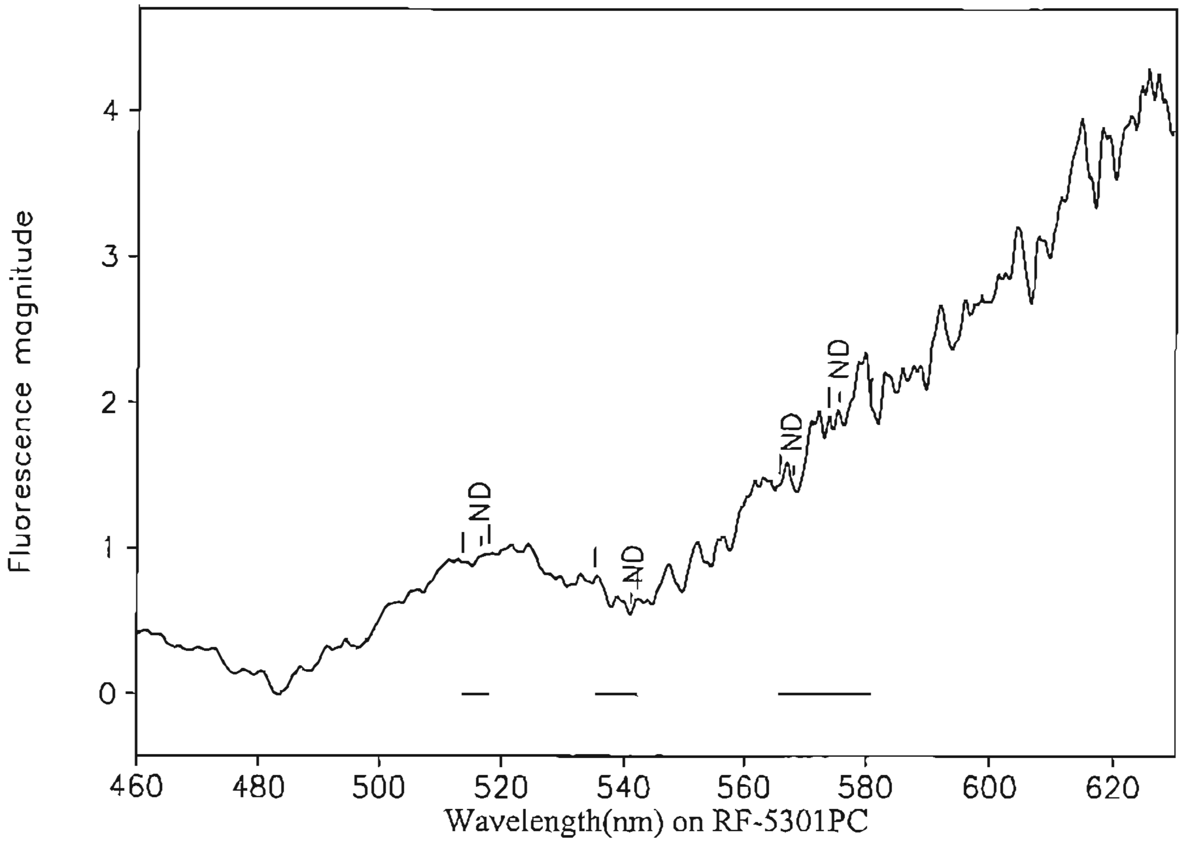
Station 4-165: MW-4 - 165 ft
OUL number: N8683
Matrix: Elutant
Placed: 02/03/05 0835

Analyzed: 02/23/05
Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND
Peaks close to the normal range of tracer dyes:						
518.8	488.2	544.4	0.98	32.10	0.03	0.722

Ozark Underground Laboratory



Station 4-180: MW-4 - 180 ft
OUL number: N8684
Matrix: Elutant
Placed: 02/03/05 0835

Analyzed: 02/23/05

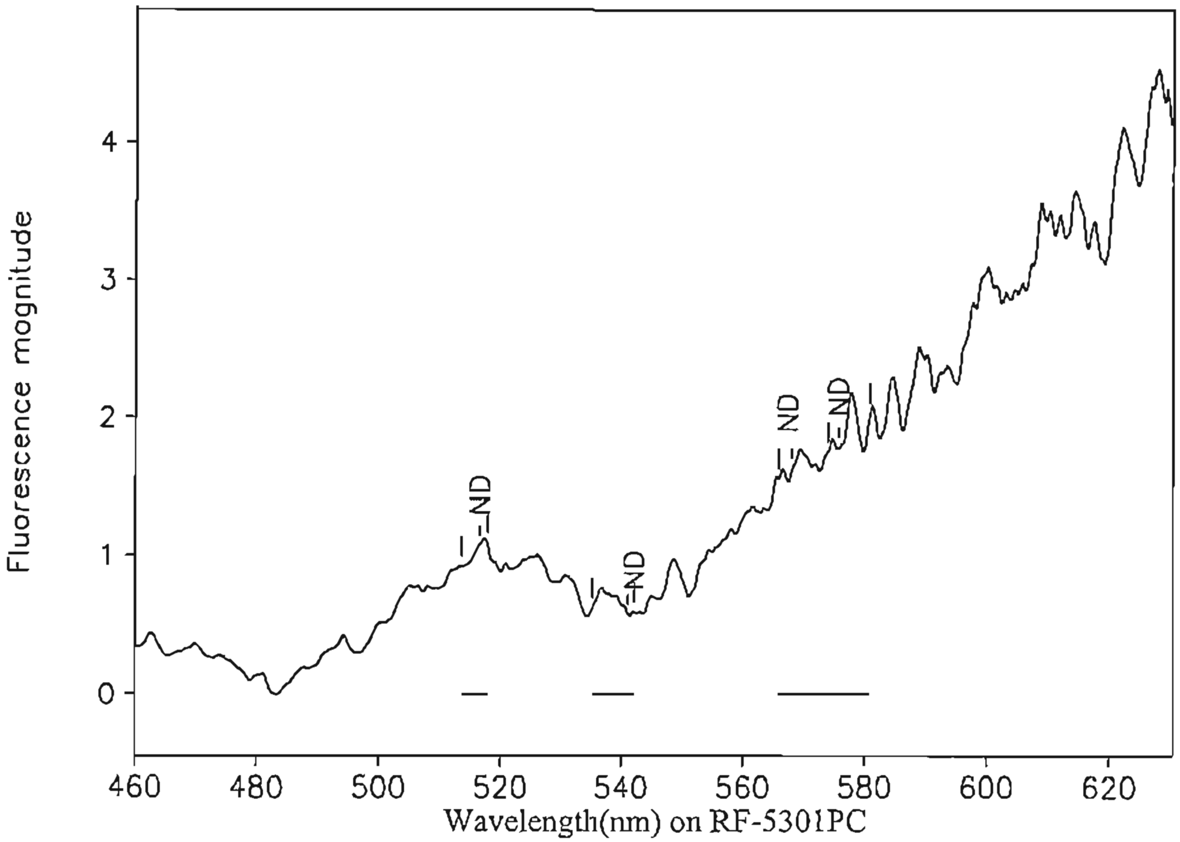
Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



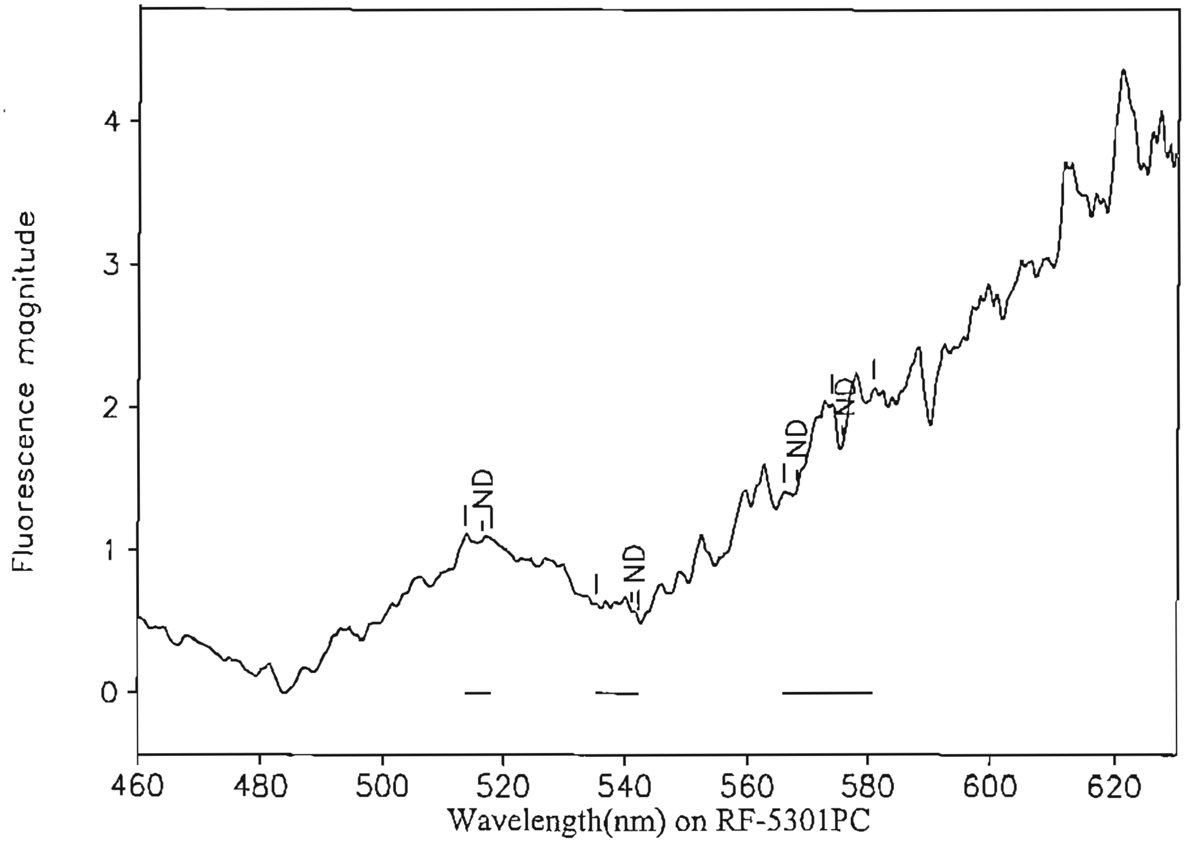
Station 4-195: MW-4 - 195 ft
OUL number: N8685 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0835 Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-210: MW-4 - 210 ft
OUL number: N8686
Matrix: Elutant
Placed: 02/03/05 0835

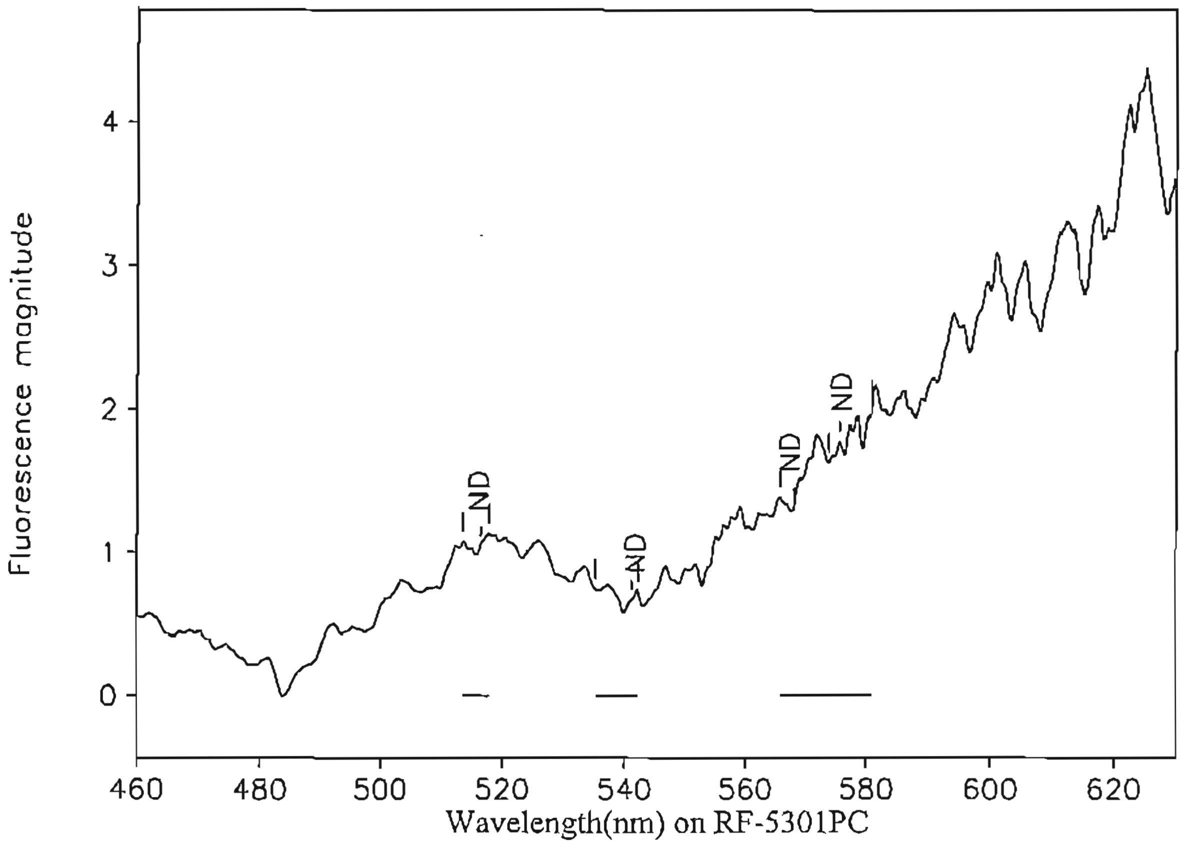
Analyzed: 02/23/05
Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



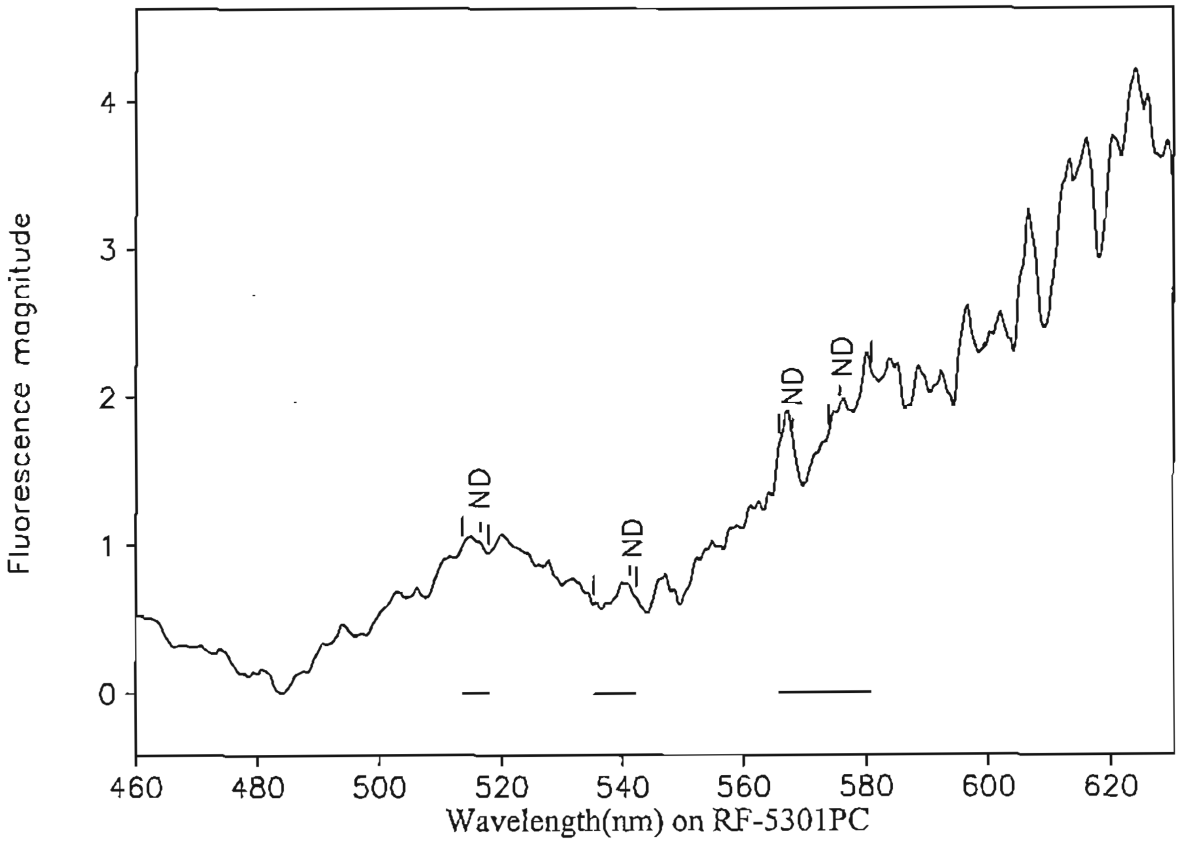
Station 4-225: MW-4 - 225 ft
OUL number: N8687 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0835 Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-240: MW-4 - 240 ft
OUL number: N8688
Matrix: Elutant
Placed: 02/03/05 0835

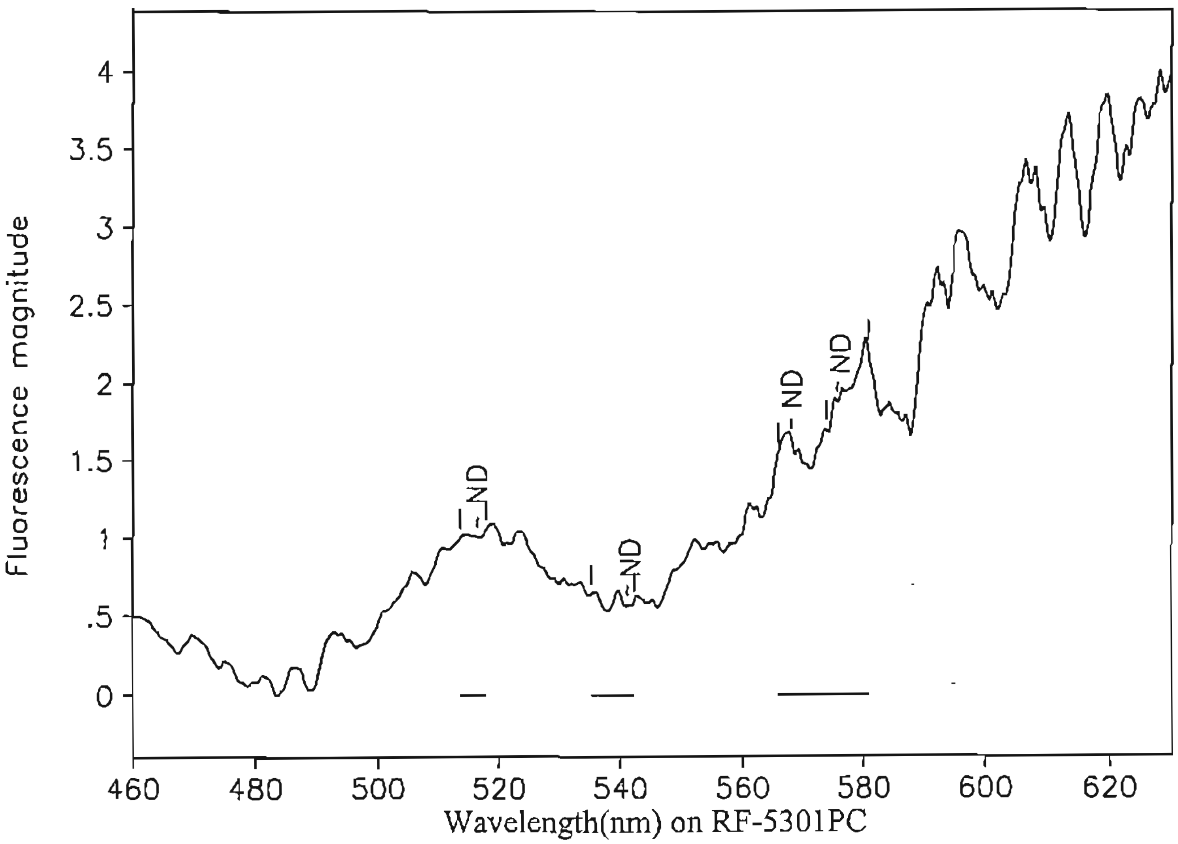
Analyzed: 02/23/05
Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 4-255: MW-4 - 255 ft
OUL number: N8689
Matrix: Elutant
Placed: 02/03/05 0835

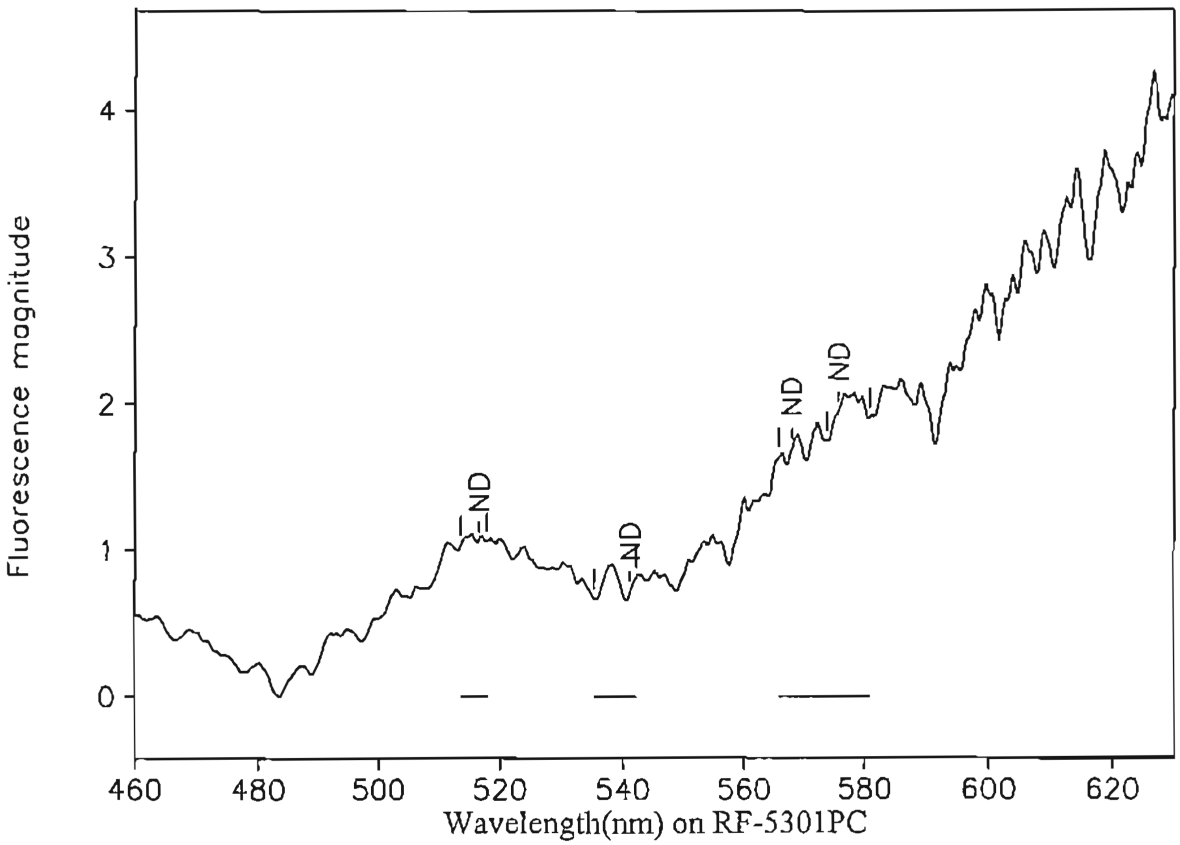
Analyzed: 02/23/05
Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



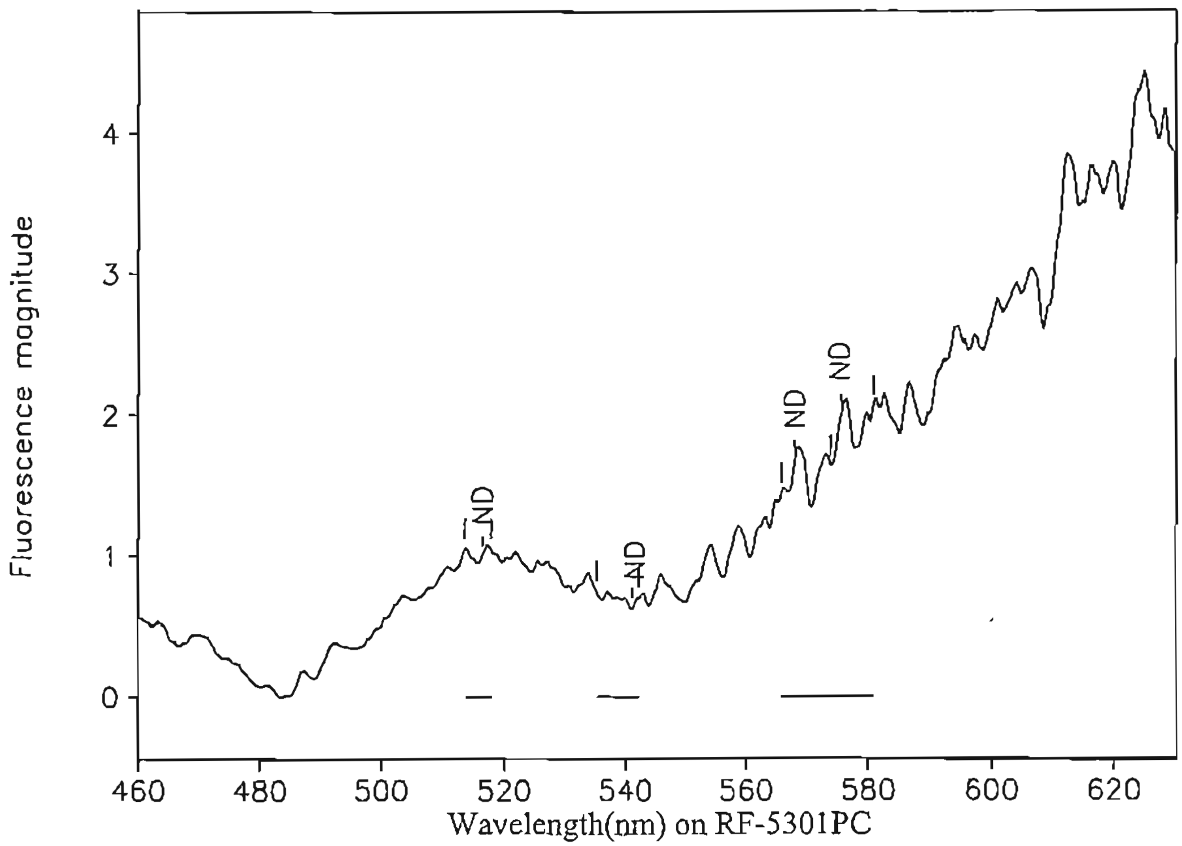
Station 4-270: MW-4 - 270 ft
OUL number: N8690 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0835 Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



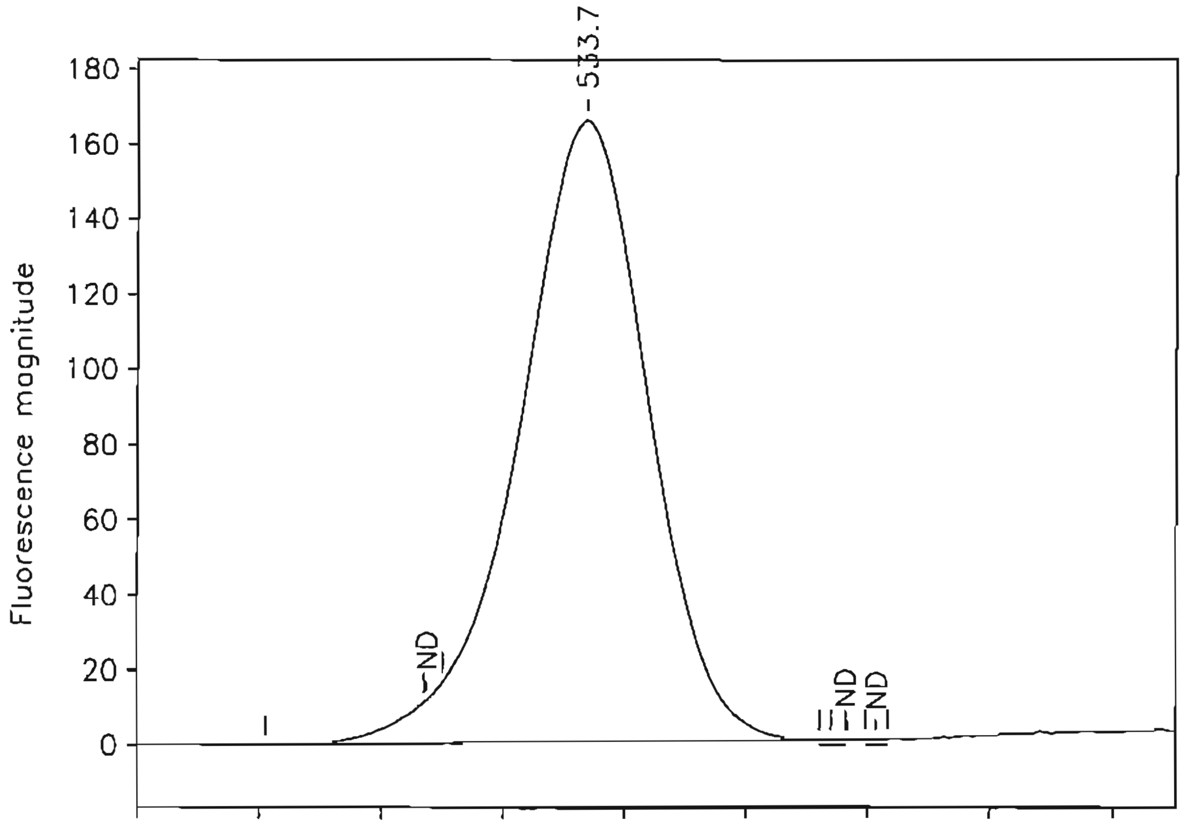
Station 4-285: MW-4 - 285 ft
OUL number: N8691 Analyzed: 02/23/05
Matrix: Elutant
Placed: 02/03/05 0835 Collected: 02/17/05 0905

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	513.6	517.9	0.00	0.00	0.00	ND
541.1	535.2	542.2	0.00	0.00	0.00	ND
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Wavelength(nm) on RF-5301PC

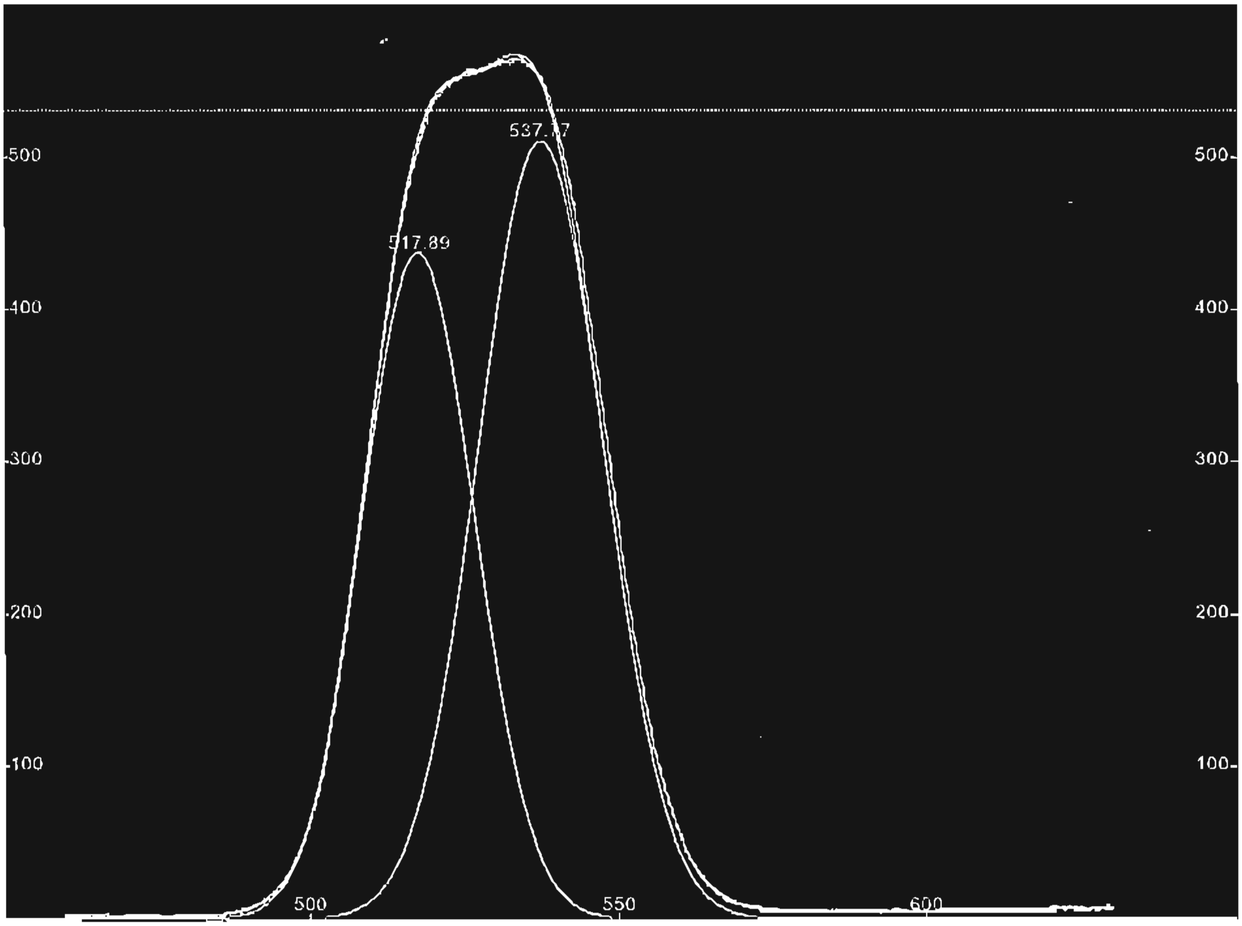
Station 2-WA: MW-2 - Water
OUL number: N8773 Analyzed: 02/23/05
Matrix: Water
Collected: 02/17/05 1100

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
533.7	481.0	573.9	165.85	4,094.68	0.04	26.1
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

A possible solution for fluorescein and eosine mixture in sample N8990A



Peak in the acceptable wavelength range of fluorescein:
Area of peak at 517.89 = 9,952
9952/44.155 = 225 ppb

Peak in the acceptable wavelength range of eosine:
Area of peak at 537.77 = 12,950
12,950/32.255 = 401 ppb

Ozark
UNDERGROUND
LABORATORY

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

March 10, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped March 3, 2005
Ozark Underground Laboratory (OUL) numbers N8990, N8991 and N9030.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on March 4, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

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Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: March 3, 2005
Date Samples Rec'd at OUL: March 4, 2005
Date Analyzed by OUL: March 9, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N8990	2-240	MW-2 - 240 ft	2/17 1110	3/3 0815	517.6 (2)	227	537.6	400	ND	
N8991	2-255	MW-2 - 255 ft	2/17 1110	3/3 0815	517.6 (2)	1,150	537.4	2,170	ND	
N9030	2-WA	MW-2 - Water	**Water**	3/3 0835	ND		533.7 (1)	25.4	ND	

FOOTNOTES:

ND = No dye detected

(1) = An eosine peak is present which is asymmetrical and skewed towards the lower wavelengths. This type of peak could mask the presence of fluorescein dye.

(2) = Although this peak does not meet the normal criteria for a positive recovery of fluorescein dye, a careful review of all background samples from this well and all the previous samples collected from this well at this depth lead to the conclusion that fluorescein dye is present. The concentrations of dye reported are based on the estimated proportion of the area under the curve that results from each of the two dyes (eosine and fluorescein). Also based on this review of previous samples from this well, we have determined that fluorescein dye was first observably present in the elutant from charcoal samplers collected from MW-2 on January 7, 2005.

OZARK UNDERGR[illegible]ND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 8 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 3/3/05 **Date Samples Received:** 3/4/05 **Time Samples Received:** 12:10 **Return Cooler? Yes** ✓ **No** ____

Bill to: ____ **Send Results to:** CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ **Ship cooler to:** Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1	N8990	2-240	MW-2 – 240 ft	2/17/05	1110	3/3/05	0815	0
1	N8991	2-255	MW-2 – 255 ft	↓	↓	↓	↓	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0		2-WA	MW-2 – Water Sample			3/3/05	0835	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ **No** ✓ **Charts for samples on this page proofed by OUL:** [illegible]

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Project 621 analyzed 3/9/05 OUL Page 1 of 1

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OZARK UNDERGRO .D LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2MHill) Week No: 8 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 3/3/05 Date Samples Received: 3/4/05 Time Samples Received: 12:10 Return Cooler? Yes ✓ No

Bill to: Send Results to: CH2M Hill

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ______ Ship cooler to: Nodarse & Assoc.

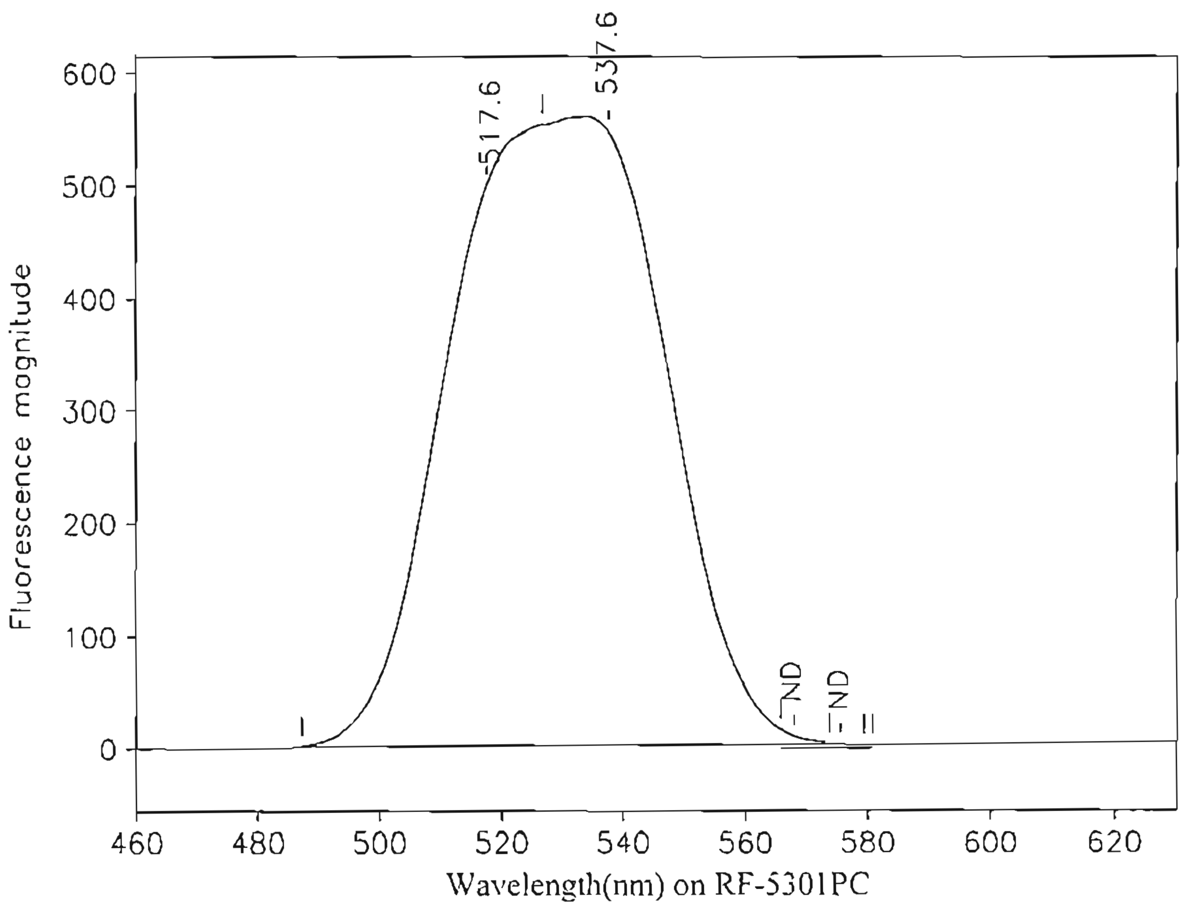
OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft.					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1		2-240	MW-2 – 240 ft	2/17/05	1110	3/3/05	0815	0
1		2-255	MW-2 – 255 ft	↓	↓	↓	↓	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0	W9030	2-WA	MW-2 – Water Sample			3/3/05	0835	1

COMMENTS:

This sheet filled out by OUL staff? Yes ______ No ✓ Charts for samples on this page proofed by OUL: [illegible]

Analyzed 3/9/05 by KR

Ozark Underground Laboratory

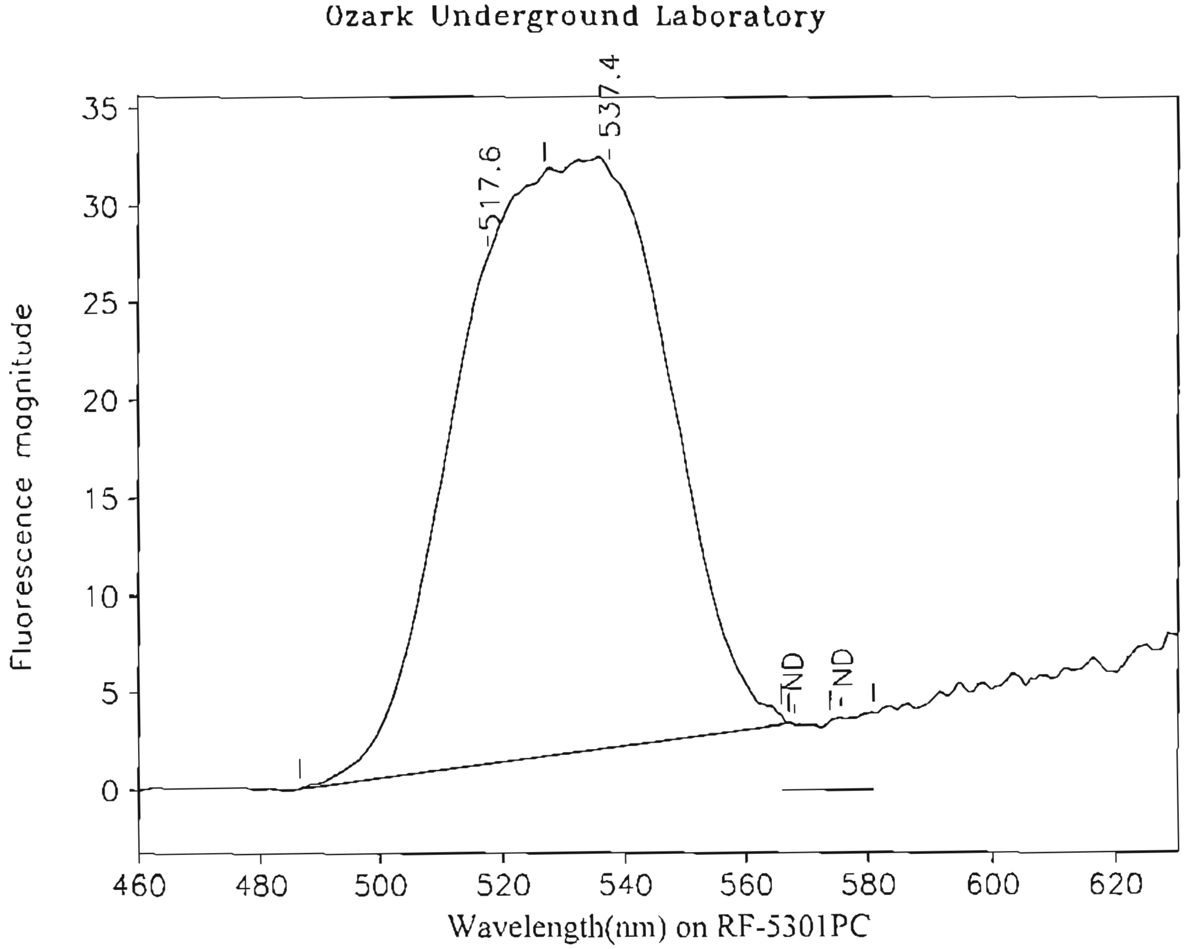


Station 2-240: MW-2 - 240 ft
OUL number: N8990 Analyzed: 03/09/05
Matrix: Elutant
Placed: 02/17/05 1110 Collected: 03/03/05 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	487.2	526.7	498.65	10.025.80	0.05	227
537.6	526.7	579.4	545.83	12.901.10	0.04	400
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 2-255: MW-2 - 255 ft
OUL number: N8991
Matrix: Elutant
Placed: 02/17/05 1110

Diluted: 1 to 100
Analyzed: 03/09/05

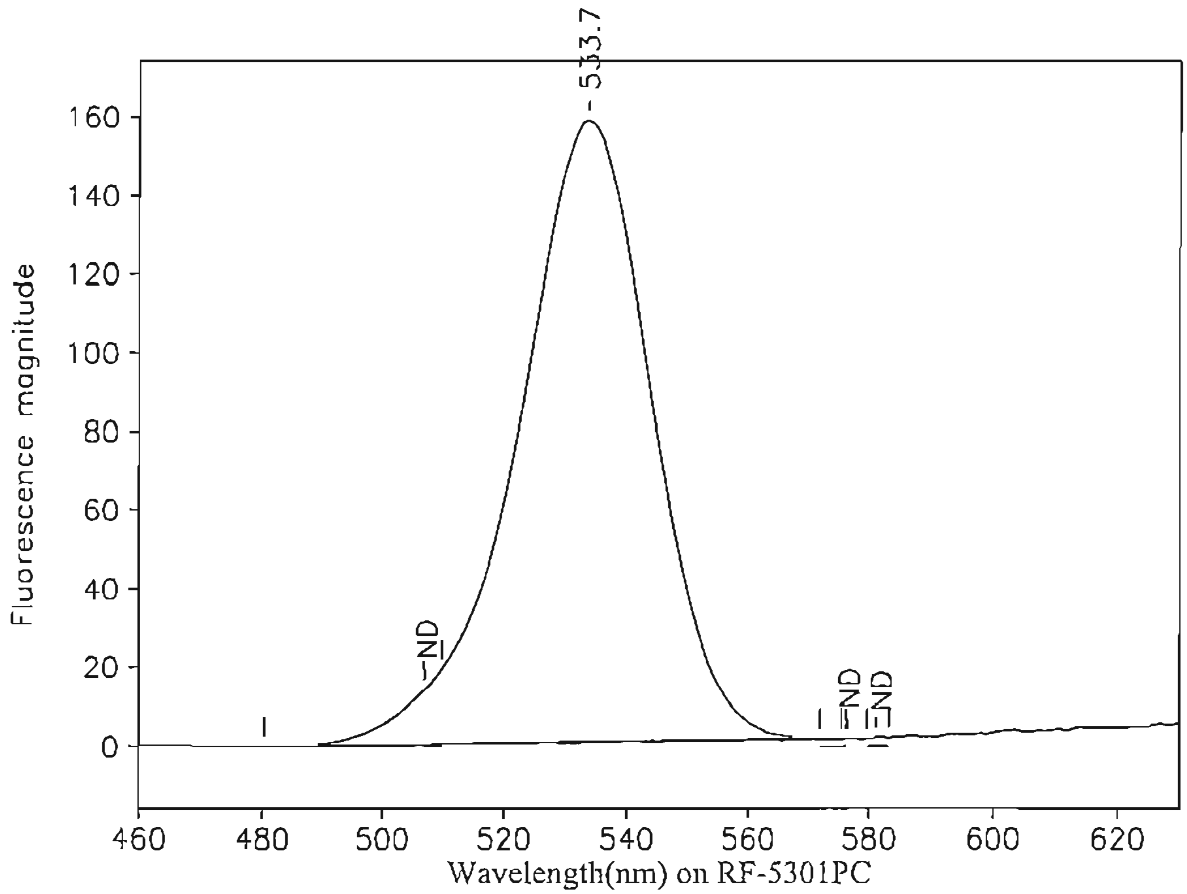
Collected: 03/03/05 0815

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	486.4	526.7	26.01	508.87	0.05	1,150
537.4	526.7	567.0	29.64	700.31	0.04	2,170
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N9030 Analyzed: 03/09/05
Matrix: Water
Collected: 03/03/05 0835

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.3	506.9	509.9	0.00	0.00	0.00	ND
533.7	480.3	575.5	158.00	4,013.82	0.04	25.4
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

March 23, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped March 17, 2005
Ozark Underground Laboratory (OUL) numbers N9327, N9328 and N9364.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on March 18, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

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Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: March 17, 2005
Date Samples Rec'd at OUL: March 18, 2005
Date Analyzed by OUL: March 22, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N9327	2-240	MW-2 - 240 ft	3/3 0845	3/17 0855	517.8 (2)	1,290	537.8	1,330	ND	
N9328	2-255	MW-2 - 255 ft	3/3 0845	3/17 0855	517.8 (2)	1,510	537.0	1,610	ND	
N9364	2-WA	MW-2 - Water	Water	3/17 0925	ND		533.6 (1)	22.7	ND	

FOOTNOTES:

ND = No dye detected

(1) = An eosine peak is present which is asymmetrical and skewed towards the lower wavelengths. This type of peak could mask the presence of fluorescein dye.

(2) = Although this peak does not meet the normal criteria for a positive recovery of fluorescein dye, a careful review of all background samples from this well and all the previous samples collected from this well at this depth lead to the conclusion that fluorescein dye is present. The concentrations of dye reported are based on the estimated proportion of the area under the curve that results from each of the two dyes (eosine and fluorescein). Also based on this review of previous samples from this well, we have determined that fluorescein dye was first observably present in the elutant from charcoal samplers collected from MW-2 on January 7, 2005.

OZARK UNDERGR(ID LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 9 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** Marty Arnold - OUL

Date Samples Shipped: 3/17/05 **Date Samples Received:** 3/18/05 **Time Samples Received:** 11:20 **Return Cooler? Yes** ✓ **No** ____

Bill to: CH2M Hill **Send Results to:** ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ______ **Ship cooler to:** Nedarse & Assoc.

OUL *use only*		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL *use only*
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1	N9327	2-240	MW-2 – 240 ft	3/3/05	0845	3/17/05	0855	0
1	N9328	2-255	MW-2 – 255 ft	|	|	|	|	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0		2-WA	MW-2 – Water Sample			3/17/05	0925	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ______ **No** ✓ **Charts for samples on this page proofed by OUL:** [illegible]

Project # 621 - Analyzed 3/22/05 OUL by M. Tidlinger

Page 1 of 1

934

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OZARK UNDERGROU_ LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 9 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: Marty Arnold - OUL

Date Samples Shipped: 3/17/05 Date Samples Received: 3/18/05 Time Samples Received: 11:20 Return Cooler? Yes ✓ No ____

Bill to: CH2M Hill Send Results to: ____

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nodarse & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1		2-240	MW-2 – 240 ft	3/3/05	0845	3/17/05	0855	0
1		2-255	MW-2 – 255 ft	|	|	|	|	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0	W9364	2-WA	MW-2 – Water Sample			3/17/05	0925	1

COMMENTS: ____

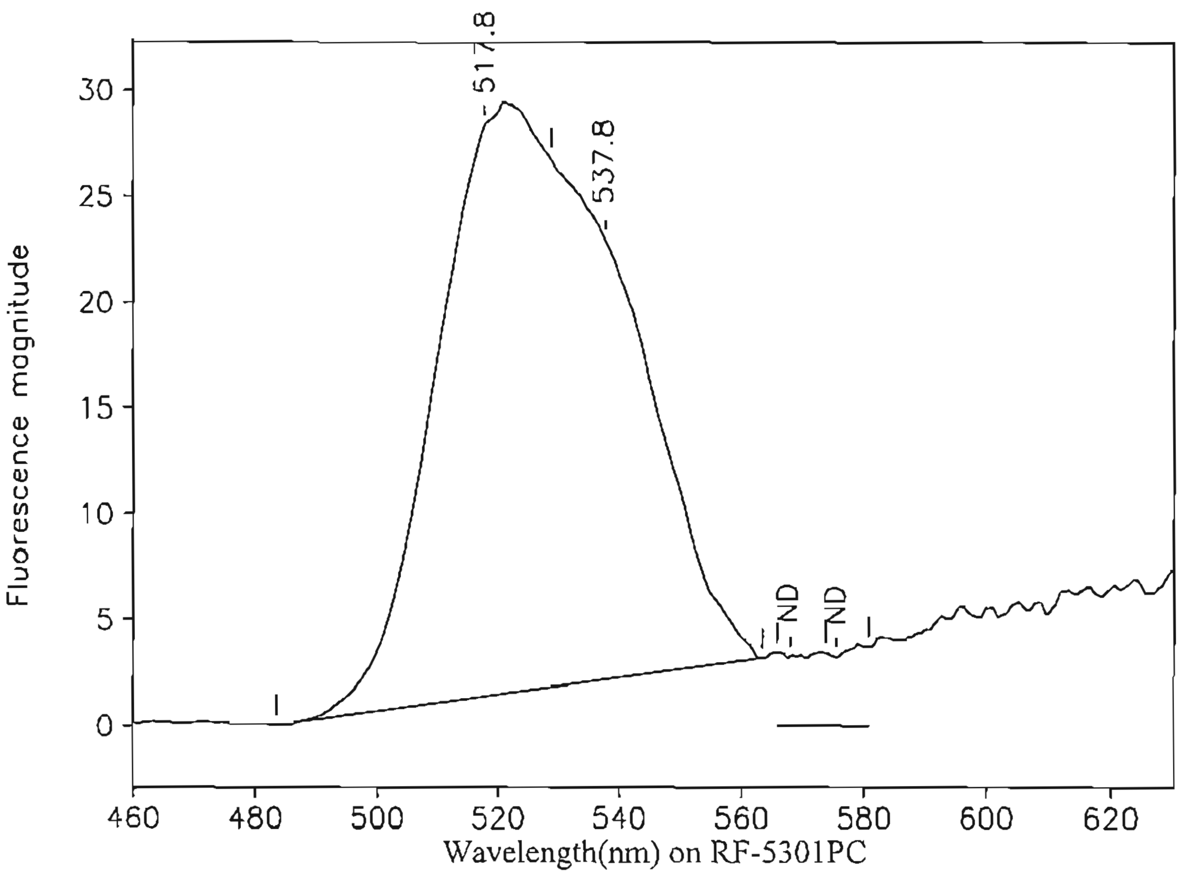
This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: CL

935

Analyzed 3/22/05 by mr

OUL Page 1 of 1

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N9327
Matrix: Elutant
Placed: 03/03/05 0845

Diluted: 1 to 100
Analyzed: 03/22/05

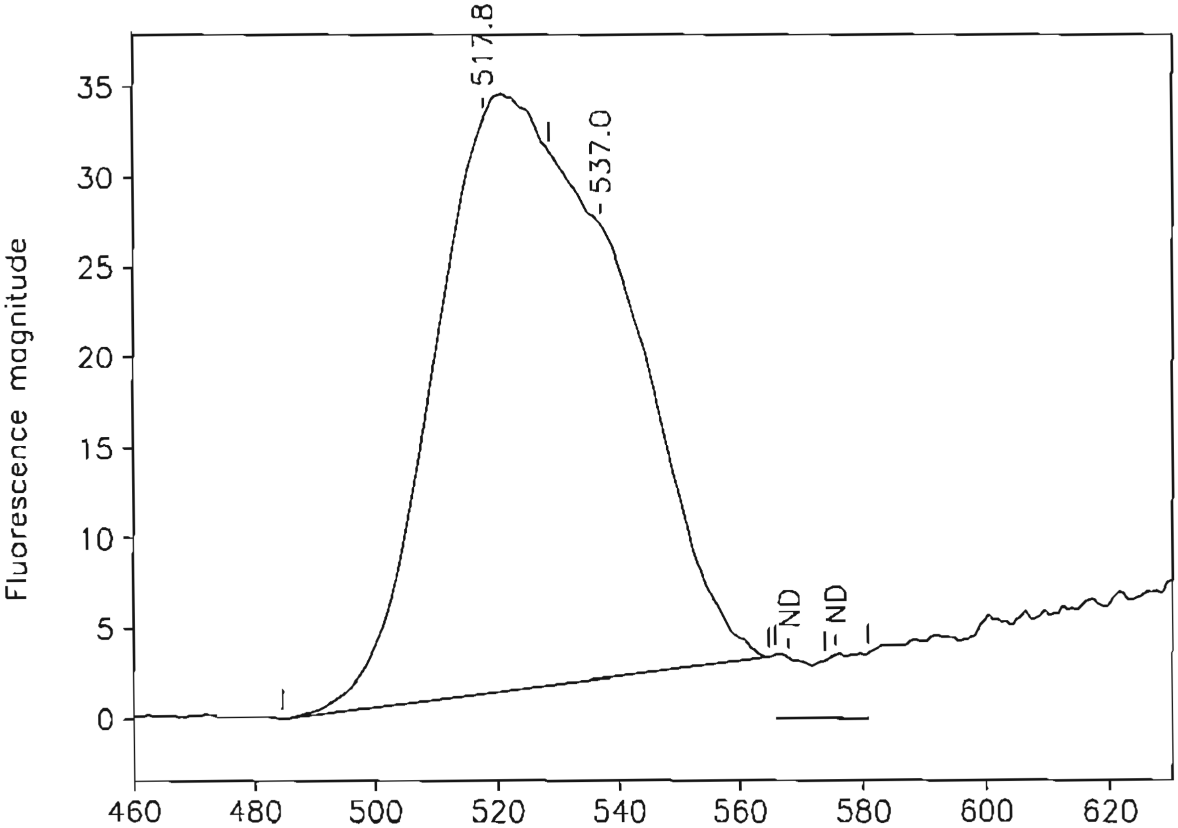
Collected: 03/17/05 0855

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	483.4	528.9	27.06	568.77	0.05	1,290 (?)
537.8	528.9	563.4	20.76	434.05	0.05	1,330
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N9328
Matrix: Elutant
Placed: 03/03/05 0845

Diluted: 1 to 100
Analyzed: 03/22/05

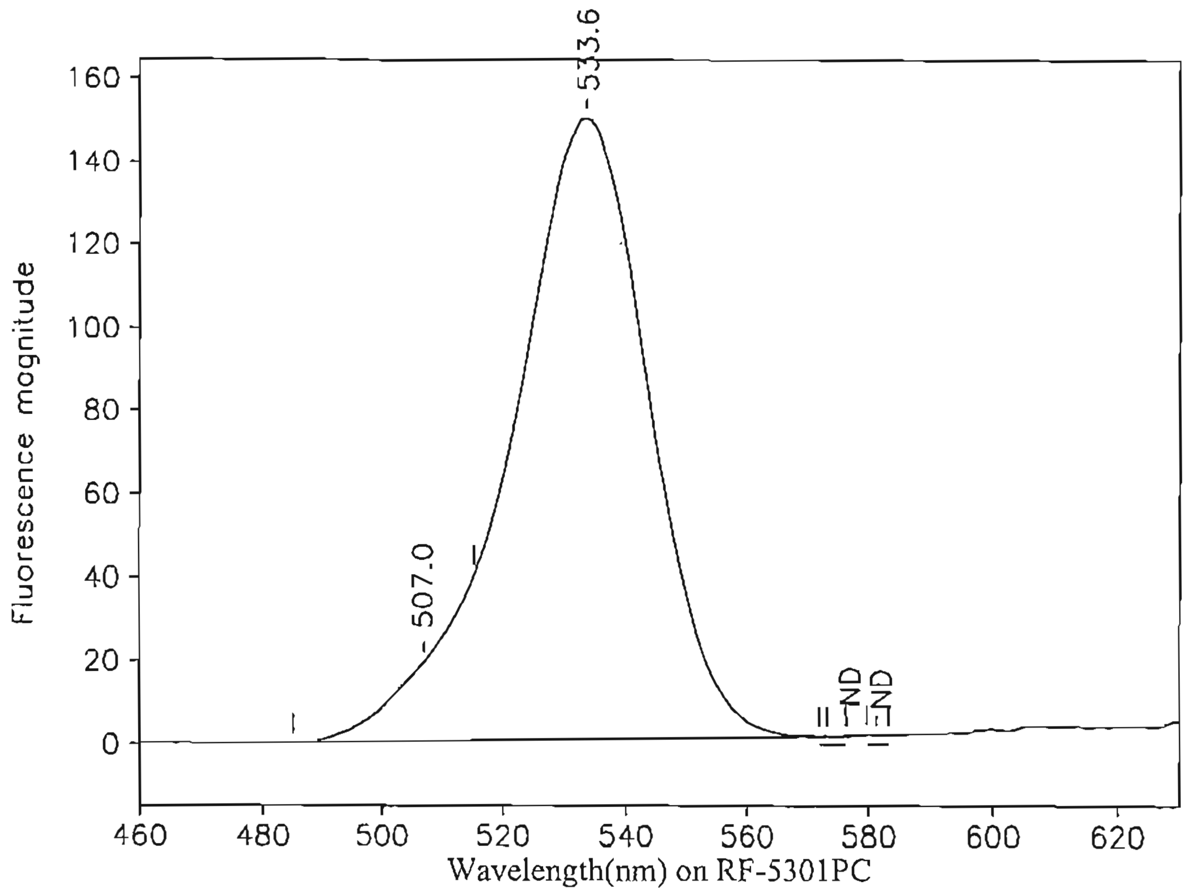
Collected: 03/17/05 0855

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	484.6	528.5	31.86	664.80	0.05	1,510 (2)
537.0	528.5	564.8	25.17	522.36	0.05	1,610
568.0	565.8	573.8	0.00	0.00	0.00	ND
575.6	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: N9364 Analyzed: 03/22/05
Matrix: Water
Collected: 03/17/05 0925

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
507.0	485.0	515.3	19.06	369.83	0.05	~~0.605~~
533.6	515.3	573.2	149.00	3,553.71	0.04	22.7
576.6	572.0	576.3	0.00	0.00	0.00	ND
581.2	579.7	583.2	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

March 23, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped March 17, 2005
Ozark Underground Laboratory (OUL) numbers N9327, N9328 and N9364.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on March 18, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

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Ozark Underground . boratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: March 17, 2005
Date Samples Rec'd at OUL: March 18, 2005
Date Analyzed by OUL: March 22, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N9327	2-240	MW-2 - 240 ft	3/3 0845	3/17 0855	517.8 (2)	1,290	537.8	1,330	ND	
N9328	2-255	MW-2 - 255 ft	3/3 0845	3/17 0855	517.8 (2)	1,510	537.0	1,610	ND	
N9364	2-WA	MW-2 - Water	Water	3/17 0925	ND		533.6 (1)	22.7	ND	

FOOTNOTES:

ND = No dye detected

(1) = An eosine peak is present which is asymmetrical and skewed towards the lower wavelengths. This type of peak could mask the presence of fluorescein dye.

(2) = Although this peak does not meet the normal criteria for a positive recovery of fluorescein dye, a careful review of all background samples from this well and all the previous samples collected from this well at this depth lead to the conclusion that fluorescein dye is present. The concentrations of dye reported are based on the estimated proportion of the area under the curve that results from each of the two dyes (eosine and fluorescein). Also based on this review of previous samples from this well, we have determined that fluorescein dye was first observably present in the elutant from charcoal samplers collected from MW-2 on January 7, 2005.

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

April 8, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped March 31, 2005
Ozark Underground Laboratory (OUL) numbers N9739 through N9742.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on April 1, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures:
1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

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Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: March 31, 2005
Date Samples Rec'd at OUL: April 1, 2005
Date Analyzed by OUL: April 5, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
N9739	2-240	MW-2 - 240 ft	3/17 0925	3/31 0730	517.6 *	739	535.8 *	484	ND	
N9740	Laboratory control charcoal blank									
N9328	2-255	MW-2 - 255 ft	3/17 0925	3/31 0730	517.8 *	1,140	537.8 *	878	ND	
N9364	2-WA	MW-2 - Water	Water	3/31 0745	508.6 **	0.824	533.2	22.4	ND	

FOOTNOTES:

ND = No dye detected
* = The concentrations of dye reported are based on the estimated proportion of the area under the curve that results from each of the two dyes (eosine and fluorescein).
** = A fluorescence peak is present that does not meet all the criteria for a positive dye result, but has been calculated as though it were dye because this dye is present in the corresponding charcoal sample.

OZARK UNDERGR ND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 10 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: 3/31/05 Date Samples Received: 4/1/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No

Bill to: CH2M Hill Send Results to:

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other Ship cooler to: Nodarse & Assoc.

OUL use only		Please indicate stations where dye was visible in the field for field technician use - use black ink only						OUL use only
# CHAR REC'D	LAB NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		2-225	MW-2 – 225 ft					
1	N9739	2-240	MW-2 – 240 ft	3/17/05	0925	3/31/05	0730	0
1	N9741	2-255	MW-2 – 255 ft	|	|	|	|	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0		2-WA	MW-2 – Water Sample			3/31/05	0745	1

COMMENTS: Charcoal Blank N9740

This sheet filled out by OUL staff? Yes No ✓ Charts for samples on this page proofed by OUL: mma

Project 621 Analyzed 4/5/05 by UR Page 1 of 1

943

OZARK UNDERGROUND LABORATORY, INC.
1572 Aley Lane Protem, MO 65733 (417) ...-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 10 Samples Collected By: Mike Burns
Samples Shipped By: Mike Burns Samples Received By: J. Arnold
Date Samples Shipped: 3/31/05 Date Samples Received: 4/1/05 Time Samples Received: 12:15 Return Cooler? Yes ✓ No ____
Bill to: CH2M Hill Send Results to: ____
Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ____ Ship cooler to: Nedgers & Assoc.

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1		2-240	MW-2 – 240 ft	3/17/05	0925	3/31/05	0730	0
1		2-255	MW-2 – 255 ft	|	|	|	|	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
1	N9742	2-WA	MW-2 – Water Sample			3/31/05	0745	1

COMMENTS: ____

This sheet filled out by OUL staff? Yes ____ No ✓ Charts for samples on this page proofed by OUL: [illegible initials]

Analyzed 4/5/05 by UK

OUL 1of 1

Page ____ of ____

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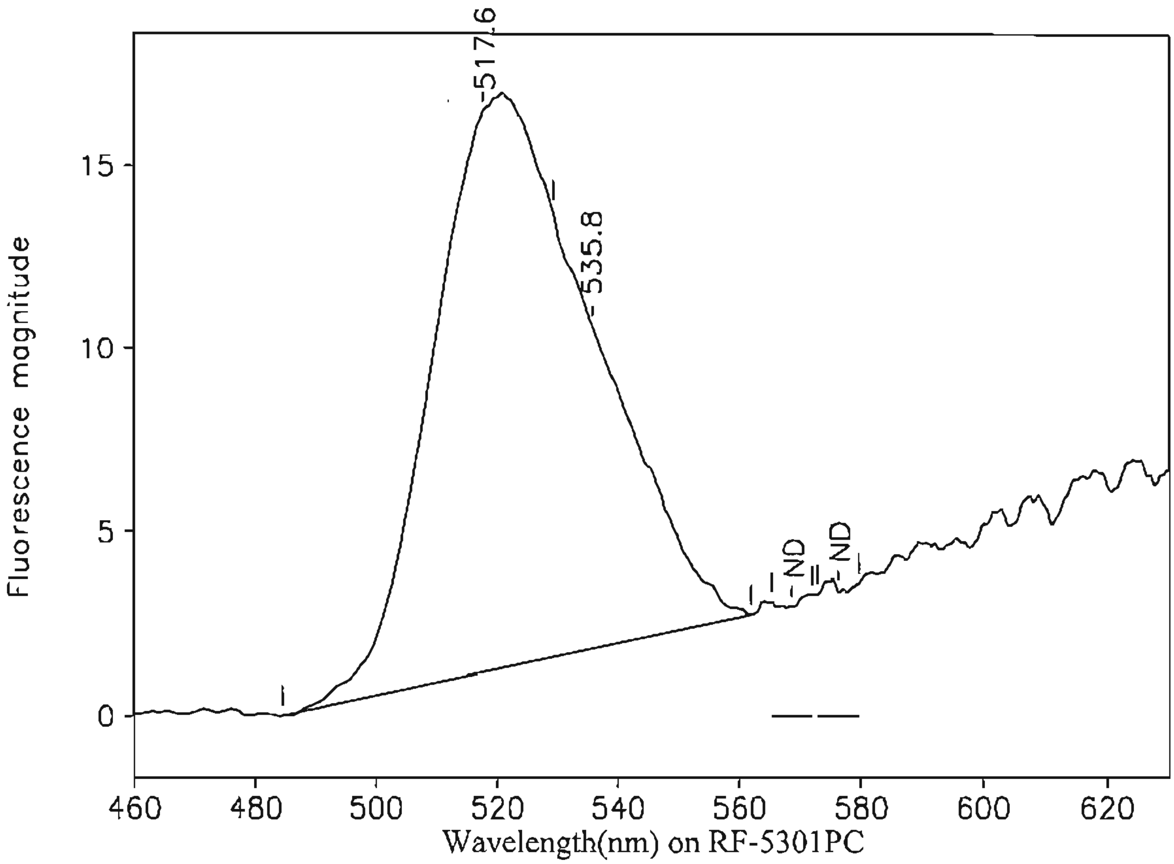
Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: N9739
Matrix: Elutant
Placed: 03/17/05 0925

Diluted: 1 to 100
Analyzed: 04/05/05

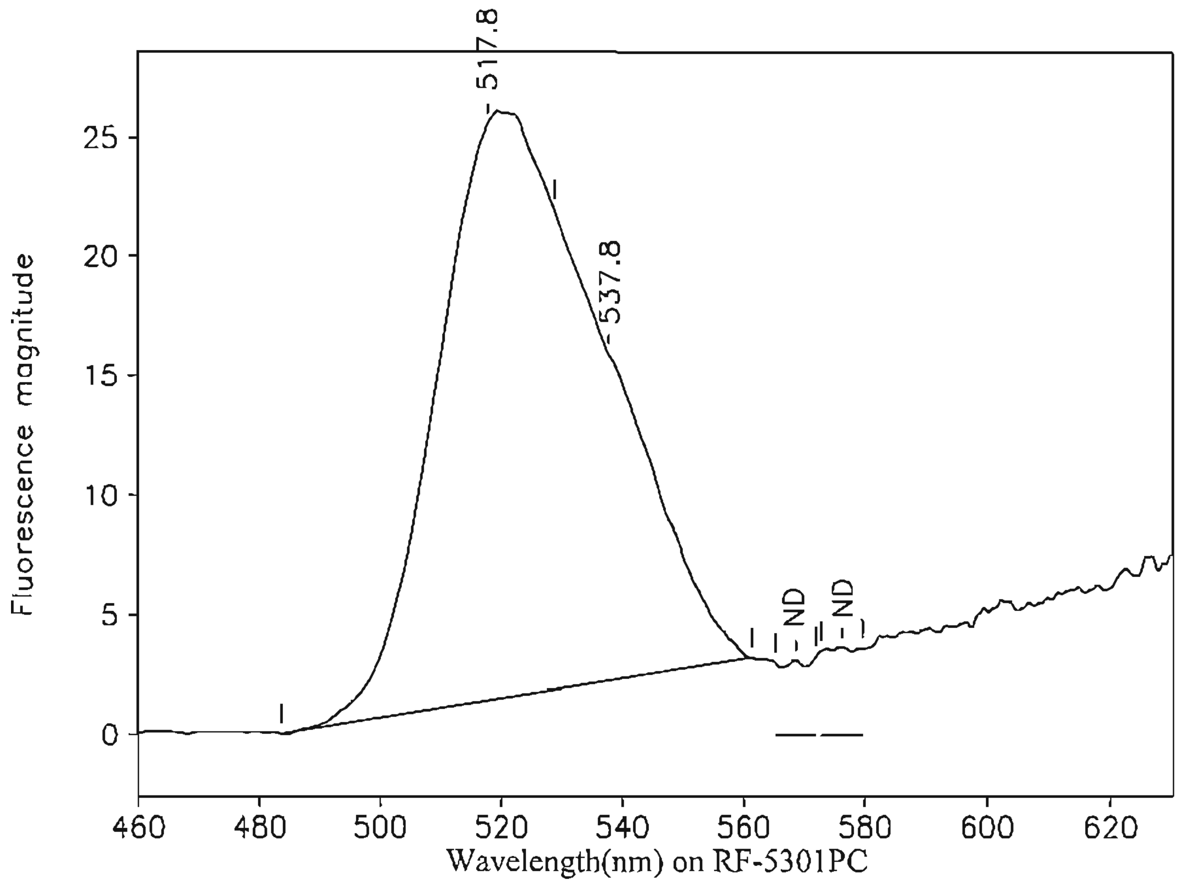
Collected: 03/31/05 0730

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.	
517.6	484.4	529.3	15.26	325.46	0.05	739	
535.8	529.3	562.0	8.80	159.71	0.06	484	Cn
568.7	565.4	572.0	0.00	0.00	0.00	ND	
576.2	572.8	579.6	0.00	0.00	0.00	ND	

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: N9741
Matrix: Elutant
Placed: 03/17/05 0925

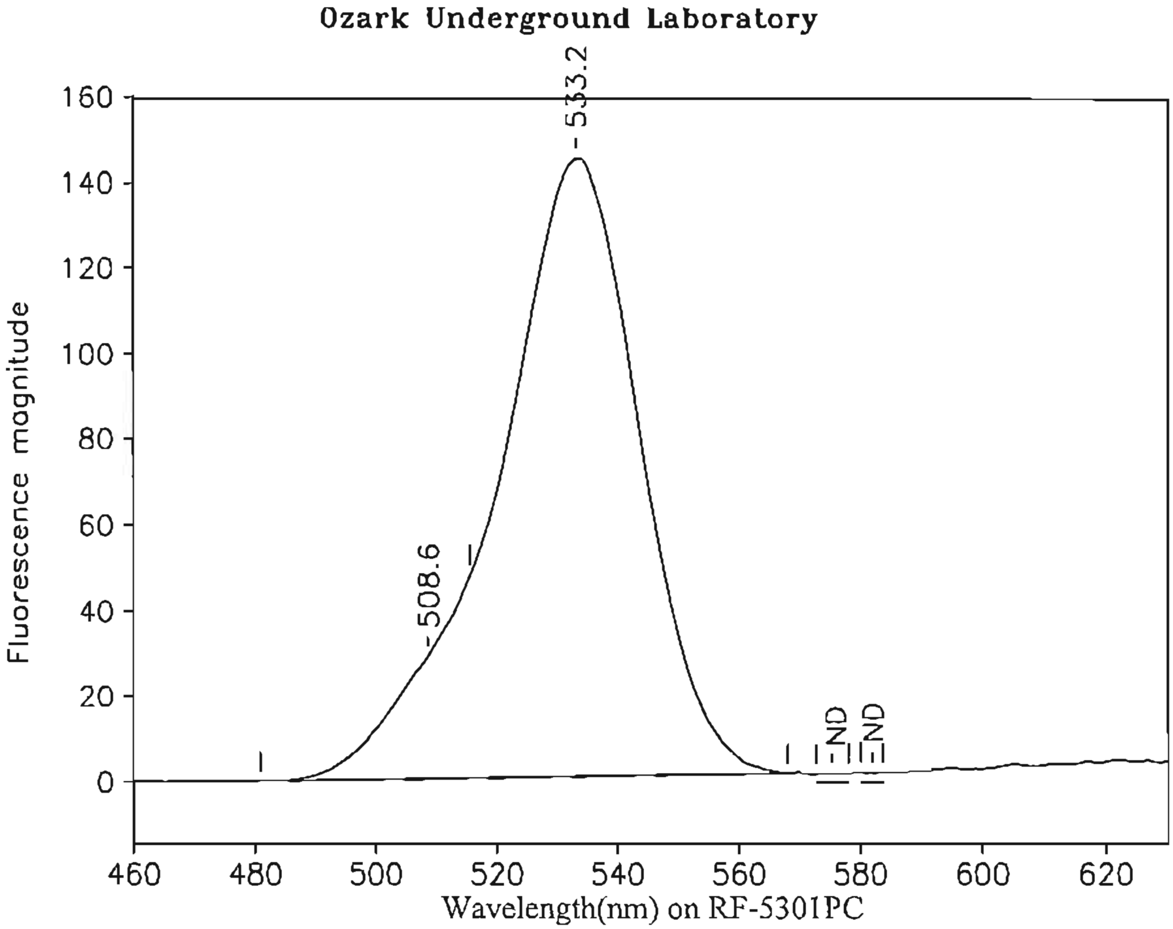
Diluted: 1 to 100
Analyzed: 04/05/05

Collected: 03/31/05 0730

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	483.6	528.8	24.14	501.11	0.05	1,140
537.8	528.8	561.4	13.66	289.63	0.05	878
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 2-WA: MW-2 - Water
OUL number: N9742 Analyzed: 04/05/05
Matrix: Water
Collected: 03/31/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
508.6	480.8	515.6	28.74	498.29	0.06	0.824
533.2	515.6	568.0	144.39	3,500.86	0.04	22.4
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Ca

Peaks close to the normal range of tracer dyes:

Ozark
UNDERGROUND
LABORATORY
1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

April 26, 2005

CERTIFICATE OF ANALYSIS

Alan W. Aikens, P.G.
CH2MHill
225 East Robinson Street, Suite 505
Orlando, Florida 32801

RE: Lake Orienta
Dye analysis results for charcoal and water samples shipped April 14, 2005
Ozark Underground Laboratory (OUL) numbers P0248, P0249 and P0342.

Dear Mr. Aikens:

We have completed analysis of the charcoal and water samples received by the OUL on April 15, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein, eosine and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein and eosine are mixtures of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG, RG

Enclosures: 1. Table 1. Analysis results for charcoal and water samples
2. Sample Collection Data Sheets
3. Sample analysis graphs

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Ozark Underground Laboratory for CH2MHill

Project: Lake Orienta
Samples Collected By: Mike Burns
Date Samples Shipped: April 14, 2005
Date Samples Rec'd at OUL: April 15, 2005
Date Analyzed by OUL: April 20, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein, eosine and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL Lab #	Station #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein		Eosine		RWT	
					Peak	Conc.	Peak	Conc.	Peak	Conc.
P0248	2-240	MW-2 - 240 ft	3/31 0755	4/14 0730	517.6 *	578	537.04 *	313	ND	
P0249	2-255	MW-2 - 255 ft	3/31 0755	4/14 0730	517.4 *	438	537.0 *	246	ND	
P0342	2-WA	MW-2 - Water	Water	4/14 0745	508.2 **	1.42	532.8	20.9	ND	

FOOTNOTES:

ND = No dye detected

* = The concentrations of dye reported are based on the estimated proportion of the area under the curve that results from each of the two dyes (eosine and fluorescein).

** = A fluorescence peak is present that does not meet all the criteria for a positive dye result, but has been calculated as though it were dye because this dye is present in the corresponding charcoal sample.

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) **Week No:** 11 **Samples Collected By:** Mike Burns

Samples Shipped By: Mike Burns **Samples Received By:** J. Arnold

Date Samples Shipped: 4/14/05 **Date Samples Received:** 4/15/05 **Time Samples Received:** 11:30 **Return Cooler? Yes** ✓ **No** ___

Bill to: CH2M Hill **Send Results to:** ___

Analyze for: Fluorescein X__ Eosine X__ Rhodamine WT X__ Other ______ **Ship cooler to:** Nodarse & Assoc

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER (Charcoal)	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1	P0248	2-240	MW-2 – 240 ft	3/31/05	0755	4/14/05	0730	0
1	P0249	2-255	MW-2 – 255 ft	|	|	|	|	0
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
0		2-WA	MW-2 – Water Sample			↑	↑	1
						4/14/05	0745	

COMMENTS:

This sheet filled out by OUL staff? Yes ______ **No** ✓ **Charts for samples on this page proofed by OUL:** [signature] 950

Analyzed 4/20/05 by WR JL Page 1 of 1

OZARK UNDERGROUND LABORATORY, INC.

1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 email: oul@tri-lakes.net

SAMPLE COLLECTION DATA SHEET for FLUORESCENCE ANALYSIS

Project: Lake Orienta (CH2Mhill) Week No: 11 Samples Collected By: Mike Burns

Samples Shipped By: Mike Burns Samples Received By: J. Arnold

Date Samples Shipped: 4/14/05 Date Samples Received: 4/15/05 Time Samples Received: 11:30 Return Cooler? Yes ✓ No ___

Bill to: CH2M Hill Send Results to: ___

Analyze for: Fluorescein X Eosine X Rhodamine WT X Other ___ Ship cooler to: Nodarse & Assoc

OUL use only		*Please indicate stations where dye was visible in the field* *for field technician use - use black ink only*						OUL use only
# CHAR REC'D	LAB NUMBER Water	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED DATE	PLACED TIME	COLLECTED DATE	COLLECTED TIME	# WATER REC'D
		2-135	MW-2 – 135 ft					
		2-150	MW-2 – 150 ft					
		2-165	MW-2 – 165 ft					
		2-180	MW-2 – 180 ft					
		2-195	MW-2 – 195 ft					
		2-210	MW-2 – 210 ft					
		3-225	MW-2 – 225 ft					
1		2-240	MW-2 – 240 ft	3/31/05	0755	4/14/05	0730	Ø
1		2-255	MW-2 – 255 ft	|	|	|	|	Ø
		2-270	MW-2 – 270 ft					
		2-285	MW-2 – 285 ft					
		2-300	MW-2 – 300 ft					
Ø	A6342	2-WA	MW-2 – Water Sample			↑	↑	1
						4/14/05	0745	

COMMENTS: ___

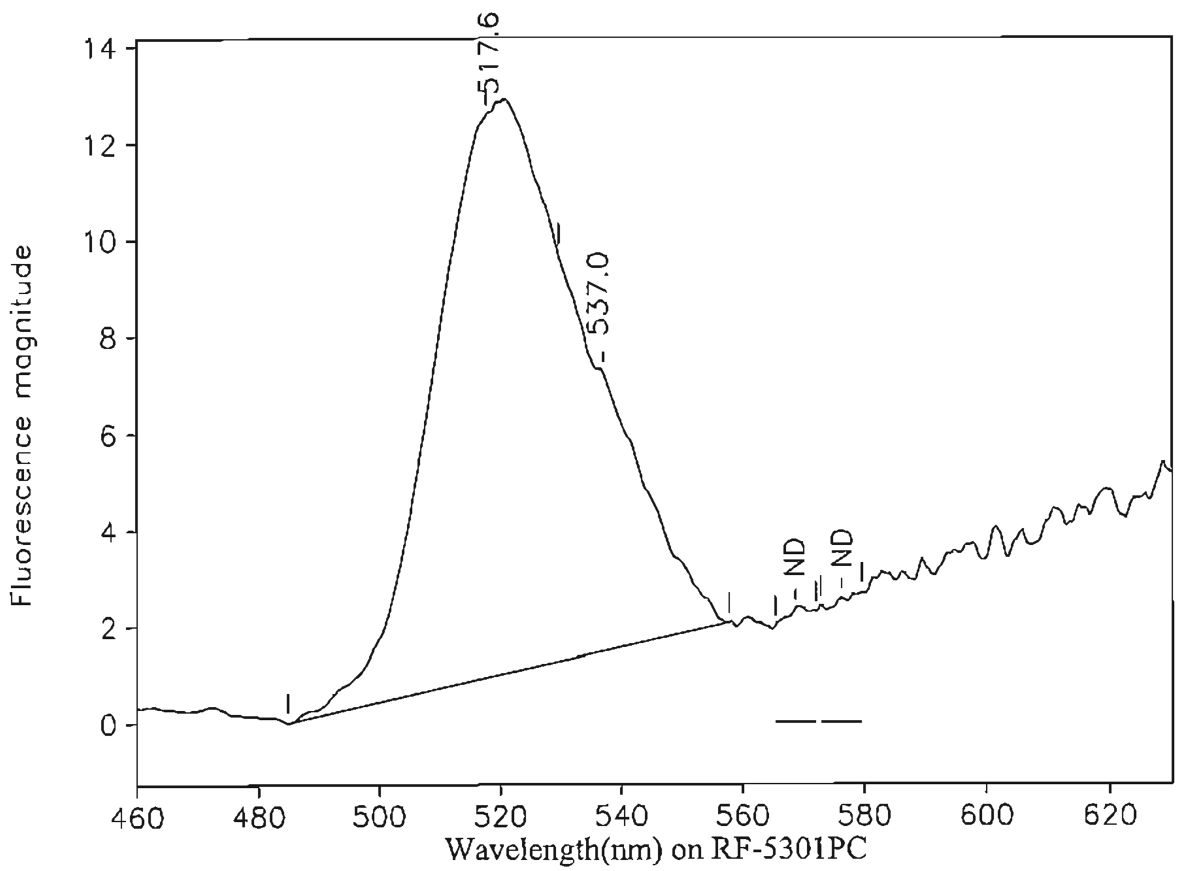
This sheet filled out by OUL staff? Yes ___ No ✓ Charts for samples on this page proofed by OUL: mma

Analyzed 4/20/05 by MR

JL Page 1 of 1

951

Ozark Underground Laboratory



Station 2-240: MW-2 - 240 ft
OUL number: P0248
Matrix: Elutant
Placed: 03/31/05 0755

Diluted: 1 to 100
Analyzed: 04/20/05

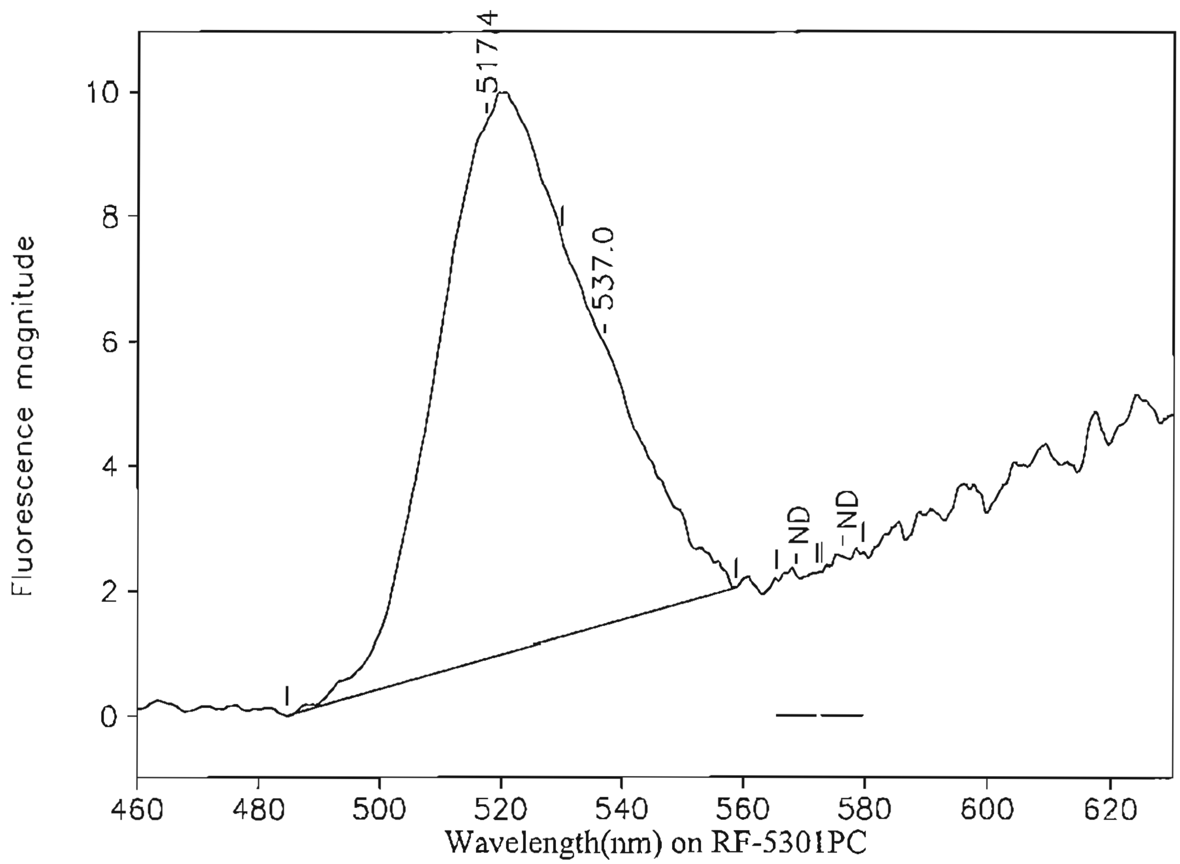
Collected: 04/14/05 0730

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	484.8	529.6	11.66	250.22	0.05	578
537.0	529.6	557.8	5.78	102.10	0.06	313
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-255: MW-2 - 255 ft
OUL number: P0249
Matrix: Elutant
Placed: 03/31/05 0755

Diluted: 1 to 100
Analyzed: 04/20/05

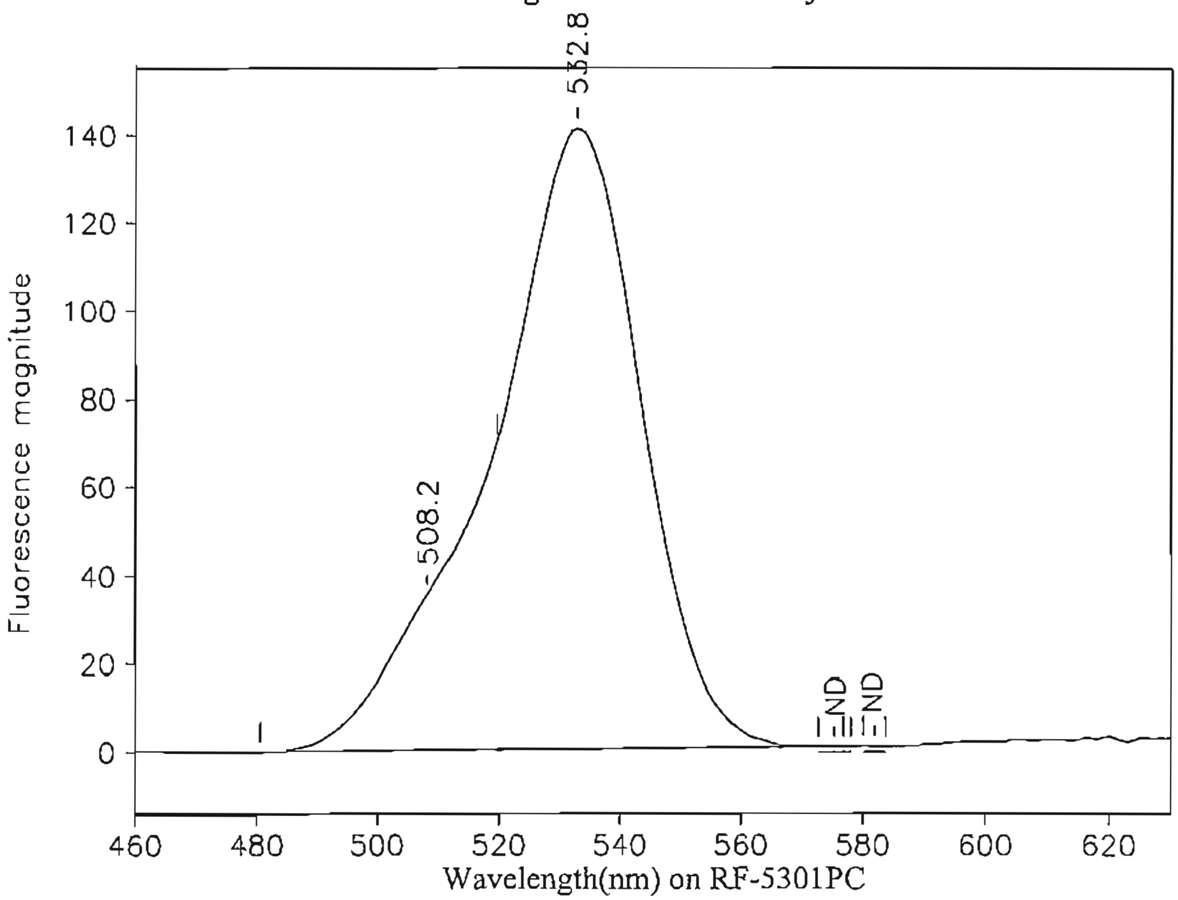
Collected: 04/14/05 0730

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	484.6	529.9	8.59	189.51	0.05	438
537.0	529.9	558.8	4.52	80.31	0.06	246
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Ozark Underground Laboratory



Station 2-WA: MW-2 - Water
OUL number: P0342 Analyzed: 04/20/05
Matrix: Water
Collected: 04/14/05 0745

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
508.2	480.6	519.7	35.33	868.76	0.04	1.42
532.8	519.7	576.8	140.83	3,211.41	0.04	20.9
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Appendix F

Material Safety Data Sheets

CROMPTON & KNOWLES CORP -- INTRACID RHODAMINE WT LIQUID 4517100 -- 6810-00N018097

===================== Product Identification =====================

Product ID:INTRACID RHODAMINE WT LIQUID 4517100
MSDS Date:05/04/1988
FSC:6810
NIIN:00N018097
MSDS Number: BLXRY
=== Responsible Party ===
Company Name:CROMPTON & KNOWLES CORP
Address:ROUTE 724
City:GIBRALTOR
State:PA
ZIP:19508
Country:US
Info Phone Num:215-582-8765
Emergency Phone Num:215-582-8765
Preparer's Name:J M WARNQUIST, CHEM SFTY
CAGE:69389
=== Contractor Identification ===
Company Name:CROMPTON & KNOWLERS CORP
Box:341
City:READING
State:PA
ZIP:19603
Country:US
Phone:215-582-8705
CAGE:69389

============= Composition/Information on Ingredients =============

Ingred Name:SODIUM HYDROXIDE
CAS:1310-73-2
RTECS #:WB4900000
Fraction by Wt: <1%
OSHA PEL:2 MG/M3
ACGIH TLV:C 2 MG/M3; 9293
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

===================== Hazards Identification =====================

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:LIQUID IN CONTACT W/EYES MAY CAUSE IRRITATION.
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:NONE SPECIFIED BY MANUFACTURER.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

======================= First Aid Measures =======================

First Aid:INHAL:MOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE O2 & GET MD IMMED. EYE:FLUSH W/FLOWING WATER FOR AT LEAST 15 MINS,

HOLDING EYELIDS APART TO IRRIGATE THOROUGHLY. GET MD IMMED. SKIN: WASH AFFEC TED AREAS THOROUGHLY W/SOAP & WATER. IFIRRITATION DEVELOPS, CALL MD. INGEST:IF SWALLOWED, DILUTE W/WATER & INDUCE VOM. GET MD IMMED. NEVER GIVE FLUIDS OR INDUCE VOM IF PATIENT IS UNCON OR HAS CONVL.

===================== Fire Fighting Measures =====================

Flash Point:N/A AQUEOUS
Extinguishing Media:WATER, DRY CHEMICAL & CARBON DIOXIDE.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE EXPECTED.

================== Accidental Release Measures ==================

Spill Release Procedures:USING AN ABSORBENT, SWEEP OR SHOVEL INTO A CONTAINER. PRODUCT IS USED AS A TRACER DYE; DO NOT ALLOW TO RUN INTO STREAMS OR WATERWAYS.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

====================== Handling and Storage ======================

Handling and Storage Precautions:IN ACCORDANCE W/GOOD INDUSTRIAL PRACTICE, HANDLE W/CARE & AVOID PERSONAL CONTACT.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

============= Exposure Controls/Personal Protection =============

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .
Ventilation:LOCAL.
Protective Gloves:RUBBER GLOVES.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:APRON, & COVERALL TO MINIMIZE SKIN CONTACT.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
PH:10.8 +/- 0.7

================== Physical/Chemical Properties ==================

HCC:N1
Boiling Pt:B.P. Text:AQUEOUS
Melt/Freeze Pt:M.P/F.P Text:14F,-10C
Spec Gravity:1.19
pH:SUPDAT
Solubility in Water:SOLUBLE
Appearance and Odor:DARK RED LIQUID, NO ODOR.

================= Stability and Reactivity Data =================

Stability Indicator/Materials to Avoid:YES
NONE KNOWN.
Stability Condition to Avoid:NONE.
Hazardous Decomposition Products:BURNING WILL PRODUCE OXIDES OF CARBON & NITROGEN.

==================== Disposal Considerations ====================

Waste Disposal Methods:BURY OR INCINERATE ACCORDING TO FEDERAL, STATE & LOCAL REGULATIONS. CONTAINERS SHOULD BE TRIPLE RINSED W/WATER BEFORE DISPOSAL.

Material Safety Data Sheet
Fluorescein
ACC# 90367

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluorescein
Catalog Numbers: NC9481589
Synonyms: 9-(o-Carboxyphenyl)-6-hydroxy-3-isoxanthenone; Dihydroxyfluorane; 3,6-Fluorandiol.
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
2321-07-5	Fluorescein	100 %	219-031-8

Hazard Symbols: XI
Risk Phrases: 36

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-orange solid. **Caution!** May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated. May cause dermatitis. Causes eye irritation. May cause skin irritation.
Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.
Skin: May cause skin irritation.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give

anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fluorescein	none listed	none listed	none listed

OSHA Vacated PELs: Fluorescein: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard

EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: red-orange
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:290 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: Not available.
Molecular Formula:$C_{20}H_{12}O_5$
Molecular Weight:332.081

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 2321-07-5: LM5075000
LD50/LC50:
CAS# 2321-07-5:
Draize test, rabbit, eye: 100 uL/24H Severe;<BR.

Carcinogenicity:
CAS# 2321-07-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Neurotoxicity: No data available.
Mutagenicity: No data available.
Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	**IATA**	**RID/ADR**	**IMO**	**Canada TDG**
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 2321-07-5 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA

CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313
No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 2321-07-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XI
Risk Phrases:
R 36 Irritating to eyes.

Safety Phrases:

WGK (Water Danger/Protection)
CAS# 2321-07-5: 1
Canada - DSL/NDSL
CAS# 2321-07-5 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D2B.
Canadian Ingredient Disclosure List
Exposure Limits

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997
Revision #2 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

EOSIN Y

1. Product Identification

Synonyms: Acid red 87; CI 45380; Eosin Y Certified (Yellowish); 2',4',5',7'-tetra bromo fluorescein
CAS No.: 17372-87-1
Molecular Weight: 691.91
Chemical Formula: C20H6Br4Na2O5
Product Codes:
J.T. Baker: L088
Mallinckrodt: 0460

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Eosin Y	17372-87-1	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY IRRITATE EYES, RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA[(tm)] Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 0 - None
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Inhalation of dust may cause irritation to the respiratory tract.
Ingestion:
Not expected to be a health hazard via ingestion.
Skin Contact:
Not expected to cause any adverse health effects from skin contact.
Eye Contact:
May cause irritation.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Not expected to require first aid measures. If large amounts were swallowed, give water to drink and get medical advice.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Brown powder.
Odor:

Odorless.
Solubility:
Soluble in water.
Specific Gravity:
Unknown
pH:
No information found.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides. Combustion will produce carbon dioxide, carbon monoxide, hydrogen bromide gas.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizers.
Conditions to Avoid:
Incompatibles.

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11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

Investigated as a tumorigen and mutagen.

```
  --------\Cancer Lists\------------------------------------------------------
-
                                                    ---NTP Carcinogen---
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Ingredient	Known	Anticipated	IARC Category
Eosin Y (17372-87-1)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Eosin Y (17372-87-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Eosin Y (17372-87-1)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.

Eosin Y (17372-87-1)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Eosin Y (17372-87-1)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY IRRITATE EYES, RESPIRATORY TRACT.
Label Precautions:
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

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Appendix G

Chemical Data Quality Evaluation Reports

Central Florida Recharge - Festival Park Data Quality Evaluation (DQE)

Introduction

The purpose of this document is to present the findings of the data quality evaluation (DQE) performed on laboratory reports of analyses from groundwater samples collected through seven sampling events (a baseline and 6 specific rainfall interval events) as part of the Baseline and Operational Characterization tasks for the Festival Park site of the Central Florida Artificial Recharge Enhancement Project. The baseline sampling is a one time event at 6 locations, and pretreatment sampling is 6 events at 6 locations.

The purpose of the data quality evaluation process is to assess the effect of the overall analytical process on the usability of the data. The two major categories of data evaluation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; either the laboratory did, or did not, analyze the samples within the limits of the analytical method. Evaluation of matrix interferences which could affect the final numerical value is more subtle and involves the analysis of several areas of results including surrogate spike recoveries, matrix spike recoveries, specific interferent check standards, and duplicate sample results.

These samples were collected over the following periods in 2003 and 2004:

- Baseline: May 27th to May 29th, 2003
- Event 1: October 1st to October 3rd, 2003
- Event 2: October 8th to October 10th, 2003
- Event 3: October 22nd to October 24th, 2003
- Event 4: November 18th to November 20th, 2003
- Event 5: February 4th to February 6th, 2004
- Event 6: February 16th to February 18th, 2004

Field quality control (QC) samples collected included field duplicates, an equipment rinsate blank, and trip blanks (analyzed for VOCs only). Additional aliquots of a normal field sample were collected for matrix spike and matrix spike duplicates to be performed in the laboratory. The "normal" samples represent the results to be used for site evaluations. The number of samples collected by type and analytical method is listed in **Exhibit 1**.

Before the analytical results were released by the laboratory, both the sample and QC data were reviewed by the laboratory to ensure method compliance and to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the data package case narrative. **Appendix A** presents the frequency of detection of target analytes for field samples.

EXHIBIT 1
Number of Samples Collected by Matrix, Method, and Type

Matrix	Analytical Method	Analytical Method Description	Preparation Method	Filtered ?	N	FD	EB	TB
WG	E110.2	Color (Colorimetric-Platinum-Cobalt)	NONE	NONE	37	3	1	
WG	E150.1	pH, Electrometric	NONE	NONE	37	3	1	
WG	E160.1	Residue, Filterable (TDS)	NONE	NONE	37	3	1	
WG	E180.1	Turbidity (Nephelometric)	NONE	NONE	37	3	1	
WG	E310.1	Alkalinity (Titrimetric)	NONE	NONE	37	3	1	
WG	E325.2	Chloride, Colorimetric	NONE	NONE	37	3	1	
WG	E350.3	Nitrogen, Ammonia (Potentiometric)	NONE	NONE	37	3	1	
WG	E351.2	Nitrogen, Kjedahl, Total (Colorimetric)	METHOD	NONE	31	2	1	
WG	E351.4	Nitrogen, Kjeldahl, Total (Potentiometric)	METHOD	NONE	6	1		
WG	E353.2	Nitrogen, Nitrate-Nitrite (Colorimetric)	NONE	NONE	37	3	1	
WG	E353.2M	Total nitrogen, calculated	NONE	NONE	37	3	1	
WG	E354.1	Nitrogen, Nitrite (Colorometric)	NONE	NONE	37	3	1	
WG	E365.2	Phosphorus, All Forms (as P)	METHOD	FLDFLT	30	2		
WG	E365.2	Phosphorus, All Forms (as P)	NONE	NONE	37	3	1	
WG	E375.4	Sulfate (As SO4), Turbidimetric	NONE	NONE	37	3	1	
WG	E405.1	Biochemical Oxygen Demand	METHOD	NONE	37	3	1	
WG	E415.1	Total Organic Carbon	NONE	FLDFLT	30	2		
WG	E415.1	Total Organic Carbon	NONE	NONE	36	3	1	
WG	E900	Gross Alpha and Beta	NONE	NONE	39	3	1	
WG	FLPRO	PETROLEUM RANGE ORGANICS - FDEP	METHOD	NONE	37	3	1	
WG	SW6010B	Inductively Coupled Plasma Emission Spectroscopy	SW3010A	NONE	37	3	1	
WG	SW7470A	Mercury in Liquid Waste (Cold-Vapor)	METHOD	NONE	37	3	1	
WG	SW8081	ORGANOCHLORINE PESTICIDES BY GC	SW3510	NONE	36	3	1	
WG	SW8082	POLYCHLORINATED BIPHENYLS (PCB)	SW3510	NONE	36	3	1	
WG	SW8141	Organophosphorus Pesticides by GC	SW3510	NONE	36	3	1	
WG	SW8151	Chlorinated Herbicides by GC	SW3510	NONE	37	3	1	
WG	SW8260B	Volatile Organic Compounds by GCMS	SW5030	NONE	37	3	1	42
WG	SW8270C	GC/MS for SVOCs	SW3510	NONE	37	3	1	

WG = Groundwater, WS = Surface Water, N = Normal Field Sample, FD = Field Duplicate, TB = Trip Blank, EB = Equipment Rinsate Blank. FLDFLT = Field Filtered

The hardcopy data packages were reviewed by the CH2M HILL project chemists applying the review criteria which generally follows that outlined in the Environmental Protection Agency (EPA) guidance documents Contract Laboratory Program National Functional Guidelines for Organic (1999) and Inorganic Data Review (1994) [NFG]). Areas of review included (when applicable to the method) holding time compliance, initial and continuing calibration verification, all associated field and laboratory blank results, matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) accuracy and precision, field duplicate results, surrogate recoveries, internal standard performance, and method interference checks. A data review worksheet was completed for each of these data packages and any non-conformances documented. This data review and validation process is independent of the laboratory's checks and focuses on the usability of the data to support the project data interpretation and decision-making processes.

A qualifying flag would be applied to data that were not within the method established acceptance limits. These flags consist of a single or double-letter abbreviation that indicates the usability of the identified non-conformance. Although the qualifying flags are entered into the database records from the validated Form I's, they are also included in the final data summary tables so that the data will not be used indiscriminately. The qualification of the data also includes secondary, or multi-digit "sub-qualifier" flags, which are entered into the data validation notes field of the database. The secondary qualifiers provide the reasoning behind the assignment of a qualifier to the data. The sub-qualifiers are presented and defined in **Appendix B**.

Numerical sample results that are greater than the method detection limit (MDL) but less than the laboratory reporting limit (RL) are qualified with a "J" for estimated as required by the NFG. The method detection limit (MDL) is defined as, "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero." Therefore, by definition, the accuracy and precision of values at or near the MDL are questionable and should be viewed as such. The reporting limit (RL) is a level at which a laboratory reports analytical results. The RL is established by the laboratory based upon laboratory determinations or project requirements. Factors such as an analye specific MDL, a calculated PQL, the lowest calibration standard (method specific), applicable regulatory agency limits, or program specific requirements may contribute to the final RL established for the project. The practical quantitation limit (PQL) is often determined to be a multiple of the MDL or other limit of detection (LOD) findings. The most common multiples are 5, 10, and 12 (the most current multiple). The major difference between a limit of detection and a limit of quantitation is that accuracy and precision improve at quantitation levels.

The following primary flags were used to qualify the data:

- **U -** Undetected. Analyte was analyzed for but not detected above the method detection limit (MDL) or other limit of detection.
- **UJ -** Detection limit estimated. Analyte was analyzed for, and qualified as not detected. The result is estimated due to its concentration or failed QC measurement.

- **J -** Estimated. The analyte was present, but the reported value may not be accurate or precise due to its concentration or failed QC measurement.
- **R -** Rejected. The data are unusable. (NOTE: Analyte/compound may or may not be present.)

The database was queried for frequency of detection in all blank types and samples', providing detailed listings of blank detects, matrix spike/matrix spike duplicate (MS/MSD) statistics, laboratory control sample / laboratory control sample duplicate (LCS/LCSD) accuracy and precision, field duplicate precision, surrogate recoveries, and preparation and analysis dates pertaining to holding times. The queries were then manipulated to calculate necessary statistics for evaluation of the data.

Once the data review and validation process was completed, the data set was reviewed for analyte frequencies of detection, dilution factors which might affect data usability, and patterns of target analyte distribution. The data set was also evaluated to identify potential data limitations, uncertainties, or both in the analytical results. Analytes that were assigned qualifiers during the validation processes are presented in **Appendix C**.

Holding Times

The holding times for each parameter were evaluated according to SW-846 requirements. **Appendix C** indicates that there were 402 records qualified for preparation or analysis holding times outside criteria, but within two times the established holding time. Of the 402 qualified records, 400 semivolatile results (all non-detects), from 5 samples were qualified as estimated, "UJ" due to re-extractions or re-analysis outside of holding time (but within 2 times HT) because the original analysis experienced QC or calibration failures and were rejected. The initial analyses were excluded because there can be only one valid result, per analyte, per sample. These 5 valid re-extracted samples are: FP-04-06-001RE1, FP-04-06-002RE1, FP-04-06-003RE1, FP-04-06-004RE1, and FP-04-06-005RE1. No data were rejected due to holding time exceedances.

Two 5-day Biological Oxygen Demand (BOD) records (non-detects) were also estimated as "UJ". No data were rejected due to holding time exceedances.

Calibration

The majority of calibration criteria pertaining to the analytical methods were met for these samples. **Appendix C** includes analytes that were qualified due to calibration issues, such as: poor relative response factors (RRFs), second source confirmation, initial or continuing calibration deficiencies (high percent D or percent RSD), and poor second source verification standard recoveries. A total of 522 records were qualified as estimated, non-detect (UJ) and 6 analuyes estimated as "J". Data that were qualified due to any calibration variances are presented in **Appendix C** with validation reasons (or a combination of these calibration specific sub-qualifiers): "CCL", "CC", "IC", "2C" and "2SL". The definition of all the sub-qualifiers are found and defined in Appendix B. The number of non-detected records per fraction qualified as estimated (UJ) included 269 semivolatiles (8270C), 85 volatiles (8260B), 38 organophosphorus pesticides (8141A), 19 chlorinated herbicides (8151A), 43 PCB's (8082), and 66 organochlorine pesticides (8081A). The 6 results estimated as "J" included 2 each TOCs (415.1) and acetone (8260B) records, and single results for heptachlor epoxide, and cis-1,2-Dichloroethene. No results were rejected due to calibration deficiencies.

Potential Field Sampling and Laboratory Contamination

Three types of blank samples were used to monitor potential contamination introduced during field sampling, sample handling, shipping activities, as well as sample preparation and analysis in the laboratory. Types of blank samples included:

- **Trip Blank (TB)**: A sample of analyte free water that is prepared in the laboratory prior to the sampling event. The water is stored in VOC sample containers and is not opened in the field, and travels back to the laboratory with the other samples for VOC analysis. This blank is used to monitor the potential for sample contamination during the sample container trip. One trip blank should be included in each sample cooler that contained samples for VOC analysis. Forty-two trip blanks were submitted to the laboratory with these samples.
- **Equipment Rinsate Blank (ERB)**: A sample of the target-free water (ambient blank) used for the final rinse during the equipment decontamination process. This blank sample is collected by rinsing the sampling equipment after decontamination and is analyzed for the same analytical parameters as the corresponding samples. This blank is used to monitor potential contamination caused by incomplete equipment decontamination. One equipment rinsate blank should be collected per day of sampling, per type of sampling equipment. A single equipment rinsate blank was submitted to the laboratory for this field effort.
- **Laboratory Method Blank or Method Blank (MB)**: A laboratory method blank is analyte free water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and contamination introduced during the analytical procedure. One method blank was prepared and analyzed for every 20 samples or per analytical batch, whichever was more frequent.

According to the NFG, concentrations of common organic contaminants detected in samples at less than 10 times the concentration of the associated blanks can be attributed to field sampling and laboratory contamination rather than environmental contamination from site activities. Common organic contaminants include acetone, methylene chloride, 2-butanone, and the phthalates. For other inorganic and organic contaminants, 5 times the concentration detected in the associated blanks (rather than the 10 times rule) is used to qualify results as potential field and/or laboratory contamination rather than environmental contamination. The 5 or 10 times rule were applied on a sample delivery group (SDG) by SDG basis and not globally. A Sample Delivery Group is a batch of no more than 20 samples prepared together, per method. Global application, however, would account for anomalous data (1 or 2 low level detects out of 40), which should also be attributed to laboratory or field blank contamination. Additionally, many results reported in blanks (especially metals) are well below a defined practical quantitation limit (PQL) and may represent Type I errors when associated with a matrix. A Type I (or alpha error) occurs when the value reported is dismissed as a biased high, or false positive result.

Detects in the samples at concentrations less than the action levels (5 or 10 times rule) were qualified as not detected. The changes in the flagging qualifier due to the data validation process associated with blank contamination are presented in **Appendix C**. Blank detections are compiled into a "frequency of detection" by target parameter and are presented in **Appendix D**. Blank contamination resulted in 144 results requiring qualification as "U" (non-detect) due to low level contamination or high instrument noise and background levels found in various blanks.

Sixteen elements found in one or more of the blank types resulted in qualification of metals data as non-detections. Five general chemistry parameters were also found to have experienced blank detections which required qualification of data. Low level detection in blanks is associated with all analytical methods and quite common. Several cations and anions are ubiquitous at low levels, while others may be exhibiting background noise due their lack of sensitivity associated with their analytical method.

Sample results less than 5 times the concentration found in the blanks associated with a specific SDG can be attributed to field sampling and laboratory contamination or considered to be indicative of environmental contamination. The majority of the reported elemental concentrations were at or near the method detection limit and could be Type I (or alpha errors), more commonly known as "false positives". This effect is often reflected in reported detections at or near the MDL in initial and continuing calibration blanks (ICB and CCB) as these are QC samples utilizing analyte free water as blank check samples. These ICB and CCB data are not part of the electronic data deliverable provided by the laboratory and thus will not be represented in **Appendix D**, however validation notes presented in **Appendix C** indicate if a CCB or ICB was the cause for qualification.

Many metals are ubiquitous at low levels because they are naturally occurring, and are materials and components used in manufacturing (aluminum, copper, chromium, zinc, iron, mercury, and manganese). Iron, chromium, and manganese are associated with alloys of steel. Zinc is a common metal and often used as a catalyst in many manufacturing processes. Copper and aluminum are used in electrical wiring and plumbing. Lead (Pb) is used in soldering applications. Mercury is also commonly encountered at low concentrations due to its vast commercial uses during the last two centuries. Other metals such as antimony, beryllium, cadmium, cobalt, silver, thallium, vanadium, and selenium are not commonly encountered and generally are quantitated just above the MDL and below the reporting limit (RL). The lack of accuracy and precision at this level, coupled with instrument noise and matrix effects, can elicit Type I errors as defined above. Detections at or near the MDL should be carefully evaluated during the projects final decision making process. **Exhibit 2** presents the numbers of records, per element, qualified as not detected due to blank contamination.

EXHIBIT 2
Number of Records per Element, Qualified as Not Detected Attributable to Blank Contamination

Element Qualified	Number of Records Resulting as Non-Detectionss by Element
Aluminum	15 of 40
Antimony	2 of 40
Beryllium	15 of 40
Cadmium	1 of 40
Chromium	4 of 40
Cobalt	1 of 40
Copper	3 of 40
Iron	19 of 40
Lead	3 of 40
Manganese	7 of 40
Selenium	6 of 40
Silver	5 of 40
Thallium	1 of 40
Vanadium	5 of 40
Zinc	12 of 40
Mercury	2 of 40

The general chemistry parameters which were found to require qualification due to various blank detections are presented in **Appencix C** and include TKN, ammonia, nitrite, TPH (FLPRO), TOC, and DOC. **Exhibit 3** presents the number of general chemistry records by parameter qualified as not detected due to blank contamination.

EXHIBIT 3
Number of Records per Parameter, Qualified as Not Detected Attributable to Blank Contamination

Sample Parameter Qualified	Number of Records Resulting as Non-Detections by Parameter
Nitrogen, Ammonia (as N)	1 of 40
Total Kjeldahl Nitrogen	12 of 40
Nitrite Nitrogen	3 of 40
Dissolved Organic Carbon (DOC)	19 of 40
Total Organic Carbon (TOC)	6 of 40
TPH (FLPRO)	2 of 40

Matrix Effects

Surrogate Spike Recovery

Surrogate spike compounds were added to every sample analyzed for the organic parameters including field and laboratory blanks as well as field environmental samples. Surrogate spikes consist of organic compounds which are similar to the method targets in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

Surrogate spike recoveries were used to monitor both laboratory performance and matrix interferences. Surrogate spike recoveries from field and laboratory blanks were used to evaluate laboratory performance because the blanks should represent an "ideal" sample matrix. Surrogate spike recoveries for field samples were used to evaluate the potential for matrix interferences. According to *Functional Guidelines*, data are not qualified with respect to surrogate recoveries unless one or more volatile surrogates are out of specifications. Semivolatiles are not qualified unless two or more surrogates, within the same fraction (base/neutral or acid fraction), are out of specification.

Thirty-four compounds were qualified for low surrogate recoveries. These flagged data included 31 organochlorine herbicides, and 3 FL-PRO TPH records. Two TPH records were estimated and non-detects (UJ) while the 3rd TPH result was estimated (J). A single organochlorine herbicide sample (FP-03-01-009) reported as non-detects was rejected for all 8 method compounds due to the surrogate recoveries below 10 percent. The other 23 organochlorine herbicide resulsts were non-detects and qualified as estimated (UJ). These data are presented in **Appendix C**. With the single method 8151 sample exception, surrogate statistics indicate that the specific sample matrix did not influence the overall analytical process or the final numerical sample result.

Matrix Spike/Matrix Spike Duplicate Precision and Accuracy

A matrix spike is an aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix. The matrix spike duplicate is an intra-laboratory split sample spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. The MS/MSD pair are used to document the precision and accuracy of a given sample matrix. For the MS/MSD measurement, 3 aliquots of a single sample are analyzed; 1 native sample and 2 aliquots of the same sample spiked with target analytes or compounds. Matrix accuracy is evaluated from the spike recoveries, while matrix precision is evaluated from comparison of the quantitated concentrations of the MS and MSD.

Organic results are typically not qualified based upon the results of MS/MSD statistics alone. Evaluation is in conjunction with surrogate, LCS, and internal standard (if applicable) results. However, professional judgment is often applied in the event of unusually low recoveries (less than 20 percent) and associated samples may be qualified as estimated.

Forty-four organic records were qualified utilizing professional judgment in association with the MS/MSD statistics. These data included 20 organophosphorus pesticides (method 8141), 9 organochlorine herbicides (method 8151), 2 volatile (method 8260B), and 13 semivolatile (method 8270C) results. All but 5 of these records were non-detects and qualified as estimated (UJ) for low MS or MSD accuracy or for high MS/MSD precision. Five semivolatile results (non-detects) were rejected (kepone and a,a-Dimethylphenethylamine associated with sample FP-04-07-003 and its field duplicate, -004; and n-nitrosodimethylamine with sample FP-03-03-007).

Two total Kjeldahl Nitrogen (TKN) results were flagged as estimated as (J) and a single non-detect petroleum hydrocarbon (FLPRO) record flagged as estimated (UJ).

The lack of data rejection (other than the 5 semivolatile results) from the measurements of matrix accuracy and precision indicate that the specific sample matrix did not influence the overall analytical process or the final numerical sample result.

Field Duplicate Sample Results

Field duplicate analyses measure both field and laboratory precision and can also be affected by the homogeneity of the samples. According to the EPA *Functional Guidelines*, there are no qualification criteria for field duplicate precision.

According to the method, up to 3 field duplicate sets were collected during these field efforts. Both the native and duplicate samples were analyzed for the same parameters.

An aqueous control limit of ± 20 percent for the RPD was used for original and duplicate sample values greater than or equal to 5 times the RL. A control limit of ± the RL was used if either the sample or the duplicate value was less than 5 times the RL for waters. In the cases where only one result is above the 5 times the RL level and the other is below, the ± RL criteria were applied. There were 62 measurable analyte results in the field duplicate database that met the criteria outlined above. Nine sample sets were outside the acceptance criteria as defined in this text. The exceptions are presented in **Appendix E.** The small percentage of field duplicate sets outside criteria (14 percent) indicate that the matrix was homogenous and that sampling activities did not affect the overall analytical process or the final numerical sample result.

ICPES Serial Dilution Results

The serial dilution is another measurement used to ascertain whether the matrix is affecting the final numerical result. A sample digestate with concentrations of elements greater than 50 times the MDL is diluted five-fold (1+4) and analyzed. The diluted result is then multiplied by 5 and this concentration compared to the original non-diluted result. If the percent difference (percent D) is greater than 10, then a matrix effect is suspected.

Twenty-four results were qualified due to SDG associated sample elements which failed the serial dilution QC measurement. These records consisted of 5 potassium, 15 sodium, and 4 zinc. All of these results were estimated (J), with the exception of 2 zinc records which were estimated as “UJ”. These 3 elements often fail serial dilution tests, mainly due to possible low level contamination and in the cases of sodium and potassium, their lack of analytical sensitivity. The fact that only 3 ubiquitous metals failed the serial dilution procedure indicates that the specific sample matrix did not influence the other elements, nor the overall analytical process or the final numerical sample result.

Laboratory Method Accuracy

Laboratory control samples (LCSs) or blank spikes (BS) are quality control samples utilized to monitor laboratory method accuracy. This sample consists of target free laboratory water spiked with the target compounds of interest. For certain methods, LCS/LCSD's (or BS/BSD's) were prepared and analyzed in order to ascertain method precision. Two-hundred and sixty-six records out of 9,348 specific targets were qualified (2.8 percent). Forty-four non-detected results were rejected, "R" (44/9,348 or 0.5 percent). The 44 rejected results consisted of 4 organochlorine herbicides (method 8151) and 40 semi-volatiles (method 8270C). The remaining 222 non-detected records were qualifies as estimated (UJ). These results were comprised of 4 organochlorine pesticides (method 8081), 29 organophosphorus pesticides (method 8141), 29 organochlorine herbicides (method 8151), 12 volatiles (method 8260B), and 148 semivolatile (method 8270C) results. These data indicate that the analytical methods were under control and did not have an effect on the final numerical results.

Sample Results for Measurements near the Method Detection Limit (MDL)

The MDL is defined as the minimum concentration of an analyte that can be identified, measured, and reported with 99 percent confidence that the analyte concentration is greater than zero. Sample results at, or near the MDL are not accurate or precise. At this level, Type I (alpha – false positives) errors can occur. This situation is often caused by instrument noise or low-level background shifts rather than a true analyte signal. As concentrations approach a defined "quantitation limit", the confidence in the values increase.

PARCCs

Precision--is defined as the agreement between duplicate results, and was estimated by comparing duplicate matrix spike recoveries, and field duplicate sample results. MS/MSD and BS/BSD laboratory precision was documented as well within control limit criteria for most samples and targets. Field duplicate precision was excellent. Both matrix and method precision criteria were demonstrated as well within criteria.

Accuracy--is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For the organic analyses, each of the samples was spiked with surrogate compounds; and for organic and inorganic analyses a MS/ MSD, and LCS were spiked with a known reference materials before preparation. Each of these approaches (except the LCS) provides a measure of the matrix effects on the analytical accuracy. The LCS/LCSD results demonstrate accuracy and precisionof the method. Spike recoveries were within the method acceptance limits for the majority of the measurements; therefore, other than the documented exceptions, there was no evidence of matrix interferences that would affect the usability of the data.

Representativeness--this criterion is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition.

Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

Completeness--is defined as the percentage of measurements that are judged to be valid compared to the total number of measurements made. The percent completeness for all analytical fractions was **99.4 percent (9295/9348)**.

Comparability--is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix type, and analytical method. Comparability is defined by the other PARCC parameters because data sets can be compared with confidence when precision and accuracy are known. Data from this investigation are comparable with other data collected at the site because only EPA methods were used to analyze the sample and EPA Level III QC data are available to support the quality of the data.

Conclusions

Conclusions of the data quality evaluation process are:

- The laboratory analyzed the samples according to the EPA methods stated in the work plan as demonstrated by the deliverable summaries and analytical run sequences.
- Of the 402 qualified records, 400 semivolatile results (all non-detects), from 5 samples were qualified as estimated, "UJ" due to re-extractions or re-analysis outside of holding time (but within 2 times HT) because the original analysis experienced QC or calibration failures and were rejected. The initial analyses were excluded because there can be only one valid result, per analyte, per sample. Two 5-day Biological Oxygen Demand (BOD) records (non-detects) were also estimated as "UJ". No data were rejected due to holding time exceedances.
- The majority of calibration criteria pertaining to the analytical methods were met for these samples. Analytes that were qualified due to calibration issues, such as: poor relative response factors (RRFs), second source confirmation, initial or continuing calibration deficiencies (high percent D or percent RSD), and poor second source verification standard recoveries. A total of 522 records were qualified as estimated, non-detect (UJ) and 6 analuyes estimated as "J".
- Forty-four organic records were qualified utilizing professional judgment in association with the MS/MSD statistics. These data included 20 organophosphorus pesticides (method 8141), 9 organochlorine herbicides (method 8151), 2 volatile (method 8260B), and 13 semivolatile (method 8270C) results. All but 5 of these records were non-detects and qualified as estimated (UJ) for low MS or MSD accuracy or for high MS/MSD precision. Five semivolatile results (non-detects) were rejected
- Forty-four non-detected results were rejected, "R" (44/9,348 or 0.5 percent). The 44 rejected results consisted of 4 organochlorine herbicides (method 8151) and 40 semi-volatiles (method 8270C). The remaining 222 non-detected records were qualified as

estimated (UJ). These results were comprised of 4 organochlorine pesticides (method 8081), 29 organophosphorus pesticides (method 8141), 29 organochlorine herbicides (method 8151), 12 volatiles (method 8260B), and 148 semivolatile (method 8270C) results.

- Sample results for target organic compounds above the MDL but less than the RL should be considered as uncertain but indicative of the presence of that compound at an estimated concentration.
- Matrix and method spike and surrogate recoveries (other than the exceptions documented in the text and tables) indicate that the specific sample matrix did not significantly interfere with the analytical process or the final numerical result from the laboratory.

The project objectives or PARCCs were met, and the data can be used in the project decision-making process as qualified by the data quality evaluation process.

APPENDIX A

Frequency of Detection in Field Samples

Matrix	Analytical Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection Limit	Maximum Detection Limit	Units
WG	E110.2	-	color	40	37	5.0	25.0	10.0	10.0	5.0	5.0	Color units
WG	E150.1	-	ph	40	40	6.0	11.1	0.10	0.10	0.10	0.10	pH units
WG	E160.1	-	total dissolved solids (residue, filterable)	40	40	89.0	386	20.0	20.0	10.0	10.0	mg/L
WG	E180.1	-	turbidity	40	29	0.20	7.0	0.25	0.25	0.12	0.12	NTU
WG	E310.1	-	Alkalinity, bicarbonate (as caco3)	40	31	11.0	211	10.0	10.0	2.0	2.0	mg/L
WG	E325.2	-	Chloride (as Cl)	40	40	3000	16200	600	600	200	266	µg/L
WG	E350.3	-	Nitrogen, ammonia (as N)	40	30	0.13	9.3	0.40	0.40	0.11	0.21	mg/L
WG	E351.2	-	nitrogen, kjeldahl, total	33	21	0.15	1.3	0.26	0.26	0.13	0.13	mg/L
WG	E351.4	-	nitrogen, kjeldahl, total	7	6	1.5	2.3	2.0	2.0	0.45	0.45	mg/L
WG	E353.2	-	Nitrogen, nitrate-nitrite	40	16	0.025	0.67	0.10	0.10	0.020	0.050	mg/L
WG	E353.2M	-	T. Nitrogen, Calculated	40	39	0.17	2.4	0.10	0.10	0.10	0.10	mg/L
WG	E354.1	-	nitrogen, nitrite	40	5	0.014	0.54	0.18	0.18	0.012	0.050	mg/L
WG	E365.2	-	phosphorus, total (as p)	40	40	0.037	0.23	0.040	0.040	0.017	0.020	mg/L
WG	E365.2	-	phosphorus, total organic (as p)	8	8	0.048	0.10	0.020	0.020	0.020	0.020	mg/L
WG	E365.2	FLDFLT	phosphorus, total organic (as p)	32	32	0.035	0.18	0.020	0.020	0.017	0.017	mg/L
WG	E365.2	-	phosphorus, total orthophosphate (as p)	40	39	0.017	0.15	0.020	0.020	0.014	0.020	mg/L
WG	E375.4	-	Sulfate (as SO4)	40	37	0.61	71.8	1.0	5.0	0.22	2.5	mg/L
WG	E405.1	-	biologic oxygen demand, five day	39	2	3.3	3.4	2.0	2.0	2.0	2.0	mg/L
WG	E415.1	FLDFLT	dissolved organic carbon	8	2	23.8	24.3	15.0	15.0	6.7	6.7	mg/L
WG	E415.1	FLDFLT	dissolved organic carbon	32	17	0.62	6.0	1.5	1.5	0.37	0.67	mg/L
WG	E415.1	-	Total organic carbon	39	24	0.54	27.8	1.0	13.4	0.37	6.7	mg/L
WG	E900	-	Alpha, gross	42	25	1.2	10.2	0.50	2.6	0.50	2.3	pCi/L
WG	E900	-	beta, gross	42	32	1.0	54.7	0.70	3.0	0.70	2.5	pCi/L
WG	FLPRO	-	petroleum hydrocarbons	40	8	0.10	0.82	0.34	0.37	0.097	0.32	mg/L
WG	SW6010B	-	Aluminum	40	6	41.0	2660	100	100	35.0	35.0	µg/L
WG	SW6010B	-	Antimony	40	7	2.7	5.0	5.0	5.0	2.5	2.5	µg/L
WG	SW6010B	-	Arsenic	40	23	2.9	19.4	5.0	5.0	2.0	2.0	µg/L
WG	SW6010B	-	Barium	40	40	4.3	55.0	2.0	2.0	0.49	0.49	µg/L
WG	SW6010B	-	Cadmium	40	8	0.36	0.55	1.0	1.0	0.36	0.36	µg/L
WG	SW6010B	-	Calcium	40	40	17100	77100	100	100	32.5	32.5	µg/L
WG	SW6010B	-	Chromium, total	40	15	0.58	10.6	2.0	2.0	0.57	0.57	µg/L
WG	SW6010B	-	Cobalt	40	2	0.78	1.2	5.0	5.0	0.57	0.57	µg/L
WG	SW6010B	-	Copper	40	9	1.2	8.4	5.0	5.0	1.2	1.2	µg/L
WG	SW6010B	-	Iron	40	12	176	4370	50.0	50.0	16.7	16.7	µg/L
WG	SW6010B	-	Lead	40	3	1.9	4.3	5.0	5.0	1.8	1.8	µg/L
WG	SW6010B	-	Magnesium	40	40	1030	8930	100	100	5.2	7.6	µg/L
WG	SW6010B	-	Manganese	40	32	0.33	24.2	2.0	2.0	0.17	0.17	µg/L
WG	SW6010B	-	Nickel	40	25	1.6	9.1	5.0	5.0	1.00	1.00	µg/L
WG	SW6010B	-	Potassium	40	40	1000	56000	500	500	11.5	11.5	µg/L
WG	SW6010B	-	Selenium	40	1	4.3	4.3	5.0	5.0	2.1	2.1	µg/L
WG	SW6010B	-	Silver	40	2	0.50	0.53	2.0	2.0	0.47	0.47	µg/L
WG	SW6010B	-	Sodium	40	40	5380	29300	300	300	22.7	22.7	µg/L

APPENDIX A

Frequency of Detection in Field Samples

Matrix	Analytical Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection Limit	Maximum Detection Limit	Units
WG	SW6010B	-	Vanadium	40	26	0.47	12.5	3.0	3.0	0.45	0.45	µg/L
WG	SW6010B	-	Zinc	40	22	0.68	67.6	10.0	10.0	0.41	0.41	µg/L
WG	SW8081	-	heptachlor epoxide	39	1	0.028	0.028	0.053	0.053	0.026	0.026	µg/L
WG	SW8260B	-	1,1-Dichloroethane	40	8	1.1	2.5	1.0	1.0	0.14	0.18	µg/L
WG	SW8260B	-	1,1-Dichloroethene	40	10	0.38	1.4	1.0	1.0	0.22	0.36	µg/L
WG	SW8260B	-	1,2-Dichlorobenzene	40	3	0.34	0.60	1.0	1.0	0.14	0.18	µg/L
WG	SW8260B	-	Acetone	40	2	3.0	3.9	10.0	10.0	1.9	1.9	µg/L
WG	SW8260B	-	Benzene	40	4	0.16	0.64	1.0	1.0	0.14	0.14	µg/L
WG	SW8260B	-	cis-1,2-Dichloroethene	40	17	0.52	4.5	1.0	1.0	0.18	0.32	µg/L
WG	SW8260B	-	o-Xylene (1,2-Dimethylbenzene)	40	1	0.16	0.16	1.0	1.0	0.12	0.12	µg/L
WG	SW8260B	-	Tetrachloroethene (PCE)	40	6	0.37	1.1	1.0	1.0	0.22	0.38	µg/L
WG	SW8260B	-	Toluene	40	6	0.18	0.67	1.0	1.0	0.11	0.19	µg/L
WG	SW8260B	-	trans-1,2-Dichloroethene	40	3	0.16	0.24	1.0	1.0	0.14	0.21	µg/L
WG	SW8260B	-	Trichloroethene (TCE)	40	3	0.23	0.32	1.0	1.0	0.20	0.20	µg/L
WG	SW8270C	-	2,3,4,6-tetrachlorophenol	40	1	5.4	5.4	10.0	10.0	0.51	0.51	µg/L
WG	SW8270C	-	p-dimethylaminoazobenzene	40	1	1.6	1.6	10.1	10.1	0.39	0.39	µg/L
WG	SW8270C	-	Pentachlorophenol	40	1	6.2	6.2	10.0	10.0	1.3	1.3	µg/L

NOTES: WG = Groundwater Sample, ug/L = micrograms per liter; mg/L = milligrams per liter, pCi/L = picocuries per liter, NTU = nephelometric turbidity units, FLDFLT = field filtered, pH = hydrogen ion

APPENDIX B

Data Validation Subqualifiers and Their Definitions

Number	Validation Code	Definition
1	2C / *CF*	Confirmation result
2	2SH	Second source calibration verification standard greater than the upper control limit
3	2SL	Second source calibration verification standard less than the lower control limit
4	ABH	Ambient blank concentration greater than the RL
5	ABL	Ambient blank concentration less than the RL
6	BKD / *PD*	The result is qualified because the DDT and/or Endrin breakdown was greater than 20%.
7	*BL*	*Blank*
8	*BS*	*Blank Spike recovery outside criteria*
9	*BD*	*Blank Spike/Blank Spike Duplicate or LCS/LCSD RPD criteria exceeded*
10	CBKD	The result is qualified because the combined DDT/Endrin breakdown is greater than 30%.
11	*CC*	*Continuing Calibration*
12	CCBH	Continuing calibration blank concentration greater than the RL
13	CCBL	Continuing calibration blank concentration less than RL
14	CCC	CCC Failure
15	CCRRF	Continuing calibration relative response factor below the LCL
16	CCVF	Continuing Calibration not analyzed at the required frequency
17	CCVH / *CCH*	Continuing calibration recovery greater than upper control limit
18	CCVL / *CCL*	Continuing calibration recovery less than lower control limit
19	CFP	Confirmation precision exceeded
20	CO	Compounds were reported combined on one column
21	DL	Secondary dilution
22	EBH	Equipment blank concentration greater than the RL
23	EBL	Equipment blank concentration less than the RL
24	EMPC	Estimated Maximum Possible Concentration Reported
25	FBH	Field blank concentration greater than the RL
26	FBL	Field blank concentration less than the RL
27	FD	Field duplicate exceeds RPD criteria
28	GPC	The results are qualified due to GPC calibration deficiencies.
29	*HT*	*Holding Time*
30	HTA	Analytical Holding Time exceeded
31	HTP	Preparation Holding Time exceeded
32	IB	Result between the MDL and RL (Metals - B's → J's)
33	*IC*	*Initial Calibration*
34	ICBH	Initial calibration blank concentration greater than the RL
35	ICBL	Initial calibration blank concentration less than RL
36	*ICH*	*Initial Calibration High*
37	*ICL*	*Initial Calibration Low*
38	ICR2	Initial calibration exceeded the R2 for first order regression
39	ICRR	Exceeds RSD criteria and initial calibration exceeded the R2 for first order regression
40	ICRRF	Initial calibration relative response factor below the LCL
41	ICRSD	Initial calibration RSD exceeded
42	ICSH	Interference present and %recovery is greater than upper control limit
43	ICSL	Interference present and %recovery is less than lower control limit
44	ICSP	Single Point Initial Calibration used for Quantitation
45	ICVH	Initial calibration recovery exceeds the upper control limit
46	ICVL	Initial calibration recovery exceeds the lower control limit
47	ICVSH	Initial calibration verification recovery greater than upper control limit
48	ICVSL	Initial calibration verification recovery less than lower control limit
49	*IS*	*Internal standard*
50	ISH	Internal standard response exceeded the UCL criteria
51	ISL	Internal standard response exceeded the LCL criteria
52	LBH	Laboratory blank contamination greater than the RL
53	LBL	Laboratory blank contamination less than the RL
54	*LCS*	*Laboratory Control Sample*
55	*LD*	*Laboratory Duplicate Precision out*
56	LCSDH / *BSH*	LCSD recovery greater than criteria
57	LCSDL / *BSL*	LCSD recovery less than the criteria
58	LCSH / *BSH*	LCS recovery greater than criteria

APPENDIX B

Data Validation Subqualifiers and Their Definitions

Number	Validation Code	Definition
59	LCSL / *BSL*	LCS recovery less than the criteria
60	LCSP / *BD*	LCS/LCSD RPD criteria exceeded
61	LDP / *LD*	Laboratory Duplicate Precision out
62	LR	Linear range exceeded. Concentration above linear range.
63	MSA	Quantitated by the method of standard additions
64	MSALL	Global matrix spike flagging
65	MSAR2	method of standard additions R2 out
66	MSDH / *MSH*	Matrix spike duplicate recovery criteria greater than the upper limit
67	MSDL / *MSL*	Matrix spike duplicate recovery criteria less than the lower limit
68	MSDP / *MD*	Matrix Spike Duplicate RPD criteria exceedance
69	MSH	Matrix spike recovery criteria greater than the upper limit
70	MSL	Matrix spike recovery criteria less than the lower limit
71	NMS	Not Site-specific Matrix Spike
72	*OT*	*Other*
73	PH	Sample pH out. Not properly preserved.
74	PRM	Result differs from Preliminary Result
75	PSH	Post spike recovery criteria greater than the upper limit
76	PSL	Post spike recovery criteria less than the lower limit
77	RA	Sample was reanalyzed
78	RE	Sample was re-extracted and reanalyzed
79	RT	Result is outside the laboratory determined retention time window
80	SCRN	Screening method and/or data
81	SDIL / *SD*	Serial Dilution %D exceeds the upper control limit
82	SPCC	SPCC Failure
83	SSH	Surrogate recovery greater than upper limit
84	SSL	Surrogate recovery less than lower limit
85	SSR	Surrogate spike recovery <10%
86	TBH	Trip blank concentration greater than the RL
87	TBL	Trip blank concentration less than the RL
88	TD	Total Concentration < Dissolved Concentration
89	TEMP	Cooler temperature out upon arrival
90	TIC	Tentatively identified compound
91	TN	GC/MS tune does not meet criteria
92	XCC	No Continuing Calibration analyzed in the analytical batch
93	XCF	No Confirmation information provided
94	X-DL	Data not used due to dilution; another value is more appropriate or data was not requested
95	XIC	No initial calibration analyzed in the analytical batch
96	XICVS	Initial calibration verification standard was not analyzed
97	XLCS	No LCS in the analytical batch
98	XLD	Laboratory Duplicate not reported
99	XMS	Matrix Spike not reported
100	XMSD	Matrix Spike Duplicate not reported
101	X-RE	Data not used due to reanalysis another value is more appropriate or data was not requested

Italics represent the "older" validation reason codes.

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-01-007	N		SW8260B	-	Acetone	3	J	J	3	J	J	1.9	10	CC
WG	FP-03-01-008	N		SW8260B	-	Acetone	3.9	J	J	3.9	J	J	1.9	10	CC
WG	FP-03-03-002	N		SW8260B	-	cis-1,2-Dichloroethene	0.88	J	J	0.88	J	J	0.32	1	IC
WG	FP-03-01-008	N		SW8081	-	heptachlor epoxide	0.028	J	J	0.028	J	J	0.026	0.053	2C
WG	FP-04-06-006	N		SW6010B	-	Potassium	1500	=	=	1500	J	J	11.5	500	SD
WG	FP-04-007-01	N		SW6010B	-	Potassium	1130	=	=	1130	J	J	11.5	500	SD
WG	FP-04-007-02	N		SW6010B	-	Potassium	1640	=	=	1640	J	J	11.5	500	SD
WG	FP-04-07-003	N		SW6010B	-	Potassium	2010	=	=	2010	J	J	11.5	500	SD
WG	FP-04-07-004	FD		SW6010B	-	Potassium	1960	=	=	1960	J	J	11.5	500	SD
WG	FP-03-02-001	N		SW6010B	-	Sodium	14300	=	=	14300	J	J	22.7	300	SD
WG	FP-03-02-002	N		SW6010B	-	Sodium	12900	=	=	12900	J	J	22.7	300	SD
WG	FP-03-02-005	N		SW6010B	-	Sodium	7860	=	=	7860	J	J	22.7	300	SD
WG	FP-03-02-006	N		SW6010B	-	Sodium	12600	=	=	12600	J	J	22.7	300	SD
WG	FP-03-02-007	N		SW6010B	-	Sodium	11300	=	=	11300	J	J	22.7	300	SD
WG	FP-03-03-001	N		SW6010B	-	Sodium	7150	=	=	7150	J	J	22.7	300	SD
WG	FP-03-03-002	N		SW6010B	-	Sodium	10500	=	=	10500	J	J	22.7	300	SD
WG	FP-03-03-003	N		SW6010B	-	Sodium	7000	=	=	7000	J	J	22.7	300	SD
WG	FP-03-03-006	N		SW6010B	-	Sodium	11700	=	=	11700	J	J	22.7	300	SD
WG	FP-03-03-007	N		SW6010B	-	Sodium	10300	=	=	10300	J	J	22.7	300	SD
WG	FP-04-007-01	N		SW6010B	-	Sodium	10400	=	=	10400	J	J	22.7	300	SD
WG	FP-04-007-02	N		SW6010B	-	Sodium	8500	=	=	8500	J	J	22.7	300	SD
WG	FP-04-07-003	N		SW6010B	-	Sodium	6550	=	=	6550	J	J	22.7	300	SD
WG	FP-04-07-007	N		SW6010B	-	Sodium	8630	=	=	8630	J	J	22.7	300	SD
WG	FP-04-07-004	FD		SW6010B	-	Sodium	6430	=	=	6430	J	J	22.7	300	SD
WG	FP-04-007-02	N		SW6010B	-	Zinc	11.8	=	=	11.8	J	J	0.409	10	SD
WG	FP-04-07-003	N		SW6010B	-	Zinc	31.8	=	=	31.8	J	J	0.409	10	SD
WG	FP-04-06-006	N		FLPRO	-	petroleum hydrocarbons	0.1	J	J	0.1	J	J	0.097	0.34	SSL
WG	FP-04-07-007	N		E415.1	FLDFLT	dissolved organic carbon	0.8	J	J	0.8	J	J	0.368	1.5	IC
WG	FP-04-07-004	FD		E415.1	FLDFLT	dissolved organic carbon	0.62	J	J	0.62	J	J	0.368	1.5	IC
WG	FP-03-02-002	N		E351.2	-	nitrogen, kjeldahl, total	0.359	=	=	0.359	J	J	0.128	0.26	MS
WG	FP-03-02-005	N		E351.2	-	nitrogen, kjeldahl, total	0.795	=	=	0.795	J	J	0.128	0.26	MS
WG	FP-04-007-01	N		SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	R	U	6	20.2	BSL
WG	FP-04-007-02	N		SW8270C	-	3,3'-dimethylbenzidine	20	U	U	20	R	U	5.9	20	BSL
WG	FP-03-02-001	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-02-002	N		SW8270C	-	a,a-Dimethylphenethylamine	20.1	U	U	20.1	R	U	3.8	20.1	BS
WG	FP-03-02-005	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-02-006	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-02-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20.4	U	U	20.4	R	U	3.9	20.4	BS
WG	FP-03-03-001	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-03-002	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-03-003	N		SW8270C	-	a,a-Dimethylphenethylamine	20.6	U	U	20.6	R	U	3.9	20.6	BS
WG	FP-03-03-006	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-03-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-04-001	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-04-004	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	R	U	3.9	20.5	BS
WG	FP-03-04-005	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	R	U	3.9	20.5	BS
WG	FP-03-05-001	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	R	U	3.9	20.2	BS
WG	FP-03-05-002	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-05-005	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-05-006	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-03-05-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BS
WG	FP-04-06-006	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.8	20	BSL
WG	FP-04-06-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20.1	U	U	20.1	R	U	3.8	20.1	BSL
WG	FP-04-007-01	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	R	U	3.7	20.2	BSL
WG	FP-04-007-02	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.7	20	BSL
WG	FP-04-07-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	R	U	3.7	20.2	BSL
WG	FP-04-07-003	N		SW8270C	-	a,a-Dimethylphenethylamine	20.3	U	U	20.3	R	U	3.8	20.3	BSL,MSL
WG	FP-04-07-004	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	R	U	3.7	20.2	BSL,MSL
WG	FP-03-02-006	N		SW8270C	-	kepone	20	U	U	20	R	U	1.5	20	BS
WG	FP-03-02-007	N		SW8270C	-	kepone	20.4	U	U	20.4	R	U	1.5	20.4	BS
WG	FP-04-07-003	N		SW8270C	-	kepone	20.3	U	U	20.3	R	U	3.1	20.3	BSL,MSL
WG	FP-04-07-004	FD		SW8270C	-	kepone	20.2	U	U	20.2	R	U	3.1	20.2	BSL,MSL
WG	FP-03-03-001	N		SW8270C	-	methapyrilene	10	U	U	10	R	U	2.6	10	BS
WG	FP-03-03-002	N		SW8270C	-	methapyrilene	10	U	U	10	R	U	2.6	10	BS
WG	FP-03-03-003	N		SW8270C	-	methapyrilene	10.3	U	U	10.3	R	U	2.6	10.3	BS
WG	FP-03-03-001	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	R	U	1.3	5	BS
WG	FP-03-03-002	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	R	U	1.3	5	BS
WG	FP-03-03-003	N		SW8270C	-	n-nitrosodimethylamine	5.2	U	U	5.2	R	U	1.3	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	R	U	1.3	5	BS
WG	FP-03-03-007	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	R	U	1.3	5	MS
WG	FP-04-007-01	N		SW8270C	-	pyridine	4	U	U	4	R	U	2.1	4	BSL
WG	FP-04-007-02	N		SW8270C	-	pyridine	4	U	U	4	R	U	2.1	4	BSL
WG	FP-03-01-009	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.53	U	U	0.53	R	U	0.074	0.53	SS
WG	FP-03-01-009	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.53	U	U	0.53	R	U	0.096	0.53	SS
WG	FP-03-01-009	N		SW8151	-	dalapon	0.53	U	U	0.53	R	U	0.053	0.53	SS
WG	FP-03-01-009	N		SW8151	-	dicamba	0.53	U	U	0.53	R	U	0.074	0.53	SS
WG	FP-03-01-009	N		SW8151	-	dichloroprop	0.53	U	U	0.53	R	U	0.12	0.53	SS
WG	FP-03-02-006	N		SW8151	-	dinoseb	0.56	U	U	0.56	R	U	0.067	0.56	BS
WG	FP-03-02-007	N		SW8151	-	dinoseb	0.56	U	U	0.56	R	U	0.067	0.56	BS
WG	FP-03-03-007	N		SW8151	-	dinoseb	0.5	U	U	0.5	R	U	0.06	0.5	BS
WG	FP-03-04-001	N		SW8151	-	dinoseb	0.51	U	U	0.51	R	U	0.061	0.51	BS
WG	FP-03-01-009	N		SW8151	-	dinoseb	0.53	U	U	0.53	R	U	0.064	0.53	SS
WG	FP-03-01-009	N		SW8151	-	Picloram	11	U	U	11	R	U	0.096	11	SS
WG	FP-03-01-009	N		SW8151	-	silvex (2,4,5-tp)	0.53	U	U	0.53	R	U	0.064	0.53	SS
WG	FP-03-05-006	N		SW7470A	-	Mercury	0.16	B	J	0.16	U	U	0.0162	0.2	BL
WG	FP-03-05-007	N		SW7470A	-	Mercury	0.183	B	J	0.183	U	U	0.0162	0.2	BL
WG	FP-03-01-002	N		SW6010B	-	Aluminum	37.7	B	J	37.7	U	U	35	100	BL
WG	FP-03-01-004	N		SW6010B	-	Aluminum	50	B	J	50	U	U	35	100	BL
WG	FP-03-01-007	N		SW6010B	-	Aluminum	73.7	B	J	73.7	U	U	35	100	BL
WG	FP-03-01-008	N		SW6010B	-	Aluminum	76.3	B	J	76.3	U	U	35	100	BL
WG	FP-03-02-001	N		SW6010B	-	Aluminum	41	B	J	41	U	U	35	100	BL
WG	FP-03-02-002	N		SW6010B	-	Aluminum	42.8	B	J	42.8	U	U	35	100	BL
WG	FP-03-02-005	N		SW6010B	-	Aluminum	59.4	B	J	59.4	U	U	35	100	BL
WG	FP-03-02-007	N		SW6010B	-	Aluminum	46.6	B	J	46.6	U	U	35	100	BL
WG	FP-03-03-001	N		SW6010B	-	Aluminum	95.5	B	J	95.5	U	U	35	100	BL
WG	FP-03-03-002	N		SW6010B	-	Aluminum	71.7	B	J	71.7	U	U	35	100	BL

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-03-003	N		SW6010B	-	Aluminum	44.1	B	J	44.1	U	U	35	100	BL
WG	FP-04-06-004	N		SW6010B	-	Aluminum	52.1	B	J	52.1	U	U	35	100	BL
WG	FP-03-01-009	N		SW6010B	-	Aluminum	150	=	=	150	U	U	35	100	BL
WG	FP-03-03-006	N		SW6010B	-	Aluminum	220	=	=	220	U	U	35	100	BL
WG	FP-04-06-002	FD		SW6010B	-	Aluminum	41.8	B	J	41.8	U	U	35	100	BL
WG	FP-04-07-003	N		SW6010B	-	Antimony	4.3	B	J	4.3	U	U	2.5	5	BL
WG	FP-04-07-004	FD		SW6010B	-	Antimony	3.5	B	J	3.5	U	U	2.5	5	BL
WG	FP-03-01-004	N		SW6010B	-	Beryllium	0.234	B	J	0.234	U	U	0.0945	1	BL
WG	FP-03-02-001	N		SW6010B	-	Beryllium	0.197	B	J	0.197	U	U	0.0945	1	BL
WG	FP-03-02-002	N		SW6010B	-	Beryllium	0.203	B	J	0.203	U	U	0.0945	1	BL
WG	FP-03-02-006	N		SW6010B	-	Beryllium	0.168	B	J	0.168	U	U	0.0945	1	BL
WG	FP-03-03-001	N		SW6010B	-	Beryllium	0.108	B	J	0.108	U	U	0.0945	1	BL
WG	FP-03-03-002	N		SW6010B	-	Beryllium	0.304	B	J	0.304	U	U	0.0945	1	BL
WG	FP-03-04-001	N		SW6010B	-	Beryllium	0.265	B	J	0.265	U	U	0.0945	1	BL
WG	FP-03-04-002	N		SW6010B	-	Beryllium	0.104	B	J	0.104	U	U	0.0945	1	BL
WG	FP-03-04-003	N		SW6010B	-	Beryllium	0.188	B	J	0.188	U	U	0.0945	1	BL
WG	FP-03-04-004	N		SW6010B	-	Beryllium	0.156	B	J	0.156	U	U	0.0945	1	BL
WG	FP-03-05-001	N		SW6010B	-	Beryllium	0.219	B	J	0.219	U	U	0.0945	1	BL
WG	FP-03-05-002	N		SW6010B	-	Beryllium	0.234	B	J	0.234	U	U	0.0945	1	BL
WG	FP-04-06-007	N		SW6010B	-	Beryllium	0.179	B	J	0.179	U	U	0.0945	1	BL
WG	FP-04-07-003	N		SW6010B	-	Beryllium	0.315	B	J	0.315	U	U	0.0945	1	BL
WG	FP-04-07-004	FD		SW6010B	-	Beryllium	0.368	B	J	0.368	U	U	0.0945	1	BL
WG	FP-03-01-004	N		SW6010B	-	Cadmium	0.493	B	J	0.493	U	U	0.356	1	BL
WG	FP-03-01-001	N		SW6010B	-	Chromium, total	1.13	B	J	1.13	U	U	0.57	2	BL
WG	FP-03-01-002	N		SW6010B	-	Chromium, total	1.79	B	J	1.79	U	U	0.57	2	BL
WG	FP-03-01-004	N		SW6010B	-	Chromium, total	1.73	B	J	1.73	U	U	0.57	2	BL
WG	FP-03-01-003	FD		SW6010B	-	Chromium, total	1.13	B	J	1.13	U	U	0.57	2	BL
WG	FP-03-01-004	N		SW6010B	-	Cobalt	0.629	B	J	0.629	U	U	0.569	5	BL
WG	FP-03-01-007	N		SW6010B	-	Copper	3.43	B	J	3.43	U	U	1.17	5	BL
WG	FP-03-01-008	N		SW6010B	-	Copper	4.34	B	J	4.34	U	U	1.17	5	BL
WG	FP-04-007-02	N		SW6010B	-	Copper	1.67	B	J	1.67	U	U	1.17	5	BL
WG	FP-03-01-002	N		SW6010B	-	Iron	30.5	B	J	30.5	U	U	16.7	50	BL
WG	FP-03-01-004	N		SW6010B	-	Iron	33.5	B	J	33.5	U	U	16.7	50	BL
WG	FP-03-01-006	N		SW6010B	-	Iron	18.4	B	J	18.4	U	U	16.7	50	BL
WG	FP-03-02-001	N		SW6010B	-	Iron	48.2	B	J	48.2	U	U	16.7	50	BL
WG	FP-03-02-007	N		SW6010B	-	Iron	22.1	B	J	22.1	U	U	16.7	50	BL
WG	FP-03-03-007	N		SW6010B	-	Iron	40.4	B	J	40.4	U	U	16.7	50	BL
WG	FP-03-04-001	N		SW6010B	-	Iron	40.7	B	J	40.7	U	U	16.7	50	BL
WG	FP-03-05-005	N		SW6010B	-	Iron	18.5	B	J	18.5	U	U	16.7	50	BL
WG	FP-03-02-002	N		SW6010B	-	Iron	57.3	=	=	57.3	U	U	16.7	50	BL
WG	FP-03-03-001	N		SW6010B	-	Iron	89.5	=	=	89.5	U	U	16.7	50	BL
WG	FP-03-03-003	N		SW6010B	-	Iron	68.4	=	=	68.4	U	U	16.7	50	BL
WG	FP-03-04-004	N		SW6010B	-	Iron	123	=	=	123	U	U	16.7	50	BL
WG	FP-03-04-005	N		SW6010B	-	Iron	114	=	=	114	U	U	16.7	50	BL
WG	FP-03-05-001	N		SW6010B	-	Iron	81.6	=	=	81.6	U	U	16.7	50	BL
WG	FP-03-05-002	N		SW6010B	-	Iron	84.3	=	=	84.3	U	U	16.7	50	BL
WG	FP-04-06-007	N		SW6010B	-	Iron	170	=	=	170	U	U	16.7	50	BL
WG	FP-04-07-003	N		SW6010B	-	Iron	217	=	=	217	U	U	16.7	50	BL

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-002	FD		SW6010B	-	Iron	150	=	=	150	U	U	16.7	50	BL
WG	FP-04-07-004	FD		SW6010B	-	Iron	222	=	=	222	U	U	16.7	50	BL
WG	FP-03-01-002	N		SW6010B	-	Lead	2.05	B	J	2.05	U	U	1.76	5	BL
WG	FP-03-01-004	N		SW6010B	-	Lead	3.21	B	J	3.21	U	U	1.76	5	BL
WG	FP-03-01-003	FD		SW6010B	-	Lead	3.26	B	J	3.26	U	U	1.76	5	BL
WG	FP-03-01-002	N		SW6010B	-	Manganese	0.413	B	J	0.413	U	U	0.167	2	BL
WG	FP-03-01-006	N		SW6010B	-	Manganese	1.35	B	J	1.35	U	U	0.167	2	BL
WG	FP-03-02-007	N		SW6010B	-	Manganese	1.11	B	J	1.11	U	U	0.167	2	BL
WG	FP-03-04-002	N		SW6010B	-	Manganese	1.36	B	J	1.36	U	U	0.167	2	BL
WG	FP-03-05-006	N		SW6010B	-	Manganese	0.278	B	J	0.278	U	U	0.167	2	BL
WG	FP-04-06-006	N		SW6010B	-	Manganese	0.259	B	J	0.259	U	U	0.167	2	BL
WG	FP-03-01-003	FD		SW6010B	-	Manganese	0.515	B	J	0.515	U	U	0.167	2	BL
WG	FP-03-03-002	N		SW6010B	-	Selenium	3.09	B	J	3.09	U	U	2.1	5	BL
WG	FP-03-03-003	N		SW6010B	-	Selenium	3.8	B	J	3.8	U	U	2.1	5	BL
WG	FP-03-04-001	N		SW6010B	-	Selenium	2.24	B	J	2.24	U	U	2.1	5	BL
WG	FP-03-04-004	N		SW6010B	-	Selenium	2.18	B	J	2.18	U	U	2.1	5	BL
WG	FP-03-04-005	N		SW6010B	-	Selenium	2.33	B	J	2.33	U	U	2.1	5	BL
WG	FP-03-05-001	N		SW6010B	-	Selenium	3.24	B	J	3.24	U	U	2.1	5	BL
WG	FP-03-01-004	N		SW6010B	-	Silver	0.722	B	J	0.722	U	U	0.325	2	BL
WG	FP-03-01-006	N		SW6010B	-	Silver	0.75	B	J	0.75	U	U	0.325	2	BL
WG	FP-04-06-005	N		SW6010B	-	Silver	0.587	B	J	0.587	U	U	0.472	2	BL
WG	FP-04-07-003	N		SW6010B	-	Silver	0.695	B	J	0.695	U	U	0.472	2	BL
WG	FP-04-07-007	N		SW6010B	-	Silver	0.54	B	J	0.54	U	U	0.472	2	BL
WG	FP-03-04-001	N		SW6010B	-	Thallium	2.93	B	J	2.93	U	U	2.54	6	BL
WG	FP-03-01-006	N		SW6010B	-	Vanadium	0.573	B	J	0.573	U	U	0.447	3	BL
WG	FP-03-01-007	N		SW6010B	-	Vanadium	1.93	B	J	1.93	U	U	0.447	3	BL
WG	FP-03-01-008	N		SW6010B	-	Vanadium	1.82	B	J	1.82	U	U	0.447	3	BL
WG	FP-03-01-009	N		SW6010B	-	Vanadium	1.8	B	J	1.8	U	U	0.447	3	BL
WG	FP-04-06-007	N		SW6010B	-	Vanadium	0.771	B	J	0.771	U	U	0.447	3	BL
WG	FP-04-06-006	N		SW6010B	-	Zinc	1.66	B	J	1.66	U	U	0.409	10	BL
WG	FP-04-06-007	N		SW6010B	-	Zinc	0.755	B	J	0.755	U	U	0.409	10	BL
WG	FP-03-01-001	N		SW6010B	-	Zinc	1.66	B	J	1.66	U	U	0.409	10	BL
WG	FP-03-01-002	N		SW6010B	-	Zinc	1.33	B	J	1.33	U	U	0.409	10	BL
WG	FP-03-01-004	N		SW6010B	-	Zinc	3.86	B	J	3.86	U	U	0.409	10	BL
WG	FP-03-01-006	N		SW6010B	-	Zinc	1.31	B	J	1.31	U	U	0.409	10	BL
WG	FP-03-01-009	N		SW6010B	-	Zinc	1.54	B	J	1.54	U	U	0.409	10	BL
WG	FP-03-02-006	N		SW6010B	-	Zinc	2.69	B	J	2.69	U	U	0.409	10	BL
WG	FP-03-02-007	N		SW6010B	-	Zinc	2.77	B	J	2.77	U	U	0.409	10	BL
WG	FP-03-05-005	N		SW6010B	-	Zinc	1.23	B	J	1.23	U	U	0.409	10	BL
WG	FP-03-05-006	N		SW6010B	-	Zinc	0.694	B	J	0.694	U	U	0.409	10	BL
WG	FP-03-01-003	FD		SW6010B	-	Zinc	0.951	B	J	0.951	U	U	0.409	10	BL
WG	FP-04-07-007	N		FLPRO	-	petroleum hydrocarbons	0.11	J	J	0.34	U	U	0.097	0.34	BL
WG	FP-04-06-001	N		E415.1	FLDFLT	dissolved organic carbon	1.36	J	J	1.36	U	U	0.368	1.5	BL
WG	FP-04-06-003	N		E415.1	FLDFLT	dissolved organic carbon	1.48	J	J	1.48	U	U	0.368	1.5	BL
WG	FP-04-06-006	N		E415.1	FLDFLT	dissolved organic carbon	1.35	J	J	1.35	U	U	0.368	1.5	BL
WG	FP-03-01-001	N		E415.1	FLDFLT	dissolved organic carbon	1.52	=	=	1.52	U	U	0.67	1.5	BL
WG	FP-03-02-001	N		E415.1	FLDFLT	dissolved organic carbon	1.88	=	=	1.88	U	U	0.67	1.5	BL
WG	FP-03-02-002	N		E415.1	FLDFLT	dissolved organic carbon	2.74	=	=	2.74	U	U	0.67	1.5	BL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-02-006	N		E415.1	FLDFLT	dissolved organic carbon	1.82	=	=	1.82	U	U	0.67	1.5	BL
WG	FP-03-05-001	N		E415.1	FLDFLT	dissolved organic carbon	2.55	=	=	2.55	U	U	0.368	1.5	BL
WG	FP-03-05-002	N		E415.1	FLDFLT	dissolved organic carbon	3.67	=	=	3.67	U	U	0.368	1.5	BL
WG	FP-03-05-005	N		E415.1	FLDFLT	dissolved organic carbon	3.07	=	=	3.07	U	U	0.368	1.5	BL
WG	FP-03-05-006	N		E415.1	FLDFLT	dissolved organic carbon	2.46	=	=	2.46	U	U	0.368	1.5	BL
WG	FP-04-06-004	N		E415.1	FLDFLT	dissolved organic carbon	1.57	=	=	1.57	U	U	0.368	1.5	BL
WG	FP-04-06-007	N		E415.1	FLDFLT	dissolved organic carbon	2.08	=	=	2.08	U	U	0.368	1.5	BL
WG	FP-03-01-002	N		E415.1	FLDFLT	dissolved organic carbon	2.67	=	=	2.67	U	U	0.67	1.5	BL
WG	FP-03-01-004	N		E415.1	FLDFLT	dissolved organic carbon	2.77	=	=	2.77	U	U	0.67	1.5	BL
WG	FP-03-01-006	N		E415.1	FLDFLT	dissolved organic carbon	2.79	=	=	2.79	U	U	0.67	1.5	BL
WG	FP-03-01-007	N		E415.1	FLDFLT	dissolved organic carbon	4.94	=	=	4.94	U	U	0.67	1.5	BL
WG	FP-04-06-002	FD		E415.1	FLDFLT	dissolved organic carbon	1.45	J	J	1.45	U	U	0.368	1.5	BL
WG	FP-03-01-003	FD		E415.1	FLDFLT	dissolved organic carbon	2.81	=	=	2.81	U	U	0.67	1.5	BL
WG	FP-03-01-001	N		E415.1	-	Total organic carbon	3.19	=	=	3.19	U	U	0.67	1.34	BL
WG	FP-03-01-002	N		E415.1	-	Total organic carbon	2.18	=	=	2.18	U	U	0.67	1.34	BL
WG	FP-03-01-004	N		E415.1	-	Total organic carbon	2.56	=	=	2.56	U	U	0.67	1.34	BL
WG	FP-03-02-006	N		E415.1	-	Total organic carbon	1.44	=	=	1.44	U	U	0.67	1.34	BL
WG	FP-04-06-007	N		E415.1	-	Total organic carbon	2.1	=	=	2.1	U	U	0.368	1	BL
WG	FP-03-01-003	FD		E415.1	-	Total organic carbon	2.83	=	=	2.83	U	U	0.67	1.34	BL
WG	FP-03-05-005	N		E354.1	-	nitrogen, nitrite	0.021	J	J	0.021	U	U	0.0118	0.18	BL
WG	FP-03-05-006	N		E354.1	-	nitrogen, nitrite	0.0119	J	J	0.0119	U	U	0.0118	0.18	BL
WG	FP-03-05-007	N		E354.1	-	nitrogen, nitrite	0.0243	J	J	0.0243	U	U	0.0118	0.18	BL
WG	FP-04-06-007	N		E351.4	-	nitrogen, kjeldahl, total	1.6	J	J	1.6	U	U	0.45	2	BL
WG	FP-03-01-009	N		E351.2	-	nitrogen, kjeldahl, total	0.198	J	J	0.198	U	U	0.128	0.26	BL
WG	FP-03-01-002	N		E351.2	-	nitrogen, kjeldahl, total	0.901	=	=	0.901	U	U	0.128	0.26	BL
WG	FP-03-01-004	N		E351.2	-	nitrogen, kjeldahl, total	0.612	=	=	0.612	U	U	0.128	0.26	BL
WG	FP-03-01-006	N		E351.2	-	nitrogen, kjeldahl, total	0.453	=	=	0.453	U	U	0.128	0.26	BL
WG	FP-03-01-007	N		E351.2	-	nitrogen, kjeldahl, total	0.484	=	=	0.484	U	U	0.128	0.26	BL
WG	FP-03-01-008	N		E351.2	-	nitrogen, kjeldahl, total	0.358	=	=	0.358	U	U	0.128	0.26	BL
WG	FP-04-007-01	N		E351.2	-	nitrogen, kjeldahl, total	0.521	=	=	0.521	U	U	0.128	0.26	BL
WG	FP-04-07-003	N		E351.2	-	nitrogen, kjeldahl, total	0.443	=	=	0.443	U	U	0.128	0.26	BL
WG	FP-04-07-007	N		E351.2	-	nitrogen, kjeldahl, total	0.533	=	=	0.533	U	U	0.128	0.26	BL
WG	FP-03-01-003	FD		E351.2	-	nitrogen, kjeldahl, total	0.741	=	=	0.741	U	U	0.128	0.26	BL
WG	FP-04-07-004	FD		E351.2	-	nitrogen, kjeldahl, total	0.412	=	=	0.412	U	U	0.128	0.26	BL
WG	FP-04-06-007	N		E350.3	-	Nitrogen, ammonia (as N)	0.308	J	J	0.308	U	U	0.107	0.4	BL
WG	FP-03-03-001	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-03-002	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-03-003	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5.2	U	U	5.2	UJ	U	1.2	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-03-007	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-04-001	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-04-002	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-04-003	N		SW8270C	-	1,2,4,5-tetrachlorobenzene	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	HT,IC
WG	FP-03-02-001	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-02-002	N		SW8270C	-	1,3,5-trinitrobenzene	20.1	U	U	20.1	UJ	U	0.42	20.1	IC
WG	FP-03-02-005	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-02-006	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-02-007	N		SW8270C	-	1,3,5-trinitrobenzene	20.4	U	U	20.4	UJ	U	0.43	20.4	IC
WG	FP-03-03-001	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-03-002	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-03-003	N		SW8270C	-	1,3,5-trinitrobenzene	20.6	U	U	20.6	UJ	U	0.43	20.6	IC
WG	FP-03-03-006	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-03-007	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-04-001	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-05-001	N		SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	0.42	20.2	IC
WG	FP-03-05-002	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-05-005	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-05-006	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-03-05-007	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	0.42	20	IC
WG	FP-04-06-006	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	IC
WG	FP-04-06-007	N		SW8270C	-	1,3,5-trinitrobenzene	20.1	U	U	20.1	UJ	U	2.8	20.1	IC
WG	FP-04-007-01	N		SW8270C	-	1,3,5-trinitrobenzene	20.2	U	U	20.2	UJ	U	2.8	20.2	IC
WG	FP-04-007-02	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	20.2	U	U	20.2	UJ	U	2.5	20.2	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	20.2	U	U	20.2	UJ	U	2.5	20.2	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	20.2	U	U	20.2	UJ	U	2.5	20.2	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	20.2	U	U	20.2	UJ	U	2.5	20.2	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	20.2	U	U	20.2	UJ	U	2.5	20.2	HT,IC
WG	FP-03-02-001	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-02-002	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.51	10	IC
WG	FP-03-02-005	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-02-006	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-02-007	N		SW8270C	-	1,3-dinitrobenzene	10.2	U	U	10.2	UJ	U	0.52	10.2	IC
WG	FP-03-03-001	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-03-002	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-03-003	N		SW8270C	-	1,3-dinitrobenzene	10.3	U	U	10.3	UJ	U	0.52	10.3	IC
WG	FP-03-03-006	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-03-03-007	N		SW8270C	-	1,3-dinitrobenzene	10	U	U	10	UJ	U	0.5	10	IC
WG	FP-04-06-006	N		SW8270C	-	1,4-naphthoquinone	10	U	U	10	UJ	U	3.1	10	BSL,IC
WG	FP-04-06-007	N		SW8270C	-	1,4-naphthoquinone	10	U	U	10	UJ	U	3.1	10	BSL,IC
WG	FP-04-007-01	N		SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	BSL,IC

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-007-02	N		SW8270C	-	1,4-naphthoquinone	10	U	U	10	UJ	U	3.1	10	BSL,IC
WG	FP-04-07-003	N		SW8270C	-	1,4-naphthoquinone	10.2	U	U	10.2	UJ	U	3.1	10.2	CCL,IC
WG	FP-04-07-007	N		SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	CCL,IC
WG	FP-04-07-004	FD		SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	CCL,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	10.1	U	U	10.1	UJ	U	3.1	10.1	HT
WG	FP-03-05-005	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BD,BS
WG	FP-03-02-007	N		SW8270C	-	1-naphthylamine	5.1	U	U	5.1	UJ	U	0.5	5.1	BS
WG	FP-03-03-001	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BS
WG	FP-03-03-002	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BS
WG	FP-03-03-003	N		SW8270C	-	1-naphthylamine	5.2	U	U	5.2	UJ	U	0.51	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BS
WG	FP-03-03-007	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BS
WG	FP-03-04-001	N		SW8270C	-	1-naphthylamine	5	U	U	5	UJ	U	0.49	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	1-naphthylamine	10.1	U	U	10.1	UJ	U	1.8	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	1-naphthylamine	10.1	U	U	10.1	UJ	U	1.8	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	1-naphthylamine	10.1	U	U	10.1	UJ	U	1.8	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	1-naphthylamine	10.1	U	U	10.1	UJ	U	1.8	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	1-naphthylamine	10.1	U	U	10.1	UJ	U	1.8	10.1	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	10.1	U	U	10.1	UJ	U	3	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	10.1	U	U	10.1	UJ	U	3	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	10.1	U	U	10.1	UJ	U	3	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	10.1	U	U	10.1	UJ	U	3	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	10.1	U	U	10.1	UJ	U	3	10.1	HT
WG	FP-03-04-001	N		SW8270C	-	2,3,4,6-tetrachlorophenol	10	U	U	10	UJ	U	0.51	10	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-03-04-001	N		SW8270C	-	2,4,5-Trichlorophenol	5	U	U	5	UJ	U	0.39	5	IC
WG	FP-03-04-005	N		SW8270C	-	2,4,5-Trichlorophenol	5.1	U	U	5.1	UJ	U	0.4	5.1	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-03-03-002	N		SW8270C	-	2,4-Dichlorophenol	5	U	U	5	UJ	U	0.3	5	IC
WG	FP-03-03-003	N		SW8270C	-	2,4-Dichlorophenol	5.2	U	U	5.2	UJ	U	0.31	5.2	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-03-03-001	N		SW8270C	-	2,4-Dimethylphenol	5	U	U	5	UJ	U	0.44	5	IC
WG	FP-03-04-002	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	CC
WG	FP-03-05-006	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	CC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	HT,IC
WG	FP-03-01-001	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-01-002	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-01-004	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-01-006	N		SW8270C	-	2,4-Dinitrophenol	10.2	U	U	10.2	UJ	U	1.3	10.2	IC
WG	FP-03-01-007	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-01-008	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-01-009	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-02-001	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-02-002	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-02-005	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-02-007	N		SW8270C	-	2,4-Dinitrophenol	10.2	U	U	10.2	UJ	U	1.3	10.2	IC
WG	FP-03-03-006	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-03-007	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-04-003	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-05-001	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-03-05-002	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-05-005	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-03-05-007	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	1.3	10	IC
WG	FP-04-06-006	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	5.6	10	IC
WG	FP-04-06-007	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	5.6	10	IC
WG	FP-04-007-01	N		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	IC
WG	FP-04-007-02	N		SW8270C	-	2,4-Dinitrophenol	10	U	U	10	UJ	U	5.6	10	IC
WG	FP-04-07-003	N		SW8270C	-	2,4-Dinitrophenol	10.2	U	U	10.2	UJ	U	5.7	10.2	IC
WG	FP-03-01-003	FD		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	1.3	10.1	IC
WG	FP-04-07-004	FD		SW8270C	-	2,4-Dinitrophenol	10.1	U	U	10.1	UJ	U	5.6	10.1	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-04-001	N		SW8270C	-	2,4-Dinitrotoluene	5	U	U	5	UJ	U	0.7	5	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-07-007	N		SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	IC
WG	FP-04-007-01	N		SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	CCL
WG	FP-04-007-02	N		SW8270C	-	2-acetylaminofluorene	10	U	U	10	UJ	U	2.5	10	CCL
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-03-04-001	N		SW8270C	-	2-acetylaminofluorene	10	U	U	10	UJ	U	0.49	10	IC
WG	FP-03-04-001	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BD,BS
WG	FP-03-05-005	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BD,BS
WG	FP-03-02-007	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5.1	U	U	5.1	UJ	U	0.74	5.1	BS
WG	FP-03-03-001	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BS
WG	FP-03-03-002	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BS
WG	FP-03-03-003	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5.2	U	U	5.2	UJ	U	0.75	5.2	BS
WG	FP-03-05-001	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.73	5	BS
WG	FP-03-05-002	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BS
WG	FP-03-05-006	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BS
WG	FP-03-05-007	N		SW8270C	-	2-aminonaphthalene (beta naphthylamine)	5	U	U	5	UJ	U	0.72	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-aminonaphthalene (beta naphthylamine)	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-aminonaphthalene (beta naphthylamine)	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-aminonaphthalene (beta naphthylamine)	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-aminonaphthalene (beta naphthylamine)	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-aminonaphthalene (beta naphthylamine)	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-04-004	N		SW8270C	-	2-Chloronaphthalene	5.1	U	U	5.1	UJ	U	0.43	5.1	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-Nitroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-Nitroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-Nitroaniline	4	U	U	4	UJ	U	3	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-Nitroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-Nitroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-03-05-005	N		SW8270C	-	2-Nitroaniline	5	U	U	5	UJ	U	0.3	5	IC
WG	FP-03-01-006	N		SW8270C	-	2-picoline (alpha-picoline)	5.1	U	U	5.1	UJ	U	0.57	5.1	BD,BS
WG	FP-03-01-007	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BD,BS
WG	FP-03-01-008	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BD,BS
WG	FP-03-01-009	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BD,BS
WG	FP-03-02-007	N		SW8270C	-	2-picoline (alpha-picoline)	5.1	U	U	5.1	UJ	U	0.57	5.1	BD,BS
WG	FP-03-04-001	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.56	5	BD,BS
WG	FP-03-01-001	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BS
WG	FP-03-01-002	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.56	5	BS
WG	FP-03-01-004	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BS
WG	FP-03-02-006	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.56	5	BS
WG	FP-03-04-002	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BS
WG	FP-03-04-003	N		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.56	5	BS
WG	FP-03-01-003	FD		SW8270C	-	2-picoline (alpha-picoline)	5	U	U	5	UJ	U	0.57	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	20.2	U	U	20.2	UJ	U	1.5	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	20.2	U	U	20.2	UJ	U	1.5	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	20.2	U	U	20.2	UJ	U	1.5	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	20.2	U	U	20.2	UJ	U	1.5	20.2	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	20.2	U	U	20.2	UJ	U	1.5	20.2	HT
WG	FP-03-01-006	N		SW8270C	-	3,3'-Dichlorobenzidine	5.1	U	U	5.1	UJ	U	1.2	5.1	BD
WG	FP-03-01-007	N		SW8270C	-	3,3'-Dichlorobenzidine	5	U	U	5	UJ	U	1.2	5	BD
WG	FP-03-01-008	N		SW8270C	-	3,3'-Dichlorobenzidine	5	U	U	5	UJ	U	1.2	5	BD
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-03-05-005	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BD
WG	FP-03-01-009	N		SW8270C	-	3,3'-dimethylbenzidine	10.1	U	U	10.1	UJ	U	1.9	10.1	BD,BS
WG	FP-03-02-007	N		SW8270C	-	3,3'-dimethylbenzidine	10.2	U	U	10.2	UJ	U	1.9	10.2	BD,BS
WG	FP-03-04-001	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BD,BS
WG	FP-03-02-006	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BS
WG	FP-03-03-001	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BS
WG	FP-03-03-002	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BS
WG	FP-03-03-003	N		SW8270C	-	3,3'-dimethylbenzidine	10.3	U	U	10.3	UJ	U	1.9	10.3	BS
WG	FP-03-03-006	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BS
WG	FP-03-03-007	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	BS
WG	FP-04-07-007	N		SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	BSL
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	20.2	U	U	20.2	UJ	U	6	20.2	HT
WG	FP-03-05-001	N		SW8270C	-	3,3'-dimethylbenzidine	10.1	U	U	10.1	UJ	U	1.9	10.1	IC
WG	FP-03-05-002	N		SW8270C	-	3,3'-dimethylbenzidine	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	HT

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	3-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	3-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	3-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	3-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	3-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-04-001	N		SW8270C	-	4-aminobiphenyl (4-biphenylamine)	5	U	U	5	UJ	U	0.51	5	BD,BS
WG	FP-03-02-006	N		SW8270C	-	4-aminobiphenyl (4-biphenylamine)	5	U	U	5	UJ	U	0.51	5	BS
WG	FP-03-02-007	N		SW8270C	-	4-aminobiphenyl (4-biphenylamine)	5.1	U	U	5.1	UJ	U	0.52	5.1	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-03-04-001	N		SW8270C	-	4-Bromophenyl phenyl ether	5	U	U	5	UJ	U	0.26	5	CC
WG	FP-03-04-002	N		SW8270C	-	4-Bromophenyl phenyl ether	5	U	U	5	UJ	U	0.26	5	CC
WG	FP-03-04-003	N		SW8270C	-	4-Bromophenyl phenyl ether	5	U	U	5	UJ	U	0.26	5	CC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4	U	U	4	UJ	U	2.3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	HT
WG	FP-03-01-001	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-01-002	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-01-004	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-01-006	N		SW8270C	-	4-Methylphenol (p-Cresol)	5.1	U	U	5.1	UJ	U	0.28	5.1	IC
WG	FP-03-01-007	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-01-008	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-01-009	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-03-04-001	N		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC

Appendix C
Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-01-003	FD		SW8270C	-	4-Methylphenol (p-Cresol)	5	U	U	5	UJ	U	0.28	5	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-Nitroaniline	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-01-001	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-01-002	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-01-004	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-01-006	N		SW8270C	-	4-Nitroaniline	5.1	U	U	5.1	UJ	U	0.47	5.1	IC
WG	FP-03-01-007	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-01-008	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-01-009	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-03-04-001	N		SW8270C	-	4-Nitroaniline	5	U	U	5	UJ	U	0.46	5	IC
WG	FP-04-06-006	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.7	10	2SL,CCL,IC
WG	FP-04-007-01	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	2SL,CCL,IC
WG	FP-04-007-02	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.7	10	2SL,CCL,IC
WG	FP-03-05-001	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	CC,IC
WG	FP-03-05-002	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	CC,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,HT,IC
WG	FP-04-06-007	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.7	10	CCL,IC
WG	FP-04-07-003	N		SW8270C	-	4-nitroquinoline-n-oxide	10.2	U	U	10.2	UJ	U	3.8	10.2	CCL,IC
WG	FP-04-07-007	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,IC
WG	FP-04-07-004	FD		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.7	10.1	CCL,IC
WG	FP-03-01-001	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	IC
WG	FP-03-01-002	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.2	10	IC
WG	FP-03-01-004	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	IC
WG	FP-03-01-009	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	IC
WG	FP-03-02-001	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-02-002	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.2	10	IC
WG	FP-03-02-005	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-02-006	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-02-007	N		SW8270C	-	4-nitroquinoline-n-oxide	10.2	U	U	10.2	UJ	U	3.2	10.2	IC
WG	FP-03-03-001	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-03-002	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-03-003	N		SW8270C	-	4-nitroquinoline-n-oxide	10.3	U	U	10.3	UJ	U	3.2	10.3	IC
WG	FP-03-03-006	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-03-007	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-04-001	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-04-002	N		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	IC
WG	FP-03-04-003	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.2	10	IC
WG	FP-03-04-004	N		SW8270C	-	4-nitroquinoline-n-oxide	10.2	U	U	10.2	UJ	U	3.2	10.2	IC
WG	FP-03-04-005	N		SW8270C	-	4-nitroquinoline-n-oxide	10.2	U	U	10.2	UJ	U	3.2	10.2	IC
WG	FP-03-05-005	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-05-006	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-05-007	N		SW8270C	-	4-nitroquinoline-n-oxide	10	U	U	10	UJ	U	3.1	10	IC
WG	FP-03-01-003	FD		SW8270C	-	4-nitroquinoline-n-oxide	10.1	U	U	10.1	UJ	U	3.2	10.1	IC
WG	FP-04-07-007	N		SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	BSL
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	10.1	U	U	10.1	UJ	U	2.6	10.1	HT
WG	FP-04-007-01	N		SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	CCL,IC
WG	FP-04-007-02	N		SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	CCL,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-006	N		SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	IC
WG	FP-04-06-007	N		SW8270C	-	7,12-dimethylbenz(a)anthracene	4	U	U	4	UJ	U	2.5	4	IC
WG	FP-03-01-006	N		SW8270C	-	a,a-Dimethylphenethylamine	20.4	U	U	20.4	UJ	U	3.9	20.4	BD,BS,CC,IC
WG	FP-03-01-007	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BD,BS,CC,IC
WG	FP-03-01-008	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BD,BS,CC,IC
WG	FP-03-01-009	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BD,BS,CC,IC
WG	FP-03-04-002	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BS,CC,IC
WG	FP-03-04-003	N		SW8270C	-	a,a-Dimethylphenethylamine	20.1	U	U	20.1	UJ	U	3.8	20.1	BS,CC,IC
WG	FP-03-01-001	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BS,CC,IC,MD,MS
WG	FP-03-01-002	N		SW8270C	-	a,a-Dimethylphenethylamine	20.1	U	U	20.1	UJ	U	3.8	20.1	BS,CC,IC,MD,MS
WG	FP-03-01-004	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BS,CC,IC,MD,MS
WG	FP-03-01-003	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	BS,CC,IC,MD,MS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	CCL,HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	CCL,HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	CCL,HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	CCL,HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.9	20.2	CCL,HT,IC
WG	FP-03-05-001	N		SW8270C	-	Acetophenone	5	U	U	5	UJ	U	0.86	5	BS
WG	FP-03-05-002	N		SW8270C	-	Acetophenone	5	U	U	5	UJ	U	0.85	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Acetophenone	4	U	U	4	UJ	U	0.67	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Acetophenone	4	U	U	4	UJ	U	0.67	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Acetophenone	4	U	U	4	UJ	U	0.67	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Acetophenone	4	U	U	4	UJ	U	0.67	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Acetophenone	4	U	U	4	UJ	U	0.67	4	HT
WG	FP-03-02-007	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	5.1	U	U	5.1	UJ	U	0.5	5.1	CC
WG	FP-03-03-006	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	5	U	U	5	UJ	U	0.49	5	CC
WG	FP-03-03-007	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	5	U	U	5	UJ	U	0.49	5	CC
WG	FP-03-05-001	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	5	U	U	5	UJ	U	0.49	5	CC,IC
WG	FP-03-05-002	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	5	U	U	5	UJ	U	0.49	5	CC,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	HT,IC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	HT,IC
WG	FP-04-06-006	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	IC
WG	FP-04-06-007	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	IC
WG	FP-04-007-02	N		SW8270C	-	Aniline (phenylamine, aminobenzene)	4	U	U	4	UJ	U	2.8	4	IC
WG	FP-03-04-002	N		SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	1	10.1	BS,CC
WG	FP-03-04-003	N		SW8270C	-	Aramite	10	U	U	10	UJ	U	1	10	BS,CC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	2.5	10.1	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	2.5	10.1	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	2.5	10.1	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	2.5	10.1	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Aramite	10.1	U	U	10.1	UJ	U	2.5	10.1	HT,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Benzyl alcohol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Benzyl alcohol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Benzyl alcohol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Benzyl alcohol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Benzyl alcohol	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4	U	U	4	UJ	U	3.5	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-007-01	N		SW8270C	-	bis(2-Chloroethyl) ether	4	U	U	4	UJ	U	3	4	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-03-04-001	N		SW8270C	-	diallate	5	U	U	5	UJ	U	0.66	5	BD,BS
WG	FP-04-07-007	N		SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	BSL
WG	FP-03-05-001	N		SW8270C	-	diallate	5	U	U	5	UJ	U	0.67	5	CC,IC
WG	FP-03-05-002	N		SW8270C	-	diallate	5	U	U	5	UJ	U	0.66	5	CC,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	HT,IC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	diallate	4	U	U	4	UJ	U	2.6	4	HT,IC
WG	FP-03-04-002	N		SW8270C	-	diallate	5	U	U	5	UJ	U	0.67	5	IC
WG	FP-03-04-003	N		SW8270C	-	diallate	5	U	U	5	UJ	U	0.67	5	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4	U	U	4	UJ	U	2.5	4	HT
WG	FP-03-05-005	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BD
WG	FP-03-03-001	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-03-002	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-03-003	N		SW8270C	-	hexachloropropene	5.2	U	U	5.2	UJ	U	0.64	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-03-007	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-04-002	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-04-003	N		SW8270C	-	hexachloropropene	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	isodrin	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	isodrin	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	isodrin	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	isodrin	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	isodrin	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Isophorone	4	U	U	4	UJ	U	3.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Isophorone	4	U	U	4	UJ	U	3.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Isophorone	4	U	U	4	UJ	U	3.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Isophorone	4	U	U	4	UJ	U	3.8	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Isophorone	4	U	U	4	UJ	U	3.8	4	HT
WG	FP-03-05-001	N		SW8270C	-	Isophorone	5	U	U	5	UJ	U	1.2	5	IC
WG	FP-03-04-001	N		SW8270C	-	isosafrole	5	U	U	5	UJ	U	0.51	5	BS
WG	FP-04-06-006	N		SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	BSL
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	isosafrole	4	U	U	4	UJ	U	2.6	4	HT
WG	FP-03-04-001	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	BD,BS
WG	FP-03-02-001	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	BS,IC
WG	FP-03-02-002	N		SW8270C	-	kepone	20.1	U	U	20.1	UJ	U	1.5	20.1	BS,IC
WG	FP-03-02-005	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	BS,IC
WG	FP-04-07-007	N		SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	BSL,IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	3.1	20.2	HT
WG	FP-03-03-001	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	IC
WG	FP-03-03-002	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	IC
WG	FP-03-03-003	N		SW8270C	-	kepone	20.6	U	U	20.6	UJ	U	1.6	20.6	IC
WG	FP-03-03-006	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	IC
WG	FP-03-03-007	N		SW8270C	-	kepone	20	U	U	20	UJ	U	1.5	20	IC
WG	FP-03-04-002	N		SW8270C	-	kepone	20.2	U	U	20.2	UJ	U	1.5	20.2	IC
WG	FP-03-04-003	N		SW8270C	-	kepone	20.1	U	U	20.1	UJ	U	1.5	20.1	IC
WG	FP-04-07-007	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	BD
WG	FP-03-01-006	N		SW8270C	-	methapyrilene	10.2	U	U	10.2	UJ	U	2.6	10.2	BD,BS
WG	FP-03-01-007	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BD,BS
WG	FP-03-01-008	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BD,BS
WG	FP-03-02-007	N		SW8270C	-	methapyrilene	10.2	U	U	10.2	UJ	U	2.6	10.2	BD,BS,CC
WG	FP-03-03-006	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BD,BS,CC
WG	FP-03-03-007	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BD,BS,CC
WG	FP-03-01-009	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BS
WG	FP-03-02-006	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BS,CC
WG	FP-03-04-001	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BS,CC
WG	FP-03-04-002	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BS,CC
WG	FP-03-04-003	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BS,CC
WG	FP-03-01-001	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BS,MD,MS
WG	FP-03-01-002	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	BS,MD,MS
WG	FP-03-01-004	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BS,MD,MS
WG	FP-03-01-003	FD		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	BS,MD,MS
WG	FP-03-02-001	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-02-002	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-02-005	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-04-004	N		SW8270C	-	methapyrilene	10.2	U	U	10.2	UJ	U	2.6	10.2	CC
WG	FP-03-04-005	N		SW8270C	-	methapyrilene	10.2	U	U	10.2	UJ	U	2.6	10.2	CC
WG	FP-03-05-001	N		SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	2.6	10.1	CC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-05-002	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-05-005	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-05-006	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-03-05-007	N		SW8270C	-	methapyrilene	10	U	U	10	UJ	U	2.6	10	CC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	methapyrilene	10.1	U	U	10.1	UJ	U	3.7	10.1	HT
WG	FP-03-03-001	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-03-03-002	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-03-03-003	N		SW8270C	-	methyl methanesulfonate	5.2	U	U	5.2	UJ	U	0.27	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-03-03-007	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-03-04-001	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-03-04-002	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.27	5	BS
WG	FP-03-04-003	N		SW8270C	-	methyl methanesulfonate	5	U	U	5	UJ	U	0.26	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	methyl methanesulfonate	20.2	U	U	20.2	UJ	U	1.9	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	methyl methanesulfonate	20.2	U	U	20.2	UJ	U	1.9	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	methyl methanesulfonate	20.2	U	U	20.2	UJ	U	1.9	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	methyl methanesulfonate	20.2	U	U	20.2	UJ	U	1.9	20.2	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	methyl methanesulfonate	20.2	U	U	20.2	UJ	U	1.9	20.2	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Nitrobenzene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Nitrobenzene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Nitrobenzene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Nitrobenzene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Nitrobenzene	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-04-001	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.65	5	BS
WG	FP-03-04-002	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	BS
WG	FP-03-04-003	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	BS
WG	FP-03-01-001	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-01-002	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-01-004	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-01-006	N		SW8270C	-	nitrosomethylethylamine	5.1	U	U	5.1	UJ	U	0.67	5.1	CC
WG	FP-03-01-007	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-01-008	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-01-009	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-03-05-007	N		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.65	5	CC
WG	FP-03-01-003	FD		SW8270C	-	nitrosomethylethylamine	5	U	U	5	UJ	U	0.66	5	CC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4	U	U	4	UJ	U	3.1	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4	U	U	4	UJ	U	3.1	4	HT
WG	FP-03-05-005	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	UJ	U	1.3	5	CC
WG	FP-03-05-006	N		SW8270C	-	n-nitrosodimethylamine	5	U	U	5	UJ	U	1.3	5	CC
WG	FP-04-07-003	N		SW8270C	-	n-nitrosodimethylamine	4.1	U	U	4.1	UJ	U	2.2	4.1	CCL
WG	FP-04-07-007	N		SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	CCL
WG	FP-04-07-004	FD		SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	CCL
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-03-05-001	N		SW8270C	-	n-nitroso-di-n-butylamine	5	U	U	5	UJ	U	0.63	5	IC
WG	FP-03-05-002	N		SW8270C	-	n-nitroso-di-n-butylamine	5	U	U	5	UJ	U	0.62	5	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4	U	U	4	UJ	U	3.4	4	HT
WG	FP-03-01-003	FD		SW8270C	-	n-Nitrosodiphenylamine	5	U	U	5	UJ	U	0.34	5	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4	U	U	4	UJ	U	3	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4	U	U	4	UJ	U	2.8	4	HT
WG	FP-03-04-002	N		SW8270C	-	n-nitrosopyrrolidine	5	U	U	5	UJ	U	0.8	5	BS
WG	FP-03-04-003	N		SW8270C	-	n-nitrosopyrrolidine	5	U	U	5	UJ	U	0.79	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-03-04-001	N		SW8270C	-	o,o,o-triethyl phosphorothioate	5	U	U	5	UJ	U	0.56	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4	U	U	4	UJ	U	2.9	4	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4	U	U	4	UJ	U	2.9	4	HT
WG	FP-03-04-001	N		SW8270C	-	o-toluidine	5	U	U	5	UJ	U	0.68	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	o-toluidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	o-toluidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	o-toluidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	o-toluidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	o-toluidine	4	U	U	4	UJ	U	2.7	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	pentachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	pentachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	pentachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	pentachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	pentachlorobenzene	4	U	U	4	UJ	U	2.2	4	HT
WG	FP-03-02-007	N		SW8270C	-	pentachloroethane	5.1	U	U	5.1	UJ	U	0.64	5.1	BS
WG	FP-03-03-001	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-03-003	N		SW8270C	-	pentachloroethane	5.2	U	U	5.2	UJ	U	0.64	5.2	BS
WG	FP-03-03-006	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-03-007	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-04-001	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.62	5	BS
WG	FP-03-04-002	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.63	5	BS
WG	FP-03-04-003	N		SW8270C	-	pentachloroethane	5	U	U	5	UJ	U	0.63	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	pentachloroethane	20.2	U	U	20.2	UJ	U	2.5	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	pentachloroethane	20.2	U	U	20.2	UJ	U	2.5	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	pentachloroethane	20.2	U	U	20.2	UJ	U	2.5	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	pentachloroethane	20.2	U	U	20.2	UJ	U	2.5	20.2	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	pentachloroethane	20.2	U	U	20.2	UJ	U	2.5	20.2	HT
WG	FP-03-04-001	N		SW8270C	-	pentachloronitrobenzene	5	U	U	5	UJ	U	0.66	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	HT
WG	FP-03-04-004	N		SW8270C	-	pentachloronitrobenzene	5.1	U	U	5.1	UJ	U	0.68	5.1	IC
WG	FP-03-04-005	N		SW8270C	-	pentachloronitrobenzene	5.1	U	U	5.1	UJ	U	0.68	5.1	IC
WG	FP-03-05-005	N		SW8270C	-	pentachloronitrobenzene	5	U	U	5	UJ	U	0.66	5	IC
WG	FP-03-02-006	N		SW8270C	-	Pentachlorophenol	10	U	U	10	UJ	U	1.3	10	BS
WG	FP-03-03-002	N		SW8270C	-	Pentachlorophenol	10	U	U	10	UJ	U	1.3	10	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Pentachlorophenol	20.2	U	U	20.2	UJ	U	2.6	20.2	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Pentachlorophenol	20.2	U	U	20.2	UJ	U	2.6	20.2	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Pentachlorophenol	20.2	U	U	20.2	UJ	U	2.6	20.2	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Pentachlorophenol	20.2	U	U	20.2	UJ	U	2.6	20.2	HT

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Pentachlorophenol	20.2	U	U	20.2	UJ	U	2.6	20.2	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	phenacetin	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	phenacetin	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	phenacetin	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	phenacetin	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	phenacetin	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-03-02-001	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-02-002	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-02-005	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-02-006	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-02-007	N		SW8270C	-	phenacetin	10.2	U	U	10.2	UJ	U	1.8	10.2	IC
WG	FP-03-03-001	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-03-002	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-03-003	N		SW8270C	-	phenacetin	10.3	U	U	10.3	UJ	U	1.8	10.3	IC
WG	FP-03-03-006	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-03-03-007	N		SW8270C	-	phenacetin	10	U	U	10	UJ	U	1.7	10	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	HT,IC
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	HT,IC
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	HT,IC
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	HT,IC
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	HT,IC
WG	FP-03-05-001	N		SW8270C	-	Phenol	5	U	U	5	UJ	U	0.25	5	IC
WG	FP-03-05-002	N		SW8270C	-	Phenol	5	U	U	5	UJ	U	0.25	5	IC
WG	FP-04-06-007	N		SW8270C	-	Phenol	20.1	U	U	20.1	UJ	U	1.7	20.1	IC
WG	FP-04-007-01	N		SW8270C	-	Phenol	20.2	U	U	20.2	UJ	U	1.7	20.2	IC
WG	FP-04-007-02	N		SW8270C	-	Phenol	20	U	U	20	UJ	U	1.7	20	IC
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	p-phenylenediamine	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	p-phenylenediamine	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	p-phenylenediamine	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	p-phenylenediamine	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	p-phenylenediamine	10.1	U	U	10.1	UJ	U	2.7	10.1	HT
WG	FP-03-03-001	N		SW8270C	-	pronamide	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-03-002	N		SW8270C	-	pronamide	5	U	U	5	UJ	U	1.2	5	BS
WG	FP-03-03-003	N		SW8270C	-	pronamide	5.2	U	U	5.2	UJ	U	1.2	5.2	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	pronamide	4	U	U	4	UJ	U	1.8	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	pronamide	4	U	U	4	UJ	U	1.8	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	pronamide	4	U	U	4	UJ	U	1.8	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	pronamide	4	U	U	4	UJ	U	1.8	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	pronamide	4	U	U	4	UJ	U	1.8	4	HT
WG	FP-03-04-001	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.88	5	BD
WG	FP-03-01-006	N		SW8270C	-	pyridine	5.1	U	U	5.1	UJ	U	0.9	5.1	BD,BS
WG	FP-03-01-007	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.89	5	BD,BS
WG	FP-03-01-008	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.89	5	BD,BS
WG	FP-03-02-007	N		SW8270C	-	pyridine	5.1	U	U	5.1	UJ	U	0.9	5.1	BD,BS
WG	FP-03-01-009	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.89	5	BS
WG	FP-03-03-001	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.88	5	BS
WG	FP-03-03-002	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.88	5	BS
WG	FP-03-03-003	N		SW8270C	-	pyridine	5.2	U	U	5.2	UJ	U	0.91	5.2	BS

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Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-03-006	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.88	5	BS
WG	FP-03-03-007	N		SW8270C	-	pyridine	5	U	U	5	UJ	U	0.88	5	BS
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	HT
WG	FP-04-06-001RE1	LR	RE	SW8270C	-	safrole	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-002RE1	LR	RE	SW8270C	-	safrole	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-003RE1	LR	RE	SW8270C	-	safrole	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-004RE1	LR	RE	SW8270C	-	safrole	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-04-06-005RE1	LR	RE	SW8270C	-	safrole	10.1	U	U	10.1	UJ	U	2.5	10.1	HT
WG	FP-03-02-002	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	BS
WG	FP-03-02-005	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	BS
WG	FP-03-02-007	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	BS
WG	FP-03-03-007	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	BS
WG	FP-03-02-001	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	BS,MS
WG	FP-03-03-001	N		SW8260B	-	2-chloro-1,3-butadiene	1	U	U	1	UJ	U	0.25	1	IC
WG	FP-03-03-002	N		SW8260B	-	2-chloro-1,3-butadiene	1	U	U	1	UJ	U	0.25	1	IC
WG	FP-03-03-003	N		SW8260B	-	2-chloro-1,3-butadiene	1	U	U	1	UJ	U	0.25	1	IC
WG	FP-03-03-006	N		SW8260B	-	2-chloro-1,3-butadiene	1	U	U	1	UJ	U	0.25	1	IC
WG	FP-03-03-007	N		SW8260B	-	2-chloro-1,3-butadiene	1	U	U	1	UJ	U	0.25	1	IC
WG	FP-04-06-006	N		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	0.64	5	IC
WG	FP-04-007-01	N		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	0.64	5	IC
WG	FP-04-007-02	N		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	0.64	5	IC
WG	FP-04-07-003	N		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	0.64	5	IC
WG	FP-04-07-004	FD		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	0.64	5	IC
WG	FP-03-01-006	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	CC
WG	FP-03-01-001	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	CC,IC
WG	FP-03-01-002	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	CC,IC
WG	FP-03-01-004	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	CC,IC
WG	FP-03-01-003	FD		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	CC,IC
WG	FP-03-01-009	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-06-006	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-007-01	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-007-02	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-07-003	N		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-04-07-004	FD		SW8260B	-	Acetone	10	U	U	10	UJ	U	1.9	10	IC
WG	FP-03-01-001	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-03-01-002	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-03-01-004	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-03-01-006	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-03-01-007	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-03-01-008	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-04-06-007	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	CC,IC
WG	FP-03-01-003	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1	10	CC,IC
WG	FP-04-07-007	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	CCL,IC
WG	FP-03-03-001	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-03-002	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-03-003	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-03-006	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-03-007	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-04-004	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-04-005	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-04-06-006	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-04-007-01	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-04-007-02	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-04-07-003	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-04-07-004	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.8	10	IC
WG	FP-03-03-001	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-03-03-002	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-03-03-003	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-03-03-006	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-03-03-007	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-06-006	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-007-01	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-007-02	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-07-003	N		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-07-004	FD		SW8260B	-	allyl chloride (3-chloropropene)	1	U	U	1	UJ	U	0.39	1	IC
WG	FP-04-06-001	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-04-06-003	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-04-06-004	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-04-06-005	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-04-06-007	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-04-06-002	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	0.41	1	CCL
WG	FP-03-01-006	N		SW8260B	-	Chloroethane	1	U	U	1	UJ	U	0.35	1	BS
WG	FP-03-01-007	N		SW8260B	-	Chloroethane	1	U	U	1	UJ	U	0.35	1	BS
WG	FP-03-01-008	N		SW8260B	-	Chloroethane	1	U	U	1	UJ	U	0.35	1	BS
WG	FP-03-03-007	N		SW8260B	-	Chloromethane	1	U	U	1	UJ	U	0.49	1	IC
WG	FP-04-07-007	N		SW8260B	-	Chloromethane	1	U	U	1	UJ	U	0.49	1	IC
WG	FP-03-03-001	N		SW8260B	-	cis-1,2-Dichloroethene	1	U	U	1	UJ	U	0.32	1	IC
WG	FP-03-03-003	N		SW8260B	-	cis-1,2-Dichloroethene	1	U	U	1	UJ	U	0.32	1	IC
WG	FP-03-03-006	N		SW8260B	-	cis-1,3-Dichloropropene	1	U	U	1	UJ	U	0.2	1	IC
WG	FP-03-03-007	N		SW8260B	-	cis-1,3-Dichloropropene	1	U	U	1	UJ	U	0.2	1	IC
WG	FP-03-03-006	N		SW8260B	-	Dibromochloromethane	1	U	U	1	UJ	U	0.16	1	IC
WG	FP-03-03-007	N		SW8260B	-	Dibromochloromethane	1	U	U	1	UJ	U	0.16	1	IC
WG	FP-03-05-001	N		SW8260B	-	Dichlorodifluoromethane	1	U	U	1	UJ	U	0.44	1	CC
WG	FP-03-05-002	N		SW8260B	-	Dichlorodifluoromethane	1	U	U	1	UJ	U	0.44	1	CC
WG	FP-03-05-006	N		SW8260B	-	Dichlorodifluoromethane	1	U	U	1	UJ	U	0.44	1	CC
WG	FP-03-05-007	N		SW8260B	-	Dichlorodifluoromethane	1	U	U	1	UJ	U	0.44	1	CC
WG	FP-03-01-001	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.17	1	IC
WG	FP-03-01-002	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.17	1	IC
WG	FP-03-01-004	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.17	1	IC
WG	FP-03-01-009	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.17	1	IC
WG	FP-04-06-001	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC
WG	FP-04-06-003	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-04-06-004	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC
WG	FP-04-06-005	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC
WG	FP-04-06-007	N		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC
WG	FP-03-01-003	FD		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.17	1	IC
WG	FP-04-06-002	FD		SW8260B	-	trans-1,3-Dichloropropene	1	U	U	1	UJ	U	0.24	1	IC
WG	FP-03-03-007	N		SW8260B	-	trans-1,4-dichloro-2-butene	3.6	U	U	3.6	UJ	U	1.8	3.6	BD,BS,CC
WG	FP-03-02-002	N		SW8260B	-	trans-1,4-dichloro-2-butene	3.6	U	U	3.6	UJ	U	1.8	3.6	BS,CC
WG	FP-03-02-005	N		SW8260B	-	trans-1,4-dichloro-2-butene	3.6	U	U	3.6	UJ	U	1.8	3.6	BS,CC
WG	FP-03-02-001	N		SW8260B	-	trans-1,4-dichloro-2-butene	3.6	U	U	3.6	UJ	U	1.8	3.6	BS,CC,MS
WG	FP-03-04-004	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.52	U	U	0.52	UJ	U	0.072	0.52	SS
WG	FP-03-04-005	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.52	U	U	0.52	UJ	U	0.072	0.52	SS
WG	FP-03-05-007	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.071	0.5	SS
WG	FP-03-04-004	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.52	U	U	0.52	UJ	U	0.093	0.52	SS
WG	FP-03-04-005	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.52	U	U	0.52	UJ	U	0.093	0.52	SS
WG	FP-03-05-007	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.091	0.5	SS
WG	FP-03-01-006	N		SW8151	-	dalapon	0.53	U	U	0.53	UJ	U	0.053	0.53	BD
WG	FP-03-01-007	N		SW8151	-	dalapon	0.53	U	U	0.53	UJ	U	0.053	0.53	BD
WG	FP-03-01-008	N		SW8151	-	dalapon	0.53	U	U	0.53	UJ	U	0.053	0.53	BD
WG	FP-03-03-007	N		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	BD,CC,IC
WG	FP-03-04-002	N		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	BS
WG	FP-03-04-003	N		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	BS
WG	FP-03-04-001	N		SW8151	-	dalapon	0.51	U	U	0.51	UJ	U	0.051	0.51	BS,CC
WG	FP-03-05-001	N		SW8151	-	dalapon	0.51	U	U	0.51	UJ	U	0.051	0.51	CC,IC
WG	FP-03-05-002	N		SW8151	-	dalapon	0.52	U	U	0.52	UJ	U	0.052	0.52	CC,IC
WG	FP-03-05-006	N		SW8151	-	dalapon	0.51	U	U	0.51	UJ	U	0.051	0.51	CC,IC
WG	FP-03-05-007	N		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	CC,IC,SS
WG	FP-03-04-004	N		SW8151	-	dalapon	0.52	U	U	0.52	UJ	U	0.052	0.52	CC,SS
WG	FP-03-04-005	N		SW8151	-	dalapon	0.52	U	U	0.52	UJ	U	0.052	0.52	CC,SS
WG	FP-03-03-006	N		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	IC
WG	FP-03-05-005	N		SW8151	-	dalapon	0.52	U	U	0.52	UJ	U	0.052	0.52	IC
WG	FP-04-07-004	FD		SW8151	-	dalapon	0.5	U	U	0.5	UJ	U	0.05	0.5	MD,MSL
WG	FP-03-02-001	N		SW8151	-	dalapon	0.56	U	U	0.56	UJ	U	0.056	0.56	MS
WG	FP-03-05-001	N		SW8151	-	dicamba	0.51	U	U	0.51	UJ	U	0.071	0.51	CC
WG	FP-03-05-002	N		SW8151	-	dicamba	0.52	U	U	0.52	UJ	U	0.072	0.52	CC
WG	FP-03-05-006	N		SW8151	-	dicamba	0.51	U	U	0.51	UJ	U	0.071	0.51	CC
WG	FP-04-07-004	FD		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.034	0.5	MD,MSL
WG	FP-03-04-004	N		SW8151	-	dicamba	0.52	U	U	0.52	UJ	U	0.072	0.52	SS
WG	FP-03-04-005	N		SW8151	-	dicamba	0.52	U	U	0.52	UJ	U	0.072	0.52	SS
WG	FP-03-05-007	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.071	0.5	SS
WG	FP-03-04-004	N		SW8151	-	dichloroprop	0.52	U	U	0.52	UJ	U	0.11	0.52	SS
WG	FP-03-04-005	N		SW8151	-	dichloroprop	0.52	U	U	0.52	UJ	U	0.11	0.52	SS
WG	FP-03-05-007	N		SW8151	-	dichloroprop	0.5	U	U	0.5	UJ	U	0.11	0.5	SS
WG	FP-03-04-002	N		SW8151	-	dinoseb	0.5	U	U	0.5	UJ	U	0.061	0.5	BD,BS,CC
WG	FP-03-04-003	N		SW8151	-	dinoseb	0.5	U	U	0.5	UJ	U	0.061	0.5	BD,BS,CC
WG	FP-03-01-006	N		SW8151	-	dinoseb	0.53	U	U	0.53	UJ	U	0.064	0.53	BS
WG	FP-03-01-007	N		SW8151	-	dinoseb	0.53	U	U	0.53	UJ	U	0.064	0.53	BS
WG	FP-03-01-008	N		SW8151	-	dinoseb	0.53	U	U	0.53	UJ	U	0.063	0.53	BS
WG	FP-03-02-001	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-02-002	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS
WG	FP-03-02-005	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS
WG	FP-03-03-001	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS
WG	FP-03-03-002	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS
WG	FP-03-03-003	N		SW8151	-	dinoseb	0.56	U	U	0.56	UJ	U	0.067	0.56	BS
WG	FP-03-03-006	N		SW8151	-	dinoseb	0.5	U	U	0.5	UJ	U	0.06	0.5	BS
WG	FP-03-04-004	N		SW8151	-	dinoseb	0.52	U	U	0.52	UJ	U	0.062	0.52	SS
WG	FP-03-04-005	N		SW8151	-	dinoseb	0.52	U	U	0.52	UJ	U	0.062	0.52	SS
WG	FP-03-05-007	N		SW8151	-	dinoseb	0.5	U	U	0.5	UJ	U	0.061	0.5	SS
WG	FP-03-01-006	N		SW8151	-	Picloram	11	U	U	11	UJ	U	0.096	11	BS
WG	FP-03-01-007	N		SW8151	-	Picloram	11	U	U	11	UJ	U	0.096	11	BS
WG	FP-03-01-008	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.095	10	BS
WG	FP-03-04-001	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.092	10	BS
WG	FP-03-04-002	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.091	10	BS
WG	FP-03-04-003	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.091	10	BS
WG	FP-03-01-001	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.093	10	BS,MS
WG	FP-03-01-002	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.091	10	BS,MS
WG	FP-03-01-004	N		SW8151	-	Picloram	28	U	U	28	UJ	U	0.25	28	BS,MS
WG	FP-03-01-003	FD		SW8151	-	Picloram	10	U	U	10	UJ	U	0.091	10	BS,MS
WG	FP-03-05-001	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.092	10	CC
WG	FP-03-05-002	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.093	10	CC
WG	FP-03-05-006	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.092	10	CC
WG	FP-03-05-007	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.091	10	CC
WG	FP-04-07-004	FD		SW8151	-	Picloram	10	U	U	10	UJ	U	0.074	10	MD,MSL
WG	FP-03-04-004	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.093	10	SS
WG	FP-03-04-005	N		SW8151	-	Picloram	10	U	U	10	UJ	U	0.093	10	SS
WG	FP-04-07-004	FD		SW8151	-	silvex (2,4,5-tp)	0.5	U	U	0.5	UJ	U	0.038	0.5	MD,MSL
WG	FP-03-04-004	N		SW8151	-	silvex (2,4,5-tp)	0.52	U	U	0.52	UJ	U	0.062	0.52	SS
WG	FP-03-04-005	N		SW8151	-	silvex (2,4,5-tp)	0.52	U	U	0.52	UJ	U	0.062	0.52	SS
WG	FP-03-05-007	N		SW8151	-	silvex (2,4,5-tp)	0.5	U	U	0.5	UJ	U	0.061	0.5	SS
WG	FP-03-02-007	N		SW8141	-	bolstar	10	U	U	10	UJ	U	0.92	10	CC
WG	FP-04-06-006	N		SW8141	-	chlorpyrifos	10	U	U	10	UJ	U	0.95	10	2SL
WG	FP-04-06-007	N		SW8141	-	chlorpyrifos	10	U	U	10	UJ	U	0.95	10	CCL
WG	FP-03-03-003	N		SW8141	-	dimethoate	10	U	U	10	UJ	U	0.58	10	MD,MS
WG	FP-03-02-007	N		SW8141	-	disulfoton	10	U	U	10	UJ	U	0.6	10	CC
WG	FP-03-04-001	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	CC
WG	FP-03-04-002	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	CC
WG	FP-03-04-003	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	CC
WG	FP-03-04-004	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	CC
WG	FP-03-04-005	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	CC
WG	FP-03-03-003	N		SW8141	-	ethoprop	10	U	U	10	UJ	U	1.1	10	MD,MS
WG	FP-03-03-003	N		SW8141	-	fenthion	10	U	U	10	UJ	U	0.54	10	MD,MS
WG	FP-03-02-001	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-02-002	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-02-005	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-02-007	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-04-001	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-04-002	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-04-003	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-04-004	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-04-005	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-05-001	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-05-002	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-05-005	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-05-006	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-05-007	N		SW8141	-	merphos	10	U	U	10	UJ	U	1.2	10	CC
WG	FP-03-01-006	N		SW8141	-	mevinphos	10	U	U	10	UJ	U	1.4	10	BD
WG	FP-03-01-007	N		SW8141	-	mevinphos	10	U	U	10	UJ	U	1.4	10	BD
WG	FP-03-01-008	N		SW8141	-	mevinphos	10	U	U	10	UJ	U	1.4	10	BD
WG	FP-03-01-009	N		SW8141	-	mevinphos	10	U	U	10	UJ	U	1.4	10	BD
WG	FP-04-06-006	N		SW8141	-	naled	10	U	U	10	UJ	U	0.9	10	2SL
WG	FP-03-02-001	N		SW8141	-	naled	10	U	U	10	UJ	U	0.9	10	CC
WG	FP-03-02-002	N		SW8141	-	naled	10	U	U	10	UJ	U	0.91	10	CC
WG	FP-03-02-005	N		SW8141	-	naled	10	U	U	10	UJ	U	0.91	10	CC
WG	FP-03-02-007	N		SW8141	-	naled	10	U	U	10	UJ	U	0.9	10	CC
WG	FP-04-06-007	N		SW8141	-	naled	10	U	U	10	UJ	U	0.9	10	CCL
WG	FP-04-07-007	N		SW8141	-	naled	10	U	U	10	UJ	U	0.9	10	CCL
WG	FP-03-01-004	N		SW8141	-	naled	28	U	U	28	UJ	U	2.5	28	MD
WG	FP-03-01-006	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.98	10	BD,BS
WG	FP-03-01-007	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.95	10	BD,BS
WG	FP-03-01-008	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.97	10	BD,BS
WG	FP-03-01-009	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.96	10	BD,BS
WG	FP-03-01-001	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.97	10	BS,MS
WG	FP-03-01-002	N		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.96	10	BS,MS
WG	FP-03-01-004	N		SW8141	-	parathion, ethyl	28	U	U	28	UJ	U	2.6	28	BS,MS
WG	FP-03-01-003	FD		SW8141	-	parathion, ethyl	10	U	U	10	UJ	U	0.96	10	BS,MS
WG	FP-03-03-003	N		SW8141	-	parathion, methyl	10	U	U	10	UJ	U	0.62	10	MD,MS
WG	FP-03-01-006	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.55	10	BS
WG	FP-03-01-007	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BS
WG	FP-03-01-008	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS
WG	FP-03-01-009	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS
WG	FP-03-02-007	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BS
WG	FP-03-01-001	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS,MS
WG	FP-03-01-002	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS,MS
WG	FP-03-01-004	N		SW8141	-	phorate	28	U	U	28	UJ	U	1.5	28	BS,MS
WG	FP-03-02-005	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS,MS
WG	FP-03-01-003	FD		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BS,MS
WG	FP-04-007-01	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	BSL
WG	FP-04-007-02	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BSL
WG	FP-04-07-007	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BSL
WG	FP-04-07-003	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BSL,MSL
WG	FP-04-07-004	FD		SW8141	-	phorate	10	U	U	10	UJ	U	0.53	10	BSL,MSL
WG	FP-03-03-003	N		SW8141	-	phorate	10	U	U	10	UJ	U	0.54	10	MD,MS
WG	FP-03-02-001	N		SW8141	-	ronnel	10	U	U	10	UJ	U	1.5	10	BS,MS
WG	FP-03-02-002	N		SW8141	-	ronnel	10	U	U	10	UJ	U	1.5	10	BS,MS
WG	FP-03-03-001	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.57	10	CC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-03-002	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.58	10	CC
WG	FP-03-03-003	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.58	10	CC
WG	FP-03-03-006	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.57	10	CC
WG	FP-03-03-007	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.57	10	CC
WG	FP-04-07-007	N		SW8141	-	simazine	10	U	U	10	UJ	U	0.57	10	CCL
WG	FP-03-02-007	N		SW8141	-	tokuthion (prothiofos)	10	U	U	10	UJ	U	0.58	10	CC
WG	FP-03-03-003	N		SW8141	-	tokuthion (prothiofos)	10	U	U	10	UJ	U	0.59	10	MD,MS
WG	FP-03-02-007	N		SW8141	-	trichloronate	10	U	U	10	UJ	U	0.52	10	CC
WG	FP-03-02-001	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-02-002	N		SW8082	-	Aroclor-1016	0.52	U	U	0.52	UJ	U	0.021	0.52	CC
WG	FP-03-02-005	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-02-006	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-03-001	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-03-002	N		SW8082	-	Aroclor-1016	0.52	U	U	0.52	UJ	U	0.021	0.52	CC
WG	FP-03-03-003	N		SW8082	-	Aroclor-1016	0.53	U	U	0.53	UJ	U	0.021	0.53	CC
WG	FP-03-03-006	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-03-007	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-04-06-001	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-04-06-003	N		SW8082	-	Aroclor-1016	0.52	U	U	0.52	UJ	U	0.38	0.52	CCL
WG	FP-04-06-005	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-04-06-007	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-04-07-003	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-04-06-002	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-04-07-004	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	CCL
WG	FP-03-05-001	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-05-002	N		SW8082	-	Aroclor-1260	0.52	U	U	0.52	UJ	U	0.021	0.52	CC
WG	FP-03-05-006	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	CC
WG	FP-03-05-007	N		SW8082	-	Aroclor-1260	0.51	U	U	0.51	UJ	U	0.02	0.51	CC
WG	FP-03-03-001	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	CC,IC
WG	FP-03-03-002	N		SW8082	-	Aroclor-1260	0.52	U	U	0.52	UJ	U	0.021	0.52	CC,IC
WG	FP-03-03-003	N		SW8082	-	Aroclor-1260	0.53	U	U	0.53	UJ	U	0.021	0.53	CC,IC
WG	FP-03-03-006	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	CC,IC
WG	FP-03-03-007	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	CC,IC
WG	FP-04-06-001	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-04-06-003	N		SW8082	-	Aroclor-1260	0.52	U	U	0.52	UJ	U	0.26	0.52	CCL
WG	FP-04-06-005	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-04-06-007	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-04-07-003	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-04-07-007	N		SW8082	-	Aroclor-1260	0.51	U	U	0.51	UJ	U	0.25	0.51	CCL
WG	FP-04-06-002	FD		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-04-07-004	FD		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.25	0.5	CCL
WG	FP-03-02-001	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-02-002	N		SW8082	-	Aroclor-1260	0.52	U	U	0.52	UJ	U	0.021	0.52	IC
WG	FP-03-02-005	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-02-006	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-02-007	N		SW8082	-	Aroclor-1260	0.51	U	U	0.51	UJ	U	0.02	0.51	IC
WG	FP-03-04-001	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-04-002	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC

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Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-04-003	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-04-004	N		SW8082	-	Aroclor-1260	0.52	U	U	0.52	UJ	U	0.021	0.52	IC
WG	FP-03-04-005	N		SW8082	-	Aroclor-1260	0.5	U	U	0.5	UJ	U	0.02	0.5	IC
WG	FP-03-05-005	N		SW8081	-	Aldrin	0.05	U	U	0.05	UJ	U	0.02	0.05	IC
WG	FP-03-03-001	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-03-002	N		SW8081	-	alpha bhc	0.052	U	U	0.052	UJ	U	0.012	0.052	IC
WG	FP-03-03-003	N		SW8081	-	alpha bhc	0.053	U	U	0.053	UJ	U	0.013	0.053	IC
WG	FP-03-03-006	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-03-007	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-05-001	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-05-002	N		SW8081	-	alpha bhc	0.052	U	U	0.052	UJ	U	0.012	0.052	IC
WG	FP-03-05-006	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-05-007	N		SW8081	-	alpha bhc	0.051	U	U	0.051	UJ	U	0.012	0.051	IC
WG	FP-04-06-007	N		SW8081	-	alpha bhc	0.05	U	U	0.05	UJ	U	0.012	0.05	IC
WG	FP-03-01-001	N		SW8081	-	delta bhc	0.063	U	U	0.063	UJ	U	0.061	0.063	IC
WG	FP-03-01-002	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-01-004	N		SW8081	-	delta bhc	0.13	U	U	0.13	UJ	U	0.13	0.13	IC
WG	FP-03-01-006	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-01-007	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-01-008	N		SW8081	-	delta bhc	0.064	U	U	0.064	UJ	U	0.062	0.064	IC
WG	FP-03-03-001	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-03-002	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-03-003	N		SW8081	-	delta bhc	0.063	U	U	0.063	UJ	U	0.061	0.063	IC
WG	FP-03-03-006	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.058	0.061	IC
WG	FP-03-03-007	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.058	0.061	IC
WG	FP-03-04-001	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-04-002	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-04-003	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-04-004	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-04-005	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.058	0.061	IC
WG	FP-03-05-001	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.058	0.061	IC
WG	FP-03-05-002	N		SW8081	-	delta bhc	0.062	U	U	0.062	UJ	U	0.06	0.062	IC
WG	FP-03-05-005	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-05-006	N		SW8081	-	delta bhc	0.06	U	U	0.06	UJ	U	0.058	0.06	IC
WG	FP-03-05-007	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.059	0.061	IC
WG	FP-04-06-007	N		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.058	0.061	IC
WG	FP-03-01-003	FD		SW8081	-	delta bhc	0.061	U	U	0.061	UJ	U	0.059	0.061	IC
WG	FP-04-07-003	N		SW8081	-	endosulfan sulfate	0.05	U	U	0.05	UJ	U	0.022	0.05	CCL
WG	FP-04-07-004	FD		SW8081	-	endosulfan sulfate	0.05	U	U	0.05	UJ	U	0.022	0.05	CCL
WG	FP-04-06-006	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	2SL
WG	FP-04-007-01	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	2SL
WG	FP-04-007-02	N		SW8081	-	endrin aldehyde	0.06	U	U	0.06	UJ	U	0.051	0.06	2SL
WG	FP-03-02-001	N		SW8081	-	endrin aldehyde	0.06	U	U	0.06	UJ	U	0.051	0.06	CC
WG	FP-03-02-002	N		SW8081	-	endrin aldehyde	0.062	U	U	0.062	UJ	U	0.052	0.062	CC
WG	FP-03-02-005	N		SW8081	-	endrin aldehyde	0.06	U	U	0.06	UJ	U	0.051	0.06	CC
WG	FP-03-05-001	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	CC
WG	FP-03-05-002	N		SW8081	-	endrin aldehyde	0.062	U	U	0.062	UJ	U	0.052	0.062	CC
WG	FP-03-05-006	N		SW8081	-	endrin aldehyde	0.06	U	U	0.06	UJ	U	0.051	0.06	CC

Appendix C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Validation Notes
WG	FP-03-05-007	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	CC
WG	FP-04-07-003	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	CCL
WG	FP-04-07-007	N		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	CCL
WG	FP-04-07-004	FD		SW8081	-	endrin aldehyde	0.061	U	U	0.061	UJ	U	0.052	0.061	CCL
WG	FP-03-05-001	N		SW8081	-	gamma bhc (lindane)	0.05	U	U	0.05	UJ	U	0.019	0.05	CC
WG	FP-03-05-002	N		SW8081	-	gamma bhc (lindane)	0.052	U	U	0.052	UJ	U	0.02	0.052	CC
WG	FP-03-05-006	N		SW8081	-	gamma bhc (lindane)	0.05	U	U	0.05	UJ	U	0.019	0.05	CC
WG	FP-03-05-007	N		SW8081	-	gamma bhc (lindane)	0.051	U	U	0.051	UJ	U	0.019	0.051	CC
WG	FP-03-02-001	N		SW8081	-	gamma-chlordane	0.05	U	U	0.05	UJ	U	0.025	0.05	CC
WG	FP-03-02-002	N		SW8081	-	gamma-chlordane	0.052	U	U	0.052	UJ	U	0.026	0.052	CC
WG	FP-03-02-005	N		SW8081	-	gamma-chlordane	0.05	U	U	0.05	UJ	U	0.025	0.05	CC
WG	FP-03-02-001	N		SW8081	-	p,p'-DDT	0.05	U	U	0.05	UJ	U	0.044	0.05	CC
WG	FP-03-02-002	N		SW8081	-	p,p'-DDT	0.052	U	U	0.052	UJ	U	0.045	0.052	CC
WG	FP-03-02-005	N		SW8081	-	p,p'-DDT	0.05	U	U	0.05	UJ	U	0.044	0.05	CC
WG	FP-03-01-001	N		SW8081	-	toxaphene	3.2	U	U	3.2	UJ	U	0.33	3.2	BS
WG	FP-03-01-002	N		SW8081	-	toxaphene	3.1	U	U	3.1	UJ	U	0.32	3.1	BS
WG	FP-03-01-004	N		SW8081	-	toxaphene	6.7	U	U	6.7	UJ	U	0.69	6.7	BS
WG	FP-03-01-003	FD		SW8081	-	toxaphene	3.1	U	U	3.1	UJ	U	0.32	3.1	BS
WG	FP-03-01-009	N		SW8081	-	toxaphene	3.1	U	U	3.1	UJ	U	0.32	3.1	CC
WG	FP-03-03-006	N		SW8081	-	toxaphene	3	U	U	3	UJ	U	0.31	3	CC
WG	FP-03-03-007	N		SW8081	-	toxaphene	3	U	U	3	UJ	U	0.31	3	IC
WG	FP-03-05-001	N		SW8081	-	toxaphene	3	U	U	3	UJ	U	0.31	3	IC
WG	FP-03-05-002	N		SW8081	-	toxaphene	3.1	U	U	3.1	UJ	U	0.32	3.1	IC
WG	FP-03-05-006	N		SW8081	-	toxaphene	3	U	U	3	UJ	U	0.31	3	IC
WG	FP-03-05-007	N		SW8081	-	toxaphene	3.1	U	U	3.1	UJ	U	0.32	3.1	IC
WG	FP-04-007-01	N		SW6010B	-	Zinc	1.71	B	J	1.71	UJ	U	0.409	10	SD
WG	FP-04-07-004	FD		SW6010B	-	Zinc	0.409	U	U	0.409	UJ	U	0.409	10	SD
WG	FP-04-07-003	N		FLPRO	-	petroleum hydrocarbons	0.11	J	J	0.34	UJ	U	0.097	0.34	BL,SSL
WG	FP-03-01-004	N		FLPRO	-	petroleum hydrocarbons	1.1	U	U	1.1	UJ	U	0.91	1.1	MD
WG	FP-04-06-007	N		FLPRO	-	petroleum hydrocarbons	0.34	U	U	0.34	UJ	U	0.097	0.34	SSL
WG	FP-04-07-003	N		E415.1	FLDFLT	dissolved organic carbon	0.368	U	U	0.368	UJ	U	0.368	1.5	IC
WG	FP-04-07-007	N		E415.1	-	Total organic carbon	0.368	U	U	0.368	UJ	U	0.368	1	IC
WG	FP-03-03-007	N		E405.1	-	biologic oxygen demand, five day	2	U	U	2	UJ	U	2	2	HT
WG	FP-03-02-007	N		E405.1	-	biologic oxygen demand, five day	2	U	U	2	UJ	U	2	2	HT

NOTES: WQ = Water Quality Control Sample, LB = Laboratory Method Blank, FLDFLT = Field Filtered. mg/L = milligrams per liter.

APPENDIX D

Frequency of Detection in Blank Samples

Matrix	Parameter Class	Sample Type	Analytical Method	Prep Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Units
WQ	Genchem	EB	E150.1	METHOD	-	pH	1	1	6.1	6.1	0.10	0.10	0.10	0.10	pH units
WQ	Genchem	LB	E160.1	METHOD	-	total dissolved solids	20	9	1.0	17.0	1.0	10.0	20.0	20.0	mg/L
WQ	Genchem	EB	E160.1	METHOD	-	total dissolved solids	1	1	15.0	15.0	10.0	10.0	20.0	20.0	mg/L
WQ	Genchem	EB	E310.1	METHOD	-	Alkalinity, bicarbonate (as CaCO3)	1	1	3.0	3.0	1.0	1.0	10.0	10.0	mg/L
WQ	Genchem	LB	E310.1	METHOD	-	Alkalinity, bicarbonate (as CaCO3)	32	17	0.50	3.0	0.50	2.0	10.0	10.0	mg/L
WQ	Genchem	EB	E351.2	METHOD	-	nitrogen, kjeldahl, total	1	1	0.17	0.17	0.13	0.13	0.26	0.26	mg/L
WQ	Genchem	LB	E351.2	METHOD	-	nitrogen, kjeldahl, total	9	3	0.19	0.23	0.13	0.13	0.26	0.26	mg/L
WQ	Genchem	LB	E351.4	METHOD	-	nitrogen, kjeldahl, total	1	1	1.5	1.5	0.45	0.45	2.0	2.0	mg/L
WQ	Genchem	LB	E353.2	METHOD	-	Nitrogen, nitrate-nitrite	18	1	0.024	0.024	0.020	0.050	0.10	0.10	mg/L
WQ	Genchem	EB	E353.2M	METHOD	-	Total Nitrogen, Calculated	1	1	0.17	0.17	0.10	0.10	0.10	0.10	mg/L
WQ	Genchem	LB	E354.1	METHOD	-	nitrogen, nitrite	18	3	0.012	0.020	0.012	0.050	0.18	0.18	mg/L
WQ	Genchem	LB	E405.1	METHOD	-	biologic oxygen demand, five day	12	5	2.0	2.0	2.0	2.0	2.0	2.0	mg/L
WQ	Diss Gen	LB	E415.1	METHOD	FLDFLT	dissolved organic carbon	10	2	0.66	0.68	0.37	0.67	1.5	1.5	mg/L
WQ	Genchem	EB	E415.1	METHOD	-	dissolved organic carbon	1	1	1.4	1.4	0.67	0.67	1.5	1.5	mg/L
WQ	Genchem	LB	E415.1	METHOD	-	Total organic carbon	15	1	0.68	0.68	0.37	0.67	1.0	1.3	mg/L
WQ	Genchem	EB	E415.1	METHOD	-	Total organic carbon	1	1	1.8	1.8	0.67	0.67	1.3	1.3	mg/L
WQ	Genchem	EB	E900	METHOD	-	beta, gross	1	1	1.7	1.7	1.7	1.7	1.7	1.7	pCi/l
WQ	TPH	LB	FLPRO	METHOD	-	petroleum hydrocarbons	12	1	0.16	0.16	0.097	0.29	0.34	0.34	mg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Aluminum	1	1	39.9	39.9	35.0	35.0	100	100	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Beryllium	1	1	0.29	0.29	0.095	0.095	1.0	1.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Calcium	14	5	32.6	96.4	32.5	32.5	100	100	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Calcium	1	1	96.4	96.4	32.5	32.5	100	100	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Chromium, total	1	1	0.99	0.99	0.57	0.57	2.0	2.0	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Cobalt	1	1	0.67	0.67	0.57	0.57	5.0	5.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Copper	14	1	2.2	2.2	1.2	1.2	5.0	5.0	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Iron	1	1	40.1	40.1	16.7	16.7	50.0	50.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Iron	14	4	26.9	40.2	16.7	16.7	50.0	50.0	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Lead	1	1	2.3	2.3	1.8	1.8	5.0	5.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Magnesium	14	8	5.9	28.9	5.2	7.6	100	100	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Magnesium	1	1	80.0	80.0	7.6	7.6	100	100	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Manganese	1	1	0.45	0.45	0.17	0.17	2.0	2.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Manganese	14	4	0.20	0.50	0.17	0.17	2.0	2.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Potassium	14	8	12.7	56.0	11.5	11.5	500	500	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Potassium	1	1	108	108	11.5	11.5	500	500	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Selenium	1	1	2.4	2.4	2.1	2.1	5.0	5.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Selenium	14	3	2.1	3.3	2.1	2.1	5.0	5.0	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Silver	1	1	0.76	0.76	0.33	0.33	2.0	2.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Silver	14	2	0.35	0.49	0.33	0.47	2.0	2.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Sodium	14	8	24.3	54.6	22.7	22.7	300	300	µg/L
WQ	Metals	EB	SW6010B	SW3010A	-	Sodium	1	1	57.2	57.2	22.7	22.7	300	300	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Thallium	14	1	3.1	3.1	2.5	2.5	6.0	6.0	µg/L
WQ	Metals	LB	SW6010B	SW3010A	-	Zinc	14	7	0.47	1.4	0.41	0.41	10.0	10.0	µg/L
WQ	Metals	LB	SW7470A	METHOD	-	Mercury	10	1	0.050	0.050	0.016	0.016	0.20	0.20	µg/L
WQ	HERB	LB	SW8151	SW3510	-	Picloram	13	1	0.64	0.64	0.074	0.10	10.0	11.0	µg/L
WQ	VOC	TB	SW8260B	SW5030	-	Acetone	42	1	6.6	6.6	1.9	1.9	10.0	10.0	µg/L
WQ	VOC	EB	SW8260B	SW5030	-	Chloroform	1	1	1.2	1.2	0.13	0.13	1.0	1.0	µg/L
WQ	VOC	TB	SW8260B	SW5030	-	Chloroform	42	1	0.96	0.96	0.13	0.15	1.0	1.0	µg/L
WQ	SVOC	EB	SW8270C	SW3510	-	Acetophenone	1	1	1.5	1.5	0.87	0.87	5.2	5.2	µg/L

NOTES: WQ = Water Quality Control Sample, LB = Laboratory Method Blank, EB = Equipment Blank, TB = Trip Blank, FLDFLT = field filtered; VOC = volatiles, SVOC = semivolatiles
ug/L = micrograms per liter; mg/L = milligrams per liter, pCi/L = picocuries per liter, NTU = nephelometric turbidity units, FLDFLT = field filtered, pH = hydrogen ion

APPENDIX E

Field Duplicate Precision

Matrix	Analytical Method	Dissolved ?	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Final Conc Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	SW6010B	-	FP-04-06-001	Zinc	0.68	J	J	0.409	10	2.99	J	J	0.409	10	ug/L	125.9
WG	E350.3	-	FP-03-01-002	Nitrogen, ammonia (as N)	1.04	=	=	0.21	0.4	0.431	=	=	0.21	0.4	mg/L	**82.8**
WG	SW6010B	-	FP-03-01-002	Magnesium	1030	=	=	7.62	100	2080	=	=	7.62	100	ug/L	**67.5**
WG	E365.2	-	FP-03-01-002	phosphorus, total (as P)	0.051	=	=	0.02	0.04	0.101	=	=	0.02	0.04	mg/L	**65.8**
WG	E110.2	-	FP-04-06-001	color	15	=	=	0	10	10	=	=	0	10	COLOR UNIT	40.0
WG	E110.2	-	FP-04-07-003	color	10	=	=	0	10	15	=	=	0	10	COLOR UNIT	40.0
WG	SW6010B	-	FP-03-01-002	Barium	51.1	=	=	0.491	2	35.3	=	=	0.491	2	ug/L	**36.6**
WG	SW6010B	-	FP-04-06-001	Manganese	9.99	=	=	0.167	2	7	=	=	0.167	2	ug/L	**35.2**
WG	E160.1	-	FP-03-01-002	TDS (residue, filterable)	386	=	=	10	20	274	=	=	10	20	mg/L	**33.9**
WG	E365.2	-	FP-03-01-002	phosphorus, total ortho (as P)	0.027	=	=	0.02	0.02	0.038	=	=	0.02	0.02	mg/L	33.8
WG	SW6010B	-	FP-03-01-002	Potassium	56000	=	=	11.5	500	41400	=	=	11.5	500	ug/L	**30.0**
WG	SW8260B	-	FP-03-01-002	Benzene	0.64	J	J	0.14	1	0.48	J	J	0.14	1	ug/L	28.6
WG	E900	-	FP-03-01-002	beta, gross	54.7	=	=	2.1	2.1	42.1	=	=	2.2	2.2	pCi/l	**26.0**
WG	SW6010B	-	FP-03-01-002	Sodium	29300	=	=	22.7	300	22900	=	=	22.7	300	ug/L	**24.5**
WG	E365.2	-	FP-04-07-003	phosphorus, total (as P)	0.094	=	=	0.017	0.04	0.12	=	=	0.017	0.04	mg/L	24.3
WG	SW8260B	-	FP-03-01-002	cis-1,2-Dichloroethene	2.4	=	=	0.18	1	3	=	=	0.18	1	ug/L	22.2
WG	SW6010B	-	FP-04-06-001	Arsenic	8.71	=	=	2.04	5	10.6	=	=	2.04	5	ug/L	19.6
WG	E353.2M	-	FP-03-01-002	Total Nitrogen, Calculated	0.901	=	=	0	0	0.741	=	=	0	0	mg/L	19.5
WG	SW6010B	-	FP-03-01-002	Calcium	17100	=	=	32.5	100	20400	=	=	32.5	100	ug/L	17.6
WG	E365.2	FLDFLT	FP-04-07-003	phosphorus, total organic (as P)	0.152	=	=	0.017	0.02	0.181	=	=	0.017	0.02	mg/L	17.4
WG	E375.4	-	FP-04-07-003	Sulfate (as SO4)	33.7	=	=	0.44	2	39.9	=	=	0.22	1	mg/L	16.8
WG	E365.2	-	FP-04-07-003	phosphorus, total ortho (as P)	0.083	=	=	0.014	0.02	0.095	=	=	0.014	0.02	mg/L	13.5
WG	SW6010B	-	FP-04-07-003	Cadmium	0.406	J	J	0.356	1	0.453	J	J	0.356	1	ug/L	10.9
WG	E310.1	-	FP-04-07-003	Alkalinity, bicarb (as CaCO3)	135	=	=	0.5	10	150	=	=	0.5	10	mg/L	10.5
WG	E180.1	-	FP-04-06-001	turbidity	1.1	=	=	0.12	0.25	1.2	=	=	0.12	0.25	NTU	8.7
WG	E365.2	-	FP-04-06-001	phosphorus, total ortho (as P)	0.09	=	=	0.014	0.02	0.097	=	=	0.014	0.02	mg/L	7.5
WG	E353.2M	-	FP-04-07-003	Total Nitrogen, Calculated	0.463	=	=	0	0	0.432	=	=	0	0	mg/L	6.9
WG	SW6010B	-	FP-04-06-001	Nickel	3.92	J	J	0.997	5	4.2	J	J	0.997	5	ug/L	6.9
WG	SW6010B	-	FP-04-06-001	Barium	20.9	=	=	0.491	2	19.7	=	=	0.491	2	ug/L	5.9
WG	SW6010B	-	FP-04-06-001	Potassium	2540	=	=	11.5	500	2400	=	=	11.5	500	ug/L	5.7
WG	E365.2	-	FP-03-01-002	phosphorus, total organic (as P)	0.054	=	=	0.02	0.02	0.057	=	=	0.02	0.02	mg/L	5.4
WG	E160.1	-	FP-04-07-003	TDS (residue, filterable)	242	=	=	0	20	255	=	=	0	20	mg/L	5.2
WG	E350.3	-	FP-04-07-003	Nitrogen, ammonia (as N)	0.149	J	J	0.107	0.4	0.142	J	J	0.107	0.4	mg/L	4.8
WG	E375.4	-	FP-04-06-001	Sulfate (as SO4)	68.5	=	=	0.44	2	71.8	=	=	0.44	2	mg/L	4.7
WG	E150.1	-	FP-03-01-002	ph	11.1	=	=	0	0	10.6	=	=	0	0	PH UNITS	4.6
WG	E900	-	FP-04-07-003	beta, gross	3.19	J	J		2.89	3.05	J	J		2.95	PCI/L	4.5
WG	SW6010B	-	FP-04-07-003	Nickel	2.96	J	J	0.997	5	3.08	J	J	0.997	5	ug/L	4.0
WG	E365.2	-	FP-04-06-001	phosphorus, total (as P)	0.111	=	=	0.017	0.04	0.107	=	=	0.017	0.04	mg/L	3.7
WG	E353.2M	-	FP-04-06-001	Total Nitrogen, Calculated	1.52	=	=	0	0	1.47	=	=	0	0	mg/L	3.3
WG	SW6010B	-	FP-04-06-001	Sodium	7630	=	=	22.7	300	7400	=	=	22.7	300	ug/L	3.1
WG	E160.1	-	FP-04-06-001	TDS (residue, filterable)	263	=	=	0	20	271	=	=	0	20	mg/L	3.0
WG	E325.2	-	FP-04-07-003	Chloride (as Cl)	7640	=	=	266	600	7420	=	=	266	600	ug/L	2.9
WG	SW6010B	-	FP-04-07-003	Barium	19.1	=	=	0.491	2	18.6	=	=	0.491	2	ug/L	2.7
WG	SW6010B	-	FP-04-07-003	Potassium	2010	J	J	11.5	500	1960	J	J	11.5	500	ug/L	2.5
WG	E325.2	-	FP-04-06-001	Chloride (as Cl)	7020	=	=	266	600	7190	=	=	266	600	ug/L	2.4
WG	SW6010B	-	FP-04-06-001	Magnesium	8790	=	=	5.23	100	8600	=	=	5.23	100	ug/L	2.2
WG	E375.4	-	FP-03-01-002	Sulfate (as SO4)	3.26	=	=	0.5	1	3.19	=	=	0.5	1	mg/L	2.2
WG	SW6010B	-	FP-04-07-003	Arsenic	9.39	=	=	2.04	5	9.59	=	=	2.04	5	ug/L	2.1
WG	E365.2	FLDFLT	FP-04-06-001	phosphorus, total organic (as P)	0.098	=	=	0.017	0.02	0.096	=	=	0.017	0.02	mg/L	2.1
WG	E351.4	-	FP-04-06-001	nitrogen, kjeldahl, total	1.48	J	J	0.45	2	1.45	J	J	0.45	2	mg/L	2.0

APPENDIX E

Field Duplicate Precision

Matrix	Analytical Method	Dissolved ?	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Final Conc Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	SW6010B	-	FP-04-07-003	Magnesium	8530	=	=	5.23	100	8360	=	=	5.23	100	ug/L	2.0
WG	E325.2	-	FP-03-01-002	Chloride (as Cl)	3060	=	=	200	600	3000	=	=	200	600	ug/L	2.0
WG	SW6010B	-	FP-04-07-003	Sodium	6550	J	J	22.7	300	6430	J	J	22.7	300	ug/L	1.8
WG	E150.1	-	FP-04-06-001	ph	7.62	=	=	0	0	7.55	=	=	0	0	PH UNITS	0.9
WG	E350.3	-	FP-04-06-001	Nitrogen, ammonia (as N)	0.126	J	J	0.107	0.4	0.125	J	J	0.107	0.4	mg/L	0.8
WG	SW6010B	-	FP-04-07-003	Vanadium	1.3	J	J	0.447	3	1.29	J	J	0.447	3	ug/L	0.8
WG	SW6010B	-	FP-04-06-001	Calcium	69500	=	=	32.5	100	69200	=	=	32.5	100	ug/L	0.4
WG	SW6010B	-	FP-04-07-003	Calcium	69800	=	=	32.5	100	70100	=	=	32.5	100	ug/L	0.4
WG	E150.1	-	FP-04-07-003	ph	7.44	=	=	0	0	7.41	=	=	0	0	PH UNITS	0.4
WG	SW6010B	-	FP-04-07-003	Manganese	6.6	=	=	0.167	2	6.61	=	=	0.167	2	ug/L	0.2
WG	E110.2	-	FP-03-01-002	color	5	J	J	0	10	5	J	J	0	10	COLOR UNIT	0.0
WG	FLPRO	-	FP-04-06-001	petroleum hydrocarbons	0.12	J	J	0.1	0.35	0.12	J	J	0.097	0.34	mg/L	0.0

NOTES: WQ = Water Quality Control Sample, LB = Laboratory Method Blank, FLDFLT = Field Filtered. mg/L = milligrams per liter.

Central Florida Recharge - Lake Orienta Data Quality Evaluation (DQE)

Introduction

The purpose of this document is to present the findings of the data quality evaluation (DQE) performed on laboratory reports of analyses from surface water samples from a lake and groundwater samples from two monitoring wells through 8 sampling events as part of the Baseline and Operational Characterization tasks for the Lake Orienta site of the Central Florida Artificial Recharge Enhancement Project.

The purpose of the data quality evaluation process is to assess the effect of the overall analytical process on the usability of the data. The two major categories of data evaluation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; either the laboratory did, or did not, analyze the samples within the limits of the analytical method. Evaluation of matrix interferences which could affect the final numerical value is more subtle and involves the analysis of several areas of results including surrogate spike recoveries, matrix spike recoveries, and duplicate sample results.

These samples were collected over eight events in 2005:

- July 12 and 13
- July 20 and 21
- July 27 and 28
- August 8 and 9
- September 7 and 8
- October 5
- October 31
- December 5

Field quality control (QC) samples collected included field duplicates, trip blanks (analyzed for VOCs only), and additional aliquots of a normal field sample for matrix spike and matrix spike duplicates. The "normal" samples represent the results to be used for site evaluations. The number of each type of sample is listed by analytical method in **Exhibit 1**.

Before the analytical results were released by the laboratory, both the sample and QC data were reviewed by the laboratory to ensure method compliance and to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the data package case narrative. **Appendix A** presents the frequency of detection of target analytes for field samples.

EXHIBIT 1
Number of Samples Collected by Matrix, Method, and Type

Matrix	Analytical Method	Analytical Method Description	Preparation Method	Filtered?	N	FD	TB
WG	E365.2	Phosphorus, all Forms (as P)	Method	FLDFLT	16	8	
WS	E365.2	Phosphorus, all Forms (as P)	Method	FLDFLT	8		
WG	E415.1	Total Organic Carbon (Combustion or Oxidation)	None	FLDFLT	16	8	
WS	E415.1	Total Organic Carbon (Combustion or Oxidation)	None	FLDFLT	8		
WG	SM4500-NH3-B,C	Ammonia, Distilled and Titrated	Method	-	10	5	
WS	SM4500-NH3-B,C	Ammonia, Distilled and Titrated	Method	-	5		
WG	E110.2	Color (Colorimetric-Platinum-Cobalt)	None	-	16	8	
WS	E110.2	Color (Colorimetric-Platinum-Cobalt)	None	-	8		
WG	E150.1	pH, Electrometric	None	-	16	8	
WS	E150.1	pH, Electrometric	None	-	8		
WG	E160.1	Residue, Filterable (TDS)	None	-	16	8	
WS	E160.1	Residue, Filterable (TDS)	None	-	8		
WG	E180.1	Turbidity (Nephelometric)	None	-	16	8	
WS	E180.1	Turbidity (Nephelometric)	None	-	8		
WG	E310.1	Alkalinity (Titrimetric)	None	-	16	8	
WS	E310.1	Alkalinity (Titrimetric)	None	-	8		
WG	E325.2	Chloride (as CL), Colorimetric	None	-	16	8	
WS	E325.2	Chloride (as CL), Colorimetric	None	-	8		
WG	E350.1	Nitrogen (Ammonia - Colorimetric)	None	-	4	2	
WS	E350.1	Nitrogen (Ammonia - Colorimetric)	None	-	2		
WG	E350.3	Nitrogen, Ammonia (Potentiometric)	None	-	2	1	
WS	E350.3	Nitrogen, Ammonia (Potentiometric)	None	-	1		
WG	E351.2	Nitrogen, Kjedahl, Total (Colorimetric)	Method	-	16	8	
WS	E351.2	Nitrogen, Kjedahl, Total (Colorimetric)	Method	-	8		
WG	E353.2	Nitrogen, Nitrate-Nitrite (Colorimetric)	None	-	16	8	

EXHIBIT 1
Number of Samples Collected by Matrix, Method, and Type

Matrix	Analytical Method	Analytical Method Description	Preparation Method	Filtered?	N	FD	TB
WS	E353.2	Nitrogen, Nitrate-Nitrite (Colorimetric)	None	-	8		
WG	E353.2M	Total Nitrogen, Calculated	None	-	16	8	
WS	E353.2M	Total Nitrogen, Calculated	None	-	8		
WG	E354.1	Nitrogen, Nitrite (Spectrophotometric)	None	-	16	8	
WS	E354.1	Nitrogen, Nitrite (Spectrophotometric)	None	-	8		
WG	E365.2	Phosphorus, all Forms (as P)	None	-	16	8	
WS	E365.2	Phosphorus, all Forms (as P)	None	-	8		
WG	E375.4	Sulfate (as SO4), Turbidimetric	None	-	16	8	
WS	E375.4	Sulfate (as SO4), Turbidimetric	None	-	8		
WG	E405.1	Biochemical Oxygen Demand	None	-	16	8	
WS	E405.1	Biochemical Oxygen Demand	None	-	8		
WG	E415.1	Total Organic Carbon (Combustion or Oxidation)	None	-	16	8	
WS	E415.1	Total Organic Carbon (Combustion or Oxidation)	None	-	8		
WG	E900	Gross Alpha and Beta Radiation	None	-	16	8	
WS	E900	Gross Alpha and Beta Radiation	None	-	8		
WG	FLPRO	TPH - FLO-PRO	Method	-	16	8	
WS	FLPRO	TPH - FLO-PRO	Method	-	8		
WG	SW6010B	Inductively Coupled Plasma Emission Spectroscopy	SW3010A	-	16	8	
WS	SW6010B	Inductively Coupled Plasma Emission Spectroscopy	SW3010A	-	8		
WG	SW7470A	Mercury in Liquid Waste (Cold-Vapor)	Method	-	16	8	
WS	SW7470A	Mercury in Liquid Waste (Cold-Vapor)	Method	-	8		
WG	SW8081	Organochlorine Pesticides by GC	SW3510	-	16	8	
WS	SW8081	Organochlorine Pesticides by GC	SW3510	-	8		
WG	SW8082	Polychlorinated Biphenyls (PCB)	SW3510	-	16	8	
WS	SW8082	Polychlorinated Biphenyls (PCB)	SW3510	-	8		
WG	SW8141	Organophosphorus Compounds	SW3510	-	16	8	

EXHIBIT 1
Number of Samples Collected by Matrix, Method, and Type

Matrix	Analytical Method	Analytical Method Description	Preparation Method	Filtered?	N	FD	TB
		by GC					
WS	SW8141	Organophosphorus Compounds by GC	SW3510	-	8		
WG	SW8151	Chlorinated Herbicides by GC	SW3510	-	16	8	
WS	SW8151	Chlorinated Herbicides by GC	SW3510	-	8		
WG	SW8260B	Volatile Organic Compounds by GCMS	SW5030	-	16	8	6
WS	SW8260B	Volatile Organic Compounds by GCMS	SW5030	-	8		
WG	SW8270C	GC/MS for Semivolatile Organics	SW3510	-	12	6	
WS	SW8270C	GC/MS for Semivolatile Organics	SW3510	-	6		

WG = Groundwater, WS = Surface Water. N = Normal Field Sample, FD = Field Duplicate, TB = Trip Blank. FLDFLT = Field Filtered

The hardcopy data packages were reviewed by the CH2M HILL project chemists applying the review criteria which generally follows that outlined in the Environmental Protection Agency (EPA) guidance document *Contract Laboratory Program National Functional Guidelines for Organic (1999) and Inorganic Data Review (1994) [NFG]*). Areas of review included (when applicable to the method) holding time compliance, initial and continuing calibration verification, all associated field and laboratory blank results, matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) accuracy and precision, field duplicate results, surrogate recoveries, internal standard performance, and method interference checks. A data review worksheet was completed for each of these data packages and any non-conformances documented. This data review and validation process is independent of the laboratory's checks and focuses on the usability of the data to support the project data interpretation and decision-making processes.

A qualifying flag would be applied to data that were not within the method established acceptance limits. These flags consist of a single or double-letter abbreviation that indicates the usability of the identified non-conformance. Although the qualifying flags are entered into the database records from the validated Form I's, they are also included in the final data summary tables so that the data will not be used indiscriminately. The qualification of the data also includes secondary, or multi-digit "sub-qualifier" flags, which are entered into the data validation notes field of the database. The secondary qualifiers provide the reasoning behind the assignment of a qualifier to the data. The sub-qualifiers are presented and defined in **Appendix B**.

Numerical sample results that are greater than the method detection limit (MDL) but less than the laboratory reporting limit (RL) are qualified with a "J" for estimated as required by the NFG. The method detection limit (MDL) is defined as, "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero." Therefore, by definition, the accuracy and precision of values at or near the MDL are questionable and should be viewed as such. The reporting limit (RL) is a level at which a laboratory reports analytical results. The RL is established by the laboratory based upon laboratory determinations or project requirements. Factors such as an analye specific MDL, a calculated PQL, the lowest calibration standard (method specific), applicable regulatory agency limits, or program specific requirements may contribute to the final RL established for the project. The practical quantitation limit (PQL) is often determined to be a multiple of the MDL or other limit of detection (LOD) findings. The most common multiples are 5, 10, and 12 (the most current multiple). The major difference between a limit of detection and a limit of quantitation is that accuracy and precision improve at quantitation levels.

The following primary flags were used to qualify the data:

- **U -** Undetected. Analyte was analyzed for but not detected above the method detection limit (MDL) or other limit of detection.
- **UJ -** Detection limit estimated. Analyte was analyzed for, and qualified as not detected. The result is estimated due to its concentration or failed QC measurement.
- **J -** Estimated. The analyte was present, but the reported value may not be accurate or precise due to its concentration or failed QC measurement.
- **R -** Rejected. The data are unusable. (NOTE: Analyte/compound may or may not be present.)

The database was queried for frequency of detection in all blank types and samples', providing detailed listings of blank detects, matrix spike/matrix spike duplicate (MS/MSD) statistics, laboratory control sample / laboratory control sample duplicate (LCS/LCSD) accuracy and precision, field duplicate precision, surrogate recoveries, and preparation and analysis dates pertaining to holding times. The queries were then manipulated to calculate necessary statistics for evaluation of the data.

Once the data review and validation process was completed, the data set was reviewed for analyte frequencies of detection, dilution factors which might affect data usability, and patterns of target analyte distribution. The data set was also evaluated to identify potential data limitations, uncertainties, or both in the analytical results. Analytes that were assigned qualifiers during the validation processes are presented in **Appendix C**.

Holding Times

The holding times for each parameter were evaluated according to SW-846 requirements. **Appendix C** indicates that there were 432 records qualified for preparation or analysis holding times outside criteria, but within two times the established holding time. Of the 432 qualified records, 427 (420 SVOCs and 7 Organochlorine herbicides) were due to re-extractions or re-analysis because the original analysis experienced QC or calibration failures. These re-extractions were non-detect and were qualified as estimated (UJ) and the initial analyses were excluded because there can be only one valid result, per analyte, per sample. Three ammonia results, and a single pH result were estimated (J) because the analytical holding times were exceeded. A single turbidity result was reported as a non-detect during analysis and subsequently also estimated (UJ) as the sample did not met holding time criteria. No data were rejected due to holding time exceedances. Rejection (R) usually occurs when a parameter of interest is greater than two times the technical holding time.

Calibration

The majority of calibration criteria pertaining to the analytical methods were met for these samples. **Appendix C** presents analytes that were qualified due to poor relative response factors (RRFs), and initial or continuing calibration deficiencies (high percentD or percentRSD). A total of 523 records were qualified as estimated, non-detect (UJ); one estimated as "J". Data that were qualified due to initial or continuing calibration variances are presented in **Appendix C** with validation reasons (or a combination of these calibration specific sub-qualifiers): "CCL", "CCVL", "CCRRF", "IC", "ICH", "ICL", "ICRRF" and "ICRSD". The definition of all the sub-qualifiers are found and defined in Appendix B. The number of non-detected records per fraction qualified as estimated included three-hundred and 21 semivolatiles (8270C), 45 volatiles (8260B), 87 organophosphorus pesticides (8141), 9 chlorinated herbicides (8151), 14 PCB's (8082), and 47 organochlorine pesticides (8081). A single organochlorine pesticide was qualified as "J" estimated. No results were rejected due to calibration deficiencies.

Potential Field Sampling and Laboratory Contamination

Two types of blank samples were used to monitor potential contamination introduced during field sampling, sample handling, shipping activities, as well as sample preparation and analysis in the laboratory. Types of blank samples included:

- **Trip Blank (TB)**: A sample of analyte free water that is prepared in the laboratory prior to the sampling event. The water is stored in VOC sample containers and is not opened in the field, and travels back to the laboratory with the other samples for VOC analysis. This blank is used to monitor the potential for sample contamination during the sample container trip. One trip blank should be included in each sample cooler that contained samples for VOC analysis. Six trip blanks were submitted to the laboratory with these samples.

- **Laboratory Method Blank or Method Blank (MB)**: A laboratory method blank is analyte free water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and contamination introduced during the analytical procedure. One method blank was prepared and analyzed for every twenty samples or per analytical batch, whichever was more frequent.

According to the NFG, concentrations of common organic contaminants detected in samples at less than ten times the concentration of the associated blanks can be attributed to field sampling and laboratory contamination rather than environmental contamination from site activities. Common organic contaminants include acetone, methylene chloride, 2-butanone, and the phthalates. For other inorganic and organic contaminants, five times the concentration detected in the associated blanks (rather than ten times rule) is used to qualify results as potential field and/or laboratory contamination rather than environmental contamination. The 5 or 10 times rule were applied on a sample delivery group (SDG) by SDG basis and not globally. A Sample Delivery Group is a batch of no more than 20 samples prepared together, per method. Global application, however, would account for anomalous data, which should also be attributed to laboratory or field blank contamination. Additionally, many results reported in blanks (especially metals) are well below a defined practical quantitation limit (PQL) and may represent Type I errors when associated with a matrix. A Type I (or alpha error) occurs when the value reported is dismissed as a biased high, or false positive result.

Detects in the samples at levels less than the action levels (5 or 10 times rule) were qualified as not detected. The changes in the flagging qualifier due to the data validation process are presented in **Appendix C**. Blank detections are compiled into a "frequency of detection" by target parameter and are presented in **Appendix D**. Blank contamination resulted in 89 total results qualified as "U" (non-detected) due to contamination or high background levels found in blanks.

Ten elements found in one or more of the blank types resulted in qualification of metals data as non-detections. Six general chemistry parameters were also found to have experienced blank detections. Low level detection in blanks is associated with all analytical methods and quite common. Several cations and anions are ubiquitous at low level, while others may be exhibiting background noise due their lack of sensitivity associated with their analytical method.

Sample results less than five times the concentration found in the blanks associated with that SDG were attributed to field sampling or laboratory contamination and are not considered to be indicative of environmental contamination. In addition, the majority of the reported concentrations were at or near the method detection limit and could be Type I (or alpha errors), more commonly known as "false positives". This effect is often reflected in reported detections at or near the MDL in initial and continuing calibration blanks (ICB and CCB) as these are QC samples utilizing analyte free water for blank samples. These ICB and CCB data are not part of the electronic data deliverable provided by the laboratory and thus will not be represented in **Appendix D**, however validation notes presented in **Appendix C** indicate if a CCB or ICB was the cause for qualification.

Many metals are ubiquitous at low levels because they are naturally occurring, and are materials and components used in manufacturing (aluminum, copper, zinc, iron, mercury, and manganese). Iron and manganese are associated with alloys of steel. Zinc is a common metal and often used as a catalyst in many manufacturing processes. Copper and aluminum are used in electrical wiring and plumbing. Mercury is also commonly encountered at low concentrations due to its vast commercial uses during the last two centuries. Other metals such as arsenic, cadmium, silver, and selenium are not commonly encountered and generally are quantitated just above the MDL and below the reporting limit (RL). The lack of accuracy and precision at this level, coupled with instrument noise and matrix effects, can elicit Type I errors as defined above. Detections at or near the MDL should be carefully evaluated during the projects final decision making process. **Exhibit 2** presents the numbers of records per element, qualified as not detected due to blank contamination.

EXHIBIT 2
Number of Records per Element, Qualified as Not Detected Attributable to Blank Contamination

Element Qualified	Number of Records Resulting as Non-Detections by Element
Aluminum	6 of 32
Arsenic	13 of 32
Cadmium	1 of 32
Copper	10 of 32
Iron	8 of 32
Manganese	2 of 32
Selenium	1 of 32
Silver	1 of 32
Zinc	8 of 32
Mercury	1 of 32

The general chemistry parameters which were found in various blanks are presented in Appencix C and include TKN, ammonia, total nitrogen (calculated), 5-day BOD, TOC, and DOC. **Exhibit 3** presents the number of records by parameter, qualified as not detected due to blank contamination.

EXHIBIT 3
Number of Records per Parameter, Qualified as Not Detected Attributable to Blank Contamination

Sample Parameter Qualified	Number of Records Resulting as Non-Detections by Parameter
Nitrogen, Ammonia (as N)	3 of 32
Total Kjeldahl Nitrogen	5 of 32
BOD – 5 day	1 of 32
Dissolved Organic Carbon (DOC)	14 of 32
Total Organic Carbon (TOC)	10 of 32
Total Nitrogen, Calculated	5 of 32

Matrix Effects

Surrogate Spike Recovery

Surrogate spike compounds were added to every sample analyzed for the organic parameters including field and laboratory blanks as well as field environmental samples. Surrogate spikes consist of organic compounds which are similar to the method targets in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

Surrogate spike recoveries were used to monitor both laboratory performance and matrix interferences. Surrogate spike recoveries from field and laboratory blanks were used to evaluate laboratory performance because the blanks should represent an "ideal" sample matrix. Surrogate spike recoveries for field samples were used to evaluate the potential for matrix interferences. According to *Functional Guidelines*, data are not qualified with respect to surrogate recoveries unless one or more volatile surrogates are out of specifications. Semivolatiles are not qualified unless two or more surrogates, within the same fraction (base/neutral or acid fraction), are out of specification.

Three FL-PRO TPH, 20 organochlorine pesticide, and 24 organochlorine herbicide records were qualified as estimated (J/UJ) for surrogate spike recoveries outside control limits as exhibited in **Appendix C**. A single organochlorine pesticide record (heptachlor in sample L0-01-MW1) was rejected. Surrogates, as a significant indicator of potential interferences induced by a matrix, the fact that only a single compound in a single sample was rejected indicates that the specific sample matrix did not influence the overall analytical process or the final numerical sample result.

Matrix Spike/Matrix Spike Duplicate Precision and Accuracy

A matrix spike is an aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix. The matrix spike duplicate is an intra-laboratory split sample spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. The MS/MSD pair are used to document the precision and accuracy of a given sample matrix. For the MS/MSD measurement, three aliquots of a single sample are analyzed; one native sample and two aliquots of the same sample spiked with target analytes or compounds. Matrix accuracy is evaluated from the spike recoveries, while matrix precision is evaluated from comparison of the quantitated concentrations of the MS and MSD.

Organic results are typically not qualified based upon the results of MS/MSD statistics alone. Evaluation is in conjunction with surrogate, LCS, and internal standard (if applicable) results. However, professional judgment is often applied in the event of unusually low recoveries (less than 20 percent) and associated samples may be qualified as estimated. 29 organic records were qualified utilizing professional judgment in association with the MS/MSD statistics. These data included a single organochlorine, 11 organophosphorus pesticides, two organophosphorus herbicides, five volatile, and eight semivolatile results which were all estimated as (J/UJ). Two organophosphorus pesticide compounds (fenthion) were rejected.

Twenty-eight general chemistry results were estimated as (J/UJ). These consisted of 4 results each for bicarbonate alkalinity, total alkalinity, ammonia nitrogen, and TOC. Additionally, 5 TKN, 2 each of nitrate/nitrite results and total nitrogen (by calculation) results were flagged as estimated (J/UJ). Two selenium and two gross alpha / gross beta results were also estimated (J/UJ) for high or low MS or MSD recoveries or precision measurements outside criteria. Additionally, three dissolved organic carbon results were qualified as estimated (J/UJ).

The lack of data rejection (other than the 2 fenthion results) from the most significant measurements of matrix accuracy and precision indicate that the specific sample matrix did not influence the overall analytical process or the final numerical sample result.

Field Duplicate Sample Results

Field duplicate analyses measure both field and laboratory precision and can also be affected by the homogeneity of the samples. According to the EPA *Functional Guidelines*, there are no qualification criteria for field duplicate precision.

Two field duplicate sets per method were collected during this field effort. Both the native and duplicate samples were analyzed for the same parameters.

An aqueous control limit of ± 20 percent for the RPD was used for original and duplicate sample values greater than or equal to five times the RL. A control limit of ± the RL was used if either the sample or the duplicate value was less than five times the RL for waters. In the cases where only one result is above the five times the RL level and the other is below, the ± RL criteria were applied. There were 179 measurable analyte results in the field duplicate database that met the criteria outlined above. Sixteen sample sets were outside the acceptance criteria as defined in this text. The exceptions are presented in **Appendix E.** The small percentage of field duplicate sets outside criteria indicate that the matrix was homogenous and that sampling activities did not affect the overall analytical process or the final numerical sample result.

ICPES Serial Dilution Results

The serial dilution is another measurement used to ascertain whether the matrix is affecting the final numerical result. A sample digestate with concentrations of elements greater than 50 times the MDL is diluted five-fold (1+4) and analyzed. The diluted result is then multiplied by 5 and this concentration compared to the original non-diluted result. If the percent difference (percentD) is greater than 10, then a matrix effect is suspected.

Results of four zinc analyses were flagged as estimated (J) for exceeding the 10 percentD criterion. Zinc is the most common contaminant seen in blanks and samples. The fact that only four metals results (and those being zinc) failed the serial dilution indicates that the specific sample matrix did not influence the other elements, nor the overall analytical process or the final numerical sample result.

Laboratory Method Accuracy

Laboratory control samples (LCSs) or blank spikes (BS) are quality control samples utilized to monitor laboratory method accuracy. This sample consists of target free laboratory water spiked with the target compounds of interest. Thirty-three records out of 5,327 specific targets were qualified as rejected {R} (33/5,327 total records or 0.6 percent). Eighty-six records were qualified as estimated (J/UJ) as documented in **Appendix C.** The rejected data included two organochlorine pesticide (SW-846 8081A) results for heptachlor. The remaining rejections were all semivolatiles (SW846 8270C) including two each of pyridine, 1,2,4-trichlorobenzene and aramite. The remainder included 8 a,a-dimethylphenethylamine results , three records each of 1,4-naphthoquinone, chlorobenzilate, diethyl phthalate, dimethol phthalate, and petachloroethane; and single records of 2, 4-dinitrotoluene and benzyl alcohol. These data indicate that the analytical methods were under control.

Sample Results for Measurements near the Method Detection Limit (MDL)

The MDL is defined as the minimum concentration of an analyte that can be identified, measured, and reported with 99 percent confidence that the analyte concentration is greater than zero. Sample results at, or near the MDL are not accurate or precise. At this level, Type I (alpha – false positives) errors can occur. This situation is often caused by instrument noise or low-level background shifts rather than a true analyte signal. As concentrations approach a defined "quantitation limit", the confidence in the values increase.

PARCCs

Precision--is defined as the agreement between duplicate results, and was estimated by comparing duplicate matrix spike recoveries, and field duplicate sample results. MS/MSD and BS/BSD laboratory precision was documented as well within control limit criteria for most samples and targets. Field duplicate precision was excellent. Both matrix and method precision criteria were demonstrated as well within criteria.

Accuracy--is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For the organic analyses, each of the samples was spiked with a surrogate compound; and for organic and inorganic analyses a MS/ MSD, and LCS were spiked with a known reference material before preparation. Each of these approaches (except the LCS) provides a measure of the matrix effects on the analytical accuracy. The LCS results demonstrate accuracy of the method. Spike recoveries were within the method acceptance limits for the majority of the measurements; therefore, other than the documented exceptions, there was no evidence of matrix interferences that would affect the usability of the data.

Representativeness--this criterion is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

Completeness--is defined as the percentage of measurements that are judged to be valid compared to the total number of measurements made. The percent completeness for all analytical fractions was **99.5 percent (7037/7072)**.

Comparability--is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix type, and analytical method. Comparability is defined by the other PARCC parameters because data sets can be compared with confidence when precision and accuracy are known. Data from this investigation are comparable with other data collected at the site because only EPA methods were used to analyze the sample and EPA Level III QC data are available to support the quality of the data.

Conclusions

Conclusions of the data quality evaluation process are:

- The laboratory analyzed the samples according to the EPA methods stated in the work plan as demonstrated by the deliverable summaries and analytical run sequences.
- Estimated holding times: 420 SVOC's and seven organochlorine herbicides were re-extracted (within 2X holding times) to replace original analyses which failed QC statistics. All of these data records were non-detect and qualified as non-detect and estimated (UJ).
- Three hundred twenty-one semivolatiles (8270C), 45 volatiles (8260B), 87 organophosphorus pesticides (8141), 9 chlorinated herbicides (8151), 14 PCB's (8082), and 47 organochlorine pesticides (8081) were qualified as not detected (UJ). A single Organochlorine pesticide was qualified as "J" estimated. No results were rejected due to calibration deficiencies.
- Three FL-PRO TPH, 20 organochlorine pesticide, and 24 organochlorine herbicide records were qualified for as estimated (J/UJ) for the surrogate outside control limits. A single organochlorine pesticide result (heptachlor in sample L0-01-MW1) was rejected.
- There were two rejections (fenthion) for the MS/MSD criterion not being met. However, the majority of the accuracy and precision results were well within established criteria, indicating that the specific sample matrix did not greatly influence the overall analytical process or the final numerical sample result.
- The field duplicate precision data (91.1 percent) indicate that the specific sample matrix did not greatly influence the overall analytical process or the final numerical sample result.
- Sample results for metals above the MDL but less than the RL may be attributed to instrument noise and/or low level contamination and not site-related activities and as such may be false positives.
- Thirty-three records (of 5,327) were rejected due to low LCS recoveries.

- Sample results for target organic compounds above the MDL but less than the RL should be considered as uncertain but indicative of the presence of that compound at an estimated concentration.
- Matrix and method spike and surrogate recoveries (other than the exceptions documented in the text and tables) indicate that the specific sample matrix did not significantly interfere with the analytical process or the final numerical result from the laboratory.

The project objectives or PARCCs were met, and the data can be used in the project decision-making process as qualified by the data quality evaluation process.

APPENDIX A
Frequency of Detection in Field Samples

Matrix	Analytical Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection Limit	Maximum Detection Limit	Units
WG	SW6010B	-	Beryllium	24	2	0.00022	0.00022	0.0050	0.0050	0.00020	0.00020	mg/L
WG	SW6010B	-	Cadmium	24	6	0.00066	0.0037	0.0050	0.0050	0.00035	0.00035	mg/L
WG	SW6010B	-	Barium	24	24	0.0050	0.0065	0.0050	0.0050	0.00044	0.00044	mg/L
WG	SW6010B	-	Manganese	24	22	0.0043	0.0062	0.0050	0.0050	0.00046	0.00046	mg/L
WG	SW8081	-	p,p'-DDD	24	1	0.0026	0.0026	0.010	0.010	0.00053	0.00053	µg/L
WG	SW6010B	-	Copper	24	3	0.00098	0.0096	0.0050	0.0050	0.00062	0.00062	mg/L
WG	SW6010B	-	Silver	24	1	0.00068	0.00068	0.0050	0.0050	0.00065	0.00065	mg/L
WG	SW6010B	-	Zinc	24	6	0.0054	0.014	0.010	0.010	0.00094	0.00094	mg/L
WG	SM4500-NH3-B,C	-	Nitrogen, ammonia (as N)	15	15	0.070	0.35	0.0010	0.20	0.0010	0.0010	mg/L
WG	SW8081	-	p,p'-DDT	24	2	0.0057	0.013	0.010	0.050	0.00022	0.0011	µg/L
WG	SW6010B	-	Vanadium	24	4	0.0012	0.0014	0.0050	0.0050	0.0011	0.0011	mg/L
WG	SW6010B	-	Chromium, total	24	9	0.0019	0.0037	0.0050	0.0050	0.0013	0.0013	mg/L
WG	SW6010B	-	Nickel	24	4	0.0018	0.0026	0.0050	0.0050	0.0017	0.0017	mg/L
WG	SW6010B	-	Arsenic	24	18	0.0082	0.019	0.0050	0.0050	0.0018	0.0018	mg/L
WG	SW6010B	-	Lead	24	2	0.0025	0.0052	0.0050	0.0050	0.0022	0.0022	mg/L
WG	SW6010B	-	Antimony	24	2	0.0027	0.0049	0.0050	0.0050	0.0023	0.0023	mg/L
WG	SW6010B	-	Selenium	24	3	0.024	0.027	0.0050	0.0050	0.0026	0.0026	mg/L
WG	SW6010B	-	Iron	24	18	0.014	0.19	0.050	0.050	0.0092	0.0092	mg/L
WG	E354.1	-	nitrogen, nitrite	24	3	0.045	0.045	0.10	0.10	0.012	0.012	mg/L
WG	E365.2	-	P, total orthophosphate (as P)	24	24	0.13	0.21	0.040	0.040	0.010	0.014	mg/L
WG	SW6010B	-	Aluminum	24	9	0.018	0.22	0.10	0.10	0.010	0.015	mg/L
WG	E365.2	-	phosphorus, total (as P)	24	23	0.080	0.32	0.040	0.040	0.010	0.017	mg/L
WG	E350.1	-	Nitrogen, ammonia (as N)	6	6	0.032	0.47	0.020	0.020	0.017	0.017	mg/L
WG	E353.2	-	Nitrogen, nitrate-nitrite	24	3	0.021	0.032	0.10	0.10	0.020	0.020	mg/L
WG	E350.3	-	Nitrogen, ammonia (as N)	3	1	0.39	0.39	0.10	0.10	0.037	0.037	mg/L
WG	SW6010B	-	Magnesium	24	24	5.1	6.5	0.10	0.10	0.040	0.040	mg/L
WG	SW6010B	-	Calcium	24	24	49.8	53.8	0.10	0.10	0.050	0.051	mg/L
WG	SW6010B	-	Potassium	24	24	0.83	2.4	0.50	0.50	0.070	0.075	mg/L
WG	E150.1	-	ph	24	24	7.2	7.8	0.10	0.10	0.10	0.10	PH UNITS
WG	E353.2M	-	T. Nitrogen, calculated	24	20	0.22	1.9	0.10	0.10	0.10	0.10	mg/L
WG	E351.2	-	nitrogen, kjeldahl, total	24	20	0.22	1.9	0.26	0.26	0.13	0.13	mg/L
WG	SW6010B	-	Sodium	24	24	6.9	14.4	0.30	0.30	0.14	0.14	mg/L
WG	E325.2	-	Chloride (as Cl)	24	24	12.2	30.7	0.50	0.50	0.26	0.27	mg/L
WG	E180.1	-	turbidity	24	16	0.40	8.0	0.30	0.30	0.30	0.30	NTU
WG	E375.4	-	Sulfate (as SO4)	24	24	0.61	33.6	1.0	2.0	0.22	0.44	mg/L
WG	E310.1	-	Alkalinity, bicarb (as CaCO3)	24	24	115	150	1.0	1.0	0.50	0.50	mg/L
WG	E310.1	-	Alkalinity, total (as CaCO3)	24	24	115	150	1.0	1.0	0.50	0.50	mg/L
WG	E110.2	-	color	24	24	10.0	25.0	1.0	1.0	1.0	1.0	COLOR UNIT
WG	E160.1	-	TDS, (residue, filterable)	24	24	115	331	20.0	20.0	1.0	1.0	mg/L
WG	SW8260B	-	Acetone	24	1	9.4	9.4	10.0	10.0	1.8	1.8	µg/L
WG	E415.1	-	Total organic carbon	24	14	1.8	9.0	1.0	5.0	0.37	1.8	mg/L
WG	E900	-	Alpha, gross	24	1	2.0	2.0	5.0	5.0	2.0	2.0	pCi/L
WG	E405.1	-	BOD, five day	24	3	3.0	3.0	10.0	10.0	2.0	2.0	mg/L
WG	E900	-	Beta, gross	24	3	4.0	5.0	3.7	5.0	2.8	4.0	pCi/L
WG	E365.2	FLDFLT	phosphorus, dissolved (as P)	24	23	0.056	0.37	0.040	0.040	0.010	0.017	mg/L
WG	E415.1	FLDFLT	Dissolved organic carbon	24	10	1.4	4.9	1.0	5.0	0.37	1.8	mg/L

APPENDIX A
Frequency of Detection in Field Samples

Matrix	Analytical Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection Limit	Maximum Detection Limit	Units
WG	SW6010B	-	Beryllium	24	2	0.00022	0.00022	0.0050	0.0050	0.00020	0.00020	mg/L
WS	SW7470A	-	Mercury	8	1	0.000026	0.000026	0.00020	0.00020	0.000025	0.000025	mg/L
WS	SW6010B	-	Barium	8	8	0.0018	0.012	0.0050	0.0050	0.00044	0.00044	mg/L
WS	SW6010B	-	Manganese	8	8	0.011	0.017	0.0050	0.0050	0.00046	0.00046	mg/L
WS	SW6010B	-	Copper	8	3	0.00076	0.0016	0.0050	0.0050	0.00062	0.00062	mg/L
WS	SW6010B	-	Zinc	8	4	0.0018	0.017	0.010	0.010	0.00094	0.00094	mg/L
WS	SM4500-NH3-B,C	-	Nitrogen, ammonia (as N)	5	3	0.070	0.14	0.0010	0.20	0.0010	0.0010	mg/L
WS	SW6010B	-	Vanadium	8	8	0.0019	0.0026	0.0050	0.0050	0.0011	0.0011	mg/L
WS	SW6010B	-	Chromium, total	8	2	0.0018	0.0022	0.0050	0.0050	0.0013	0.0013	mg/L
WS	SW6010B	-	Nickel	8	1	0.0028	0.0028	0.0050	0.0050	0.0017	0.0017	mg/L
WS	SW6010B	-	Arsenic	8	1	0.0070	0.0070	0.0050	0.0050	0.0018	0.0018	mg/L
WS	SW6010B	-	Iron	8	6	0.021	0.060	0.050	0.050	0.0092	0.0092	mg/L
WS	E354.1	-	nitrogen, nitrite	8	4	0.014	0.045	0.10	0.10	0.012	0.012	mg/L
WS	E365.2	-	P, total orthophosphate (as P)	8	4	0.017	0.027	0.040	0.040	0.010	0.014	mg/L
WS	SW6010B	-	Aluminum	8	7	0.070	0.28	0.10	0.10	0.010	0.015	mg/L
WS	E365.2	-	phosphorus, total (as P)	8	7	0.034	0.22	0.040	0.040	0.010	0.017	mg/L
WS	E350.1	-	Nitrogen, ammonia (as N)	2	1	0.032	0.032	0.020	0.020	0.017	0.017	mg/L
WS	E353.2	-	Nitrogen, nitrate-nitrite	8	1	0.021	0.021	0.10	0.10	0.020	0.020	mg/L
WS	SW6010B	-	Magnesium	8	8	2.5	2.7	0.10	0.10	0.040	0.040	mg/L
WS	SW6010B	-	Calcium	8	8	12.9	14.4	0.10	0.10	0.050	0.051	mg/L
WS	SW6010B	-	Potassium	8	8	3.0	3.3	0.50	0.50	0.070	0.075	mg/L
WS	E150.1	-	ph	8	8	6.6	7.5	0.10	0.10	0.10	0.10	PH UNITS
WS	E353.2M	-	T. Nitrogen, calculated	8	7	0.17	1.8	0.10	0.10	0.10	0.10	mg/L
WS	E351.2	-	Nitrogen, Kjeldahl, total	8	7	0.66	1.8	0.26	0.26	0.13	0.13	mg/L
WS	SW6010B	-	Sodium	8	8	19.2	20.9	0.30	0.30	0.14	0.14	mg/L
WS	E375.4	-	Sulfate (as SO4)	8	8	21.6	27.1	1.0	1.0	0.22	0.22	mg/L
WS	E325.2	-	Chloride (as Cl)	8	8	28.9	34.3	0.50	0.50	0.26	0.27	mg/L
WS	E180.1	-	Turbidity	8	8	2.5	33.0	0.30	0.30	0.30	0.30	NTU
WS	E310.1	-	Alkalinity, bicarb (as CaCO3)	8	8	27.0	42.0	1.0	1.0	0.50	0.50	mg/L
WS	E310.1	-	Alkalinity, total (as CaCO3)	8	8	27.0	42.0	1.0	1.0	0.50	0.50	mg/L
WS	E110.2	-	Color	8	8	40.0	60.0	1.0	1.0	1.0	1.0	COLOR UNIT
WS	E160.1	-	TDS, (residue, filterable)	8	8	97.0	301	20.0	20.0	1.0	1.0	mg/L
WS	E405.1	-	BOD, five day	8	6	2.6	3.0	2.0	10.0	2.0	2.0	mg/L
WS	E900	-	Alpha, gross	8	5	2.7	5.1	5.0	5.0	1.9	2.8	pCi/L
WS	E900	-	Beta, gross	8	4	5.0	5.6	3.1	5.0	3.1	5.3	pCi/L
WS	E415.1	-	Total organic carbon	8	8	9.9	62.9	1.0	100	0.36	36.8	mg/L
WS	FLPRO	-	TPH	8	2	120	120	340	354	97.0	101	µg/L
WS	E365.2	FLDFLT	Phosphorus, dissolved (as P)	8	6	0.029	0.13	0.040	0.040	0.017	0.017	mg/L
WS	E415.1	FLDFLT	Dissolved organic carbon	8	7	7.5	42.1	1.0	50.0	0.36	18.4	mg/L

NOTES: WG = Groundwater; WS = Surface Water; NTU = Nephelometric Turbity Units;
FLDFLT = Field Filtered. µg/L = micrograms per liter, mg/L = milligrams per liter, pCi/L = picocuries per liter

APPENDIX A

Frequency of Detection in Field Samples

Matrix	Analytical Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection Limit	Maximum Detection Limit	Units
WG	SW6010B	-	Beryllium	24	2	0.00022	0.00022	0.0050	0.0050	0.00020	0.00020	mg/L
WG	SW6010B	-	Cadmium	24	6	0.00066	0.0037	0.0050	0.0050	0.00035	0.00035	mg/L
WG	SW6010B	-	Barium	24	24	0.0050	0.0065	0.0050	0.0050	0.00044	0.00044	mg/L
WG	SW6010B	-	Manganese	24	22	0.0043	0.0062	0.0050	0.0050	0.00046	0.00046	mg/L
WG	SW8081	-	p,p'-DDD	24	1	0.0026	0.0026	0.010	0.010	0.00053	0.00053	µg/L
WG	SW6010B	-	Copper	24	3	0.00098	0.0096	0.0050	0.0050	0.00062	0.00062	mg/L
WG	SW6010B	-	Silver	24	1	0.00068	0.00068	0.0050	0.0050	0.00065	0.00065	mg/L
WG	SW6010B	-	Zinc	24	6	0.0054	0.014	0.010	0.010	0.00094	0.00094	mg/L
WG	SM4500-NH3-B,C	-	Nitrogen, ammonia (as N)	15	15	0.070	0.35	0.0010	0.20	0.0010	0.0010	mg/L
WG	SW8081	-	p,p'-DDT	24	2	0.0057	0.013	0.010	0.050	0.00022	0.0011	µg/L
WG	SW6010B	-	Vanadium	24	4	0.0012	0.0014	0.0050	0.0050	0.0011	0.0011	mg/L
WG	SW6010B	-	Chromium, total	24	9	0.0019	0.0037	0.0050	0.0050	0.0013	0.0013	mg/L
WG	SW6010B	-	Nickel	24	4	0.0018	0.0026	0.0050	0.0050	0.0017	0.0017	mg/L
WG	SW6010B	-	Arsenic	24	18	0.0082	0.019	0.0050	0.0050	0.0018	0.0018	mg/L
WG	SW6010B	-	Lead	24	2	0.0025	0.0052	0.0050	0.0050	0.0022	0.0022	mg/L
WG	SW6010B	-	Antimony	24	2	0.0027	0.0049	0.0050	0.0050	0.0023	0.0023	mg/L
WG	SW6010B	-	Selenium	24	3	0.024	0.027	0.0050	0.0050	0.0026	0.0026	mg/L
WG	SW6010B	-	Iron	24	18	0.014	0.19	0.050	0.050	0.0092	0.0092	mg/L
WG	E354.1	-	nitrogen, nitrite	24	3	0.045	0.045	0.10	0.10	0.012	0.012	mg/L
WG	E365.2	-	P, total orthophosphate (as P)	24	24	0.13	0.21	0.040	0.040	0.010	0.014	mg/L
WG	SW6010B	-	Aluminum	24	9	0.018	0.22	0.10	0.10	0.010	0.015	mg/L
WG	E365.2	-	phosphorus, total (as P)	24	23	0.080	0.32	0.040	0.040	0.010	0.017	mg/L
WG	E350.1	-	Nitrogen, ammonia (as N)	6	6	0.032	0.47	0.020	0.020	0.017	0.017	mg/L
WG	E353.2	-	Nitrogen, nitrate-nitrite	24	3	0.021	0.032	0.10	0.10	0.020	0.020	mg/L
WG	E350.3	-	Nitrogen, ammonia (as N)	3	1	0.39	0.39	0.10	0.10	0.037	0.037	mg/L
WG	SW6010B	-	Magnesium	24	24	5.1	6.5	0.10	0.10	0.040	0.040	mg/L
WG	SW6010B	-	Calcium	24	24	49.8	53.8	0.10	0.10	0.050	0.051	mg/L
WG	SW6010B	-	Potassium	24	24	0.83	2.4	0.50	0.50	0.070	0.075	mg/L
WG	E150.1	-	ph	24	24	7.2	7.8	0.10	0.10	0.10	0.10	PH UNITS
WG	E353.2M	-	T. Nitrogen, calculated	24	20	0.22	1.9	0.10	0.10	0.10	0.10	mg/L
WG	E351.2	-	nitrogen, kjeldahl, total	24	20	0.22	1.9	0.26	0.26	0.13	0.13	mg/L
WG	SW6010B	-	Sodium	24	24	6.9	14.4	0.30	0.30	0.14	0.14	mg/L
WG	E325.2	-	Chloride (as Cl)	24	24	12.2	30.7	0.50	0.50	0.26	0.27	mg/L
WG	E180.1	-	turbidity	24	16	0.40	8.0	0.30	0.30	0.30	0.30	NTU
WG	E375.4	-	Sulfate (as SO4)	24	24	0.61	33.6	1.0	2.0	0.22	0.44	mg/L
WG	E310.1	-	Alkalinity, bicarb (as CaCO3)	24	24	115	150	1.0	1.0	0.50	0.50	mg/L
WG	E310.1	-	Alkalinity, total (as CaCO3)	24	24	115	150	1.0	1.0	0.50	0.50	mg/L
WG	E110.2	-	color	24	24	10.0	25.0	1.0	1.0	1.0	1.0	COLOR UNIT
WG	E160.1	-	TDS, (residue, filterable)	24	24	115	331	20.0	20.0	1.0	1.0	mg/L
WG	SW8260B	-	Acetone	24	1	9.4	9.4	10.0	10.0	1.8	1.8	µg/L
WG	E415.1	-	Total organic carbon	24	14	1.8	9.0	1.0	5.0	0.37	1.8	mg/L
WG	E900	-	Alpha, gross	24	1	2.0	2.0	5.0	5.0	2.0	2.0	pCi/L
WG	E405.1	-	BOD, five day	24	3	3.0	3.0	10.0	10.0	2.0	2.0	mg/L
WG	E900	-	Beta, gross	24	3	4.0	5.0	3.7	5.0	2.8	4.0	pCi/L
WG	E365.2	FLDFLT	phosphorus, dissolved (as P)	24	23	0.056	0.37	0.040	0.040	0.010	0.017	mg/L
WG	E415.1	FLDFLT	Dissolved organic carbon	24	10	1.4	4.9	1.0	5.0	0.37	1.8	mg/L

Number	Validation Code	Definition
50	LDP	Laboratory Duplicate Precision out
51	LR	Linear range exceeded. Concentration above linear range.
52	MSA	Quantitated by the method of standard additions
53	MSALL	Global matrix spike flagging
54	MSAR2	method of standard additions R2 out
55	MSDH	Matrix spike duplicate recovery criteria greater than the upper limit
56	MSDL	Matrix spike duplicate recovery criteria less than the lower limit
57	MSDP	Matrix Spike Duplicate RPD criteria exceedance
58	MSH	Matrix spike recovery criteria greater than the upper limit
59	MSL	Matrix spike recovery criteria less than the lower limit
60	NMS	Not Site-specific Matrix Spike
61	NVP	No Valid peak (mostly used for radiological analyses)
62	PH	Sample pH out. Not properly preserved.
63	PRM	Result differs from Preliminary Result
64	PSH	Post spike recovery criteria greater than the upper limit
65	PSL	Post spike recovery criteria less than the lower limit
66	RA	Sample was reanalyzed
67	RE	Sample was re-extracted and reanalyzed
68	RT	Result is outside the laboratory determined retention time window
69	SCRN	Screening method and/or data
70	SDIL	Serial Dilution percentD exceeds the upper control limit
71	SPCC	SPCC Failure
72	SSH	Surrogate recovery greater than upper limit
73	SSL	Surrogate recovery less than lower limit
74	SSR	Surrogate spike recovery <10 percent
75	TBH	Trip blank concentration greater than the RL
76	TBL	Trip blank concentration less than the RL
77	TD	Total Concentration < Dissolved Concentration
78	TEMP	Cooler temperature out upon arrival
79	TIC	Tentatively identified compound
80	TN	GC/MS tune does not meet criteria
81	X2C	Second Column/Detector confirmation not reported
82	XCC	No Continuing Calibration analyzed in the analytical batch
83	X-DL	Data not used due to dilution; another value is more appropriate or data was not requested
84	XIC	No initial calibration analyzed in the analytical batch
85	XICSAB	Interference Check Standard Solutions A&B not reported/provided
86	XICVS	Initial calibration verification standard was not analyzed
87	XLCS	No LCS in the analytical batch
88	XLD	Laboratory Duplicate not reported
89	XMS	Matrix Spike not reported
90	XMSD	Matrix Spike Duplicate not reported
91	X-RE	Data not used due to reanalysis another value is more appropriate or data was not requested
92	XSDIL	Serial Dilution not reported (if MS/MSD requested)

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-DUPE	FD		E351.2	-	nitrogen, kjeldahl, total	0.156	B	J	0.156	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-DUPE	FD		E353.2M	-	Total Nitrogen, calculated	0.156	=	=	0.156	U	U	0	0	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.66	=	=	1.66	U	U	0.368	1	mg/L	CCBL
WG	LO-03-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.4	=	=	2.4	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.97	=	=	1.97	U	U	0.36	1	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	-	Total organic carbon	1.97	=	=	1.97	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	-	Total organic carbon	2.21	=	=	2.21	U	U	0.36	1	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Aluminum	0.029	B	J	0.029	U	U	0.015	0.1	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Arsenic	0.0105	=	=	0.0105	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Arsenic	0.0109	=	=	0.0109	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Iron	0.0336	B	J	0.0336	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Iron	0.0265	B	J	0.0265	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Manganese	0.00514	=	=	0.00514	U	U	0.00046	0.005	mg/L	CCBL
WG	L0-01-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.69	=	=	2.69	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-00-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-DUPE	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-04-Dupe	FD		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	p,p'-DDT	0.0057	J	J	0.0057	J	J	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-DUPE	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-DUP	FD		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8151	-	dalapon	0.65	U	U	0.65	UJ	U	0.38	0.65	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8270C	-	bis(2-Chloroisopropyl) ether	4.4	U	U	4.4	UJ	U	3.7	4.4	µg/L	CCVL
WG	LO-06-DUP	FD		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	LO-04-Dupe	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	4-nitroquinoline-n-oxide	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD
WG	LO-06-DUP	FD		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	a,a-Dimethylphenethylamine	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-DUP	FD		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-DUPE	FD		E351.2	-	nitrogen, kjeldahl, total	0.156	B	J	0.156	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-DUPE	FD		E353.2M	-	Total Nitrogen, calculated	0.156	=	=	0.156	U	U	0	0	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.66	=	=	1.66	U	U	0.368	1	mg/L	CCBL
WG	LO-03-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.4	=	=	2.4	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.97	=	=	1.97	U	U	0.36	1	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	-	Total organic carbon	1.97	=	=	1.97	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	-	Total organic carbon	2.21	=	=	2.21	U	U	0.36	1	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Aluminum	0.029	B	J	0.029	U	U	0.015	0.1	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Arsenic	0.0105	=	=	0.0105	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Arsenic	0.0109	=	=	0.0109	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Iron	0.0336	B	J	0.0336	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Iron	0.0265	B	J	0.0265	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Manganese	0.00514	=	=	0.00514	U	U	0.00046	0.005	mg/L	CCBL
WG	L0-01-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.69	=	=	2.69	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-00-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-DUPE	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-04-Dupe	FD		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	p,p'-DDT	0.0057	J	J	0.0057	J	J	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-DUPE	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-DUP	FD		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8151	-	dalapon	0.65	U	U	0.65	UJ	U	0.38	0.65	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8270C	-	bis(2-Chloroisopropyl) ether	4.4	U	U	4.4	UJ	U	3.7	4.4	µg/L	CCVL
WG	LO-06-DUP	FD		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	LO-04-Dupe	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	4-nitroquinoline-n-oxide	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD
WG	LO-06-DUP	FD		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	a,a-Dimethylphenethylamine	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-DUP	FD		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-DUPE	FD		E351.2	-	nitrogen, kjeldahl, total	0.156	B	J	0.156	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-DUPE	FD		E353.2M	-	Total Nitrogen, calculated	0.156	=	=	0.156	U	U	0	0	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.66	=	=	1.66	U	U	0.368	1	mg/L	CCBL
WG	LO-03-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.4	=	=	2.4	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.97	=	=	1.97	U	U	0.36	1	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	-	Total organic carbon	1.97	=	=	1.97	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	-	Total organic carbon	2.21	=	=	2.21	U	U	0.36	1	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Aluminum	0.029	B	J	0.029	U	U	0.015	0.1	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Arsenic	0.0105	=	=	0.0105	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Arsenic	0.0109	=	=	0.0109	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Iron	0.0336	B	J	0.0336	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Iron	0.0265	B	J	0.0265	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Manganese	0.00514	=	=	0.00514	U	U	0.00046	0.005	mg/L	CCBL
WG	L0-01-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.69	=	=	2.69	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-00-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-DUPE	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-04-Dupe	FD		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	p,p'-DDT	0.0057	J	J	0.0057	J	J	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-DUPE	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-DUP	FD		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8151	-	dalapon	0.65	U	U	0.65	UJ	U	0.38	0.65	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8270C	-	bis(2-Chloroisopropyl) ether	4.4	U	U	4.4	UJ	U	3.7	4.4	µg/L	CCVL
WG	LO-06-DUP	FD		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	LO-04-Dupe	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	4-nitroquinoline-n-oxide	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD
WG	LO-06-DUP	FD		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	a,a-Dimethylphenethylamine	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-DUP	FD		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-01-DupB	LR	RE	SW8270C	-	2-acetylaminofluorene	4	U	U	4	UJ	U	2.5	4	µg/L	CCVL
WG	L0-01-MW1B	LR	RE	SW8270C	-	2-acetylaminofluorene	4	U	U	4	UJ	U	2.5	4	µg/L	CCVL
WG	L0-00-MW2B	LR	RE	SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	CCVL
WG	L0-01-DupB	LR	RE	SW8270C	-	methapyrilene	4	U	U	4	UJ	U	3.7	4	µg/L	CCVL
WG	L0-01-MW1B	LR	RE	SW8270C	-	methapyrilene	4	U	U	4	UJ	U	3.7	4	µg/L	CCVL
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	21	U	U	21	UJ	U	3.9	21	µg/L	CCVL,ICRSD,MSL
WG	LO-04-02RE1	LR	RE	SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.53	U	U	0.53	UJ	U	0.12	0.53	µg/L	HTP
WG	LO-04-02RE1	LR	RE	SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.53	U	U	0.53	UJ	U	0.16	0.53	µg/L	HTP
WG	LO-04-02RE1	LR	RE	SW8151	-	dichloroprop	0.53	U	U	0.53	UJ	U	0.19	0.53	µg/L	HTP
WG	LO-04-02RE1	LR	RE	SW8151	-	dinoseb	0.53	U	U	0.53	UJ	U	0.059	0.53	µg/L	HTP
WG	LO-04-02RE1	LR	RE	SW8151	-	Picloram	0.53	U	U	0.53	UJ	U	0.078	0.53	µg/L	HTP
WG	LO-04-02RE1	LR	RE	SW8151	-	silvex (2,4,5-tp)	0.53	U	U	0.53	UJ	U	0.04	0.53	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	1-naphthylamine	10.5	U	U	10.5	UJ	U	1.9	10.5	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	1-naphthylamine	10.5	U	U	10.5	UJ	U	1.9	10.5	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	1-naphthylamine	10.5	U	U	10.5	UJ	U	1.9	10.5	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4	U	U	4	UJ	U	3.4	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.8	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4	U	U	4	UJ	U	3.6	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.8	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4	U	U	4	UJ	U	3.1	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4	U	U	4	UJ	U	2.3	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	UJ	U	5.9	21	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	UJ	U	5.9	21	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	20	U	U	20	UJ	U	5.6	20	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	20	U	U	20	UJ	U	5.6	20	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	UJ	U	5.9	21	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-acetylaminofluorene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-aminonaphthalene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-aminonaphthalene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-aminonaphthalene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2-Chlorophenol	4	U	U	4	UJ	U	2.9	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	µg/L	HTP
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-Nitroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-Nitroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-Nitroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	21	U	U	21	UJ	U	1.6	21	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	21	U	U	21	UJ	U	1.6	21	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	21	U	U	21	UJ	U	1.6	21	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	21	U	U	21	UJ	U	6.3	21	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	3-methylcholanthrene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	3-methylcholanthrene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	3-Nitroaniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	3-Nitroaniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	3-Nitroaniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.5	U	U	10.5	UJ	U	6.4	10.5	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.5	U	U	10.5	UJ	U	6.4	10.5	µg/L	HTP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10	U	U	10	UJ	U	6.1	10	µg/L	HTP

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-DUPE	FD		E351.2	-	nitrogen, kjeldahl, total	0.156	B	J	0.156	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-DUPE	FD		E353.2M	-	Total Nitrogen, calculated	0.156	=	=	0.156	U	U	0	0	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.66	=	=	1.66	U	U	0.368	1	mg/L	CCBL
WG	LO-03-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.4	=	=	2.4	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.97	=	=	1.97	U	U	0.36	1	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	-	Total organic carbon	1.97	=	=	1.97	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	-	Total organic carbon	2.21	=	=	2.21	U	U	0.36	1	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Aluminum	0.029	B	J	0.029	U	U	0.015	0.1	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Arsenic	0.0105	=	=	0.0105	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Arsenic	0.0109	=	=	0.0109	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Iron	0.0336	B	J	0.0336	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Iron	0.0265	B	J	0.0265	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Manganese	0.00514	=	=	0.00514	U	U	0.00046	0.005	mg/L	CCBL
WG	L0-01-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.69	=	=	2.69	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-00-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-DUPE	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-04-Dupe	FD		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	p,p'-DDT	0.0057	J	J	0.0057	J	J	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-DUPE	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-DUP	FD		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8151	-	dalapon	0.65	U	U	0.65	UJ	U	0.38	0.65	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8270C	-	bis(2-Chloroisopropyl) ether	4.4	U	U	4.4	UJ	U	3.7	4.4	µg/L	CCVL
WG	LO-06-DUP	FD		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	LO-04-Dupe	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	4-nitroquinoline-n-oxide	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD
WG	LO-06-DUP	FD		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	a,a-Dimethylphenethylamine	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-DUP	FD		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	Isophorone	4.2	U	U	4.2	UJ	U	4	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	Isophorone	4.2	U	U	4.2	UJ	U	4	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	isosafrole	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	isosafrole	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	isosafrole	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	methapyrilene	4.2	U	U	4.2	UJ	U	3.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	methapyrilene	4.2	U	U	4.2	UJ	U	3.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	methyl methanesulfonate	21	U	U	21	UJ	U	2	21	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	methyl methanesulfonate	21	U	U	21	UJ	U	2	21	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	methyl methanesulfonate	21	U	U	21	UJ	U	2	21	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	Nitrobenzene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	Nitrobenzene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	Nitrobenzene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	o-toluidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	o-toluidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	o-toluidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	pentachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	pentachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	pentachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	pentachloroethane	21	U	U	21	UJ	U	2.6	21	µg/L	HTP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	pentachloroethane	21	U	U	21	UJ	U	2.6	21	µg/L	HTP
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	pentachloroethane	21	U	U	21	UJ	U	2.6	21	µg/L	HTP

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-DUPE	FD		E351.2	-	nitrogen, kjeldahl, total	0.156	B	J	0.156	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-DUPE	FD		E353.2M	-	Total Nitrogen, calculated	0.156	=	=	0.156	U	U	0	0	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.66	=	=	1.66	U	U	0.368	1	mg/L	CCBL
WG	LO-03-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.4	=	=	2.4	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	FLDFLT	Diss.organic carbon	1.97	=	=	1.97	U	U	0.36	1	mg/L	CCBL
WG	L0-01-DUPE	FD		E415.1	-	Total organic carbon	1.97	=	=	1.97	U	U	0.368	1	mg/L	CCBL
WG	LO-05-DUPE	FD		E415.1	-	Total organic carbon	2.21	=	=	2.21	U	U	0.36	1	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Aluminum	0.029	B	J	0.029	U	U	0.015	0.1	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Arsenic	0.0105	=	=	0.0105	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-Dup	FD		SW6010B	-	Arsenic	0.0109	=	=	0.0109	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-00-Dupe	FD		SW6010B	-	Iron	0.0336	B	J	0.0336	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Iron	0.0265	B	J	0.0265	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-Dupe	FD		SW6010B	-	Manganese	0.00514	=	=	0.00514	U	U	0.00046	0.005	mg/L	CCBL
WG	L0-01-Dup	FD		E415.1	FLDFLT	Diss.organic carbon	2.69	=	=	2.69	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-00-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-DUPE	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-Dup	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-04-Dupe	FD		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	p,p'-DDT	0.0057	J	J	0.0057	J	J	0.00022	0.01	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-DUPE	FD		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-DUP	FD		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-03-Dup	FD		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8151	-	dalapon	0.65	U	U	0.65	UJ	U	0.38	0.65	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-Dupe	FD		SW8270C	-	bis(2-Chloroisopropyl) ether	4.4	U	U	4.4	UJ	U	3.7	4.4	µg/L	CCVL
WG	LO-06-DUP	FD		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-Dupe	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-Dupe	FD		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	LO-04-Dupe	FD		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	4-nitroquinoline-n-oxide	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD
WG	LO-06-DUP	FD		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-07-Dupe	FD		SW8270C	-	a,a-Dimethylphenethylamine	22.2	U	U	22.2	UJ	U	4.1	22.2	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-DUP	FD		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	phenacetin	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP,ICRSD
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	p-phenylenediamine	21	U	U	21	UJ	U	2.8	21	µg/L	HTP,ICRSD
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	p-phenylenediamine	21	U	U	21	UJ	U	2.8	21	µg/L	HTP,ICRSD
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	p-phenylenediamine	21	U	U	21	UJ	U	2.8	21	µg/L	HTP,ICRSD
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	pyridine	4.2	U	U	4.2	UJ	U	2.2	4.2	µg/L	HTP,ICRSD
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	pyridine	4.2	U	U	4.2	UJ	U	2.2	4.2	µg/L	HTP,ICRSD
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	pyridine	4.2	U	U	4.2	UJ	U	2.2	4.2	µg/L	HTP,ICRSD
WG	L0-00-DupeRE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	UJ	U	3.9	21	µg/L	HTP,ICRSD,LCSL,LCSP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	UJ	U	3.9	21	µg/L	HTP,ICRSD,LCSL,LCSP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	21	U	U	21	UJ	U	6.3	21	µg/L	HTP,ICRSD,LCSP
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	kepone	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP,ICRSD,LCSP
WG	LO-04-02RE1	LR	RE	SW8151	-	dicamba	0.53	U	U	0.53	UJ	U	0.036	0.53	µg/L	HTP,LCSDL,LCSL
WG	L0-00-MW1RE1	LR	RE	SW8270C	-	methapyrilene	4.2	U	U	4.2	UJ	U	3.9	4.2	µg/L	HTP,LCSP
WG	L0-01-DupB	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	µg/L	ICRSD
WG	L0-01-MW1B	LR	RE	SW8270C	-	3-methylcholanthrene	4	U	U	4	UJ	U	2.2	4	µg/L	ICRSD
WG	L0-00-MW2B	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	UJ	U	3.7	20	µg/L	ICRSD
WG	L0-01-MW-2RE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	UJ	U	3.9	21	µg/L	ICRSD,MSDL,MSL
WG	L0-01-DupRE1	LR	RE	SW8151	-	dicamba	0.53	U	U	0.53	UJ	U	0.036	0.53	µg/L	LCSDL
WG	L0-00-MW2B	LR	RE	SW8270C	-	1,4-naphthoquinone	4	U	U	4	R	U	3.1	4	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	1,4-naphthoquinone	4	U	U	4	R	U	3.1	4	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	1,4-naphthoquinone	4	U	U	4	R	U	3.1	4	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	Aramite	4	U	U	4	R	U	2.5	4	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	Aramite	4	U	U	4	R	U	2.5	4	µg/L	LCSL
WG	L0-00-MW2C	LR	RE	SW8270C	-	Benzyl alcohol	5	U	U	5	R	U	1.6	5	µg/L	LCSL
WG	L0-00-MW2B	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	R	U	2.5	4	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	R	U	2.5	4	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	R	U	2.5	4	µg/L	LCSL
WG	L0-00-MW2B	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	R	U	2.8	4	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	R	U	2.8	4	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	R	U	2.8	4	µg/L	LCSL
WG	L0-00-MW2B	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	R	U	3	4	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	R	U	3	4	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	R	U	3	4	µg/L	LCSL
WG	L0-00-MW2B	LR	RE	SW8270C	-	pentachloroethane	20	U	U	20	R	U	2.5	20	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	pentachloroethane	20	U	U	20	R	U	2.5	20	µg/L	LCSL
WG	L0-01-MW1B	LR	RE	SW8270C	-	pentachloroethane	20	U	U	20	R	U	2.5	20	µg/L	LCSL
WG	L0-01-DupB	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	LCSP
WG	L0-01-MW1B	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	LCSP
WG	L0-01-DupB	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	LCSP
WG	L0-01-MW1B	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	LCSP
WG	L0-01-DupB	LR	RE	SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	LCSP
WG	L0-01-MW1B	LR	RE	SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	LCSP
WG	L0-01-DupRE1	LR	RE	SW8270C	-	1,4-naphthoquinone	4	U	U	4	R	U	3.1	4	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	1,4-naphthoquinone	4	U	U	4	R	U	3.1	4	µg/L	RE
WG	L0-01-DupRE1	LR	RE	SW8270C	-	Aramite	4	U	U	4	R	U	2.5	4	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	Aramite	4	U	U	4	R	U	2.5	4	µg/L	RE
WG	L0-00-MW2RE1	LR	RE	SW8270C	-	Benzyl alcohol	10.2	U	U	10.2	R	U	3.2	10.2	µg/L	RE
WG	L0-00-MW2RE1	LR	RE	SW8270C	-	chlorobenzilate	4.1	U	U	4.1	R	U	2.6	4.1	µg/L	RE
WG	L0-01-DupRE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	R	U	2.5	4	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	chlorobenzilate	4	U	U	4	R	U	2.5	4	µg/L	RE
WG	L0-00-MW2RE1	LR	RE	SW8270C	-	Diethyl phthalate	4.1	U	U	4.1	R	U	2.9	4.1	µg/L	RE
WG	L0-01-DupRE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	R	U	2.8	4	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	Diethyl phthalate	4	U	U	4	R	U	2.8	4	µg/L	RE

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-00-MW2RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4.1	U	U	4.1	R	U	3.1	4.1	µg/L	RE
WG	L0-01-DupRE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	R	U	3	4	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	Dimethyl phthalate	4	U	U	4	R	U	3	4	µg/L	RE
WG	L0-00-MW2RE1	LR	RE	SW8270C	-	pentachloroethane	20.5	U	U	20.5	R	U	2.6	20.5	µg/L	RE
WG	L0-01-DupRE1	LR	RE	SW8270C	-	pentachloroethane	20	U	U	20	R	U	2.5	20	µg/L	RE
WG	L0-01-MW1RE1	LR	RE	SW8270C	-	pentachloroethane	20	U	U	20	R	U	2.5	20	µg/L	RE
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	4.2	U	U	4.2	R	U	3.2	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	R	U	3.6	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	R	U	3.8	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	R	U	3.3	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	R	U	2.4	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	R	U	5.9	21	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2,6-dichlorophenol	4.2	U	U	4.2	R	U	3.7	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	R	U	3	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	R	U	2.7	4.2	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.5	U	U	10.5	R	U	6.4	10.5	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	Benzyl alcohol	10.5	U	U	10.5	R	U	3.3	10.5	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	Pentachlorophenol	21	U	U	21	R	U	2.7	21	µg/L	SSR
WG	L0-01-MW-2C	LR	RE	SW8270C	-	Phenol	21	U	U	21	R	U	1.8	21	µg/L	SSR
WG	LO-04-02	N		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	2SL
WG	LO-05-01	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-02	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-01	N		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,CCVL,ICRSD
WG	LO-05-02	N		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,CCVL,ICRSD
WG	LO-04-02	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	2SL,ICRSD
WG	LO-05-01	N		E351.2	-	nitrogen, kjeldahl, total	0.323	=	=	0.323	U	U	0.12	0.26	mg/L	CCBL
WG	LO-05-02	N		E351.2	-	nitrogen, kjeldahl, total	0.435	=	=	0.435	U	U	0.12	0.26	mg/L	CCBL
WG	LO-07-01	N		E351.2	-	nitrogen, kjeldahl, total	0.478	=	=	0.478	U	U	0.128	0.26	mg/L	CCBL
WG	LO-05-01	N		E353.2M	-	Total Nitrogen, calculated	0.323	=	=	0.323	U	U	0	0	mg/L	CCBL
WG	LO-05-02	N		E353.2M	-	Total Nitrogen, calculated	0.435	=	=	0.435	U	U	0	0	mg/L	CCBL
WG	LO-07-01	N		E353.2M	-	Total Nitrogen, calculated	0.478	=	=	0.478	U	U	0	0	mg/L	CCBL
WG	L0-01-MW-1	N		E415.1	FLDFLT	Diss.organic carbon	1.86	=	=	1.86	U	U	0.368	1	mg/L	CCBL
WG	L0-01-MW-2	N		E415.1	FLDFLT	Diss.organic carbon	1.3	=	=	1.3	U	U	0.368	1	mg/L	CCBL
WG	LO-03-MW1	N		E415.1	FLDFLT	Diss.organic carbon	2.33	=	=	2.33	U	U	0.368	1	mg/L	CCBL
WG	LO-05-01	N		E415.1	FLDFLT	Diss.organic carbon	2.28	=	=	2.28	U	U	0.36	1	mg/L	CCBL
WG	LO-05-02	N		E415.1	FLDFLT	Diss.organic carbon	2.46	=	=	2.46	U	U	0.36	1	mg/L	CCBL
WG	LO-05-01	N		E415.1	-	Total organic carbon	2.18	=	=	2.18	U	U	0.36	1	mg/L	CCBL
WG	LO-05-02	N		E415.1	-	Total organic carbon	2.37	=	=	2.37	U	U	0.36	1	mg/L	CCBL
WG	LO-03-MW1	N		SW6010B	-	Aluminum	0.0248	B	J	0.0248	U	U	0.015	0.1	mg/L	CCBL
WG	LO-04-01	N		SW6010B	-	Aluminum	0.0178	B	J	0.0178	U	U	0.015	0.1	mg/L	CCBL
WG	L0-02-MW2	N		SW6010B	-	Arsenic	0.0124	=	=	0.0124	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-MW1	N		SW6010B	-	Arsenic	0.011	=	=	0.011	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-03-MW-2	N		SW6010B	-	Arsenic	0.01	=	=	0.01	U	U	0.0018	0.005	mg/L	CCBL
WG	LO-06-02	N		SW6010B	-	Arsenic	0.00985	=	=	0.00985	U	U	0.0018	0.005	mg/L	CCBL
WG	L0-02-MW2	N		SW6010B	-	Copper	0.0019	B	J	0.0019	U	U	0.00062	0.005	mg/L	CCBL
WG	LO-04-01	N		SW6010B	-	Copper	0.00096	B	J	0.00096	U	U	0.00062	0.005	mg/L	CCBL
WG	LO-06-01	N		SW6010B	-	Copper	0.00088	B	J	0.00088	U	U	0.00062	0.005	mg/L	CCBL
WG	LO-06-02	N		SW6010B	-	Copper	0.00307	B	J	0.00307	U	U	0.00062	0.005	mg/L	CCBL
WG	LO-07-01	N		SW6010B	-	Copper	0.00235	B	J	0.00235	U	U	0.00062	0.005	mg/L	CCBL
WG	LO-07-02	N		SW6010B	-	Copper	0.0014	B	J	0.0014	U	U	0.00062	0.005	mg/L	CCBL
WG	L0-00-MW2	N		SW6010B	-	Iron	0.0228	B	J	0.0228	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-03-MW-2	N		SW6010B	-	Iron	0.0123	B	J	0.0123	U	U	0.0092	0.05	mg/L	CCBL
WG	LO-04-01	N		SW6010B	-	Iron	0.0283	B	J	0.0283	U	U	0.0092	0.05	mg/L	CCBL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-04-01	N		SW6010B	-	Manganese	0.00524	=	=	0.00524	U	U	0.00046	0.005	mg/L	CCBL
WG	LO-07-01	N		SW6010B	-	Silver	0.00072	B	J	0.00072	U	U	0.00065	0.005	mg/L	CCBL
WG	L0-02-MW2	N		SW6010B	-	Zinc	0.00448	B	J	0.00448	U	U	0.00094	0.01	mg/L	CCBL
WG	LO-05-02	N		SW7470A	-	Mercury	8.1E-05	B	J	8.1E-05	U	U	0.000025	0.0002	mg/L	CCBL
WG	L0-01-MW1	N		E415.1	FLDFLT	Diss.organic carbon	0.685	B	J	0.685	U	U	0.368	1	mg/L	CCBL,LBL
WG	L0-01-MW-1	N		SW6010B	-	Zinc	0.00332	B	J	0.00332	U	U	0.00094	0.01	mg/L	CCBL,LBL
WG	L0-00-MW2	N		E415.1	FLDFLT	Diss.organic carbon	0.68	B	J	0.68	UJ	U	0.368	1	mg/L	CCBL,MSDH
WG	L0-01-MW1	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	L0-01-MW-1	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF
WG	LO-04-02	N		SW8270C	-	4-nitroquinoline-n-oxide	21	U	U	21	UJ	U	3.9	21	µg/L	CCRRF
WG	L0-00-MW1	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-01-MW-2	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-02-MW2	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	LO-03-MW1	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WG	L0-02-MW2	N		SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	CCRRF,ICRRF,ICRSD
WG	L0-00-MW1	N		SW8151	-	dalapon	0.64	U	U	0.64	UJ	U	0.38	0.64	µg/L	CCVF
WG	L0-01-MW-2	N		SW8081	-	alpha-chlordane	0.05	U	U	0.05	UJ	U	0.003	0.05	µg/L	CCVL
WG	LO-04-01	N		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-02	N		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WG	LO-04-01	N		SW8081	-	endrin ketone	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-01	N		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-02	N		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WG	LO-04-01	N		SW8081	-	p,p'-DDT	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-02	N		SW8081	-	p,p'-DDT	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WG	LO-04-01	N		SW8081	-	toxaphene	0.1	U	U	0.1	UJ	U	0.037	0.1	µg/L	CCVL
WG	LO-05-01	N		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL
WG	LO-05-02	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	bolstar	5.3	U	U	5.3	UJ	U	0.69	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	bolstar	5.1	U	U	5.1	UJ	U	0.68	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	coumaphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	coumaphos	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	demeton-s	5.3	U	U	5.3	UJ	U	0.35	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	demeton-s	5.1	U	U	5.1	UJ	U	0.34	5.1	µg/L	CCVL
WG	L0-02-MW2	N		SW8141	-	diazinon	5	U	U	5	UJ	U	0.27	5	µg/L	CCVL
WG	LO-03-MW1	N		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	CCVL
WG	L0-02-MW2	N		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.91	5	µg/L	CCVL
WG	LO-03-MW1	N		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	CCVL
WG	LO-06-01	N		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-06-02	N		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	disulfoton	5.3	U	U	5.3	UJ	U	0.93	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	disulfoton	5.1	U	U	5.1	UJ	U	0.9	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.78	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	ethoprop	5.1	U	U	5.1	UJ	U	0.76	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	merphos	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	merphos	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.5	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	parathion, ethyl	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	phorate	5.1	U	U	5.1	UJ	U	0.97	5.1	µg/L	CCVL
WG	L0-02-MW2	N		SW8141	-	stirofos	5	U	U	5	UJ	U	0.64	5	µg/L	CCVL
WG	LO-03-MW1	N		SW8141	-	stirofos	5.1	U	U	5.1	UJ	U	0.65	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.44	5.3	µg/L	CCVL

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APPENDIX C

Change in Qualifier Through the Data Validation Process

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-07-02	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.1	U	U	5.1	UJ	U	0.43	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	tokuthion (prothiofos)	5.3	U	U	5.3	UJ	U	0.63	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	tokuthion (prothiofos)	5.1	U	U	5.1	UJ	U	0.62	5.1	µg/L	CCVL
WG	LO-07-01	N		SW8141	-	trichloronate	5.3	U	U	5.3	UJ	U	0.59	5.3	µg/L	CCVL
WG	LO-07-02	N		SW8141	-	trichloronate	5.1	U	U	5.1	UJ	U	0.57	5.1	µg/L	CCVL
WG	L0-00-MW2	N		SW8151	-	dalapon	0.64	U	U	0.64	UJ	U	0.38	0.64	µg/L	CCVL
WG	LO-07-01	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-07-02	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WG	LO-04-01	N		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	CCVL
WG	LO-04-01	N		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	CCVL
WG	LO-07-01	N		SW8270C	-	bis(2-Chloroisopropyl) ether	4.2	U	U	4.2	UJ	U	3.5	4.2	µg/L	CCVL
WG	LO-07-02	N		SW8270C	-	bis(2-Chloroisopropyl) ether	4	U	U	4	UJ	U	3.3	4	µg/L	CCVL
WG	LO-06-01	N		SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	CCVL
WG	LO-04-01	N		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	CCVL
WG	L0-00-MW1	N		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	L0-00-MW2	N		SW8082	-	Aroclor-1016	0.51	U	U	0.51	UJ	U	0.37	0.51	µg/L	CCVL,ICRSD
WG	L0-01-MW-2	N		SW8141	-	dichlorvos	5.3	U	U	5.3	UJ	U	0.96	5.3	µg/L	CCVL,ICRSD
WG	LO-04-01	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	CCVL,ICRSD
WG	LO-06-01	N		SW8270C	-	4-nitroquinoline-n-oxide	20.8	U	U	20.8	UJ	U	3.8	20.8	µg/L	CCVL,ICRSD
WG	LO-06-02	N		SW8270C	-	4-nitroquinoline-n-oxide	20.4	U	U	20.4	UJ	U	3.8	20.4	µg/L	CCVL,ICRSD
WG	LO-07-01	N		SW8270C	-	4-nitroquinoline-n-oxide	21	U	U	21	UJ	U	3.9	21	µg/L	CCVL,ICRSD
WG	LO-07-02	N		SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	CCVL,ICRSD
WG	LO-06-01	N		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,ICRSD
WG	LO-06-02	N		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.8	4.1	µg/L	CCVL,ICRSD
WG	LO-07-01	N		SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	UJ	U	3.9	21	µg/L	CCVL,ICRSD,LCSDL
WG	LO-07-02	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	UJ	U	3.7	20	µg/L	CCVL,ICRSD,LCSDL
WG	LO-06-01	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL
WG	LO-06-02	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	CCVL,LCSDL,LCSL
WG	L0-02-MW2	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	CCVL,LCSL,MSL
WG	L0-00-MW2	N		E150.1	-	pH	7.33	=	=	7.33	J	J	0	0	PH UNITS	HTA
WG	L0-00-MW2	N		E180.1	-	turbidity	0.3	U	U	0.3	UJ	U	0.3	0.3	NTU	HTA
WG	LO-07-01	N		E350.1	-	Nitrogen, ammonia (as N)	0.108	=	=	0.108	J	J	0.017	0.02	mg/L	HTA
WG	LO-07-02	N		E350.1	-	Nitrogen, ammonia (as N)	0.474	=	=	0.474	J	J	0.017	0.02	mg/L	HTA
WG	LO-03-MW-2	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	ICRRF
WG	L0-02-MW2	N		SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	ICRRF,ICRSD
WG	L0-00-MW1	N		SW8081	-	alpha bhc	0.051	U	U	0.051	UJ	U	0.00059	0.051	µg/L	ICRSD
WG	L0-00-MW2	N		SW8081	-	alpha bhc	0.051	U	U	0.051	UJ	U	0.00059	0.051	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8081	-	beta bhc	0.051	U	U	0.051	UJ	U	0.0012	0.051	µg/L	ICRSD
WG	L0-00-MW1	N		SW8081	-	delta bhc	0.051	U	U	0.051	UJ	U	0.0031	0.051	µg/L	ICRSD
WG	L0-00-MW2	N		SW8081	-	delta bhc	0.051	U	U	0.051	UJ	U	0.0031	0.051	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8081	-	endrin aldehyde	0.05	U	U	0.05	UJ	U	0.0015	0.05	µg/L	ICRSD
WG	L0-01-MW-2	N		SW8081	-	endrin aldehyde	0.05	U	U	0.05	UJ	U	0.0015	0.05	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8081	-	endrin aldehyde	0.051	U	U	0.051	UJ	U	0.0015	0.051	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8081	-	methoxychlor	0.05	U	U	0.05	UJ	U	0.0018	0.05	µg/L	ICRSD
WG	L0-01-MW-2	N		SW8081	-	methoxychlor	0.05	U	U	0.05	UJ	U	0.0018	0.05	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8081	-	methoxychlor	0.051	U	U	0.051	UJ	U	0.0018	0.051	µg/L	ICRSD
WG	L0-00-MW1	N		SW8081	-	p,p'-DDT	0.051	U	U	0.051	UJ	U	0.0011	0.051	µg/L	ICRSD
WG	L0-00-MW2	N		SW8081	-	p,p'-DDT	0.051	U	U	0.051	UJ	U	0.0011	0.051	µg/L	ICRSD
WG	L0-01-MW-2	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	ICRSD
WG	LO-03-MW1	N		SW8082	-	Aroclor-1254	0.52	U	U	0.52	UJ	U	0.12	0.52	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8082	-	Aroclor-1254	0.51	U	U	0.51	UJ	U	0.12	0.51	µg/L	ICRSD

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-01-MW1	N		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	ICRSD
WG	L0-01-MW1	N		SW8141	-	mevinphos	5.1	U	U	5.1	UJ	U	0.47	5.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8141	-	mevinphos	5	U	U	5	UJ	U	0.46	5	µg/L	ICRSD
WG	L0-00-MW1	N		SW8141	-	naled	5.1	U	U	5.1	UJ	U	0.73	5.1	µg/L	ICRSD
WG	L0-00-MW2	N		SW8141	-	naled	5	U	U	5	UJ	U	0.72	5	µg/L	ICRSD
WG	L0-01-MW1	N		SW8141	-	naled	5.1	U	U	5.1	UJ	U	0.74	5.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8141	-	naled	5	U	U	5	UJ	U	0.72	5	µg/L	ICRSD
WG	L0-01-MW-2	N		SW8141	-	naled	5.3	U	U	5.3	UJ	U	0.76	5.3	µg/L	ICRSD
WG	LO-05-01	N		SW8141	-	parathion, methyl	5.1	U	U	5.1	UJ	U	0.55	5.1	µg/L	ICRSD
WG	LO-05-02	N		SW8141	-	parathion, methyl	5.1	U	U	5.1	UJ	U	0.55	5.1	µg/L	ICRSD
WG	LO-03-MW1	N		SW8260B	-	trans-1,2-Dichloroethene	1	U	U	1	UJ	U	0.18	1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD
WG	LO-04-01	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD
WG	L0-00-MW2	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WG	L0-01-MW-2	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WG	LO-05-01	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WG	LO-05-02	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	ICRSD
WG	LO-07-01	N		SW8270C	-	1,3,5-trinitrobenzene	21	U	U	21	UJ	U	2.9	21	µg/L	ICRSD
WG	LO-07-02	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	1,3-dinitrobenzene	20	U	U	20	UJ	U	2.5	20	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	1,3-dinitrobenzene	20.5	U	U	20.5	UJ	U	2.6	20.5	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	1,3-dinitrobenzene	20.5	U	U	20.5	UJ	U	2.6	20.5	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	1,4-naphthoquinone	4	U	U	4	UJ	U	3.1	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	1,4-naphthoquinone	4	U	U	4	UJ	U	3.1	4	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	1,4-naphthoquinone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4.1	U	U	4.1	UJ	U	3.1	4.1	µg/L	ICRSD
WG	LO-04-01	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4.1	U	U	4.1	UJ	U	3.1	4.1	µg/L	ICRSD
WG	LO-04-02	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	ICRSD
WG	LO-07-01	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	ICRSD
WG	LO-07-02	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	2,4-Dichlorophenol	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	2,4-Dichlorophenol	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	ICRSD
WG	LO-04-02	N		SW8270C	-	2,4-Dinitrophenol	21	U	U	21	UJ	U	5.9	21	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	2,4-Dinitrotoluene	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	2-acetylaminofluorene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	2-acetylaminofluorene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	2-acetylaminofluorene	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	2-acetylaminofluorene	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	2-acetylaminofluorene	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-06-01	N		SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	2-Methylphenol (o-Cresol)	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	2-Nitroaniline	4.1	U	U	4.1	UJ	U	3.1	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	3,3'-dimethylbenzidine	20	U	U	20	UJ	U	6	20	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	3,3'-dimethylbenzidine	20	U	U	20	UJ	U	6	20	µg/L	ICRSD

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-01	N		SW8270C	-	3,3'-dimethylbenzidine	20.5	U	U	20.5	UJ	U	6.2	20.5	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	3,3'-dimethylbenzidine	20.5	U	U	20.5	UJ	U	6.2	20.5	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	3-Nitroaniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	ICRSD
WG	LO-06-01	N		SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.1	4.2	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	4-Chloroaniline	4.1	U	U	4.1	UJ	U	3.1	4.1	µg/L	ICRSD
WG	LO-06-01	N		SW8270C	-	4-Methylphenol (p-Cresol)	10.4	U	U	10.4	UJ	U	6.4	10.4	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	4-Methylphenol (p-Cresol)	10.2	U	U	10.2	UJ	U	6.2	10.2	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	4-nitroquinoline-n-oxide	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	4-nitroquinoline-n-oxide	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	5-nitro-o-toluidine	4	U	U	4	UJ	U	2.6	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	5-nitro-o-toluidine	4	U	U	4	UJ	U	2.6	4	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	5-nitro-o-toluidine	4.1	U	U	4.1	UJ	U	2.7	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	UJ	U	3.7	20	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	UJ	U	3.7	20	µg/L	ICRSD
WG	LO-07-01	N		SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	ICRSD
WG	LO-07-02	N		SW8270C	-	Aniline	4	U	U	4	UJ	U	2.8	4	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	Aramite	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	Aramite	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	Aramite	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	Aramite	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WG	LO-07-01	N		SW8270C	-	Aramite	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	ICRSD
WG	LO-07-02	N		SW8270C	-	Aramite	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8270C	-	Benzyl alcohol	10.5	U	U	10.5	UJ	U	3.3	10.5	µg/L	ICRSD
WG	LO-06-01	N		SW8270C	-	Dibenzofuran	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	Dibenzofuran	4.1	U	U	4.1	UJ	U	2.8	4.1	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	hexachloropropene	4.1	U	U	4.1	UJ	U	2	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	methapyrilene	4.1	U	U	4.1	UJ	U	3.8	4.1	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	methapyrilene	4.1	U	U	4.1	UJ	U	3.8	4.1	µg/L	ICRSD
WG	LO-04-02	N		SW8270C	-	nitrosomethylethylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	ICRSD
WG	LO-04-01	N		SW8270C	-	n-Nitrosodiphenylamine	4.1	U	U	4.1	UJ	U	3.5	4.1	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	p-dimethylaminoazobenzene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	p-dimethylaminoazobenzene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	µg/L	ICRSD
WG	LO-03-MW1	N		SW8270C	-	pentachloronitrobenzene	4.1	U	U	4.1	UJ	U	2.5	4.1	µg/L	ICRSD
WG	LO-03-MW-2	N		SW8270C	-	Pentachlorophenol	21	U	U	21	UJ	U	2.7	21	µg/L	ICRSD
WG	LO-04-02	N		SW8270C	-	Pentachlorophenol	21	U	U	21	UJ	U	2.7	21	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	Pentachlorophenol	20.5	U	U	20.5	UJ	U	2.7	20.5	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	Pentachlorophenol	20.5	U	U	20.5	UJ	U	2.7	20.5	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	phenacetin	4	U	U	4	UJ	U	2.7	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	phenacetin	4	U	U	4	UJ	U	2.7	4	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	p-phenylenediamine	20	U	U	20	UJ	U	2.7	20	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	p-phenylenediamine	20	U	U	20	UJ	U	2.7	20	µg/L	ICRSD
WG	L0-01-MW-1	N		SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	µg/L	ICRSD
WG	L0-02-MW2	N		SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	µg/L	ICRSD
WG	LO-05-01	N		SW8270C	-	pyridine	4.1	U	U	4.1	UJ	U	2.2	4.1	µg/L	ICRSD
WG	LO-05-02	N		SW8270C	-	pyridine	4.1	U	U	4.1	UJ	U	2.2	4.1	µg/L	ICRSD
WG	LO-06-01	N		SW8270C	-	pyridine	4.2	U	U	4.2	UJ	U	2.2	4.2	µg/L	ICRSD
WG	LO-06-02	N		SW8270C	-	pyridine	4.1	U	U	4.1	UJ	U	2.1	4.1	µg/L	ICRSD 1049
WG	LO-06-01	N		SW8270C	-	a,a-Dimethylphenethylamine	20.8	U	U	20.8	UJ	U	3.8	20.8	µg/L	ICRSD,LCSDL,LCSL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-06-02	N		SW8270C	-	a,a-Dimethylphenethylamine	20.4	U	U	20.4	UJ	U	3.8	20.4	µg/L	ICRSD,LCSDL,LCSL
WG	LO-04-02	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD,MSDL,MSL
WG	L0-01-MW-2	N		SW8141	-	mevinphos	5.3	U	U	5.3	UJ	U	0.49	5.3	µg/L	ICRSD,MSL
WG	L0-01-MW1	N		SW8081	-	endrin aldehyde	0.051	U	U	0.051	UJ	U	0.0015	0.051	µg/L	ICRSD,SSL
WG	L0-01-MW1	N		SW8081	-	methoxychlor	0.051	U	U	0.051	UJ	U	0.0018	0.051	µg/L	ICRSD,SSL
WG	L0-00-MW1	N		E350.3	-	Nitrogen, ammonia (as N)	0.206	B	J	0.206	U	U	0.0366	0.3	mg/L	LBH
WG	L0-00-MW1	N		E415.1	-	Total organic carbon	1	=	=	1	U	U	0.368	1	mg/L	LBH
WG	L0-01-MW-2	N		E405.1	-	BOD, five day	4	J	J	4	U	U	2	10	mg/L	LBL
WG	LO-04-01	N		E415.1	FLDFLT	Diss.organic carbon	2.34	=	=	2.34	U	U	0.368	1	mg/L	LBL
WG	LO-04-02	N		E415.1	FLDFLT	Diss.organic carbon	2.59	=	=	2.59	U	U	0.368	1	mg/L	LBL
WG	L0-00-MW2	N		E415.1	-	Total organic carbon	0.53	B	J	0.53	U	U	0.368	1	mg/L	LBL
WG	LO-04-01	N		E415.1	-	Total organic carbon	1.93	=	=	1.93	U	U	0.368	1	mg/L	LBL
WG	L0-00-MW2	N		SW6010B	-	Aluminum	0.024	B	J	0.024	U	U	0.015	0.1	mg/L	LBL
WG	L0-01-MW-2	N		SW6010B	-	Aluminum	0.0243	B	J	0.0243	U	U	0.015	0.1	mg/L	LBL
WG	L0-00-MW1	N		SW6010B	-	Iron	0.0348	B	J	0.0348	U	U	0.0092	0.05	mg/L	LBL
WG	L0-00-MW2	N		SW6010B	-	Zinc	0.00486	B	J	0.00486	U	U	0.00094	0.01	mg/L	LBL
WG	LO-03-MW-2	N		SW6010B	-	Zinc	0.00303	B	J	0.00303	U	U	0.00094	0.01	mg/L	LBL
WG	L0-01-MW-1	N		SW8141	-	phorate	5	U	U	5	UJ	U	0.95	5	µg/L	LCSDL
WG	L0-01-MW1	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.11	0.5	µg/L	LCSDL
WG	L0-01-MW1	N		SW8151	-	silvex (2,4,5-tp)	0.5	U	U	0.5	UJ	U	0.038	0.5	µg/L	LCSDL
WG	LO-07-01	N		SW8260B	-	1,2-Dichlorobenzene	1	U	U	1	UJ	U	0.26	1	µg/L	LCSDL
WG	LO-07-02	N		SW8260B	-	1,2-Dichlorobenzene	1	U	U	1	UJ	U	0.26	1	µg/L	LCSDL
WG	LO-07-01	N		SW8260B	-	1,4-Dichlorobenzene	1	U	U	1	UJ	U	0.18	1	µg/L	LCSDL
WG	LO-07-02	N		SW8260B	-	1,4-Dichlorobenzene	1	U	U	1	UJ	U	0.18	1	µg/L	LCSDL
WG	LO-04-02	N		SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	R	U	3.9	21	µg/L	LCSDL
WG	L0-01-MW1	N		SW8081	-	gamma bhc (lindane)	0.051	U	U	0.051	UJ	U	0.0025	0.051	µg/L	LCSDL,LCSL,SSL
WG	L0-01-MW1	N		SW8081	-	gamma-chlordane	0.051	U	U	0.051	UJ	U	0.0025	0.051	µg/L	LCSDL,LCSL,SSL
WG	L0-01-MW1	N		SW8081	-	alpha-chlordane	0.051	U	U	0.051	UJ	U	0.0031	0.051	µg/L	LCSDL,SSL
WG	L0-01-MW1	N		SW8081	-	heptachlor	0.051	U	U	0.051	R	U	0.0014	0.051	µg/L	LCSDL,SSL
WG	L0-01-MW1	N		SW8081	-	p,p'-DDE	0.051	U	U	0.051	UJ	U	0.0039	0.051	µg/L	LCSDL,SSL
WG	L0-01-MW-1	N		SW8081	-	gamma-chlordane	0.05	U	U	0.05	UJ	U	0.0024	0.05	µg/L	LCSL
WG	L0-01-MW1	N		SW8141	-	phorate	5.1	U	U	5.1	UJ	U	0.97	5.1	µg/L	LCSL
WG	L0-01-MW-2	N		SW8141	-	phorate	5.3	U	U	5.3	UJ	U	1	5.3	µg/L	LCSL
WG	L0-01-MW1	N		SW8141	-	ronnel	5.1	U	U	5.1	UJ	U	0.24	5.1	µg/L	LCSL
WG	L0-01-MW1	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.1	U	U	5.1	UJ	U	0.43	5.1	µg/L	LCSL
WG	L0-01-MW-2	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.52	U	U	0.52	UJ	U	0.11	0.52	µg/L	LCSL
WG	LO-05-02	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	LCSL
WG	L0-01-MW-2	N		SW8151	-	dicamba	0.52	U	U	0.52	UJ	U	0.035	0.52	µg/L	LCSL
WG	LO-05-02	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.03	0.5	µg/L	LCSL
WG	L0-01-MW-2	N		SW8151	-	silvex (2,4,5-tp)	0.52	U	U	0.52	UJ	U	0.039	0.52	µg/L	LCSL
WG	LO-04-01	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	µg/L	LCSL
WG	LO-04-02	N		SW8260B	-	1,2,3-Trichloropropane	1	U	U	1	UJ	U	0.44	1	µg/L	LCSL
WG	LO-04-02	N		SW8270C	-	1,2,4-Trichlorobenzene	4.2	U	U	4.2	R	U	2.7	4.2	µg/L	LCSL
WG	LO-03-MW1	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	R	U	3.8	20.5	µg/L	LCSL
WG	LO-03-MW-2	N		SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	R	U	3.9	21	µg/L	LCSL
WG	LO-04-01	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	R	U	3.8	20.5	µg/L	LCSL
WG	LO-03-MW-2	N		SW8270C	-	pyridine	4.2	U	U	4.2	R	U	2.2	4.2	µg/L	LCSL
WG	LO-04-02	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	µg/L	LCSL,MSDL,MSL
WG	L0-01-MW-2	N		SW8141	-	ronnel	5.3	U	U	5.3	UJ	U	0.24	5.3	µg/L	LCSL,MSL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	L0-01-MW-2	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.3	U	U	5.3	UJ	U	0.45	5.3	µg/L	LCSL,MSL
WG	LO-05-01	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	LCSL,SSL
WG	LO-05-01	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.03	0.5	µg/L	LCSL,SSL
WG	L0-00-MW2	N		E351.2	-	nitrogen, kjeldahl, total	0.781	=	=	0.781	J	J	0.128	0.26	mg/L	MSDL
WG	LO-03-MW-2	N		E353.2	-	Nitrogen, nitrate-nitrite	0.0201	U	U	0.0201	UJ	U	0.0201	0.1	mg/L	MSDL
WG	LO-03-MW-2	N		E900	-	Alpha, gross	2.89	U	U	2.89	UJ	U	2.89	5	pCi/L	MSDL
WG	LO-05-02	N		SW8141	-	ronnel	5.1	U	U	5.1	UJ	U	0.24	5.1	µg/L	MSDL
WG	LO-04-02	N		SW8260B	-	2-Hexanone	5	U	U	5	UJ	U	4	5	µg/L	MSDL
WG	LO-06-01	N		E310.1	-	Alkalinity, bicarb (as CaCO3)	141	=	=	141	J	J	0.5	1	mg/L	MSDL,MSL
WG	LO-06-02	N		E310.1	-	Alkalinity, bicarb (as CaCO3)	127	=	=	127	J	J	0.5	1	mg/L	MSDL,MSL
WG	LO-06-01	N		E310.1	-	Alkalinity, total (as CaCO3)	141	=	=	141	J	J	0.5	1	mg/L	MSDL,MSL
WG	LO-06-02	N		E310.1	-	Alkalinity, total (as CaCO3)	127	=	=	127	J	J	0.5	1	mg/L	MSDL,MSL
WG	LO-06-01	N		E350.1	-	Nitrogen, ammonia (as N)	0.0316	=	=	0.0316	J	J	0.017	0.02	mg/L	MSDL,MSL
WG	LO-06-02	N		E350.1	-	Nitrogen, ammonia (as N)	0.179	=	=	0.179	J	J	0.017	0.02	mg/L	MSDL,MSL
WG	L0-01-MW-2	N		E351.2	-	nitrogen, kjeldahl, total	1.26	=	=	1.26	J	J	0.128	0.26	mg/L	MSDL,MSL
WG	LO-03-MW-2	N		E351.2	-	nitrogen, kjeldahl, total	0.377	=	=	0.377	J	J	0.128	0.26	mg/L	MSDL,MSL
WG	LO-03-MW-2	N		E353.2M	-	Total Nitrogen, calculated	0.377	=	=	0.377	J	J	0	0	mg/L	MSDL,MSL
WG	LO-03-MW-2	N		E415.1	-	Total organic carbon	5.94	=	=	5.94	J	J	0.368	1	mg/L	MSDL,MSL
WG	LO-04-02	N		E415.1	-	Total organic carbon	8.98	=	=	8.98	J	J	0.368	1	mg/L	MSDP,MSH,MSH
WG	LO-03-MW-2	N		E415.1	FLDFLT	Diss.organic carbon	4.94	=	=	4.94	J	J	0.368	1	mg/L	MSL
WG	L0-01-MW-2	N		SW6010B	-	Selenium	0.0026	U	U	0.0026	UJ	U	0.0026	0.005	mg/L	MSL
WG	L0-01-MW-2	N		SW8141	-	ethoprop	5.3	U	U	5.3	UJ	U	0.79	5.3	µg/L	MSL
WG	LO-03-MW-2	N		SW8141	-	fenthion	5.4	U	U	5.4	R	U	0.58	5.4	µg/L	MSL
WG	L0-01-MW-2	N		SW8141	-	parathion, ethyl	5.3	U	U	5.3	UJ	U	0.51	5.3	µg/L	MSL
WG	LO-05-02	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.11	0.5	µg/L	MSL
WG	LO-05-02	N		SW8151	-	Picloram	0.5	U	U	0.5	UJ	U	0.07	0.5	µg/L	MSL
WG	LO-05-01	N		SW6010B	-	Zinc	0.00094	U	U	0.00094	UJ	U	0.00094	0.01	mg/L	SDIL
WG	LO-05-02	N		SW6010B	-	Zinc	0.00094	U	U	0.00094	UJ	U	0.00094	0.01	mg/L	SDIL
WG	LO-07-01	N		FLPRO	-	petroleum hydrocarbons	358	U	U	358	UJ	U	102	358	µg/L	SSL
WG	LO-07-02	N		FLPRO	-	petroleum hydrocarbons	349	U	U	349	UJ	U	99.5	349	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	Aldrin	0.051	U	U	0.051	UJ	U	0.00086	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	alpha bhc	0.051	U	U	0.051	UJ	U	0.00059	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	alpha endosulfan	0.051	U	U	0.051	UJ	U	0.0044	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	beta bhc	0.051	U	U	0.051	UJ	U	0.0012	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	beta endosulfan	0.051	U	U	0.051	UJ	U	0.0016	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	delta bhc	0.051	U	U	0.051	UJ	U	0.0031	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	Dieldrin	0.051	U	U	0.051	UJ	U	0.0028	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	endosulfan sulfate	0.051	U	U	0.051	UJ	U	0.001	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	endrin	0.051	U	U	0.051	UJ	U	0.0018	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	endrin ketone	0.051	U	U	0.051	UJ	U	0.0011	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	heptachlor epoxide	0.051	U	U	0.051	UJ	U	0.0014	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	p,p'-DDD	0.051	U	U	0.051	UJ	U	0.0027	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	p,p'-DDT	0.051	U	U	0.051	UJ	U	0.0011	0.051	µg/L	SSL
WG	L0-01-MW1	N		SW8081	-	toxaphene	0.51	U	U	0.51	UJ	U	0.18	0.51	µg/L	SSL
WG	LO-05-01	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.11	0.5	µg/L	SSL
WG	LO-05-01	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.15	0.5	µg/L	SSL
WG	LO-05-01	N		SW8151	-	dichloroprop	0.5	U	U	0.5	UJ	U	0.18	0.5	µg/L	SSL
WG	LO-05-01	N		SW8151	-	dinoseb	0.5	U	U	0.5	UJ	U	0.05	0.5	µg/L	SSL
WG	LO-05-01	N		SW8151	-	Picloram	0.5	U	U	0.5	UJ	U	0.07	0.5	µg/L	SSL

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WG	LO-05-01	N		SW8151	-	silvex (2,4,5-tp)	0.5	U	U	0.5	UJ	U	0.03	0.5	µg/L	SSL
WG	L0-02-MW2	N		E365.2	-	P, total (as P)	0.241	=	=	0.241	J	J	0.017	0.04	mg/L	TD
WG	LO-03-MW-2	N		E365.2	-	P, total (as P)	0.236	=	=	0.236	J	J	0.017	0.04	mg/L	TD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	kepone	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	CCRRF,ICRRF,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Aniline	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	CCVH,HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Aniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	CCVL,HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	21	U	U	21	UJ	U	3.9	21	µg/L	CCVL,HTP,ICRSD,MSL
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4.3	U	U	4.3	UJ	U	2.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1,2,4,5-tetrachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1,2,4-Trichlorobenzene	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1-naphthylamine	10.8	U	U	10.8	UJ	U	1.9	10.8	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1-naphthylamine	10.5	U	U	10.5	UJ	U	1.9	10.5	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.3	U	U	4.3	UJ	U	3.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.3	U	U	4.3	UJ	U	3.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	UJ	U	3.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.3	U	U	4.3	UJ	U	3.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.3	U	U	4.3	UJ	U	2.5	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	21.6	U	U	21.6	UJ	U	6	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	UJ	U	5.9	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,4-Dinitrotoluene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-aminonaphthalene	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-aminonaphthalene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-Chloronaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-Chlorophenol	4.3	U	U	4.3	UJ	U	3.1	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-Methylnaphthalene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-Nitroaniline	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-Nitroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	21.6	U	U	21.6	UJ	U	1.6	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-picoline (alpha-picoline)	21	U	U	21	UJ	U	1.6	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	3,3'-Dichlorobenzidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	3-methylcholanthrene	4.3	U	U	4.3	UJ	U	2.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	3-methylcholanthrene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	3-Nitroaniline	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	3-Nitroaniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4.3	U	U	4.3	UJ	U	2.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-aminobiphenyl (4-biphenylamine)	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4.3	U	U	4.3	UJ	U	2.5	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-Bromophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.4	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-Chloroaniline	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-Chlorophenyl phenyl ether	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.8	U	U	10.8	UJ	U	6.6	10.8	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.5	U	U	10.5	UJ	U	6.4	10.5	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-Nitroaniline	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	4-Nitroaniline	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	7,12-dimethylbenz(a)anthracene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Acetophenone	4.3	U	U	4.3	UJ	U	0.71	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Acetophenone	4.2	U	U	4.2	UJ	U	0.69	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Benzyl alcohol	10.8	U	U	10.8	UJ	U	3.4	10.8	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Benzyl alcohol	10.5	U	U	10.5	UJ	U	3.3	10.5	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Benzyl butyl phthalate	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4.3	U	U	4.3	UJ	U	3.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Bis(2-Chloroethoxy) methane	4.2	U	U	4.2	UJ	U	3.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	bis(2-Chloroethyl) ether	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4.3	U	U	4.3	UJ	U	3.6	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	bis(2-Chloroisopropyl) ether	4.2	U	U	4.2	UJ	U	3.5	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	chlorobenzilate	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	chlorobenzilate	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	diallate	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	diallate	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Dibenzofuran	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Dibenzofuran	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Diethyl phthalate	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Diethyl phthalate	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Dimethyl phthalate	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Dimethyl phthalate	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	ethyl methanesulfonate	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	hexachloropropene	4.3	U	U	4.3	UJ	U	2.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	hexachloropropene	4.2	U	U	4.2	UJ	U	2.1	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	isodrin	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	isodrin	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Isophorone	4.3	U	U	4.3	UJ	U	4.1	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Isophorone	4.2	U	U	4.2	UJ	U	4	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	isosafrole	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	isosafrole	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	methapyrilene	4.3	U	U	4.3	UJ	U	4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	methapyrilene	4.2	U	U	4.2	UJ	U	3.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	methyl methanesulfonate	21.6	U	U	21.6	UJ	U	2	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	methyl methanesulfonate	21	U	U	21	UJ	U	2	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Nitrobenzene	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Nitrobenzene	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	nitrosomethylethylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4.3	U	U	4.3	UJ	U	3.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitrosodiethylamine	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4.3	U	U	4.3	UJ	U	2.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitrosodimethylamine	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitroso-di-n-butylamine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-Nitrosodi-n-propylamine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4.3	U	U	4.3	UJ	U	3.7	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-Nitrosodiphenylamine	4.2	U	U	4.2	UJ	U	3.6	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitrosomorpholine	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4.3	U	U	4.3	UJ	U	3	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitrosopiperidine	4.2	U	U	4.2	UJ	U	2.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	n-nitrosopyrrolidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4.3	U	U	4.3	UJ	U	3.1	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	o,o,o-triethyl phosphorothioate	4.2	U	U	4.2	UJ	U	3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	o-toluidine	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	o-toluidine	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	pentachlorobenzene	4.3	U	U	4.3	UJ	U	2.4	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	pentachlorobenzene	4.2	U	U	4.2	UJ	U	2.3	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	pentachloroethane	21.6	U	U	21.6	UJ	U	2.7	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	pentachloroethane	21	U	U	21	UJ	U	2.6	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Pentachlorophenol	21.6	U	U	21.6	UJ	U	2.8	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Pentachlorophenol	21	U	U	21	UJ	U	2.7	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Phenol	21.6	U	U	21.6	UJ	U	1.8	21.6	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Phenol	21	U	U	21	UJ	U	1.8	21	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	pronamide	4.3	U	U	4.3	UJ	U	1.9	4.3	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	pronamide	4.2	U	U	4.2	UJ	U	1.9	4.2	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	safrole	10.8	U	U	10.8	UJ	U	2.7	10.8	µg/L	HTP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	safrole	10.5	U	U	10.5	UJ	U	2.6	10.5	µg/L	HTP
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	21.6	U	U	21.6	UJ	U	3	21.6	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1,3,5-trinitrobenzene	21	U	U	21	UJ	U	2.9	21	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	21.6	U	U	21.6	UJ	U	2.7	21.6	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1,3-dinitrobenzene	21	U	U	21	UJ	U	2.6	21	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	1,4-naphthoquinone	4.3	U	U	4.3	UJ	U	3.4	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	1,4-naphthoquinone	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	4.3	U	U	4.3	UJ	U	3.2	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4.3	U	U	4.3	UJ	U	3.8	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2,6-dichlorophenol	4.2	U	U	4.2	UJ	U	3.7	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	2-acetylaminofluorene	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	2-acetylaminofluorene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	21.6	U	U	21.6	UJ	U	6.5	21.6	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	3,3'-dimethylbenzidine	21	U	U	21	UJ	U	6.3	21	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	4-nitroquinoline-n-oxide	21.6	U	U	21.6	UJ	U	4	21.6	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	4.3	U	U	4.3	UJ	U	2.8	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	5-nitro-o-toluidine	4.2	U	U	4.2	UJ	U	2.7	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	Aramite	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	Aramite	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	kepone	4.3	U	U	4.3	UJ	U	3.4	4.3	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	4.3	U	U	4.3	UJ	U	2.7	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	p-dimethylaminoazobenzene	4.2	U	U	4.2	UJ	U	2.6	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4.3	U	U	4.3	UJ	U	2.6	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	pentachloronitrobenzene	4.2	U	U	4.2	UJ	U	2.5	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	phenacetin	4.3	U	U	4.3	UJ	U	2.9	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	phenacetin	4.2	U	U	4.2	UJ	U	2.8	4.2	µg/L	HTP,ICRSD

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	p-phenylenediamine	21.6	U	U	21.6	UJ	U	2.9	21.6	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	p-phenylenediamine	21	U	U	21	UJ	U	2.8	21	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	pyridine	4.3	U	U	4.3	UJ	U	2.3	4.3	µg/L	HTP,ICRSD
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	pyridine	4.2	U	U	4.2	UJ	U	2.2	4.2	µg/L	HTP,ICRSD
WS	L0-00-LakeRE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	21.6	U	U	21.6	UJ	U	4	21.6	µg/L	HTP,ICRSD,LCSL,LCSP
WS	L0-01-LakeRE1	LR	RE	SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	UJ	U	3.9	21	µg/L	HTP,ICRSD,MSDL,MSL
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,3,4,6-tetrachlorophenol	4.2	U	U	4.2	R	U	3.2	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,4,5-Trichlorophenol	4.2	U	U	4.2	R	U	3.6	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,4,6-Trichlorophenol	4.2	U	U	4.2	R	U	3.8	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	R	U	3.3	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,4-Dimethylphenol	4.2	U	U	4.2	R	U	2.4	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,4-Dinitrophenol	21	U	U	21	R	U	5.9	21	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2,6-dichlorophenol	4.2	U	U	4.2	R	U	3.7	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2-Chlorophenol	4.2	U	U	4.2	R	U	3	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	2-Methylphenol (o-Cresol)	4.2	U	U	4.2	R	U	2.7	4.2	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	4-Methylphenol (p-Cresol)	10.5	U	U	10.5	R	U	6.4	10.5	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	Benzyl alcohol	10.5	U	U	10.5	R	U	3.3	10.5	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	Pentachlorophenol	21	U	U	21	R	U	2.7	21	µg/L	SSR
WS	L0-01-LakeC	LR	RE	SW8270C	-	Phenol	21	U	U	21	R	U	1.8	21	µg/L	SSR
WS	LO-04-03	N		SW8260B	-	iodomethane	2	U	U	2	UJ	U	1	2	µg/L	2SL
WS	LO-05-03	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WS	LO-05-03	N		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,CCVL,ICRSD
WS	LO-04-03	N		SW8260B	-	Bromomethane	1	U	U	1	UJ	U	1	1	µg/L	2SL,ICRSD
WS	LO-03-Lake	N		SW6010B	-	Aluminum	0.144	=	=	0.144	U	U	0.015	0.1	mg/L	CCBH
WS	LO-05-03	N		E351.2	-	nitrogen, kjeldahl, total	0.415	=	=	0.415	U	U	0.12	0.26	mg/L	CCBL
WS	LO-05-03	N		E353.2M	-	Total Nitrogen, calculated	0.415	=	=	0.415	U	U	0	0	mg/L	CCBL
WS	L0-00-Lake	N		SW6010B	-	Arsenic	0.00841	=	=	0.00841	U	U	0.0018	0.005	mg/L	CCBL
WS	L0-01-Lake	N		SW6010B	-	Arsenic	0.00858	=	=	0.00858	U	U	0.0018	0.005	mg/L	CCBL
WS	L0-02-Lake	N		SW6010B	-	Arsenic	0.00888	=	=	0.00888	U	U	0.0018	0.005	mg/L	CCBL
WS	LO-03-Lake	N		SW6010B	-	Arsenic	0.00927	=	=	0.00927	U	U	0.0018	0.005	mg/L	CCBL
WS	LO-05-03	N		SW6010B	-	Arsenic	0.0118	=	=	0.0118	U	U	0.0018	0.005	mg/L	CCBL
WS	LO-06-03	N		SW6010B	-	Arsenic	0.00805	=	=	0.00805	U	U	0.0018	0.005	mg/L	CCBL
WS	LO-05-03	N		SW6010B	-	Cadmium	0.00132	B	J	0.00132	U	U	0.00035	0.005	mg/L	CCBL
WS	L0-01-Lake	N		SW6010B	-	Copper	0.00442	B	J	0.00442	U	U	0.00062	0.005	mg/L	CCBL
WS	L0-02-Lake	N		SW6010B	-	Copper	0.00207	B	J	0.00207	U	U	0.00062	0.005	mg/L	CCBL
WS	LO-06-03	N		SW6010B	-	Copper	0.00159	B	J	0.00159	U	U	0.00062	0.005	mg/L	CCBL
WS	LO-07-03	N		SW6010B	-	Copper	0.00282	B	J	0.00282	U	U	0.00062	0.005	mg/L	CCBL
WS	LO-03-Lake	N		SW6010B	-	Iron	0.0312	B	J	0.0312	U	U	0.0092	0.05	mg/L	CCBL
WS	LO-07-03	N		SW6010B	-	Selenium	0.00601	=	=	0.00601	U	U	0.0026	0.005	mg/L	CCBL
WS	L0-00-Lake	N		SW6010B	-	Zinc	0.0131	=	=	0.0131	U	U	0.00094	0.01	mg/L	CCBL
WS	L0-02-Lake	N		SW6010B	-	Zinc	0.00498	B	J	0.00498	U	U	0.00094	0.01	mg/L	CCBL
WS	LO-04-03	N		SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	CCRRF
WS	L0-00-Lake	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WS	L0-01-Lake	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WS	L0-02-Lake	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCRRF,ICRRF
WS	L0-01-Lake	N		SW8081	-	alpha-chlordane	0.058	U	U	0.058	UJ	U	0.0035	0.058	µg/L	CCVL
WS	LO-04-03	N		SW8081	-	endrin aldehyde	0.01	U	U	0.01	UJ	U	0.00031	0.01	µg/L	CCVL
WS	LO-04-03	N		SW8081	-	methoxychlor	0.01	U	U	0.01	UJ	U	0.00037	0.01	µg/L	CCVL
WS	LO-04-03	N		SW8081	-	p,p'-DDT	0.01	U	U	0.01	UJ	U	0.00022	0.01	µg/L	CCVL
WS	LO-05-03	N		SW8082	-	Aroclor-1016	0.5	U	U	0.5	UJ	U	0.36	0.5	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	azinphos, methyl (guthion)	5.1	U	U	5.1	UJ	U	0.52	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	bolstar	5.1	U	U	5.1	UJ	U	0.68	5.1	µg/L	CCVL 1055
WS	LO-07-03	N		SW8141	-	coumaphos	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	LO-07-03	N		SW8141	-	demeton-s	5.1	U	U	5.1	UJ	U	0.34	5.1	µg/L	CCVL
WS	L0-02-Lake	N		SW8141	-	diazinon	5.2	U	U	5.2	UJ	U	0.28	5.2	µg/L	CCVL
WS	L0-02-Lake	N		SW8141	-	dichlorvos	5.2	U	U	5.2	UJ	U	0.94	5.2	µg/L	CCVL
WS	LO-06-03	N		SW8141	-	dichlorvos	5	U	U	5	UJ	U	0.9	5	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	disulfoton	5.1	U	U	5.1	UJ	U	0.9	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	ethoprop	5.1	U	U	5.1	UJ	U	0.76	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	merphos	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	parathion, ethyl	5.1	U	U	5.1	UJ	U	0.49	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	phorate	5.1	U	U	5.1	UJ	U	0.97	5.1	µg/L	CCVL
WS	L0-02-Lake	N		SW8141	-	stirofos	5.2	U	U	5.2	UJ	U	0.66	5.2	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.1	U	U	5.1	UJ	U	0.43	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	tokuthion (prothiofos)	5.1	U	U	5.1	UJ	U	0.62	5.1	µg/L	CCVL
WS	LO-07-03	N		SW8141	-	trichloronate	5.1	U	U	5.1	UJ	U	0.57	5.1	µg/L	CCVL
WS	L0-00-Lake	N		SW8151	-	dalapon	0.66	U	U	0.66	UJ	U	0.39	0.66	µg/L	CCVL
WS	LO-07-03	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	CCVL
WS	LO-07-03	N		SW8270C	-	bis(2-Chloroisopropyl) ether	4.1	U	U	4.1	UJ	U	3.4	4.1	µg/L	CCVL
WS	LO-06-03	N		SW8270C	-	hexachloropropene	4	U	U	4	UJ	U	2	4	µg/L	CCVL
WS	L0-00-Lake	N		SW8082	-	Aroclor-1016	0.52	U	U	0.52	UJ	U	0.38	0.52	µg/L	CCVL,ICRSD
WS	L0-01-Lake	N		SW8141	-	dichlorvos	5.4	U	U	5.4	UJ	U	0.97	5.4	µg/L	CCVL,ICRSD
WS	LO-06-03	N		SW8270C	-	Aniline	4	U	U	4	UJ	U	2.8	4	µg/L	CCVL,ICRSD
WS	LO-07-03	N		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	CCVL,ICRSD,LCSDL,MSDL, MSL
WS	LO-07-03	N		SW8270C	-	4-nitroquinoline-n-oxide	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	CCVL,ICRSD,MSDL,MSL
WS	LO-06-03	N		SW8151	-	dalapon	0.64	U	U	0.64	UJ	U	0.38	0.64	µg/L	CCVL,LCSDL,LCSL
WS	L0-02-Lake	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	CCVL,LCSL,MSL
WS	LO-05-03	N		SW6010B	-	Zinc	0.00175	B	J	0.00175	J	J	0.00094	0.01	mg/L	IB,SDIL
WS	LO-03-Lake	N		SW8260B	-	Acrolein	10	U	U	10	UJ	U	1.4	10	µg/L	ICRRF
WS	L0-02-Lake	N		SW8270C	-	4-nitroquinoline-n-oxide	20	U	U	20	UJ	U	3.7	20	µg/L	ICRRF,ICRSD
WS	L0-02-Lake	N		SW8270C	-	kepone	4	U	U	4	UJ	U	3.1	4	µg/L	ICRRF,ICRSD
WS	L0-00-Lake	N		SW8081	-	alpha bhc	0.052	U	U	0.052	UJ	U	0.0006	0.052	µg/L	ICRSD
WS	LO-03-Lake	N		SW8081	-	beta bhc	0.051	U	U	0.051	UJ	U	0.0012	0.051	µg/L	ICRSD
WS	L0-00-Lake	N		SW8081	-	delta bhc	0.052	U	U	0.052	UJ	U	0.0031	0.052	µg/L	ICRSD
WS	L0-01-Lake	N		SW8081	-	endrin aldehyde	0.058	U	U	0.058	UJ	U	0.0017	0.058	µg/L	ICRSD
WS	LO-03-Lake	N		SW8081	-	endrin aldehyde	0.051	U	U	0.051	UJ	U	0.0015	0.051	µg/L	ICRSD
WS	L0-01-Lake	N		SW8081	-	methoxychlor	0.058	U	U	0.058	UJ	U	0.0021	0.058	µg/L	ICRSD
WS	LO-03-Lake	N		SW8081	-	methoxychlor	0.051	U	U	0.051	UJ	U	0.0018	0.051	µg/L	ICRSD
WS	L0-00-Lake	N		SW8081	-	p,p'-DDT	0.052	U	U	0.052	UJ	U	0.0011	0.052	µg/L	ICRSD
WS	L0-01-Lake	N		SW8082	-	Aroclor-1016	0.58	U	U	0.58	UJ	U	0.42	0.58	µg/L	ICRSD
WS	LO-03-Lake	N		SW8082	-	Aroclor-1254	0.51	U	U	0.51	UJ	U	0.12	0.51	µg/L	ICRSD
WS	L0-01-Lake	N		SW8141	-	mevinphos	5.4	U	U	5.4	UJ	U	0.5	5.4	µg/L	ICRSD
WS	L0-00-Lake	N		SW8141	-	naled	5.2	U	U	5.2	UJ	U	0.74	5.2	µg/L	ICRSD
WS	L0-01-Lake	N		SW8141	-	naled	5.4	U	U	5.4	UJ	U	0.78	5.4	µg/L	ICRSD
WS	LO-05-03	N		SW8141	-	parathion, methyl	5.1	U	U	5.1	UJ	U	0.55	5.1	µg/L	ICRSD
WS	LO-03-Lake	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD
WS	LO-04-03	N		SW8260B	-	trans-1,4-dichloro-2-butene	4	U	U	4	UJ	U	0.72	4	µg/L	ICRSD
WS	L0-01-Lake	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WS	LO-05-03	N		SW8260B	-	Vinyl chloride	1	U	U	1	UJ	U	0.4	1	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	1,3,5-trinitrobenzene	20	U	U	20	UJ	U	2.8	20	µg/L	ICRSD
WS	LO-07-03	N		SW8270C	-	1,3,5-trinitrobenzene	20.5	U	U	20.5	UJ	U	2.9	20.5	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	1,3-dinitrobenzene	20	U	U	20	UJ	U	2.5	20	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	1,3-dinitrobenzene	20.5	U	U	20.5	UJ	U	2.6	20.5	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	1,4-naphthoquinone	4	U	U	4	UJ	U	3.1	4	µg/L	ICRSD

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	L0-02-Lake	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WS	LO-04-03	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WS	LO-07-03	N		SW8270C	-	2,3,4,6-tetrachlorophenol	4.1	U	U	4.1	UJ	U	3.1	4.1	µg/L	ICRSD
WS	LO-03-Lake	N		SW8270C	-	2,4-Dichlorophenol	4.2	U	U	4.2	UJ	U	3.3	4.2	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	2,4-Dichlorophenol	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	ICRSD
WS	LO-04-03	N		SW8270C	-	2,4-Dinitrophenol	20	U	U	20	UJ	U	5.6	20	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	2,6-dichlorophenol	4	U	U	4	UJ	U	3.5	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	2-acetylaminofluorene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	2-acetylaminofluorene	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	2-Methylphenol (o-Cresol)	4	U	U	4	UJ	U	2.6	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	3,3'-dimethylbenzidine	20	U	U	20	UJ	U	6	20	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	3,3'-dimethylbenzidine	20.5	U	U	20.5	UJ	U	6.2	20.5	µg/L	ICRSD
WS	LO-03-Lake	N		SW8270C	-	4-Chloroaniline	4.2	U	U	4.2	UJ	U	3.2	4.2	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	4-Chloroaniline	4	U	U	4	UJ	U	3	4	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	4-Methylphenol (p-Cresol)	10.1	U	U	10.1	UJ	U	6.2	10.1	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	4-nitroquinoline-n-oxide	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	4-nitroquinoline-n-oxide	20.2	U	U	20.2	UJ	U	3.7	20.2	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	5-nitro-o-toluidine	4	U	U	4	UJ	U	2.6	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	UJ	U	3.7	20	µg/L	ICRSD
WS	LO-07-03	N		SW8270C	-	Aniline	4.1	U	U	4.1	UJ	U	2.9	4.1	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	Aramite	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	Aramite	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WS	LO-07-03	N		SW8270C	-	Aramite	4.1	U	U	4.1	UJ	U	2.6	4.1	µg/L	ICRSD
WS	LO-03-Lake	N		SW8270C	-	Benzyl alcohol	10.5	U	U	10.5	UJ	U	3.3	10.5	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	Dibenzofuran	4	U	U	4	UJ	U	2.7	4	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	methapyrilene	4.1	U	U	4.1	UJ	U	3.8	4.1	µg/L	ICRSD
WS	LO-04-03	N		SW8270C	-	nitrosomethylethylamine	4	U	U	4	UJ	U	2.7	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	p-dimethylaminoazobenzene	4	U	U	4	UJ	U	2.5	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	pentachloronitrobenzene	4	U	U	4	UJ	U	2.4	4	µg/L	ICRSD
WS	LO-03-Lake	N		SW8270C	-	Pentachlorophenol	21	U	U	21	UJ	U	2.7	21	µg/L	ICRSD
WS	LO-04-03	N		SW8270C	-	Pentachlorophenol	20	U	U	20	UJ	U	2.6	20	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	Pentachlorophenol	20.5	U	U	20.5	UJ	U	2.7	20.5	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	phenacetin	4	U	U	4	UJ	U	2.7	4	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	p-phenylenediamine	20	U	U	20	UJ	U	2.7	20	µg/L	ICRSD
WS	L0-02-Lake	N		SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	µg/L	ICRSD
WS	LO-05-03	N		SW8270C	-	pyridine	4.1	U	U	4.1	UJ	U	2.2	4.1	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	pyridine	4	U	U	4	UJ	U	2.1	4	µg/L	ICRSD
WS	LO-06-03	N		SW8270C	-	a,a-Dimethylphenethylamine	20.2	U	U	20.2	UJ	U	3.7	20.2	µg/L	ICRSD,LCSDL,LCSL,MSL
WS	L0-00-Lake	N		E350.3	-	Nitrogen, ammonia (as N)	0.0568	B	J	0.0568	U	U	0.0366	0.3	mg/L	LBH
WS	LO-04-03	N		SW6010B	-	Arsenic	0.00696	=	=	0.00696	U	U	0.0018	0.005	mg/L	LBL
WS	L0-00-Lake	N		SW6010B	-	Iron	0.0276	B	J	0.0276	U	U	0.0092	0.05	mg/L	LBL
WS	L0-01-Lake	N		SW6010B	-	Zinc	0.00321	B	J	0.00321	U	U	0.00094	0.01	mg/L	LBL
WS	LO-03-Lake	N		SW6010B	-	Zinc	0.00426	B	J	0.00426	U	U	0.00094	0.01	mg/L	LBL
WS	LO-07-03	N		SW8260B	-	1,2-Dichlorobenzene	1	U	U	1	UJ	U	0.26	1	µg/L	LCSDL
WS	LO-07-03	N		SW8260B	-	1,4-Dichlorobenzene	1	U	U	1	UJ	U	0.18	1	µg/L	LCSDL
WS	LO-03-Lake	N		SW8270C	-	2,4-Dinitrotoluene	4.2	U	U	4.2	R	U	2.9	4.2	µg/L	LCSDL
WS	LO-04-03	N		SW8270C	-	a,a-Dimethylphenethylamine	20	U	U	20	R	U	3.7	20	µg/L	LCSDL
WS	LO-04-03	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	LCSDL,LCSL
WS	L0-01-Lake	N		SW8141	-	phorate	5.4	U	U	5.4	UJ	U	1	5.4	µg/L	LCSL
WS	L0-01-Lake	N		SW8141	-	ronnel	5.4	U	U	5.4	UJ	U	0.25	5.4	µg/L	LCSL
WS	L0-01-Lake	N		SW8141	-	thiodiphosphoric acid tetraethyl ester	5.4	U	U	5.4	UJ	U	0.45	5.4	µg/L	LCSL

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Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Dissolved ?	Parameter	Lab Result	Lab Qual	Lab Conc Qual	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Units	Validation Notes
WG	LO-05-DUPE	FD		SW8270C	-	a,a-Dimethylphenethylamine	20.5	U	U	20.5	UJ	U	3.8	20.5	µg/L	2SL,CCVL,ICRSD
WG	LO-05-DUPE	FD		SW8270C	-	kepone	4.1	U	U	4.1	UJ	U	3.2	4.1	µg/L	2SL,ICRSD
WS	L0-01-Lake	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.11	0.5	µg/L	LCSL
WS	LO-04-03	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.5	U	U	0.5	UJ	U	0.11	0.5	µg/L	LCSL
WS	LO-05-03	N		SW8151	-	dalapon	0.62	U	U	0.62	UJ	U	0.37	0.62	µg/L	LCSL
WS	L0-01-Lake	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.034	0.5	µg/L	LCSL
WS	LO-04-03	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.034	0.5	µg/L	LCSL
WS	LO-05-03	N		SW8151	-	dicamba	0.5	U	U	0.5	UJ	U	0.03	0.5	µg/L	LCSL
WS	L0-01-Lake	N		SW8151	-	silvex (2,4,5-tp)	0.5	U	U	0.5	UJ	U	0.038	0.5	µg/L	LCSL
WS	LO-04-03	N		SW8260B	-	1,1,2,2-Tetrachloroethane	1	U	U	1	UJ	U	0.24	1	µg/L	LCSL
WS	LO-04-03	N		SW8260B	-	1,2,3-Trichloropropane	1	U	U	1	UJ	U	0.44	1	µg/L	LCSL
WS	LO-04-03	N		SW8270C	-	1,2,4-Trichlorobenzene	4	U	U	4	R	U	2.6	4	µg/L	LCSL
WS	LO-03-Lake	N		SW8270C	-	a,a-Dimethylphenethylamine	21	U	U	21	R	U	3.9	21	µg/L	LCSL
WS	LO-03-Lake	N		SW8270C	-	pyridine	4.2	U	U	4.2	R	U	2.2	4.2	µg/L	LCSL
WS	LO-03-Lake	N		E353.2	-	Nitrogen, nitrate-nitrite	0.0201	U	U	0.0201	UJ	U	0.0201	0.1	mg/L	MSDL
WS	LO-03-Lake	N		E900	-	Alpha, gross	4.55	=	=	4.55	J	J	2.32	5	pCi/L	MSDL
WS	LO-07-03	N		SW8141	-	Atrazine	5.1	U	U	5.1	UJ	U	0.24	5.1	µg/L	MSDL
WS	LO-07-03	N		SW8141	-	diazinon	5.1	U	U	5.1	UJ	U	0.28	5.1	µg/L	MSDL
WS	LO-07-03	N		SW8141	-	dichlorvos	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	MSDL
WS	LO-07-03	N		SW8141	-	fensulfothion	5.1	U	U	5.1	UJ	U	0.92	5.1	µg/L	MSDL
WS	LO-07-03	N		SW8141	-	simazine	5.1	U	U	5.1	UJ	U	0.26	5.1	µg/L	MSDL
WS	LO-04-03	N		E415.1	-	Total organic carbon	13.1	=	=	13.1	J	J	0.368	1	mg/L	MSDL,MSDP,MSH
WS	LO-06-03	N		E310.1	-	Alkalinity, bicarb (as CaCO3)	28.8	=	=	28.8	J	J	0.5	1	mg/L	MSDL,MSL
WS	LO-06-03	N		E310.1	-	Alkalinity, total (as CaCO3)	28.8	=	=	28.8	J	J	0.5	1	mg/L	MSDL,MSL
WS	LO-06-03	N		E350.1	-	Nitrogen, ammonia (as N)	0.017	U	U	0.017	UJ	U	0.017	0.02	mg/L	MSDL,MSL
WS	L0-01-Lake	N		E351.2	-	nitrogen, kjeldahl, total	1.6	=	=	1.6	J	J	0.128	0.26	mg/L	MSDL,MSL
WS	LO-03-Lake	N		E351.2	-	nitrogen, kjeldahl, total	0.661	=	=	0.661	J	J	0.128	0.26	mg/L	MSDL,MSL
WS	LO-03-Lake	N		E353.2M	-	Total Nitrogen, calculated	0.661	=	=	0.661	J	J	0	0	mg/L	MSDL,MSL
WS	LO-03-Lake	N		E415.1	-	Total organic carbon	10.5	=	=	10.5	J	J	0.368	1	mg/L	MSDL,MSL
WS	LO-06-03	N		SW8270C	-	1,4-naphthoquinone	4	U	U	4	UJ	U	3.1	4	µg/L	MSDL,MSL
WS	L0-03-Lake	N		E415.1	FLDFLT	Diss.organic carbon	8.48	=	=	8.48	J	J	0.368	1	mg/L	MSL
WS	L0-01-Lake	N		SW6010B	-	Selenium	0.0026	U	U	0.0026	UJ	U	0.0026	0.005	mg/L	MSL
WS	L0-01-Lake	N		SW8081	-	beta endosulfan	0.058	U	U	0.058	UJ	U	0.0019	0.058	µg/L	MSL
WS	L0-03-Lake	N		SW8141	-	fenthion	5.3	U	U	5.3	R	U	0.57	5.3	µg/L	MSL
WS	L0-02-Lake	N		SW8151	-	2,4,5-t (trichlorophenoxyacetic acid)	0.54	U	U	0.54	UJ	U	0.12	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	2,4-d (dichlorophenoxyacetic acid)	0.54	U	U	0.54	UJ	U	0.16	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	dalapon	0.68	U	U	0.68	UJ	U	0.4	0.68	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	dicamba	0.54	U	U	0.54	UJ	U	0.037	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	dichloroprop	0.54	U	U	0.54	UJ	U	0.19	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	dinoseb	0.54	U	U	0.54	UJ	U	0.06	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	Picloram	0.54	U	U	0.54	UJ	U	0.08	0.54	µg/L	SSL
WS	L0-02-Lake	N		SW8151	-	silvex (2,4,5-tp)	0.54	U	U	0.54	UJ	U	0.041	0.54	µg/L	SSL
WS	L0-02-Lake	N		E365.2	-	P, total (as P)	0.126	=	=	0.126	J	J	0.017	0.04	mg/L	TD
WS	L0-03-Lake	N		E365.2	-	P, total (as P)	0.034	B	J	0.034	J	J	0.017	0.04	mg/L	TD

NOTES: WG = Groundwater, WS = Surface Water, N = Normal Field Sample, FD = Field Duplicate, LR = Lab Replicate, RE = re-extraction or re-analysis, DL = Dilution, CF = confirmation, D = Lab Duplicate. FLDFLT = Field Filtered, µg/L = micrograms per liter, mg/L = milligrams per liter.

APPENDIX D

Frequency of Detection in Blank Samples

Matrix	Sample Type	LR Type	Analytical Method	Preparation Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Units
WG	FD		E110.2	NONE	-	color	8	8	10.0	15.0	1.0	1.0	1.0	1.0	COLOR UNIT
WG	FD		E150.1	NONE	-	pH	8	8	7.4	7.7	0.10	0.10	0.10	0.10	pH UNITS
WG	FD		E160.1	NONE	-	TDS (residue, filterable)	8	8	125	298	1.0	1.0	20.0	20.0	mg/L
WG	FD		E180.1	NONE	-	turbidity	8	5	0.40	8.0	0.30	0.30	0.30	0.30	NTU
WG	FD		E310.1	NONE	-	Alkalinity, bicarb (as CaCO3)	8	8	129	141	0.50	0.50	1.0	1.0	mg/L
WG	FD		E310.1	NONE	-	Alkalinity, total (as CaCO3)	8	8	129	141	0.50	0.50	1.0	1.0	mg/L
WG	FD		E325.2	NONE	-	Chloride (as Cl)	8	8	12.2	29.6	0.26	0.27	0.50	0.50	mg/L
WG	FD		E350.1	NONE	-	Nitrogen, ammonia (as N)	2	2	0.034	0.11	0.017	0.017	0.020	0.020	mg/L
WG	FD		E351.2	METHOD	-	nitrogen, kjeldahl, total	8	7	0.22	1.9	0.12	0.13	0.26	0.26	mg/L
WG	FD		E353.2	NONE	-	Nitrogen, nitrate-nitrite	8	1	0.021	0.021	0.020	0.020	0.10	0.10	mg/L
WG	FD		E353.2M	NONE	-	Total Nitrogen, calculated	8	7	0.22	1.9	0.10	0.10	0.10	0.10	mg/L
WG	FD		E354.1	NONE	-	nitrogen, nitrite	8	1	0.045	0.045	0.010	0.012	0.10	0.10	mg/L
WG	FD		E365.2	METHOD	FLDFLT	phosphorus, dissolved (as P)	8	7	0.10	0.27	0.010	0.017	0.040	0.040	mg/L
WG	FD		E365.2	NONE	-	phosphorus, total (as P)	8	7	0.15	0.32	0.010	0.017	0.040	0.040	mg/L
WG	FD		E365.2	NONE	-	phosphorus, total ortho (as P)	8	8	0.13	0.21	0.010	0.014	0.040	0.040	mg/L
WG	FD		E375.4	NONE	-	Sulfate (as SO4)	8	8	0.61	5.4	0.22	0.22	1.0	1.0	mg/L
WG	FD		E405.1	NONE	-	BOD, five day	8	1	3.0	3.0	2.0	2.0	2.0	10.0	mg/L
WG	FD		E415.1	NONE	FLDFLT	dissolved organic carbon	8	3	1.8	3.3	0.36	0.37	1.0	1.0	mg/L
WG	FD		E415.1	NONE	-	Total organic carbon	8	3	2.2	3.0	0.36	0.37	1.0	1.0	mg/L
WG	FD		E900	NONE	-	beta, gross	8	1	5.0	5.0	2.8	4.5	3.7	5.0	pCi/L
WG	FD		SM4500-NH3-B,C	METHOD	-	Nitrogen, ammonia (as N)	5	5	0.070	0.21	0.0010	0.0010	0.0010	0.20	mg/L
WG	FD		SW6010B	SW3010A	-	Aluminum	8	2	0.018	0.22	0.010	0.015	0.10	0.10	mg/L
WG	FD		SW6010B	SW3010A	-	Arsenic	8	6	0.0097	0.019	0.0018	0.0018	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Barium	8	8	0.0050	0.006	0.00044	0.00044	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Cadmium	7	1	0.0036	0.004	0.00035	0.00035	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Calcium	8	8	49.8	52.7	0.050	0.051	0.10	0.10	mg/L
WG	FD		SW6010B	SW3010A	-	Chromium, total	8	3	0.0022	0.004	0.0013	0.0013	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Iron	8	6	0.018	0.080	0.0092	0.0092	0.050	0.050	mg/L
WG	FD		SW6010B	SW3010A	-	Lead	8	1	0.0025	0.003	0.0022	0.0022	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Magnesium	8	8	5.1	5.3	0.040	0.040	0.10	0.10	mg/L
WG	FD		SW6010B	SW3010A	-	Manganese	8	7	0.0043	0.006	0.00046	0.00046	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Nickel	8	1	0.0021	0.002	0.0017	0.0017	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Potassium	8	8	0.88	1.3	0.070	0.075	0.50	0.50	mg/L
WG	FD		SW6010B	SW3010A	-	Selenium	7	1	0.025	0.025	0.0026	0.0026	0.0050	0.0050	mg/L
WG	FD		SW6010B	SW3010A	-	Sodium	8	8	7.1	8.2	0.14	0.14	0.30	0.30	mg/L
WG	FD		SW6010B	SW3010A	-	Zinc	8	2	0.0073	0.007	0.00094	0.00094	0.010	0.010	mg/L
WG	FD		SW8081	SW3510	-	p,p'-DDD	8	1	0.0026	0.003	0.00053	0.0027	0.010	0.051	µg/L
WG	FD		SW8081	SW3510	-	p,p'-DDT	8	1	0.0057	0.006	0.00022	0.0011	0.010	0.051	µg/L
WG	FD		SW8260B	SW5030	-	Acetone	8	1	9.4	9.4	1.8	1.8	10.0	10.0	µg/L
WG	LR	RE	SW6010B	SW3010A	-	Cadmium	2	2	0.00090	0.002	0.00035	0.00035	0.0050	0.0050	mg/L
WG	N		E110.2	NONE	-	color	16	16	10.0	25.0	1.0	1.0	1.0	1.0	COLOR UNIT
WG	N		E150.1	NONE	-	pH	16	16	7.2	7.8	0.10	0.10	0.10	0.10	pH UNITS
WG	N		E160.1	NONE	-	TDS (residue, filterable)	16	16	115	331	1.0	1.0	20.0	20.0	mg/L
WG	N		E180.1	NONE	-	turbidity	16	11	0.40	5.0	0.30	0.30	0.30	0.30	NTU
WG	N		E310.1	NONE	-	Alkalinity, bicarb (as CaCO3)	16	16	115	150	0.50	0.50	1.0	1.0	mg/L
WG	N		E310.1	NONE	-	Alkalinity, total (as CaCO3)	16	16	115	150	0.50	0.50	1.0	1.0	mg/L
WG	N		E325.2	NONE	-	Chloride (as Cl)	16	16	12.5	30.7	0.26	0.27	0.50	0.50	mg/L
WG	N		E350.1	NONE	-	Nitrogen, ammonia (as N)	4	4	0.032	0.47	0.017	0.017	0.020	0.020	mg/L

APPENDIX D
Frequency of Detection in Blank Samples

Matrix	Sample Type	LR Type	Analytical Method	Preparation Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Units
WG	FD		E110.2	NONE	-	color	8	8	10.0	15.0	1.0	1.0	1.0	1.0	COLOR UNIT
WG	N		E350.3	NONE	-	Nitrogen, ammonia (as N)	2	1	0.39	0.39	0.037	0.037	0.10	0.30	mg/L
WG	N		E351.2	METHOD	-	nitrogen, kjeldahl, total	16	13	0.27	1.3	0.12	0.13	0.26	0.26	mg/L
WG	N		E353.2	NONE	-	Nitrogen, nitrate-nitrite	16	2	0.027	0.032	0.020	0.020	0.10	0.10	mg/L
WG	N		E353.2M	NONE	-	Total Nitrogen, calculated	16	13	0.22	1.3	0.10	0.10	0.10	0.10	mg/L
WG	N		E354.1	NONE	-	nitrogen, nitrite	16	2	0.045	0.045	0.010	0.012	0.10	0.10	mg/L
WG	N		E365.2	METHOD	FLDFLT	phosphorus, dissolved (as P)	16	16	0.056	0.37	0.010	0.017	0.040	0.040	mg/L
WG	N		E365.2	NONE	-	phosphorus, total (as P)	16	16	0.080	0.31	0.010	0.017	0.040	0.040	mg/L
WG	N		E365.2	NONE	-	phosphorus, total ortho (as P)	16	16	0.13	0.21	0.010	0.014	0.040	0.040	mg/L
WG	N		E375.4	NONE	-	Sulfate (as SO4)	16	16	0.64	33.6	0.22	0.44	1.0	2.0	mg/L
WG	N		E405.1	NONE	-	BOD, five day	16	2	3.0	3.0	1.0	2.0	2.0	10.0	mg/L
WG	N		E415.1	NONE	FLDFLT	dissolved organic carbon	16	7	1.4	4.9	0.36	1.8	1.0	5.0	mg/L
WG	N		E415.1	NONE	-	Total organic carbon	16	11	1.8	9.0	0.36	1.8	1.0	5.0	mg/L
WG	N		E900	NONE	-	alpha, gross	16	1	2.0	2.0	1.6	4.0	1.9	5.0	pCi/L
WG	N		E900	NONE	-	beta, gross	16	2	4.0	4.8	3.7	4.8	3.7	5.0	pCi/L
WG	N		SM4500-NH3-B,C	METHOD	-	Nitrogen, ammonia (as N)	10	10	0.070	0.35	0.0010	0.0010	0.0010	0.20	mg/L
WG	N		SW6010B	SW3010A	-	Aluminum	16	7	0.018	0.087	0.010	0.015	0.10	0.10	mg/L
WG	N		SW6010B	SW3010A	-	Antimony	16	2	0.0027	0.005	0.0023	0.0023	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Arsenic	16	12	0.0082	0.017	0.0018	0.0018	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Barium	16	16	0.0050	0.006	0.00044	0.00044	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Beryllium	16	2	0.00022	0.00022	0.00020	0.00020	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Cadmium	15	3	0.00066	0.004	0.00035	0.00035	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Calcium	16	16	50.0	53.8	0.050	0.051	0.10	0.10	mg/L
WG	N		SW6010B	SW3010A	-	Chromium, total	16	6	0.0019	0.004	0.0013	0.0013	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Copper	16	3	0.00098	0.010	0.00062	0.00062	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Iron	16	12	0.014	0.19	0.0092	0.0092	0.050	0.050	mg/L
WG	N		SW6010B	SW3010A	-	Lead	16	1	0.0052	0.005	0.0022	0.0022	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Magnesium	16	16	5.1	6.5	0.040	0.040	0.10	0.10	mg/L
WG	N		SW6010B	SW3010A	-	Manganese	16	15	0.0044	0.005	0.00046	0.00046	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Nickel	16	3	0.0018	0.003	0.0017	0.0017	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Potassium	16	16	0.83	2.4	0.070	0.075	0.50	0.50	mg/L
WG	N		SW6010B	SW3010A	-	Selenium	14	2	0.024	0.027	0.0026	0.0026	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Silver	16	1	0.00068	0.00068	0.00065	0.00065	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Sodium	16	16	6.9	14.4	0.14	0.14	0.30	0.30	mg/L
WG	N		SW6010B	SW3010A	-	Vanadium	16	4	0.0012	0.001	0.0011	0.0011	0.0050	0.0050	mg/L
WG	N		SW6010B	SW3010A	-	Zinc	16	4	0.0054	0.014	0.00094	0.00094	0.010	0.010	mg/L
WG	N		SW8081	SW3510	-	p,p'-DDT	16	1	0.013	0.013	0.00022	0.0011	0.010	0.052	µg/L
WS	N		E110.2	NONE	-	color	8	8	40.0	60.0	1.0	1.0	1.0	1.0	COLOR UNIT
WS	N		E150.1	NONE	-	pH	8	8	6.6	7.5	0.10	0.10	0.10	0.10	pH UNITS
WS	N		E160.1	NONE	-	TDS (residue, filterable)	8	8	97.0	301	1.0	1.0	20.0	20.0	mg/L
WS	N		E180.1	NONE	-	turbidity	8	8	2.5	33.0	0.30	0.30	0.30	0.30	NTU
WS	N		E310.1	NONE	-	Alkalinity, bicarb (as CaCO3)	8	8	27.0	42.0	0.50	0.50	1.0	1.0	mg/L
WS	N		E310.1	NONE	-	Alkalinity, total (as CaCO3)	8	8	27.0	42.0	0.50	0.50	1.0	1.0	mg/L
WS	N		E325.2	NONE	-	Chloride (as Cl)	8	8	28.9	34.3	0.26	0.27	0.50	0.50	mg/L
WS	N		E350.1	NONE	-	Nitrogen, ammonia (as N)	2	1	0.032	0.032	0.017	0.017	0.020	0.020	mg/L
WS	N		E351.2	METHOD	-	nitrogen, kjeldahl, total	8	7	0.66	1.8	0.12	0.13	0.26	0.26	mg/L
WS	N		E353.2	NONE	-	Nitrogen, nitrate-nitrite	8	1	0.021	0.021	0.020	0.020	0.10	0.10	mg/L
WS	N		E353.2M	NONE	-	Total Nitrogen, calculated	8	7	0.17	1.8	0.10	0.10	0.10	0.10	mg/L

Frequency of Detection in Blank Samples

Matrix	Sample Type	LR Type	Analytical Method	Preparation Method	Dissolved ?	Parameter	Number Analyzed	Number Detected	Minimum Detected	Maximum Detected	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Units
WG	FD		E110.2	NONE	-	color	8	8	10.0	15.0	1.0	1.0	1.0	1.0	COLOR UNIT
WS	N		E354.1	NONE	-	nitrogen, nitrite	8	4	0.014	0.045	0.010	0.012	0.10	0.10	mg/L
WS	N		E365.2	METHOD	FLDFLT	phosphorus, dissolved (as p)	8	6	0.029	0.13	0.010	0.017	0.040	0.040	mg/L
WS	N		E365.2	NONE	-	phosphorus, total (as p)	8	7	0.034	0.22	0.010	0.017	0.040	0.040	mg/L
WS	N		E365.2	NONE	-	phosphorus, total ortho (as P)	8	4	0.017	0.027	0.010	0.014	0.040	0.040	mg/L
WS	N		E375.4	NONE	-	Sulfate (as SO4)	8	8	21.6	27.1	0.22	0.22	1.0	1.0	mg/L
WS	N		E405.1	NONE	-	BOD, five day	8	6	2.6	3.0	2.0	2.0	2.0	10.0	mg/L
WS	N		E415.1	NONE	FLDFLT	dissolved organic carbon	8	7	7.5	42.1	0.36	18.4	1.0	50.0	mg/L
WS	N		E415.1	NONE	-	Total organic carbon	8	8	9.9	62.9	0.36	36.8	1.0	100	mg/L
WS	N		E900	NONE	-	Alpha, gross	8	5	2.7	5.1	1.9	2.9	2.1	5.0	pCi/L
WS	N		E900	NONE	-	beta, gross	8	4	5.0	5.6	3.1	5.3	3.1	5.0	pCi/L
WS	N		FLPRO	METHOD	-	TPH	8	2	120	120	97.0	102	340	358	µg/L
WS	N		SM4500-NH3-B,C	METHOD	-	Nitrogen, ammonia (as N)	5	3	0.070	0.14	0.0010	0.0010	0.0010	0.20	mg/L
WS	N		SW6010B	SW3010A	-	Aluminum	8	7	0.070	0.28	0.010	0.015	0.10	0.10	mg/L
WS	N		SW6010B	SW3010A	-	Arsenic	8	1	0.0070	0.007	0.0018	0.0018	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Barium	8	8	0.0018	0.012	0.00044	0.00044	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Calcium	8	8	12.9	14.4	0.050	0.051	0.10	0.10	mg/L
WS	N		SW6010B	SW3010A	-	Chromium, total	8	2	0.0018	0.002	0.0013	0.0013	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Copper	8	3	0.00076	0.002	0.00062	0.00062	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Iron	8	6	0.021	0.060	0.0092	0.0092	0.050	0.050	mg/L
WS	N		SW6010B	SW3010A	-	Magnesium	8	8	2.5	2.7	0.040	0.040	0.10	0.10	mg/L
WS	N		SW6010B	SW3010A	-	Manganese	8	8	0.011	0.017	0.00046	0.00046	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Nickel	8	1	0.0028	0.003	0.0017	0.0017	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Potassium	8	8	3.0	3.3	0.070	0.075	0.50	0.50	mg/L
WS	N		SW6010B	SW3010A	-	Sodium	8	8	19.2	20.9	0.14	0.14	0.30	0.30	mg/L
WS	N		SW6010B	SW3010A	-	Vanadium	8	8	0.0019	0.003	0.0011	0.0011	0.0050	0.0050	mg/L
WS	N		SW6010B	SW3010A	-	Zinc	8	4	0.0018	0.017	0.00094	0.00094	0.010	0.010	mg/L
WS	N		SW7470A	METHOD	-	Mercury	8	1	0.000026	0.000026	0.000025	0.000025	0.00020	0.00020	mg/L

NOTES: WG = Groundwater. WS = Surface Water. N = Normal Field Sample, FD = Field Duplicate, LR = Lab Replicate, RE = re-extraction or re-analysis, NTU = Nephelometric Turbity Units.
FLDFLT = Field Filtered. µg/L = micrograms per liter, mg/L = milligrams per liter, pCi/L = picocuries per liter

APPENDIX E

Field Duplicate Precision

Matrix	Analytical Method	Dissolved Method	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	E150.1	-	LO-07-01	pH	7.4	=	=	0.10	0.10	7.66	=	0.1	0.1	pH units	3.3
WG	E150.1	-	L0-00-MW1	pH	7.5	=	=	0.10	0.10	7.68	=	0.1	0.1	pH units	2.4
WG	E150.1	-	L0-01-MW-1	pH	7.3	=	=	0.10	0.10	7.36	=	0.1	0.1	pH units	0.5
WG	E150.1	-	LO-04-01	pH	7.5	=	=	0.10	0.10	7.42	=	0.1	0.1	pH units	0.5
WG	E150.1	-	LO-06-01	pH	7.8	=	=	0.10	0.10	7.74	=	0.1	0.1	pH units	0.5
WG	E150.1	-	LO-03-MW1	pH	7.4	=	=	0.10	0.10	7.45	=	0.1	0.1	pH units	0.4
WG	E150.1	-	LO-05-01	pH	7.6	=	=	0.10	0.10	7.58	=	0.1	0.1	pH units	0.3
WG	E150.1	-	L0-01-MW1	pH	7.5	=	=	0.10	0.10	7.52	=	0.1	0.1	pH units	0.0
WG	E180.1	-	LO-05-01	turbidity	1.2	=	=	0.30	0.30	0.4	=	0.3	0.3	NTU	**100.0**
WG	E180.1	-	L0-01-MW-1	turbidity	5.0	=	=	0.30	0.30	8	=	0.3	0.3	NTU	**46.2**
WG	E180.1	-	LO-04-01	turbidity	0.40	=	=	0.30	0.30	0.4	=	0.3	0.3	NTU	0.0
WG	E180.1	-	LO-03-MW1	turbidity	2.0	=	=	0.30	0.30	2	=	0.3	0.3	NTU	0.0
WG	E180.1	-	L0-01-MW1	turbidity	3.0	=	=	0.30	0.30	3	=	0.3	0.3	NTU	0.0
WG	SW6010B	-	LO-06-01	Aluminum	0.049	J	J	0.015	0.10	0.223	=	0.015	0.1	mg/L	**127.5**
WG	E375.4	-	LO-06-01	Sulfate (as SO4)	2.9	=	=	0.22	1.0	0.92	J	0.22	1	mg/L	**103.4**
WG	SW6010B	-	LO-06-01	Iron	0.023	J	J	0.0092	0.050	0.0623	=	0.0092	0.05	mg/L	93.2
WG	SW6010B	-	LO-03-MW1	Iron	0.19	=	=	0.0092	0.050	0.0802	=	0.0092	0.05	mg/L	**79.5**
WG	E325.2	-	LO-06-01	Chloride (as Cl)	14.3	=	=	0.27	0.50	29.6	=	0.266	0.5	mg/L	**69.7**
WG	SW6010B	-	LO-07-01	Lead	0.0052	=	=	0.0022	0.0050	0.00251	J	0.0022	0.005	mg/L	68.9
WG	SM4500-NH3-B,C	-	LO-03-MW1	Nitrogen, ammonia (as N)	0.14	J	J	0.0010	0.20	0.07	J	0.001	0.2	mg/L	66.7
WG	E353.2M	-	L0-01-MW-1	TOTAL NITROGEN, CALCULATED	0.93	=	=	0.020	0.020	0.662	=	0.020	0.020	mg/L	**33.7**
WG	E351.2	-	L0-01-MW-1	nitrogen, kjeldahl, total	0.93	=	=	0.13	0.26	0.662	=	0.128	0.26	mg/L	**33.7**
WG	E375.4	-	LO-05-01	Sulfate (as SO4)	3.8	=	=	0.22	1.0	5.36	=	0.22	1	mg/L	**33.0**
WG	E365.2	FLDFLT	LO-04-01	phosphorus, diss (as P)	0.10	=	=	0.017	0.040	0.143	=	0.017	0.04	mg/L	**32.5**
WG	E415.1	FLDFLT	L0-00-MW1	dissolved organic carbon	1.4	=	=	0.37	1.0	1.88	=	0.368	1	mg/L	32.1
WG	SM4500-NH3-B,C	-	LO-05-01	Nitrogen, ammonia (as N)	0.28	=	=	0.0010	0.20	0.21	=	0.001	0.2	mg/L	28.6
WG	SW6010B	-	L0-00-MW1	Aluminum	0.023	J	J	0.015	0.10	0.018	J	0.015	0.1	mg/L	26.1
WG	SW6010B	-	L0-01-MW1	Manganese	0.0048	J	J	0.00046	0.0050	0.00617	=	0.00046	0.005	mg/L	24.8
WG	E365.2	FLDFLT	L0-00-MW1	phosphorus, diss (as P)	0.24	=	=	0.017	0.040	0.188	=	0.017	0.04	mg/L	**24.3**
WG	E365.2	-	LO-05-01	phosphorus, total (as P)	0.25	=	=	0.010	0.040	0.322	=	0.01	0.04	mg/L	**23.6**
WG	E160.1	-	L0-01-MW-1	total dissolved solids	185	=	=	1.0	20.0	146	=	1	20	mg/L	**23.6**
WG	SW6010B	-	LO-05-01	Arsenic	0.015	=	=	0.0018	0.0050	0.0191	=	0.0018	0.005	mg/L	22.1
WG	E365.2	FLDFLT	LO-07-01	phosphorus, diss (as P)	0.093	=	=	0.017	0.040	0.116	=	0.017	0.04	mg/L	22.0
WG	E353.2M	-	LO-06-01	TOTAL NITROGEN, CALCULATED	0.23	=	=	0.020	0.020	0.289	=	0.020	0.020	mg/L	**21.9**
WG	E353.2M	-	LO-03-MW1	TOTAL NITROGEN, CALCULATED	0.27	=	=	0.020	0.020	0.218	=	0.020	0.020	mg/L	**21.3**
WG	E351.2	-	LO-03-MW1	nitrogen, kjeldahl, total	0.27	=	=	0.13	0.26	0.218	J	0.128	0.26	mg/L	21.3
WG	SW6010B	-	LO-07-01	Iron	0.023	J	J	0.0092	0.050	0.0191	J	0.0092	0.05	mg/L	20.2
WG	E415.1	-	LO-07-01	Total organic carbon	1.8	=	=	0.37	1.0	2.15	=	0.368	1	mg/L	18.8
WG	SW6010B	-	LO-06-01	Zinc	0.0062	J	J	0.00094	0.010	0.00748	J	0.00094	0.01	mg/L	18.7
WG	E375.4	-	L0-01-MW-1	Sulfate (as SO4)	4.5	=	=	0.22	1.0	3.71	=	0.22	1	mg/L	18.1
WG	SW6010B	-	L0-01-MW1	Arsenic	0.0082	=	=	0.0018	0.0050	0.0097	=	0.0018	0.005	mg/L	17.2
WG	E160.1	-	L0-01-MW1	total dissolved solids	257	=	=	1.0	20.0	298	=	1	20	mg/L	14.8
WG	E415.1	-	LO-03-MW1	Total organic carbon	2.9	=	=	0.37	1.0	2.47	=	0.368	1	mg/L	14.6
WG	SW6010B	-	LO-06-01	Chromium, total	0.0019	J	J	0.0013	0.0050	0.00221	J	0.0013	0.005	mg/L	14.6
WG	SW6010B	-	LO-04-01	Arsenic	0.013	=	=	0.0018	0.0050	0.0115	=	0.0018	0.005	mg/L	13.8
WG	SW6010B	-	LO-06-01	Nickel	0.0018	J	J	0.0017	0.0050	0.00208	J	0.0017	0.005	mg/L	12.2
WG	E365.2	FLDFLT	LO-05-01	phosphorus, diss (as P)	0.093	=	=	0.010	0.040	0.105	=	0.01	0.04	mg/L	12.1

Field Duplicate Precision

Matrix	Analytical Method	Dissolved Method	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	E365.2	-	LO-07-01	P, total ortho (as P)	0.14	=	=	0.014	0.040	0.126	=	0.014	0.04	mg/L	11.9
WG	E375.4	-	L0-00-MW1	Sulfate (as SO4)	2.6	=	=	0.22	1.0	2.91	=	0.22	1	mg/L	10.9
WG	SW6010B	-	LO-07-01	Selenium	0.027	=	=	0.0026	0.0050	0.0247	=	0.0026	0.005	mg/L	10.0
WG	E351.2	-	L0-00-MW1	nitrogen, kjeldahl, total	0.75	=	=	0.13	0.26	0.823	=	0.128	0.26	mg/L	9.8
WG	E353.2M	-	L0-00-MW1	TOTAL NITROGEN, CALCULATED	0.77	=	=	0.020	0.020	0.844	=	0.020	0.020	mg/L	9.7
WG	E365.2	-	L0-01-MW-1	phosphorus, total (as P)	0.19	=	=	0.017	0.040	0.169	=	0.017	0.04	mg/L	9.0
WG	E160.1	-	L0-00-MW1	total dissolved solids	160	=	=	1.0	20.0	175	=	1	20	mg/L	9.0
WG	E310.1	-	L0-01-MW1	Alkalinity, total (as CaCO3)	141	=	=	0.50	1.0	129	=	0.5	1.0	mg/L	8.9
WG	E310.1	-	L0-01-MW1	Alkalinity, bicarb (as CaCO3)	141	=	=	0.50	1.0	129	=	0.5	1.0	mg/L	8.9
WG	E365.2	-	L0-01-MW-1	P, total ortho (as P)	0.17	=	=	0.014	0.040	0.157	=	0.014	0.04	mg/L	8.5
WG	E160.1	-	LO-07-01	total dissolved solids	160	=	=	1.0	20.0	174	=	1	20	mg/L	8.4
WG	E310.1	-	LO-04-01	Alkalinity, total (as CaCO3)	150	=	=	0.50	1.0	138	=	0.5	1.0	mg/L	8.3
WG	E310.1	-	LO-04-01	Alkalinity, bicarb (as CaCO3)	150	=	=	0.50	1.0	138	=	0.5	1.0	mg/L	8.3
WG	E160.1	-	LO-04-01	total dissolved solids	115	=	=	1.0	20.0	125	=	1	20	mg/L	8.3
WG	E415.1	FLDFLT	LO-06-01	dissolved organic carbon	3.0	=	=	0.37	1.0	3.27	=	0.368	1	mg/L	8.3
WG	E353.2M	-	L0-01-MW1	TOTAL NITROGEN, CALCULATED	0.74	=	=	0.020	0.020	0.684	=	0.020	0.020	mg/L	8.3
WG	E351.2	-	L0-01-MW1	nitrogen, kjeldahl, total	0.74	=	=	0.13	0.26	0.684	=	0.128	0.26	mg/L	8.3
WG	E365.2	-	L0-01-MW1	phosphorus, total (as P)	0.22	=	=	0.017	0.040	0.202	=	0.017	0.04	mg/L	8.1
WG	SW6010B	-	L0-01-MW1	Iron	0.021	J	J	0.0092	0.050	0.0191	J	0.0092	0.05	mg/L	8.0
WG	E365.2	-	LO-04-01	phosphorus, total (as P)	0.24	=	=	0.017	0.040	0.217	=	0.017	0.04	mg/L	8.0
WG	E351.2	-	LO-04-01	nitrogen, kjeldahl, total	0.65	=	=	0.13	0.26	0.599	=	0.128	0.26	mg/L	7.9
WG	SW6010B	-	LO-05-01	Potassium	0.86	=	=	0.070	0.50	0.925	=	0.07	0.5	mg/L	7.6
WG	E365.2	-	LO-03-MW1	phosphorus, total (as P)	0.24	=	=	0.017	0.040	0.259	=	0.017	0.04	mg/L	7.6
WG	E353.2M	-	LO-04-01	TOTAL NITROGEN, CALCULATED	0.67	=	=	0.020	0.020	0.619	=	0.020	0.020	mg/L	7.6
WG	E375.4	-	LO-04-01	Sulfate (as SO4)	3.2	=	=	0.22	1.0	2.95	=	0.22	1	mg/L	7.2
WG	E350.1	-	LO-06-01	Nitrogen, ammonia (as N)	0.032	J	J	0.017	0.020	0.0339	J	0.017	0.02	mg/L	7.0
WG	SW6010B	-	LO-04-01	Sodium	8.1	=	=	0.14	0.30	7.59	=	0.14	0.3	mg/L	6.9
WG	SW6010B	-	LO-05-01	Chromium, total	0.0029	J	J	0.0013	0.0050	0.0027	J	0.0013	0.005	mg/L	6.8
WG	E365.2	FLDFLT	L0-01-MW-1	phosphorus, diss (as P)	0.21	=	=	0.017	0.040	0.199	=	0.017	0.04	mg/L	6.8
WG	SW6010B	-	LO-03-MW1	Potassium	0.83	=	=	0.075	0.50	0.885	=	0.075	0.5	mg/L	6.5
WG	SW6010B	-	LO-05-01	Cadmium	0.0034	J	J	0.00035	0.0050	0.0036	J	0.00035	0.005	mg/L	6.3
WG	E365.2	-	L0-00-MW1	phosphorus, total (as P)	0.14	=	=	0.017	0.040	0.152	=	0.017	0.04	mg/L	6.1
WG	E415.1	FLDFLT	LO-07-01	dissolved organic carbon	1.9	=	=	0.37	1.0	1.75	=	0.368	1	mg/L	6.1
WG	E415.1	-	LO-06-01	Total organic carbon	2.8	=	=	0.37	1.0	2.96	=	0.368	1	mg/L	5.9
WG	SW6010B	-	L0-01-MW-1	Arsenic	0.011	=	=	0.0018	0.0050	0.0103	=	0.0018	0.005	mg/L	5.7
WG	E375.4	-	LO-03-MW1	Sulfate (as SO4)	3.7	=	=	0.22	1.0	3.48	=	0.22	1	mg/L	5.6
WG	SW6010B	-	LO-06-01	Manganese	0.0048	J	J	0.00046	0.0050	0.00507	=	0.00046	0.005	mg/L	5.5
WG	E350.1	-	LO-07-01	Nitrogen, ammonia (as N)	0.11	J	J	0.017	0.020	0.114	J	0.017	0.02	mg/L	5.4
WG	E365.2	-	LO-07-01	phosphorus, total (as P)	0.17	=	=	0.017	0.040	0.165	=	0.017	0.04	mg/L	5.3
WG	SW6010B	-	LO-07-01	Chromium, total	0.0037	J	J	0.0013	0.0050	0.00354	J	0.0013	0.005	mg/L	5.2
WG	E375.4	-	LO-07-01	Sulfate (as SO4)	0.64	J	J	0.22	1.0	0.608	J	0.22	1	mg/L	5.1
WG	E365.2	-	LO-04-01	P, total ortho (as P)	0.14	=	=	0.014	0.040	0.133	=	0.014	0.04	mg/L	5.1
WG	E365.2	FLDFLT	LO-03-MW1	phosphorus, diss (as P)	0.25	=	=	0.017	0.040	0.266	=	0.017	0.04	mg/L	5.0
WG	SW6010B	-	LO-06-01	Arsenic	0.015	=	=	0.0018	0.0050	0.0142	=	0.0018	0.005	mg/L	4.8
WG	E160.1	-	LO-06-01	total dissolved solids	206	=	=	1.0	20.0	197	=	1	20	mg/L	4.5
WG	SW6010B	-	LO-07-01	Potassium	1.0	=	=	0.075	0.50	0.995	=	0.075	0.5	mg/L	4.4
WG	SW6010B	-	LO-03-MW1	Barium	0.0050	=	=	0.00044	0.0050	0.00522	=	0.00044	0.005	mg/L	4.3

Field Duplicate Precision

Matrix	Analytical Method	Dissolved Method	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	E310.1	-	LO-07-01	Alkalinity, total (as CaCO3)	146	=	=	0.50	1.0	140	=	0.5	1.0	mg/L	4.2
WG	E310.1	-	LO-07-01	Alkalinity, bicarb (as CaCO3)	146	=	=	0.50	1.0	140	=	0.5	1.0	mg/L	4.2
WG	SW6010B	-	LO-04-01	Potassium	1.0	=	=	0.075	0.50	0.969	=	0.075	0.5	mg/L	4.1
WG	SW6010B	-	LO-03-MW1	Sodium	7.0	=	=	0.14	0.30	7.27	=	0.14	0.3	mg/L	4.1
WG	SW6010B	-	L0-01-MW-1	Potassium	0.91	=	=	0.075	0.50	0.878	=	0.075	0.5	mg/L	4.0
WG	SW6010B	-	LO-07-01	Manganese	0.0046	J	J	0.00046	0.0050	0.00441	J	0.00046	0.005	mg/L	3.3
WG	SW6010B	-	LO-07-01	Arsenic	0.012	=	=	0.0018	0.0050	0.0128	=	0.0018	0.005	mg/L	3.2
WG	SW6010B	-	L0-00-MW1	Potassium	1.3	=	=	0.075	0.50	1.25	=	0.075	0.5	mg/L	3.1
WG	SW6010B	-	LO-07-01	Sodium	7.5	=	=	0.14	0.30	7.23	=	0.14	0.3	mg/L	3.1
WG	SW6010B	-	L0-01-MW1	Magnesium	5.1	=	=	0.040	0.10	5.24	=	0.04	0.1	mg/L	3.1
WG	SW6010B	-	LO-03-MW1	Calcium	51.1	=	=	0.051	0.10	52.7	=	0.051	0.1	mg/L	3.1
WG	E160.1	-	LO-05-01	total dissolved solids	224	=	=	1.0	20.0	231	=	1	20	mg/L	3.1
WG	E375.4	-	L0-01-MW1	Sulfate (as SO4)	4.6	=	=	0.22	1.0	4.69	=	0.22	1	mg/L	3.0
WG	SW6010B	-	LO-06-01	Potassium	1.0	=	=	0.075	0.50	0.98	=	0.075	0.5	mg/L	3.0
WG	E365.2	FLDFLT	L0-01-MW1	phosphorus, diss (as P)	0.21	=	=	0.017	0.040	0.201	=	0.017	0.04	mg/L	2.9
WG	E365.2	-	LO-05-01	P, total ortho (as P)	0.14	=	=	0.010	0.040	0.141	=	0.01	0.04	mg/L	2.9
WG	SW6010B	-	LO-03-MW1	Magnesium	5.2	=	=	0.040	0.10	5.35	=	0.04	0.1	mg/L	2.8
WG	E325.2	-	LO-04-01	Chloride (as Cl)	14.5	=	=	0.27	0.50	14.1	=	0.266	0.5	mg/L	2.8
WG	SW6010B	-	LO-07-01	Calcium	51.5	=	=	0.051	0.10	50.1	=	0.051	0.1	mg/L	2.8
WG	SW6010B	-	L0-00-MW1	Barium	0.0064	=	=	0.00044	0.0050	0.00621	=	0.00044	0.005	mg/L	2.5
WG	SW6010B	-	L0-01-MW-1	Barium	0.0052	=	=	0.00044	0.0050	0.00505	=	0.00044	0.005	mg/L	2.5
WG	SW6010B	-	LO-05-01	Sodium	6.9	=	=	0.14	0.30	7.08	=	0.14	0.3	mg/L	2.4
WG	E325.2	-	LO-03-MW1	Chloride (as Cl)	12.5	=	=	0.27	0.50	12.2	=	0.266	0.5	mg/L	2.4
WG	SW6010B	-	L0-01-MW1	Calcium	50.5	=	=	0.051	0.10	51.7	=	0.051	0.1	mg/L	2.3
WG	E310.1	-	L0-01-MW-1	Alkalinity, total (as CaCO3)	137	=	=	0.50	1.0	140	=	0.5	1.0	mg/L	2.2
WG	E310.1	-	L0-01-MW-1	Alkalinity, bicarb (as CaCO3)	137	=	=	0.50	1.0	140	=	0.5	1.0	mg/L	2.2
WG	SW6010B	-	LO-07-01	Magnesium	5.3	=	=	0.040	0.10	5.15	=	0.04	0.1	mg/L	2.1
WG	E365.2	-	LO-06-01	P, total ortho (as P)	0.15	=	=	0.014	0.040	0.147	=	0.014	0.04	mg/L	2.0
WG	SW6010B	-	LO-07-01	Barium	0.0051	=	=	0.00044	0.0050	0.00502	=	0.00044	0.005	mg/L	2.0
WG	SW6010B	-	L0-01-MW1	Barium	0.0052	=	=	0.00044	0.0050	0.00531	=	0.00044	0.005	mg/L	1.9
WG	SW6010B	-	L0-01-MW1	Potassium	0.92	=	=	0.075	0.50	0.933	=	0.075	0.5	mg/L	1.8
WG	SW6010B	-	L0-01-MW-1	Iron	0.018	J	J	0.0092	0.050	0.0178	J	0.0092	0.05	mg/L	1.7
WG	SW6010B	-	LO-05-01	Manganese	0.0049	J	J	0.00046	0.0050	0.00477	J	0.00046	0.005	mg/L	1.7
WG	SW6010B	-	LO-05-01	Barium	0.0052	=	=	0.00044	0.0050	0.00516	=	0.00044	0.005	mg/L	1.5
WG	SW6010B	-	L0-01-MW1	Sodium	7.3	=	=	0.14	0.30	7.39	=	0.14	0.3	mg/L	1.5
WG	SW6010B	-	L0-00-MW1	Sodium	8.3	=	=	0.14	0.30	8.21	=	0.14	0.3	mg/L	1.5
WG	E310.1	-	LO-03-MW1	Alkalinity, total (as CaCO3)	141	=	=	0.50	1.0	139	=	0.5	1.0	mg/L	1.4
WG	E310.1	-	LO-03-MW1	Alkalinity, bicarb (as CaCO3)	141	=	=	0.50	1.0	139	=	0.5	1.0	mg/L	1.4
WG	SW6010B	-	LO-06-01	Sodium	7.5	=	=	0.14	0.30	7.41	=	0.14	0.3	mg/L	1.3
WG	E325.2	-	LO-05-01	Chloride (as Cl)	15.2	=	=	0.26	0.50	15.4	=	0.26	0.5	mg/L	1.3
WG	SW6010B	-	L0-01-MW-1	Manganese	0.0048	J	J	0.00046	0.0050	0.00477	J	0.00046	0.005	mg/L	1.0
WG	E351.2	-	LO-06-01	nitrogen, kjeldahl, total	0.60	=	=	0.13	0.26	0.609	=	0.128	0.26	mg/L	1.0
WG	SW6010B	-	LO-05-01	Magnesium	5.2	=	=	0.040	0.10	5.14	=	0.04	0.1	mg/L	0.8
WG	E325.2	-	L0-00-MW1	Chloride (as Cl)	13.0	=	=	0.27	0.50	12.9	=	0.266	0.5	mg/L	0.8
WG	E365.2	-	L0-01-MW1	P, total ortho (as P)	0.13	=	=	0.014	0.040	0.13	=	0.014	0.04	mg/L	0.8
WG	E325.2	-	L0-01-MW1	Chloride (as Cl)	13.2	=	=	0.27	0.50	13.3	=	0.266	0.5	mg/L	0.8
WG	SW6010B	-	LO-06-01	Magnesium	5.4	=	=	0.040	0.10	5.35	=	0.04	0.1	mg/L	0.7

Matrix	Analytical Method	Dissolved Method	Sample ID	Parameter	Final Result	Final Qual	Final Conc Qual	Detection Limit	Reporting Limit	Field Dup Final Result	Field Dup Final Qual	Field Dup Detection Limit	Field Dup Reporting Limit	Units	RPD
WG	E365.2	-	L0-00-MW1	P, total ortho (as P)	0.14	=	=	0.014	0.040	0.137	=	0.014	0.04	mg/L	0.7
WG	E325.2	-	LO-07-01	Chloride (as Cl)	15.2	=	=	0.27	0.50	15.1	=	0.266	0.5	mg/L	0.7
WG	SW6010B	-	L0-00-MW1	Calcium	50.3	=	=	0.051	0.10	50	=	0.051	0.1	mg/L	0.6
WG	SW6010B	-	LO-06-01	Calcium	52.1	=	=	0.051	0.10	51.8	=	0.051	0.1	mg/L	0.6
WG	SW6010B	-	L0-00-MW1	Magnesium	5.4	=	=	0.040	0.10	5.32	=	0.04	0.1	mg/L	0.6
WG	SW6010B	-	LO-06-01	Barium	0.0054	=	=	0.00044	0.0050	0.00542	=	0.00044	0.005	mg/L	0.6
WG	E365.2	-	LO-03-MW1	P, total ortho (as P)	0.21	=	=	0.014	0.040	0.207	=	0.014	0.04	mg/L	0.5
WG	SW6010B	-	L0-00-MW1	Manganese	0.0044	J	J	0.00046	0.0050	0.00434	J	0.00046	0.005	mg/L	0.5
WG	SW6010B	-	LO-05-01	Calcium	50.0	=	=	0.050	0.10	49.8	=	0.05	0.1	mg/L	0.4
WG	SW6010B	-	LO-04-01	Barium	0.0050	=	=	0.00044	0.0050	0.00498	J	0.00044	0.005	mg/L	0.4
WG	SW6010B	-	L0-01-MW-1	Calcium	51.2	=	=	0.051	0.10	51.4	=	0.051	0.1	mg/L	0.4
WG	SW6010B	-	LO-05-01	Iron	0.029	J	J	0.0092	0.050	0.029	J	0.0092	0.05	mg/L	0.3
WG	SW6010B	-	L0-01-MW-1	Magnesium	5.3	=	=	0.040	0.10	5.32	=	0.04	0.1	mg/L	0.2
WG	SW6010B	-	LO-03-MW1	Manganese	0.0054	=	=	0.00046	0.0050	0.00535	=	0.00046	0.005	mg/L	0.2
WG	SW6010B	-	L0-01-MW-1	Sodium	7.1	=	=	0.14	0.30	7.12	=	0.14	0.3	mg/L	0.1
WG	SW6010B	-	LO-04-01	Magnesium	5.3	=	=	0.040	0.10	5.31	=	0.04	0.1	mg/L	0.0
WG	SW6010B	-	LO-04-01	Calcium	52.3	=	=	0.051	0.10	52.3	=	0.051	0.1	mg/L	0.0
WG	SM4500-NH3-B,C	-	L0-01-MW1	Nitrogen, ammonia (as N)	0.14	J	J	0.0010	0.0010	0.14	J	0.001	0.001	mg/L	0.0
WG	SM4500-NH3-B,C	-	L0-01-MW-1	Nitrogen, ammonia (as N)	0.070	J	J	0.0010	0.20	0.07	J	0.001	0.2	mg/L	0.0
WG	SM4500-NH3-B,C	-	LO-04-01	Nitrogen, ammonia (as N)	0.21	=	=	0.0010	0.20	0.21	=	0.001	0.2	mg/L	0.0
WG	E405.1	-	LO-03-MW1	BOD, 5 day	3.0	J	J	2.0	10.0	3	J	2	10	mg/L	0.0
WG	E354.1	-	LO-07-01	nitrogen, nitrite	0.045	J	J	0.012	0.10	0.0449	J	0.0118	0.1	mg/L	0.0
WG	E325.2	-	L0-01-MW-1	Chloride (as Cl)	12.5	=	=	0.27	0.50	12.5	=	0.266	0.5	mg/L	0.0
WG	E310.1	-	LO-06-01	Alkalinity, total (as CaCO3)	141	J	J	0.50	1.0	141	J	0.5	1.0	mg/L	0.0
WG	E310.1	-	LO-05-01	Alkalinity, total (as CaCO3)	138	=	=	0.50	1.0	138	=	0.5	1.0	mg/L	0.0
WG	E310.1	-	L0-00-MW1	Alkalinity, total (as CaCO3)	141	=	=	0.50	1.0	141	=	0.5	1.0	mg/L	0.0
WG	E310.1	-	LO-06-01	Alkalinity, bicarb (as CaCO3)	141	J	J	0.50	1.0	141	J	0.5	1.0	mg/L	0.0
WG	E310.1	-	LO-05-01	Alkalinity, bicarb (as CaCO3)	138	=	=	0.50	1.0	138	=	0.5	1.0	mg/L	0.0
WG	E310.1	-	L0-00-MW1	Alkalinity, bicarb (as CaCO3)	141	=	=	0.50	1.0	141	=	0.5	1.0	mg/L	0.0
WG	E160.1	-	LO-03-MW1	total dissolved solids	174	=	=	1.0	20.0	174	=	1	20	mg/L	0.0
WG	E110.2	-	L0-01-MW-1	color	25.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	**50.0**
WG	E110.2	-	L0-00-MW1	color	10.0	=	=	1.0	1.0	10	=	1.0	1.0	color unit	0.0
WG	E110.2	-	L0-01-MW1	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0
WG	E110.2	-	LO-03-MW1	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0
WG	E110.2	-	LO-04-01	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0
WG	E110.2	-	LO-05-01	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0
WG	E110.2	-	LO-06-01	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0
WG	E110.2	-	LO-07-01	color	15.0	=	=	1.0	1.0	15	=	1.0	1.0	color unit	0.0

NOTES: WG = Groundwater. FLDFLT = Field Filtered. µg/L = micrograms per liter, mg/L = milligrams per liter, NTU = Nephelometric Turbity Units

Appendix H

Field Sampling Documentation

Festival Park

3.3

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL.	
WELL NO: MW-1	SAMPLE ID: FP-03-01-009	DATE: 5/29/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): Hole 250' Casing 120	STATIC DEPTH TO WATER (ft): 55.8	WELL CAPACITY (gal/ft):

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD: Grundfos Pump	PURGE INITIATED AT: 08.44	PURGE ENDED AT:	TOTAL VOL. PURGED (gal): 32.08 + 2.38

TIME	VOLUME PURGED ~~(gal)~~	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0848		2.38	.66	55.93	11.60	24.9	558	6.76	1.91	Clear	none	049
0853	2.3	5.68		55.93	11.56	24.9	543	5.69	2.05			059
0858	3.77	8.98			11.49	25.0	473	5.20	2.01			062
0903	5.15	12.28			11.43	25.1	422	5.07	2.08			066
0908	6.5	15.58			11.34	25.2	397	3.28	1.11			0.64
0913	7.93	18.88			11.31	25.2	384	3.07	0.77			062
0918	9.31	22.18			11.25	25.3	357	2.77	0.70			061
0923	10.7	25.48			10.68	25.3	250	2.02	0.67			038
0928	12.09	28.78			9.90	25.3	221	1.42	1.20			053
0933	13.67	32.08			9.22	25.4	226	0.82	1.20			-001

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
			see Attached			

REMARKS: Equip Vol = 125' x .0125 = 1.28 Gal + 1 Gal Flow cell + .1 Pump = 2.38 Gal.

Lots of small bubbles effervescent

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL	
WELL NO: MW-2/001	SAMPLE ID: FP-03-01-001	DATE: 5-27-03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): Casing 120'	STATIC DEPTH TO WATER (ft): 56.56	WELL CAPACITY (gal/ft): 0.65

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

Open Hole after 120' = (250' - 56.56) X =

PURGE METHOD: Grundfos Pump	PURGE INITIATED AT: 1022	PURGE ENDED AT: 1046	TOTAL VOL. PURGED (gal): 8.38

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (μmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	Redox mV
1025	1	2.33	.86	56.7	7.59	25.5	344	3.38	1.84	Clear	None	239
1030	2.85	6.63		56.7	7.60	25.6	363	2.84	1.63			243
1035	4.69	10.93			7.51	25.5	350	2.56	1.67			246
1040	6.53	15.23			7.46	25.5	363	2.10	1.45			250
1045	8.38	19.53			7.38	25.5	360	1.81	1.24			252

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse & Associates	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Grundfos Pump	SAMPLING INITIATED AT: 1047	SAMPLING ENDED AT: 1102
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled)	DUPLICATE: Y N (circled)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Using Tubing Volume For purge 120 ft. ,041 x .5 x .5 = ,010 x 120 ft = 1.23 Gal + flow cell 1 Gal + Pump .1 Gal = 2.33 Gallon purge vol.

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

W01-E-120-1

E ME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: MW-3/002	SAMPLE ID: FP-03-01-002		DATE: 5/27/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 250	STATIC DEPTH TO WATER (ft): 57.55	WELL CAPACITY (gal/ft): 0.65

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

120' Casing = (–) X =

PURGE METHOD: Grundfos Pump	PURGE INITIATED AT: 1238	PURGE ENDED AT: 1317	TOTAL VOL PURGED (gal): 32.48

TIME	VOLUME PURGED ~~(gal)~~ #	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1241	1	2.38	.86	57.66	11.56	25.8	1373	0.51	19.2	Clear	None	-106
1246	2.81	6.68		57.66	11.60	25.7	1201	0.35	14.9			-121
1251	4.61	10.98			11.59	25.7	1044	0.30	4.88			-126
1256	6.42	15.28			11.54	25.6	879	0.26	8.06			-133
1301	8.22	19.58			11.42	25.6	550	0.24	8.76			-137
1306	10.03	23.88			11.32	25.6	488	0.23	5.86			-138
1311	11.84	28.18			11.20	25.5	480	0.22	6.23			-139
1316	13.64	32.48			11.10	25.4	501	0.22	6.72			-140

LL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1318	SAMPLING ENDED AT: 1328
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (N circled)	DUPLICATE: Y N (Y circled) FP-03-01-003

MS/MSD FP-03-01-004

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
			see Attached			

REMARKS: Well casing is 120' to open Hole – Tubing volume 125' x .0125 = 1.28 + 1gal – flow cell + 1 Bar pump = 2.38 Gal.

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

4.6

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL
WELL NO: MW-4 FP-03-01-006	SAMPLE ID:	DATE: 5-28-03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): Casing @ 120 ?	STATIC DEPTH TO WATER (ft): 58.16	WELL CAPACITY (gal/ft): 0.65'

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD: Grundfos Pump	PURGE INITIATED AT: 0928	PURGE ENDED AT: 0956	TOTAL VOL. PURGED (gal): 10.54 + 250

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0932	1	2.41	.92	58.4	9.83	25.0	175	0.75	1.35	clear	None	078
0934	2.91	7.01	↓	58.39	10.14	24.8	173	0.43	1.17			037
0938	4.82	11.61			10.23	24.9	168	0.34	1.28			018
0946	6.72	16.21			1023	24.9	136	0.28	1.32			008
0951	8.63	20.81			10.21	24.9	129	0.26	1.30			004
0956	10.54	25.41			10.17	24.9	131	0.24	1.45			010

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse & Assoc.	SAMPLER(S) SIGNATURE(S): [signatures]	
SAMPLING METHOD(S): Grundfos Pump	SAMPLING INITIATED AT: 1420	SAMPLING ENDED AT: 1440
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled)	DUPLICATE: Y N (circled)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
			See Attached			

REMARKS: Well casing is at 120' to spin table – Tubing Volume 128'

$V = [.5(0.041) \times .5 \times 128] + 1 + .1 = 2.41$ gal

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL

WELL NO: North Recharge Well	SAMPLE ID: FP-03-01-008	DATE: 5/28/03

PURGING DATA

WELL DIAMETER (in): NA	TOTAL WELL DEPTH (ft): NA	STATIC DEPTH TO WATER (ft): NA	WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =
= (–) X = NA

PURGE METHOD:	PURGE INITIATED AT:	PURGE ENDED AT:	TOTAL VOL. PURGED (gal): NA (Grab)

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
	NA	NA	NA	NA	6.45	29.2	218	3.19	4.79	Clear	none	195
				Recharge Well								

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodgren	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Grab	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1700
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled)	DUPLICATE: Y N (circled)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
				See Attached		

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: South Recharge Well	SAMPLE ID: FP-03-01-007		DATE: 5/28/03

PURGING DATA

WELL DIAMETER (in): NA	TOTAL WELL DEPTH (ft): NA	STATIC DEPTH TO WATER (ft): NA	WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD:	PURGE INITIATED AT:	PURGE ENDED AT:	TOTAL VOL. PURGED (gal): Grab

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1156	NA	NA	NA	NA	5.89	32.8	139	2.70	29.5	Clear	None	211

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1220
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
		See	Attached			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

PEL Laboratories, Inc.

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill (Al Aikens)
Project Name/Number: Festival Park ; 17765C
Address: 225 E. Robinson St., Ste# 505 Orlando, Florida 32801-4322
Project Manager: Al Aikens
Phone: 407 423 0030 Fax: 407 839-5901
Purchase Order:
Print Names(s) / Affiliation: Mike Burns, Tiffiny Fairlamb (Nodarse & Assoc)
Preservatives (see codes): see attached list
Sampler(s) Signature(s): [signatures]
Analyses Requested: see attached list

Page of
DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	see attached list	Remarks	Lab. No.
1	FP-03-01-001	5/27/03	1102	G	GW	27 + 2 Xtra	X		
2	FP-03-01-002		1328	G	GW	~~28~~ 29	X		
3	FP-03-01-003		1328	G	GW	~~28~~ 29	X		
4	FP-03-01-004		800	G	GW	~~28~~ 29	X		
5	FP-03-01-005		1540	G	GW	~~28~~ 29	X		

Shipment Method: FedEx — 145 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: 5/27/03	Via. FedEx	1 thru 5	Mike Burns (Nodarse & Assoc)	5/27/03	1730	Fed Ex	5/27/03	1730

Additional Comments:
FP-03-01-004 is Matrix spike / matrix duplicate

1074

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE / /

Company: CH2M Hill

Project Name/Number: Festival Park 177652

Address: 225 East Robinson Ste 505 Orlando, FL 32801-4322

Project Manager: Al Aikens

Phone: 407 4236030 Fax: 407 839-5901

Purchase Order:

Print Names(s) / Affiliation: Mike Burns Lydia Wing (Nodarse & Assoc.)

Sampler(s) Signature(s): [signatures]

Preservatives (see codes): see attached list

Analyses Requested: see attached list

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses	Remarks	Lab. No.
1	FP-03-01-09	5/29/03	1250	G	GW	29	X		

Shipment Method — 29 ← Total Number of Containers

	Via	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Out: / /								
Returned: 5/29/03	FedEx	1 only	Lydia Wing / Nodarse	5/29/03				

Additional Comments:

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 0104000028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.65
Standard B 58.3
Standard C 486

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5-27-03	0908	A	6.65	6.75		yes	Init	TFMB
		B	58.3	58.6				
		C	486	487				
	1320	A	6.65	6.60		yes	Cont	MB TF
		B	58.3	57.4				
		C	486	479				
5/28/03	0820	A	6.65	6.64		Yes	Init	MB
		B	58.3	58.4				
		C	486	485				
	1340	A	6.65	6.64			Cont	MB
		B	58.3	58.2				
		C	486	486				
	1750	A	6.65	6.65				
		B	58.3	58.3				
		C	486	486				
4/29/03	0800	A	6.65	6.65		Yes	Init	MB
		B	58.3	58.2				
		C	486	486				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 25.3

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5-27-03	0913	A	25.3	25.3		Yes	Init.	ZFMB
	1023	A	25.3	25.3		yes	Cont	ZFMB
5/28/03	0834	A	26.3	26.3		Yes	Init	MB
	1343	A	26.9	26.9			Cont	MB
	1753	A	26.8	26.8				
5/29/03	0802	A	25.1	25.1		Yes	Init	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Cal.

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5-27-03	0914	A	100%	110 %		yes	Init	MB JF
	1324	A	100%	140 %		yes	cont	MBJF
5/28/03	0845	A	100%	110 %		yes	Init	MB
	1346	A	100%	98.4			cont	
	1955	A	100%	99.8				
5/29/03	0803	A	100%	97.2		yes	Init	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05-27-03	0916	A	447	361		yes	Init.	MB TF
	1322	A	447	486		yes	Cont.	MB TF
5/28/03	0831	A	447	497		Yes	Init	MB TF
	1338	A	447	437			Cont	MB
	1757	A	447	441				
5/29/03	0805	A	447	439		Yes	Init	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5-27-03	0917	A	4.0	4.01		yes	Init	MB702
		B	7.0	7.0				
		C	10.0	9.75				
	1328	A	4.0	4.02		yes	Cont.	TFMB
		B	7.0	7.0				
		C	10.0	9.98				
5/28/03	0722	A	4	4.02		yes	Init	MB
		B	7	7.20				
		C	10	9.68				
	1340	A	4	4.03			Cont	MB
		B	7	7.05				
		C	10	9.94				
	1759	A	4	4.01				
		B	7	7.02				
		C	10	9.99				
5/29/03	0807	A	4	4.02		Yes	Init	MB
		B	7	7.06				
		C	10	10.2				

1080

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG 177652

TE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: MW-1	SAMPLE ID: FP-03-02-001		DATE: 10/1/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190'	STATIC DEPTH TO WATER (ft): 50.73	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = ¼ well vol = 23 gallons

= (190 – 50.73) x .66 = 91.9 gallons

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 845 am	PURGE ENDED AT: 1355	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED ~~(gal)~~ #	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1150	1	91.9	.5	50.75	7.36	24.8	485	8.25	0.73	clear	none	142
1250	1 1/4	115	.4	50.75	7.35	24.9	484	5.71	1.17			143
1350	1 1/2	138	.4	5. 71	7.37	24.8	478	3.80	0.85			135

ELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1415
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled)	DUPLICATE: Y (circled) N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Discharge water has small air bubbles

Dupe 1315
MS
MS Dupe

MATERIAL CODES. AG = AMBER GLASS. CG = CLEAR GLASS. PE = POLYETHYLENE: O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando FL.	
WELL NO: MW-2	SAMPLE ID: FP-03-02-006		DATE: 10/2/07

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 52.17	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 of 91 Gal = 23 Gal.

= (190 – 52.17) x .66 = 91 Gal

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0710	PURGE ENDED AT: 1310	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1010	1	91	.63	52.18	7.37	24.8	527	1.91	0.83	clear	none	119
1102	1 1/4	114	.44		7.30	25.3	486	1.64	1.18			107
1216	1 1/2	137	.31	52.2	7.26	25.2	463	1.04	0.88			109.5
1308	1 3/4	160	.44	↓	7.20	25.1	464	0.71	0.68	↓	↓	0.80

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): Mike Bor[illegible]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1315	SAMPLING ENDED AT: 1345
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

W02-E-126-1

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: MW-4	SAMPLE ID: FP-03-02-007		DATE: 10/3/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190'	STATIC DEPTH TO WATER (ft): 53.40	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 of 90 = 22.5

= (190 – 53.40) X .66 = 90 Gal

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0705	PURGE ENDED AT: 1427	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED ~~(gal)~~	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1025	1	90	.47	53.51	10.71	24.5	262	0.30	1.85	clear	None	+00
1125	1 1/4	112.5	.38	53.52	8.01	24.8	294	0.42	0.83			+15
1226	1 1/2	135.	.36	53.50	7.90	24.9	316	0.49	0.60			+169
1334	1 3/4	157.5	.33	53.51	7.89	25.1	317	0.42	0.46			+164
1426	2.0	180	.43	53.52	7.93	25.1	321	0.55	0.30			+

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): Mike Burn		
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1430	SAMPLING ENDED AT: 1455	
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled)	DUPLICATE: Y N (circled)	

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando FL.

WELL NO: North Recharge Well	SAMPLE ID: FP-03-02-005	DATE: 10/1/03

PURGING DATA

WELL DIAMETER (in): NA	TOTAL WELL DEPTH (ft): NA	STATIC DEPTH TO WATER (ft): NA	WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD:	PURGE INITIATED AT:	PURGE ENDED AT:	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
NA →					8.01	27.0	210	3.25	3.70	clear		124

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nolarse	SAMPLER(S) SIGNATURE(S):

SAMPLING METHOD(S): Diaphram Pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1630

FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 ı endola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill
Address: 225 E. Robinson St. Orlando, FL 32801
Phone: 407-423-0030 Fax:
Project Name/Number: Festival Park 177652
Project Manager: Alan Akens
Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE / /

Print Names(s) / Affiliation: Mike Burns / Nodarse
Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)
Analyses Requested: See Attached List

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	~~MB~~							
	FP-03-02-096	10/2/03	1345	Grab	GW	18		
	Temp & Trip Blanks				~~2~~9	2		

Shipment Method: FEDX | 20 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned. / /	Via.		Mike Burns / Nodarse	10/2/03				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)
PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pe. .la Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Address: 225 E. Robinson St, Suite 505 Orlando Fl. 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

Page of

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE / /

Print Names(s) / Affiliation: Mike Burns Nodarse & Assoc.

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached List

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-02-001	10/1/03	1415	Grab	GW	18		
	FP-03-02-002	↓	1315	↓	↓	18		
	FP-03-02-003	↓	1215	↓	↓	18		
	FP-03-02-004	↓	1115	↓	↓	18		
	FP-03-02-005	↓	1630	↓	↓	18		

Shipment Method: Fed X — 90 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns / Nodarse	10/1/03	1700			

Additional Comments:

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pe. ola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Address: 225 E. Robinson St, Orlando FL. 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park / 177652

Project Manager: Alan Akens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse & Assoc.

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-02-007	10/3/03	1455	Grab	GW	18		
	Trip & Temp Blank	|				2		

Shipment Method: FEDX

Total Number of Containers: 20

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns/Nodarse					
Additional Comments:								

Cooler No. (s) / Temperature(s) (C):

Sampling Kit No.:

Equipment ID No.:

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 0104000 28774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.95

Standard B 59.3

Standard C 486

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1106	A	6.95	6.95		Yes	Init.	MB
		B	59.3	60.1				
		C	486	490				
	1530	A	6.95	6.94			cont	MB
		B	59.3	59.5				
		C	486	486				
10/2/03	0945	A	6.95	6.94			Init	MB
		B	59.3	60.4				
		C	486	485				
	1400	A	6.95	6.96			cont	
		B	59.3	60.0				
		C	486	486				
10/3/03	0955	A	6.95	6.97		Yes	Init	MB
		B	59.3	60.2				
		C	486	489				
	1350	A	6.95	6.95			cont	MB
		B	59.3	59.6				
		C	486	487				
	1830	A	6.95	6.94				MB
		B	59.3	59.3				
		C	486	486				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 24.7
Standard B 27.1
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1109	A	24.7	24.7		Yes	Init	MB
|	1533	A	27.1	27.1		|	cont	MB
10/2/03	0947	A	22.3	22.3		|	Init	MB
|	1402	A	25.6	25.6		|	Cont	MB
10/3/03	0958	A	22.5	22.5		|	Init	MB
|	1353	A	25.1	25.1		|	cont	MB
|	1812	A	25.3	25.3		|	|	|

1089

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Cal.

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1110	A	100%	99.9%		Yes	Init	mB
	1534	A	100%	98.3			cont	mB
10/2/03	0948	A	100%	94.2%			Init	mB
	1403	A	100%	98.6			cont	mB
10/3/03	0959	A	100%	98.5			Init	mB
	1355	A	100%	97.4			cont	mB
	1814	A	100%	99.4				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447

Standard B 1413

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1112	A	447	440		Yes	Init	MB
		B	1413	1431				
	1535	A	447	439			cont	MB
		B	1413	1420				
10/2/03	0951	A	447	489			Init	MB
	0952	B	1413	1300				
	1406	A	447	446			cont	MB
		B	1413	1389				
10/3/03	1003	A	447	470		Yes	Init	MB
		B	1413	1280				
	1357	A	447	446			cont	MB
		B	1413	1399				
	1816	A	447	447				
		B	1413	1401				

1091

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1114	A	4	4.29		yes	Init	MB
		B	7	6.94				
		C	10	9.99				
	1537	A	4	3.99			cont	MB
		B	7	6.98				
		C	10	10.04				
10/2/03	0955	A	4	4.14			Init	MB
		B	7	7.10				
		C	10	9.90				
	1410	A	4	4.04			cont	MB
		B	7	6.99				
		C	10	10.02				
10/3/03	1005	A	4	4.13			Init	MB
		B	7	6.94				
		C	10	9.99				
	1359	A	4	4.07			cont	MB
		B	7	7.04				
		C	10	10.03				
	1820	A	4	4.01				
		B	7	7.04				
		C	10	10.1				

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

W01-5-120 1

.E NAME: Festival Park	SITE LOCATION: Orlando	
WELL NO: MW-1	SAMPLE ID: FP-03-03-001	DATE: 10/8/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 51.2	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 of 91.6 Gal = 22.9

= (190 - 51.2) x .66 = 91.6 Gal

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0702	PURGE ENDED AT:	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (μmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0930	1	91.6	.67	51.3	7.87	24.4	310	1.03	2.69	Clear	None	160
1022	1 1/4	114.6	.44		7.75	24.6	322	0.85	2.46			172
1114	1 1/2	137.6	.44		7.67	24.8	334	0.60	4.45			077
1207	1 3/4	160.6	.43		7.53	24.8	328	0.29	4.56			042

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse & Assoc	SAMPLER(S) SIGNATURE(S): Mike Bu[illegible]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1345
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Dupe MS MSD

Small bubbles entrained in water column discharge from well

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE, O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL	
WELL NO: MW-2	SAMPLE ID: FP03-03-007	DATE: 10/10/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 52.89	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 of 90.49 = 22.6 Gal

= (190 – 52.89) X .66 = 90.49

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0650	PURGE ENDED AT: 1158	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED ~~(gal)~~	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0925		90.5	.64	53.01	7.80	24.6	473	1.12	1.53	Clear	None	14[illegible]
1014	1 1/4	113.5	.47	|	7.56	24.7	475	1.08	0.86	|	|	141
1107	1 1/2	136.5	.43	53.1	7.44	24.9	463	0.76	1.09	|	|	038
1156	1 3/4	159.5	.47	53.05	7.38	24.9	455	0.59	1.02			008

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1210	SAMPLING ENDED AT: 1230
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Small bubbles entrained in water column discharged from well

MATERIAL CODES AG = AMBER GLASS. CG = CLEAR GLASS. PE = POLYETHYLENE. O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

0,3

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando FL.
WELL NO: MW-4	SAMPLE ID: FP-03-03-006	DATE: 10/9/03

PURGING DATA

WELL DIAMETER (in): 4" TOTAL WELL DEPTH (ft): 190 STATIC DEPTH TO WATER (ft): 54.1 WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 = 22.6 Gallons

= (190 - 54.1) x .66 = 89.69 Gal

PURGE METHOD: Dedicated Bladder Pump PURGE INITIATED AT: 0702 PURGE ENDED AT: 1305 TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1042	7	80	.44	54.3	7.95	25.0	360	1.89	0.59	Clear	None	-130
1129	1 1/2	112	.47		7.93	25.0	364	1.50	0.26			-148
1206	1 1/4	134	.47		7.84	24.8	368	0.83	0.20			-171
1303	1 3/4	156	.47		7.81	24.8	368	0.54	0.19			-185

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse

SAMPLER(S) SIGNATURE(S): Mike Bu[illegible]

SAMPLING METHOD(S): Pump

SAMPLING INITIATED AT: 1310 SAMPLING ENDED AT: 1330

FIELD DECONTAMINATION: (Y) N FIELD-FILTERED: Y (N) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS.

MATERIAL CODES. AG = AMBER GLASS. CG = CLEAR GLASS. PE = POLYETHYLENE. O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL
WELL NO: North Recharge Well	SAMPLE ID: FP-03-03-002	DATE: 10/08/03

PURGING DATA

WELL DIAMETER (in): NA. TOTAL WELL DEPTH (ft): NA STATIC DEPTH TO WATER (ft): NA WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =
NA = (–) X =

PURGE METHOD: Diaphram Pump PURGE INITIATED AT: 1233 PURGE ENDED AT: TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1233	Initi	0	0.7	NA	—	—	—	—	—	clear	None	
1304	NA	10.5	NA	NA	6.11	27.4	197	1.29	3.58	clear	none	062

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse SAMPLER(S) SIGNATURE(S): [signature]

SAMPLING METHOD(S): Diaphram Pump SAMPLING INITIATED AT: 1305 SAMPLING ENDED AT: 1325

FIELD DECONTAMINATION: Y N FIELD-FILTERED: Y N DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

PEL Laboratories, Inc.

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill

Project Name/Number: Festival Park 167752

Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801

Project Manager: Alan Akens

Phone: 407-423-0030 Fax:

Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-03-001	10/8/03	1345	Grab	GW	26		
	FP-03-03-002	↓	1325	↓	↓	↓		
	FP-03-03-003	↓	1400	↓	↓	↓	Dupe	
	FP-03-03-004	↓	1415	↓	↓	↓	MS	
	FP-03-03-005	↓	1445	↓	↓	↓	MSDupe	

Shipment Method: Fed X — 130 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	5	Mike Burns Nodarse	10/8/03	1800			
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

1097

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill	Project Name/Number: Festival Park 167752	Page 1 of 1
Address: Suite 505 225E. Robinson St. Orlando FL. 32801	Project Manager: Alan Aikens	DEP Form #: 62-770.900(2)
Phone: 407.423.0030 Fax:	Purchase Order:	Form Title: Chain of Custody Record
Print Names(s) / Affiliation: Mike Burns / Nodarse	Preservatives (see codes)	Effective Date: September 23, 1997
Sampler(s) Signature(s): Mike Burns	Analyses Requested: See Attached	FDEP Facility No.
		Project Name:
		Sampling CompQAP No:
		Approval Date:
		REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
	FP-03-03-006	10/9/03	1330	Grab	GW	26			
	Trip & Temp Blanks								

Shipment Method	28	← Total Number of Containers

Out: / /	Via: FED X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via	1	Mike Burns Nodarse	10/9/03				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Project Name/Number: Festival Park 167752

Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801

Project Manager: Alan Aikens

Phone: 407-423-0030 Fax:

Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
	FP-03-03-007	10/10/03	1230	Grab	GW	26	+3	Holding time of unpreserved VOC's is 7 Days, analyze only vials with no headspace	
	Trip & Temp blank					2			

Shipment Method: 28 ← Total Number of Containers 31

Out: / / Via: Fed X

Returned: / / Via:

Additional Comments:

Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
1	Mike Burns / Nodarse	10/10/03	1700			

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

1099

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

FIELD EQUIPMENT CALIBRATION LOG

DATE: 10/08/05	PROJECT NAME: Festival Park	SHEET: 1 OF 1 / PROJECT NO:

EQUIPMENT: WTW Multiline P3				SERIAL NO:	81552054		
ACTUAL TIME: 1230		PERFORMED BY: David M. Cattery					
		pH			CONDUCTIVITY		
CALIBRATION STANDARDS USED:		4.00	7.00	10.00	100.5 us/cm	1413 us/cm	us/cm
m = -58.6	Lot #	2242	2170	3010	RKT187C/1	RVH177A/1	
-16mV	Expiration	8/31/2004	6/30/2004	1/31/2004	11/25/2003	2/15/2004	
Cal. Accepted							
CALIBRATION READINGS LOG:		pH 4.00	pH 7.00	pH 10.00	100.5 us/cm	1413 us/cm	us/cm
	Before Cal.	4.02	7.00	—	—	1428	
	After Cal.	4.00	7.00	—	—	1411	
		4.01	6.96	—	109	1413	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

EQUIPMENT: WTW Oxi 330		SERIAL NO:	260001
ACTUAL TIME: 1250	PERFORMED BY: DMC		

CALIBRATION STANDARDS USED: Air Saturation

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☐ AFTER USE ☐ EACH SAMPLE LOCATION

☒ OTHER (SPECIFY)
4 hr Max.

REMARKS/CORRECTIVE ACTION:

Time	1250		
Temp°C	32.1		
Sat.	0.70		

EQUIPMENT: HF Scientific DRT-15CE Turbidimeter			SERIAL NO:	907173		
ACTUAL TIME: 1250	PERFORMED BY: DMC					
CALIBRATION STANDARDS USED:	Standard	1.0 ntu	20.0 ntu			
	Lot #	A2340	A3113			
	Expiration	Dec. '04	Apr. '05			

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

REMARKS/CORRECTIVE ACTION:	Standard	1.0ntu	20.0ntu			
	Reading	1.0				
		1.0	21.8			

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0900	A	4	4.16		Yes	Init	MB
		B	7	6.99				
		C	10	10.01				
	1300	A	4	4.02			cont	MB
		B	7	7.0				
		C	10	10.03				
	1705	A	4	4.01				
		B	7	7.0				
		C	10	10.0				
10/9/03	1025	A	4	4.04			Init	MB
		B	7	7.09				
		C	10	9.77				
	1330	A	4	4.01			cont	
		B	7	7.0			cont	MB
		C	10	10.06				
10/10/03	0900	A	4	4.03			Init	MB
		B	7	7.04				
		C	10	9.88				
	1300	A	4	4.02			cont	MB
		B	7	7.0				
		C	10	10.01				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAK TON 10 **INSTRUMENT #** 4C453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447
Standard B 1413
Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0905	A	447	487		Yes	Init	MB
		B	1413	1080				
	1304	A	447	447			Cont	
		B	1413	1356				
	1706	A	447	446				
		B	1412	1358				
10/9/03	1028	A	447	454			Init	MB
		B	1413	1354				
	1332	A	447	446			Cont	MB
		B	1413	1396				
10/10/03	0904	A	447	446			Init	MB
		B	1413	1362				
	1303	A	447	447			Cont	MB
		B	1413	1368				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0908	A	100%	105		Yes	Init	MB
	1306	A	100%	98%			cont	MB
	1708	A	100%	99%				
10/9/03	1030	A	100%	94.6%			Init	MB
	1335	A	100%	98.4			cont	MB
10/10/03	0906	A	100%	106.4%			Init	MB
	1705	A	100%	100.7%			cont	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI F55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 21.7
Standard B ________
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0908	A	21.7	21.7		Yes	Init	MB
	1306	A	25.7	25.7			Cont	MB
	1708	A	26.2	26.2				
10/9/03	1030	A	23.9	23.9			Init	MB
	1335	A	25.8	25.8			Cont	MB
10/10/03	0906	A	23.7	23.7			Init	MB
	1305	A	24.6	24.6			Cont	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400C28774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.85

Standard B 60.1

Standard C 494

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0910	A	6.85	6.95		Yes	Init	MB
		B	60.1	60.1				
		C	494	494				
	1308	A	6.85	6.95			cont	MB
		B	60.1	60.1				
		c	494	494				
	1710	A	6.85	6.94				
		B	60.1	60.1				
		C	494	493				
10/9/03	1035	A	6.85	6.85			Init	MB
		B	60.1	60.6				
		C	494	494				
	1337	A	6.85	6.85			cont	MB
		B	60.1	60.2				
		c	494	494				
10/10/03	0910	A	6.85	6.94			Init	MB
		B	60.1	60.4				
		c	494	494				
	1307	A	6.85	6.87			Cont.	MB
		B	60.1	60.2				
		C	494	494				

DEP-SOP-001/01

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: MW-2	SAMPLE ID: FR03-03-007		DATE: 10/10/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 52.89	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 of 90.49 = 22.6 Gal

= (190 - 52.89) X .66 = 90.49

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0650	PURGE ENDED AT: 1158	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED ~~(gal)~~	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR
0925	1	90.5	.64	53.01	7.80	24.6	1473	1.12	1.53	Clear	None
1014	1 1/4	113.5	.47	|	7.56	24.7	1475	1.08	0.86	|	|
1107	1 1/2	136.5	.43	53.1	7.44	24.9	1463	0.76	1.09	|	|
1156	1 3/4	159.5	.47	53.05	7.38	24.9	1455	0.59	1.02		

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1210	SAMPLING ENDED AT: 1230
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Small bubbles entrained in water column discharged from well

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

1106

DEP-SOP-001/01

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: North Recharge Well	SAMPLE ID: FP-03-03-002		DATE: 10/08/03

PURGING DATA

WELL DIAMETER (in): NA	TOTAL WELL DEPTH (ft): NA	STATIC DEPTH TO WATER (ft): NA	WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

NA = (–) X =

PURGE METHOD: Diaphram Pump	PURGE INITIATED AT: 1233	PURGE ENDED AT:	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	
1233	Initi	0	0.7	NA	—	—	—	—	—	clear	none	0%
1304	NA	10.5	NA	NA	6.11	27.4	197	1.29	3.58	clear	none	06

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Diaphram Pump	SAMPLING INITIATED AT: 1305	SAMPLING ENDED AT: 1325
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (N circled)	DUPLICATE: Y N (N circled)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

DEP-SOP-001/01

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

WOI-E-120-1

SITE NAME: Festival Park		SITE LOCATION: Orlando	
WELL NO: MW-1	SAMPLE ID: FP-03-03-001		DATE: 10/8/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): ~~[illegible]~~ 190	STATIC DEPTH TO WATER (ft): 51.2	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 @ 91.6 Gal = 22.9

= (190 – 51.2) x .66 = 91.6 Gal

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0702	PURGE ENDED AT:	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR
0930	1	91.6	.67	51.3	7.82	24.4	310	1.03	2.69	Clear	None
1022	1 1/4	114.6	.44	↓	7.75	24.6	322	0.85	2.46	↓	↓
1114	1 1/2	137.6	.44	↓	7.67	24.8	334	0.60	4.45	↓	↓
1207	1 3/4	160.6	.43	↓	7.53	24.8	328	0.29	4.56	↓	↓

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse & Assoc	SAMPLER(S) SIGNATURE(S): Mike B[illegible]	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1345
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: Dupe MS MSD   Small bubbles entrained in water column discharge from well

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE, O = OTHER (SPECIFY)

1108

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

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DEP-SOP-001/01

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando FL.	
WELL NO: MW-4	SAMPLE ID: FP-03-03-006		DATE: 10/9/03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 54.1	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 1/4 = 22.6 Gallons

= (190 – 54.1) x .66 = 89.69 Gal

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0702	PURGE ENDED AT: 1305	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	O
1042	1	80	.44	54.3	7.95	25.0	1360	1.89	0.59	Clear	None	-1
1129	1 1/2	112	.47		7.93	25.0	1364	1.50	0.26			-1
1206	1 1/4	139	.47		7.84	24.8	1368	0.83	0.20			-1
1303	1 3/4	156	.47		7.81	24.8	1368	0.54	0.19			+1

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse	SAMPLER(S) SIGNATURE(S): Mike Bw	
SAMPLING METHOD(S): Pump	SAMPLING INITIATED AT: 1310	SAMPLING ENDED AT: 1330
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

~~1109~~

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2002

FIELD EQUIPMENT CALIBRATION LOG

SHEET: 1 OF 1
PROJECT NO:

DATE: 10/08/03 PROJECT NAME: Festival Park

EQUIPMENT: WTW Multiline P3				SERIAL NO:	61562054	
ACTUAL TIME: 1230	PERFORMED BY: David M. Caffery					
	pH			CONDUCTIVITY		
CALIBRATION STANDARDS USED:	4.00	7.00	10.00	100.5 us/cm	1413 us/cm	us/cm
m = -58.6 / Lot #	2242	2170	3010	RKT187C/1	RVH177A/1	
-16mV / Expiration	8/31/2004	6/30/2004	1/31/2004	11/25/2003	2/15/2004	
Cal. Accepted						
CALIBRATION READINGS LOG:	pH 4.00	pH 7.00	pH 10.00	100.5 us/cm	1413 us/cm	us/cm
Before Cal.	4.02	7.00	—	—	1428	
After Cal.	4.00	7.00	—	—	1411	
	4.01	6.96	—	109	1413	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

EQUIPMENT: WTW Oxi 330	SERIAL NO: 280001
ACTUAL TIME: 1250	PERFORMED BY: DMC

CALIBRATION STANDARDS USED: Air Saturation

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☐ AFTER USE ☐ EACH SAMPLE LOCATION

☒ OTHER (SPECIFY) 4 hr Max.

REMARKS/CORRECTIVE ACTION:

Time	1250		
Temp°C	32.1		
Sat.	0.70		

EQUIPMENT: HF Scientific DRT-15CE Turbidimeter	SERIAL NO: 907173
ACTUAL TIME: 1250	PERFORMED BY: DMC

CALIBRATION STANDARDS USED:

Standard	1.0 ntu	20.0 ntu			
Lot #	A2340	A3113			
Expiration	Dec. '04	Apr. '05			

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

REMARKS/CORRECTIVE ACTION:

Standard	1.0ntu	20.0ntu			
Reading	1.0				
	1.6	24.8			

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.95
Standard B 59.3
Standard C 486

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1106	A	6.95	6.95		Yes	Init.	MB
		B	59.3	60.1				
		C	486	490				
	1530	A	6.95	6.94			cont	MB
		B	59.3	59.5				
		C	486	486				
10/2/03	0945	A	6.95	6.94			Init	MB
		B	59.3	60.6				
		C	486	485				
	1400	A	6.95	6.96			cont	
		B	59.3	60.0				
		C	486	486				
10/3/03	0955	A	6.95	6.97		Yes	Init	MB
		B	59.3	60.2				
		C	486	489				
	1350	A	6.95	6.95			cont	MB
		B	59.3	59.6				
		C	486	487				
	1850	A	6.95	6.94				MB
		B	59.3	59.3				
		C	486	486				

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 24.7

Standard B 27.1

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1109	A	24.7	24.7		Yes	Init	MB
		1533	A	27.1	27.1			cont	MB
10/2/03	0947	A	22.3	22.3			Init	MB
	1402	A	25.6	25.6			Cont	MB
10/5/03	0958	A	22.5	22.5			Init	MB
	1353	A	25.1	25.1			cont	MB
	1812	A	25.3	25.3				

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Cal.

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1110	A	100%	99.9%		Yes	Init	MB
↓	1534	A	100%	98.3		↓	cont	MB
10/2/03	0948	A	100%	94.2%		↓	Init	MB
↓	1403	A	100%	98.6		↓	cont	MB
10/3/03	0959	A	100%	98.5		↓	Init	MB
↓	1355	A	100%	97.4		↓	cont	MB
↓	1814	A	100%	99.4		↓	↓	↓

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447
Standard B 1413
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1112	A	447	440		Yes	Init	MB
		B	1413	1431				
	1535	A	447	439			cont	MB
		B	1413	1420				
10/2/03	0951	A	447	489			Init	MB
	0952	B	1413	1300				
	1406	A	447	446			cont	MB
		B	1413	1389				
10/3/03	1003	A	447	470		yes	Init	MB
		B	1413	1280				
	1357	A	447	446			cont	MB
		B	1413	1399				
	1816	A	447	447				
		B	1413	1401				

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *(Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased)*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/1/03	1114	A	4	4.29		Yes	Init	MB
		B	7	6.94				
		C	10	9.99				
	1537	A	4	3.99			cont	MB
		B	7	6.98				
		C	10	10.04				
10/2/03	0955	A	4	4.14			Init	MB
		B	7	7.10				
		C	10	9.90				
	1410	A	4	4.04			cont	MB
		B	7	6.99				
		C	10	10.02				
10/3/03	1005	A	4	4.13			Init	MB
		B	7	6.94				
		C	10	9.99				
	1359	A	4	4.07			cont	MB
		B	7	7.04				
		C	10	10.03				
	1820	A	4	4.01				
		B	7	7.84				
		C	10	10.1				

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0900	A	4	4.16		Yes	Init	MB
		B	7	6.99				
		C	10	10.01				
	1300	A	4	4.02			cont	MB
		B	7	7.0				
		C	10	10.03				
	1705	A	4	4.01				
		B	7	7.0				
		C	10	10.0				
10/9/03	1025	A	4	4.04			Init	MB
		B	7	7.09				
		C	10	9.77				
	1330	A	4	4.01			cont	
		B	7	7.0			cont	MB
		C	10	10.06				
10/10/03	0900	A	4	4.03			Init	MB
		B	7	7.04				
		C	10	9.88				
	1300	A	4	4.02			cont	MB
		B	7	7.0				
		C	10	10.01				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447
Standard B 1413
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0905	A	447	487		Yes	Init	MB
		B	1413	1080				
	1304	A	447	447			cont	
		B	1413	1356				
	1706	A	447	446				
		B	1413	1358				
10/9/03	1028	A	447	454			Init	MB
		B	1413	1354				
	1332	A	447	446			cont	MB
		B	1413	1396				
10/10/03	0904	A	447	446			Init	MB
		B	1413	1362				
	1303	A	447	447			cont	MB
		B	1413	1368				

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YST 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0908	A	100%	105		Yes	Init	MB
	1306	A	100%	98%			cont	MB
	1708	A	100%	99%				
10/9/03	1030	A	100%	94.6%			Init	MB
	1335	A	100%	98.4			cont	MB
10/10/03	0906	A	100%	106.4%			Init	MB
	1305	A	100%	100.7%			cont	MB

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FT 1000 General Field Testing and Measurement

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI #55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 21.7

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0908	A	21.7	21.7		Yes	Init	MB
	1306	A	25.7	25.7			Cont	MB
	1708	A	26.2	26.2				
10/9/03	1030	A	23.9	23.9			Init	MB
	1335	A	25.8	25.8			Cont	MB
10/10/03	0906	A	23.7	23.7			Init	MB
	1305	A	24.6	24.6			Cont	MB

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.85
Standard B 60.1
Standard C 494

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/8/03	0910	A	6.85	6.95		Yes	Init	MB
		B	60.1	60.1				
		C	494	494				
	1308	A	6.85	6.95			Cont	MB
		B	60.1	60.1				
		C	494	494				
	1710	A	6.85	6.94				
		B	60.1	60.1				
		C	494	493				
10/9/03	1035	A	6.85	6.85			Init	MB
		B	60.1	60.6				
		C	494	494				
	1337	A	6.85	6.85			Cont	MB
		B	60.1	60.2				
		C	494	494				
10/10/03	0910	A	6.85	6.94			Init	MB
		B	60.1	60.4				
		C	494	494				
	1307	A	6.85	6.87			Cont.	MB
		B	60.1	60.2				
		C	494	494				

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL	
WELL NO: MW-1	SAMPLE ID: FP-03-04-004		DATE: 10/24/03

PURGING DATA

WELL DIAMETER (in): 4	TOTAL WELL DEPTH (ft): 190'	STATIC DEPTH TO WATER (ft): 52.82	WELL CAPACITY (gal/ft): 0.66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =
1 vol = (190' – 52.82') x 0.66 = 90.6 gals

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0712	PURGE ENDED AT: 1445	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR ORP mV
0712	Init	0	0.48	52.82	—	—	—	—	—	clear	None
1048	90.6	90.6	0.42	52.92	6.97	28.1	363	0.18	1.38	"	-115
1142	22.4	113	0.42	52.92	7.46	25.4	360	0.21	1.26	"	-176
1237	23.0	136	0.42	52.92	7.60	25.3	359	0.18	1.39	"	-180
1332	23.0	159	0.41	52.92	7.53	25.1	360	0.15	1.57	"	-167
1429	23.0	182	0.40	52.92	7.51	25.2	361	0.16	1.64	"	-158

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: David McCaffery / Modarso	SAMPLER(S) SIGNATURE(S):	
SAMPLING METHOD(S): Dedicated Pump	SAMPLING INITIATED AT: 1500	SAMPLING ENDED AT: 1640
FIELD DECONTAMINATION: Y N (N circled)	FIELD-FILTERED: Y N (N circled)	DUPLICATE: Y N (Y circled)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD +MS +MSDup
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

W01-E-120-1

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL	
WELL NO. MW-2	SAMPLE ID: FP-03-04-001	DATE. 10-22-03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190'	STATIC DEPTH TO WATER (ft): 53.45	WELL CAPACITY (gal/ft): .66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (190 − 53.95) X .66 = 89.8

PURGE METHOD: Dedicated Bladder Pump	PURGE INITIATED AT: 0800	PURGE ENDED AT: 1312	TOTAL VOL. PURGED (gal):

ow eter started at 45 ↓ low eter readings 735

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE * (gpm) 0.25	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	(mV) ORP
1242	90	90	~~0.5~~	54.06	7.32	25.5	427	0.38	0.67	Clear	ND	0 2
1252	2.5	92.5	0.25	54.0	7.30	25.4	429	0.29	0.54	↓	↓	029
1302	2.5	95	↓	↓	7.33	25.4	428	0.23	0.50	↓	↓	018
1312	2.5	97.5	↓	↓	7.32	25.4	425	0.20	0.50	↓	↓	006

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION Nodarse & Associates	SAMPLER(S) SIGNATURE(S)	
SAMPLING METHOD(S): Bladder Pump	SAMPLING INITIATED AT: 1313	SAMPLING ENDED AT: 1340
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS: * Purge Rate began at 0.5 then at time of first reading, the purge Rate was 0.25

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Festival Park	
WELL NO: MW-4	SAMPLE ID: FP-03-04-002	DATE: 10-23-03

PURGING DATA

WELL DIAMETER (in): 4"	TOTAL WELL DEPTH (ft): 190	STATIC DEPTH TO WATER (ft): 55.3	WELL CAPACITY (gal/ft): 0.66

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY = 190 - 55.3) x 0.66 = 88.9 gallon

3 well vol ≃ 266.7 gallons
1/4 vol = 22.25 gallons

PURGE METHOD: dedicated Bladder pump	PURGE INITIATED AT: 7.35 am	PURGE ENDED AT:	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
10:38	1	89	0.48	54.1	9.19	25.8	305	2.12	16.9	Clear	None	+120
1124	1 1/4	111			8.07	24.7	401	0.67	0.39			+167
1210	1 1/2	133			7.92	25.0	413	0.57	0.22			+179
1256	1 3/4	155			7.91	25.4	411	0.98	0.60			+123

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Lydia Wing	SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): dedicated bladder pump	SAMPLING INITIATED AT: 1607	SAMPLING ENDED AT: 1626
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	
						see chain-of-custody

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Festival Park
WELL NO: North Recharge	SAMPLE ID: FP-03-04-003	DATE: 10/28/03

PURGING DATA

WELL DIAMETER (in): N/A	TOTAL WELL DEPTH (ft):	STATIC DEPTH TO WATER (ft): N/A	WELL CAPACITY (gal/ft):

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD:	PURGE INITIATED AT: 1416	PURGE ENDED AT:	TOTAL VOL PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
	NA	—	—	5	7.73	28.5	246	3.0	32.8	sl. Grey		065

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse & Assoc	SAMPLER(S) SIGNATURE(S):	
SAMPLING METHOD(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1500
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

1124

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Page of

Company: CH2M Hill	Project Name/Number: CH2M Hill - Festival Park 167752
Address:	Project Manager: Al Aikens
Phone: 407 4230030 Fax:	Purchase Order:
Print Names(s) / Affiliation: Mike Burns / Lydia Wing	
Sampler(s) Signature(s):	

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE
/ /

Preservatives (see codes)

Analyses Requested

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
	~~Aquifer Recharge~~						See attached Parameter list		
	FP-03-04-002	10/23/03	1626	grab	water	26	✓		
	FP-03-04-003	10/23/03	1500	grab	water	24	✓		
	Temp Trip Blank	/	~~1626~~	—	—	5			

Shipment Method: 55 ← Total Number of Containers

Out: / /	Via: FED X	Item Nos. 3	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		[signature]	9/15/03	1715			
Additional Comments:			Lydia Wing, NAN	10/23/03	1800			

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 [illegible]ndola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CHZMHILL ~~Madane & Associates~~

Address:

Phone: 407-740-6110 Fax: 407-740-6112

Project Name/Number: Festival Park / 167752

Project Manager: Al Aikens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Dave Caffery / Tiffany Fairlamb

Sampler(s) Signature(s): [signatures]

Preservatives (see codes)

Analyses Requested: x See attached List; 8260 (2 vials) without HCL *

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	See attached List	8260 (2 vials) without HCL	Remarks	Lab. No.
	FP03-04-004		1535	G	GW	27	x	x		
	005		1600	G	GW	27	x	x		
	006		1835	G	GW	27	x	x	MS (FP03-04-004)	
	007		1300	G	GW	27	x	x	MSD (FP-03-04-004)	
	TRIP BLANK				W	4				
	TEMP BLANK				W	8 **			* Please analyze 8260 with least headspace:	
									Both → 1 set of vials w/ HCL	
									→ 1 set of vials without HCL	

Shipment Method | ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		[signature]	9.15.03	1715	x [signature]	10/24/03	0800
Additional Comments:			x [signature]	10-24-03	1730			

** There are 8 Temp Blanks (1 per cooler)

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 Series INSTRUMENT # 88023

PARAMETER: *[check only one]*

- [ ] TEMPERATURE
- [x] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [ ] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ___

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1413
Standard B 447
Standard C ___

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-22-03	1112	A	1413	1210		Y	Init	TK
⟩	1505	B	447	426		Y	Init	TK

1127

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10series INSTRUMENT # 88023

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4
Standard B 7
Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-22-03	~~[illegible]~~ 1106	B	7	6.97		y		
		A	4	4.12		y		
		C	10	9.92		y		

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 INSTRUMENT # 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ~~000~~ Auto Calibration

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/22/03	0839	A	100	123		Y	Init	ZF

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 01040002877y

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.75

Standard B 59.6

Standard C 491

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/21/03	0847	A	6.75	6.72		Y	Init	TF
		B	59.6	6.00		Y	Init	TF
		C	491	492		Y	Init	TF

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-23-03	10:05	A	100	100.6	~~100~~ 0.005%	Yes	Initial	LW
	1400	A	100	97.8			Con	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI F55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A Thermometer
Standard B ________
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-23-03	10:05	A	21.8	21.8°C	0%	y	initial	LW
↓	14:01	A	25.4	25.4C°		y	cont	MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.95

Standard B 60.1

Standard C 494

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-23-03	10:05	A	6.95	6.93	0.002	y	init.	LW
10-23-03	10:05	B	60.1	60.2	0.001	y	init.	LW
10-23-03	10:05	C	494	494	0	y	init.	LW
	14:05	A	6.95	6.94		y	cont.	MA
		B	60.1	60.1		y		
		C	494	494		y		

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 4C453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447 µs
Standard B 1413 µs
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-23-03	10:05	A	447	371	0.1%	y	init	LW
		B	1413	1200	0.15%	y	init	LW
	1408	A	447	440		y	cont	MB
		B	1417	1320		y		MB

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0

Standard B 7.0

Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10-23-03	10:05	B	7	7.18	0.18%	Y	init	LW
10-23-03	10:05	A	4	4.20	0.05%	Y	init	LW
10-23-03	10:05	C	10	9.40	0.06%	Y	init	LW
	1410	B	7	7.04		Y	Cont	MB
		A	4	4.10		Y		
		C	10	10.02		Y		

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW/197i **INSTRUMENT #** 2270005

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A pH 4.00 - Lot# 2242 / Expir. - 08/31/04
Standard B pH 7.00 - Lot# 2170 / Expir. - 06/30/04
Standard C pH 10.00 - Lot# 3010 / Expir. - 01/31/04

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
03/10/24	1017	A	4.00	3.95		Yes	Init	DMC
"	1019	B	7.00	7.04		Yes	"	"
	1024	A	4.00	4.00		after Cal.	"	"
	1026	B	7.00	7.01		after cal.	"	"
	1720	A	4.00	4.01		No	Conti	"
	1722	B	7.00	7.01		No	Conti	"

1136

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW/197i INSTRUMENT # 2270005

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1413 uS/cm, Lot# RVH177A/1, Expir. - 02/15/04
Standard B 100.5 uS/cm, Lot# RKT187C/1, Expir. - 11/25/03
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
03/10/24	1017	B	1413	1434		Yes	Init.	DLC
	1018	B	1413	1420		after cal.	"	"
	1720	B	1413	1422		No	Cont.	"
✓	1721	A	100.5	109		"	"	"

1137

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW/197i **INSTRUMENT #** 270005

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A Air Saturation

Standard B ____

Standard C ____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
03/10/24	1016	A	—	16.6°C/50.95	—	Yes	Init.	DMC
"	1330	A	—	31.4°C/50.93	—	"	"	"

1138

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) Barnant 20 **INSTRUMENT #** E03003315

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☒ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ORP 220mV±5mV, Lot# 1K326A, Expir.- 11/03

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
03/10/24	1025	A	220mV	219mV		NO	Cont.	DMC
"	1440	A	220mV	215mV		NO	"	"

1139

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HF/DRT-15CE Turbidimeter INSTRUMENT # 709107

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1.0 ntu, Lot# A2340, Dec. '04

Standard B 20.0 ntu, Lot# A3113, Apr. '05

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
03/10/24	1020	A	1.0	1.0	—	No	Cont.	DHC
	1720	A	1.0	1.0	—	"	"	"
	1720	B	20.0	20.4		"	"	"

1140

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park | SITE LOCATION: Orlando, FL.

WELL NO: MW-1 | SAMPLE ID: FP-03-05-001 | DATE: 11/18/03

PURGING DATA

WELL DIAMETER (inches): 4" | TUBING DIAMETER (inches): | WELL SCREEN INTERVAL DEPTH: NA feet to feet | STATIC DEPTH TO WATER (feet): 52.93 | PURGE PUMP TYPE OR BAILER: Dedicated BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY 1/4 = 22.6 Gal
only fill out if applicable)
= (190 feet − 52.93 feet) X .66 gallons/foot = 90.46 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 120 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 120 | PURGING INITIATED AT: 0657 | PURGING ENDED AT: 1314 | TOTAL VOLUME PURGED (gallons): 180

TIME	VOLUME PURGED ~~(gallons)~~	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
0926	1	90.46	.65	52.95	7.32	24.4	318	2.51	1.13	clear	none	
1013	1 1/4	113.06	.48	52.94	7.32	24.8	332	1.22	1.17			1066
1101	1 1/2	135.66	.47	52.94	7.33	24.9	325	0.65	2.57			067
1156	1 3/4	158.26	.41	52.94	7.35	24.9	321	0.42	4.52			018
1214	2.0	180.86	.39	52.93	7.37	25.0	319	0.40	5.61			012

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Woodarje | SAMPLER(S) SIGNATURES: Mike Burns | SAMPLING INITIATED AT: 1315 | SAMPLING ENDED AT: 1345

PUMP OR TUBING DEPTH IN WELL (feet): 120 | SAMPLE PUMP FLOW RATE (mL per minute): | TUBING MATERIAL CODE: T / PE

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: Y (N) FILTER SIZE: µm | Filtration Equipment Type: | DUPLICATE: (Y) N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
		see	Attached					

REMARKS: Open hole well, 190' Casing
very small bubbles in discharge water

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL
WELL NO: MW-2	SAMPLE ID: FP-03-05-005	DATE: 11/19/03

PURGING DATA

WELL DIAMETER (inches): 4" | TUBING DIAMETER (inches): | WELL SCREEN INTERVAL DEPTH: NA feet to feet | STATIC DEPTH TO WATER (feet): 54.48 | PURGE PUMP TYPE OR BAILER: BP Dedicated

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY 1/4 = 22 Gallons
only fill out if applicable)
= (190 feet – 54.48 feet) X .65 gallons/foot = 88.0 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 120' | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 126' | PURGING INITIATED AT: 0640 | PURGING ENDED AT: 1213 | TOTAL VOLUME PURGED (gallons): 198

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
0902	1	88	.66	54.5	7.11	24.5	462	0.89	0.76	clear	none	108
0936	1 1/4	110	.65	54.5	7.0	24.5	451	0.74	0.64			098
1012	1 1/2	132	.54	54.5	7.01	24.7	431	0.67	0.87			094
1053	1 3/4	154	.54	54.5	6.91	24.7	420	0.60	0.74			079
1133	2.0	176			6.91	24.6	404	0.46	0.66			067
1213	2 1/4	198			6.91	24.5	408	0.35	0.85			058

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse | SAMPLER(S) SIGNATURES: [signature] | SAMPLING INITIATED AT: 1412 | SAMPLING ENDED AT: 1450

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | TUBING MATERIAL CODE: T PE

FIELD DECONTAMINATION: Y N (Y circled) | FIELD-FILTERED: Y N (N circled) | FILTER SIZE: µm | Filtration Equipment Type: | DUPLICATE: Y N (N circled)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See	Attached List				

REMARKS: very small Bubbles in discharge water
Open Hole well Casing to 190'

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL.	
WELL NO: North Recharge	SAMPLE ID: FP-03-05-007		DATE: 11/20/03

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: NA feet to feet	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: diaphram Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) N.A = (feet − feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) NA = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
	NA				6.38	24.4	197	4.63	6.73	clear	SL. ?

ORP
-047

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nadaraie	SAMPLER(S) SIGNATURES: Mike Bu	SAMPLING INITIATED AT: 1320	SAMPLING ENDED AT: 1340
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		

REMARKS: Sampled from influent water entering recharge well

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL.	
WELL NO: MW-4	SAMPLE ID: FP-03-05-006	DATE: 11/26/03

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 55.43	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY 1/4 = 21.8 Gal.
only fill out if applicable)
= (190 feet − 55.43 (feet) X .65 gallons/foot = 87.47 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 120	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 120	PURGING INITIATED AT: 0641	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
0951	|	87.47	.47	55.70	7.49	23.4	291	0.72	1.25	clear	sl. sulfur	-129
1039	1 1/4	109.27	|	|	7.43	23.4	335	0.68	0.34	|	|	-140
1127	1 1/2	131.07	.45	|	7.53	23.6	332	0.63	0.38	|	|	-128
1215	1 3/4	152.87	|	|	7.55	23.6	328	0.58	0.19	|	|	-109

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1615	SAMPLING ENDED AT: 1640
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: T/PE	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See	Attached				

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Address: Suite 505, 1225 E. Robinson St. Orlando, FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park / 177652

Project Manager: Alan Aitken

Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse & Associates

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FF-03-05-005	11/19/03	1430	G	GW	23		
	Trip + Temp Blank					2		
							11/19/03 1630	

Shipment Method — 26 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	1	Mike Burns / Nodarse	11/19/03	1630			
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

1145

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: Ch2M Hill

Address: Suite 505, 225 E. Robinson St. Orlando FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-05-006	11/20/03	1640	Grab	GW	18 + 3	3 Additional Non	
	FP-03-05-007	↓	1340	Grab	GW	18	Preserved VOCs	
	Trip / Temp Blanks					4		

Shipment Method | 43 ← Total Number of Containers

Out: / / Via: Fed X

Returned: / / Via.

Additional Comments:

Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
2	[signature] / PEL	11/10/03	16:00	Mike Burns / Nodarse	11/14/03	
2	Mike Burns / Nodarse	11/20/03				

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 20.9

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
11/18/03	0800	A	20.9	20.9		Yes	Init	MB
↓	1159	A	25.2	25.2		↓	Cont	MB
11/19/03	0806	A	20.8	20.8			Init	MB
	1525	A	21.2	21.2			Cont	MB
11/20/03	0908	A	20.7	20.7			Init	MB
↓	1350	A	25.3	25.3			Cont	MB

1147

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400C23774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.95
Standard B 60.1
Standard C 494

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
11/18/03	0803	A	6.95	6.99		Yes	Init	MB
		B	60.1	61.4				
		C	494	497				
	1157	A	6.95	6.94			Cont	MB
		B	60.1	60.2				
		C	494	495				
11/19/03	0810	A	6.95	6.90		Yes	Init	MB
		B	60.1	60.8				
		C	494	495				
	1528	A	6.95	6.90			Cont	MB
		B	60.1	60.7				
		C	494	498				
11/20/03	0910	A	6.95	7.0			Init	MB
		B	60.1	61.8				
		C	494	502				
11/20/03	1355	A	6.95	6.93			Cont	MB
		B	60.1	60.8				
		C	494	493				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
11/18/03	0759	A	100%	116.2		Yes	Init	mB
↓	1200	A	100%	107.1			Cont	mB
11/19/03	0806	A	100%	101.1			Init	mB
|	1529	A	100%	103.7			Cont	mB
11/20/03	0907	A	100%	107.6			Init	mB
|	1349	A	100%	101.2			Cont	mB

1149

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAK TON 10 **INSTRUMENT #** 4C453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447

Standard B 1413

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
11/18/03	0757	A	447	496		Yes	Init	MB
		B	1413	1349				
	1205	A	447	437			Cont	MB
		B	1413	1310				
11/19/03	0804	A	447	432			Init	MB
		B	1413	1330				
	1522	A	447	446			cont	MB
		B	1413	1387				
11/20/03	0905	A	447	456			Init	MB
		B	1413	1346				
	1345	A	447	449			cont	MB
		B	1413	1368				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 INSTRUMENT # 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0
Standard B 7.0
Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
11/18/03	0755	A	4	4.20		yes	Init	MB
		B	7	7.10				
		C	10	10.22				
	1203	A	4	4.06			Cont	MB
		B	7	7.09				
		C	10	10.01				
11/19/03	0820	A	4	3.98			Init	MB
		B	7	7.09				
		C	10	9.96				
	1520	A	4	3.97			Cont	MB
		B	7	6.99				
		C	10	9.97				
11/20/03	0900	A	4	4.08			Init	MB
		B	7	7.0				
		C	10	9.87				
	1343	A	4	4.03			Cont	MB
		B	7	7.02				
		C	10	10.08				

1151

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

2311184 ums

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: Ch2M Hill

Address: Suite 505, 225 E. Robinson St. Orlando FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse

Sampler(s) Signature(s): [signature]

Preservatives (see codes)

Analyses Requested

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-05-006	11/20/03	1640	Grab	GW	18 + 3	3 Additional Non	01
	FP-03-05-007	↓	1340	Grab	GW	18	Preserved VOCs	02
	Trip + Temp Blanks					4		03, 04

Shipment Method | 43 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	2	[signature] / PEL	11/10/03	16:00	Mike Burns / Nodarse	11/14/03	
Additional Comments:		2	Mike Burns / Nodarse	11/21/03		[signature] / PEL	11/21/03	10:30

pH<2 (8260, 9040, 365.2, FL PRO, 6010, 900, 353.2, 7501, 351.2, 365.4)

Gross Alpha sent to FL RAD

BOD sent to STL TAMPA

Cooler No. (s) / Temperature(s) (C): 4C

Sampling Kit No.

Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Parameter List

2311 184

EPA Method	Container	Preservative
8151 (Herbicides)	1 L Amber Glass	4°C
8270 (SVOCs)	1 L Amber Glass	4°C
8081 (Organochlorine pesticides)	1 L Amber Glass	4°C
8141 (organophosphorous Pesticides)	1 L Amber Glass	4°C
FL-PRo (TPH)	2 x 1 L Amber Glass	H_2SO_4
8082 (PCBs)	1 L Amber Glass	4°C
pH	250 ml PE	4°C
Total metals	500 ml PE	HNO_3
8260 (VOC)	3 x 40 ml CG vials	HCL
Trip Blank	2 x 40 ml CG vials	HCL
Temperature Blank	1 x 40 ml CG vial	4°C
Gross Alpha	1,000 ml PE	HCL
BOD	1,000 ml PE	4°C
Nitrate / Nitrite	500 ml PE	H_2SO_4
Ammonia, TKN	500 ml PE	H_2SO_4
Dissolved Phosphorous	500 ml PE	H_2SO_4
Phosphorous	500 ml PE	H_2SO_4
Alkalinity	1,000 ml PE	4°C
SO_4		
CL		
TDS		
Color	500 ml PE	4°C
Turbidity	500 ml PE	4°C
Nitrite NO	500 ml PE	4°C
Ortho-phosphorous	500 ml PE	4°C
TOC	250 ml PE	HCL
Dissolved TOC	250 ml PE	HCL

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

2311161

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill / Nodarse 3 Assoc.
Address: Suite 505, 225 E. Robinson St. Orlando FL 32801
Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652
Project Manager: Alan Aikens
Purchase Order:

Page of

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE / /

Print Names(s) / Affiliation: Mike Burns Nodarse 3 Assoc.
Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)
Analyses Requested: See Attached List

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
1	FP-03-05-001	11/18/03	1345	Grab	GW	18+3	Additional 40 ml	01
2	FP-03-05-002		1400			18+3	vials collected with	02
3	FP-03-05-003		1430			18+3	no HCL due to	~~03~~ 04
4	FP-03-05-004		1445			18+3	small bubbles entrained in	~~04~~ 05
5	Trip & Temp Blanks		—	—	—	8	sample. Call CH2M Hill to	
	TB-001	11/18/03	—				find out which sets to	~~05~~ 06
	TB-002	11/18/03	—				analyze.	~~06~~ 07
	TB-003	11/18/03	—					~~07~~ 08
	TB-004	11/18/03	—					~~08~~ 09

Shipment Method — ~~80~~ 92 ← Total Number of Containers

Out: / / Via: FED X Item Nos. 4
Returned: / / Via.

Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Mike Burns / Nodarse	11/18/03		FedEx		
FedEx			[signature] / PEL	11/19/03	10:45

Additional Comments: TEMP: 4C
Item #3 is MS
Item #4 is MSD
Parent for MS/MSD is item #1
pH<2 (8240, 9060, 6010, 365.2, 353.2, 350.1, 351.2, 365.4, 405.1, FL PRO, 900)
Gross Alpha sent to FL Rad Chem
BOD sent to STL Tampa

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Parameter List

EPA Method	Container	Preservative
8151 (Herbicides)		
8270 (SVOCs)		
8081 (Organochlorine pesticides)		
8141 (organophosphorous Pesticides)		
FL-PRo (TPH)		
8082 (PCBs)		
pH		
Total metals		
8260 (VOC)		
Trip Blank		
Temperature Blank		
Gross Alpha		
BOD		
Nitrate / Nitrite		
Ammonia, TKN		
Dissolved Phosphorous		
Phosphorous		
Alkalinity		
SO_4		
CL		
TDS		
Color		
Turbidity		
Nitrite NO		
Ortho-phosphorous		
TOC		
Dissolved TOC		

PEL Laboratories, Inc.
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E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

2311171 ums

Company: CH2M Hill

Address: Suite 505 225 E. Robinson St. Orlando, FL. 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park / 177652

Project Manager: Alan Aikens

Purchase Order:

DEP Form #: 62-770.900(3)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns / Nodarse & Assoc.

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-03-05-005	11/19/03	1430	G	GW	23		01
	Trip + Temp Blank					2		02

Shipment Method — 26 ← Total Number of Containers

Out: / / Via: Fed X
Returned: / / Via.

Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
1	Mike Burns / Nodarse	11/19/03	1630	FED EX		
	FED EX			[signature] H2	11/20/03	10:30

Additional Comments:
TEMP: 4C
pH<2 (8260, 9060, 365.2, FL-PRO, 6010, 900, 353.2, 350.1, 351.2, 365.4)
Gross Alpha sent to FL RAD.
BOD sent to STL. TAMPA

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Parameter List

EPA Method	Container	Preservative
8151 (Herbicides)	1 L Amber Glass	4°C
8270 (SVOCs)	1 L Amber Glass	4°C
8081 (Organochlorine pesticides)	1 L Amber Glass	4°C
8141 (organophosphorous Pesticides)	1 L Amber Glass	4°C
FL-PRo (TPH)	2 x 1 L Amber Glass	H_2SO_4
8082 (PCBs)	1 L Amber Glass	4°C
pH	250 ml PE	4°C
Total metals	500 ml PE	HNO_3
8260 (VOC)	3 x 40 ml CG vials	HCL
Trip Blank	2 x 40 ml CG vials	HCL
Temperature Blank	1 x 40 ml CG vial	4°C
Gross Alpha	1,000 ml PE	HCL
BOD	1,000 ml PE	4°C
Nitrate / Nitrite	500 ml PE	H_2SO_4
Ammonia, TKN	500 ml PE	H_2SO_4
Dissolved Phosphorous	500 ml PE	H_2SO_4
Phosphorous	500 ml PE	H_2SO_4
Alkalinity	1,000 ml PE	4°C
SO_4		
CL		
TDS		
Color	500 ml PE	4°C
Turbidity	500 ml PE	4°C
Nitrite NO	500 ml PE	4°C
Ortho-phosphorous	500 ml PE	4°C
TOC	250 ml PE	HCL
Dissolved TOC	250 ml PE	HCL

Event 6

2/4/04

FP-04-06-001 MW-1
FP-04-06-002 (Dup/MW-1)
FP-04-06-003 (MS/MW-1)
FP-04-06-004 (MSD/MW-1)

2/5/04

FP-04-06-006 MW-4

2/6/04

FP-04-06-007 MW-2

Out

To: Aikens_Al/ORL
Subject: Festival Labeling
Cc: Kevin.Sanders@ch2m.com

Wednesday 2/4/04
FP-04-06-001 MW-1
FP-04-06-002 Duplicate (MW-1)
FP-04-06-003 MS (MW-1)
FP-04-06-004 MSD (MW-1)
FP-04-06-005 North Recharge Well

Thursday 2/5/04
FP-04-06-006 MW-4

Friday 2/6/04
FP-04-06-007 MW-2

CONTROL SAMPLES
Our office samples were collected in (yellow top glass vials without preservatives) indicated the following:
FP-04-06-001:
MW-1 in the field was very effervescent on the sampling day (even though purge rates was only about 0.3 gpm). Our control samples in the office indicated one vial with headspace about 4mm, while the other one didnt indicate any headspace.
FP-04-06-002:
The Duplicate sample from MW-1 - one vial no head space, the other vial 5 mm head space
FP-04-06-003:
the MS sample from MW-1 indicated head space of 2mm and 4 mm respectively
FP-04-06-004:
The MSD sample from MW-1 indicated 0 mm head space in both vials

FP-04-06-005: North recharge well no additional control samples taken

FP-04-06-006:
MW-4 no head space either vial

FP-04-06-007: being collected today

I discussed with Mike (sampler) for his opinion on why 50% of the vials from the same well had head space and the rest had no head space. He indicated that the samples were so bubbly that the samples looked opaque. He said on some of the vials he may have waited a tad longer before he got the cap on. (Please note: we DO NOT wait for bubbles to disperse before we cap vials)

Please let me know if you have any questions

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL.	
WELL NO: MW-1	SAMPLE ID: FP-04-06-001	DATE: 2/4/04

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: Open to Hole feet	STATIC DEPTH TO WATER (feet): 52.89	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (190 feet – 52.89 feet) X .65 gallons/foot = 90.49 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 125	PURGING INITIATED AT: 0030	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
1010	|	90	.44	53.13	8.0	23.0	343	0.60	2.95	Clear	None	-031
1101	1 1/4	112.5	.44	53.1	7.40	24.4	428	0.53	2.32	|	|	-098
1152	1 1/2	135	|	|	7.32	24.6	406	0.23	1.08	|	|	+127
1243	1 3/4	157.5	|	|	7.29	24.4	403	0.34	0.98	|	|	-090

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse Mike Burns	SAMPLER(S) SIGNATURES: M Burns	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1440
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
See Attached List								BP
FP-04-06-002 (Duplicate/MW-1)								
FP-04-06-003 (MS/MW-1)								
FP-04-06-004 (MSD/MW-1)								

REMARKS: Effluent water has small bubbles
Dupe, MS & MSD Also Collected

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); 1160
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

DEP-SOP-001/01

Florida Department of Environmental Protection
GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando FL	
WELL NO: North Recharge well	SAMPLE ID: FP-04-06-005		DATE: 2/4/04

PURGING DATA

WELL DIAMETER (in): NA	TOTAL WELL DEPTH (ft): NA	STATIC DEPTH TO WATER (ft): NA	WELL CAPACITY (gal/ft): NA

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) X WELL CAPACITY =

= (–) X =

PURGE METHOD:	PURGE INITIATED AT: 1332	PURGE ENDED AT: 1355	TOTAL VOL. PURGED (gal):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (°C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR
		3.7	.42	NA	6.05	20.1	157.3	5.02	4.68	clear	

off –odd

WELL CAPACITY (Gallons per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Barr / Nodarse & Assoc.	SAMPLER(S) SIGNATURE(S): Mike Barr	
SAMPLING METHOD(S): Diaphragm pump	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1410
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH	

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; PE = POLYETHYLENE; O = OTHER (SPECIFY)

NOTE: The above do not constitute all of the information required by Chapter 62-160, F.A.C.

1161

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL.	
WELL NO: MW-4	SAMPLE ID: FP-04-06-006		DATE: 2/5/04

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: feet to 190 feet	STATIC DEPTH TO WATER (feet): 55.83	PURGE PUMP TYPE OR BAILER: B.P.

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (190 feet – 55.83 feet) x .65 gallons/foot = 87 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 125'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 125'	PURGING INITIATED AT: 0636	PURGING ENDED AT: 1249	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (umhos/cm or uS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
0936	1	87	.49	55.91	7.06	23.3	224	0.78	0.47	Clear	None	+148
1024	1 1/4	108.75	.45		7.54	24.0	295	0.92	0.37			+142
1112	1 1/2	130.5			7.56	24.1	305	0.48	0.29			+136
1200	1 3/4	152.25			7.55	24.2	317	0.35	0.21			+180
1248	2.0	174.0			7.56	24.2	317	0.37	0.17			+164

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike B	SAMPLING INITIATED AT: 1300	SAMPLING ENDED AT: 1330
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: μm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
								BP
		See	List					

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs). 1162

DEP-SOP-001/01
FS 2200 Groundwater Sampling

48min

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park | SITE LOCATION: Orlando, FL.

WELL NO: MW-2 | SAMPLE ID: FP-04-06-007 | DATE: 2/6/04

PURGING DATA

WELL DIAMETER (inches): 4" | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH: open feet to 190 feet | STATIC DEPTH TO WATER (feet): 54.48 | PURGE PUMP TYPE OR BAILER: B.P

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (190 feet − 54.48 (feet) X .65 gallons/foot = 88 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 125 | PURGING INITIATED AT: 0630 | PURGING ENDED AT: 1416 | TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (umhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP mV
0948	1	88	.46	54.65	8.22	24.6	352	2.15	2.28	clear	none	0.81
1036	1 1/4	110	↓	|	7.73	24.7	379	1.16	1.40	|	|	0.59
1216	1 1/2	132	*.26	|	7.53	25.0	400	0.83	0.81	|	|	−911
1416	1 3/4	154	*.18	54.54	7.49	24.9	410	0.29	1.04	↓	↓	−19

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: [illegible] Nodarse | SAMPLER(S) SIGNATURES: [illegible] | SAMPLING INITIATED AT: 1415 | SAMPLING ENDED AT: 1435

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | TUBING MATERIAL CODE:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: µm | Filtration Equipment Type: | DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			see	List				

REMARKS: * Purge rate slowed due to filter becoming clogged.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); 1163
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill / Nodarse & Assoc	Project Name/Number: Festival Park 177652	Page 1 of 1
Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801	Project Manager: Alan Aikens	DEP Form #: 62-770.900(2) Form Title: Chain of Custody Record Effective Date: September 23, 1997
Phone: 407-423-0030 Fax:	Purchase Order:	FDEP Facility No.
Print Names(s) / Affiliation: Mike Burns / Nodarse	Preservatives (see codes)	Project Name: Sampling CompQAP No:
Sampler(s) Signature(s): Mike Burns	Analyses Requested: See Attached List	Approval Date:

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix: (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
	FP-04-GW-006	2/5/04	1330	Grab	GW	22	See Attached List	3 Additional non-preserved 40 mL vials	

Shipment Method			← Total Number of Containers

Out: / /	Via: Fed X	Item Nos. 1	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns / Nodarse	2/5/04				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No:	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

NODARSE AND ASSOC

008/033

PEL Laboratories, Inc.

Chain of Cus ly Record
Record/Work Request

4420 Pendola Point Road
Tampa, F la 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Company: CH2M Hill / Nodarse & Assoc

Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

Print Names(s) / Affiliation: Mike Burns Killroy Fairbank Nodarse & Assoc.

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-04-06-001	2/4/04	1440	Grab	GW	22	3 Additional GW-P received	
	FP-04-06-002	↓	1500	↓	↓	22	4 one Mile	
	FP-04-06-003		1520			22		
	FP-04-06-004		1540			22		
	FP-04-06-005		1410			22		

Shipment Method — 110 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos. 4	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns / Nodarse	2/4/04				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

NODARSE AND ASSOC

009/033

Festival Park

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0
Standard B 7.0
Standard C 10.0

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/4/04	0930	A	4	4.05		Yes	Init	MB
		B	7	6.95				
		C	10	10.05				
2/4/04	1505	A	4	4.05		Yes	Cont	MB
		B	7	6.98				
		C	10	10.01				
2/5/04	0855	A	4	4.04			Init	MB
		B	7	7.05				
		C	10	10.01				
2/5/04	1330	A	4	4.02			Cont	MB
		B	7	7.0				
		C	10	10.01				
2/6/04	0600	A	4	4.24		yes	Init	MB
		B	7	7.01				
		C	10	10.00				
2/6/04	1513	A	4	4.15		yes	Cont	TF
		B	7	7.10				
		C	10	9.87				

Lot# 211800
Exp. 6/1/05

1166

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 4C45 3

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447
Standard B 1413
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/4/04	0935	A	447	476		Yes	Init	MB
		B	1413	1397				
2/4/04	1510	A	447	449			cont	MB
		B	1413	1391				
2/5/04	0900	A	447	450			Init	MB
		B	1413	1357				
2/5/04	1334	A	447	446			cont	MB
		B	1413	1392				
2/6/04	0605	A	447	448		Yes	Init	MB
		B	1413	1400				
2/6/04	1519	A	447	445		Yes	Cont	TF
		B	1413	1401				

Lot # 2306059
Exp 5/04

Page ___of___

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 INSTRUMENT # 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER* ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration
Standard B ______
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/4/04			~~[illegible]~~%					
2/4/04	0939	A	100%	96.9%		Yes	Init	MA
2/4/04	1512	A	100%	99.7			Cont	MB
2/5/04	0905	A	100%	108.1			Init	
2/5/04	1338	A	100%	101.2			cont	MB
2/6/04	0608	A	100%	102.5			Init	MB
2/6/04	1510	A	100%	96.4		yes	Cont	TF

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 INSTRUMENT # 96M0178AF

PARAMETER: *[check only one]*

- [x] TEMPERATURE
- [ ] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [ ] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 22.3

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/4/04	0940	A	22.3	22.3		Yes	Init	MB
2/4/04	1513	A	24.1	24.1		Yes	Cont	MB
2/5/04	0906	A	22.4	22.4			Init	
2/5/04	1339	A	22.2	22.4			Cont	MB
2/6/04	0609	A	20.2	20.2			Init	MB
2/6/04	1511	A	22.1	22.1		yes	Cont	TP

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400C28774

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.95

Standard B 60.1

Standard C 494

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/4/04	0943	A	6.95	6.96		Yes	Init	MB
		B	60.1	60.4				
		C	494	495				
2/4/04	1516	A	6.95	6.95			Cont	MB
		B	60.1	60.2				
		C	494	494				
2/5/04	0915	A	6.95	7.0			Init	MB
		B	60.1	60.1				
		C	494	495				
2/5/04	1342	A	6.95	6.94			cont	MB
		B	60.1	60.2				
		C	494	494				
2/6/04	0611	A	6.95	6.96			Init	MB
		B	60.1	60.4				
		C	494	493				
2/6/04	1505	A	6.95	6.96		Yes	Cont	TP
		B	60.1	60.1				
		C	494	490				

1170

PEL Laboratories, Inc.

Chain of Cus y Record
Record/Work Request

Tampa, F a 33619
(813) 247-2805 • Fax: (81) 248-1537
E-Mail: login@Pelab.com

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997

Company: CH2M Hill / Nodarse & Assoc.

Address: 225 E. Robinson Street, Suite 505 Orlando, FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

FDEP Facility No.

Project Name:

Sampling CompQAP No:

Approval Date:

Print Names(s) / Affiliation: Tiffany Fairclomb / Nodarse & Assoc.

Sampler(s) Signature(s): [signature]

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
	FP-04-06-007	2/6/04	1435	Grab	GW	22	See Attached List	3 additional unpreserved 40ml vials	

Shipment Method | Total Number of Containers

Out: / /	Via: Fed Ex	Item Nos. 1	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Tiffany Fairclomb / Nodarse	2/6/04	1600			
Additional Comments:								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Event 7

2/16/04 thru 2/18/04

* Control Sample head space (MW)

2/16/04

* 0mm and 0mm FP-04-07-001 MW-4

* 0 and 0mm FP-04-07 -002 North Recharge

2/17/04

* 12mm and 0mm FP-04-07-003 MW-1

FP-04-07004 Duplicate (MW-1)

* ~~n/a~~ FP-04-07-005 MS (MW-1)

* n/a FP-04-07-006 MSD (MW-1)

* n/a

2/18/04

FP-04-07-007 MW-2

* 6mm and 0mm

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

22.15

SITE NAME: Festival Park		SITE LOCATION: Orlando, FL.	
WELL NO: mw-1	SAMPLE ID: FP-04-07-003		DATE: 2/17/04

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: feet to 190 feet	STATIC DEPTH TO WATER (feet): 53.59	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (190 feet – 53.59 feet) x .65 gallons/foot = 88.6 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 125'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0636	PURGING ENDED AT: 1224	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (umhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP mV
0957	1	88.6	.46	53.61	7.81	23.9	389	0.2	0.34	clear	NONE	-185
1045	1 1/4	110.75	"	53.59	7.73	23.9	388	0.2	0.21	"	"	+239
1133	1 1/2	132.9	"	53.59	7.67	23.9	389	0.2	0.34	"	"	+240
1221	1 3/4	155.05	.41	"	7.62	24.1	393	0.2	0.25	"	"	+237

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Dave Caffery Nudarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1300
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: µm	DUPLICATE: Y N

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
			See	List				

REMARKS:
Dupe, MS, MSD
1330, 1400, 1430
small bubbles in water effluent

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

21.9

SITE NAME: Festival Park | SITE LOCATION: Orlando, FL
WELL NO: MW-2 | SAMPLE ID: FP-04-07-007 | DATE: 2/18/04

PURGING DATA

WELL DIAMETER (inches): 4" | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH: 150 feet to 190 feet | STATIC DEPTH TO WATER (feet): 55.20 | PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (190 feet – 55.20 feet) X .65 gallons/foot = 87.62 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 125' | FINAL PUMP OR TUBING DEPTH IN WELL (feet): | PURGING INITIATED AT: 0535 | PURGING ENDED AT: | TOTAL VOLUME PURGED (gallons):

TIME	well VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
915	1	87.62	.43	55.39	7.30	23.9	286	0.17	2.51	clear	none	128
1006	1 1/4	109.5	|	55.4	6.84	24.0	288	0.20	1.97	|	|	-030
1057	1 1/2	131.4	|	|	6.68	24.1	309	0.19	1.21	|	|	-057
1150	1 3/4	153.3	.41	|	6.61	24.3	305	0.21	0.87	|	|	-055

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse | SAMPLER(S) SIGNATURES: Mike Burns | SAMPLING INITIATED AT: 1210 | SAMPLING ENDED AT: 1250

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | TUBING MATERIAL CODE: PE

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: Y (N) | FILTER SIZE: µm | Filtration Equipment Type: | DUPLICATE: Y (N)

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
			See List					

REMARKS: small bubbles in water column

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and < 50 NTUs) or 10% (for readings > 50 NTUs).

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

21.9 1/4

SITE NAME: Festival Park		SITE LOCATION: Orlando FL	
WELL NO: MW-4	SAMPLE ID: FA-04-07-001		DATE: 2/16/04

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: ?? feet to 190 feet	STATIC DEPTH TO WATER (feet): 55.25	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (190 feet - 55.25 feet) X .65 gallons/foot = 87.58 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0630	PURGING ENDED AT: 1220	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (umhos/cm or uS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)	ORP
940	1	87.58	.43	55.33	7.44	22.6	365	0.4	0.91	clear	none	-144
031	1 1/4	109.48	|		7.83	23.6	371	0.4	0.36	|	|	-128
122	1 1/2	113.38	|		7.82	23.6	372	0.2	0.25	|	|	-149
213	1 3/4	153.28	|		7.81	23.8	371	0.2	0.04	|	|	-163

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Dave Caffrey	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1455	SAMPLING ENDED AT: 1530
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm Filtration Equipment Type:	DUPLICATE: Y N	

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
		See List						

REMARKS: MS, MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = + 0.2; Temperature = + 0.2 °C; Specific Conductance = readings are within + 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within + 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within + 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

DEP-SOP-001/01
FS 2200 Groundwater Sampling

GROUNDWATER SAMPLING LOG

SITE NAME: Festival Park	SITE LOCATION: Orlando, FL
WELL NO: N Recharge well	SAMPLE ID: FP-04-07-002	DATE: 2/16/04

PURGING DATA

WELL DIAMETER (inches): | TUBING DIAMETER (inches): 1/2" | WELL SCREEN INTERVAL DEPTH: feet to N/A feet | STATIC DEPTH TO WATER (feet): NA | PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): | FINAL PUMP OR TUBING DEPTH IN WELL (feet): | PURGING INITIATED AT: | PURGING ENDED AT: | TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (umhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
					6.63	20.6	192	3.1	3.04	Dirty clear	Sulfur

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Nodarse | SAMPLER(S) SIGNATURES: [signature] | SAMPLING INITIATED AT: | SAMPLING ENDED AT: 1330

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | TUBING MATERIAL CODE:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: µm | Filtration Equipment Type: | DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
				See List				

REMARKS: MS, MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%;
Dissolved Oxygen = A) < 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L);
Turbidity = A) < 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and < 50 NTUs) or 10% (for readings > 50 NTUs).

PEL Laboratories, Inc.

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill / Nodarse

Address: 225 E. Robinson St. Suite 505 Orlando, FL. 32801

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aitken

Purchase Order:

Page of

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997

FDEP Facility No.

Project Name:

Sampling CompQAP No:

Approval Date:

Print Names(s) / Affiliation Nodarse
Mike Burns / David Caffery

Sampler(s) Signature(s) [signature]

Preservatives (see codes)

Analyses Requested: See List Attached

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
1	FP-04-07-003	2/17/04	1300	Grab	GW	25	MW-1	
2	FP-04-07-004		1330			25	Dupe	
3	FP-04-07-005		1400			25	MS	
4	FP-04-07-006		1430			25	MSD	
	Trip + Temp					8		

Shipment Method | 108 ← Total Number of Containers

		Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Out: / /	Via: FED X	4	[signature] / PEL	02/17/04	12:00	[signature]	2/17/04	
Returned: / /	Via.		[signature]	2/17/04	1700			
Additional Comments:								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

1177

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CHZM Hill / Nodarse

Address: 225 E. Robinson St., Suite 505, Orlando, FL 32801

Phone: 407-423-0030 Fax:

Project Name/Number: 177652

Project Manager: Allen Aikens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

REQUESTED DUE DATE / /

Print Names(s) / Affiliation: Mike Burns / David Cattery

Sampler(s) Signature(s):

Preservatives (see codes)

Analyses Requested

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analyses Requested	Remarks	Lab. No.
1	FP-04-007-01	02/16/04	1530	Grab	GW	25	See List		
2	FP-04-007-02		1330			25			
3	Trip 3 Field blank					4			

Shipment Method: 54 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos. 2 Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	/ PEL	02/12/04	12:00		2/13/04	1700
Additional Comments:			2/16/04	1700			

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

1178

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill / Nodarse

Address: 225 E. Robinson St. Suit 505 Orlando, FL.

Phone: 407-423-0030 Fax:

Project Name/Number: Festival Park 177652

Project Manager: Alan Aikens

Purchase Order:

Page of

DEP Form #: 62-770.900(2)

Form Title: Chain of Custody Record

Effective Date: September 23, 1997

FDEP Facility No.

Project Name:

Sampling CompQAP No:

Approval Date:

Print Names(s) / Affiliation: Mike Burns Nodarse & Assoc.

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	FP-04-07-007	2/18/04	1250	Grab	GW	25		
	Trip & Temp Blank					2		

Shipment Method — 27 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		[signature] PEL	02/12/04	12:00	Mike Burns	2/18/04	1700
Additional Comments:			Mike Burns	02/18/04				

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW Multiline P3 **INSTRUMENT #** 81552054

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A pH 4.00, Lot# 2242, Expir.-08/31/04
Standard B pH 7.00, Lot# 2170, Expir.-06/30/04
Standard C pH 10.00, Lot# 3010, Expir.-01/31/04

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
04/02/16	0920	A	4.00	4.03		Yes	Init	DMC
		B	7.00	7.00		Yes	"	"
		A	4.00	3.99		After	"	"
	0930	B	7.00	7.03		Cali	"	"
	1600	B	7.00	7.05		No	Cont.	"
	1604	C	10.00	10.10		"	"	"
04/2/17	0930	A	4.00	3.98		Yes BH	Init	DMC
		B	7.00	7.04				
		A	4.00	3.98		After		
	0940	B	7.00	7.03		Cali		
	1400	B	7.00	7.04		No	Cont	"
	"	C	10.00	10.09		No	"	"

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW Multiline P3 **INSTRUMENT #** 81552054

PARAMETER: *(check only one)*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *(Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased)*

Standard A 1413 us/cm, Lot# RVH177A/1, Expir. - 02/30/04

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
04/02/16	0920	A	1413	1433		Yes	Init	DMC
↓		A	1413	1415		After Cal.	"	"
↓	1600	A	1413	1434		No	CONT.	"
04/02/17	0930	A	1413	1464		Yes	Init.	"
↓	"	A	1413	1445		After Cal.	"	"
↓	1400	A	1413	1418		NO	CONT.	"

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW Oxi 330 **INSTRUMENT #** Z60001

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A Air Saturation

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
04/02/16	0925	A	—	50.90/14.5°C	—	Yes	Init.	DMC
04/02/17	0935	A	—	50.91/12.5°C	—	Yes	"	"

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HF DRT-15CE Turbidimeter INSTRUMENT # 902173

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1.0 ntu, Lot#A2340, Exp.- 12/04
Standard B 20.0 ntu, Lot#A3113, Exp. - 04/05
Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
04/02/16	0930	A	1.0	1.0	—	No	Init.	DMC
↓	~~1610~~	B	20.0	20.9		No	"	"
	1610	A	1.0	1.0		No	Cont.	"
	"	B	20.0	20.9		No	"	"
04/02/17	0950	A	1.0	1.0		No	Init.	"
		B	20.0	20.9		No	"	"
		A	1.0	1.0		No	Cont.	"
		B	20.0	20.9		No	"	"

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) WTW Multiline P3 **INSTRUMENT #** 81552054

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☒ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 240mV, Lot #7021, Exp - 09/06

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
04/02/16	0930	A	240	249		NO	CONT.	DMC
04/02/16	1610	A	240	248		↓	↓	↓
04/02/17	0940	A	240	250		↓	↓	↓
04/02/17	1405	A	240	248		↓	↓	↓

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAKTON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.0 Lot# 05977-18 Exp. 2/25/04

Standard B 7.0 Lot# 05977-14

Standard C 10.0 Lot# 05977-12

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/12/04	0851	A	4.0	3.83		Yes	Init	MB
		B	7.0	7.0				
		C	10.0	9.0				
	1212	A	4	3.98			Cont	MB
		B	7	7.0				
		C	10	10.1				

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Page ___of___

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) OAK TON 10 **INSTRUMENT #** 40453

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 447 Exp May 2004 Lot# 23C6057
Standard B ____________________
Standard C ____________________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/12/04	0855	A	447	428		Yes	Init	MS
	1210	A	447	441		|	Cont	MF

DEP-SOP-001/01 Page ___ of ___

FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/18/04	0859	A	100%	103.7		Yes	Init	MA
|	1205	A	100%	98.5			Cont	MA

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Page ___of___

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 INSTRUMENT # 96M0178AF

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ________
Standard B ________
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/12/04	0900		23.8	23.8		Yes	Init'l	MB
√	1206		24.0	24.0		|	cont	MF

DEP-SOP-001/01
FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 01C40000028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 6.91 Gelex
Standard B 60.3
Standard C 490

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
2/18/04	0904	A	6.91	6.91		Yes	Init	MA
		B	60.6	60.3				
		C	490	490				
	1200	A	6.91	6.71			Cont	MA
		B	60.3	60.3				
		C	490	490				

Primary Standards <0.1, 20, 200 and 800 NTU
Exp. May 05
Lot. A3134, A3078, A3107

Primary cal. on 2/13/04

Lake Orienta

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Spgs.

WELL NO: MW-1	SAMPLE ID: LO-00-MW-1	DATE: 7/13/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet 210' openhole	STATIC DEPTH TO WATER (feet): 48.6	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210 feet – 48.6 feet) X .66 gallons/foot = 106 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 75'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0705	PURGING ENDED AT: 1421	TOTAL VOLUME PURGED (gallons): 159

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (μmhos/cm or μS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1200	106	106	.38	48.65	7.64	25.0	287	0.23	1.03	Clear	None	
1310	26.5	132.5	|	|	7.82	24.2	274	0.18	1.86	{	{	
1420	26.5	159	|	|	7.65	24.2	277	0.17	2.35	{	{	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns/Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1423	SAMPLING ENDED AT: 1505
PUMP OR TUBING DEPTH IN WELL (feet): 75'	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: μm	DUPLICATE: Y	LO-00-Dup

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See List					BP

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

3.49

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Springs	
WELL NO: MW-2	SAMPLE ID: LO-00-MW2	DATE: 7/12/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet 130' open hole	STATIC DEPTH TO WATER (feet): 18.69	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130' feet – 18.69 feet) X .66 gallons/foot = 73.46 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 87'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0747	PURGING ENDED AT: 1324	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1151	73.46	73.46	.35	18.70	7.52	24.5	420	0.50	0.34	Clear	None	
1237	18.36	91.82	.40	|	7.59	24.3	425	0.37	0.49	|	|	
1323	18.36	110.18	|	|	7.57	24.3	409	0.36	0.55	|	|	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1330	SAMPLING ENDED AT: 1430
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (N circled) FILTER SIZE: µm	DUPLICATE: MS/MSD	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
		See List						BP

REMARKS: LO-00-MS
LO-00-MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Spgs.	
WELL NO: Lake	SAMPLE ID: LO-00 - Lake	DATE: 7/13/05

PURGING DATA

WELL DIAMETER (inches): NA	TUBING DIAMETER (inches): NA	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: Grab

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
NA	—	—	—	→	7.96	32.2	248.6	7.39	4.66	clear	none	—

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / NoLaRSE	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1215	SAMPLING ENDED AT: 1245
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: NA	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
				See	List			

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☑ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4
Standard B 7
Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/12/05	0730	A	4	3.96		Yes	Init	MB
		B	7	6.93				
		C	10	10.01				
7/13/05	0700	A	4	4.1			cont	
		B	7	7.0				
		C	10	10.01				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0962

PARAMETER: *[check only one]*

- ☑ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ______________________________

Standard B ______________________________

Standard C ______________________________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/12/05	0734	A	26.1	26.1		Yes	Init	MB
7/13/05	0705		24.5	24.5			Cont	

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ~~449~~ 70

Standard B ~~1413~~ 1000

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/12/05	0738	A	70	60.7		yes	Init	MB
		B	1000	991				
7/13/05	0707	A	70	68.9			cont	
		B	1000	998				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.17

Standard B 51.9

Standard C 495

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/12/05	0743	A	5.17	5.26		Yes	Init	MB
		B	51.9	52.0				
		C	495	495				
7/13/05	0712	A	5.17	5.2			cont	
		B	51.9	52.0				
		C	495	495				

1197

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/12/05	0745	A	100%	100.1%		Yes	Init	MD
7/13/05	0715	A	100%	100.2%		|	Cont	|

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Springs	
WELL NO: Mw-1	SAMPLE ID: LO-01-mw-1	DATE: 7/21/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 48.78	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210 feet – 48.78 feet) X .66 gallons/foot = 106 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0716	PURGING ENDED AT: 1445	TOTAL VOLUME PURGED (gallons): 119

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (μmhos/cm or μS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1216	106	106	.35	48.8	7.47	24.0	289.6	0.17	1.04	Clear	None	-101
1331	26.5	112.0	|	|	7.40	24.0	295.6	0.14	0.90	|	|	-099
1445	26.5	119.0	|	|	7.40	23.9	299.3	0.13	1.08	|	|	-100

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Craig Fenner Nodarse	SAMPLER(S) SIGNATURES: Mike B	SAMPLING INITIATED AT: 1447	SAMPLING ENDED AT: 1535
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: μm		DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
							See Full list on Chain-of-custody	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Spgs.	
WELL NO: MW-2	SAMPLE ID: CO-01-MW-1		DATE: 7/20/08

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet 130 open	STATIC DEPTH TO WATER (feet): 18.42	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 18.42 feet) X .66 gallons/foot = 73.64 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0800	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1045	73.64	73.64	.5	18.5	7.31	24.1	248.3	0.33	0.36	Clear	None	–
1122	18.4	92.04	|	|	7.43	24.2	254	0.60	0.35	|	|	–
1208	18.4	110.44	.40	|	7.47	24.2	251	0.62	0.37	|	|	–

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns Modern	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See List				See Full list on Chain-of-custody	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Spgs.	
WELL NO: Lake	SAMPLE ID:		DATE: 7/20/05

PURGING DATA

WELL DIAMETER (inches): NA	TUBING DIAMETER (inches): NA	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: Diaphram

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
NA					7.30	30.4	196.9	5.88	6.50	Lt.Green	Non	–

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns/Craig Ferrer/Kenny Tennant	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1015 ~~1030~~
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm		DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
								Grab
			See List					

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☑ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4

Standard B 7

Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/20/05	0825	A	4	4.01		Yes	Init	MB
		B	7	7.1				
		C	10	9.97				
7/21/05	0725	A	4	4.01			Cont	
		B	7	7.0				
		C	10	10.01				
	1500	A	4	4.02				
		B	7	7.0				
		C	10	10.01				

1202

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B09622

PARAMETER: *[check only one]*

- ☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ________________

Standard B ________________

Standard C ________________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/20/05	0820		27.9	27.9		Yes	Init	MB
7/21/05	0733		27.8	27.8			Cont	MB
	1504		24.0	24.0				

1203

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 44T 70

Standard B HH3 1000

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/20/05	0830	A	70	87		Yes	Init	MB
		B	1000	991				
7/21/05	0740	A	70	75.9			Cont	
		B	1000	989				
	1506	A	70	76				
		B	1000	1000				

1204

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

- [ ] TEMPERATURE
- [ ] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [x] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.17 ~~Lot#~~s ~~exp.~~

Standard B 51.9

Standard C 495

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/20/05	0846	A	5.17	5.29		Yes	Init	MB
		B	51.9	52.0				
		C	495	495				
7/21/05	0745	A	5.17	5.19			cont	
		B	51.9	52				
		C	495	495				
	1511	A	5.17	5.18				
		B	51.9	52				
		C	495	495				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
7/20/05	0833	A	100%	96.2%		Yes	Int	MB
7/21/05	0750	A	100%	99.6%		|	Cont	|
|	1515	A	100%	100.1%		|	|	|

GROUNDWATER SAMPLING LOG

SITE NAME: CH2M HILL		SITE LOCATION: LAKE ORIENTA	
WELL NO: MW-1	SAMPLE ID: LO-02-MW-1		DATE: 7/28/15

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 0.37	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 50.70	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210.0 feet – 50.70 feet) X 0.65 gallons/foot = 103.5 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) N/A = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): N/A	FINAL PUMP OR TUBING DEPTH IN WELL (feet): N/A	PURGING INITIATED AT: 1000	PURGING ENDED AT: 1442	TOTAL VOLUME PURGED (gallons): 155.1

	TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP (mV)
[illegible]	1303	103.5	103.5	0.53	50.72	8.39	23.6	302	0.31	0.79	NONE	NONE	-220.3
47	1355	25.8	129.3	0.55	50.71	8.33	23.6	301	0.27	0.79	NONE	NONE	-216.1
47	1442	25.8	155.1	0.55	50.70	8.29	23.5	300	0.26	0.69	NONE	NONE	-214.9

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: C. FENNER / HZA	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1444	SAMPLING ENDED AT: 1528
PUMP OR TUBING DEPTH IN WELL (feet): N/A	SAMPLE PUMP FLOW RATE (mL per minute): 150	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ___µm	DUPLICATE: (Y) N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			SEE LIST					

REMARKS:
LO02-DUP

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: C'H2MHILL	SITE LOCATION: LAKE UNIENTO
WELL NO: MW-2	SAMPLE ID: LU-02-MW2	DATE: 7/27/05

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 0.5	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 20.18	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130.0 feet – 20.08 feet) X 0.65 gallons/foot = 71.45 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) N/A gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): N/A	FINAL PUMP OR TUBING DEPTH IN WELL (feet): N/A	PURGING INITIATED AT: 1030	PURGING ENDED AT: 1232	TOTAL VOLUME PURGED (gallons): 126

	TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP (mV)
64	1134	72	72	0.90	20.10	6.01	23.6	340	0.23	1.13	NONE	SULFIDE	-148.0
16	1150	18	90	0.90	20.09	7.26	23.7	339	0.29	1.01	NONE	SULFIDE	-155.2
16	1206	18	108	0.90	20.10	7.29	23.7	339	0.26	1.00	NONE	SULFIDE	-156.5
	1232	18	126	0.90	20.06	7.32	23.6	339	0.25	1.01	NONE	SULFIDE	-158.7

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: C. FEMMER / N4A	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1235	SAMPLING ENDED AT: 1410
PUMP OR TUBING DEPTH IN WELL (feet): N/A	SAMPLE PUMP FLOW RATE (mL per minute): 150	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ___ µm	~~DUPLICATE~~: (Y) N ~~MATRIX SPIKE~~ MATRIX SPIKE DUP.

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
							SEE LIST	B.P.

REMARKS: MS/MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 15-6 INSTRUMENT # ________

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☑ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100%

Standard B ________

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/07/27	1115	A	99.1%	7.63 @ 28.8°C		Y	INIT	CF
05/07/27	1200	A	99.8%	6.64 @ 37.4		Y	INIT	CF
05/07/27	1600	A	99.5%	6.72 @ 36.7		Y	FINAL	CF

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 156   INSTRUMENT # ______

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☑ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.00 OAKTON
Standard B 7.00
Standard C 10.00

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/07/27	1115	ABC	4.00/7.00/10.00	-58.4 slope		Y	INIT	CF
05/09/28	1200	ABC	4.00/7.00/10.00	-56.6 slope		Y	INIT	CF
05/07/28	1600	ABC	4.00/7.00/10.00	-57.2 slope		Y	FINAL	CF

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P INSTRUMENT # ______

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☑ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.79
Standard B 56.4
Standard C 549

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
15/07/27	1115	5.79/56.4/549		5.79/56.4/549		Y	INIT	CF
05/07/28	1200	5.79/56.4/549		5.73/56.0/544		Y	INIT	CF
05/07/28	1600	5.79/56.4/549		5.76/56.1/547		Y	FINAL	CF

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 156 INSTRUMENT # ______

PARAMETER: *[check only one]*

- [ ] TEMPERATURE
- [x] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [ ] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1413

Standard B 23

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/07/27	1115	A B	1413/23	1379/24.9		Y	INIT	CF
05/07/28	1200	A B	1413/23	1365/25.1		Y	INIT	CF
05/07/28	1600	A B	1413/23	1377/23.9		Y	FINAL	CF

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Springs
WELL NO: MW-1	SAMPLE ID: LO-03-MW1	DATE: 8/9/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 49.44	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210 feet – 49.44 feet) X .65 gallons/foot = 104 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 75'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0710	PURGING ENDED AT: 1426	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (μmhos/cm or μS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1210	104	104	.34	49.50	7.62	23.8	213.2	0.12	0.64	clear	none	-085
1318	26	130	.38	|	7.57	23.8	202.5	0.11	0.77	|	|	-086
1426	26	156	|	|	7.56	23.5	198.2	0.10	0.58	|	|	-082

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Craig Fenner	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1427	SAMPLING ENDED AT: 1450
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PET	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: μm	DUPLICATE: Y N Dup	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
		See List						

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Spgs, FL	
WELL NO: MW-2	SAMPLE ID: LO-05-MW2		DATE: 8/?/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 1/2"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 19.61	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet − 19.61 feet) X .65 gallons/foot = 71.7 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 85	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0722	PURGING ENDED AT: 1105	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0910	71.7	71.7	.65	19.65	7.68	23.8	266.9	0.21	1.0	clear	none	-191
0938	18.0	89.7			7.69	23.8	306.8	0.29	0.34			-126
1006	18.0	107.7			7.65	23.8	251.1	0.18	0.24			-155
1034	18.0	125.7			7.66	23.8	252.4	0.17	0.24			-156
1102	18.0	143.7			7.65	23.8	254.	0.17	0.23			-158

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04, 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1130	SAMPLING ENDED AT: 1220
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PET	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm	DUPLICATE: Y	QA MS/MSD

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
				See List				

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P INSTRUMENT # ______

PARAMETER: *[check only one]*

- [ ] TEMPERATURE
- [ ] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [x] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.55
Standard B 56.2
Standard C 550

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/08/08	0840	ABC	5.55/56.2/550			Y	INIT	CT

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 156 INSTRUMENT # ________

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☑ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.00 } OAKTON
Standard B 7.00
Standard C 10.00

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/08/08	0840	ABC	4.00/7.00/10.00	-62.5 slope		Y	INIT	CL

1216

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 156 INSTRUMENT # ________

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☑ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1413

Standard B 23

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
05/08/08	0840	AB	1371/23.5			Y	INIT	CP

1217

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4

Standard B 7

Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
8/8/05	0738	A	4	4.3		Yes	Init	mB
		B	7	6.92				
		C	10	10.1				
	1500	A	4	4.07			Cont	
		B	7	7.0				
		C	10	10.03				
8/9/05	1510	A	4	4.01				
		B	7	7.0				
		C	10	9.98				

1218

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0962

PARAMETER: *[check only one]*

☑ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ____________

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
8/8/05	0741		25.5	25.5		Yes	Init	MB
|	1503		26.7	26.7		|	Cont	|
8/9/05	1512		27.6	27.6		|	|	|

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 70

Standard B 1000

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
8/8/05	0730	A	70	69.2		Yes	Init	mB
		B	1000	997				
	1505	A	70	67.3			cont	
		B	1000	994				
8/9/05	1515	A	70	71.1				
		B	1000	1004				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 010400028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.37
Standard B 52.1
Standard C 496

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
8/8/05		A	5.37	5.23		Yes	Init	mp
		B	52.1	52.0				
		C	496	495				
	1510	A	5.37	5.30			Cont	
		B	52.1	52.0				
		C	496	496				
8/9/05	1518	A	5.37	5.36				
		B	52.1	52.1				
		C	496	496				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 55 **INSTRUMENT #** 96M0178AF

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100% Auto Calibration

Standard B ______________________

Standard C ______________________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
8/2/05	0745	A	100%	99.9		Yes	Init	MB
|	1513	A	100%	100.4%		|	Cont	|
8/4/05	1520	A	100%	102.1%		|	|	|

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Springs, FL	
WELL NO: MW-1	SAMPLE ID: LO-04-01		DATE: 9/5/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 49.97	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210 feet – 49.97 feet) X .65 gallons/foot = 104 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0725	PURGING ENDED AT: 1326	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1125	104	104	.44	49.99	7.46	23.5	225.1	0.16	0.58	clear	none	-0.72
1225	26	130			7.40	23.5	210.9	0.17	0.56			-072
1325	26	156			7.38	23.5	216.8	0.24	0.75			-074

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns, Craig Fenner Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1330	SAMPLING ENDED AT: 1400
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm		DUPLICATE: Y Dup

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
				See List				

(SAMPLE CONTAINER SPECIFICATION: SAMPLE ID CODE, # CONTAINERS, MATERIAL CODE, VOLUME; SAMPLE PRESERVATION: PRESERVATIVE USED, TOTAL VOL ADDED IN FIELD, FINAL pH)

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: LK Orienta		SITE LOCATION: Altamont, Springs	
WELL NO: MW-7	SAMPLE ID: LO-04-02		DATE: 9/7/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/4"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 20.14	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 20.14 feet) X .65 gallons/foot = 71.4 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0845	PURGING ENDED AT: 1107	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0956	71.4	71.4	1.0	20.16	7.03	23.8	311.6	0.50	0.62	Clear	None	-163
1014	17.85	89.25	|	|	7.27	23.8	301.0	0.47	0.47	|	|	-153
1032	17.85	107.1	|	|	7.31	23.8	345.1	0.54	0.49	|	|	-118
1050	17.85	124.95	|	|	7.49	23.8	326.0	0.28	0.48	|	|	-130
1107	17.85	142.8	|	|	7.35	23.8	311.0	0.20	0.78			-143

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike B	SAMPLING INITIATED AT: 1110	SAMPLING ENDED AT: 1135
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See	Separate List				BP

REMARKS: MS / MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 INSTRUMENT # 64B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4

Standard B 7

Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0915	A	4	3.71		Yes	Init	MB
		B	7	7.03				
		C	10	9.97				
9/8/05	0710	A	4	3.98		Ye.	Cont	
		B	7	7.0				
		C	10	10.03				
	1420	A	4	4.0				
		B	7	7.02				
		C	10	10.01				

1225

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 70

Standard B 1000

Standard C ____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0921	A	70	88		Yes	Init	MB
		B	1000	924				
9/8/05	0713	A	70	74		Yes	Cont	
		B	1000	997				
	1424	A	70	72				
		B	1000	998				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550 A **INSTRUMENT #** 03G0266 AT

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ______________________

Standard B ______________________

Standard C ______________________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0925		24.8	24.8		Yes	Init	[illegible]
9/8/05	0717		25.1	25.1		|	Cont	|
|	1926		23.5	23.5		|	|	|
|								

1227

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A **INSTRUMENT #** 05G0266A7

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100%

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0927	A	100%	97.5		Yes	Init	MP
9/8/05	0920	A	100%	101.2		|	Cont	|
|	1427	A	100%	98.6			|	|

1228

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 0K4ccc22774

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.17

Standard B 52.1

Standard C 496

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0930	A	5.17	5.0		yes	Init	MB
		B	52.1	52.1				
		C	496	495				
9/8/05	0924	A	5.17	5.16		yes	cont	
		B	52.1	52.1				
		C	496	496				
	1430	A	5.17	5.16				
		B	52.1	52.1				
		C	496	496				

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) Barnant 20 **INSTRUMENT #** F03003315

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☒ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 231

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
9/7/05	0732	A	231	210		no	Init	mb
9/8/05	0928	A	231	215			cont	
	1433	A	231	218				

1230

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Crescenta		SITE LOCATION:	
WELL NO: MW-1	SAMPLE ID: LO-05-01		DATE: 10/05/05

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 49.73	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) 1 Vol. = (210 feet – 49.73 feet) X 0.65 gallons/foot = 105 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 75'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 75'	PURGING INITIATED AT: 0845	PURGING ENDED AT: 1505	TOTAL VOLUME PURGED (gallons): 152

TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP (mV)
0845	Init.	0	0.4	49.73	—			—	—	clear	None	—
1335	104	104	0.4	49.79	7.44	23.6	307	0.13	0.19	"	"	-52
1405	24	128	0.4	49.78	7.40	23.4	308	0.14	0.12	"	"	-74
1535	24	152	0.4	49.78	7.39	23.5	310	0.13	0.07	"	"	-81

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Daniel McCaffery / Hodarse	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1506	SAMPLING ENDED AT: 1535
PUMP OR TUBING DEPTH IN WELL (feet): 75'	SAMPLE PUMP FLOW RATE (mL per minute): 0.4gpm	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___µm Filtration Equipment Type:		DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	* see		List					

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

DEP-SOP-001/01

GROUNDWATER SAMPLING LOG

SITE NAME: LK Orienta	SITE LOCATION: Altamont Sprs. FL.

WELL NO: MW-2	SAMPLE ID: LO-05-05	DATE: 10/5/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/4"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 19.74	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 19.74 feet) X .65 gallons/foot = 71.6 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0940	PURGING ENDED AT: 1037	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0942	71.6	71.6	1GPM	19.75	7.25	23.8	338.4	0.26	1.06	clear	none	-192
1000	18	89.6			7.36	23.8	313.4	0.24	1.04			-191
1018	18	107			7.40	23.8	306.3	0.22	0.92			-192
1036	18	125			7.42	23.2	305.8	0.21	1.65			-194

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike B	SAMPLING INITIATED AT: 1040	SAMPLING ENDED AT: 1110
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm	DUPLICATE: MS/MSD	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
				See List				

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Spgs., FL
WELL NO: Lake	SAMPLE ID:	DATE: 10/5/05

PURGING DATA

WELL DIAMETER (inches): NA	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER: DP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet − feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
NA	—	—	—	—	7.85	28.3	231	9.38	5.97	clear	Lake	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010, 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nidaria	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1150
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: Y (circled) N	FIELD-FILTERED: Y N (circled) FILTER SIZE: µm	DUPLICATE: Y N (circled)	

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
			See	List				

(SAMPLE CONTAINER SPECIFICATION: SAMPLE ID CODE, # CONTAINERS, MATERIAL CODE, VOLUME; SAMPLE PRESERVATION: PRESERVATIVE USED, TOTAL VOL ADDED IN FIELD, FINAL pH)

REMARKS:

MATERIAL CODES: AG = Amber Glass, CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon, O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C, Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

FIELD EQUIPMENT CALIBRATION LOG

DATE: 10/05/05	PROJECT NAME: Lake Orienta	SHEET: 1 OF 1
		PROJECT NO:

EQUIPMENT: WTW Multiline P3				SERIAL NO:	81552054		
ACTUAL TIME: 0910		PERFORMED BY: David M. [illegible]					
		pH			CONDUCTIVITY		
CALIBRATION STANDARDS USED:		4.01	7.00	10.00	200 us/cm	1413 us/cm	us/cm
	Lot #	5022	50519	50519	2504247	RAEO 003C/1	
	Expiration	1/31/2007	11/30/2006	11/30/2006	4/30/2006	1/26/2006	
CALIBRATION READINGS LOG:		pH 4.01	pH 7.00	pH 10.00	200 us/cm	1413 us/cm	us/cm
mV = -59.1	Before Cal.	4.05	6.99	—	—	1416	
-7mV	After Cal.	4.01	7.01	—	—	1413	
Cal Accepted	1540	4.01	7.02	9.96	200	1415	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

EQUIPMENT: WTW Oxi 330	SERIAL NO:	260001
ACTUAL TIME: 0920	PERFORMED BY: DMC	
CALIBRATION STANDARDS USED: Air Saturation		

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☐ AFTER USE ☐ EACH SAMPLE LOCATION

☒ OTHER (SPECIFY)
4 hrs. [illegible]

REMARKS/CORRECTIVE ACTION:

Cal Accepted

Time	0920		
Temp	25.0°C		
Sat.	50.9C		

EQUIPMENT: HF Scientific DRT-15CE Turbidimeter			SERIAL NO:	907173		
ACTUAL TIME: 0930	PERFORMED BY: DMC					
CALIBRATION STANDARDS USED:	Standard	1.0 ntu	20.0 ntu			
	Lot #	A4182	A4182			
	Expiration	Jun.'06	Jun. '06			

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER US☐ ☒ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

REMARKS/CORRECTIVE ACTION:

Cal. Good

Standard	1.0ntu	20.0ntu			
Reading	1.0	20.2			
1540	1.0	20.2			

PEL Laboratories, Inc.

Chain of Custody Record
Record/Work Request

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Address: 225 E. Robinson St. Suite 505, Orlando, FL 32801

Phone: 407.423-0030 Fax:

Project Name/Number: Lake Orienta

Project Manager: Al Aikens

Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

REQUESTED DUE DATE / /

Print Names(s) / Affiliation: Mike Burns, Dave Calling / Nodarse

Sampler(s) Signature(s): Mike Burns

Preservatives (see codes): I

Analyses Requested: 405.1

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	405.1	Remarks	Lab. No.
	LO-05-01	10/5/05	1520	G	GW	1	✓	MW-1	
	LO-05-02		1050	G	GW	1	✓	MW-2	
	LO-05-03		1150	G	SW	1	✓	Lake	
	LO-05-Dup		1535	G	GW	1	✓	MW-1	
	LO-05-MS		1100	G	GW	1	✓	MW-2	
	LO-05-MSD		1110	G	GW	1	✓	MW-2	

Shipment Method — 6 ← Total Number of Containers

Out: / /	Via: FedX	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	1	Mike Burns	10/5/05				
Additional Comments:								

	Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATI CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric aci ce S = Sulfuric acid + ice O = Other (specify)

Chain of Custody Record
Record/Work Request

PEL Laboratories, Inc.

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Company: CH2M Hill

Project Name/Number: Lake Orienta

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801

Project Manager: Al Aikens

Phone: 407-423-0030 Fax:

Purchase Order:

Print Names(s) / Affiliation: Mike Burns, David Caffery / Nodarse

Sampler(s) Signature(s): [signature]

Preservatives (see codes)

Analyses Requested: See Attached List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	LO-05-01	10/5/05	1520	G	GW	24	MW-1	
	LO-05-02		1050	G	GW	24	MW-2	
	LO-05-03		1150	G	SW	24	Lake	
	LO-05-Dupe		1535	G	GW	24	MW-1	
	LO-05-MS		1100	G	GW	24	MW-2	
	LO-05-MSD		1110	G	GW	24	MW-2	
	Tested Trip Blanks							

Shipment Method: Delivery — 144 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	12	[signature]					
Additional Comments:								

	Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

1236

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04609 63 AC

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4.
Standard B 7
Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/5/05	0955	A	4.0	4.06		yes	Init	mb
		B	7.0	7.01				
		C	10.0	9.91				
	1210	A	4	4.02			cont	
		b	7	7.01				
		C	10	10.0				

1237

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 INSTRUMENT # 04609 68AC

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 70

Standard B 1000

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/5/05	0900	A	70	93		Yes	Init	MB
		B	1000	950				
	1218	A	70	74			Cont	
		B	1000	999				

1238

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A **INSTRUMENT #**

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100%
Standard B ________
Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/5/05	0905	A	100%	92.0		Yes	Init	MP
|	1221	A	100%	100.4%		|	Cont	|
10/5/05	0907	A	25.1	25.1		Yes	Init	MP
|	1222		24.7	24.7		|	Cont	|

1239

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT** #010410 00 28774

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.17

Standard B 52.1

Standard C 496

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/5/05	0910	A	5.17	5.21		Yes	Init	NB
		B	52.1	52.1				
		C	496	495				
	1225	A	5.17	5.18			Cont	
		B	52.1	52.1				
		C	496	496				

1240

10/31/05 LK Orienta (G)

LO-06-02 MW-2 MS, MSD

MSU Sampling Start 0906 End Time 1008

Start Flow Meter 194 End 220

26 Gal through Filt. .5 GPM

.446pm End,

LO.06.03 Lake Sample. (Time: 1130

Ph.	Con.	Temp.	DO.	Turb.	ORP.
8.19	175.8	21.8	7.58	6.54	002

Flow meter start: 1108 stop: 1115

460 .05

Meter Reading 87.0 Stop 89.1 = 2.1 Gal

Lake Level High

LO.06.01 MW-1 and LO-06-Dup

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 0164000028774

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.17

Standard B 52.1

Standard C 496

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/31/05	0754	A	5.17	5.23		yes	Init	MB
		B	52.1	52.7				
		C	496	498				
	1230	A	5.17	5.18			Cont	MB
		B	52.1	52.3				
		C	496	496				

1242

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
- ☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4

Standard B 7

Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/31/05	0800	A	4	4.02		Yes	Int	MB
		B	7	7.10				
		C	10	9.97				
10/31/05	1233	A	4	4.01			Cont	MB
		B	7	7.0				
		C	10	10.03				

1243

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968

PARAMETER: *[check only one]*

☐ TEMPERATURE ☑ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 70

Standard B 1000

Standard C ________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/31/05	0808	A	70	84		Yes	Init	mB
		B	1000	966				
10/31/05	1230	A	70	71			Cont	
		B	1000	998				

1244

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A INSTRUMENT # 03G0266AT

PARAMETER: *[check only one]*

- [x] TEMPERATURE
- [ ] CONDUCTIVITY
- [ ] SALINITY
- [ ] pH
- [ ] ORP
- [ ] TURBIDITY
- [ ] RESIDUAL CL
- [ ] DO
- [ ] OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A ____________

Standard B ____________

Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/31/05	0913		17.8	17.8		Yes	Init	ms
10/31/05	1240		23.7	23.7			cont	|

1245

FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A INSTRUMENT # 03G0266AT

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100 %

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
10/31/05	0815	A	100%	98.6%		Yes	Init	mB
	1242	A	100%	100.1%			Cont	

1246

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill

Address: 225 E. Robinson St. Suite 505 Orlando, FL. 32801

Phone: 407-423-0030 Fax: 407-839-5901

Project Name/Number: Lake Orienta

Project Manager: Al Aikens

Purchase Order:

Page of

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation Modarez Mike Burns/Dave Collins

Sampler(s) Signature(s) Mike Burns

Preservatives (see codes)

Analyses Requested: See List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	LO-06-01	10/31/07	1500	G	GW	24	mw-1	
	LO-06-02		1202	G	GW	24	mw-2	
	LO-06-03		1130	G	SW	24	Lake	
	LO-06-MS		1219	G	GW	24	mw-2	
	LO-06-MSD		1234	G	GW	24	mw-2	
	LO-06-Dup			G	GW	24		
	Trip/Temp Blanks							

Shipment Method 144 ← Total Number of Containers

Out: / /	Via: Deliver	Item Nos. 12	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns	10/31/07				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify) 1247

PRESERVATI CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric aci ce S = Sulfuric acid + ice O = Other (specify)

Chain of Custody Record
Record/Work Request

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Page of

Company: CH2M Hill

Address: 225 E. Robinson St. Suite 505 Orlando, FL. 32801

Phone: 407-423-0030 Fax: 407-839-5901

Project Name/Number: Lake Orienta

Project Manager: Al Aikens

Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns, Dyer Collier / Modarze & Assoc.

Sampler(s) Signature(s)

Preservatives (see codes)

Analyses Requested

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers		BOD 405.1							Remarks	Lab. No.
	LO-06-01	10/31/05	1500	G	GW	1		✓							MW-1	
	LO-06-02	|	1202	G	GW	1		✓							MW 2	
	LO-06-03	|	1130	G	SW	1		✓							Lake	
	LO-06-MS	|	1219	G	GW	1		✓							MW-2	
	LO-06-MSD	|	1234	G	GW	1		✓							MW 2	
	LO-06-Dup	|		G	GW	1		✓								

Shipment Method — 6 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		[signature]	11/3/05				
Additional Comments:								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATI CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric aci ce S = Sulfuric acid + ice O = Other (specify)

FIELD EQUIPMENT CALIBRATION LOG

DATE: 10/31/05	PROJECT NAME: Lake Ontario	SHEET: 1 OF 1 / PROJECT NO:

EQUIPMENT: WTW Multiline P3				SERIAL NO:	81552054		
ACTUAL TIME: 0915		PERFORMED BY: Daniel M. Caffrey					
		pH			CONDUCTIVITY		
CALIBRATION STANDARDS USED:		4.01	7.00	10.00	200 us/cm	1413 us/cm	us/cm
	Lot #	5022	50519	50519	2504247	RAEO 003C/1	
	Expiration	1/31/2007	11/30/2006	11/30/2006	4/30/2006	1/26/2006	
CALIBRATION READINGS LOG:		pH 4.01	pH 7.00	pH 10.00	200 us/cm	1413 us/cm	us/cm
M = -56.9	Before Cal.	4.01	7.03	—	200	1412	
-4 mV	After Cal.	4.00	7.01	—	—	1418	
Cal. Accepted	1505	4.00	7.02	9.97	200	1420	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION ☐ OTHER (SPECIFY)

EQUIPMENT: WTW Oxi 330	SERIAL NO: 260001
ACTUAL TIME: 0920	PERFORMED BY: DMC
CALIBRATION STANDARDS USED: Air Saturation	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☐ AFTER USE ☐ EACH SAMPLE LOCATION ☒ OTHER (SPECIFY) 4 hrs. max

REMARKS/CORRECTIVE ACTION: Cal. Accepted

Time	0920	1100	
Temp	17.9°C	24.6°C	
Sat.	50.89	50.88	

EQUIPMENT: HF Scientific DRT-15CE Turbidimeter			SERIAL NO: 907173		
ACTUAL TIME: 0930	PERFORMED BY: DMC				
CALIBRATION STANDARDS USED:	Standard	1.0 ntu	20.0 ntu		
	Lot #	A4182	A4182		
	Expiration	Jun.'06	Jun. '06		

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☒ EACH SAMPLE LOCATION ☐ OTHER (SPECIFY)

REMARKS/CORRECTIVE ACTION: Cal. Good

Standard	1.0ntu	20.0ntu			
Reading	1.0	20.2			
1503	1.0	20.2			

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Oriente		SITE LOCATION: Altamonte Springs, FL	
WELL NO: MW-1	SAMPLE ID: LO-06-01		DATE: 10/31/05

PURGING DATA

WELL DIAMETER (inches): 4	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 48.39	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) 1 vol. = (210 feet – 48.39 feet) X 0.65 gallons/foot = 105 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + NA gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 80	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0751	PURGING ENDED AT: 1423	TOTAL VOLUME PURGED (gallons): 157

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0751	Init	0	0.4	48.39	—	—	—	—	—	clear	None	—
1213	105	105	0.4	48.41	7.51	23.4	297	0.16	0.19	"	"	-42
1318	26	131	0.4	48.41	7.44	23.5	297	0.15	0.17	"	"	-57
1423	26	157	0.4	48.41	7.40	23.5	298	0.15	0.15	"	"	-85

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47, 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006, 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: David M. Cathey / Woodard	SAMPLER(S) SIGNATURES: D.M. Cathey	SAMPLING INITIATED AT: 1424	SAMPLING ENDED AT: 1500
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute): 0.4 gpm	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) FILTER SIZE: µm	DUPLICATE: (Y) LO-06-Dup	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
		See List						

REMARKS:

MATERIAL CODES. AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon, O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: LK. Orienta	SITE LOCATION: Altamont Spgs, FL
WELL NO: MW-2	SAMPLE ID: LO-06-02
DATE: 10/31/05	

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/4"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 18.33	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 18.33 feet) X .65 gallons/foot = 72.5 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 85'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0745	PURGING ENDED AT: 1140	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1026	72.5	72.5	.5	18.35	7.64	23.8	305.2	0.30	0.50	clear	sl. sulfur	-193
1102	18.1	90.6			7.57	23.8	306.1	0.35	0.40			-202
1138	18.1	108.7			7.62	23.8	319.2	0.39	0.45			-152

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns/Nodarse	SAMPLER(S) SIGNATURES: Mike Bu	SAMPLING INITIATED AT: 1142	SAMPLING ENDED AT: 1202, 1219/23
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (N circled) FILTER SIZE: µm	DUPLICATE: Y	QMS/MSD

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
			See List					BP

(SAMPLE CONTAINER SPECIFICATION: SAMPLE ID CODE, # CONTAINERS, MATERIAL CODE, VOLUME; SAMPLE PRESERVATION: PRESERVATIVE USED, TOTAL VOL ADDED IN FIELD, FINAL pH)

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%, Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME Lake Orienta		SITE LOCATION Altamont Sprgs., FL.	
WELL NO: Lake Sample	SAMPLE ID: LO-06-03		DATE: 10/31/05

PURGING DATA

WELL DIAMETER (inches): NA	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER: DP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
	NA	—	—	—	8.19	21.8	175.8	7.58	6.5	Greenish Clear	Lake	002

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1130
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See List					

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Oriente	SITE LOCATION: Altamonte Springs, FL
WELL NO: MW-1	SAMPLE ID: ~~[illegible]~~ LO-07-01 / DATE: 12/05/05

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
4		@ 210	50.40	BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
1 Vol. = (210 feet − 50.40 feet) X 0.65 gallons/foot = 104 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + NA gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
78	75	0812	1442	156

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP (mV)
0812	Init	0	0.4	50.40	—			—	—	Clear	None	—
1232	104	104	0.4	50.50	7.57	23.5	293	0.20	0.18	"	"	-176
1337	26	130	0.4	50.55	7.47	23.5	293	0.09	0.26	"	"	-204
1442	26	156	0.4	50.55	7.43	23.4	297	0.11	0.28	"	"	-214

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
David M. Cattery / Nodarse	[signature]	1443	1500

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:
78	0.4gpm	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
							See list	

REMARKS:

26 gal

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: LK. Orienta	SITE LOCATION: Altamont Springs. FL.	
WELL NO: MW-2	SAMPLE ID: LO-07-02	DATE: 12/5/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 5/8"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 20.42	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 20.42 feet) X .65 gallons/foot = 71.22 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 80'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 80'	PURGING INITIATED AT: 0730	PURGING ENDED AT: 1017	TOTAL VOLUME PURGED (gallons): 114.62

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0905	71.22	71.22	.75	20.45	7.40	23.7	267.5	0.39	0.42	Clear	None	
0929	17.80	89.02	|	20.46	7.31	23.7	293.6	0.45	0.46	|	|	
0953	17.80	106.82	|	|	7.31	23.7	279.9	0.43	0.45	|	|	
1017	17.80	114.62	|	|	7.39	23.7	277.8	0.41	0.47	|	|	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1158	SAMPLING ENDED AT: 1210, 1220/1230
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm	DUPLICATE: Y N ms/msd	

SAMPLE CONTAINER SPECIFICATION			SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See List					BP

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta	SITE LOCATION: Altamont Spgs, FL
WELL NO: Lake	SAMPLE ID: 60-07-03	DATE: 12/5/05

PURGING DATA

WELL DIAMETER (inches): NA	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet − feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
—	—	—	—	—	8.03	20.3	181.8	7.69	10.6	Lt. Green	none	—

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT:	SAMPLING ENDED AT: 1325
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (N circled) FILTER SIZE: µm	DUPLICATE: Y N (N circled)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
			See List					

REMARKS:

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene, S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2 M Hill	Project Name/Number: Lake Orienta
Address: 225 E. Robinson St. Suite 505 Orlando, FL 32801	Project Manager: AL Aikens
Phone: 407-423-0030 Fax: 407-839-5901	Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns, Dave Caffrey / Nodarse
Sampler(s) Signature(s): [signature]

Preservatives (see codes)

Analyses Requested: See List

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Remarks	Lab. No.
	LO-07-01	12/8/05	1445	G	GW	18		
	LO-07-02		1210	G	GW	15		
	LO-07-03		1325	G	SW	11		
	LO-07-Dupe			G	GW	15	MW-1	
	LO-07-MS		1220	G	GW	13	MW 2	
	LO-07-MSD		1230	G	GW	13	MW 2	
	Trip 3 Temp Blank							

Shipment Method: Delivery — 108 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.	6	Mike Burns					
Additional Comments:								

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVAT[illegible] CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric ac[illegible] ice S = Sulfuric acid + ice O = Other (specify)

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Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill	Project Name/Number: Lake Orienta
Address: 225 E Robinson St. Suite 505 Orlando, FL. 32801	Project Manager: AL Aikens
Phone: 407-423-0030 Fax:	Purchase Order:

Page 1 of 1

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns, Dave Chaffers / Nodarse

Sampler(s) Signature(s): Mike B

Preservatives (see codes): I

Analyses Requested: 405.1 BOD

REQUESTED DUE DATE / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	405.1 BOD							Remarks	Lab. No.
	LO-07-01	12/05/05		G	GW	1	✓								
	LO-07-02	|	1210	G	GW	1	✓								
	LO-07-03	|	1325	G	SW	1	✓								
	LO-07-Dupe	|		G	GW	1	✓							MW-1	
	LO-07-MS	|	1220	G	GW	1	✓							MW-2	
	LO-07-MSD	|	1230	G	GW	1	✓							MW-2	

Shipment Method | 6 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike B	12/05/05				
Additional Comments:								

	Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify) 1257

PRESERVATI[illegible] CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric aci[illegible] [illegible]e S = Sulfuric acid + ice O = Other (specify)

PEL Laboratories, Inc.

4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

Company: CH2M Hill	Project Name/Number: Lake Orienta
Address: 225 E. Robinson St Ste 505 Orlando FL 32801	Project Manager: Al Aikens
Phone: 407-423-0030 Fax:	Purchase Order:

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Print Names(s) / Affiliation: Mike Burns, Mike Burns, Andersen 3 Assoc

Sampler(s) Signature(s): [signature]

Preservatives (see codes): I

Analyses Requested: 8021 / 625.1 (?)

REQUESTED DUE DATE: / /

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	Analysis	Remarks	Lab. No.
	LO-07-01	12/12/03	1422	G	GW	1	✓	MW-1	
	LO-07-02	|	1030	G	GW	1	✓	MW-3	
	LO-07-03	|	0955	G	SW	1	✓	Lake	
	LO-07-MS	|	1035	G	GW	1	✓	MW-2	
	LO-07-MSD	|	1040	G	GW	1	✓	MW-3	
	LO-07 Dupe	|		G	GW	1	✓	MW-1	

Shipment Method | 6 ← Total Number of Containers

Out: / /	Via: Fed X	Item Nos. 1	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.		Mike Burns	12/11/03				
Additional Comments:								

	Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATI CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric aci ce S = Sulfuric acid + ice O = Other (specify)

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Springs, FL.
WELL NO: MW-1	SAMPLE ID: LO-07-02	DATE: 12/12/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches): 3/8"	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 49.35	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (210 feet – 49.35 feet) X .65 gallons/foot = 104.4 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0745	PURGING ENDED AT: 1416	TOTAL VOLUME PURGED (gallons): 156.4

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
1206	104.4	104.4	.40	49.45	7.59	23.4	284.1	0.27	0.51	Clear	None	-114
1311	26	130.4	|	|	7.58	23.4	282.1	0.38	0.50	|	|	-113
1416	26	156.4	|	|	7.53	23.3	272.2	0.25	0.38	|	|	-115

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: Mike Burns	SAMPLING INITIATED AT: 1418	SAMPLING ENDED AT: 1422
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	LO-07-Dupe
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N µm	FILTER SIZE:	DUPLICATE: Y Dupe

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	1	PE	1L	—	—	—	405.1	BP

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene, S = Silicone; T = Teflon, O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamonte Springs	
WELL NO: MW-2	SAMPLE ID: LO-07-02		DATE: 12/12/05

PURGING DATA

WELL DIAMETER (inches): 4"	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 19.45	PURGE PUMP TYPE OR BAILER: BP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (130 feet – 19.45 feet) X .65 gallons/foot = 71.85 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 0725	PURGING ENDED AT: 1026	TOTAL VOLUME PURGED (gallons): 125.85

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
0902	71.85	71.85	.70	19.50	7.56	23.6	306.3	0.39	0.54	clear	Sulfur	-239
0934	18.0	89.85		19.50	7.42	23.4	280.0	0.32	0.59			-215
1000	18.0	107.85			7.16	23.6	302.2	0.26	0.57			-208
1026	18.0	125.85			7.14	23.5	293.7	0.27	0.59			-206

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nichols	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1027	SAMPLING ENDED AT: 1030
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE/T	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: µm	DUPLICATE: Y (N) MS/MSD	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	3	PE	1L	–	–	–	BOD 405.1	BP

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

GROUNDWATER SAMPLING LOG

SITE NAME: Lake Orienta		SITE LOCATION: Altamont Springs
WELL NO: Lake	SAMPLE ID: 60-07-03	DATE: 12/12/05

PURGING DATA

WELL DIAMETER (inches): Surface Water	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER: Grab

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (std units)	TEMP (°C)	COND (µmhos/cm or µS/cm)	DO (mg/L or % sat.)	TURBIDITY (NTUs)	COLOR	ODOR	ORP
n/a	—	—	—	→	7.79	17.1	170.6	6.35	5.66	Clear	None	-022

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Mike Burns / Nodarse	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 0934	SAMPLING ENDED AT: 0935
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: PE	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	FILTER SIZE: µm	DUPLICATE:

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
		PE	1L	—	—	—	405.1	Grab

REMARKS:

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene, S = Silicone; T = Teflon, O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA: pH = ± 0.2; Temperature = ± 0.2 °C; Specific Conductance = readings are within ± 5%; Dissolved Oxygen = A) ≤ 20% saturation or B) readings are within ± 0.2 mg/L (for readings ≤ 2 mg/L) or 10% (for readings > 2 mg/L); Turbidity = A) ≤ 20 NTUs or B) readings are within ± 5 NTUs (for readings > 20 and ≤ 50 NTUs) or 10% (for readings > 50 NTUs).

FIELD EQUIPMENT CALIBRATION LOG

DATE: 12/05/05	PROJECT NAME: Lake Ontario	SHEET: 1 OF 1
		PROJECT NO:

EQUIPMENT: WTW Multiline P3				SERIAL NO:	81552054		
ACTUAL TIME: 0905		PERFORMED BY: David M. Caffery					
		pH			CONDUCTIVITY		
CALIBRATION STANDARDS USED:		4.01	7.00	10.00	200 us/cm	1413 us/cm	us/cm
	Lot #	5022	50519	50519	2504247	RAEO 003C/1	
	Expiration	1/31/2007	11/30/2006	11/30/2006	4/30/2006	1/26/2006	
CALIBRATION READINGS LOG:		pH 4.01	pH 7.00	pH 10.00	200 us/cm	1413 us/cm	us/cm
m = -57.3	Before Cal.	4.02	7.03	—	—	1418	
-4mV	After Cal.	4.00	7.01	—	—	1414	
Cal. Accepted			7.01	9.98	200	1415	

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☐ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

ORP: std 240mV / Response 240mV

EQUIPMENT: WTW Oxi 330		SERIAL NO:	260001
ACTUAL TIME: 0900	PERFORMED BY: DMC		

CALIBRATION STANDARDS USED: Air Saturation

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☐ AFTER USE ☐ EACH SAMPLE LOCATION

☒ OTHER (SPECIFY) 4 hrs max

REMARKS/CORRECTIVE ACTION: Cal. Accepted

Time	0900	1300	
Temp	19.5°C	21.3°C	
Sat.	50.96	50.98	

EQUIPMENT: HF Scientific DRT-15CE Turbidimeter			SERIAL NO:	907173
ACTUAL TIME: 0915	PERFORMED BY: DMC			

CALIBRATION STANDARDS USED:

Standard	1.0 ntu	20.0 ntu			
Lot #	A4182	A4182			
Expiration	Jun.'06	Jun. '06			

CALIBRATION TECHNIQUE/FREQUENCY: ☒ PRIOR TO USE ☒ AFTER USE ☒ EACH SAMPLE LOCATION

☐ OTHER (SPECIFY)

REMARKS/CORRECTIVE ACTION: Cal. Good

Standard	1.0ntu	20.0ntu			
Reading	1.0	20.2			

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968 AC

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 4

Standard B 7

Standard C 10

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
12/5/05	0736	A	4	3.98		Yes	Init	MB
		B	7	6.99				
		C	10	10.01				
12/5/05	1200	A	4	4.0			cont	
		B	7	7.02				
		C	10	10.01				
12/12/05	0835	A	4	3.99		Yes	cont	
		B	7	6.97				
		C	10	9.98				
	1430	A	4	4.02			cont	MB
		B	7	7.0				
		C	10	10.01				

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FT 1000 General Field Testing and Measurement

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 63 **INSTRUMENT #** 04B0968 AC

PARAMETER: *[check only one]*

- ☐ TEMPERATURE
- ☒ CONDUCTIVITY
- ☐ SALINITY
- ☐ pH
- ☐ ORP
- ☐ TURBIDITY
- ☐ RESIDUAL CL
- ☐ DO
- ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 47

Standard B 1000

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
12/5/05	0741	A	47	47		Yes	Init	MB
|	|	B	1000	996		|	|	|
|	1205	A	47	43		|	Cont	|
|	|	B	1000	998		|	|	|
12/12/05	0840	A	47	41		Yes	cont	|
|	|	B	1000	991		|	|	|
|	1435	A	47	45		|	cont	|
|	|	B	1000	1001		|	|	|

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Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) YSI 550A **INSTRUMENT #** 03G0266AT

PARAMETER: *[check only one]*

☒ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CL ☒ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 100%

Standard B ______

Standard C ______

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
12/5/05	0745	A	100%	106%		Yes	Init	mb
|	1209	A	100%	99.8%		|	cont	|
12/12/05	0844	A	100%	99.6%		|	cont	mb
|	1439	A	100%	99.8%			|	|
Temp								
12/5/05	0746		1°	17.9			Init	mb
|	1210		20.9	20.4			cont	|
12/12/05	1440		23.4	23.4			|	|

Field Instrument Calibration Records

INSTRUMENT (MAKE/MODEL#) HACH 2100P **INSTRUMENT #** 01040002877 4

PARAMETER: *[check only one]*

- ☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
- ☒ TURBIDITY ☐ RESIDUAL CL ☐ DO ☐ OTHER ______

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 5.41
Standard B 54
Standard C 516

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
12/5/05	0752	A	5.41	5.41		Yes	Init	MB
		B	54	54.1				
		C	516	518				
	1212	A	5.41	5.40			cont	MB
		B	54	54.1				
		C	516	516				
12/12/05	0846	A	5.41	5.39		Yes	cont	MB
		B	54	53				
		C	516	516				
	1443	A	5.41	5.40			cont	MB
		B	54	54.1				
		C	516	516				

1266

12/5/05 LK Orienta
Event 7

MW-2 LO-07-02 W/L 20.42'

Flow Meter Start 220.2 Time Start 0903
" " Stop 246.2 Time Stop 0955
.5GPM

Finish purge at 1030 Waiting on PEL Lab coolers

Lake LO-07-03

Ph	Con.	Temp	D.O.	Turb
8.03	181.8	20.3	7.69	10.6

Flowmeter Start 89.2 Time Start 1303
" " Stop 92.3 Time Stop 1311
GPM Start .6 Stop .01

1325

GOA
LK.
PH
Airpo

12/12/05 Lk. Orienta WO4-E-010
Re Collect BOD & MSU Bio Samples.
LO-07-02
LO-07-MS
LO-07-MSD
MW-2

LO-07-03 - Lake collect at 0935

LO-07-01 - MW-1 & Dupe LO-07-Dup

Appendix I

Microbial Evaluation

The Central Florida Aquifer Recharge Enhancement Phase 1 (CFARE1) Project

Analyses of Microbial and Related Data from the Festival Park and Lake Orienta Study Sites

John Lisle, PhD
Microbiologist
U.S. Geological Survey

Introduction

The Central Florida Aquifer Recharge Enhancement – Phase 1 (CFARE1) project was initiated to investigate the feasibility of increasing the direct flow of untreated surface waters into the Floridan aquifer via existing, open drain wells as a possible alternative for enhancing an alternative water supply in Orange and Seminole Counties. One task of this project focused on the microbiology of the surface and groundwater systems in selected watersheds. In general, the microbiology studies included the establishment of baseline data on the occurrence and abundance of microbial indicators of fecal contamination (i.e., total and fecal coliforms, *E. coli*, enterococci, coliphage, *Giardia* spp. and *Cryptosporidium* spp.) and an assessment of the fate and transport of introduced bacteria in the Floridan aquifer.

This section of the report is a critical review and analysis of microbiology abundance data from this project that were collected during several sampling events that occurred from 2003-2005 (Table 1). Chemical, nutrient and physical data will also be evaluated within the context of the microbiology analyses. These data were provided by CH_2M Hill in the form of data summary tables and two published reports [Kamarainen, A., W. Quintero-Betancourt, M. Woodall and J. Rose (2004). Central Florida Artificial Recharge Demonstration Program: Festival Park-Orlando, FL; Ives, R. and J. Rose (2006). Central Florida Artificial Recharge Demonstration Program: Lake Orienta-Orlando, FL]. The methods used for collection and enumeration of the microbial indicators are provided in the referenced reports and will not be restated here.

Sample site descriptions

Two areas were sampled for microbiological analyses: Festival Park and Lake Orienta. A detailed description of these sample sites can be found elsewhere in this report. Flow rates between recharge and monitoring wells were determined by injecting fluorescein and eosine tracer dyes into the recharge wells and sampling at timed intervals at the monitoring wells.

The Festival Park area had four sampling sites that were analyzed in this report; Recharge well R143 and monitoring wells MW1, MW2 and MW4. Based upon the dye tracer studies, water entering the aquifer system via R143 moved towards MW1 and MW2 with a travel of time of approximately two weeks. However, the flow to both monitoring wells was not equal, as dye concentrations reaching MW1 were approximately 600-fold greater than those arriving at MW2. Neither dye was detected at MW4.

The Lake Orienta area had three sampling sites; a recharge well within Lake Orienta and monitoring wells MW1 and MW2. Based upon the dye tracer studies, water entering the Lake Orienta recharge well moved towards MW2 with a travel time of approximately two weeks. Neither dye was detected at MW1.

Data processing for the microbiology data sets

1. Any “<” value in the total and fecal coliforms, *E. coli* and entrococci data sets that was below 0.5 or between 1-5 CFU 100 ml^{-1} was set to 0 or 1.0, respectively.

2. All of the data for *Giardia* spp. and *Cryptosporidium* spp., except for the two positive samples in the Lake Orienta data set, were assigned a value of 0. The recovery efficiency rates for the respective methods were so low that assigning a value based upon the equation, (Detection Limit Value × 0.5), was not appropriate. There were also “+” designations within these data sets. However, there was no appropriate method for

assigning a non-zero value to these data points and they were not included in the analyses.

Table 1. Sampling sites and dates.

Sample Date	Festival Park R-143	Festival Park MW-1	Festival Park MW-2	Festival Park MW-4	Lake Orienta Lake	Lake Orienta MW-1	Lake Orienta MW-2
28-May-2003	R143a			MW4a			
29-May-2003		MW1a	MW2a				
1-Oct-2003	R143b	MW1b					
2-Oct-2003			MW2b				
3-Oct-2003				MW4b			
8-Oct-2003	R143c	MW1c					
9-Oct-2003				MW4c			
10-Oct-2003			MW2c				
22-Oct-2003			MW2d				
23-Oct-2003	R143d			MW4d			
24-Oct-2003		MW1d					
19-Nov-2003		MW1e					
20-Nov-2003			MW2e				
21-Nov-2003	R143e			MW4e			
4-Feb-2004	R143f	MW1f					
5-Feb-2004			MW2f	MW4f			
16-Feb-2004	R143g			MW4g			
17-Feb-2004		MW1g					
18-Feb-2004			MW2g				
11-Jul-2005					Lake a	MW1 a	MW2 a
20-Jul-2005					Lake b	MW1 b	MW2 b
27-Jul-2005					Lake c	MW1 c	MW2 c
8-Aug-2005					Lake d	MW1 d	MW2 d
7-Sep-2005					Lake e	MW1 e	MW2 e
5-Oct-2005					Lake f	MW1 f	MW2 f
31-Oct-2005					Lake g	MW1 g	MW2 g
6-Dec-2005					Lake h	MW1 h	MW2 h

3. All “<” values within the coliphage data sets were set to 1.0. All “–” data points were assigned a value of 0. Any coliphage data point that had been assigned a “+” designation was assigned a value of 1.0.

Data processing for the chemical, nutrient and physical data sets

1. The following designations were used in these data sets to denote data quality: = : a true detection value; U : a non-detection event greater than the reporting limit value listed; J : an estimated value between the detection limit and the practical quantification limit; UJ :

a non-detection event greater than the value shown; and R : rejected data. All data in the "=" and "J" categories were included in the analyses as listed. All data in the "U" and "UJ" categories were assigned a value using the following equations: ($U \times 0.5$) or ($UJ \times 0.5$). The resulting products were used in the analyses. All data in the "R" category were removed from the data sets prior to analyses.

Caveats for the microbial indicator and chemical, nutrient and physical data sets

The inclusion of data sets that contained a relatively large percentage of values that were below the detection limit may overestimate the statistical importance of these data within the context of data interpretation. Also, those data sets that were consistently below the detection limit and were assigned a value have no variance associated with their distribution. Therefore, these data sets could not be used in some of the analyses as will be noted in the following sections.

Statistical analyses

Prior to initiating the statistical analyses of the microbiology and chemical, nutrient and physical data, all data sets were processed to test of normality and homogeneity of variance. All raw data failed to meet the minimum requirements for normality. Though $\log_{10}$ data transformations were applied, only a very small subset of data approached a normal distribution. Accordingly, the more common statistical analyses used for comparisons of means (e.g., ANOVA, t-tests) were not possible. Also, attempts were made to analyze the microbiology and chemical, nutrient and physical data using time and trend analyses. It was determined that the data generated from these analyses were not reliable as the number of sample points between the start and finish of the data collection period were too few.

The raw data from the chemical, nutrient and physical data sets were used to assess correlations between the sample sites. Multivariate analyses (i.e., principle component and factor analyses) were performed on the microbiological and chemical, nutrient and physical data sets to compare the sample sites and to determine which parameters within those data sets contribute to the variance. These types of analyses, though not directly comparing data sets for significant differences, do promote the testing and development of hypotheses on which informed decision can be made.

Due to the structure of the data sets and the low number of sample events, direct statistical comparisons were not attempted. Instead, statistical analyses were conducted that will allow engineers and planners to develop hypotheses for further evaluation of these data sets and possible design of future research efforts. Based upon the flow path data established from the dye injection tests, the hypotheses under which the following data analyses were performed are as follows:

Festival Park:

H_o: R143 is hydraulically connected to MW1 and MW2, but not MW4.
H_o: MW1 and MW 2 are not hydraulically connected to MW4.

Lake Orienta:

H_o: Lake Orienta is hydraulically connected to MW2, but not MW1.
H_o: MW2 is not hydraulically connected to MW1.

All statistical analyses were performed using Minitab (rel. 14.0).

Correlations. Pearson product correlation coefficients and associated *P*-values were calculated using the chemical, nutrient and physical data sets from the respective sample sites. The objective of these analyses was to investigate if changes in one or more parameters at the inlet sites (i.e., R143 at Festival Park and Lake Orienta) correlated with monitoring well sites that had been previously shown to be hydraulically connected and to also assess if the putative non-hydraulically connected wells experienced the same fluctuations.

Due to the large number of comparisons, the original α value of 0.05 was adjusted using the Bonferroni adjustment, which minimizes the probability of making a Type I error (i.e., incorrectly designating a correlation as being statistically significant). Based upon the Festival Park and Lake Orienta data sets having 23 parameters that were compared, the adjusted α values for these data sets were set at 0.0002. Without using this adjustment to the α values, there was a > 99% chance of finding significant correlations that would lead to Type I errors. However, though the Bonferroni adjustment is an accepted procedure, it is not universally accepted, as this adjustment may make the test too restrictive thereby missing truly significant correlations. The statistically significant correlations listed in Tables 2 and 3 include those comparisons whose α is ≤ 0.05 and those that meet the criterion set by the Bonferroni adjustment. The *P*-values are listed below the respective correlation coefficients in italics.

Multivariate analysis. Multivariate analyses were conducted on selected raw data for the microbial indicators and chemical, nutrient and physical analyses using principle component analysis (PCA) and factor analysis (FA). Each PCA analysis was conducted using a correlation matrix, as all variables within the respective data sets were not measured using the same method. The PCA scores and loading values for the first two components and their respective contributions to the overall variance (expressed as a percentage) were graphed. As previously discussed, the assignment of values to data sets that were consistently below detection limit produced a new data set with no variation. These types of data cannot be used in PCA. The following data sets were not used in the PCA analyses for Festival Park: *Giardia* spp. and *Cryptosporidium* spp. and for Lake Orienta: *Giardia* spp. *Cryptosporidium* spp. (when comparing MW1 and MW2 data only) and coliphage.

FA was conducted on microbiological and chemical, nutrient and physical data sets using the raw data. FA was performed using the principle components method for data extraction from a correlation matrix. The factor loading axes positions were optimized using a varimax rotation. The FA scores and loading values for the first two components and their respective contributions to the overall variance (expressed as a percentage) were graphed. The chemical, nutrient and physical data used in the PCA and FA analyses graphs are listed in Table 4.

Results and Discussion

Data correlations for the chemical, nutrient and physical data sets. Statistically significant correlation coefficients are not onto themselves proof of causation. However, their restrictive use as defined previously may provide some insight into if the untreated waters are impacting the aquifer as determined by data from the monitoring wells. Evaluating the statistically significant correlation coefficients for the Festival Park chemical, nutrient and physical data (Table 2), from the perspective of the hypotheses stated previously, increases in concentrations of organic phosphate, ortho-phosphate, sulfates, total nitrogen species and total organic carbon at the inlet also occur at MW4. Also, the fluctuations in water color data, which could be used as a conservative tracer, from all of the monitoring wells at the Festival Park site are positively correlated. Additionally, the calcium, water color, total phosphate, total nitrogen, total organic carbon and turbidity data from MW1 and MW4 are positively correlated. Collectively, these data indicate that MW4 may not be as isolated from R143, MW1 and MW2 as previously assumed. These associations may be positively influenced by the relatively greater flow rate between R143 and MW1 as MW1 and MW4 have several parameters that are positively correlated. However, an additional hydraulic connection to the aquifer zone from which MW4 extracts water cannot be ruled out. If MW4 is to be used as a “native control” for this zone within the aquifer, further investigation into the hydrogeology of this site may be warranted.

Table 2. Festival Park Correlation Data

Correlated Parameters	R143 MW1	R143 MW2	R143 MW4	MW1 MW2	MW1 MW4	MW2 MW4
Calcium					0.828 *0.022*	
Chloride	1.000 < *0.0001*	1.000 < *0.0001*	1.000 *< 0.0001*	1.000 *< 0.0001*	1.000 *< 0.0001*	1.000 *< 0.0001*
Color				0.824 *0.023*	0.943 *0.001*	0.906 *0.005*
DOC	0.990 < *0.0001*					0.830 *0.021*
Total Phosphate					0.772 *0.042*	
Organic Phosphate			0.850 *0.015*			
Ortho-phosphate			0.825 *0.022*			
Sulfates			0.757 *0.049*			
Total Nitrogen	0.965 < *0.0001*		0.912 *0.004*		0.946 *< 0.0001*	
TOC	0.990 < *0.0001*		0.949 *0.001*		0.974 *< 0.0001*	
Turbidity					0.772 *0.042*	

The Lake Orienta correlation data follows a similar trend (Table 3). The lake data are significantly correlated with chloride, water color, dissolved phosphate and turbidity data from MW1 and MW2. These positive correlations suggest that perhaps the flow path between the Lake Orienta inlet and MW2 is not as isolated, in regard to MW1, as previously assumed. The relatively high number of correlated data sets (9 of 13 or 69.2%) between MW1 and MW2 supports this hypothesis. Additionally, those parameters that would be considered possible conservative tracers (i.e., chloride, color, turbidity) were all positively and significantly correlated between MW1 and MW2. As with MW4 at the Festival Park site, if MW1 at the Lake Orienta site is to be used the "native control" further investigation into the hydrogeology of this site may be necessary.

Table 3. Lake Orienta Correlation Data

Correlated Parameters	Lake MW1	Lake MW2	MW1 MW2
Alkalinity			0.964
			< 0.001
Ammonium	0.857		
	0.006		
Chloride	0.897	0.824	0.971
	0.003	*0.012*	*< 0.001*
Color	0.868	0.857	0.908
	0.005	*0.007*	*0.002*
Total Phosphate			0.751
			0.032
Dissolved Phosphate	0.739	0.793	0.879
	0.036	*0.019*	*0.004*
pH	0.801		0.798
	0.017		*0.018*
Potassium		0.732	
		0.039	
Sodium		0.722	
		0.043	
Sulfates			0.719
			0.044
TDS			0.875
			0.004
Total Nitrogen		0.928	
		0.001	
Turbidity	0.716	0.917	0.861
	0.046	*0.001*	*0.006*

Microbial indicators and chemical, nutrient, and physical data. Microbial indicators of fecal pollution are routinely used to assess the microbiological quality of drinking, source and recreational waters. These groups of and individual microbes have public health and regulatory significance but have no influence on the geochemical and geomicrobial processes that dominate aquifer systems. Though dissolved oxygen concentrations in aquifer systems may be perceived as being important for bacteria to survive, this is not the case as facultative anaerobes and anaerobes dominate these systems. In fact, most of the bacterial indicators are facultative anaerobes and can survive for prolonged periods of time under very low oxygen tension or in the absence of oxygen. The dissolved oxygen concentrations recorded at the inlet sites at the Festival Park and Lake Orienta study sites indicate that relatively high concentrations of dissolved oxygen are being introduced into the subsurface, but these concentrations are reduced to common detection limits (~ 2.0 mg L^{-1}) before reaching any of the monitoring wells at either site. This oxygen demand can be attributed to geochemical reactions and microbial respiration.

For the non-parasitic microbial indicators (i.e., encysted parasites and coliphage) to survive and persist, they need to have a minimum amount carbon, nitrogen and phosphorus to maintain basal cellular processes. Carbon:nitrogen:phosphate (C:N:P) ratios were calculated as a rough estimate of the tropic status of the sample sites at each location. Using the total organic carbon, total nitrogen species and total phosphorus (as phosphates) data the C:N:P ratios indicate that phosphate is the limiting nutrient and all sites could be classified as oligotrophic.

The inlet at the Festival Park study site (R143) had a C:N:P range between 2:11:1 to 267:3:1, while the highest ratios for monitoring wells MW1 (2:5:1 to 123:1:1), MW2 (1:1:1 to 38:5:1) and MW4 (24:2:1 to 145:3:1) were less than that for R143, they still show a wide range of variability.

The Lake Orienta inlet site also had a wide range of C:N:P ratios, from 49:2:1 to 1534:39:1. The two monitoring wells, MW1 (7:5:1 to 29:2:1) and MW2 (9:2:1 to 38:3:1), had significantly lower ratios but also had a wide range of variability though not as great as the Festival Park monitoring wells.

In regard to carbon, what is the demand for this nutrient by bacterial indicators in aquifer systems? The data collected during this study cannot address this question. However, recent studies in the U.S. Geological Survey microbiology laboratory have shown that native groundwater bacterial populations, at an average abundance of 10^7 cells L^{-1}, incorporate approximately 0.81 µg C $L^{-1}d^{-1}$ into biomass. Assuming that 50% of the total organic carbon is assimilable by the native bacterial population, each 1.0 mg of total organic carbon is approximately 600-fold greater than that needed to support the survival and replication of 10^7 cells L^{-1} d^{-1}. The minimum carbon requirement or that needed to simply survive in a physiological state of maintenance within an aquifer system is even less. Though microbial indicators are not major contributors to subsurface processes, these microorganisms require the same energy sources as native microbes. The example of native bacterial productivity in aquifer waters is generally applicable to microbial indicators as well.

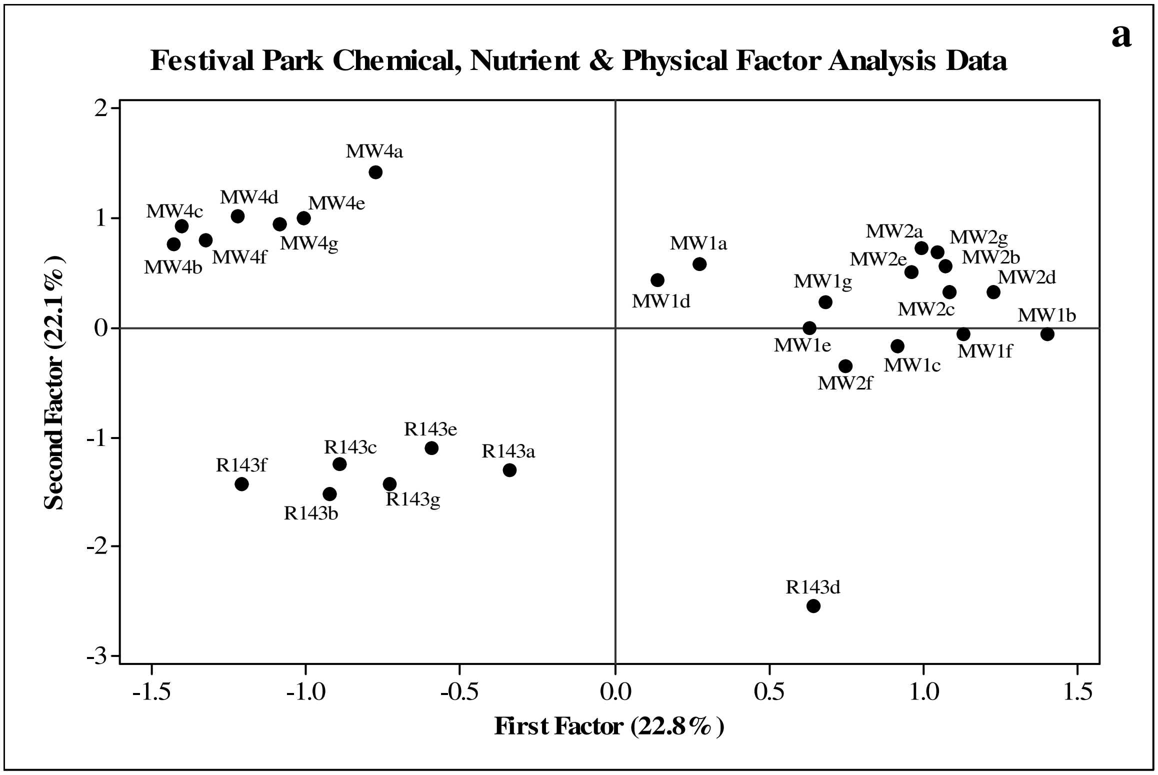
Correlations on the chemical, nutrient and physical data sets provide a very general approach to analyzing the data on a one-to-one comparison basis. This approach does not allow the assessment of relatedness within and between samples sites. Factor analysis was used to assess large and diverse data sets from the sample sites to determine if the different sites were related, based on flow path, and the data or factors that make the site similar or dissimilar.

The Festival Park factor analysis data scores graph does indicate that the inlet R143 is different from all of the monitoring wells and monitoring wells MW1 and MW2 are relatively similar but different than MW4 (Figure 1a). The data point R143d (sample date: 10/23/03. Refer to Table 1 for an explanation of the data point notation) is removed from the general cluster formed by the rest of the data points from this site. A review of the raw data and the factor analysis loadings graph for this data set (Figure 1b) (See Table 4 for explanation of factor loading graph notation.) reveals that on this date there was a significant increase in iron, turbidity and, to a lesser extent, barium, nickel and manganese (see the lower right quadrant of the Figure 1b). Factor analysis loading graphs can be compared to the scores graphs (Figure 1a) by referring to the same quadrants. The factor loadings for the analytes or parameters that occur in the same quadrant as the score data points can be generally taken as contributing to the variability that either groups or separates data points. Also, these figures may at first suggest that the comments previously stated about the correlation data and how those data indicate that specific sites may not be truly isolated hydraulically are incorrect. However, closer examination of the distribution of the data points for each site in Figure 1a shows that there is a general trend that starts with the "b" dates in the lower left of each cluster and moves to the "a" date in the upper right area of each cluster. These general trends also suggest that the chemical, nutrient and physical parameters used in these analyses increase or decrease in a similar fashion.

Table 4. Analyte or parameter abbreviations

Analyte or Parameter	Abbreviation in Graph
Alkalinity	ALK
Ammonia nitrogen	NH4
Arsenic	As
Barium	Ba
Calcium	Ca
Chloride	CL
Color	Color
Dissolved organic carbon	DOC
Dissolved phosphate	Dis P
Iron	Fe
Magnesium	Mg
Manganese	Mn
Nickel	Ni
Organic phosphate	Org P
Ortho phosphate	Ort P
pH	pH
Potassium	K
Sodium	Na
Sulfate	SO4
Total dissolved solids	TDS
Total nitrogen species	TTL N
Total organic carbon	TOC
Total phosphate	TTL P
Turbidity	NTU

The Lake Orienta chemical, nutrient and physical factor analysis data show a similar trend, though along a different axis. Figure 2a shows that the data from the inlet and two monitoring wells do cluster but not in discrete zones like the Festival Park data. The factor loading data (Figure 2b) along the first factor axis (X-axis) indicates that at the earlier dates that those factors in the upper and lower right quardrants dominate the variance in the data sets. However, as the sample dates progress the factors located in the lower left quadrant now separate the lake inlet and MW2, with MW1 being influenced by factors common to both of the other sites. Also, and like the Festival Park data, there is a general trend in the distribution of the data points within each data set, suggesting there are common factors between the sites that are influencing their respective variances and distributions.



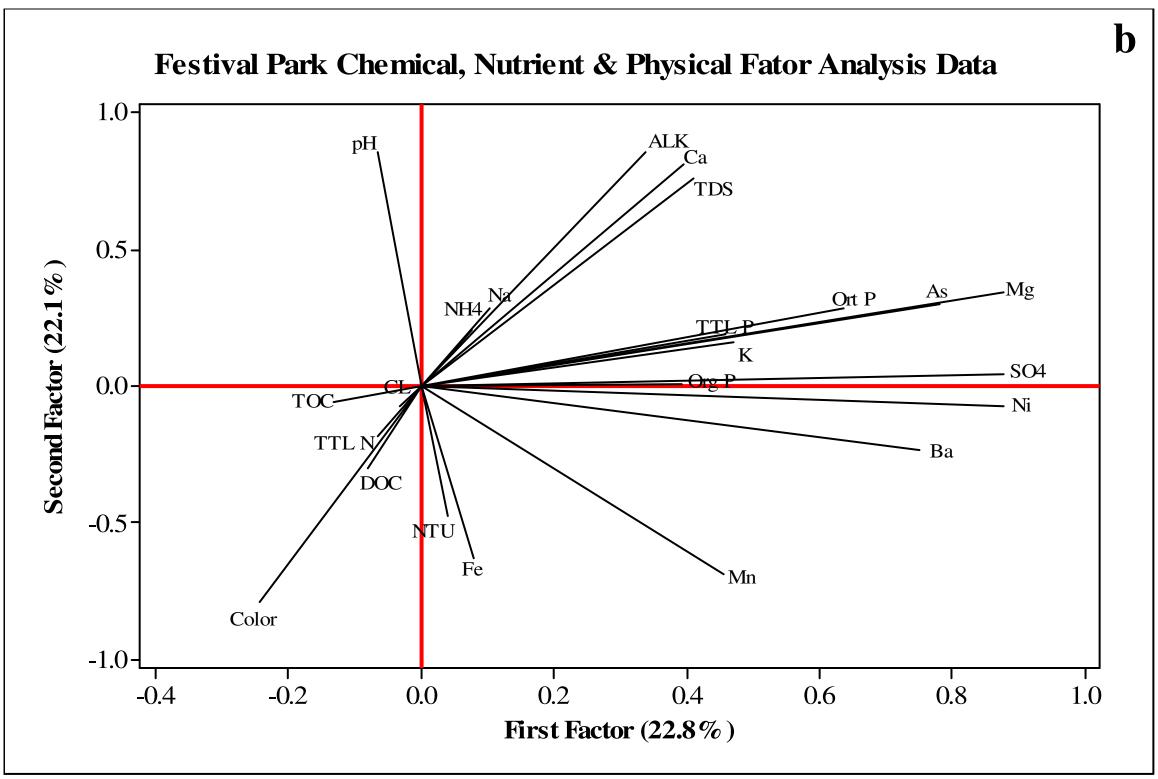


Figure 1. Festival Park factor analysis data. a) Factor analysis score graph. Refer to Table 1 for explanation of data point notation. b) Factor analysis factor loadings graphs. Refer to Table 4 for explanation of abbreviations.

Microbial indicator abundance data. Principle component analysis was used to assess the relatedness between the sample sites at Festival Park and Lake Orienta. These same data were then analyzed by factor analysis to determine which sites were being significantly impacted by one or more of the indicators.

The Festival Park principle component analysis show that, based on selected microbial indicator data, that the MW1 and MW2 sites are similar but dramatically different than the inlet (R143) and MW4 (Figure 3a). The inlet and MW4 are not similar, as well. The first two components of the data set account for 100% of the variance. The total and fecal coliforms, *E. coli*, enterococci and one of the coliphage contribute equally while the second coliphage data set appears to be responsible for separating the MW4 site (Figure 3b). Caution should be used in the interpretation of the data sets that contain coliphage data as this data set was predominantly at or below the detection limit of the method.

The factor analysis of the Festival Park data (Figure 4a) show that the indicator data are not unique enough to force clusters based on sample site. Instead there are two tight groupings of MW1, MW2 and MW4 data points and a relatively wide spread distribution of the inlet data points. The factor analysis loadings (Figure 4b) again show that the bacterial indicators are equal factors in discriminating the sites with the two coliphage being a minor contributor. These data reflect the variability in the runoff waters that are drained into the inlet well, R143, and there doesn't appear to be a significant correlation between the sites in regard to microbial indicators.

The principle component analysis for Lake Orienta shows that the microbial indicator data for the inlet (Lake Orienta) and the two monitoring wells, MW1 and MW2 are not similar between the sites (Figure 5a). The distribution of the sites in Figure 5a is forced by the total coliform data for MW2 on 12/6/05, when the abundance was 60 CFU 100 ml^{-1}, compared to values that were just above or below the detection limit of the method.

Factor analysis was also performed on the Lake Orienta microbial indicator data. Figure 6a shows the inlet site distributed over a relatively wide range along both axes. All of the factor analysis score data points for MW1 and MW2 are contained within a very tight area. The factor loading graph (Figure 6b) shows that the enterococci and *Cryptosporidium* spp. have a significant impact. This effect is due to the lake inlet sample having several sampling events with relatively high enterococci counts and Cryptosporidium being detected in these samples on two occasions. Also, MW1 had several positive samples for enterococci that were above the detection limit of the method. As with the Festival Park data, the wide spread in the lake inlet factor data points reflects the variable microbial indicator counts in the source water that is entering the aquifer.

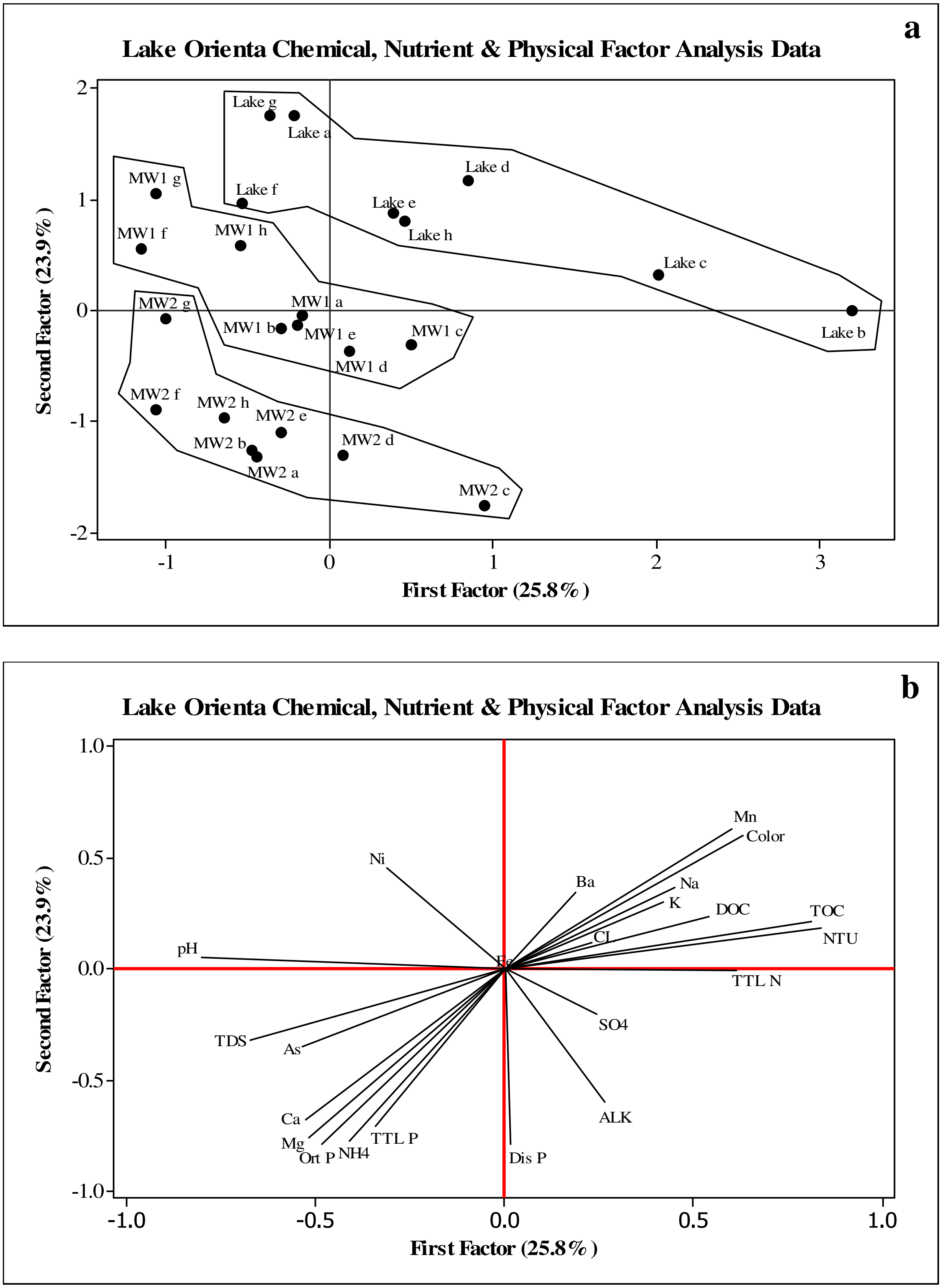
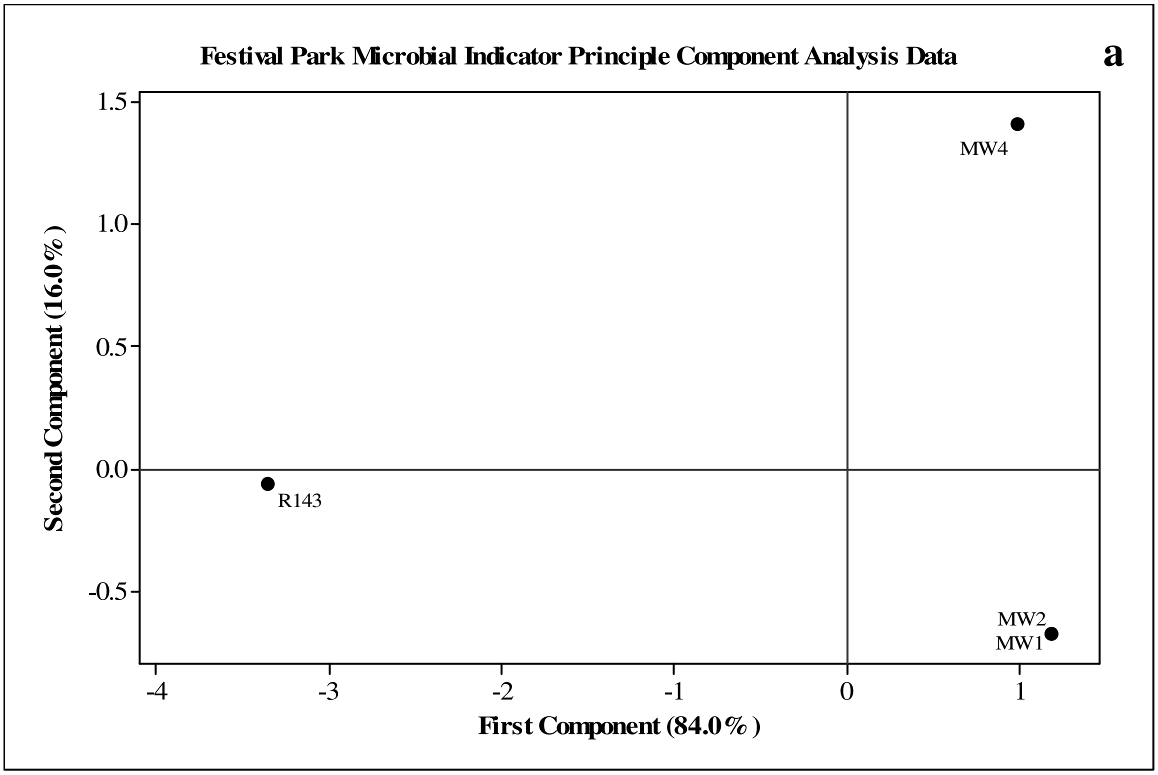


Figure 2. Lake Orienta factor analysis data. a) Factor analysis score graph. Refer to Table 1 for explanation of data point notation. b) Factor analysis factor loadings graphs. Refer to Table 4 for explanation of abbreviations.



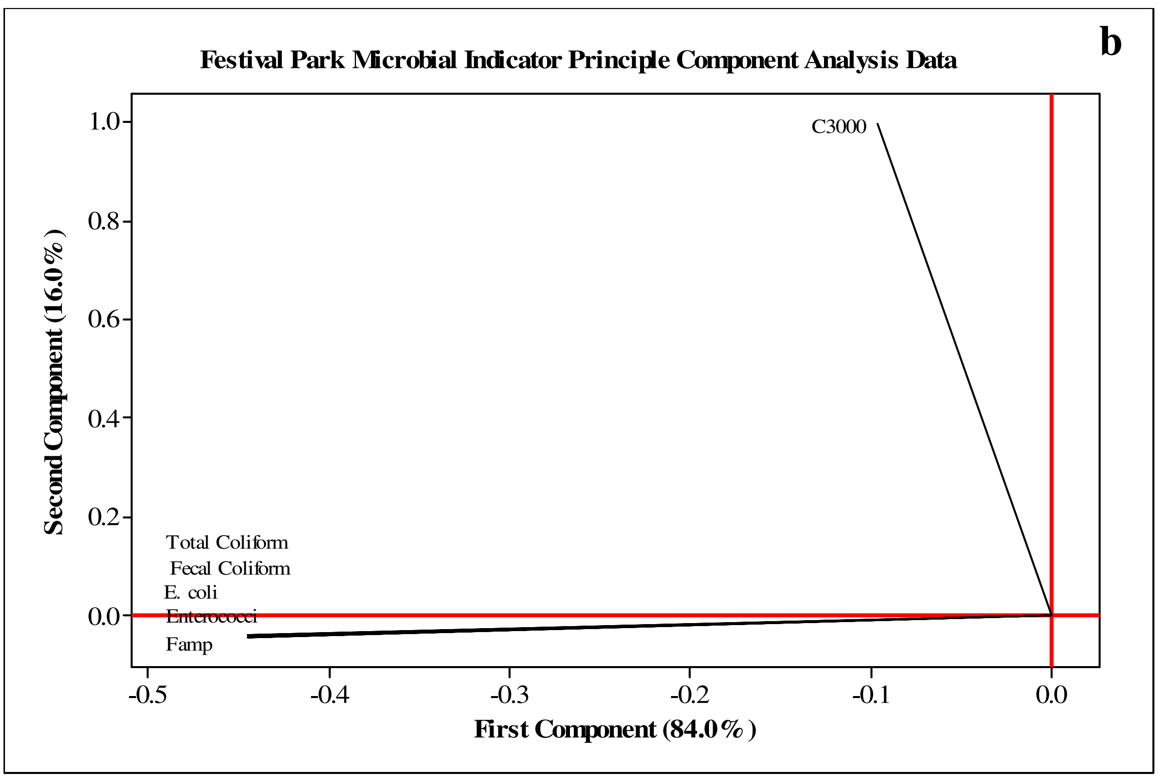
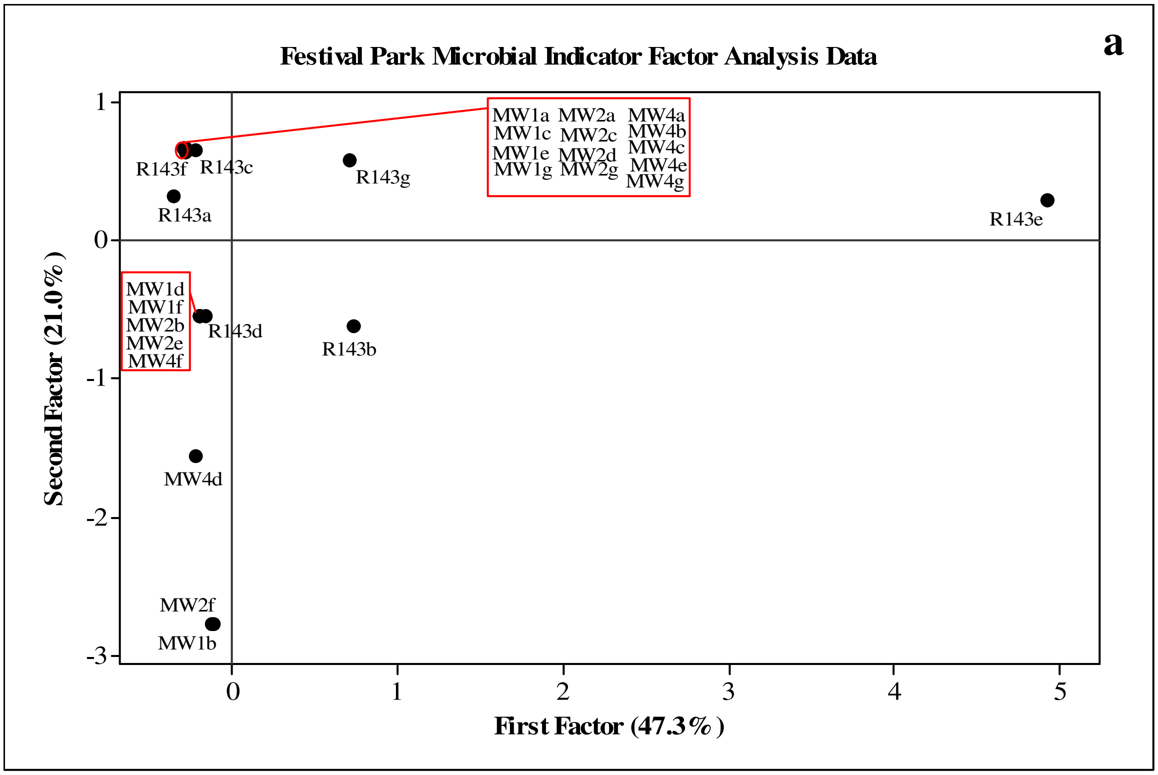


Figure 3. Festival Park principle component analysis. a) Principle component score graph. b) Principle component loadings graph.



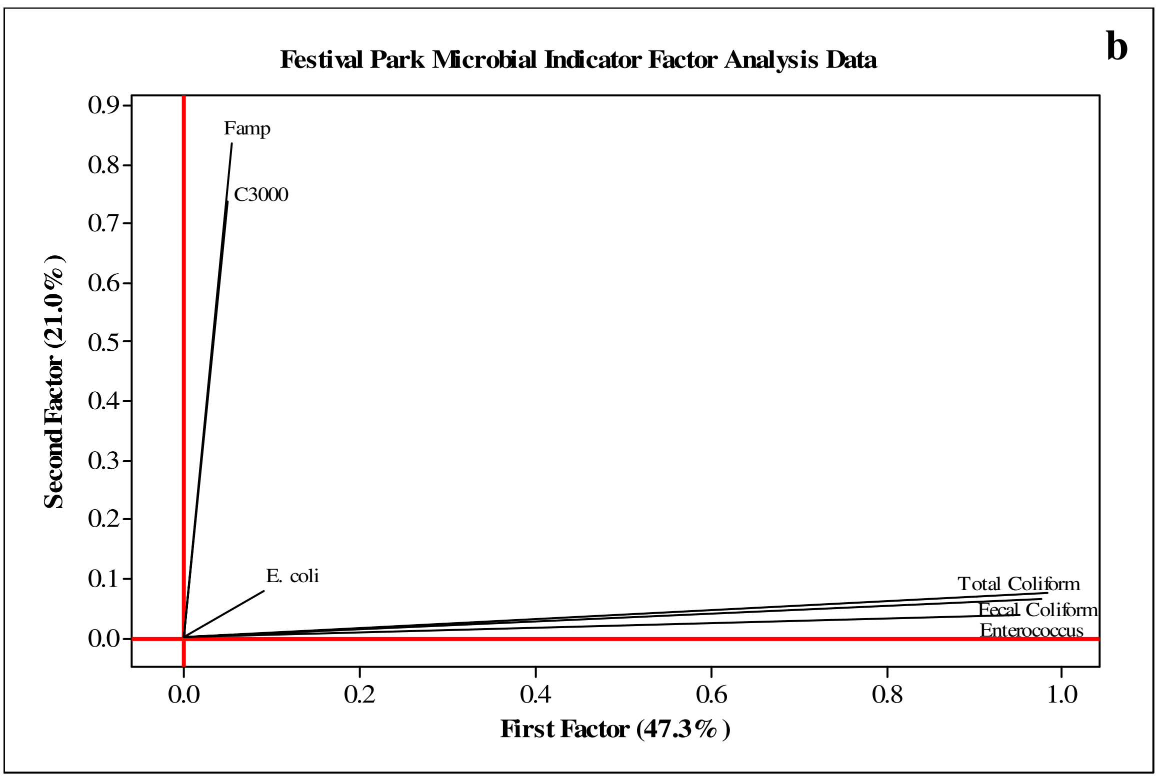


Figure 4. Festival Park factor analysis data. a) Factor analysis score graph. Refer to Table 1 for explanation of data point notation. b) Factor analysis factor loadings graphs. Refer to Table 4 for explanation of abbreviations.

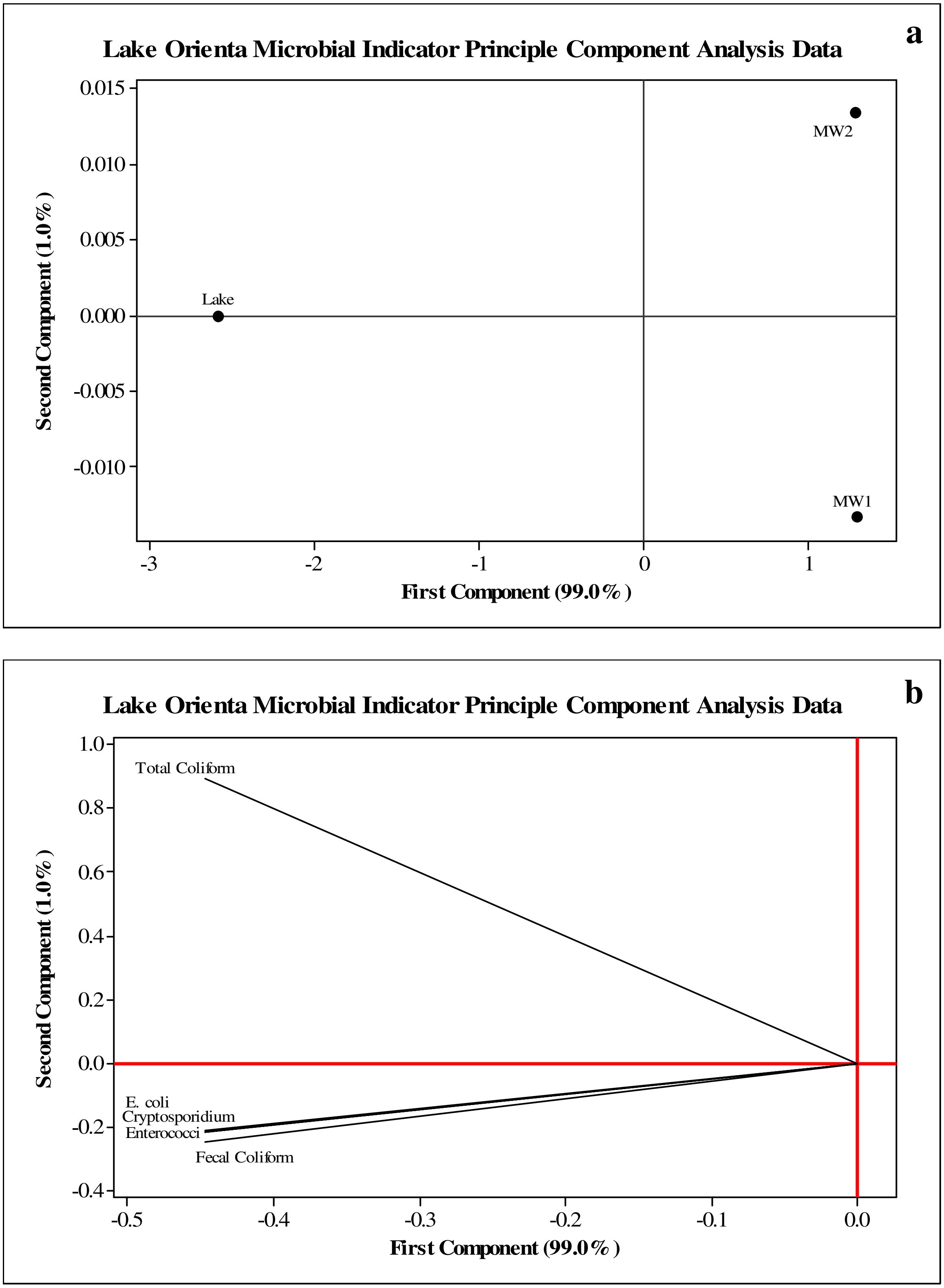


Figure 5. Lake Orienta principle component analysis. a) Principle component score graph. b) Principle component loadings graph.

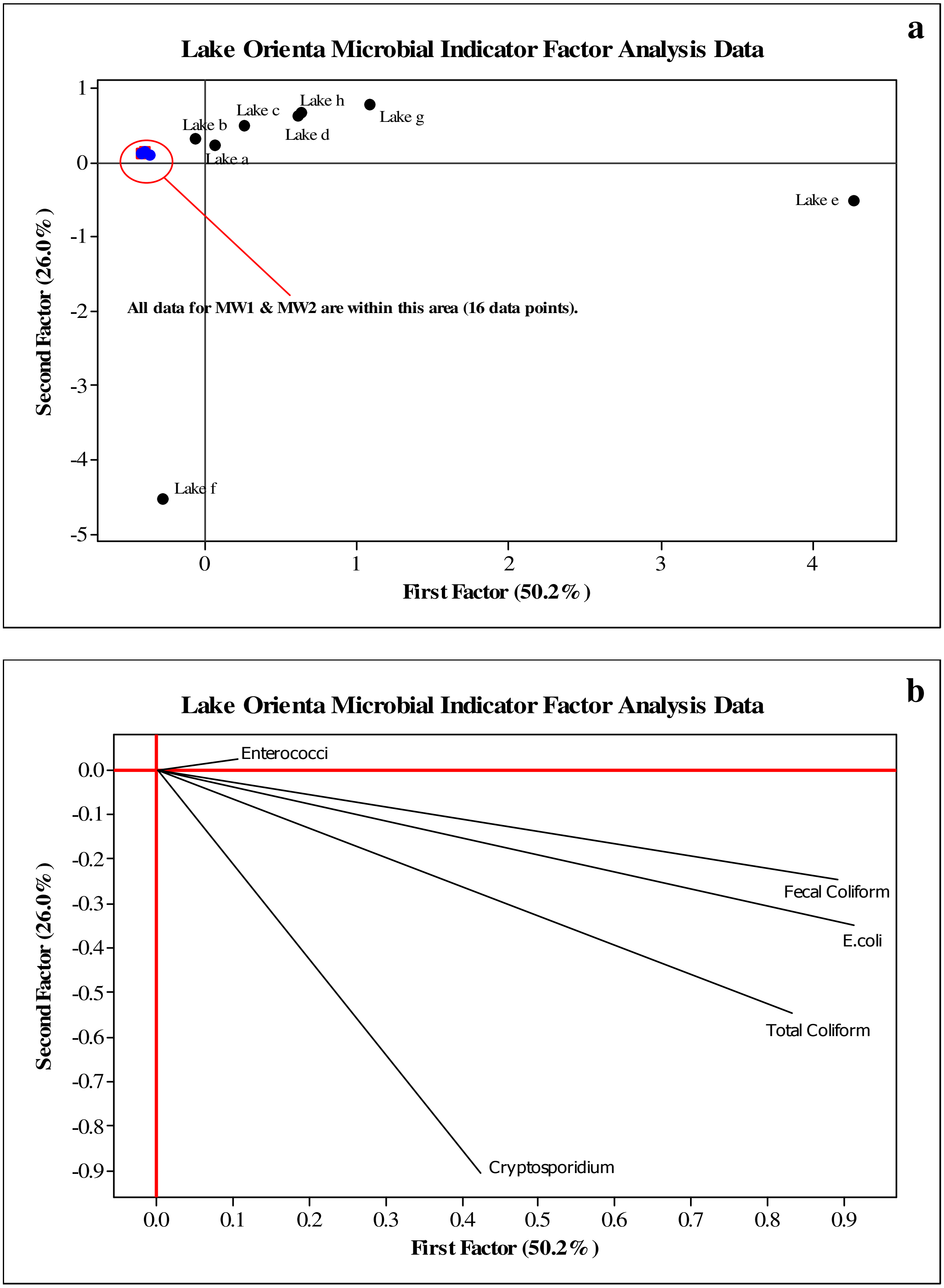


Figure 6. Lake Orienta factor analysis data. a) Factor analysis score graph. Refer to Table 1 for explanation of data point notation. b) Factor analysis factor loadings graphs. Refer to Table 4 for explanation of abbreviations.

Microbial indicator inactivation rates. One of the tasks of the original project was to assess the inactivation of microbial indicators under in situ conditions. This is of interest due to the apparent absence or extremely low occurrence of microbial indicator of fecal contamination at the monitoring well sites even though there are extremely high counts of these same indicators entering the aquifer and have been doing so for decades. The question remains as to the fate and transport of these microorganisms. Several studies have addressed the issue of inactivation of bacteria, viruses and protozoans in groundwaters. Interestingly, for the indicator bacteria, the average inactivation rate in untreated groundwater and within the temperature range of the aquifer at the two study areas is 0.3 log d^{-1}. Applying that inactivation or decay rate to the abundance data for the two inlet sites (i.e., R143 at Festival Park and Lake Orienta), an estimate of how long an introduced indicator bacterium would survive in the aquifer can be calculated. At the Festival Park study site, it would take approximately ten days for the enterococci to be reduced to below 1 CFU $100ml^{-1}$, 11 days for *E. coli* and 16 days for total and fecal coliforms. At the Lake Orienta study site it would take approximately seven days for *E. coli* to be reduce in abundance to below 1.0 CFU 100 ml^{-1} and nine days for the total and fecal coliforms and enterococci to reach this level.

When considering the flow rate between the inlets and the monitoring wells takes approximately two weeks at both sites, positive samples for bacterial indicators would be expected at Festival Park and possibly Lake Orienta, which is the case for both sites. In fact, the abundance data for the indicators may be interpreted as being greater than would be expected when decay rates are considered. This is not surprising considering the conditions within the aquifer at both sites, as there is sufficient carbon, nitrogen, phosphate and dissolved oxygen present to not only support survival of the bacterial populations but most likely an increase in biomass over time.

It is tempting to hypothesize that the aquifer surfaces have been colonized by microorganisms during the operation of these wells over the decades and that these elevated indicator abundances reflect the detachment of biofilm-associated bacteria or coliphage. This may be the case, but there are several factors within these same aquifer systems that would contribute to the lower indicator abundances at the monitoring wells. These include, but are not limited to: a) predation by zooplankton and bacteriophage that are being introduced into the aquifer along with the bacteria, coliphage and protozoan parasites, b) physiological stresses are reducing the vitality and possibly the viability of the indicators making them much more difficult to recover. Also, the use of standard media for the recovery of indicator bacteria from these types of environments almost assures the technician of obtaining a zero or below detection limit value from most samples, and 3) the majority of the indicator populations are being transported out of area via a flow path that has yet to be characterized.

Due to the atypical aquifer recharge at these sites, data on microbial survival, attachment, detachment and inactivation that have been developed from studies of more typical, hydraulically isolated and regional aquifer systems may not be applicable. If an understanding of microbial indicator and pathogen fate and transport in aquifers impacted by this recharge system is of interest, additional studies need to be conducted that quantify rates of transport and inactivation using waters from these systems, but preferably using an in situ approach.

Recommendations

1. If fate and transport of bacteria, viruses and protozoan parasites is a priority, some type of in situ experiments need to be designed and performed. These types of experiments could

use down well diffusion chambers, above ground flow-thru system and possibly bench top microcosm if native water conditions can be maintained.

2. Microbial indicators, though of public health and regulatory interest, are most likely not able to compete with the native microbial populations for resources. Studies that investigate the fate and transport of microbial indicators need to include studies that investigate how those same indicators interact and influence the microbial ecology of the native populations.
3. Non-culture based methods for the recovery, enumeration and assessment of physiological activity and status should be included in any study on the fate and transport of microbial indicators.
4. Any study that is designed to investigate the fate and transport of microbes in the subsurface should also include a geochemical component.

Field sampling logs and field notes, as applicable, are presented in Appendix H.

Appendix J

Geochemical Evaluation

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FESTIVAL PARK WATER-QUALITY DATA SET: DATA ANALYSIS

June Mirecki, Ph.D., Florida Professional Geologist 2430

Methods

Water-quality data for surface-water and ground-water samples were provided by CH2M HILL. The surface-water quality dataset consisted of 7 samples collected from inflow points R143 and R40 between May 2003 and February 2004. The ground-water quality dataset consisted of samples collected from MW-1, MW-2, and MW-4 (each n=7) collected at the same time. All samples were analyzed for field parameters (pH, ORP, temperature, specific conductance, and turbidity), major and trace inorganic constituents, and volatile and semi-volatile organic constituents. Only field parameters and inorganic constituent data are considered here.

Water-quality data were grouped by location for statistical analysis. Due to small population size for each location, data did not show normal distribution and so were described using non-parametric statistical methods (median value, 25 and 75 percentiles) at each location. Concentrations that were "U-flagged" representing nondetections were entered as 0.5 times the practical quantification limit for each analyte. Trace metal concentrations (particularly for antimony, beryllium, cadmium, chromium, cobalt, copper, lead, and thallium) frequently were U-flagged. Therefore, these elements do not show statistically significant differences among locations. Bar graphs comparing water-quality data by location are shown in Figure 1. Median values of each parameter and constituent for inflow, MW-1 and MW-2 served as the basis for inverse geochemical model development.

Inverse geochemical models permit the calculation of mass transfer resulting from all geochemical reactions along a ground-water flowpath. Median values calculated during statistical interpretation are used as input values in the PHREEQC geochemical modeling code (Parkhurst and Appelo, 1999). Inverse geochemical models use water-quality data at the beginning and end of a flowpath as input. Charge balance errors for input data sets are less than 3 percent. Mass transfer values that result from specified reactions *at equilibrium* are the output from each run. At the Festival Park site, recharge or inflow samples (n=7) characterize the beginning of the flowpath; MW-1 and MW-2 data (n=7) characterize the end of the flowpath. Separate model runs were performed for MW-1 (n=2 simulations that satisfied the model input) and MW-2 (n=2), and the variation that resulted from multiple model runs was noted.

Water-Quality Trends

Festival Park Flowpath. Water-quality changes occur as surface water recharge (or inflow) flows down-gradient toward MW-1, MW-2. The ground-water flowpath begins at the point of inflow, and extends to MW-1 and MW-2. Based on tracer test data, MW-4 does not sample this flowpath, and may represent site reference conditions in the Upper Floridan aquifer. As such, water-quality data from MW-4 appears not influenced by surface water, and is consistent with the results of the groundwater tracer test. Bar graphs comparing all dissolved constituents along the flowpath are shown in Figure 1. Water-quality evolution along the flowpath is interpreted from bar graphs in Figure 1 and is summarized below.

- Statistically significant increases in calcium carbonate saturation, marked by increased bicarbonate alkalinity, calcium, and magnesium concentrations in all downgradient wells.

- Increased (but only weakly significant) concentrations of sodium, potassium, and sulfate in all downgradient wells.

- Increased (but only weakly significant) concentrations of arsenic and barium in downgradient wells MW-1 and MW-2. MW-4 does not show significant increases of these two constituents.

- Decreased (but only weakly significant) concentrations of iron, manganese, zinc, and dissolved organic carbon (DOC) in all downgradient wells.

- More reducing redox environment in the groundwater, characterized by more negative ORP values and diminished dissolved oxygen concentration in the wells. Water quality at MW-4 indicates the most extensive reducing environment.

- No statistically significant changes in nutrients (nitrogen and phosphorus species), aluminum, cadmium, cobalt, copper, lead, mercury, nickel, and vanadium concentrations along the flowpath.

- No statistically significant changes in total organic carbon (TOC) concentrations along the flowpath.

Water-quality changes along the Festival Park flowpath are affected by mixing of runoff constituents, microbial activity, and water-rock interactions. Inverse geochemical modeling methods can define and quantify the mass transfer values that result from dominant reactions along the flowpath.

- $CaCO_3$ saturation after limited $CaCO_3$ dissolution and microbial oxidation of TOC/DOC
- Gypsum/anhydrite dissolution resulting in increased sulfate and decreased DOC in MW-1 and MW-2
- Microbial sulfate reduction resulting in low sulfate and negative ORP in MW-4
- Pyrite oxidation resulting in release of arsenic and possibly other trace elements
- Iron oxyhydroxide precipitation
- Mixing of barium-rich inflow with native aquifer waters along the flowpath

Nearly identical models of water-quality changes and major reactions result at Festival Park when MW-1 or MW-2 are used as end-points (Figure 2). The greatest mass transfer results from organic matter oxidation with subsequent generation of carbonic acid/dissolved CO_2 gas. This explains increased alkalinity along the flowpath. Surprisingly, the flowpath is saturated with respect to calcite (saturation index [SI] equals 0.48 for MW-1, 0.08 for MW-2) indicating that calcite dissolution is not an important control on water quality. Gypsum, halite, and dolomite are inferred to precipitate, or exist as stable solids. These minerals serve as sinks for dissolved sulfate, sodium, and magnesium which enter the system at inflow. Elevated barium concentrations characterize inflow, and this element may serve locally as a semi-conservative tracer of surface run-off (inflow). Barite (barium sulfate) remains undersaturated along the flowpath in this system (SI = -0.68 for MW-1, -0.75 for MW-2).

Trace metal transport and fate are difficult to simulate in this setting for several reasons. Most trace metals are at or near the limits of detection in all samples (generally less than 5 µg/L), and use of U-flagged values (represented at half the PQL) limits the statistical rigor of interpretations. Trace metals such as arsenic, vanadium, and nickel probably exist as trace inclusions in finely disseminated pyrite. Oxidation of pyrite will release these metals, but they can then sorb onto iron oxyhydroxide surfaces that also are inferred from these geochemical models. Lithological evidence is not available to confirm pyrite oxidation and subsequent sorption onto iron oxyhydroxide surfaces. However, this process is indicated by geochemical models at Festival Park. In these models, pyrite is forced to oxidize, and iron oxyhydroxide ($Fe(OH)_3$(amorphous)) is forced to precipitate along the flowpaths. Concurrently, arsenic shows a weakly significant increase, while other trace metals show no statistically significant change. Finally, interpretation of trace metal mass transfer using unfiltered sample data is difficult. Colloidal or microparticulate iron and manganese oxides probably are captured in these samples. Quantification of mass transfer between water and rock is confounded when additional solid phases such as metal oxides are present in the sample.

Well MW-4 shows similar water-quality characteristics when compared to MW-1 and MW-2, with the exception of redox condition and sulfate concentration. ORP values are significantly lower (to -200 mV) and sulfate concentrations also are much lower (generally less than 1 mg/L). These characteristics are consistent with sulfate-reducing conditions and a redox environment that is generally removed from contact with surface water. Barium concentrations are much lower in MW-4 (less than 6 µg/L) compared to that of MW-1 and MW-2 (approximately 20 to 30 µg/L). This is consistent with the interpretation that MW-4 is not affected by surface water inflow.

LAKE ORIENTA WATER-QUALITY DATA SET: DATA ANALYSIS

Methods

Water-quality data for lake and ground-water samples were provided by CH2M HILL. The lake water dataset consisted of 8 samples collected between July and December 2005. The ground-water quality dataset consisted of samples collected from MW-1 and MW-2 (each n=8) collected at the same time. All samples were analyzed for field parameters (pH, ORP, temperature, specific conductance, and turbidity), major and trace inorganic constituents, and volatile and semi-volatile organic constituents. Only field parameters and inorganic constituent data are considered here.

Water-quality data were grouped by location for statistical analysis. Due to small population size for each location, data did not always show normal distribution and so were described using non-parametric statistical methods (median value, 25 and 75 percentiles) at each location. Concentrations that were "U-flagged" representing nondetections were entered as 0.5 times the practical quantification limit for each analyte. Nitrite-Nitrogen, total phosphorus, ortho-phosphorus and many trace metal concentrations (particularly for antimony, beryllium, cadmium, chromium, cobalt, copper, lead, and thallium) frequently were U-flagged. Therefore, these elements do not show statistically significant differences among locations. Bar graphs comparing water-quality data by location are shown in Figure 3. Median values of each parameter and constituent for inflow, MW-1 and MW-2 served as the basis for inverse geochemical model development.

Inverse geochemical models permit the calculation of mass transfer resulting from all geochemical reactions along a ground-water flowpath. Median values calculated during statistical interpretation are used as input values in the PHREEQC geochemical modeling code (Parkhurst and Appelo, 1999). Inverse geochemical models use water-quality data at the beginning and end of a flowpath as input. Charge balance errors for input data sets are less than 3 percent. Mass transfer values that result from specified reactions *at equilibrium* are the output from each run. At the Lake Orienta site, lake data (n=8) characterize the recharge, while MW-1 and MW-2 data characterize the end of the flowpath. Results of the groundwater tracer test indicated that MW-2 was in the flowpath from two recharge wells, while MW-1 was not in a flowpath from a recharge well relative to the 12-week duration of the tracer test. Separate model runs were performed for MW-1 and MW-2, and the variation that resulted from multiple model runs was noted to evaluate consistency with the results of the tracer test.

Water-Quality Trends

Lake Orienta Flowpath. Water-quality changes occur as lake water recharges the upper Floridan aquifer and flows down-gradient toward MW-2. Tracer tests showed a strong dye signature in MW-2, indicating connection with the lake. Differences in water quality in MW-1 suggest that this well is not the same as the MW-2 flowpath, which is consistent with the results of the groundwater tracer test. Bar graphs comparing all dissolved constituents along the flowpaths to MW-1 and MW-2 are shown in Figure 3. Water-quality evolution along the flowpath is interpreted from bar graphs in Figure 3 and is summarized below.

- Statistically significant increases in bicarbonate alkalinity and calcium concentrations in all down-gradient wells.
- Statistically significant increases in arsenic, total and *ortho*-phosphorus, and ammonia nitrogen concentrations.
- Increased (but only weakly significant) concentrations of magnesium in all down-gradient wells.
- Lower sodium, chloride, and sulfate in MW-1 samples compared to MW-2
- Statistically significant decreased concentrations of aluminum, barium, manganese, sodium, total nitrogen and total Kjeldahl nitrogen in MW-1 and MW-2

- Statistically significant decreased concentrations of total and dissolved organic carbon (TOC, DOC) in MW-1 and MW-2

- More reducing redox environment, characterized by more negative ORP values and diminished dissolved oxygen concentration in MW-1 and MW-2.

- No statistically significant changes in cadmium, chromium, cobalt, copper, iron, lead, mercury, nickel, potassium, selenium, vanadium, and zinc concentrations along the flowpath.

Water-quality changes along the short Lake Orienta flowpath to MW-2 are affected primarily by limestone dissolution and microbial-redox reactions. These controls on water-quality are not clearly evident when lake samples are compared to MW-1 samples. Concentrations of sodium, chloride, and sulfate are lower in MW-1 compared to Lake Orienta and MW-2 samples. Because these constituents behave conservatively, it is not possible to simulate water-quality changes without invoking halite and gypsum precipitation along the flowpath between Lake Orienta and MW-1. For reasons discussed below, this is unlikely. Therefore, it appears that MW-1 samples do not reflect water-quality changes along a flowpath that extends from Lake Orienta. The dominant geochemical reactions that control water-quality changes along the Lake Orienta flowpath ending MW-2 are:

- Dissolution of calcium carbonate and possibly gypsum/anhydrite

- Microbe-mediated oxidation of organic carbon with increasing alkalinity

- Increased ammonia (NH_4^+) from rain or microbe-mediated nitrogen fixation

- Minor pyrite oxidation, sometimes coupled with precipitation of iron oxyhydroxide

Seven similar inverse geochemical models were generated to explain water quality changes between Lake Orienta and MW-2. The model script was similar to that defined for Festival Park (Appendix 1). Mineral solubility does affect water quality over the short length of the Lake Orienta flowpath. Saturation indices for calcite in lake water and MW-2 samples are negative (-1.10 and -0.07, respectively) indicating dissolution. Saturation indices for gypsum are negative along this flowpath as well, although there is no lithological evidence for gypsum in samples from MW-2. “Halite” precipitation is inferred, but only to serve as an apparent sink for sodium and chloride in the absence of an exchange surface for these constituents.

Trends in nutrient concentrations along the Lake Orienta flowpath are complex, particularly related to nitrogen species. Increased ammonia concentrations could be contributed from rain or nitrogen fixation in soils adjacent to the lake. Total nitrogen concentrations decline along the flowpath, yet ammonia increases. Total and ortho-phosphorus concentrations are greater in ground water samples compared to lake water.

MEMO

Pyrite oxidation is inferred in most models, often coupled with iron oxyhydroxide precipitation. Arsenic that occurs in MW-1 and MW-2 can be released during this reaction. The arsenic concentrations measured in MW-1 are statistically indistinguishable from MW-2.

Water-quality characteristics in MW-1 differ from those in MW-2 with respect to major dissolved constituents sodium, chloride, and sulfate. Concentrations of these constituents are significantly lower than that of lake water. If MW-1 was the distal end of a flowpath extending from Lake Orienta, gypsum, calcite, and halite precipitation would have to occur to explain MW-1 sample composition. Mineral precipitation is not inferred from negative saturation indices for Lake Orienta and MW-2 samples. Therefore, it is most likely that MW-1 does not reflect influence of lake water recharge.

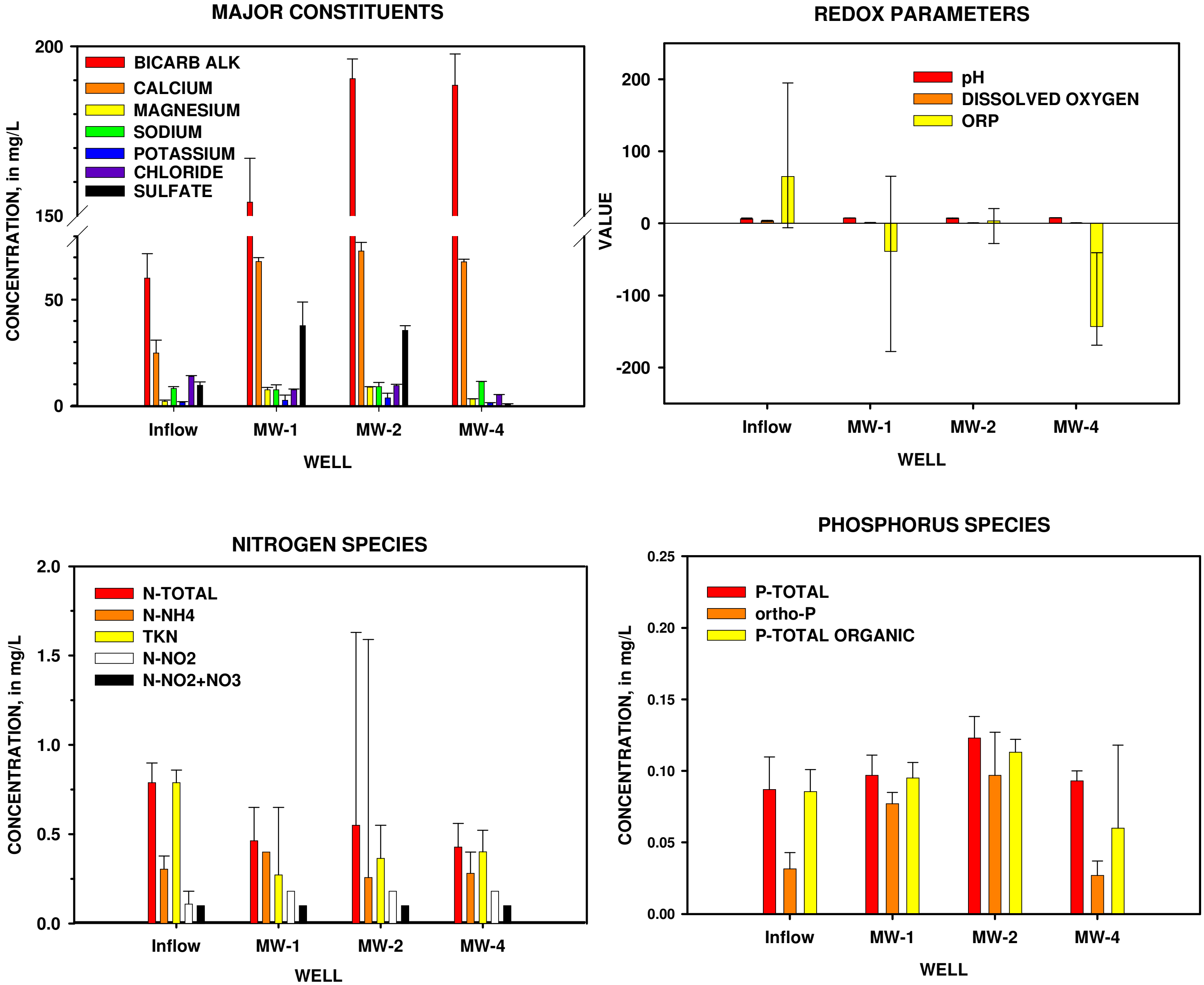
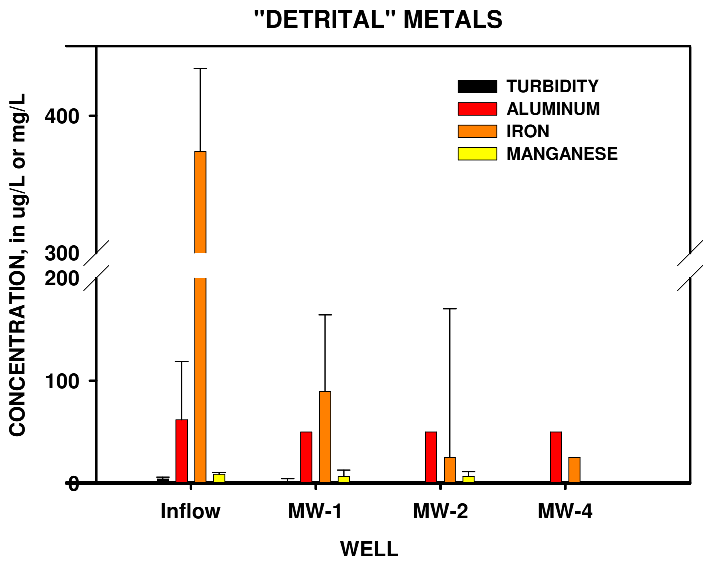
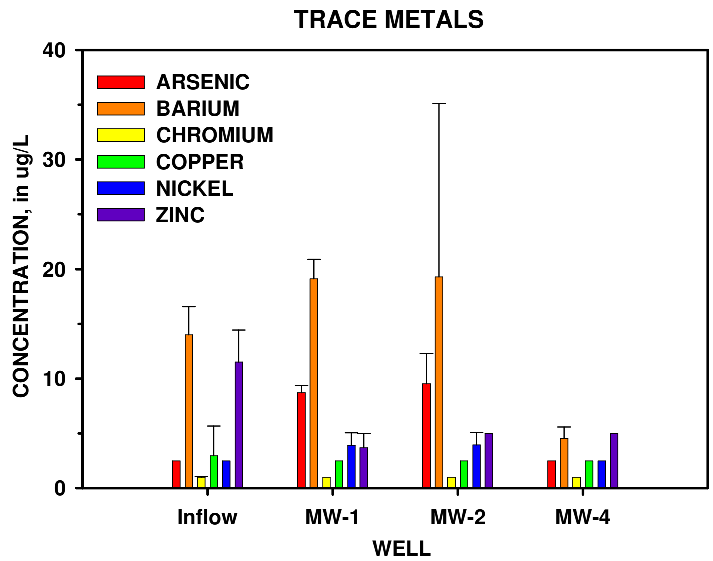


Figure 1. Median concentrations of field parameters and inorganic constituents from surface-water inflow samples, and ground-water samples from MW-1, MW2, and MW-4 near Festival Park, FL.





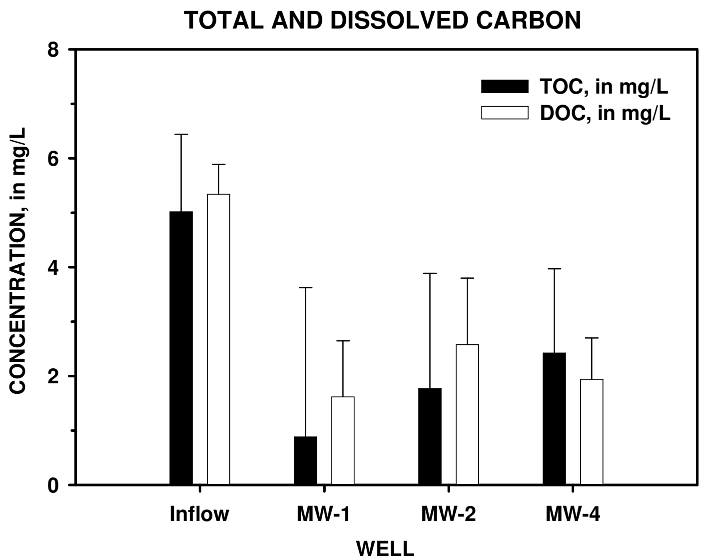


Figure 1 – *continued*. Median concentrations of field parameters and inorganic constituents from surface-water inflow samples, and ground-water samples from MW-1, MW2, and MW-4 near Festival Park, FL.

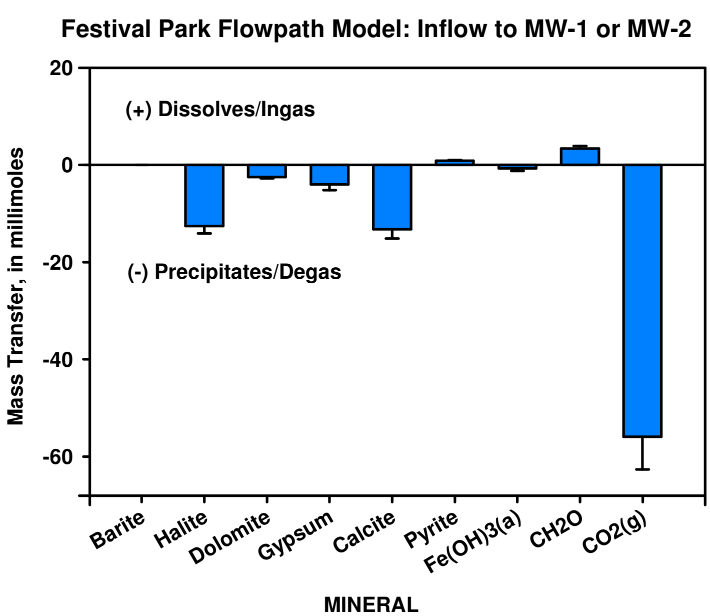


Figure 2. Bar graph summarizing mass transfer values calculated from inverse geochemical models of the Festival Park flowpath.

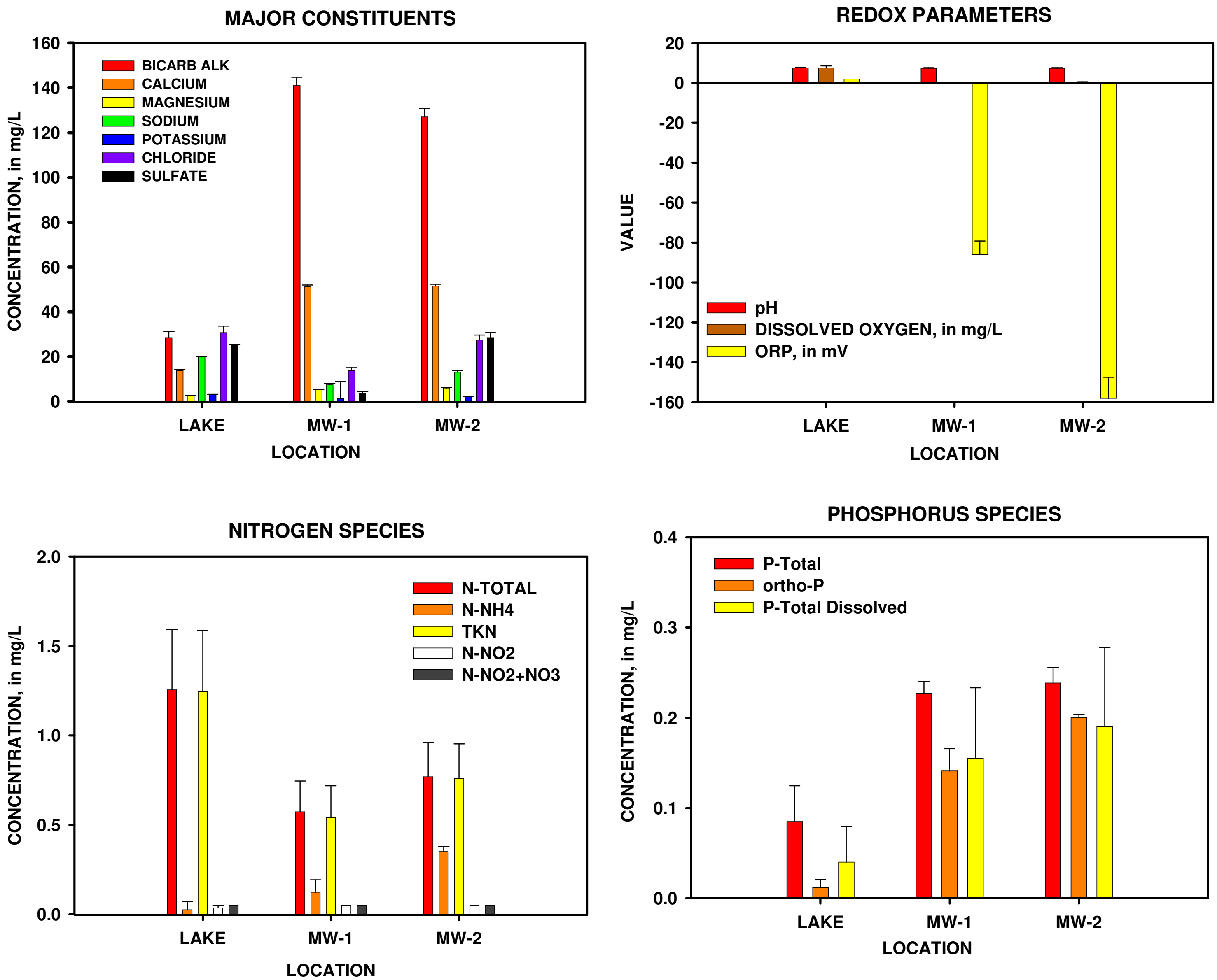
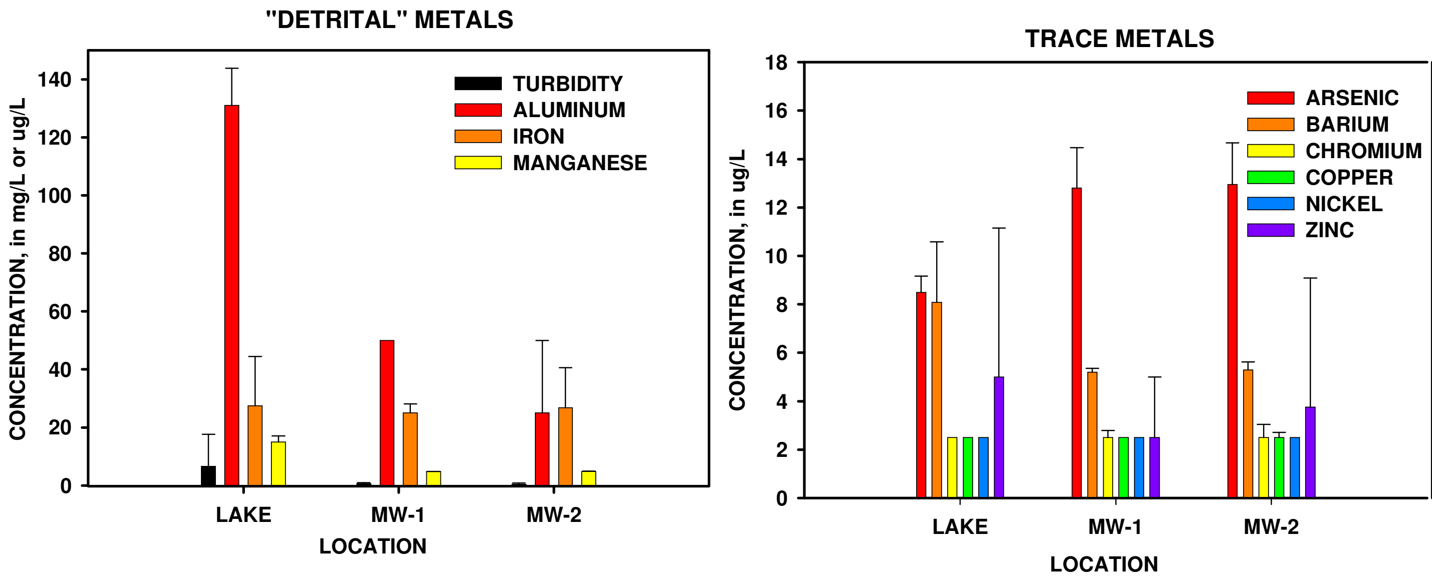


Figure 3. Median concentrations of field parameters and inorganic constituents from Lake Orienta surface water, and ground-water samples at MW-1 and MW-2.



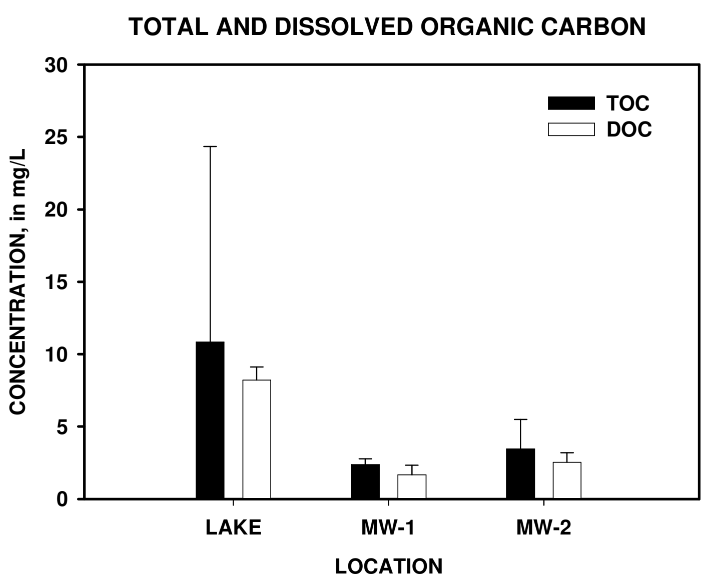


Figure 3 - *continued*. Median concentrations of field parameters and inorganic constituents from Lake Orienta surface water, and ground-water samples at MW-1 and MW-2.

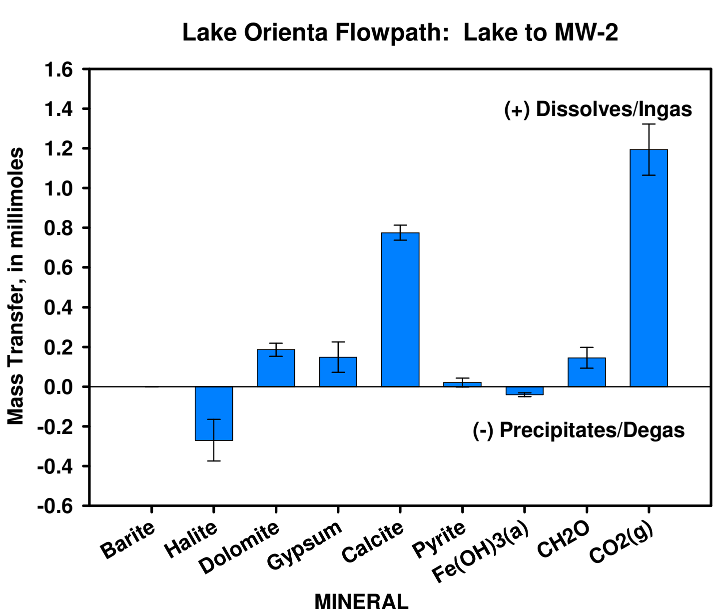


Figure 4. Bar graph summarizing mass transfer values calculated from inverse geochemical models of the Lake Orienta flowpath.

Cited References

Parkhurst, D.L. and Appelo, C.A.J., 1999. *User's guide to PHREEQC (version 2) - a computer program for speciation, reaction-path, 1D-transport, and inverse geochemical calculations.* US Geol. Surv. Water Resour. Inv. Rep. 99-4259, 312p.

APPENDIX 1: Representative PHREEQC input for Festival Park flowpath extending from inflow to MW-2

DATABASE C:\Program Files\Phreeqc\phreeqc.dat
TITLE Festival Park Flowpath Inverse Model

```
SOLUTION 1 Recharge/Inflow Water #Median values of 8 samples
units mg/L
pH 6.4
temp 27.2
redox O(0)/O(-2)
Ca      24.8
Mg       1.96
Na      8.12
K       1.51
Cl      13.75
Fe      0.394
S(6)    9.53
Alkalinity      60.25 as CaCO3
O(0)    3.15
Ba      0.014
SAVE SOLUTION 1
END

SOLUTION 2 DOWNGRADIENT MW-2 #Median of 7 samples
units mg/L
temp 24.9
redox O(0)/O(-2)
pH 7.32
Ca      70.4
Mg       8.58
Na      9.04
Cl      9.48
Fe      0.025
S(6)    34.7
Alkalinity 192 as CaCO3
O(0)    0.35
Ba      0.019
SAVE SOLUTION 2
END

PHASES
CH2O
   CH2O + H2O = CO2 + 4H+ + 4e-
   log_k  0.0
```

```
MEMO

Fe(OH)3(a)
        Fe(OH)3 + 3 H+ = Fe+3 + 3 H2O
   log_k  0.0

INVERSE_MODELING 1
-solutions 1 2
-phases
  barite
  halite
  dolomite
  CO2(g)
  H2O(g)
  gypsum
  calcite
  pyrite diss
  Fe(OH)3(a) precip
  CH2O     diss
-balances Cl 0.05
-uncertainty 0.05
-multiple_precision

END
```

Appendix K

Price and Pichler 2004 - Source and Mobilization of Arsenic

Arsenic and ASR in Southwest Florida: Source, Abundance, and Mobilization Mechanism

Suwannee Limestone, Upper Floridan Aquifer

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Abstract:

Recent analyses of recovered water from two ASR facilities in west-central Florida showed arsenic concentration in excess of 100 µg/L, more than 10-times the current EPA drinking water standard. Detailed mineralogical and chemical analyses of the Suwannee Limestone, the primary storage zone for ASR in Central Florida, indicates that, while arsenic is ubiquitous throughout the Suwannee Limestone, it is highly concentrated in framboidal pyrite. Elevated levels of arsenic in pyrite were documented by SEM and Electron Probe Microanalysis with EDX and WDX capabilities, respectively, showing greater than 1000 ppm arsenic. The pyrite containing the arsenic is normally stable in the reducing environment of the aquifer, but the artificial recharge of oxidized surface water during ASR changes the redox conditions and is believed to cause the framboidal pyrite to become unstable, thus releasing the arsenic.

Statement of Problem

During recharge and recovery cycle testing of two ASR facilities in the Southwest Florida Water Management District (SWFWMD, Figure 1), it was determined that high levels of naturally occurring arsenic were present in recovered water (Arthur et al. 2001).

Concentrations were highest in the first recharge-recovery cycle and reached levels of nearly 100 ug/l (ppb) in one of the four wells undergoing testing (Figure 2). Although arsenic concentrations decreased in subsequent cycle tests, in the first well to complete three full cycle tests, concentrations still ranged from 5 to 35 ug/l. The analyses not only show elevated arsenic levels, but also show an increase in concentrations of uranium, strontium, and other potentially harmful elements (Arthur et al., 2000).

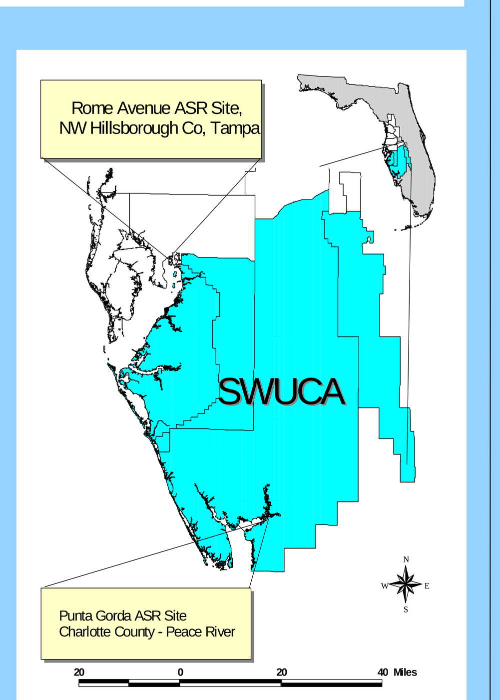


Figure 1: Location of two ASR facilities containing elevated arsenic concentrations (modified from Arthur et al, 2001). The Southern Water-use Caution Area is the most likely area for future ASR projects.

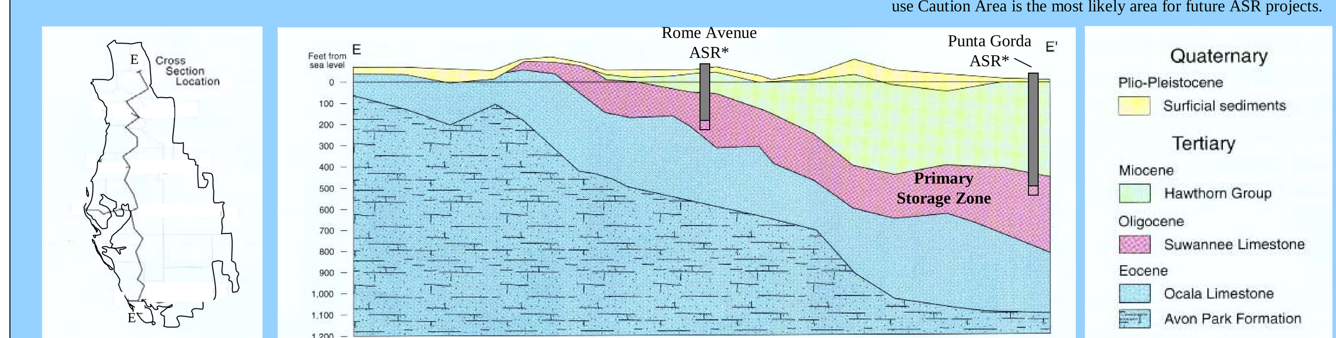


Figure 2: Stratigraphic cross section of the Southwest Florida Water Management District. The Suwannee Limestone is confined by the overlying Hawthorn Group. *Locations are approximate.

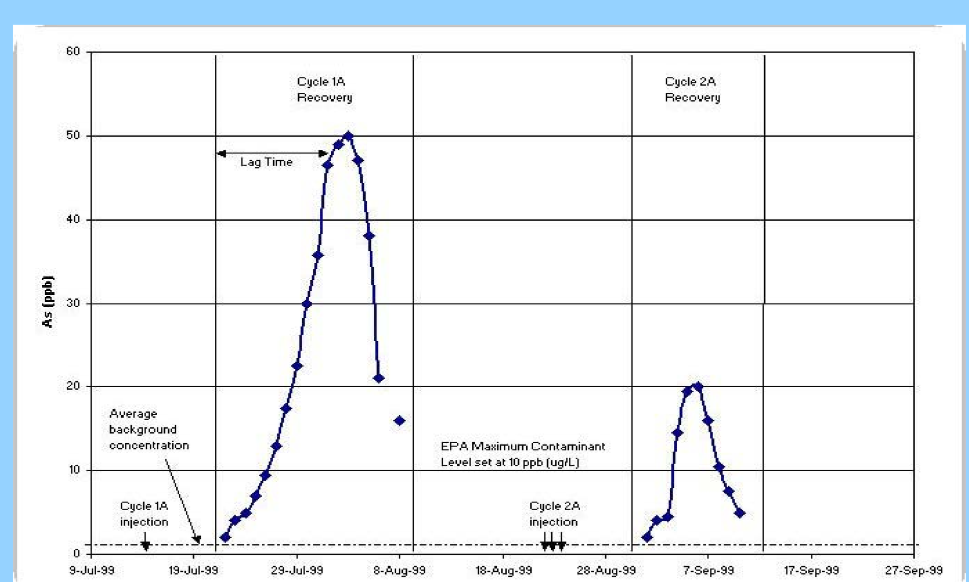


Figure 3: Arsenic concentration through time for two recharge/recovery cycles, Punta Gorda ASR, Charlotte County, Florida (modified from Arthur et al, 2001). The Rome Avenue ASR site also showed increased As concentrations.

Arthur and others (2001), have proposed three potential sources for naturally occurring arsenic being mobilized from the Suwannee Limestone:

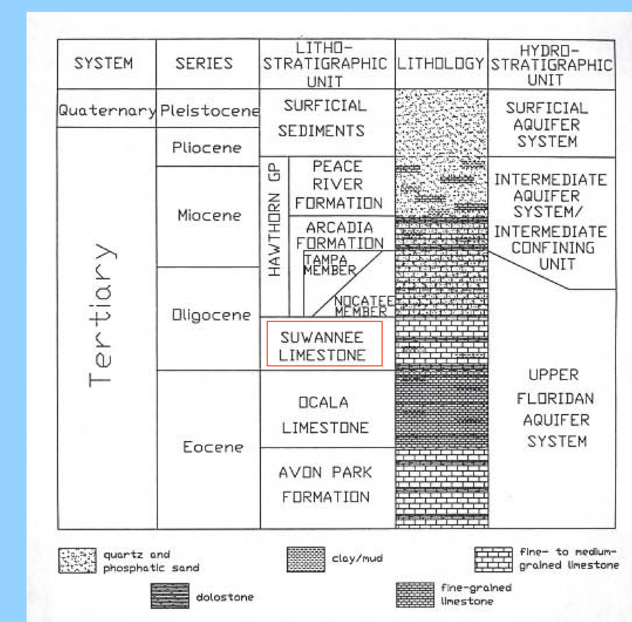
1) In sulfide minerals such as pyrite (FeS_2) within the limestone matrix,
2) Adsorbed to iron and manganese oxyhydroxide coatings on the limestone grains,
3) Or in organic material in the limestone matrix.

Natural arsenic in groundwater of the United States has also been shown to source from these minerals, with the sulfides and iron oxides being the most common association (Welch et al., 2000). Arsenic can be mobilized either by oxidation of pyrite or reduction of iron hydroxides.

Hydrology and Stratigraphy

The Suwannee Limestone is confined by the Hawthorn Group (Figures 2 and 4) and contains abundant mollusk molds and casts in some areas, creating moldic porosity. These conditions are ideal for ASR.

The lithology of the Suwannee Limestone throughout the study area consists primarily of limestone, which has been described as a wackestone mud to pelletal, foraminiferal grainstone. It contains minor amounts of phosphatic quartz sand and clay, some dolomite, chert nodules, and organic material (Green et al, 1995). Framboidal pyrite has also been documented in trace amounts.



Figures 4: Hydrology and Stratigraphy in the SWFWMD showing confinement of the primary ASR storage zone in the area, the Oligocene Suwannee Limestone. The cross section below also shows this confinement, as well as the distribution of the Suwannee in the SWFWMD.

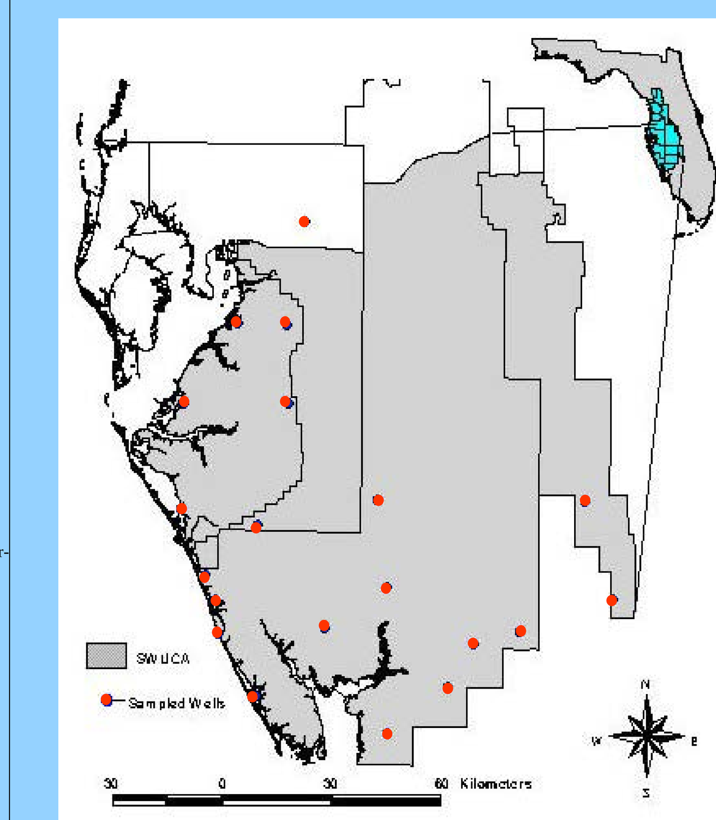


Figure 5: Map showing the location of SWFWMD wells where core samples were collected. Future ASR facilities will likely be near the west coast where saltwater upconing limits the supply of groundwater. Core samples were supplied by the Regional Observation Monitor Well Program (ROMP) of the SWFWMD and the Florida Geological Survey.

Sample Collection

During this study, cores from 22 wells were sampled to gain a better understanding of the arsenic distribution and mineralogy within the Suwannee Limestone (Figure 3). Core selection was limited to wells with discrete monitor intervals in the Suwannee Limestone to allow for future correlation of core data and water quality data with the certainty that no mixing with other formation water has occurred.

Each core was sampled at an even spacing to ensure representation of the entire Suwannee Limestone interval. "Special Interest" samples were also taken. These areas contained visible pyrite, organic material or iron oxyhydroxides.

Analytical Methods

To determine the exact location of the arsenic, the following steps were used:

1) Well Selection based on core availability and open-casing interval
2) Core collection – samples were taken with depth and suspected areas of arsenic occurrence (ie. observable FeOH, FeS_2, $CaPO_4$, or organic material).
3) Acid digestion of powdered sample using Aqua Regia (3:1 HCl to HNO_3) after removing all drill bit surfaces.
4) Analyze aliquot using Hydride Generation-Atomic Fluorescence Spectrometry (HG-AFS) to determine total As concentration in Rock (PSA Millennium)
5) Analyze aliquot using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) to determine other elements such as Fe, S, P, etc. and compare with As concentrations (PE Optima 2000 DV)
6) Analyze thin sections of the highest 25 As samples using Scanning Electron Microscopy with Energy Dispersive X-ray (SEM-EDX) capabilities and a Robinson backscatter detector for elemental analysis.(JSM-5900-LV)
7) Analyze thin sections using Electron Probe Microanalyzer (EPMA) with Wave Dispersive X-Ray (EM-WDX) capabilities (JXA-8900-R)

Results

Lithologic Descriptions

Visual and microscopic inspection of the Suwannee Limestone mineralogy showed all previously suggested sources of arsenic were present in trace amounts throughout. Samples were largely composed of pure limestone. Primary and secondary trace minerals, including framboidal pyrite or marcasite, apatite, and quartz sand occurred throughout. Pyrite was the most abundant and often occurred along with secondary calcite in fossil molds.

Scanning Electron Microscope

The following SEM images show well developed framboidal pyrite distributed throughout the entire thickness of the Suwannee Limestone. Each framboid is about 10 to 20 µm in diameter and is composed of many equant, equidimensional pyrite microcrystals. Single euhedral pyrite crystals were also observed (circled). Energy Dispersive Spectroscopy (Figure 6) shows a well defined arsenic peak (Figure 6), proving for the first time that the framboids contain As greater than 1000 ppm.

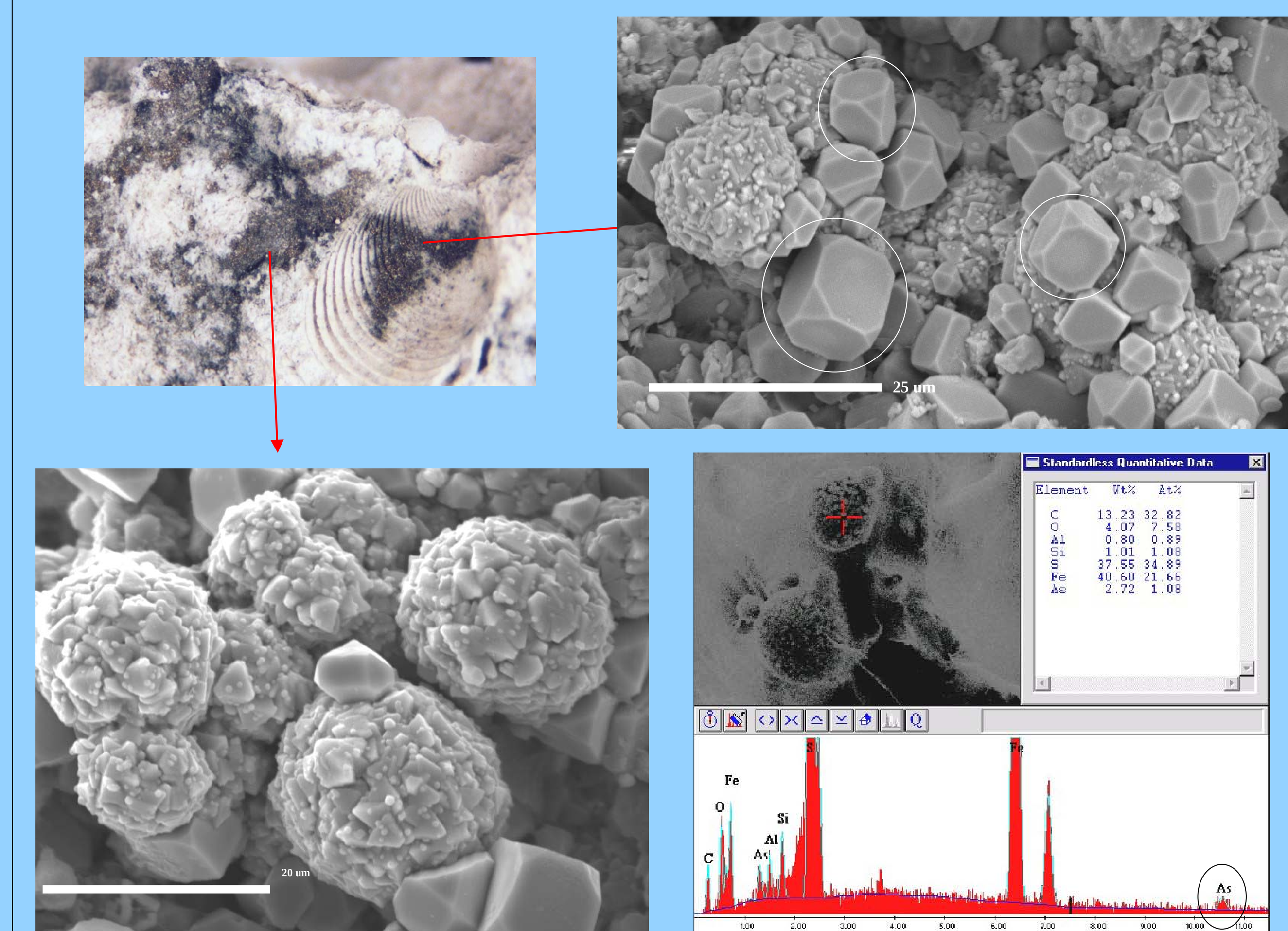


Figure 6: Typical SEM spectrograph of a framboid of pyrite collected from the Suwannee Limestone. Note two As peaks. The As peak on the left can sometimes be confused with Mg. The As peak on the right proves the pyrite contains arsenic.

Whole Rock Chemistry

Chemical analyses of digested samples were carried out using HG-AFS to detect total arsenic concentrations, and ICP–OES for other important elements including Fe, S, P, Ca, Si, Sr, Mn, and Mg. Iron and sulfur have very good correlation, suggestion that all of the iron and sulfur in the rock is bound together as pyrite (Figure 7). Lack of correlation with arsenic may suggest another source, but probably indicates the varying percentage of arsenic in pyrite (Figures 8 and 9). Microprobe data (Table 1) supports this interpretation.

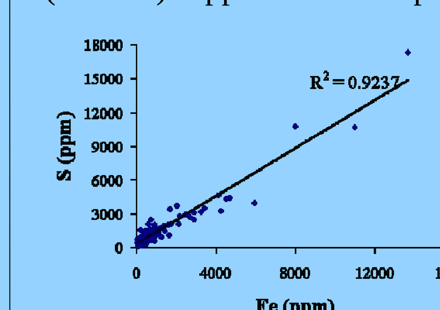


Figure 7: XY plot of Sulfur vs. Iron in the Suwannee Limestone. Very good correlation exists between Fe and S.

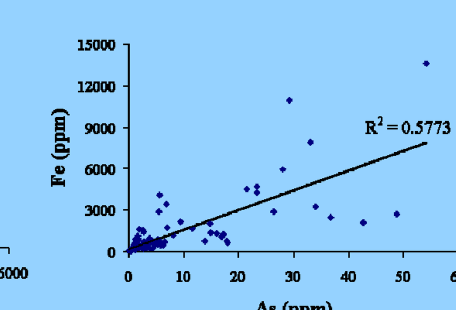


Figure 8: XY plot of Fe vs. As.

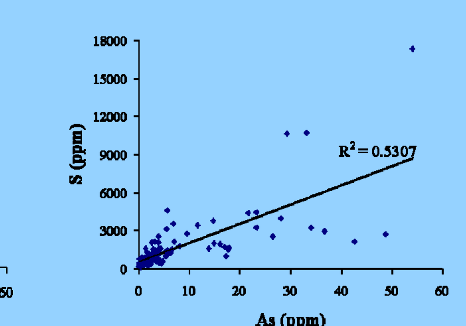


Figure 9: XY plot of Sulfur vs. Arsenic.

Electron Probe Microanalysis

Electron Microprobe with Wave Dispersive X-ray analyzer was used to analyze pyrites, iron hydroxides, organics, and phosphate for arsenic. Both arsenic peaks are present only in framboidal pyrite and supports SEM data. Table 1 shows the variability of arsenic within each framboid.

Sample	Fe	S	As
DV-249-1	43.93	49.08	1.23
LB-764-1	39.65	48.94	0.1819
H-281-1	41.76	48.55	0.1711
14-730G-1	38.24	47.16	0.2287
5-875-1	42.81	49.32	1.28
P-2-58-1	44.04	51.81	0.3141
8-1-544-1	39.83	33.32	0.2521
8-1-544-2	42.24	33.02	0.2933

Table 1: Wt % Fe, S, and As in selected pyrite framboids from Electron Probe Microanalysis. Note variability in As concentrations vs. Fe and S.

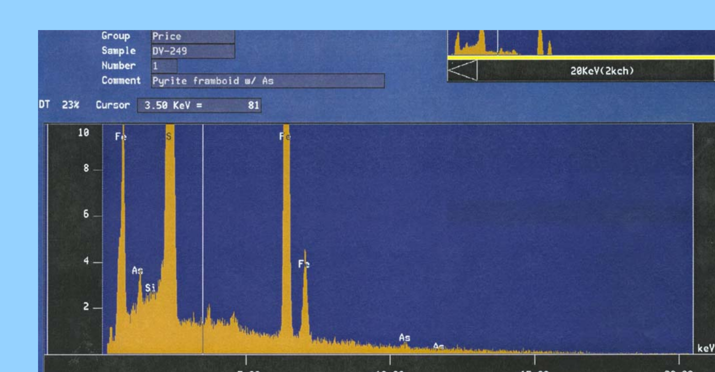


Figure 10: Spectrograph from Microprobe analysis of pyrite framboids showing both arsenic peaks.

Discussion

The Fe-S-As-O-H system in groundwater is primarily controlled by redox conditions. Groundwater of the Suwannee LS is, in most cases, reducing, and pyrite is believed to be the dominant mineral phase following the Eh pH diagram below (Figure 11).

The following images show oxidized framboids of pyrite with a ring of iron hydroxide. This ring is typical of oxidized framboids (Evangelou, 1995). Based on the Eh-pH stability diagram given as an example, the iron hydroxides are not believed to be stable in subsurface reducing environment and are only a result of oxidation of pyrite after exposure to the atmosphere. This is, however, the same oxidation process that would take place during aquifer storage and recovery. ASR recharge water is treated to potable drinking water standards prior to injection and thus has much higher DO content than typical groundwater. Oxidation of pyrite takes place by the following reactions:

Initial oxidation by O_2:

$$FeS_2 + 7/2\ O_2 + H_2O \Rightarrow Fe^{2+} + 2\ SO_4^{2-} + 2\ H^+$$

The Fe^{2+} produced can be further oxidized to Fe^{3+}, which in turn hydrolyzes into iron hydroxide.

$$Fe^{2+} + 0.5\ O_2 + H^+ \Rightarrow Fe^{3+} + H_2O \quad \text{and}$$

$$Fe^{3+} + 3\ H_2O \Rightarrow Fe(OH)_3 + 3\ H^+$$

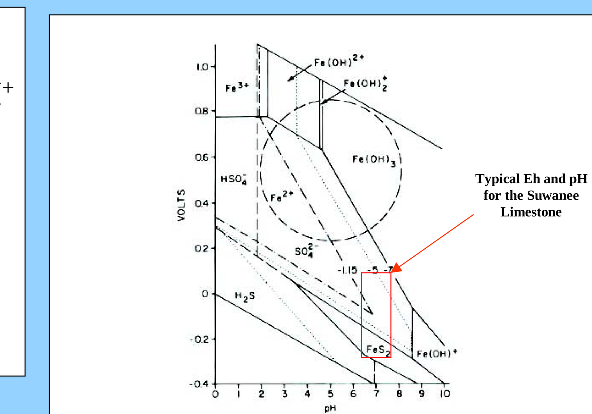
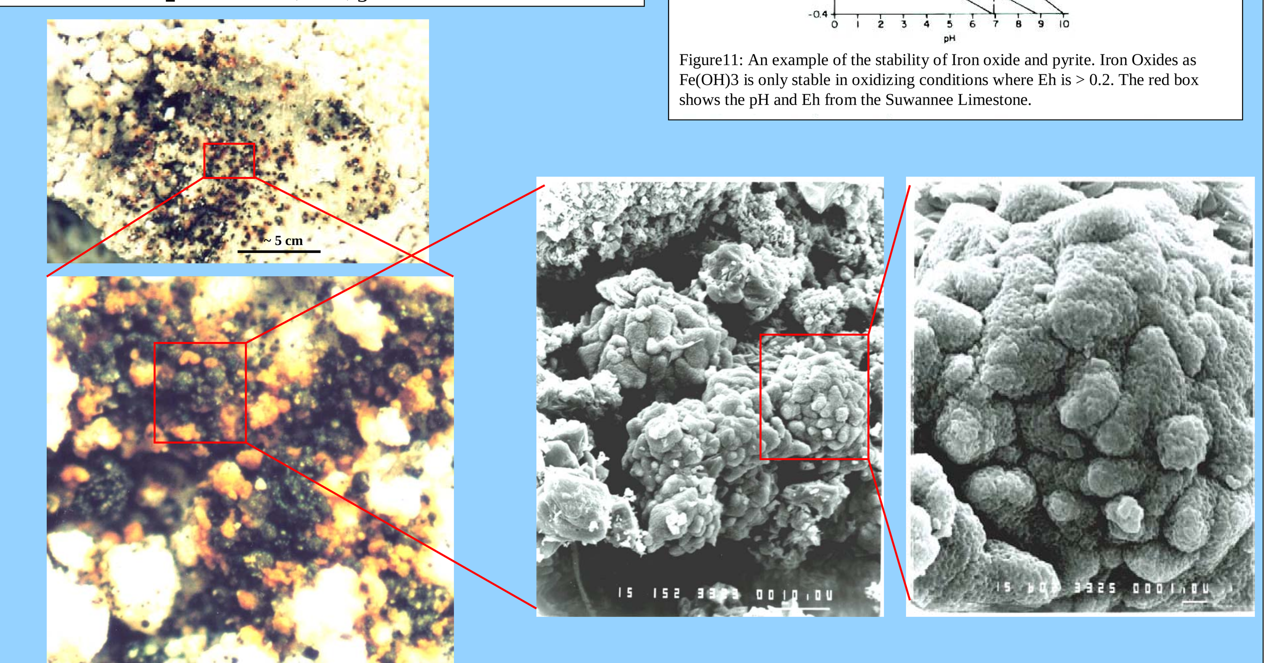


Figure11: An example of the stability of Iron oxide and pyrite. Iron Oxides as Fe(OH)3 is only stable in oxidizing conditions where Eh is > 0.2. The red box shows the pH and Eh from the Suwannee Limestone.



Conclusions

Our detailed lithological, mineralogical, and geochemical study of arsenic in the Upper Floridan aquifer, Suwannee Limestone shows:

1) All previously suggested sources for the arsenic can be found in trace amounts throughout the Suwannee Limestone.
2) Framboidal pyrite was the most abundant and was unevenly distributed throughout, occurring most often with secondary calcite in moldic porosity zones used during ASR.
3) Nodular phosphate, quartz, clay, and organics were also present in trace amounts, while iron hydroxides were very rarely observed.
4) Framboidal pyrite contains arsenic at concentrations in excess of 1000 ppm, although arsenic concentrations vary from pyrite crystal to pyrite crystal. Other trace minerals contain arsenic in much lower amounts when compared to framboidal pyrite.

ASR recharge water in Florida is treated with O_3 prior to injection, which causes the water to be highly oxidized relative to the low-oxygen conditions of the Suwannee Limestone water. This change in redox conditions will cause the dissolution of framboidal pyrite, thus releasing high concentrations of arsenic. This study indicates that, if the pyrite hypothesis is accepted, the current injection practices in Florida should be revised to prevent the release of arsenic during ASR.

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