Technical Publication SJ 84-9

# HOWELL BRANCH BASIN SURFACE WATER MANAGEMENT STUDY PHASE I

## (VOLUME II) TECHNICAL APPENDIX

by

Thirasak Suphunvorranop

David A. Clapp

Department of Water Resources

St. Johns River Water Management District

Post Office Box 1429
Palatka, Florida
August 1984

Project Number 20 200 05

TABLE OF CONTENTS

VOLUME II

APPENDIX A SCS Equations

APPENDIX B Discharge and Stage Hydrographs

FIGURE

B1. Stage-Storage-Discharge Relationships for the chain of Lakes Consisting of Sue, Rowena, Formosa, Winyah and Estelle.

B2. Stage-Storage-Discharge Relationships for the chain of Lakes Consisting of Osceola, Virginia and Mizell.

B3. Stage-Storage-Discharge Relationships for Lake Killarney Weir.

B4. Stage-Storage-Discharge Relationships for Park Lake.

B5. Stage-Storage-Discharge Relationships for Lake Minnehaha.

B6. Stage-Storage-Discharge Relationships for Lake Maitland Weir.

B7. Stage-Storage-Discharge Relationships for Lake Howell.

B8. Stage-Storage-Discharge Relationships for Bear Gully Lake.

B9. Stage-Storage-Discharge Relationships for the Chain of Lakes Consisting of Burkett, Martha, and Pearl.

B10. Lake Sue: 10-Year Discharge Hydrographs

B11. Lake Sue: 25-Year Discharge Hydrographs

B12. Lake Sue: 100-Year Discharge Hydrographs

B13. Lake Sue: 25-Year, 6-Hour Discharge Hydrographs

B14. Lake Osceola: 10-Year Discharge Hydrographs

B15. Lake Osceola: 25-Year Discharge Hydrographs

B16. Lake Osceola: 100-Year Discharge Hydrographs

B17. Lake Osceola: 25-Year, 6-Hour Discharge Hydrographs

B18. Lake Killarney Weir: 10-Year Discharge Hydrographs

B19. Lake Killarney Weir: 25-Year Discharge Hydrographs

B20. Lake Killarney Weir: 100-Year Discharge Hydrographs

TABLE OF CONTENTS (Continued)

FIGURE

B21. Lake Killarney Weir: 25-Year, 6-Hour Discharge Hydrographs

B22. Park Lake: 10-Year Discharge Hydrographs

B23. Park Lake: 25-Year Discharge Hydrographs

B24. Park Lake: 100-Year Discharge Hydrographs

B25. Park Lake: 25-Year, 6-Hour Discharge Hydrographs

B26. Lake Minnehaha: 10-Year Discharge Hydrographs

B27. Lake Minnehaha: 25-Year Discharge Hydrographs

B28. Lake Minnehaha: 100-Year Discharge Hydrographs

B29. Lake Minnehaha: 25-Year, 6-Hour Discharge Hydrographs

B30. Lake Maitland Weir: 10-Year Discharge Hydrographs

B31. Lake Maitland Weir: 25-Year Discharge Hydrographs

B32. Lake Maitland Weir: 100-Year Discharge Hydrographs

B33. Lake Maitland Weir: 25-Year, 6-Hour Discharge Hydrographs

B34. At SR436: 10-Year Discharge Hydrographs

B35. At SR436: 25-Year Discharge Hydrographs

B36. At SR436: 100-Year Discharge Hydrographs

B37. At SR436: 25-Year, 6-Hour Discharge Hydrographs

B38. Lake Howell: 10-Year Discharge Hydrographs

B39. Lake Howell: 25-Year Discharge Hydrographs

B40. Lake Howell: 100-Year Discharge Hydrographs

B41. Lake Howell: 25-Year, 6-Hour Discharge Hydrographs

B42. Lake Burkett: 10-Year Discharge Hydrographs

B43. Lake Burkett: 25-Year Discharge Hydrographs

B44. Lake Burkette: 100-Year Discharge Hydrographs

B45. Lake Burkett: 25-Year, 6-Hour Discharge Hydrographs

B46. Bear Gully Lake: 10-Year Discharge Hydrographs

B47. Bear Gully Lake: 25-Year Discharge Hydrographs

TABLE OF CONTENTS (Continued)

FIGURE

B48. Bear Gully Lake: 100-Year Discharge Hydrographs

B49. Bear Gully Lake: 25-Year, 6-Hour Discharge Hydrographs

B50. At Confluence: 10-Year Discharge Hydrographs

B51. At Confluence: 25-Year Discharge Hydrographs

B52. At Confluence: 100-Year Discharge Hydrographs

B53. At Confluence: 25-Year, 6-Hour Discharge Hydrographs

B54. At Outlet: 10-Year Discharge Hydrographs

B55. At Outlet: 25-Year Discharge Hydrographs

B56. At Outlet: 100-Year Discharge Hydrographs

B57. At Outlet: 25-Year, 6-Hour Discharge Hydrographs

B58. Lake Killarney Weir: 10-Year Stage Hydrographs

B59. Lake Killarney Weir: 25-Year Stage Hydrographs

B60. Lake Killarney Weir: 100-Year Stage Hydrographs

B61. Lake Killarney Weir: 25-Year, 6-Hour Stage Hydrographs

B62. Lake Maitland Weir: 10-Year Stage Hydrographs

B63. Lake Maitland Weir: 25-Year Stage Hydrographs

B64. Lake Maitland Weir: 100-Year Stage Hydrographs

B65. Lake Maitland Weir: 25-Year, 6-Hour Stage Hydrographs

B66. Lake Howell: 10-Year Stage Hydrographs

B67. Lake Howell: 25-Year Stage Hydrographs

B68. Lake Howell: 100-Year Stage Hydrographs

B69. Lake Howell: 25-Year, 6-Hour Stage Hydrographs

TABLE OF CONTENTS (Continued)

APPENDIX C Flood Profiles for 24-Hour Storm under Existing Conditions

FIGURE

C-1. Flood Profiles of Howell Creek Under Existing Conditions

C-2. Flood Profiles of Howell Creek Tributary 1 under Existing Conditions

C-3. Flood Profiles of Howell Creek Tributary 2 under Existing Conditions

C-4. Flood Profiles of Howell Creek Tributary 3 under Existing Conditions

C-5. Flood Profiles of Howell Creek Tributary 4 under Existing Conditions

C-6. Flood Profiles of Howell Creek Tributary 5 under Existing Conditions

C-7. Flood Profiles of Howell Creek Tributary 6 under Existing Conditions

C-8. Flood Profiles of Bear Creek under Existing Conditions

C-9. Flood Profiles of Bear Creek Tributary 1 under Existing Conditions

C-10. Flood Profiles of Bear Creek Tributary 2 under Existing Conditions

TABLE OF CONTENTS (Continued)

APPENDIX D Flood Profiles for 24- Hour Storm under Future Development

FIGURE

D-1. Flood Profiles of Howell Creek under Future Development

D-2. Flood Profiles of Howell Creek Tributary 1 under Future Development

D-3. Flood Profiles of Howell Creek Tributary 2 under Future Development

D-4. Flood Profiles of Howell Creek Tributary 3 under Future Development

D-5. Flood Profiles of Howell Creek Tributary 4 under Future Development

D-6. Flood Profiles of Howell Creek Tributary 5 under Future Development

D-7. Flood Profiles of Howell Creek Tributary 6 under Future Development

D-8. Flood Profiles of Bear Creek under Future Development

D-9. Flood Profiles of Bear Creek Tributary 1 under Future Development

D-10. Flood Profiles of Bear Creek Tributary 2 under Future Developemnt

TABLE OF CONTENTS (Continued)

APPENDIX E Flood Profiles for 25- Year, 6- Hour Storm under Existing Conditions and Future Development

FIGURE

E-1. Flood Profiles of Howell Creek for 25-year, 6-hour Storm under Existing Conditions and Future Development

E-2. Flood Profiles of Howell Creek Tributary 1 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-3. Flood Profiles of Howell Creek Tributary 2 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-4. Flood Profiles of Howell Creek Tributary 3 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-5. Flood Profiles of Howell Creek Tributary 4 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-6. Flood Profiles of Howell Creek Tributary 5 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-7. Flood Profiles of Howell Creek Tributary 6 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-8. Flood Profiles of Bear Creek for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-9. Flood Profiles of Bear Creek Tributary 1 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

E-10. Flood Profiles of Bear Creek Tributary 2 for 25-Year, 6-Hour Storm under Existing Conditions and Future Development

APPENDIX F 100-Year Flood Prone Areas of Howell Branch Basin

# APPENDIX A

## SCS Equations

The following equations developed by the Soil Conservation Service (SCS) were used in computation of runoff hydrograph and peak discharge. Computation of direct runoff is given as:

$$S = \frac{1000}{CN} - 10 \qquad (1)$$

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S} \qquad (2)$$

Where S = potential maximum retention in inches

CN = SCS Runoff Curve Number

Q = accumulated direct runoff in inches

P = accumulated rainfall in inches

Computation of peak discharge is given by the following:

$$L = \frac{\ell^{0.8}(S+1)^{0.7}}{1900y^{0.5}} \qquad (3)$$

$$T_c = 1.67\ L \qquad (4)$$

$$D = 0.133\ T_c \qquad (5)$$

$$T_p = D/2 + L \qquad (6)$$

$$q_p = \frac{484\ AQ}{T_p} \qquad (7)$$

where L = lag time in hours

$\ell$ = hydraulic length of watershed in feet

S = potential maximum retention in inches

y = average watershed land slope in percent

$T_c$ = time of concentration in hours

$D$ = duration of unit excess rainfall in hours

$A$ = watershed area in square miles

$T_p$ = time to the peak in hours

$q_p$ = peak discharge in cubic feet per second

$Q$ = runoff in inches

# APPENDIX B

## Discharge and Stage Hydrographs

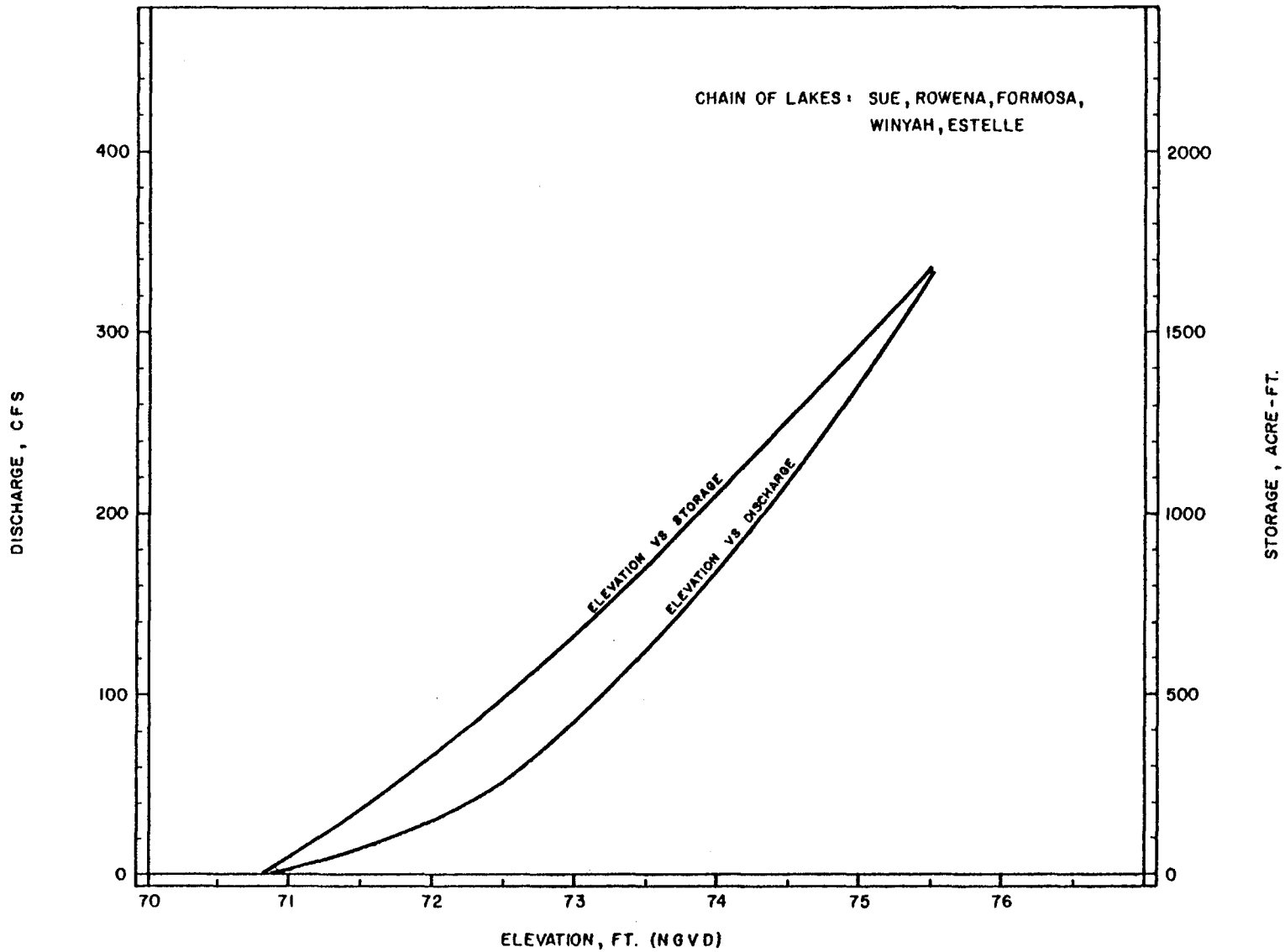



FIGURE B1. Stage - Storage - Discharge Relationships for the Chain of Lakes Consisting of Sue, Rowena, Formosa, Winyah, and Estelle.

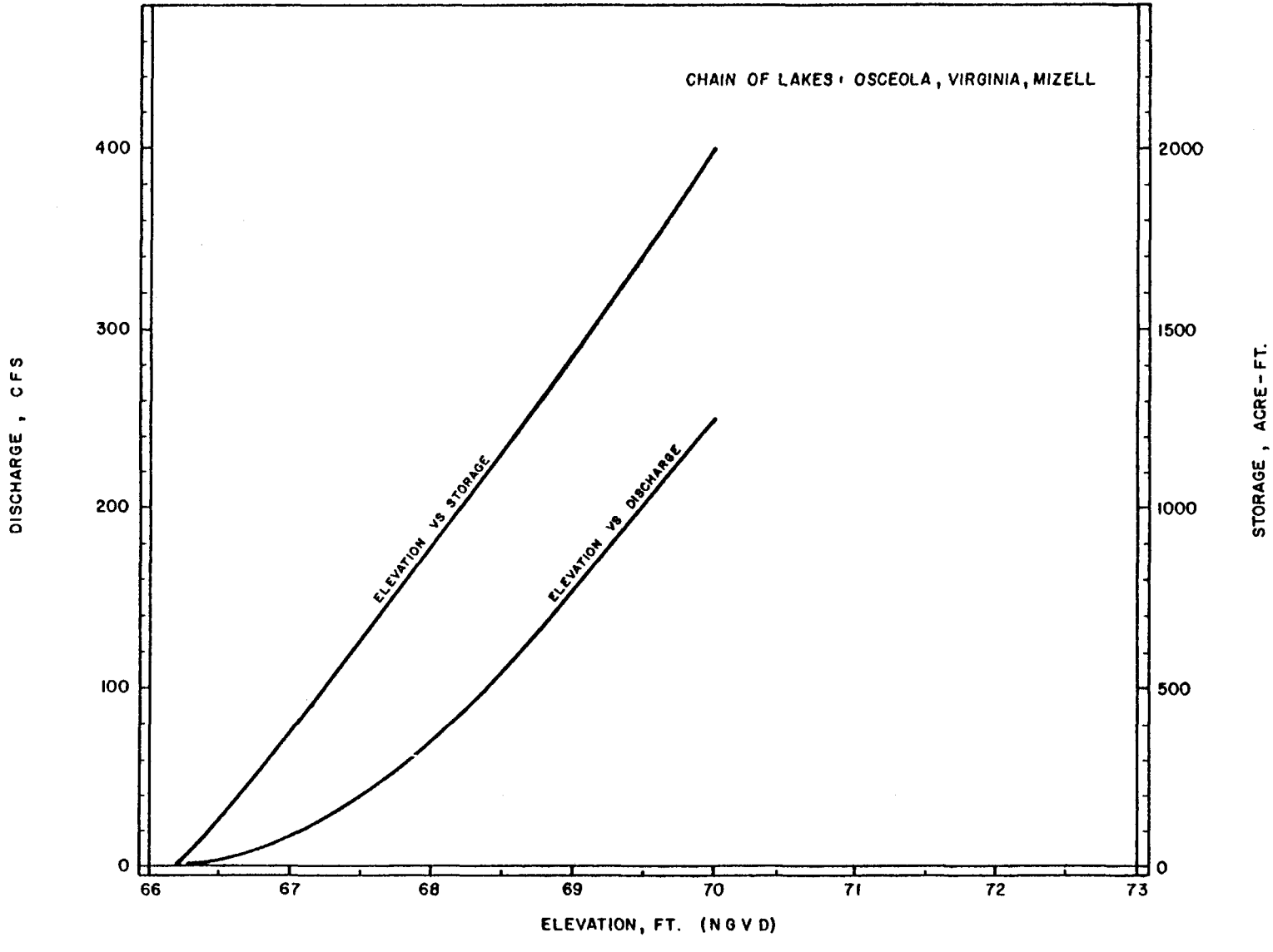



FIGURE B2. Stage - Storage - Discharge Relationships for the Chain of Lakes Consisting of Osceola, Virginia, and Mizell.

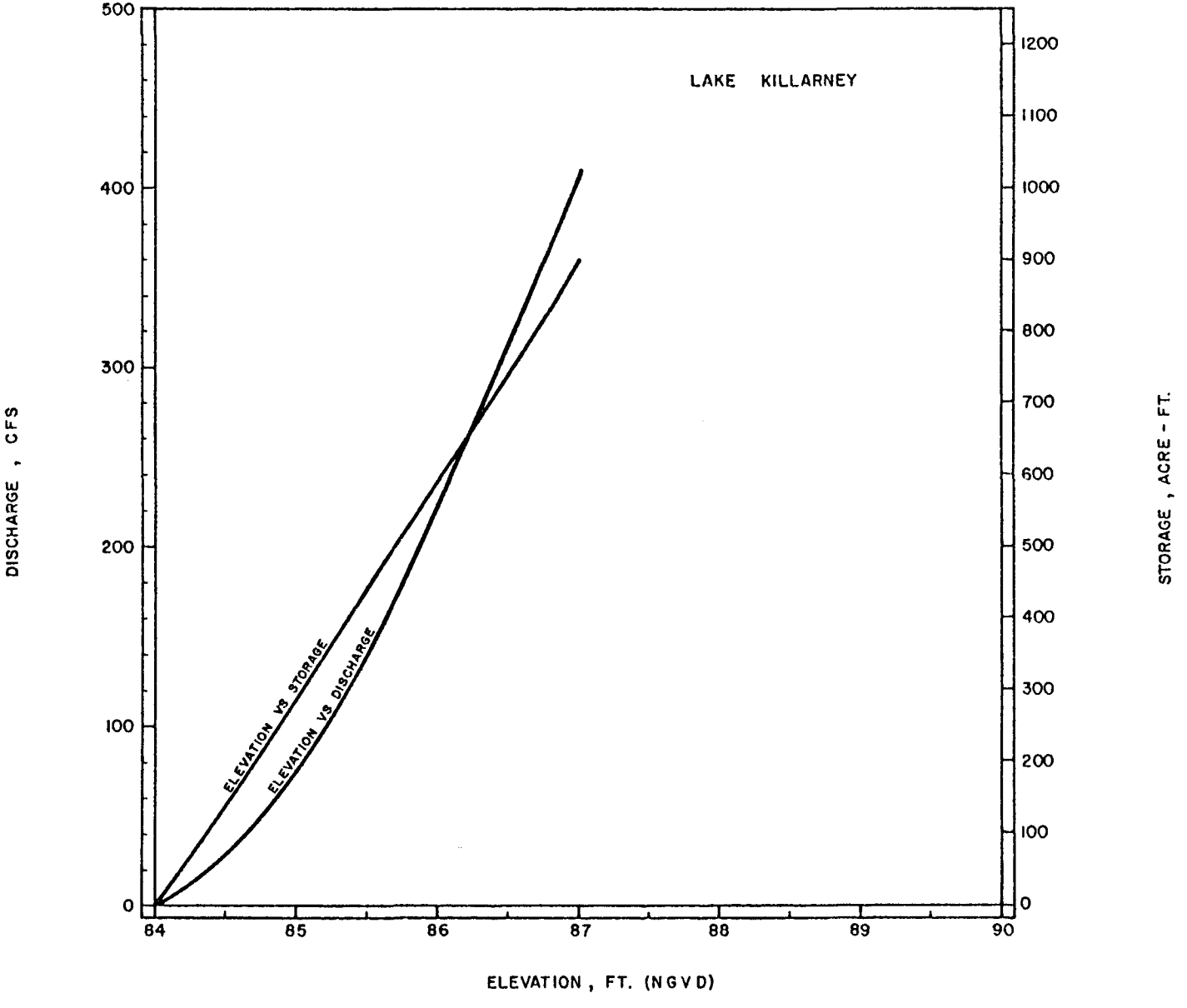



FIGURE B3. Stage - Storage - Discharge Relationships for Lake Killarney Weir.

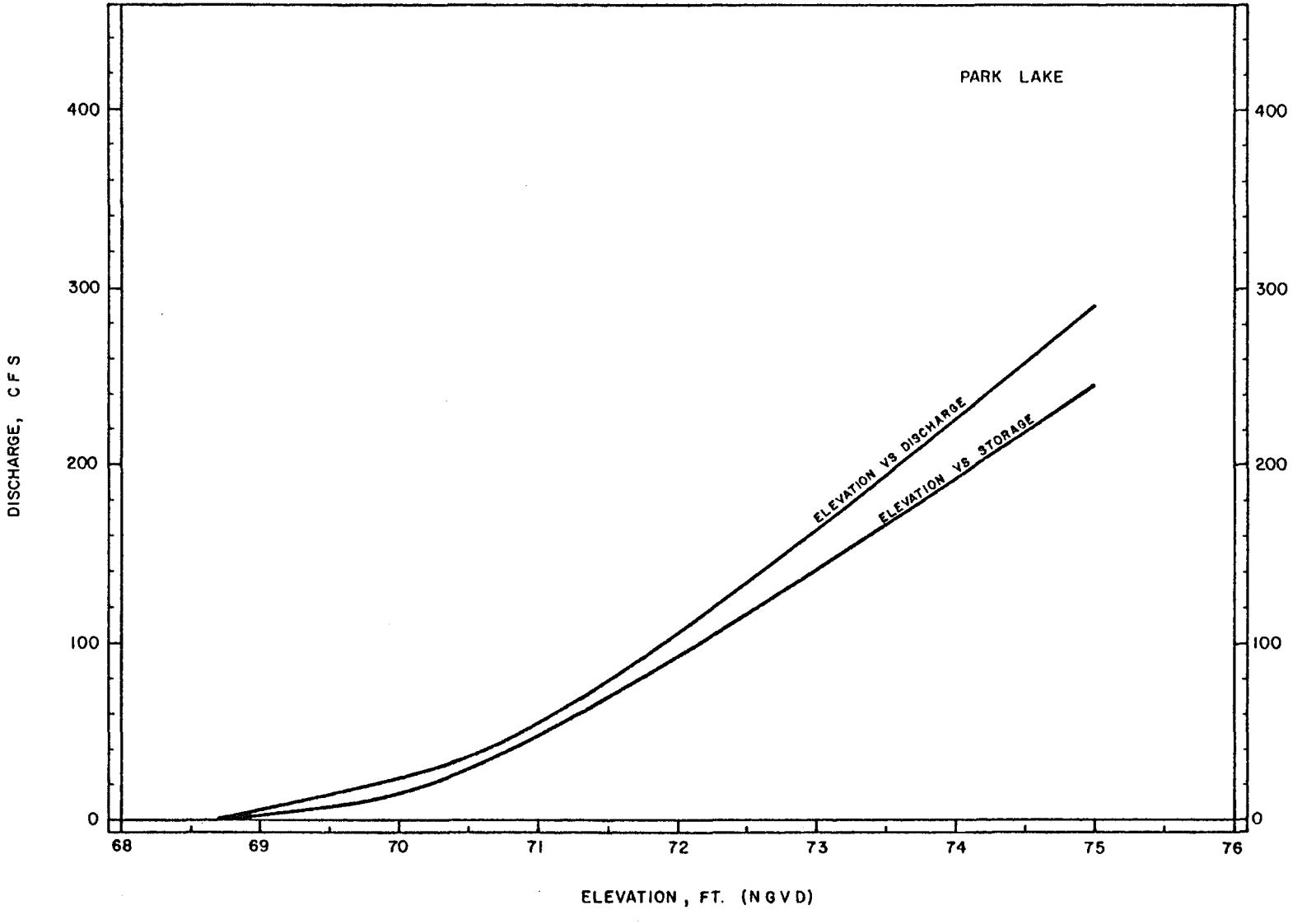



FIGURE B4. Stage - Storage - Discharge Relationships for Park Lake.

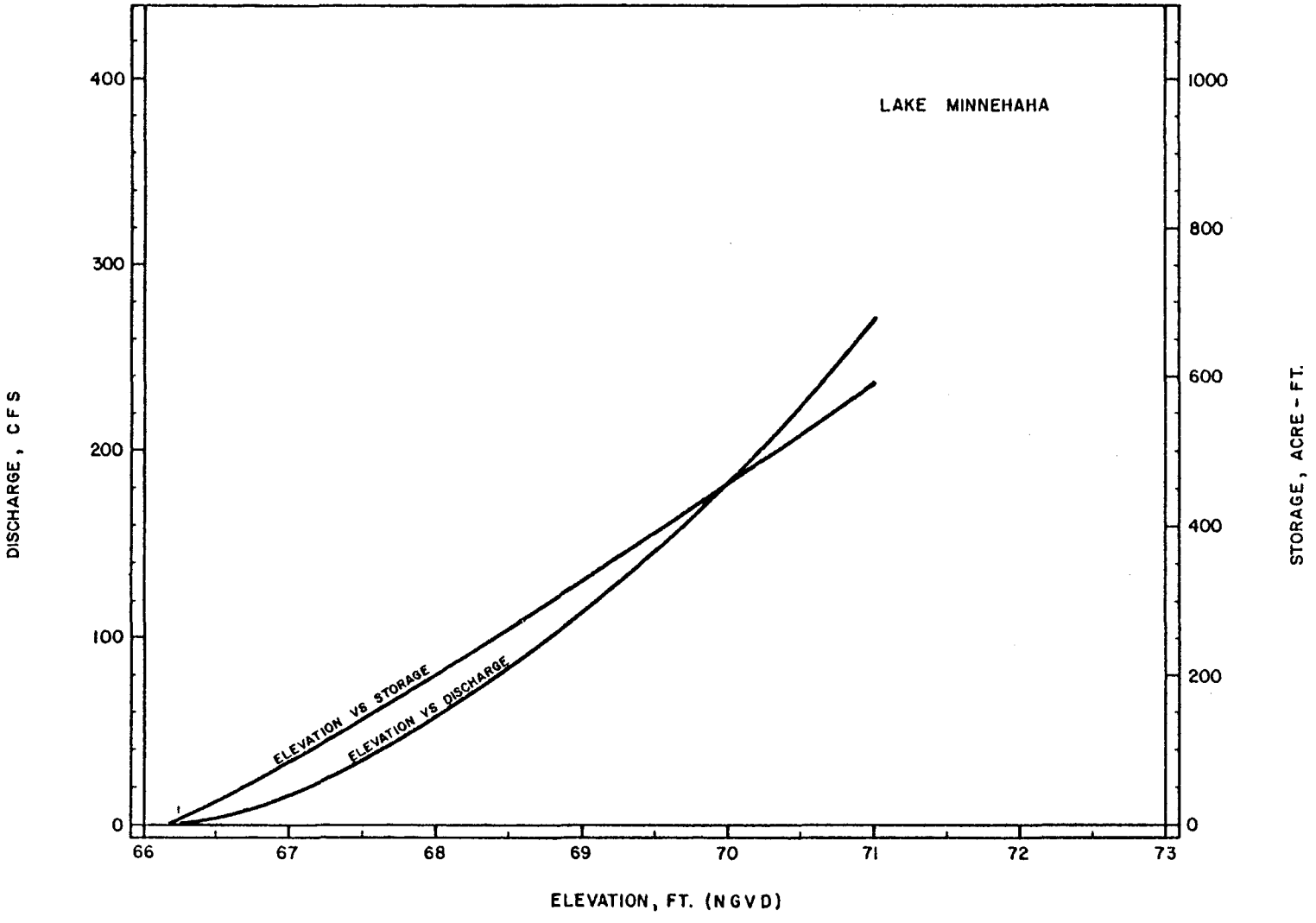



FIGURE B5. Stage - Storage - Discharge Relationships for Lake Minnehaha.

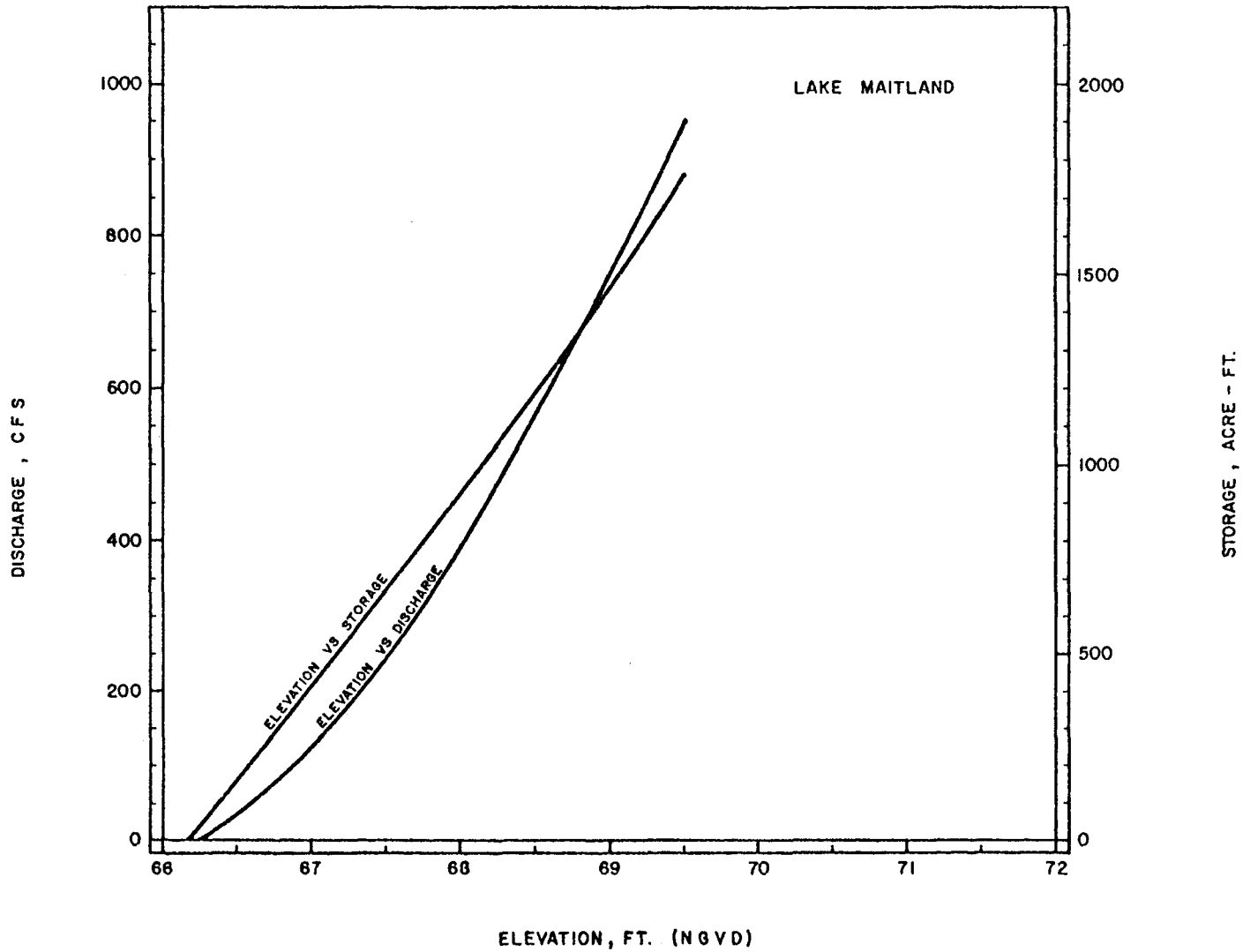



FIGURE B6. Stage - Storage - Discharge Relationships for Lake Maitland Weir.

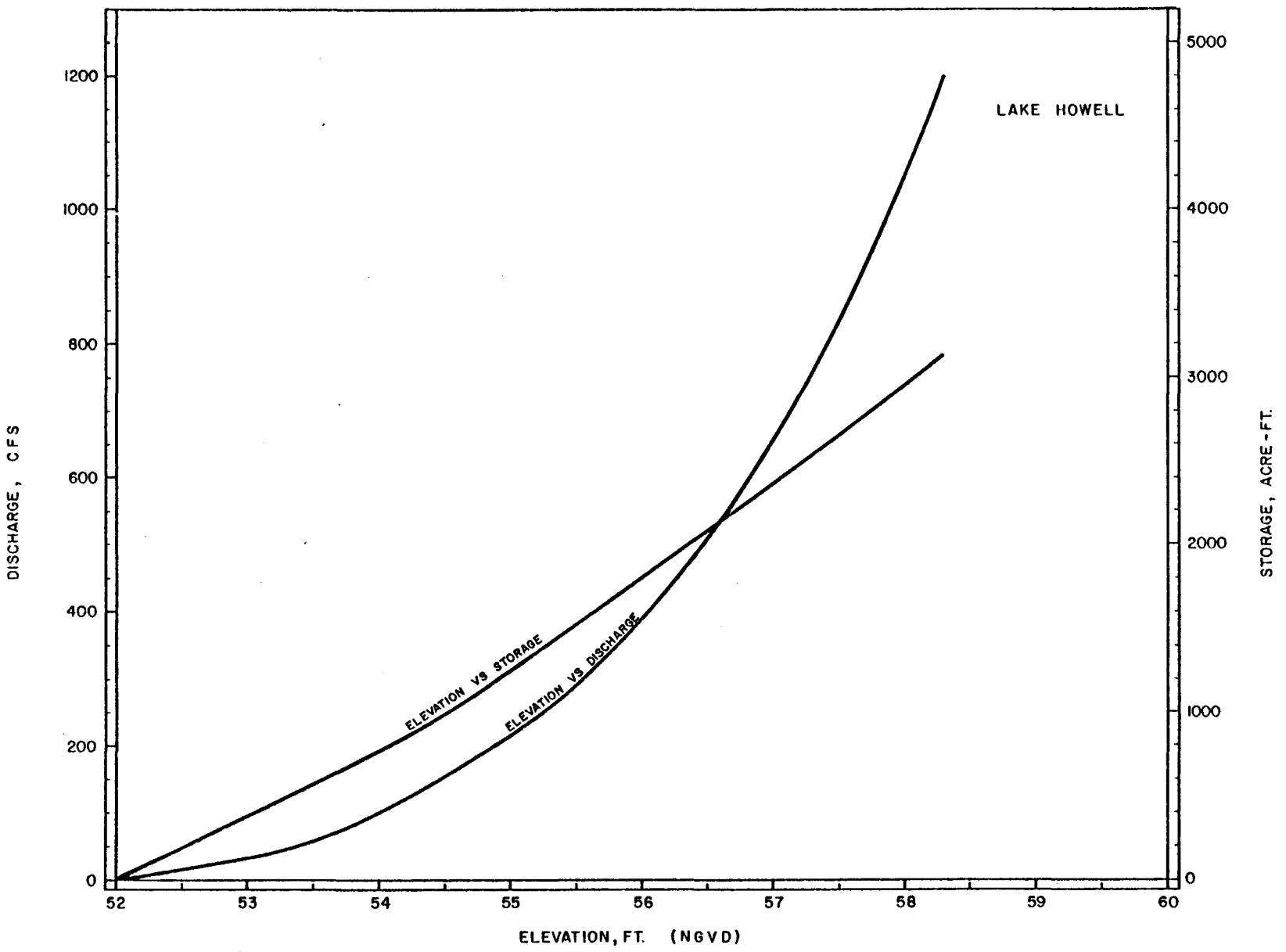



FIGURE B7. Stage - Storage - Discharge Relationships for Lake Howell.

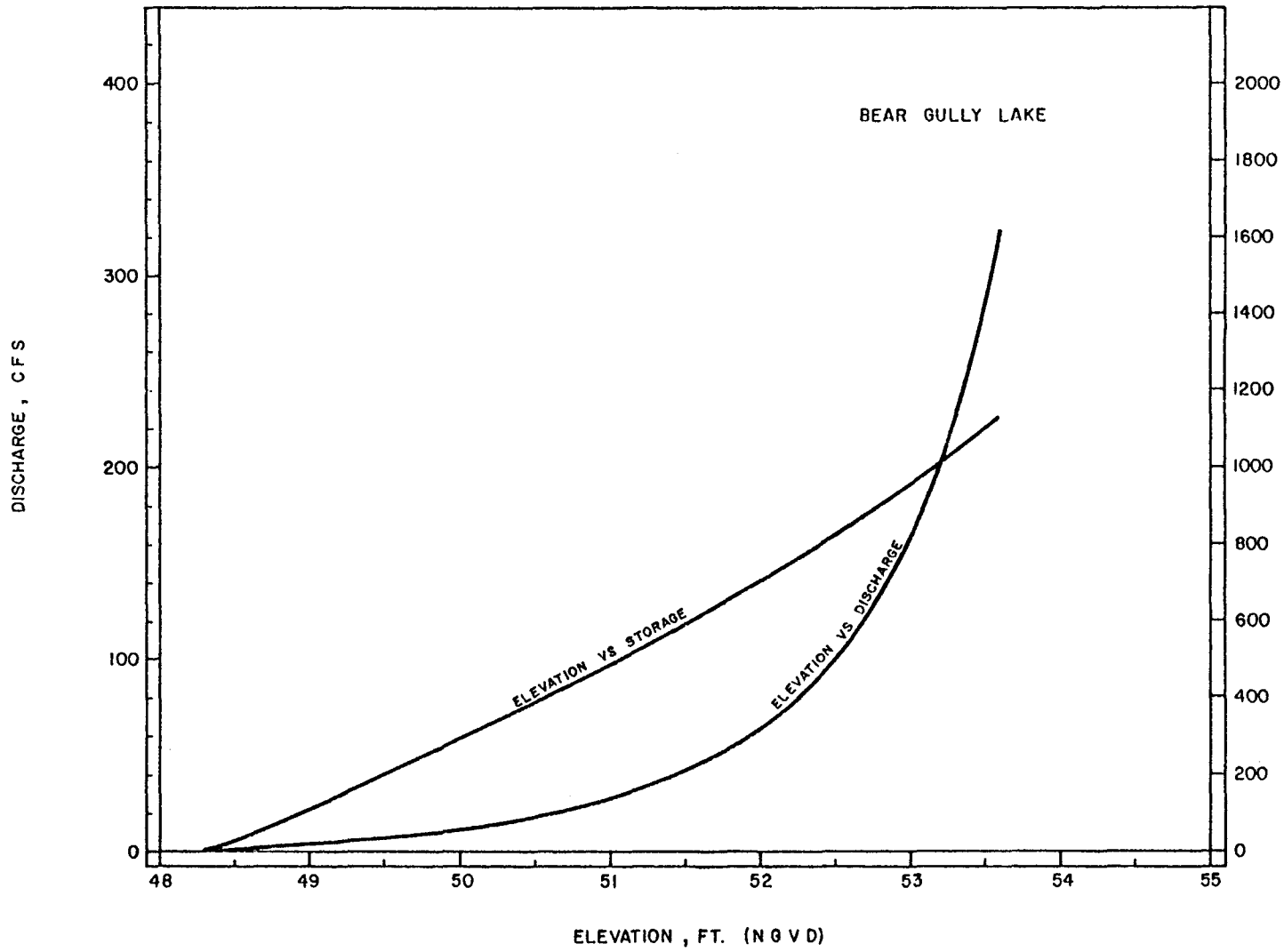



FIGURE B8. Stage - Storage - Discharge Relationships for Bear Gully Lake.

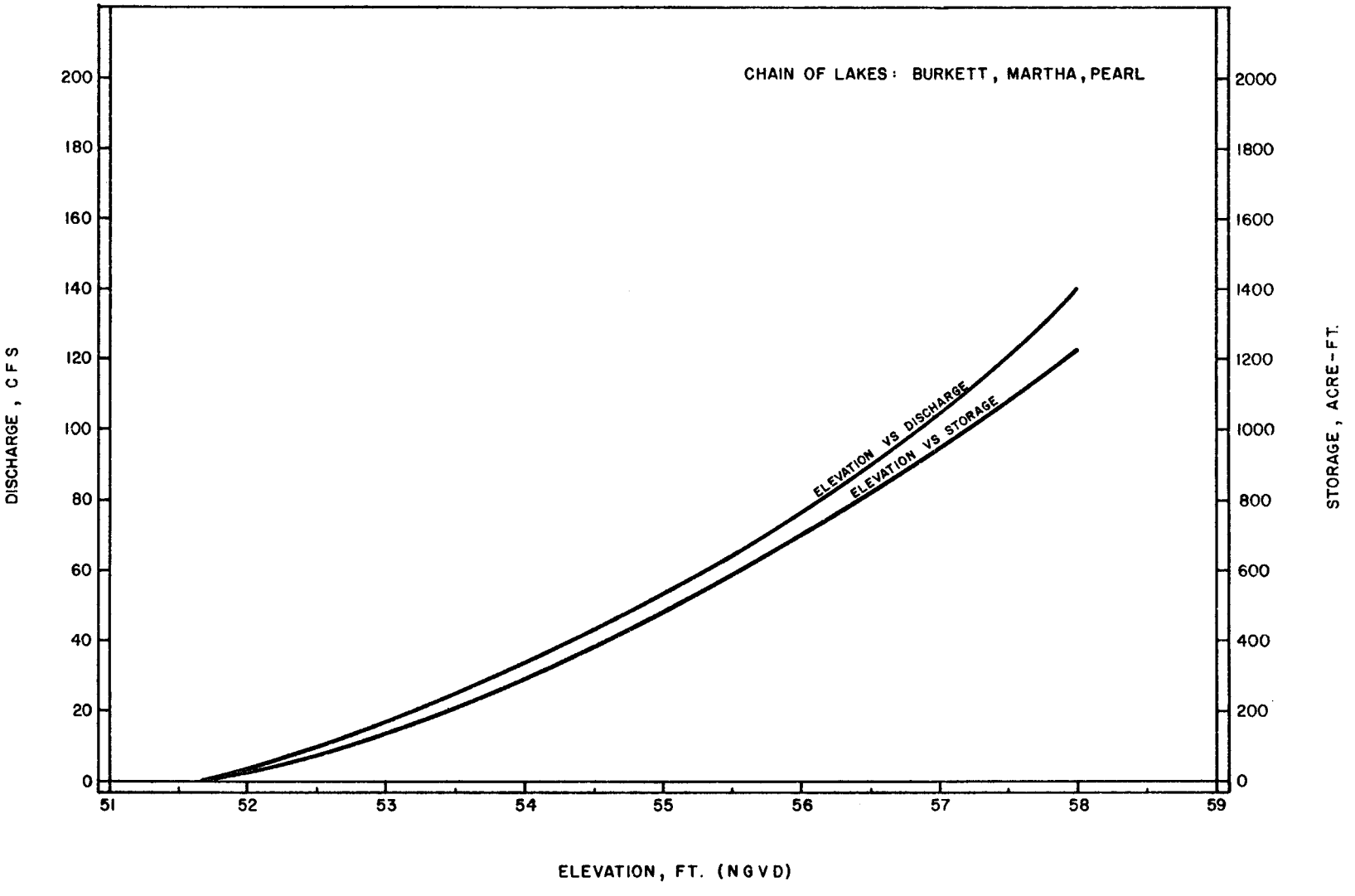



FIGURE B9. Stage - Storage - Discharge Relationships for the Chain of Lakes Consisting of Burkett, Martha, and Pearl.

FIGURE B10. LAKE SUE : 10-YEAR DISCHARGE HYDROGRAPHS

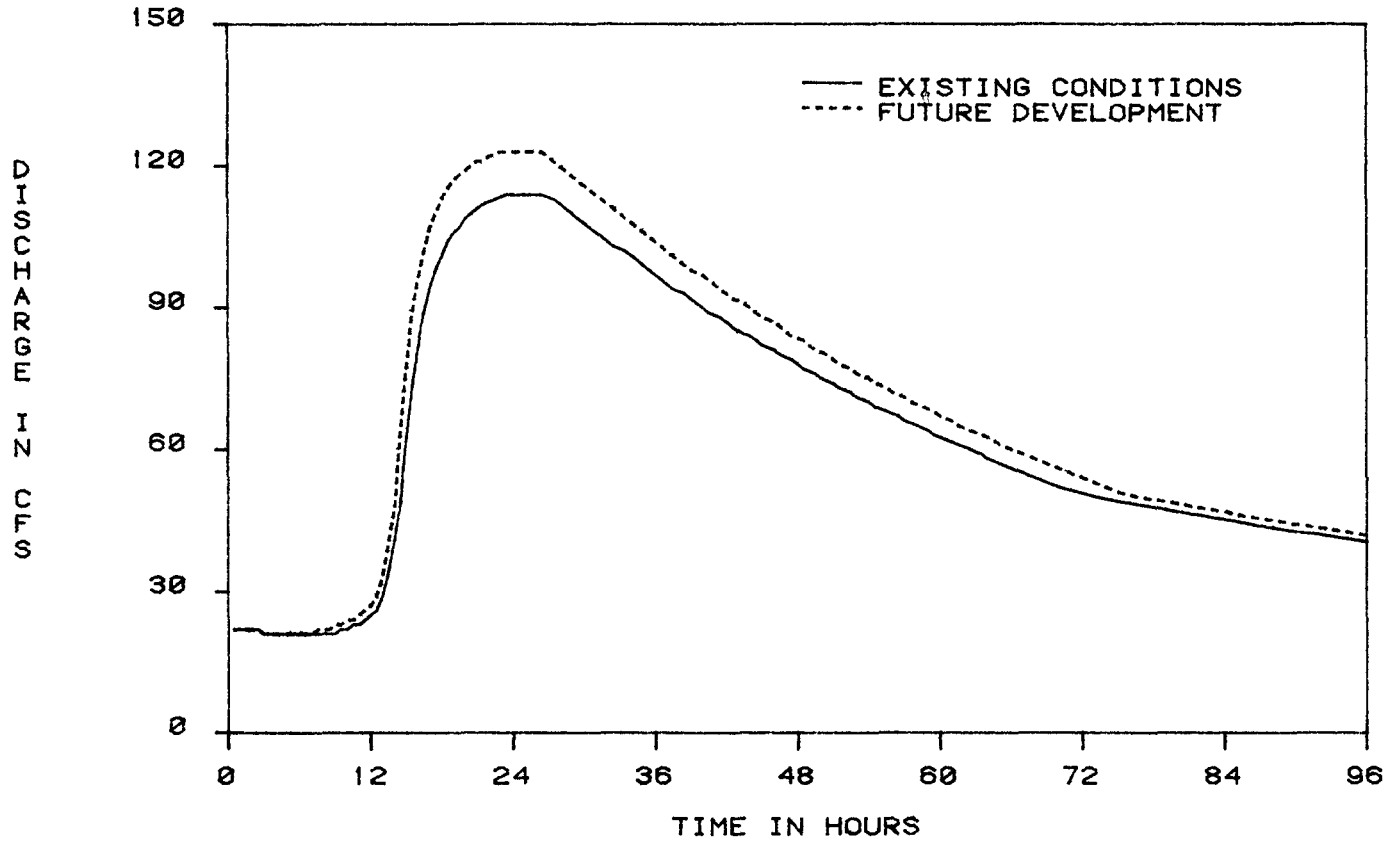



FIGURE B11. LAKE SUE : 25-YEAR DISCHARGE HYDROGRAPHS

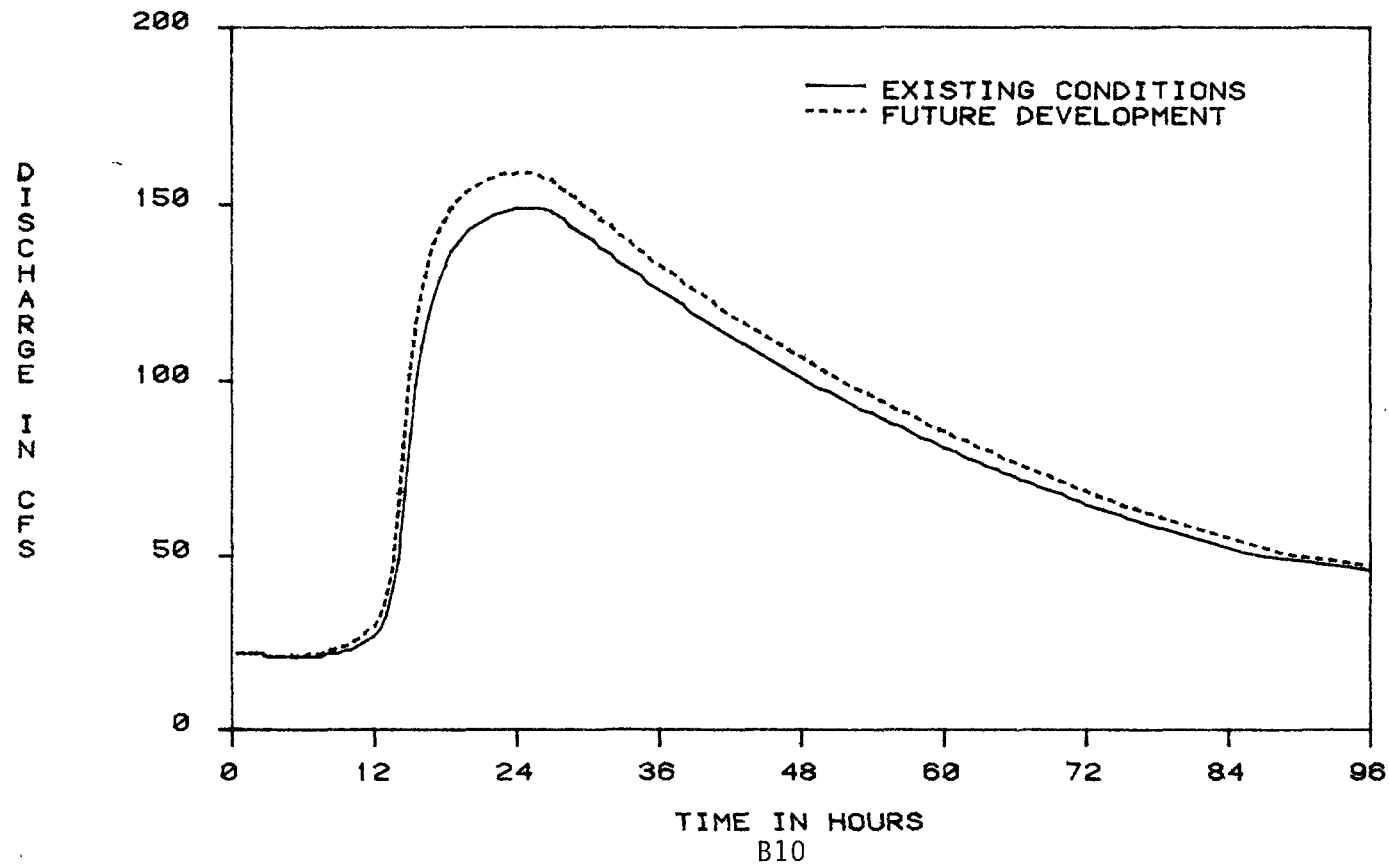


FIGURE B12. LAKE SUE : 100-YEAR DISCHARGE HYDROGRAPHS

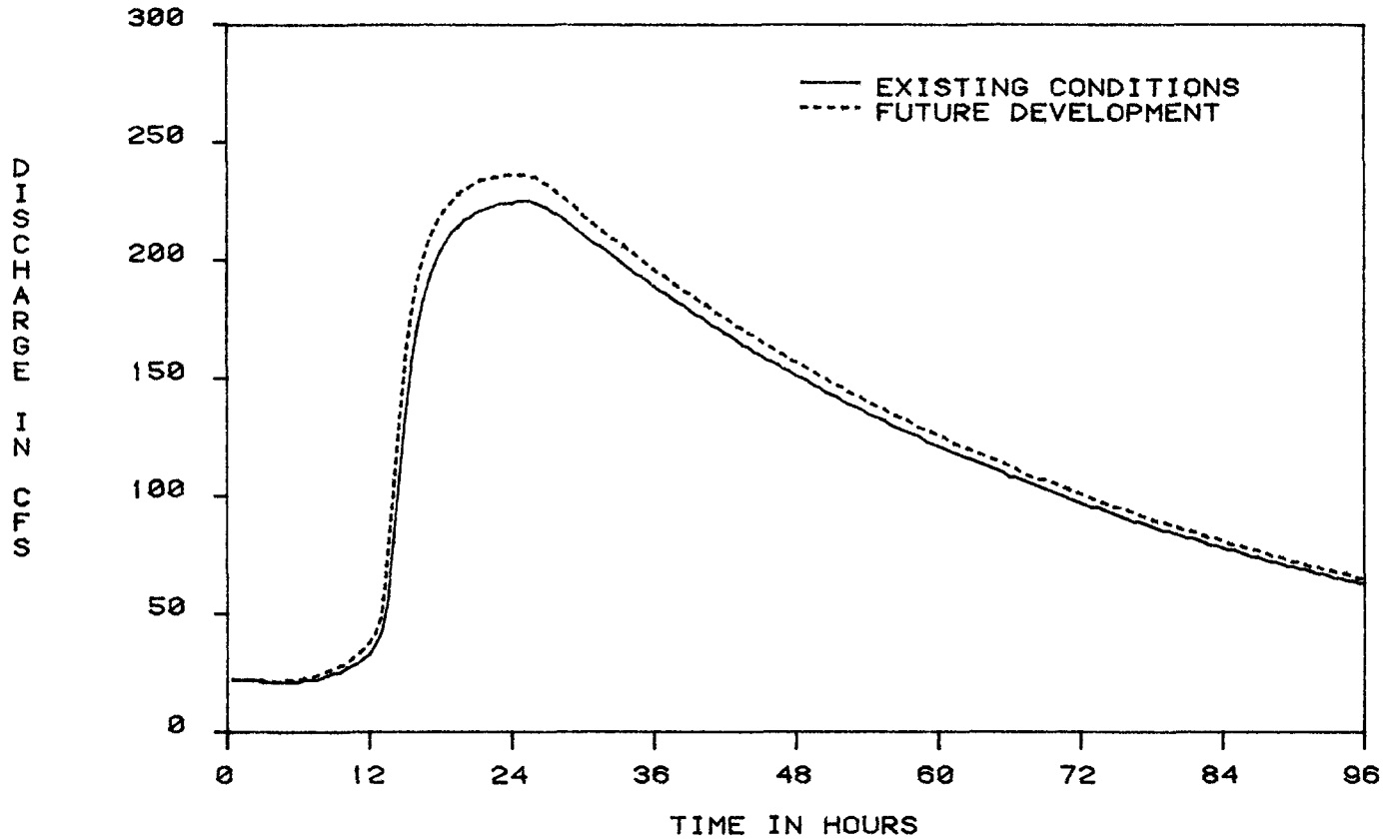



FIGURE B13. LAKE SUE : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

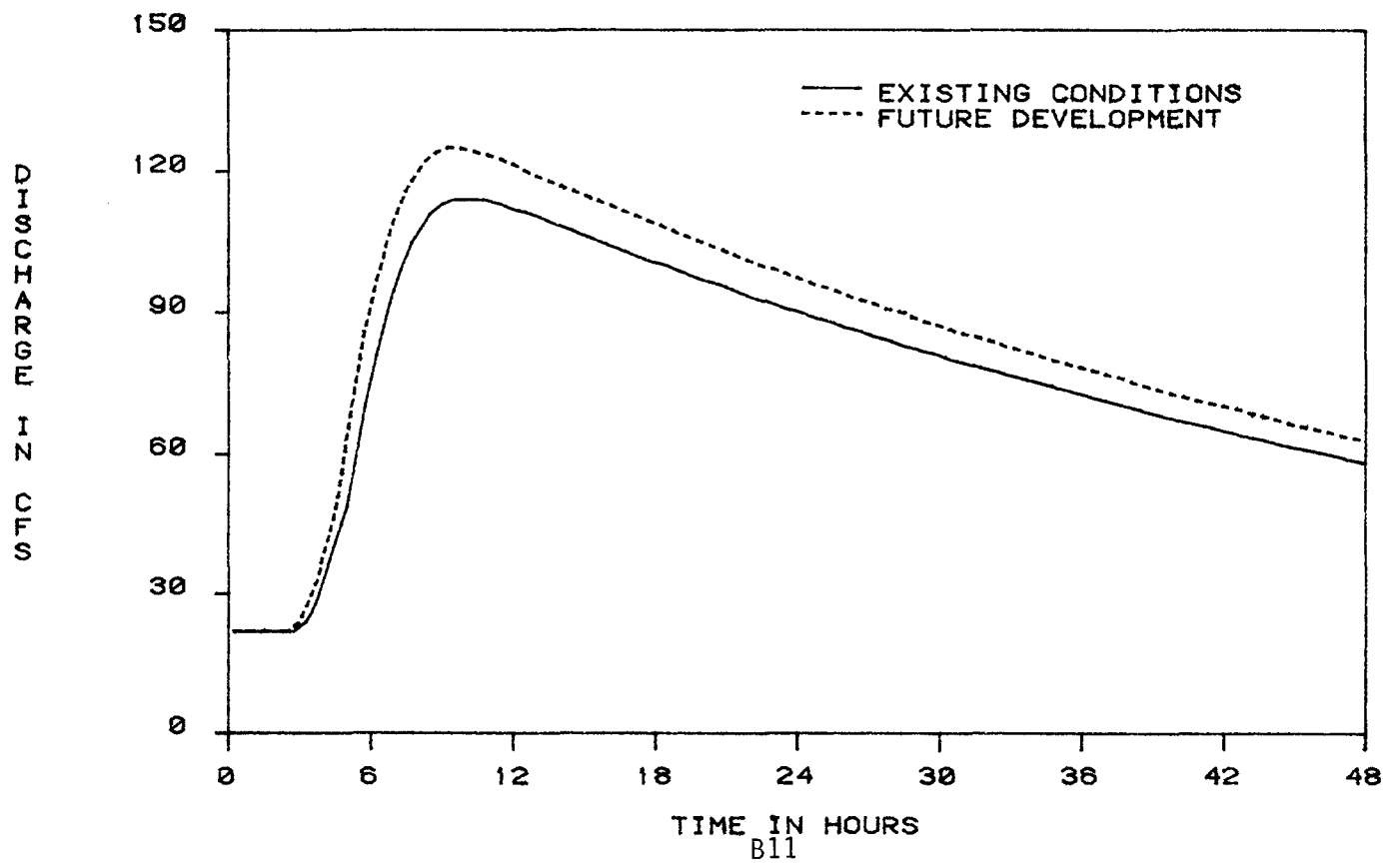


FIGURE B14. LAKE OSCEOLA : 10-YEAR DISCHARGE HYDROGRAPHS

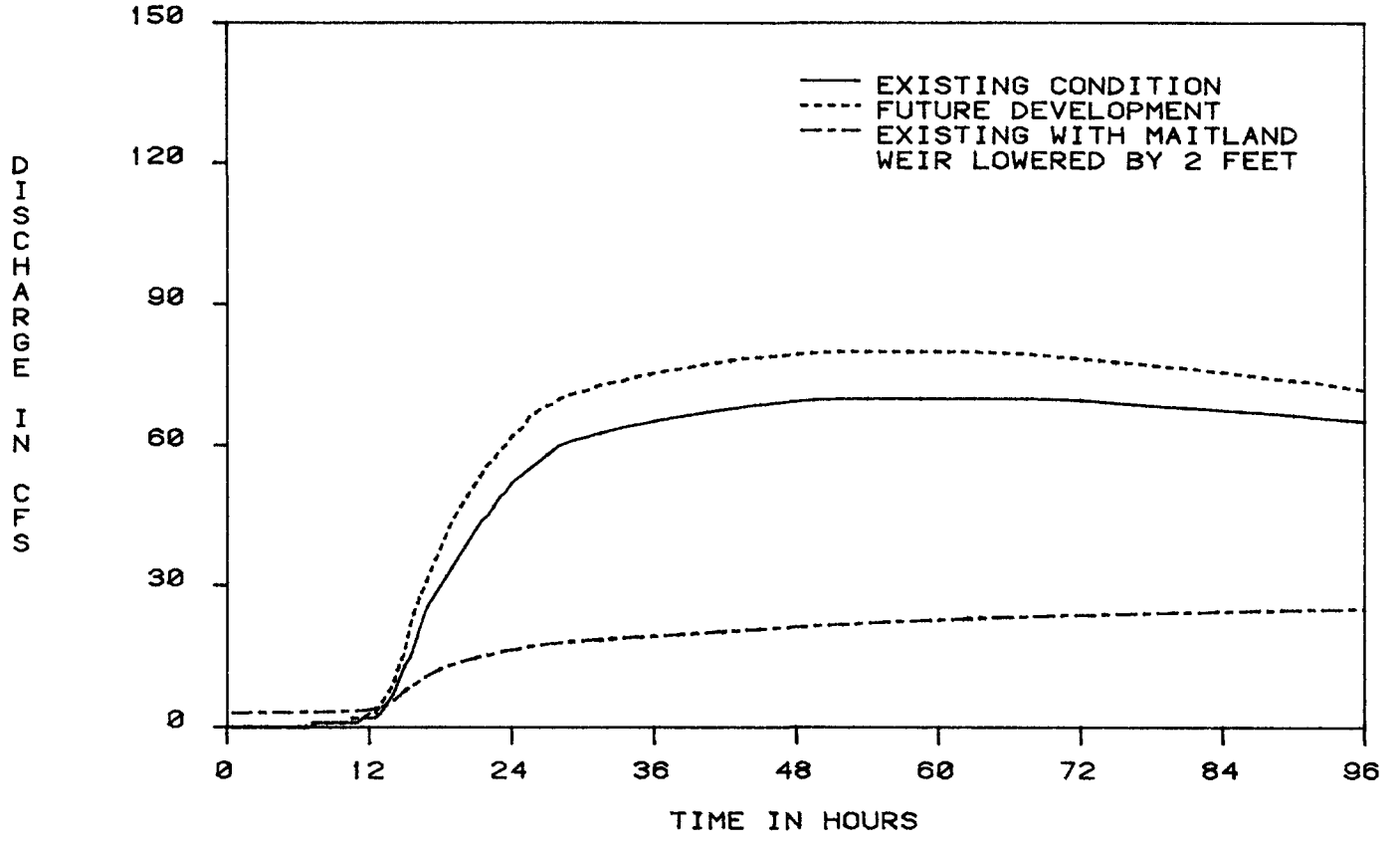



FIGURE B15. LAKE OSCEOLA : 25-YEAR DISCHARGE HYDROGRAPHS

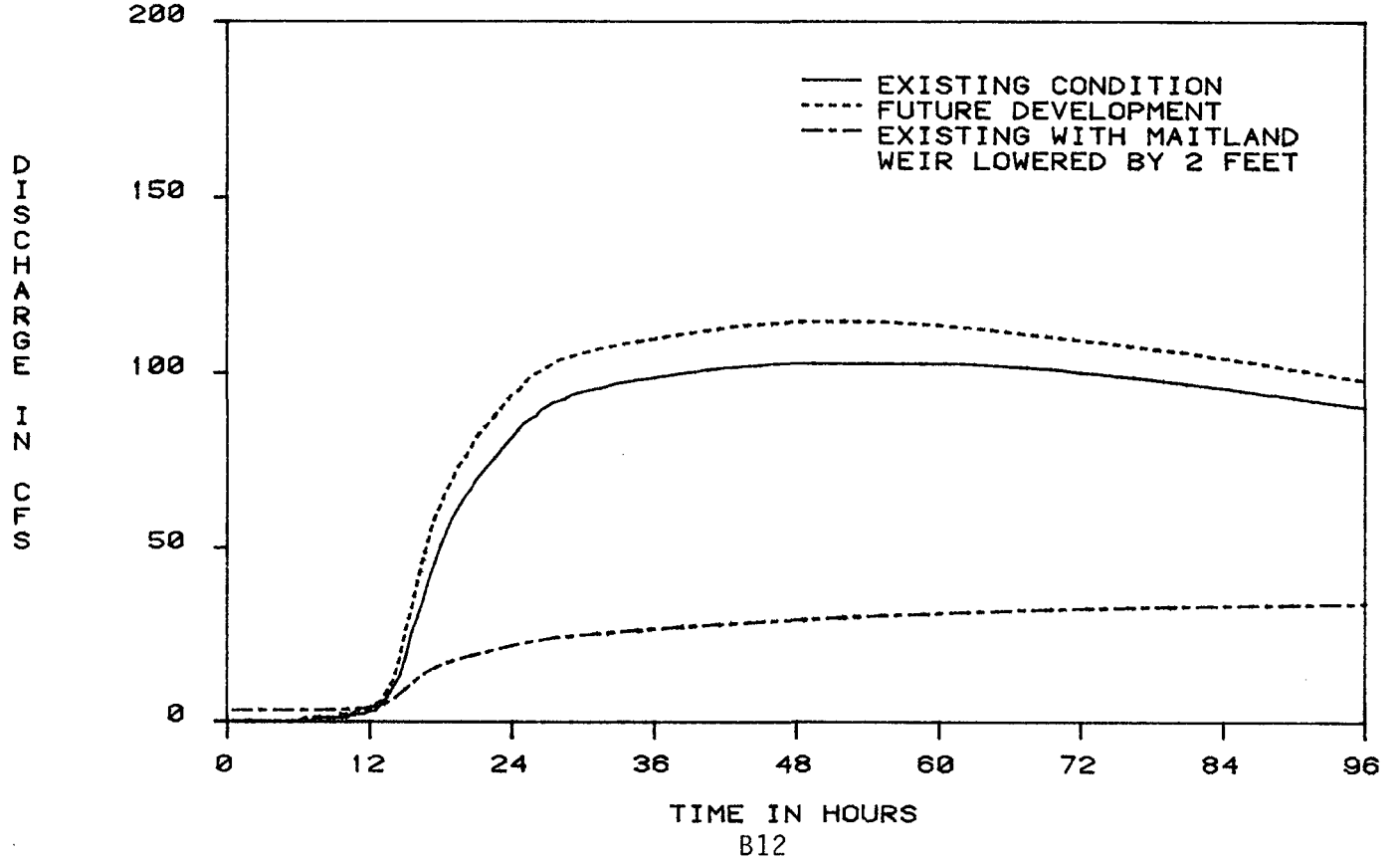


FIGURE B16. LAKE OSCEOLA : 100-YEAR DISCHARGE HYDROGRAPHS

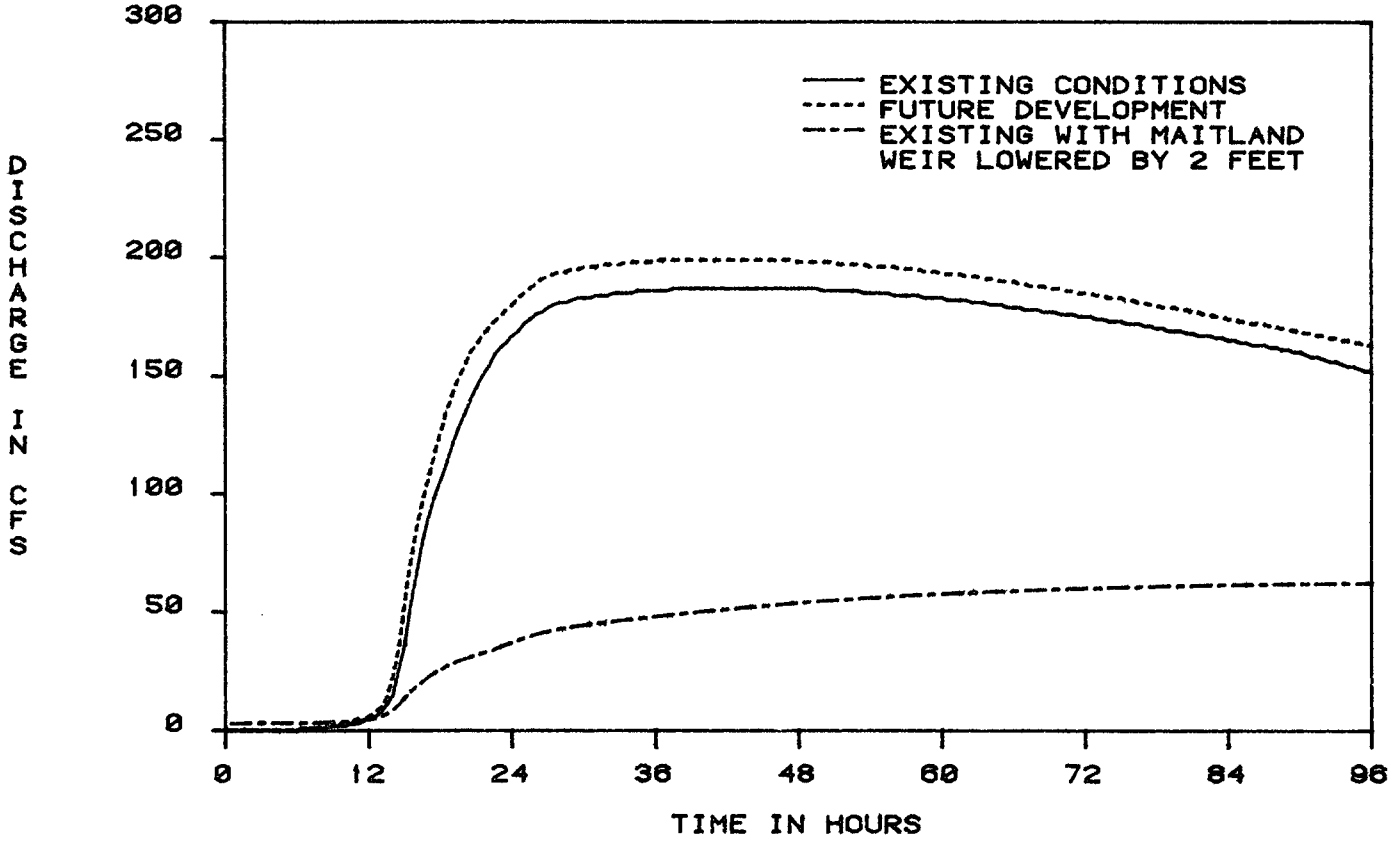



FIGURE B17. LAKE OSCEOLA : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

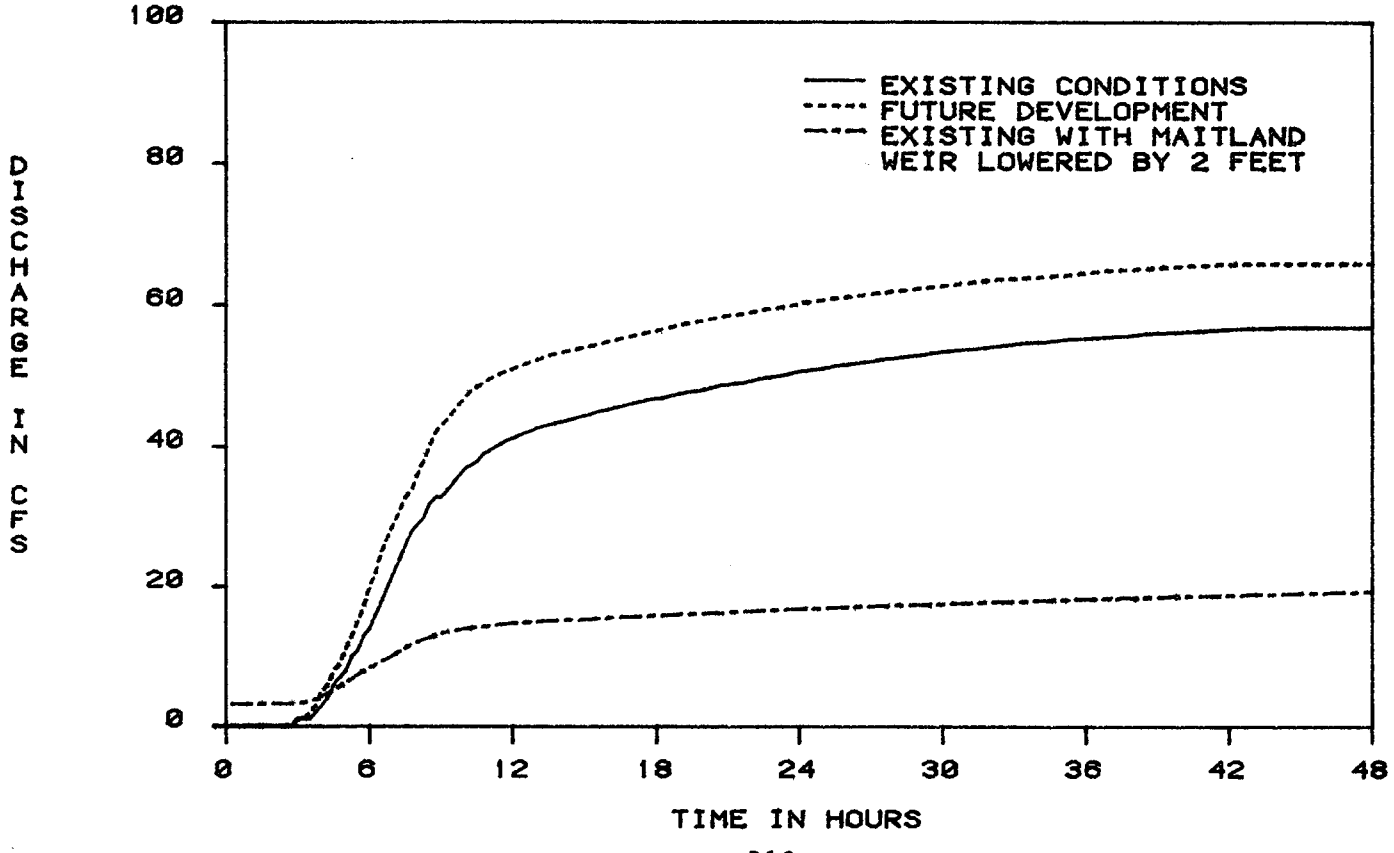


FIGURE B18. LAKE KILLARNEY WEIR : 10-YEAR DISCHARGE HYDROGRAPHS

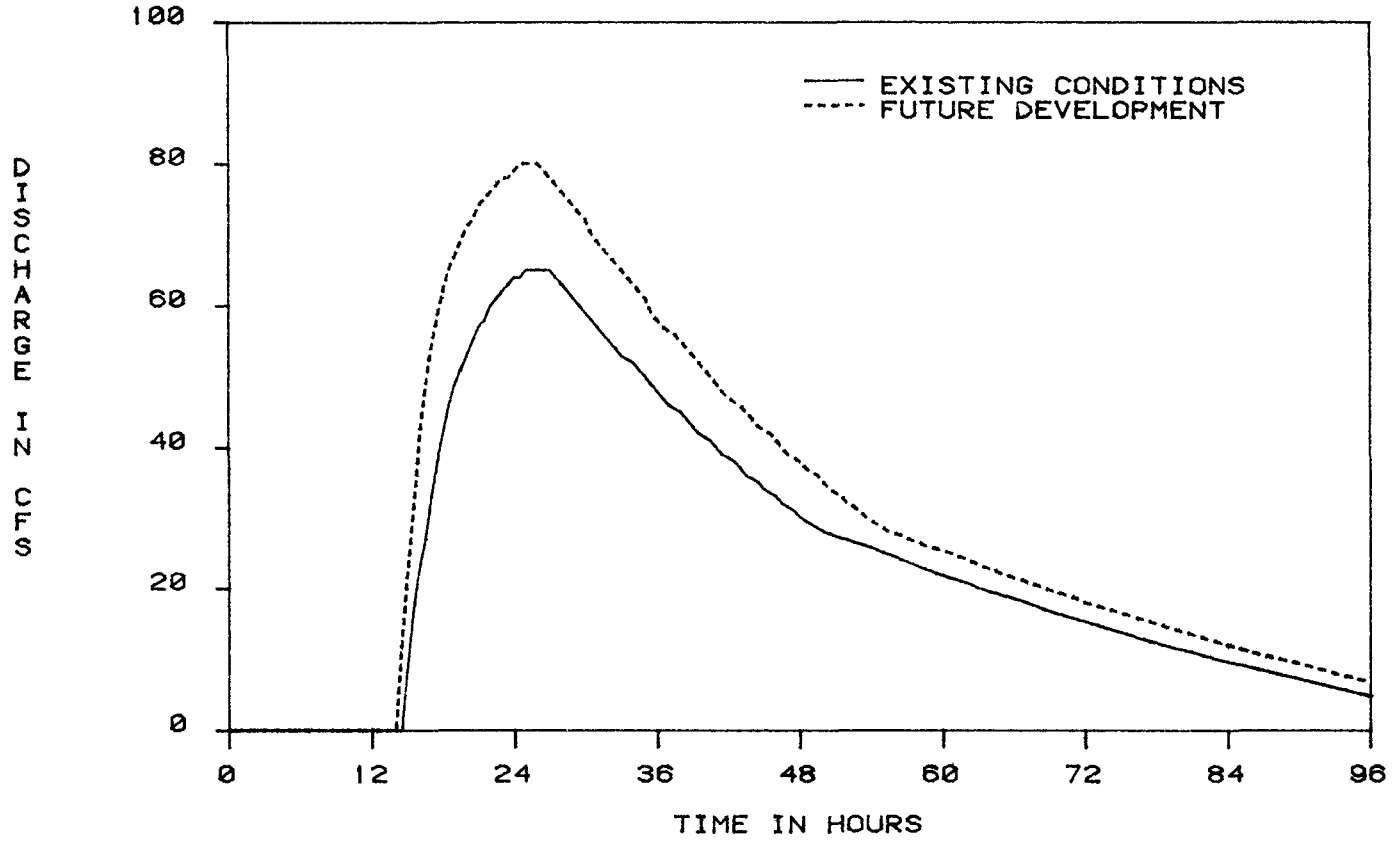



FIGURE B19. LAKE KILLARNEY WEIR : 25-YEAR DISCHARGE HYDROGRAPHS

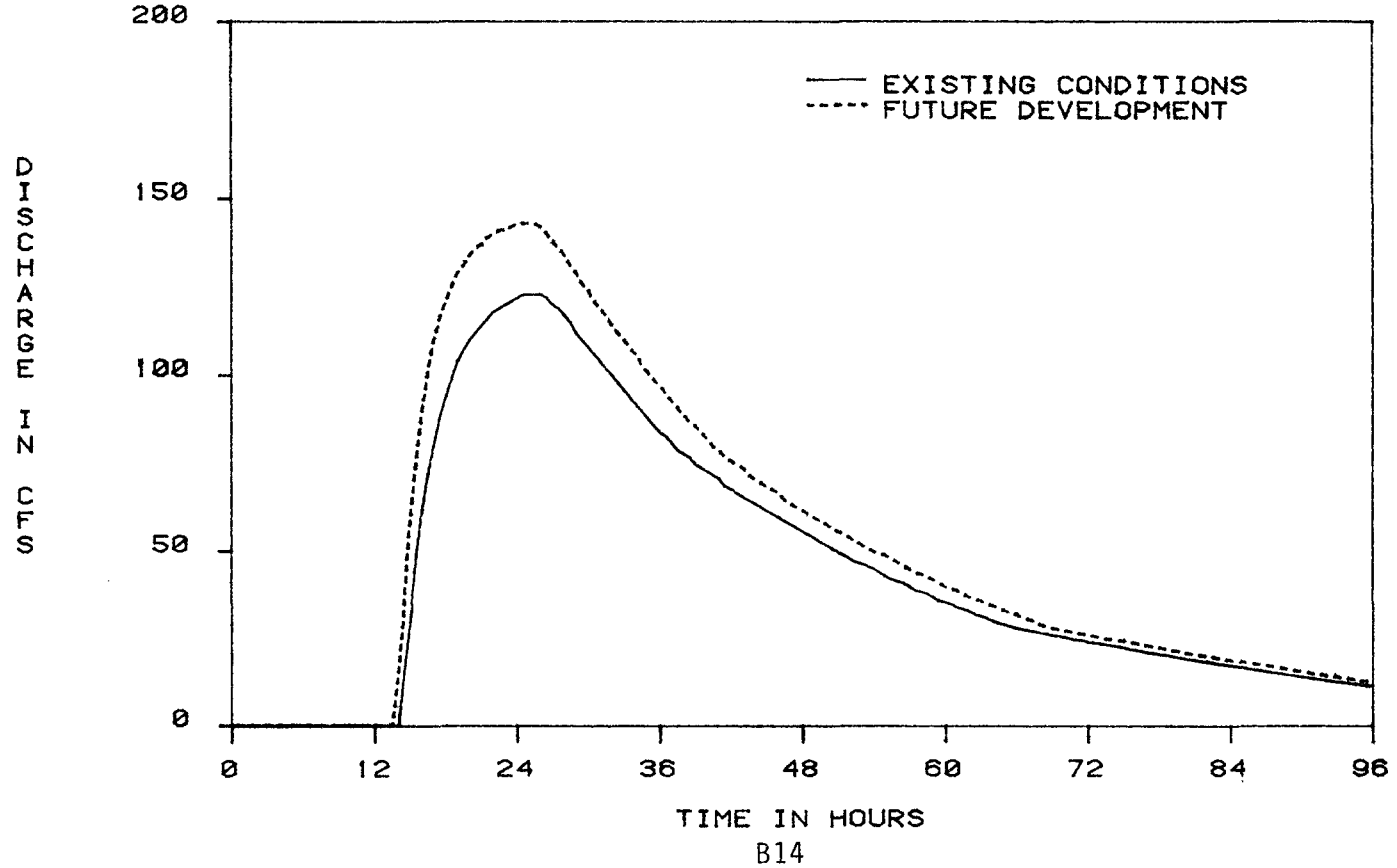


FIGURE B20. LAKE KILLARNEY WEIR : 100-YEAR DISCHARGE HYDROGRAPHS

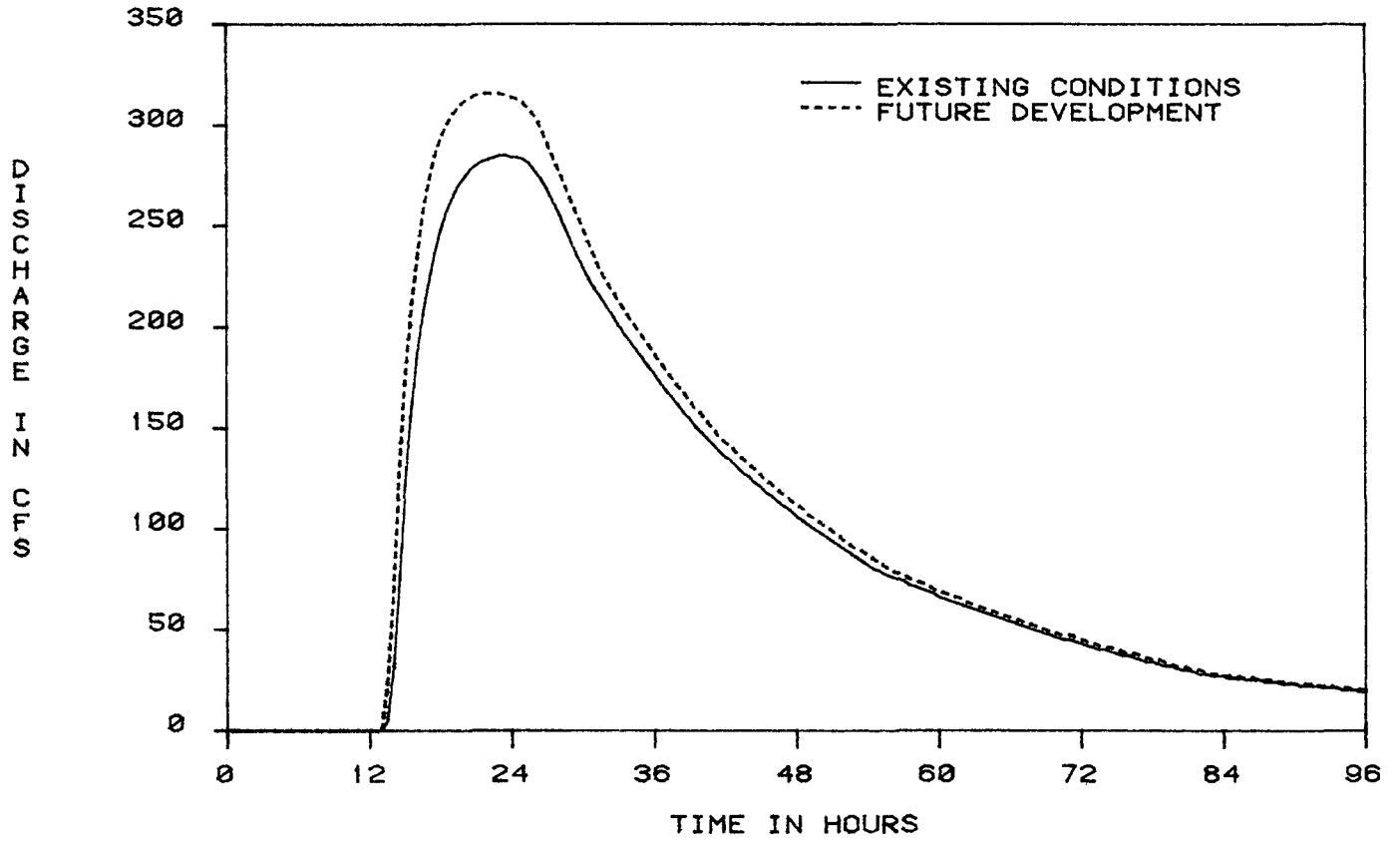



FIGURE B21. LAKE KILLARNEY WEIR : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

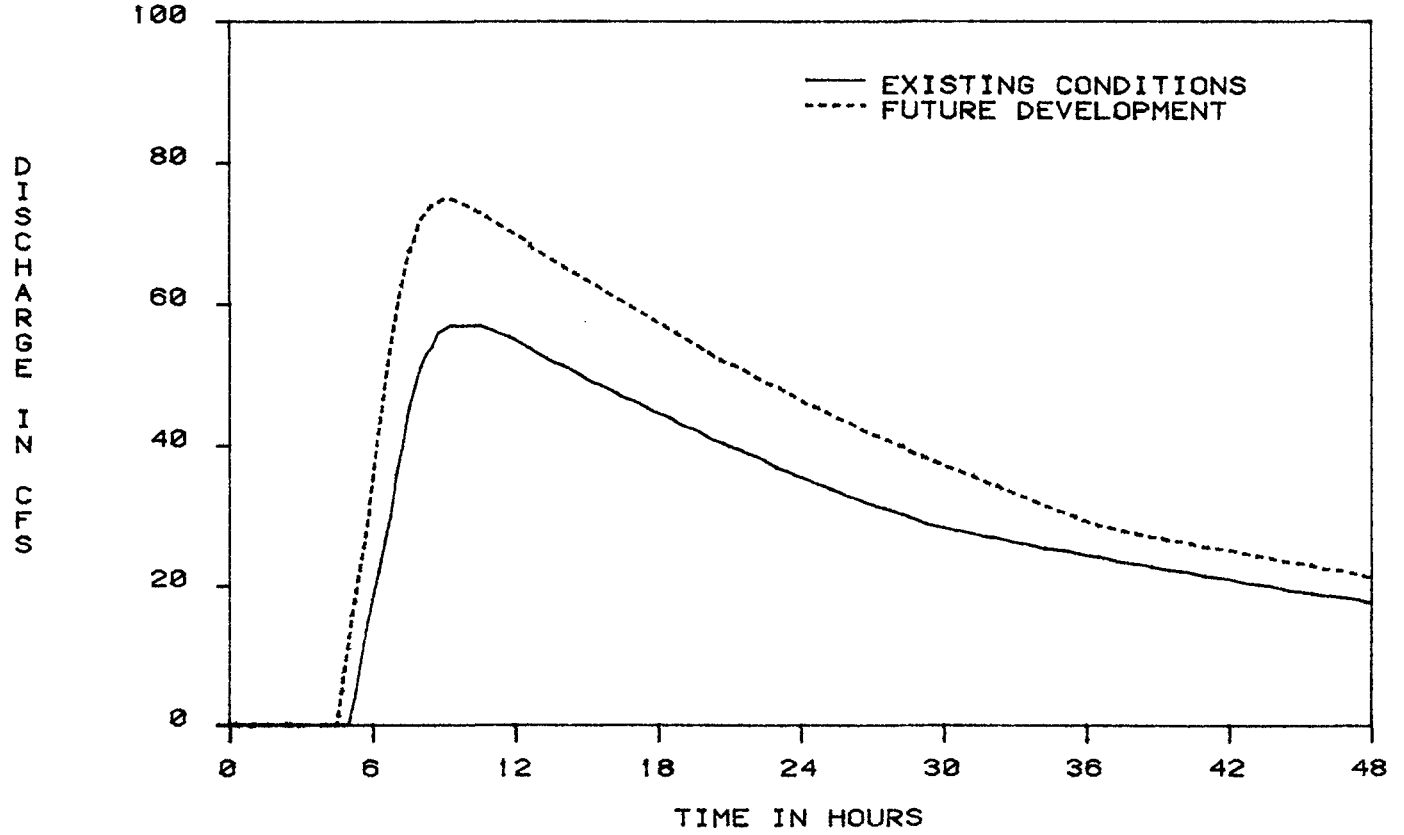


FIGURE B22. PARK LAKE : 10-YEAR DISCHARGE HYDROGRAPHS

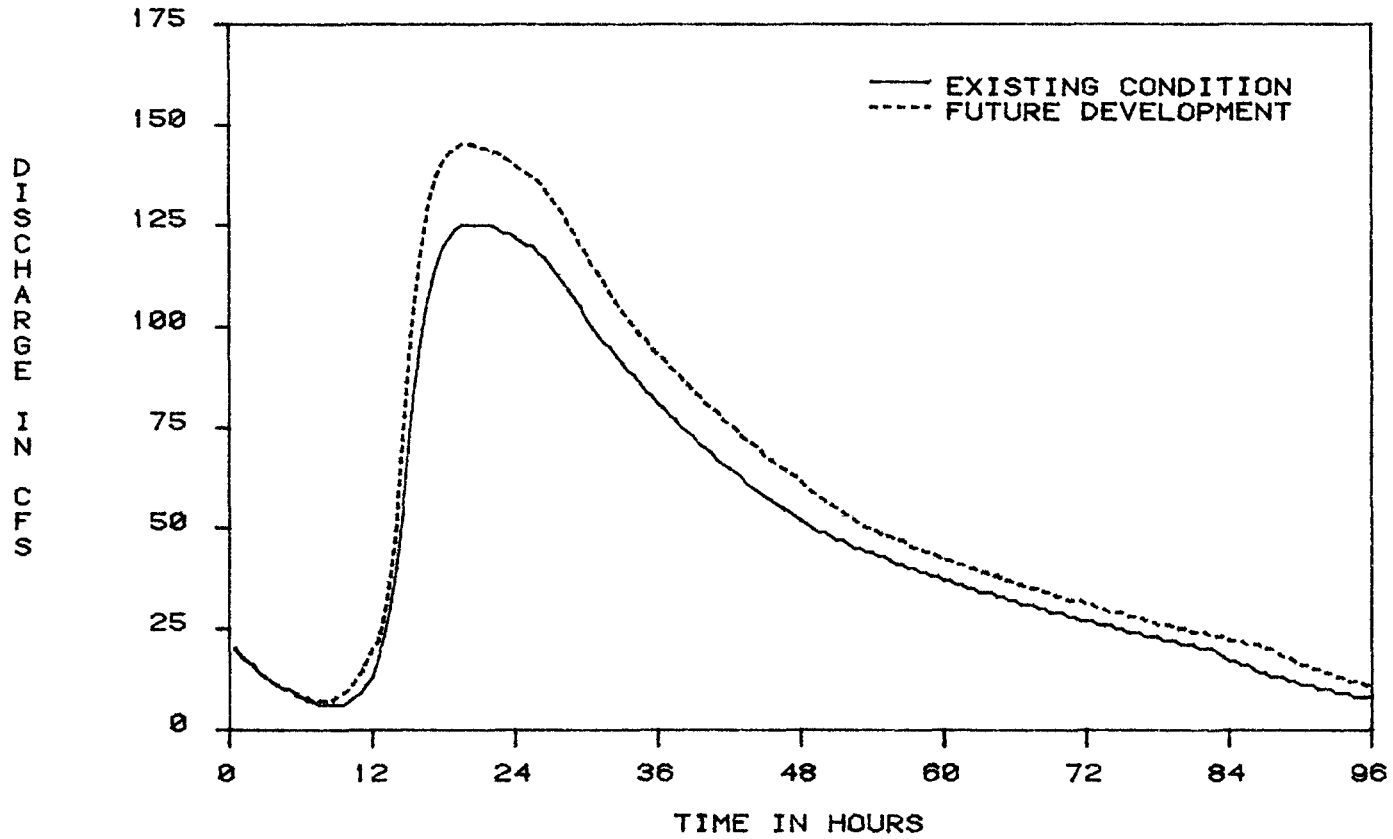



FIGURE B23. PARK LAKE : 25-YEAR DISCHARGE HYDROGRAPHS

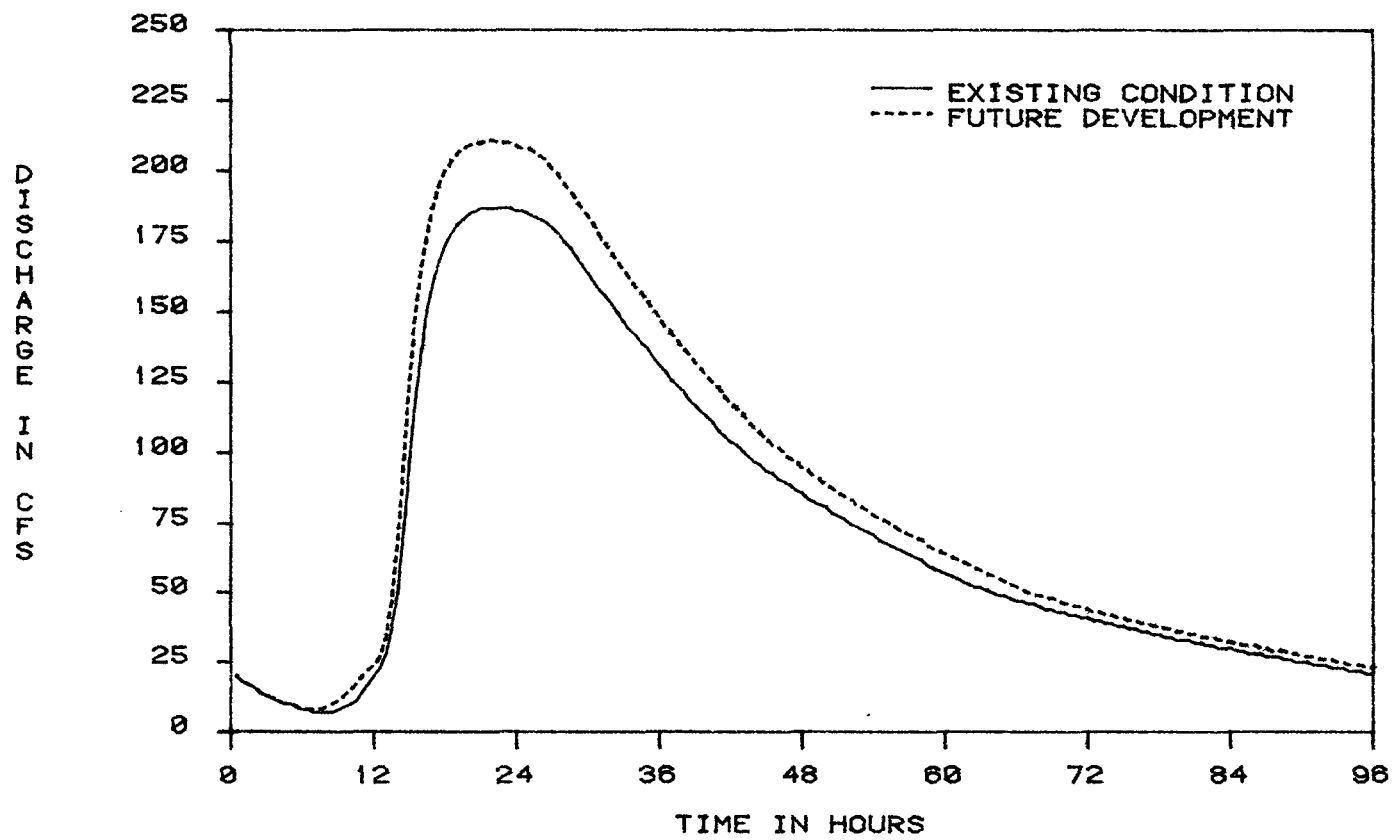


FIGURE B24. PARK LAKE : 100-YEAR DISCHARGE HYDROGRAPHS

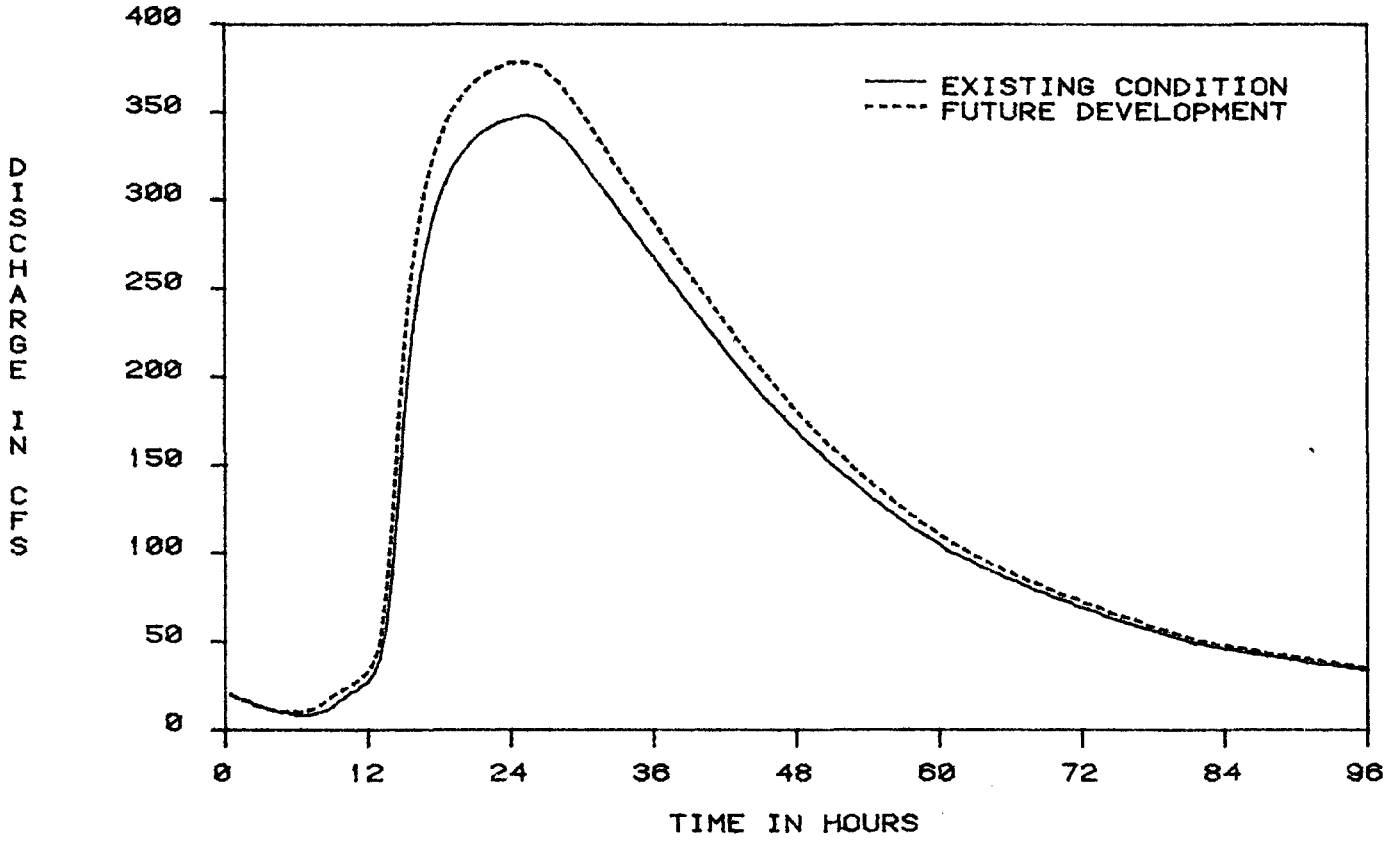



FIGURE B25. PARK LAKE : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

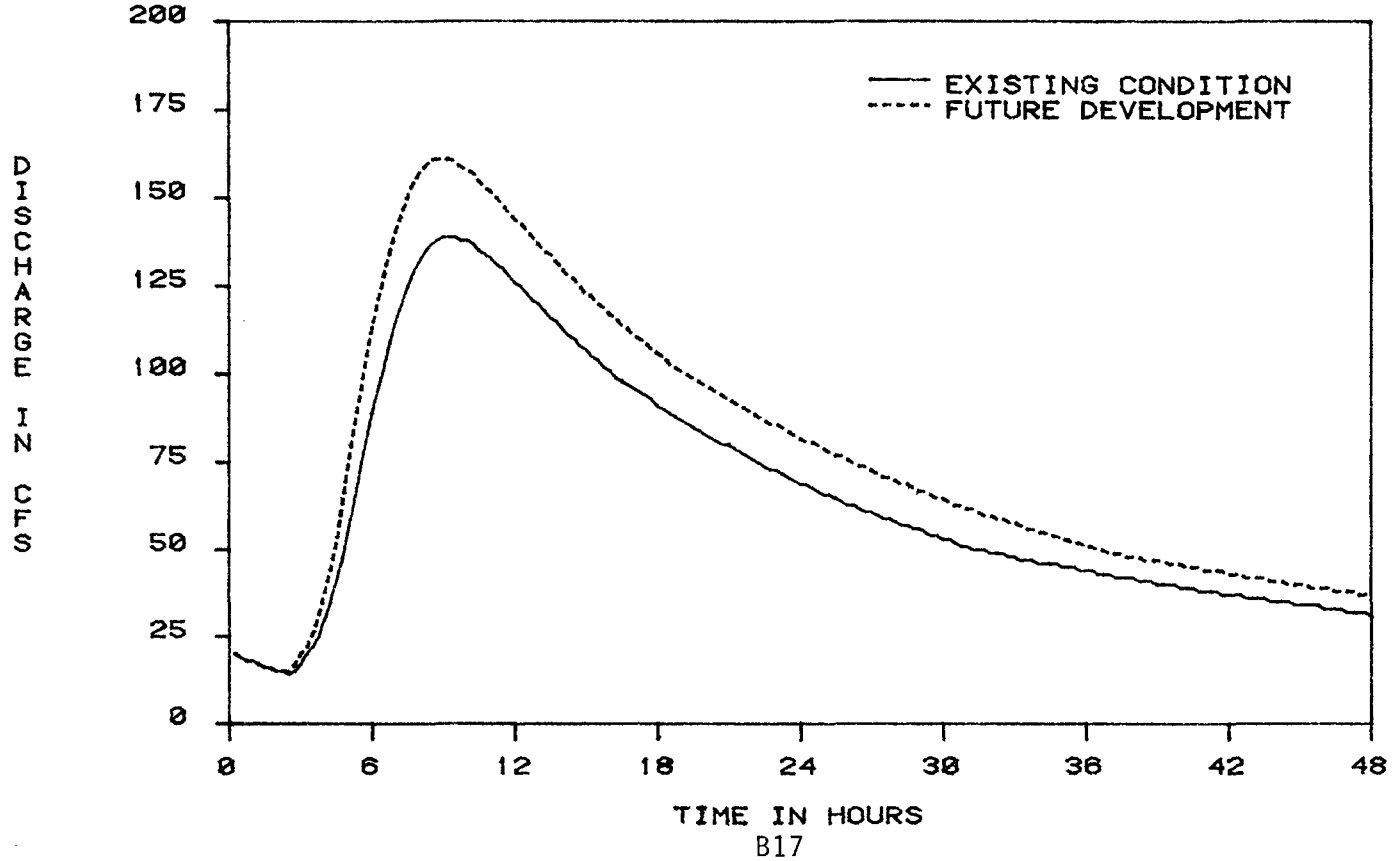


FIGURE B26. LAKE MINNEHAHA : 10-YEAR DISCHARGE HYDROGRAPHS

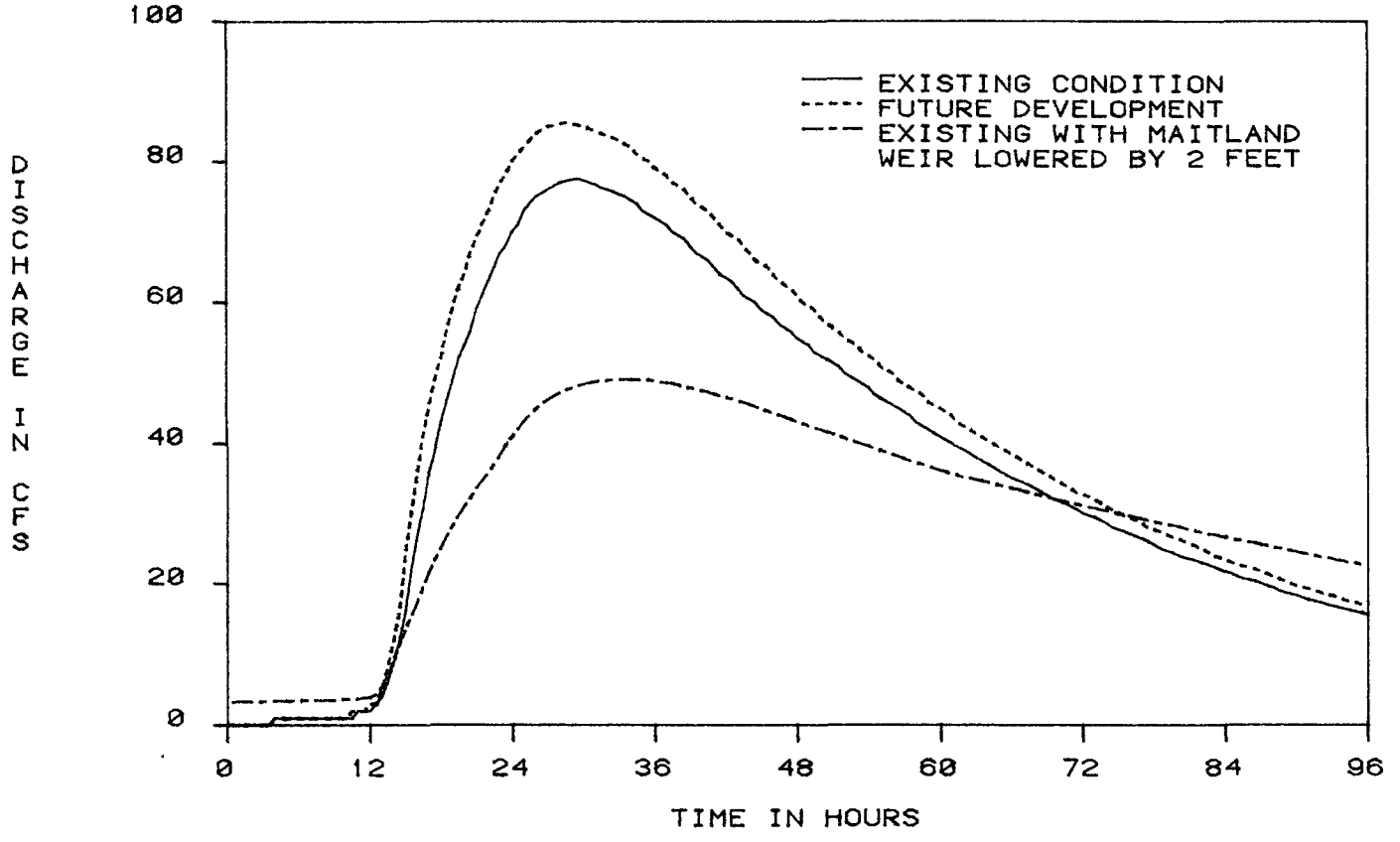



FIGURE B27. LAKE MINNEHAHA : 25-YEAR DISCHARGE HYDROGRAPHS

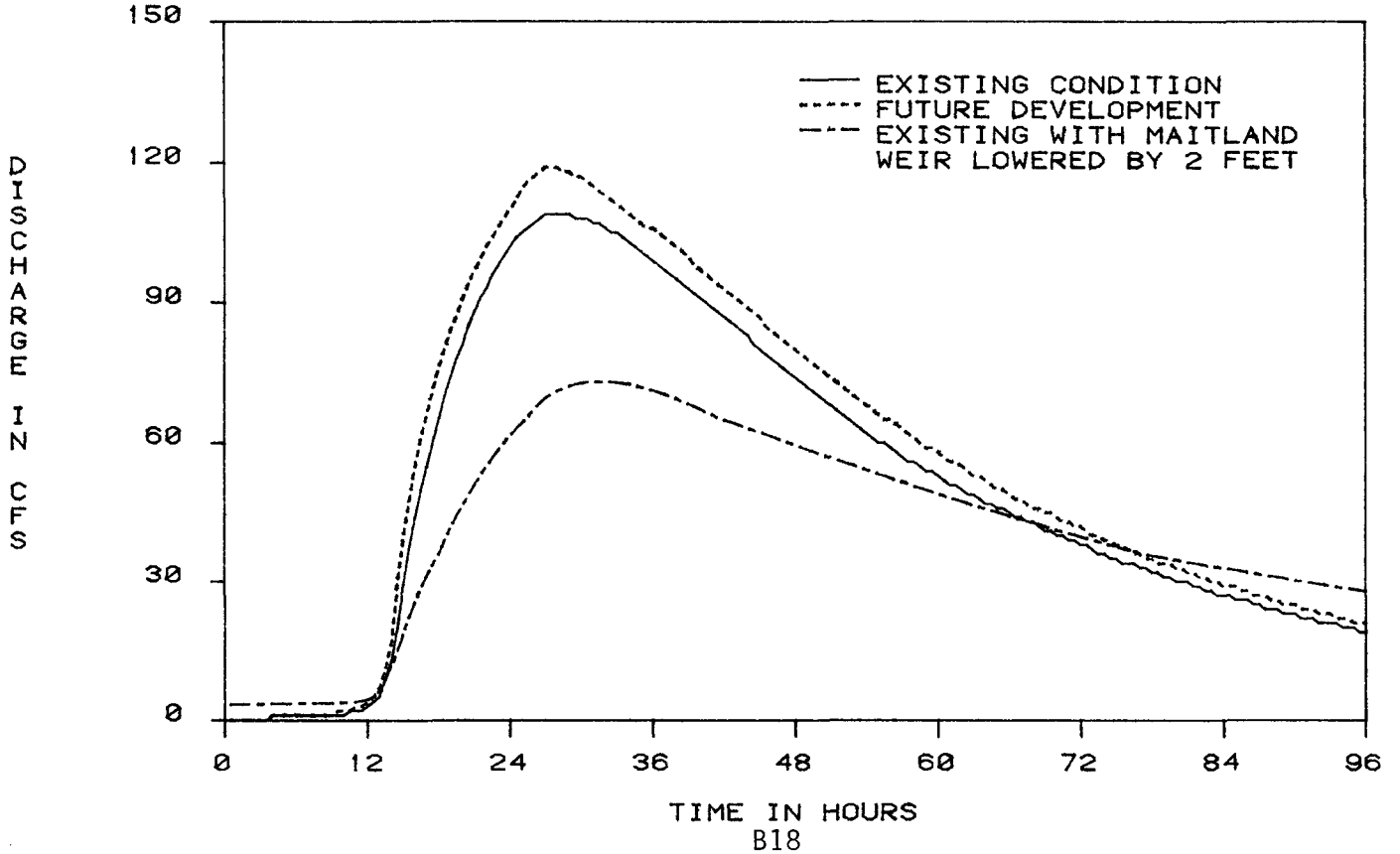


FIGURE B28. LAKE MINNEHAHA : 100-YEAR DISCHARGE HYDROGRAPHS

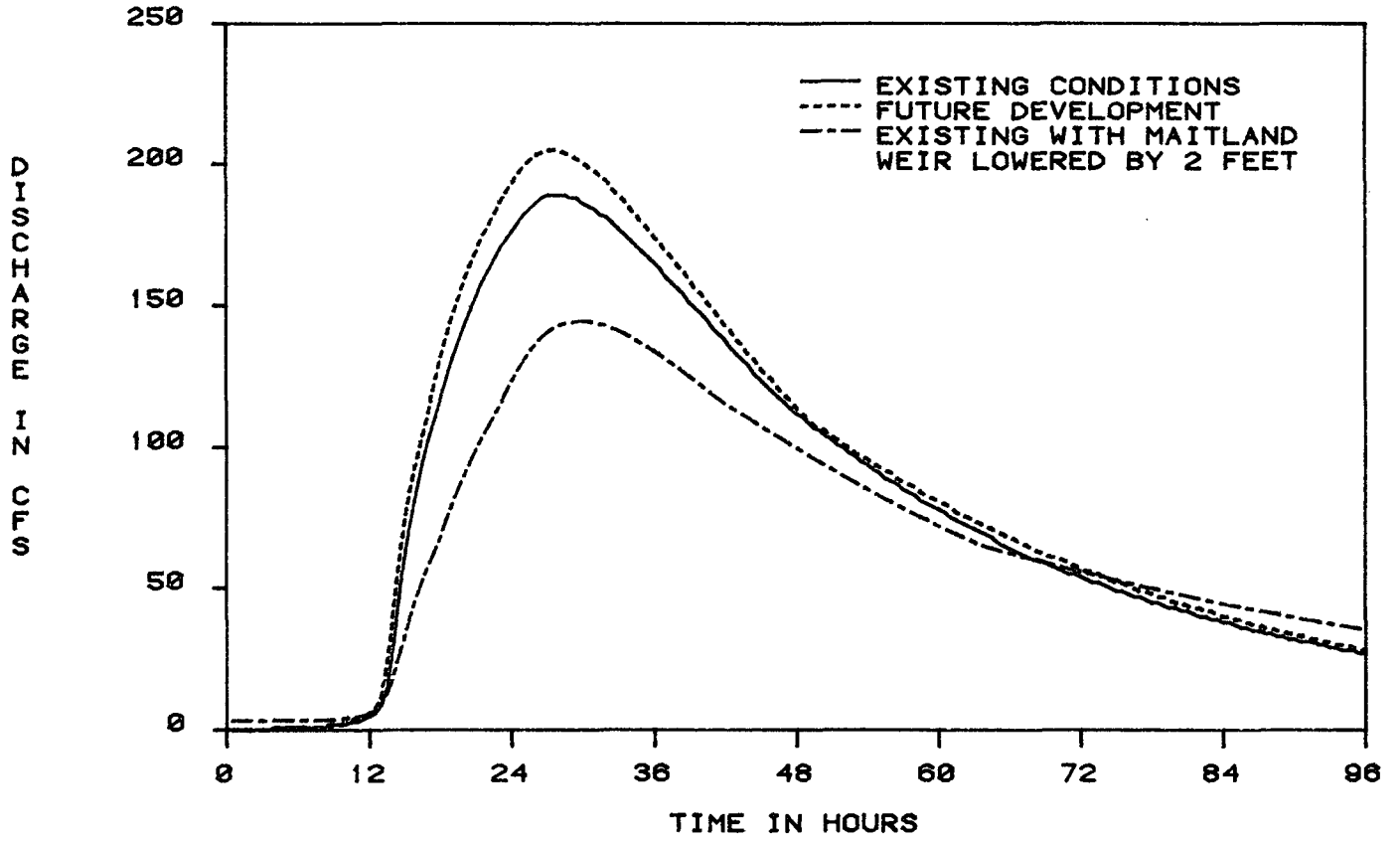



FIGURE B29. LAKE MINNEHAHA : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

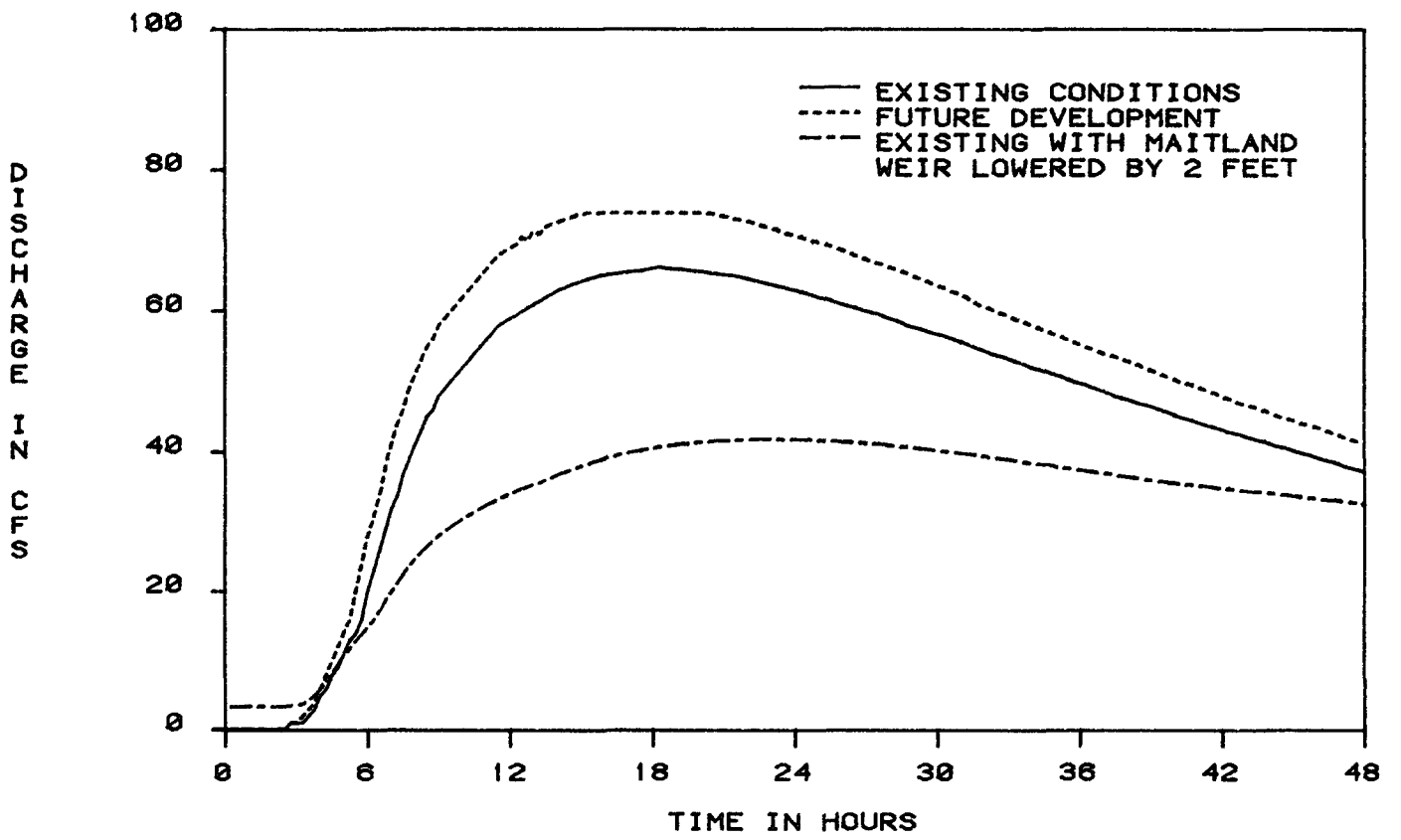


FIGURE B30. LAKE MAITLAND WEIR : 10-YEAR DISCHARGE HYDROGRAPHS

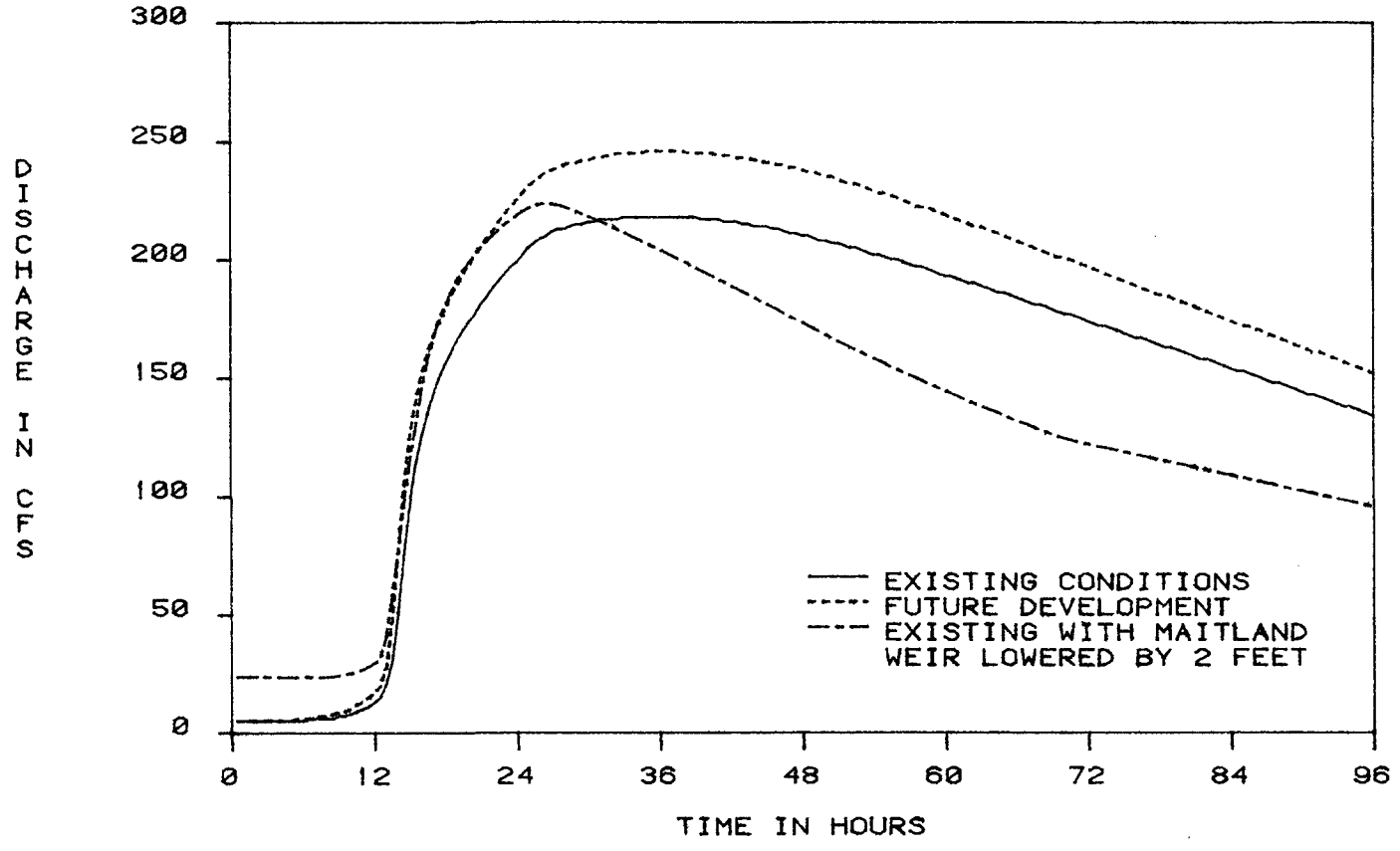



FIGURE B31. LAKE MAITLAND WEIR : 25-YEAR DISCHARGE HYDROGRAPHS

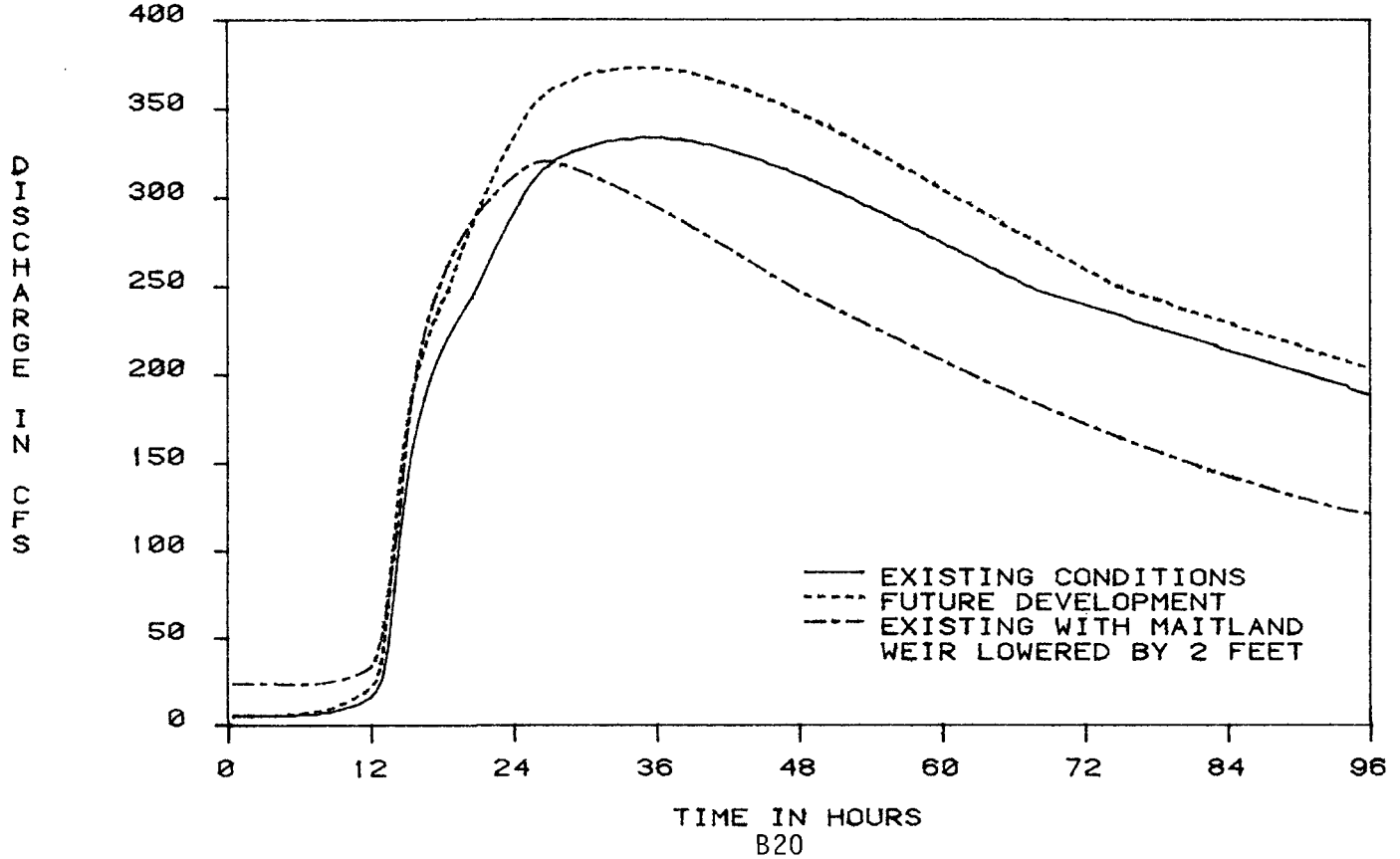


FIGURE B32. LAKE MAITLAND WEIR : 100-YEAR DISCHARGE HYDROGRAPHS

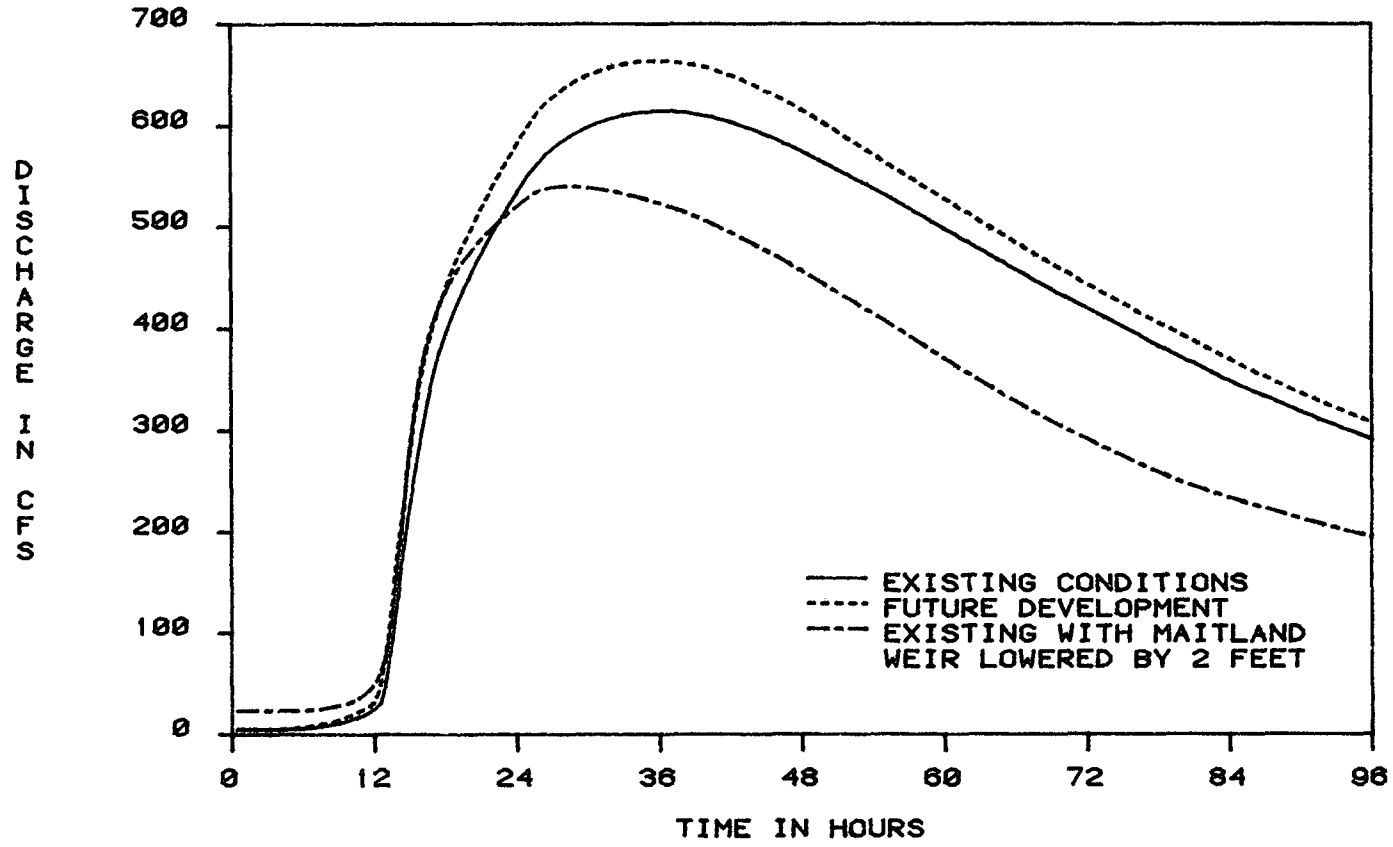



FIGURE B33. LAKE MAITLAND WEIR : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

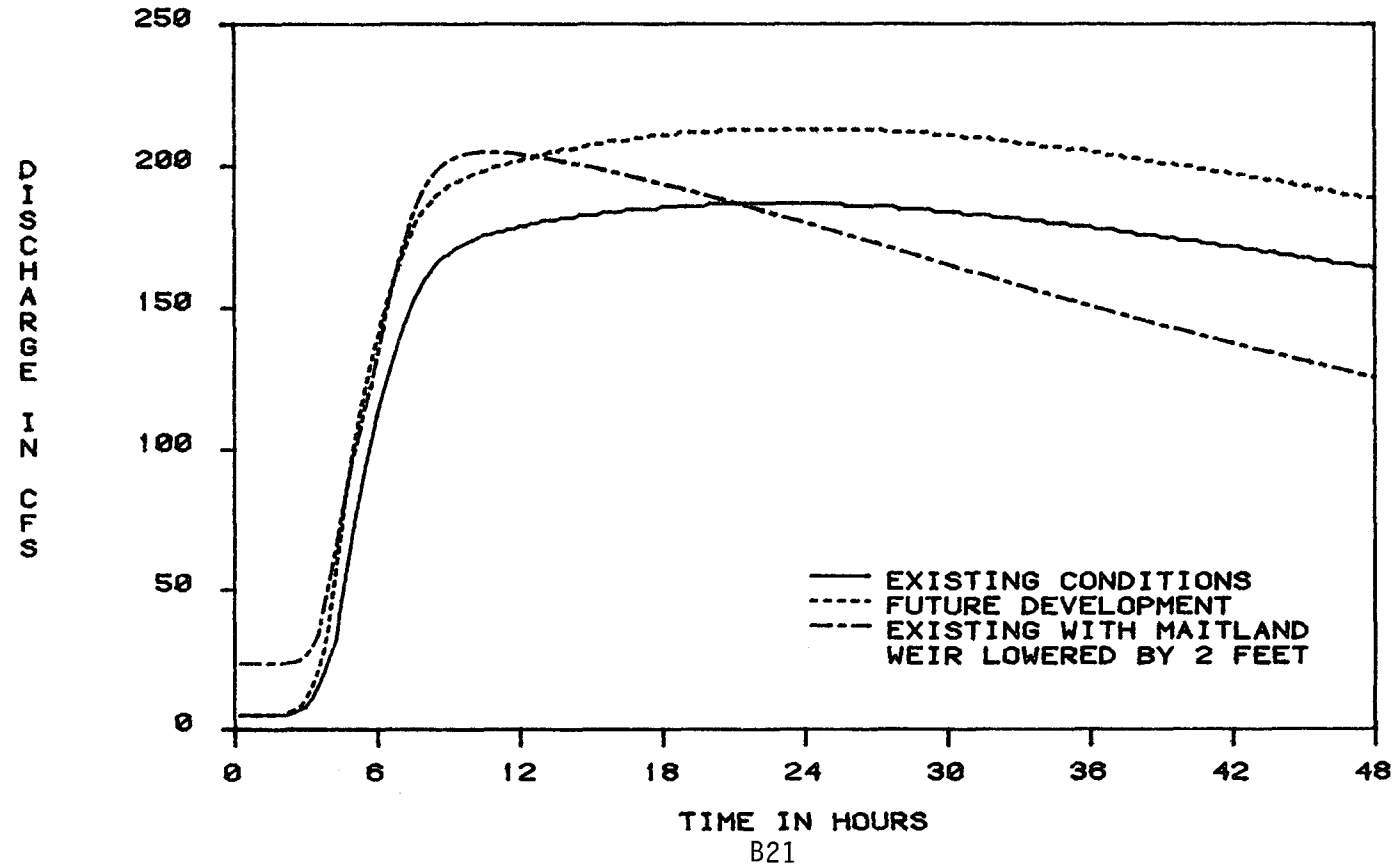


FIGURE B34. AT SR436 : 10-YEAR DISCHARGE HYDROGRAPHS

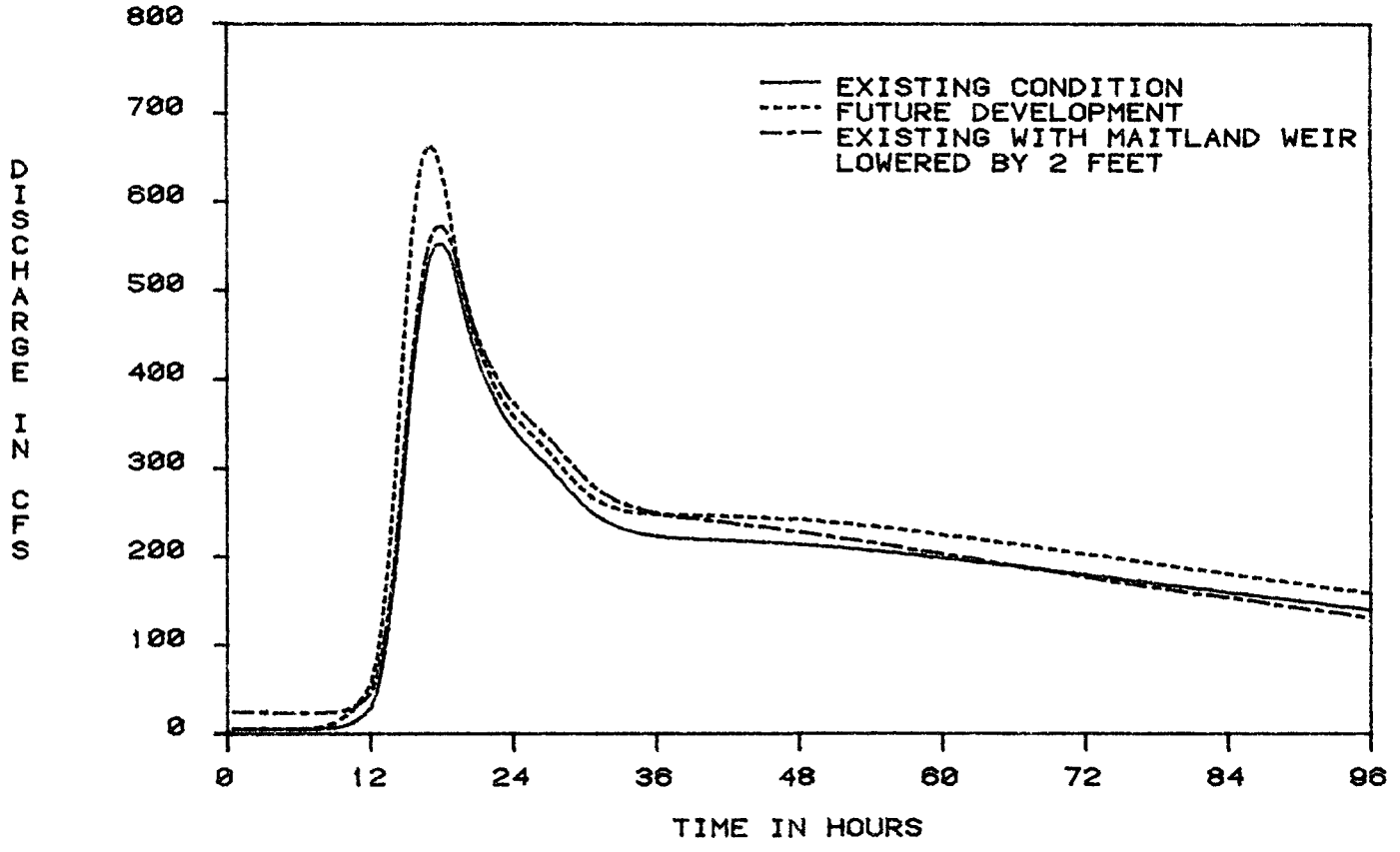



FIGURE B35. AT SR436 : 25-YEAR DISCHARGE HYDROGRAPHS

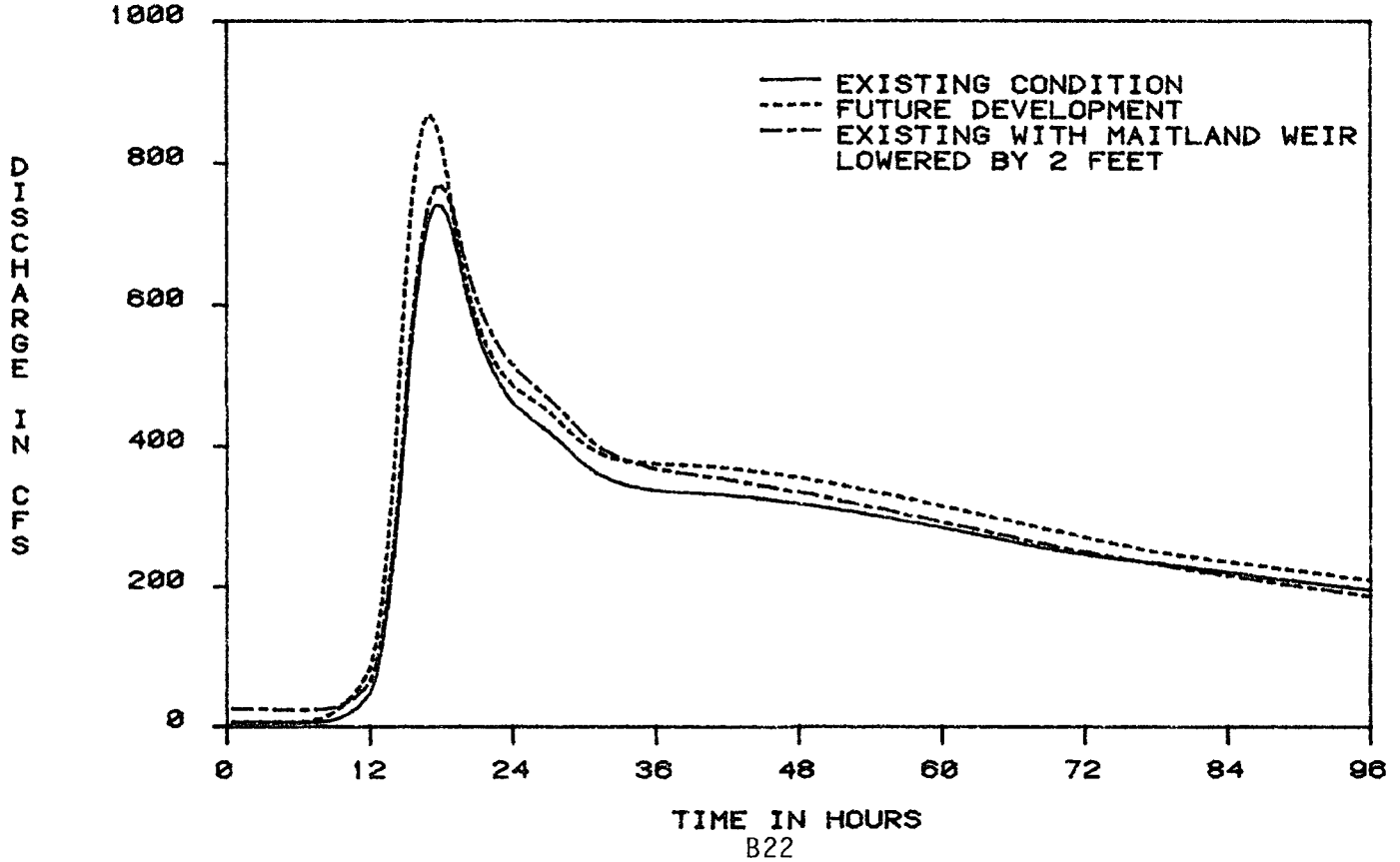


FIGURE B36. AT SR436 : 100-YEAR DISCHARGE HYDROGRAPHS

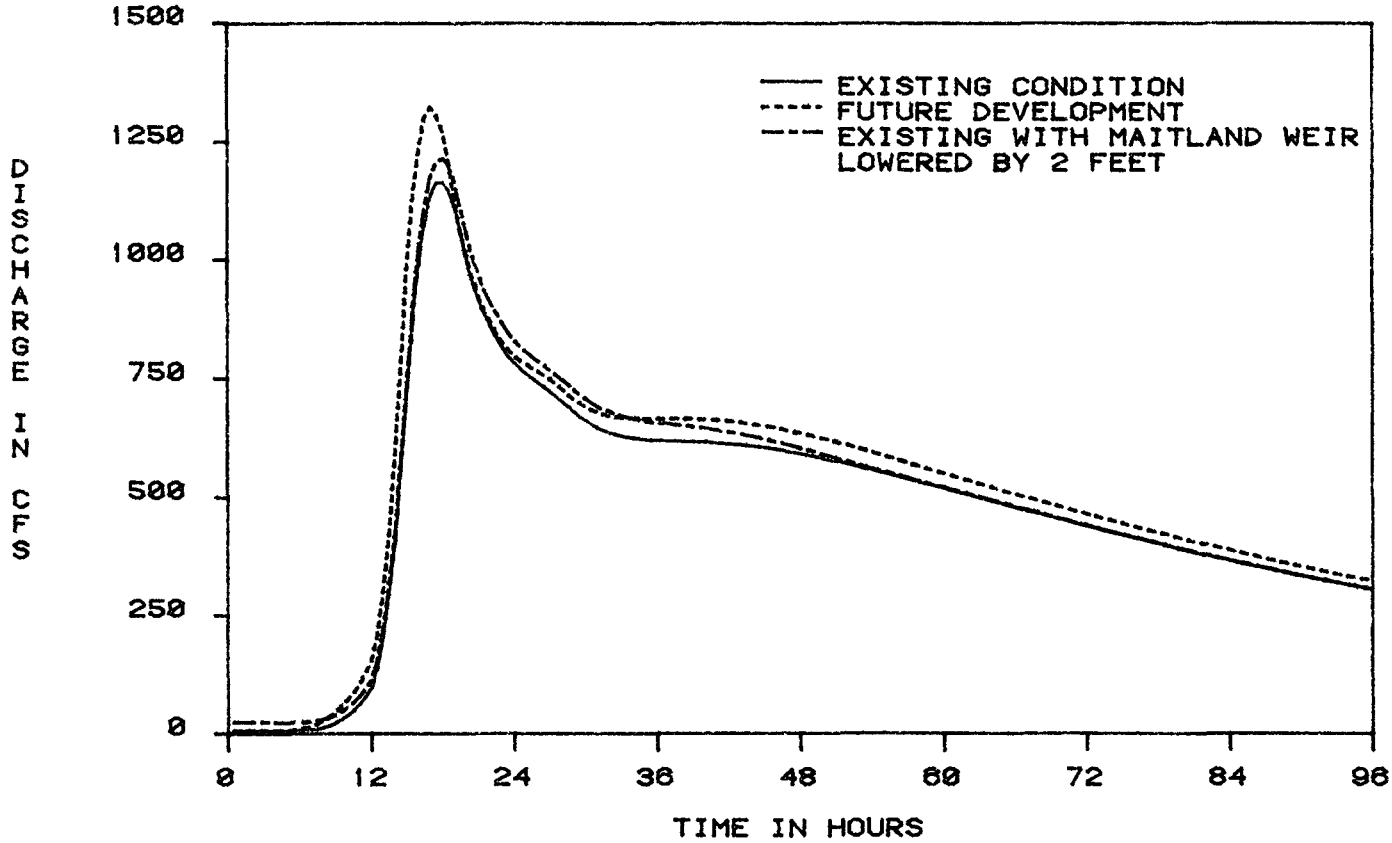



FIGURE B37. AT SR436 : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

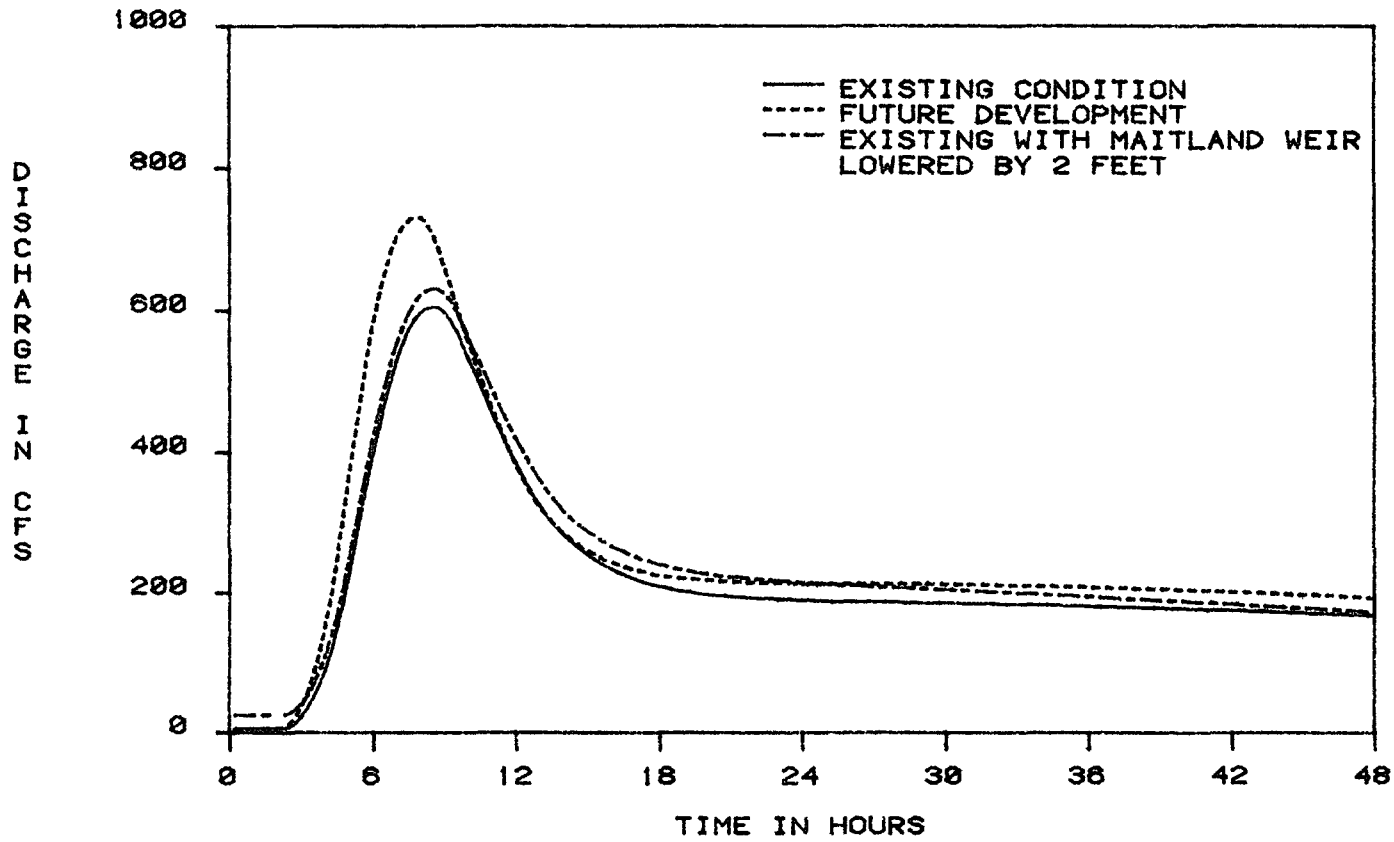


FIGURE B38. LAKE HOWELL : 10-YEAR DISCHARGE HYDROGRAPHS

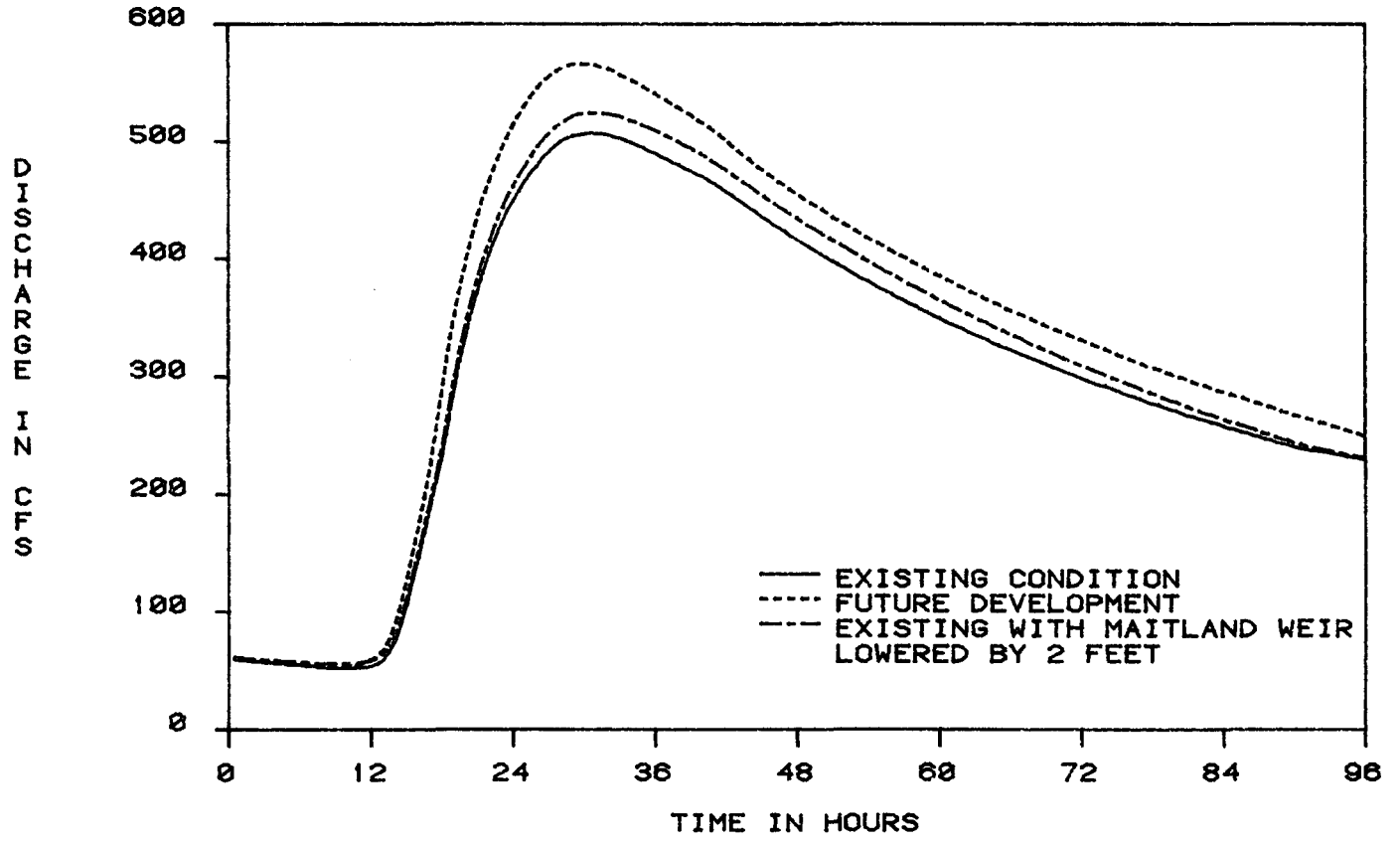



FIGURE B39. LAKE HOWELL : 25-YEAR DISCHARGE HYDROGRAPHS

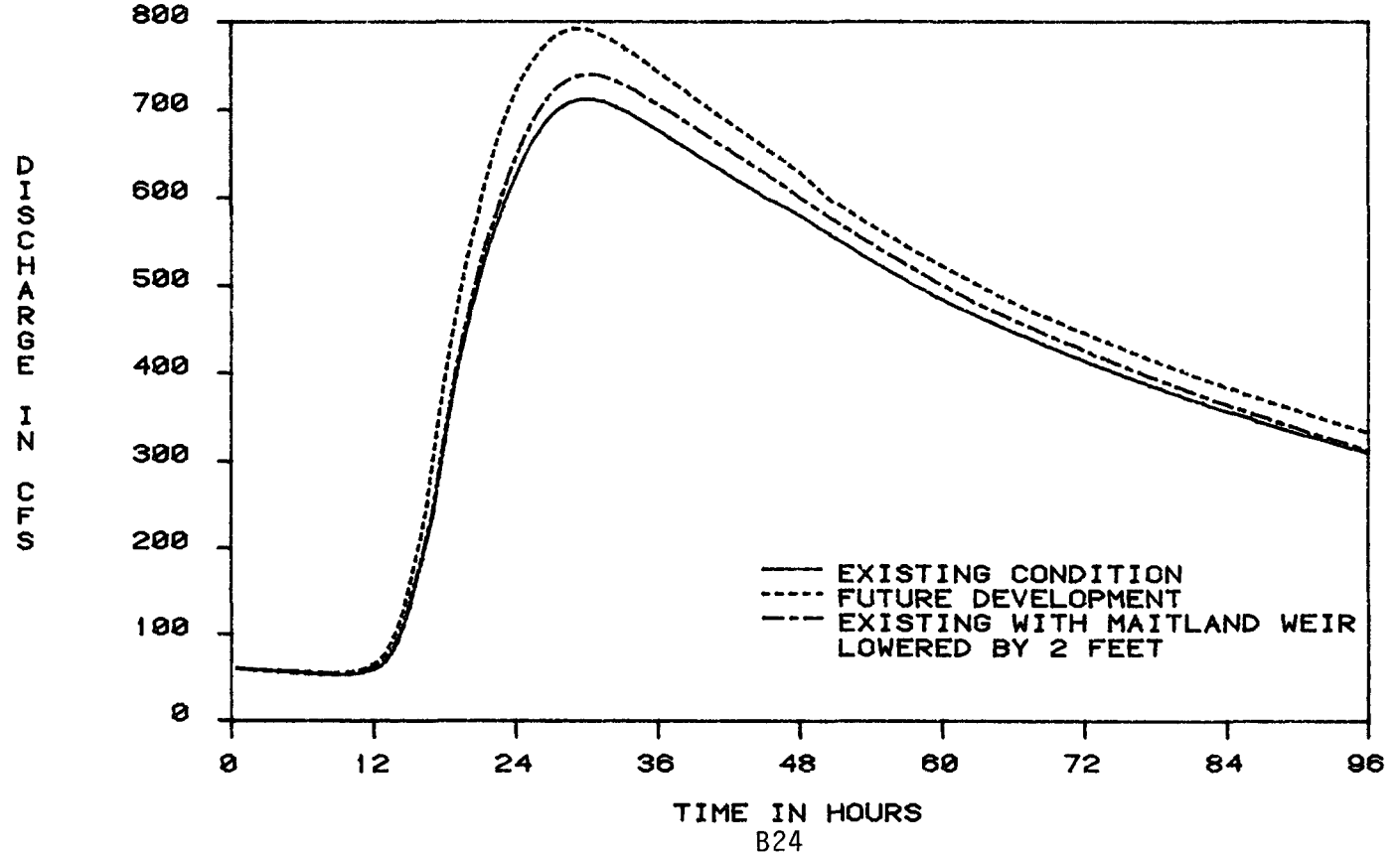


FIGURE B40. LAKE HOWELL : 100-YEAR DISCHARGE HYDROGRAPHS

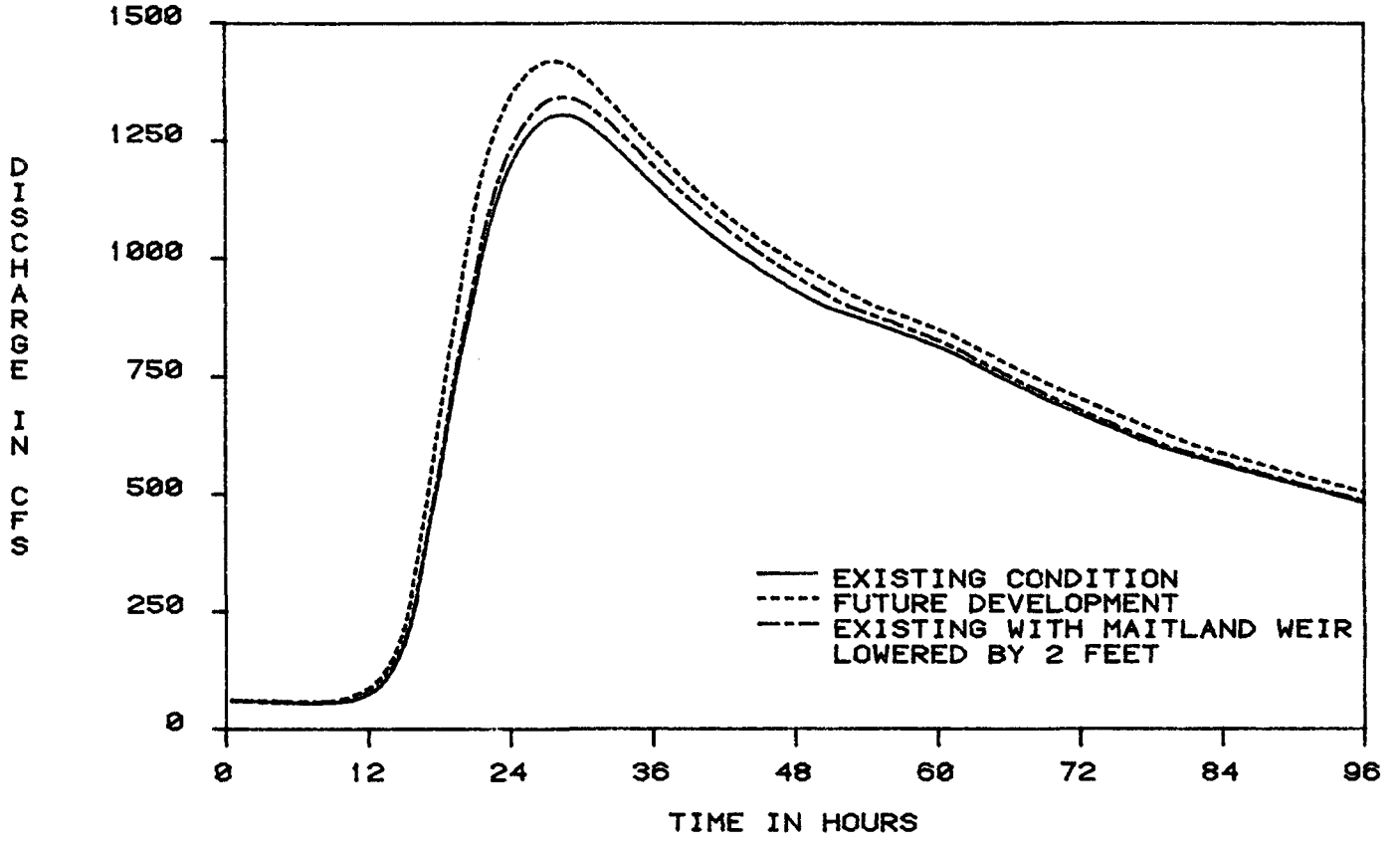



FIGURE B41. LAKE HOWELL : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

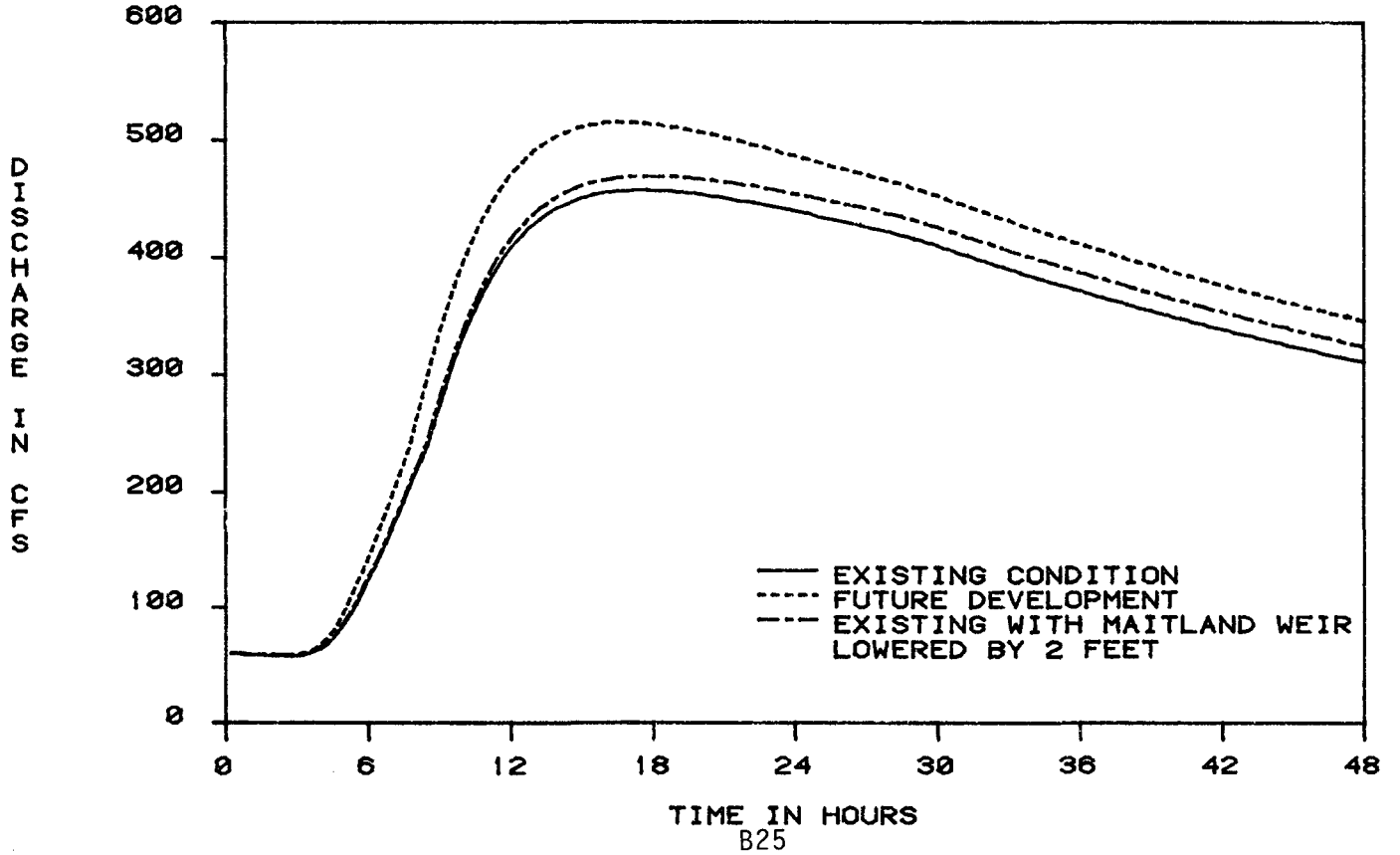


FIGURE B42. LAKE BURKETT : 10-YEAR DISCHARGE HYDROGRAPHS

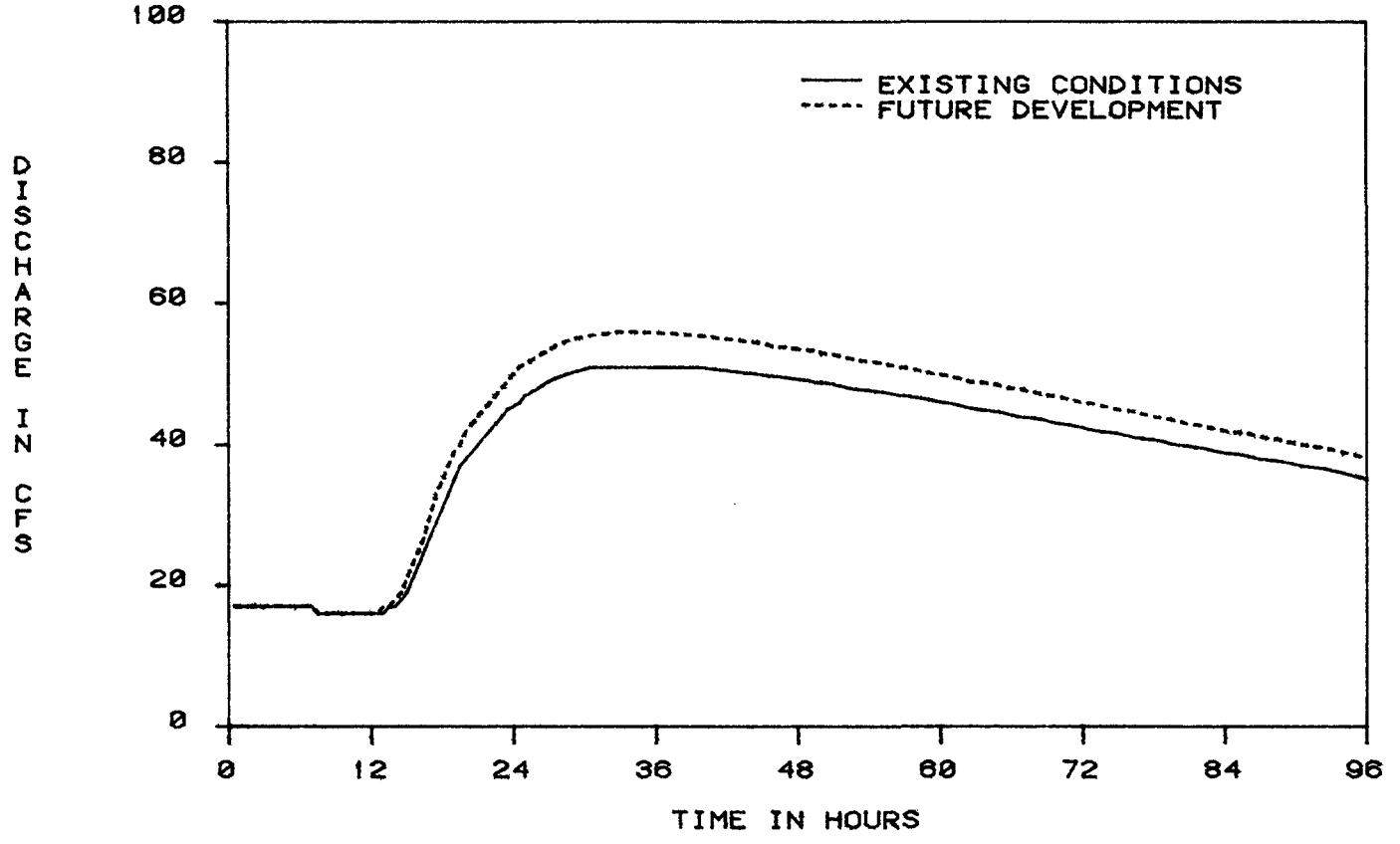



FIGURE B43. LAKE BURKETT : 25-YEAR DISCHARGE HYDROGRAPHS

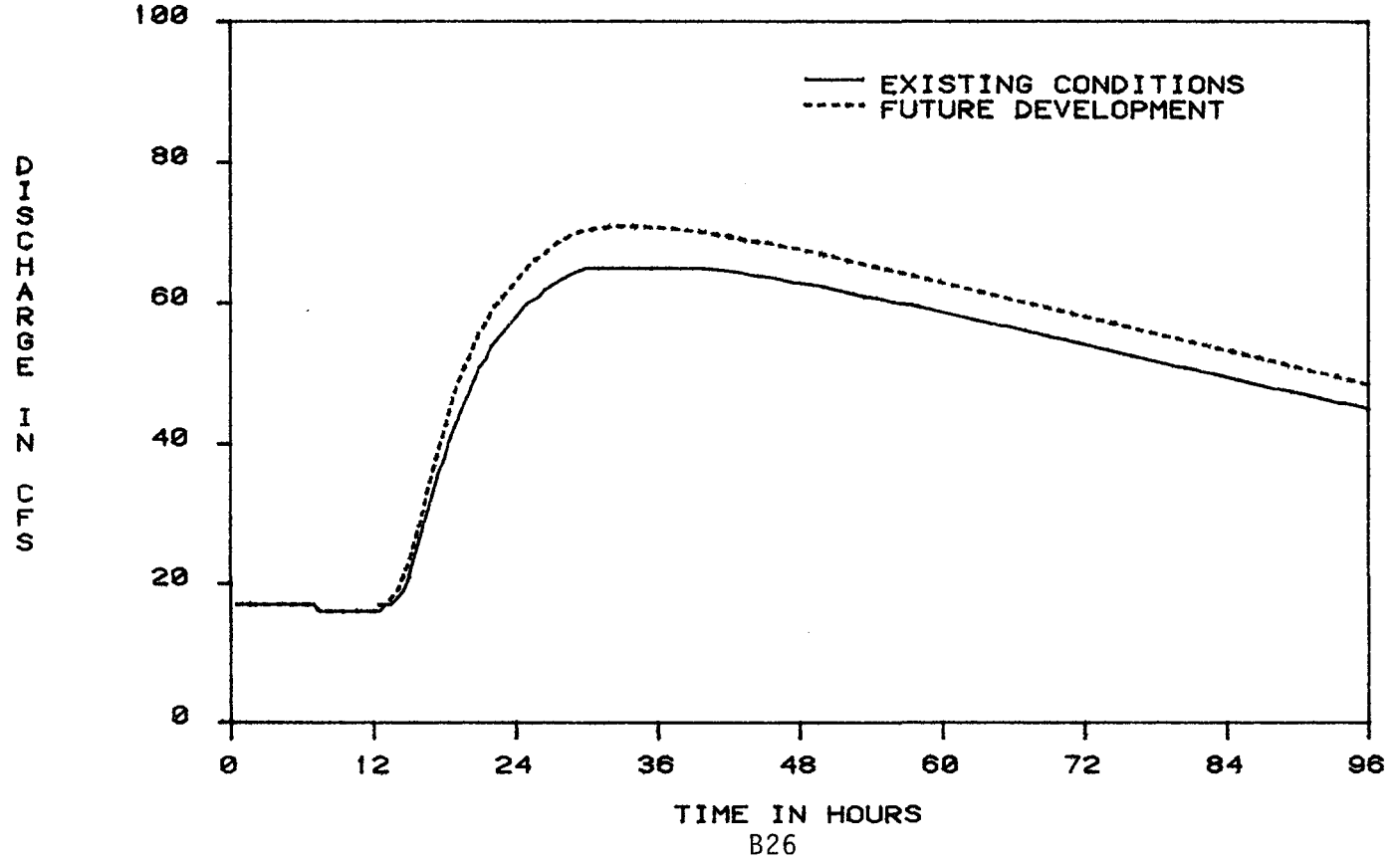


FIGURE B44. LAKE BURKETT : 100-YEAR DISCHARGE HYDROGRAPHS

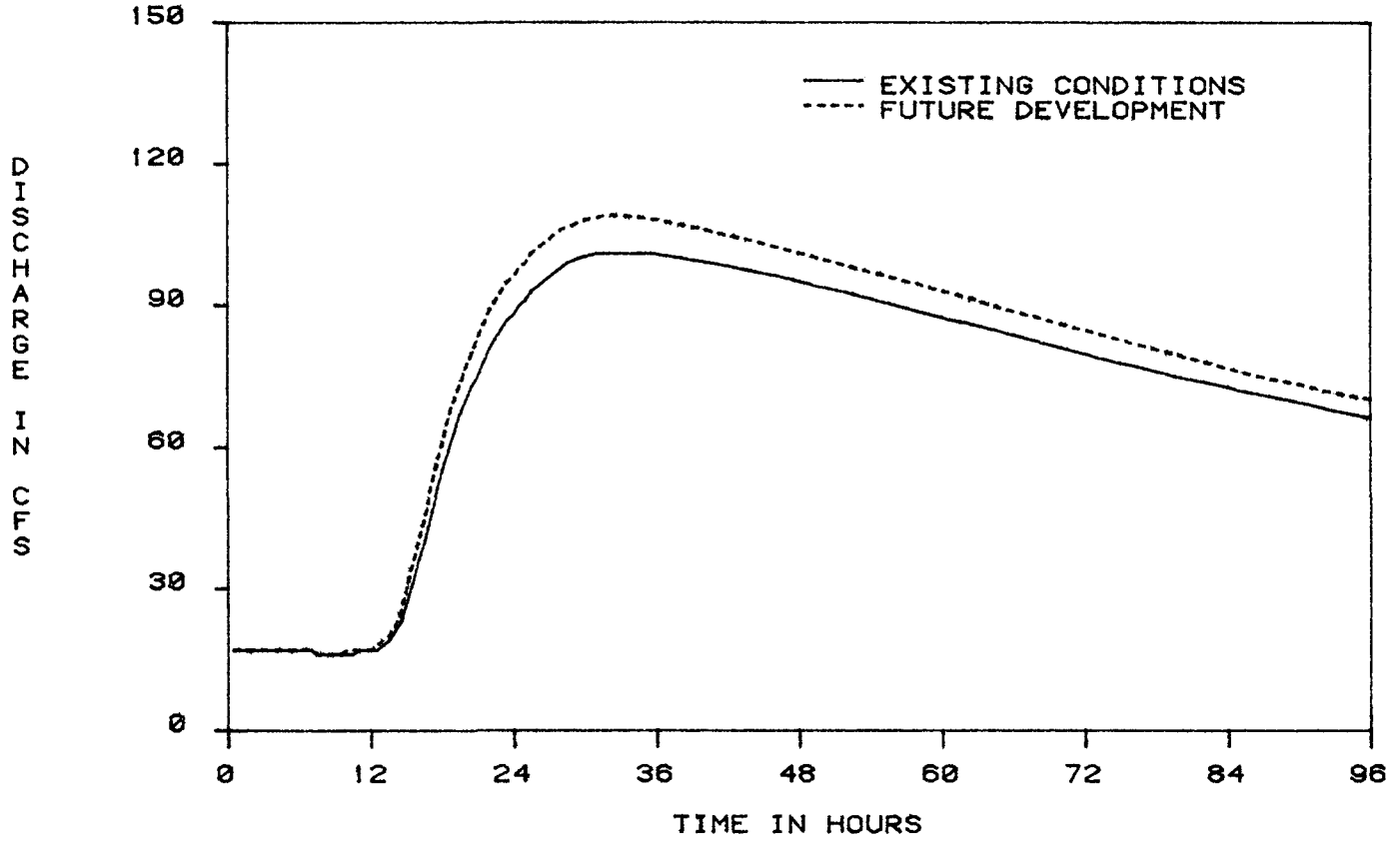



FIGURE B45. LAKE BURKETT : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

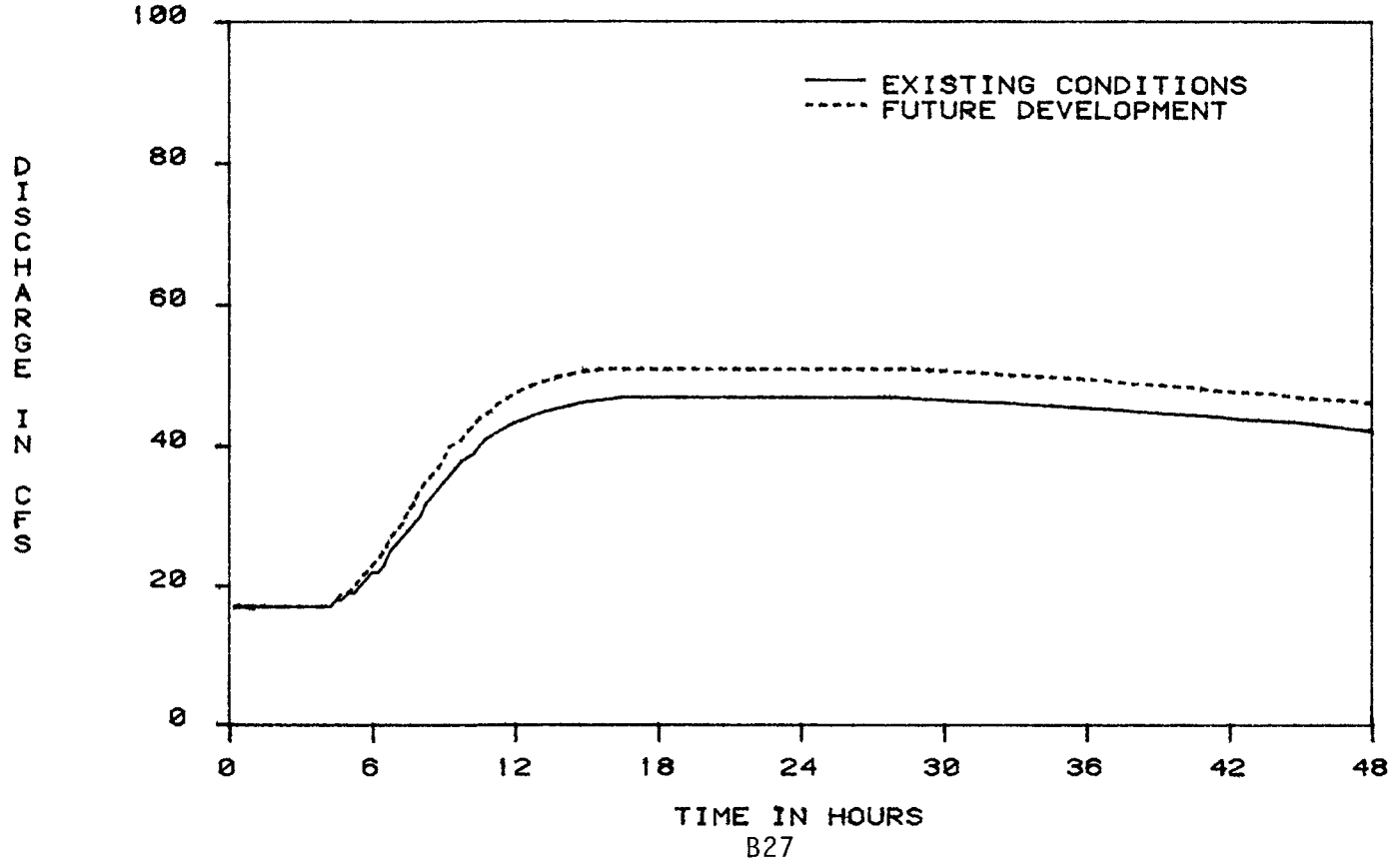


FIGURE B46. BEAR GULLY LAKE : 10-YEAR DISCHARGE HYDROGRAPHS

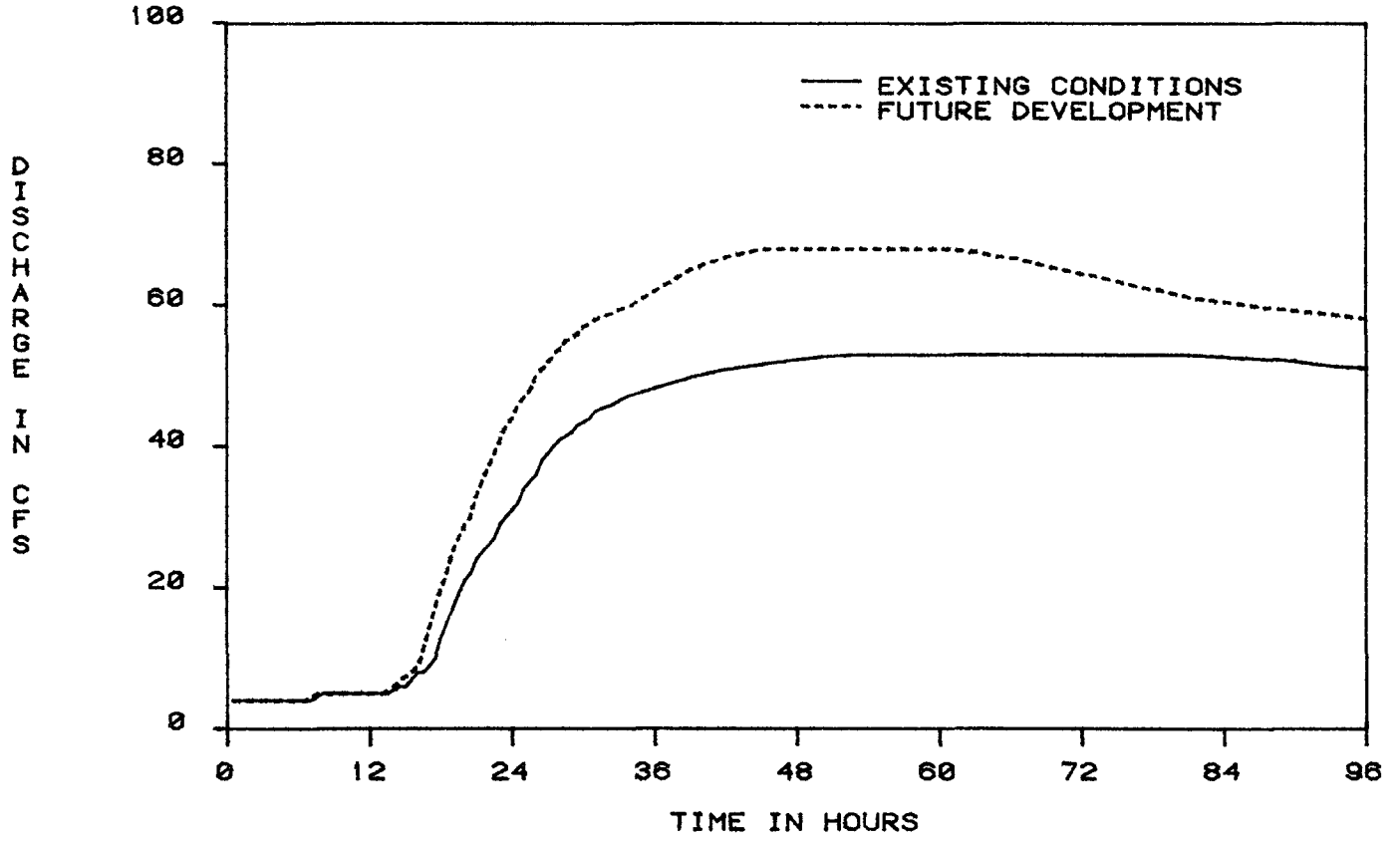



FIGURE B47. BEAR GULLY LAKE : 25-YEAR DISCHARGE HYDROGRAPHS

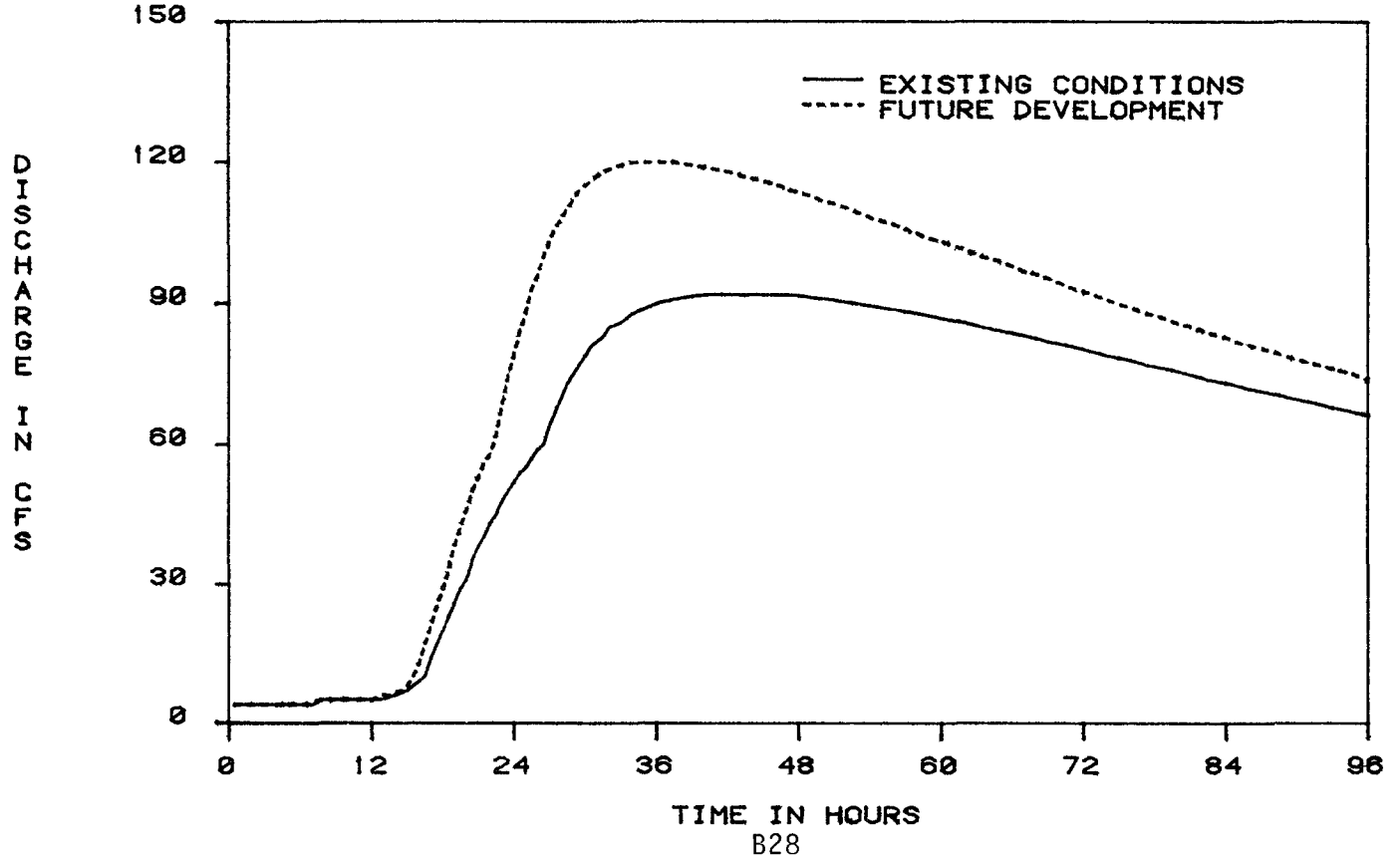


FIGURE B48. BEAR GULLY LAKE : 100-YEAR DISCHARGE HYDROGRAPHS

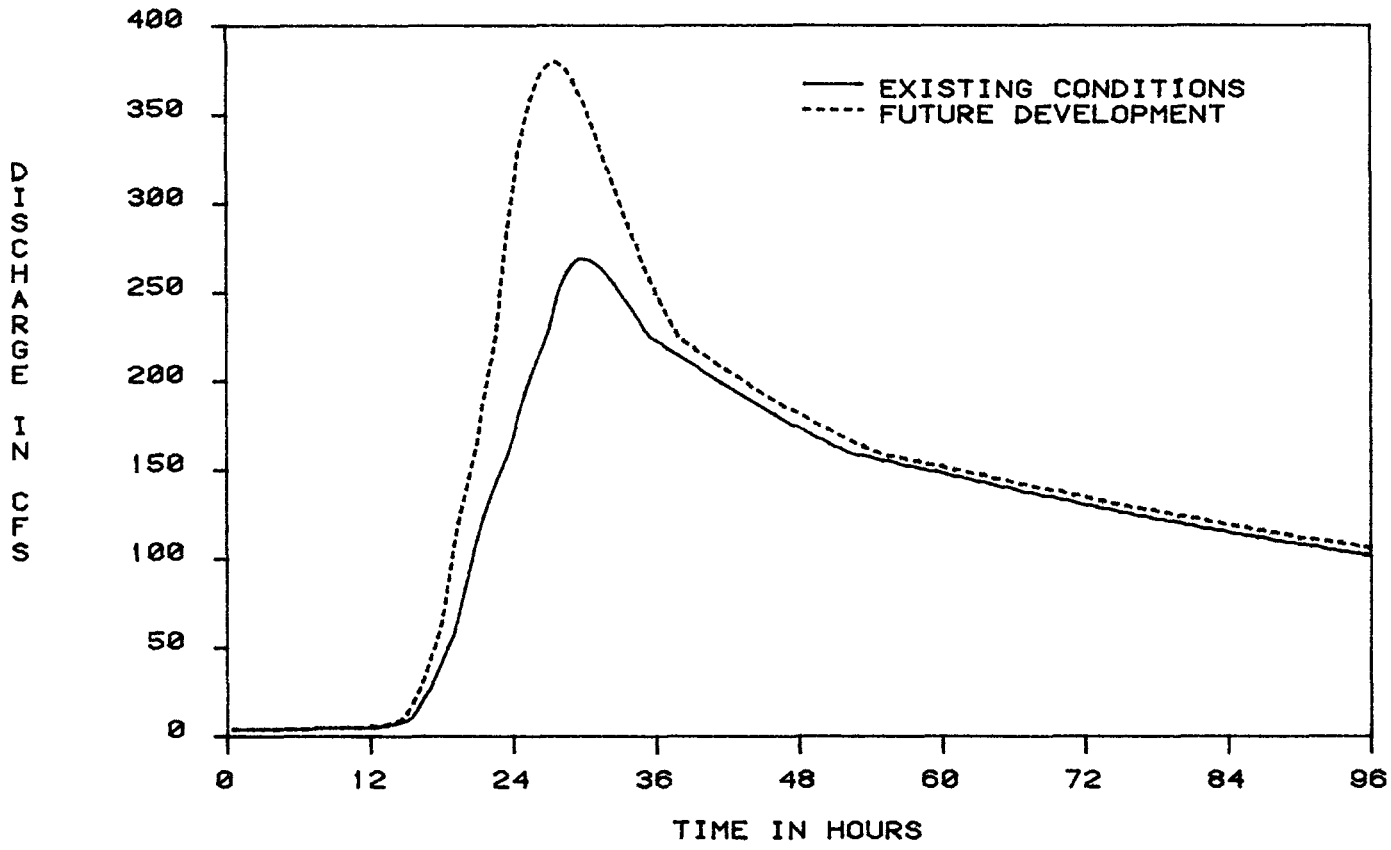



FIGURE B49. BEAR GULLY LAKE : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

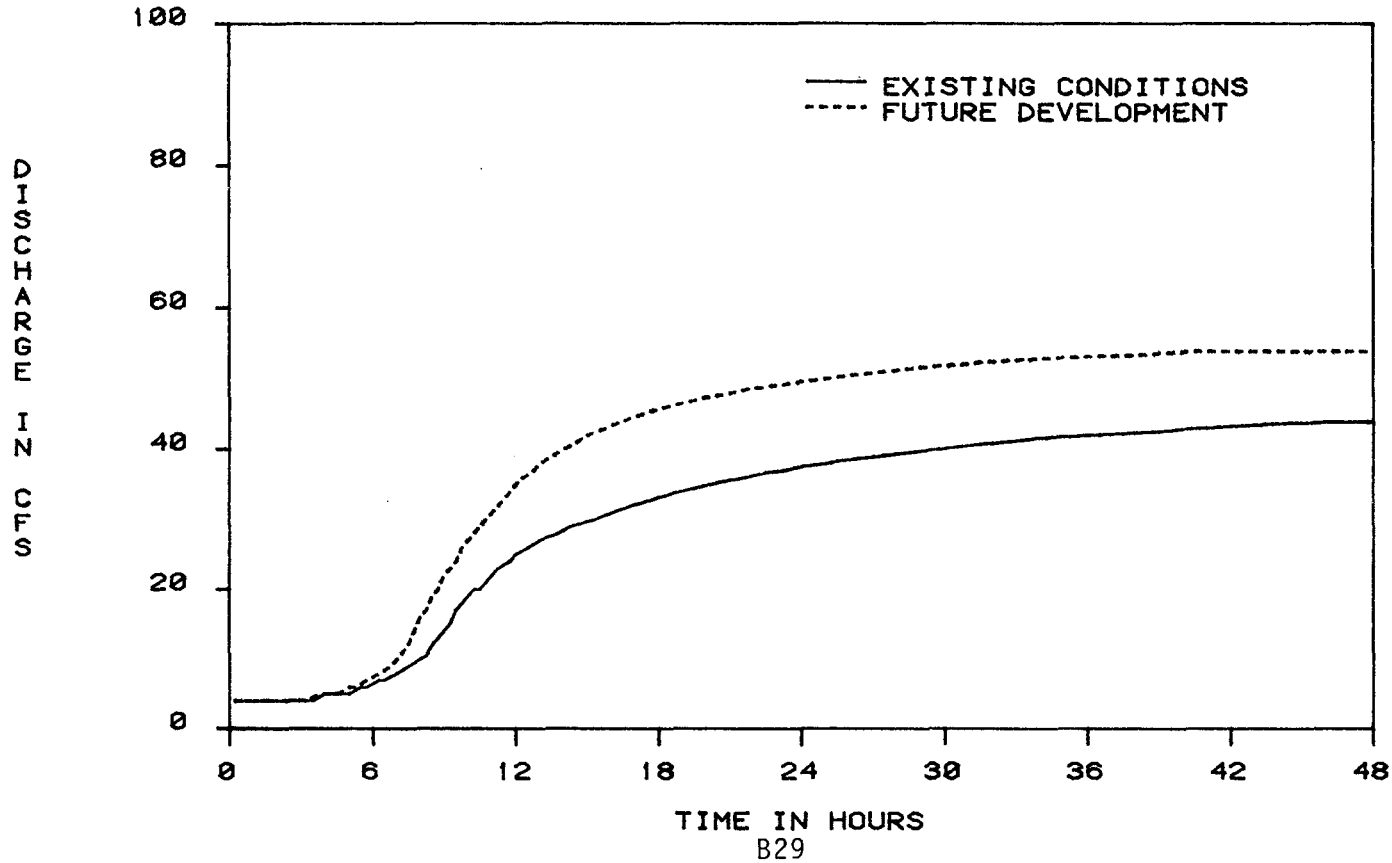


FIGURE B50. AT CONFLUENCE : 10-YEAR DISCHARGE HYDROGRAPHS

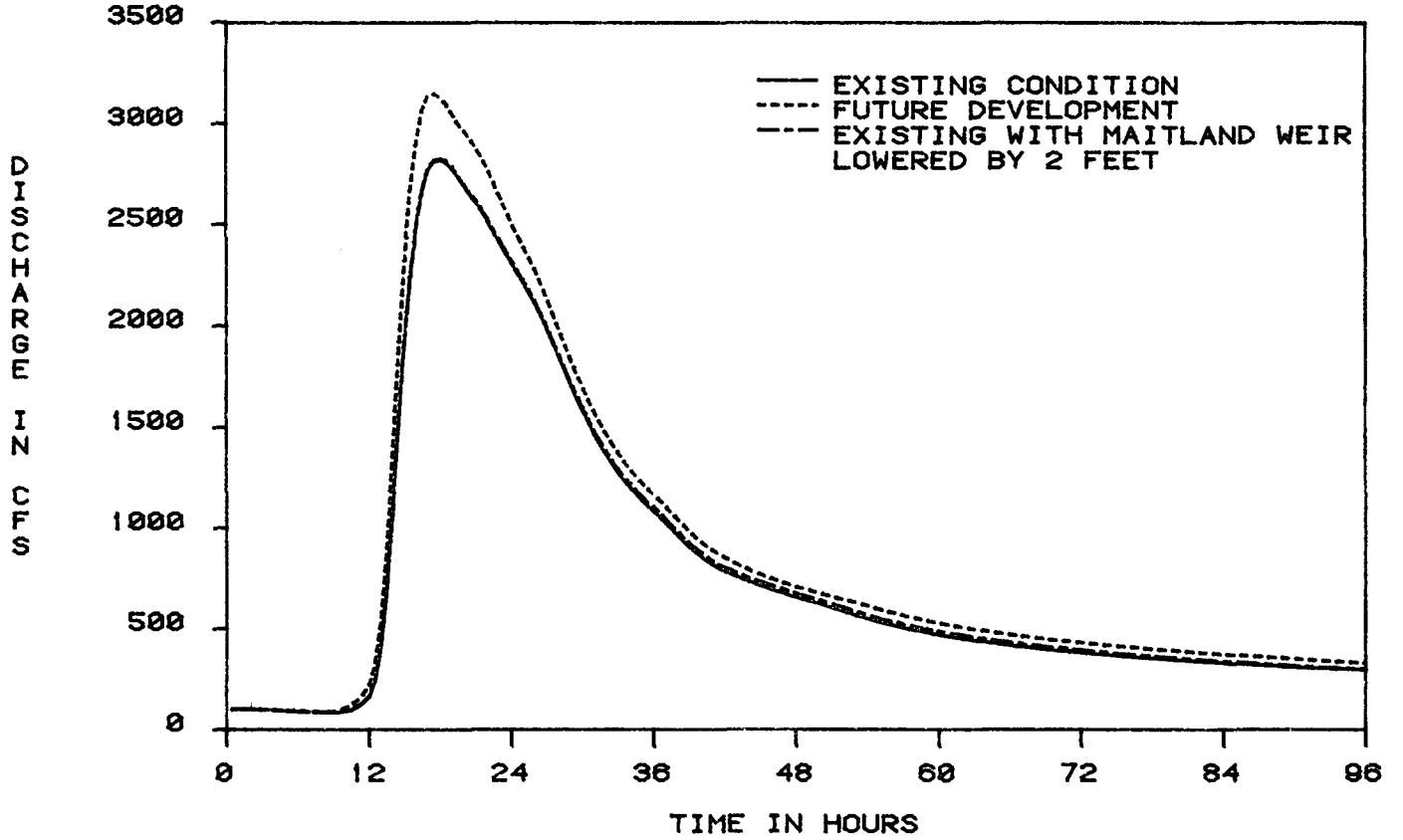



FIGURE B51. AT CONFLUENCE : 25-YEAR DISCHARGE HYDROGRAPHS

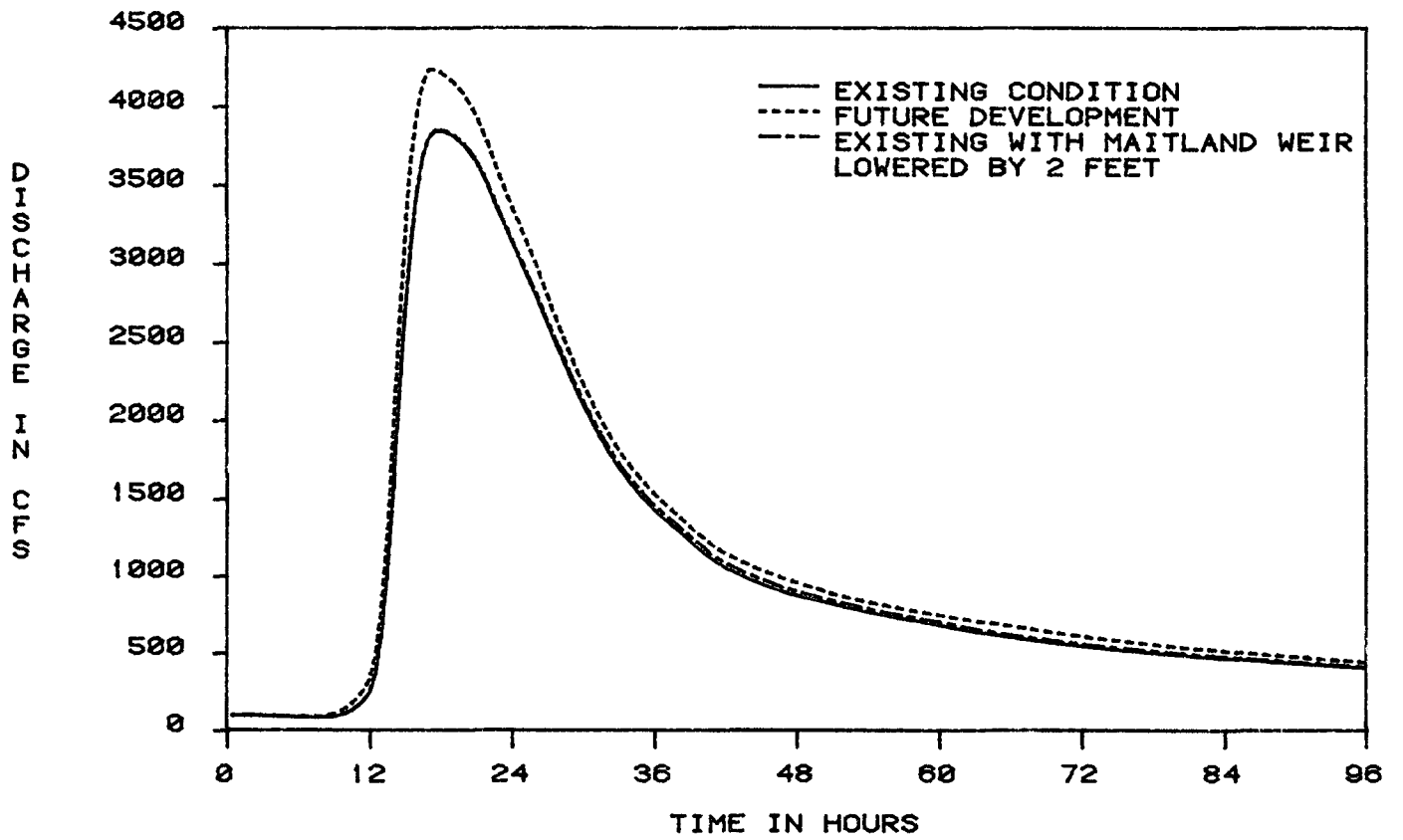


FIGURE B52. AT CONFLUENCE : 100-YEAR DISCHARGE HYDROGRAPHS

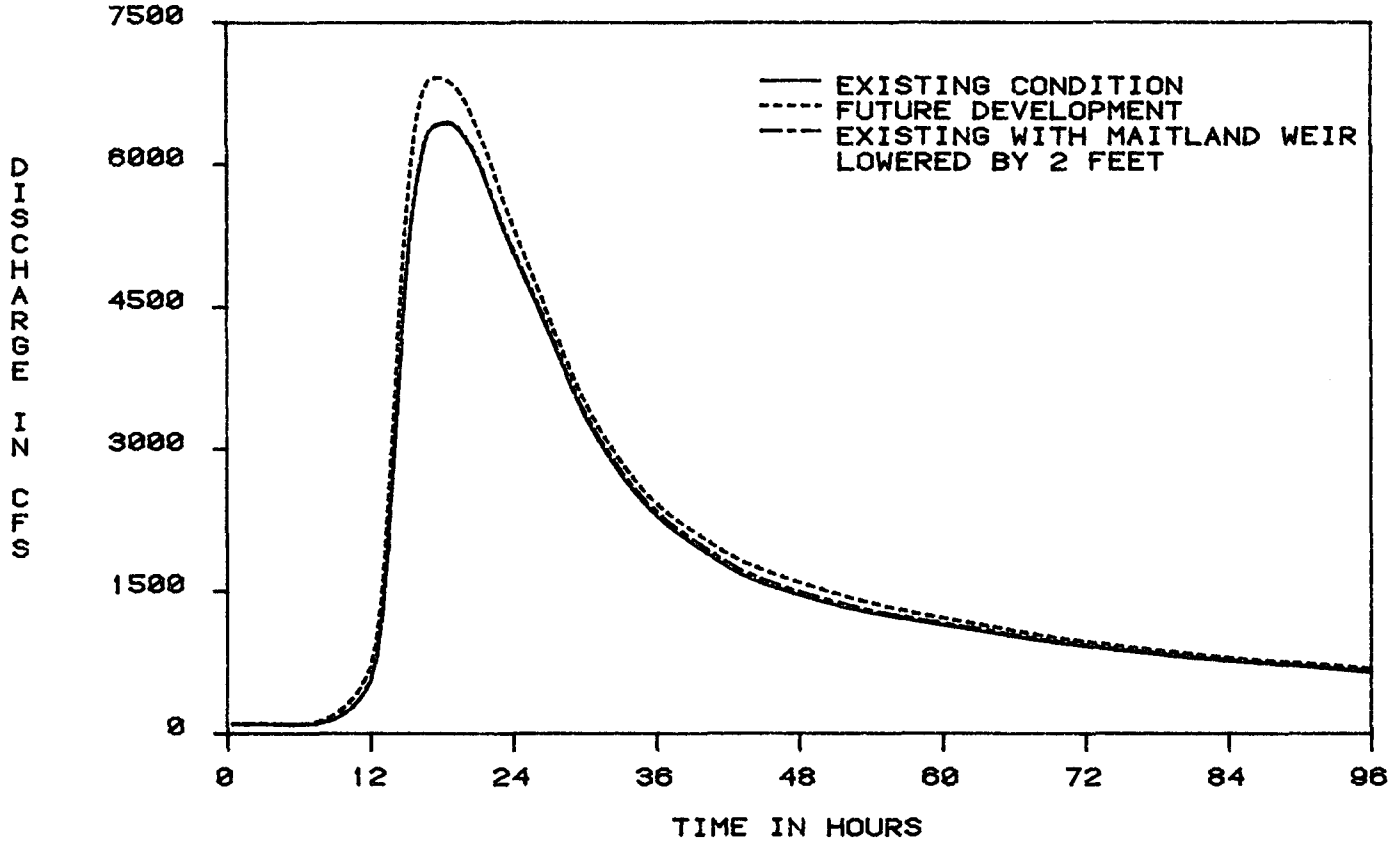



FIGURE B53. AT CONFLUENCE : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

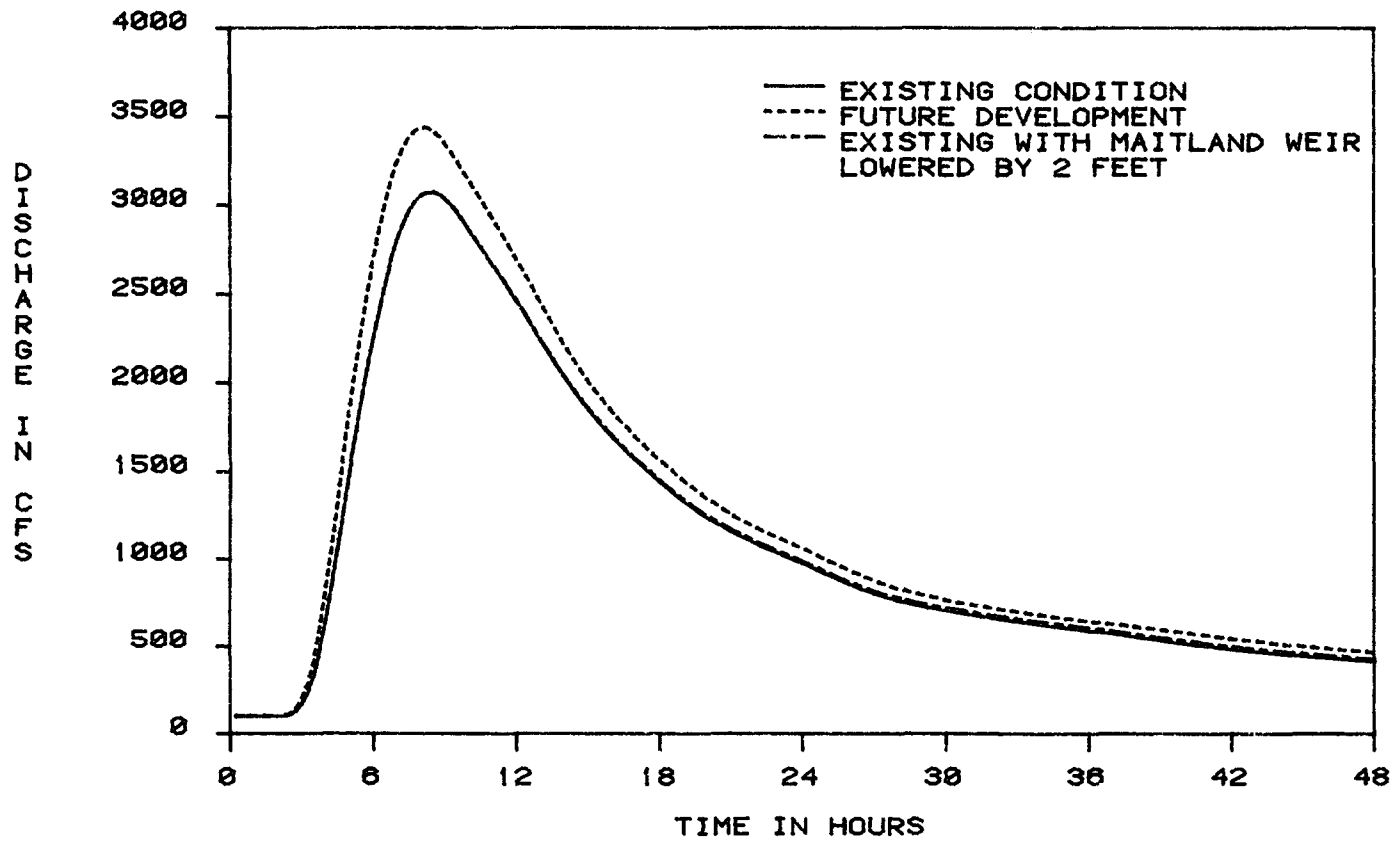


FIGURE B54. AT OUTLET : 10-YEAR DISCHARGE HYDROGRAPHS

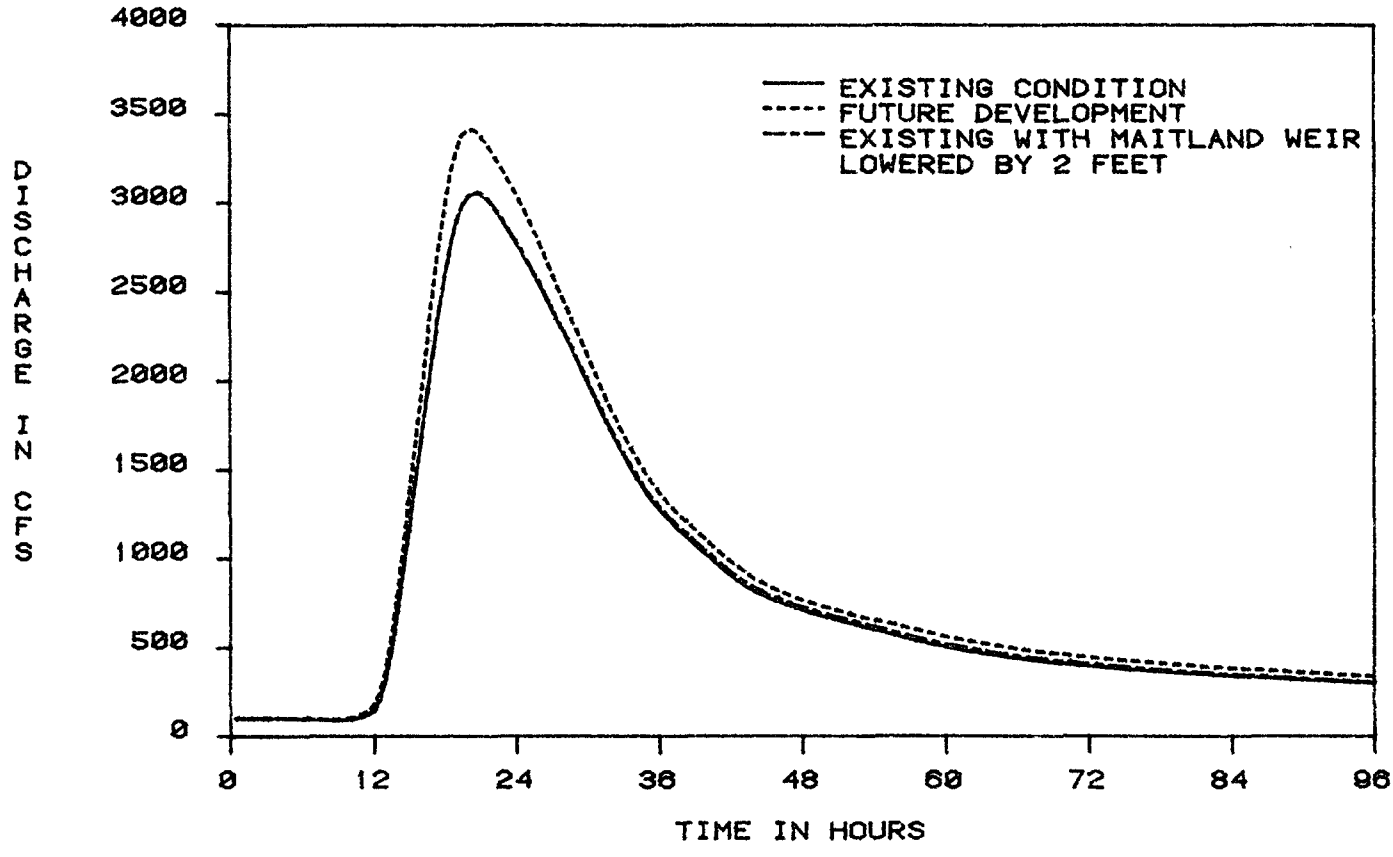



FIGURE B55. AT OUTLET : 25-YEAR DISCHARGE HYDROGRAPHS

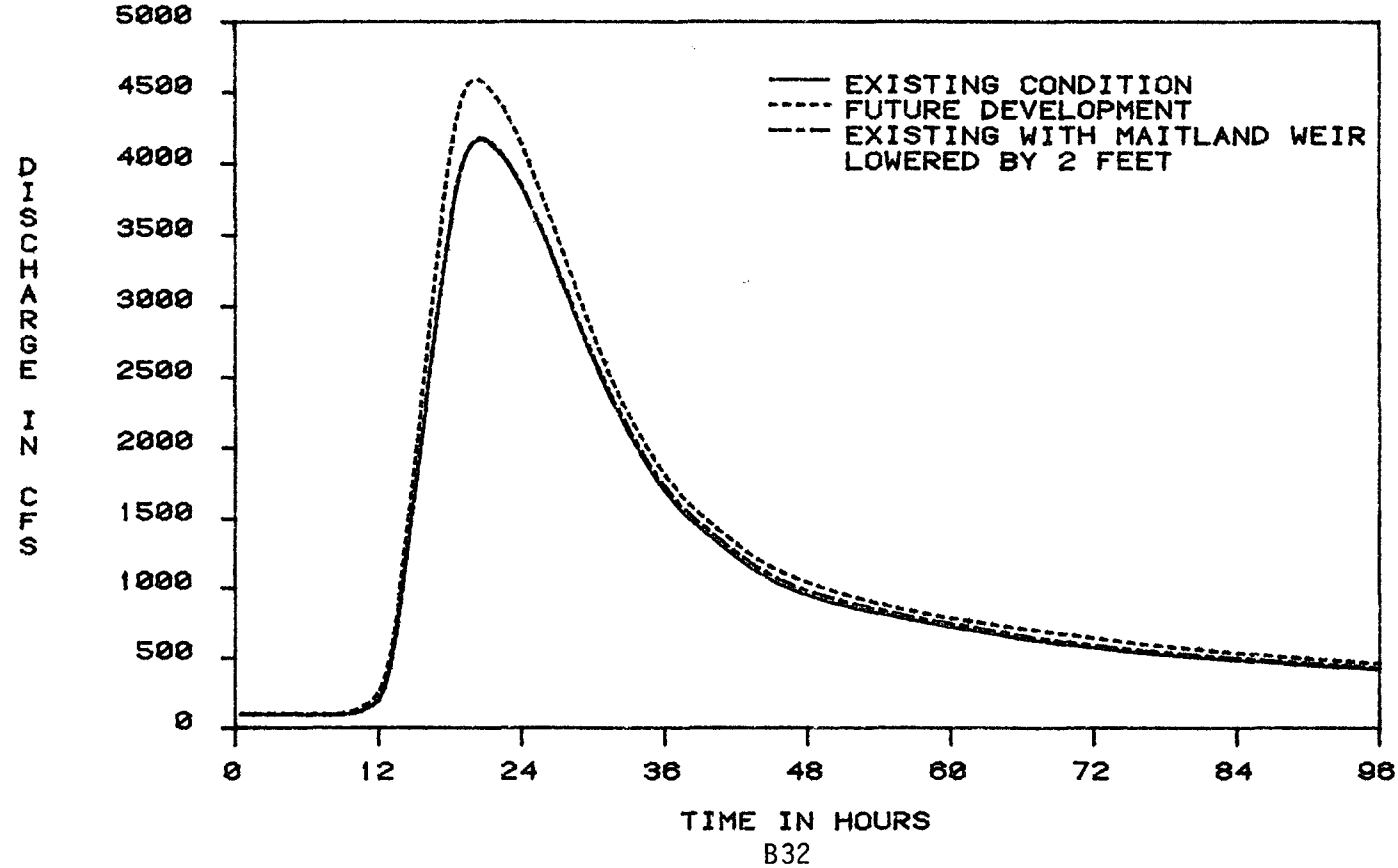


FIGURE B56. AT OUTLET : 100-YEAR DISCHARGE HYDROGRAPHS

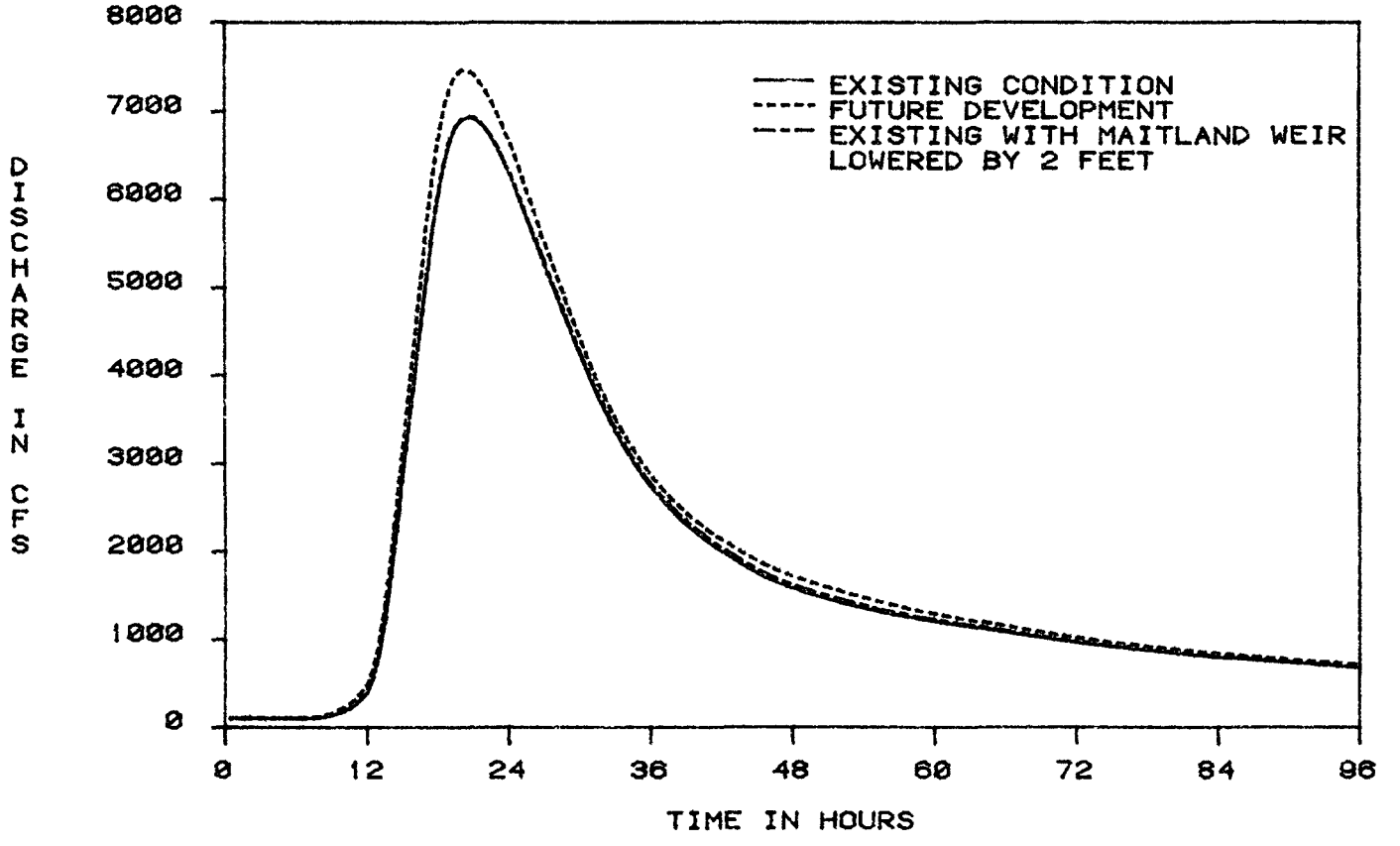



FIGURE B57. AT OUTLET : 25-YR, 6-HR DISCHARGE HYDROGRAPHS

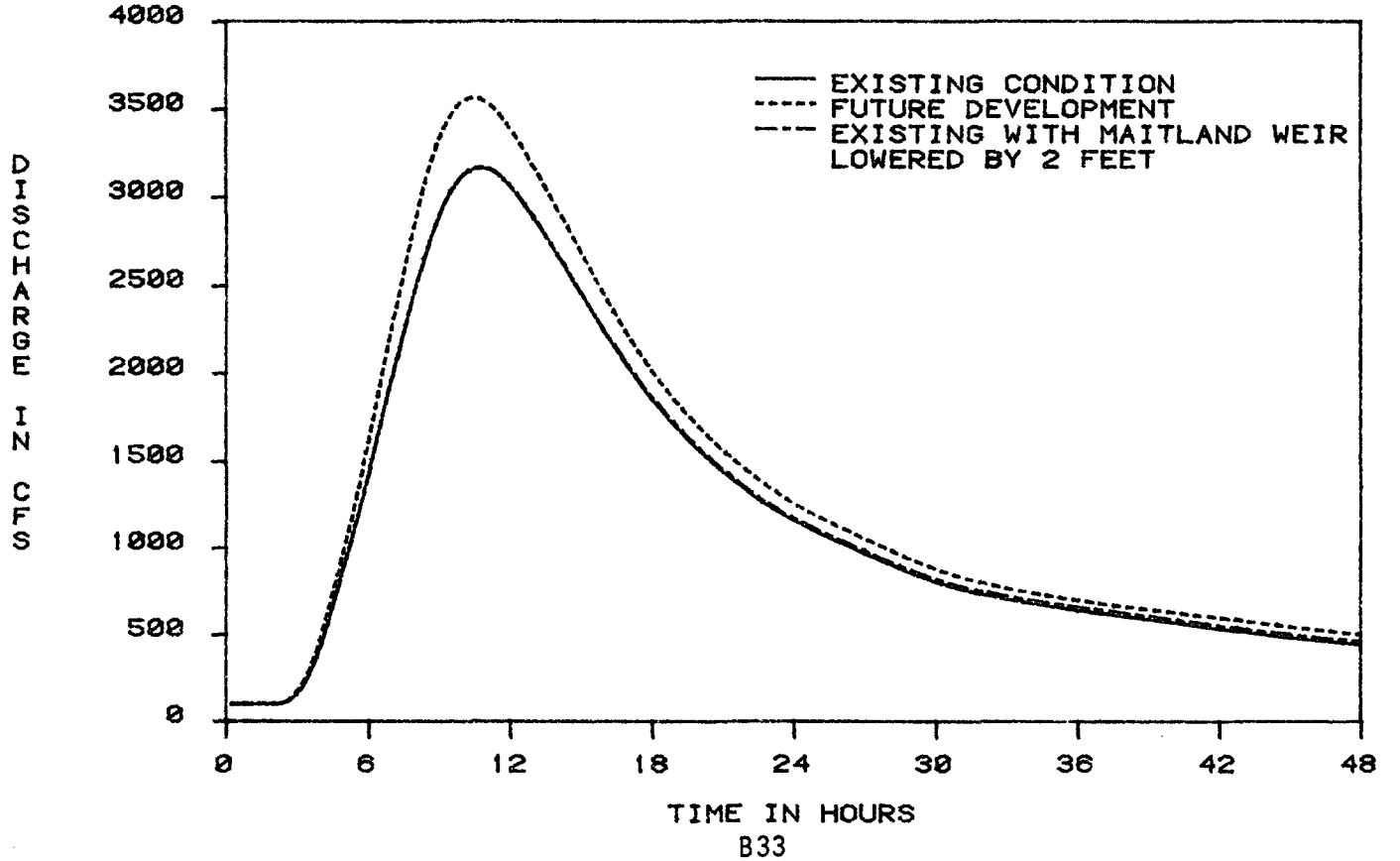


FIGURE B58. LAKE KILLARNEY WEIR : 10-YEAR STAGE HYDROGRAPHS

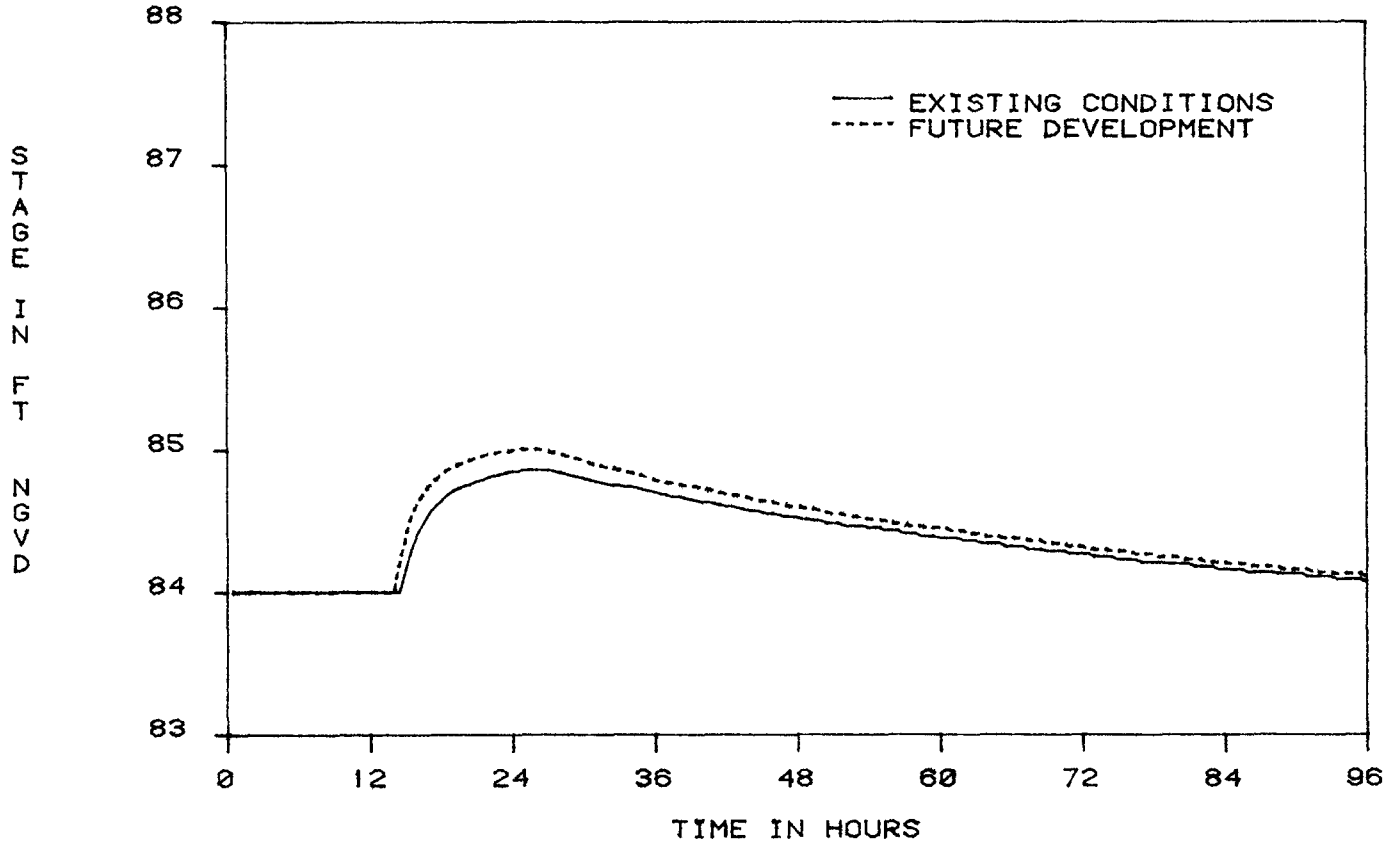



FIGURE B59. LAKE KILLARNEY WEIR : 25-YEAR STAGE HYDROGRAPHS

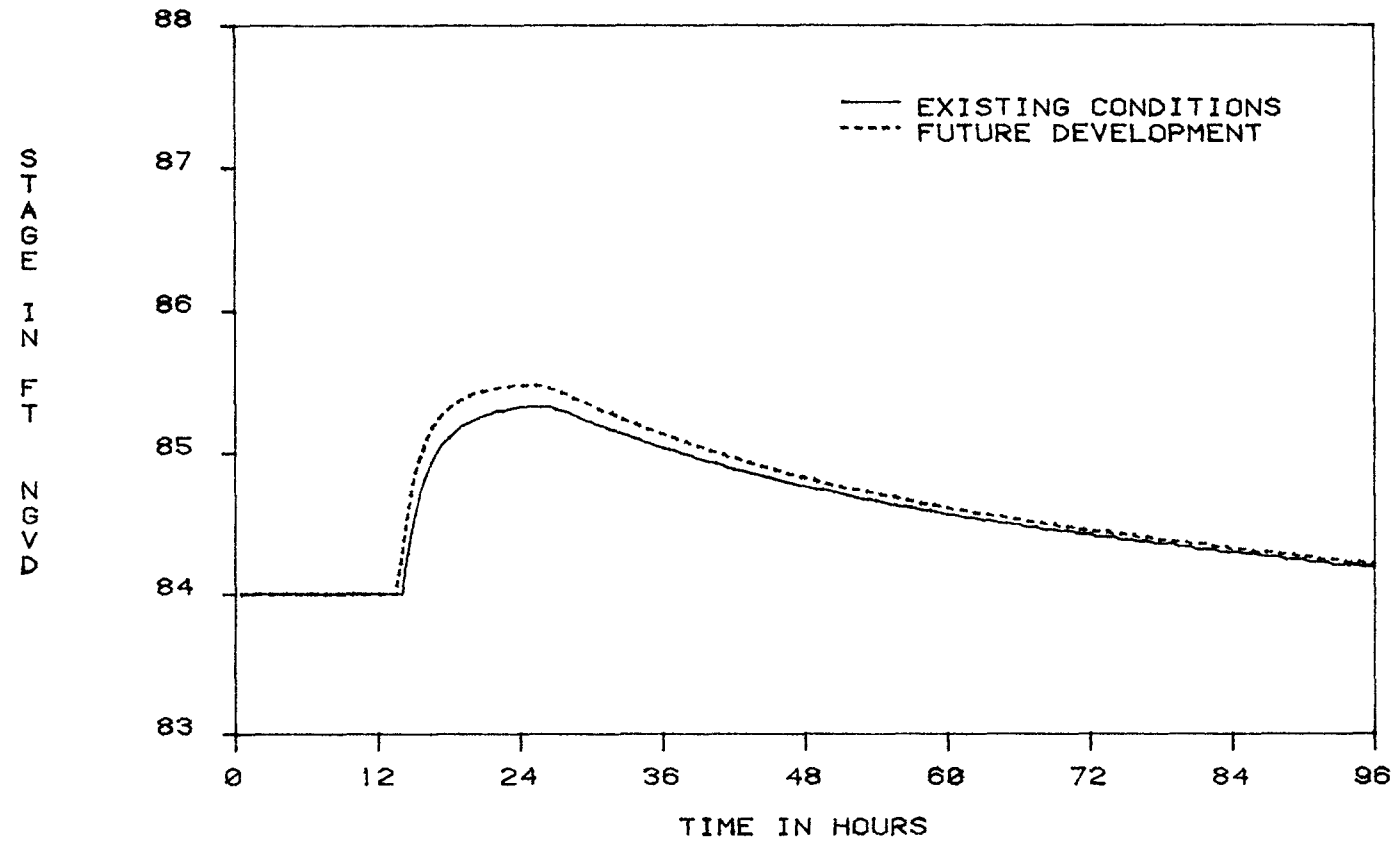


FIGURE B60. LAKE KILLARNEY WEIR : 100-YEAR STAGE HYDROGRAPHS

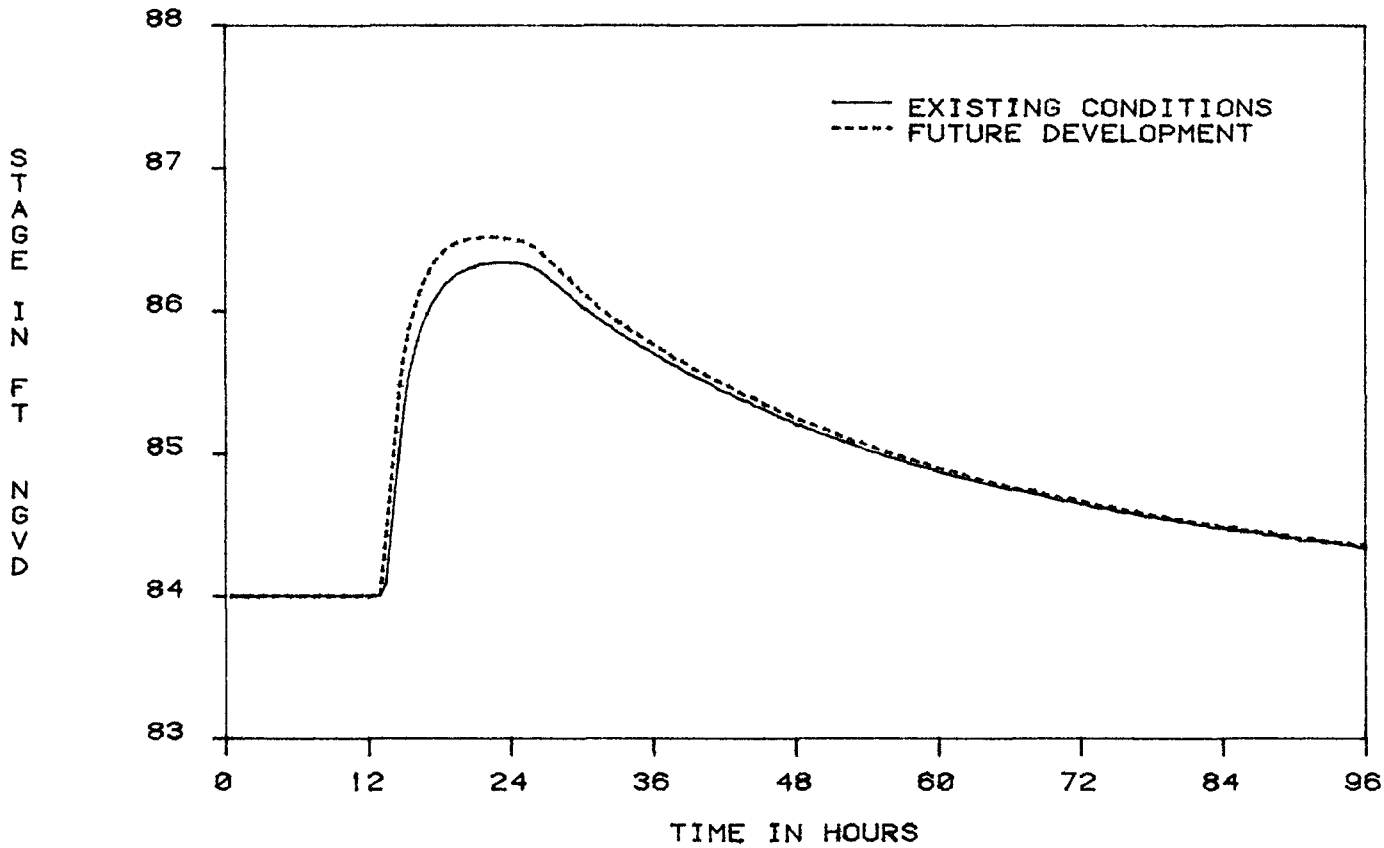



FIGURE B61. LAKE KILLARNEY WEIR : 25-YR, 6-HR STAGE HYDROGRAPHS

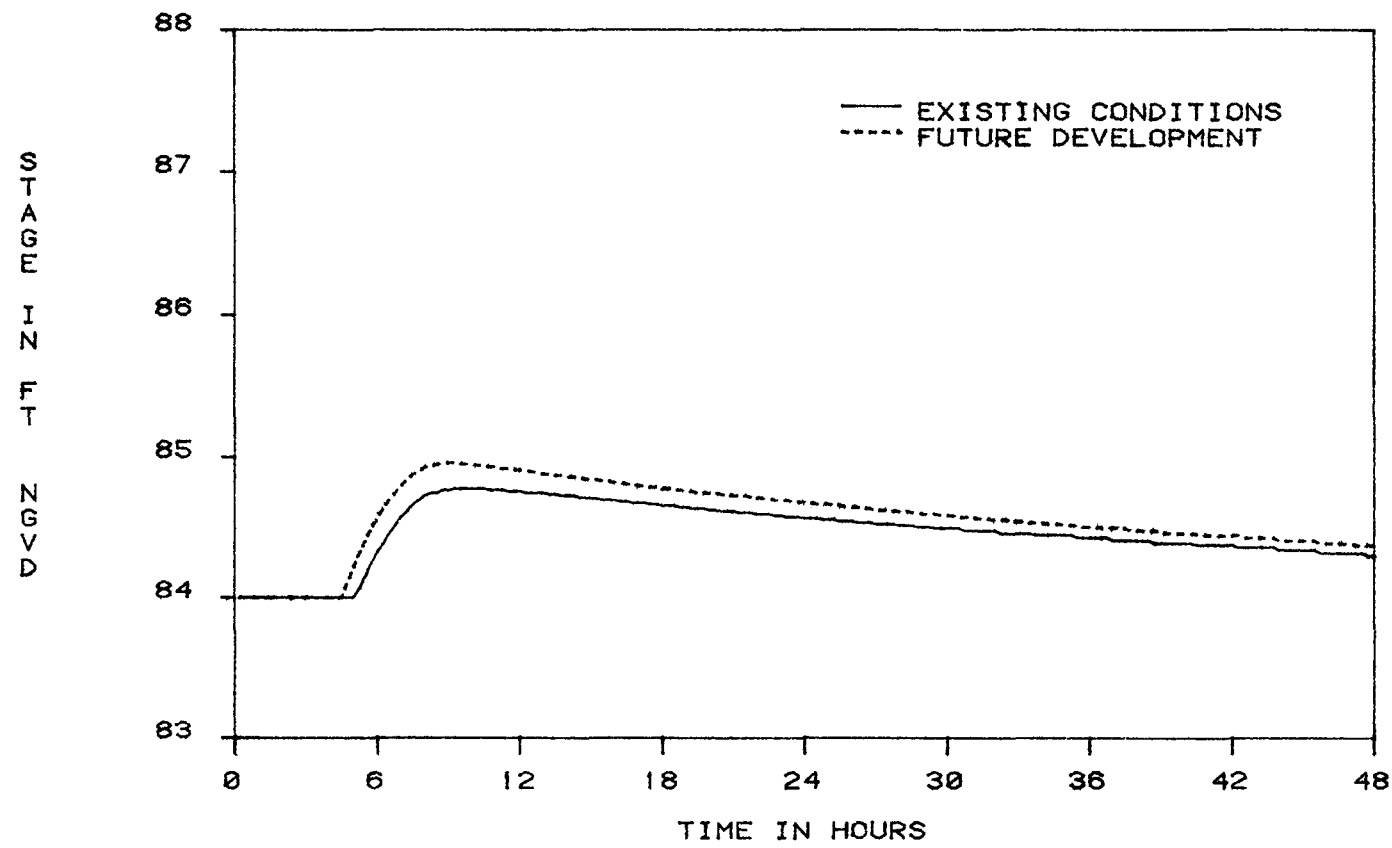


FIGURE B62. LAKE MAITLAND WEIR : 10-YEAR STAGE HYDROGRAPHS

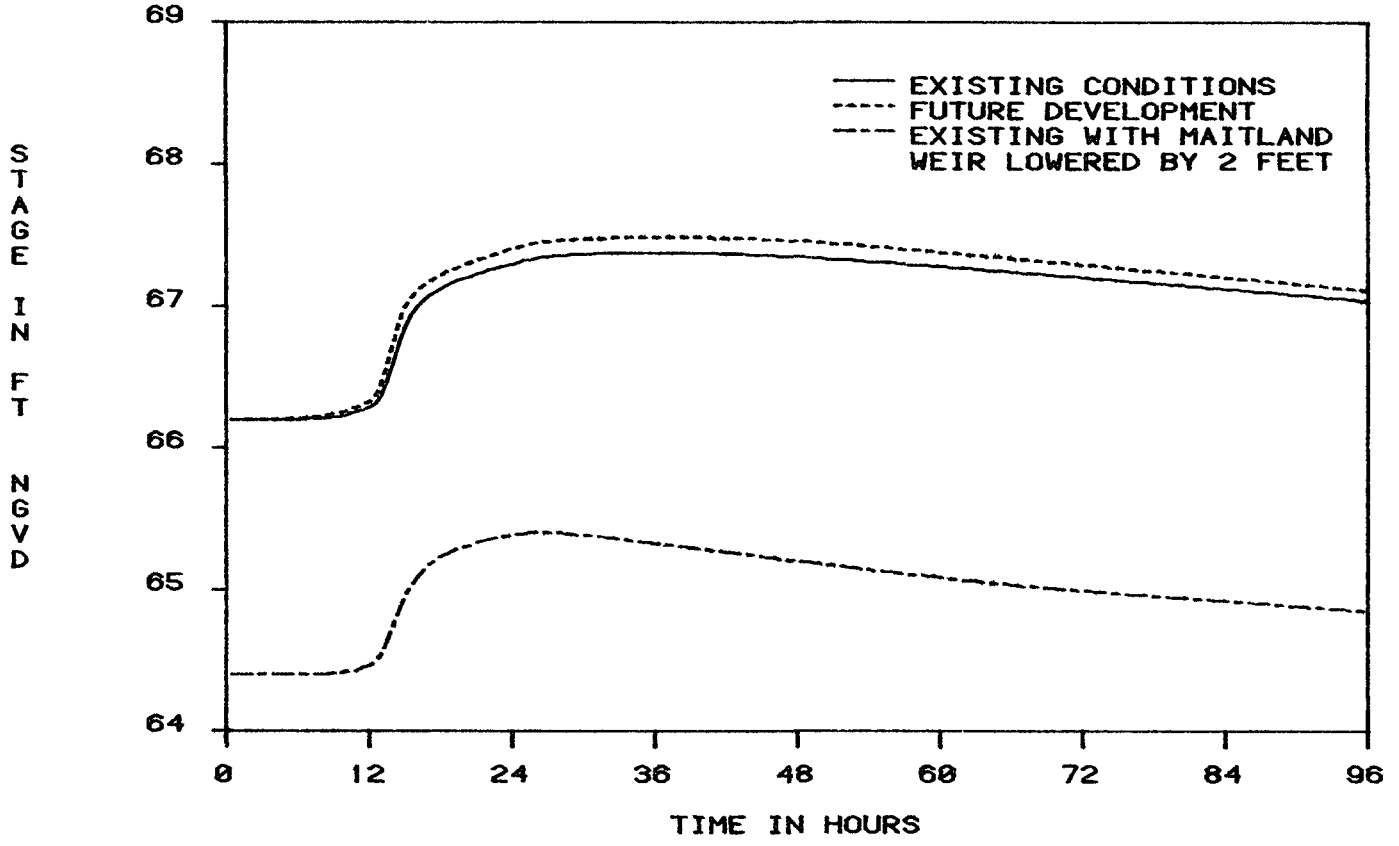



FIGURE B63. LAKE MAITLAND WEIR : 25-YEAR STAGE HYDROGRAPHS

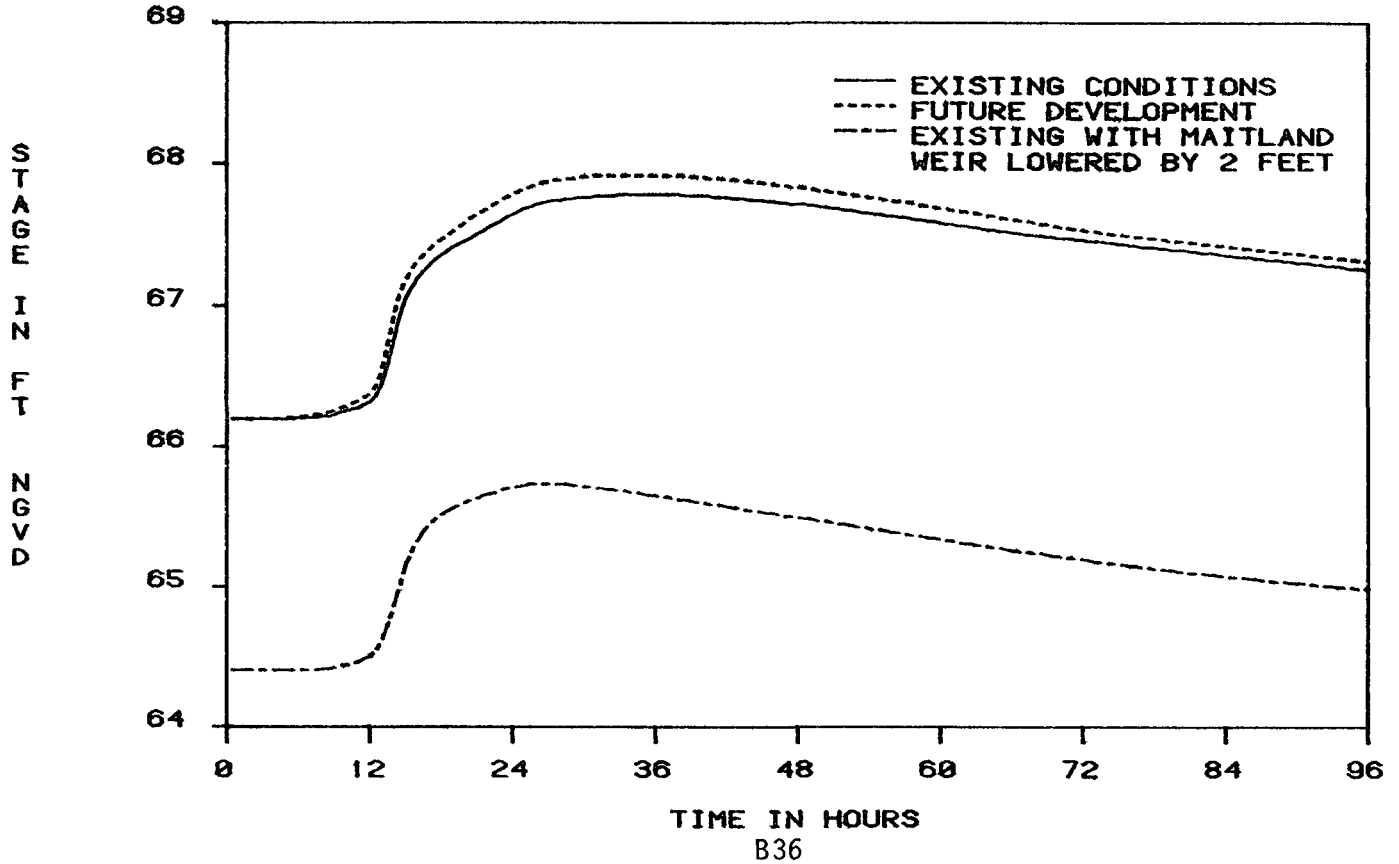


FIGURE B64. LAKE MAITLAND WEIR : 100-YEAR STAGE HYDROGRAPHS

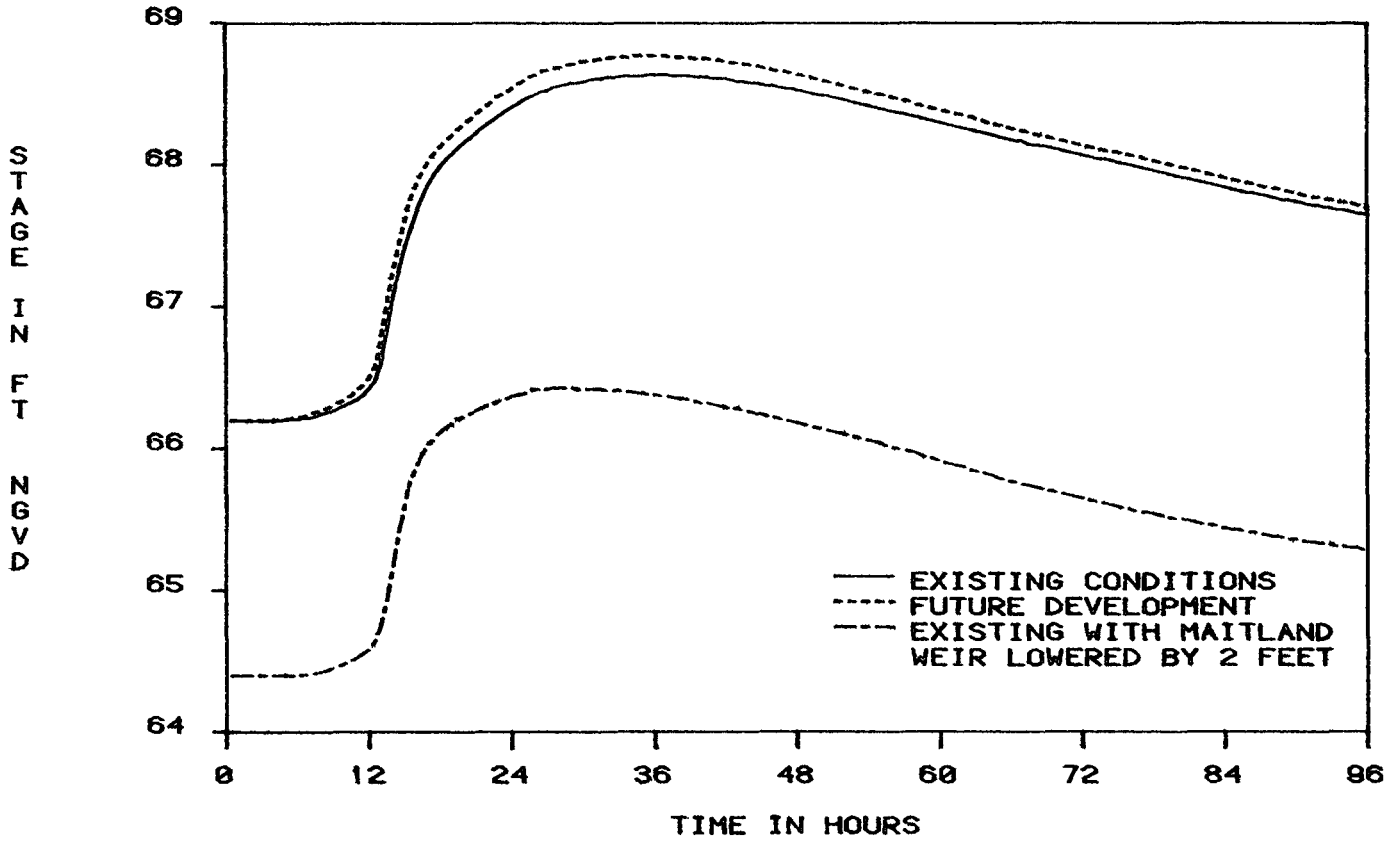



FIGURE B65. LAKE MAITLAND WEIR : 25-YR, 6-HR STAGE HYDROGRAPHS

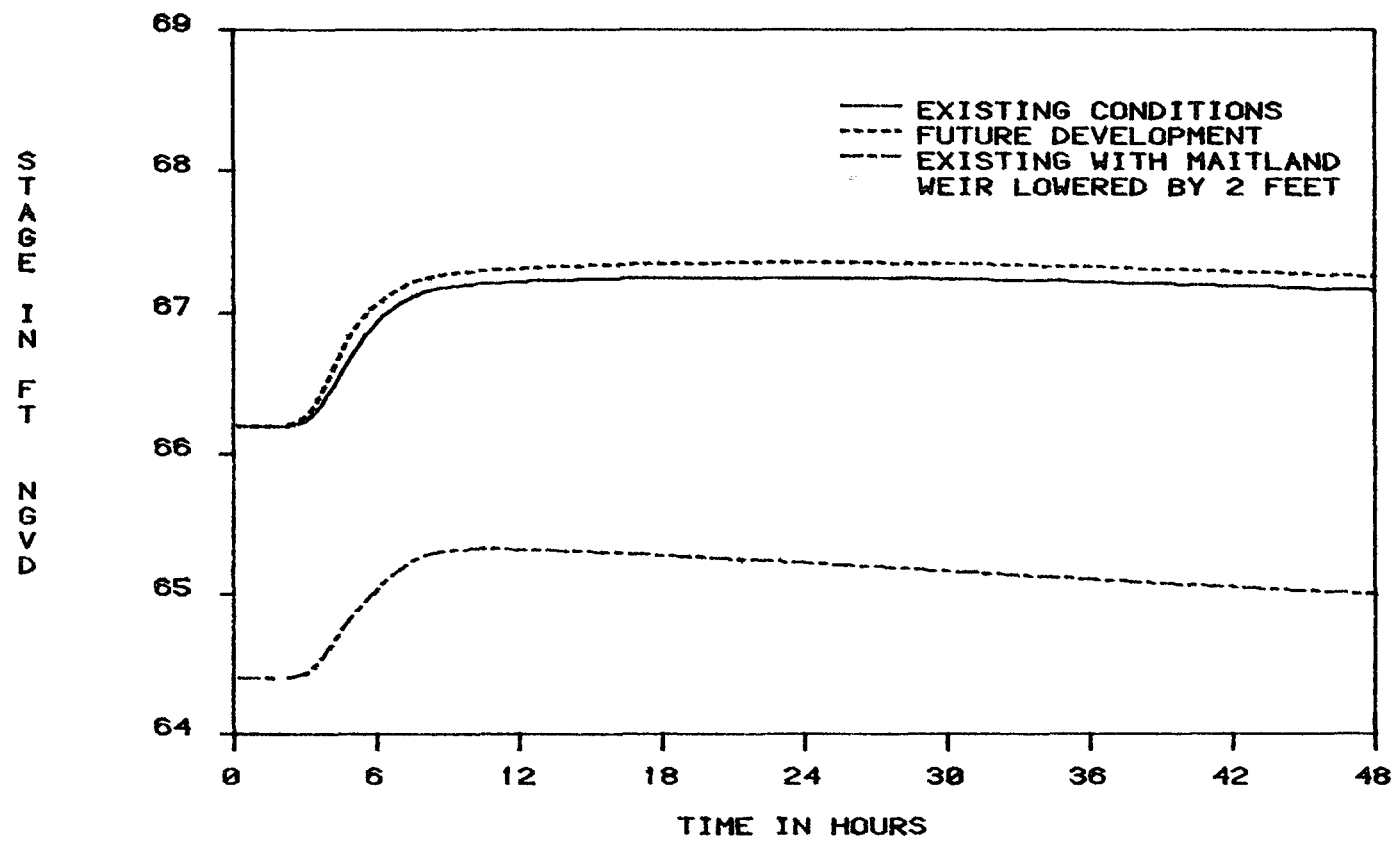


FIGURE B66. LAKE HOWELL : 10-YEAR STAGE HYDROGRAPHS

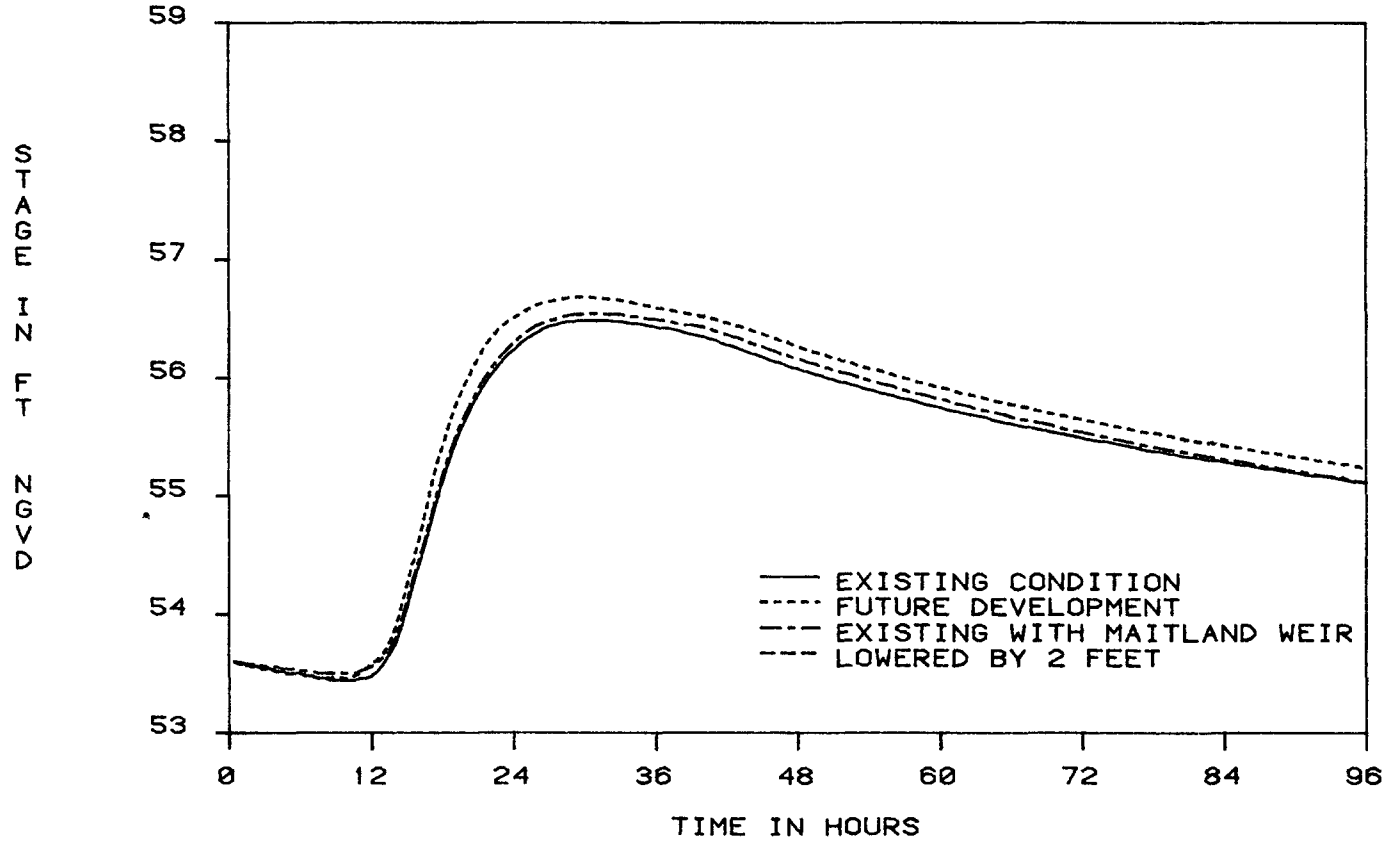



FIGURE B67. LAKE HOWELL : 25-YEAR STAGE HYDROGRAPHS

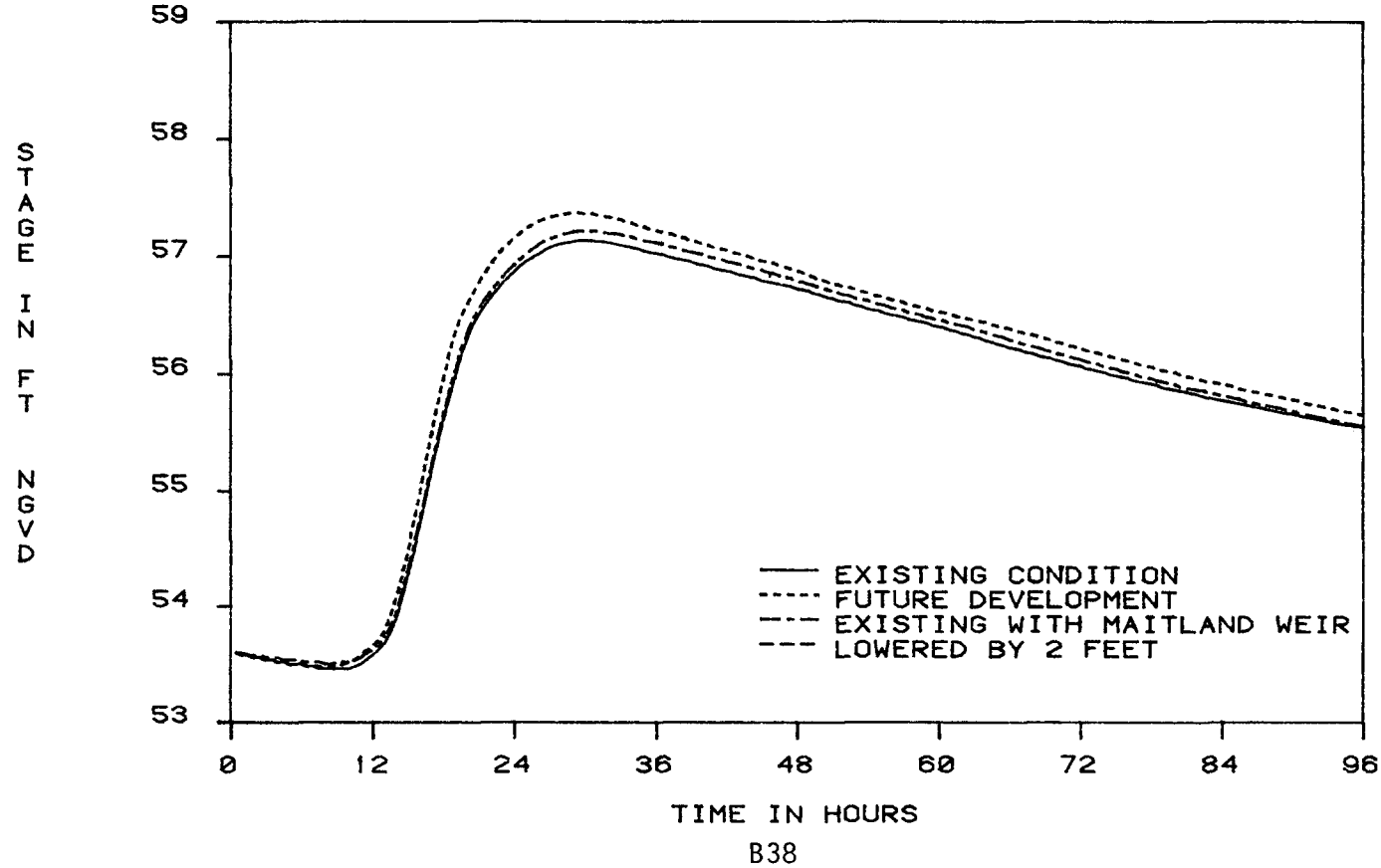


FIGURE B68. LAKE HOWELL : 100-YEAR STAGE HYDROGRAPHS

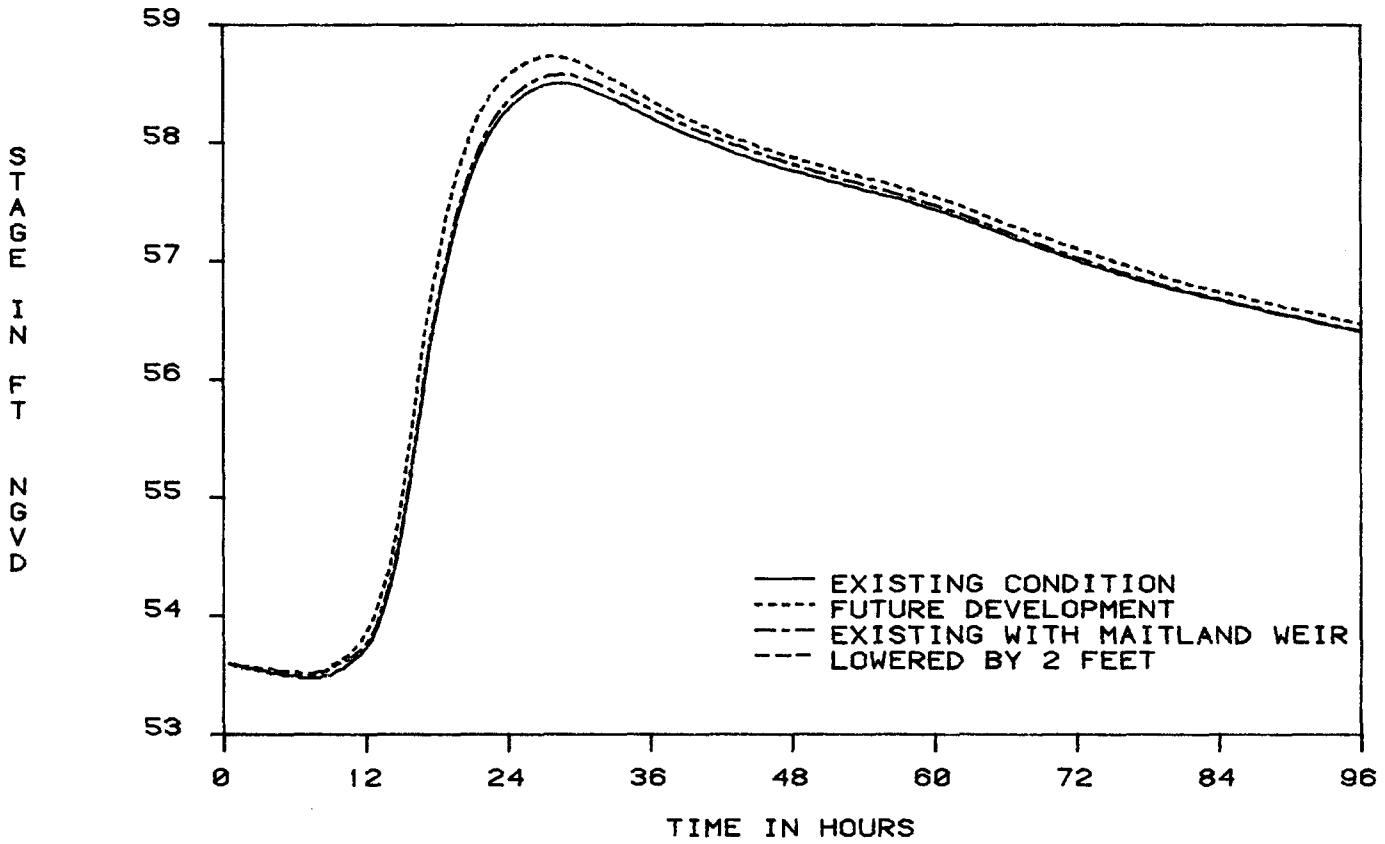
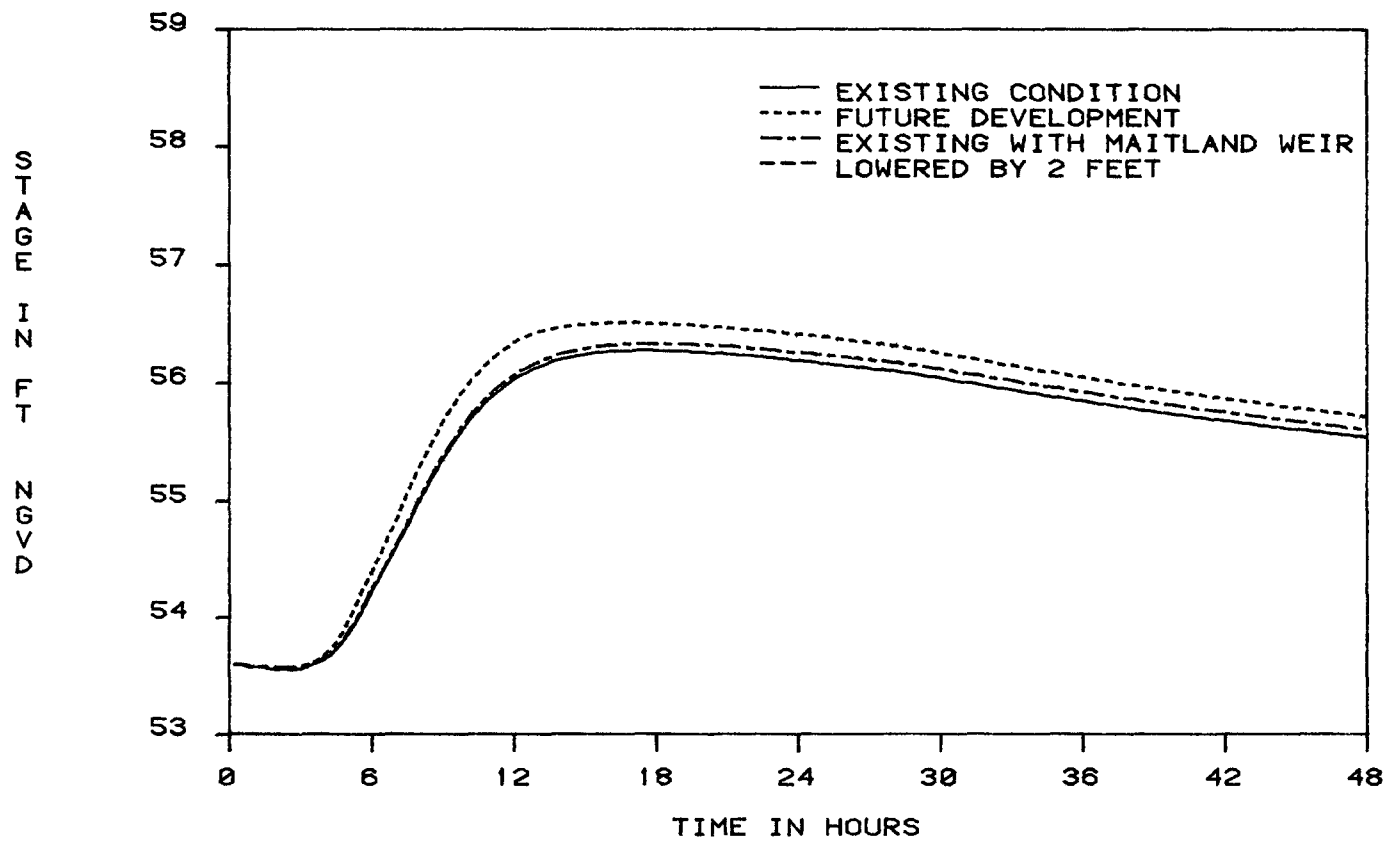
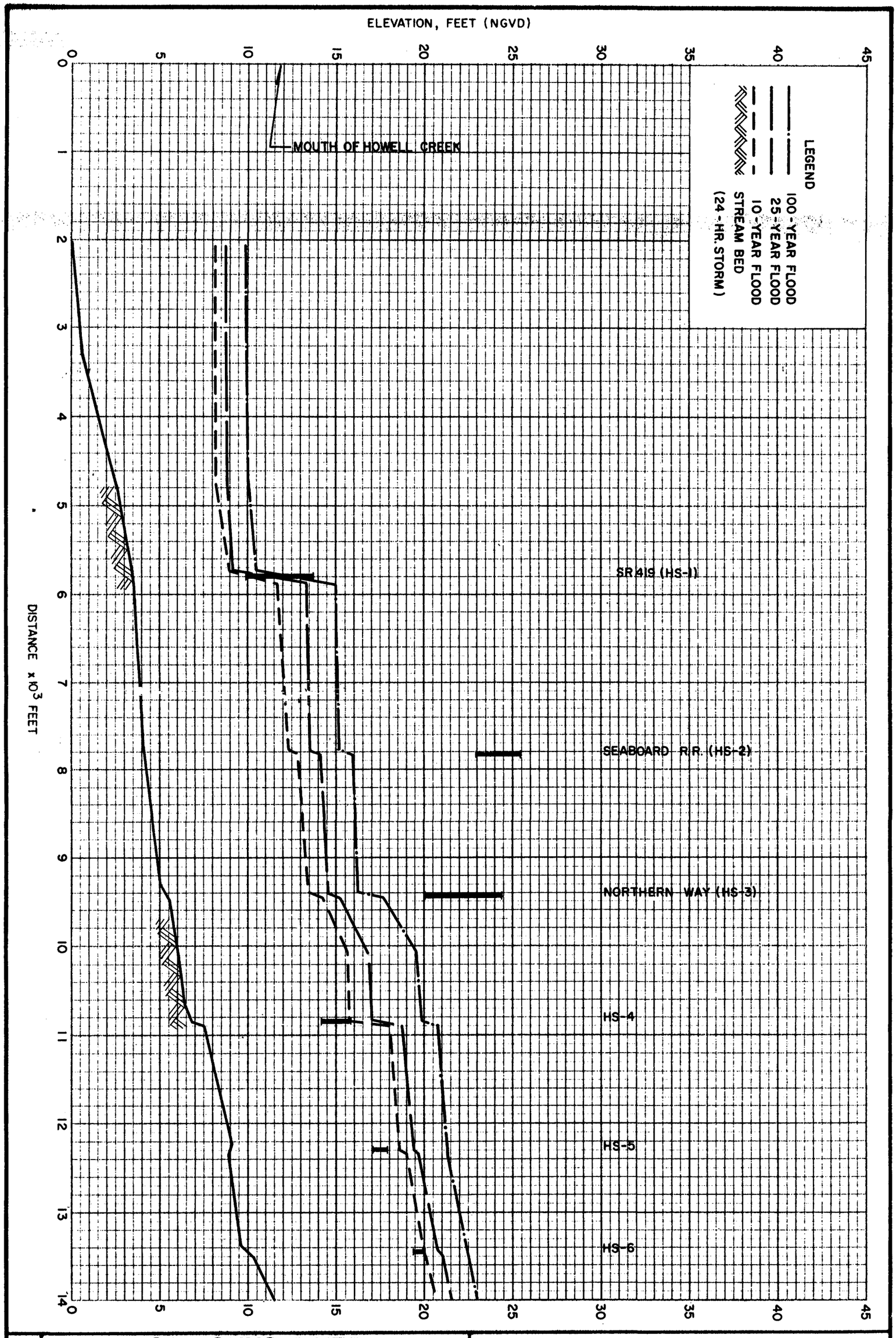



FIGURE B69. LAKE HOWELL : 25-YR, 6-HR STAGE HYDROGRAPHS



# APPENDIX C

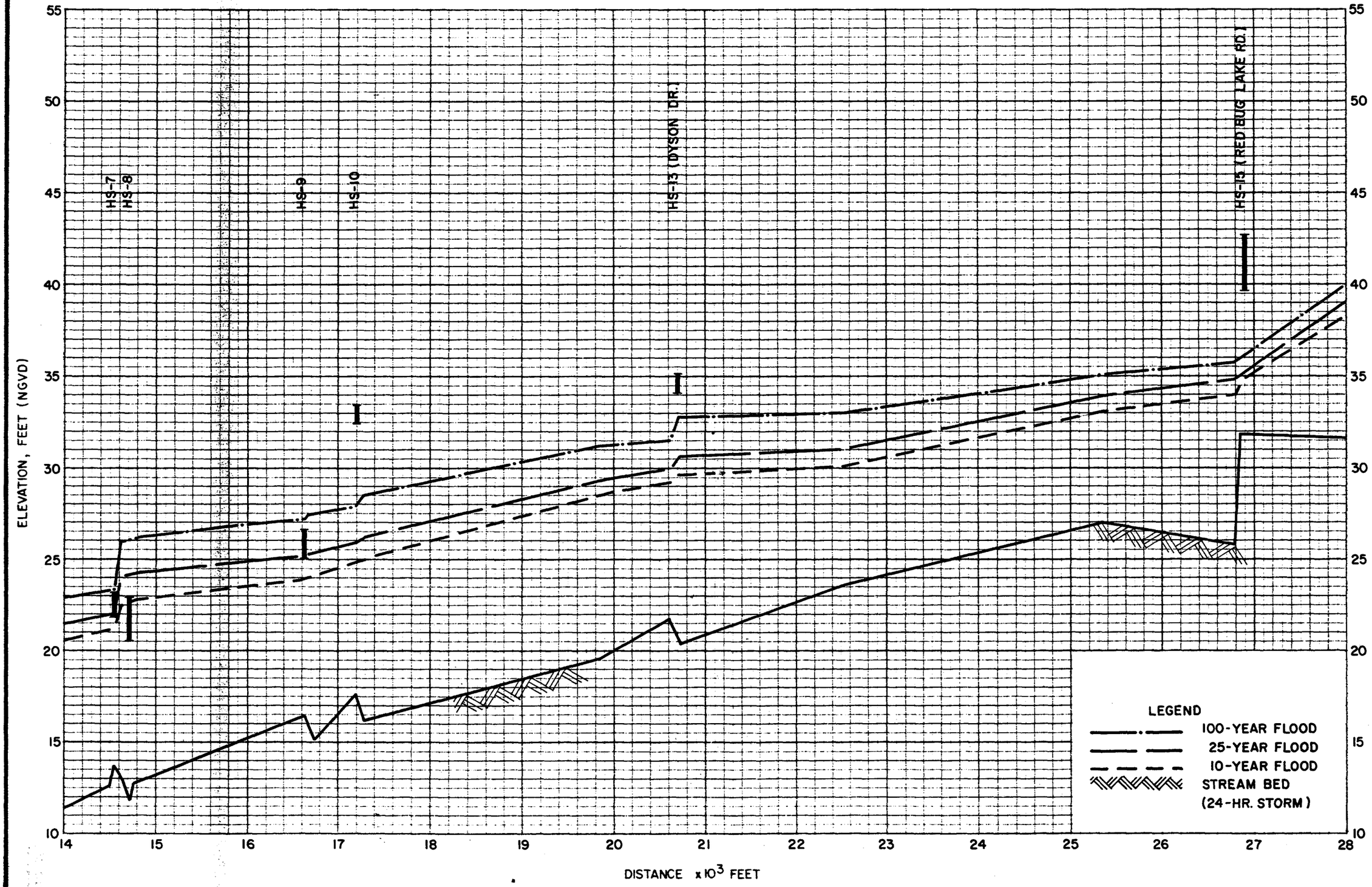
## Flood Profiles for 24-Hour Storm under Existing Conditions




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE C-1a

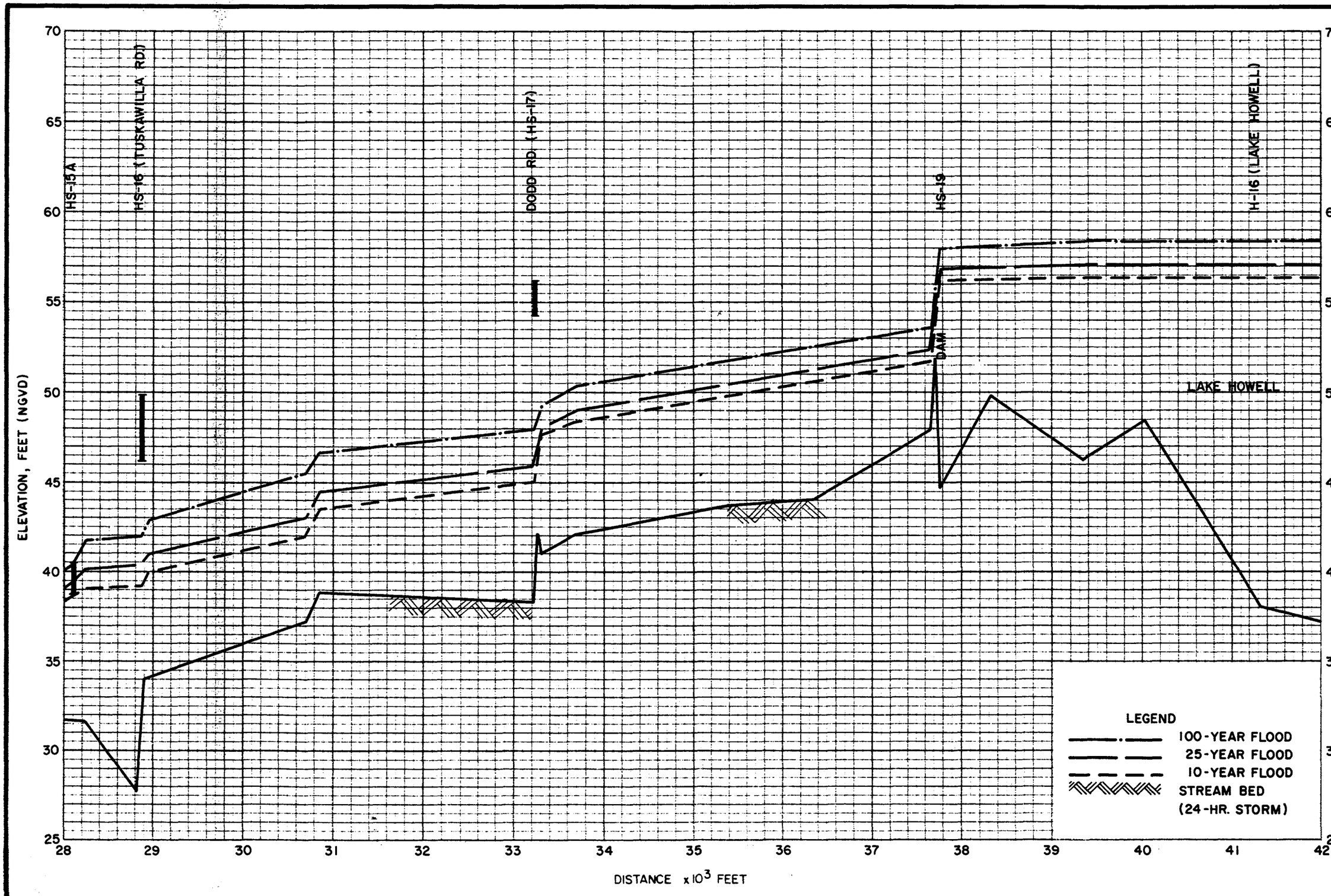
FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 0 TO STATION 140)




FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 140 TO STATION 280)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

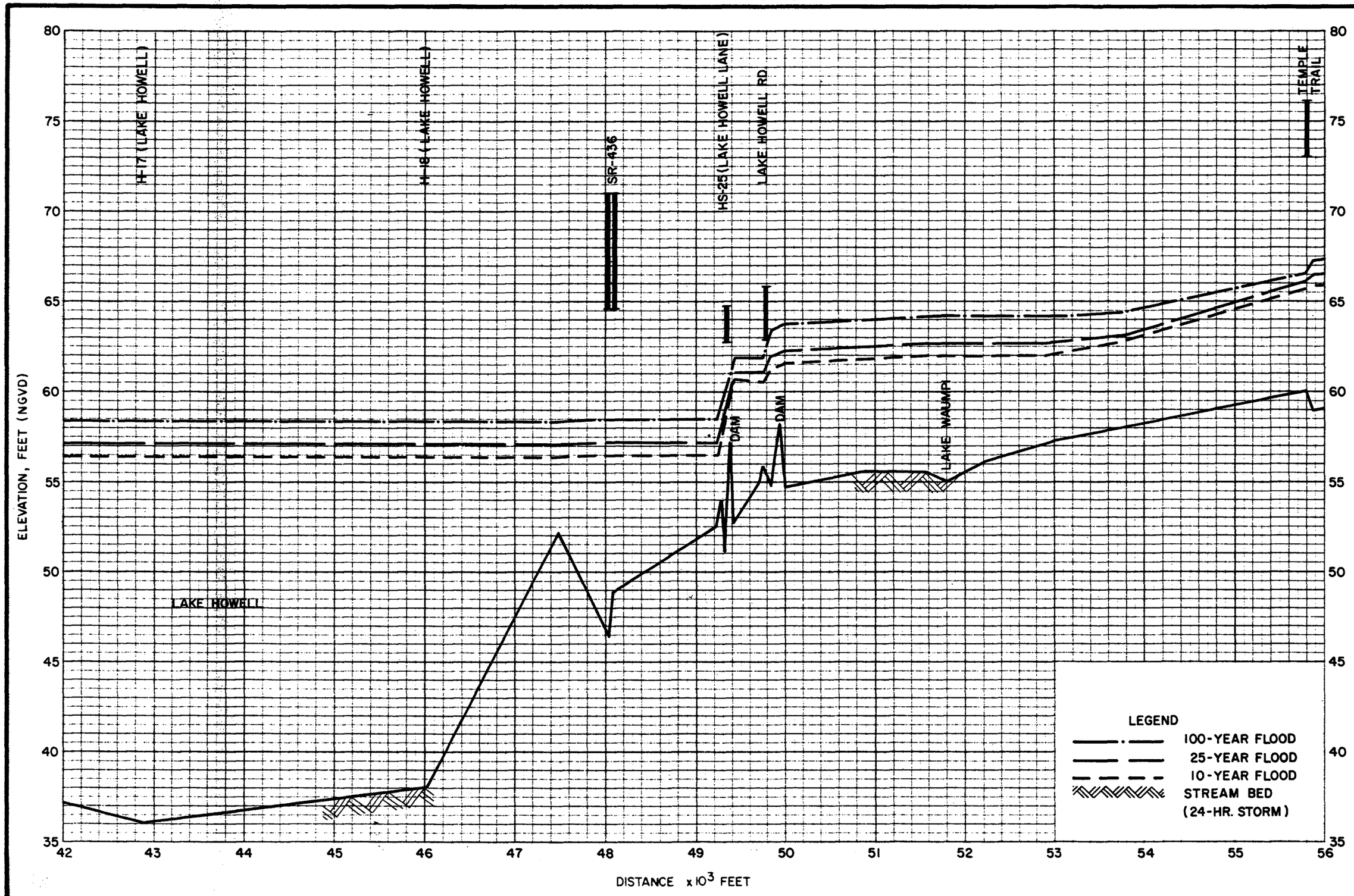
FIGURE C-1b




FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 280 TO STATION 420)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

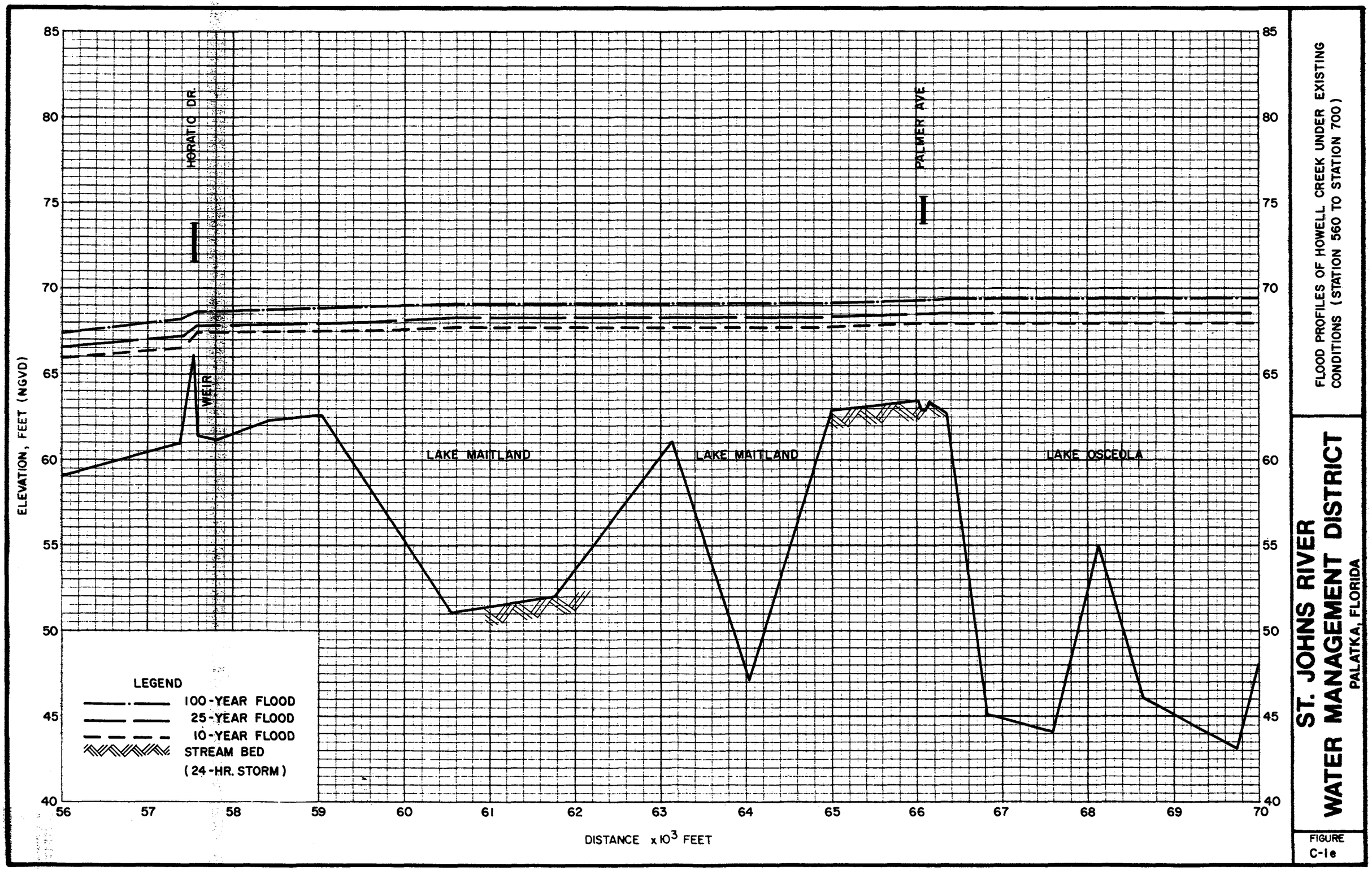
FIGURE
C-1c




FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 420 TO STATION 560)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
C-1d




FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 560 TO STATION 700)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE C-1e

OSCEOLA AVE
STIRLING AVE
PENNSYLVANIA AVE
LAKE SHORE DR.
LAKESIDE DR
LAKE VIRGINIA
LAKE SUE

ELEVATION, FEET (NGVD)

90
85
80
75
70
65
60
55
50
45

70 71 72 73 74 75 76 77 78 79 80 81 82 83 84

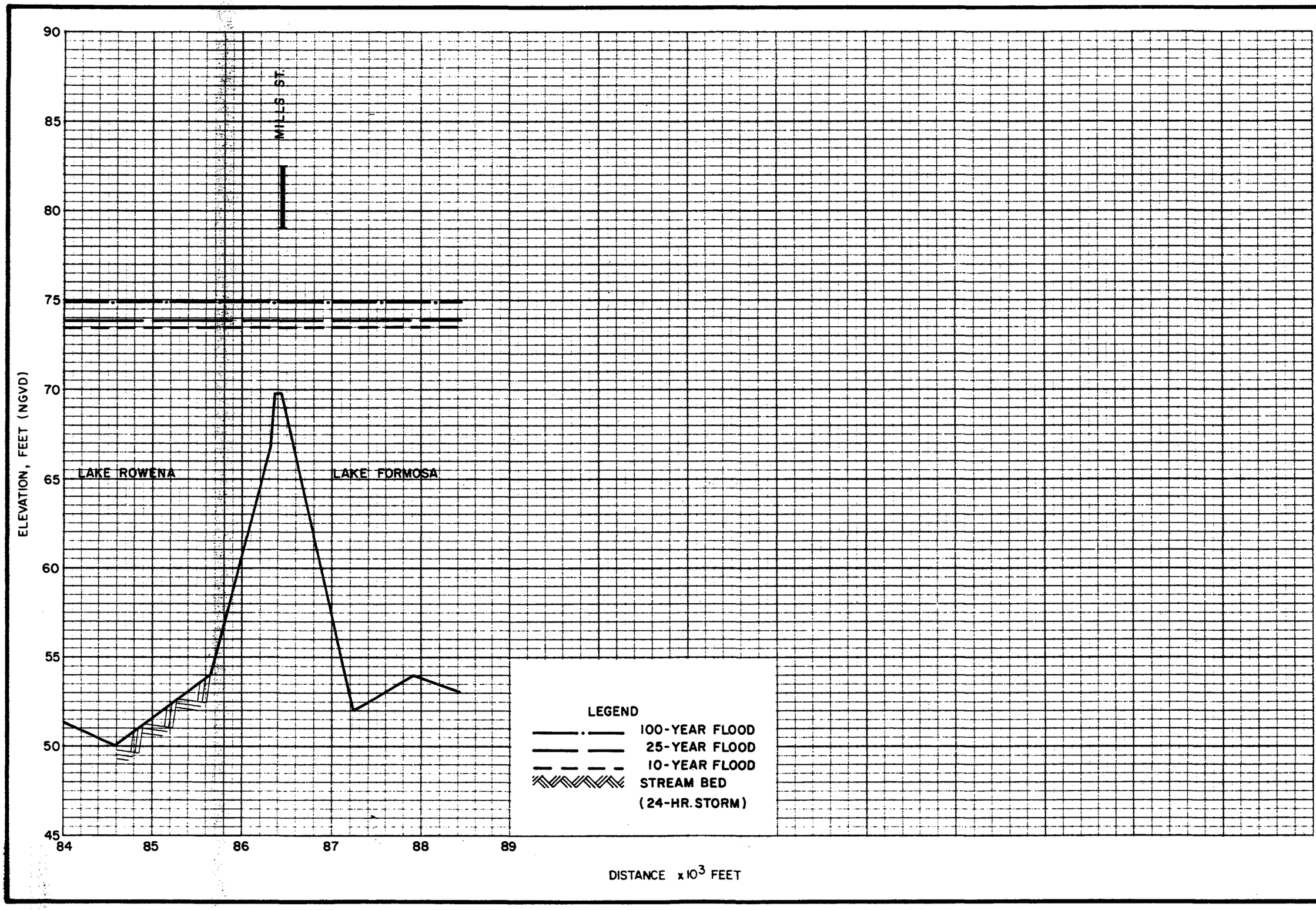
DISTANCE x $10^3$ FEET

LEGEND
100-YEAR FLOOD
25-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
(24-HR. STORM)

FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS (STATION 700 TO STATION 840)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

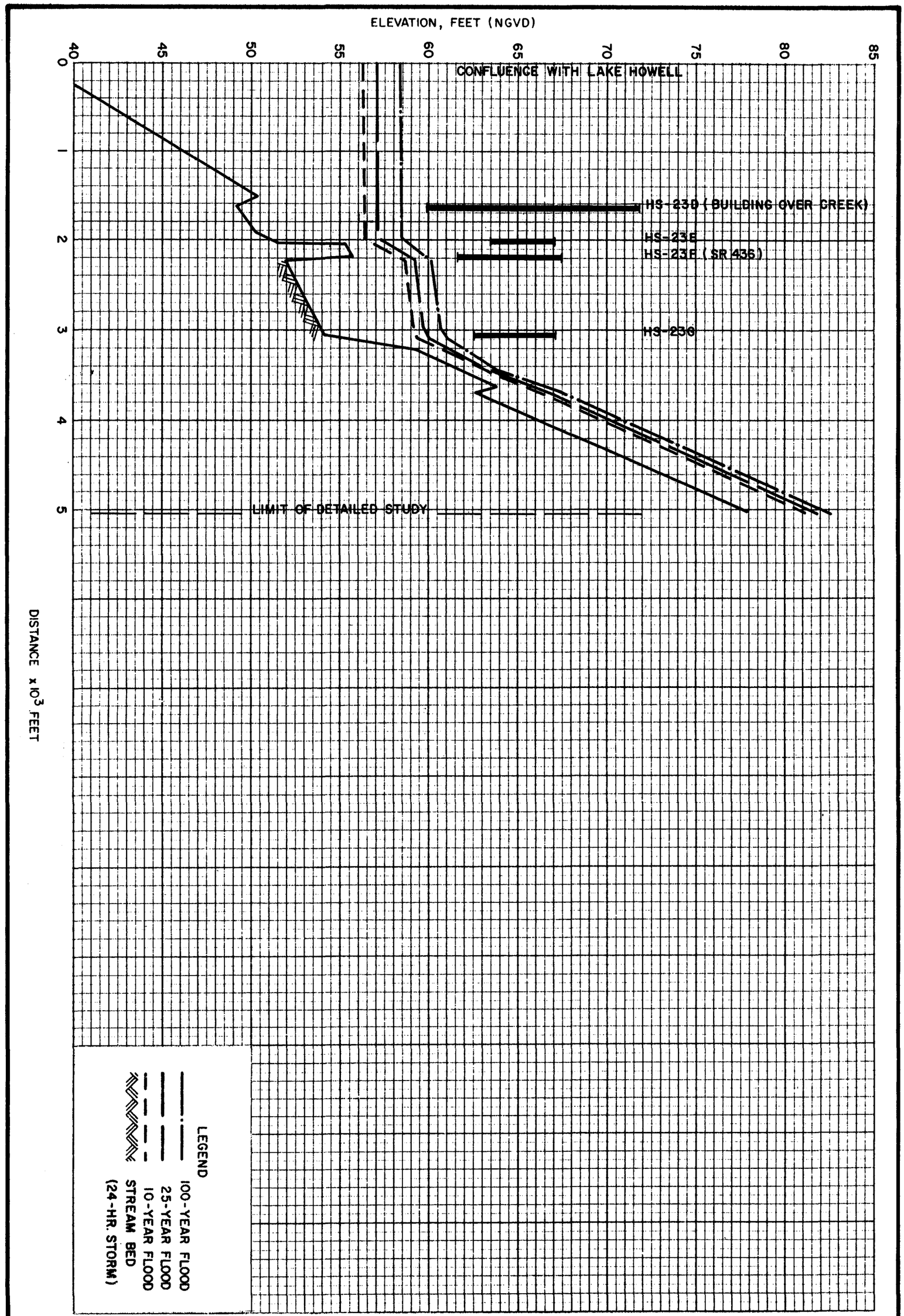
FIGURE
C-1f




FLOOD PROFILES OF HOWELL CREEK UNDER EXISTING CONDITIONS ( STATION 840 TO STATION 884 )

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

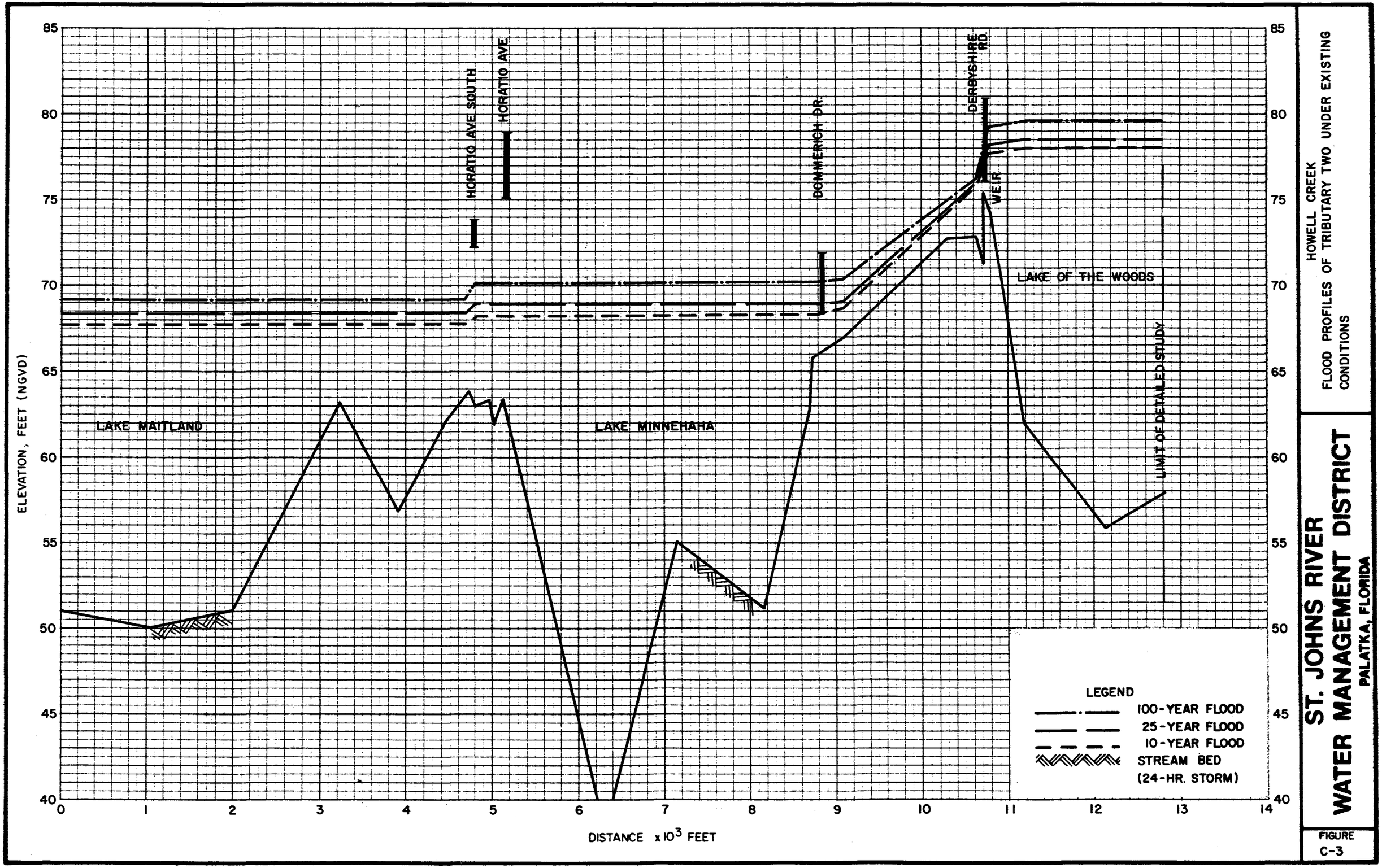
FIGURE
C-1g




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE C-2

HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY ONE UNDER EXISTING CONDITIONS




HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY TWO UNDER EXISTING CONDITIONS

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
C-3

HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY THREE UNDER EXISTING CONDITIONS (STATION 0 TO STATION 140)

ELEVATION, FEET (NGVD)

DISTANCE x $10^3$ FEET

US-17

SEABOARD RAILROAD

SR 438

WEIR

LAKE KILLARNEY

PARK LAKE

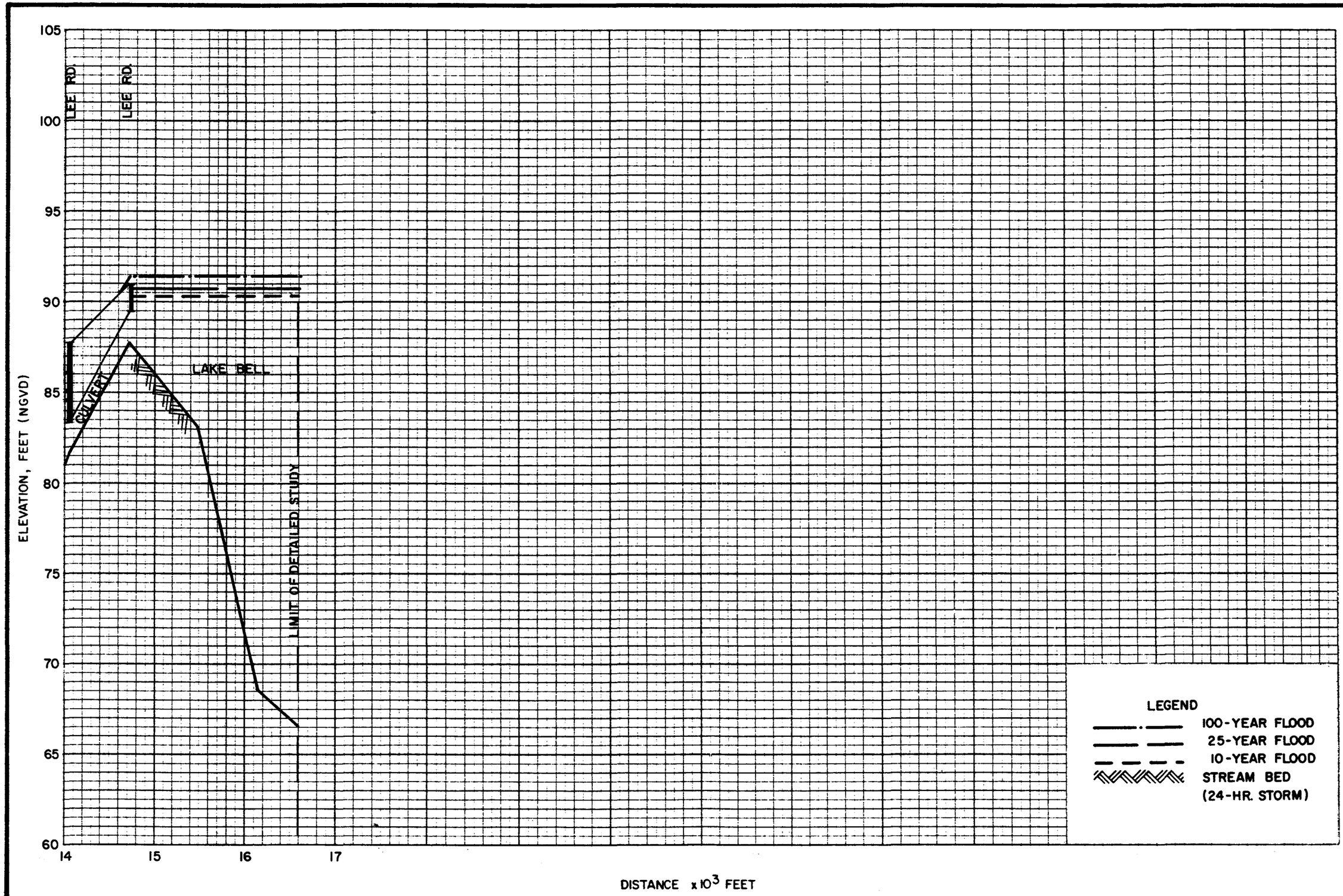
CULVERT

LAKE MAITLAND

LEGEND
100-YEAR FLOOD
25-YEAR FLOOD
10-YEAR FLOOD
STREAM BED (24-HR. STORM)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

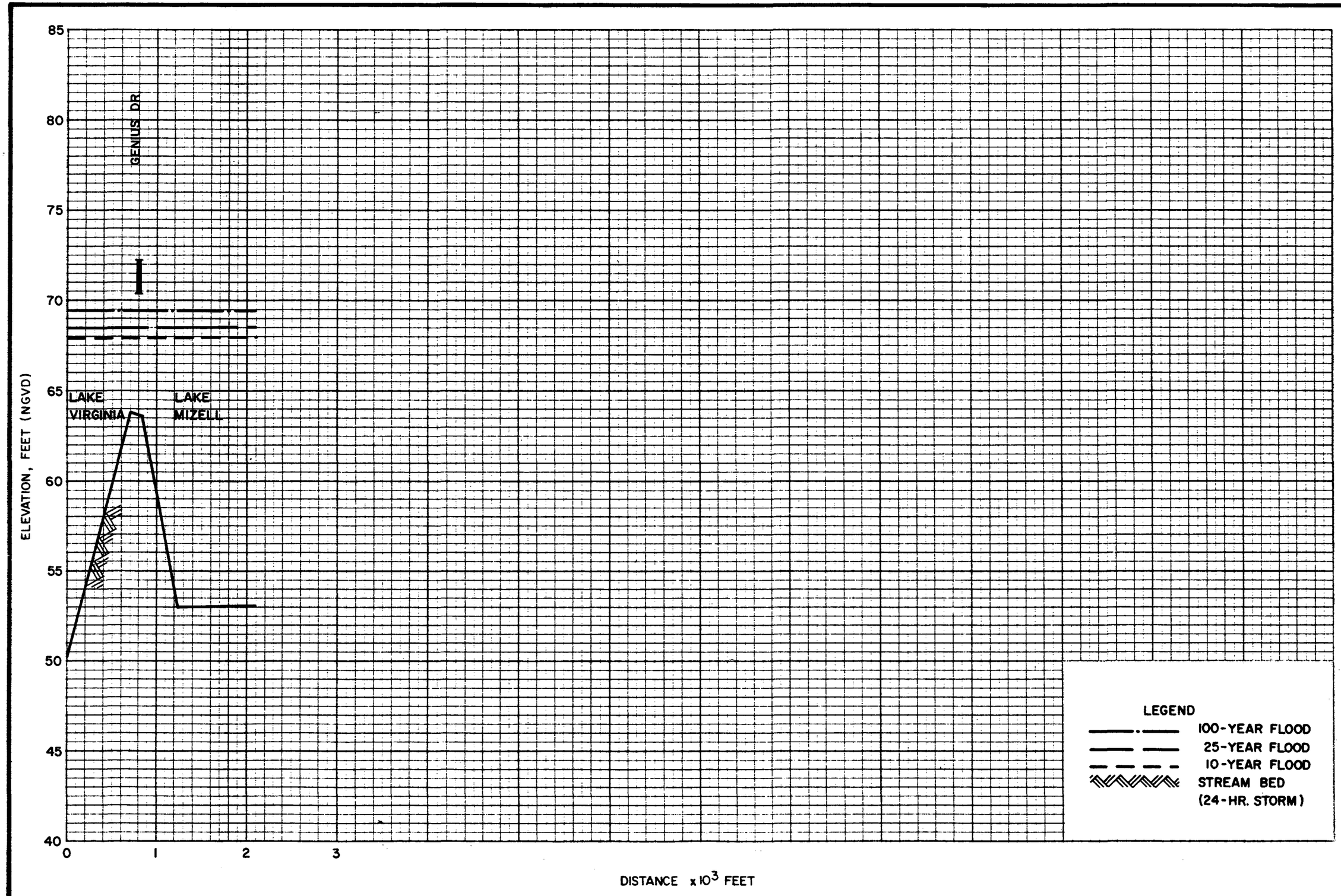
FIGURE C-4a




HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY THREE UNDER EXISTING CONDITIONS (STATION 140 TO STATION 166)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

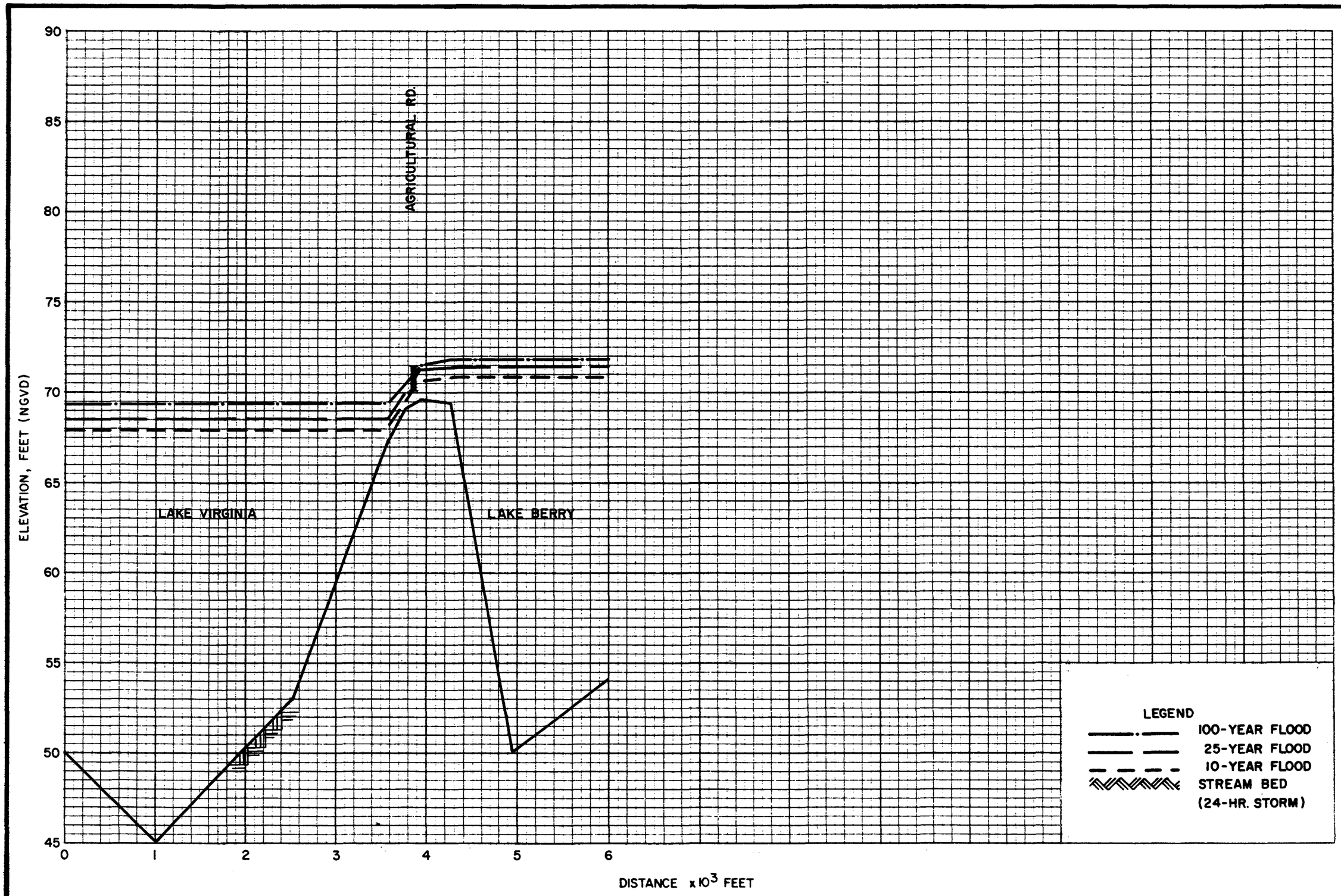
FIGURE
C-4b




HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY FOUR UNDER EXISTING CONDITIONS

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

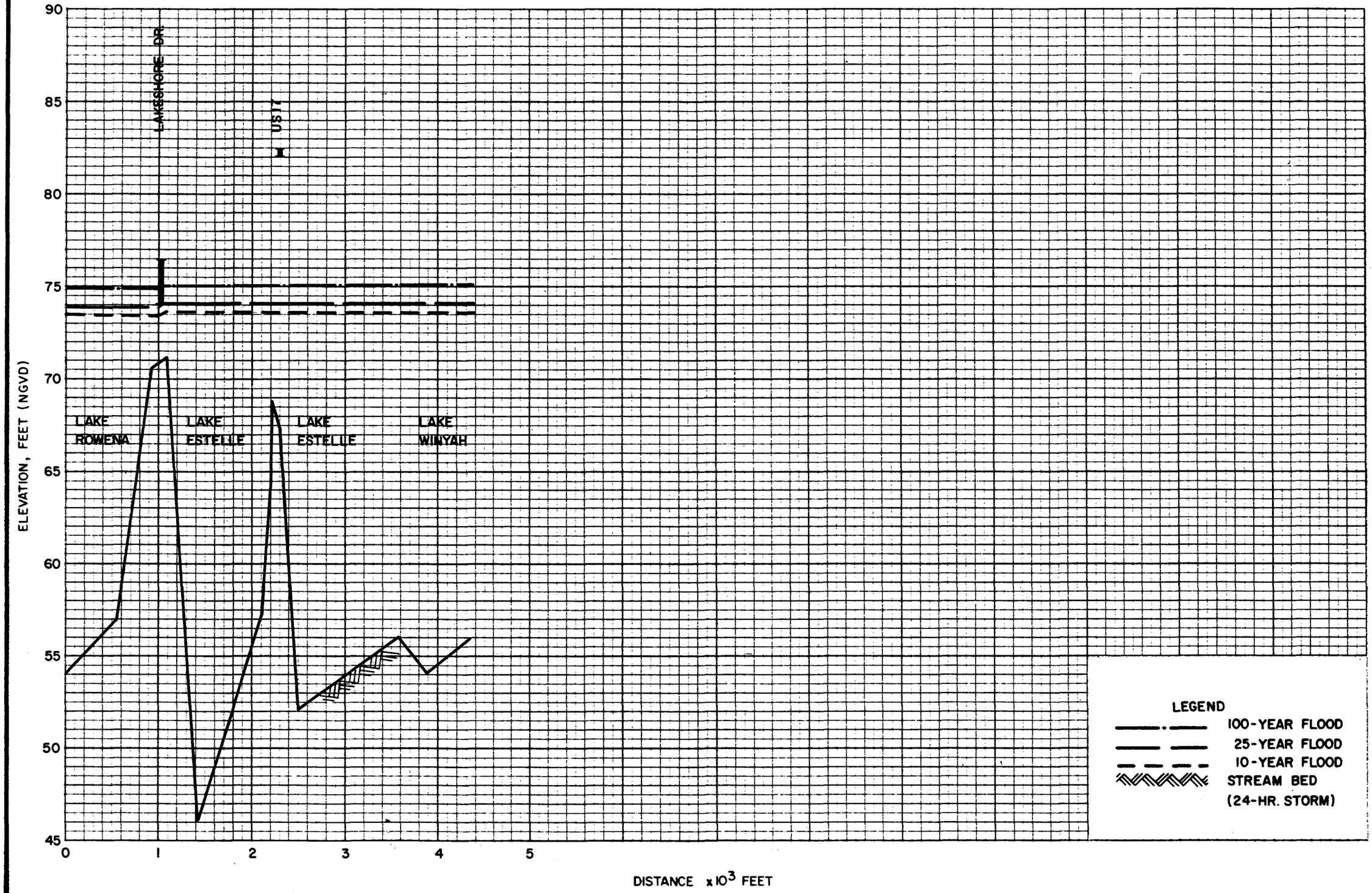
FIGURE
C-5




HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY FIVE UNDER EXISTING CONDITIONS

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

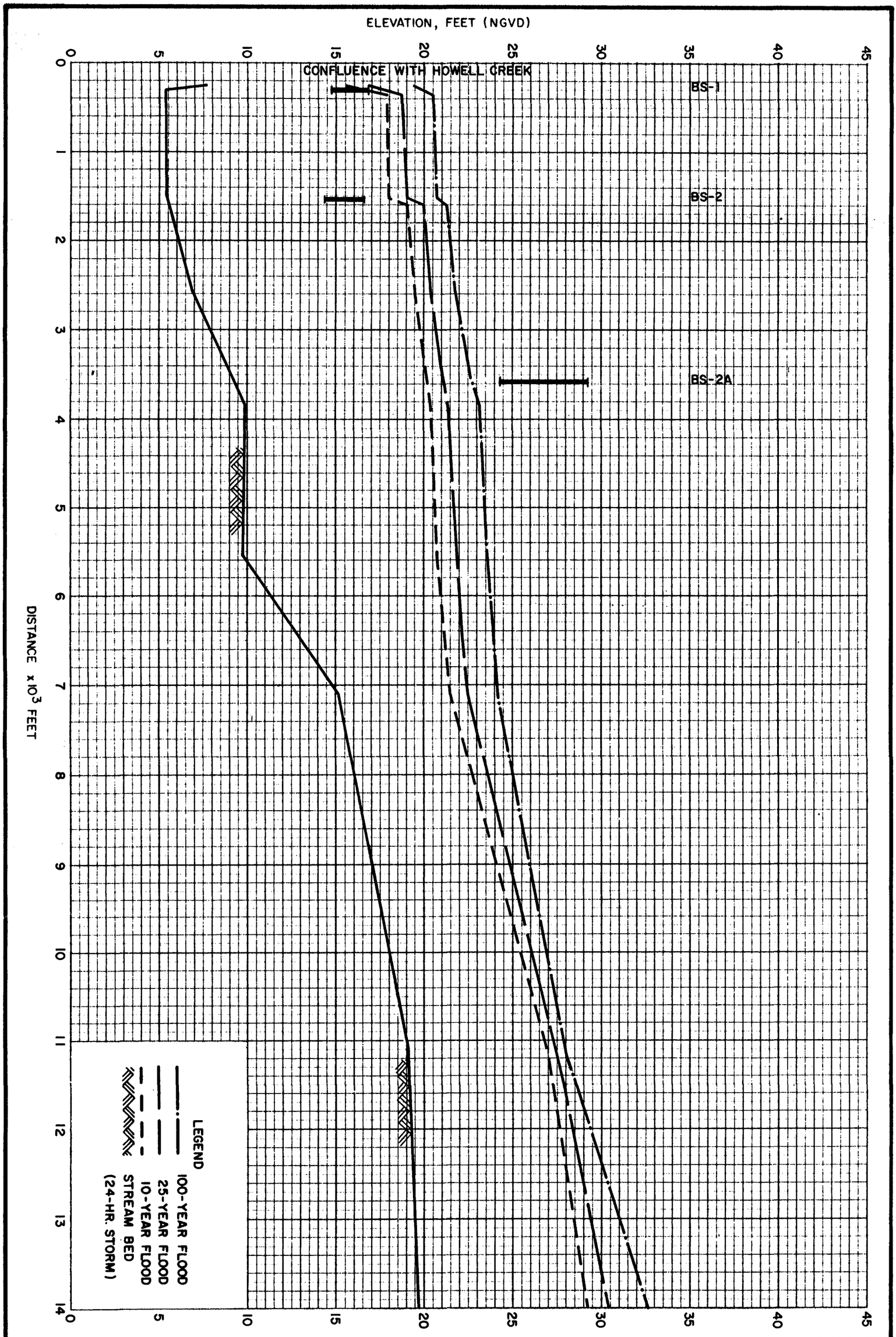
FIGURE
C-6




HOWELL CREEK
FLOOD PROFILES OF TRIBUTARY SIX UNDER EXISTING CONDITIONS

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

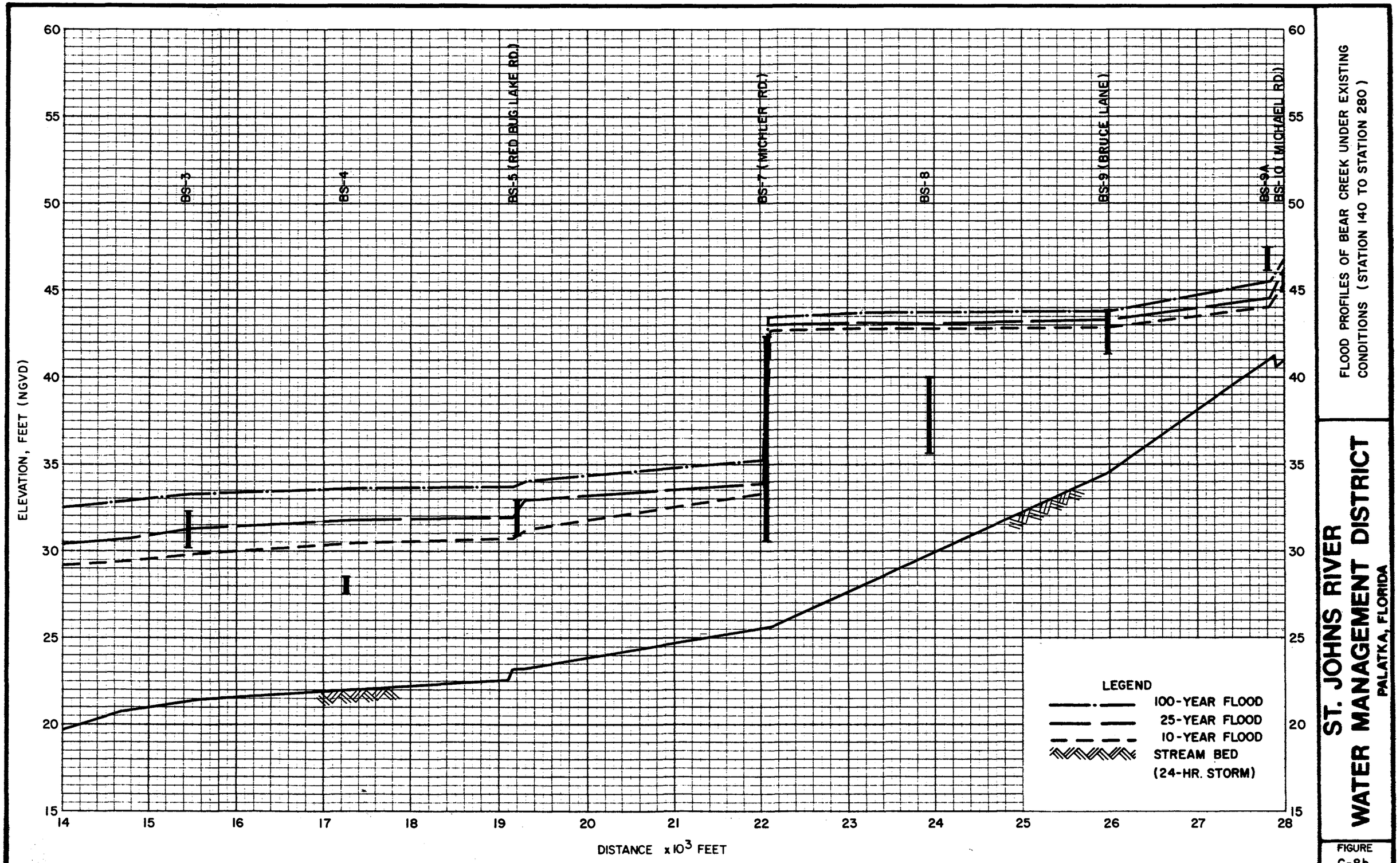
FIGURE
C-7




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE C-8a

FLOOD PROFILES OF BEAR CREEK UNDER EXISTING CONDITIONS (STATION 0 TO STATION 140)




FLOOD PROFILES OF BEAR CREEK UNDER EXISTING CONDITIONS ( STATION 140 TO STATION 280 )

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
C-8b

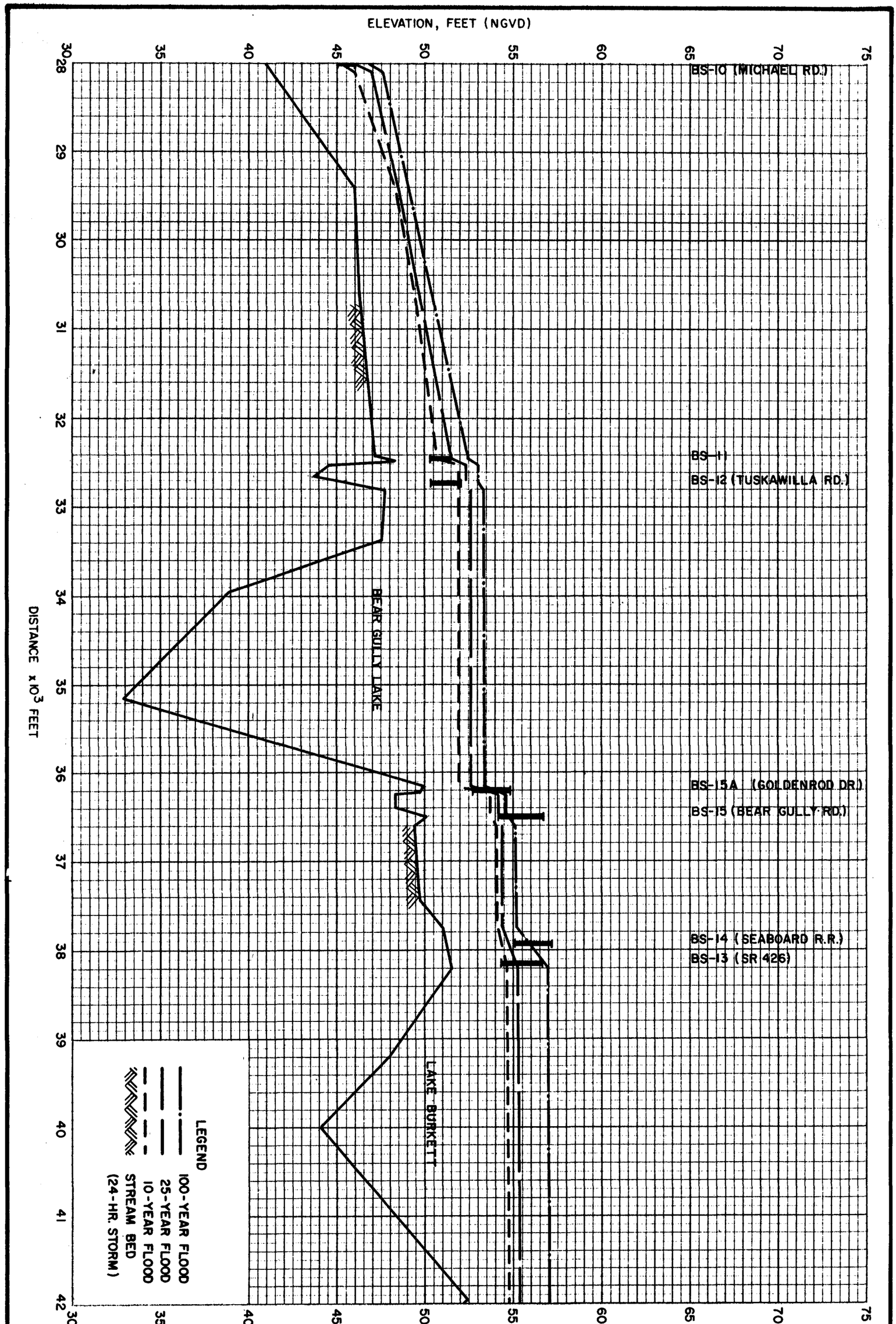
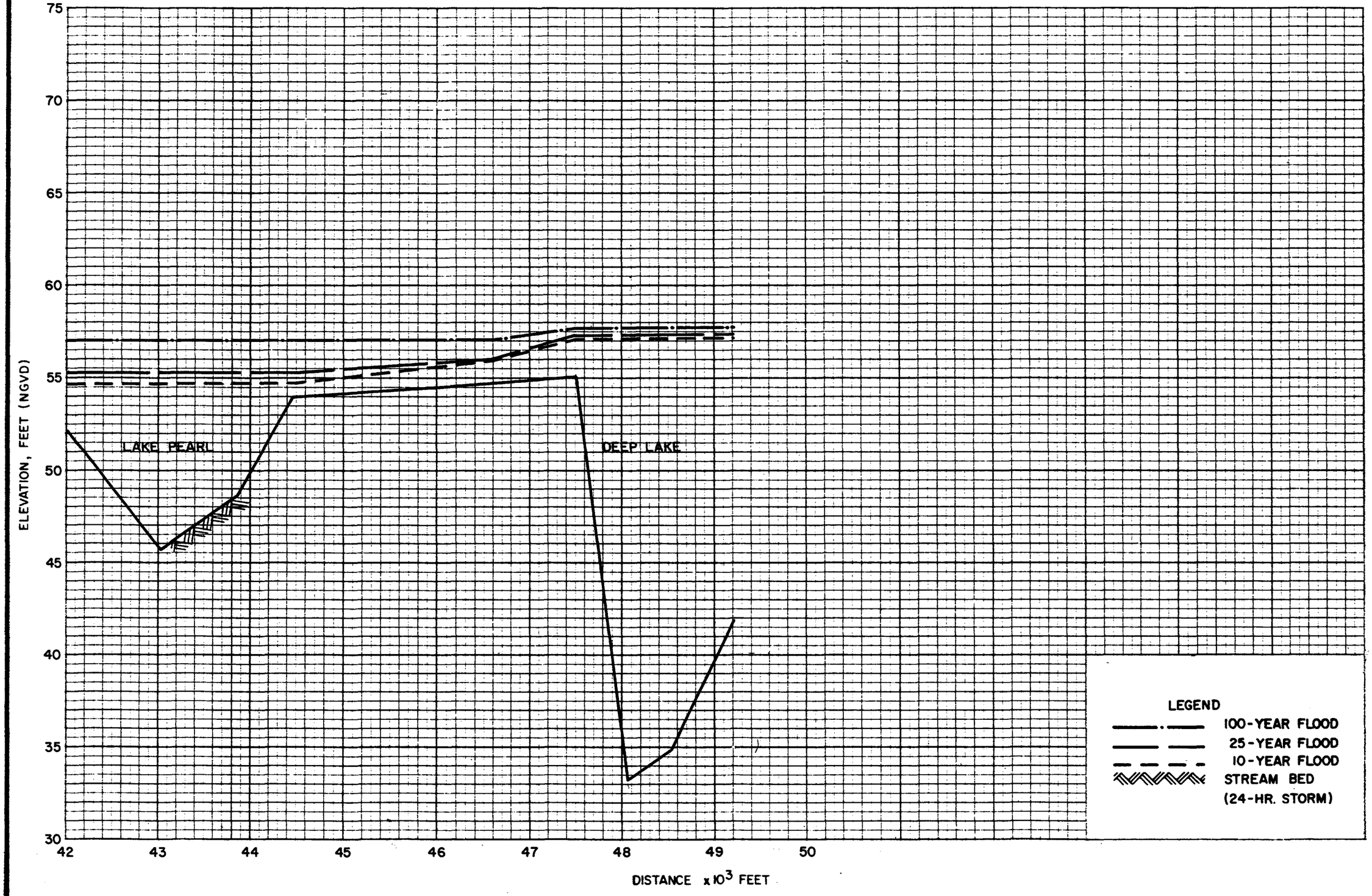



FIGURE C-8c

# ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

PALATKA, FLORIDA

FLOOD PROFILES OF BEAR CREEK UNDER EXISTING CONDITIONS (STATION 280 TO STATION 420)




FLOOD PROFILES OF BEAR CREEK UNDER EXISTING CONDITIONS ( STATION 420 TO STATION 492 )

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
C-8d

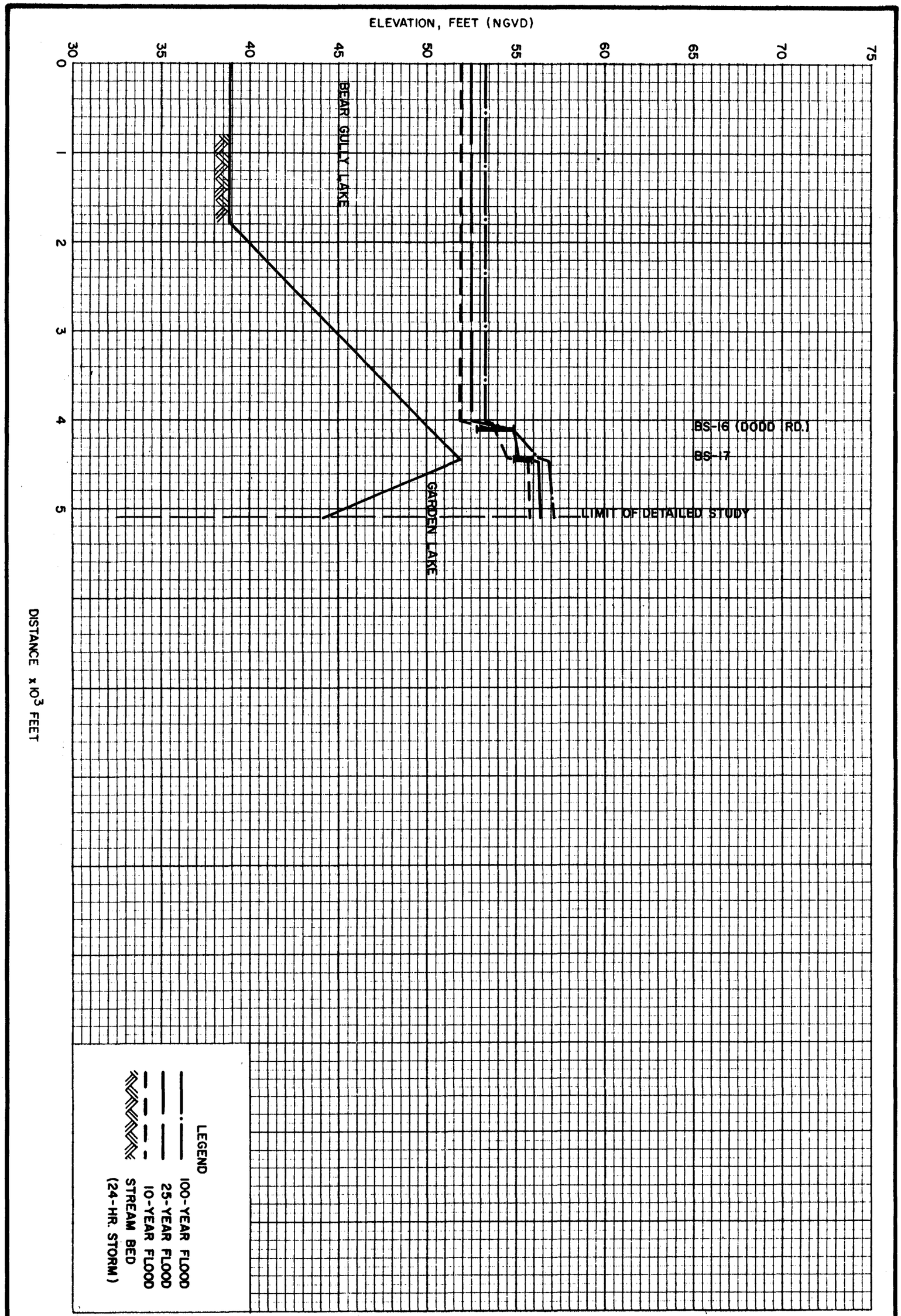
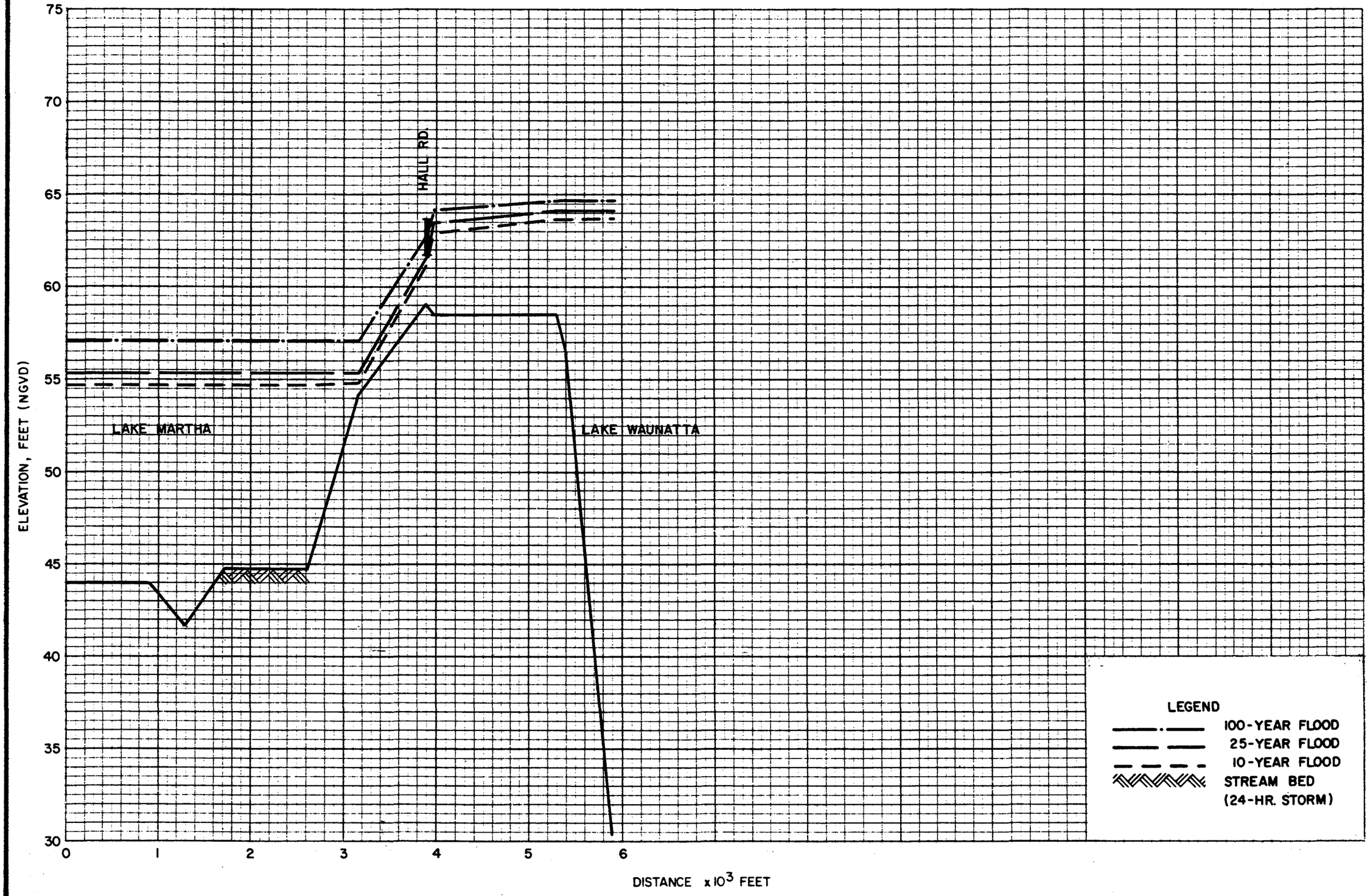



FIGURE C-9

**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FLOOD PROFILES OF BEAR CREEK TRIBUTARY ONE UNDER EXISTING CONDITIONS



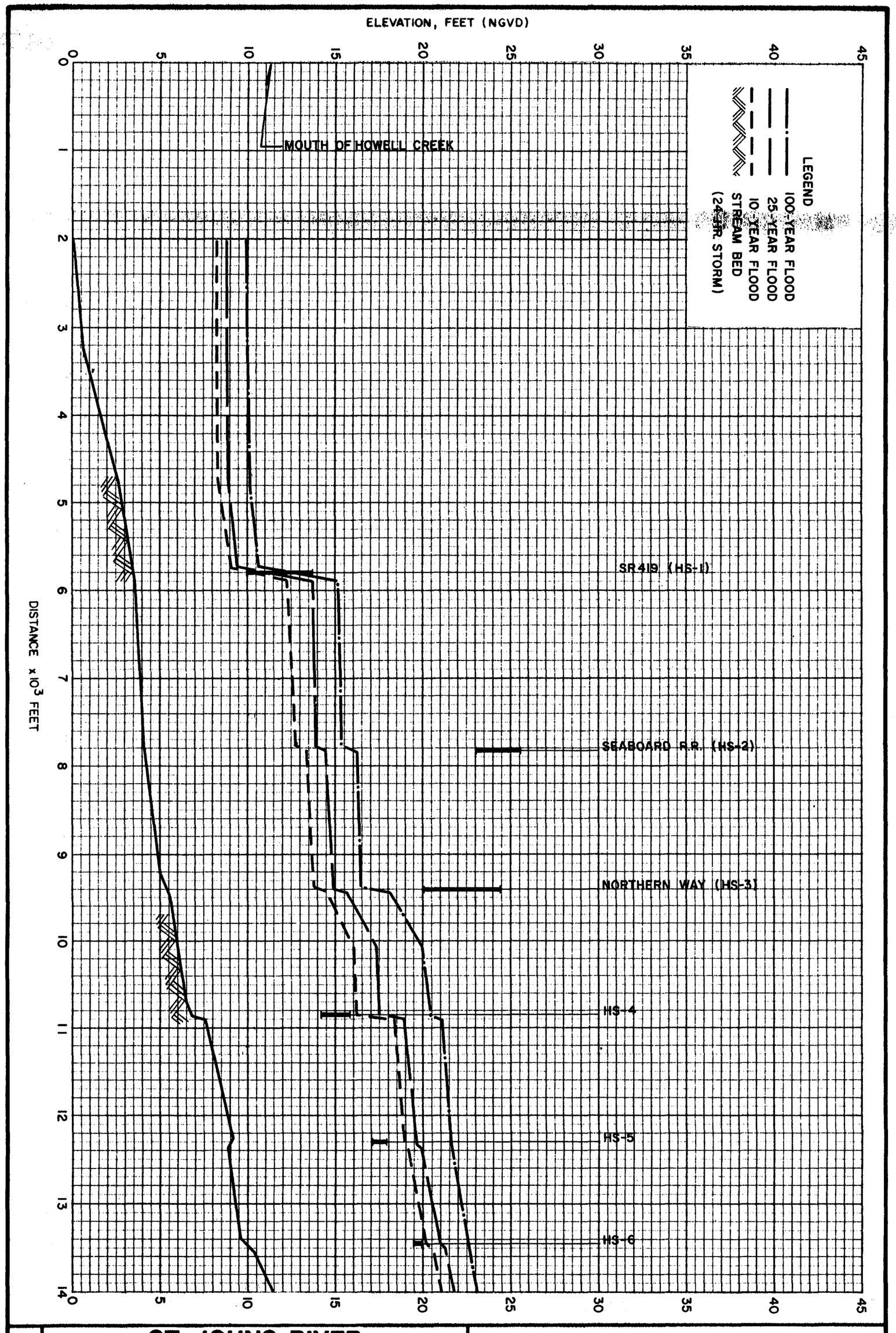

FLOOD PROFILES OF BEAR CREEK TRIBUTARY TWO
UNDER EXISTING CONDITIONS

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
C-10

# APPENDIX D

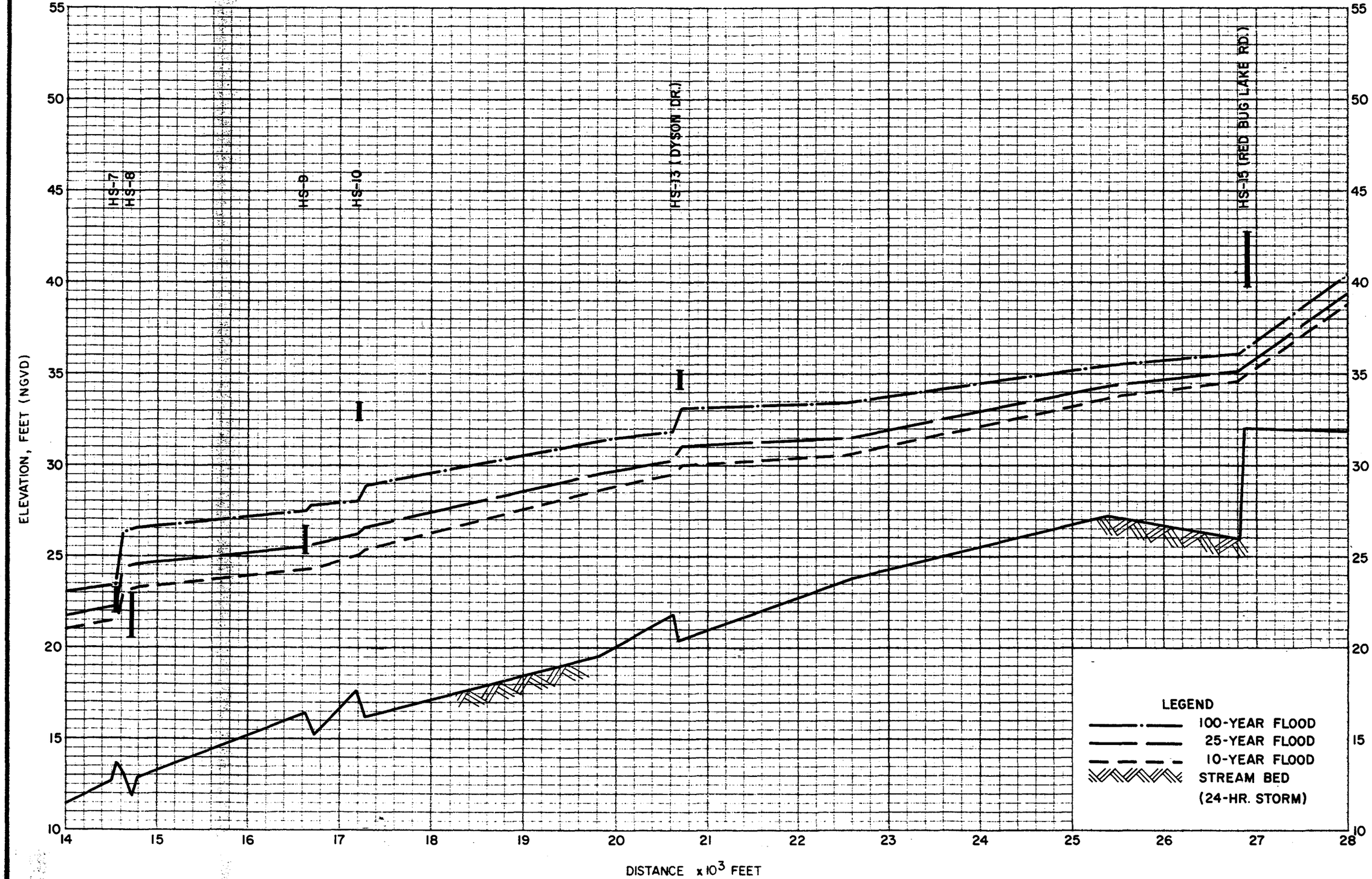
## Flood Profiles for 24-Hour Storm under Future Development




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE D-1a

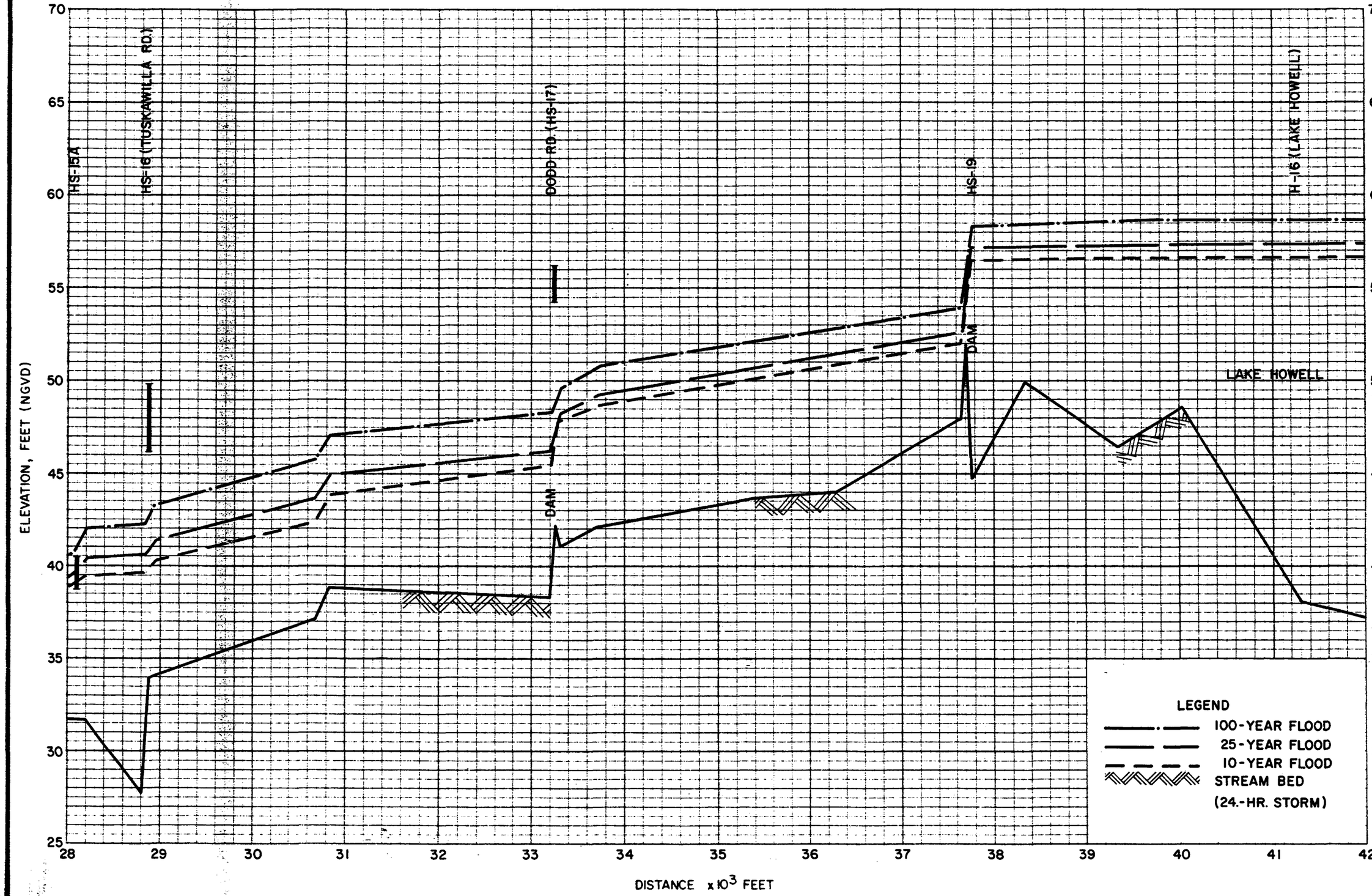
FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 0 TO STATION 140)




FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 140 TO STATION 280)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

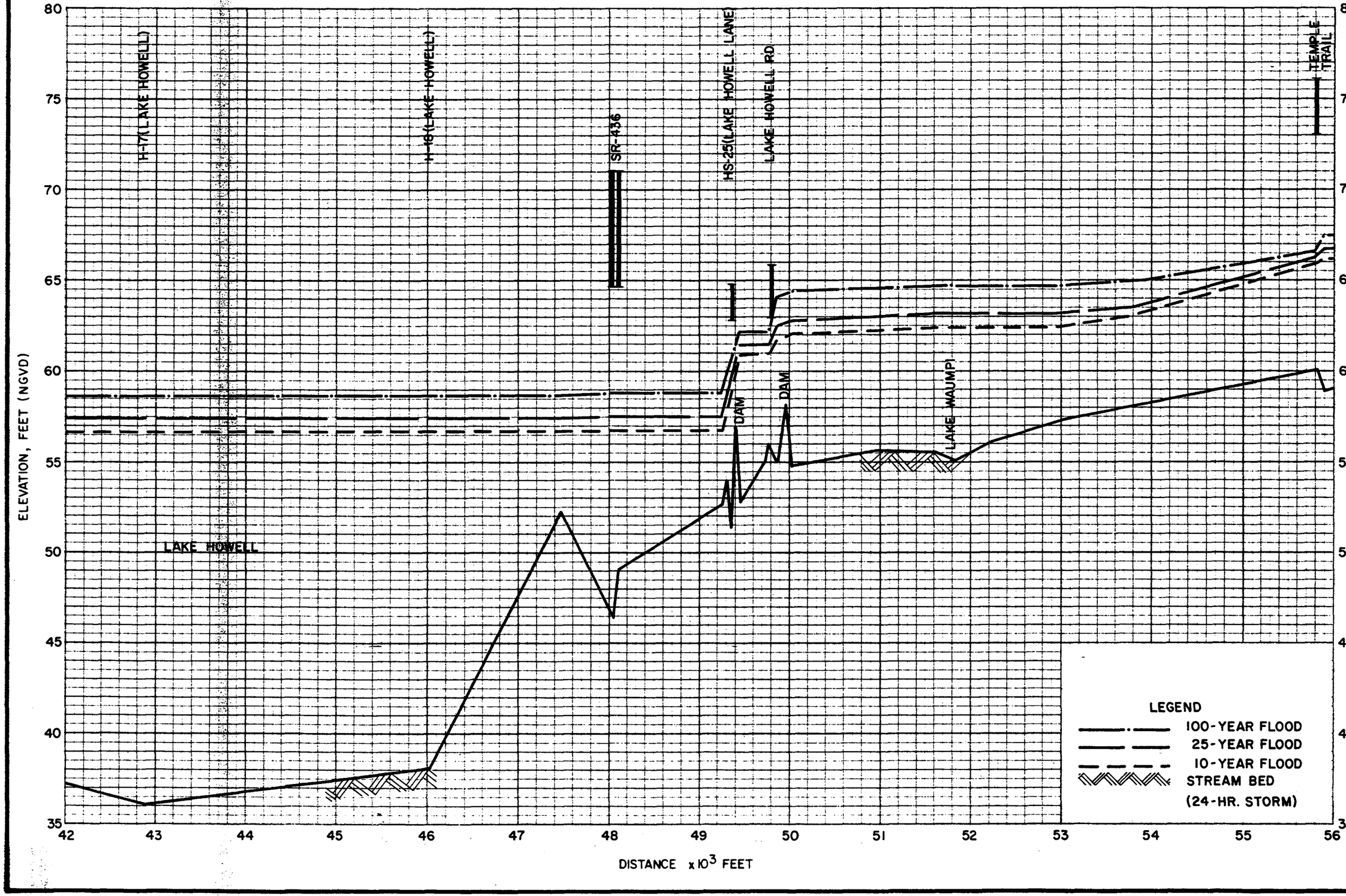
FIGURE
D-1b




FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 280 TO STATION 420)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE D-1c




FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 420 TO STATION 560)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE D-1d

FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 560 TO STATION 700)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-1e

ELEVATION, FEET (NGVD)

DISTANCE x $10^3$ FEET

HORATIO DR.

PALMER AVE

WEIR

LAKE MAITLAND

LAKE MAITLAND

LAKE OSCEOLA

LEGEND
- 100-YEAR FLOOD
- 25-YEAR FLOOD
- 10-YEAR FLOOD
- STREAM BED (24-HR. STORM)

OSCEOLA AVE

STIRLING AVE

PENNSYLVANIA AVE

LAKE SHORE DR.

LAKESIDE DR.

LAKE VIRGINIA

LAKE SUE

ELEVATION, FEET (NGVD)

DISTANCE x $10^3$ FEET

LEGEND

100-YEAR FLOOD

25-YEAR FLOOD

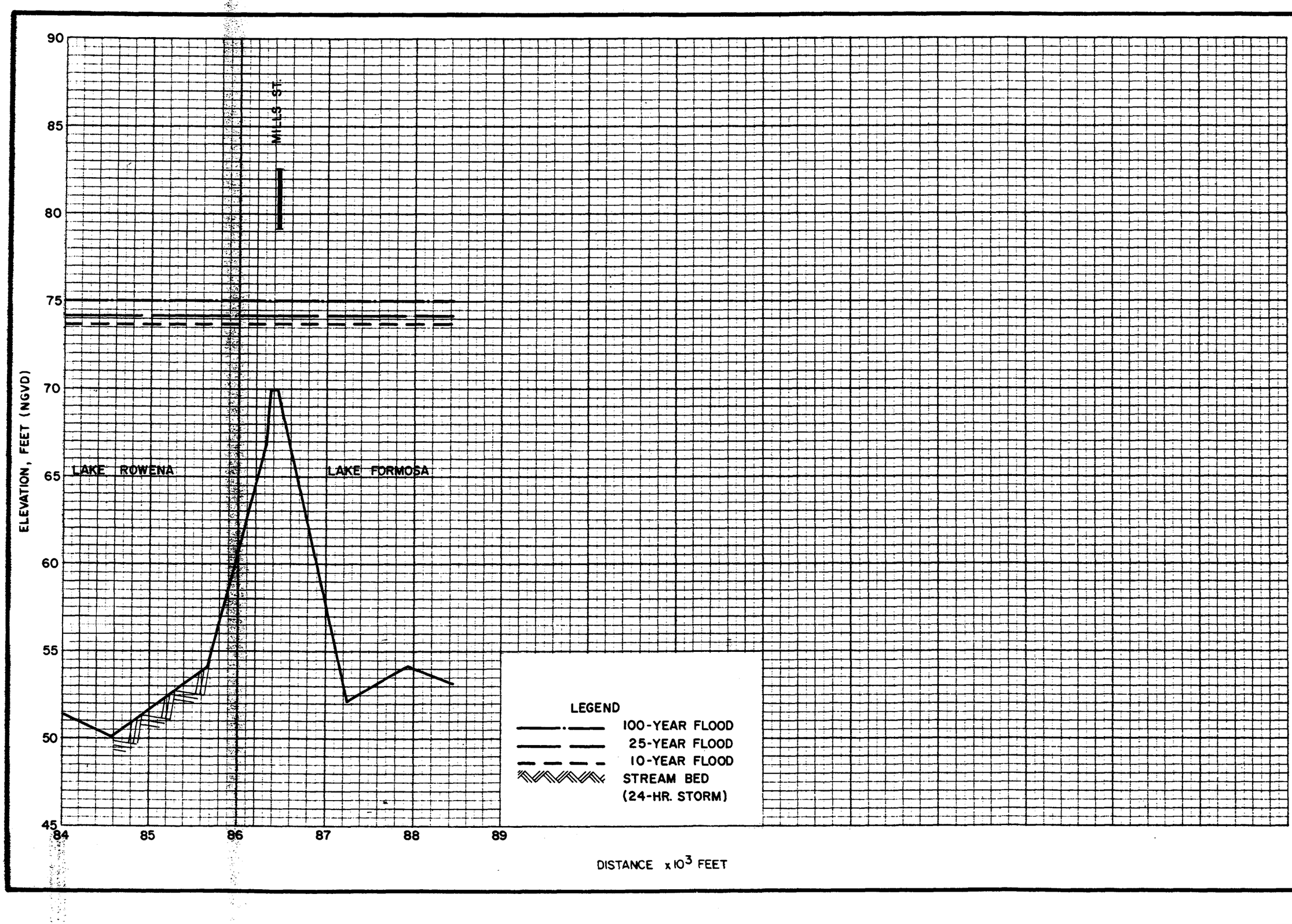
10-YEAR FLOOD

STREAM BED (24-HR. STORM)

FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 700 TO STATION 840)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

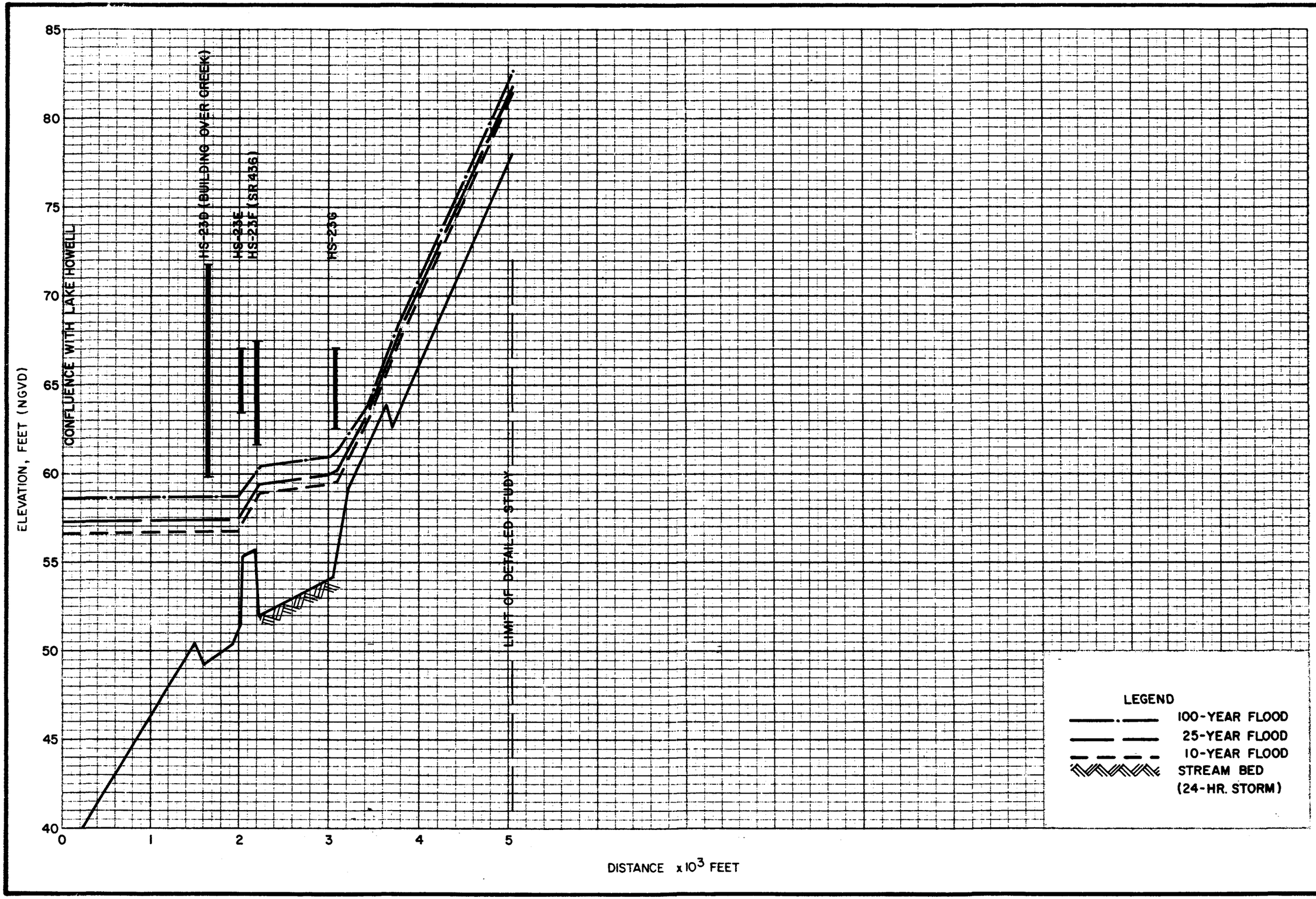
FIGURE D-1f




FLOOD PROFILES OF HOWELL CREEK UNDER FUTURE DEVELOPMENT (STATION 840 TO STATION 884)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

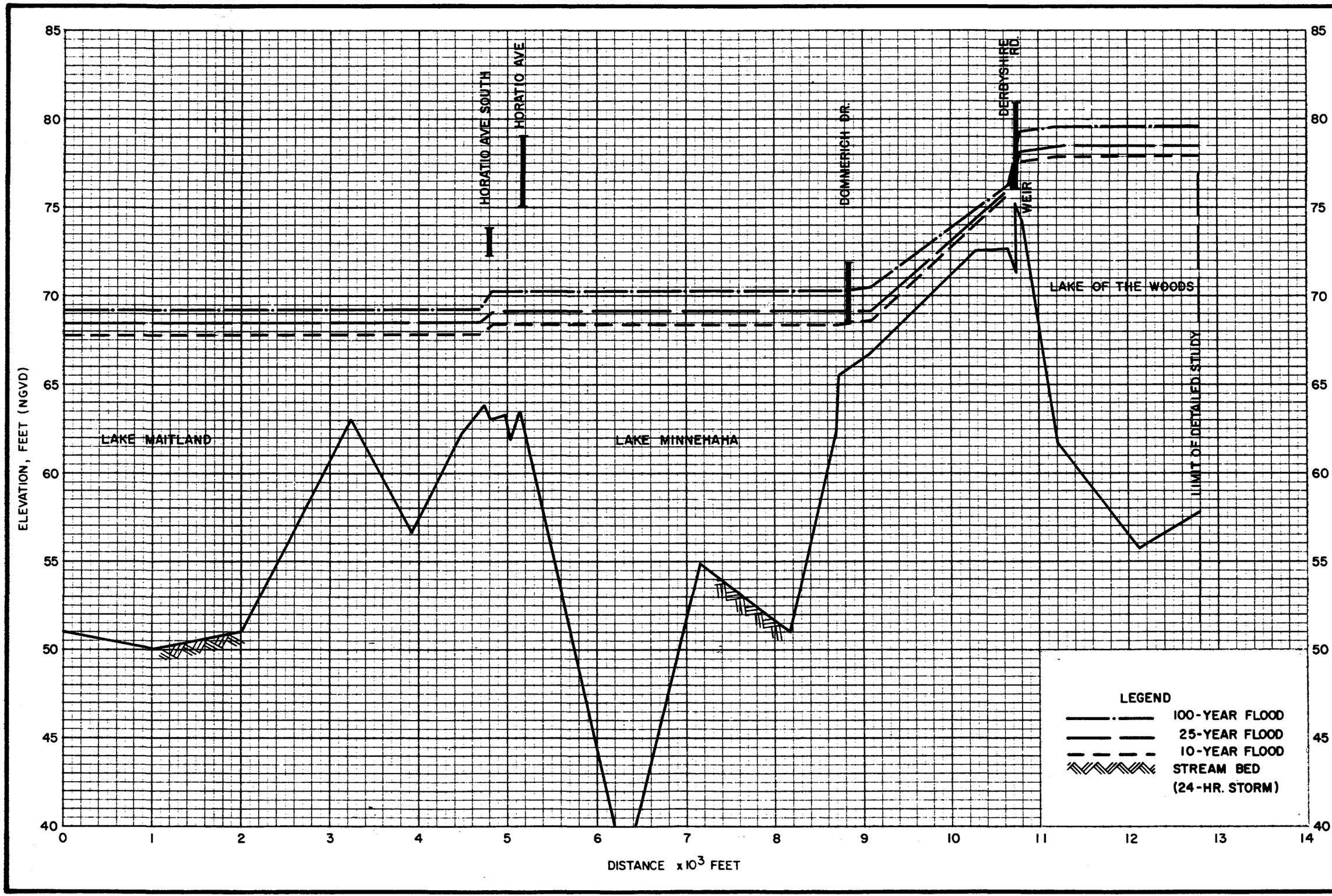
FIGURE
D-1g




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY ONE
UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

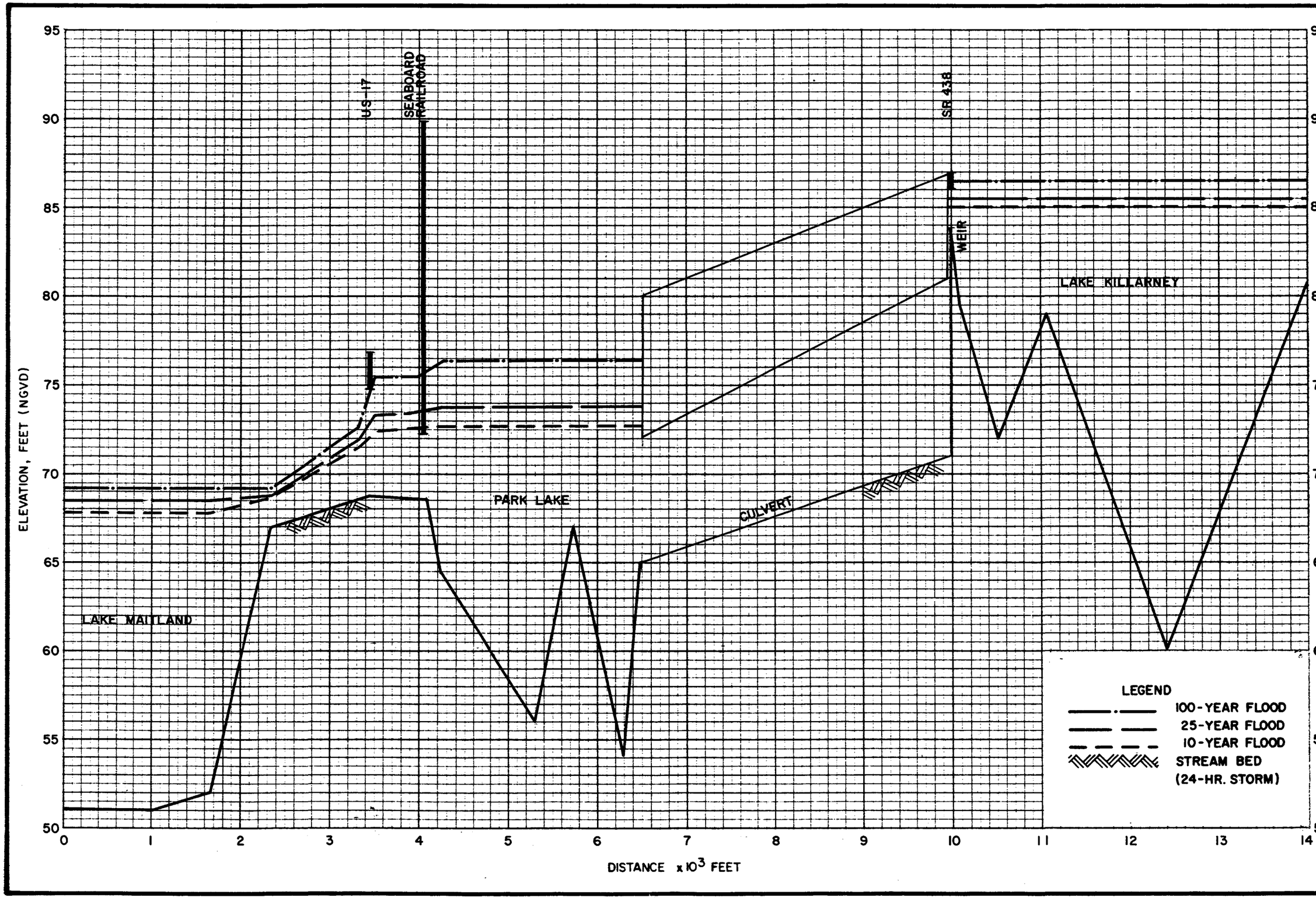
FIGURE
D-2




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY TWO
UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

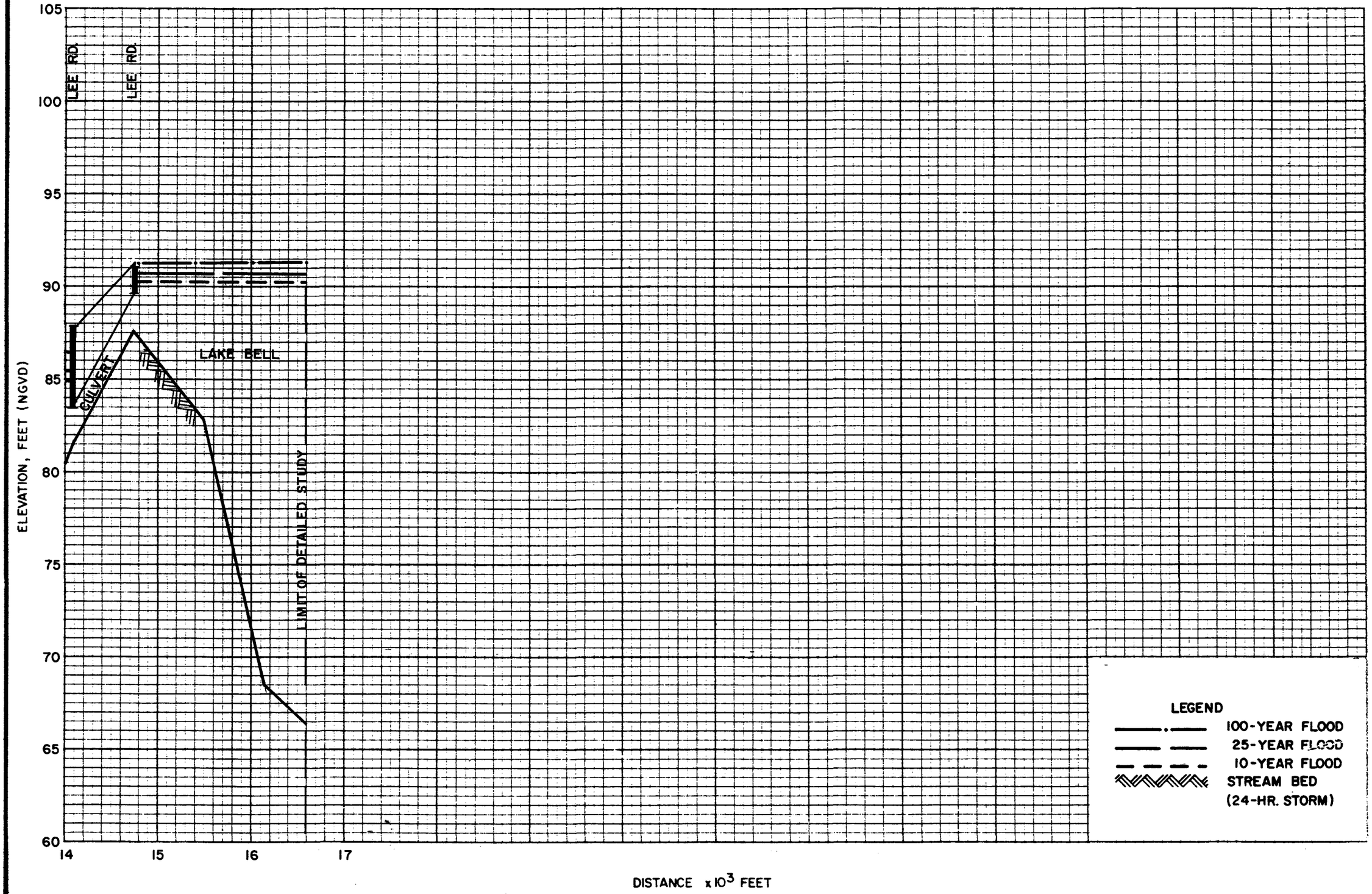
FIGURE
D-3




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY THREE
UNDER FUTURE DEVELOPMENT (STATION 0 TO STATION 140)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-4a




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY THREE
UNDER FUTURE DEVELOPMENT (STATION 140 TO STATION 166)

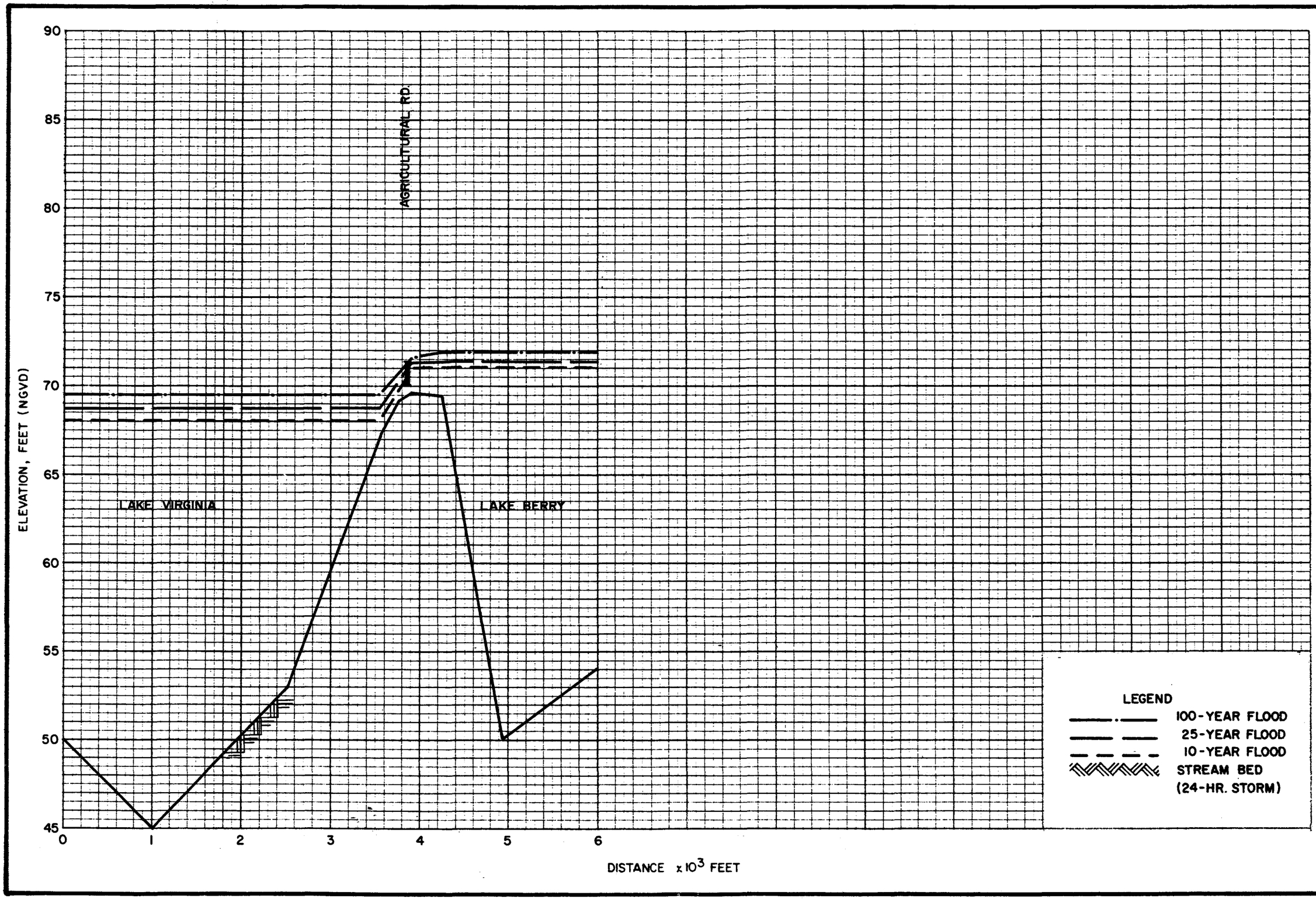
ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-4b

FLOOD PROFILES OF HOWELL CREEK TRIBUTARY FOUR
UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

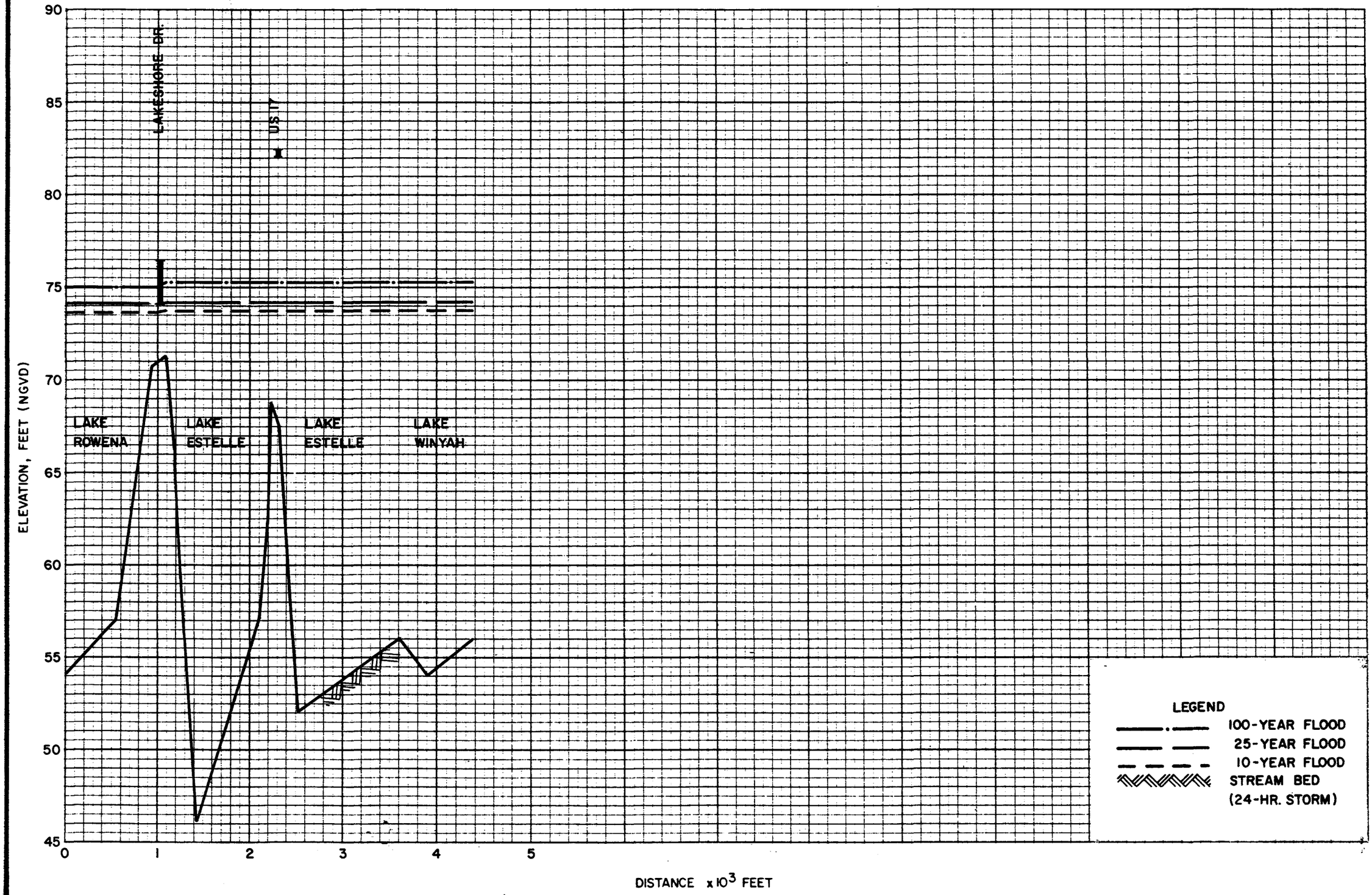
FIGURE
D-5




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY FIVE
UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

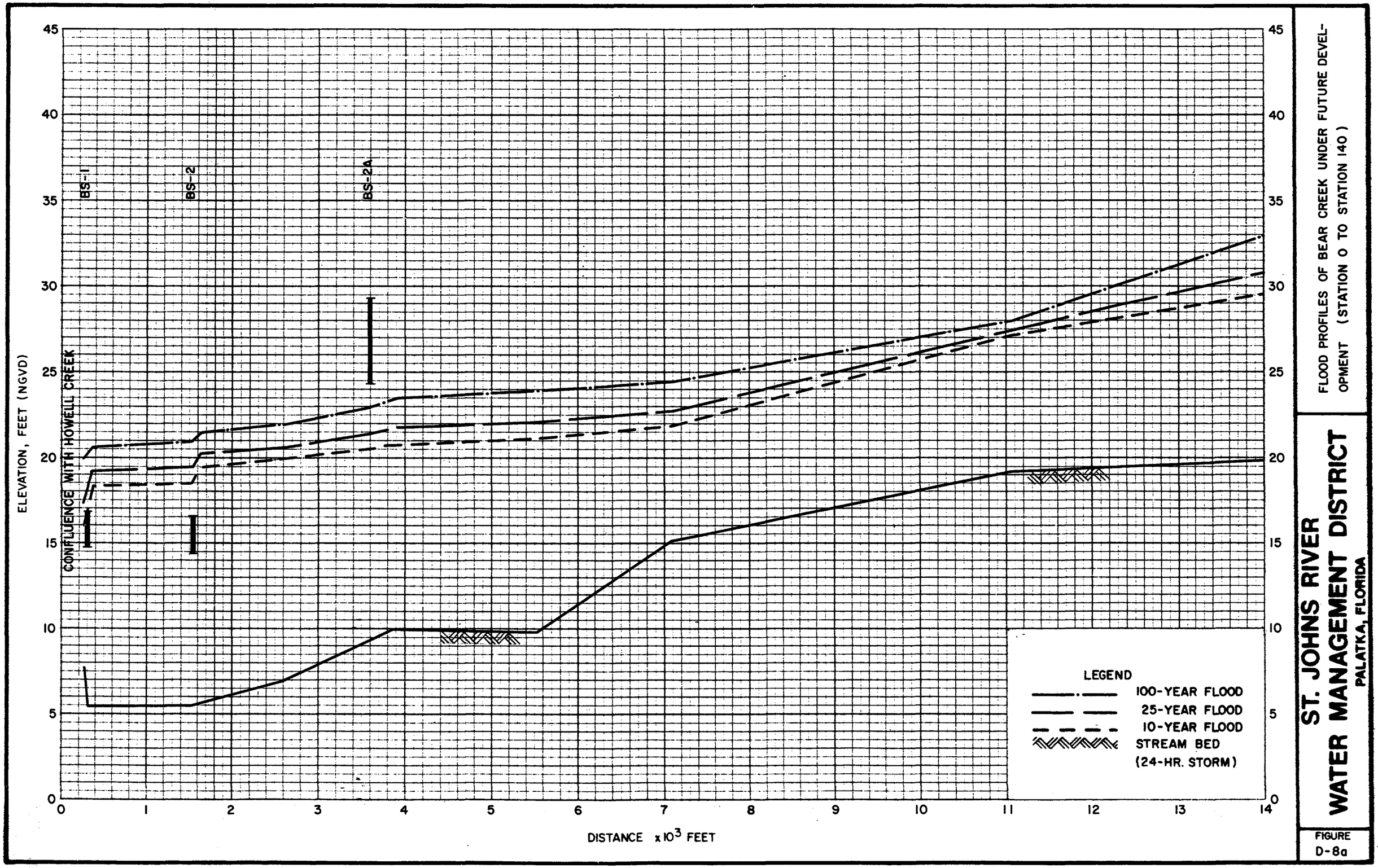
FIGURE
D-6




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY SIX
UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

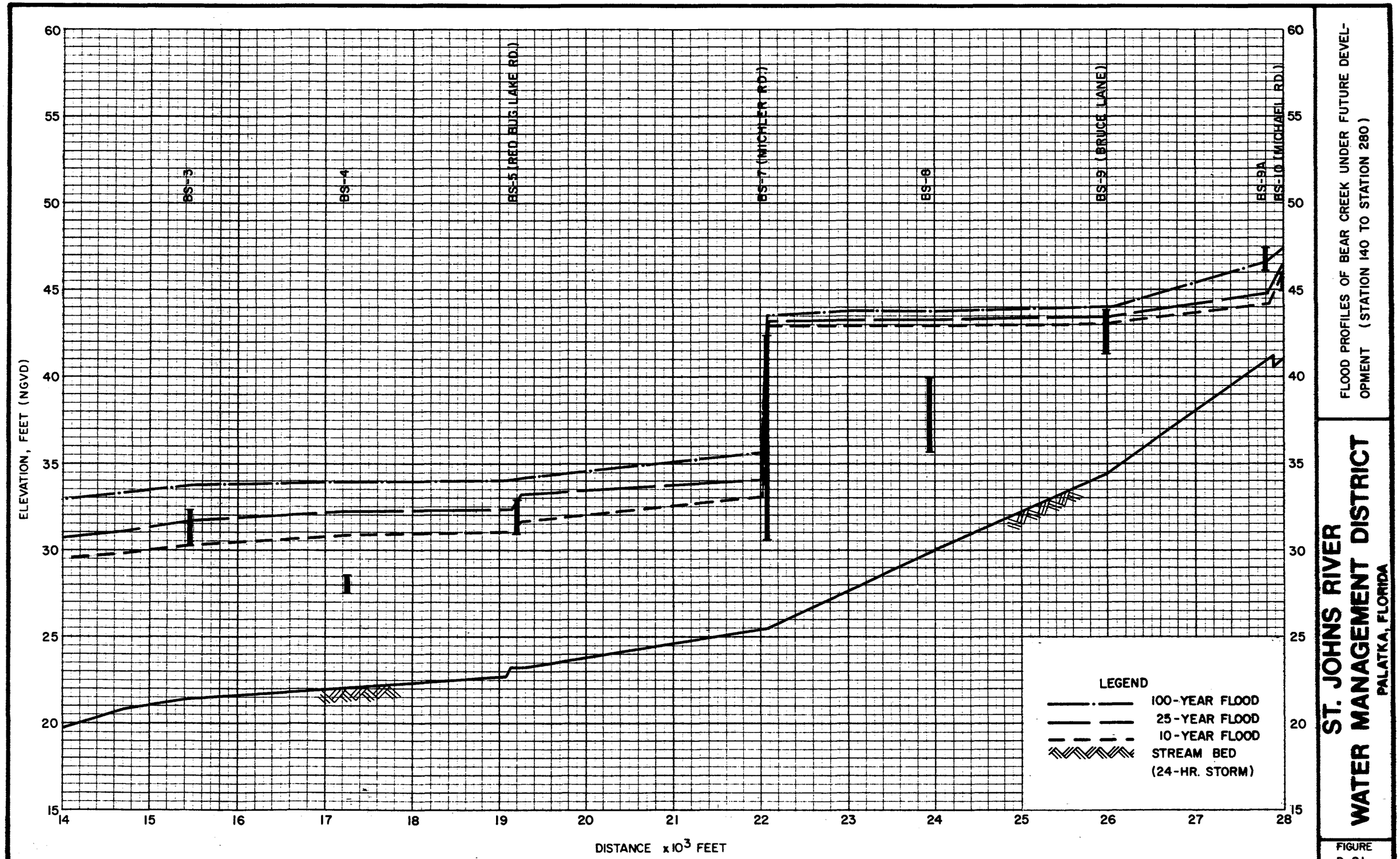
FIGURE
D-7




FLOOD PROFILES OF BEAR CREEK UNDER FUTURE DEVELOPMENT (STATION 0 TO STATION 140)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-8a




FLOOD PROFILES OF BEAR CREEK UNDER FUTURE DEVELOPMENT (STATION 140 TO STATION 280)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-8b

BS-10 (MICHAEL DR.)
BS-11
BS-12 (TUSKAWILLA RD.)
BS-15A (GOLDENROD DR.)
BS-15 (BEAR GULLY RD)
BS-14 (SEABOARD R.R.)
BS-13 (SR 426)

BEAR GULLY LAKE

LAKE BURKETT

LEGEND
100-YEAR FLOOD
25-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
(24-HR. STORM)

ELEVATION, FEET (NGVD)

75 70 65 60 55 50 45 40 35 30

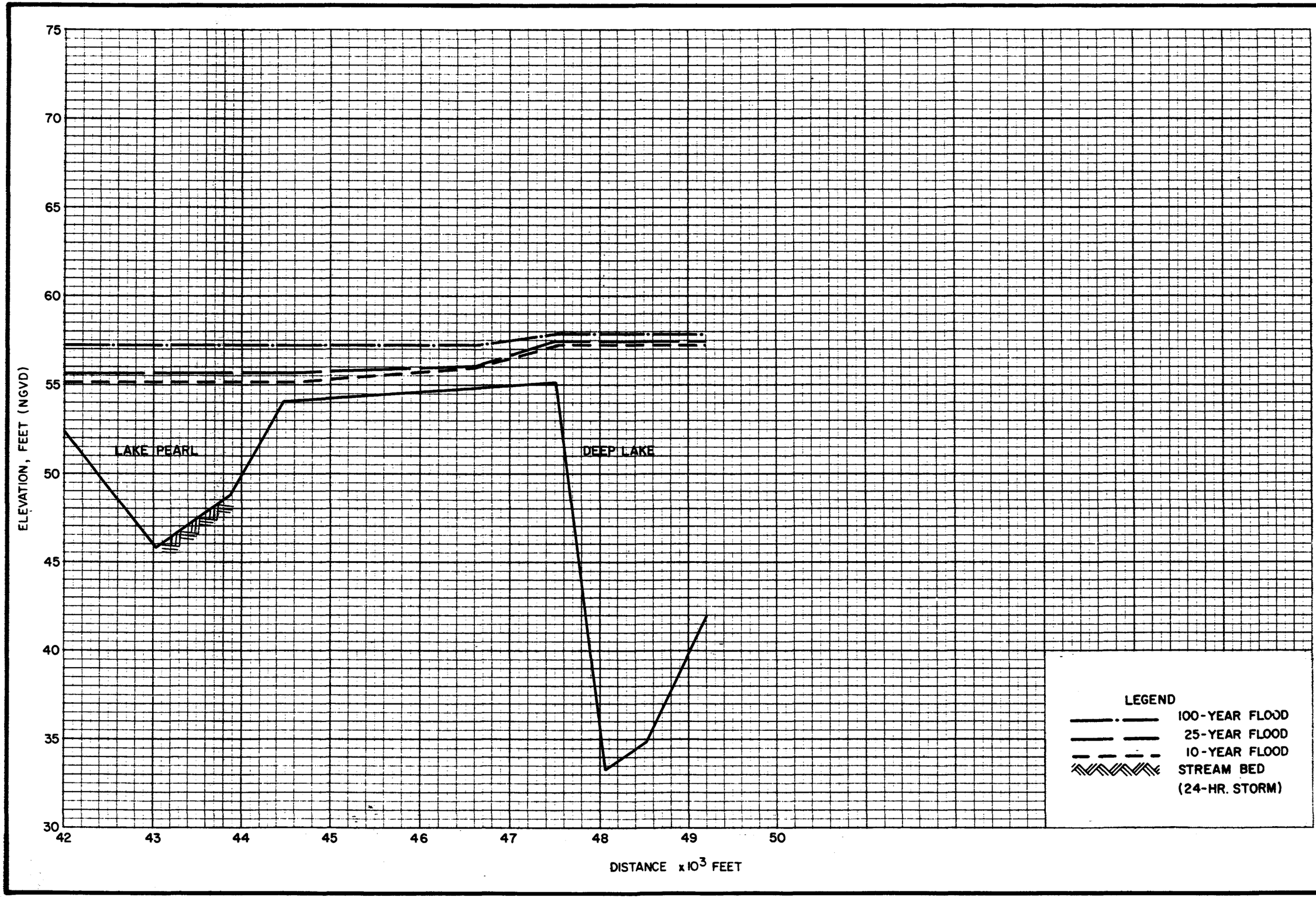
28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

DISTANCE x $10^3$ FEET

FLOOD PROFILES OF BEAR CREEK UNDER FUTURE DEVELOPMENT (STATION 280 TO STATION 420)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

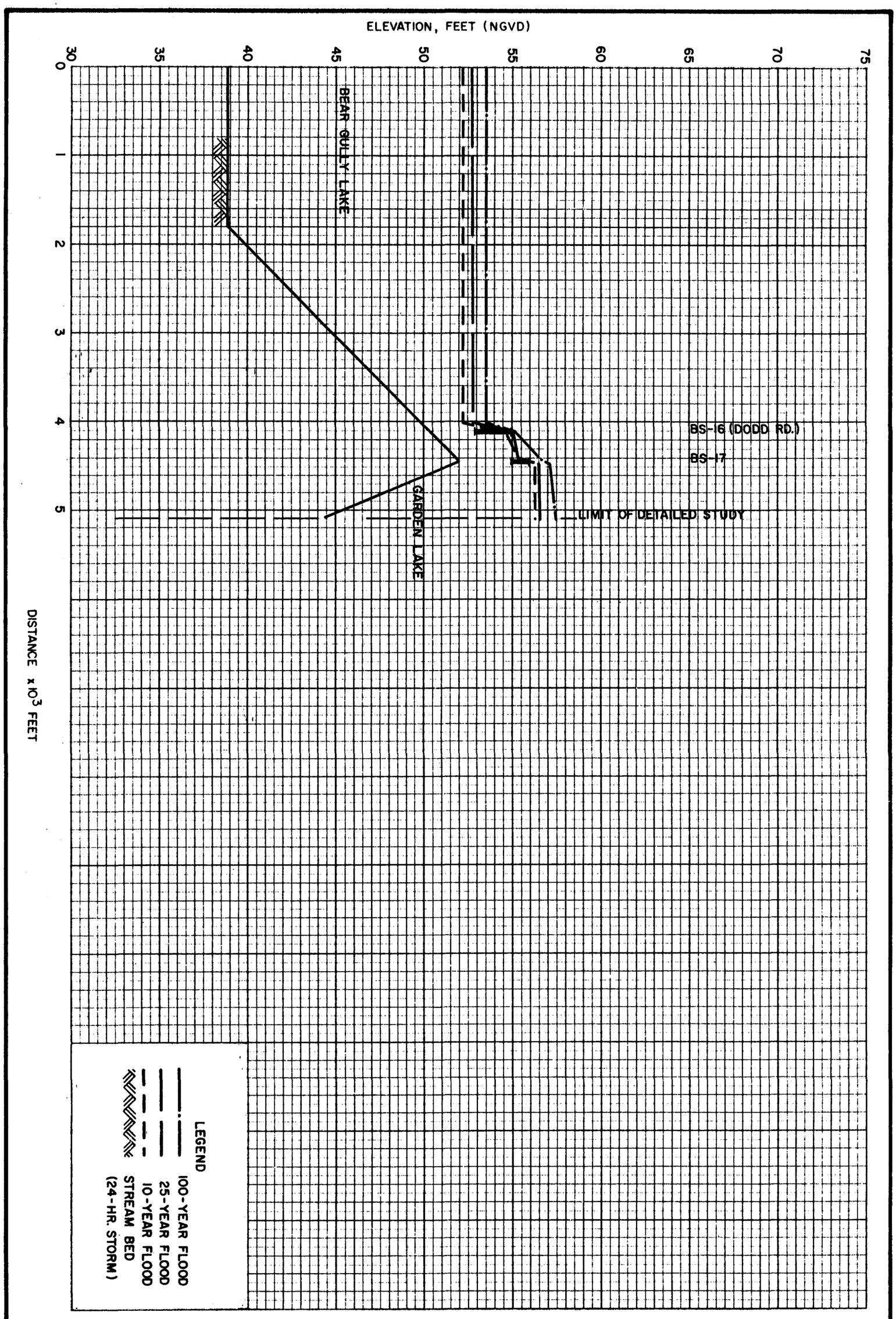
FIGURE
D-8c




FLOOD PROFILES OF BEAR CREEK UNDER FUTURE DEVELOPMENT (STATION 420 TO STATION 492)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

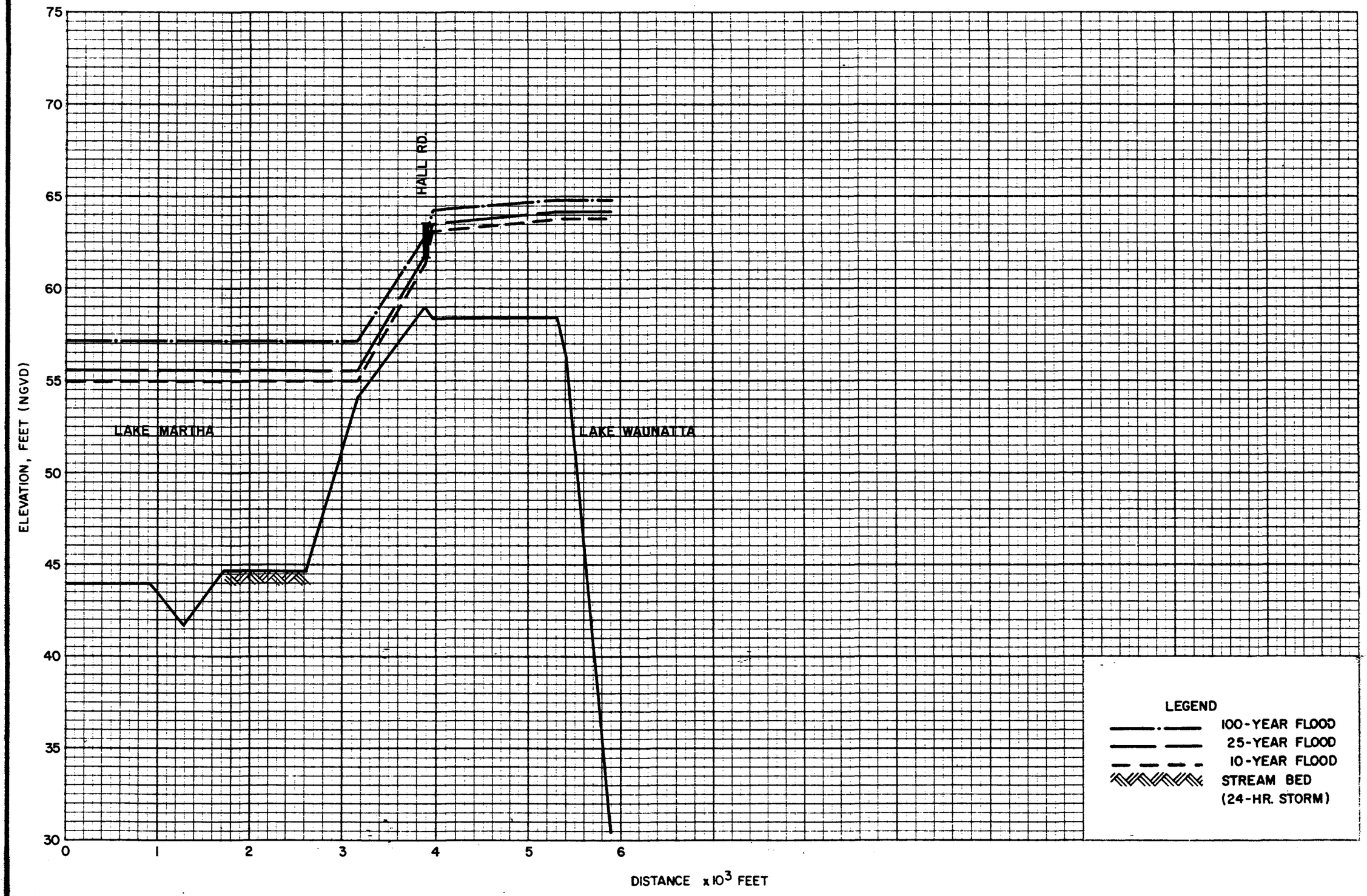
FIGURE
D-8 d




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE D-9

FLOOD PROFILES OF BEAR CREEK TRIBUTARY ONE UNDER FUTURE DEVELOPMENT




FLOOD PROFILES OF BEAR CREEK TRIBUTARY TWO UNDER FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
D-10

# APPENDIX E

Flood Profiles for 25-Year, 6-Hour Storm
under Existing Conditions and Future Development

LEGEND

— — — 25-YEAR FLOOD (FUTURE)

—·—·—·— 25-YEAR FLOOD (EXISTING)

STREAM BED (6-HR. STORM)

SR419 (HS-1)

SEABOARD R.R. (HS-2)

NORTHERN WAY (HS-3)

HS-4

HS-5

HS-6

MOUTH OF HOWELL CREEK

ELEVATION, FEET (NGVD)

DISTANCE x $10^3$ FEET

FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 0 TO STATION 140)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE
E-1a

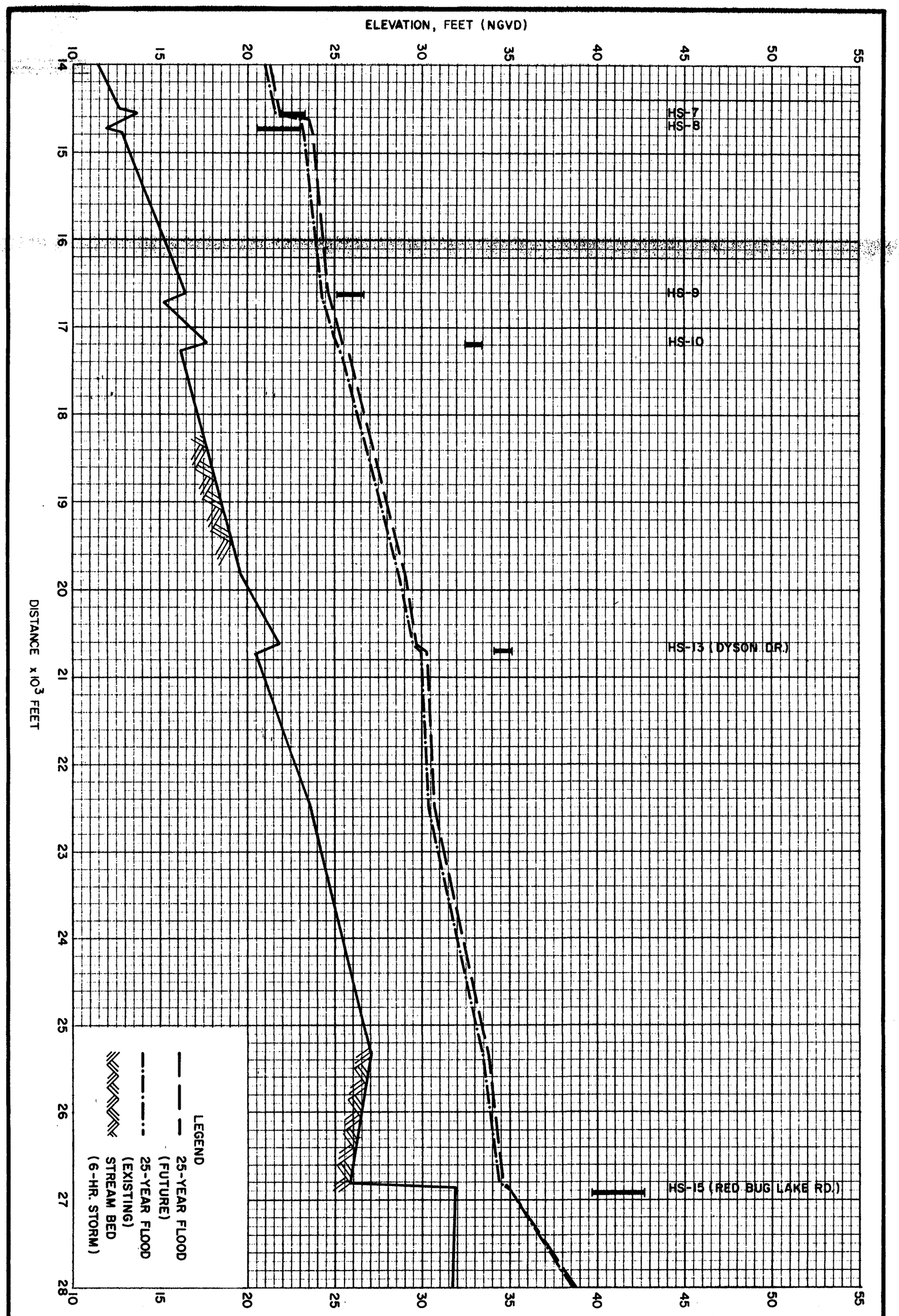
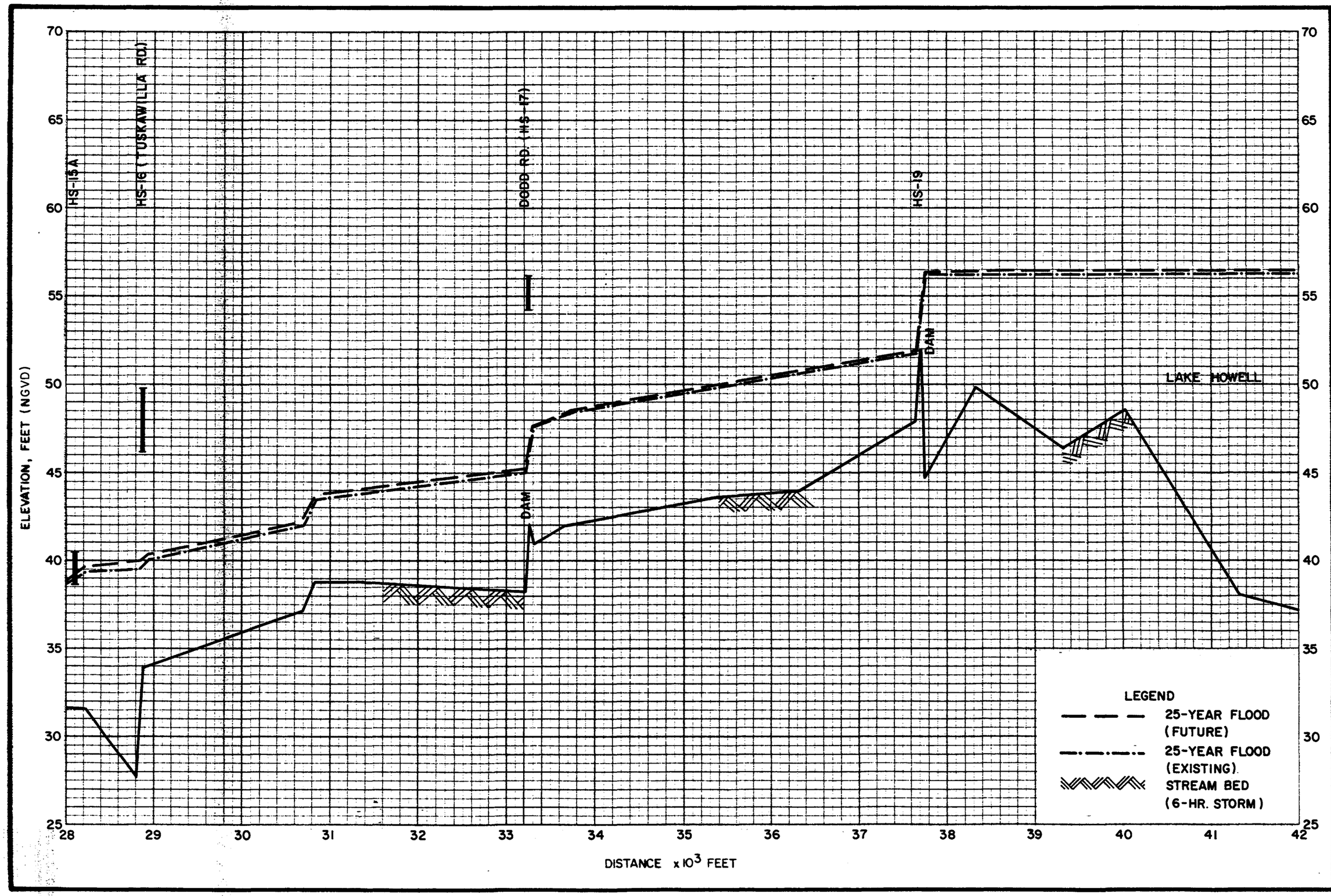



FIGURE E-1b

**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

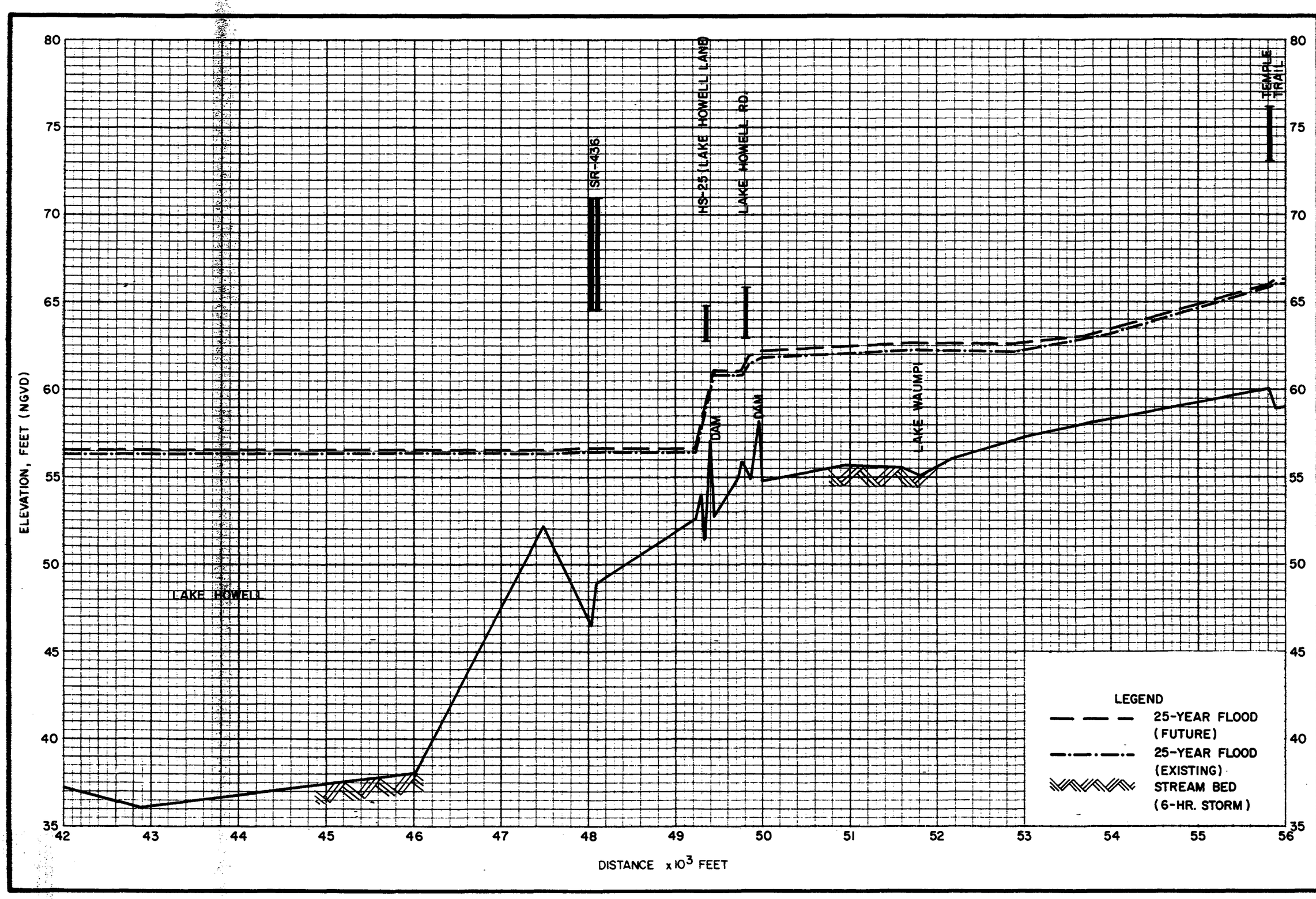
FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 140 TO STATION 280)




FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 280 TO STATION 420)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

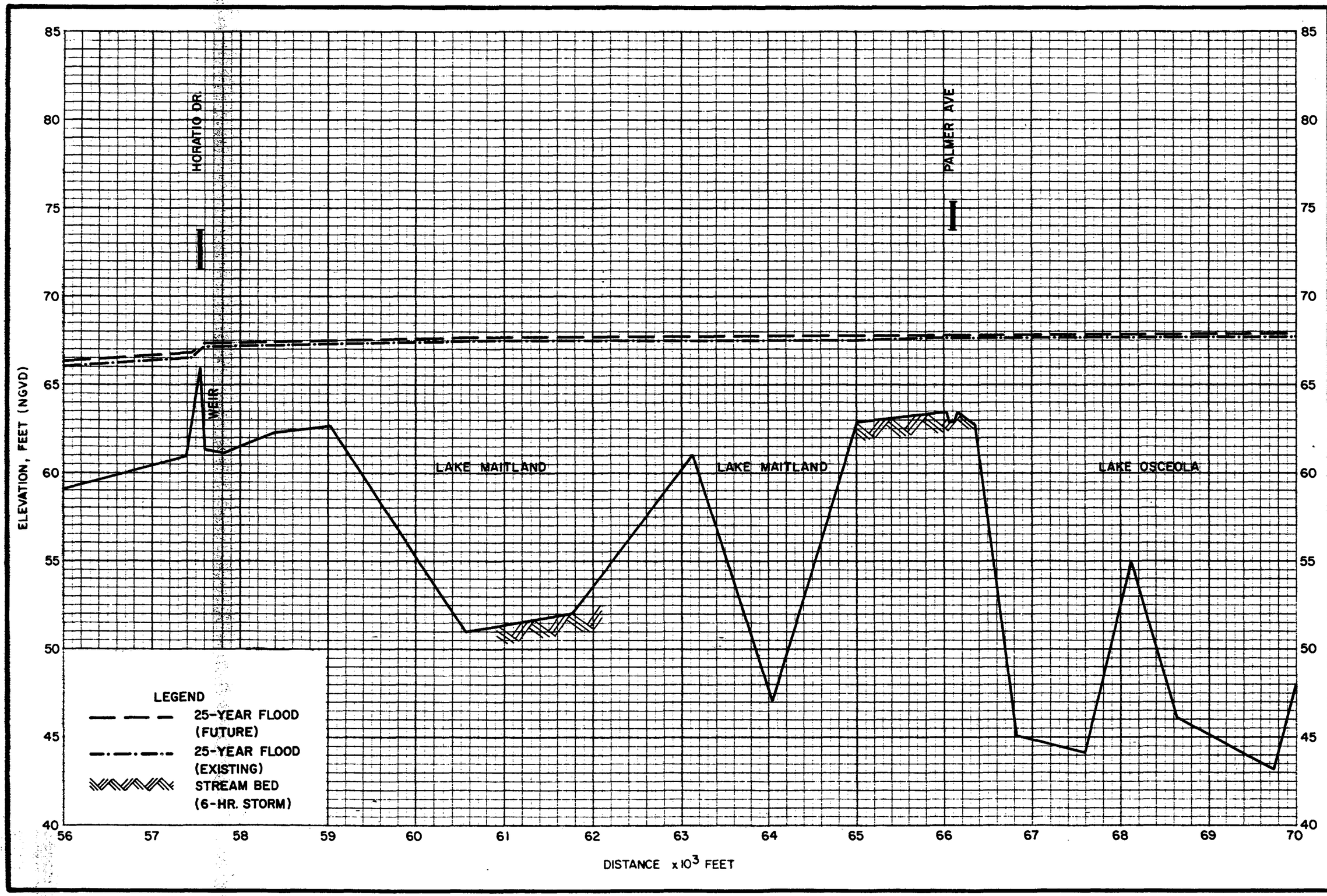
FIGURE E-1c




FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT ( STATION 420 TO STATION 560 )

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

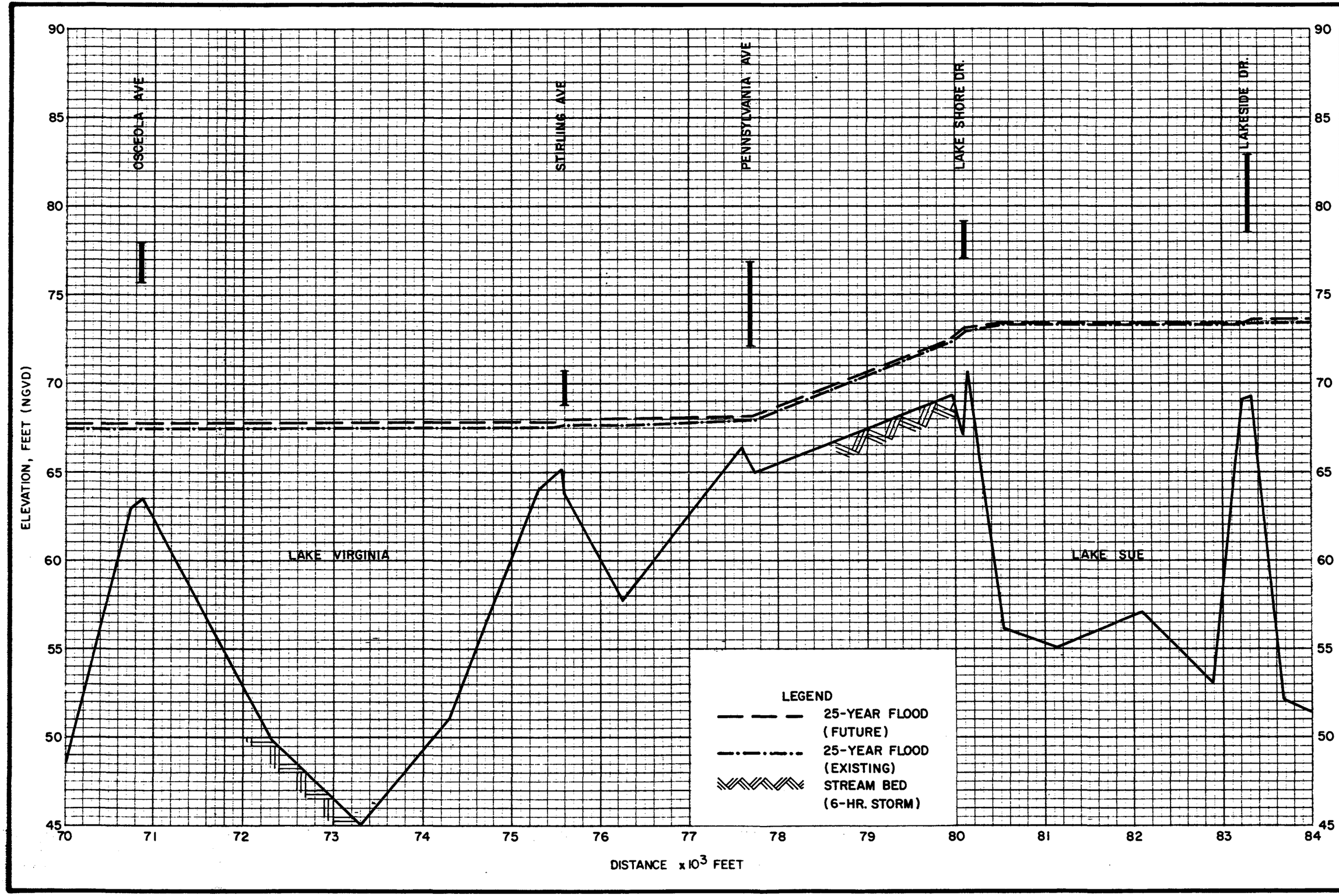
FIGURE E-1d




FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 560 TO STATION 700)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

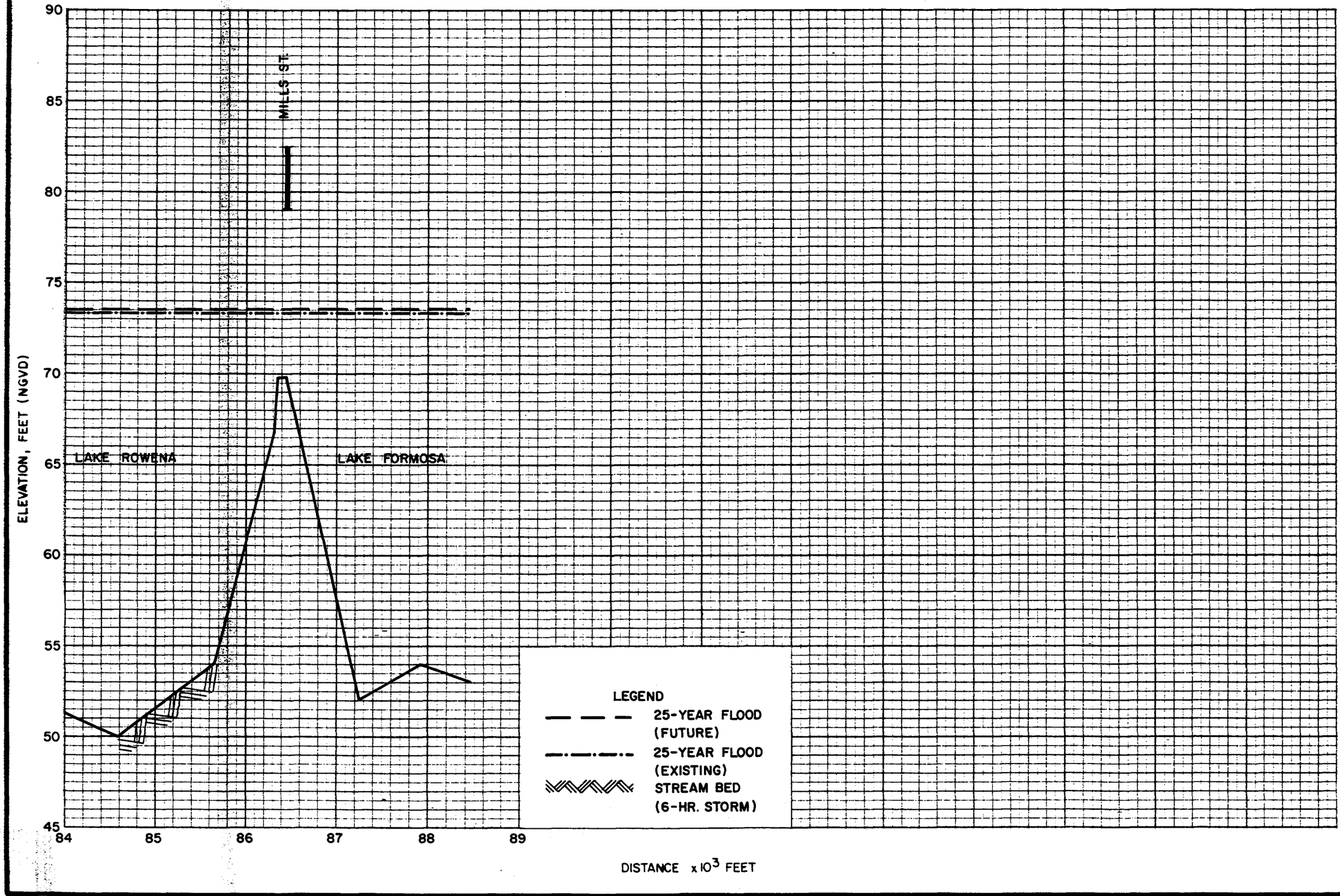
FIGURE E-1e




FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 700 TO STATION 840)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

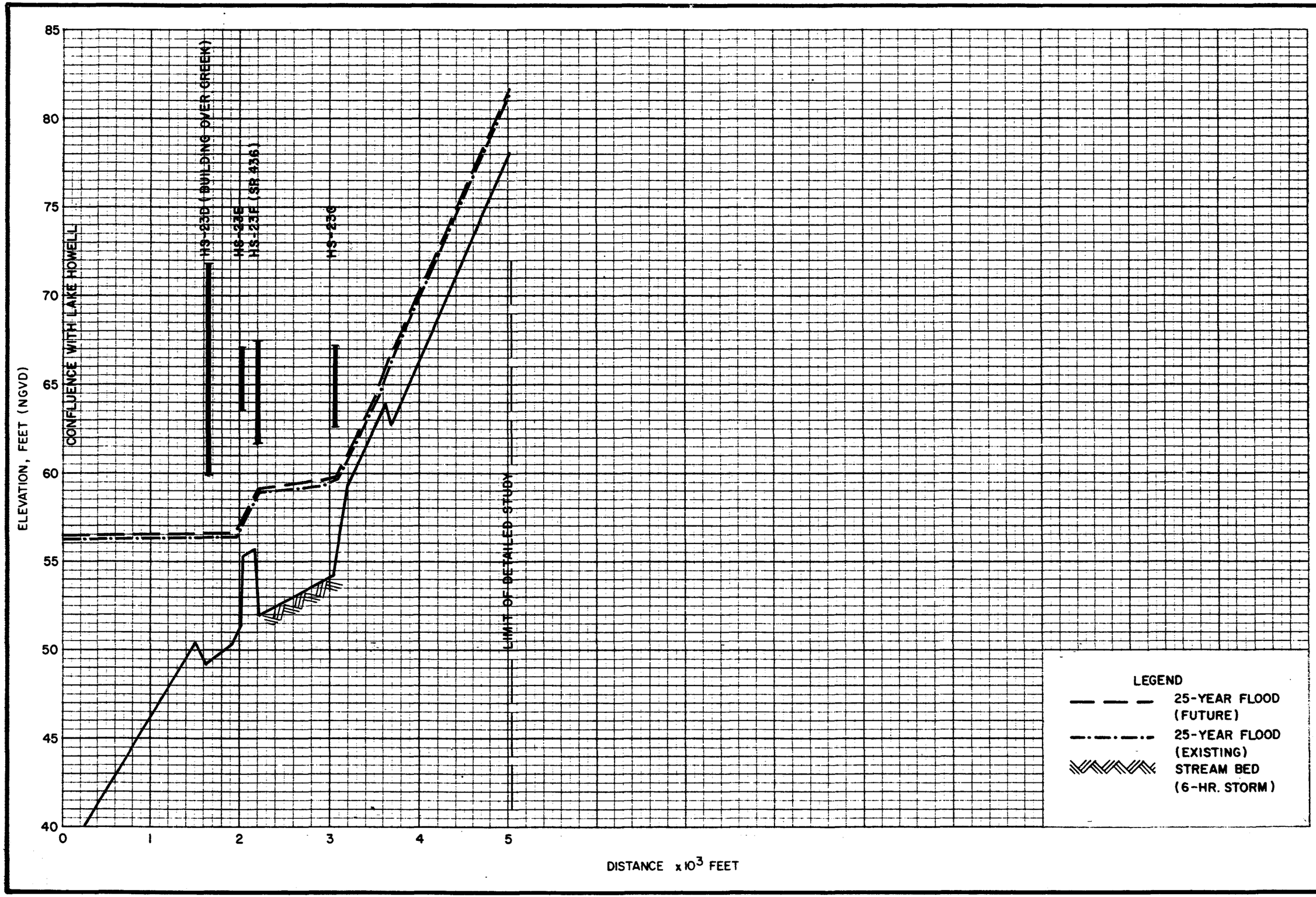
FIGURE
E-1f




FLOOD PROFILES OF HOWELL CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT ( STATION 840 TO STATION 884 )

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

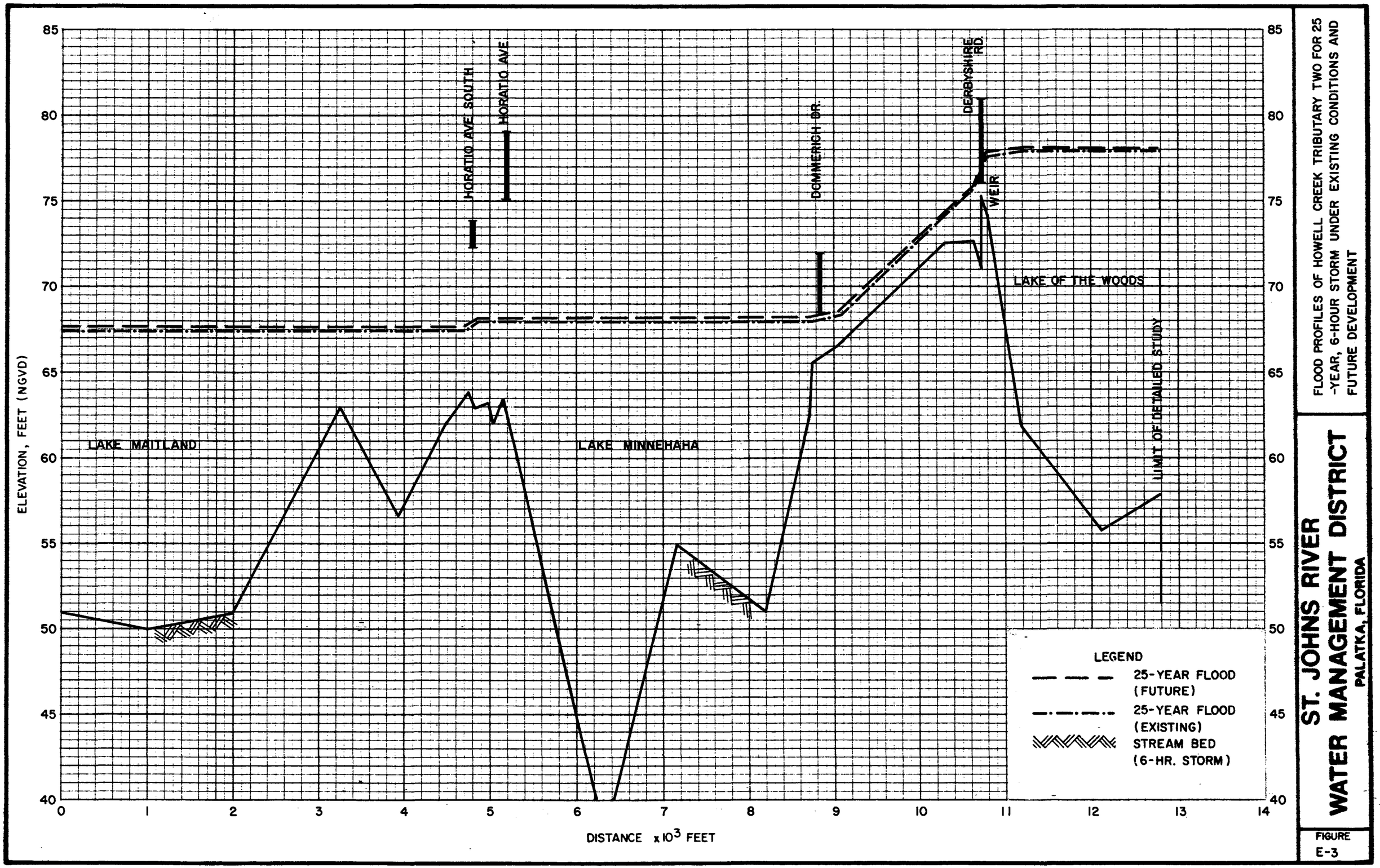
FIGURE E-1g




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY ONE FOR 25 -YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

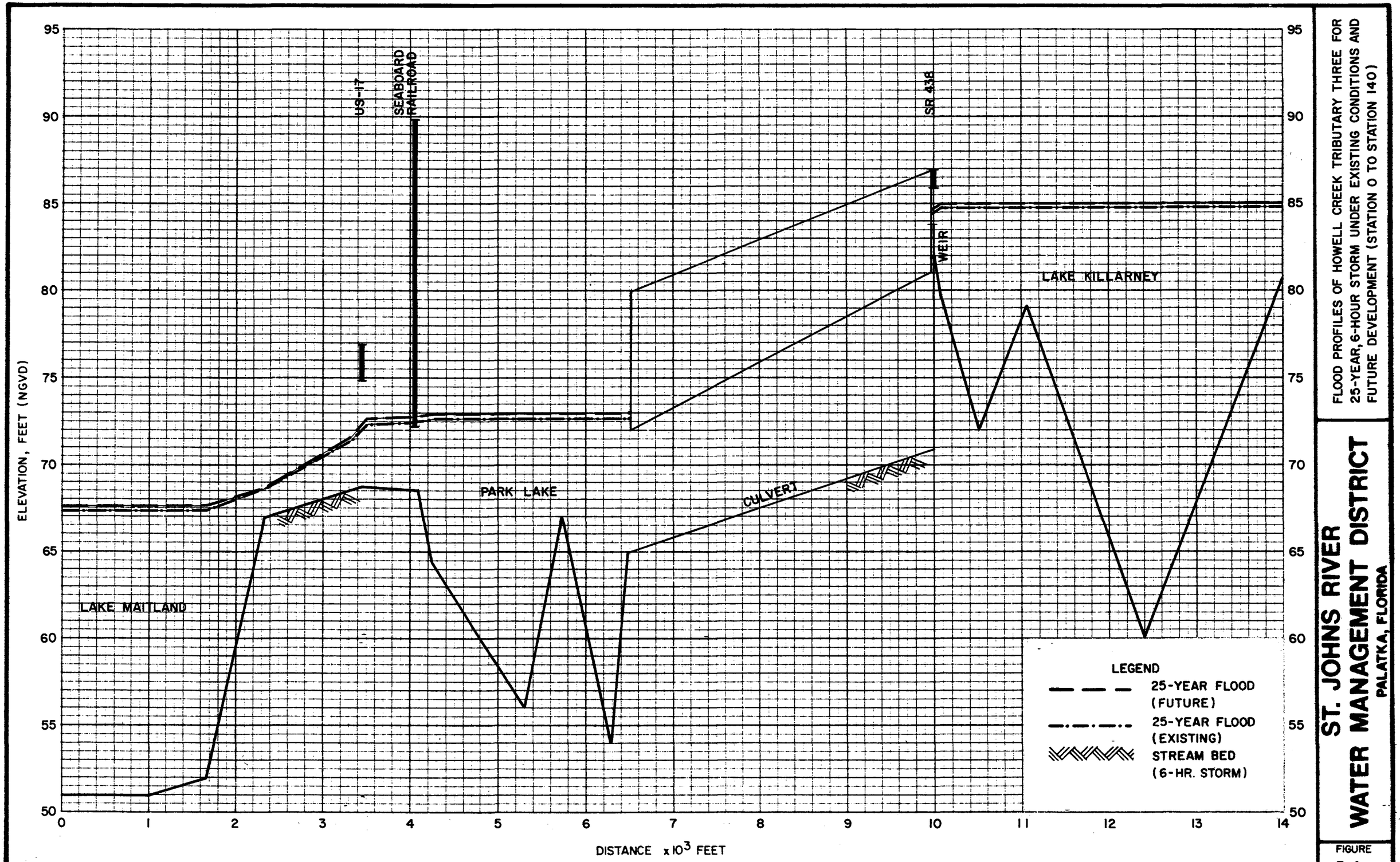
FIGURE E-2




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY TWO FOR 25 -YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

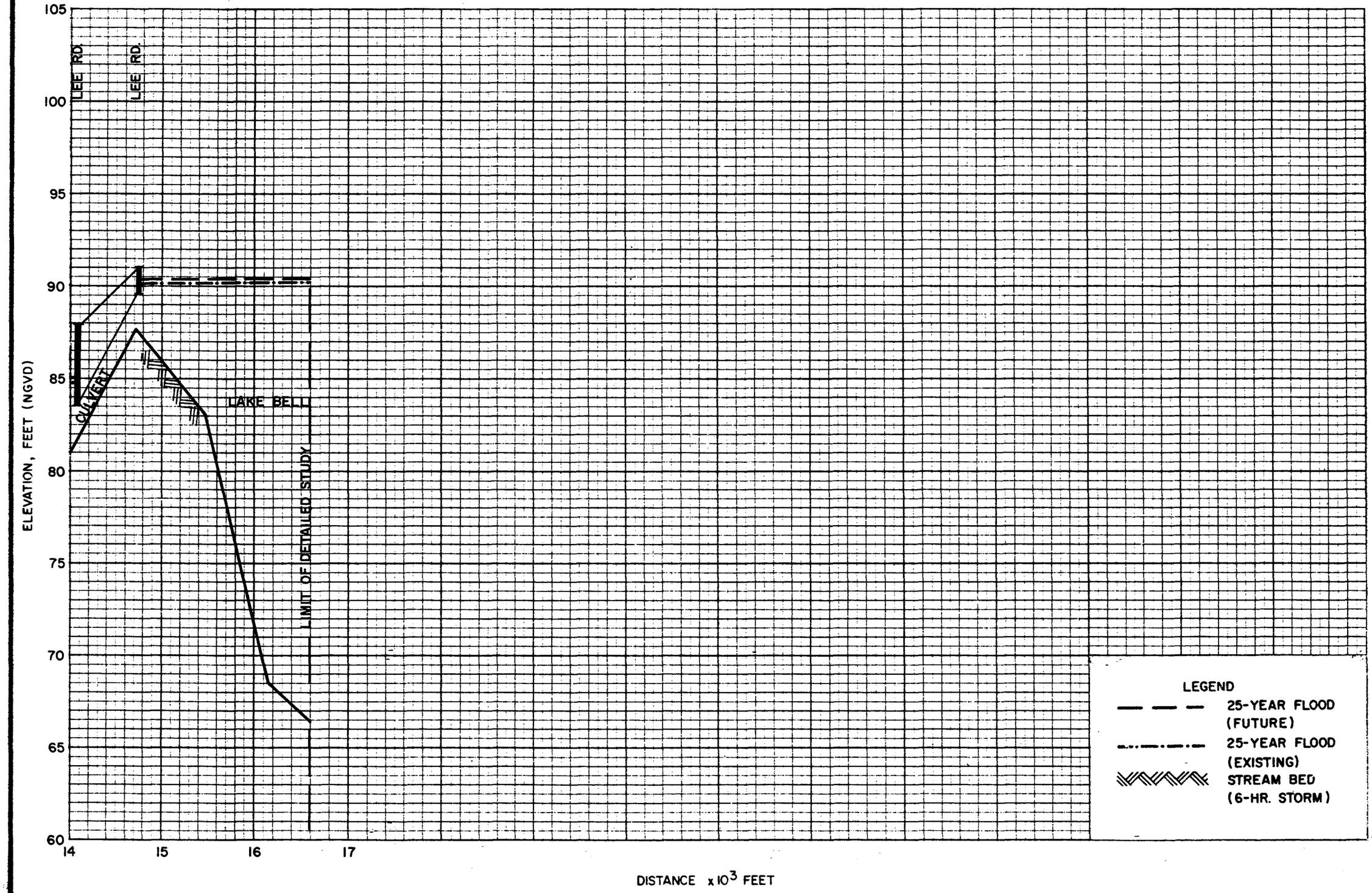
FIGURE
E-3




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY THREE FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 0 TO STATION 140)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

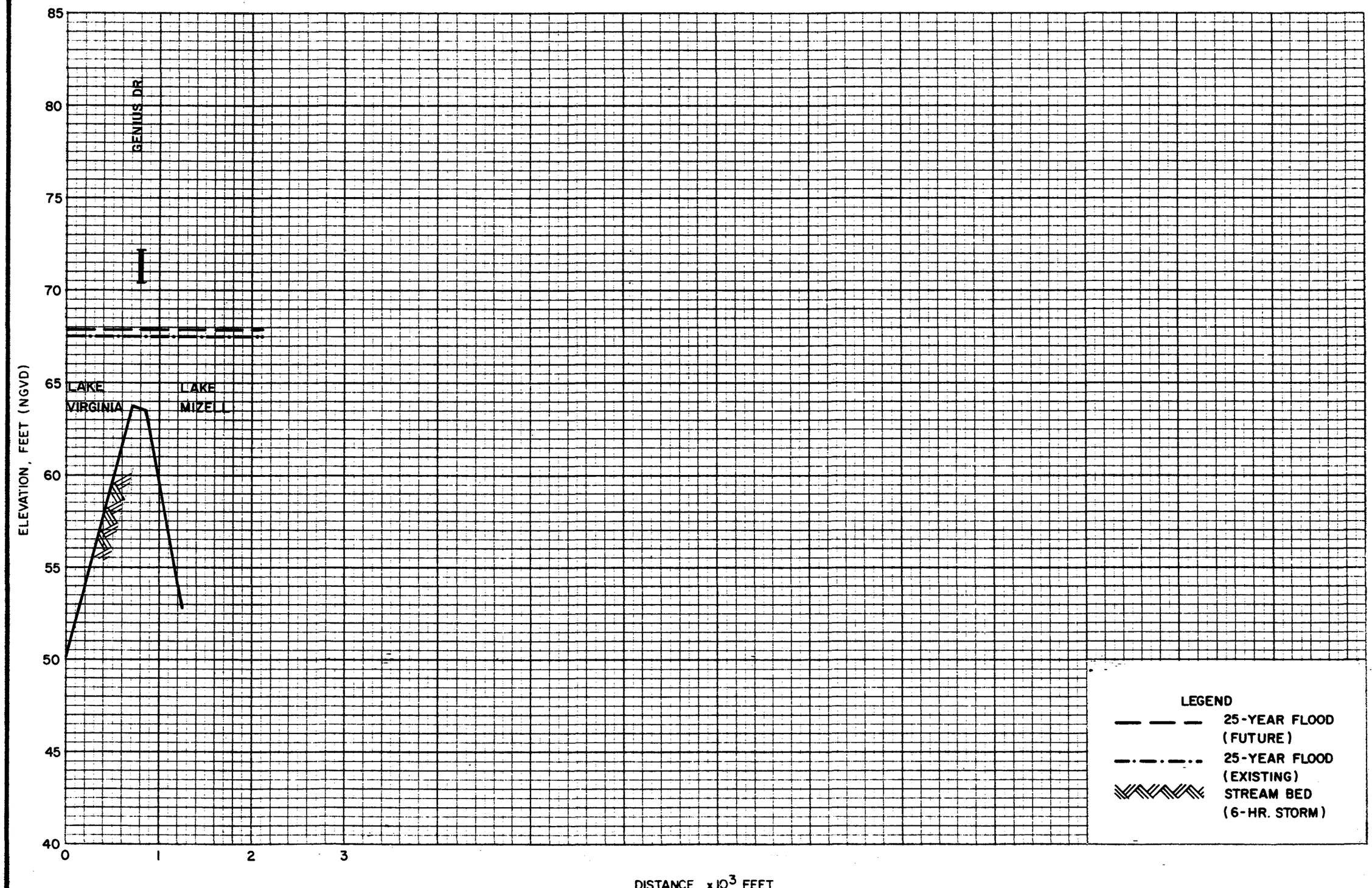
FIGURE
E-4a




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY THREE FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 140 TO STATION 166)

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

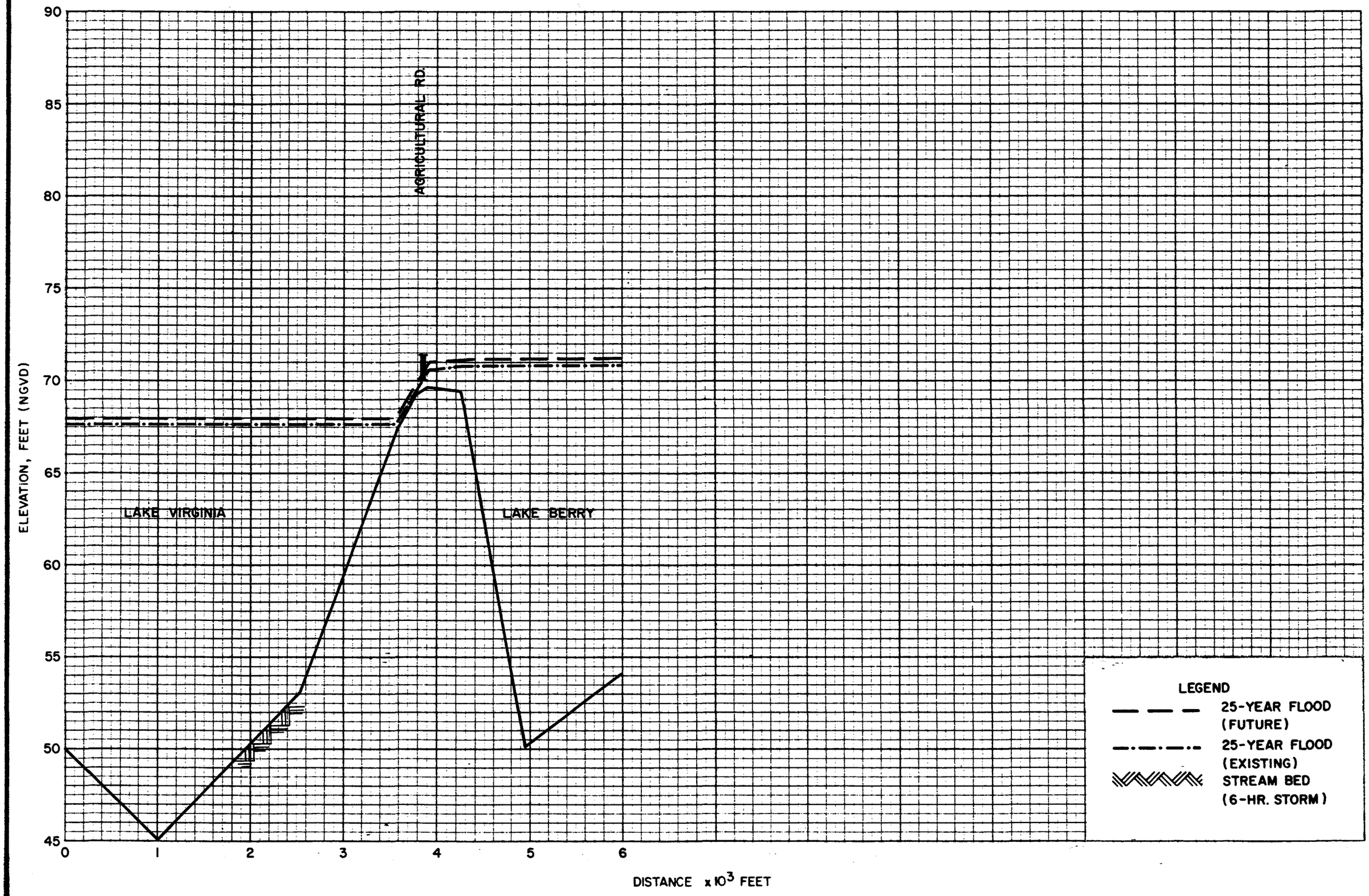
FIGURE E-4b




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY FOUR FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

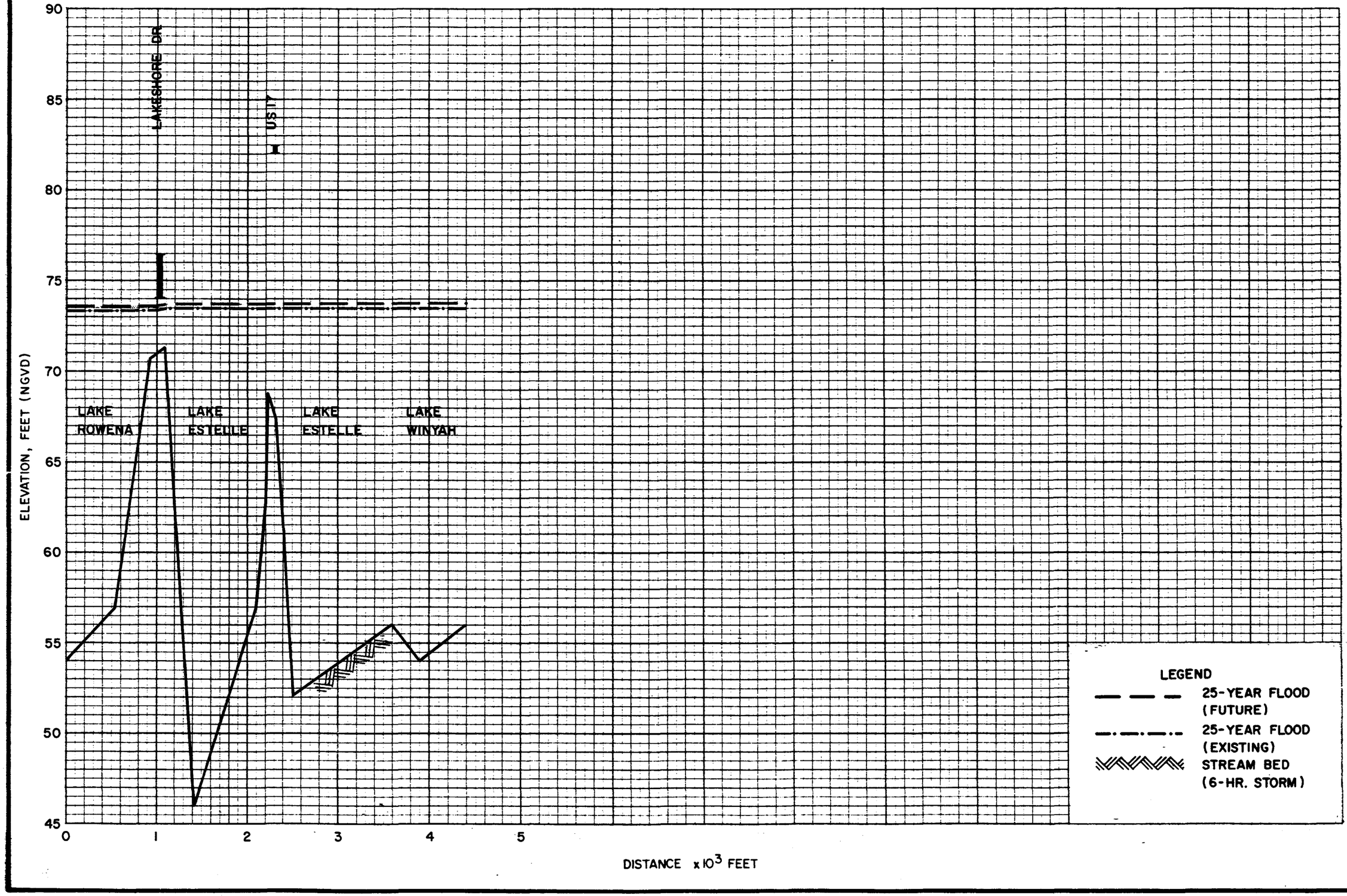
FIGURE E-5




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY FIVE FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

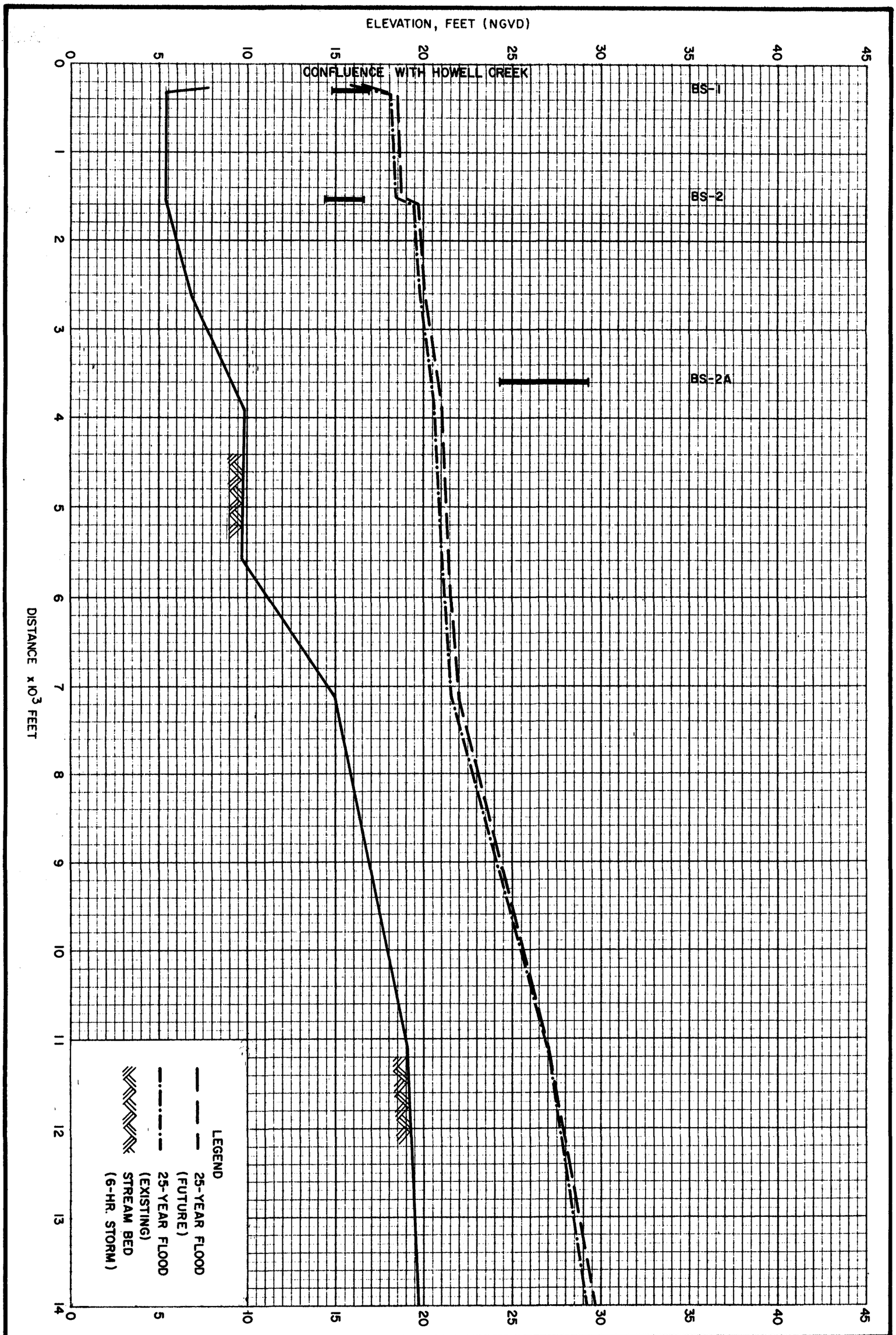
FIGURE E-6




FLOOD PROFILES OF HOWELL CREEK TRIBUTARY SIX FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

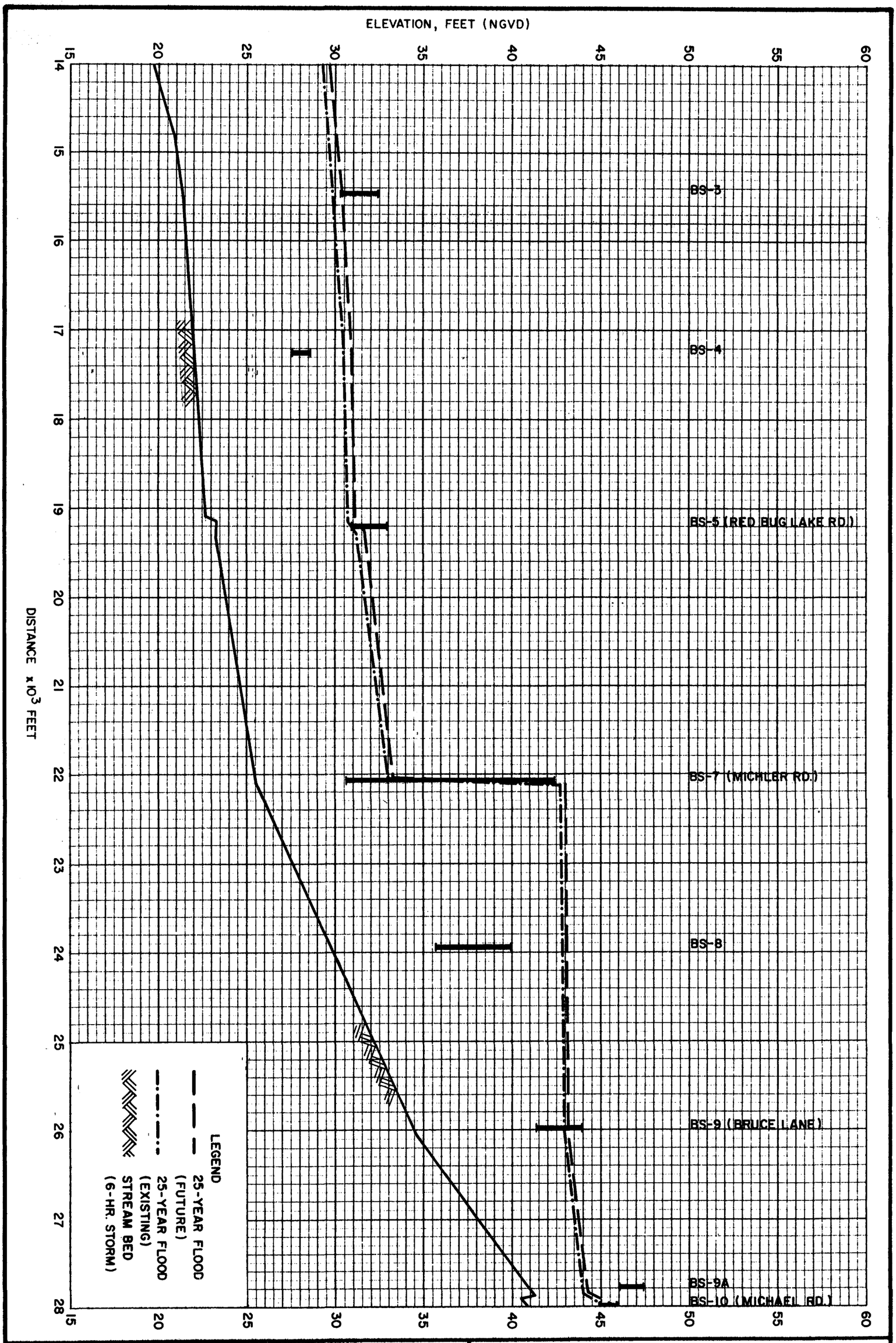
FIGURE E-7




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE E-8a

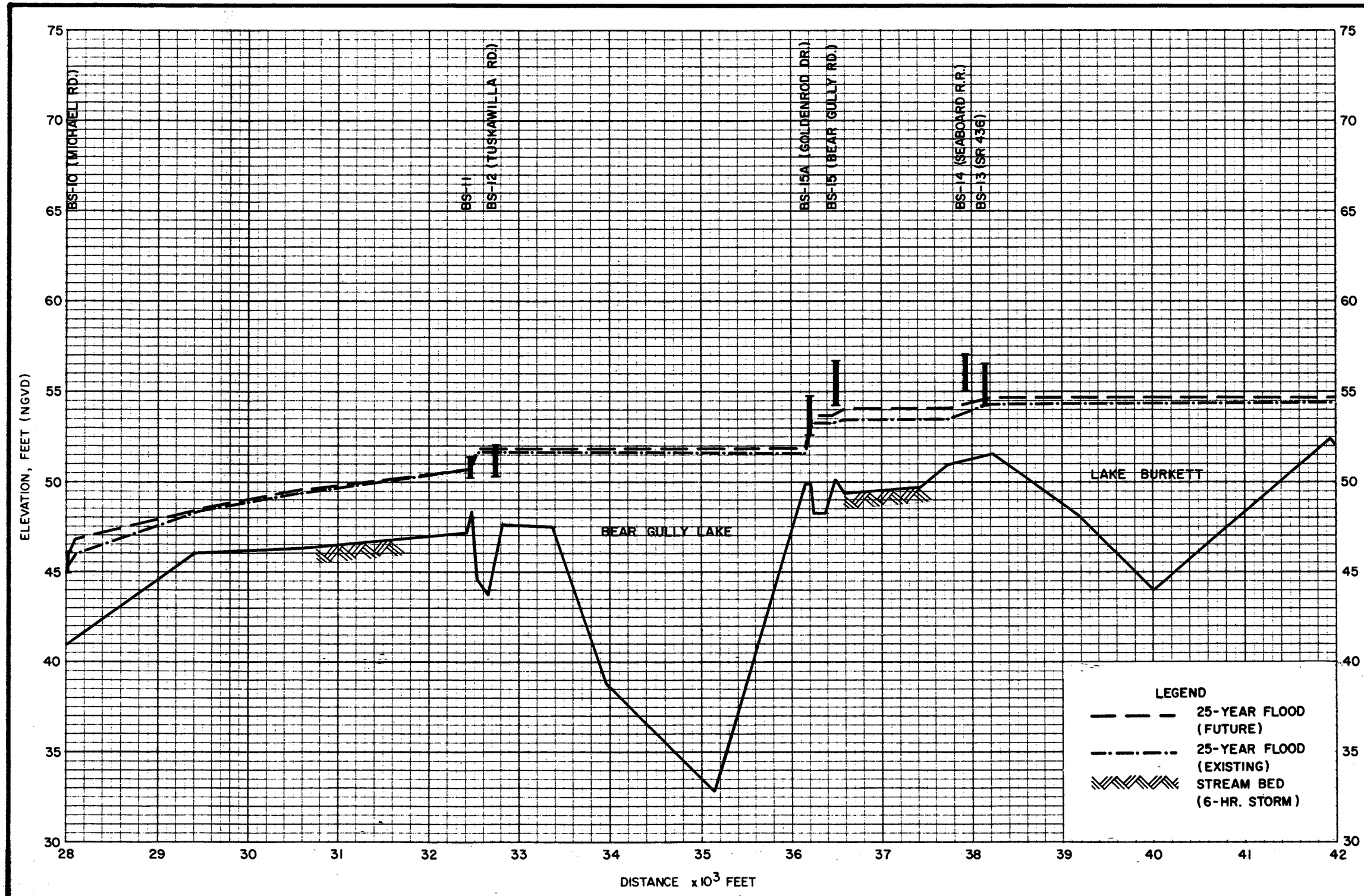
FLOOD PROFILES OF BEAR CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 0 TO STATION 140)




**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT**
PALATKA, FLORIDA

FIGURE E-8b

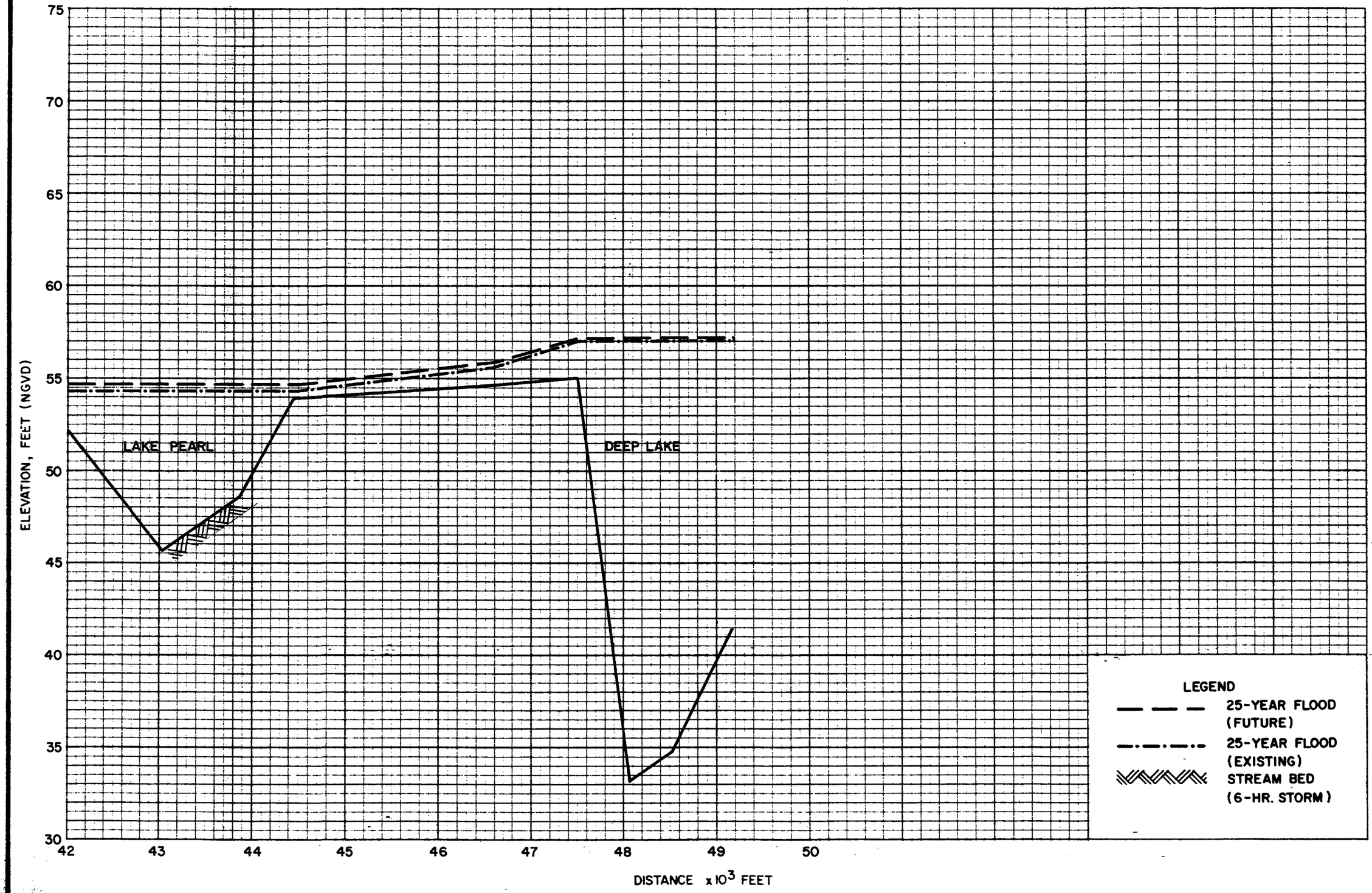
FLOOD PROFILES OF BEAR CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 140 TO STATION 280)




FLOOD PROFILES OF BEAR CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 280 TO STATION 420)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

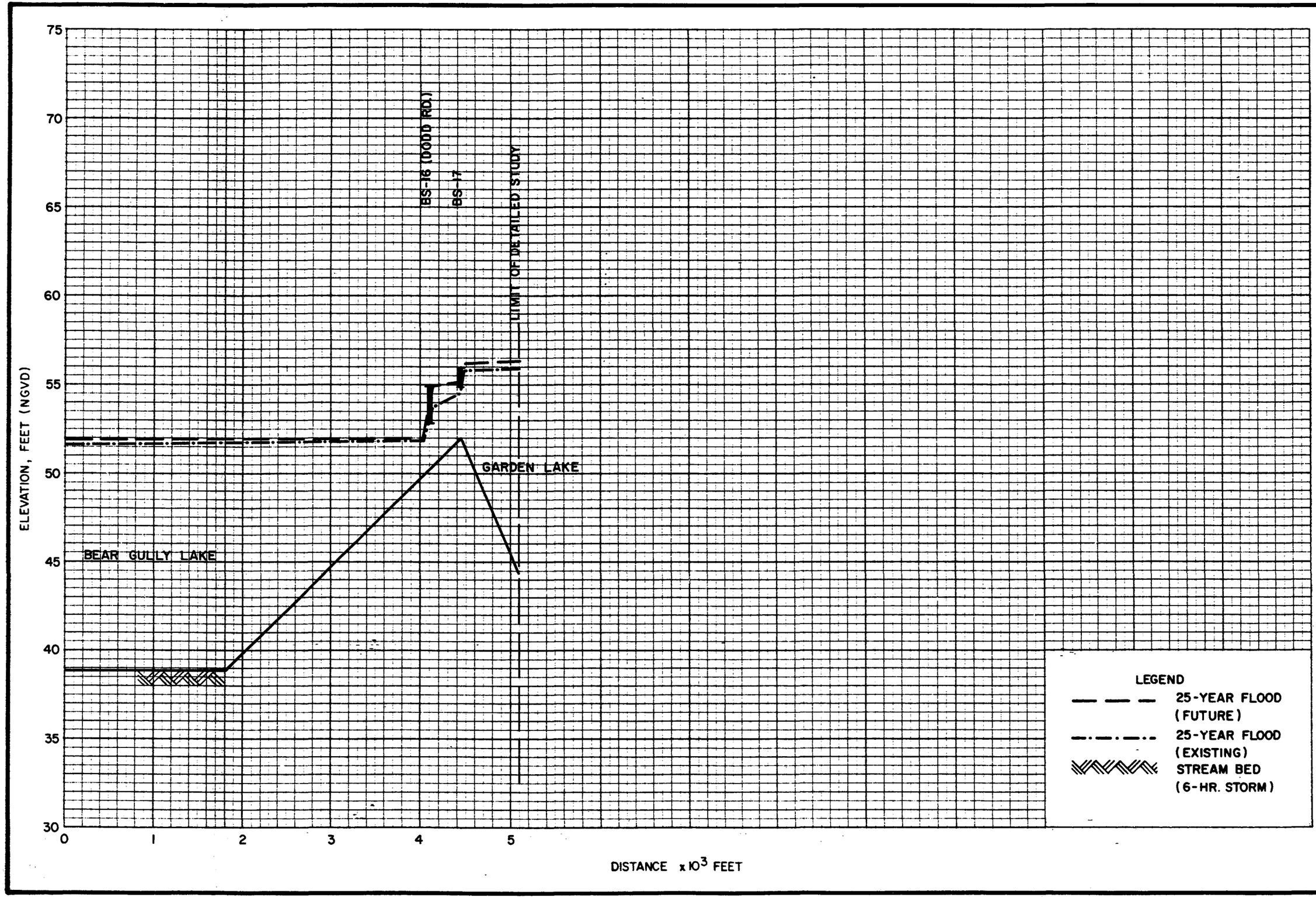
FIGURE
E-8c




FLOOD PROFILES OF BEAR CREEK FOR 25-YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT (STATION 420 TO STATION 492)

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

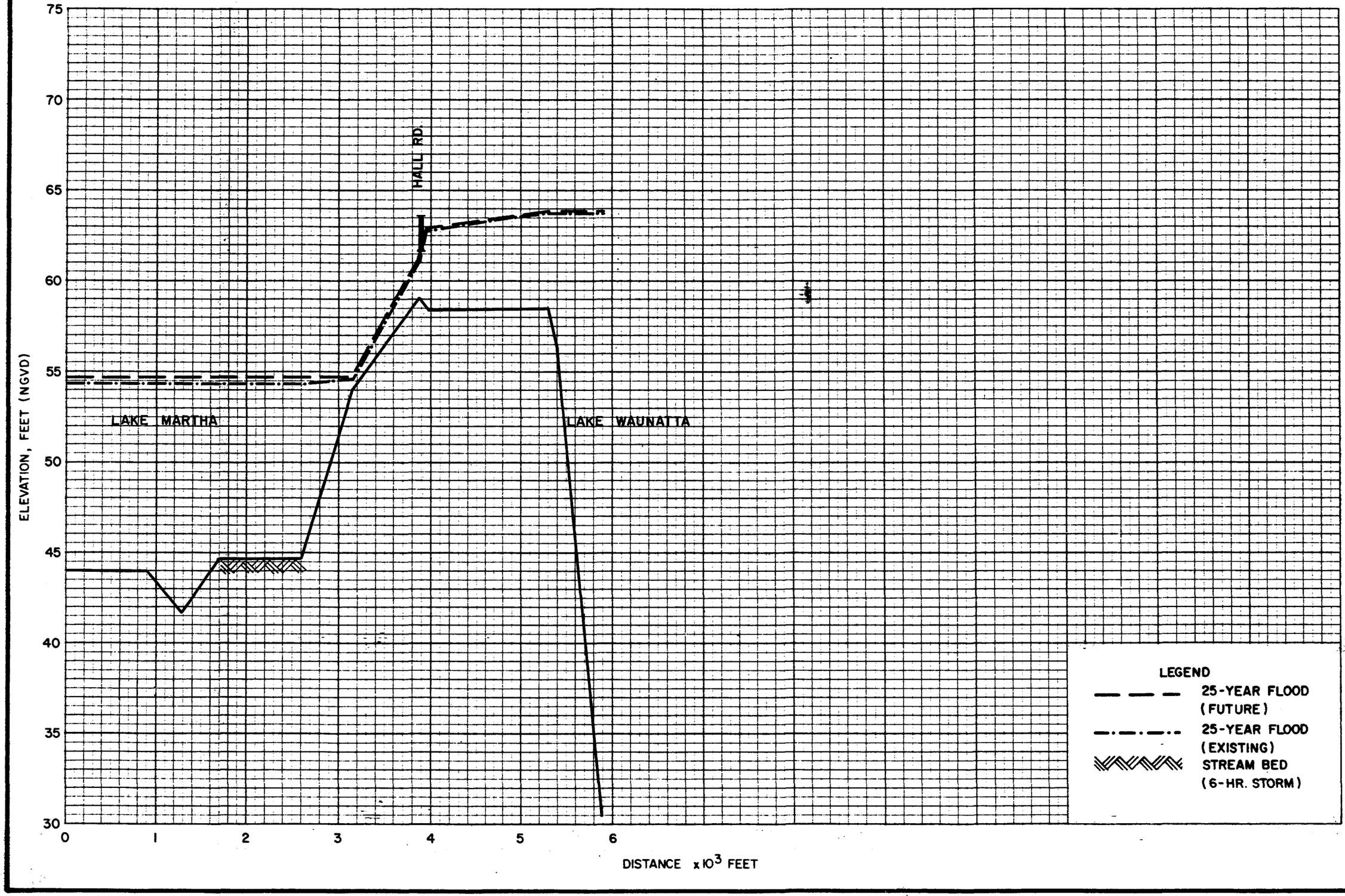
FIGURE
E-8d




FLOOD PROFILES OF BEAR CREEK TRIBUTARY ONE FOR 25 -YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE E-9




FLOOD PROFILES OF BEAR CREEK TRIBUTARY TWO FOR 25 -YEAR, 6-HOUR STORM UNDER EXISTING CONDITIONS AND FUTURE DEVELOPMENT

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
PALATKA, FLORIDA

FIGURE E-10

The original document contained a page too large for scanning.

Each instance of this page represents a single page missing from the PDF file.

The original document contained a page too large for scanning.

Each instance of this page represents a single page missing from the PDF file.