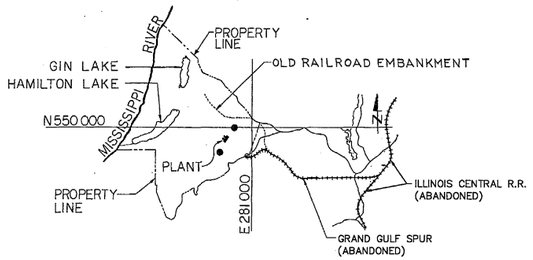
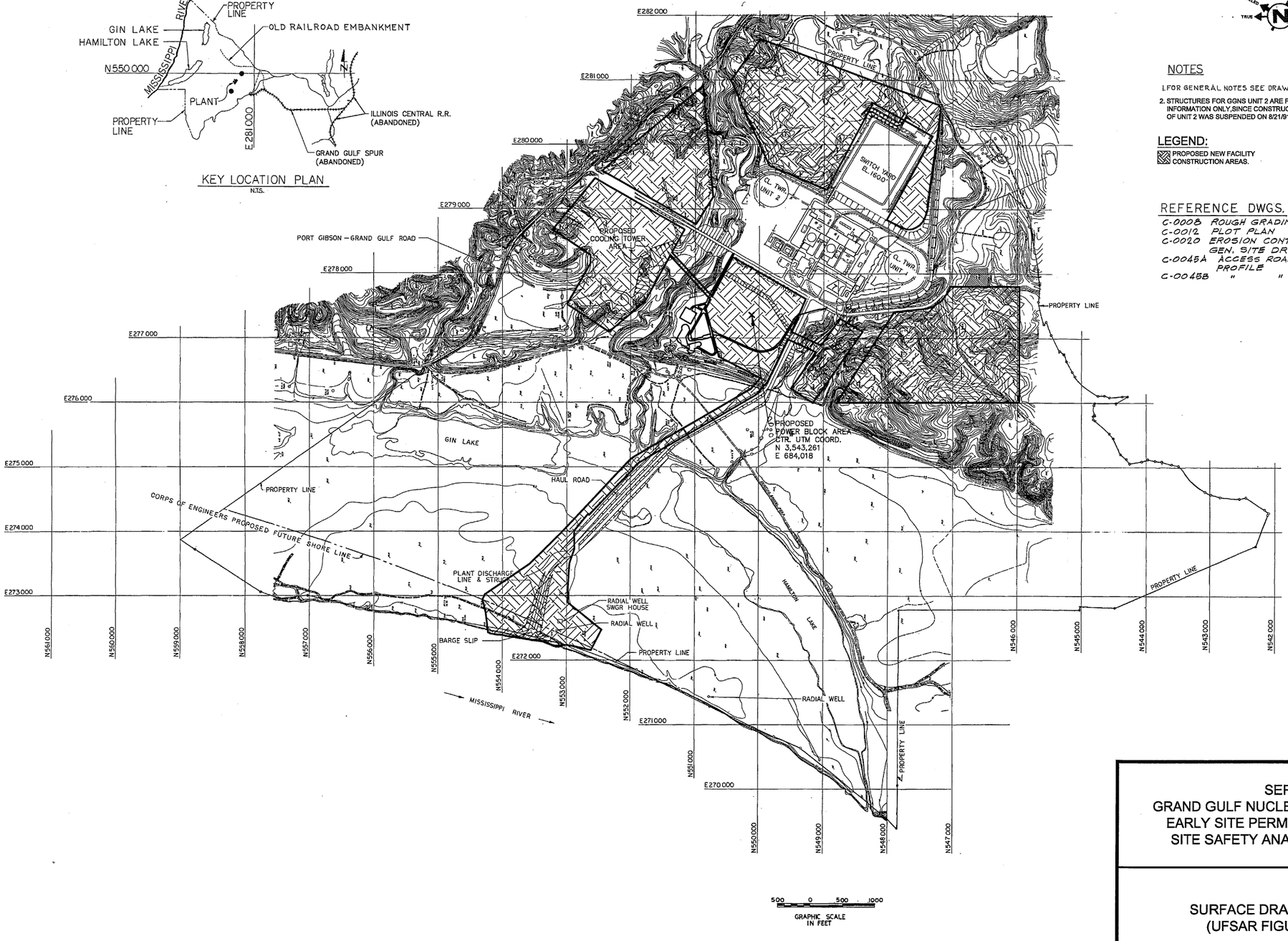


KEY LOCATION PLAN
N.T.S.



CALLED TRUE N

NOTES

1. FOR GENERAL NOTES SEE DRAWING NO. C-0001
2. STRUCTURES FOR GGNS UNIT 2 ARE FOR INFORMATION ONLY, SINCE CONSTRUCTION OF UNIT 2 WAS SUSPENDED ON 8/21/91.

LEGEND:

PROPOSED NEW FACILITY CONSTRUCTION AREAS.

REFERENCE DWGS.

C-0008 ROUGH GRADING PLAN
C-0012 PLOT PLAN
C-0020 EROSION CONTROL & GEN. SITE DRAINAGE
C-0045A ACCESS ROAD PLAN & PROFILE
C-0045B " " "

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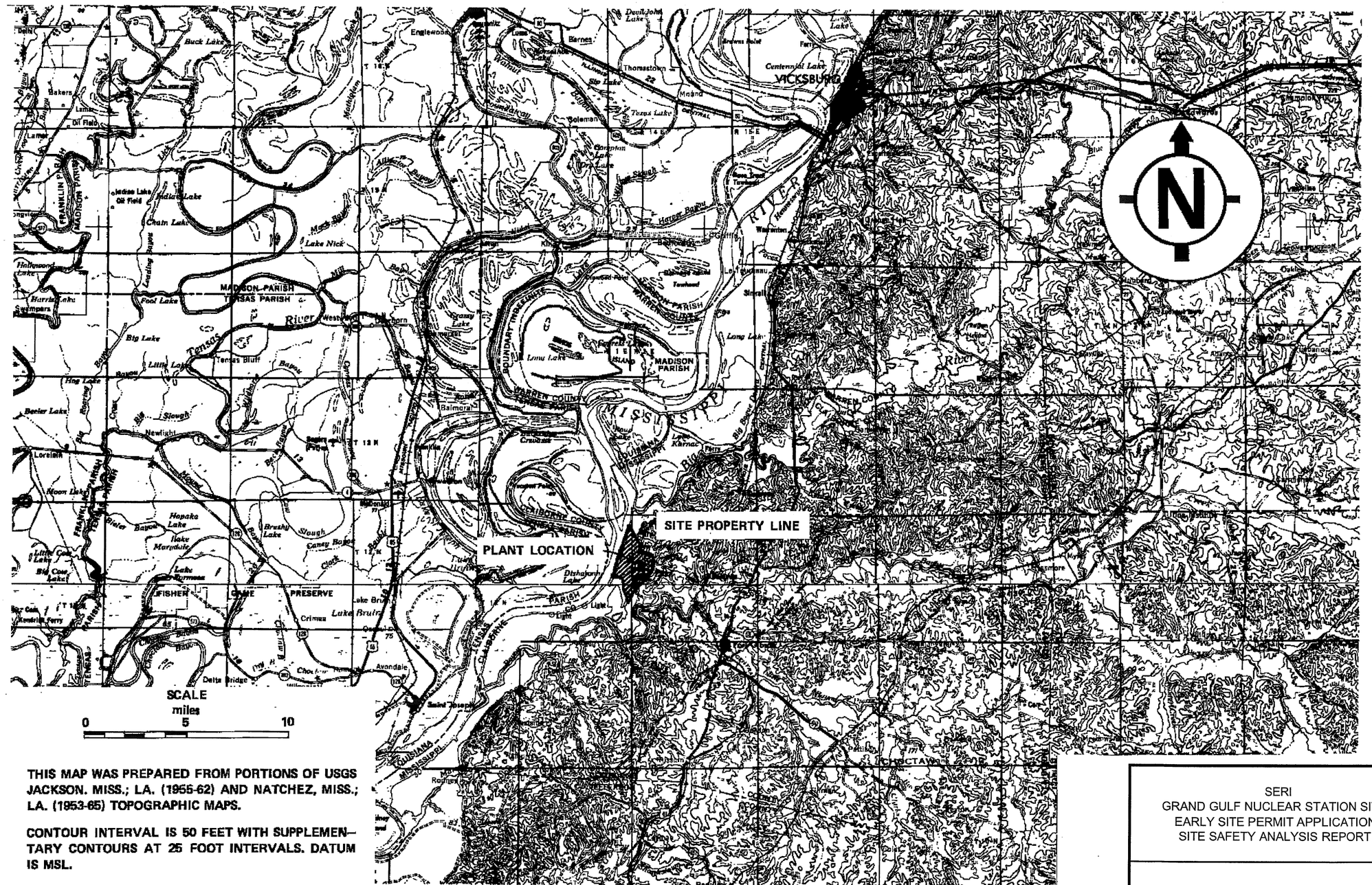
SURFACE DRAINAGE PLAN
(UFSAR FIGURE 2.4-1)

FIGURE 2.4-1 REV. 1



THIS MAP WAS PREPARED FROM PORTIONS OF USGS JACKSON. MISS.; LA. (1955-62) AND NATCHEZ, MISS.; LA. (1953-65) TOPOGRAPHIC MAPS.

CONTOUR INTERVAL IS 50 FEET WITH SUPPLEMENTARY CONTOURS AT 25 FOOT INTERVALS. DATUM IS MSL.

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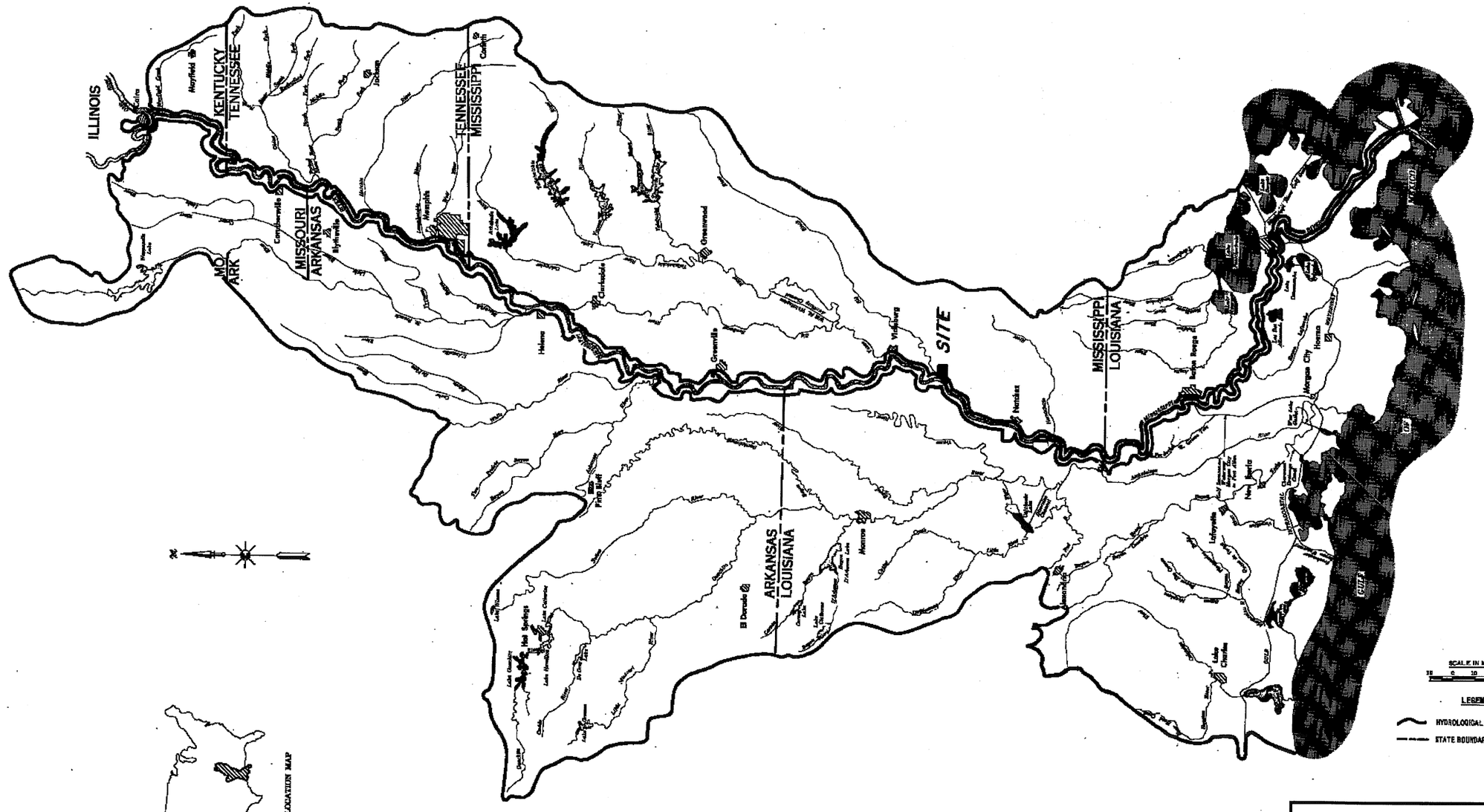
REGIONAL TOPOGRAPHY
(UFSAR FIGURE 2.4-2)

FIGURE 2.4-2 REV. 1



Source: Mississippi River Commission, "Lower Mississippi Region Comprehensive Study," Appendix C, Figure-1, 1974

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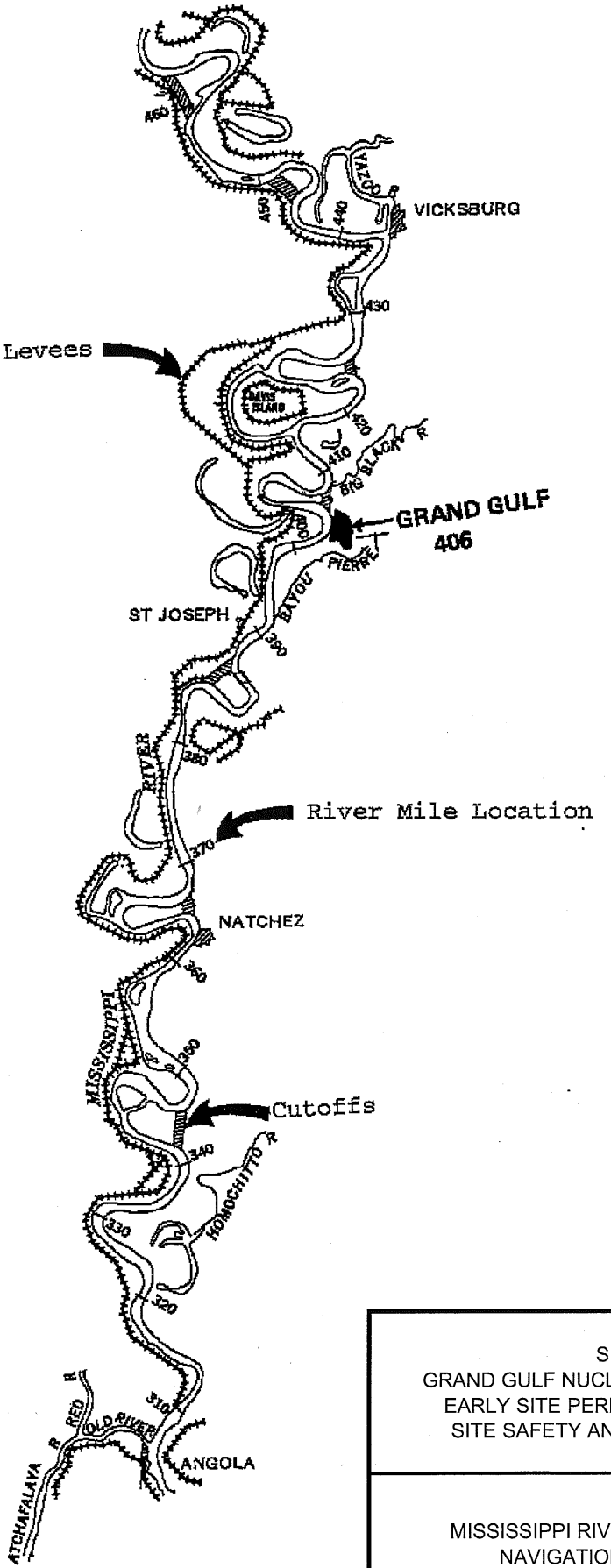
LOWER MISSISSIPPI REGION
HYDROLOGIC BOUNDARY
(UFSAR FIGURE 2.4-3)

FIGURE 2.4-3 REV. 1



SOURCE: ADAPTED FROM U.S. ARMY CORPS OF ENGINEERS

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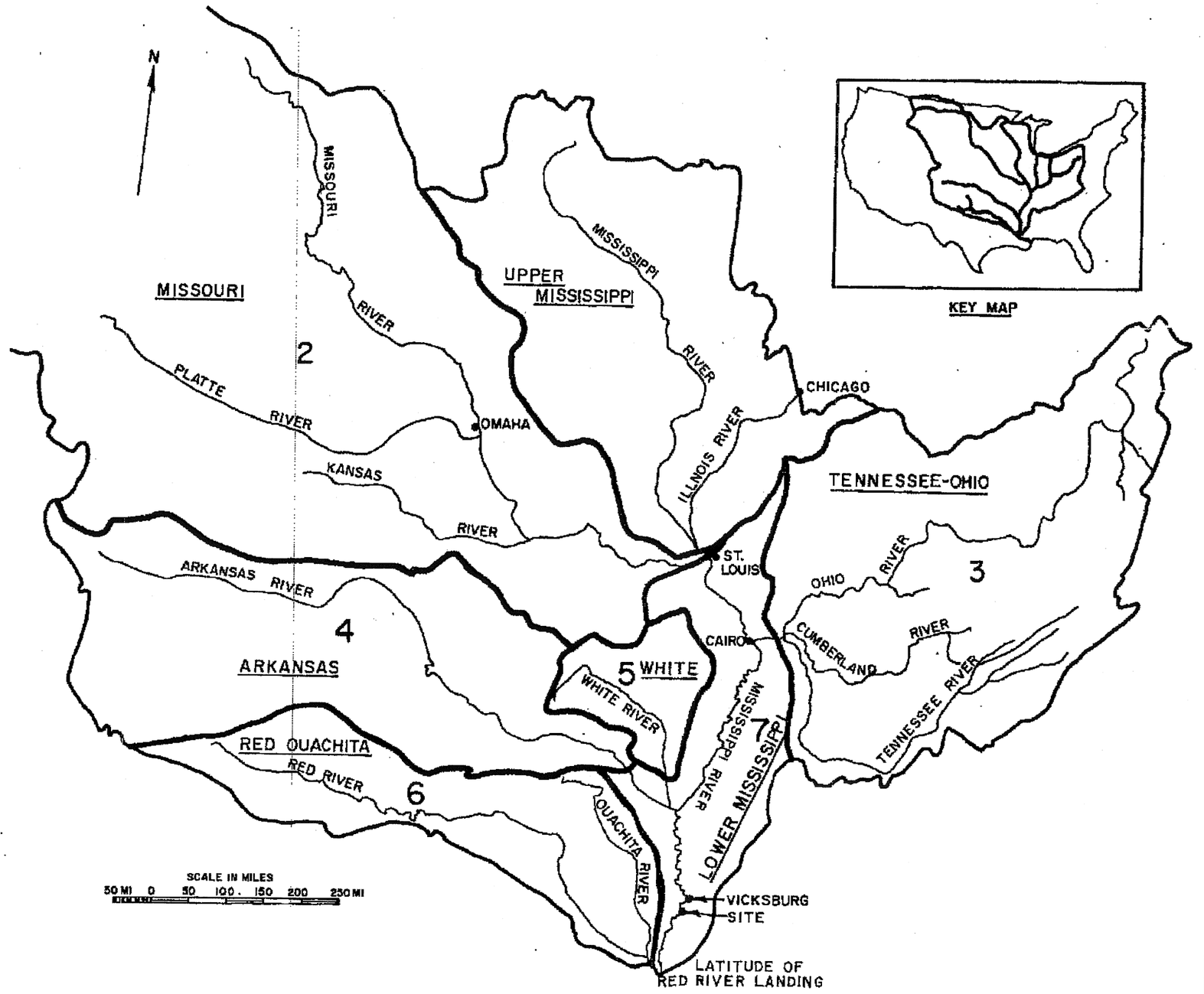
MISSISSIPPI RIVER LEVEES AND
NAVIGATION CUTOFFS

FIGURE 2.4-3a REV. 1



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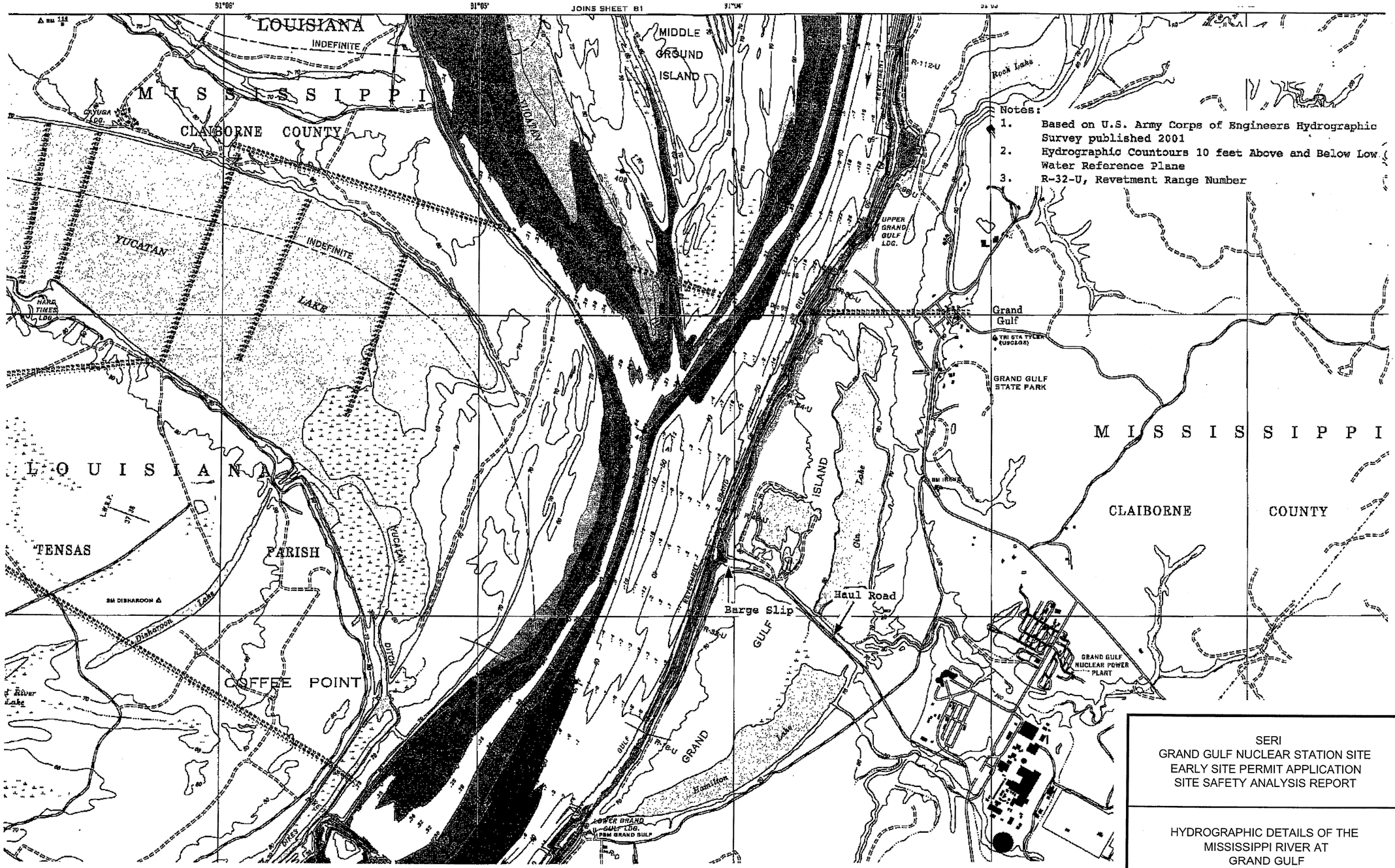
DRAINAGE AREAS OF THE
MISSISSIPPI BASIN
(UFSAR FIGURE 2.4-4)

FIGURE 2.4-4 REV. 1



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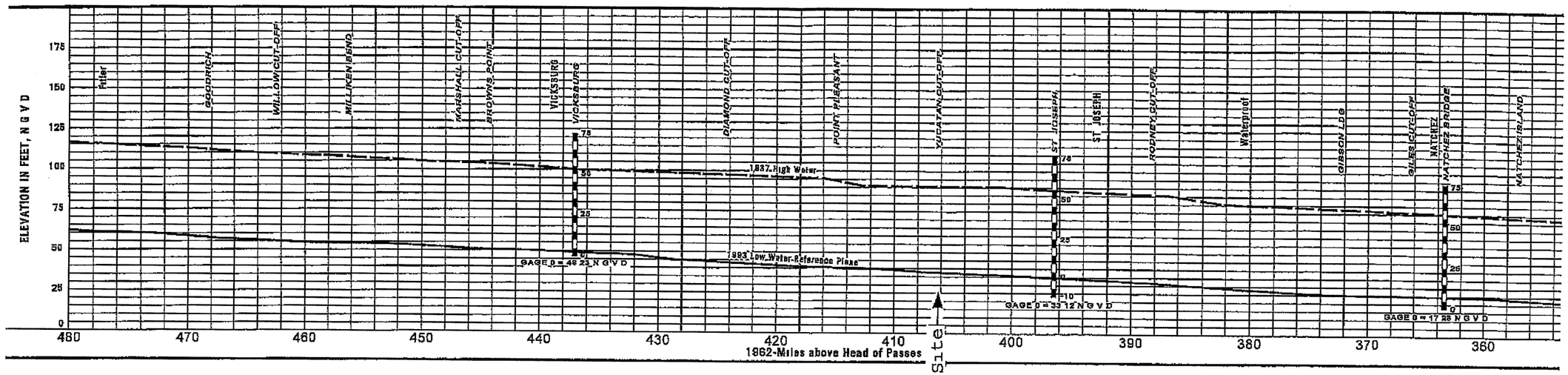
HYDROGRAPHIC DETAILS OF THE MISSISSIPPI RIVER AT GRAND GULF

FIGURE 2.4-5 REV. 1



LEGEND

430 1962 Mileage above Head of Passes

Low Water Reference Plane*

1937 High Water

Source: Adapted from USACE, 2001

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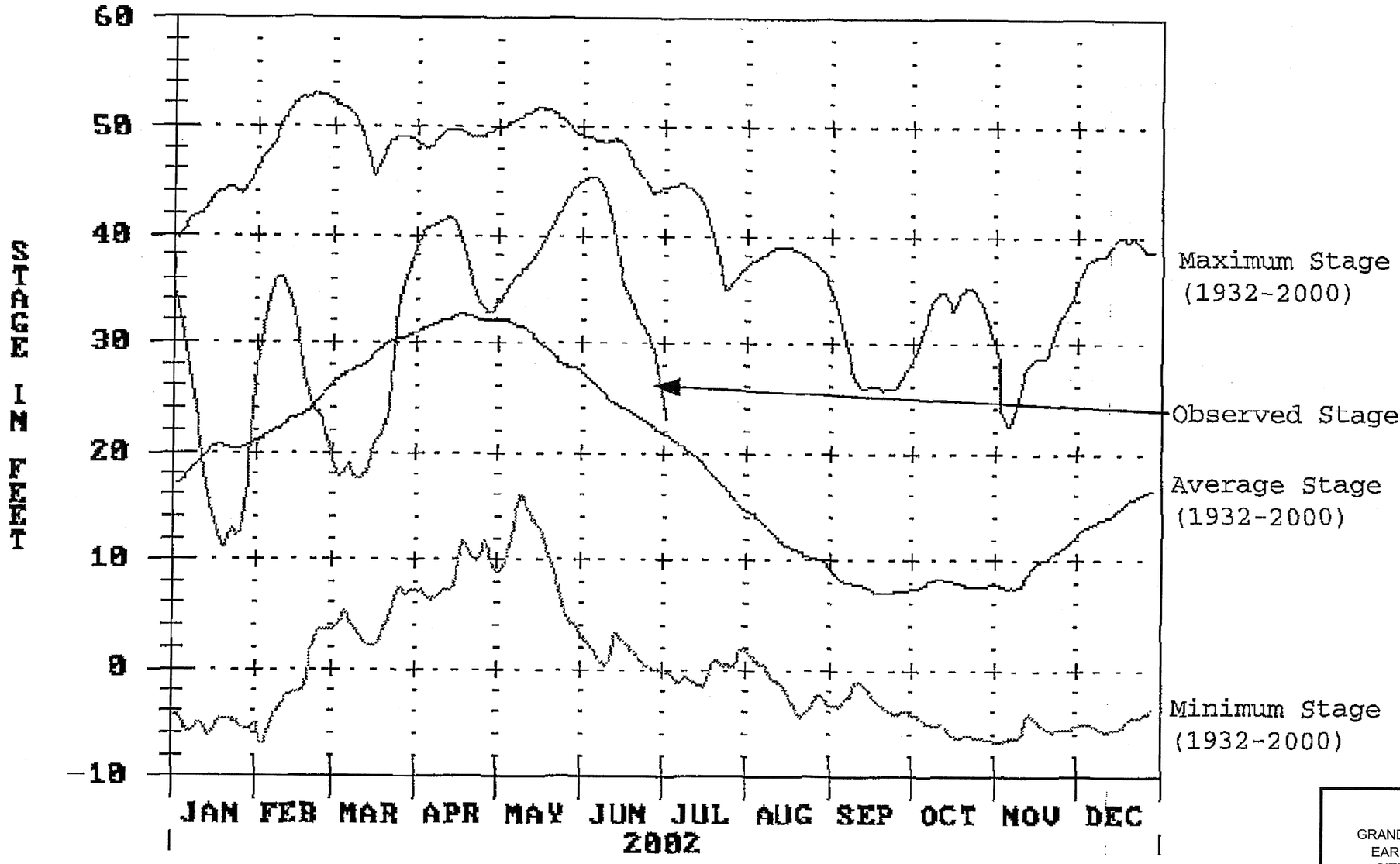
WATER SURFACE PROFILES FOR 1937 HIGH FLOW AND 1993 LOW WATER REFERENCE PLANE

FIGURE 2.4-6 REV. 1



Source: Adapted from U.S. Army Corps of Engineers

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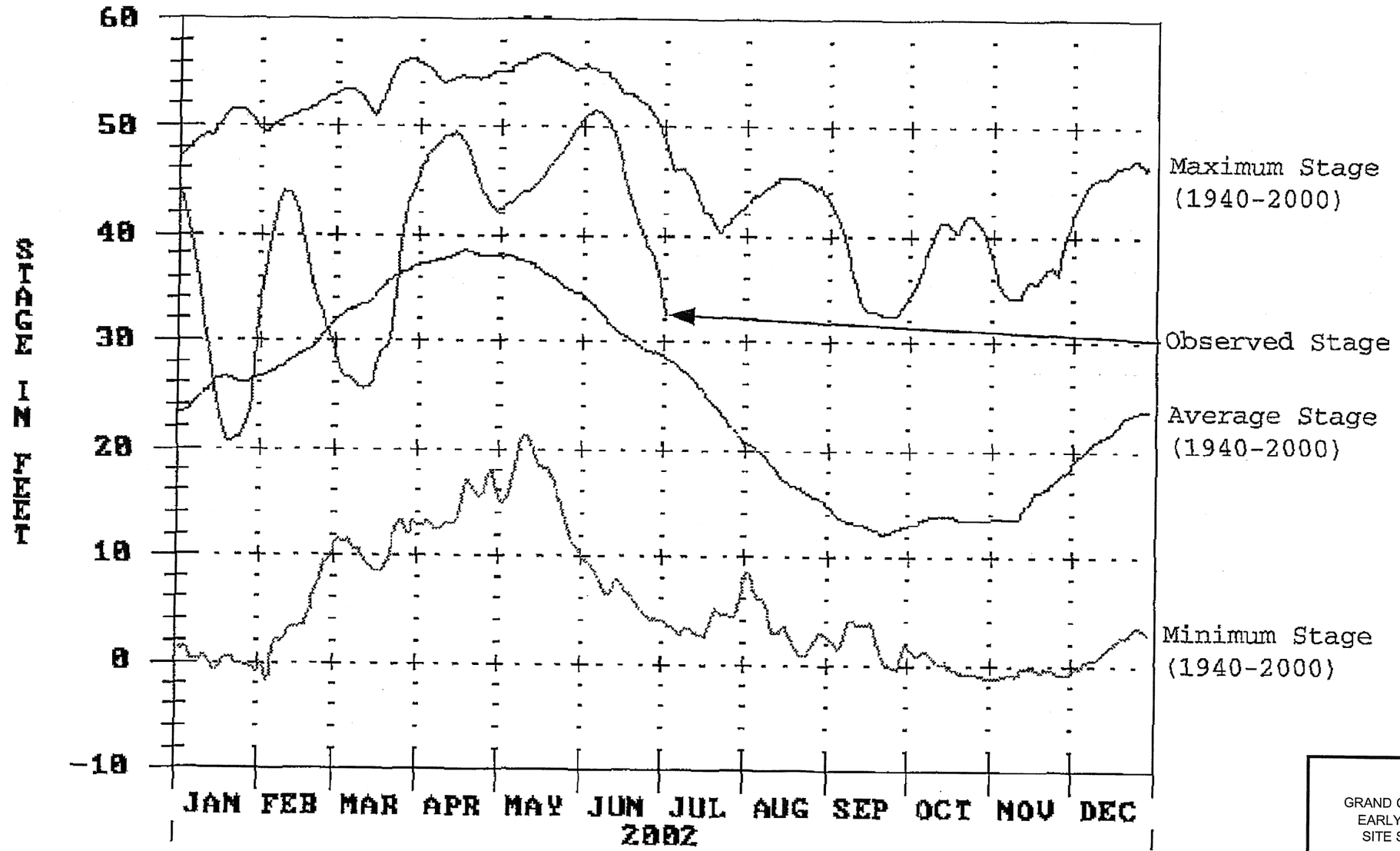
HYDROGRAPH FOR THE MISSISSIPPI RIVER AT VICKSBURG, MS

FIGURE 2.4-7 REV. 1



Source: Adapted from U.S. Army Corps of Engineers

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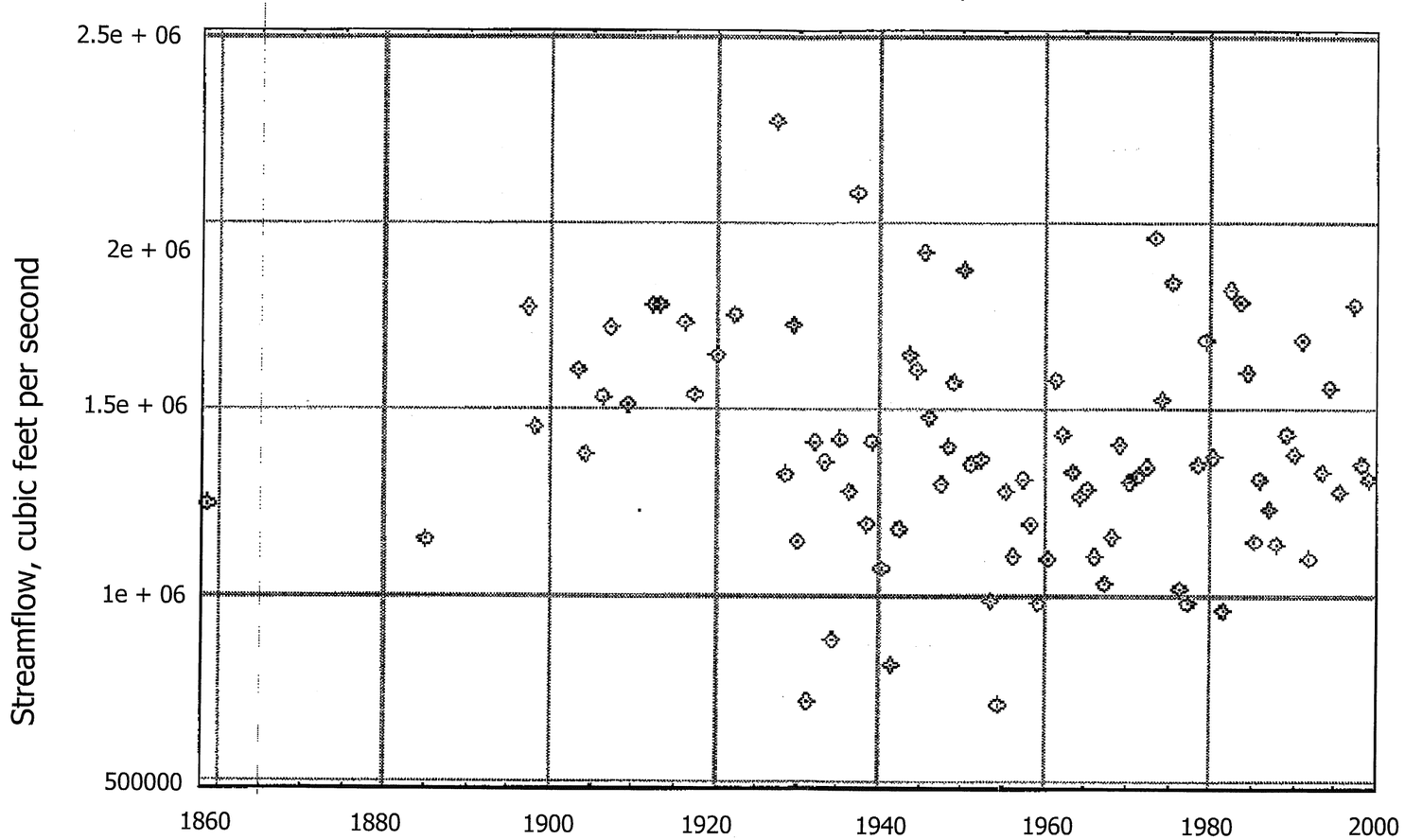
HYDROGRAPH FOR MISSISSIPPI RIVER
AT NATCHEZ, MS

FIGURE 2.4-8 REV. 1



DATES: 06/24/1858 to 02/13/1999

Source: U.S.G.S.

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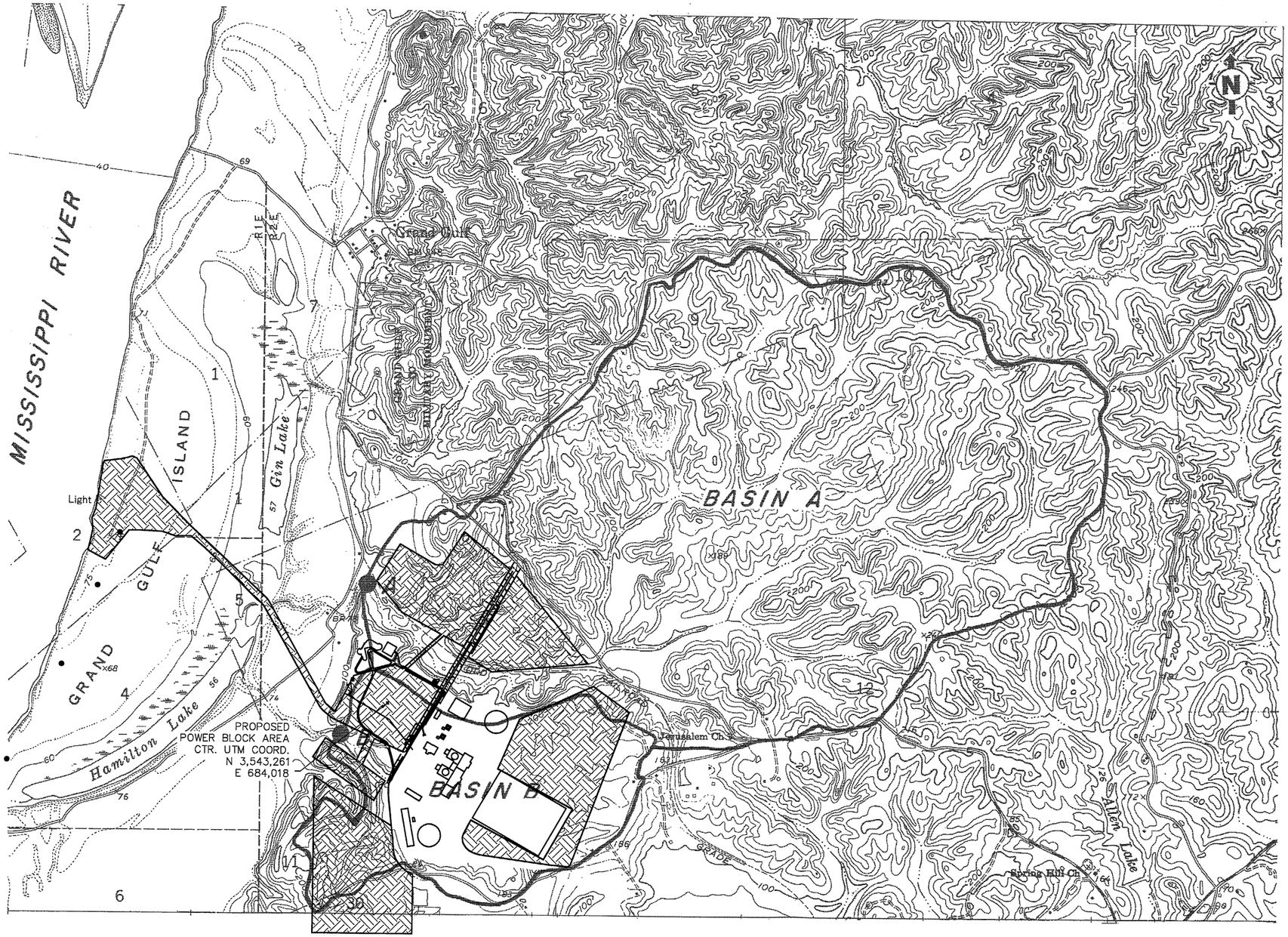
SITE SAFETY ANALYSIS REPORT

ANNUAL MAXIMUM INSTANTANEOUS PEAK
STREAMFLOW - MISSISSIPPI RIVER
USGS STATION, VICKSBURG, MS

FIGURE 2.4-9 REV. 1



Adapted from U.S.G.S. 7.5 Minute
Topographic Sheet 1963 Series

NOTES:

1. GGNS UNIT 1 FACILITIES ADDED FOR REFERENCE.

LEGEND:

PROPOSED NEW FACILITY CONSTRUCTION AREAS

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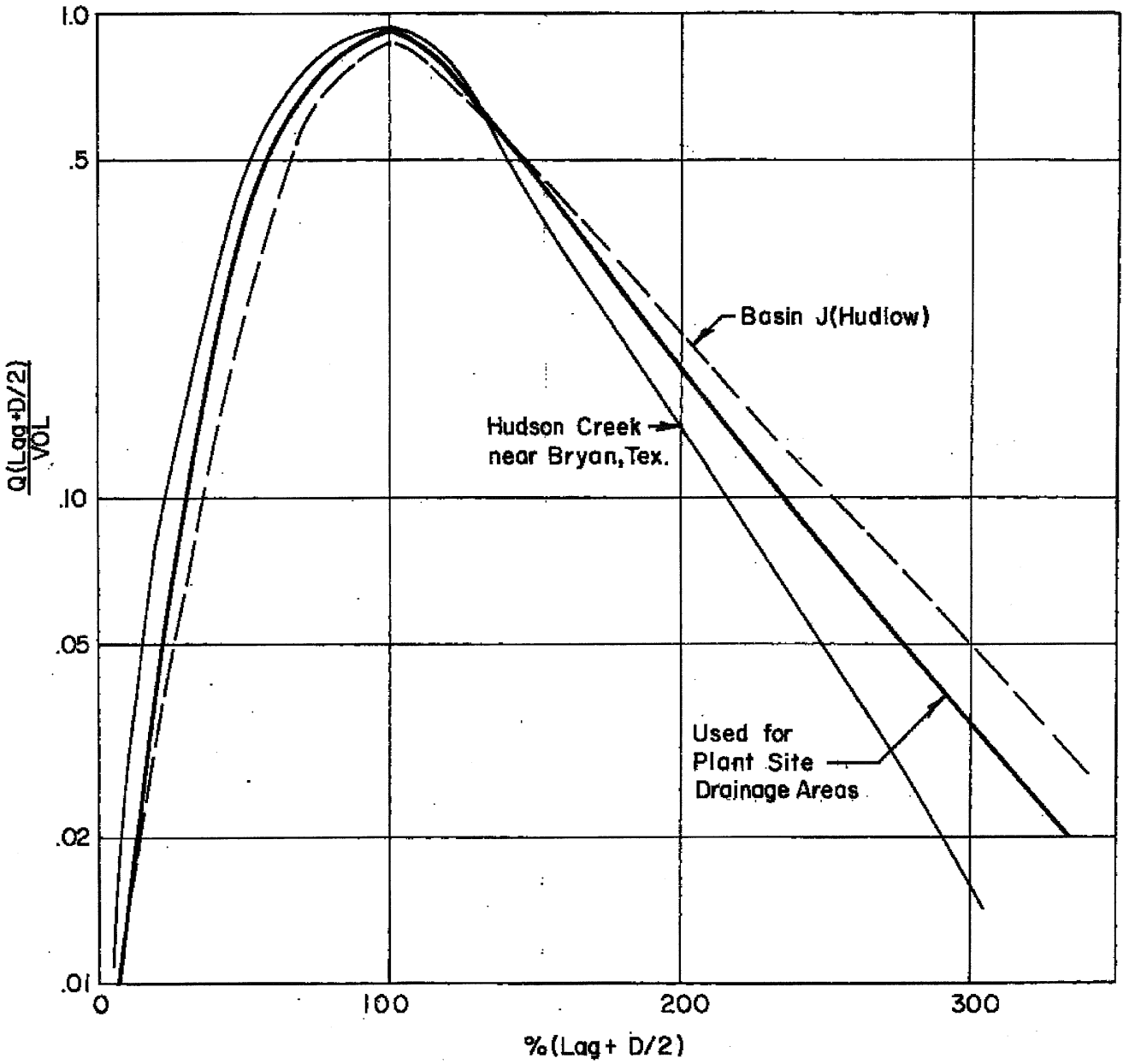
SITE SAFETY ANALYSIS REPORT

LOCAL DRAINAGE BASINS
(UFSAR FIGURE 2.4-8)

FIGURE 2.4-10 REV. 1



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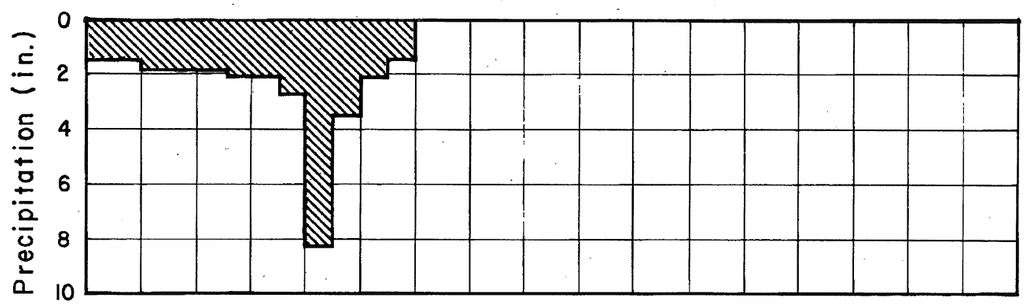
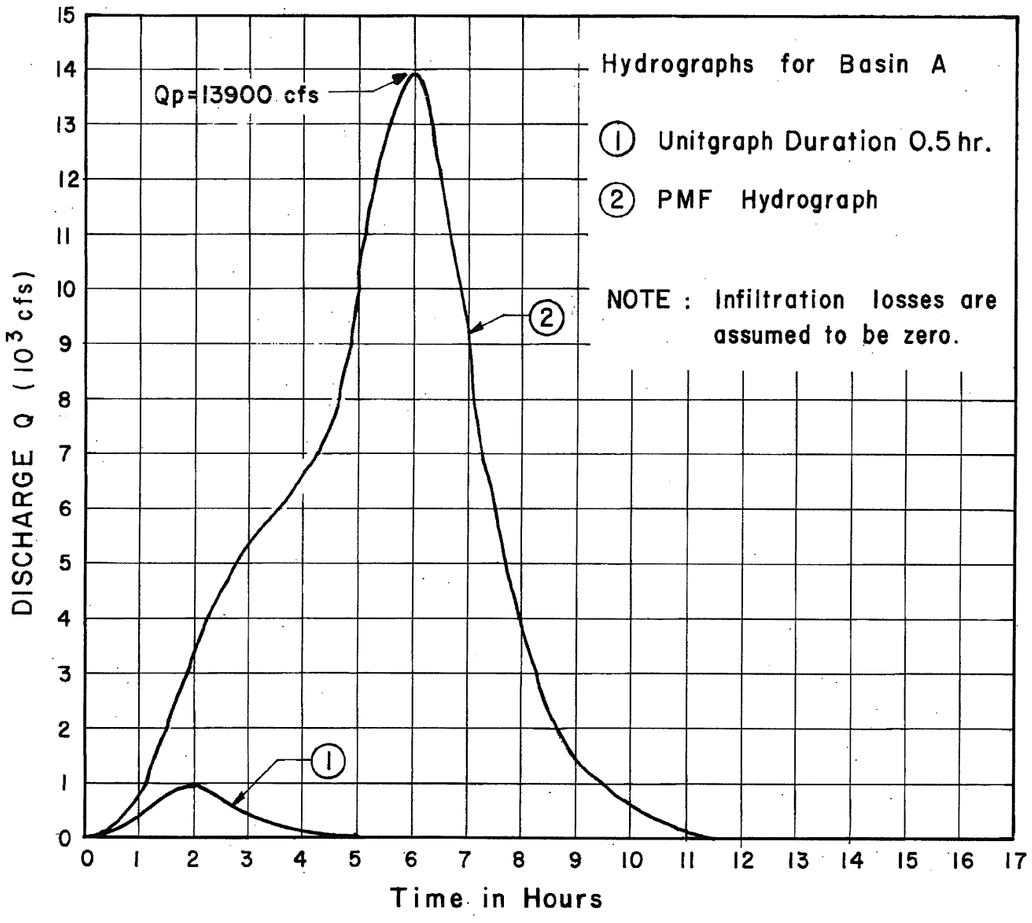
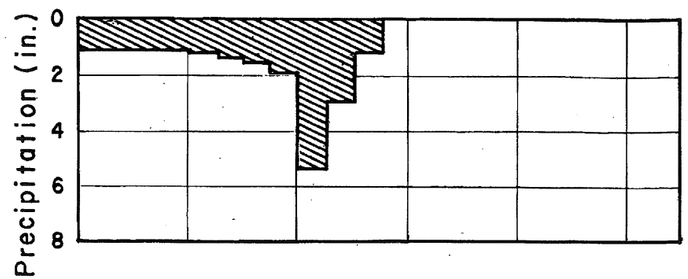
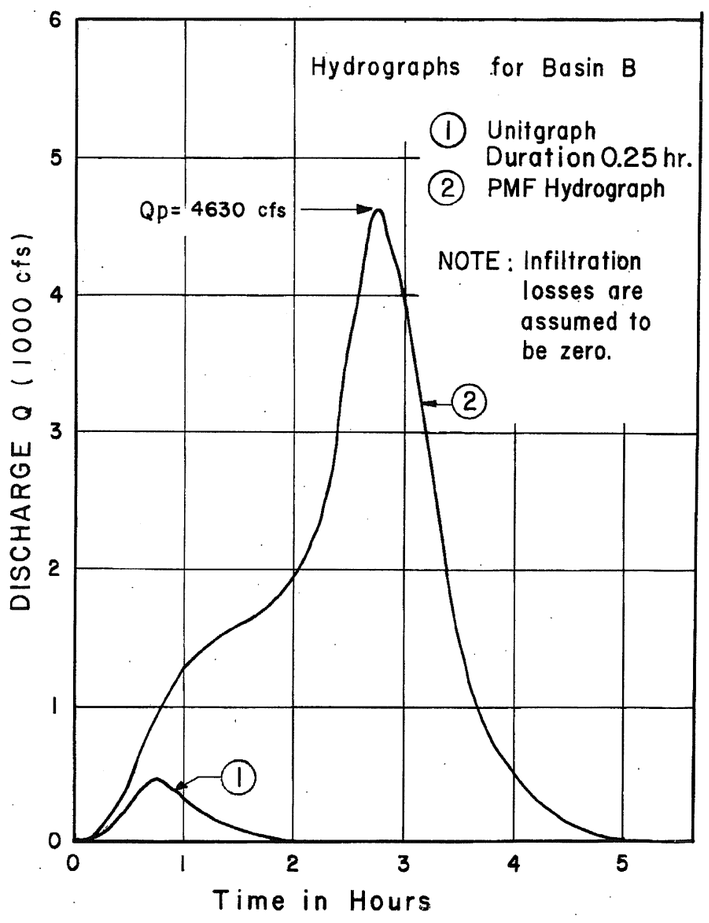
DIMENSIONLESS HYDROGRAPH FOR
THE PLANT SITE DRAINAGE BASINS
(UFSAR FIGURE 2.4-9)

FIGURE 2.4-11 REV. 1









NOTE:
THESE HYDROGRAPHS WERE DEVELOPED FOR GGNS UNIT 1 USING RAINFALL RATES FROM HMR 33 AND USACE EM-1110-2-1411 AND ARE PRESENTED FOR INFORMATION ONLY.

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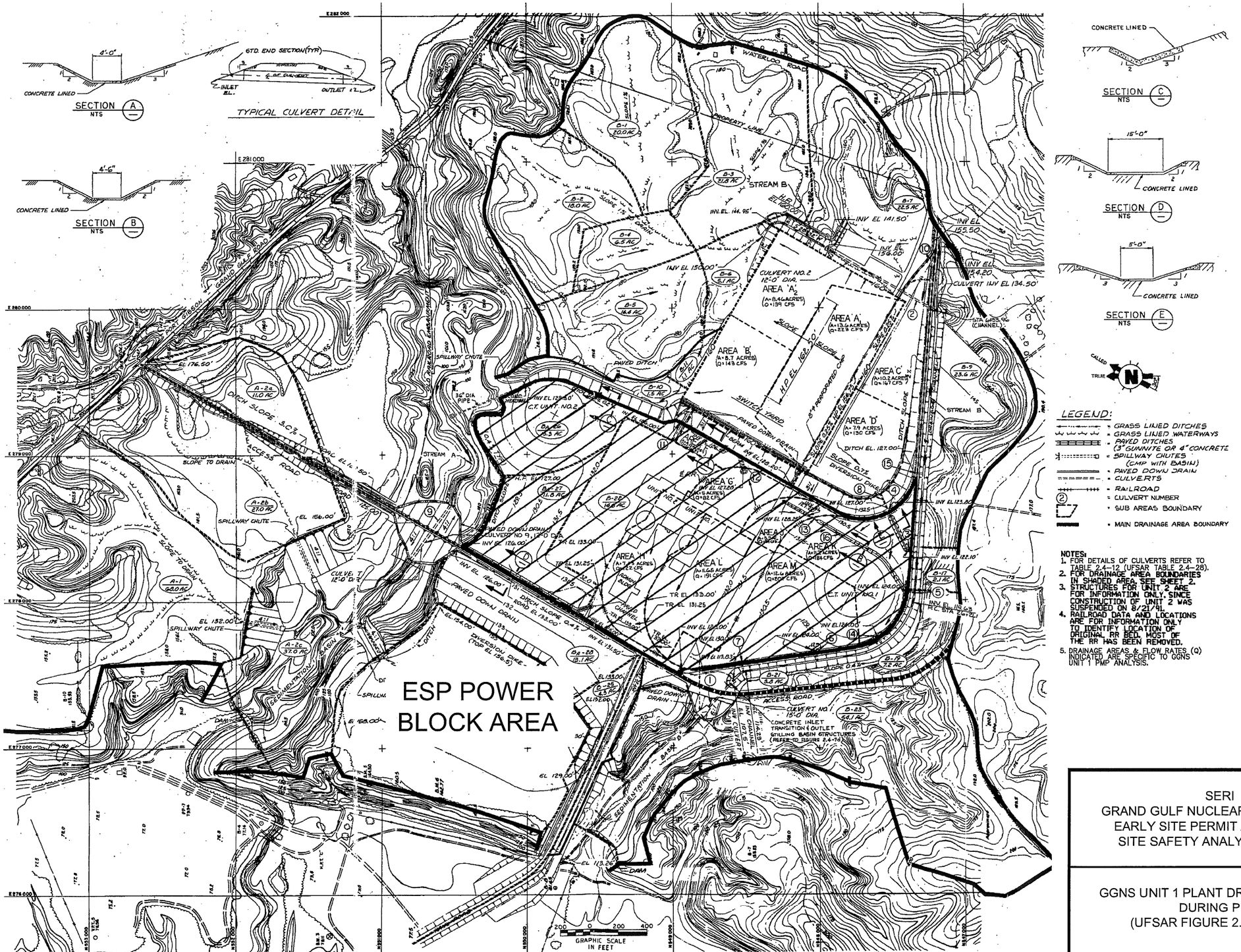
BASIN A & B
HYDROGRAPHS
(UFSAR FIGURE 2.4-10)

FIGURE 2.4-12 REV. 1



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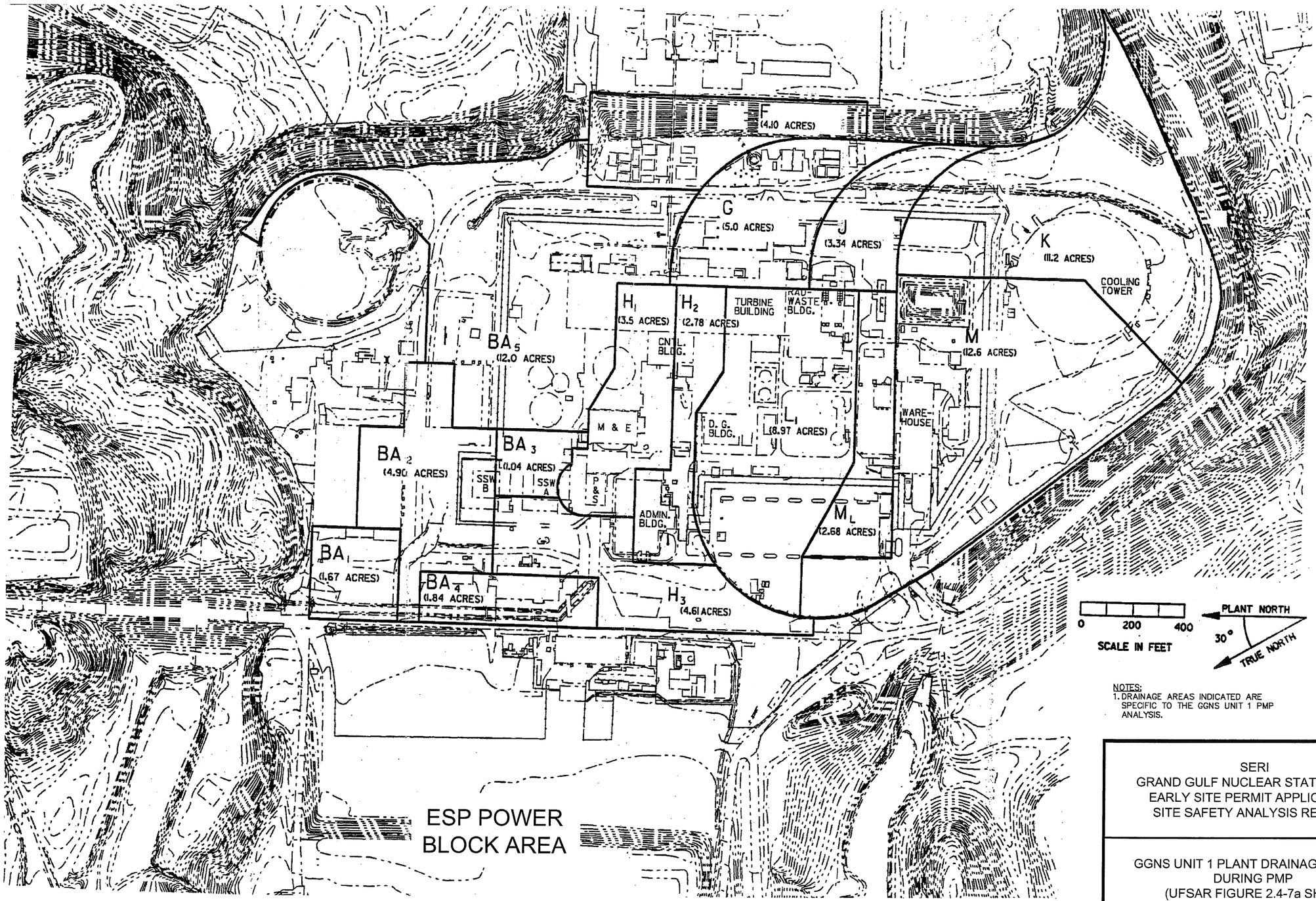
GGNS UNIT 1 PLANT DRAINAGE AREAS
DURING PMP
(UFSAR FIGURE 2.4-7a SH. 1)

FIGURE 2.4-13 SHEET 1 OF 2 REV. 1



NOTES:
1. DRAINAGE AREAS INDICATED ARE SPECIFIC TO THE GGNS UNIT 1 PMP ANALYSIS.

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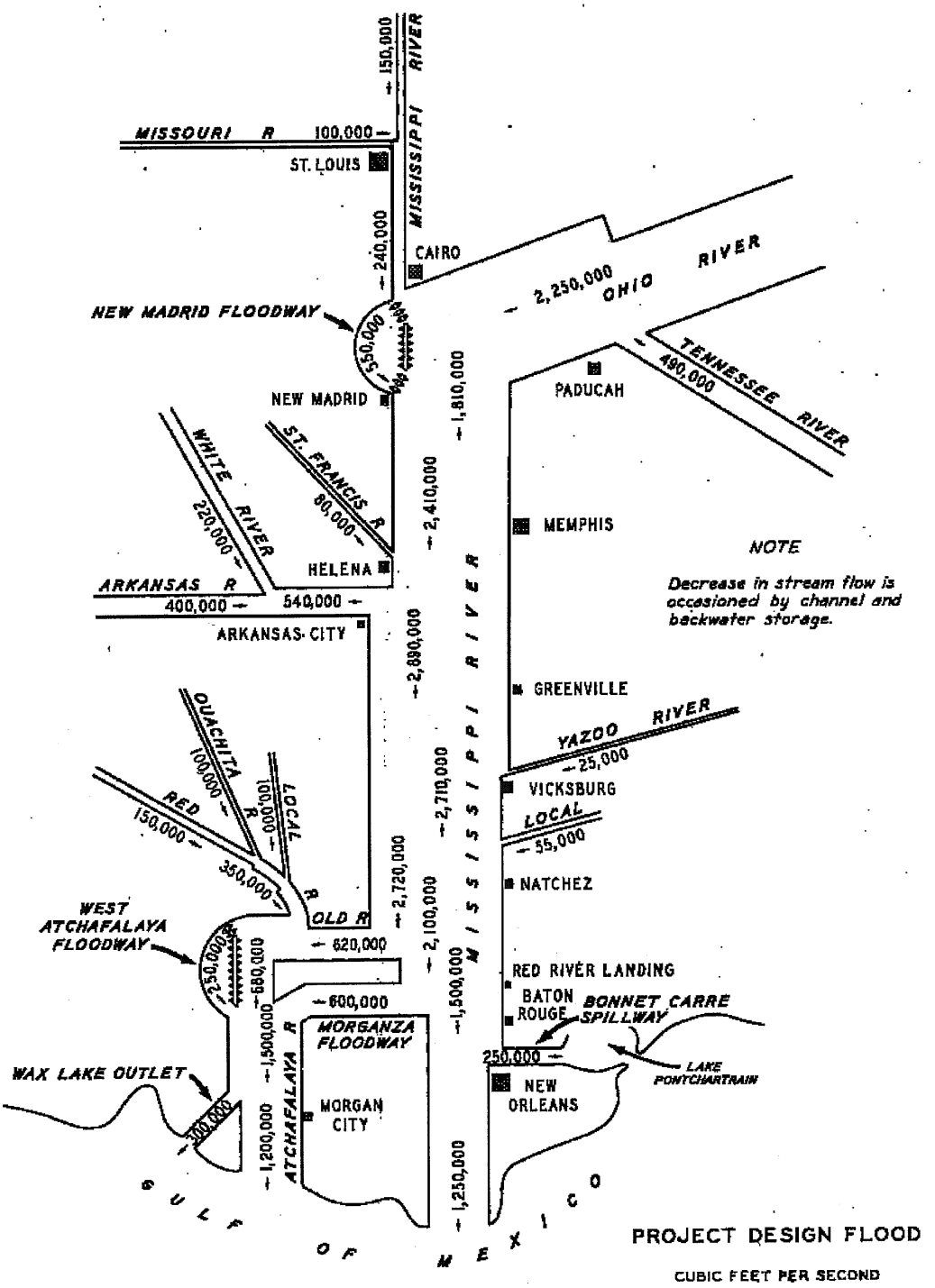
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

GGNS UNIT 1 PLANT DRAINAGE AREAS DURING PMP
(UFSAR FIGURE 2.4-7a SH. 2)

FIGURE 2.4-13 SHEET 2 OF 2 REV. 1



SOURCE: MISSISSIPPI RIVER COMMISSION, "LOWER MISSISSIPPI REGION COMPREHENSIVE STUDY," APPENDIX C, FIGURE-69, 1974

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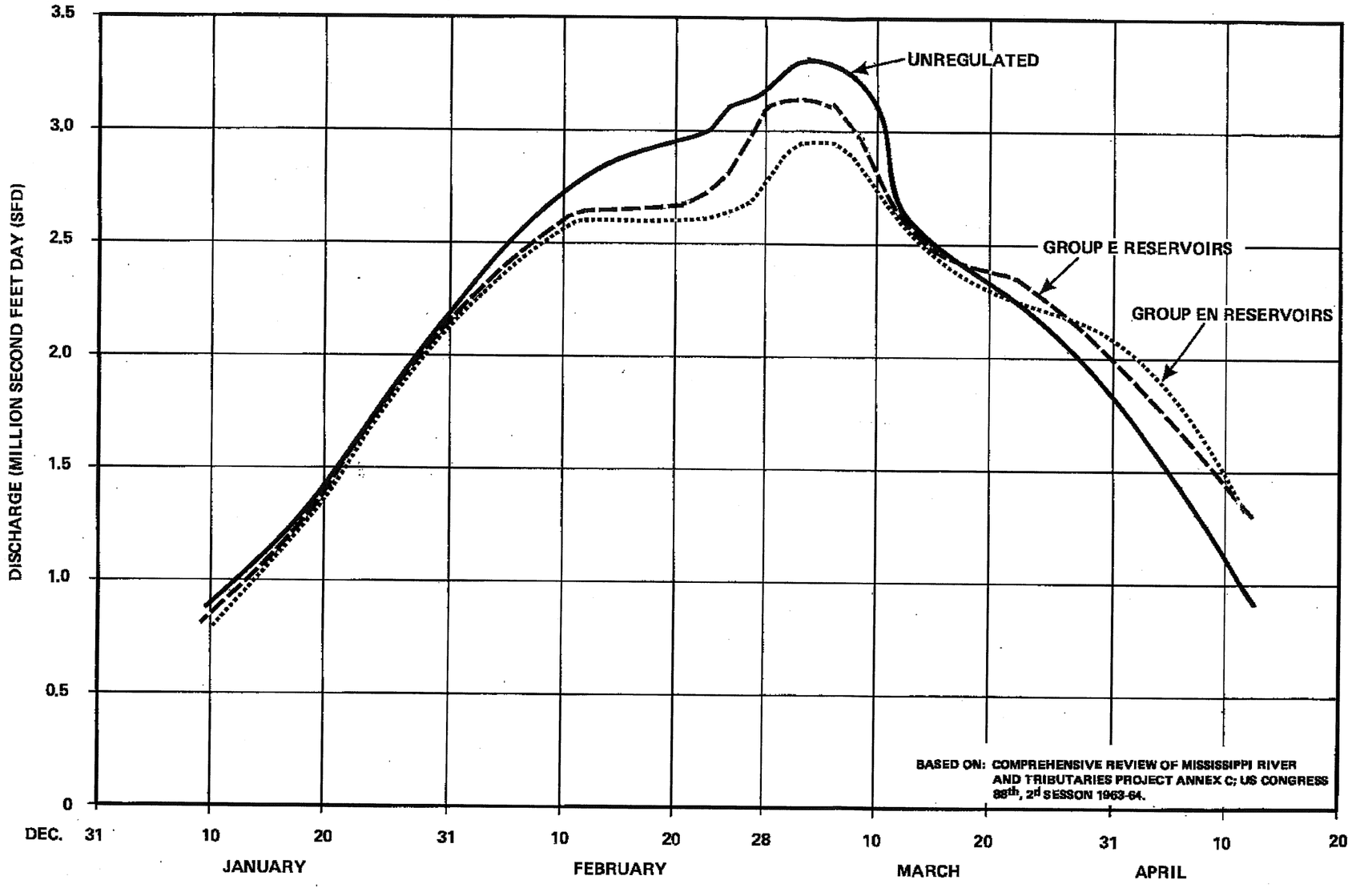
DESIGN-PROJECT FLOOD FOR THE LOWER MISSISSIPPI RIVER
U.S. CORPS OF ENGINEERS 1958
(UFSAR FIGURE 2.4-11)

FIGURE 2.4-14 REV. 1



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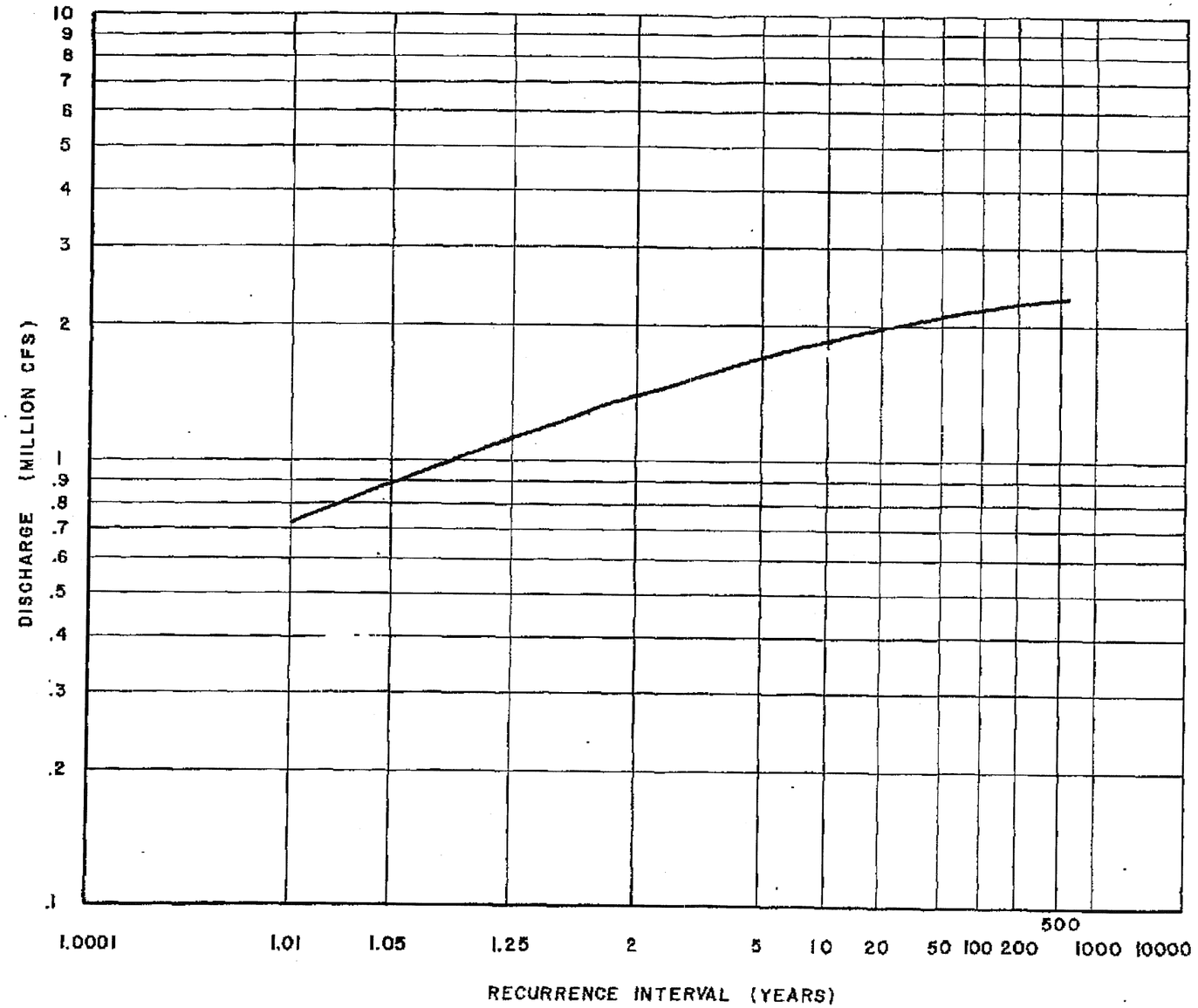
SITE SAFETY ANALYSIS REPORT

DPF HYDROGRAPHS FOR
MISSISSIPPI RIVER
(UFSAR FIGURE 2.4-12)

FIGURE 2.4-15 REV. 1



SOURCE: U.S.G.S.
PERIOD OF RECORD: 1858 – 1973

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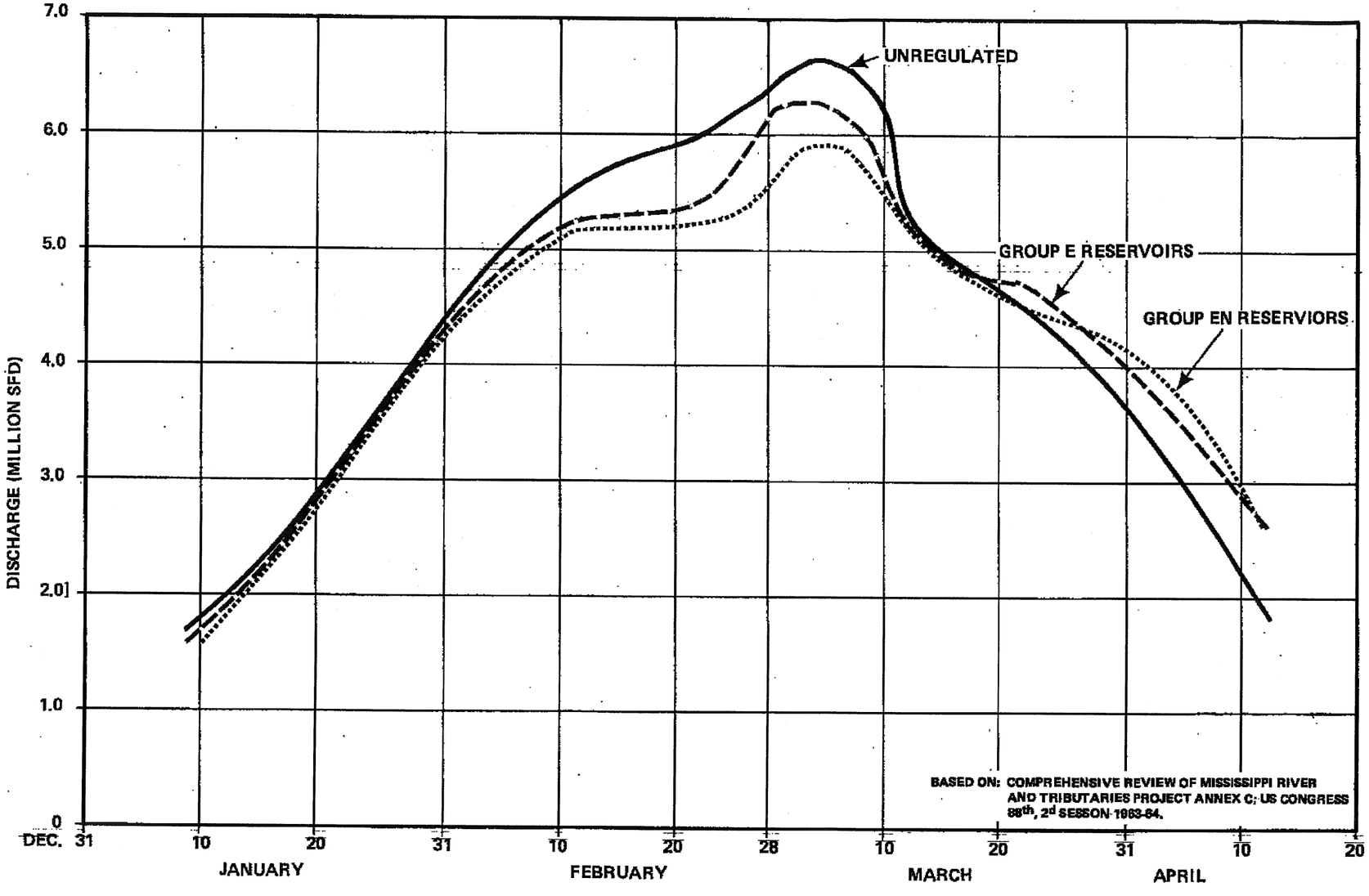
SITE SAFETY ANALYSIS REPORT

DISCHARGE-FREQUENCY RELATIONSHIP
FOR MISSISSIPPI RIVER FLOODS AT
VICKSBURG
(UFSAR FIGURE 2.4-13)

FIGURE 2.4-16 REV. 1



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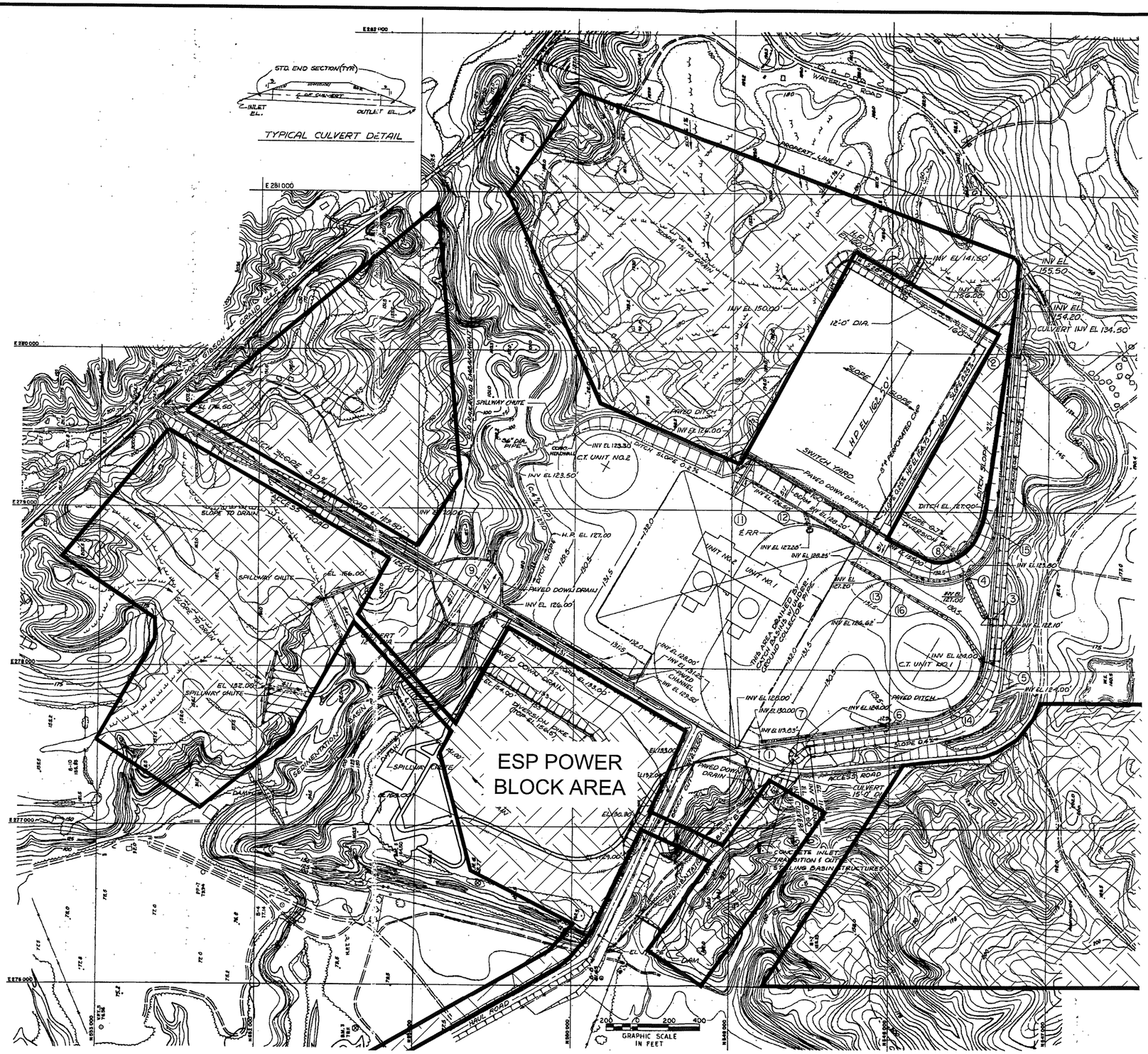
PMF HYDROGRAPHS FOR
MISSISSIPPI RIVER
(UFSAR FIGURE 2.4-14)

FIGURE 2.4-17 REV. 1



CALLED TRUE N

LEGEND:

- = GRASS LINED DITCHES
- = GRASS LINED WATERWAYS
- = PAVED DITCHES (3" GUNNITE OR 4" CONCRETE
- = SPILLWAY CHUTES (CMP WITH BASIN)
- = PAVED DOWN DRAIN
- = RAILROAD
- = CULVERTS
- PROPOSED NEW FACILITY CONSTRUCTION AREAS.

NOTES:
1. STRUCTURES FOR GGNS UNIT 2 ARE FOR INFORMATION ONLY, SINCE CONSTRUCTION OF UNIT 2 WAS SUSPENDED ON 8/21/91.
2. RAILROAD DATA AND LOCATIONS ARE FOR INFORMATION ONLY TO IDENTIFY LOCATION OF ORIGINAL RR BED. MOST OF THE RR HAS BEEN REMOVED.

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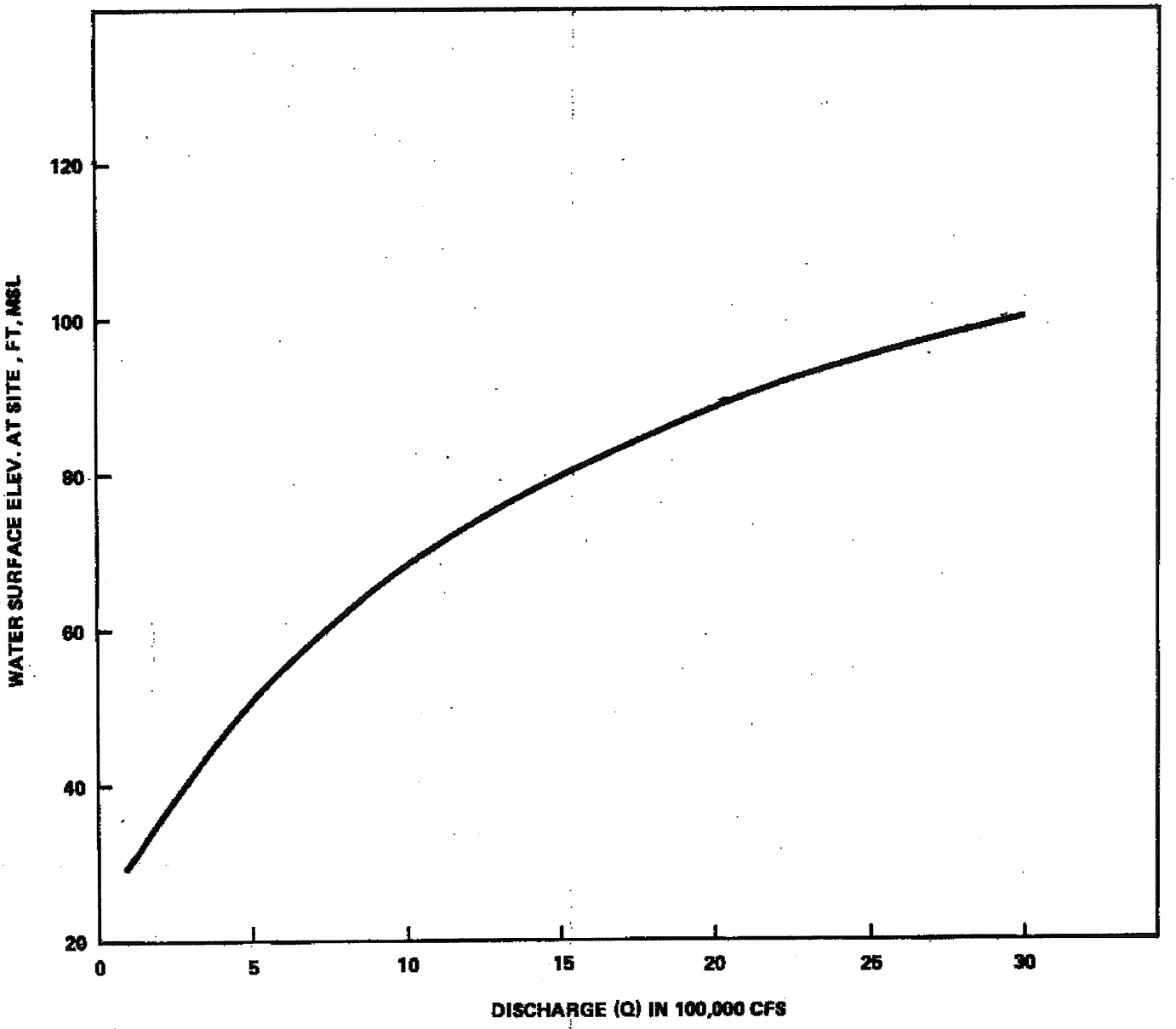
SITE DRAINAGE PLAN
(UFSAR FIGURE 2.4-7)

FIGURE 2.4-18 REV. 1



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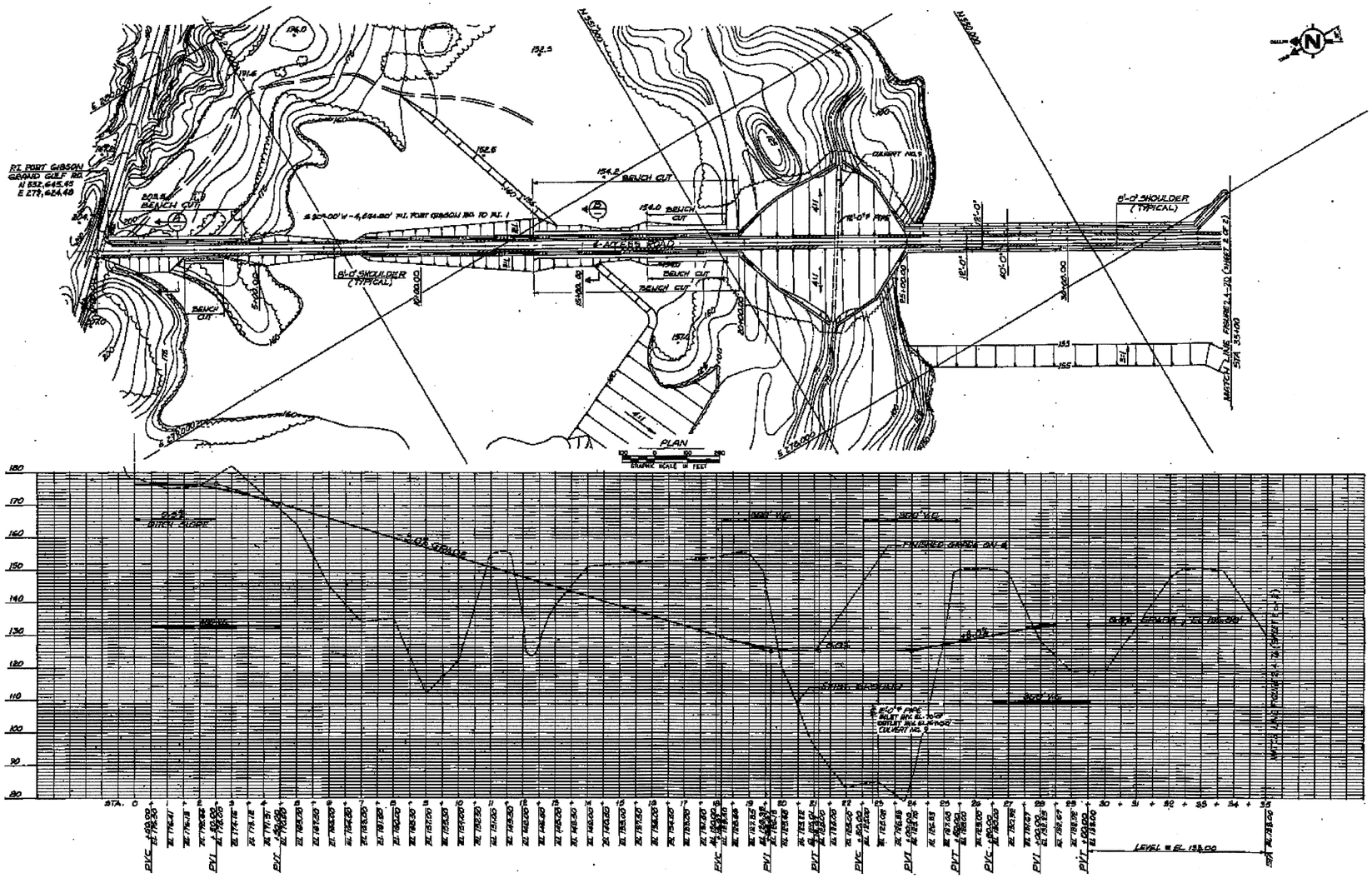
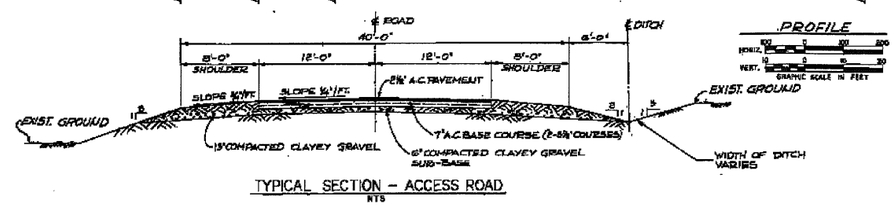
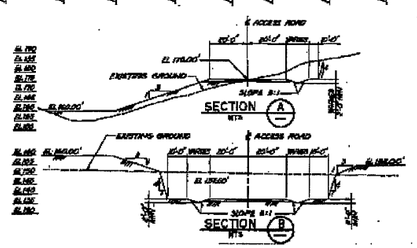
RATING CURVE FOR THE MISSISSIPPI RIVER AT GRAND GULF SITE
(UFSAR FIGURE 2.4-15)

FIGURE 2.4-19 REV. 1





TYPICAL SECTION – ACCESS ROAD
NTS



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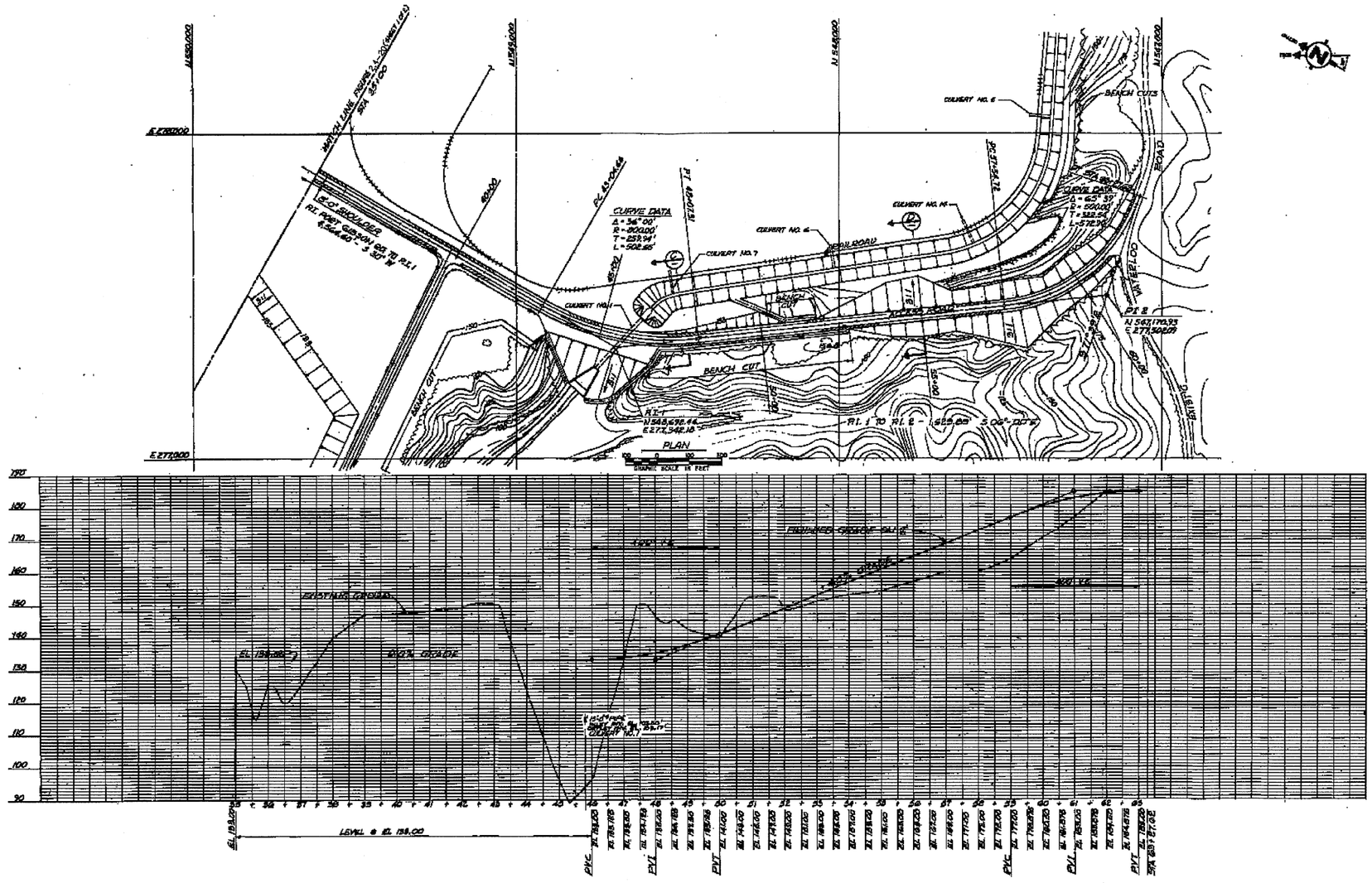
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

ACCESS ROAD
PLAN AND PROFILE
(UFSAR FIGURE 2.4-7b SH. 1)

FIGURE 2.4-20 SHEET 1 OF 2 REV. 1



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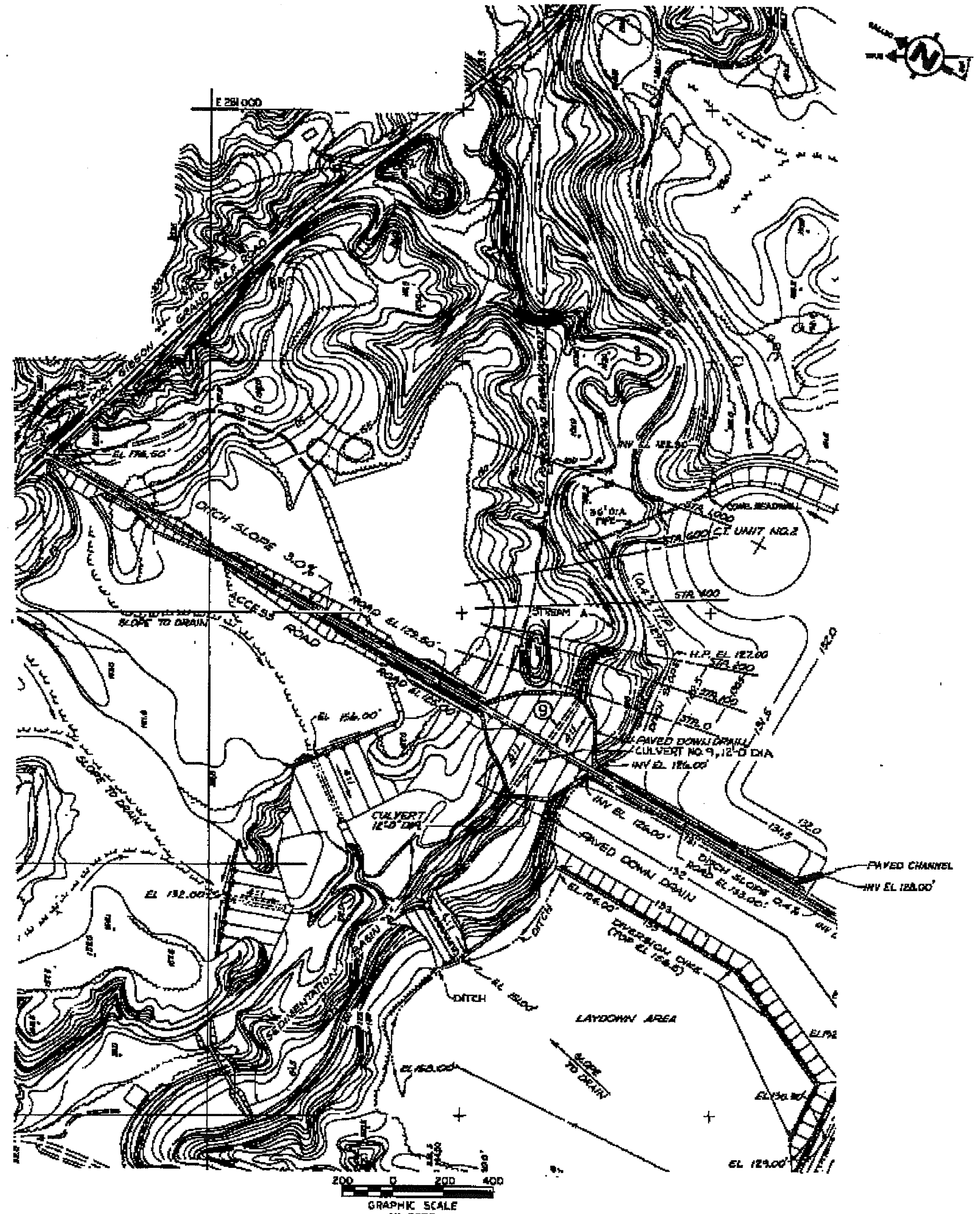
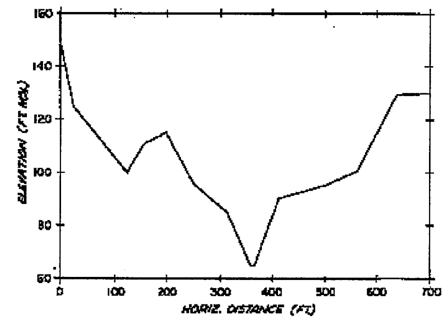
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

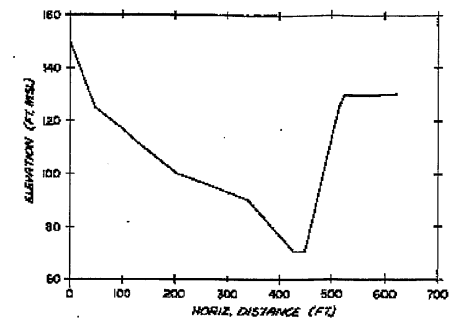
ACCESS ROAD
PLAN AND PROFILE
(UFSAR FIGURE 2.4-7b SH. 2)

FIGURE 2.4-20 SHEET 2 OF 2 REV. 1

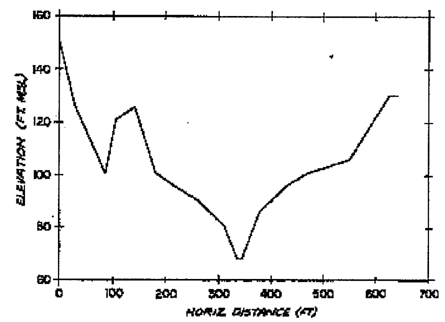




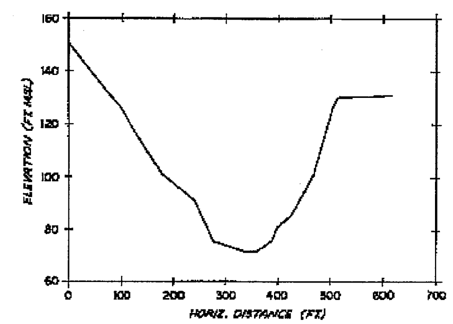
CROSS SECTION @ STA. 0



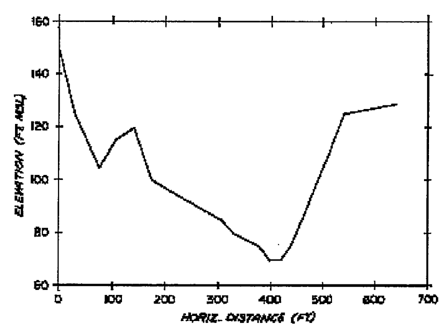
CROSS SECTION @ STA. 400



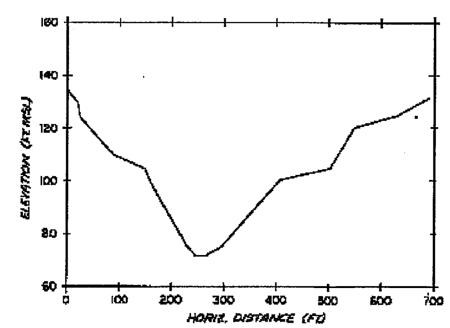
CROSS SECTION @ STA. 100



CROSS SECTION @ STA 600



CROSS SECTION @ STA. 200



CROSS SECTION @ STA 1000

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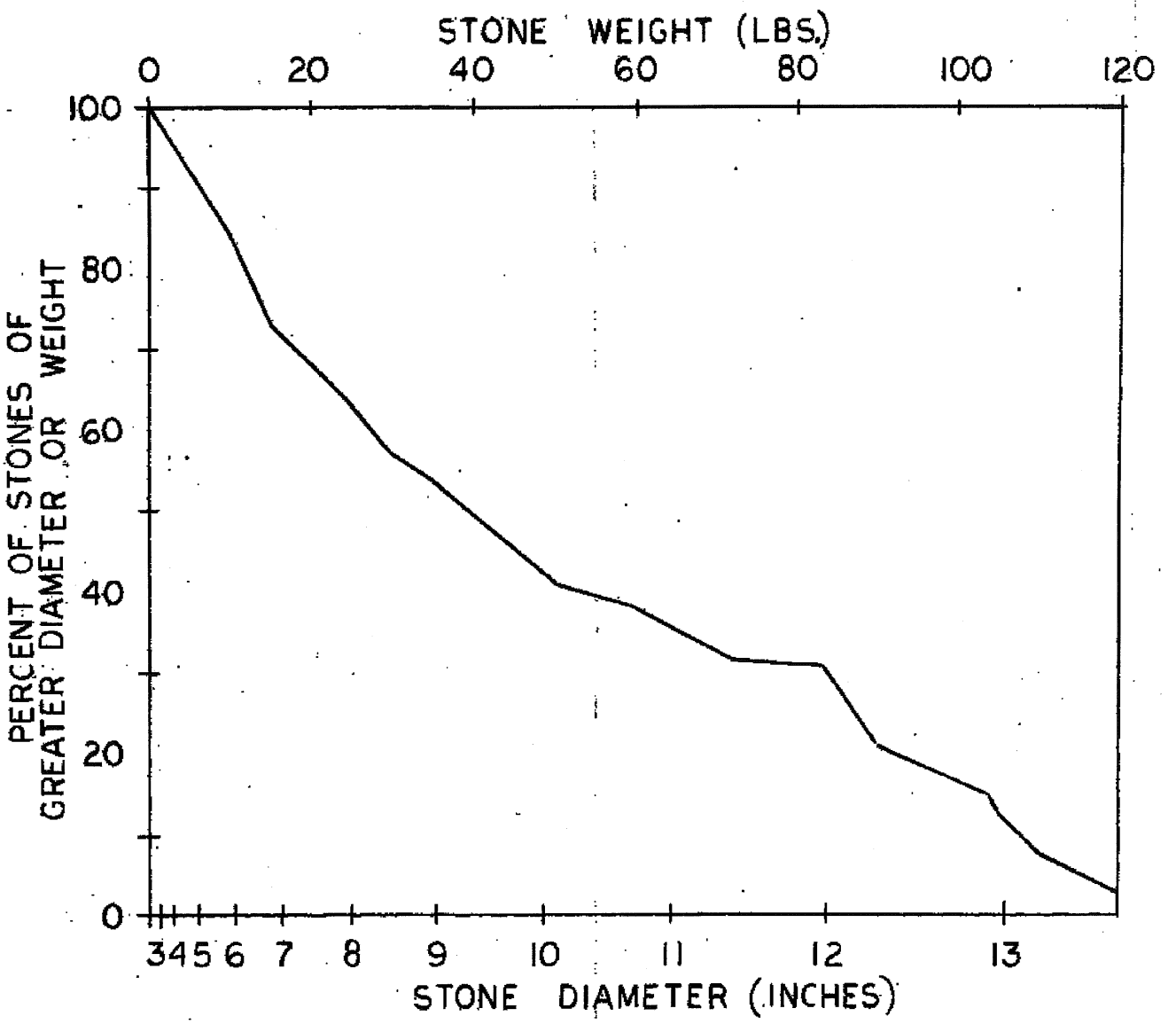
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

CROSS SECTIONS OF STREAM A
(UFSAR FIGURE 2.4-7c)

FIGURE 2.4-21 REV. 1



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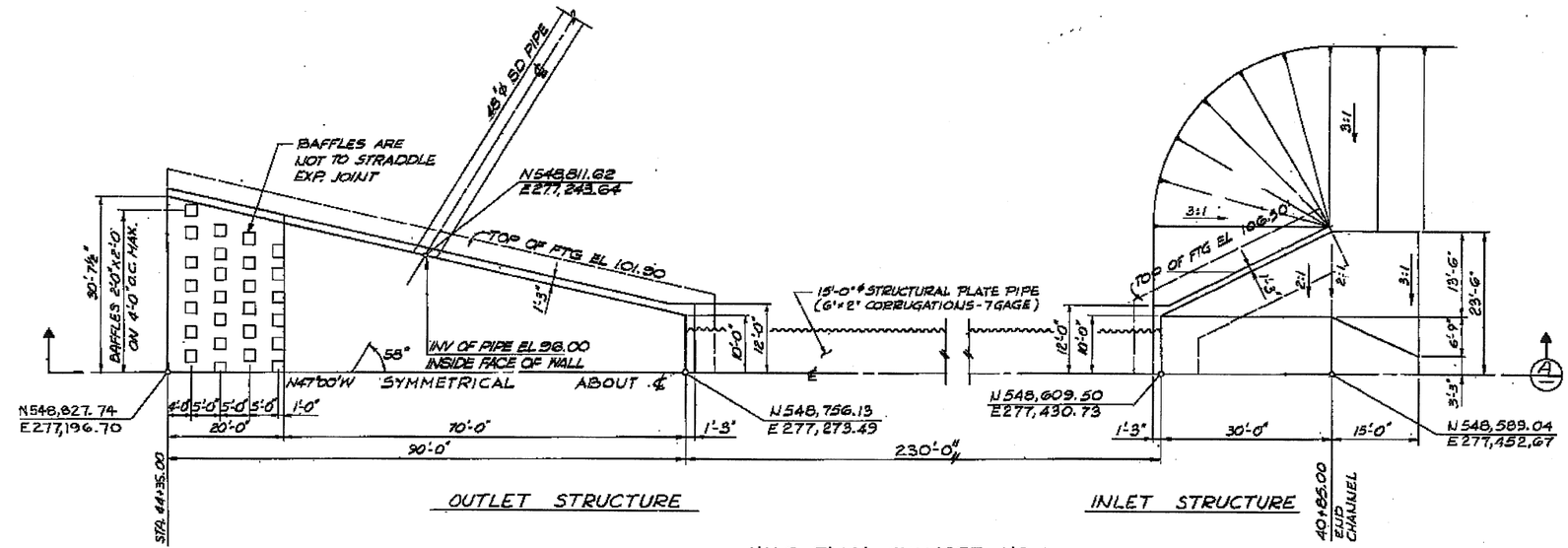
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

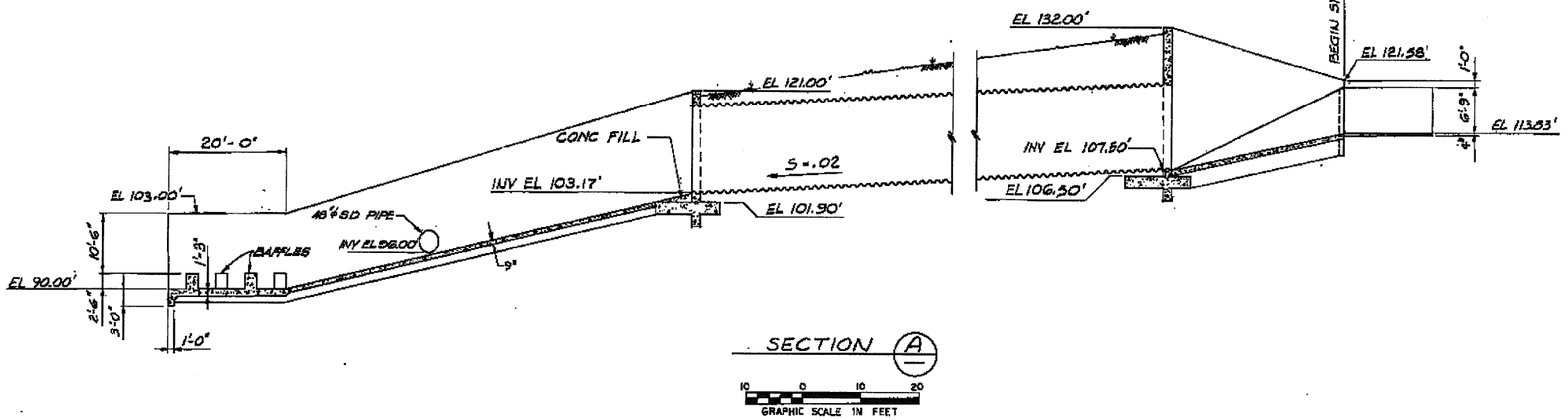
RIPRAP GRADATION CURVE
(USAR FIGURE 2.4-16a)

FIGURE 2.4-22 REV. 1



HALF PLAN CULVERT NO. 1

10 0 10 20
GRAPHIC SCALE IN FEET



SECTION (A)

10 0 10 20
GRAPHIC SCALE IN FEET

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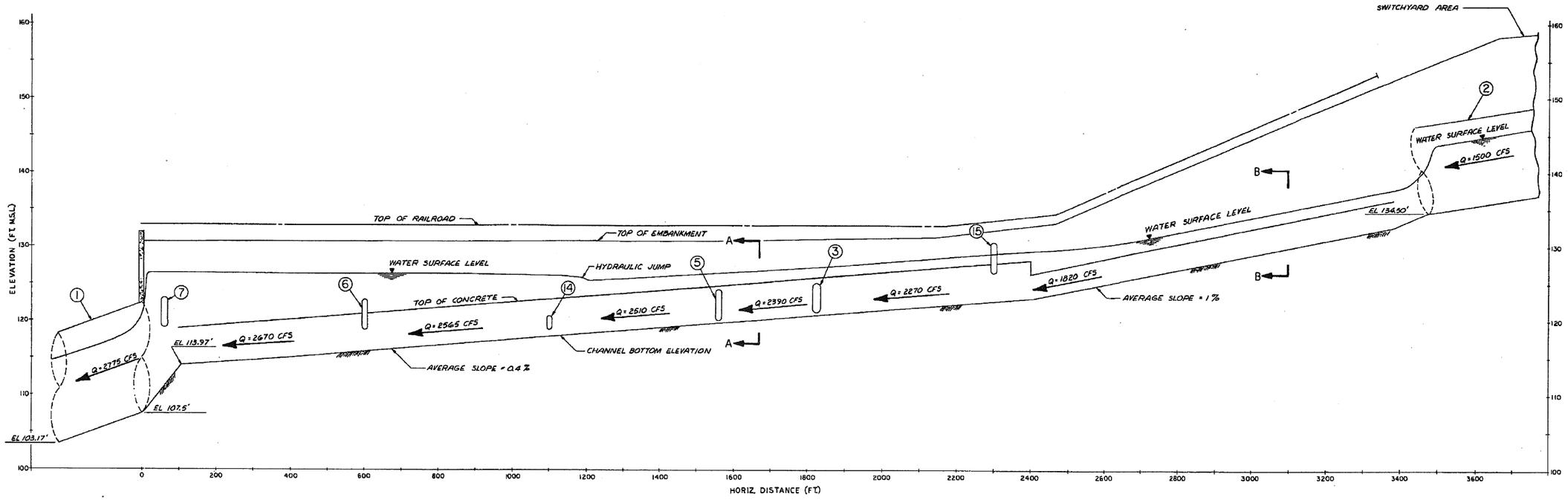
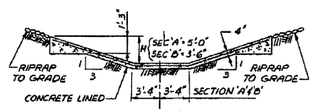
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

CULVERT NO. 1
PLAN AND SECTIONS
(UFSAR FIGURE 2.4-7d)

FIGURE 2.4-23 REV. 1



DISTANCE UPSTREAM OF CULVERT 1 INLET



SECTION A & B OF CHANNEL
NOT TO SCALE

REPRESENTS CULVERT LOCATION

NOTES:

1. FOR DETAIL OF CULVERTS REFER TO TABLE 2.4-12 (GGNS UFSAR TABLE 2.4-28).
2. FOR PLAN OF PERIPHERAL DRAINAGE DITCH OF BASIN B REFER TO FIGURES 2.4-13 & 2.4-18 (GGNS UFSAR FIGURE 2.4-7 & 2.4-7A).
3. FLOW RATES (Q) SHOWN ARE FOR GGNS UNIT 1 PMP ANALYSIS ONLY.

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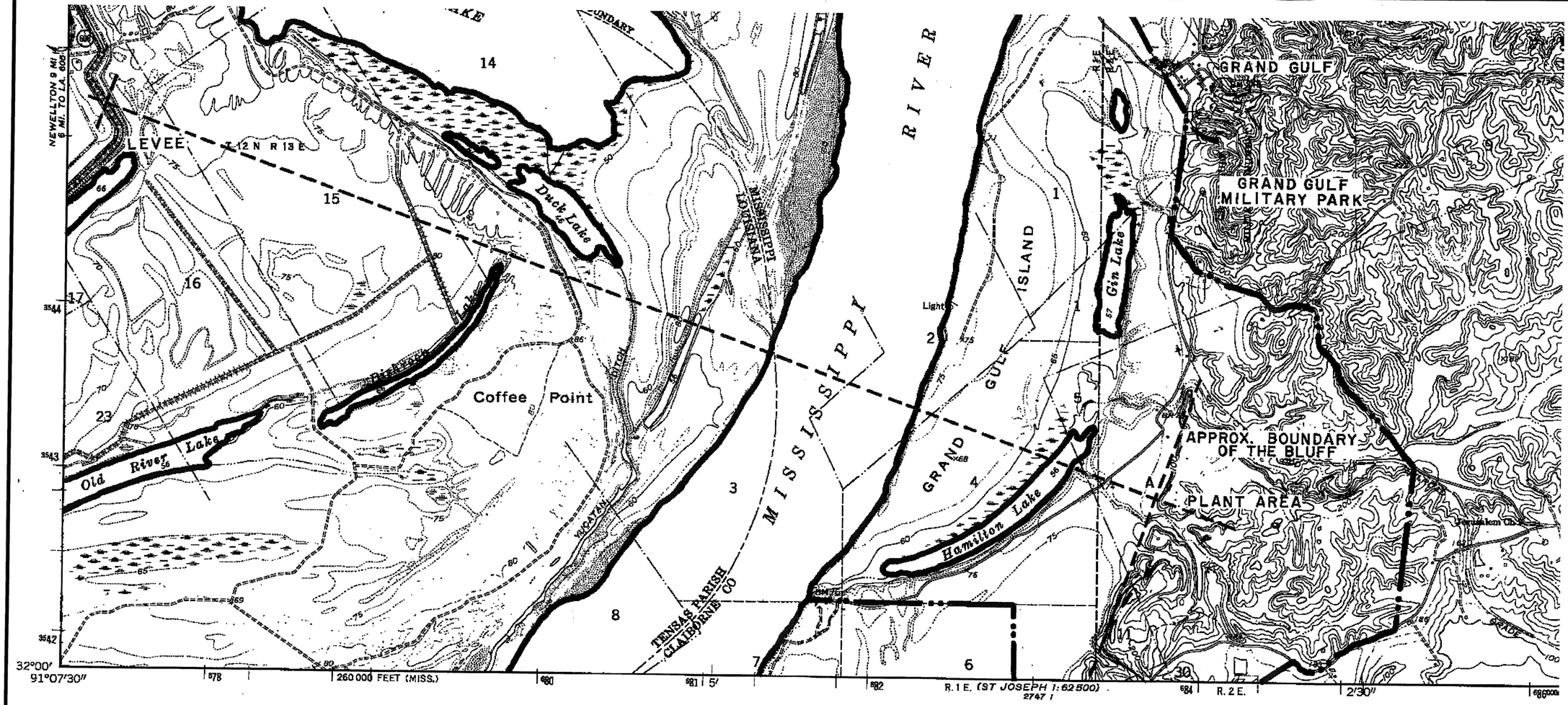
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

PROFILE AND SECTIONS
OF PERIPHERAL DRAINAGE
FOR BASIN B
(UFSAR FIGURE 2.4-16)

FIGURE 2.4-24 REV. 1



1,000 0 2,000

SCALE IN FEET

Adapted from U.S.G.S. 7.5 Minute Topographic Sheet 1963 Series

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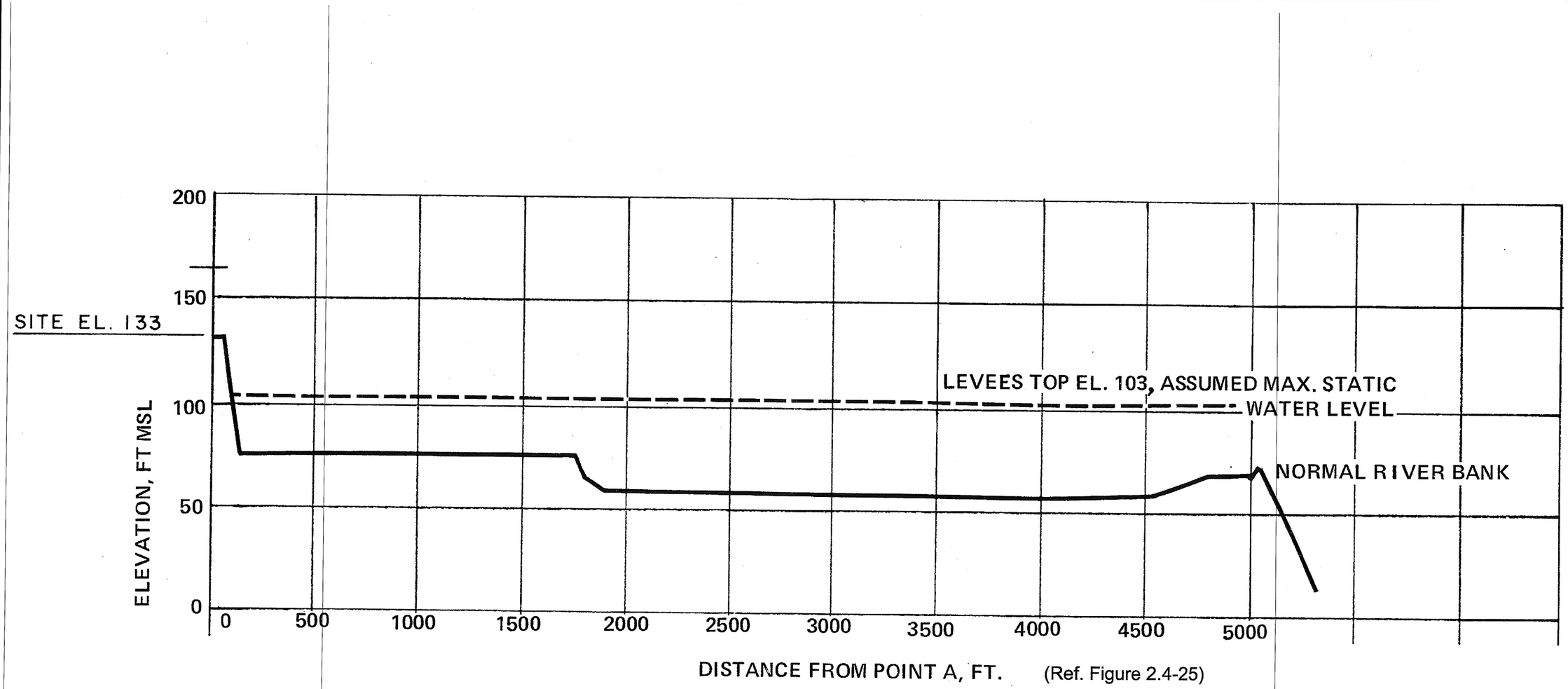
BOUNDARIES OF WATER SURFACE AT EL. 103 IN THE SITE REGION
(UFSAR FIGURE 2.4-17)

FIGURE 2.4-25 REV. 1



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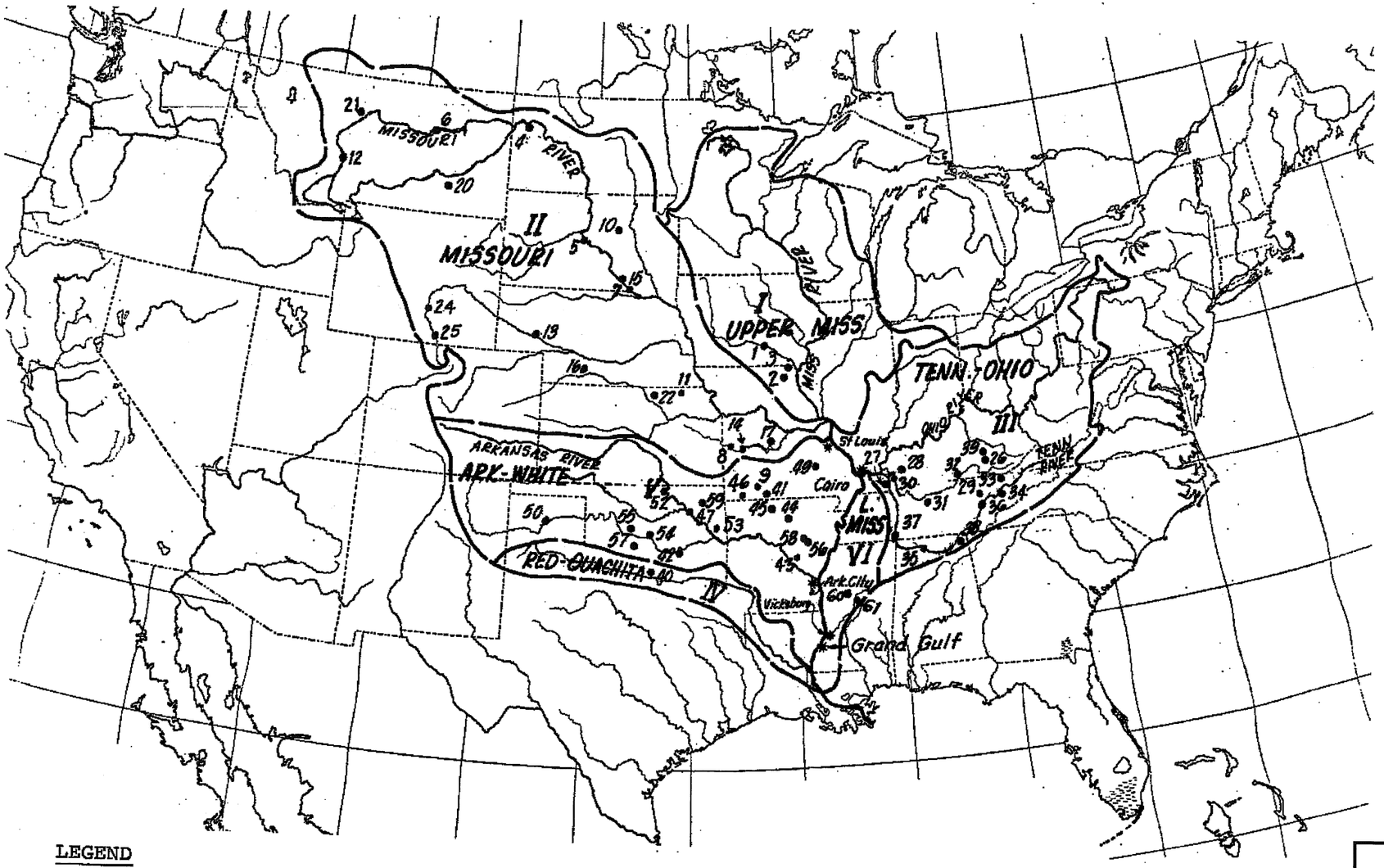
GROUND SURFACE PROFILE OF
MISSISSIPPI RIVER FLOOD PLAIN
(UFSAR FIGURE 2.4-18)

FIGURE 2.4-26 REV. 1



LEGEND

- 20 NUMBERS REFER TO RESERVOIRS LISTED IN TABLE 2.4–15 (UFSAR TABLE 2.4–14)

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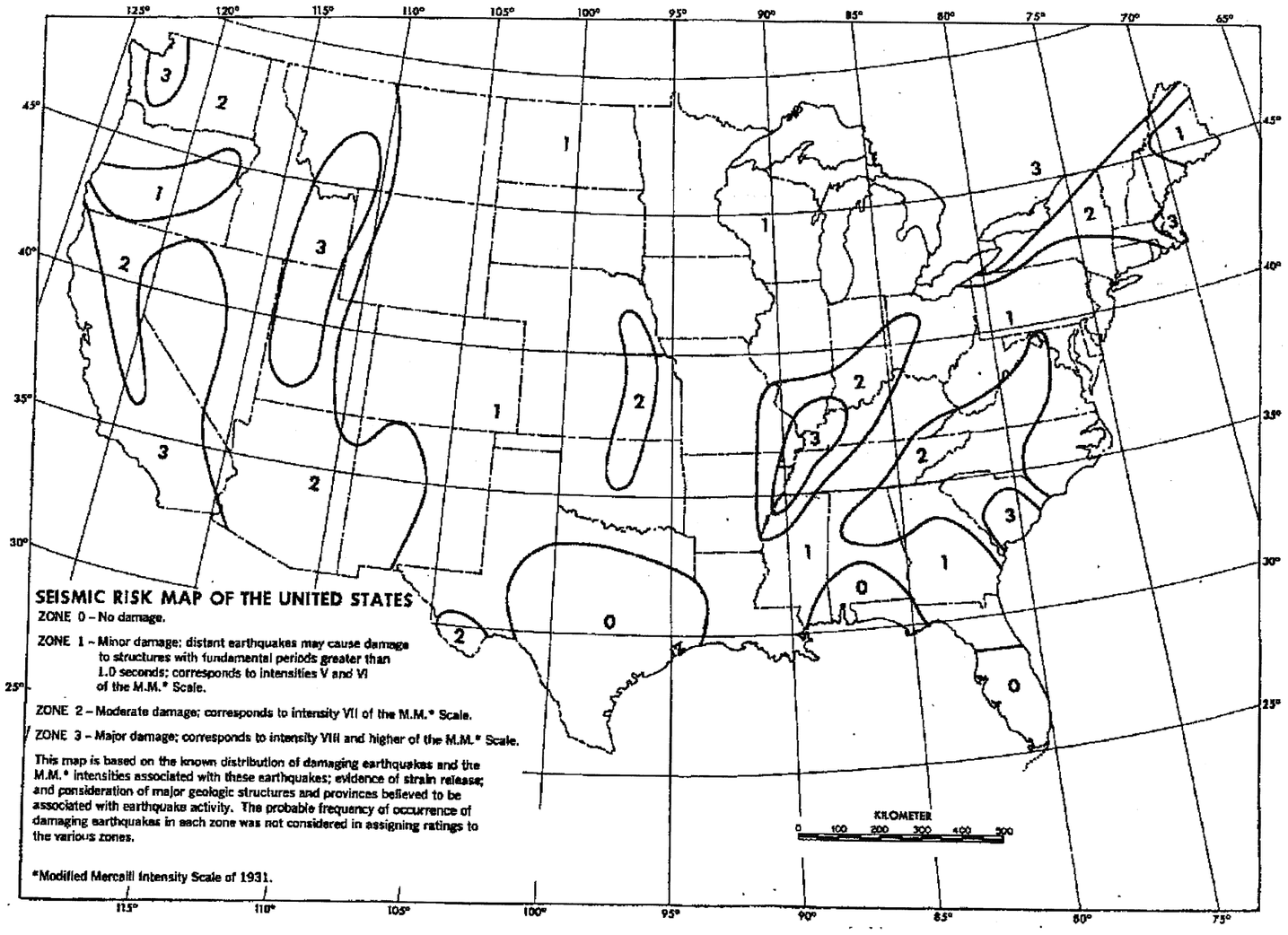
MAJOR RESERVOIRS IN
THE MISSISSIPPI BASIN
(UFSAR FIGURE 2.4-19)

FIGURE 2.4-27 REV. 1



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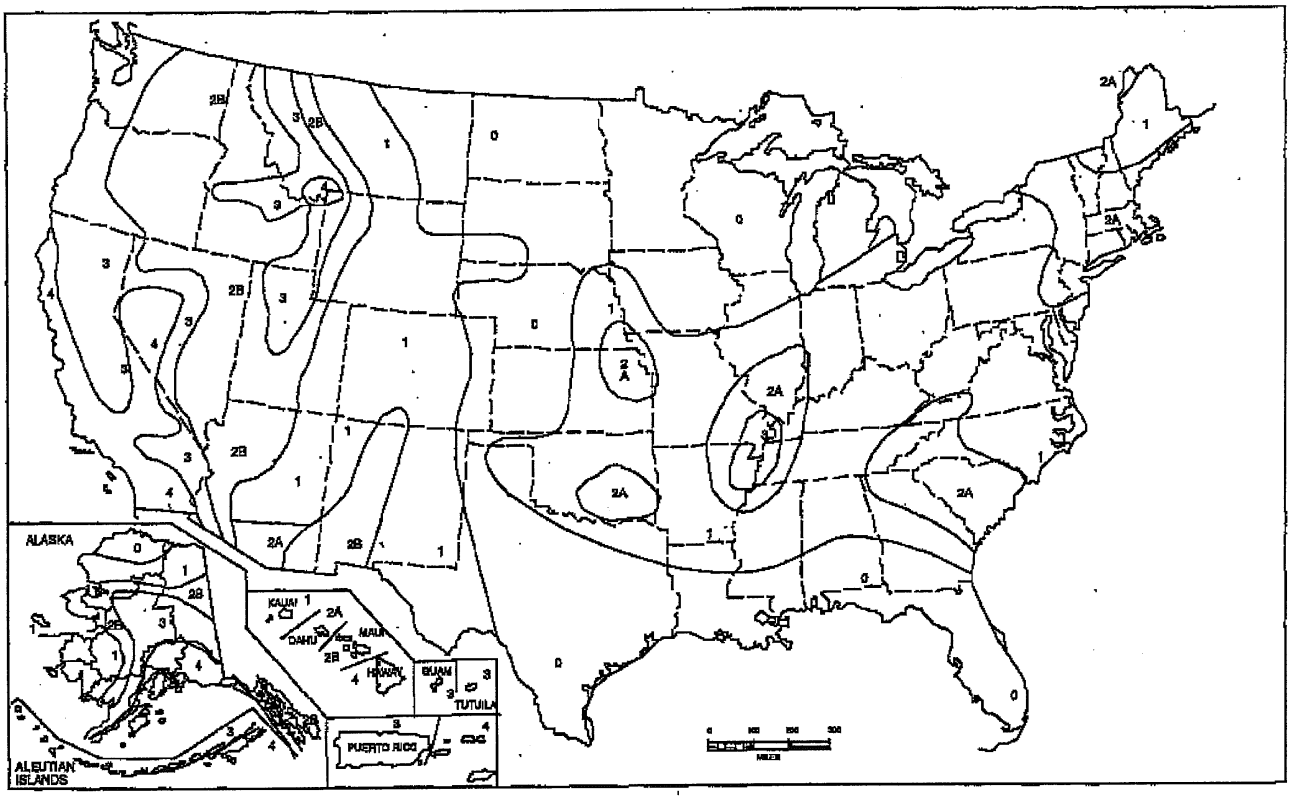
SEISMIC RISK MAP
FOR THE UNITED STATES
(UFSAR FIGURE 2.4-20)

FIGURE 2.4-28 REV. 1



SEISMIC ZONE FACTOR Z

ZONE	1	2A	2B	3	4
Z	0.075	0.15	0.20	0.30	0.40

SOURCE: 1997 UNIFORM BUILDING CODE

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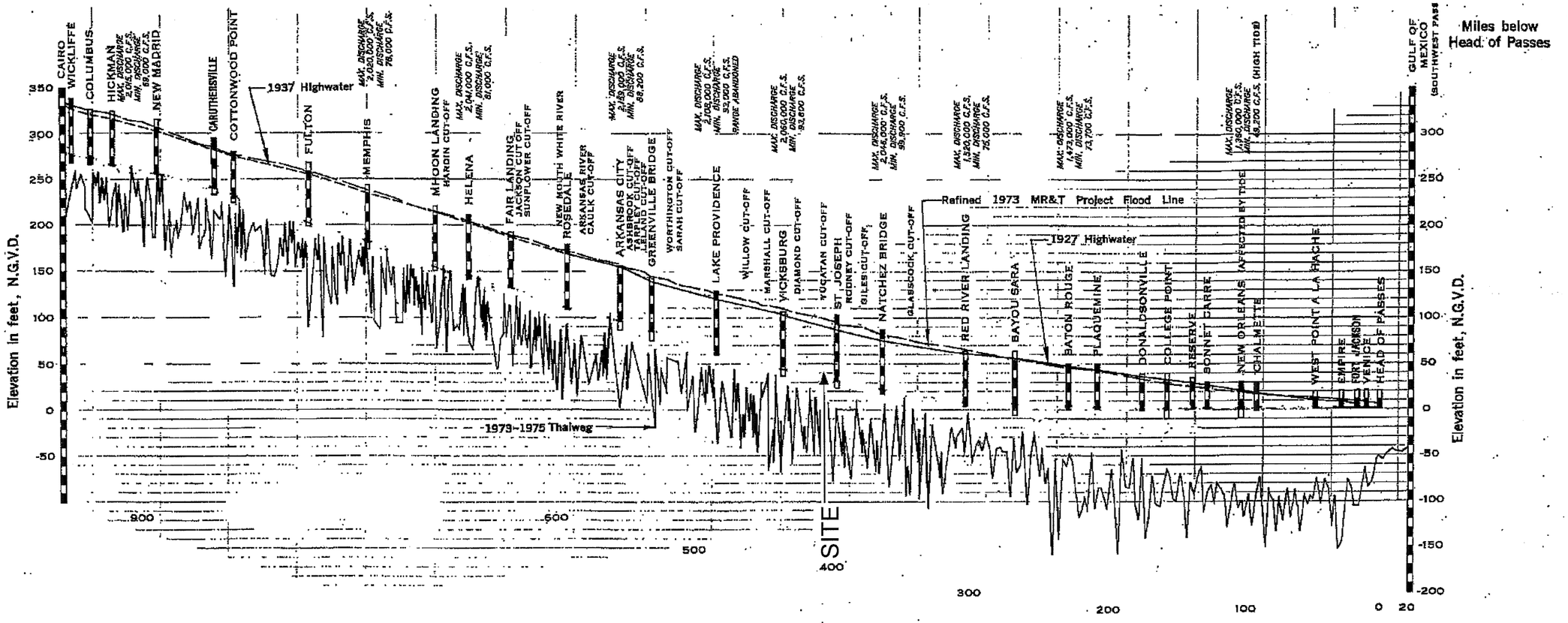
SEISMIC ZONE MAP
OF THE UNITED STATES

FIGURE 2.4-28a REV. 1



Source: Adapted from USACE

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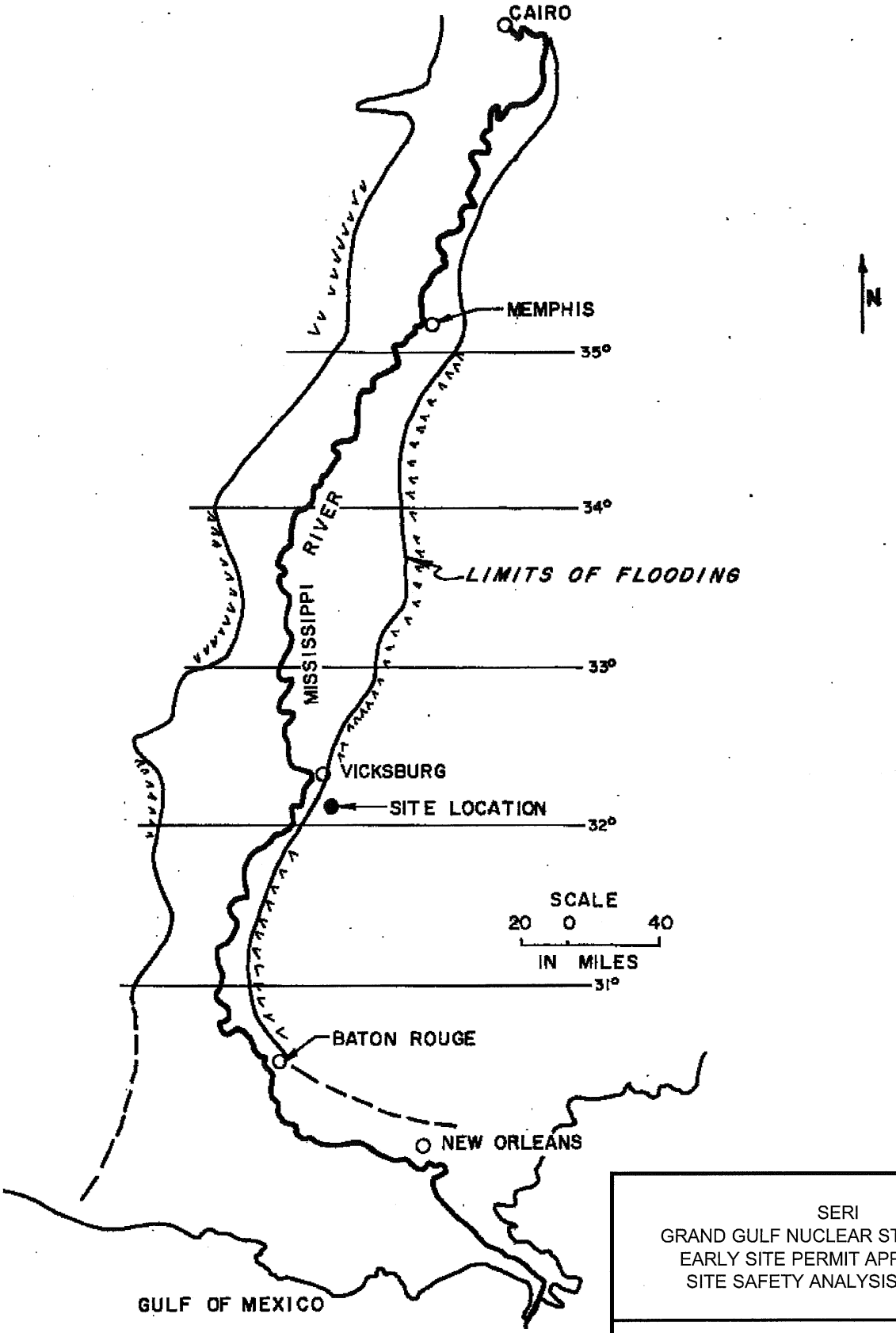
DESIGN PROJECT FLOOD ELEVATIONS FROM CAIRO, ILLINOIS TO HEAD OF PASSES

FIGURE 2.4-29 REV. 1



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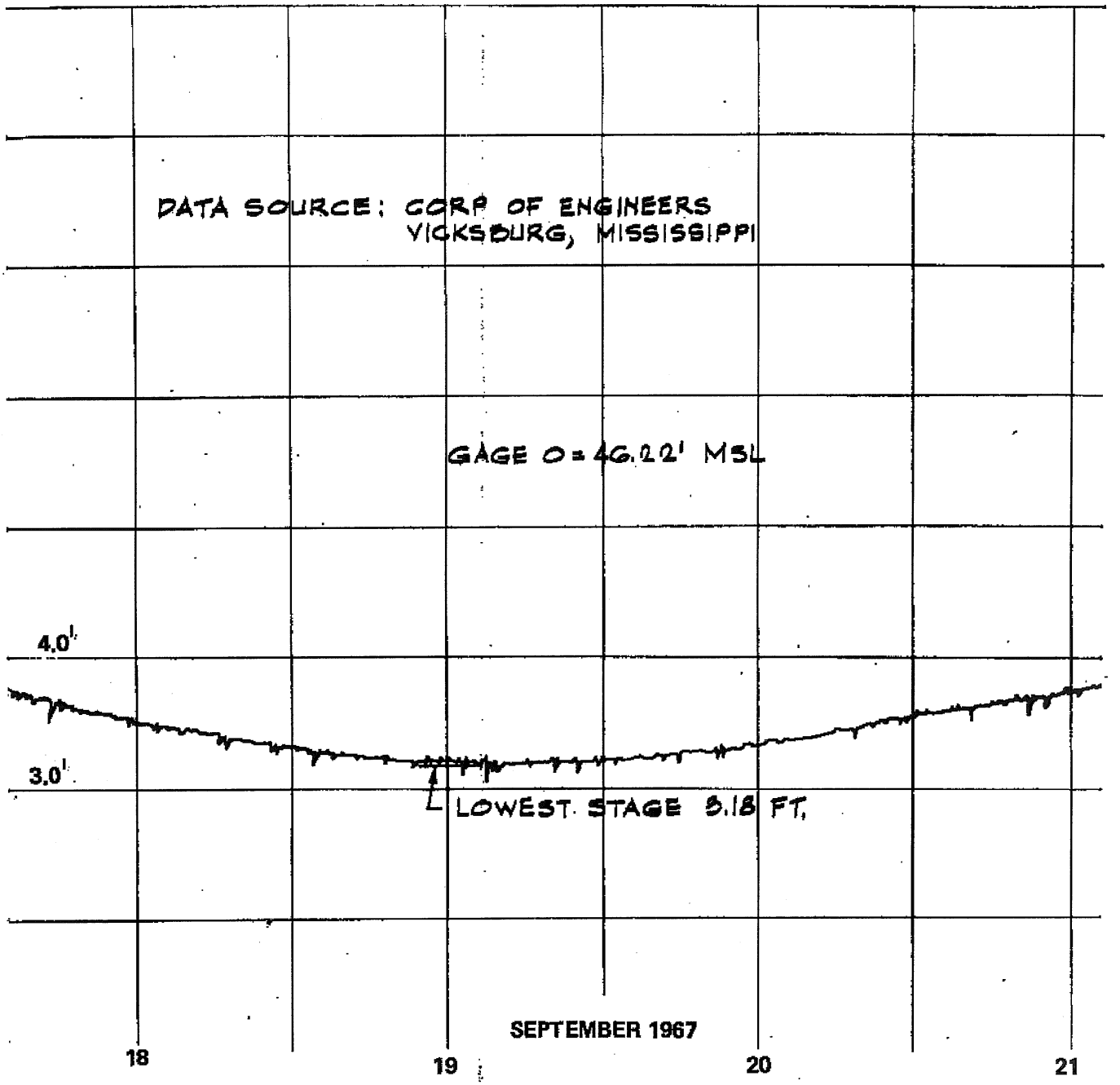
PLAN SHOWING AREAS THAT MAY BE SUBMERGED DUE TO A FLOOD RISING TO EL. 103 MSL AT THE SITE
(UFSAR FIGURE 2.4-22)

FIGURE 2.4-30 REV. 1



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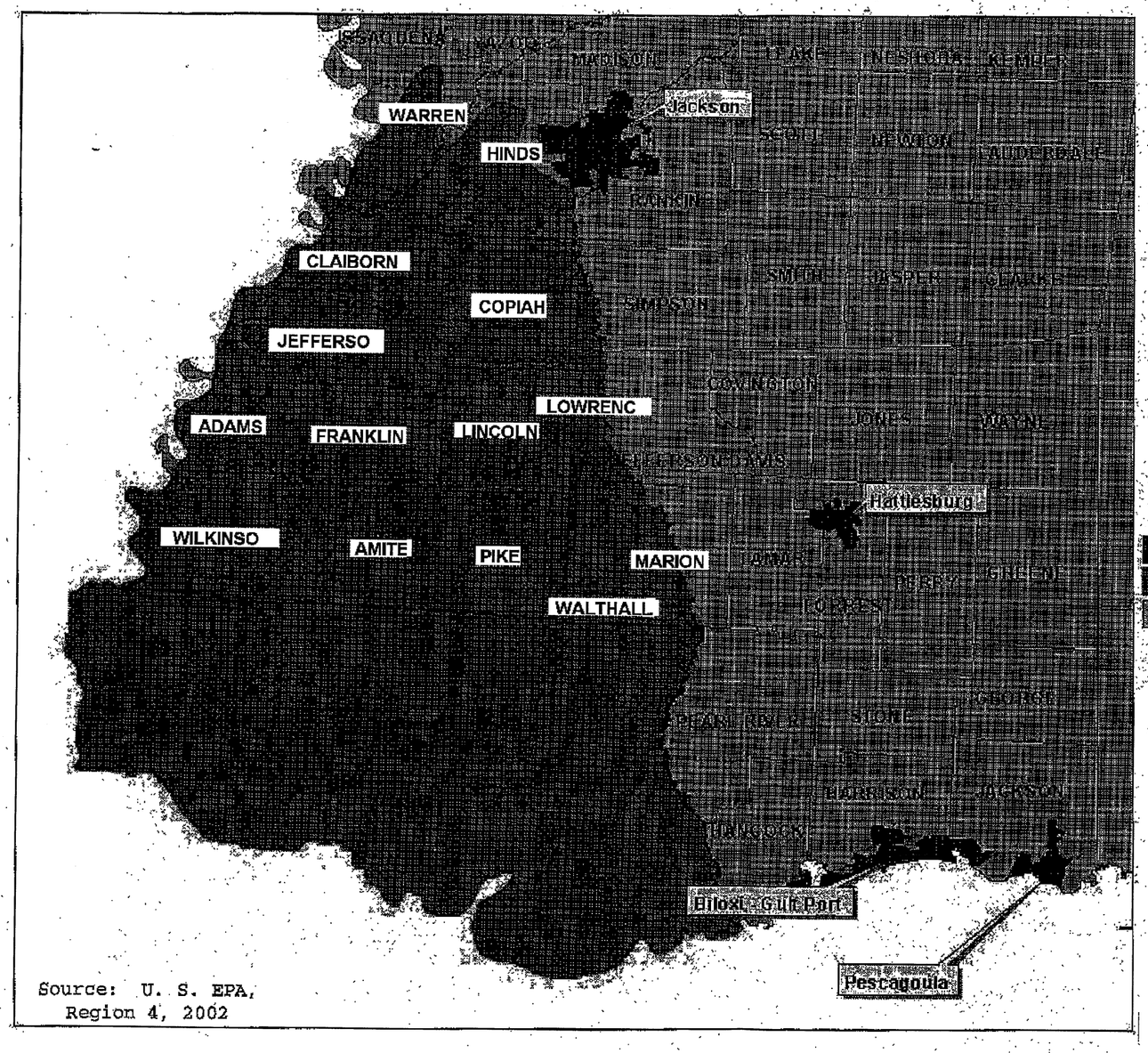
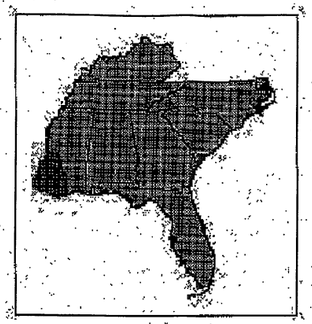
SITE SAFETY ANALYSIS REPORT

INSTANTANEOUS LOW FLOW IN MISSISSIPPI RIVER-TYPICAL GAUGE RECORD AT VICKSBURG, MISS. SEPTEMBER 18, 19, 20 & 21, 1967 (UFSAR FIGURE 2.4-25)

FIGURE 2.4-31 REV. 1





SOUTHERN HILLS REGIONAL AQUIFER SYSTEM

Major Cities
Sole Source Aquifer
Counties

0 0 9 18 Miles

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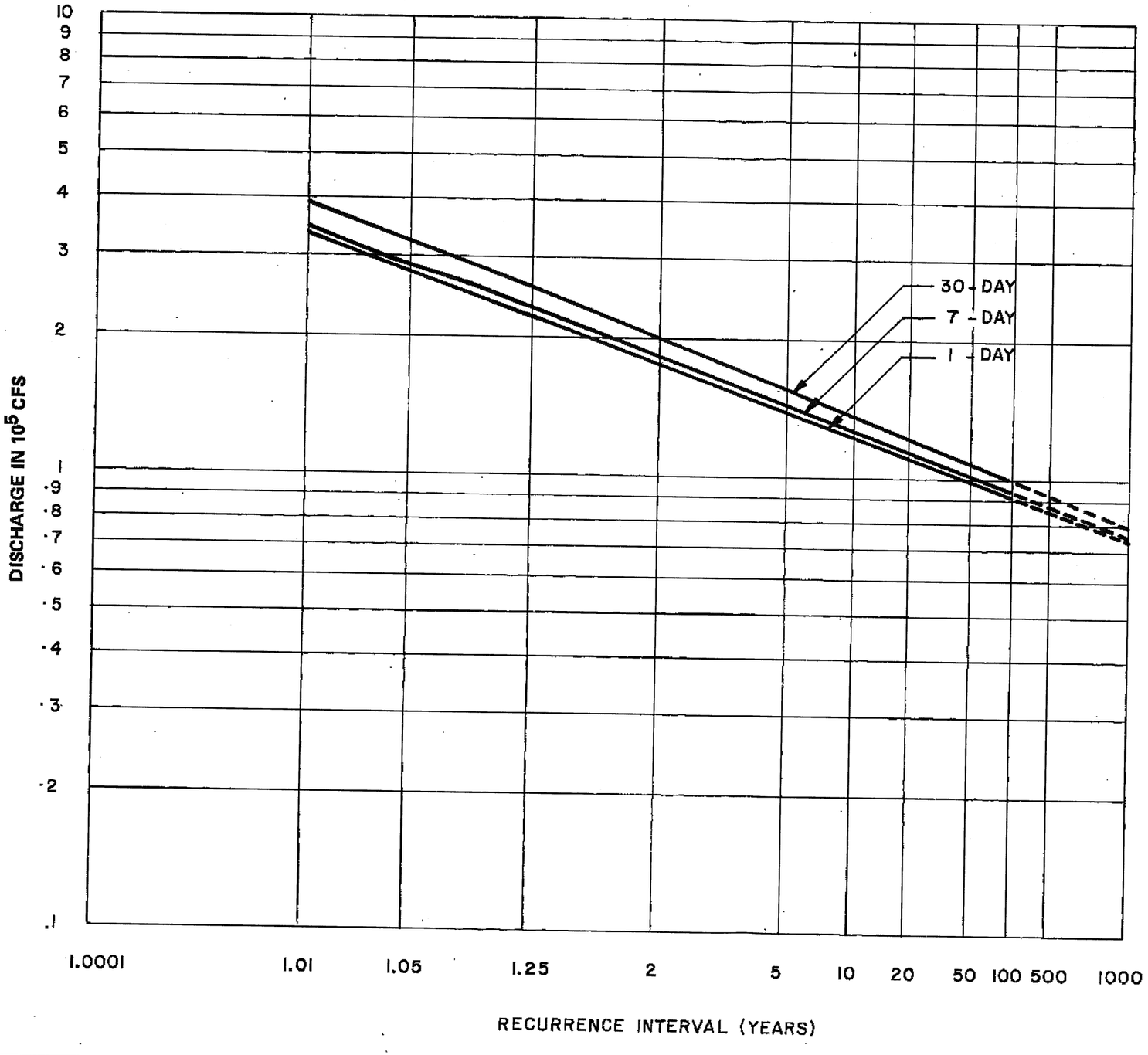
SOLE SOURCE AQUIFER MAP

FIGURE 2.4-31a REV. 1



SOURCE: U.S.G.S.
PERIOD OF RECORD: 1933—79

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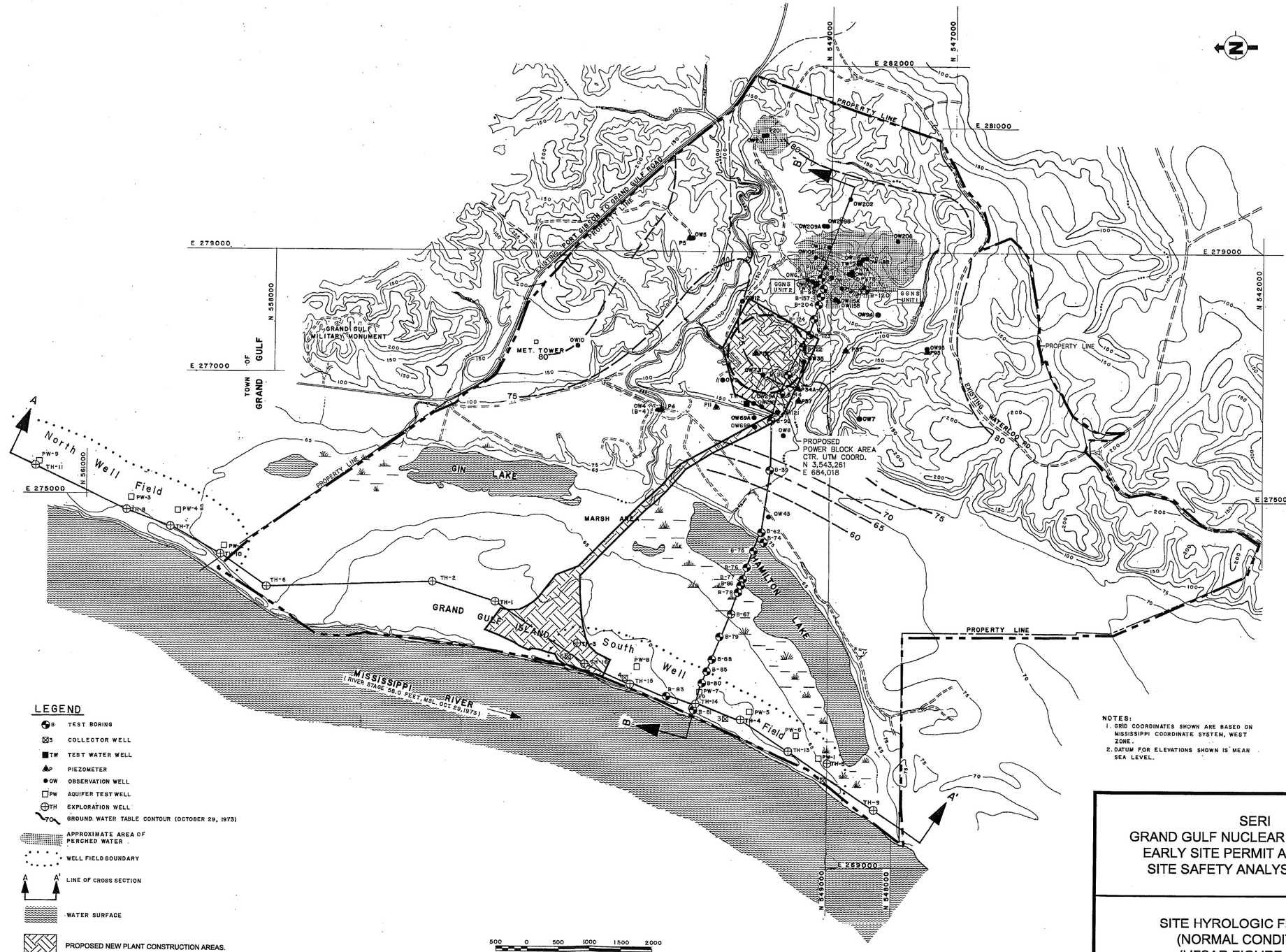
LOW FLOWS IN THE MISSISSIPPI RIVER AT VICKSBURG
(UFSAR FIGURE 2.4-26)

FIGURE 2.4-32 REV. 1



NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL.

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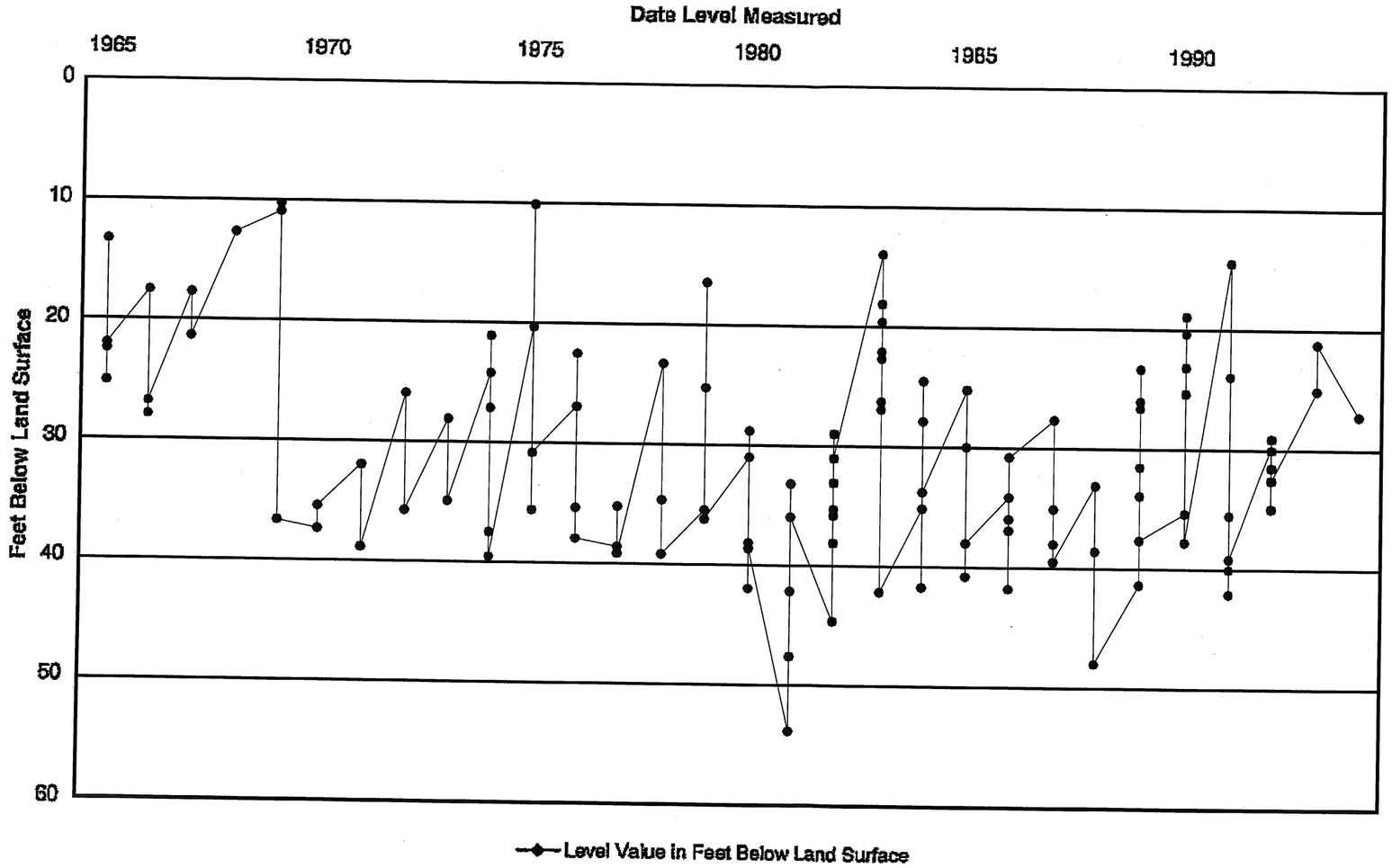
SITE HYROLOGIC FEATURES
(NORMAL CONDITIONS)
(UFSAR FIGURE 2.4-27)

FIGURE 2.4-33 REV. 1

Ground Water Levels Vicksburg Well Completed in the Mississippi River Alluvial Aquifer



SOURCE: USGS

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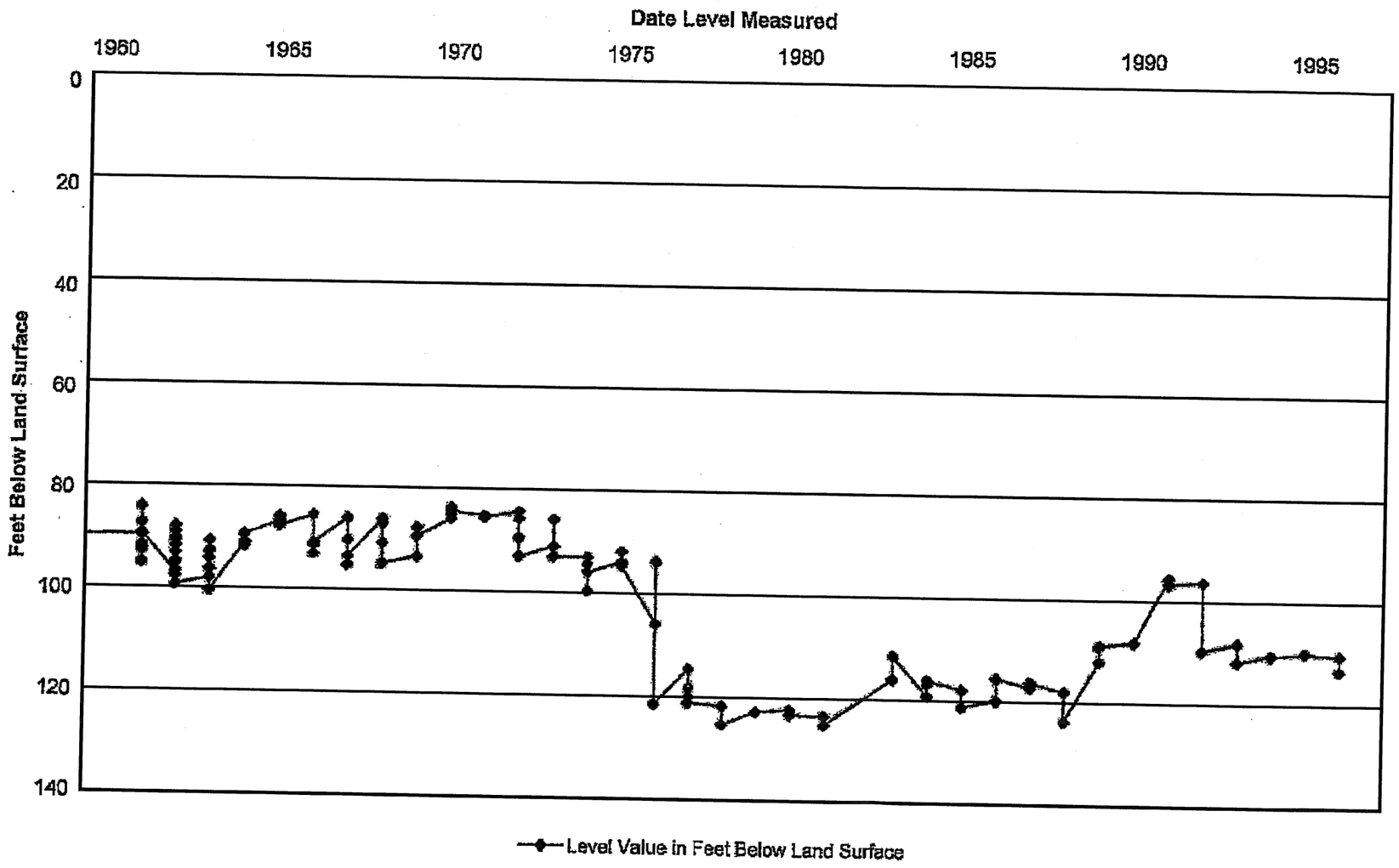
HYDROGRAPH OF A WELL COMPLETED IN THE MS RIVER ALLUVIAL AQUIFER, VICKSBURG, MS

FIGURE 2.4-34 REV. 1

Ground Water Levels - Port Gibson, Well Completed in the Lower Catahoula Formation



SOURCE: USGS

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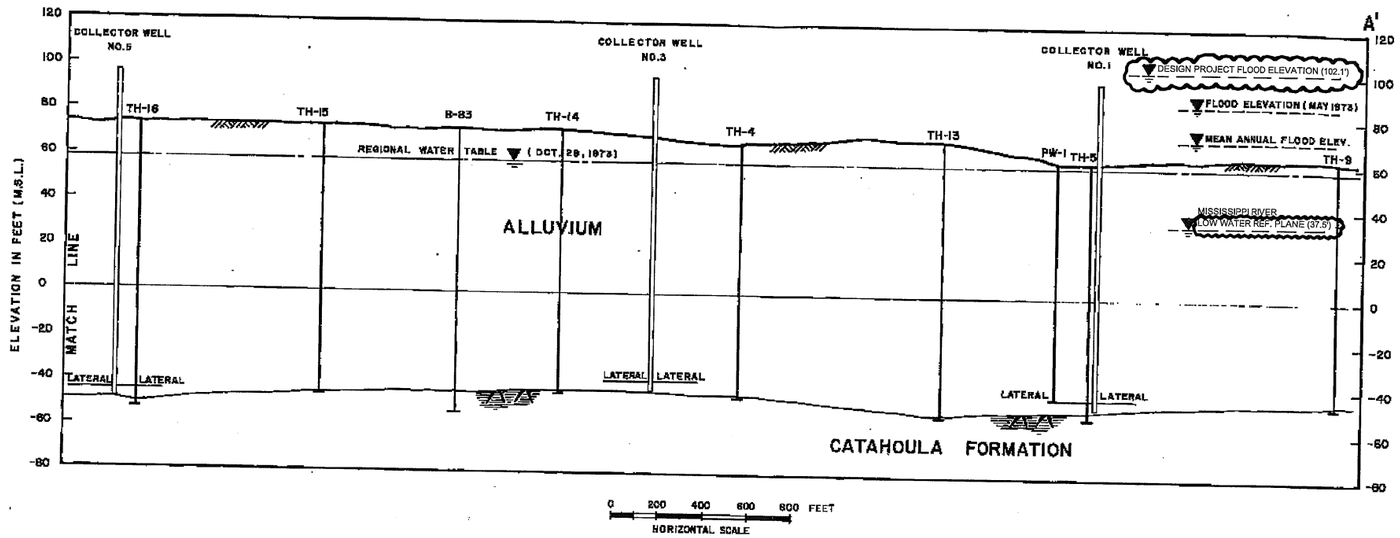
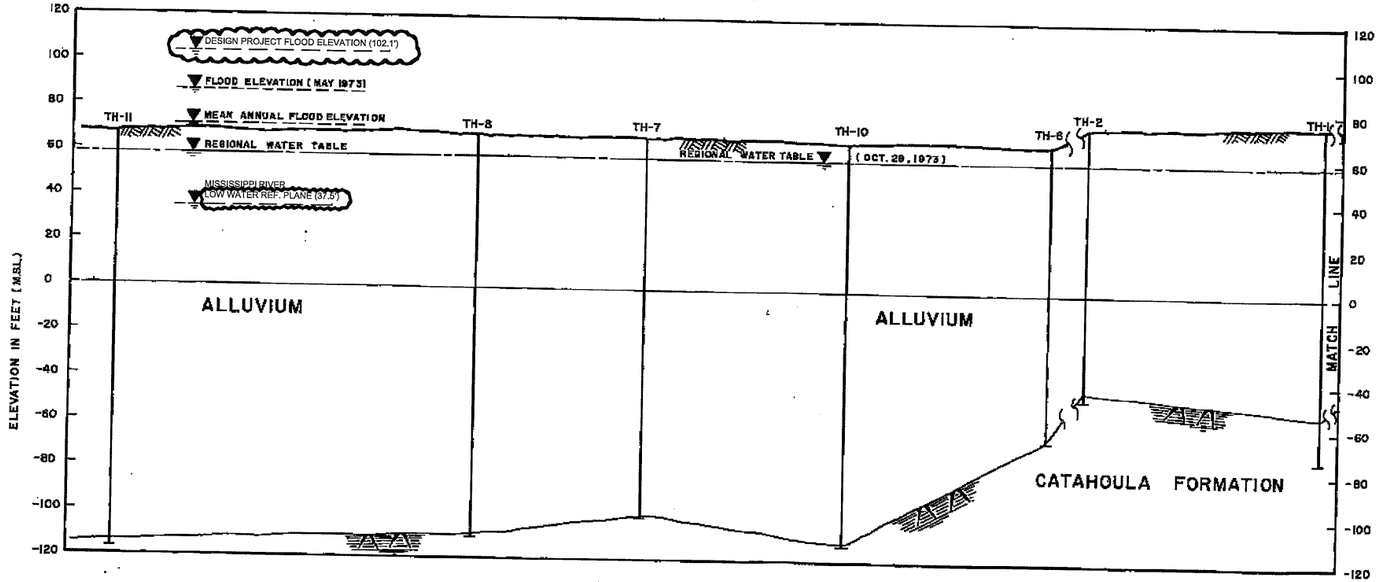
HYDROGRAPH OF A WELL COMPLETED IN THE LOWER CATAHOULA FORMATION, PORT GIBSON, MS

FIGURE 2.4-35 REV. 1





NOTES:
1. SEE REF. 1 AND 8 FOR SOURCE DATA & GGNS UFSAR FIGURE 2.4-28.
2. CLOUDS INDICATE ESP APPLICATION DATA.

SECTION LOCATION IS SHOWN IN (UFSAR FIGURE 2.4-27) FIGURE 2.4-33

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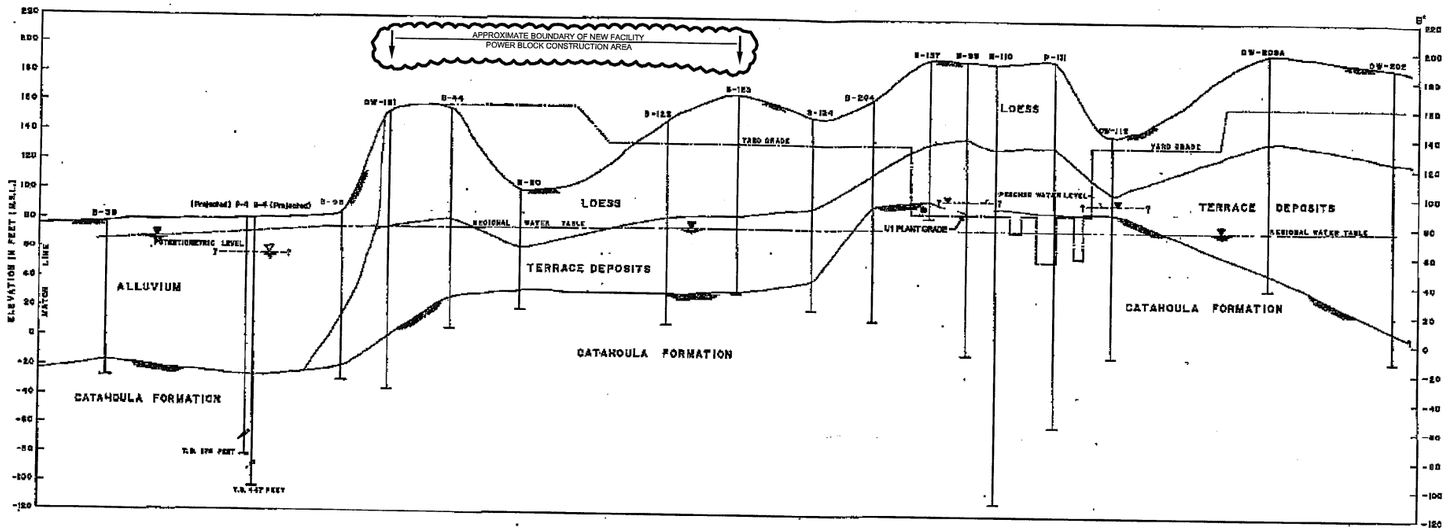
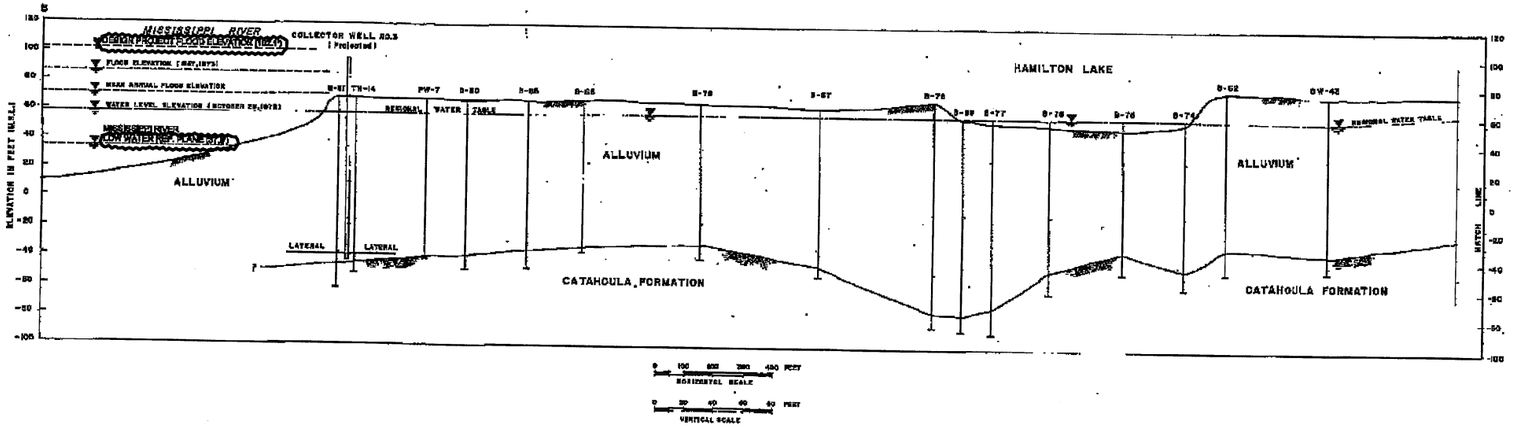
HYDROGEOLOGIC
CROSS SECTION A-A'
(UFSAR FIGURE 2.4-28)

FIGURE 2.4-36 REV. 1





NOTES:
1. SEE REF. 1 AND 8 FOR SOURCE DATA.
2. CLOUDS INDICATE ESP APPLICATION CHANGES.

SECTION LOCATION IS SHOWN IN (UFSAR FIGURE 2.4-27) FIGURE 2.4-33

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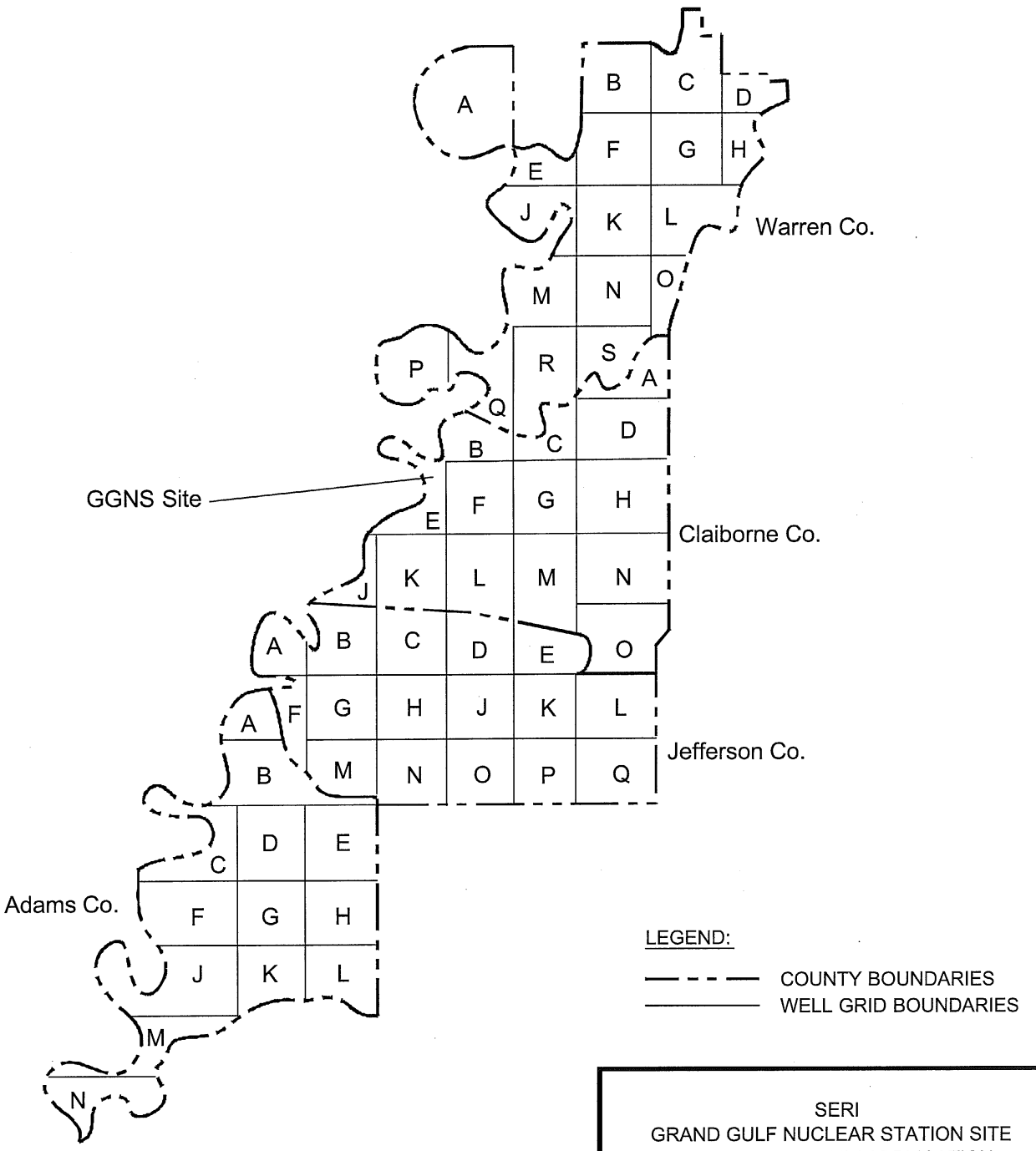
HYDROGEOLOGIC
CROSS SECTION B-B'
(UFSAR FIGURE 2.4-29)

FIGURE 2.4-37 REV. 1



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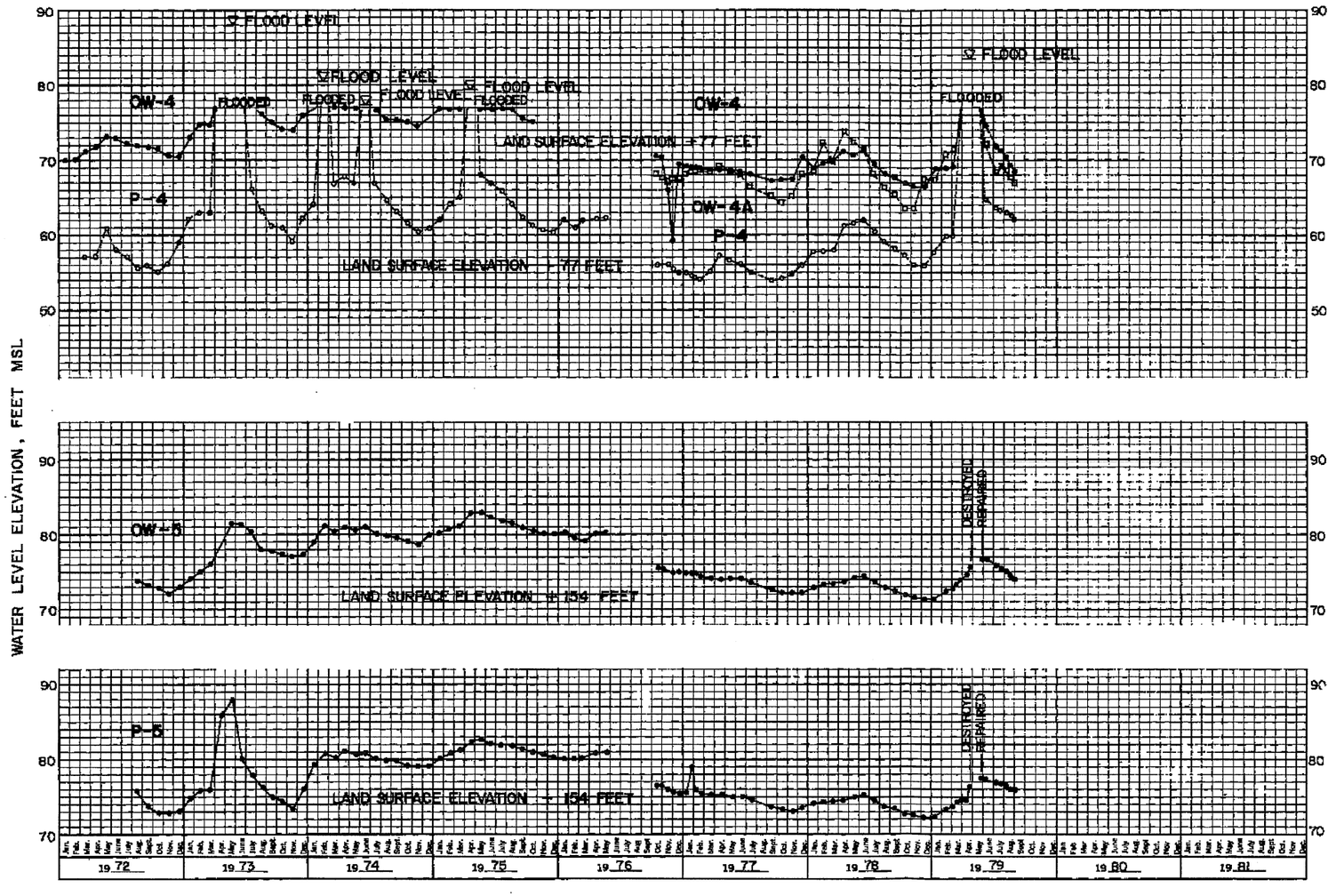
COUNTY WELL LOCATION GRID

Source: Adapted from Mississippi Industrial and Technological Research Commission, Water Research Bulletin 63-1

FIGURE 2.4-38 REV. 1



NOTES:
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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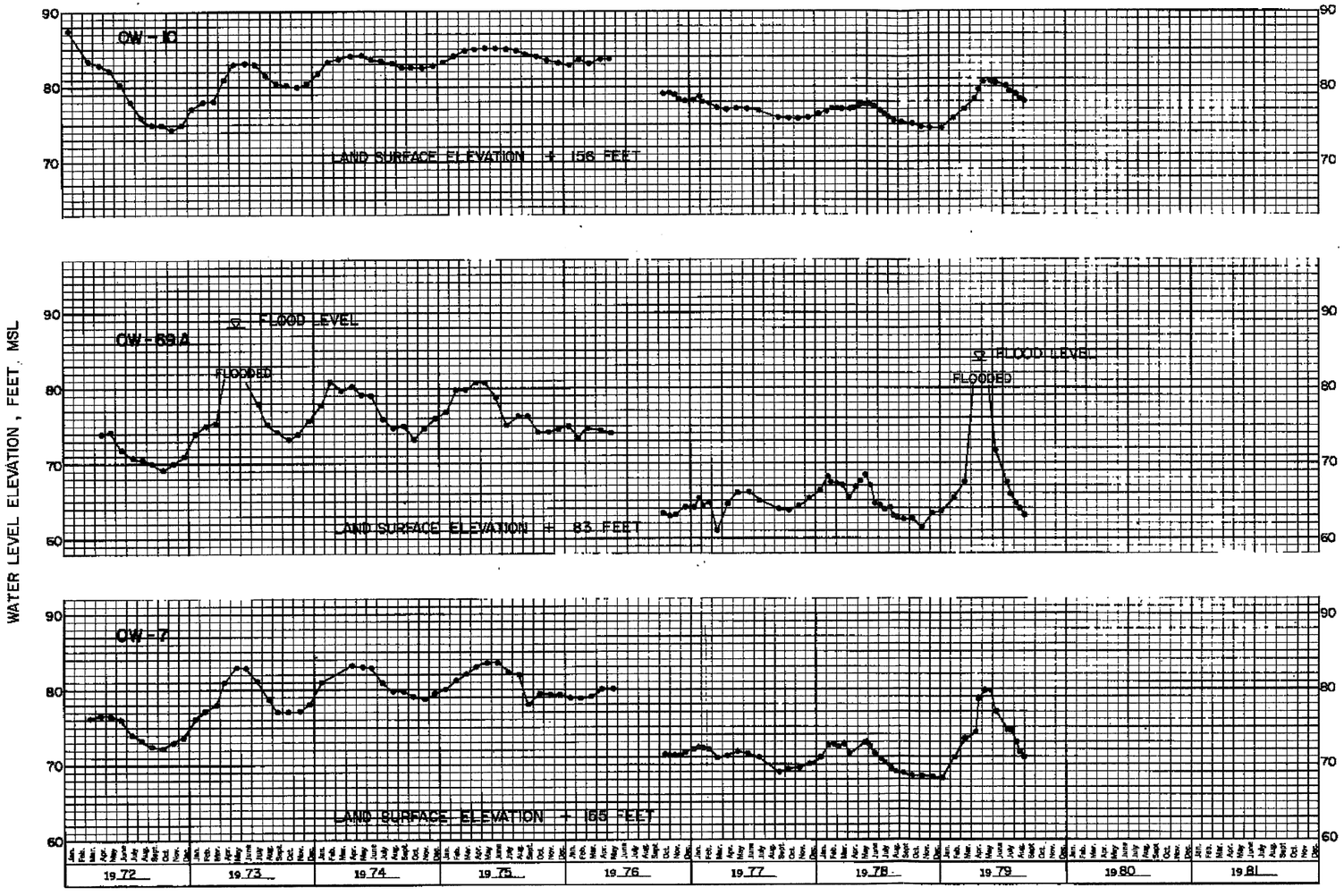
HYDROGRAPHS OF WELLS AND PIEZOMETERS
(UFSAR FIGURE 2.4-32, SH.1)

FIGURE 2.4-39 SHEET 1 OF 5 REV. 1



NOTES:
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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EARLY SITE PERMIT APPLICATION
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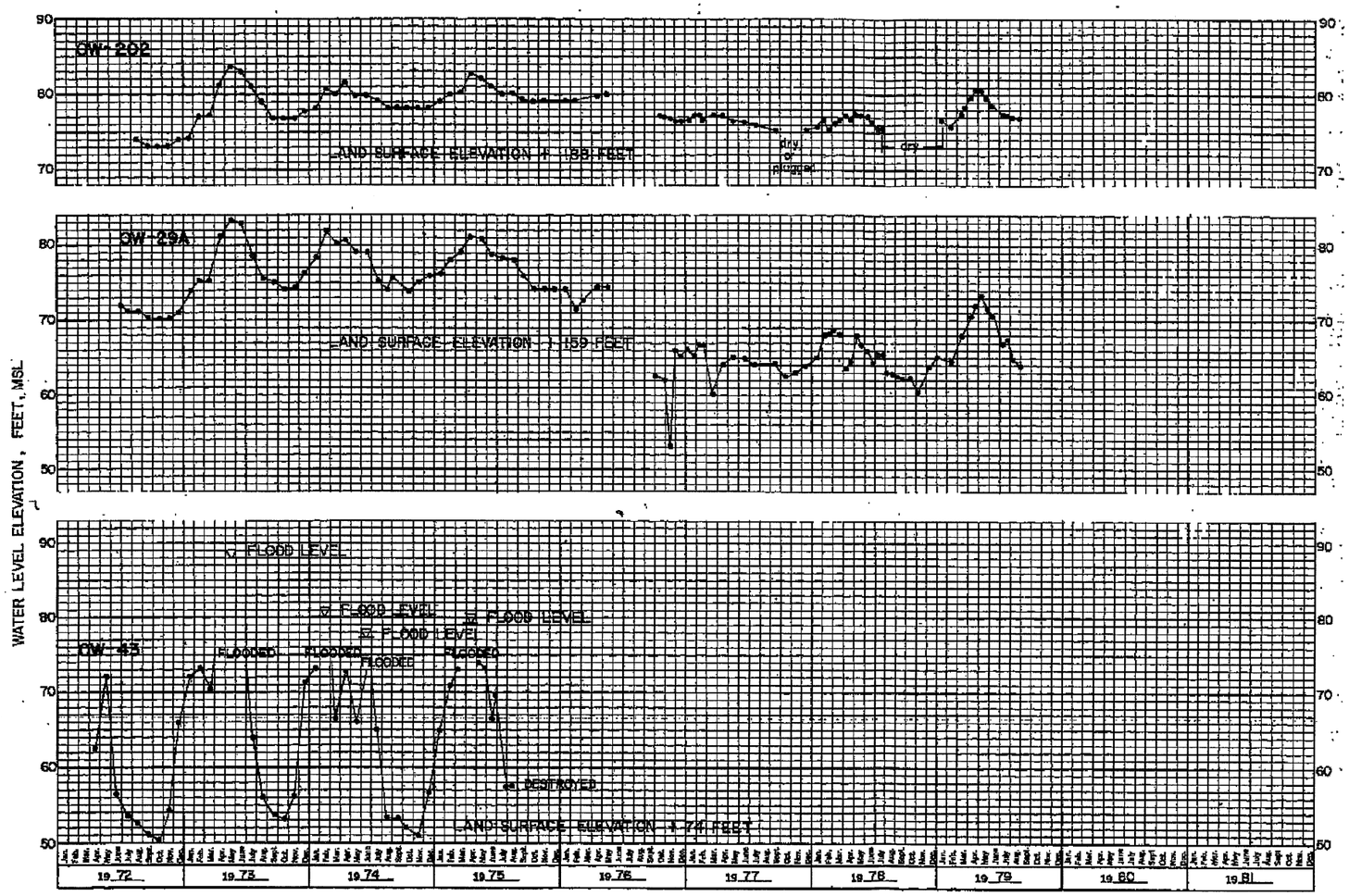
HYDROGRAPHS OF WELLS AND PIEZOMETERS
(UFSAR FIGURE 2.4-32. SH.2)

FIGURE 2.4-39 SHEET 2 OF 5 REV. 1



NOTES:
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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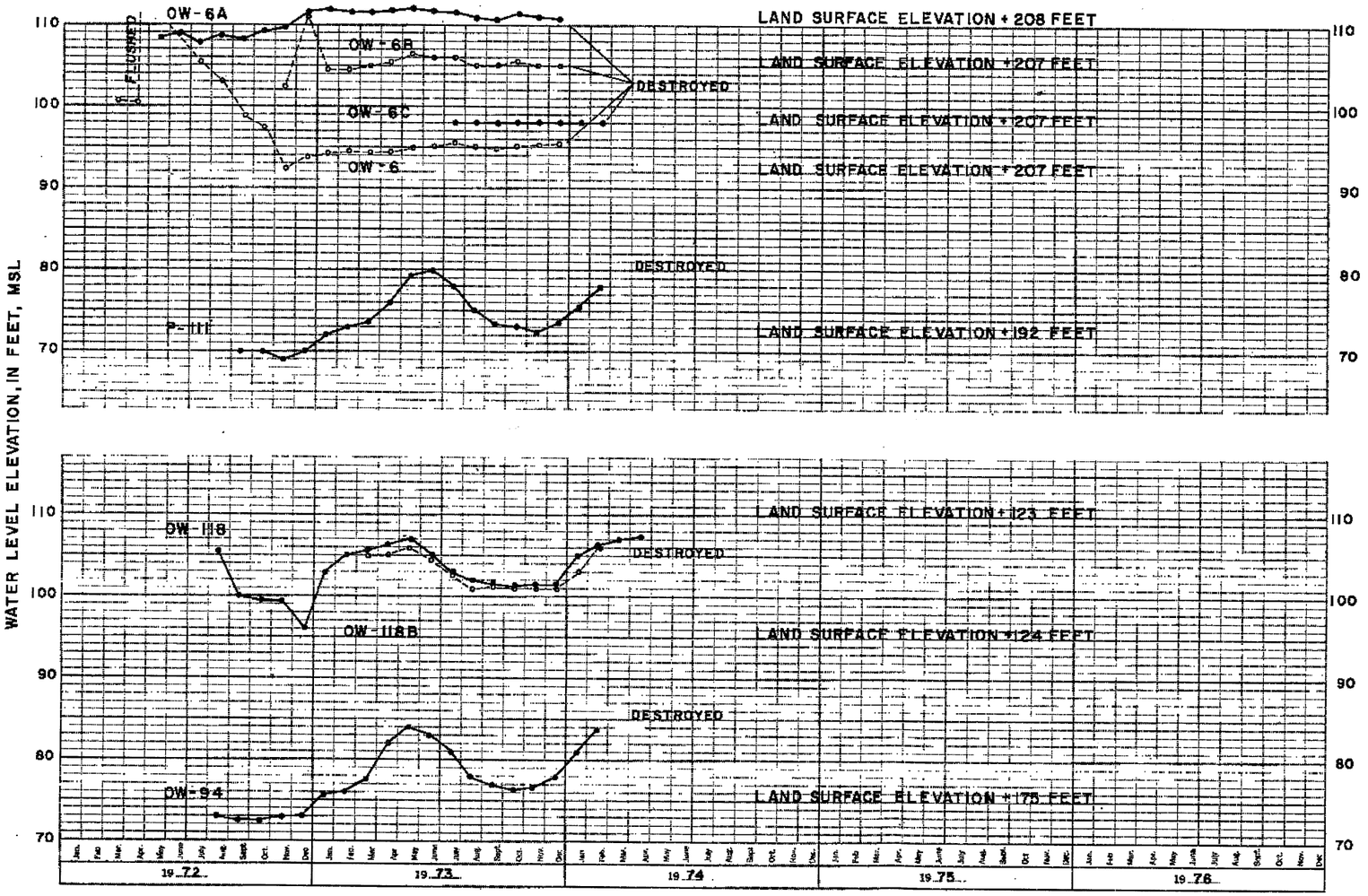
HYDROGRAPHS OF REPLACEMENT PIEZOMETERS
(UFSAR FIGURE 2.4-32, SH.3)

FIGURE 2.4-39 SHEET 3 OF 5 REV. 1



NOTES:
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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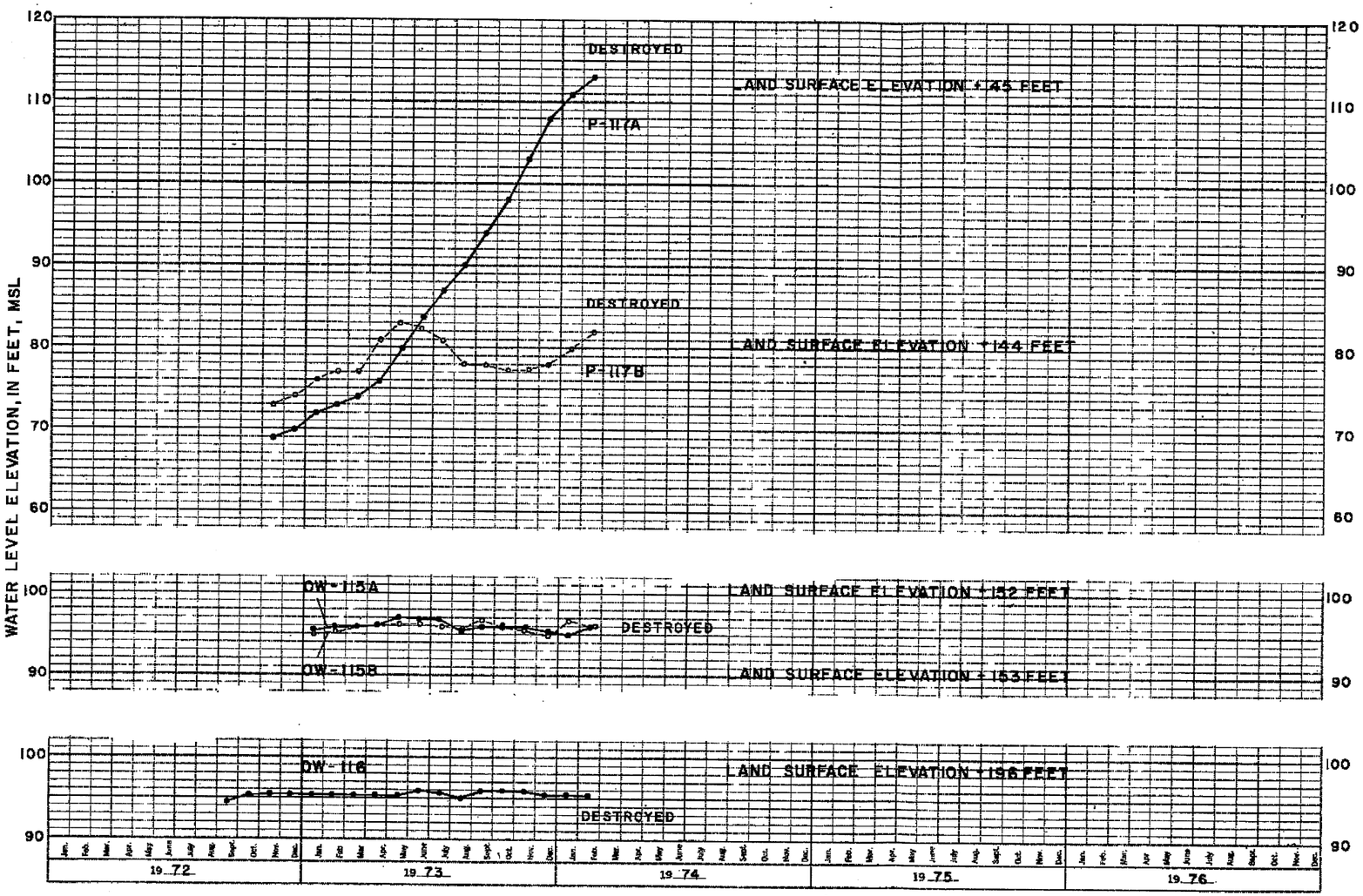
HYDROGRAPHS OF WELLS AND PIEZOMETERS
(UFSAR FIGURE 2.4-32, SH.4)

FIGURE 2.4-39 SHEET 4 OF 5 REV. 1



NOTES:
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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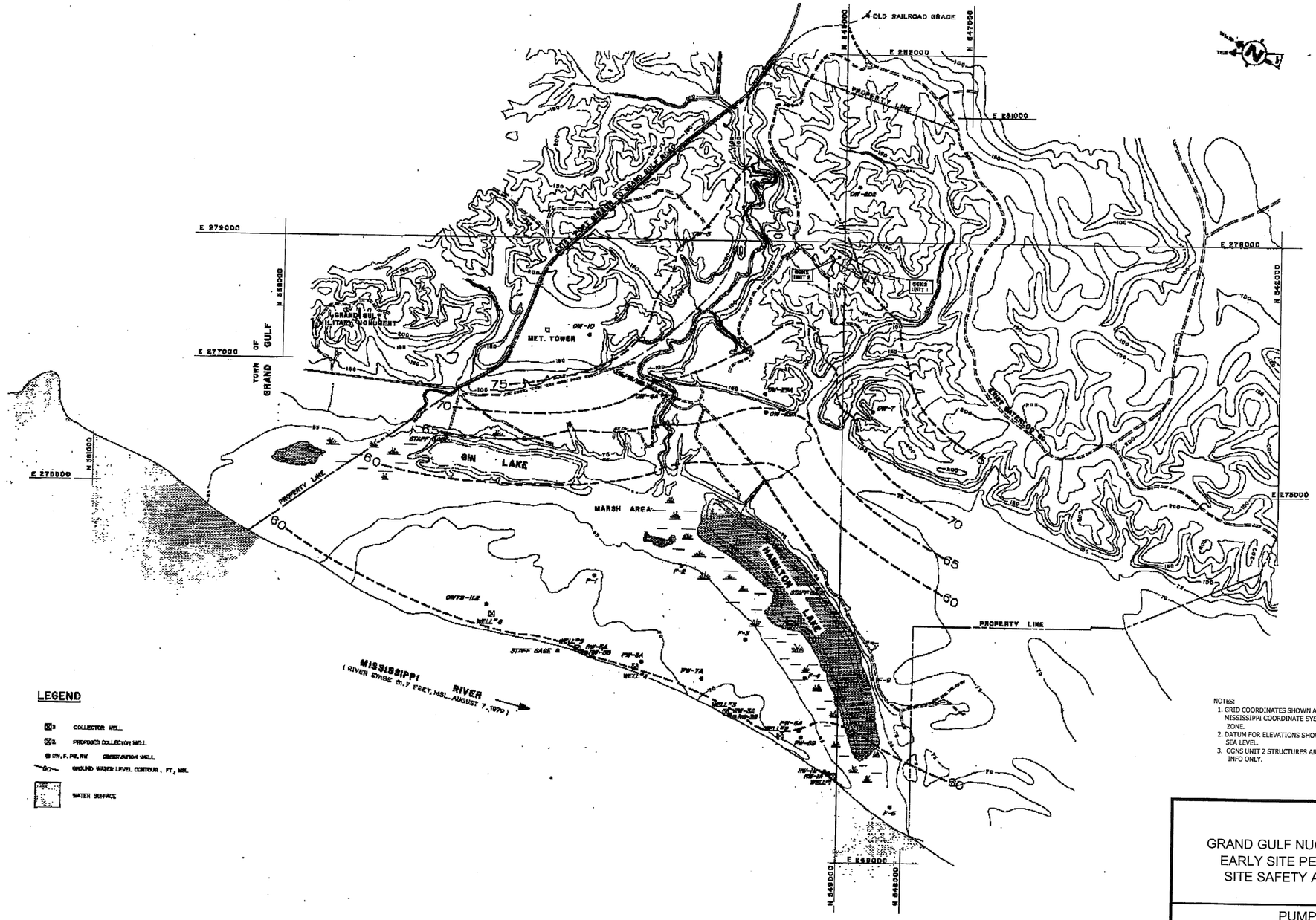
HYDROGRAPHS OF WELLS AND PIEZOMETERS
(UFSAR FIGURE 2.4-32, SH.5)

FIGURE 2.4-39 SHEET 5 OF 5 REV. 1



LEGEND

- COLLECTOR WELL
- PROPOSED COLLECTOR WELL
- OW, P, PZ, RW OBSERVATION WELL
- GROUND WATER LEVEL CONTOUR, FT, MSL
- WATER SURFACE

NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL.
3. GGNS UNIT 2 STRUCTURES ARE SHOWN FOR INFO ONLY.

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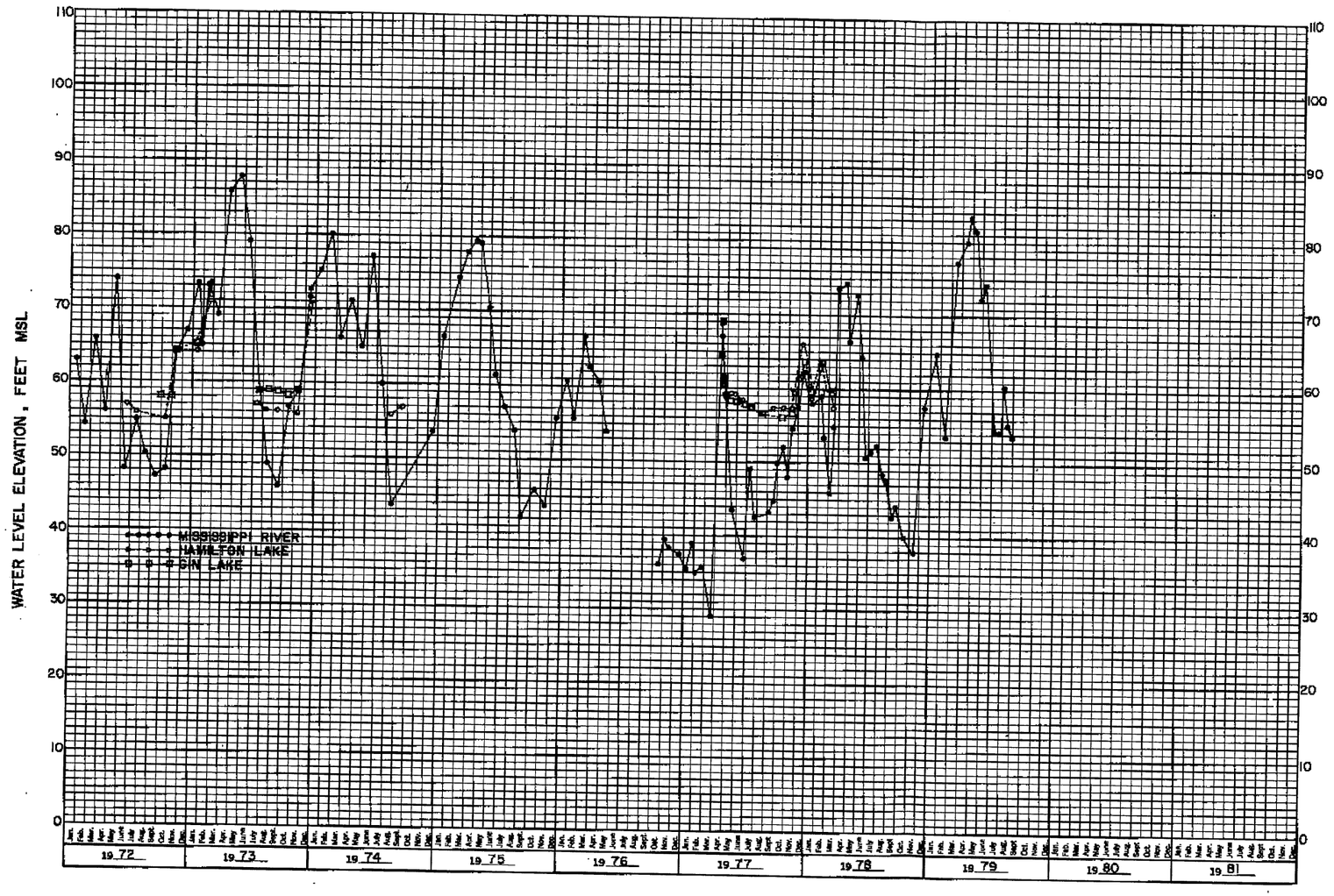
PUMPOUT TEST
GROUND WATER LEVEL CONTOURS
(PREPUMPING STATIC LEVELS)
AUGUST 7, 1979
(UFSAR FIGURE 2.4-38)

FIGURE 2.4-40 REV. 1



NOTES:

1. LOCATIONS OF MISSISSIPPI RIVER, HAMILTON & GIN LAKES ARE SHOWN IN FIGURE 2.4-33 (UFSAR FIGURE 2.4-27).

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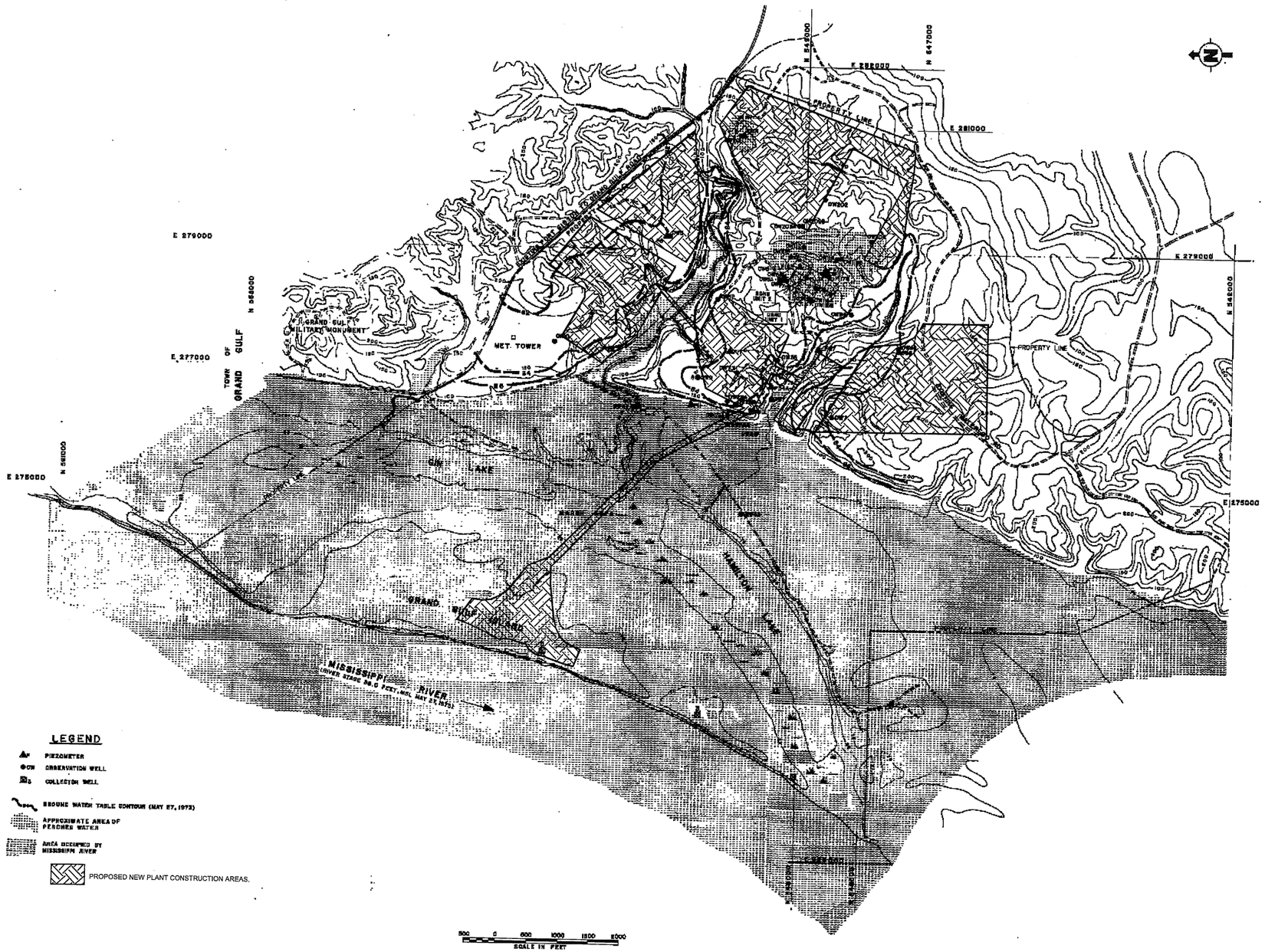
HYDROGRAPHS OF MISSISSIPPI RIVER, GIN LAKE, AND HAMILTON LAKE (UFSAR FIGURE 2.4-33)

FIGURE 2.4-41 REV. 1



NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL.
3. GGNS UNIT 2 STRUCTURES ARE SHOWN FOR INFO ONLY.

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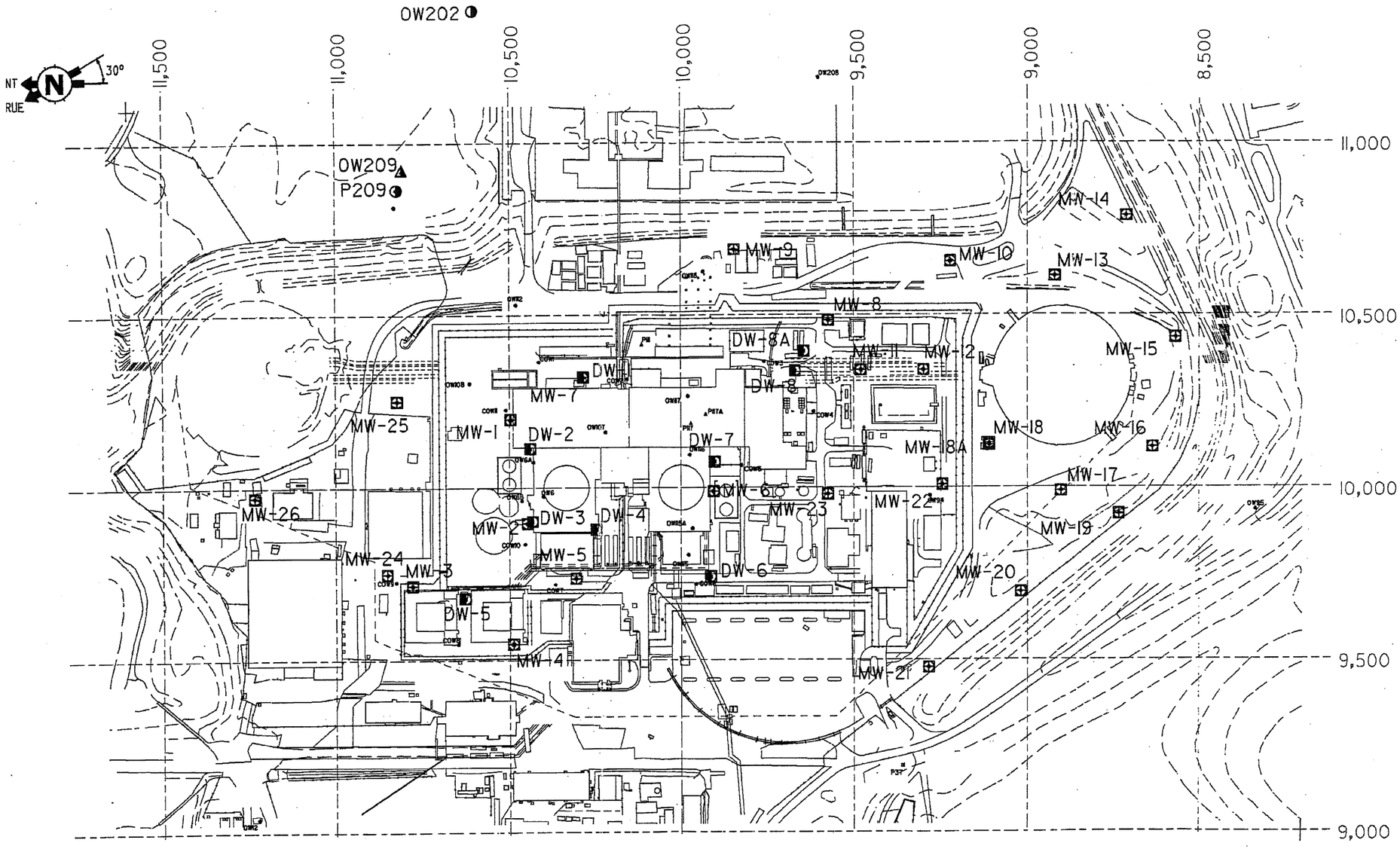
SITE HYDROLOGIC FEATURES
FLOOD CONDITIONS MAY 1973
(UFSAR FIGURE 2.4-34)

FIGURE 2.4-42 REV. 1



LEGEND

- HISTORICAL MONITORING WELL - CATAHOULA FORMATION
- HISTORICAL MONITORING WELL - TERRACE DEPOSITS
- MONITORING WELL
- DEWATERING WELL
- ----- TIE-BACK WALL PROJECTION

0 100 200 300
SCALE IN FEET

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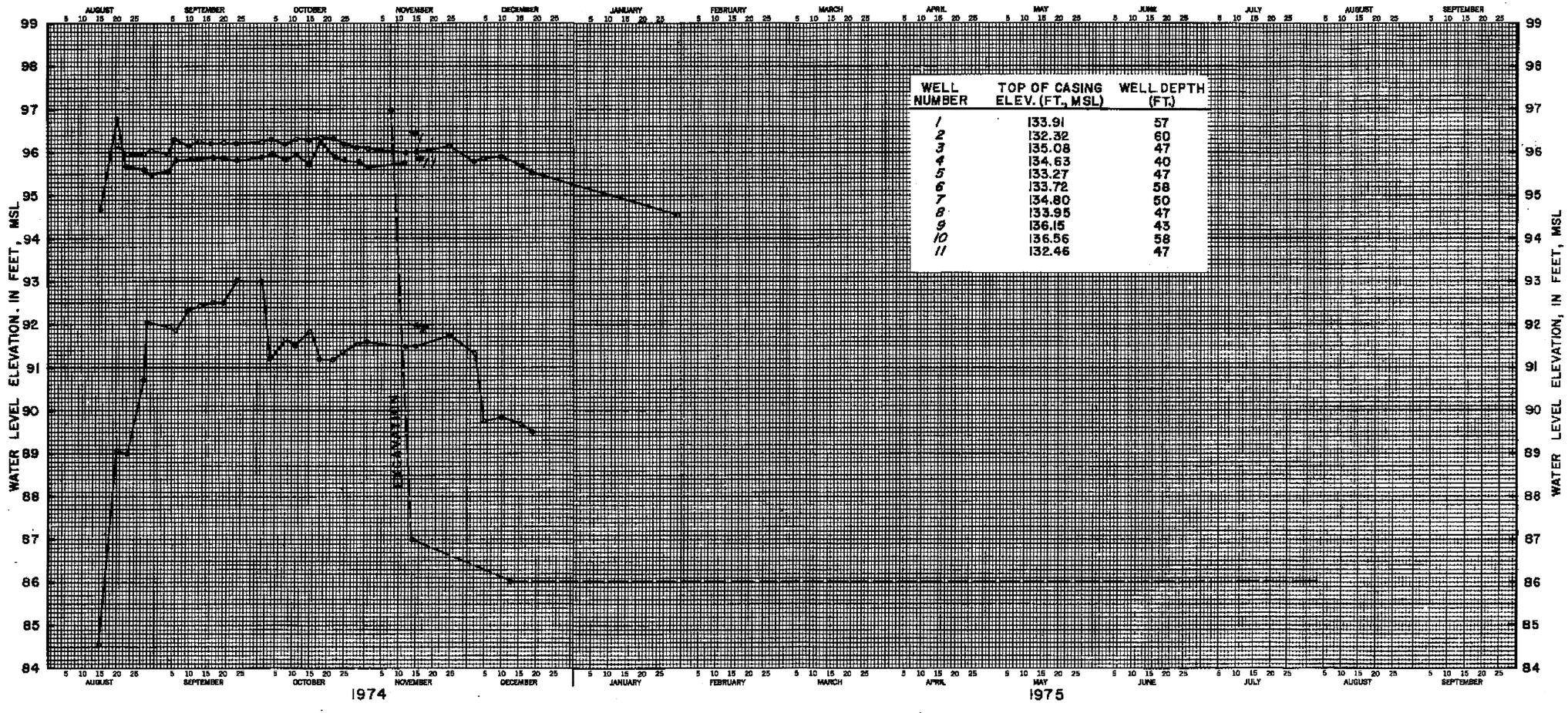
GGNS UNIT 1 PLANT SITE
WELL PLAN
(UFSAR FIGURE 2.4-35c)

FIGURE 2.4-43 REV. 1



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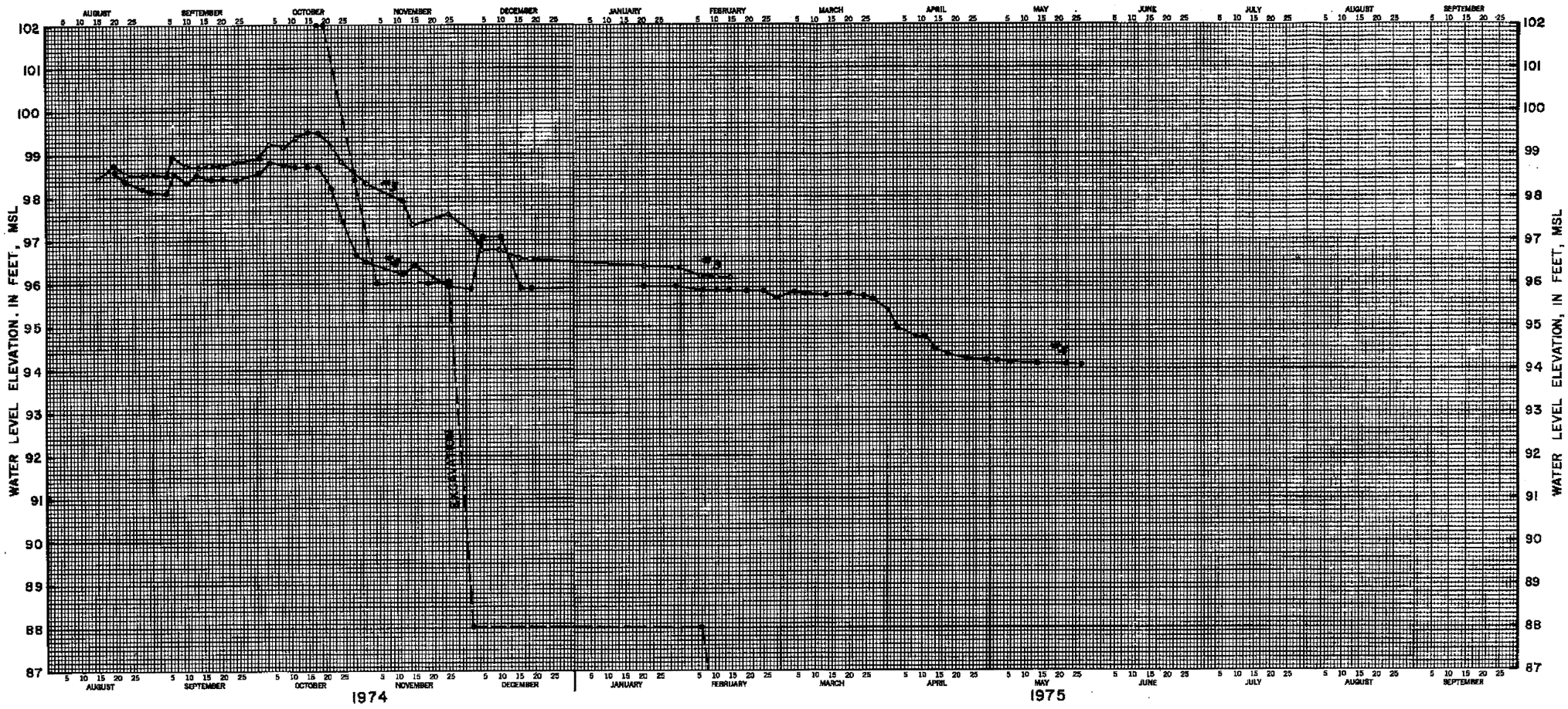
HYDROGRAPHS OF
CONSTRUCTION OBSERVATION WELLS
(UFSAR FIGURE 2.4-36, SH.1)

FIGURE 2.4-44 SHEET 1 OF 5 REV. 1



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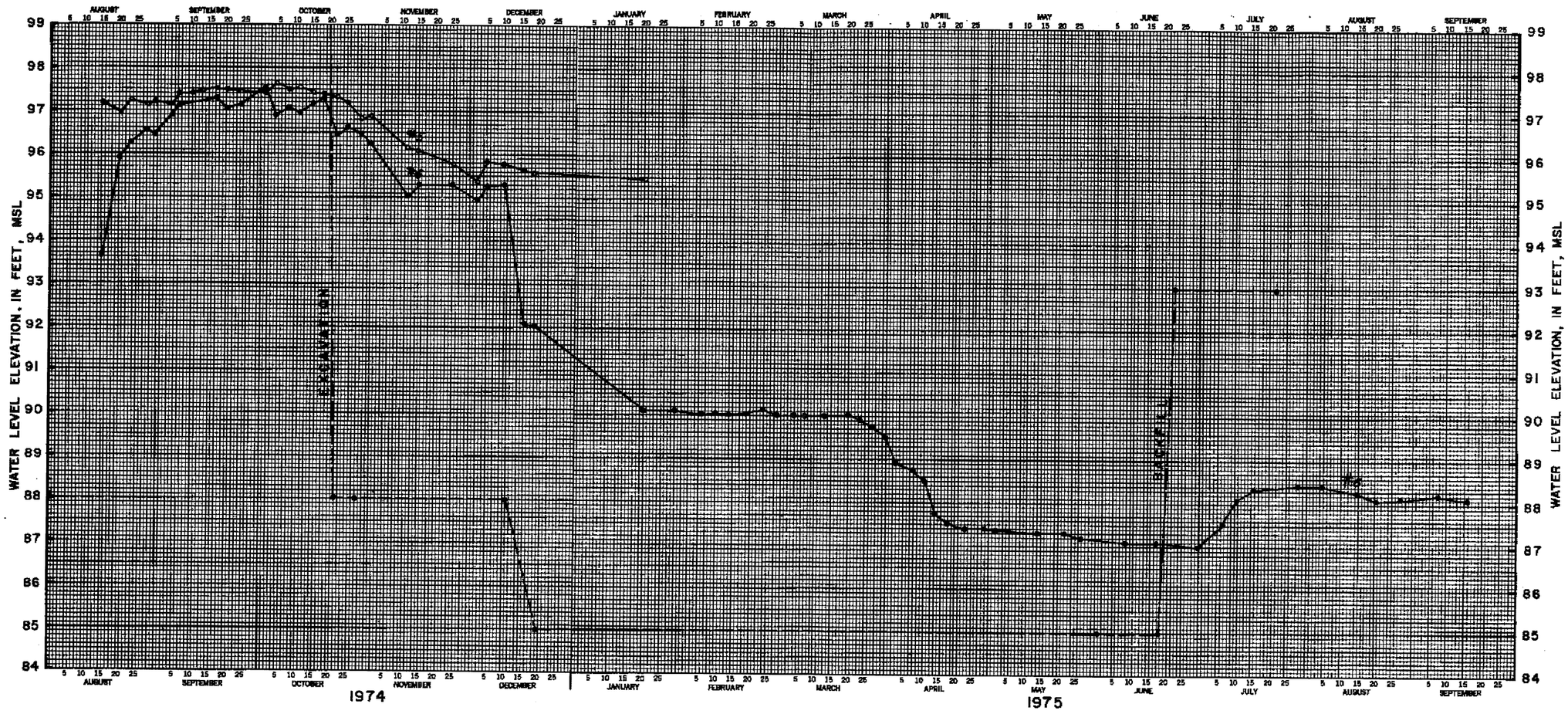
HYDROGRAPHS OF
CONSTRUCTION OBSERVATION WELLS
(UFSAR FIGURE 2.4-36, SH.2)

FIGURE 2.4-44 SHEET 2 OF 5 REV. 1



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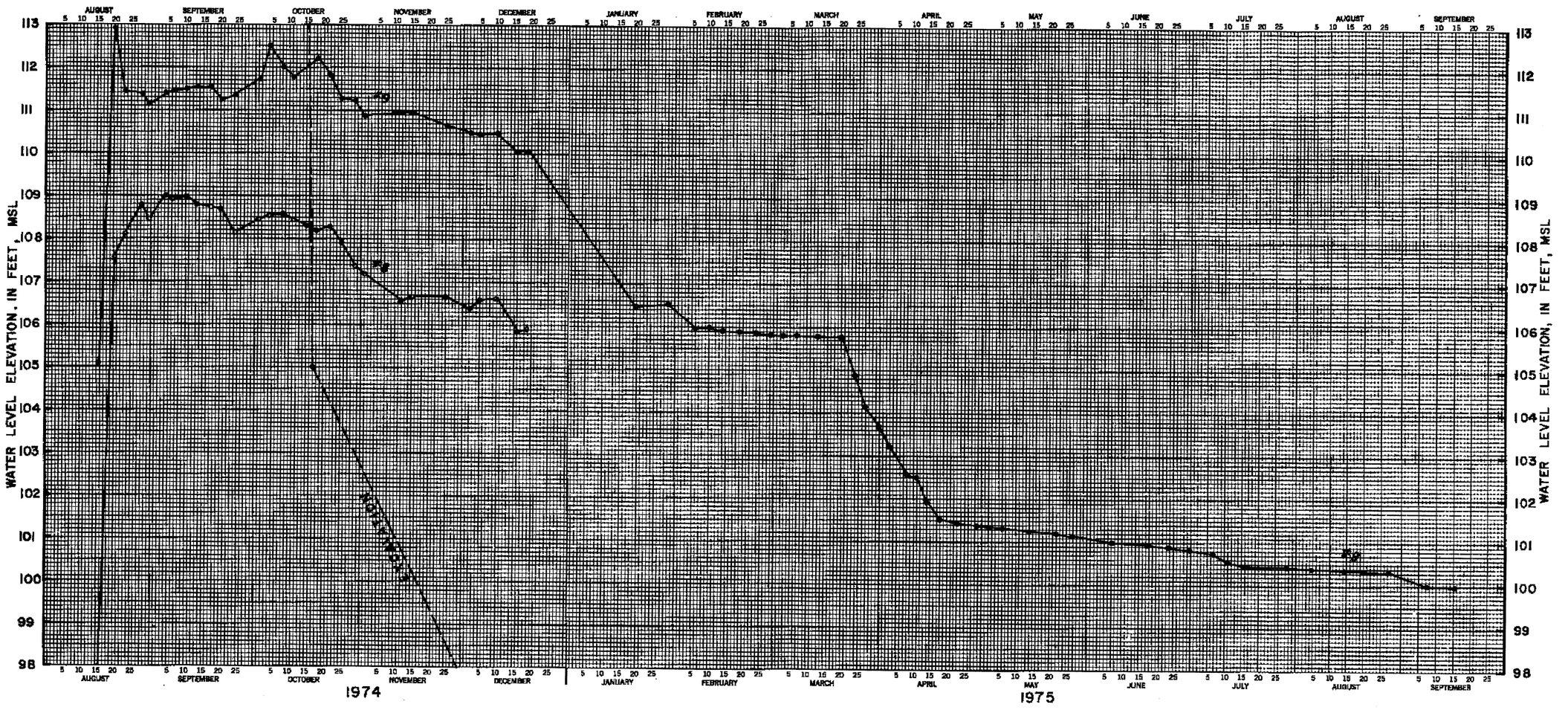
GRAND GULF NUCLEAR STATION SITE
EARLY SITE PERMIT APPLICATION
SITE SAFETY ANALYSIS REPORT

HYDROGRAPHS OF
CONSTRUCTION OBSERVATION WELLS
(UFSAR FIGURE 2.4-36, SH.3)

FIGURE 2.4-44 SHEET 3 OF 5 REV. 1



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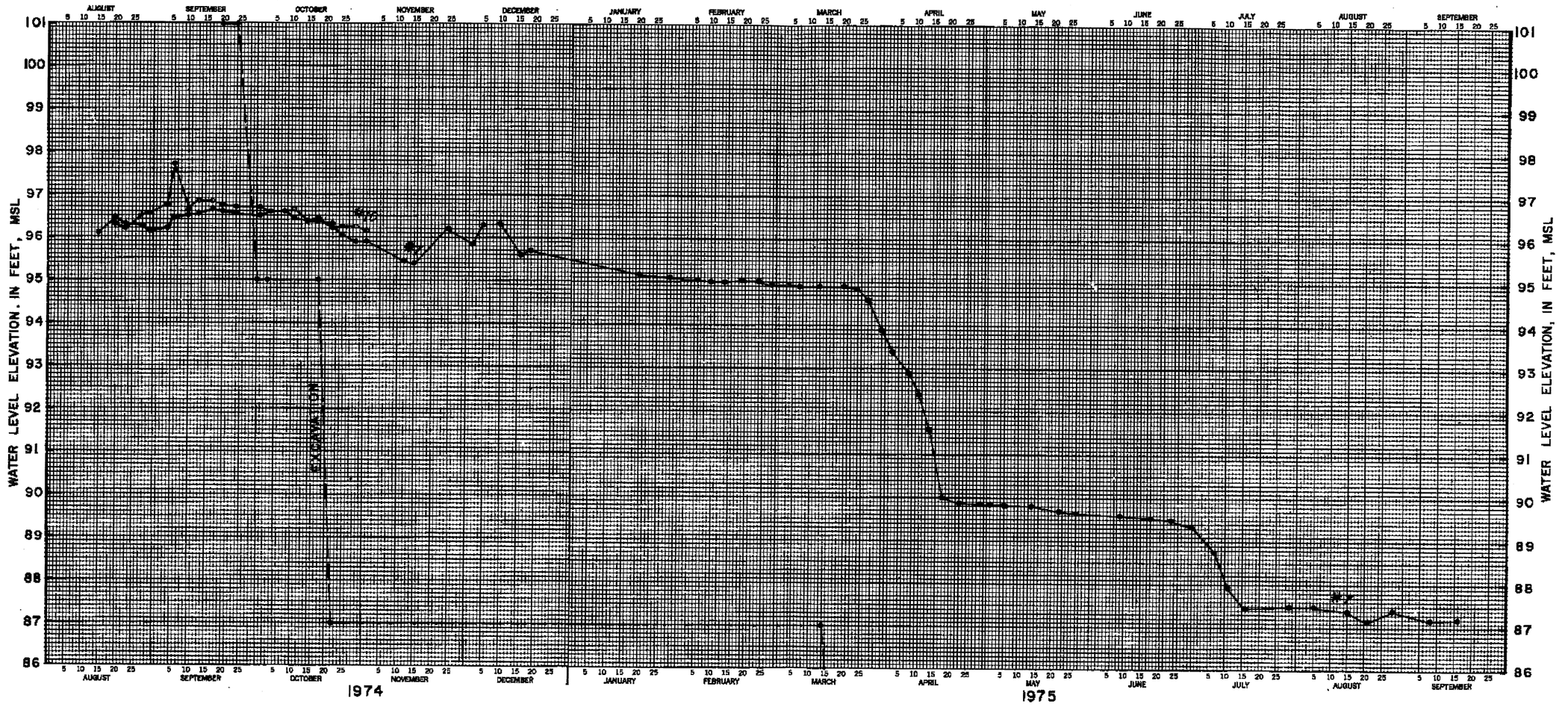
HYDROGRAPHS OF
CONSTRUCTION OBSERVATION WELLS
(UFSAR FIGURE 2.4-36, SH.4)

FIGURE 2.4-44 SHEET 4 OF 5 REV. 1



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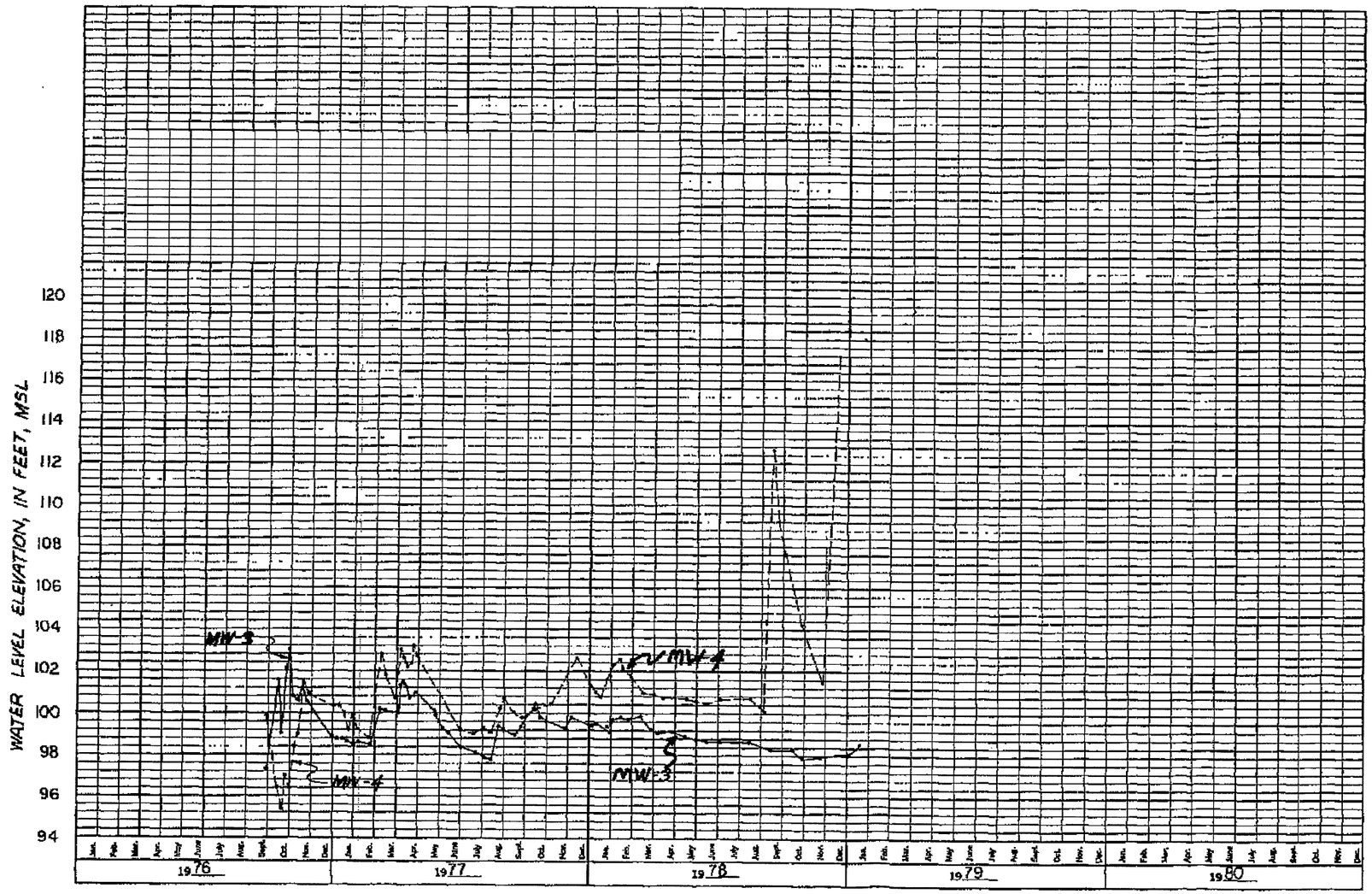
HYDROGRAPHS OF
CONSTRUCTION OBSERVATION WELLS
(UFSAR FIGURE 2.4-36, SH.5)

FIGURE 2.4-44 SHEET 5 OF 5 REV. 1



NOTES:

1. OBSERVATION WELLS MW-1 AND MW-2 WERE DRY FROM SEPT., 1976 TO JAN., 1979.
2. OBSERVATION WELL LOCATIONS SHOWN ON FIGURE 2.4-43 (UFSAR FIGURE 2.4-35c).
3. TEMPORARY SITE DRAINAGE CAUSES RECHARGE INTO FILL NEAR MW-4. AREA TO BE REGRADED NEAR MW-4 FEB., 1979.

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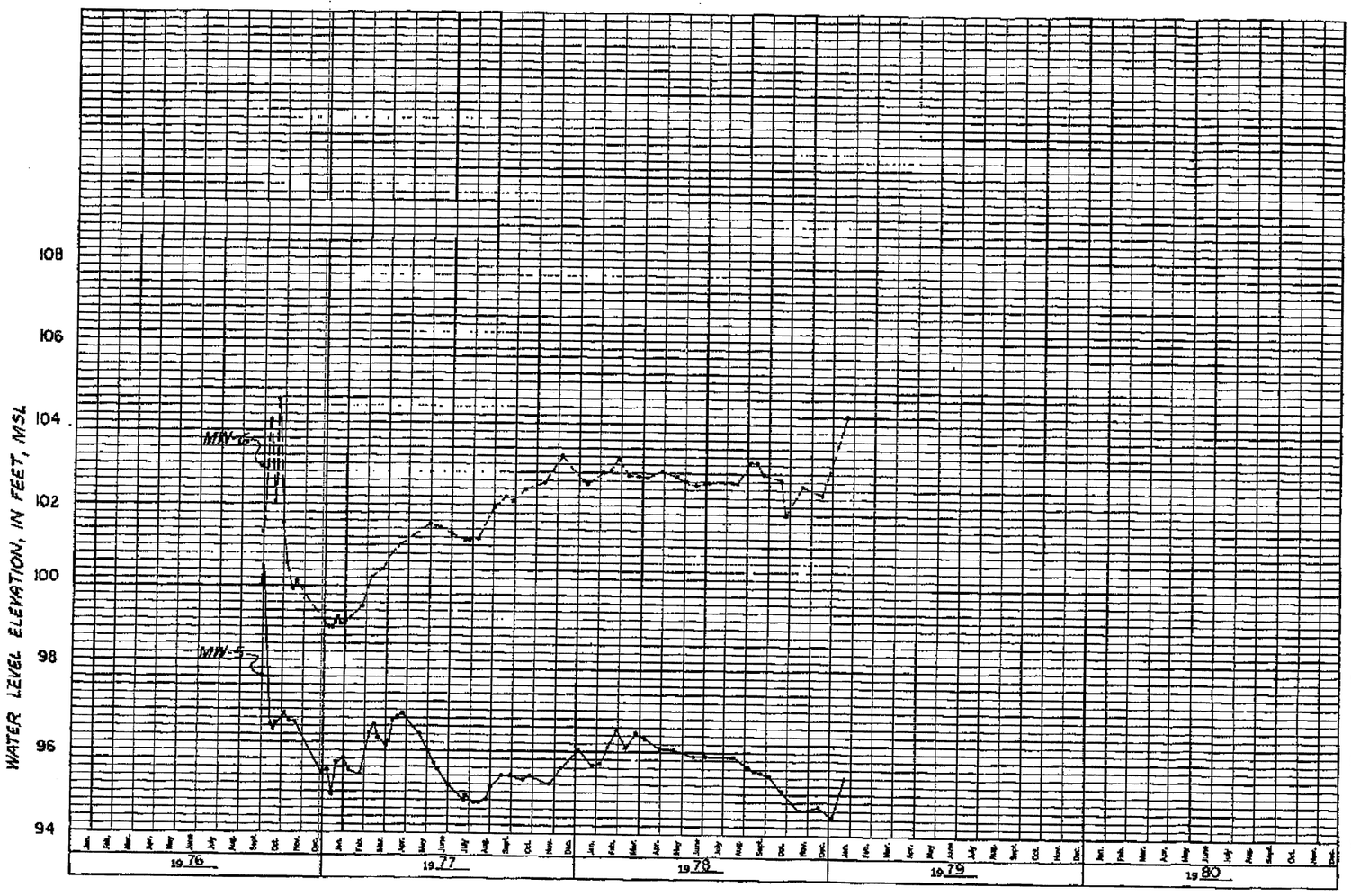
HYDROGRAPHS OF REPLACEMENT
OBSERVATION WELLS
MW-3 AND MW-4
(UFSAR FIGURE 2.4-36a, SH.1)



NOTES:
1. OBSERVATION WELL LOCATIONS SHOWN ON FIGURE 2.4-43 (UFSAR FIGURE 2.4-35c).

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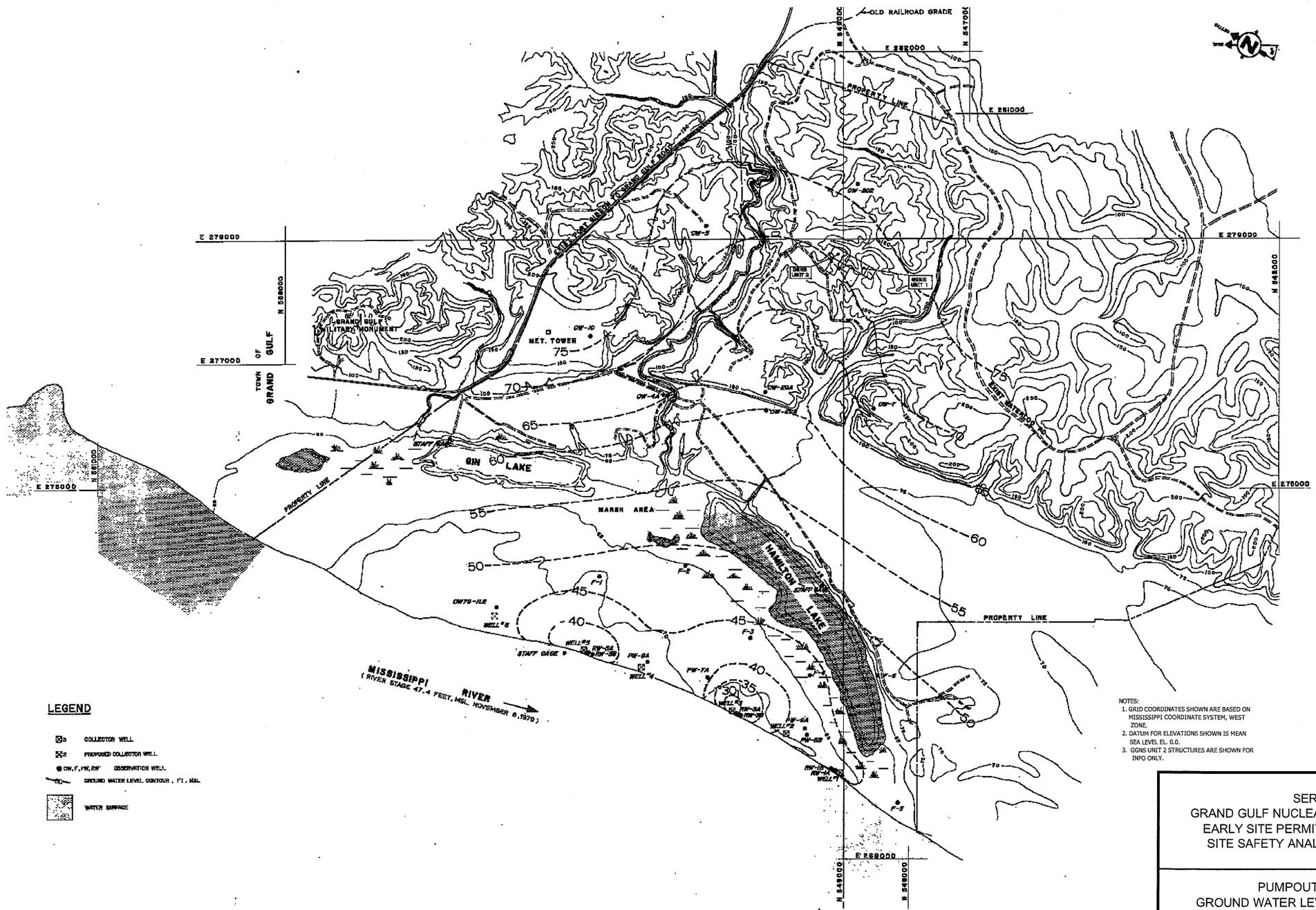
HYDROGRAPHS OF REPLACEMENT
OBSERVATION WELLS
MW-5 AND MW-6
(UFSAR FIGURE 2.4-36a, SH.2)

FIGURE 2.4-45 SHEET 2 OF 2 REV. 1



LEGEND

- COLLECTOR WELL
- PROPOSED COLLECTOR WELL
- OW, F, PW, RW OBSERVATION WELL
- GROUND WATER LEVEL CONTOUR, FT, MSL
- WATER SURFACE

NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL EL. 0.0.
3. GGNS UNIT 2 STRUCTURES ARE SHOWN FOR INFO ONLY.

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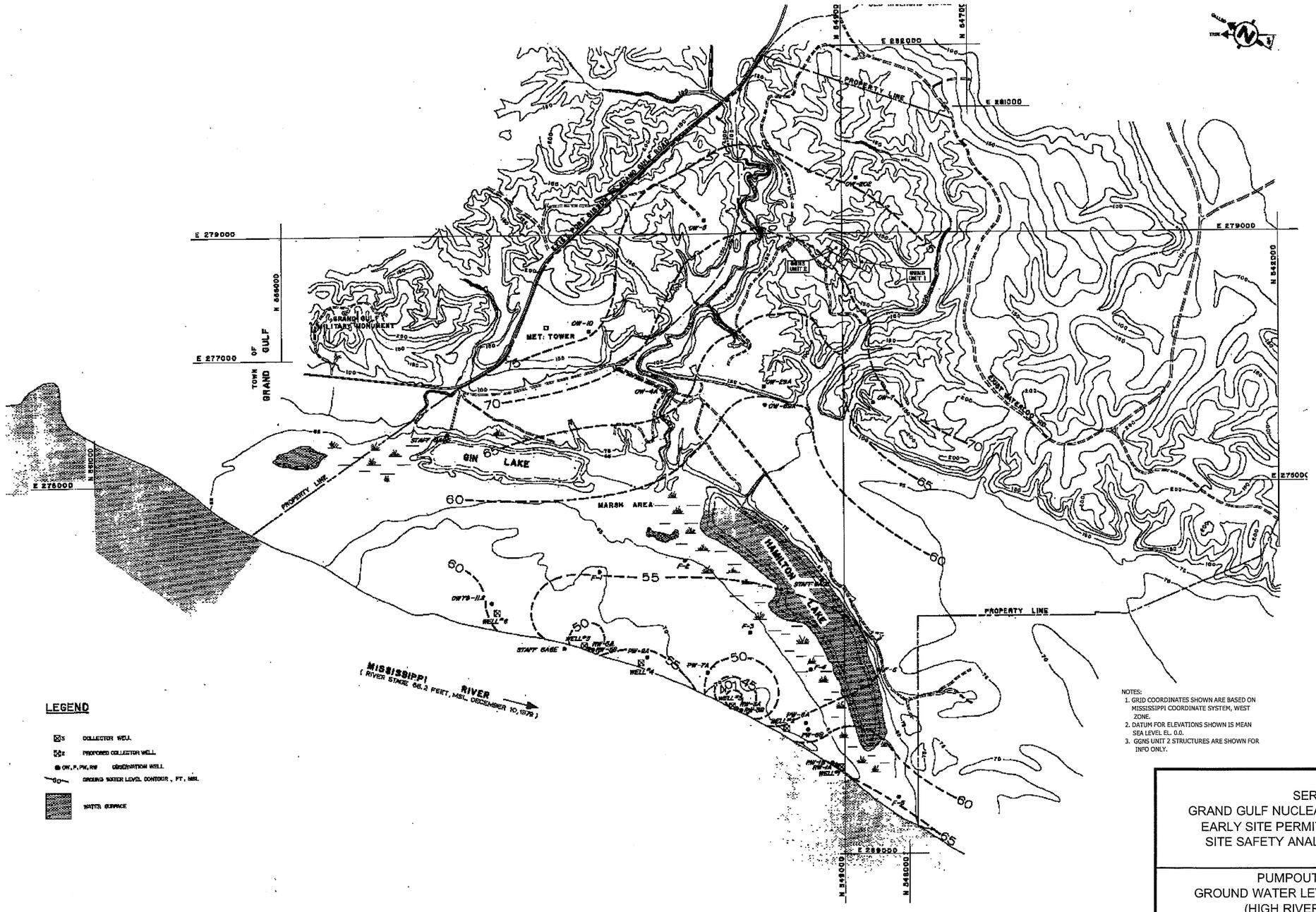
PUMPOUT TEST
GROUND WATER LEVEL CONTOURS
NOVEMBER 6 , 1979
(UFSAR FIGURE 2.4-39)

FIGURE 2.4-46 REV. 1



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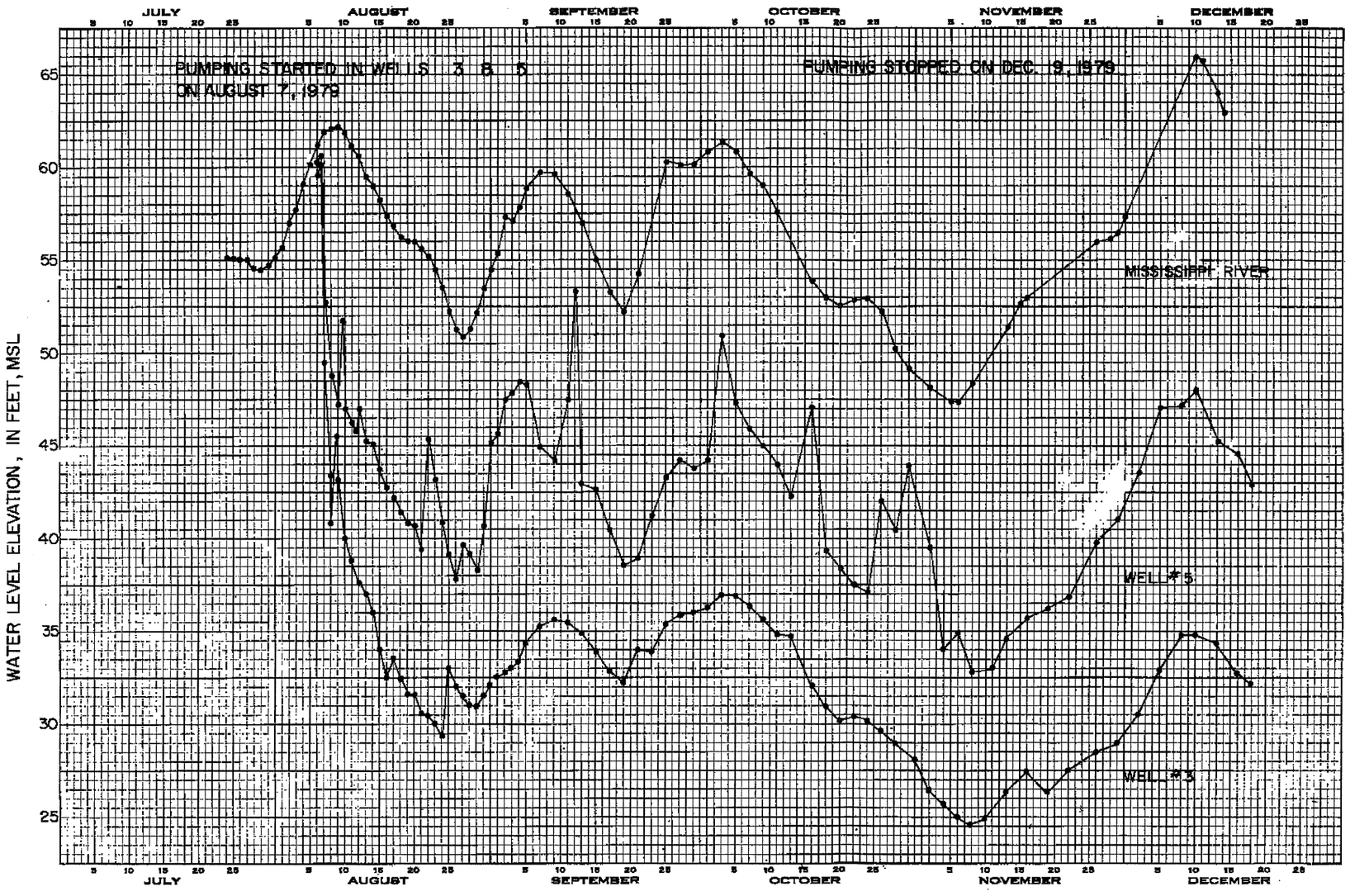
PUMPOUT TEST
GROUND WATER LEVEL CONTOURS
(HIGH RIVER LEVEL)
DECEMBER 10 , 1979
(UFSAR FIGURE 2.4-40)

FIGURE 2.4-47 REV. 1



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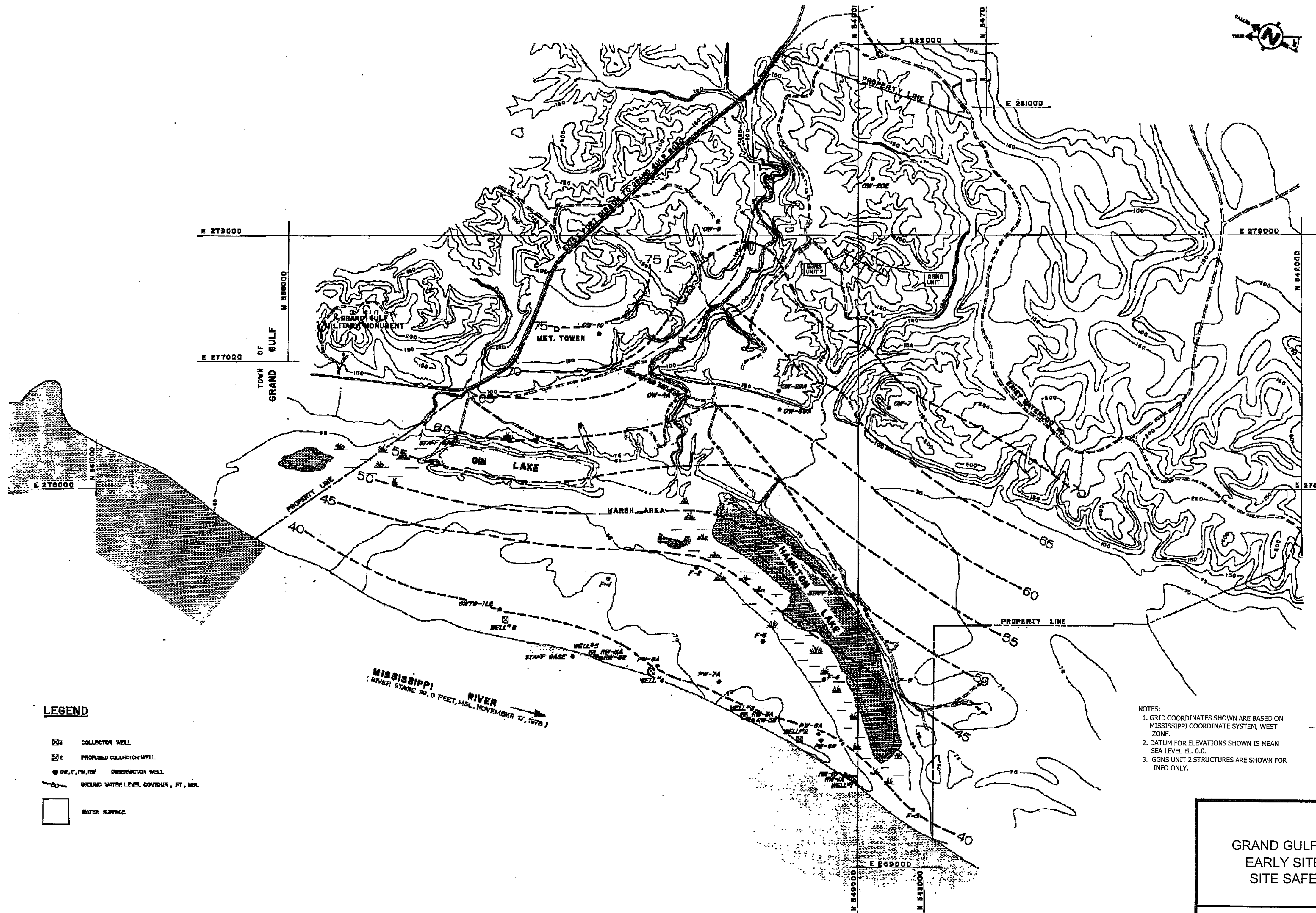
HYDROGRAPHS OF MISSISSIPPI
RIVER WELLS 3 AND 5
DURING PUMP TEST
(UFSAR FIGURE 2.4-41)

FIGURE 2.4-48 REV. 1



NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL EL. 0.0.
3. GGNS UNIT 2 STRUCTURES ARE SHOWN FOR INFO ONLY.

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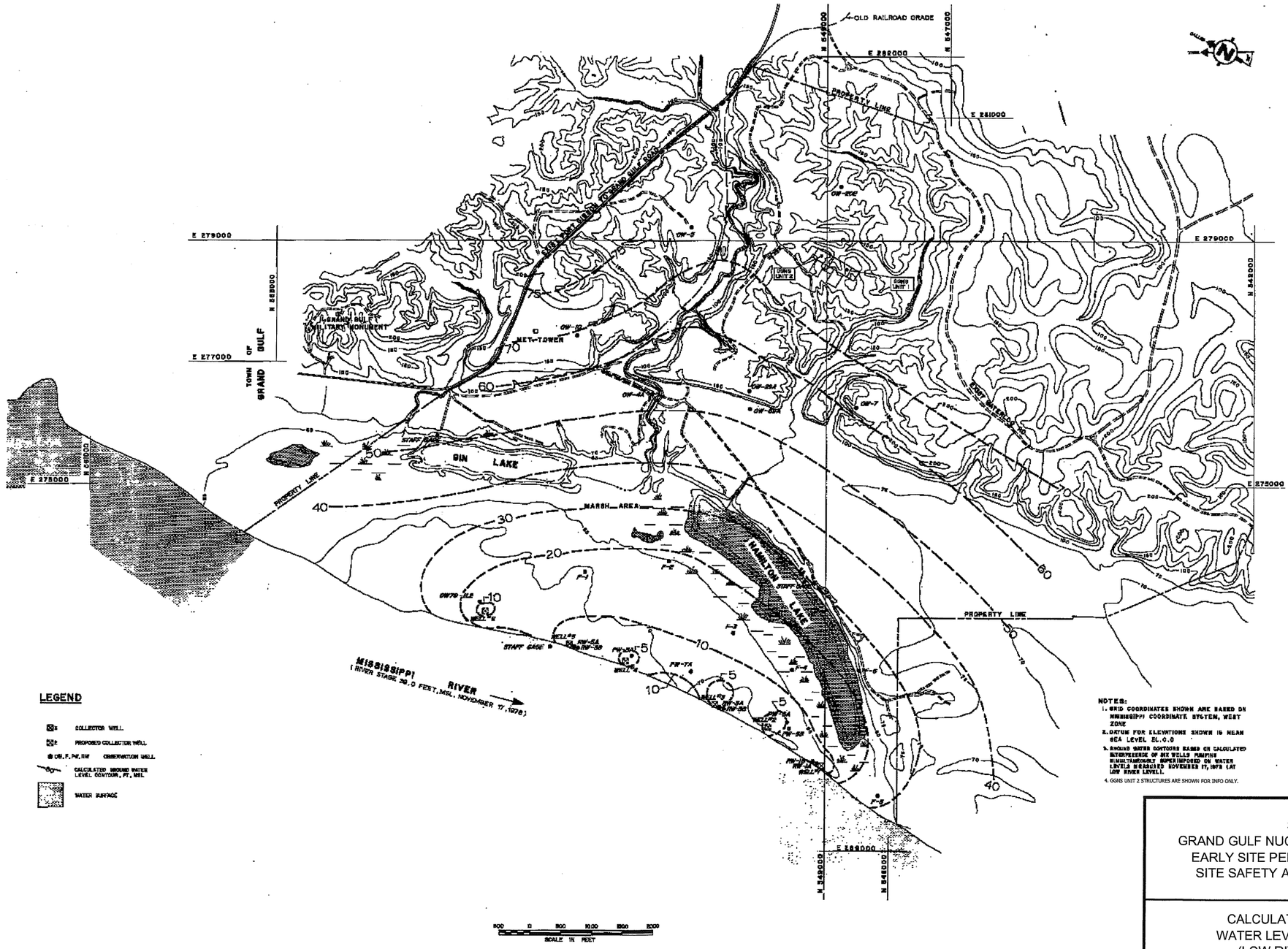
PUMPOUT TEST
GROUND WATER LEVEL CONTOURS
(LOW RIVER LEVEL)
NOVEMBER 17, 1978
(UFSAR FIGURE 2.4-42)

FIGURE 2.4-49 REV. 1



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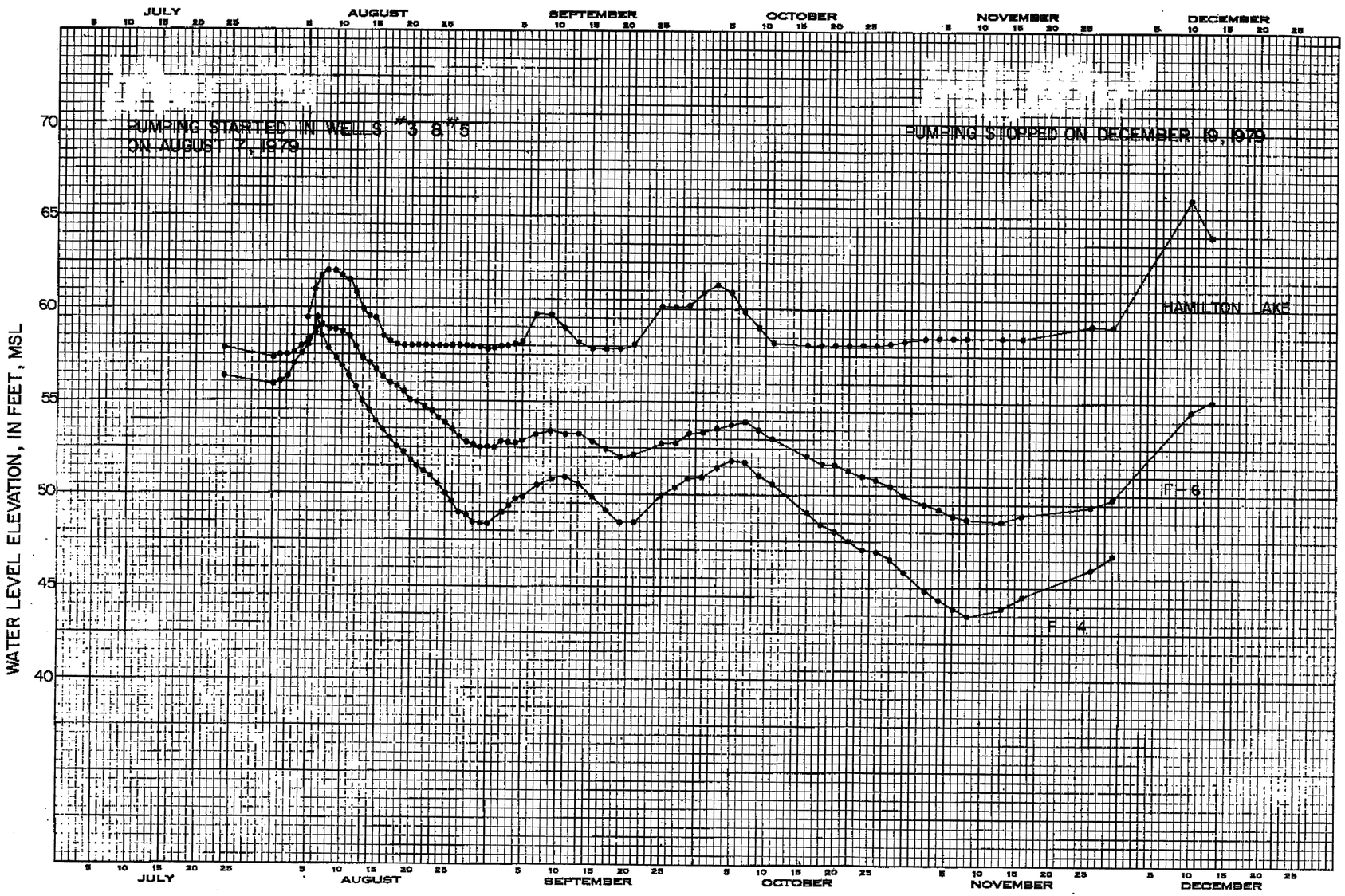
CALCULATED GROUND
WATER LEVEL CONTOURS
(LOW RIVER LEVEL)
(UFSAR FIGURE 2.4-43)

FIGURE 2.4-50 REV. 1



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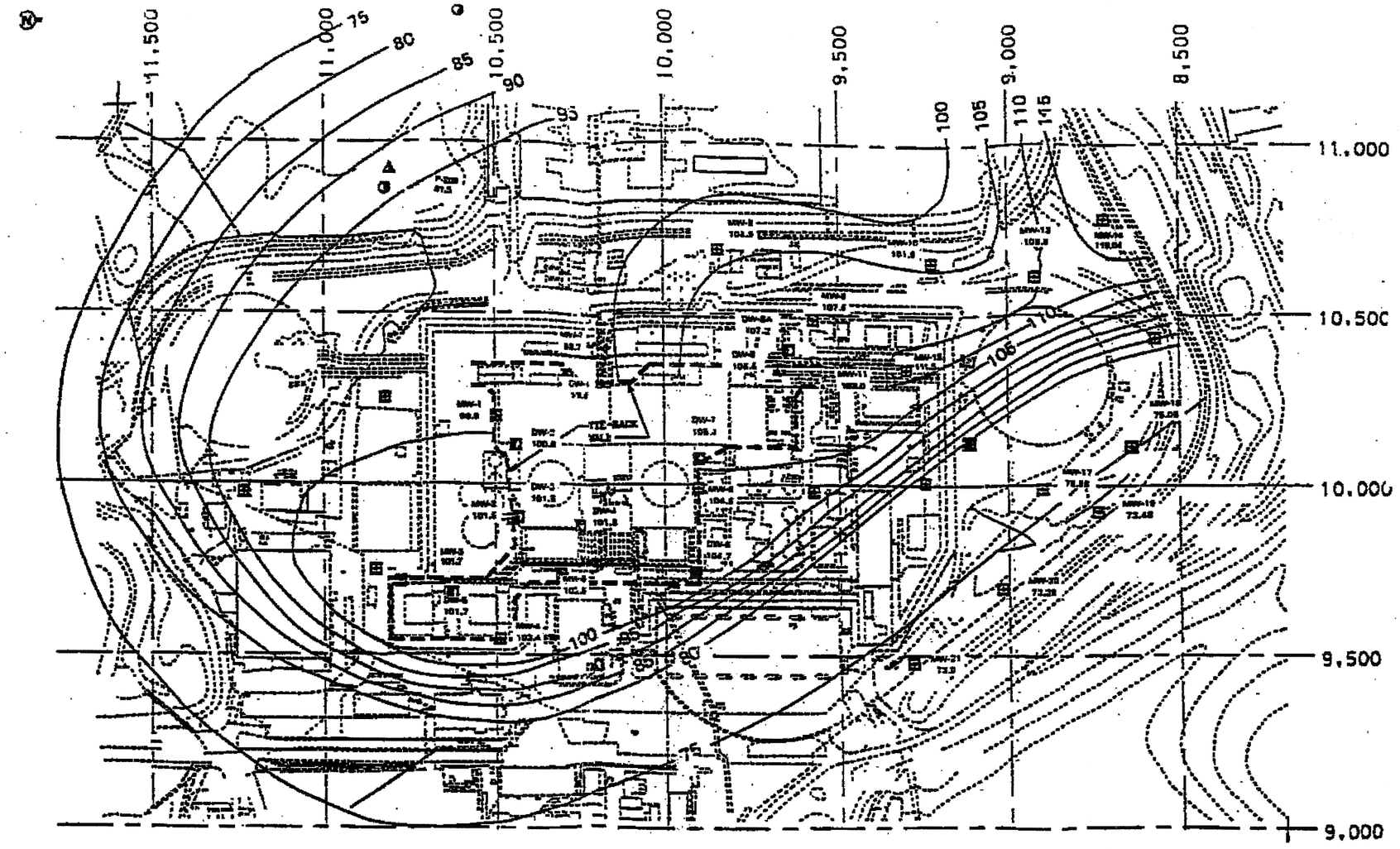
HYDROGRAPHS OF HAMILTON LAKE
AND OBSERVATION WELLS
F-4 AND F-6 DURING PUMP TESTS
(UFSAR FIGURE 2.4-45)

FIGURE 2.4-51 REV. 1



LEGEND:

- Ground water dewatering wells, monitoring wells, observation wells and estimated average post-construction ground water elevations based on measurements taken on 11/08/90
- 115 — Ground water elevation contour; contour interval is 5 feet
- Tieback Wall Project

0 100 200 300
SCALE IN FEET

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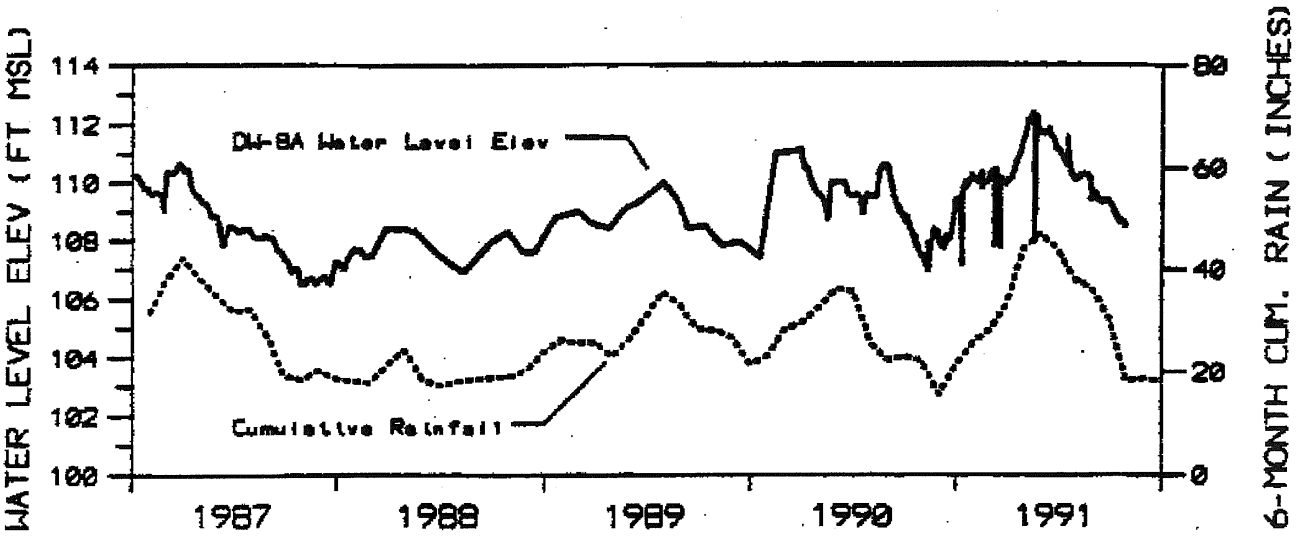
AVERAGE
POST-CONSTRUCTION
GROUND WATER ELEVATIONS
(UFSAR FIGURE 2.4-48)

FIGURE 2.4-52 REV. 1



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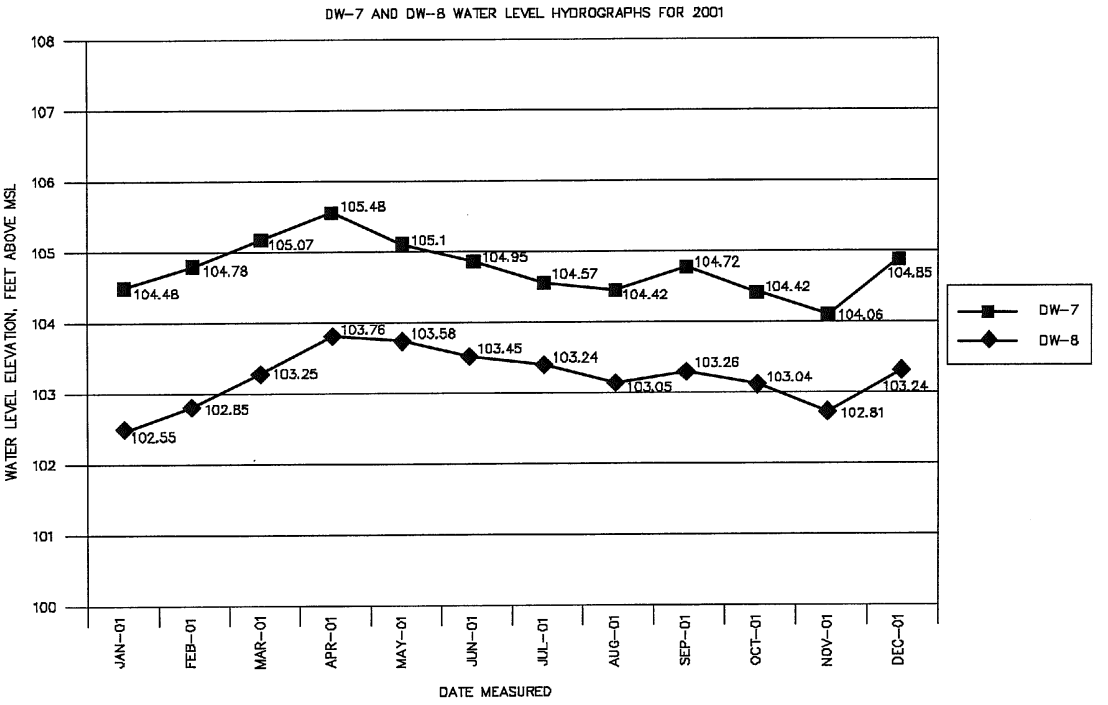
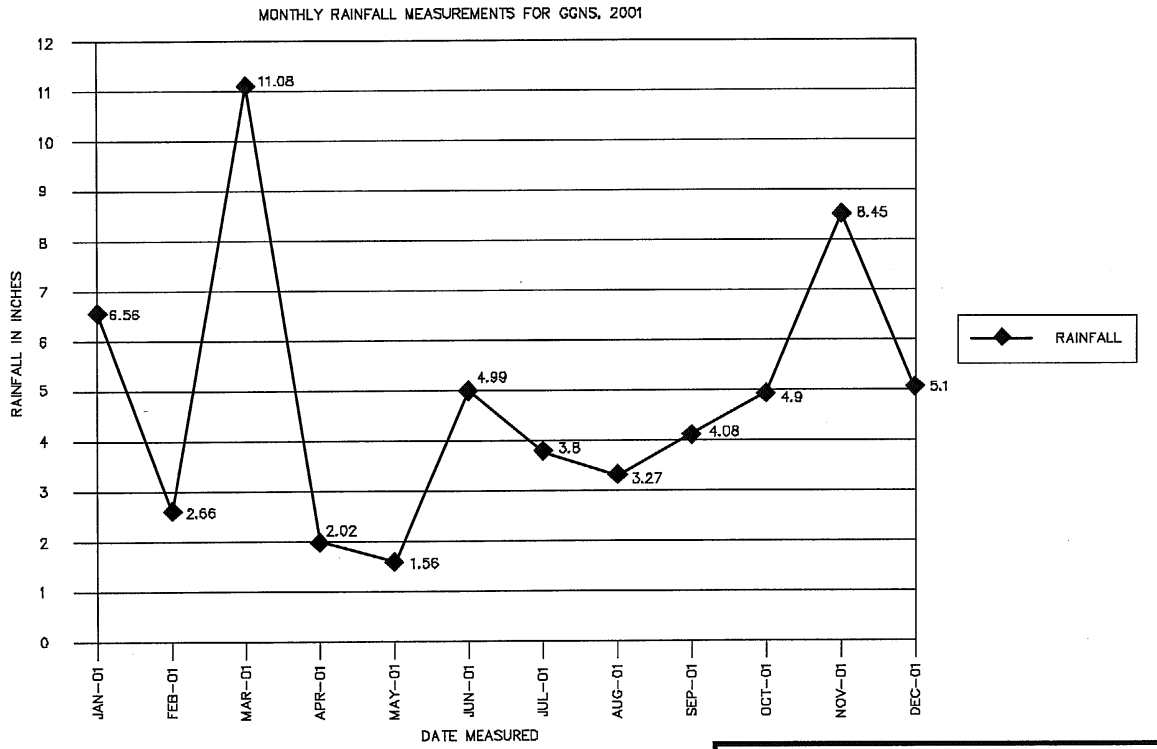
DW-8A WATER-LEVEL HYDROGRAPH
AND 6-MONTH CUMULATIVE PRECIPITATION
1987-1991
(UFSAR FIGURE 2.4-50)

FIGURE 2.4-53 REV. 1





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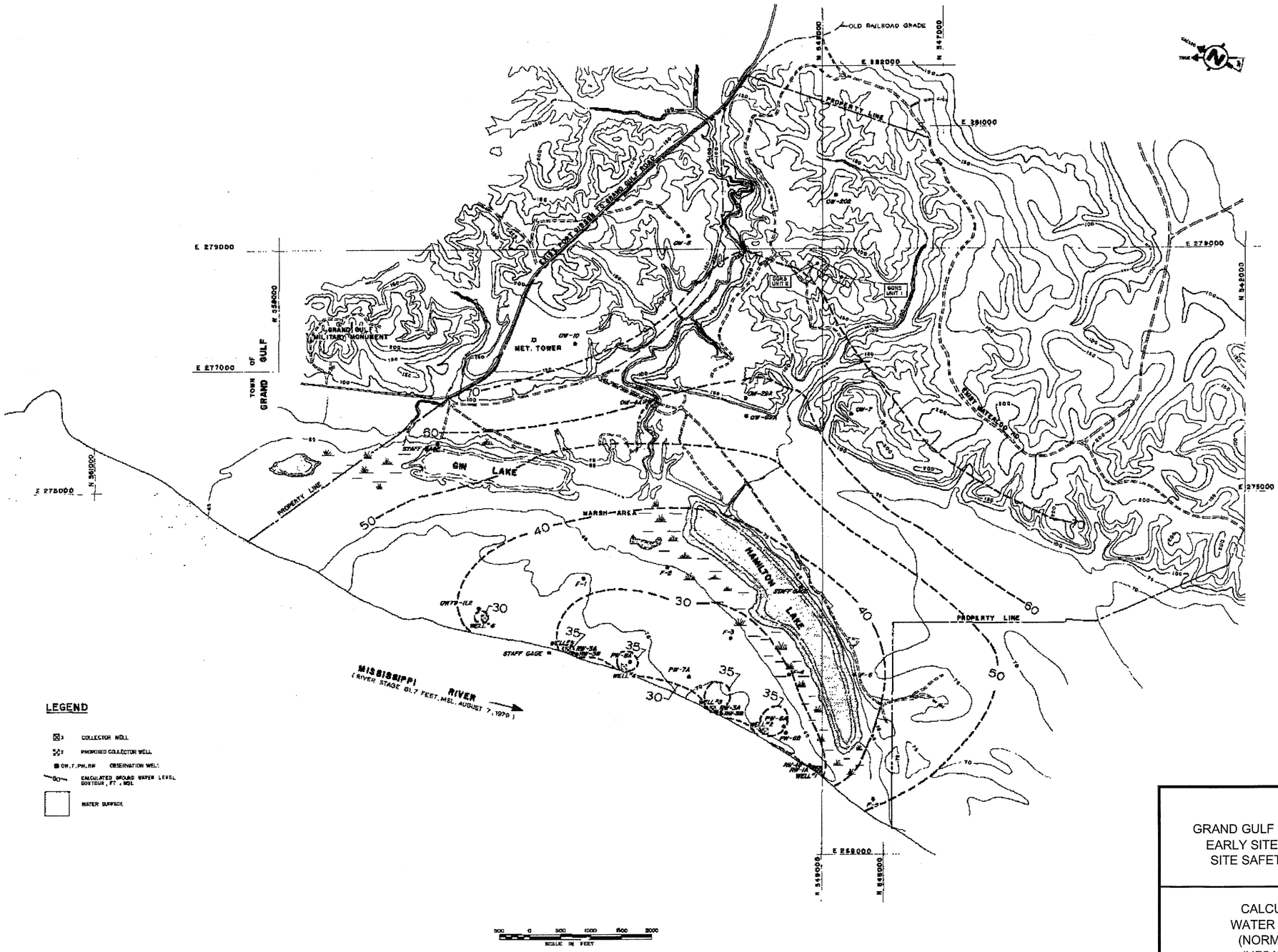
GGNS GROUNDWATER LEVEL AND
RAINFALL HYDROGRAPHS - 2001

FIGURE 2.4-54 REV. 1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TOWN OF GRAND GULF
GRAND GULF MILITARY MONUMENT
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