Figure 2.4-30 thru Figure 2.4-40 Are Not Used

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Figure 2.4-40a Main Plant Site Grading And Drainage System For Flood Studies Sheet 1

Figure 2.4-40a Deleted by Amendment 101

Figure 2.4-40a Deleted by Amendment 101

Figure 2.4-40b Main Plant General Plan

Figure 2.4-40c Yard Site Grading and Drainage System For Flood Studies

Figure 2.4-40d-1 Main Plant Plant Perimeter Roads Plan and Profile Sheet 1

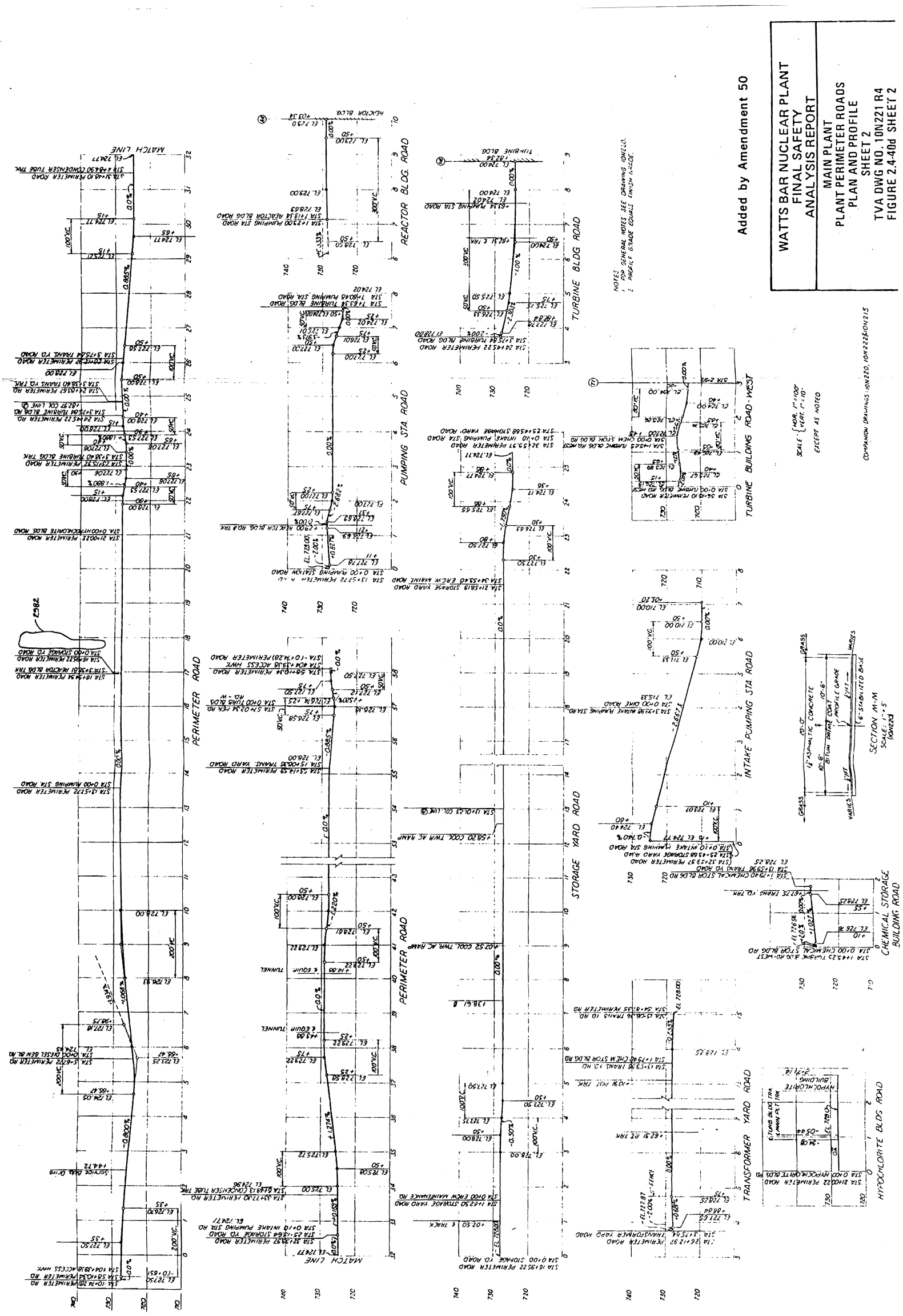


Figure 2.4-40d Main Plant Plant Perimeter Roads Plan and Profile - Sheet 2

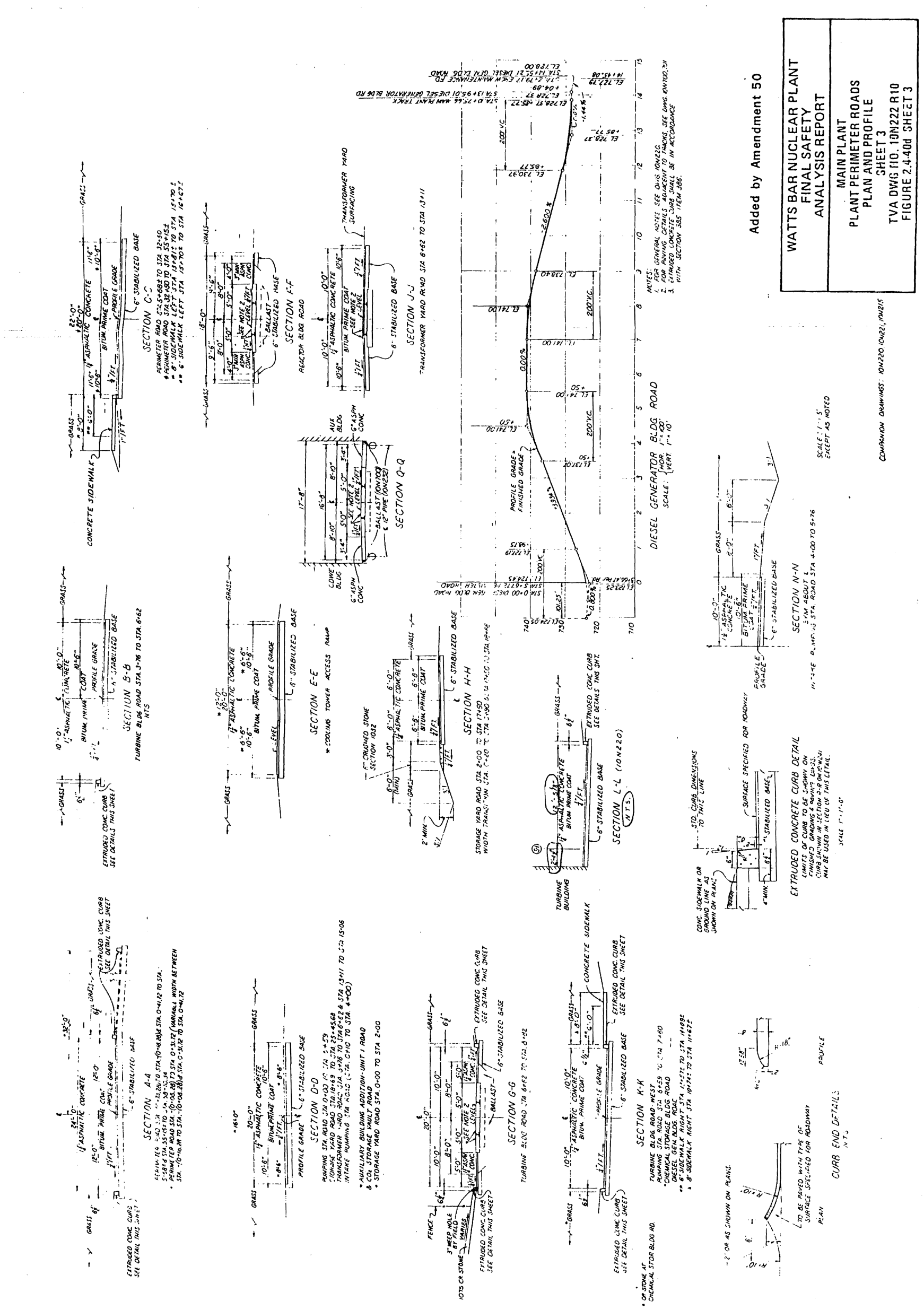


Figure 2.4-40d Main Plant Plant Perimeter Roads Plan and Profile - Sheet 3

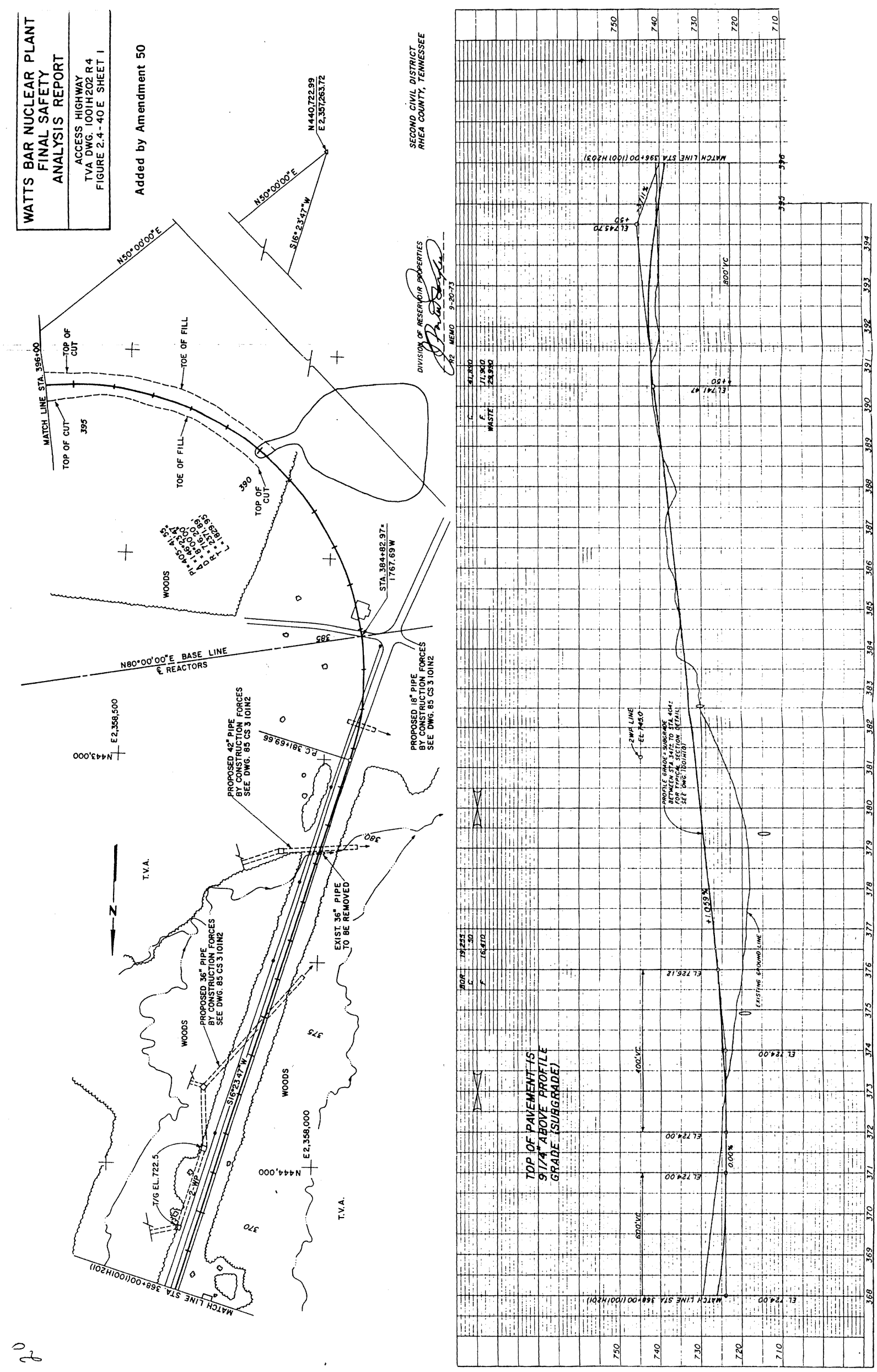


Figure 2.4-40e Access Highway TVA DWG 1001H202 R4 - Sheet 1

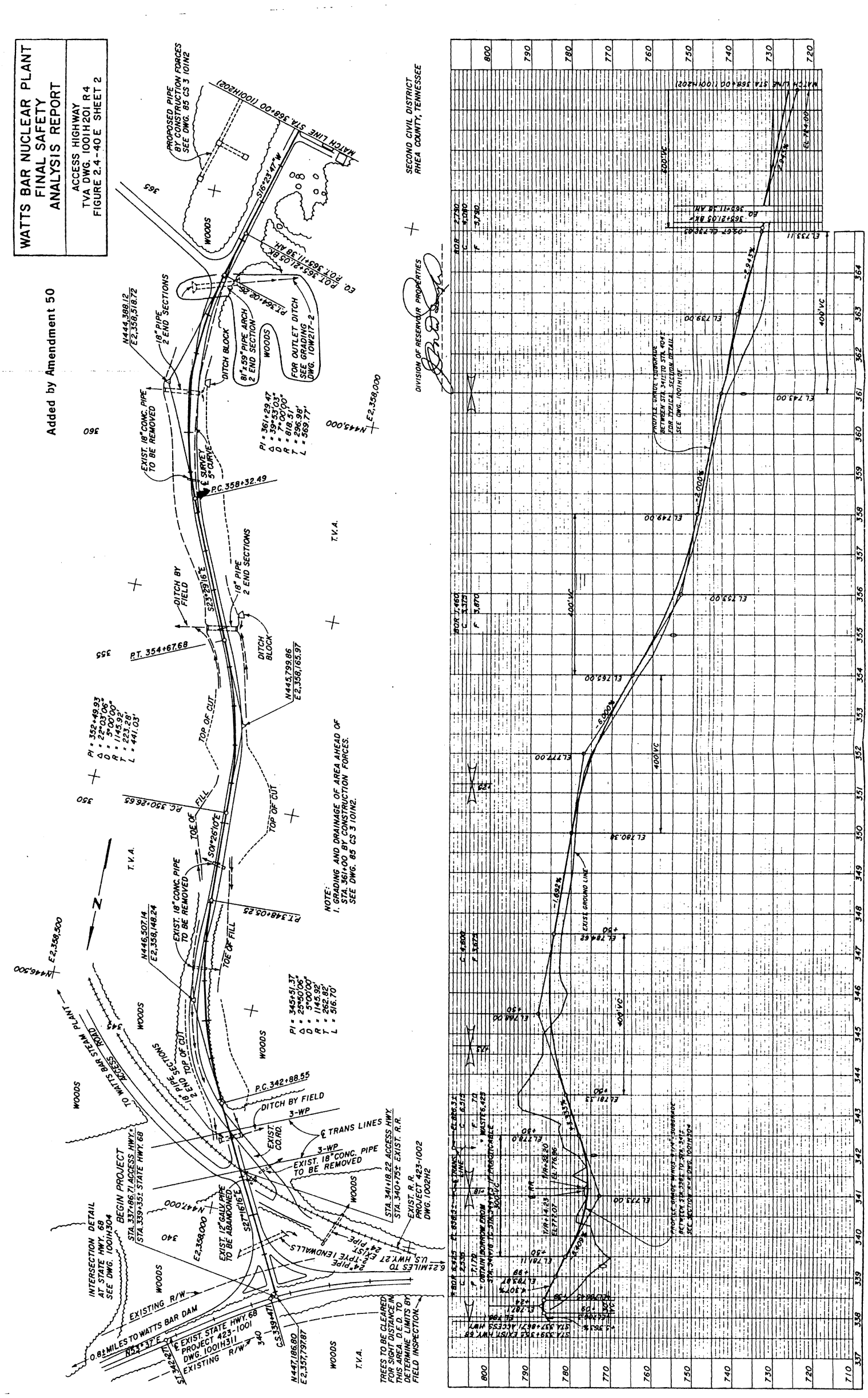


Figure 2.4-40e Access Highway TVA DWG. 1001H201 R4 - Sheet 2

Figure 2.4-40f Main Plant Main Plant Tracks Plan - Sheet 1

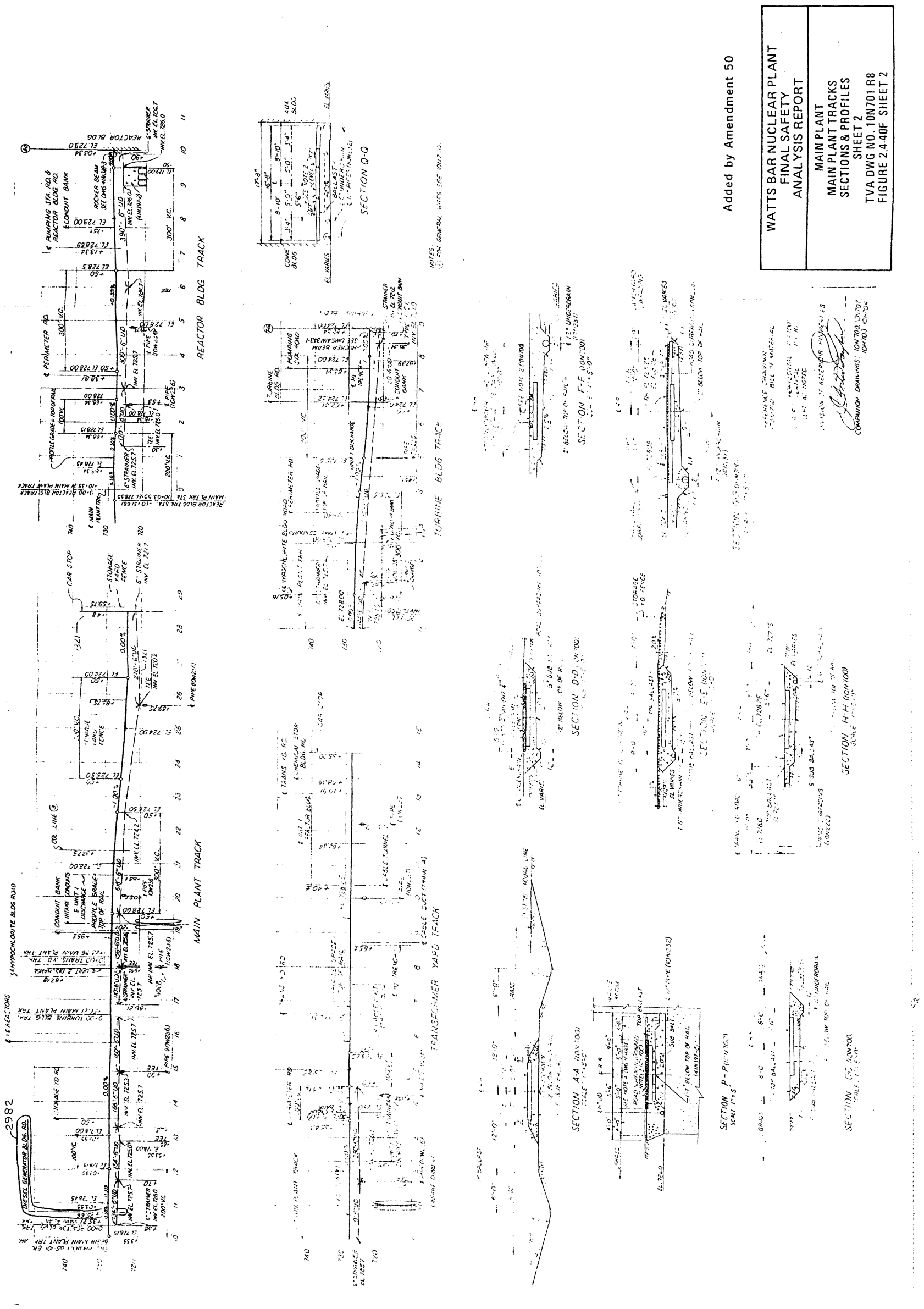


Figure 2.4-40f Main Plant Main Plant Tracks Sections & Profiles - Sheet 2

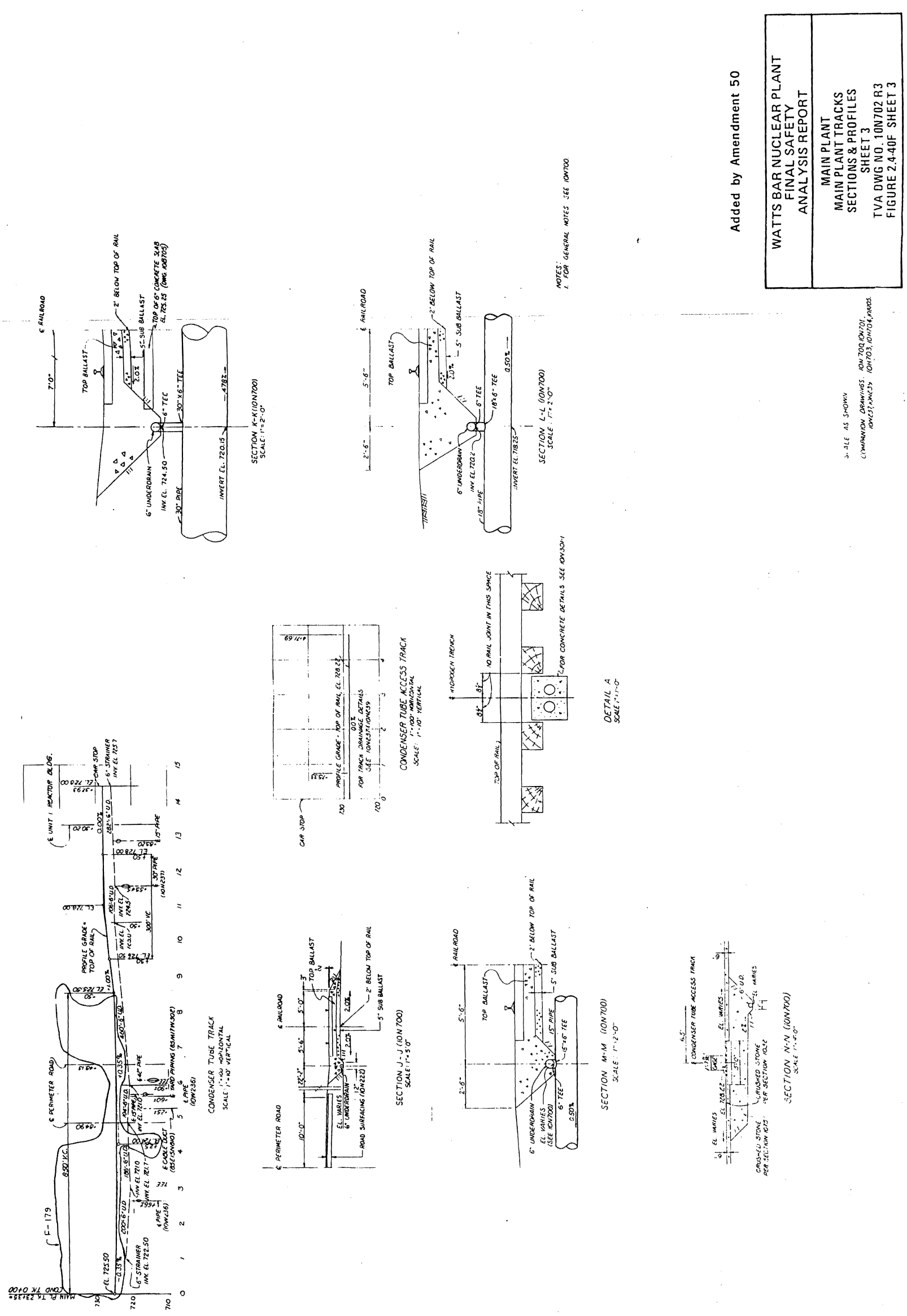


Figure 2.4-40f Main Plant Main Plant Tracks Sections & Profiles - Sheet 3

Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 1

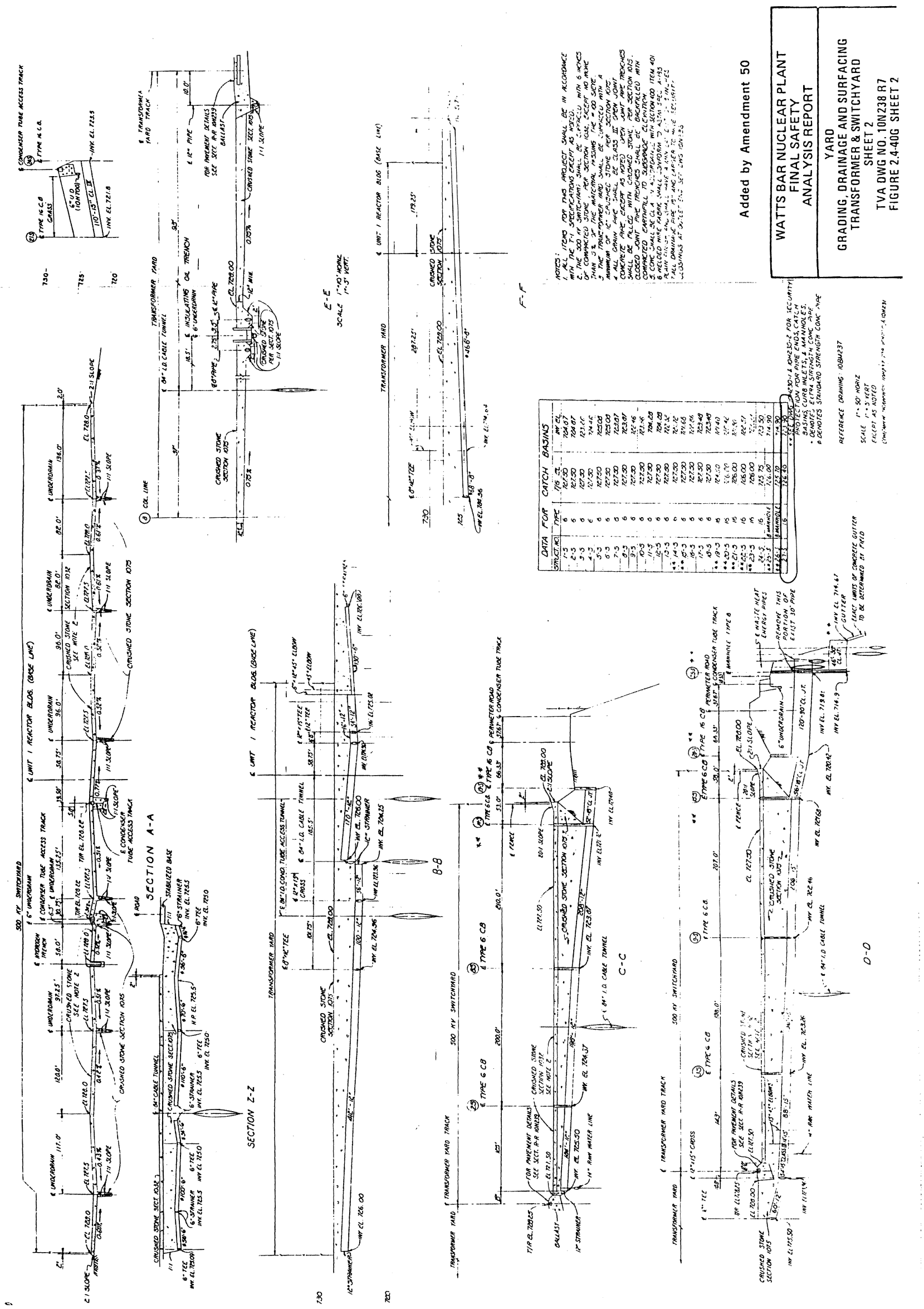
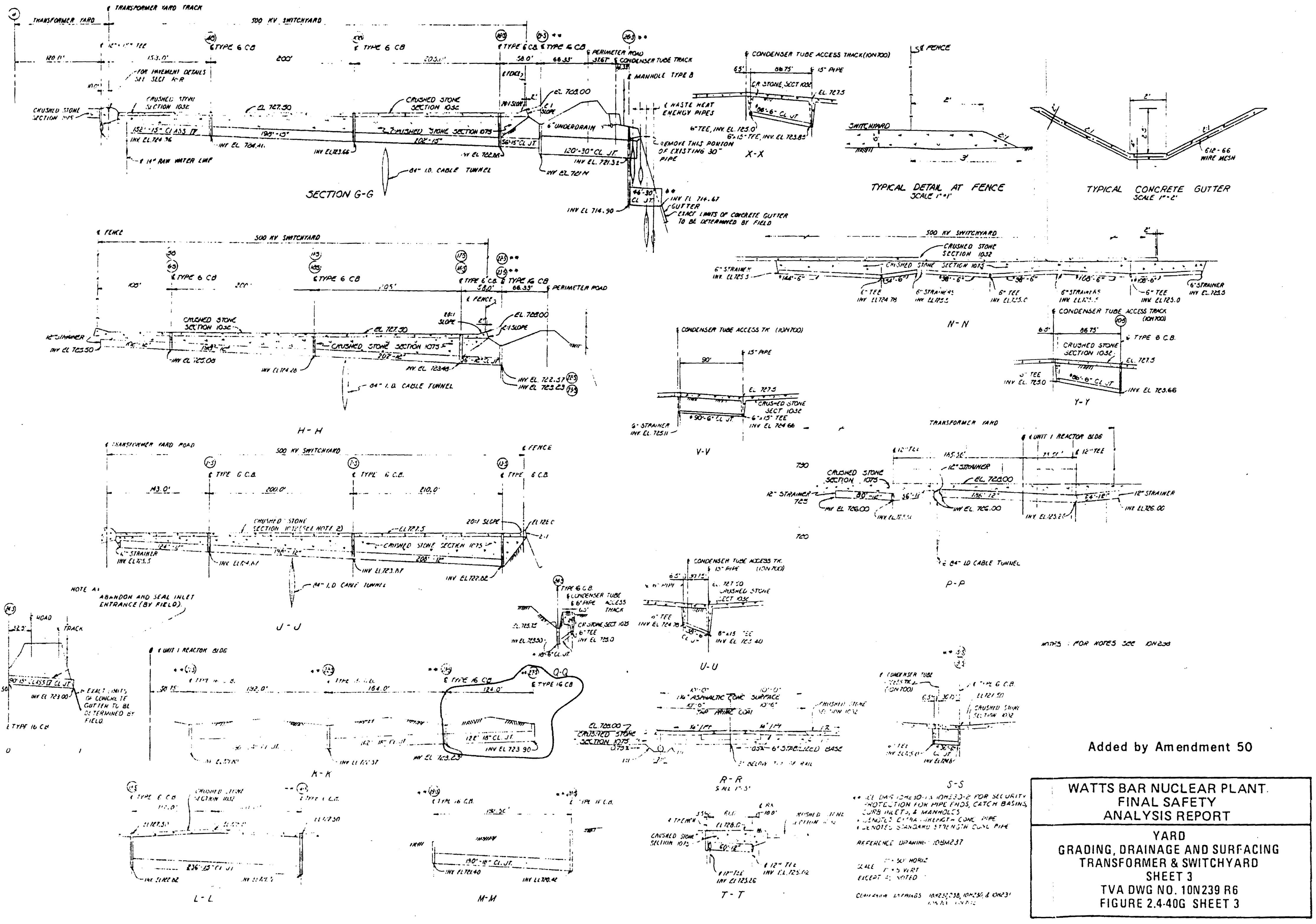


Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 2



Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

YARD
GRADING, DRAINAGE AND SURFACING
TRANSFORMER & SWITCHYARD
SHEET 3
TVA DWG NO. 10N239 R6
FIGURE 2.4-40G SHEET 3

Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 3

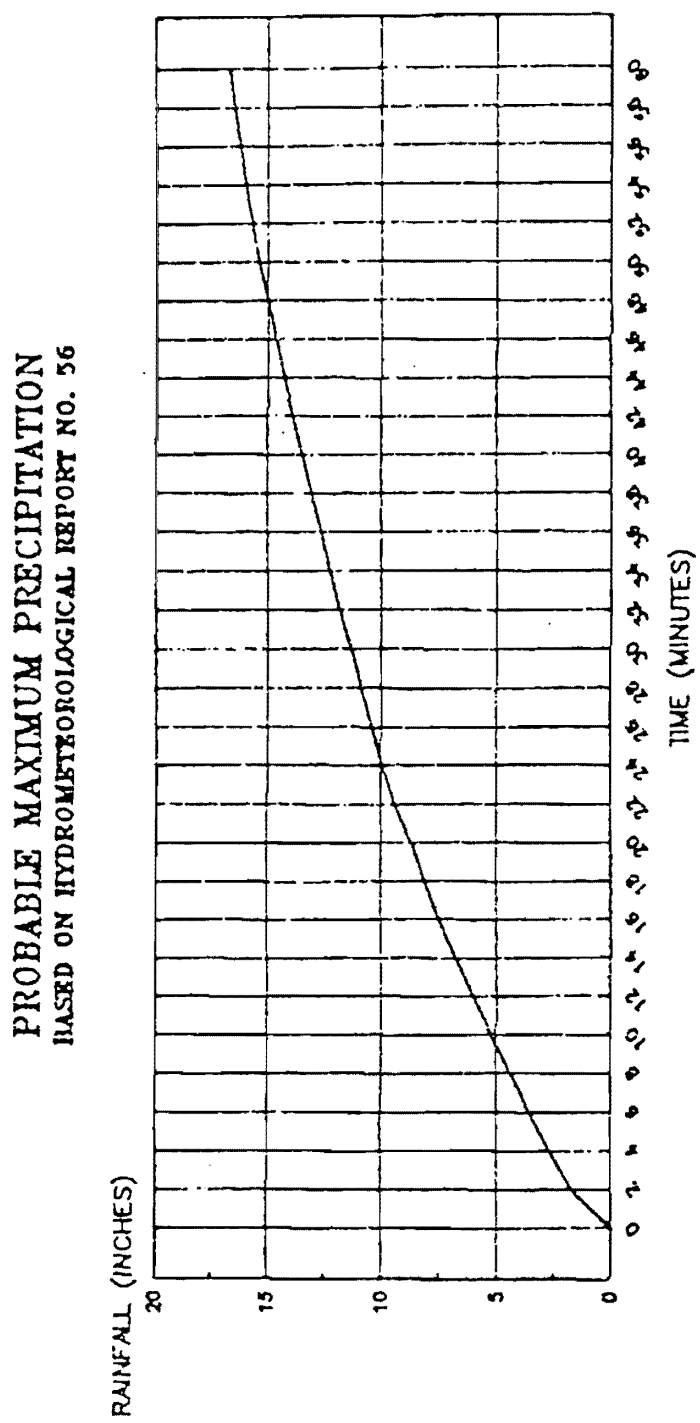


Figure 2.4-40h Probable Maximum Precipation Point Rainfall

AMENDMENT 83

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

PROBABLE MAXIMUM PRECIPATION
POINT RAINFALL

FIGURE 2.4-40h

Figure 2.4-40i Deleted by Amendment 83

Figure 2.4-40j Deleted by Amendment 83

Figure 2.4-40k Deleted by Amendment 83

Figure 2.4-40L Deleted by Amendment 83

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Figure 2.4-41 thru Figure 2.4-60 Are Not Used

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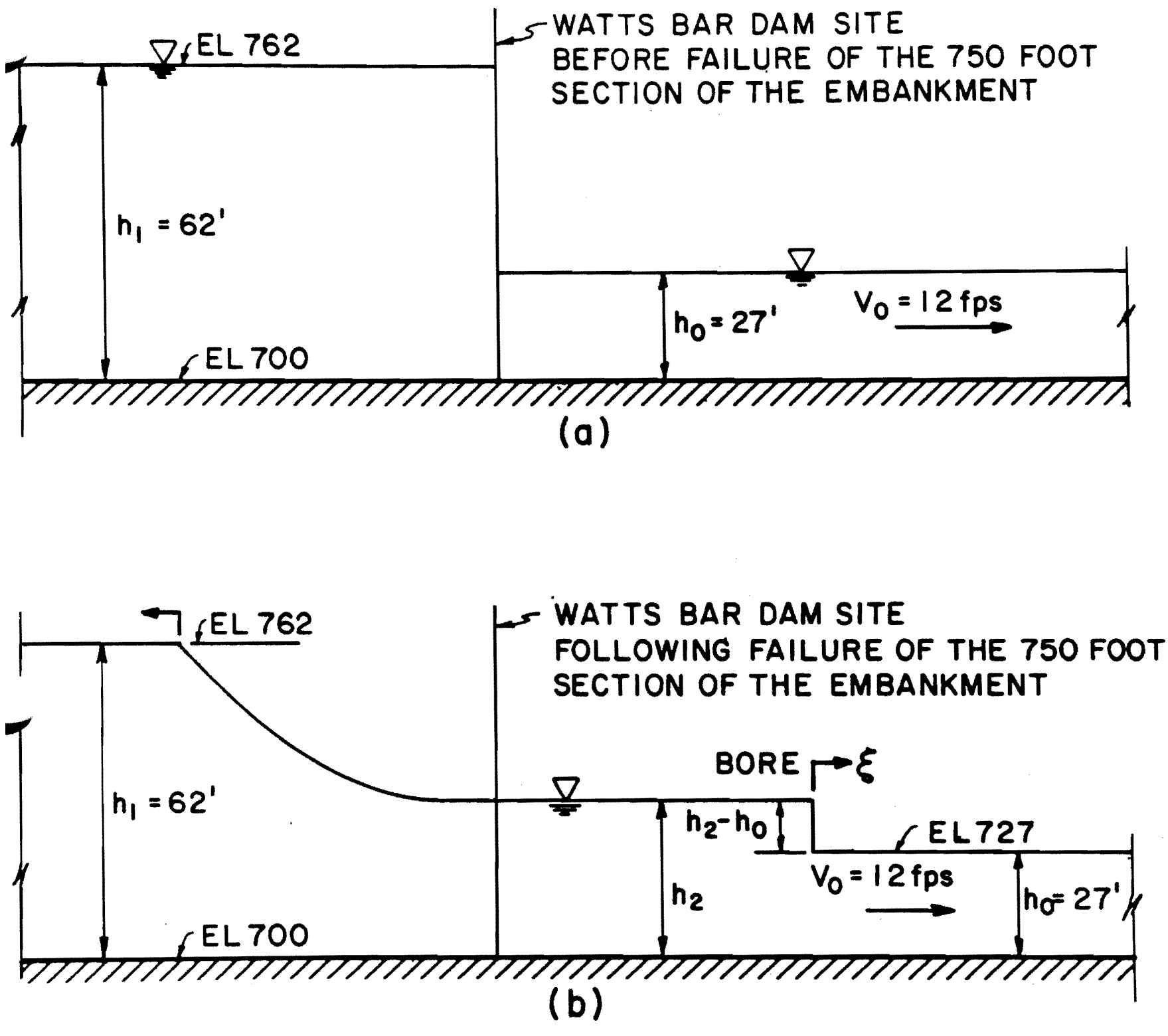
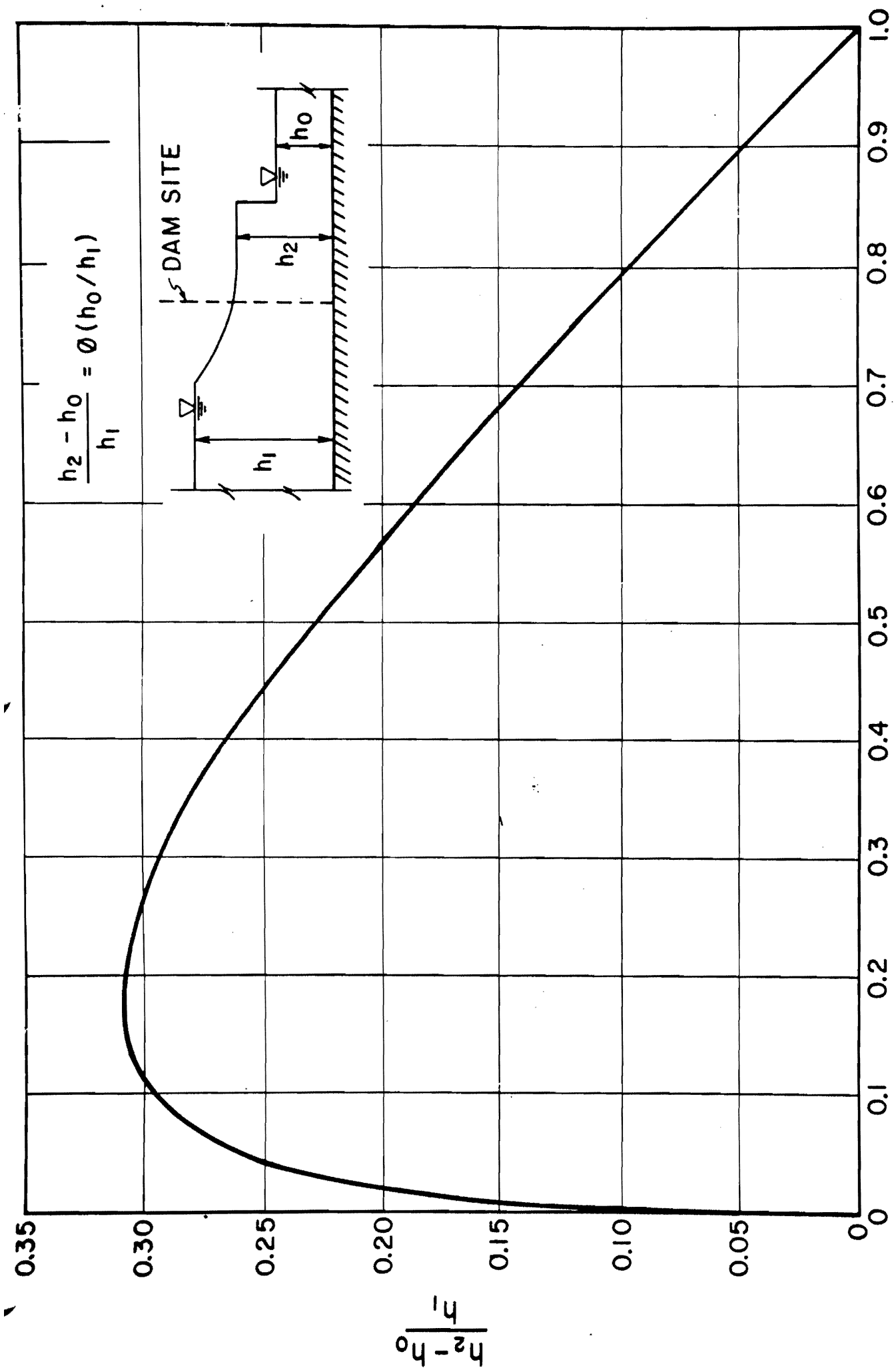


WATTS BAR PROBABLE MAXIMUM FLOOD
WATER LEVELS BEFORE & AFTER EMBANKMENT FAILURE
FIGURE 2.4-61

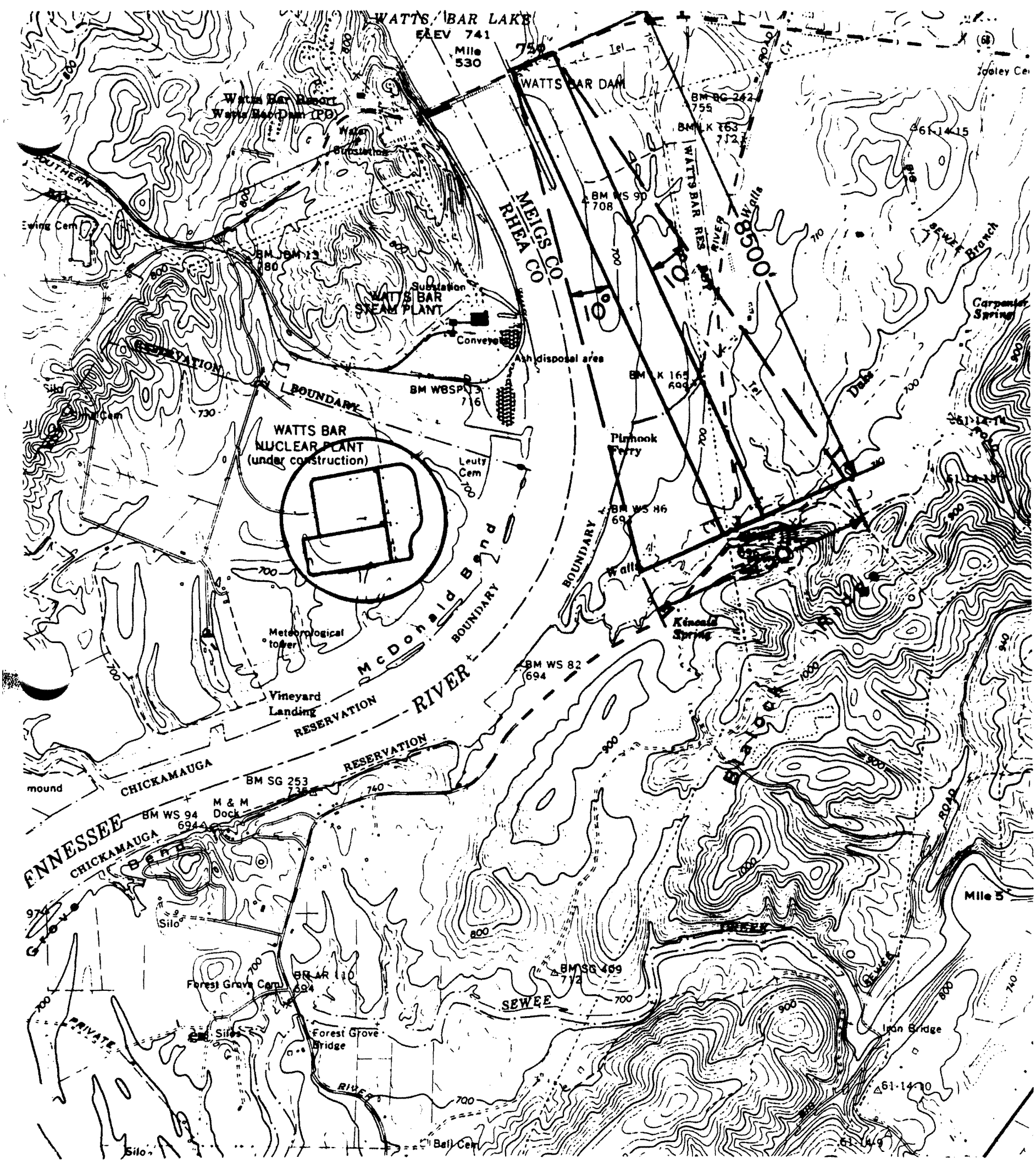
Revised by Amendment 39

Figure 2.4-61 Watts Bar Probable Maximum Flood Water Levels Before and After Embankment Failure



RELATIVE BORE HEIGHT (AFTER J.J. STROKER, REF. 31)
FIGURE 2.4-62
Revised by Amendment 39

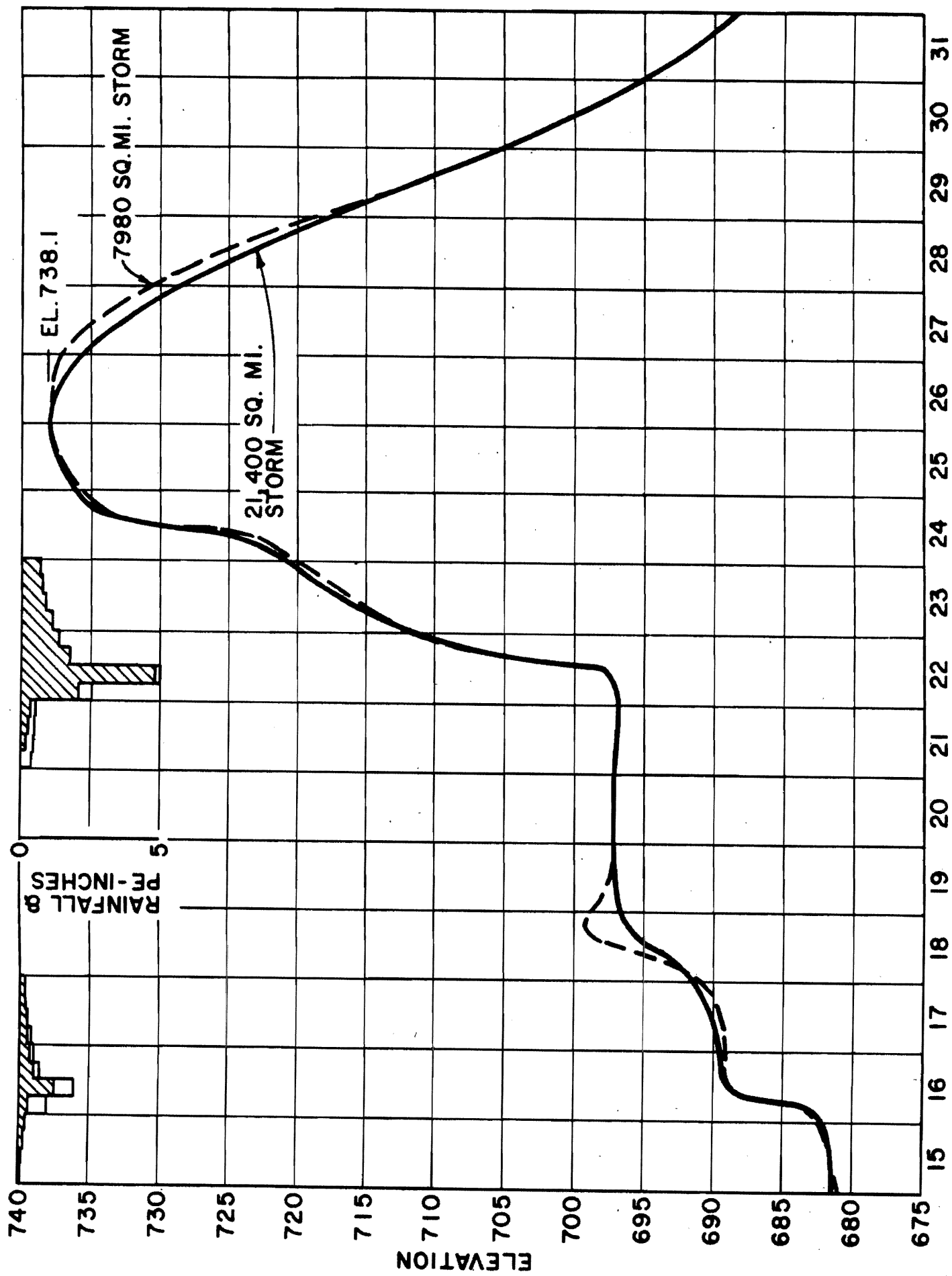
Figure 2.4-62 Relative Bore Height (After J. J. Stroker, REF. 31)



ASSUMED LIMITS OF EMBANKMENT FAILURE
WAVE EXPANSION
FIGURE 2.4-63

Revised by Amendment 39

Figure 2.4-63 Assumed Limits of Embankment Failure Wave Expansion



WATTS BAR NUCLEAR PLANT PROBABLE MAXIMUM FLOOD ELEVATION
FIGURE 2.4-64

Revised by Amendment 32

Figure 2.4-64 Watts Bar Nuclear Plant Probable Maximum Flood Elevation

Figure 2.4-65 thru Figure 2.4-67 Are Not Used

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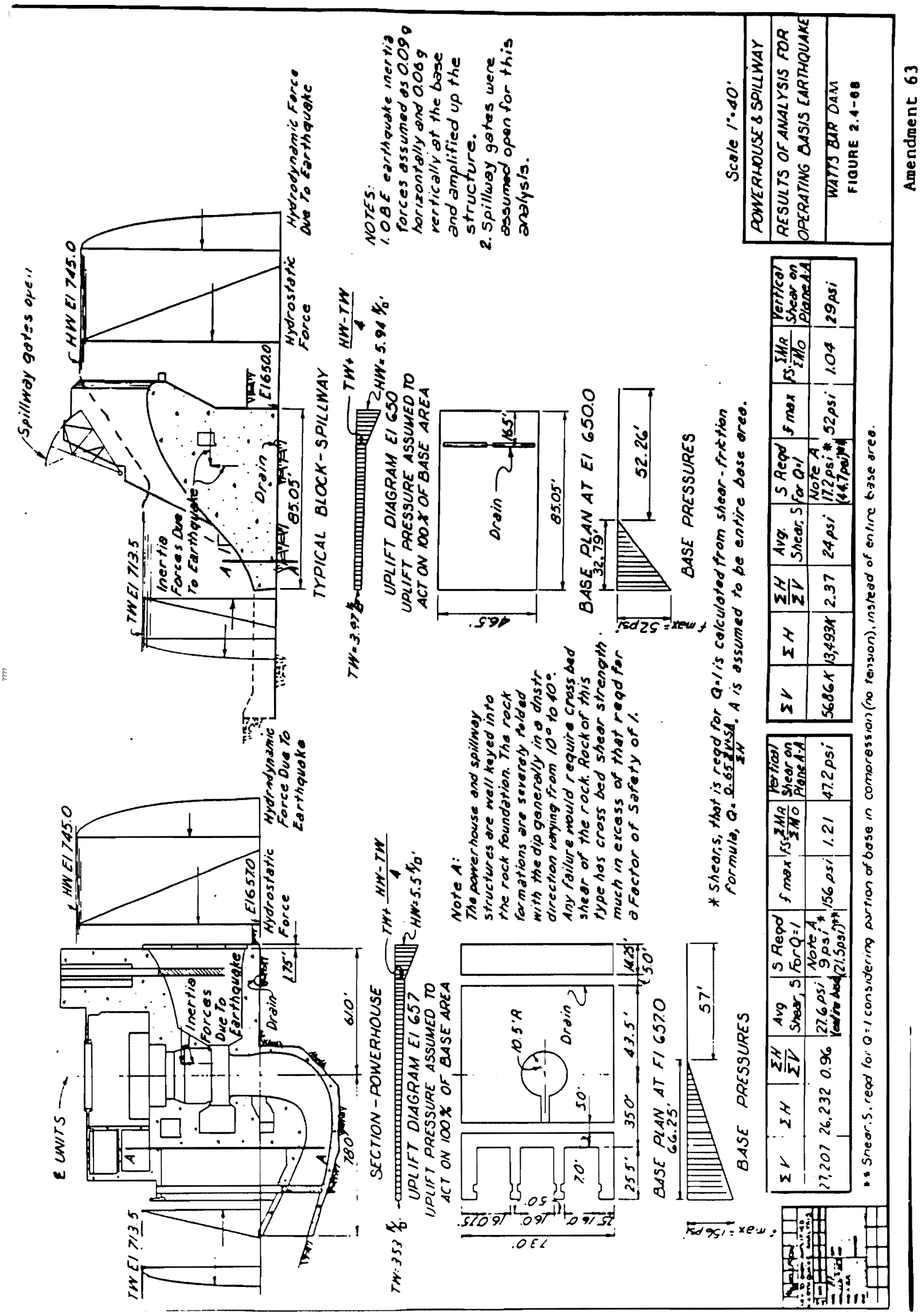
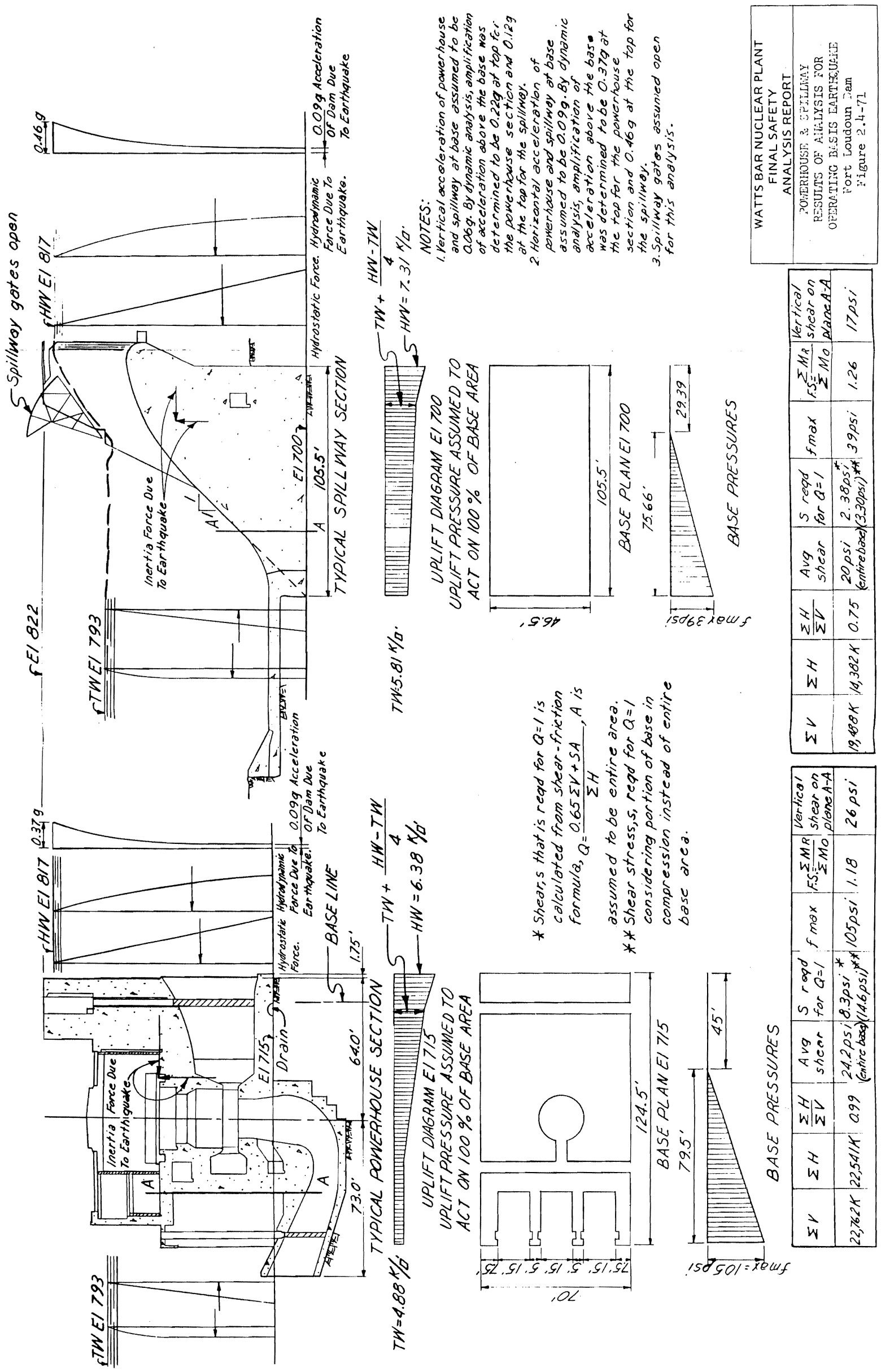


Figure 2.4-68 Powerhouse & Spillway Results of Analysis For Operating Basis Earthquake - Watts Bar Dam

Figure 2.4-69 Deleted by Amendment 103

Figure 2.4-70 Deleted by Amendment 83



ΣV	ΣH	ΣH/ΣV	Avg shear	S reqd for Q=1	f max	F.S. = ΣMR/ΣMo	Vertical shear on plane A-A
19,488K	14,382K	0.75	20psi (entire base)	2.38psi* (3.30psi)**	39psi	1.26	17psi

ΣV	ΣH	ΣH/ΣV	Avg shear	S reqd for Q=1	f max	F.S. = ΣMR/ΣMo	Vertical shear on plane A-A
22,762K	22,541K	0.99	24.2psi (entire base)	8.3psi* (14.6psi)**	105psi	1.18	26psi

Figure 2.4-71 Powerhouse & Spillway Results of Analysis For Operating Basis Earthquake - Fort Loudoun Dam

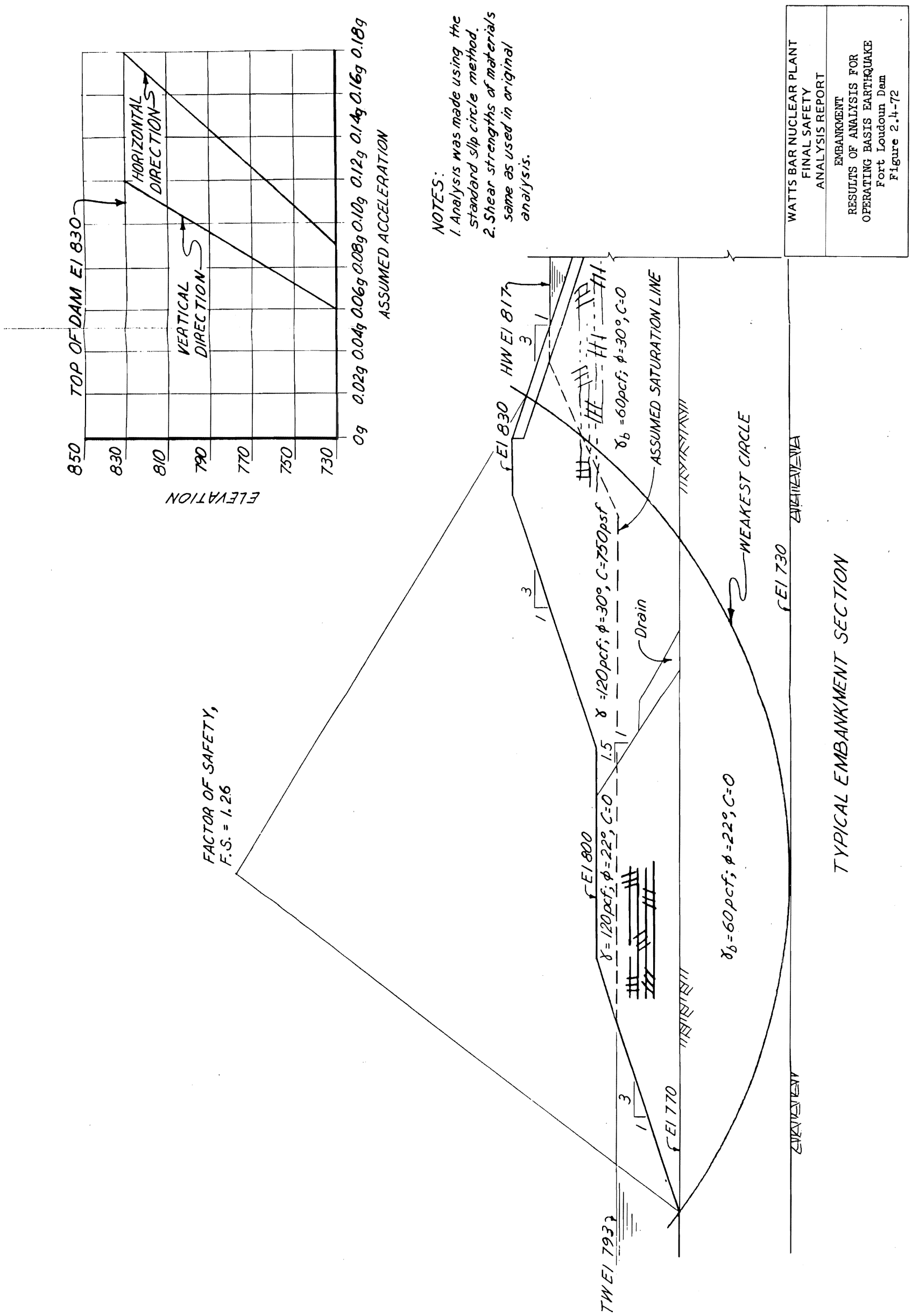


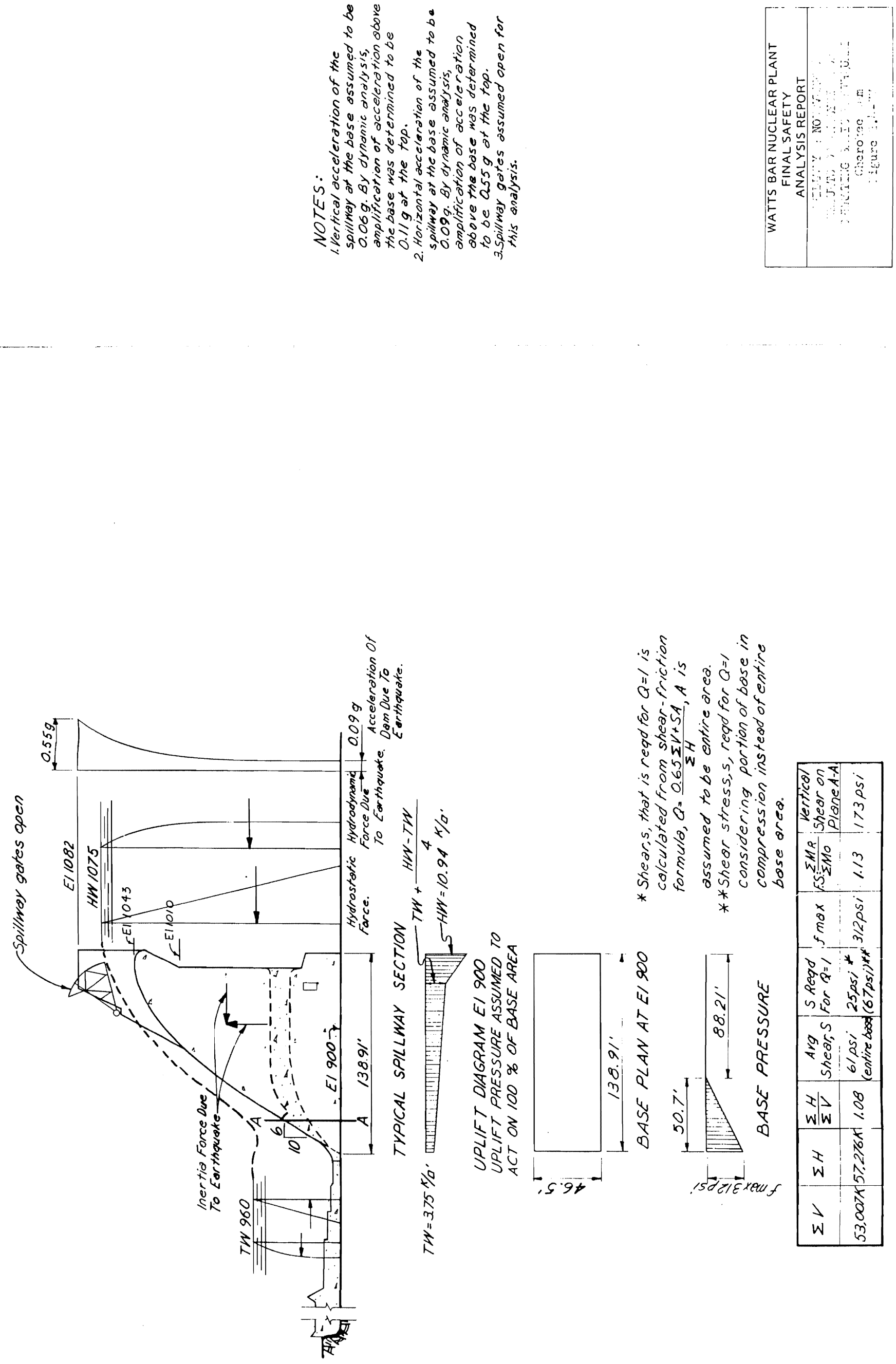
Figure 2.4-72 Embankment Results Of Analysis For Operating Basis Earthquake - Fort Loudoun Dam

Figure 2.4-73 Deleted by Amendment 103

Figure 2.4-74 Deleted by Amendment 103

Figure 2.4-75 Deleted by Amendment 103

Figure 2.4-76 Analysis For OBE & 1/2 PMF Assumed Condition of Dam After Failure Norris Dam



ΣV	ΣH	ΣH/ΣV	Avg Shear, S	S Reqd For Q=1	f max	FS: ΣMR/ΣMo	Vertical Shear on Plane A-A
53,007K	57,276K	1.08	61 psi (entire base)	25psi * (67psi)**	312psi	1.13	173 psi

Figure 2.4-77 Spillway & Nonoverflow Results of Analysis For Operating Basis Earthquake -Cherokee Dam

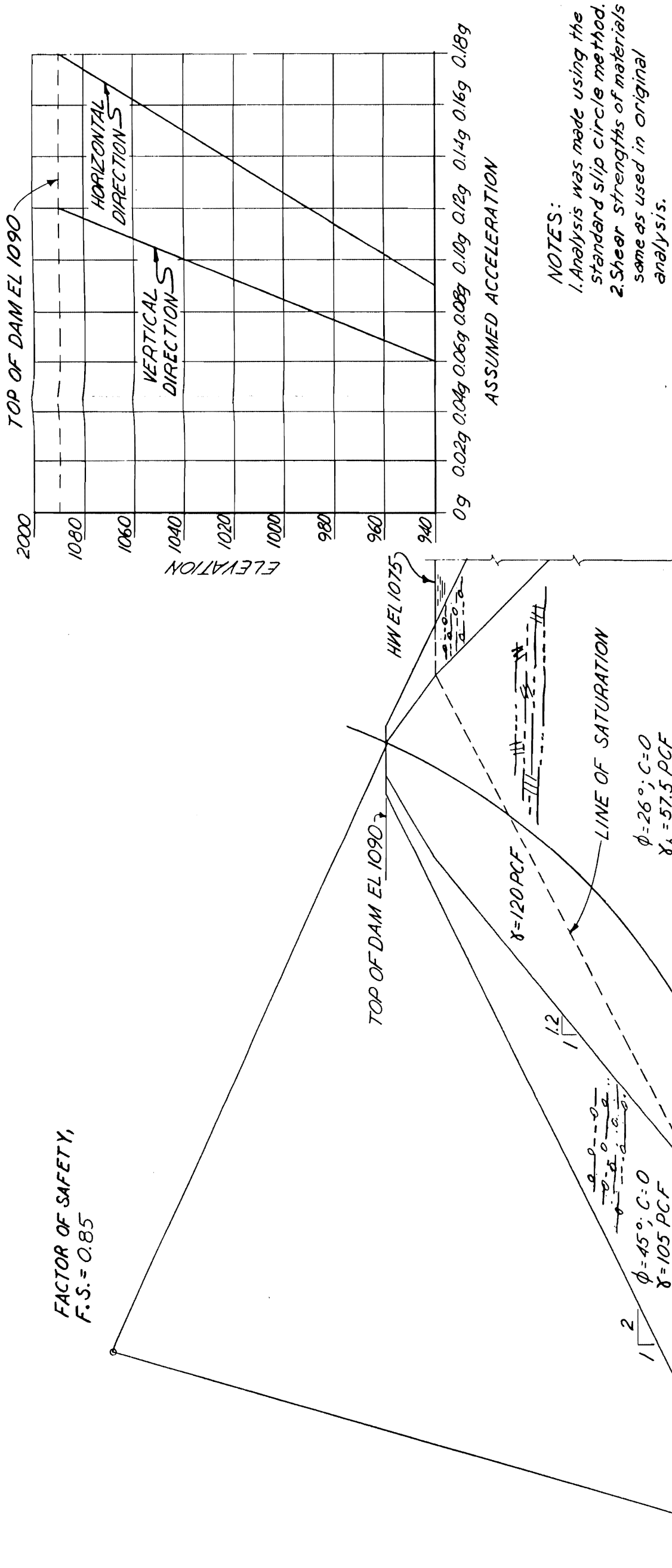
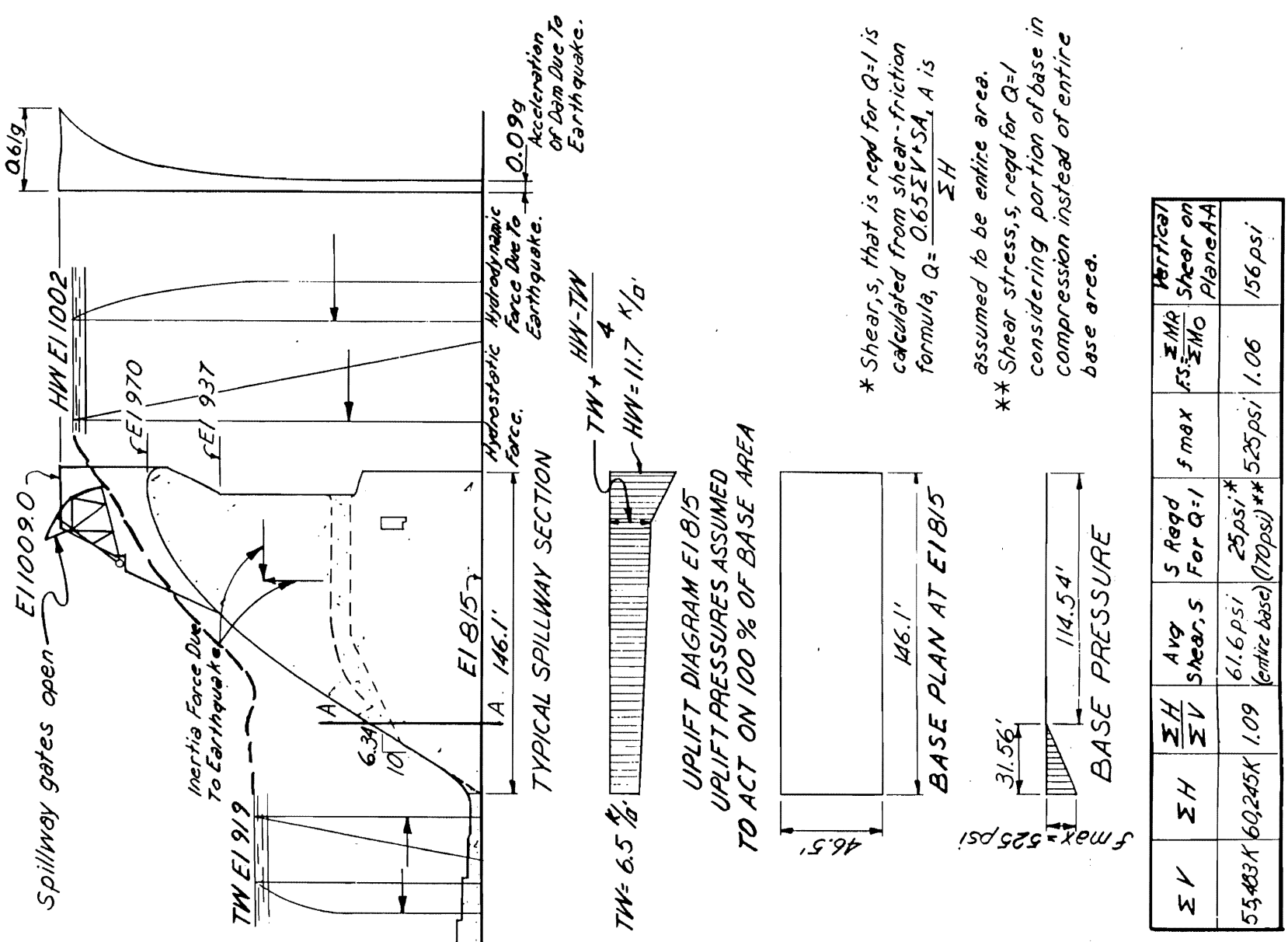


Figure 2.4-78 Embankment Results of Analysis For Operating Basis Earthquake - Cherokee Dam

Figure 2.4-79 Assumed Condition of Dam After Failure PBE And 1/2 Probable Max Flood - Cherokee Dam



ΣV	ΣH	ΣH/ΣV	Avg Shear, s	S Reqd For Q=1	f max	F.S.=ΣMR/ΣMO	Vertical Shear on Plane A-A
53,483K	60,245K	1.09	61.6 psi (entire base)	25psi* (170psi)**	525psi	1.06	156psi

Figure 2.4-80 Spillway & Nonoverflow Results of Analysis For Operating Basis Earthquake - Douglas Dam

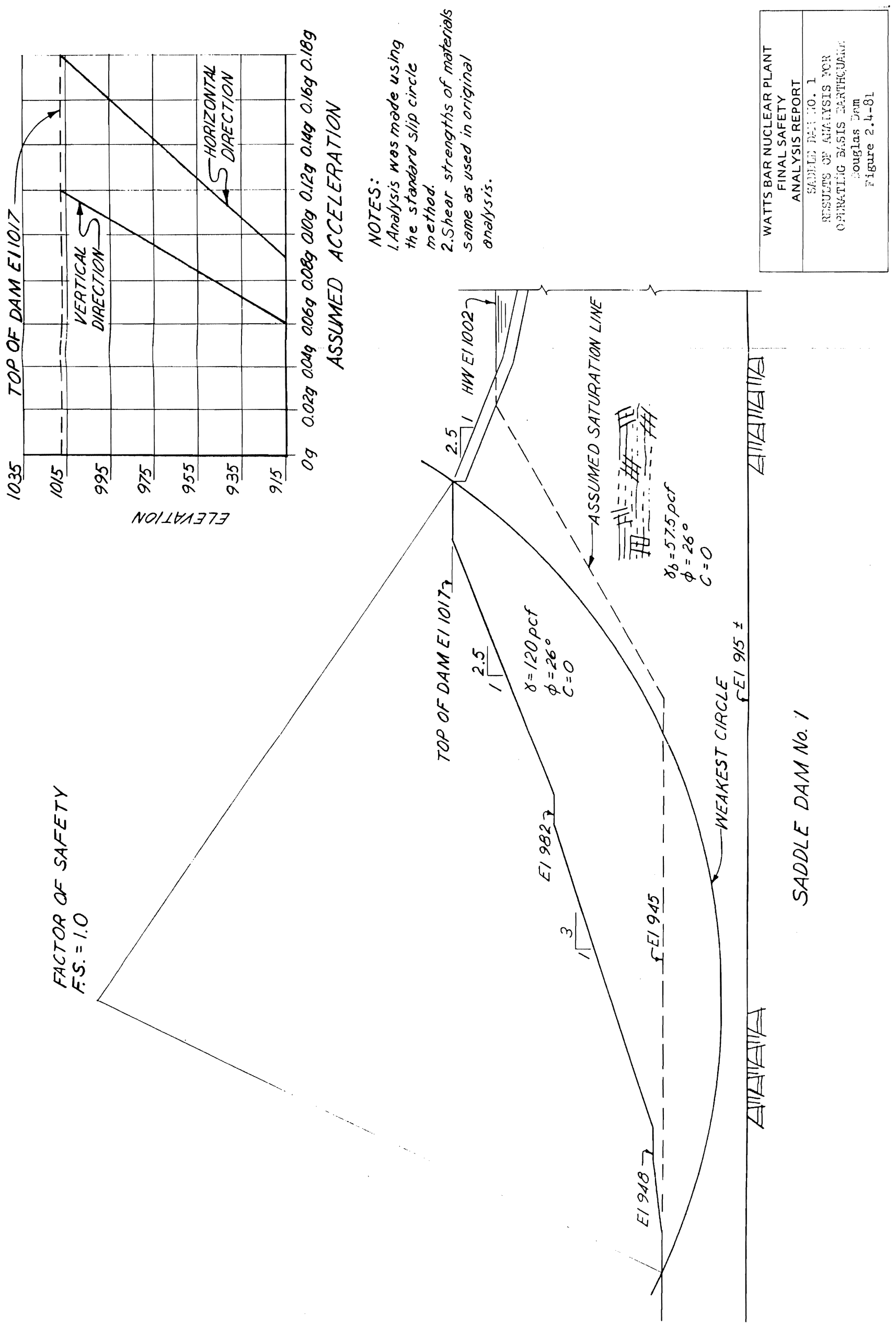


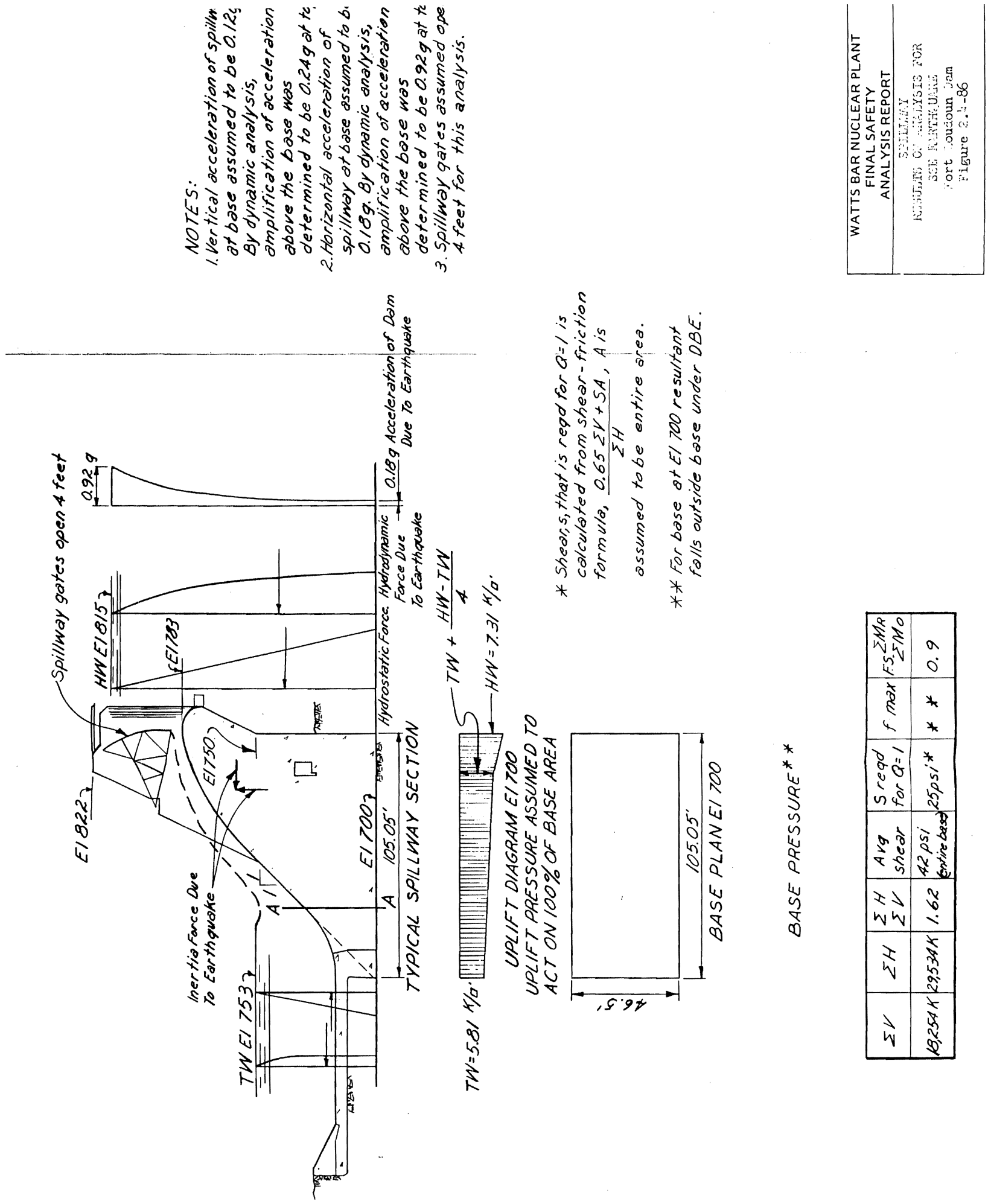
Figure 2.4-81 Saddle Dam No. 1 Results of Analysis For Operating Basis Earthquake - Douglas Dam

Figure 2.4-82 Douglas Dam Assumed Condition of Dam After Failure aBE And 1/2 Probable Maximum Flood - Douglas Project

Figure 2.4-83 Fontana Dam Assumed Condition of Dam after Failure OBE And 1/2 Probable Maximum Flood

Figure 2.4-84 Deleted by Amendment 63

Figure 2.4-85 Deleted by Amendment 63



ΣV	ΣH	ΣH/ΣV	Avg shear	S reqd for Q=1	f max	F.S. ΣMR/ΣMO
18,254 K	29,534 K	1.62	42 psi (entire base)	25 psi*	**	0.9

Figure 2.4-86 Spillway Results of Analysis For SSE Earthquake Fort Loudoun Dam

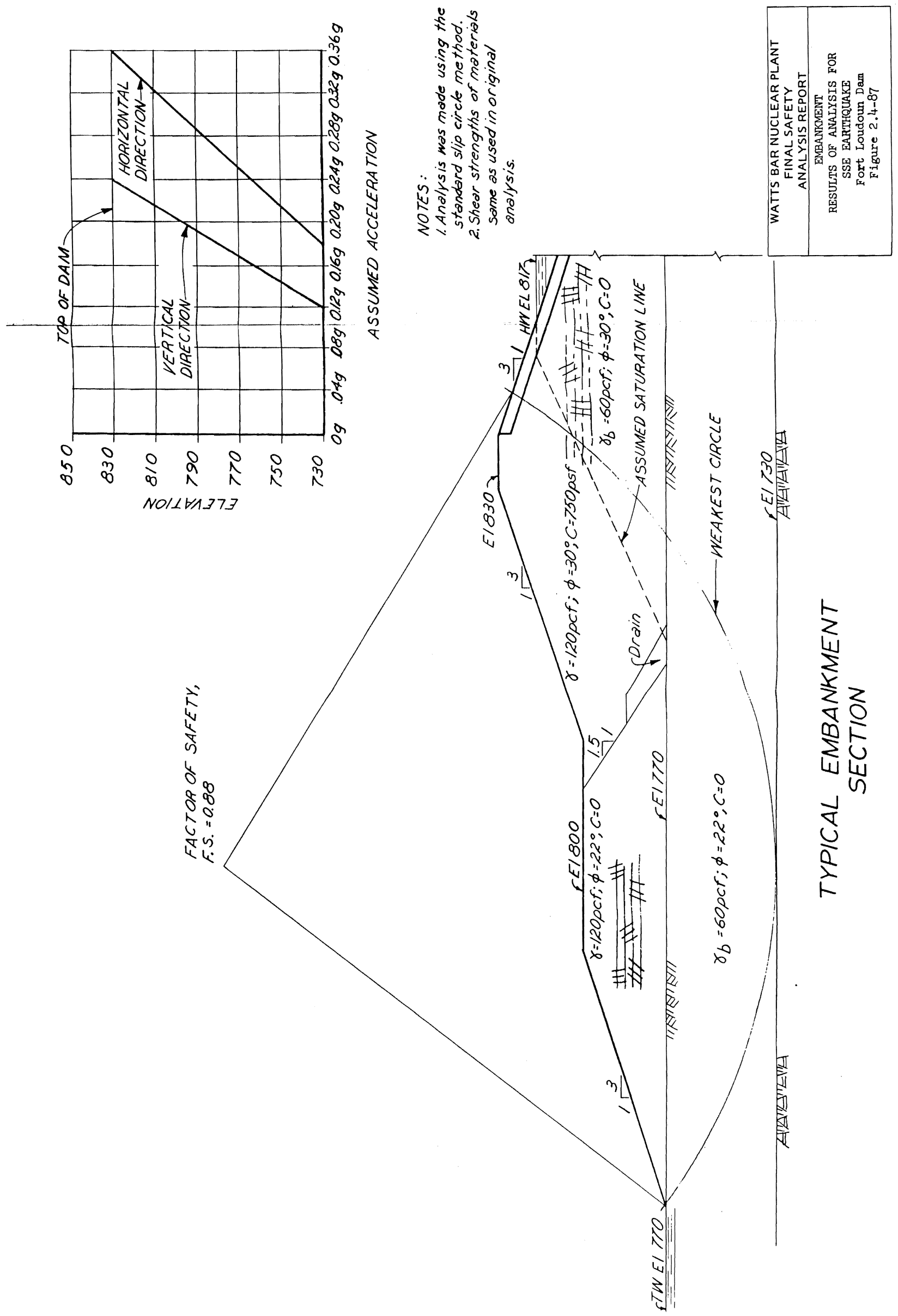


Figure 2.4-87 Embankment Results of Analysis For SSE Earthquake Fort Loudoun Dam

Figure 2.4-88 Fort Loudoun Dam Assumed Condition of Dam After Failure SSE Combined With a 25 Year Flood - Fort Loudoun Dam

Figure 2.4-89 Tellico Dam Assumed Condition of Dam After Failure SSE Combined With a 25 Year Flood Tellico Project

Figure 2.4-90 Norris Dam SSE + 25 Year Flood Judged Condition of Dam After Failure - Norris Dam

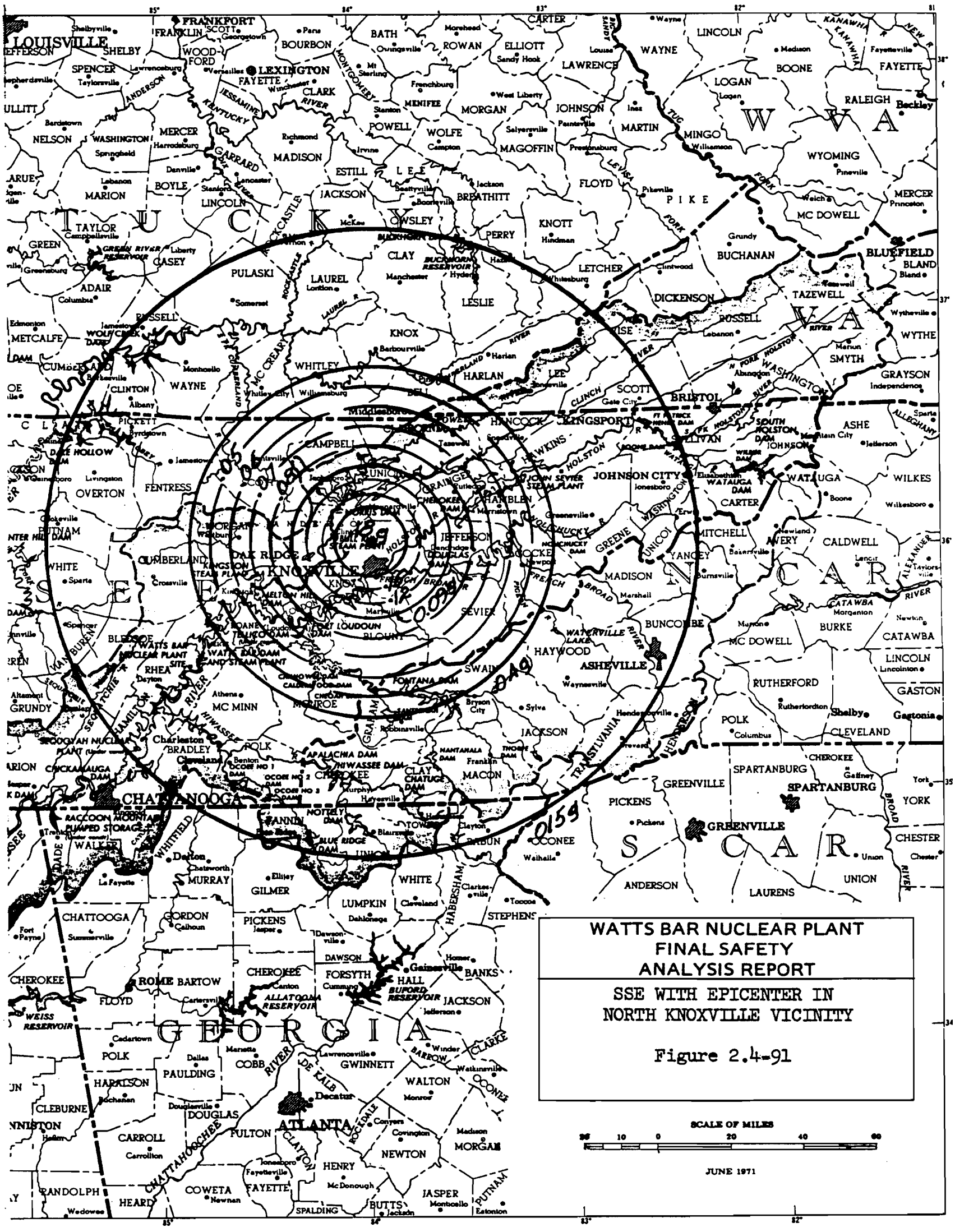


Figure 2.4-91 SSE With Epicenter In North Knoxville Vicinity

Figure 2.4-92 Deleted by Amendment 103

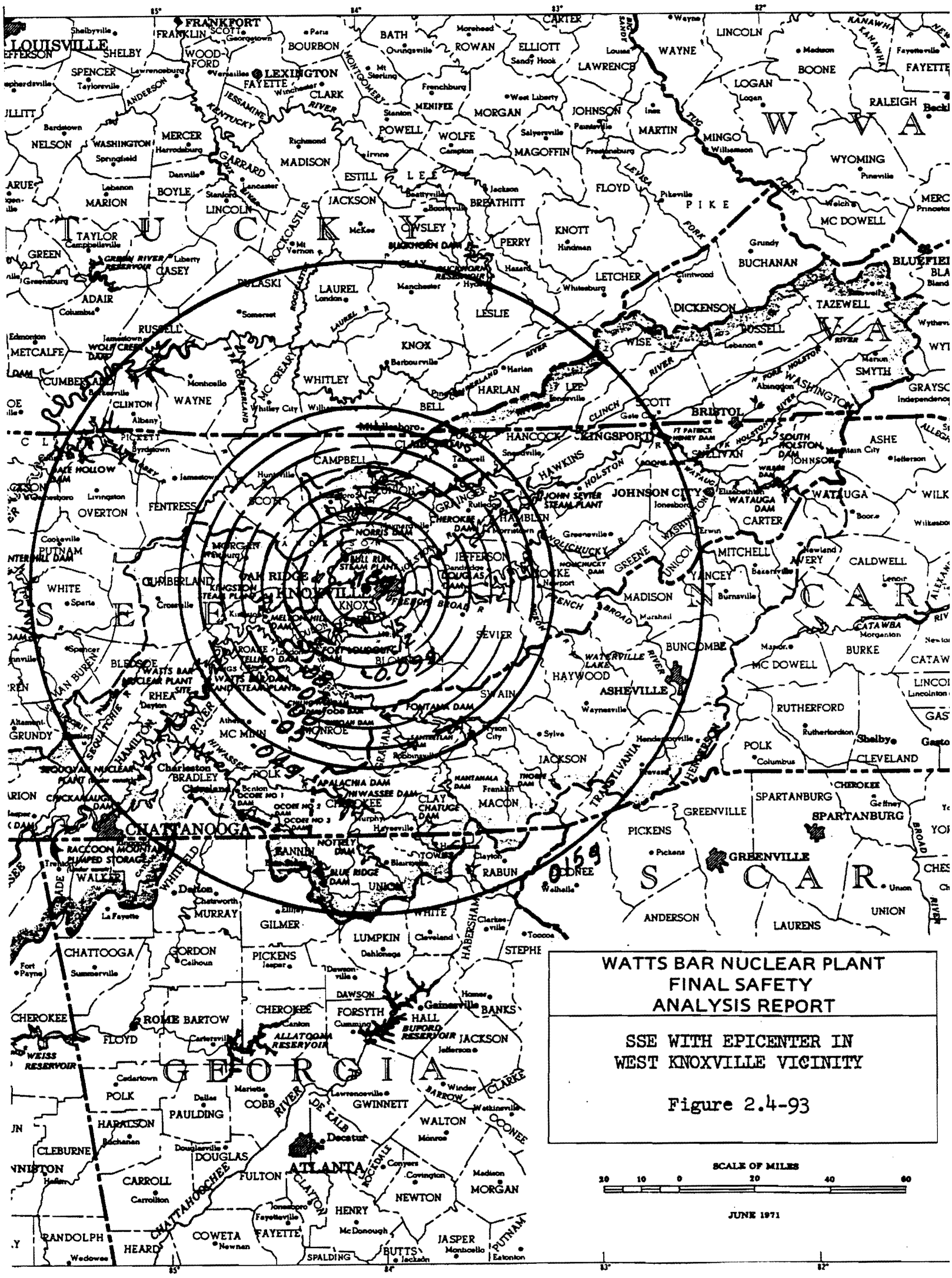


Figure 2.4-93 SSE With Epicenter In West Knoxville Vicinity

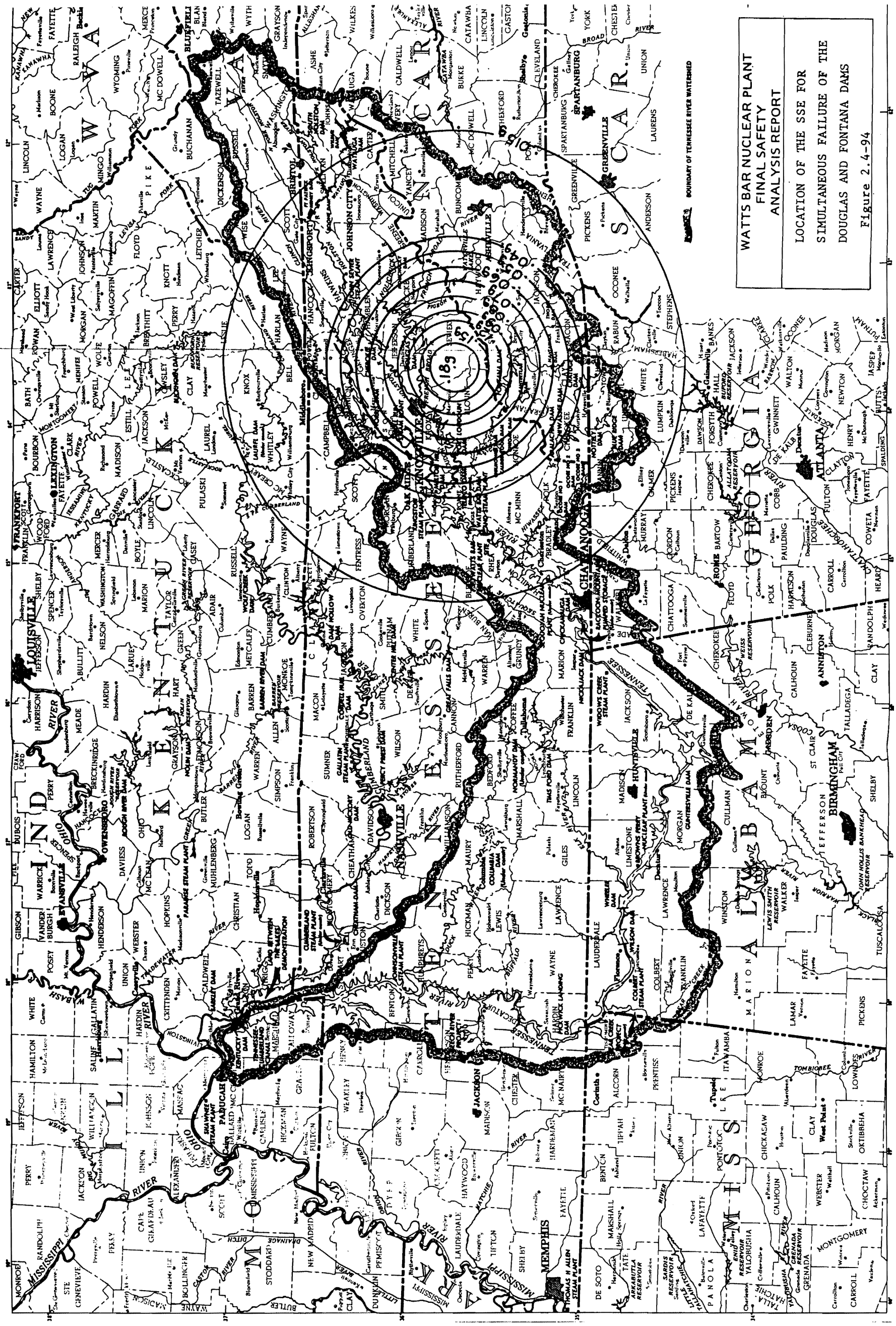


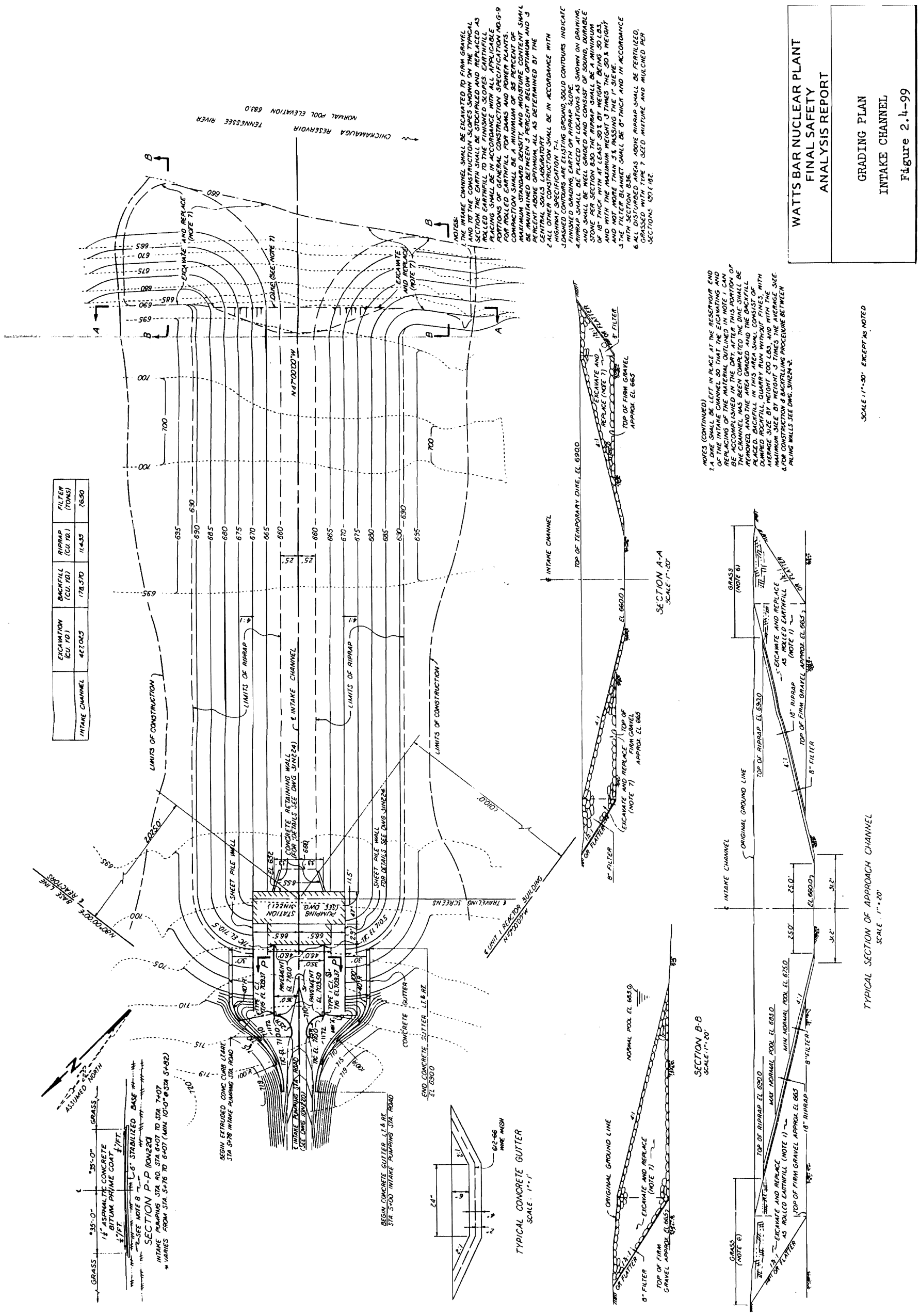
Figure 2.4-94 Location of SSE For Simultaneous Failure of The Douglas and Fontana Dams

Figure 2.4-95 Deleted by Amendment 103

Figure 2.4-96 Deleted by Amendment 103

Figure 2.4-97 Deleted by Amendment 103

Figure 2.4-98 Not Used

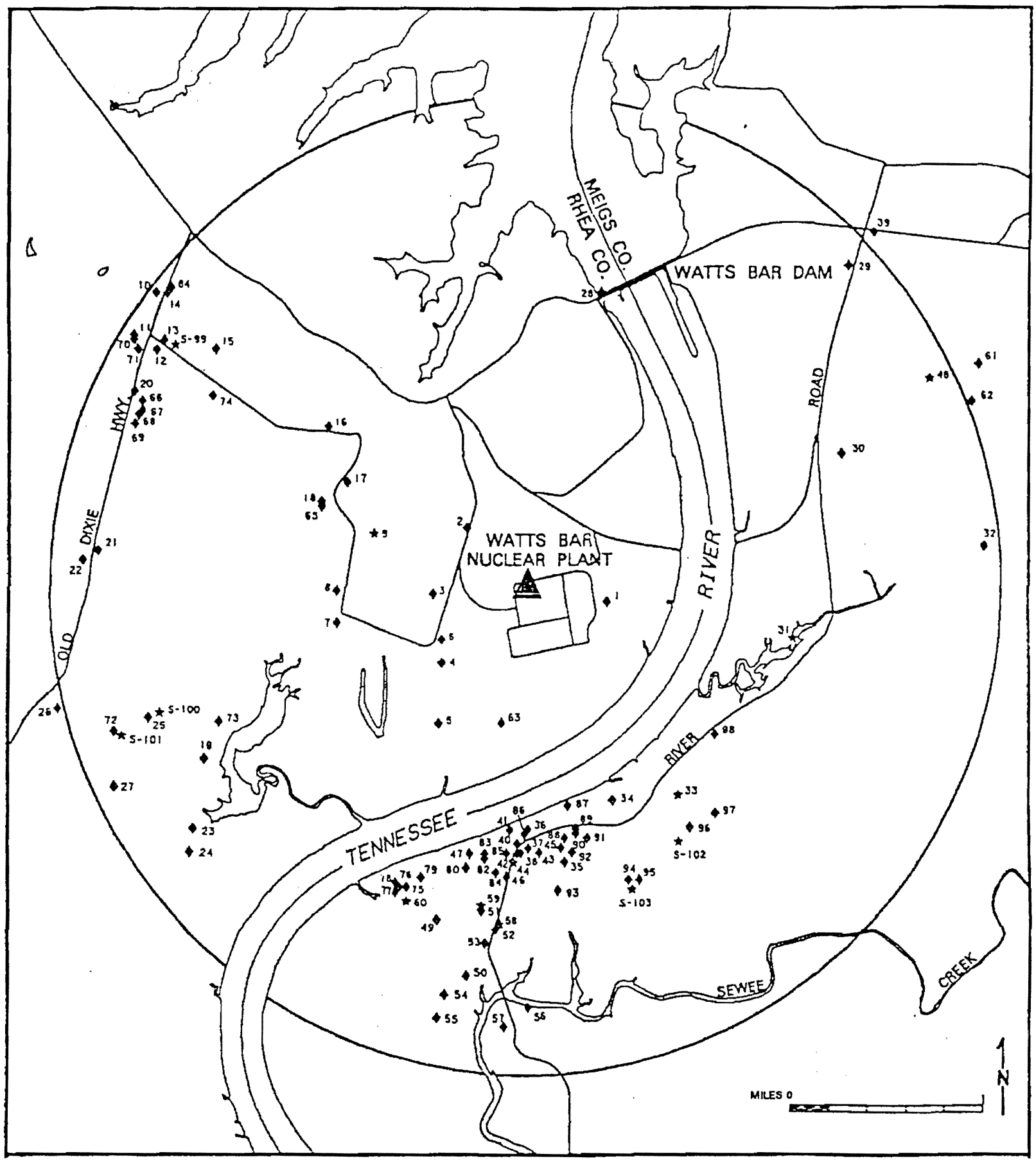


	EXCAVATION (CU. YD.)	BACKFILL (CU. YD.)	RIPRAP (CU. YD.)	FILTER (TONS)
INTAKE CHANNEL	427,025	179,570	11,435	7,650

Figure 2.4-99 Grading Plan Intake Channel

Figure 2.4-100 Deleted by Amendment 83

Figure 2.4-101 Deleted by Amendment 33



LEGEND

- ♦ WELL
- ★ SPRING
- — ROADS
- ○ 2 MILE RADIUS OF PLANT SITE

AMENDMENT 83

WATTS BAR NUCLEAR PLANT
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WELL AND SPRING INVENTORY
WITHIN 2 MILE RADIUS OF WATTS BAR
NUCLEAR PLANT SITE
FSAR FIG 2.4-102

Figure 2.4-102 Wells And Spring Inventory Within 2-Mile Radius of Watts Bar Nuclear Plant Site

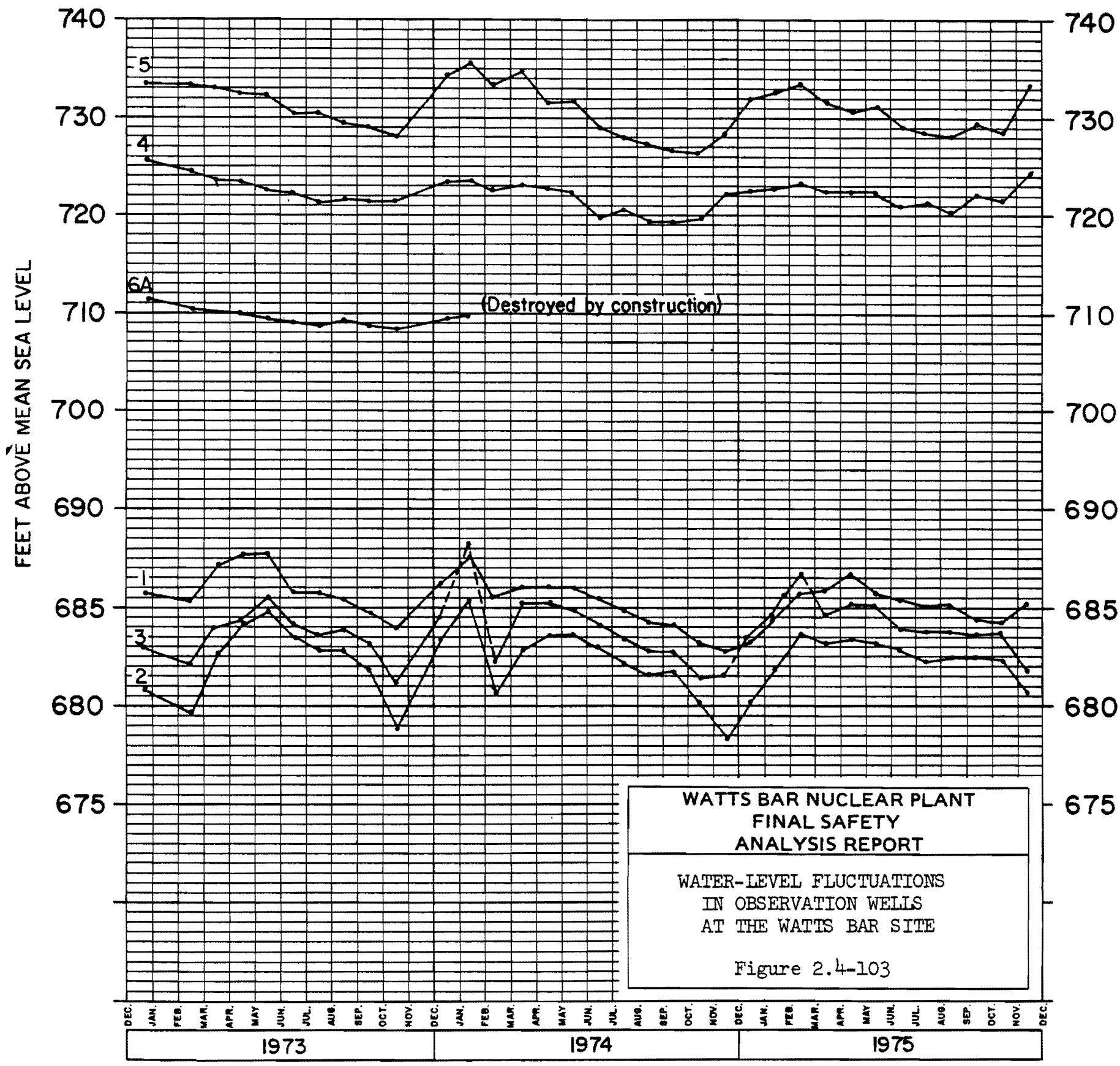
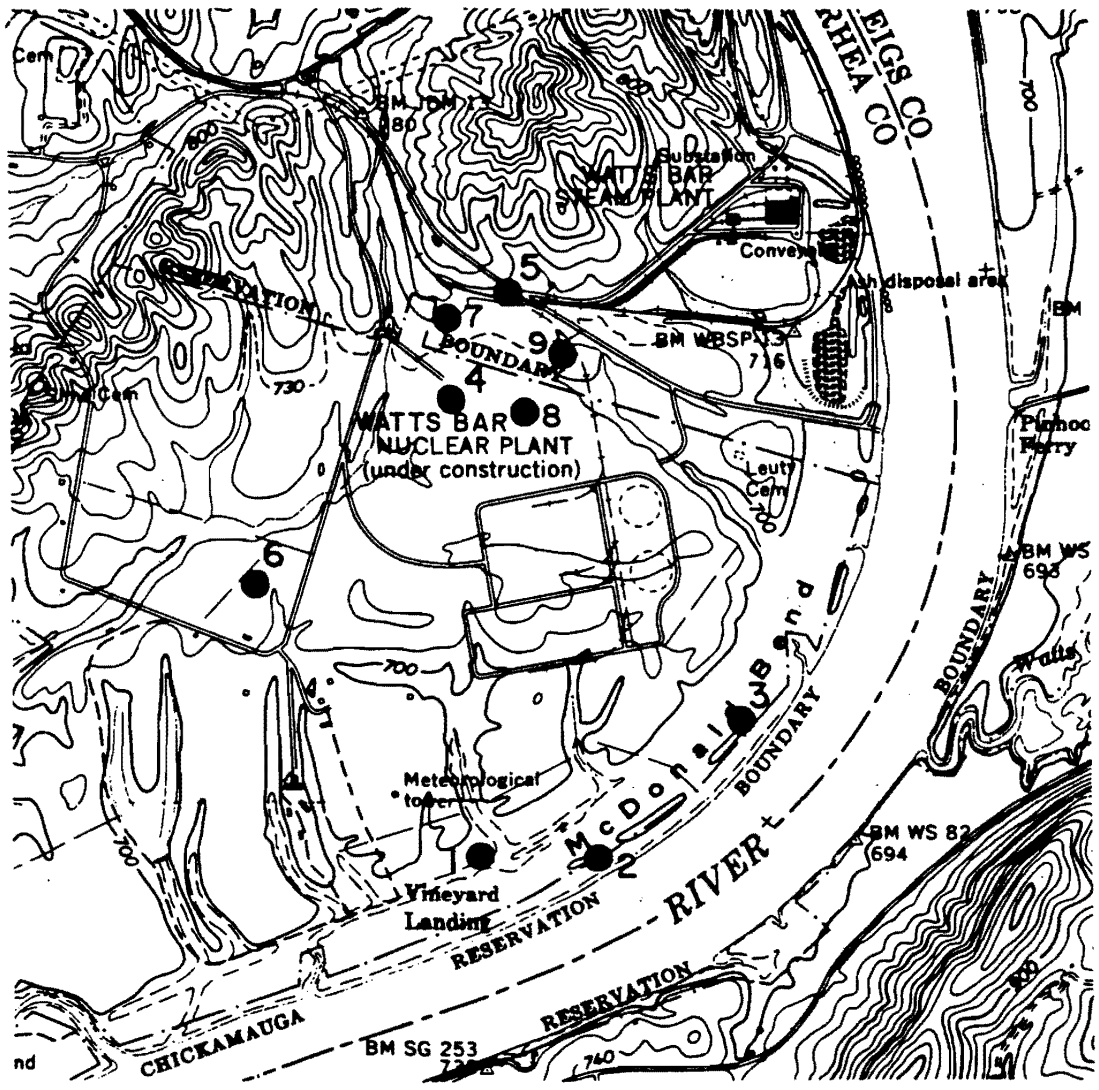


Figure 2.4-103 Water-Level Fluctuations In Observation Wells at The Watts Bar Site



NOTE:

Topographic base from U.S.G.S - T.V.A. 7.5 minute quadrangle, Decatur, Tenn., 118-SE, Contour interval 20 feet.

LEGEND:

●2 — Ground-water observation well showing number.

SCALE:

1000 0 1000 2000 Feet

Revised by Amendment 50

WATTS BAR NUCLEAR PLANT
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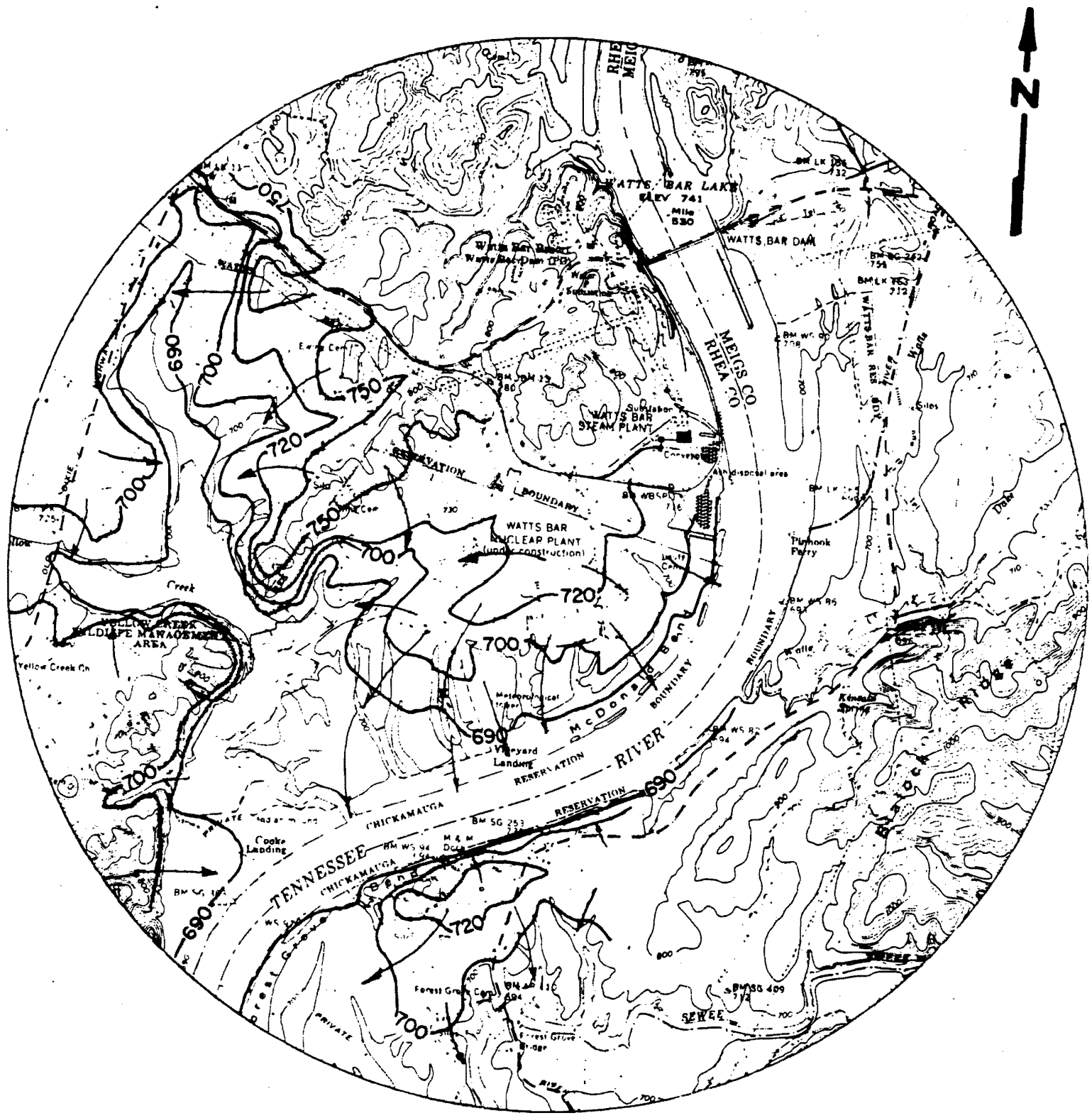
ANALYSIS REPORT

LOCATIONS OF
GROUND - WATER
OBSERVATION WELLS
FIGURE 2.4-104

Figure 2.4-104 Locations of Ground - Water Observation Wells



EXPLANATION:

700 — Water table contour, in feet above mean sea level.

— General direction of ground-water movement.

SCALE:

2000 0 4000 Feet

Revised by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

GENERALIZED WATER-TABLE
CONTOUR MAP

Figure 2.4-105

Figure 2.4-105 Generalized Water-Table Contour Map January 1972

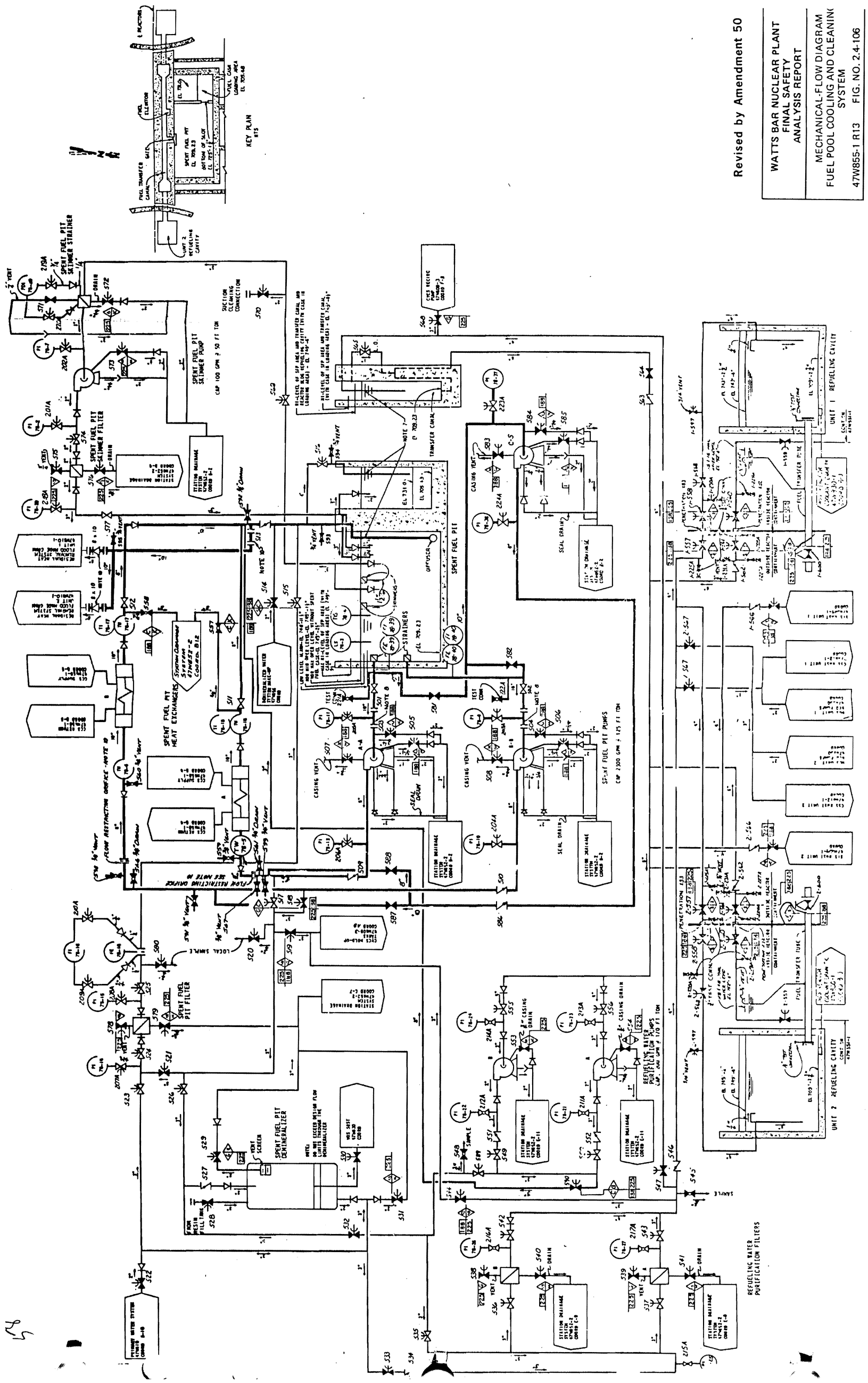


Figure 2.4-106 Mechanical - Flow Diagram Fuel Pool Cooling and Cleaning System

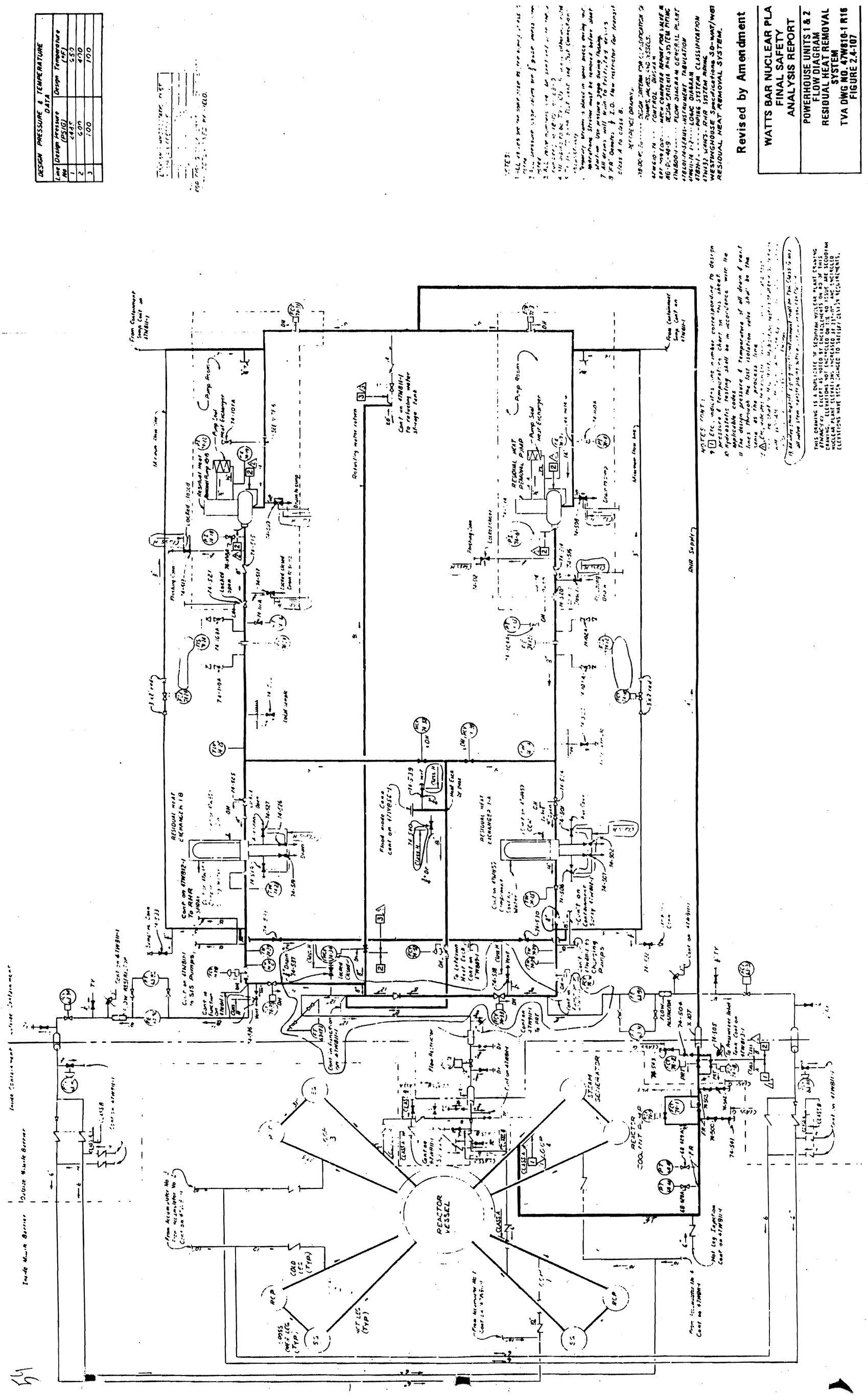


Figure 2.4-107 Powerhouse Units 1 & 2 Flow Diagram - Residual Heat Removal System

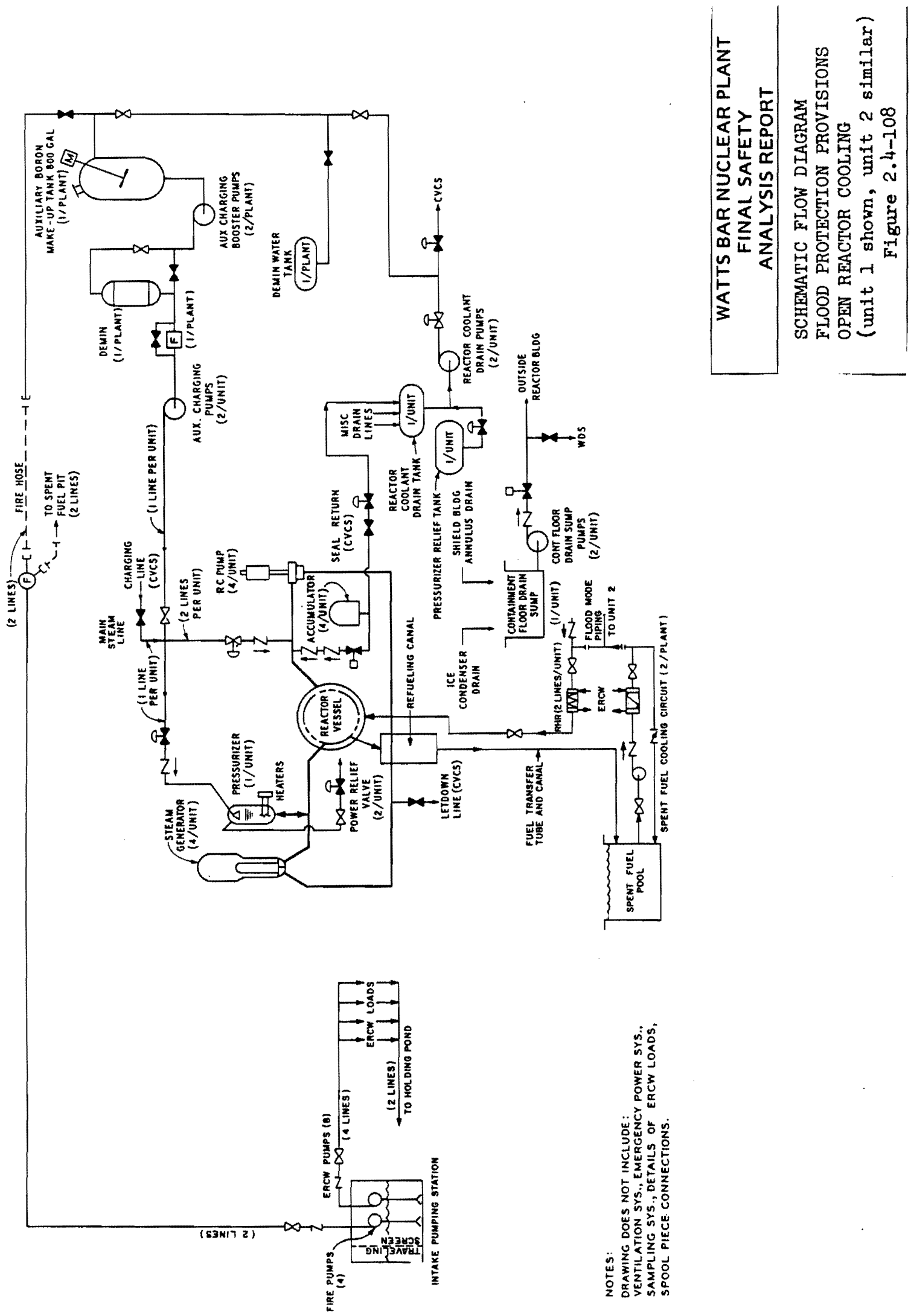


Figure 2.4-108 Schematic Flow Diagram Flood Protection Provisions Open Reactor Cooling (Unit 1 Shown, Unit 2 Similar)

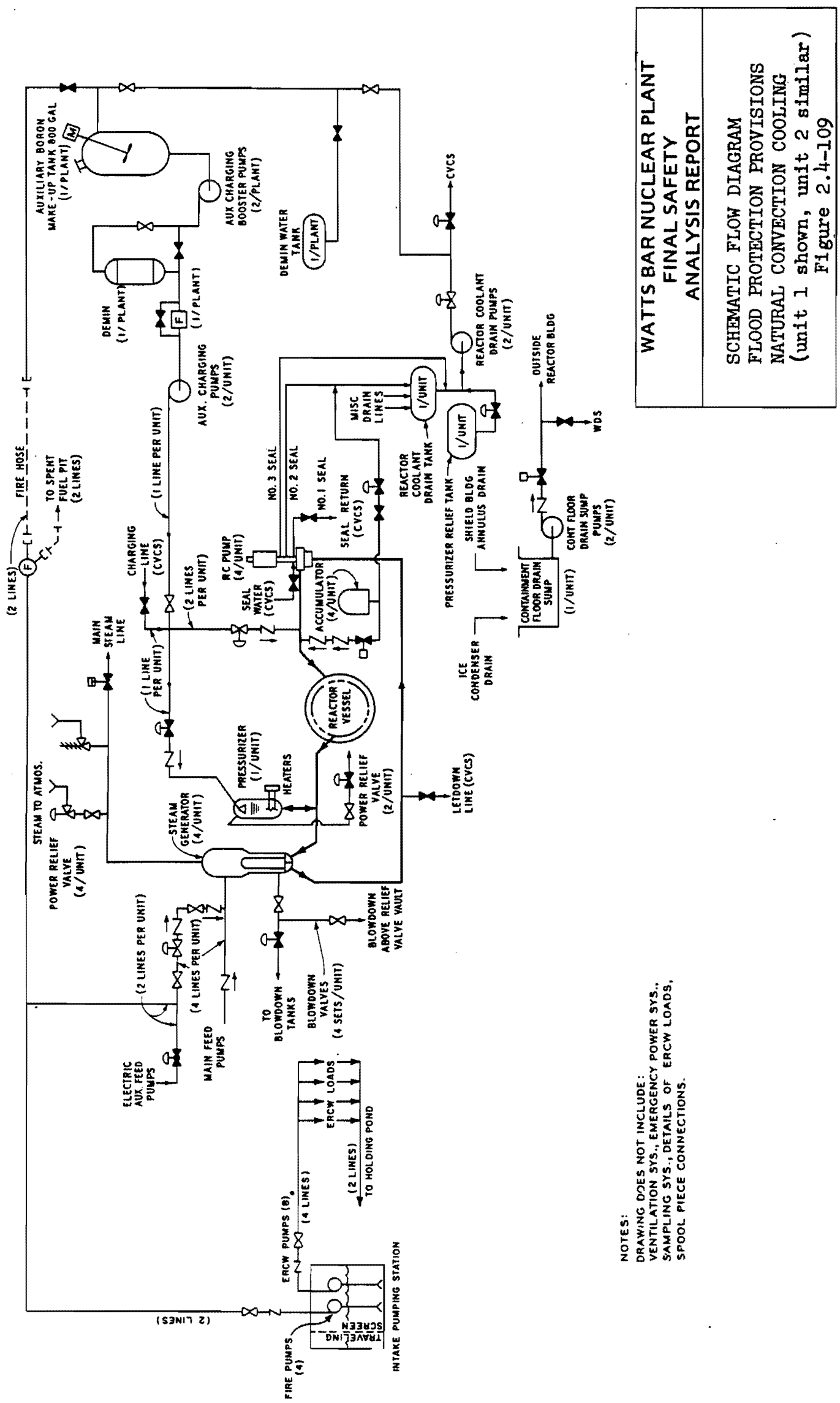
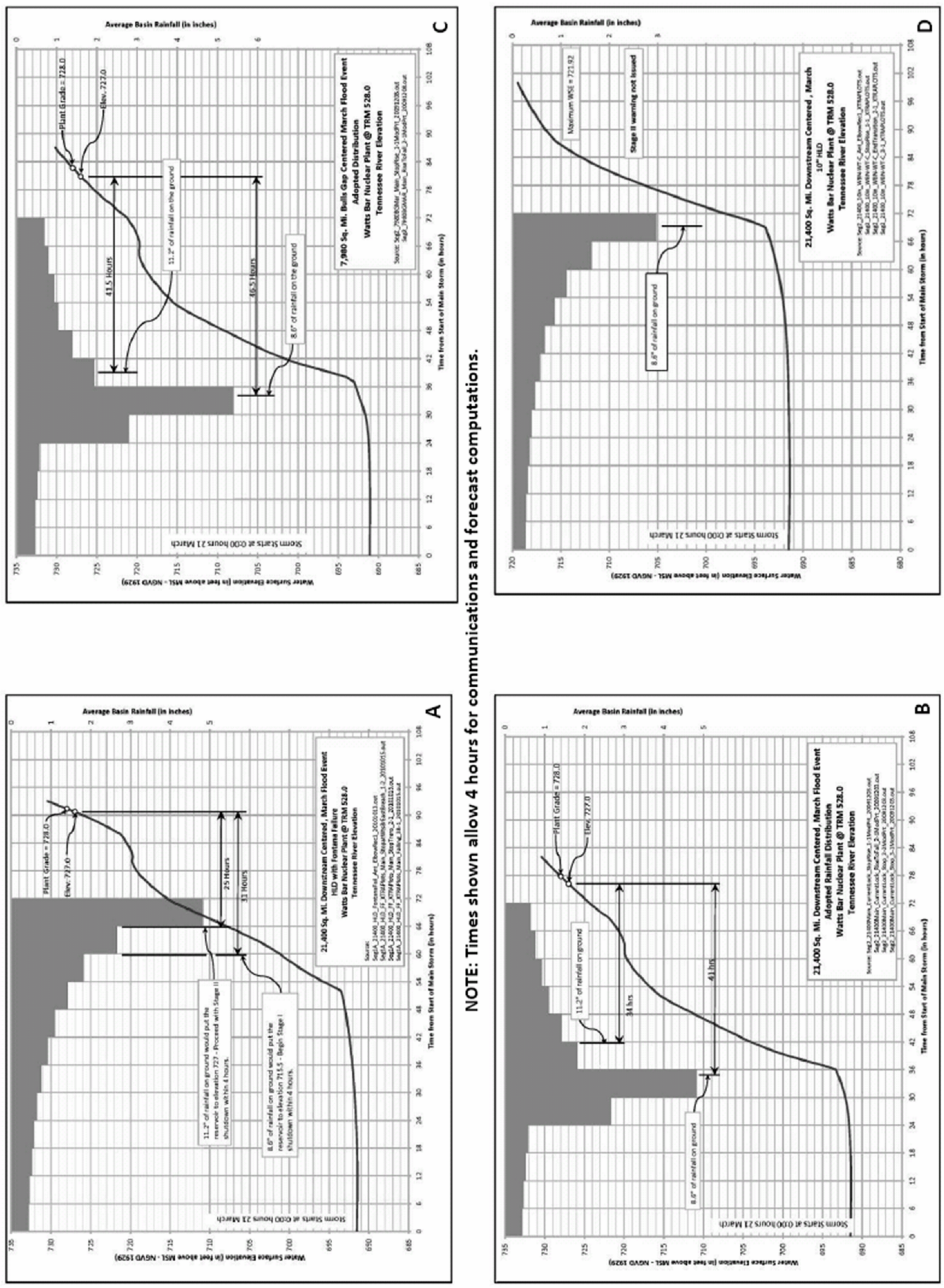
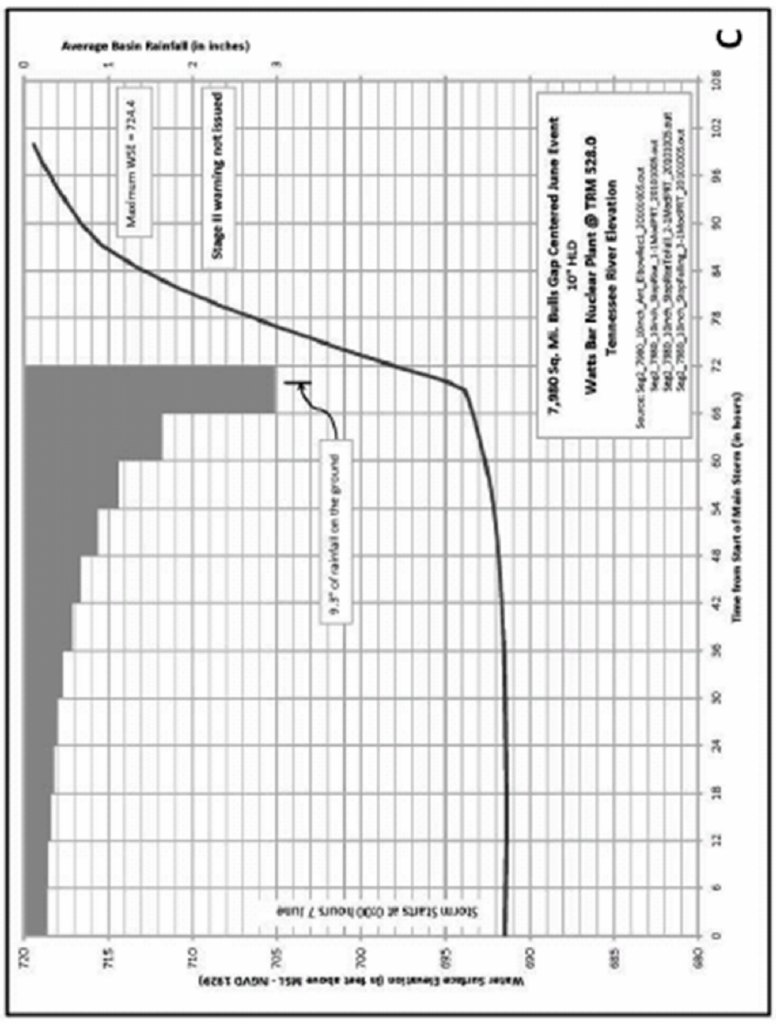


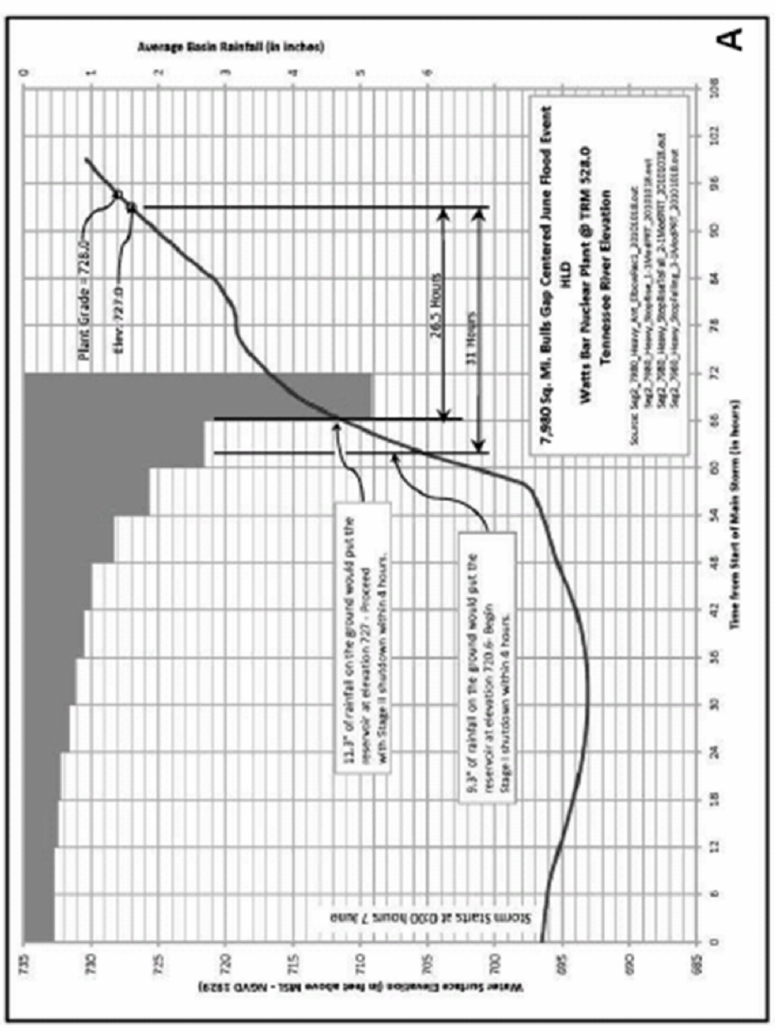
Figure 2.4-109 Schematic Flow Diagram Flood Protection Provisions Natural Convection Cooling (Unit 1 Shown, Unit 2 Similar)



NOTE: Times shown allow 4 hours for communications and forecast computations.

Figure 2.4-110 (Sheet 1) Watts Bar Nuclear Plant Rainfall Flood Warning Time Basis For Safe Shutdown For Plant Flooding - Winter Events





NOTE: Times shown allow 4 hours for communications and forecast computations.

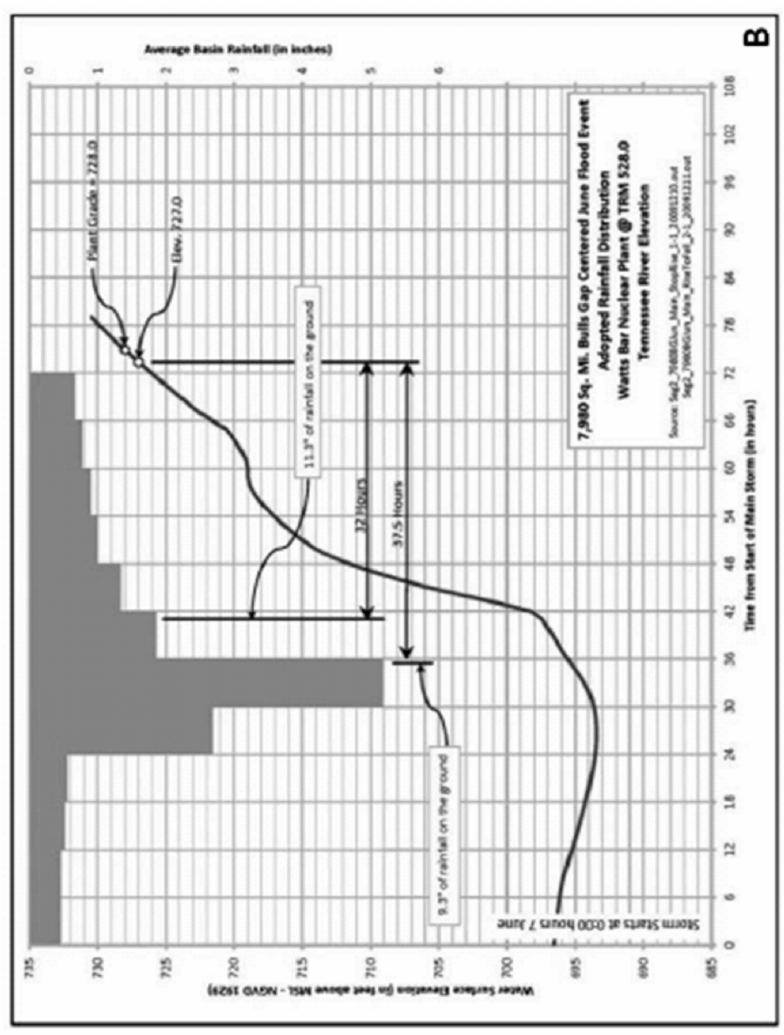


Figure 2.4-110 (Sheet 2) Watts Bar Nuclear Plant Rainfall Flood Warning Time Basis For Safe Shutdown For Plant Flooding - Summer Events

Figure 2.4-111 Deleted by Amendment 103

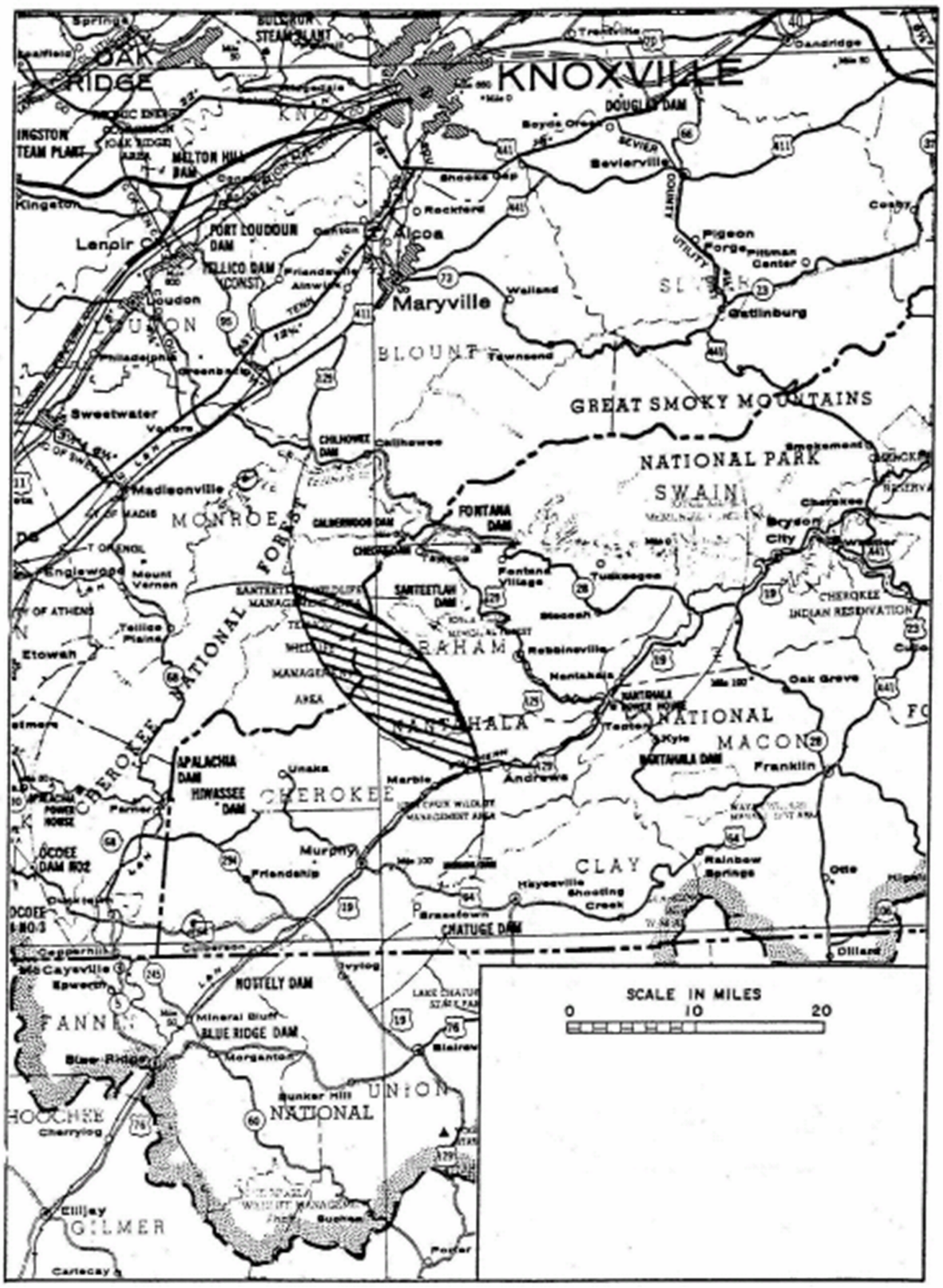


Figure 2.4-112 OBE with Epicenter Within Area Shown

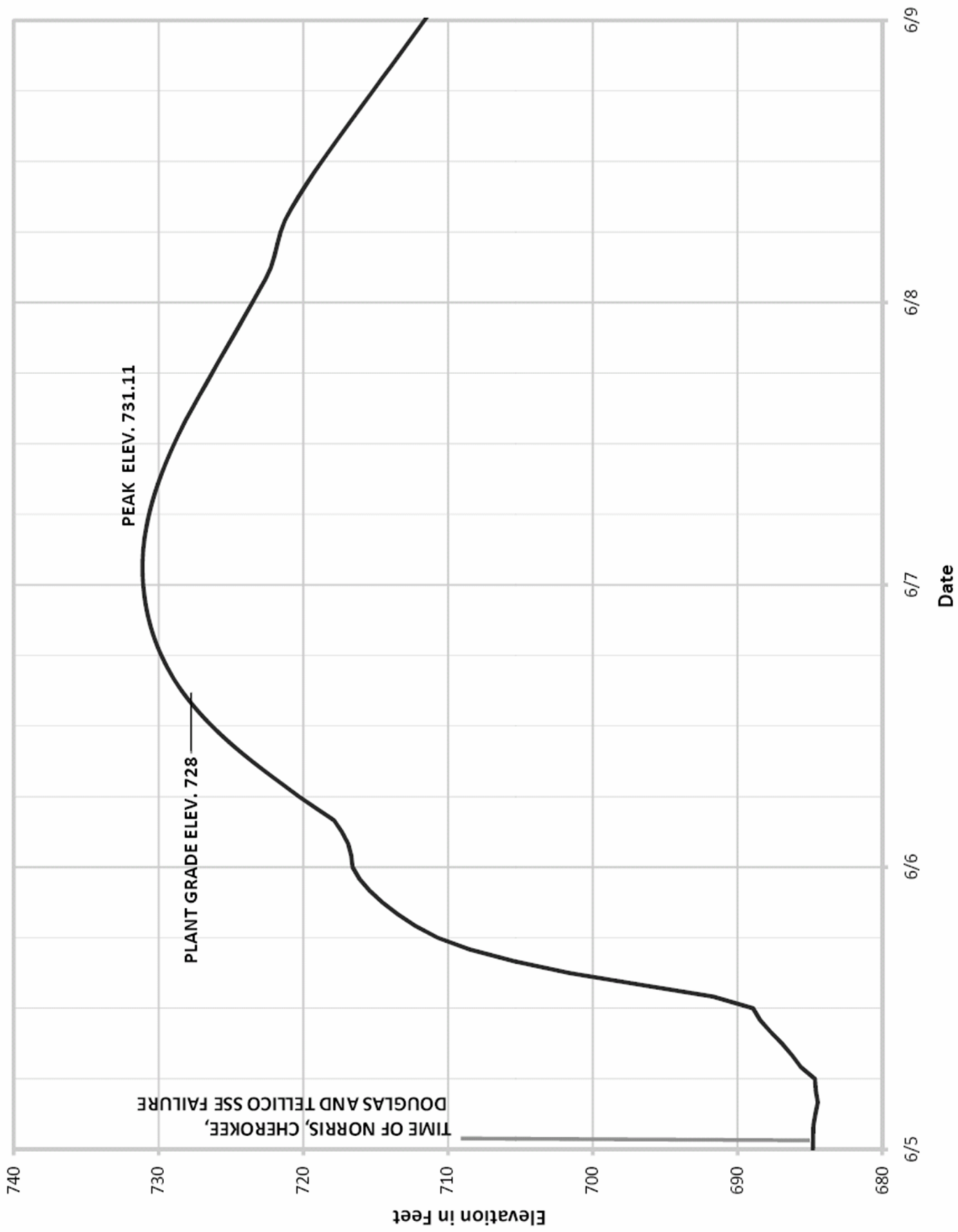


Figure 2.4-113 SSE Failure of Norris, Cherokee, Douglas, and Tellico Dams with 25-Year Flood Failure Wave at Watts Bar Nuclear Plant

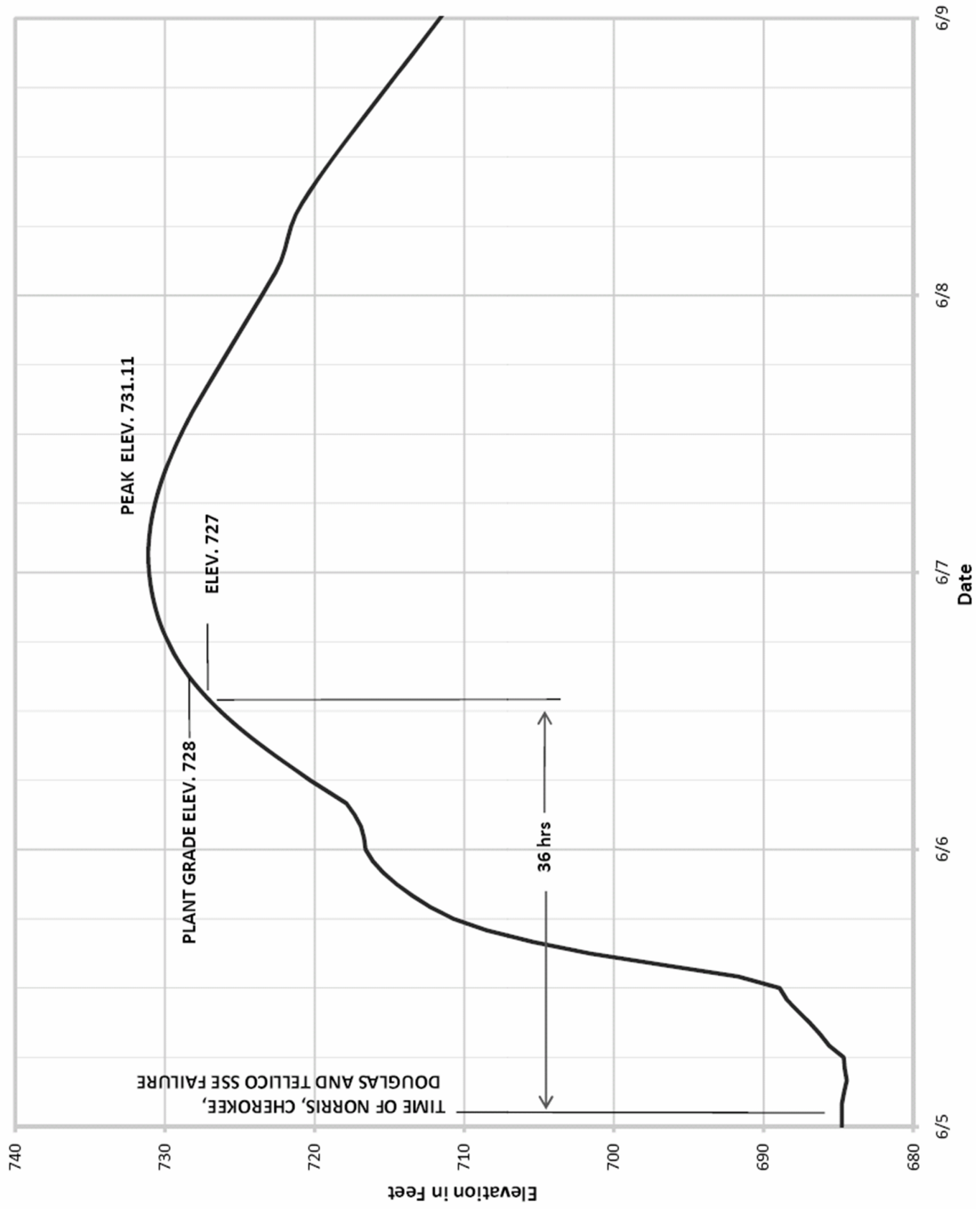


Figure 2.4-114 SSE Failure of Norris, Cherokee, Douglas, and Tellico Dams with 25-Year Flood Failure Wave at Watts Bar Nuclear Plant

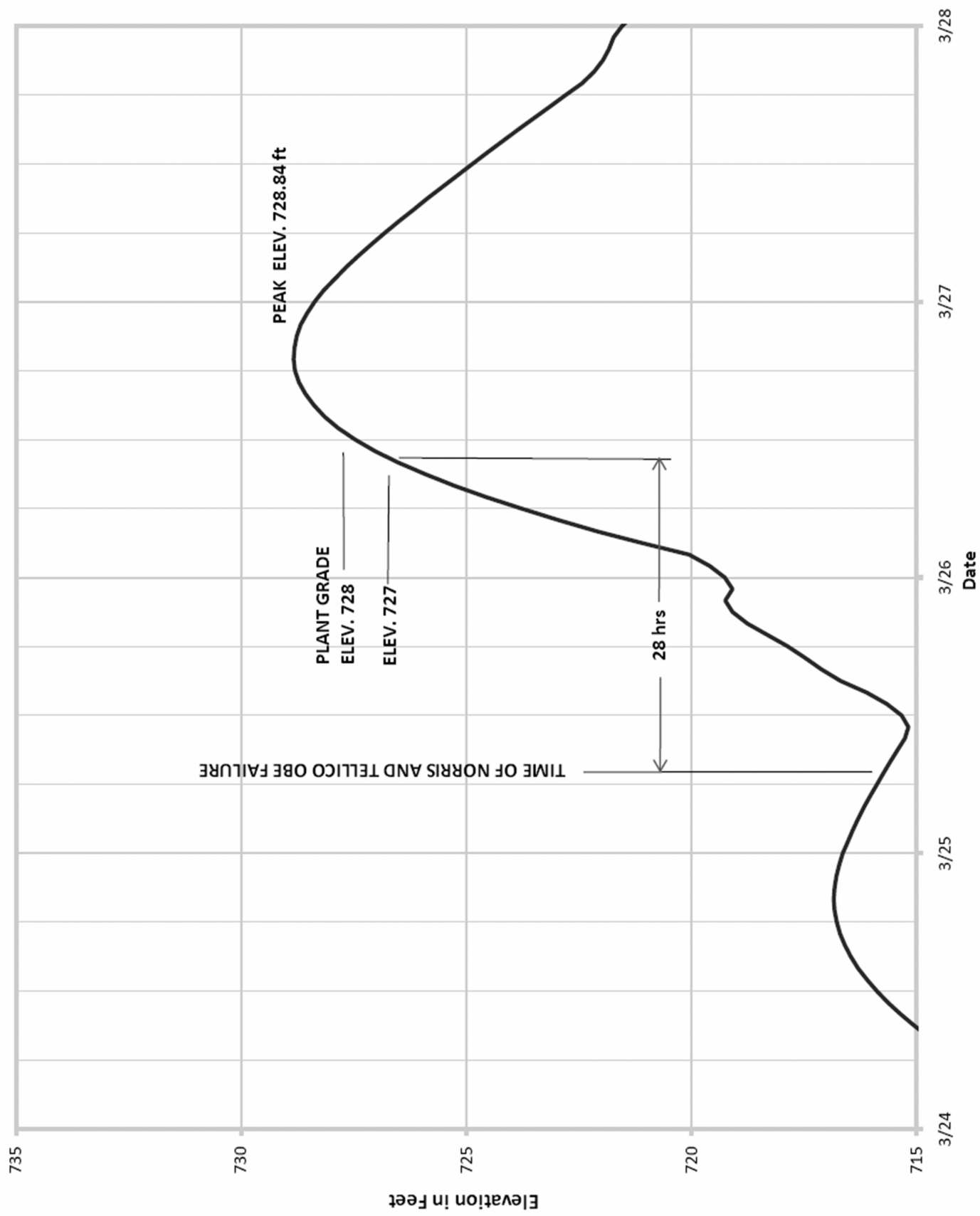


Figure 2.4-115 OBE Failure of Norris and Tellico Dams with 1/2 PMF Event Failure Wave at Watts Bar Nuclear Plant

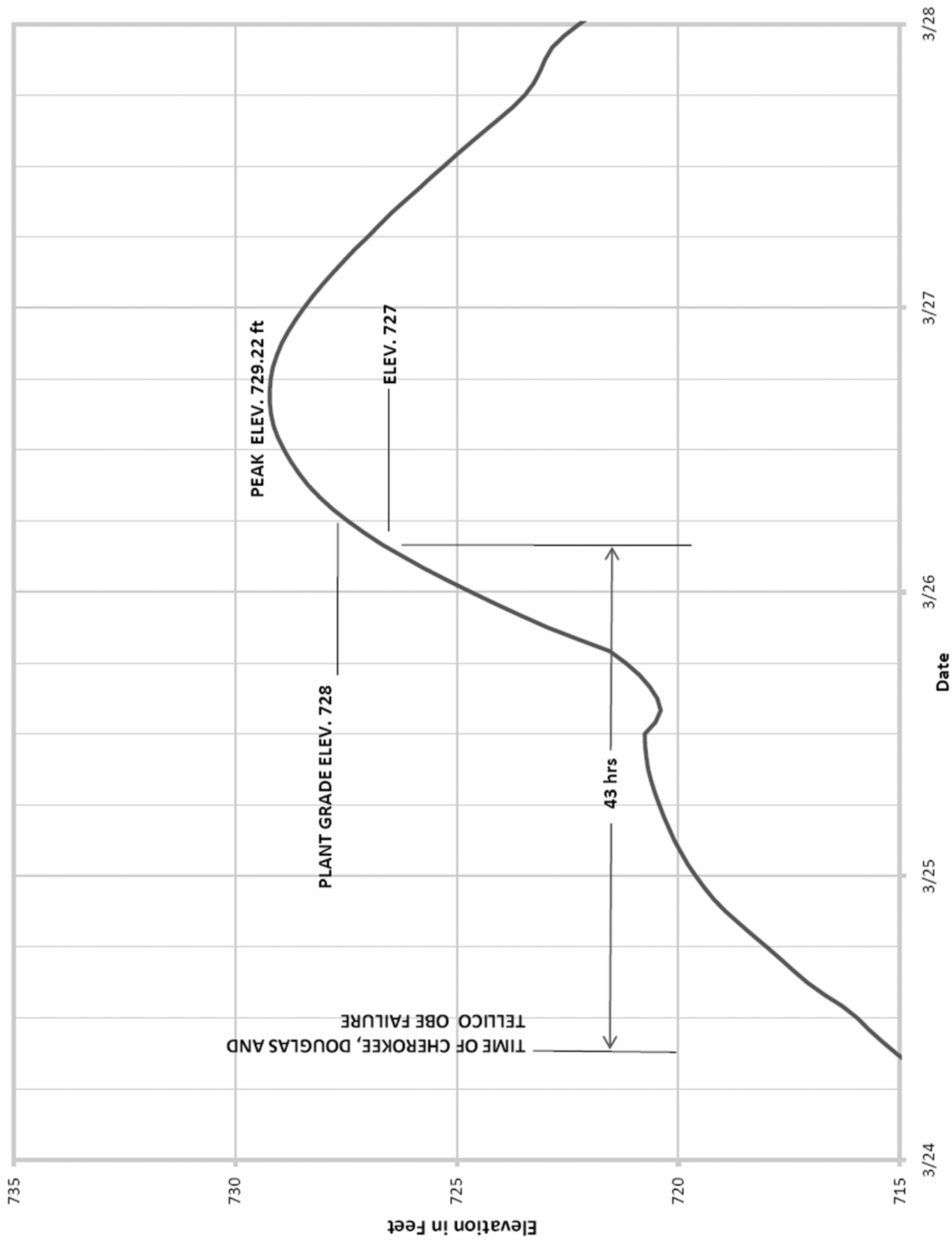


Figure 2.4-116 OBE Failure of Cherokee, Douglas and Tellico Dams with 1/2 PMF Event Failure Wave at Watts Bar Nuclear Plant