TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

CDB '80 1014 004

TO : H. S. Fox, Director of Fossil and Hydro Power, 716 EB-C

FROM : M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

DATE : October 14, 1980

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

HRB Kingston Ash Disposal

Attached is a report from Joseph W. Touchton to Frank D. Stansberry dated October 9, 1980 (CDB 801014 003), on the joint inspection of the ash disposal areas at Kingston Steam Plant which includes a recommendation for corrective work. I concur in this recommendation.

Original Signed By
I. L. Burroughs

M. N. Sprouse

GLB:JWT:TLT
Attachment
cc: R. O. Barnett, W9D224 C-K
D. B. Bowen, 6204 MIB-K
G. L. Buchanan, W3C126 C-K
J. P. Darling, 403 KB-C (Attachment)
MEDS, E4B37 C-K
E. F. Thomas, 550 CST2-C (Attachment)

OCT 16 '80
CIVIL ENG. & DES. BRANCH

IN				OUT	
N	Date	Time		Date	Time
✓			GLB		
			DLG		
			TJA		
			HCB		
			ELS		
			REH		
			REA		
✓			NAL		
✓			FDS		
	10/20	8301	RJB		
✓			JRF		
			RAD		
			JHC		
			REB		
			SDS		
			RWA		

✓ 20 11/15 JWT 20 11:30
✓ 20 11 EWS 20 11:30

TVA 64 (05-9-55)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

CDB '80 1014 003

TO : Frank D. Stansberry, Head Civil Engineer (Site Development, Highway, Railroad, and Bridge Design), W3A51 C-K

FROM : Joseph W. Touchton, Civil Engineer (Site Development, Highway, and Railroad Design), W3A57 C-K

DATE : October 9, 1980

HRB
Kingston-
Ash Disposal

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

On September 18, 1980, Terry Pratt of F&H PR and Jerry Glover, Don Galloway, and I of EN DES inspected the ash disposal areas at Kingston Steam Plant. The findings were discussed with Ford Clayton, Assistant Plant Superintendent.

The last annual inspection was made on September 13, 1979 (CDB 791101 003).

On the attached print of drawing 10N~~240~~420, the different areas are designated.

Change in Dikes Since Last Inspection

There has been no significant change in the dikes since last year's annual inspection.

A small area of surface wetness was observed at the toe of the exterior slope of the south end of dike C. We believe this condition is due to a concentration of rainfall surface runoff.

Placement of a bottom ash berm along the interior dike slopes of the ash disposal area has been completed.

A finger dike of bottom ash has been constructed parallel to and 200± feet north of the east end of the divider dike. This finger dike provides some relief from the effects of wave action and wind load on the buoyant skimmer in the divider dike flow-through spillway; however, this has not helped to reduce the amount of floating ash that passes into the stilling pool.

The tops of all dikes are smooth and sloped to the inside with a good crushed stone surface.

Change in Pond Operation Since Last Inspection

There has been no change in pond operation since last year's annual inspection.

Condition of Spillways, Skimmers, and Outlets

The standard spillways and skimmer in the stilling pool area appear to be in good condition and functioning properly (picture 1). The spillway outlets are discharging equally (picture 4), and the concrete end wall is in good condition. The riprap outfall to the intake channel appears to be in good condition with no sign of erosion. There was no sign of loss of ash into the intake channel. The weep holes in the concrete end wall of the spillway outlet pipes were seeping; however, the dike slope behind the end wall appeared to be dry and well compacted.

Frank D. Stansberry
October 9, 1980

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

The buoyant skimmer in the divider dike flow-through spillway is not adequate to prevent ash from passing into the stilling pool area. This is due mainly to the unusually high quantity of fly ash slurry present at Kingston Steam Plant. This high quantity causes a large buildup of slurry on the upstream side of the skimmer (pictures 6 and 7) which causes an unacceptable amount of fly ash to pass into the stilling pool area. In an attempt to alleviate this situation, plant personnel have designed and fabricated and were installing on the day of the inspection a sheet metal spillway and skimmer (pictures 9 through 15).

This spillway has dimensions of 5 feet by 10 feet and the skimmer has a dimension of 10 feet by 20 feet. There are two 36-inch corrugated metal pipes which extend from the spillway through the divider dike into the stilling pool. EN DES had no input into the design or location of this structure and, subsequently, do not feel responsible for its adequacy. We feel the ash finger dike, which the plant constructed to facilitate the placement of the new structure, should be left in place. This would provide access to the structure for routine maintenance and to raise it as the pond level rises. We understand the spillway through the divider dike will be plugged and the floating skimmer removed after the field-constructed skimmer is in place.

The outlets of the plugged and abandoned spillways in the northern portion of dike C were submerged by Watts Bar Lake and could not be inspected for leakage.

Action on Recommendations of Last Inspection

1. Plant personnel had not regraded the wet area at the south end of dike C, but they had seeded it last spring. The seeding resulted in very little vegetation due to the extremely hot dry summer. This was discussed with Mr. Clayton and he said he would reseed the area.

2. The eroded slopes seem to have been adequately corrected.

3. Badly eroded areas on divider dike have been repaired.

Recommendation

Fertilize and reseed all areas of the dike slopes where an adequate vegetative cover has not been established, with type 6, mixture E, in accordance with sections 180 and 182 of the T-1 Specifications.

Joseph W. Touchton

JWT:TLT
Attachments

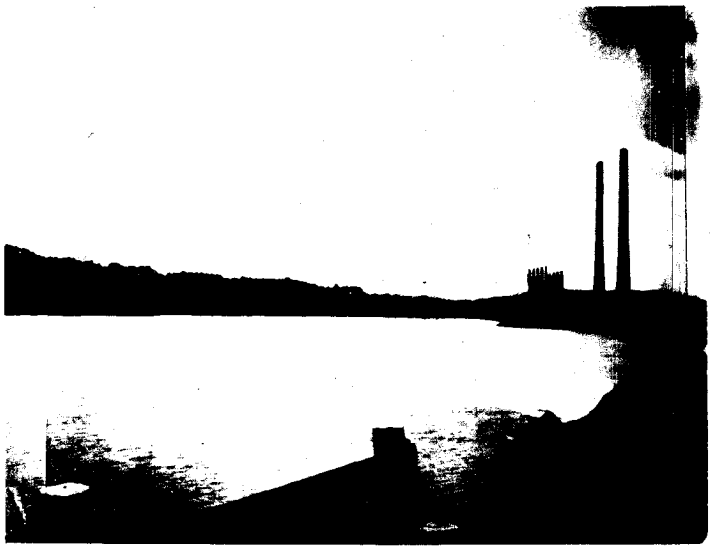
Concur: Frank D. Stansberry G. L. Buchanan

cc: R. O. Barnett, W9D224 C-K (Attachments)
D. B. Bowe[illegible] 6204 MIB-K (Attachments)
MEDS, E4B37 C-K (Attachments)
M. N. Sprouse, W11A9 C-K

10/9/80 - GLB:TLT
cc: G. L. Buchanan, W3C126 C-K (Attachments)

KINGSTON STEAM PLANT
1980

④
NOTE EVEN FLOW OF PIPES & RIPRAP



⑤
NOTE FLY ASH SLURRY ON STILLING POOL

⑥
NOTE AMOUNT OF SLURRY ON UPSTREAM SIDE OF SKIMMER

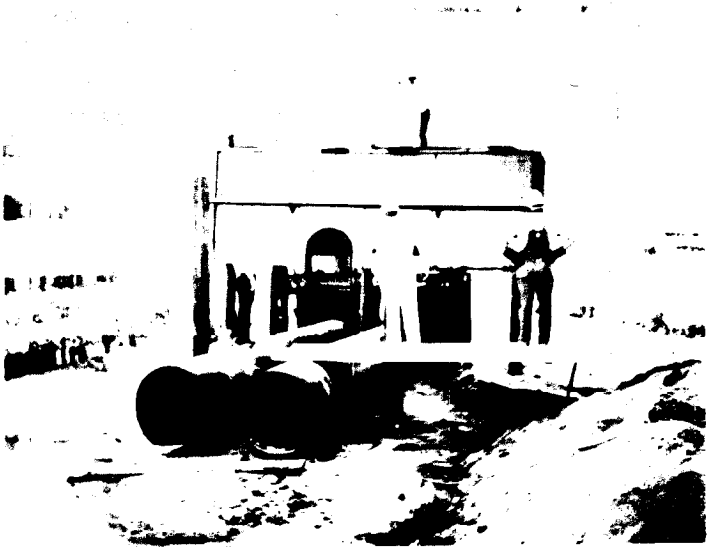
KINGSTON STEAM PLANT
1980

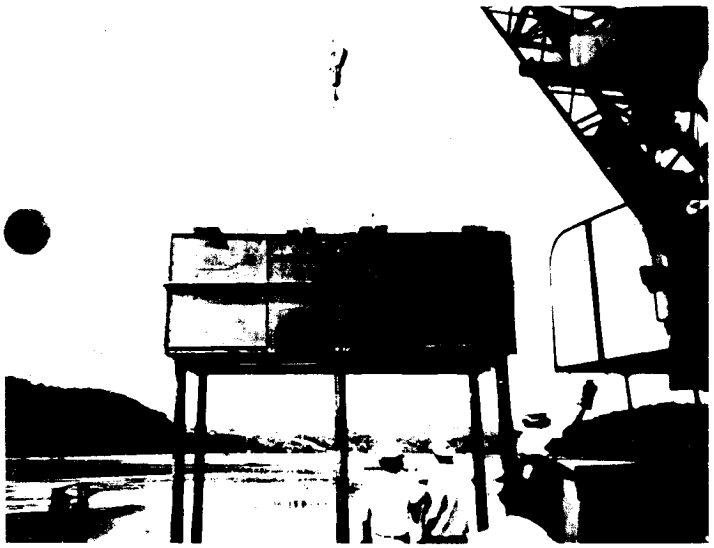
⑦
NOTE CONDITION OF DIVIDER DIKE AND FLY ASH SLURRY

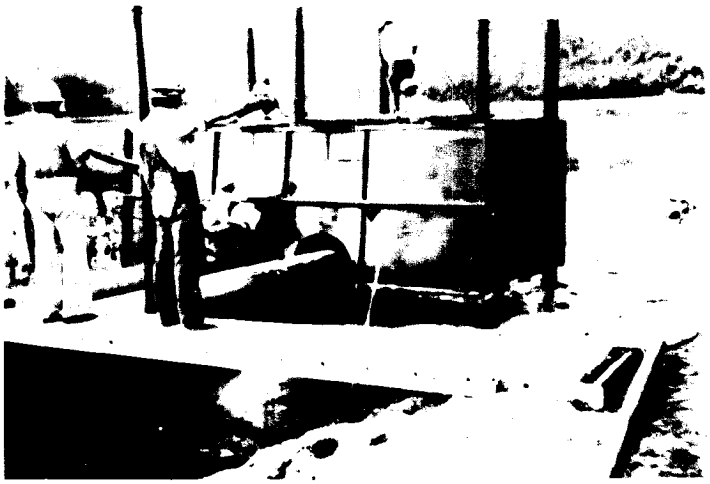
⑧
NOTE DIVIDER DIKE AND SLURRY ON STILLING POOL

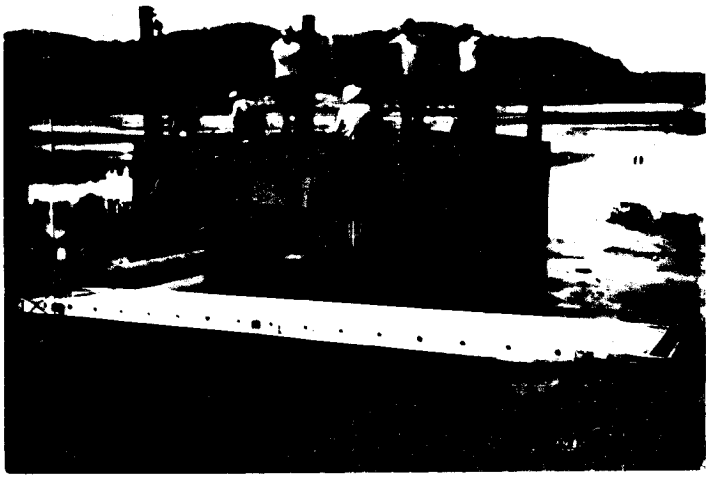
⑨
INSIDE OF SKIMMER DESIGNED AND BUILT BY PLANT PERSONNEL

PLANT PERSONNEL ASSEMBLING
THEIR SKIMMER









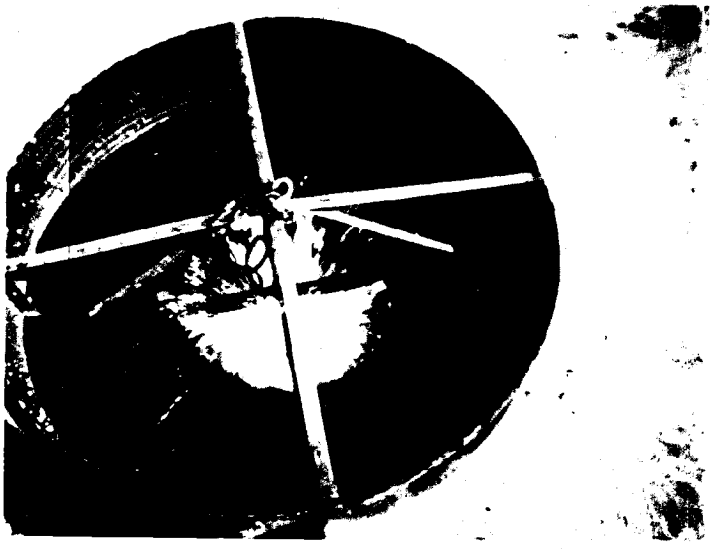
KINGSTON STEAM PLANT
1980

(1)

NOTE SKIMMERS, FLY ASH SLURRY & VEGETATION ON DIKE SLOPES

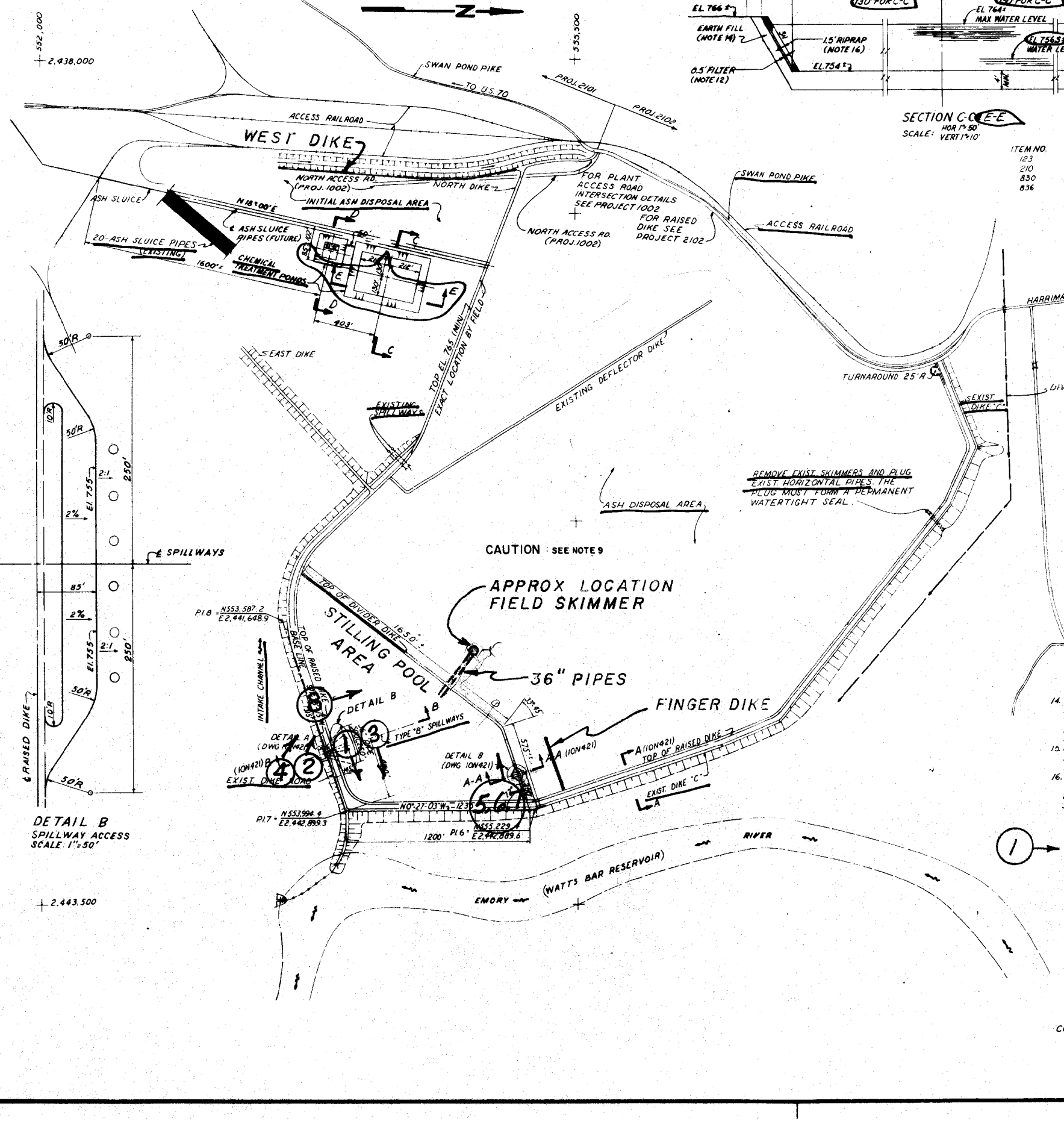
(2)

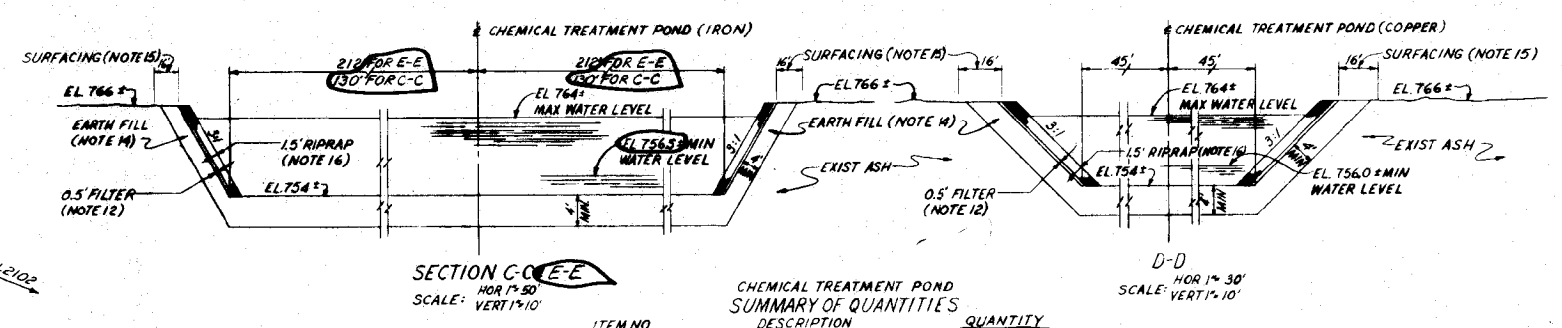
NOTE RIPRAP



(3)

NOTE AMOUNT OF SLURRY OUTSIDE SKIMMER AND CLEAR WATER INSIDE SKIMMER





CHEMICAL TREATMENT POND
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY
123	EARTH BORROW	32,000 CY
210	CRUSHED STONE	800 TONS
830	RIPRAP	4,200 CY.
836	FILTER BLANKET	2,400 TONS
	ASH EXCAVATION	100,000 CY.

NOTES:

1. SOIL EXPLORATION AND LABORATORY TESTING IS RECORDED IN MEMORANDUM REPORT FROM GENE FARMER TO G.L. BUCHANAN, DATED NOVEMBER 3, 1975.
2. CIRCULAR-ARC STABILITY ANALYSIS SAFETY FACTORS FOR THE NEW DIKES BASED UPON AN EVALUATION OF THE SOILS INVESTIGATION REPORT ARE AS FOLLOWS:
   A. INITIAL CONSTRUCTION, EXTERIOR SLOPE: SAFETY FACTOR = 2.6
   B. INITIAL CONSTRUCTION, INTERIOR SLOPE: SAFETY FACTOR = 1.9
   C. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, EXTERIOR SLOPE: SAFETY FACTOR = 2.7
   D. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, INTERIOR SLOPE: SAFETY FACTOR = 1.6
3. ALL WORK TO BE IN ACCORDANCE WITH T-1 SPECIFICATIONS UNLESS NOTED.
4. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. G-9 FOR ROLLED EARTHFILL FOR DAMS AND POWER PLANTS. FILL COMPACTION SHALL BE AT LEAST 95% OF STANDARD MAXIMUM DENSITY AND FILL MOISTURE CONTENT SHALL BE WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE CENTRAL SOILS LABORATORY.
5. FOUNDATION PREPARATION FOR EARTH EMBANKMENTS SHALL CONSIST OF REMOVING ORGANIC TOPSOIL, TO A DEPTH THAT WILL REMOVE ALL ROOTS, AND ALL PERVIOUS MATERIAL (RIPRAP, GRAVEL, CRUSHED STONE, COARSE ASH, ETC.), AND EXCAVATION SHALL CONTINUE TO A DEPTH THAT WILL SUPPORT HEAVY EARTH MOVING EQUIPMENT WITHOUT RUTTING INTO THE GROUND AND WITHOUT HEAVING THE GROUND SO AS TO REDUCE ITS STABILITY.
6. PIPE BACKFILL SHALL CONSIST OF IMPERVIOUS SOIL, FREE OF DEBRIS, WITH NO HARD LUMPS OR CLODS LARGER THAN 3" IN DIAMETER. COMPACTION SHALL BE BY HAND-HELD COMPACTORS TO A MINIMUM OF 1' ABOVE THE TOP OF THE PIPE. THE SOIL SHALL BE PLACED IN 6" LAYERS AND COMPACTED TO AT LEAST 95% OF STANDARD MAXIMUM DENSITY AS ESTABLISHED BY THE CENTRAL SOILS LABORATORY. BACKFILL MOISTURE SHALL BE CONTROLLED TO OBTAIN THE MAXIMUM PRACTICABLE DENSITY. THE BACKFILL SHALL BE PLACED SO AS TO MAINTAIN THE SAME ELEVATION ON BOTH SIDES OF THE PIPE.
7. THE DIVIDER DIKE SHALL BE CONSTRUCTED OF BOTTOM ASH. PLACEMENT OF THE UNDERWATER ASH FILL SHALL BE BY END DUMPING ALONG THE LENGTH OF THE DIKE. THE TOP SURFACE OF THE UNDERWATER DIKE JUST ABOVE THE WATER SHALL BE THOROUGHLY COMPACTED AND SCARIFIED BEFORE PLACING THE OVERLYING ASH FILL. BOTTOM ASH FOR THAT PORTION OF THE DIVIDER DIKE ABOVE WATER SHALL BE PLACED IN NOT MORE THAN 9-INCH LAYERS, AND SHALL BE WELL COMPACTED WITH RUBBER TIRED HAULING EQUIPMENT.
8. CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIKES SHALL NOT BE EXCAVATED STEEPER THAN 3:1 AND TOP OF CUT SHALL BE A MINIMUM OF 20' FROM THE TOE OF ANY DIKE.
9. WHEN CONNECTING THE NEW DIKE TO THE OLD DIKE, EXTREME CARE SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE EXISTING DIKES SHALL BE STRIPPED OF ALL VEGETATION, RIPRAP, GRAVEL, CRUSHED STONE, COARSE ASH AND OTHER PERVIOUS MATERIAL. BENCHED, AND SCARIFIED TO A MINIMUM DEPTH OF 6" AND COMPACTED SO AS TO FORM A BOND WITH THE NEW FILL. THE UTMOST CAUTION SHALL BE USED IN BENCHING THE EXISTING DIKE SLOPES SO AS NOT TO CREATE AN UNSTABLE CONDITION. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED.
10. GRASSING: CUT AND FILL SLOPES, AND DISTURBED AREAS SHALL BE SEEDED WITH TYPE 6E MIXTURE (SPRING SEEDING) OR TYPE 8 (FALL SEEDING). IF COVER IS NEEDED PRIOR TO SEEDING DATES USE TYPE 9 FOR WINTER SEEDING AND TYPE 10A FOR SUMMER SEEDING. ALL AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED IN ACCORDANCE WITH SECTIONS 180 AND 182.
11. RIPRAP IS TO BE PLACED AT THE LOCATIONS AS SHOWN. AT LEAST 50% OF THE RIPRAP SHALL CONSIST OF STONE OF A WEIGHT EQUAL TO OR GREATER THAN 150 LBS., AND IN ACCORDANCE WITH SECTION 830.
12. FILTER BLANKET SHALL BE 6" THICK AND IN ACCORDANCE WITH SECTION 836.
13. SUMMARY OF QUANTITIES - SEE DWG. 2102H101
14. EARTH FILL COMPACTION IN CHEMICAL PONDS SHALL BE DONE WITH SHEEPSFOOT ROLLERS AND SHALL BE AT LEAST 95% OF STANDARD PROCTOR MAXIMUM DENSITY. FILL MOISTURE SHALL BE CONTROLLED TO ACHIEVE OPTIMUM COMPACTION.
15. SURFACING FOR THE EARTH FILL AROUND CHEMICAL PONDS SHALL BE 4" OF CRUSHED STONE, PER SECTION 210 OF THE T-1 SPECS.
16. RIPRAP IN CHEMICAL PONDS SHALL BE 18" THICK, WITH A MINIMUM OF 50% BY WEIGHT CONSISTING OF STONES AT LEAST 100 POUNDS EACH. RIPRAP SHALL CONFORM TO SECTION 830 OF THE T-1 SPECS.

(1) → Photograph taken at this point in this direction.

COMPANION DRAWING: 10N421, N422, N423
HWY. PROJECT 2102

INSPECTED AND APPROVED FOR ISSUE

REV NO.	ECN NO.	DATE	DSGN	DRWN	CHKD	SUPV	ENGR	INSP	SUPER	RECM	APPR
2		5-6-77	RWS	RWS	JJG	LLG	KWB		RJB	JPB	KWB
Rev iron cham pond & summary of quantities, PA 3076.											
1		12-21-77	GM	GM	MSL	LLG	KWB		RJB	JPB	KWB
Added chemical treatment ponds detail B PA 3076, Add Proj 1002.											

DSGN D.R. GALLOWAY
DRWN J.R.L. LORE
CHKD D.R. GALLOWAY
SUPV W.P.H. STOKES
INSP S.D. STONE JR FOR
ENGINEER E.B. Logan

ASH POND DIKE

PLAN-RAISING ASH DISPOSAL AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
Albert J. Bowman	F. B. [illegible]	E. B. Logan

KNOXVILLE 5-20-74 | 38 | C | 10N420 R2

PRINTS REQD-R 2
ON MF PROJ

DWG SIZE	F	M
ME		
EE		
CE		
AD		
CS	2	
EG		
MD		
DF		
SW		
DL		
PA		

MF R2 R1 R2

TVA-00005797