TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

HRB

TENNESSEE VALLEY AUTHORITY

CDB '82 0825 017

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 : August 25, 1982

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Attached is a report from Ronald D. Powell to Frank D. Stansberry dated August 25, 1982 (CDB 820825 016), on the joint inspection of the ash disposal area at Kingston Steam Plant which includes recommendations for corrective work. I concur in these recommendations.

Original Signed By
I. L. Burroughs

M. N. Sprouse

GLB:RDP:TLT
Attachment: 4
cc: R. O. Barnett, W9D224 C-K
G. L. Buchanan, W3C126 C-K
J. P. Darling, 546 CST2-C (Attachment)
S. B. Jack, 5100 MIB-K
MEDS, W5B63 C-K

Principally prepared by: R. D. Powell, extension 3581.

RECD 10:00 AUG 27 '82

CIVIL ENG. & DES. BRANCH

IN N	Date	Time		OUT Date	Time
✓			GLB		
			DLG		
			TJA		
			HCB		
			ELS		
			REH		
			CNJ		
		3d	NAL		
✓	27	11	FDS	27	10
✓	27	1	RJB	27	2
			JRF		
			RAD		
			JHC		
			REB		
			SDS		
			JTP		

✓ ~~RDP~~
✓ 27 230 KWB 27 245

Y12236.03

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

HRB

Memorandum

TENNESSEE VALLEY AUTHORITY

CDB '82 0825 016

TO : Frank D. Stansberry, Head Civil Engineer (Site Development, Highway, Railroad, and Bridge Design), W3A7 C-K

FROM : Ronald D. Powell, Civil Engineer (Site Development, Highway, and Railroad Design), W3A25 C-K

DATE : August 25, 1982

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

On August 4, 1982, Joel Paris of F&H PR and I inspected the ash disposal area at Kingston Steam Plant. We were accompanied on the inspection by Coy Wood, Yard Operations Supervisor. Findings were discussed with L. B. Kennedy, Plant Superintendent, and Ford Clayton, Assistant Plant Superintendent.

The last annual inspection was made on September 9, 1981 (CDB 810925 010). An interim inspection was made on March 10, 1982 (CDB 820316 002).

On the attached print of drawing 10N420, 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.

The small area of surface wetness at the toe of the exterior slope of the south end of dike C was observed to still exist (picture 4 and recommendation 1).

An interior dike of bottom ash, extending northeast from the existing deflector dike in the approximate location shown on the attached print of drawing 10N420, is presently under construction.

All dikes appear to be in good condition with no visible signs of instability. The tops of the dikes are surfaced with crushed stone and have a good slope to the inside.

Both the interior and exterior slopes of all earth dikes have a good vegetative cover (picture 5).

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 skimmers in the stilling pool area appear to be in good condition and functioning properly. Five of these six spillway outlets are discharging equally. The spillway on the west end has been raised and is not discharging. The concrete end wall appears to be in good condition; however, some small trees and brush were observed to be growing

Frank D. Stansberry
August 25, 1982

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

in very close proximity to the end wall and should be removed (picture 6 and recommendation 2). The dike slope behind the end wall appeared to be dry and well compacted. The riprap outfall to the plant intake channel was submerged and could not be closely inspected. There was no sign of loss of ash into the intake channel.

The plant-designed and plant-constructed spillways and skimmers from the ash disposal area to the stilling pool area appear to be in good condition and functioning properly (picture 1). There has been no noticeable settlement of these structures, although it was reported to us during our subsequent discussion with Mr. Kennedy that plant personnel had encountered a seam of very soft material while driving the piles for the foundations of these structures. This seam of soft material was reported to be 10 to 12 feet beneath the earth surface and approximately 10± feet thick. The outlets of these spillways were in good condition (pictures 2 and 3). Some algae was present in the stilling pool area around the outlet for the circular spillway.

The plant-constructed spillways of the initial ash disposal area in the east end of the north dike were submerged; however, they appeared to be functioning adequately.

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 Recommendation of Last Inspection

Sparsely vegetated areas of the dike slopes have been reseeded and fertilized. Both the interior and exterior slopes of all earth dikes have a good vegetative cover.

Recommendations

1. Plant personnel shall continue to observe the area of surface wetness at the toe of the exterior slope of the south end of dike C. Any worsening of this condition shall be reported to EN DES immediately.

Y12236.02

Frank D. Stansberry
August 25, 1982

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

2. Remove small trees and brush from around the concrete end wall for the stilling pool area discharge pipes.

Ronald D. Powell

KWB RDP:TLT
Attachments

Concur: Frank D. Stansberry

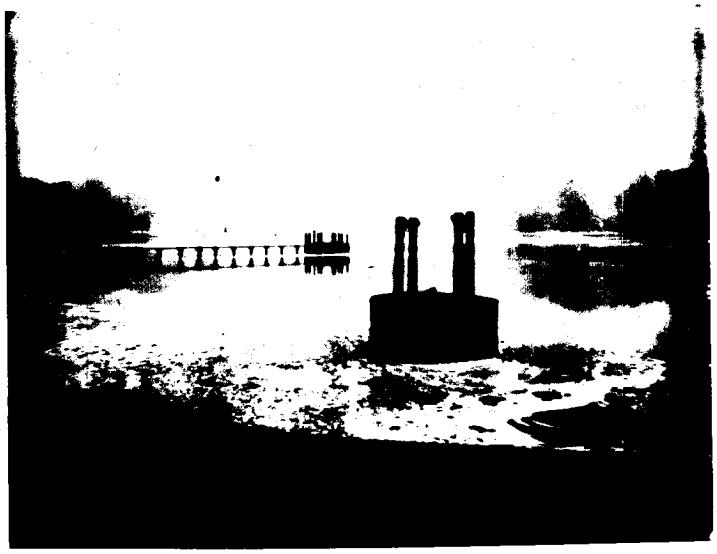
G. L. Buchanan

8/25/82 - FDS:TLT
cc: G. L. Buchanan, W3C1126 C-K (Attachments)

8/25/82 - GLB:TLT
cc: R. O. Barnett, W9D224 C-K (Attachments)
S. B. Jack, 5100 MIB-K (Attachments)
MEDS, W5B63 C-K (Attachments)
M. N. Sprouse, W11A9 C-K

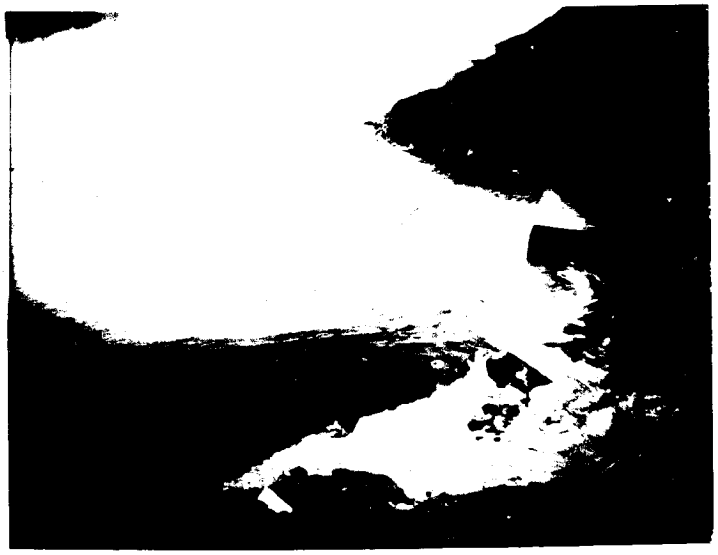
Y12236.02

KINGSTON STEAM PLANT 1982



(1)

Looking west at ash disposal area. Spillways & skimmers Plant designed and constructed



(2)

Discharge outlet for circular spillway and skimmer into stilling pool.

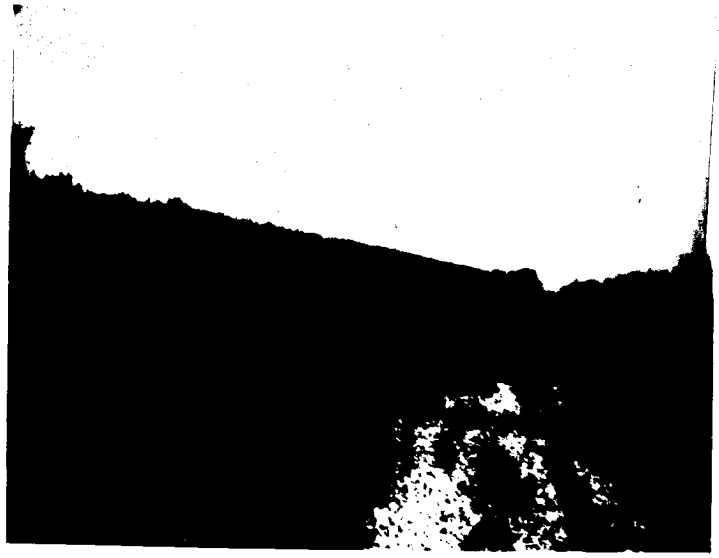
(3)

Discharge outlets for sheet metal spillway and skimmer into stilling pool.

KINGSTON STEAM PLANT 1982

(4)

Looking North at area of surface wetness at toe of exterior slope dike C adjacent to stilling pool.

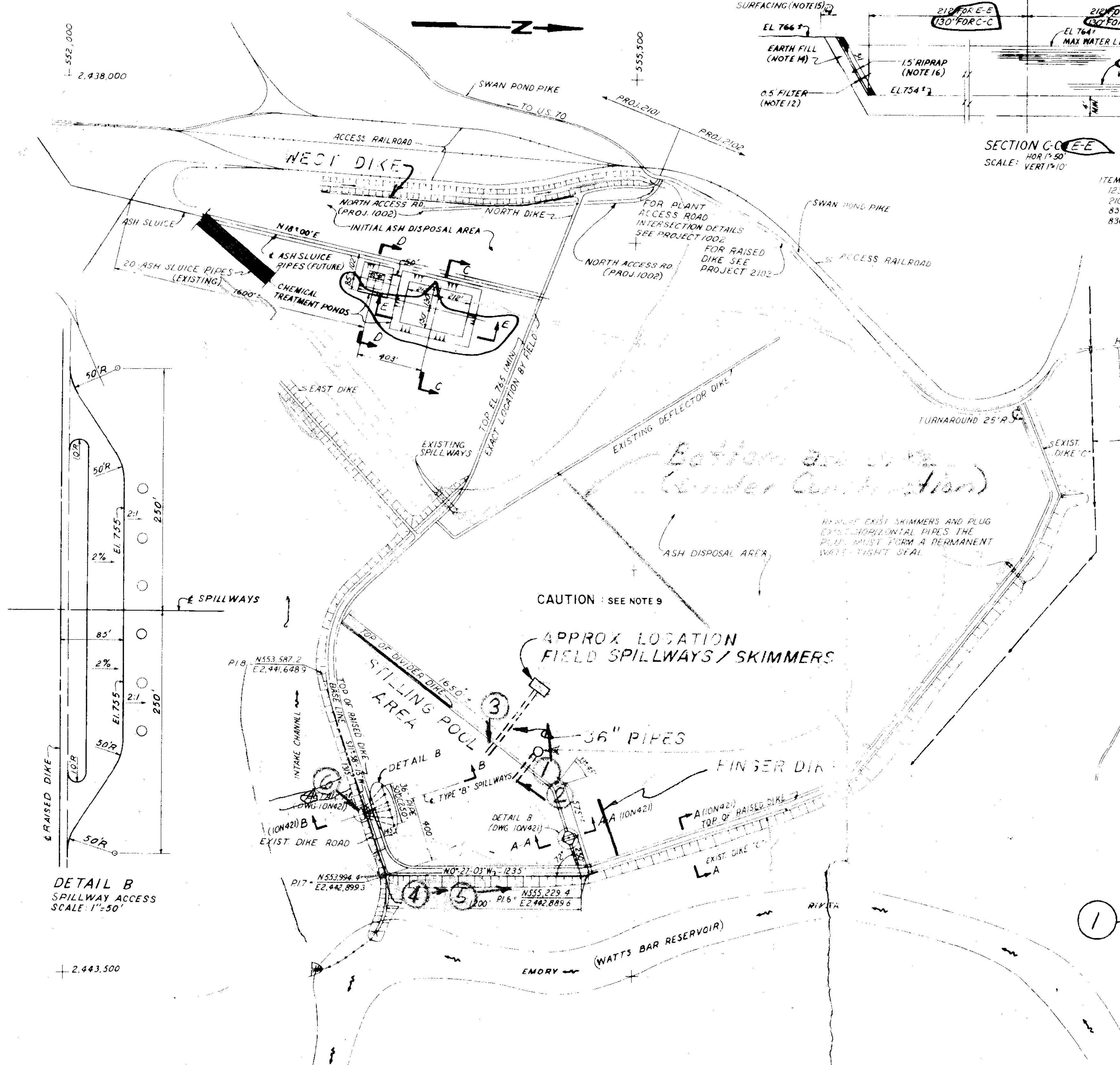


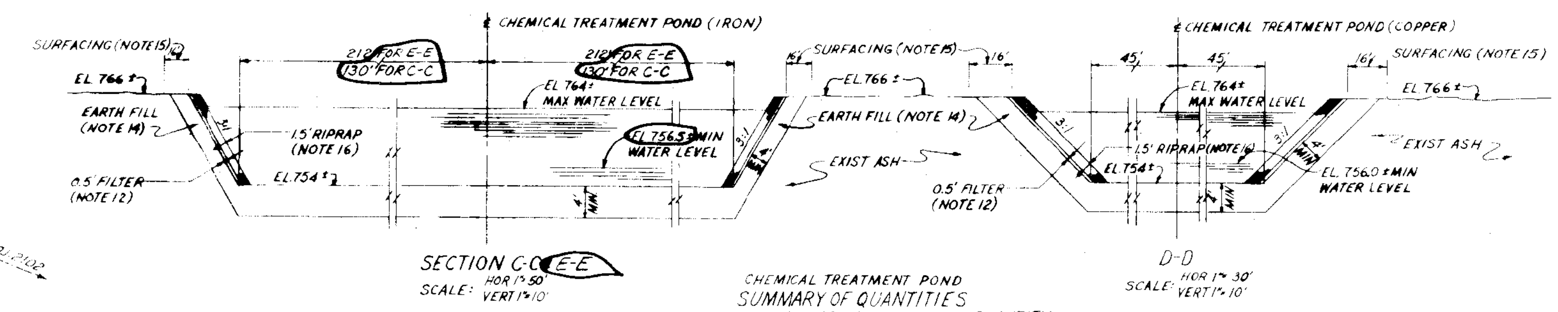
(5)

Looking North along exterior slope of Dike C. Note excellent vegetative cover.

(6)

Looking Northeast at discharge outlet structure for standard spillways into plant intake channel





CHEMICAL TREATMENT POND
SUMMARY OF QUANTITIES

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

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 ±3% 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 OVERLAYING 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

SCALE: 1" = 300'

REV NO.	ECN NO.	DATE	DSGN	DRWN	CHKD	SUPV	ENGR	INSP	SUBM	RECM	APPR
2		5-6-77	RWS	RWS	JLG	JLG	KWB		RJB		GLB
	Rev iron chem ponds summary of quantities. PA 3076.										
1		2-16-77	GRO	GRO	RWS	JLG	KWB		RJB		GLB
	Added chemical treatment ponds, detail B PA 3076. Add Proj 1002.										

DSGN D.R. GALLOWAY
DRWN J.R.L. & DRG
CHKD D.R. GALLOWAY
SUPV J.P.H. Stivers
INSP S.D. STONE JR Fox
ENGINEER E.B. Logan

ASH POND DIKE

PLAN-RAISING ASH DISPOSAL AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

CDB '82 0316 002

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

FROM : Jerry L. Glover, Civil Engineer (Site Development, Highway, and Railroad Design), W3A67 C-K

DATE : March 15, 1982

SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Kingston Steam Plant Area: Ash Disposal Area

Date of last annual inspection: September 9, 1981 (CDB 810925 010)

Date of this inspection: March 10, 1982 Weather: Cloudy and warm (65°±)

Inspected by: Jerry Glover (EN DES)

Joel Paris (F&H PR)

Coy Woods (Yard Operations Supervisor)

Discussed with: Ford Clayton (Assistant Plant Superintendent)

	Excellent	Good	Poor
General condition of perimeter dikes		X	
Vegetative cover on slopes			X
Condition of standard skimmers and spillways		X	
Condition of outlet structure and channel		X	
General condition of divider dike		X	

Signs of loss of ash? ____ Yes X No

Has action been taken on recommendations of annual inspection report? X Yes ___ No

Comments: Vegetative cover on the dike slopes is generally sparse. The slopes were reseeded and fertilized last spring with very poor results due to the dry weather. Seed and fertilizer have been purchased and the slopes will soon be reseeded and fertilized again.

Comments:

Jerry L. Glover

JLG:TLT

Bcc: G. L. Buchanan, W3C126 C-K

3/15/82 - GLB:TLT

cc: S. B. Jack, 5100 MIB-K
MEDS, 100 UB-K
M. N. Sprouse, W11A9 C-K

TVA-00005813