TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

D. R. Galloway
334 SPT-K

TENNESSEE VALLEY AUTHORITY

FEP 840912 004

TO : C. C. Schonhoff, Director of Fossil and Hydro Power, 716 EB-C

FROM : R. G. Domer, Director of Engineering Projects, W11A6 C-K

DATE : SEP 12 1984

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Attached is a report (FEP 840912 003) from D. R. Galloway to R. E. Harris concerning the joint inspection of the Kingston Steam Plant ash disposal area. This report includes recommendations for corrective work. I concur with these recommendations.

Original Signed By
John E. Holladay
R. G. Domer

OPT:DRG:FS
Attachment
cc (Attachment):
R. O. Barnett, W9D224 C-K
C. Bonine, E7B24 C-K
MEDS, W5B63 C-K
O. P. Thornton, 102 SPT-K
F. Van Meter, 500 SPT-K (3)

Principally Prepared By: D. R. Galloway, Extension 2272

F64242.02

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FEP 840912 003

TO : R. E. Harris, Civil Project Engineer, Fossil Engineering Projects, 338 SPT-K

FROM : D. R. Galloway, Civil Engineer, Fossil Engineering Projects, 334 SPT-K

DATE : SEP 12 1984

SUBJECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

On August 8, 1984, V. Hutchinson of F&H PR, Robert Spencer of Engineering, and I inspected the ash disposal area at Kingston Steam Plant. We were accompanied on the inspection by E. McClung, Yard Operations Supervisor. Findings were discussed with Mr. McClung.

The last annual inspection was made on August 24, 1983 (FDP 830920 012). An interim inspection was made on April 9, 1984 (FDP 840409 002).

On the attached print of drawing 10N420, the different areas are designated.

Changes in Dikes Since Last Inspection

The exterior dikes appear to be structurally stable. Wetness is still evident at the toe of the south end of dike "C." A soils investigation, EN DES Soil Schedule 82.3 dated May 1984, of this area indicated a bottom ash base for the raised dike (construction 1977) is most likely the avenue of the seepage (see recommendation No. 1).

Pooled water at the base of the raised dike was also observed at the north end of dike "C." This area is indicated on the attached drawing 10N420 (see recommendation No. 1).

Several small trees were observed along the exterior slopes with a growing concentration at north end of dike "C" (see recommendation No. 2).

The redwater seepage was still evident along the original southeast dike; however, the magnitude of the flow appeared to be somewhat less at the western end than that observed in previous inspections. Repair of this acidic seepage is pending.

F&H PR constructed an interior ash dike for the containment of material dredged by a private contractor. On the morning of August 8, a failure of this dike resulted in the loss of much of the dredged material to the previously dredged area (see attached print of 10N420). With the sudden rise in the water/ash elevation, the plant constructed spillways and skimmers were inundated, thus discharging floating ash into the stilling pool.

The original divider dike was designed with a riprapped spillway without any differential water elevation on either side. The construction of the standpipe style spillways have negated and altered this condition to 4'-6' head differential; however, the dike does appear to be stable at this time.

R. E. Harris

SEP 12 1984

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Changes in Pond Operation Since Last Inspection

A rubber-lined fly ash discharge trench has been installed by F&H PR adjacent to bottom ash discharge trench.

As previously noted, a dredging of the southern section of the pond occurred this summer in order to accommodate the storage of continuing ash deposits. Interior ash dikes were constructed adjacent to Swan Pond Road and the northern section of dike "C." EN DES was not requested to perform stability analyses for these dikes. The exterior dikes were not designed for additional interior loads which may occur as a result of this dredging future stacking operation (see recommendations No. 3 and No. 4).

Condition of Spillways, Skimmers, and Outlets

The standard spillways and skimmers in the stilling pool appear to be in good condition even though some floating ash was discharged due to the interior dike failure. Vegetation could be seen growing within several of the spillway/skimmers (see recommendation No. 5).

All discharge outlets are operating properly and unrestricted.

Action on Recommendation of Last Inspection

Additional and larger recommended stone was added at the base of the outlet structure.

Small brush and trees were still evident along the exterior slopes.

Vegetation was still evident within the spillways/skimmers.

Recommendations

1. Plant personnel should continue to monitor the seepage at the indicated locations and contact F&H PR, Chattanooga, and EN DES immediately if any apparent changes are observed.

2. Should remove all small trees and brush from exterior slopes.

3. Slope stability analyses of the exterior dikes should be performed to ensure their stability before any additional loads (dredging or stacking) are incurred. Engineered interior dikes could reduce the risks of their failure also.

R. E. Harris

SEP 12 1984

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

4. Should grade ditch between interior and exterior dikes to drain.

5. Should remove any vegetation within the spillways/skimmers.

Donald R. Galloway

Donald R. Galloway

Concur:

Robert E. Harris

Robert E. Harris

for O. P. Thornton

O. P. Thornton

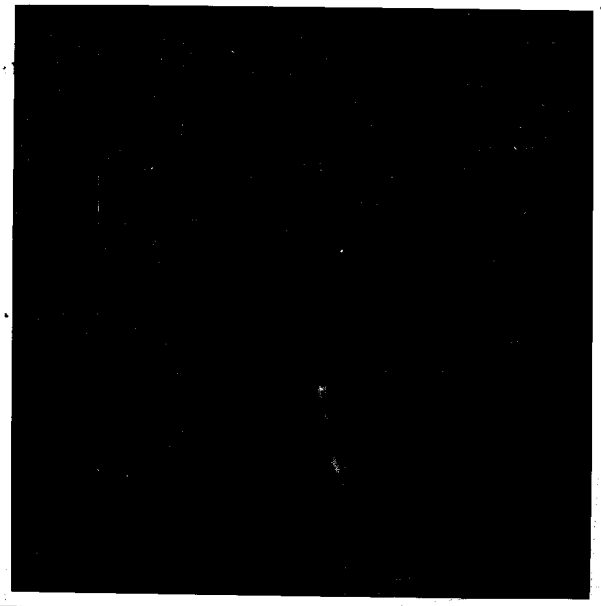
DRG:FS
Attachment
cc: O. P. Thornton, 102 SPT-K (Attachment)

9/12/84 - OPT:DRG:FLC
cc (Attachment):
R. O. Barnett, W9D224 C-K
C. Bonine, E7B24 C-K
R. G. Domer, W11A6 C-K
MEDS, W5B63 C-K (except drawing)
F. Van Meter, 500 SPT-K (3)

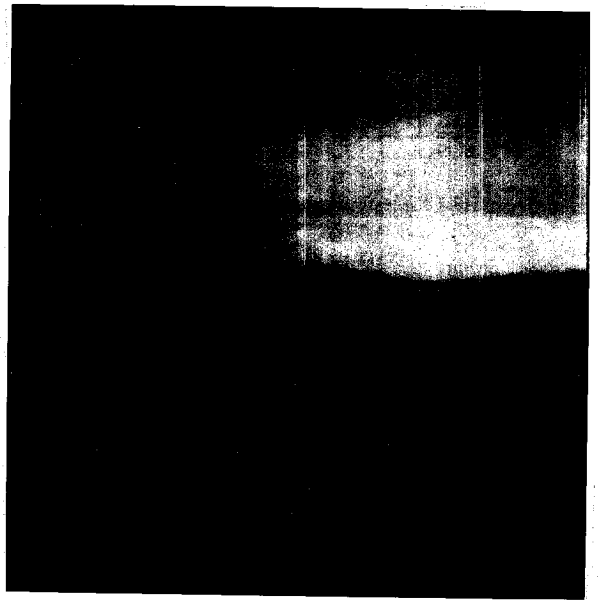
Principally Prepared By: D. R. Galloway, Extension 2272

F64242.02

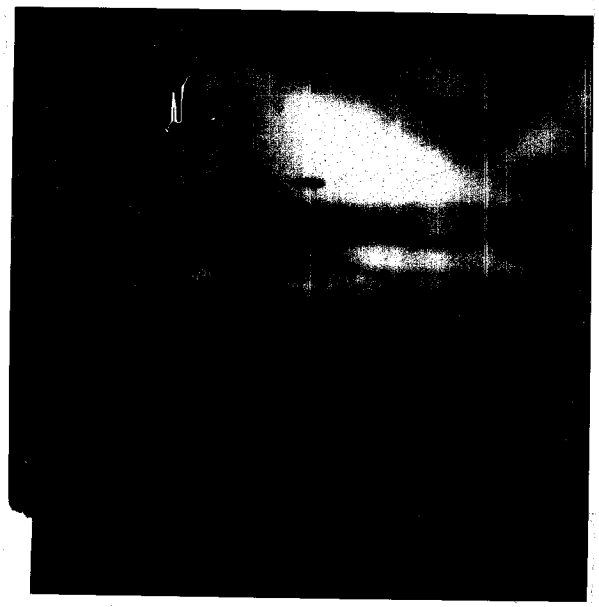
KINGSTON C.F.
AUGUST 1984



(1) RUBBER LINED FLY ASH DISCHARGE TRENCH



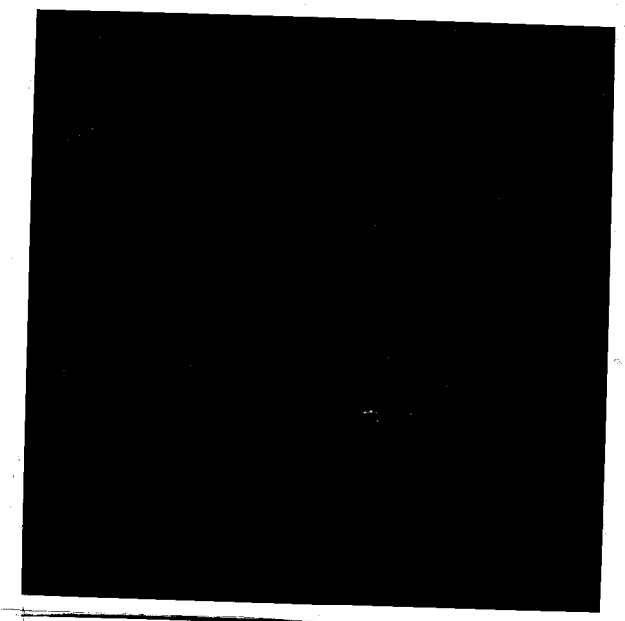
(2) INTERIOR ASH DIKE ADJACENT TO SWAN POND ROAD



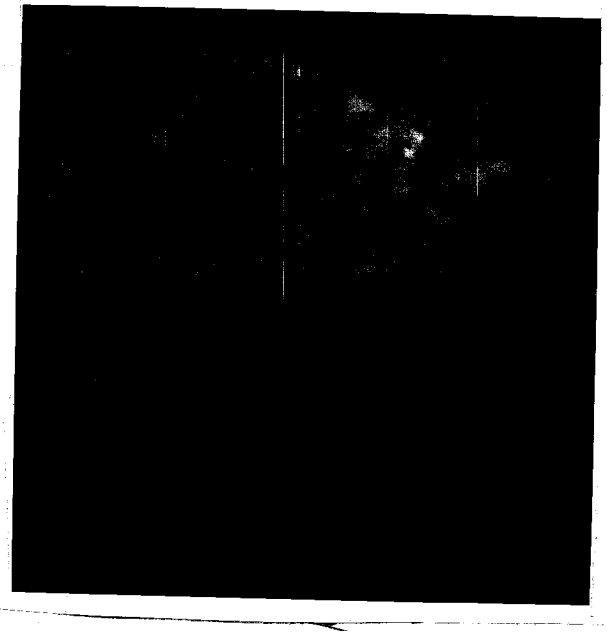
(3) INTERIOR ASH DIKE ADJACENT TO DIKE "C"

KINGSTON STEAM PLANT
AUGUST 1984

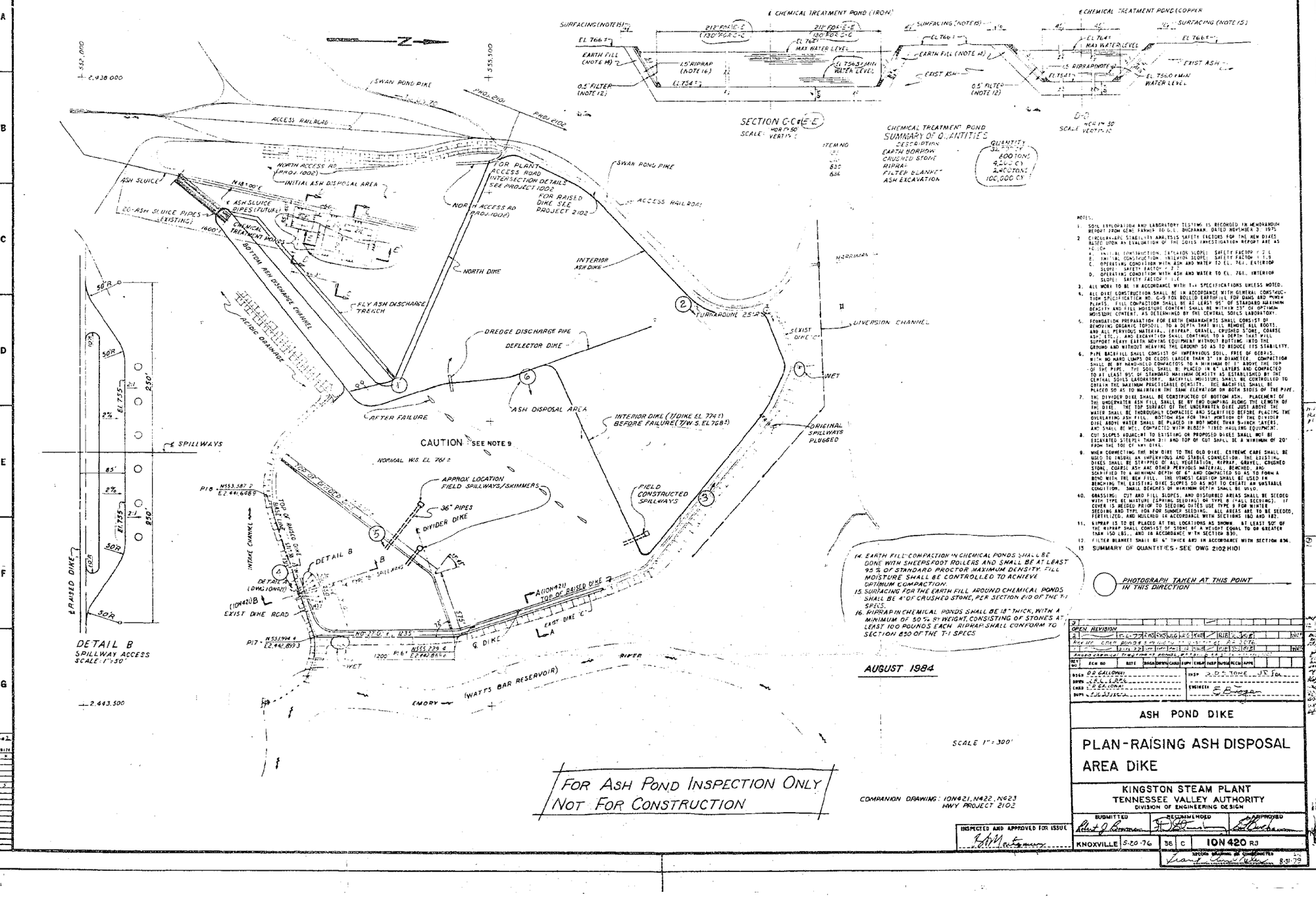
(4) OUTLET / DISCHARGE STRUCTURE



(5) STILLING POOL - FLY ASH DUE TO INTERIOR DIKE FAILURE



(6) REMAINS OF FAILED INTERI DIKE FOR DREDGED ASH CONTAINMENT



CHEMICAL TREATMENT POND
SUMMARY OF QUANTITIES

DESCRIPTION	ITEM NO	QUANTITY
EARTH BORROW	211	600 TONS
CRUSHED STONE	830	4,200 C.Y.
RIPRAP	836	2,400 TONS
FILTER BLANKET		
ASH EXCAVATION		100,000 C.Y.

NOTES:

1. SOILS EXPLORATION AND LABORATORY TESTING IS RECORDED IN MEMORANDUM REPORT FROM GENE FARMER TO G.L. BINGHAM, 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 FOLLOW:
   A. INITIAL CONSTRUCTION, EXTERIOR SLOPES: SAFETY FACTOR = 1.5
   B. INITIAL CONSTRUCTION, INTERIOR SLOPES: SAFETY FACTOR = 1.3
   C. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, EXTERIOR SLOPES: SAFETY FACTOR = 1.5
   D. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, INTERIOR SLOPES: SAFETY FACTOR = 1.0
3. ALL WORK TO BE IN ACCORDANCE WITH T.V.A. SPECIFICATIONS UNLESS NOTED.
4. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. G-9 FOR ROLLED EARTHFILL FOR DAMS AND PONDS 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 OVERLAYING ASH FILL. BOTTOM ASH FOR THAT PORTION OF THE DIVIDER DIKE ABOVE WATER SHALL BE PLACED IN NOT MORE THAN 8-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 2102 H101
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

PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION

AUGUST 1984

SCALE 1"=300'

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

COMPANION DRAWING: ION421, N422, N423
HWY PROJECT 2102

INSPECTED AND APPROVED FOR ISSUE
E.M. Montgomery

REV NO	ECN NO	DATE	DRGR	DSPR	CHKD	SUPV	CHMP	DSEP	PWSR	PCCH	APPR
3											
2	OPEN REVISION										
1		11-6-75	ENGINEERING LAYOUT								INITIAL ISSUE

DRGR D.D. GALLOWAY
DSPR J.R.C., J.P.C.
CHKD D.D. GALLOWAY
SUPV E.M. MONTGOMERY

INSP J.D. STONE, J.R. Fox
ENGINEER E. Brogan

ASH POND DIKE

PLAN-RAISING ASH DISPOSAL AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
Robert J. Brannon	E. Brogan	L. Burcham

KNOXVILLE 5-20-76 | 38 | C | ION 420 R3

RECORD DRAWING AS CONSTRUCTED
Evan Montgomery 8-31-79

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '84 0409 002

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

FROM : R. W. Cantrell, Manager of Engineering Design (Acting), W11A9 C-K

DATE : APR 9 1984

SUBJECT: KINGSTON STEAM PLANT - INTERIM WASTE DISPOSAL AREA INSPECTIONS

Attached is the interim waste disposal area inspection report dated April 4, 1984 (FDP 840404 002), from D. R. Galloway to R. E. Harris for Kingston Steam Plant. I concur with the recommendations of corrective work as noted in the report.

R. W. Cantrell

REH JEB4/6

OPT:DRG:EFS
Attachment
cc: C. Bonine, E7B24 C-K, w/attachment
R. O. Barnett, W9D224 C-K
J. P. Darling, 546 CST2-C, w/attachment
MEDS, W5B63 C-K
O. P. Thornton, 102 SPT-K
F. Van Meter, 500 SPT-K (3), w/attachment

Principally Prepared By: D. R. Galloway, Extension 2272

BC/PM: DRG

MO:

S64095.02

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TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '84 0404 002

TO : Robert E. Harris, Civil Project Engineer, Fossil Design Project, 338 SPT-K

FROM : D. R. Galloway, Civil Engineer, Fossil Design Project, 334 SPT-K

DATE : APR 4 1984

SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Kingston Area: Ash Disposal Area

Date of last annual inspection: August 24, 1983

Date of this inspection: March 28, 1984 Weather: Rain, 55° +

Inspected by: Donald Galloway (EN DES) Virgil Hutchinson (F&H PR)

James Hoskins (EN DES)

Joel Paris (F&H PR)

Discussed with: H. F. Clayton (Plant Superintendent)

	Excellent	Good	Poor
General condition of perimeter dikes	See comment No. 1		
Vegetative cover on slopes		X	
Condition of standard skimmers and spillways	See comment No. 2		
Condition of outlet structure and channel	See comment No. 3		
General condition of divider dike		X	

Signs of loss of ash? ___ Yes X No

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

Comments: 1. Seepage was still evident along the south toe of dike "C". Construction for the acidic seepage repair along the original southeast dike is "on hold" pending review of design. 2. Vegetation should be removed from the inlets of the spillways. 3. Riprap should be placed at the discharge structure and should weigh 200 to 250 pounds. Due to the vertical drop immediately at the discharge, heavy equipment should not be allowed above this structure until the riprap has been placed.

D. R. Galloway

See page 2 for distribution.

2

Robert E. Harris

APR 4 1984

INTERIM DISPOSAL AREA INSPECTION

DRG:EFS
cc: O. P. Thornton, 102 SPT-K

OPT:EFS - APR 4 1984
cc: R. O. Barnett, W9D224 C-K
MEDS, W5B63 C-K

Principally Prepared By: D. R. Galloway, Extension 2272 S64095.03

S64095.03