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May 19, 1994

R. M. Cole, Kingston Fossil Plant

KINGSTON FOSSIL PLANT (KIF) - INSPECTION OF THE ASH DISPOSAL AREAS

Attached is a report from C. L. Mount to K. W. Burnett dated May 19, 1994, concerning the inspection of the KIF ash disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB (CLM) PHF
Attachment

cc: R. L. Keyser, LP 5G-C
RIMS, CST 13B-C

0433B

TVA-00005892

May 18, 1994

K. W. Burnett, LP 2G-C

KINGSTON FOSSIL PLANT- ANNUAL FOSSIL ENGINEERING INSPECTION OF ASH
DISPOSAL AREAS

1.0 General

1.1 This joint inspection of the ash disposal areas was conducted on April 18, 1994 by the following personnel:

C. L. Mount, Fossil Engineering
E. J. Reed, Fossil Engineering
M. A. Hedgecoth, Fuels
J. M. Huber, Fuels
B. Foster, KIF- Yard Operations
R. L. Pope, KIF- Environmental Engineer

1.2 The last inspection was made on March 30, 1993 (B65 931006 201).

1.3 The different areas referenced in this report are designated on the attached print of drawing 10N420.

2.0 Change in Dikes Since Last Inspection

2.1 Dike "C" appears to be stable although there are three wet surface areas and one area of the slope sluffing (see 2.1.6).

2.1.1 The exterior slopes have a good vegetative cover.

2.1.2 Wet area No. 1 continues to be monitored by the plant.

2.1.3 Wet area number 2 identified during a 1988 inspection was not wet but was dark green with everything around it dry.

2.1.4 The third wet area observed during the 1988 inspection was also dry.

2.1.5 There is a good gravel surface on the dike "C" roads. Additional drainage from the berm is needed (see 6.2).

2.1.6 There is a sluff about 150 feet from Swan Pond Road on the outside of dike "C". This 50 foot sluff has been checked three additional times

between the original inspection and June 4, 1993.

This appears to be a surface sluff caused by a temporary condition of water collecting and crossing the road from an area being prepared for closure and is not a structural problem.

- 2.1.7 Runoff water from the new runoff pipes are washing out dike "C" and forming gullies along it (see 6.3).
- 2.2 Seepage of redwater persists along the exterior slope of the southeast dike. The redwater is collected in an interception ditch and routed to an engineered wetland. The water is then pumped to the ash pond. Cattail and other aquatic growth continues to increase in the wetland and removal and replacement will not be necessary for several years.
- 2.3 Red water seeps along Dike C were observed during the 1993 inspection, but could not be observed during this inspection because the lake was at summer pool.

This is an old area of seepage and past reports indicate that it does not appear to be increasing.
- 2.4 The divider dike at the stilling pool appears to be stable.
- 2.5 The original north dike drainage (now south toe of cell 1) has been lowered to remove the ponding. The road crossing at the east end of the ditch was reworked and the pipe lowered four feet. An additional section of pipe was also added. This allows an extra four foot drop in the 1800-foot ditch.

3.0 Changes in Pond Operations Since Last Inspection

- 3.1 The bottom ash continues to be sluiced into a channel at the south end of the initial ash pond and removed by dragline. The bottom ash continues to be sluiced faster than it is being used for dike building.
- 3.2 The fly ash continues to be sluiced into a rubber-lined ditch. The lining has deteriorated. Plant personnel have cleaned out the ditch and placed earth fill and rip

rap on the slopes for approximately 150 feet of the ash sluice ditch (see 6.4).

- 3.3 The fly ash and bottom ash waters continue to be routed through a spillway skimmer into the stilling basin and then discharged through five of six spillways to the intake channel.
- 3.4 Cell No. 1 is full and dike elevation is 795. The return spillway is located in the east end.
- 3.5 Cell No. 3 (center cell) is being dredged into at this time by plant personnel.
- 3.6 Cell No. 2 (northern cell) is being used to dry stack bottom ash. Bottom ash is being put into Cell No. 2 by means of hauling.

4.0 Conditions of Spillways, Skimmers, and Outlets

- 4.1 The plant constructed spillway and skimmer discharging water from the pond area into the stilling pool area appear to be in good condition and there is considerable floating ash on the stilling basin.
- 4.2 Five of the six standard spillways and skimmers in the stilling pool area appear to be in good condition and functioning properly. The spillway on the west end has been raised one section higher than the other five and is not discharging. Algae continues to collect around the spillway on the west end (see 6.1).
- 4.3 The riprap looks good at the spillway discharge outlets.

5.0 Actions on Recommendations of Last Inspection

- 5.1 The algae was removed from the skimmer of the western most spillway (see 6.1).
- 5.2 Riprap has been placed on the inside slope of the stilling pool dike (see 6.5).
- 5.3 Riprap has been placed at the outlet end of the existing dike storm drains (see 6.5).
- 5.4 Drain pipes have been added to Dike C across the berms; however, additional drainage is required (see 6.2).
- 5.5 Earth fill and rip rap, as opposed to the recommended

rubber liner, have been added in the ash sluice ditch (see 6.4).

6.0 Recommendations

- 6.1 The algae needs to be removed from the skimmer of the western most spillway on a continuous basis.
- 6.2 Additional drain pipes (at least 2) should be added to Dike C across the berms.
- 6.3 Add fill, tamp, and use riprap at each pipe along Dike C.
- 6.4 Plant personnel should replace the rubber liner in the ash sluice ditch or continue to clean out the ditch and fill with earth liner.
- 6.5 Continue to add and monitor riprap at the outlet end of the existing dike storm drains and on the inside slope of the stilling pool dike to prevent additional erosion.

7.0 Chemical Treatment Ponds

- 7.1 The chemical treatment ponds (iron and copper) are located between North Access Road and the fly ash discharge trench. The chemical ponds are excavated below grade and there are no exterior dikes. Both chemical pond internal dikes are covered with riprap. They appear to be in good condition.
- 7.2 The copper and iron pond water is discharged periodically by pumping to the bottom ash ditch which flows into the active ash disposal area.

8.0 Coal Yard Drainage Basin

- 8.1 The coal yard drainage basin is located at the southwest corner of the coal pile. This basin was excavated below grade; therefore, there are no exterior dikes.
- 8.2 All discharge from this basin is pumped into the fly ash discharge pipe which flows to the active ash disposal area.
- 8.3 During the ash pond inspection, the water in this area was very high.

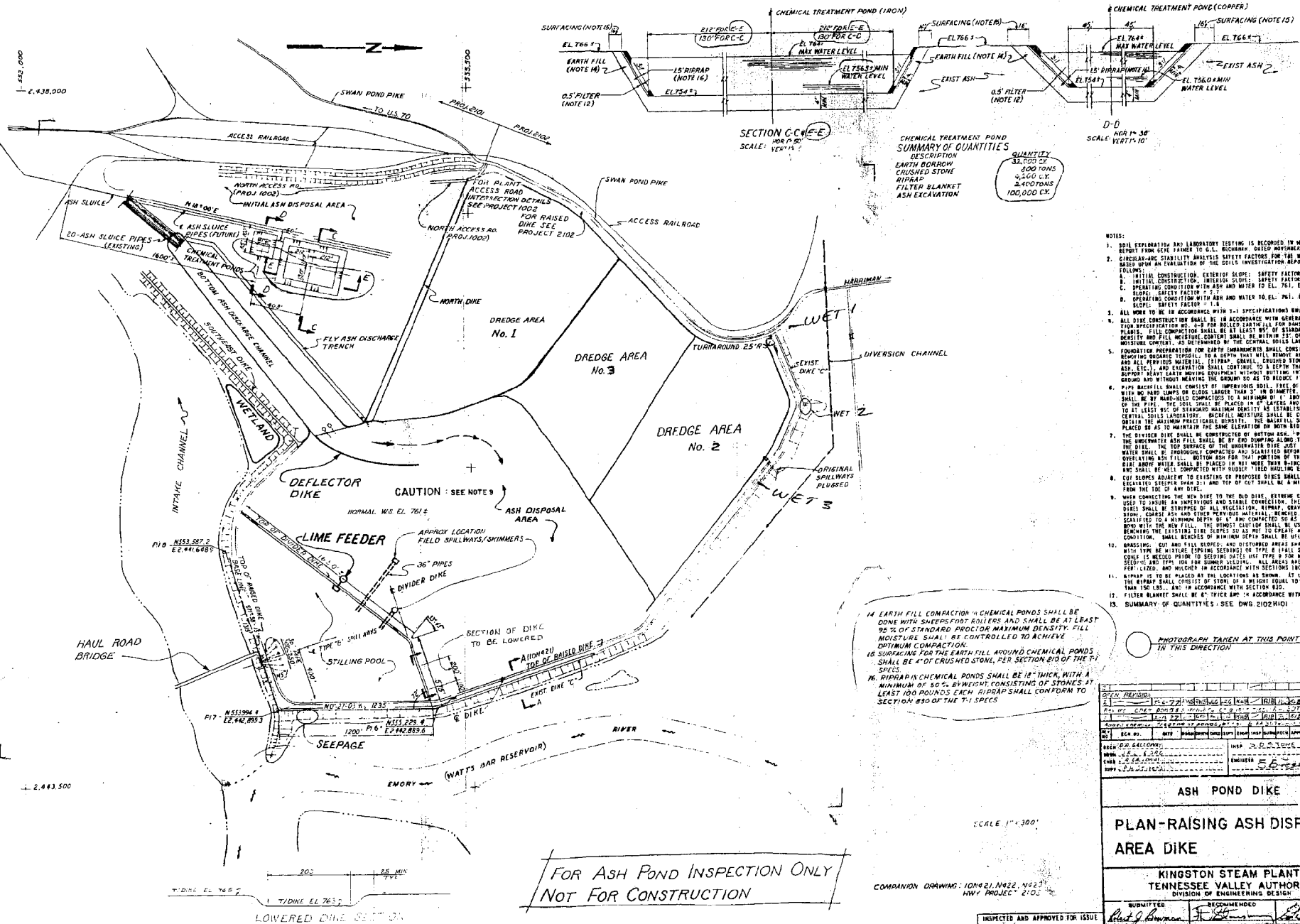
K. W. Burnett
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May 18, 1994

CL Mount

C.L. Mount
Site Engineering

CLM:clm
Attachment

A
B
C
D
E
F
G



FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

SECTION C-C (E-E)
SCALE: 1/8" = 1'-0"

CHEMICAL TREATMENT POND
SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY
EARTH BORROW	200,000 CY
CRUSHED STONE	2,000,000 CY
RIPPRAP	2,000,000 CY
FILTER BLANKET	100,000 CY
ASH EXCAVATION	100,000 CY

- NOTES:
- SOIL ESTIMATION AND LABORATORY TESTING IS RECORDED IN MEMORANDUM REPORT FROM GEE FARMER TO C.L. BUCHANAN DATED NOVEMBER 3, 1975.
 - CIRCULAR AND STABILITY ANALYSIS SAFETY FACTORS FOR THE NEW DIKES ARE SHOWN UPON AN EVALUATION OF THE CIVIL INVESTIGATION REPORT AND AS FOLLOWS:
 - A. INITIAL CONSTRUCTION, EXTERIOR SLOPE: SAFETY FACTOR = 2.6
 - B. INITIAL CONSTRUCTION, INTERIOR SLOPE: SAFETY FACTOR = 2.0
 - C. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, EXTERIOR SLOPE: SAFETY FACTOR = 2.0
 - D. OPERATING CONDITION WITH ASH AND WATER TO EL. 761, INTERIOR SLOPE: SAFETY FACTOR = 1.6
 - ALL WORK TO BE IN ACCORDANCE WITH T-1 SPECIFICATIONS UNLESS NOTED.
 - ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. C-5 FOR ROLLER COMPACTED ALL PURPOSE STONE AND STONE PLANS. FULL COMPACTION SHALL BE AT LEAST 95% OF STANDARD MAXIMUM DENSITY AND FILL INSITU CONTENT SHALL BE WITHIN 1% OF STANDARD MAXIMUM DENSITY, AS DETERMINED BY THE CENTRAL SOILS LABORATORY.
 - FOUNDATION PREPARATION FOR EARTH IMPROVEMENTS SHALL CONSIST OF REMOVING OBSCURE TOPSOIL TO A DEPTH THAT WILL REMOVE ALL ROOTS, AND ALL PERVIOUS MATERIAL (RIPPRAP, GRAVEL, CRUSHED STONE, COARSE SAND, ETC.). EXCAVATION SHALL CONTINUE TO A DEPTH THAT WILL SUPPORT HEAVY EARTH MOVING EQUIPMENT WITHOUT SETTLING INTO THE GROUND AND WITHOUT INTERFERING WITH THE STABILITY.
 - PIPE BACKFILL SHALL CONSIST OF IMPERVIOUS SOIL, FREE OF DEBRIS, WITH NO HARD LUMPS OR CLUMBS 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 LAYERS NOT EXCEEDING 12" TO AT LEAST 95% OF STANDARD MAXIMUM DENSITY AS ESTABLISHED BY THE CENTRAL SOILS LABORATORY. BACKFILL MATERIAL SHALL BE CONTROLLED TO OBTAIN THE MAXIMUM PRACTICAL DENSITY. THE BACKFILL SHALL BE PLACED IN 6" TO 8" LAYERS TO MAINTAIN THE SAME ELEVATION ON BOTH SIDES OF THE PIPE.
 - THE DIVERSION 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: PRODUKTY COMPACTED AND SCARIFIED BEFORE PLACING THE ASH. THE ASH FILL BOTTOM ASH FOR THAT PORTION OF THE DIVERSION DIKE ABOVE WATER SHALL BE PLACED IN NOT MORE THAN 8-INCH LAYERS, AND SHALL BE WELL COMPACTED WITH ROLLER TIED TO THE EQUIPMENT.
 - CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIKES SHALL NOT BE EXCEPTED STEEPER THAN 3:1, AND TOP OF CUT SHALL BE A MINIMUM OF 30' FROM THE TOE OF ANY DIKE.
 - WHEN CONNECTING THE NEW DIKE TO THE OLD DIKE, BEYOND GRAY SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE 24" DIKE SHALL BE STRIPPED OF ALL VEGETATION, RIPPRAP, GRAVEL, CRUSHED STONE, COARSE ASH AND OTHER MATERIAL. REMOVED MATERIAL SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 12" AND COMPACTED TO 95% OF STANDARD MAXIMUM DENSITY. THE EXISTING DIKE SLOPES SHALL BE USED IN REMOVING THE EXISTING DIKE SLOPES SO AS NOT TO EXPLAIN AN UNDESIRABLE CONDITION. SMALL REMOVED OF MINIMUM DEPTH SHALL BE 12".
 - GRASSING, CUT AND FILL SLOPES, AND DISTURBED AREAS SHALL BE SEEDS WITH TYPE III WEEDS TOPPING SEEDINGS OF TYPE I SHALL BE USED. IF SEEDS IS NEEDED PRIOR TO SEEDING DATES USE TYPE 9 FOR MIXED SEEDING AND TYPE 10 FOR SUMMER SEEDING. SEEDS SHALL BE SPREAD, FERTILIZED, AND MULCHED IN ACCORDANCE WITH SECTIONS 180 AND 182.
 - RIPPRAP IS TO BE PLACED AT THE LOCATIONS AS SHOWN. AT LEAST 50% OF THE RIPPRAP SHALL CONSIST OF STONE OF A WEIGHT EQUAL TO OR GREATER THAN 150 LBS., AND IN ACCORDANCE WITH SECTION 810.
 - FILTER BLANKET SHALL BE 6" THICK AND IN ACCORDANCE WITH SECTION 836.
 - SUMMARY OF QUANTITIES - SEE DWG. 2102(M)1

- 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.
- SURFACING FOR THE EARTH FILL AROUND CHEMICAL PONDS SHALL BE 4" OF CRUSHED STONE, PER SECTION 810 OF THE T-1 SPECS.
- RIPPRAP IN CHEMICAL PONDS SHALL BE 18" THICK WITH A MINIMUM OF 50% BY WEIGHT CONSISTING OF STONES AT LEAST 100 POUNDS EACH. RIPPRAP SHALL CONFORM TO SECTION 830 OF THE T-1 SPECS.

PHOTOGRAPH TAKEN AT THIS POINT
IN THIS DIRECTION

DATE	BY	REVISION
10/20/75	J. H. ...	...
10/21/75	J. H. ...	...
10/22/75	J. H. ...	...
10/23/75	J. H. ...	...
10/24/75	J. H. ...	...
10/25/75	J. H. ...	...
10/26/75	J. H. ...	...
10/27/75	J. H. ...	...
10/28/75	J. H. ...	...
10/29/75	J. H. ...	...
10/30/75	J. H. ...	...
10/31/75	J. H. ...	...

ASH POND DIKE
PLAN-RAISING ASH DISPOSAL
AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

INSPECTED AND APPROVED FOR ISSUE
SUBMITTED BY: J. H. ...
RECOMMENDED BY: J. H. ...
KNOXVILLE 5-20-76 36 C ION 420 R