B65 931006 201

September 30, 1993

R. M. Cole, Kingston Fossil Plant

KINGSTON FOSSIL PLANT - INSPECTION OF THE WASTE DISPOSAL AREA

Attached is a report from Joel D. Paris to K. W. Burnett dated September 30, 1993, concerning the inspection of Kingston Fossil Plant's waste disposal areas.

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

RG Johnson

Ralph G. Johnson
Manager, Fossil Engineering
BR 2B-C

KWB:JDP:ECV
Attachments
cc (Attachments):
R. L. Keyser, LP 2E-C
RIMS, CST 13B-C

2064J

RF

September 30, 1993

K. W. Burnett, MR 3D-C

KINGSTON FOSSIL PLANT - INSPECTION OF ASH DISPOSAL AREAS

1.0 General

1.1 Jim Huber and J. D. Paris inspected the ash disposal area on March 30, 1993, and were accompanied by Raymond Gutiner, Plant Coal Yard Foreman.

1.2 The last inspection was on June 26, 1990 (B65 900928 072).

1.3 The ash disposal area is shown on the attached print of drawing 10N420.

2.0 Change In Dike Since Last Inspection

2.1 Dike "C" appears to be stable although there are three wet surface areas and one slope failure on the berm.

2.1.1 The exterior slopes have a good vegetative cover (picture 1). Wet area No. 1 continues to be monitered by the plant.

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

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

2.1.4 There is a good gravel surface on the dike "C" roads. Additional drainage from the berm is needed (see 6.1.4).

2.1.5 There is a sluff about 150 feet from Swan Pond Road on the outside of dike "C" (picture 4). This 50 foot sluff has been checked three additional times by me 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 retirement and is a structural problem.

2.2 Seepage of redwater still 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 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 The lake was at winter pool and there were red water seeps all along Dike C in the draw down area. There is a stream discharging out of the Swan Pond Road fill at the Dike C intercept (Pictures 2 and 3) and below the summer pool.

This is an old area of seepage and does not appear to be increasing.

2.4 The divider dike at the stilling pool appears to be stable.

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 that has deteriorated. This liner should be replaced. (See 6.1.5.)

3.3 The fly ash and bottom ash waters are 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 dike elevation is 795. The return spillway is located in the east end.

3.5 Cell No. 3 (center cell) is being cleaned out but the ash is wet and hard to remove.

3.6 Cell No. 2, northern cell, is being dredged into at this time. The dike is at elevation 775. The north end (about 5 acres) has been filled in and is the cause of wet areas 1 and 2 drying up (2.1.2 and 2.1.3).

3.7 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 fall in the 1800-foot ditch.

4.0 Condition 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 as there is very little 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. The algae should be periodically removed for accurate discharge readings. (See Recommendation 6.1.1.)

4.3 The interior dike bank is washing into the pond due to wave action (picture 6). (See Recommendation 6.1.2.)

4.4 The riprap looks good at the spillway discharge outlets.

5.0 Action On Recommendation Of Last Inspection

5.1 All trees were removed from the dike.

6.0 Recommendations

6.1 Action Items

6.1.1 The algae needs to be removed from the skimmer of the western most spillway on a continuous basis.

6.1.2 Riprap needs to be placed on the inside slope of the stilling pool dike, average 100 lbs., to stop the wave erosion.

6.1.3 Add riprap at the outlet end of the existing dike storm drains to correct the existing erosion and prevent additional erosion. The stones should be in the range of 40 to 80 lbs.

6.1.4 Additional drain pipes should be added to Dike C across the berms, see 10N420 for locations, (reference 2.1.4).

6.1.5 The rubber liner in the ash sluice ditch should be replaced (see 3.2).

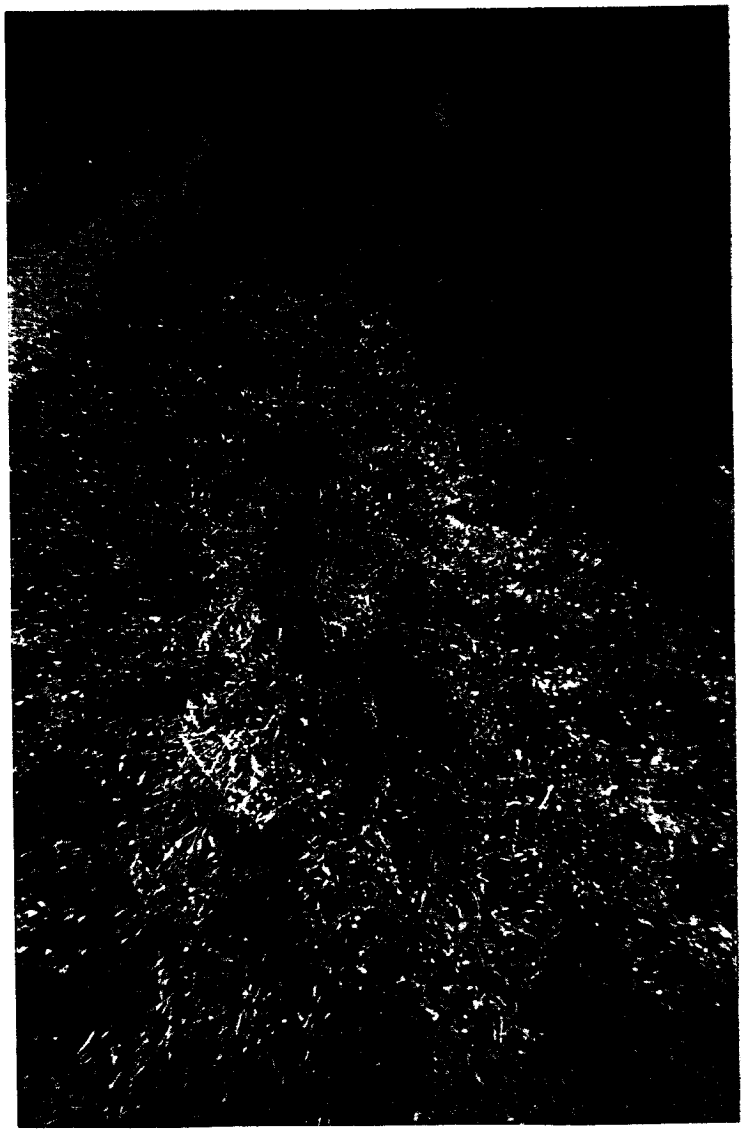
J. D. Paris
Civil Engineer
MR 3D-C

2064J

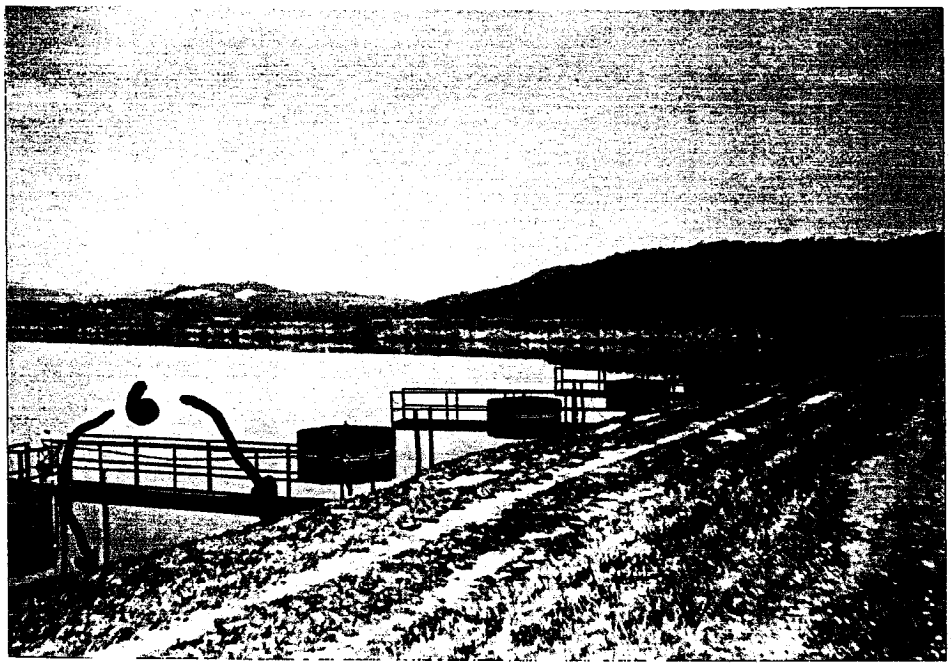
Picture 1-Grass Cover (2.1.1)

Picture 2-Location of the Red water flow and slough.


Picture 3-Red water flow.

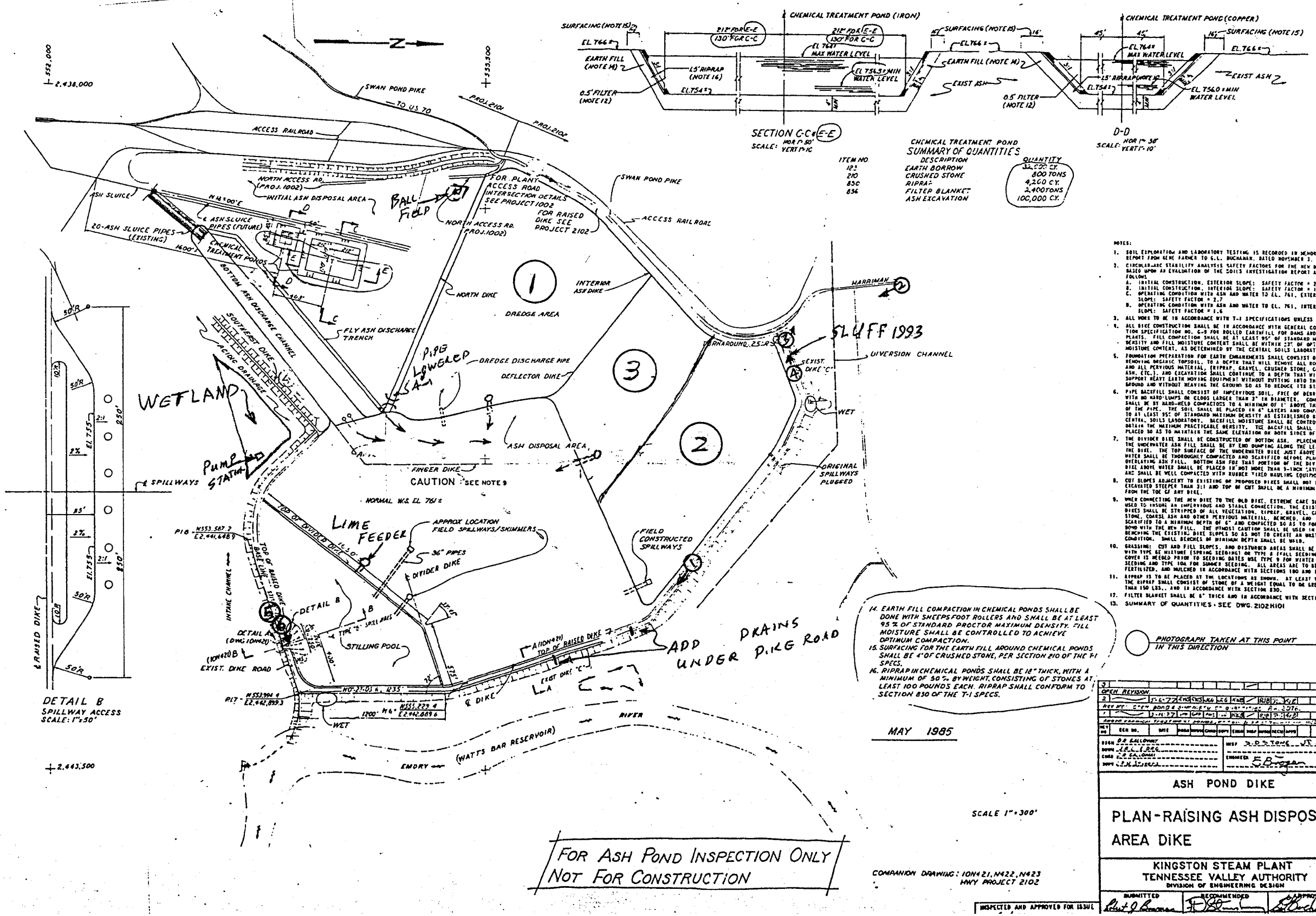


Picture 4- A slough that has been stable for four months.



Picture 5-Skimmers in the stilling pond and location of the wave damage.

Picture 6-Wave damaged area.




CHEMICAL TREATMENT POND
SUMMARY OF QUANTITIES

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 123 | EARTH BORROW | 32,000 CY. |
| 210 | CRUSHED STONE | 800 TONS |
| 830 | RIPRAP | 9,260 CY. |
| 834 | 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 ANALYSES 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 = 1.5
   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-I 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 PUTTING INTO THE GROUND AND WITHOUT MIXING 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 FILL 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 LIFTS NOT MORE THAN 3-INCH LOOSE, 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 2:1 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 EQUIPMENT 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 6 (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 90% OF THE RIPRAP SHALL CONSIST OF STONE OF A WEIGHT EQUAL TO OR GREATER THAN 150 LBS., AND IS ACCORDANCE WITH SECTION 830.
12. FILTER BLANKET SHALL BE 6" THICK AND IN ACCORDANCE WITH SECTION 834.
13. SUMMARY OF QUANTITIES - SEE DWG. 2102H101
14. EARTH FILL COMPACTION IN CHEMICAL PONDS SHALL BE DONE WITH SHEEPS FOOT 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-I 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-I SPECS.

PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION

MAY 1985

SCALE 1"=300'

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

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

INSPECTED AND APPROVED FOR ISSUE

| NO. | DESCRIPTION | DATE | DRAWN | DESIGN | CHKD | APPD | ENGR | MGR | CHIEF | RECOM | APPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | OPEN REVISION | | | | | | | | | | |
| 2 | | 5-6-77 | ENG | CHS | LEE | KLB | | RJB | | | |
| 1 | | 12-15-77 | JMC | CHS | | | | RJB | | | |

DESIGN: D.P. GALLOWAY
DRAWN: J.R.L. LEE
CHKD: D.P. GALLOWAY
DRAWN: J.M. JENNINGS
WEST: R.D. STONE
ENGINEER: E.B. MORGAN

ASH POND DIKE

PLAN-RAISING ASH DISPOSAL AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

| SUBMITTED | RECOMMENDED | APPROVED |
|---|---|---|
| | | |