

HISTORY OF CONSTRUCTION
40 CFR 257.73(c)(1)(i)-(xii)
PLANT BOWEN ASH POND (AP-1)
GEORGIA POWER COMPANY

(i) Site Name and Ownership Information:

Site Name:	Plant Bowen
Location:	Euharlee, Georgia
Site Address:	317 Covered Bridge Rd. S.W. Cartersville, GA 30120
Owner:	Georgia Power Company
Owner Address:	241 Ralph McGill Blvd Atlanta, GA 30308
CCR Impoundment Name:	AP-1
NID ID:	GA03958 (008-031-04136 Georgia State ID)

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule (40 C.F.R. Part 257 and Part 261), §257.73(c)(1), requires the owner or operator of an existing CCR surface impoundment to compile a history of construction. To the extent feasible, the following information is provided:

(ii) CCR Unit Location Map:

34.129954, -84.929855
See Location Map in the Appendix

(iii) Purpose of CCR Unit:

Plant Bowen is a four (4) coal fire unit electric generating facility. AP-1 was designed to receive and store coal combustion residuals and low volume wastes produced during the electric generating process at Plant Bowen.

(iv) Watershed Description:

Plant Bowen is located within the Richland Creek-Etowah River HUC-12 watershed which has a total area of 13,421 acres and the Lower Euharlee Creek HUC-12 watershed which has a total area of 17,334 acres. AP-1 is located entirely within the Lower Euharlee watershed. The entire Plant Bowen property is located within the Etowah HUC-8 watershed which has a drainage area of 1,193,693 acres. No drainage from the watershed flows into AP-1.

(v) Description of physical and engineering properties of CCR Unit foundation/abutments:

AP-1 was created by construction of the main dike, which bounds AP-1 on the east, south and west sides, and approximately two-thirds of the north dike. The remaining portions of the impoundment are contained by natural ground. The main and north dikes were constructed in 1968 creating a storage area of approximately 257 acres. AP-1's impounding dikes are homogenous structures comprised of low permeability compacted residual soils (clay/silt) supported above the residuum silty/clay foundation

soils, with a height ranging from 35 feet for the north dike to 45 feet for the west dike. The upstream and downstream slopes are graded at 2H:1V. The crest is at elevation 715 ft. A berm, approximately 25 ft. wide, was constructed as part of the Phase I construction along the northern section of the west dike to elevation 693 ft.

AP-1 lies within the Valley and Ridge physiographic province about three to four miles north of the Cartersville Fault. The Cartersville Fault separates the late Precambrian-aged metamorphic rocks to the east and south from the Cambrian-aged sedimentary rocks to the north and west. AP-1 lies within an area mapped primarily as Knox Group undifferentiated. The Knox Group produces a characteristic orange to red clayey residuum, often cherty, that can range in thickness from ten to a hundred feet or more. The soils underlying AP-1, embankment, and abutments are residual, formed from the in-place weathering of the underlying dolomite and limestone.

In general, the abutment foundation soils consist of a relatively thick mantle of virgin residual soils varying from a stiff to hard fine, sandy clayey silt to sandy silty clay with isolated areas of soft to firm clayey silts overlying rock. The residual soils range in thickness from 10 ft. or more on the abutments to 40 ft. on higher elevations. Foundation soils along the lower elevations of the impounding dike consist of residual soils comprised of soft clayey silts. In lower portions of the alignment, alluvial soils overlie the residual soils. The alluvium generally consists of sandy silty clays with gravel varying up to 3 ft. thick. Approximately 6 ft. to 16 ft. of alluvial sands and gravel were associated with small streams crossing the alignment.

The dikes were constructed of residual soils obtained from borrow areas adjacent to and around AP-1. Engineering design parameters were obtained from samples collected and tested during pre-construction geotechnical investigations.

A longitudinal foundation drain was constructed along the west dike. Finger drains, extended laterally from the longitudinal drain were constructed at 200 ft. spacing, with the outlet at the downstream toe of the dike.

(vi) Summary of Site Preparation and Construction Activities:

The main and north dikes were originally constructed in 1968 creating a storage area of about 257 acres. The east dike was a single staged construction to elevation 715 ft. The west dike was a two staged construction with the first stage constructed to elevation 693 ft. The second stage was constructed to the final crest elevation of 715 ft. The fill for dike construction was placed in 6 – inch lifts and compacted to 95% maximum dry density.

Pre – construction geotechnical reports recommended foundation preparation methods consisting of stripping to a minimum of 12–inches to remove all topsoil, organic, and surface sandy alluvium materials. Undercutting was recommended to remove soft materials and deeper alluvial deposits. Any undercut areas were to be backfilled with compacted clay fill. In areas where rock would possibly be exposed, it was to be cleaned with cracks and solution features treated. Foundation inspections were recommended.

In 1992 and again in 2001 Georgia Power developed Ash Stacking Plans to expand the capacity of the facility and transition from a wet process to dry handling process. This transition to dry handling was an engineered plan to reduce the impacts of the hydrostatic levels in AP-1 from impacting the underlying karst topography. The result of this change in operations within AP-1 was that only about 60 acres contains liquid. These areas have been lined with geosynthetic clay liners (GCL), HDPE liners, and/or clay soil liners. The remaining 197 acres of the AP-1 contains the dry-stacked ash (with final soil cover) in the

northern 128 acres and the bottom ash dewatering and process area. The areas where liquid is contained are comprised of two ash dewatering cells, two gypsum settling ponds, gypsum clear pool, and a water recycle pond.

In 2016, activities were completed for a modification to the west dike to divert storm water discharges from the HDPE lined northern perimeter ditch to a detention pond constructed at the downstream toe. The modifications consisted of the construction of a lined channel from the existing ditch to discharge pipes installed in the upper section of the west dike. The piping extends down the downstream slope to the detention pond. The storm water is routed from the detention pond to Euharlee Creek.

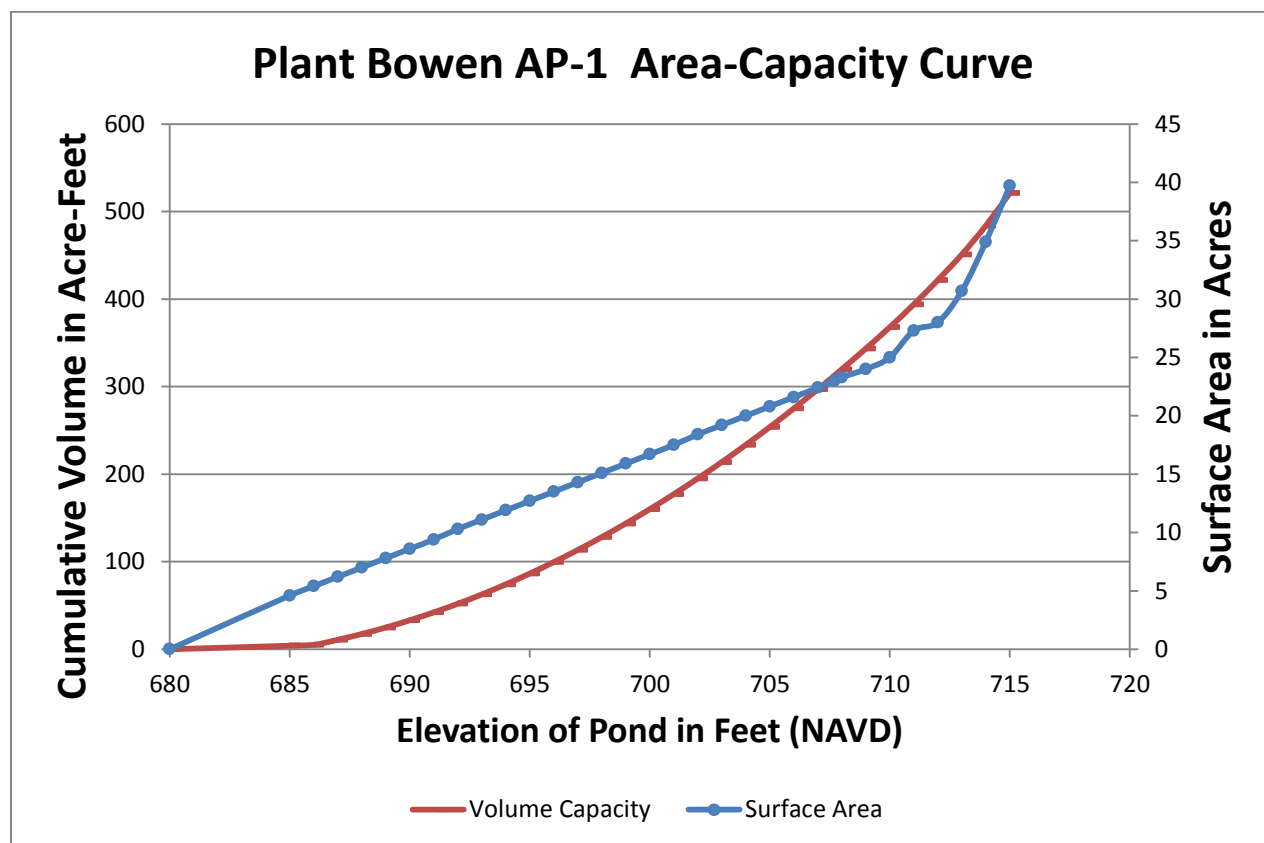
(vii) Engineering Diagram:

The following drawings reflecting the construction of the Plant Bowen Ash Pond can be found in the Appendix:

- Site Location Map
- Georgia Power Company Drawing D-1050 – Etowah Steam Plant County Road
- Georgia Power Company Drawing D-1051 – Etowah Steam Plant County Road
- Georgia Power Company Drawing D-1055 – Etowah Steam Plant Plan & Profile West Ash Pond Dike
- Georgia Power Company Drawing D-1056 – Etowah Steam Plant Plan And Profile South End West Ash Pond Dike
- Georgia Power Company Drawing H-1157 – Etowah Steam Plant North Ash Pond Dike & Overflow Culvert
- Georgia Power Company Drawing E13881 – Plant Bowen Ash Pond Plugging of Overflow Structure
- Georgia Power Company Drawing H-944-3 – Plant Bowen Ash Pond (RADAS) Remote Automatic Data Acquisition System Site Plant with Piezometers

(viii) Description of Instrumentation: There are fifty-two (52) piezometers installed in and around the main impoundment dikes, Recycle Pond, and dewatering cell dikes at Plant Bowen with the majority being monitored remotely. These piezometers are used to monitor water levels around the impoundment.

(ix) Area-capacity curves:



(x) Spillways and Diversions

AP-1 was originally designed with a primary discharge structure located at the north dike consisting of a riser and discharge pipe. This structure was abandoned in 1993 as part of the ash stacking process which began in 1992. The abandonment was achieved through plugging the outlet and filling the structure with concrete. Since that time, the primary and emergency discharge point has been located in the southeast portion of AP-1, which is used as a Recycle Pond. The wet ash settling portion of AP-1 itself discharges overflow into the Recycle Pond portion of AP-1. Discharge from the Recycle Pond portion of AP-1 is routed via four NPDES pumps back to various Plant systems. Intake piping for the pumps penetrates the southern dike at the Recycle Pond portion of AP-1. Manual valves located upstream of the pumps can be used to divert emergency discharges to a tributary to Euharlee Creek. Evaluation of the capacity of AP-1 indicates that runoff from a 1000-year, 24-hour storm event can be completely stored within the Recycle Pond portion of AP-1. The existing water management systems, except for certain sections of the perimeter toe ditch for the northern stack area, are designed, constructed, operated and maintained to adequately manage flow during and following the peak discharge from the 1000-year storm.

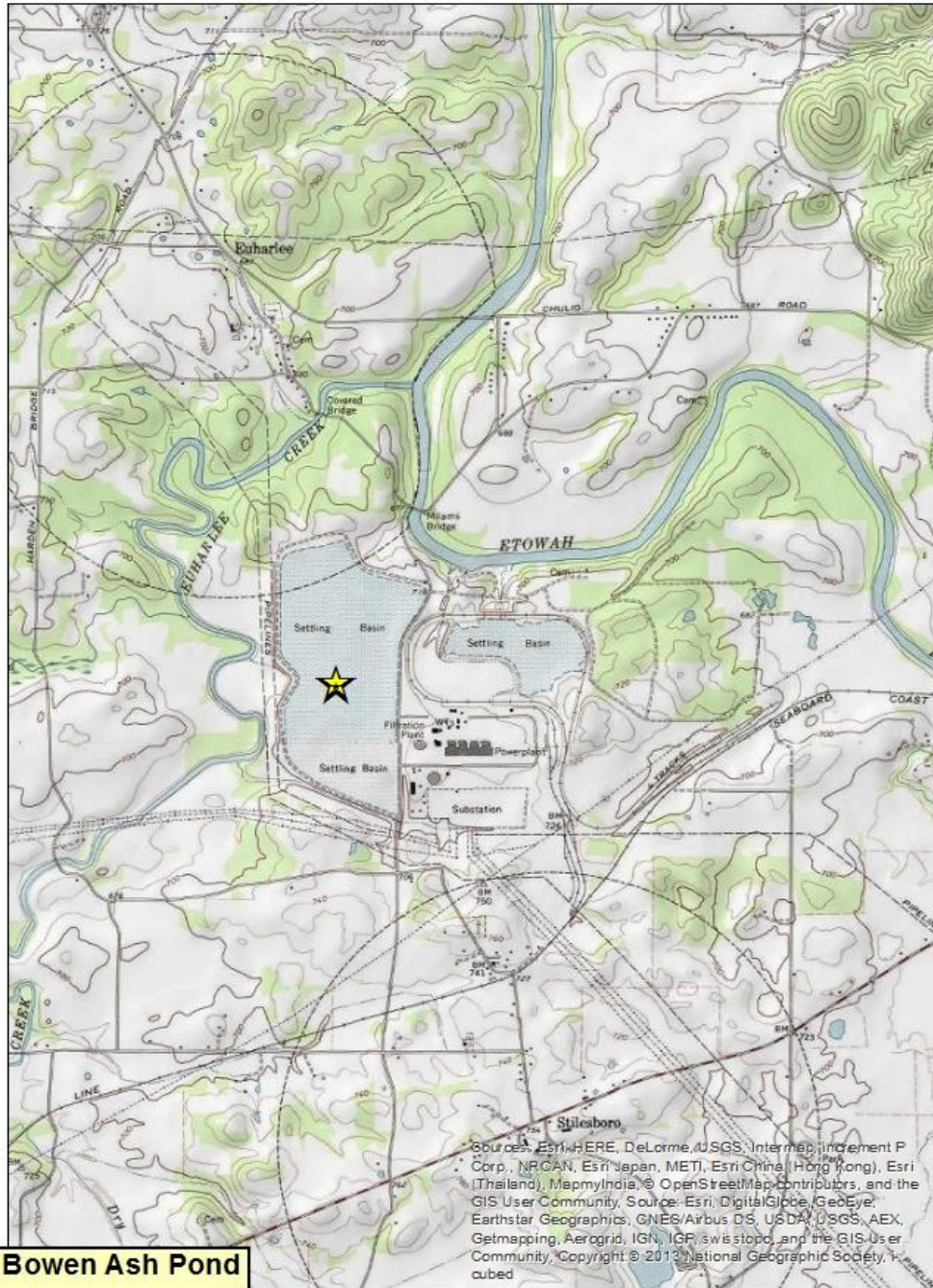
(xi) Provisions for surveillance, maintenance and repair:

Inspections of dikes are critical components and are conducted on a regular basis—currently semi-annually by professional dam safety engineers and at least weekly by trained plant personnel. In addition, inspections are performed after significant events such as storms. The inspections provide assurance that structures are sound and that action is taken, as needed, based on the findings. Safety inspections include numerous checklist items. Specific items vary from site to site but may include observations of such things as pond levels, weather conditions, rainfall since the prior inspection, instrument readings, conditions of slopes and drains, erosion, animal damage, ant hills, alignment of retaining structures and more. Dam safety engineers assess instrument readings, inspect any maintenance or remediation performed since the previous inspection, check the status of work recommended at prior inspections, ensure that emergency notification information is current and evaluate any items noted during plant personnel inspections.

(xii) Known record of structural instability:

There have been three (3) previously identified AP-1 issues at Plant Bowen. Only one issue in 2008 involved the dike. These issues were not caused by improper operation or failure of the dike. Two (2) of the three (3) incidents resulted in release of CCR from the AP-1. In July 2002 a release of ash occurred due to the opening of karst features beneath AP-1, and in September 2008 a release of ash occurred due to rainfall triggered sloughing of the dry stacked ash portion of AP-1, which flowed over the main dike. In December 2008 a sinkhole developed at the north dike abutment and dike, however no CCR was released. This area was downslope of the northern stack area and did not impound water.

Appendix

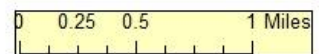


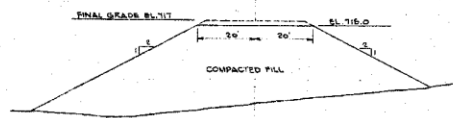
Plant Bowen Ash Pond

★ Ash Pond Location

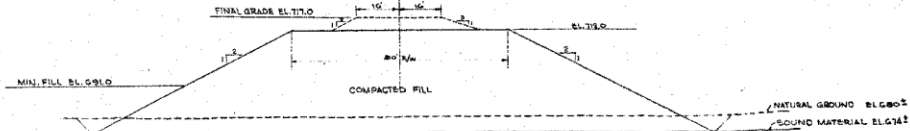
USA Topo Maps

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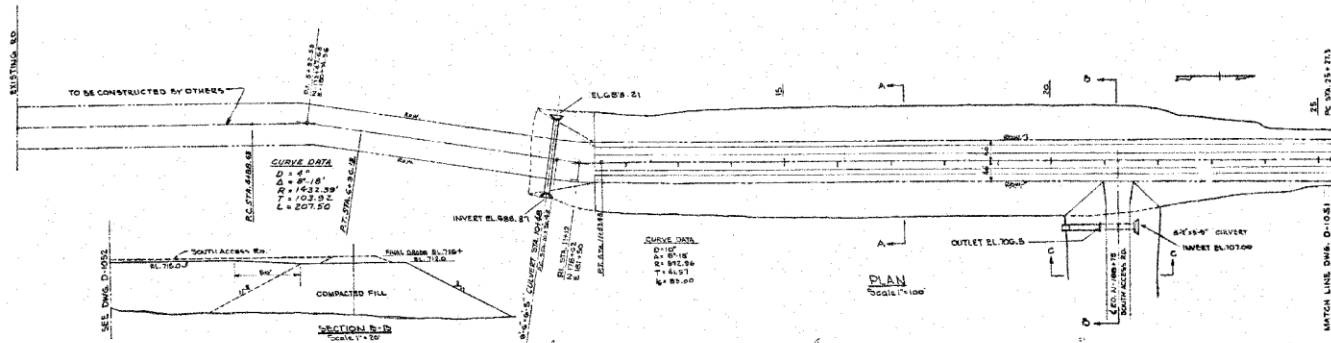


SECTION C-C
Scale 1"=20'

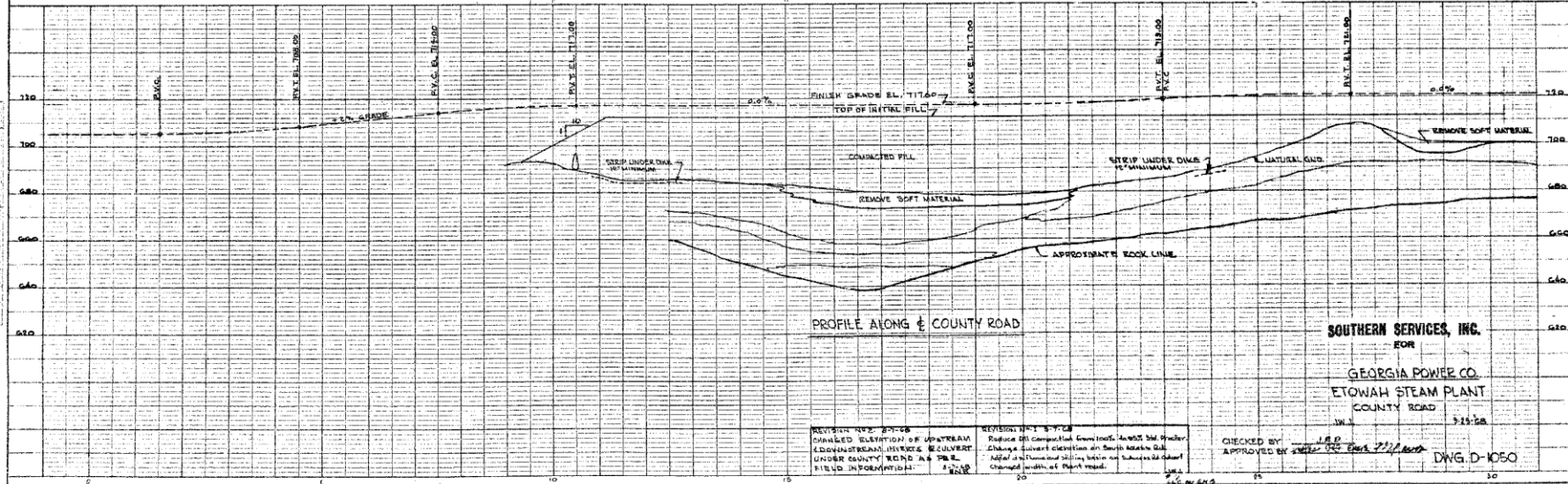


SECTION A-A
Scale 1"=20'

NOTE:
COMPACTED FILL TO BE MADE FROM SELECTED
SAND, AND TRUCK MATERIALS AND COMPACTED
TO 95% STANDARD PROCTOR.



PLAN
Scale 1"=100'



PROFILE ALONG E COUNTY ROAD

SOUTHERN SERVICES, INC.
FOR
GEORGIA POWER CO.
ETOWAH STEAM PLANT
COUNTY ROAD

REVISIONS:
1. CHANGED ELEVATION OF UPSTREAM
EDGEMOORE BRIDGE, INVERT, RECURVED
UNDER COUNTY ROAD A 1051.
2. ADDED INFORMATION:
3. ADDED INFORMATION:
4. ADDED INFORMATION:

CHECKED BY: J.B.D.
APPROVED BY: J.B.D.

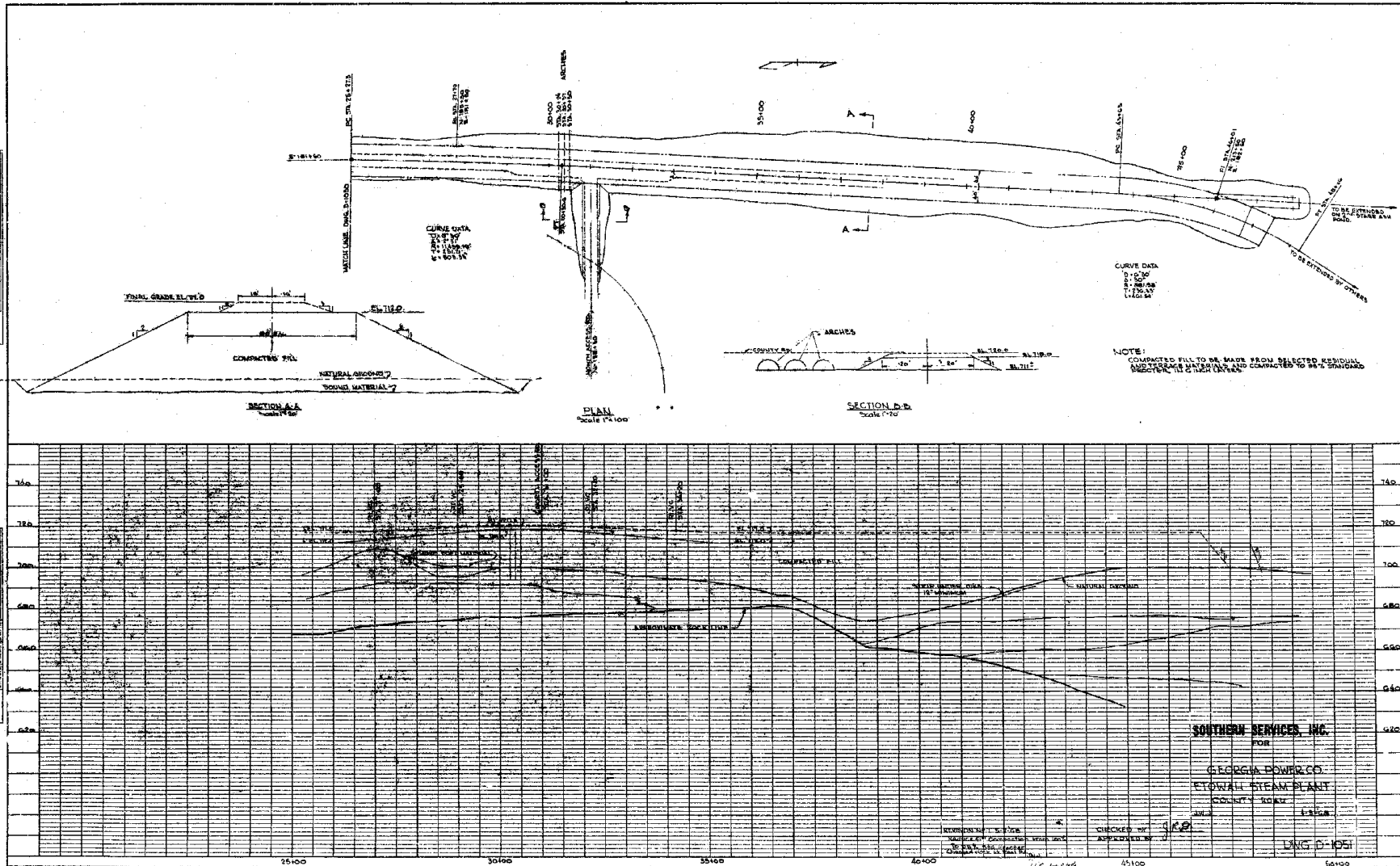
DWG. D-1050

PLATE 1: PLAN/PROFILE
42700P

RETURN TO HYDRO SECTION

PLAN	DATE	BY
DESIGNED BY		
CHECKED BY		
APPROVED BY		

PROFILE	DATE	BY
DESIGNED BY		
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APPROVED BY		

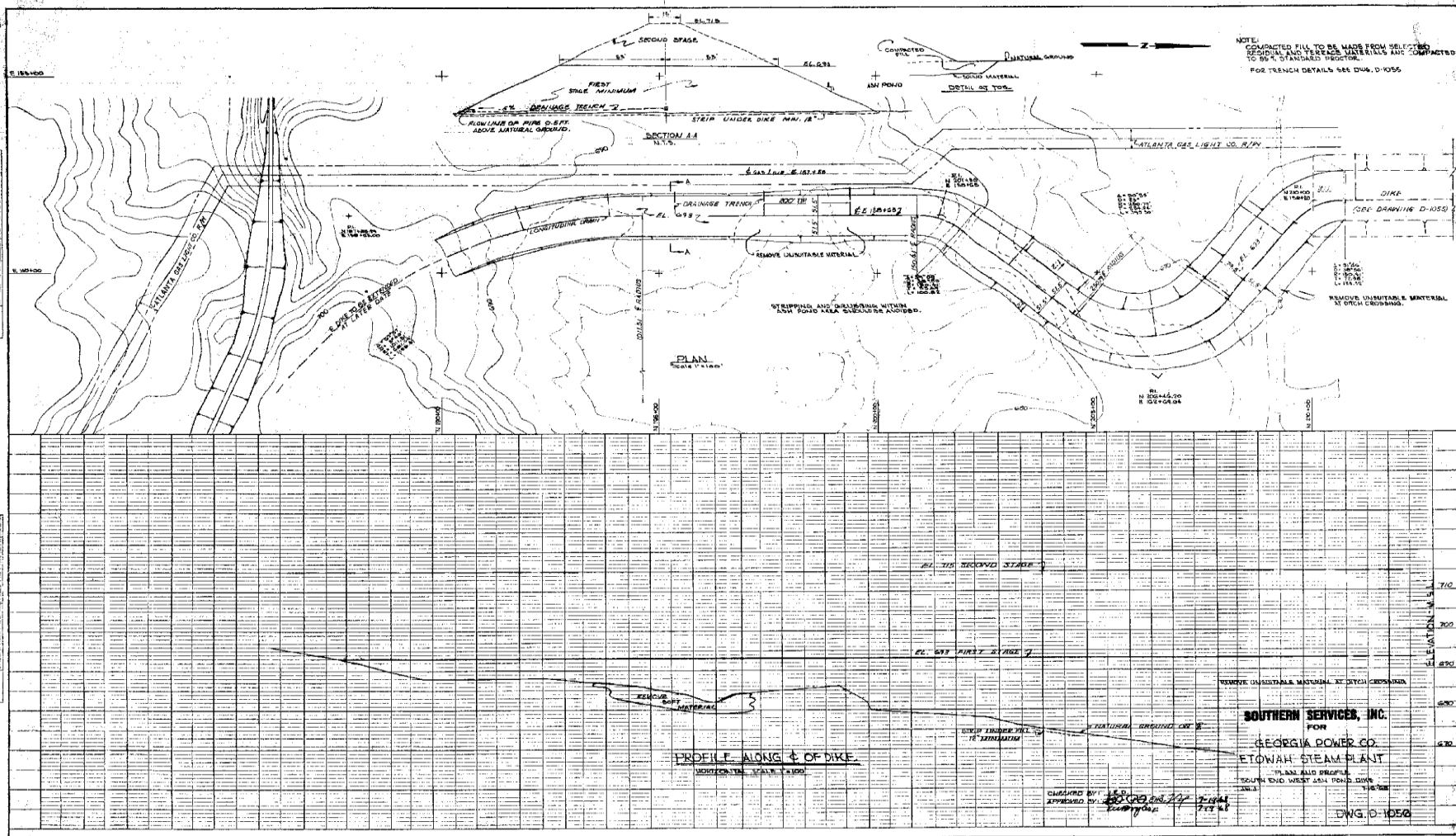


K-E
PLATE 1, PLAN PROFILE
SHEET 1 OF 10



PLAN
DATE: _____ DRAWN BY: _____ CHECKED BY: _____ APPROVED BY: _____ TITLE: _____

PROFILE
DATE: _____ DRAWN BY: _____ CHECKED BY: _____ APPROVED BY: _____ TITLE: _____



K-2 PLY 11, 100' HIGH
100' WIDE

RETURN TRACERS TO HYDRO SECTION

