FINAL

Coal Combustion Waste Impoundment

Round 5 - Dam Assessment Report

Lansing Smith Plant

Ash Pond Embankments
Gulf Power Company
Southport, Florida

Prepared for:

United States Environmental Protection Agency
Office of Resource Conservation and Recovery

Prepared by:

Dewberry & Davis, LLC
Fairfax, Virginia

Under Contract Number: EP-09W001727

December 2010
Revised: April 2011

INTRODUCTION, SUMMARY, CONCLUSION AND RECOMMENDATIONS

The release of over five million cubic yards of coal ash from the Tennessee Valley Authority's Kingston, Tennessee facility in December 2008, which flooded more than 300 acres of land, damaging homes and property, is a wake-up call for diligence on coal combustion waste disposal units. . A first step to prevent such catastrophic failure and damage is to assess the stability and functionality of ash impoundments and other units, then quickly take any needed corrective measures.

This assessment of the stability and functionality of the Lansing Smith fly ash management unit is based on a review of available documents and on the site assessment conducted by Dewberry personnel on July 6, 2010. We found the supporting technical information adequate (Section 1.1.3). Recommendations to help maintain a safe and trouble-free operation were included in the Draft Report and have subsequently been addressed by Gulf Power Company.

In summary, the Lansing Smith Plant ash pond embankments are **SATISFACTORY** for continued safe and reliable operation, with no apparent existing or potential management unit safety deficiencies.

PURPOSE AND SCOPE

The U.S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of Coal Combustion Surface Impoundments (i.e. management unit) from occurring at electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impoundment slurry. The EPA initiative is intended to identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures (if present); to note the extent of deterioration (if present); status of maintenance and/or a need for immediate repair; to evaluate conformity with current design and construction practices, and to determine the hazard potential classification for units not currently classified by the management unit owner or by a state or federal agency. The initiative will address management units that are classified a Less-than-Low, Low, Significant or High Hazard Potential ranking. (For Classification, see pp. 3-8 of the 2004 Federal Guidelines for Dam Safety)

In December 2009, the EPA sent letters to coal-fired electric utilities seeking information on the safety of surface impoundments and similar facilities that receive liquid-borne material that store or dispose if coal combustion waste. This letter was issued under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104(e), to assist the Agency in assessing the structural stability and functionality of such management units, including which facilities should be visited to perform a safety assessment of the berms, dikes, and dams used in the construction of these impoundments.

EPA asked utility companies to identify all management units: surface impoundments or similar diked or bermed structures; and; landfills receiving liquid-borne materials that store or dispose of coal-combustion residuals or by-products, including, but not limited to, fly ash, bottom ash, boiler slag, and flue gas emission control residuals. Utility companies responded with information on the size, design, age, and the amount of material placed in the units so that EPA could gauge which management units had or potential could rank as having High Hazard Potential. The USEPA and its contractors used the following definitions for this study:

> "Surface Impoundment or impoundment means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling and aeration pits, ponds, and lagoons."
>
> For this study, the earthen materials could include coal combustion residuals. EPA did not provide an exclusion for small units based on whether the placement was temporary or permanent. Furthermore, the study covers not only waste units designated as surface impoundments, but also other units designated as landfills which receive free liquids.
>
> EPA is addressing any land-based units that receive fly ash, bottom ash, boiler slag, or flue gas emission control waster along with free liquids. If the landfill is receiving coal combustion wastes with liquids limited to that for proper compaction, then there should not be free liquids present and the EPA did not seek information on such units which are appropriately designated a landfill.
>
> In some cases coal combustion wastes are separated from the water, and the water containing de minimum levels of fly ash, bottom ash, boiler slag, or flue gas emission control wastes are sent to an impoundment. EPA is including such impoundments in this study, because chemicals of concern may have leached from the solid coal combustion wastes into the waster waters, and the suspended solids from the coal combustion wastes remain.

The purpose of this report is to **evaluate the condition and potential of waste release from management units. Some have and some have not been rated for hazard potential classification**. A two-person team reviewed the information submitted to EPA, reviewed any relevant publicly available information from state or federal agencies regarding the unit potential hazard classification (if any) and accepted information provided via telephone communication with a management unit representative.

This evaluation included a site visit. EPA sent two engineers, one licensed in the State of Florida, for a one-day visit. The two-person team met with the owner of the management unit as well as technical and several technical representative and management unit supervisors to discuss the engineering characteristics of the unit as part of the site visit. During the site visit the team collected additional information about the management unit to be used in determining the hazard potential classifications of the management unit(s). Subsequent to the site visit the management unit owner provided additional engineering data pertaining to the management unit(s).

Factors considered in determining the hazard potential classification of the management unit(s) included the age and size of the impoundment, that quantity of coal combustion residuals or by-products that were stored or disposed in the these impoundments, its past operating history, and its geographic location relative to down gradient population centers and/or sensitive environmental systems.

This report presents the opinion of the assessment team as to the potential of catastrophic failure and reports on the condition of the management units(s). The team considered criteria in evaluating the dams under the National Inventory of Dams in making these determinations.

LIMITATIONS

The assessment of dam safety reported herein is based on field observations and review of readily available information provided by the owner/operator of the subject coal combustion waste management unit(s). Qualified Dewberry engineering personnel performed the field observations and review and made the assessment in conformance with the required scope of work and in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is made with regard to our assessment of dam safety.

FINAL

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1.0 CONCLUSIONS AND RECOMMENDATIONS

1.1 CONCLUSIONS

Conclusions are based on visual observations from the one-day site visit, review of technical documentation provided by Gulf Power Company (GPC), and review of state inspection reports.

1.1.1 Conclusions Regarding the Structural Soundness of the Management Unit(s)

The structural stability of the ash pond embankments is uncertain based on the following conditions:

- Surface sloughing has occurred in four areas along the northeast downstream slope of the embankment. Only one of those areas has been repaired, using slush grouted rip-rap;
- There is evidence of some small animal burrows along the downstream embankment;
- Widespread rill erosion, surface sloughing and sediment deposition has occurred along downstream slope; and
- Irregular road surface along the west dike downstream buttress with rutting and small surface depressions holding water.

These conditions have been corrected since the initial site visit and photo documented by GPC.

1.1.2 Conclusions Regarding the Hydrologic/Hydraulic Safety of the Management Unit(s)

According to information provided by GPC, adequate capacity and freeboard exist to safely pass the design storm. The crest elevation of 20' and the pond elevation at 17.5' were provided in the Hydrologic and Hydraulic Analysis Report dated June 29, 2010 (See Appendix A: Doc 1) leaving 2.5' of freeboard. However, these elevations need to be verified based on site observation and concerns identified in annual site inspections.

1.1.3 Conclusions Regarding the Adequacy of Supporting Technical Documentation

Supporting technical documentation is adequate.

1.1.4 Conclusions Regarding the Description of the Management Unit(s)

Descriptions provided are appropriate.

1.1.5 Conclusions Regarding the Field Observations

Evidence of surficial sloughing was observed along the northeastern downstream dike. Widespread rill erosion, surface sloughing and sediment deposition were apparent on downstream slopes. Crest elevations appear irregular and have minor depressions. The team observed cut woody-stem vegetation that had recently been cut along the embankment and evidence of small animal burrows along the downstream dike.

1.1.6 Conclusions Regarding the Adequacy of Maintenance and Methods of Operation

The maintenance procedures appeared to be inadequate since there were multiple outstanding maintenance issues. Subsequent to these initial conclusions, GPC has developed and provided a copy of a site specific “Ash Pond Maintenance Plan” that addresses these concerns.

1.1.7 Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

Existing surveillance and monitoring programs are adequate.

1.1.8 Classification Regarding Suitability for Continued Safe and Reliable Operation

Facility is SATISFACTORY for continued safe and reliable operation. A classification of “satisfactory” is appropriate when acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable safety regulatory criteria.

1.2 RECOMMENDATIONS

1.2.1 Recommendations Regarding the Structural Stability

An action plan should be developed to address surficial sloughing, rill erosion and sediment deposition along downstream slopes. Based on photographic documentation, the plan should consider changes in drainage patterns to direct runoff back inside the embankments. The draft report included the above recommendations; subsequently GPC has developed and provided a copy of a site specific “Ash Pond Maintenance Plan” that incorporates the recommendations.

1.2.2 Recommendations Regarding the Hydrologic/Hydraulic Safety

The amount of freeboard needs to be verified. Per information provided by GPC, the freeboard is currently 2.5'. The available freeboard based on visual observations made during the site visit along portions of the dike system appears to be less than 1-ft.

1.2.3 Recommendations Regarding the Supporting Technical Documentation

None appear warranted at this time.

1.2.4 Recommendations Regarding the Description of the Management Unit(s)

None appear warranted at this time.

1.2.5 Recommendations Regarding the Field Observations

From the field observations the following issues were identified as needing to be addressed with routine maintenance:

- Surface sloughing has occurred in four areas along the northeast downstream slope of the embankment. One of those areas has been repaired with slush grouted rip-rap;
- There is evidence of small animal burrows along the downstream embankment;
- Widespread rill erosion, surface sloughing and sediment deposition has occurred along downstream slope; and
- Irregular road along west dike downstream buttress with rutting and small surface depressions holding water.

Subsequent to the time these initial recommendations were made, GPC has addressed these concerns, provided photo-documentation of the corrections, and prepared a site specific "Ash Pond Maintenance Plan" that incorporates these recommendations.

1.2.6 Recommendations Regarding the Maintenance and Methods of Operation

Vegetation should be cut or mowed on an as-needed basis to prevent the establishment of large woody-stemmed vegetation. In the draft report there was a recommendation to develop a plan of action to handle the maintenance of surficial sloughing, crest depression and rill erosion when observed. Subsequent to this recommendation, GPC prepared a site specific "Ash Pond Maintenance Plan" that incorporates these recommendations.

1.2.7 Recommendations Regarding the Surveillance and Monitoring Program

None appear warranted at this time.

1.2.8 Recommendations Regarding Continued Safe and Reliable Operation

The draft report contained the following recommendations concerning safe operation:

- Develop an action plan to address surficial sloughing along the downstream slopes.
- Perform remediation along downstream slopes to address surficial sloughing.
- Perform remediation along the slopes where erosion is occurring.
- Perform remediation along the crest where depressions are present.

Subsequently GPC addressed these concerns, photo-documented the corrections, and prepared a site specific "Ash Pond Maintenance Plan" that incorporates these recommendations.

- It is recommended that verification be made to ensure adequate freeboard (2.5-ft) exists along all points of the diked embankment system.

1.3 PARTICIPANTS AND ACKNOWLEDGEMENT

1.3.1 List of Participants

James O. Vick – Gulf Power Company (GPC)
Brian Heinfeld – Gulf Power Company (GPC)
James C. Pegues, P.E. – Southern Company Generation (SCG)
Ben Gallagher – Southern Company Generation (SCG)
Michael P. Petrovich – Hopping Green & Sams (HGS)
Russell A. Badders – Beggs & Lane (BL)
Michael Hanson – Dewberry & Davis, Inc.
Frederic Shmurak – Dewberry & Davis, Inc

1.3.2 Acknowledgement and Signature

We acknowledge that the management unit referenced herein was assessed on July 6, 2010.

Michael Hanson, PE, LEED AP
Civil Engineer

Frederic M. Shmurak, PE, Civil Engineer

2.0 DESCRIPTION OF THE COAL COMBUSTION WASTE MANAGEMENT UNIT(S)

2.1 LOCATION

The Lansing Smith Electric Generating Plant and ash pond are located approximately 4 miles south of Chattahoochee, Florida along the western bank of the Apalachicola River. The Town of Lynn Haven is approximately 1 ½ miles downstream of the ash pond dams. Figure 2.1 depicts a vicinity map around the Lansing Smith Facility, while Figure 2.1 b depicts an aerial view of the Lansing Smith Facility.

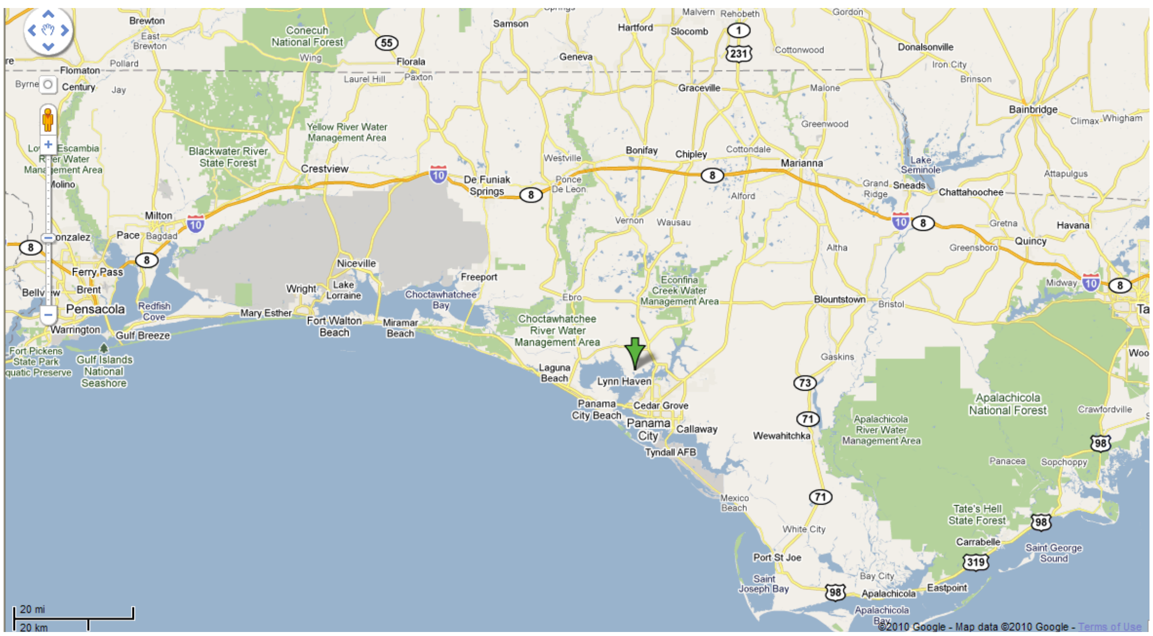


Figure 2.1 a: Lansing Smith Facility Vicinity Map

Figure 2.1 b: Lansing Smith Facility Aerial View

2.2 SIZE AND HAZARD CLASSIFICATION

The ash pond is impounded by an earthen embankment system consisting of a combination of an incised and diked configuration. There are two internal dikes that create a three cell complex (See Figure 2.2). Based on data provided by Gulf Power Company (GPC), the ash pond embankment system was originally constructed to a maximum height of 15 feet, with side slopes of 1.5(H):1(V) to 1 (H):1(V) and crest widths ranging from 20 to 30 feet. In 1980 remedial work was recommended and apparently performed that resulted in shallower slopes and a wider crest. No documentation on the follow up of the remedial work recommendation was provided. The maximum remaining storage volume corresponding to the top of the embankment is 818,081 cubic yards according to plans provided by GPC dated March 11, 2010 (see Appendix A Doc: 02 Ash Pond Topo and Volume.pdf). The classification for size, based on the height of the dam and storage capacity, is Intermediate in accordance with the USACE Recommended Guidelines for Safety Inspection of Dams ER 1110-2-106 criteria (see Table 2.2a for size classification criteria).

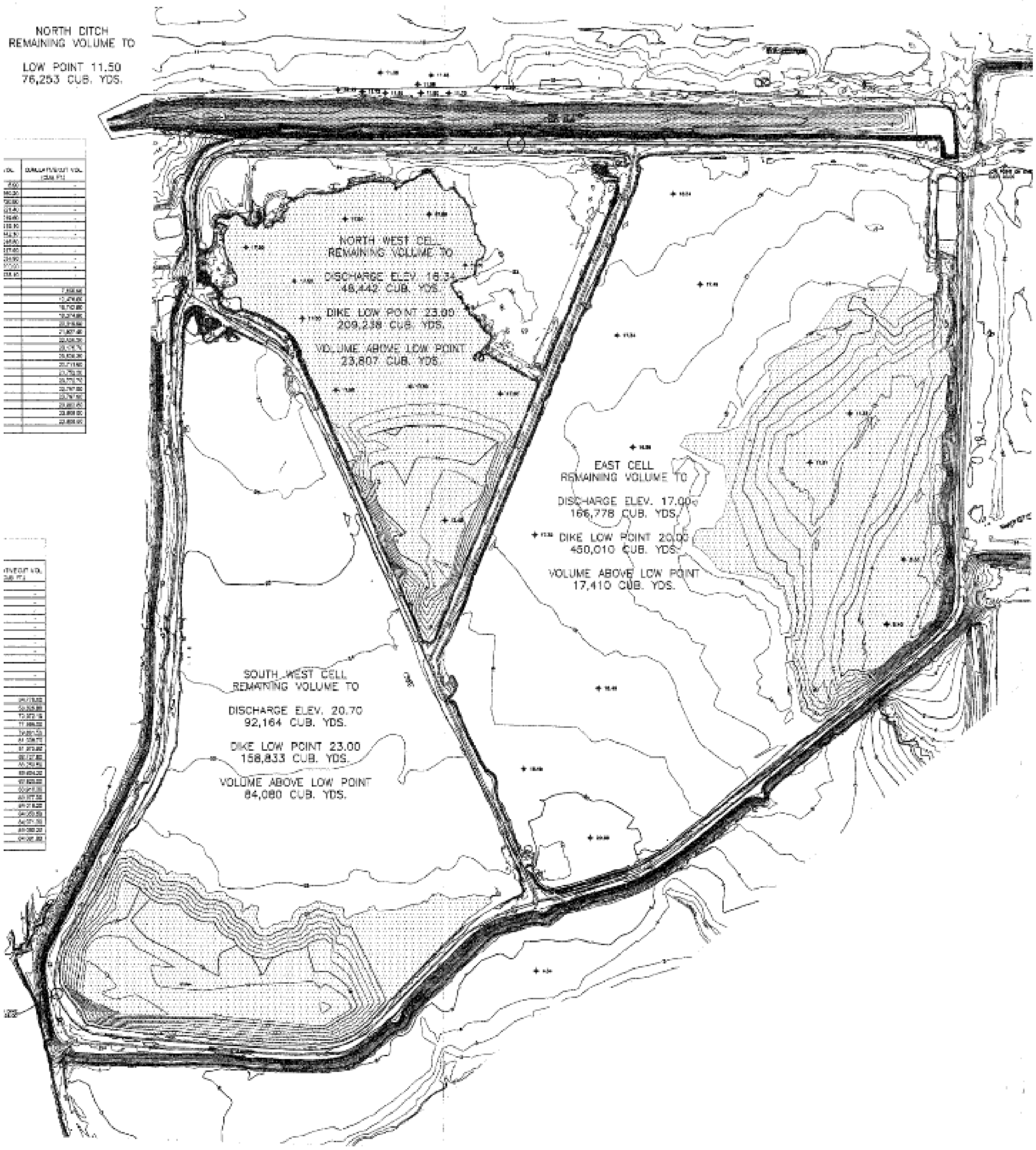


Figure 2.2: Fly Ash Pond Plan View (GPC Drawing No. 3727LAN)

Table 2.2a USACE ER 1110-2-106 Size Classification		
Category	**Impoundment**	
	Storage (Ac-ft)	**Height (ft)**
Small	< 1,000	< 40
Intermediate	1,000 to < 50,000	40 to < 100
Large	> 50,000	> 100

Table 2.2b: Summary of Dam Dimensions and Size	
	Bottom Ash Pond
Dam Height (ft)	15
Crest Width (ft)	20 (Min) – 30'
Length (ft)	Perimeter of ash pond approximately 10,800'
Side Slopes (upstream) H:V	Not Listed
Side Slopes (downstream) H:V	1.5 to 1:1 – Modified to 2.5:1
Hazard Classification	Significant

*length of perimeter dike

No information on the Hazard Classification was provided, but based on observations, a classification of Low appears to be appropriate. Per the Federal Guidelines for Dam Safety dated April 2004, a Low Hazard Potential classification applies to those dams where failure or mis-operation results in no probable loss of human life and low economic loss, environmental damage, disruption of lifeline facilities, or impact to other concerns. Low Hazard Potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure. Considering the low probability of loss of life should the fly ash dam system fail, a Federal Hazard Classification of **Low** appears to be appropriate for this facility (see Table 2.2c for Hazard classification criteria).

Table 2.2c FEMA Federal Guidelines for Dam Safety Hazard Classification		
Hazard Potential Classification	**Loss of Human Life**	**Economic, Environmental, Lifeline Losses**
Low	None Expected	Low and generally limited to owner
Significant	None Expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

2.3 AMOUNT AND TYPE OF RESIDUALS CURRENTLY CONTAINED IN THE UNIT(S) AND MAXIMUM CAPACITY

Per the State of Florida Wastewater Facility Permit dated December 2, 2009, the Fly Ash Pond may receive boiler blowdown, water treatment filter backwash, air preheater wash, ash and pyrite sluice, coal pile runoff, yard runoff, treated metal cleaning waste, treated demineralizer regeneration waste, treated domestic wastewater, and other minor process and non-process waste streams. Documentation was provided stating the ash pond occupies 165 acres. The drainage area is assumed to be the surface area of the pond. The maximum design storage capacity is approximately 4,212,716 cubic yards.

Table 2.3: Amount of Residuals and Maximum Capacity of Unit*

	Ash Pond
Surface Area (acre)	Approximately 165
Current Storage Volume (acre-feet)	2,032
Max. Design Storage Capacity (acre-feet)	2,611

2.4 PRINCIPAL PROJECT STRUCTURES

2.4.1 Earth Embankment Dam

The original material of the dam embankment was not provided. Test results from 1981 were provided for the modification and a recommendation that was made.

2.4.2 Outlet Structures

The weir outlet structure of the East Pond contains three sections of stoplogs and two 14 inch diameter pipes. The top of the stoplogs are at approximately elevation 17'. The outlet pipe through the East Dike is a free outlet with no tailwater condition. The water flows over a weir before entering the recycle canal.

2.5 CRITICAL INFRASTRUCTURE WITHIN FIVE MILES DOWN GRADIENT

All critical infrastructures were located using aerial photography and might not accurately represent what currently exists down-gradient of the site. Not all critical infrastructures are labeled for clarity purposes. Figure 2.5 shows the Lansing Smith Plant and associated critical infrastructure, listed in Table 2.5.

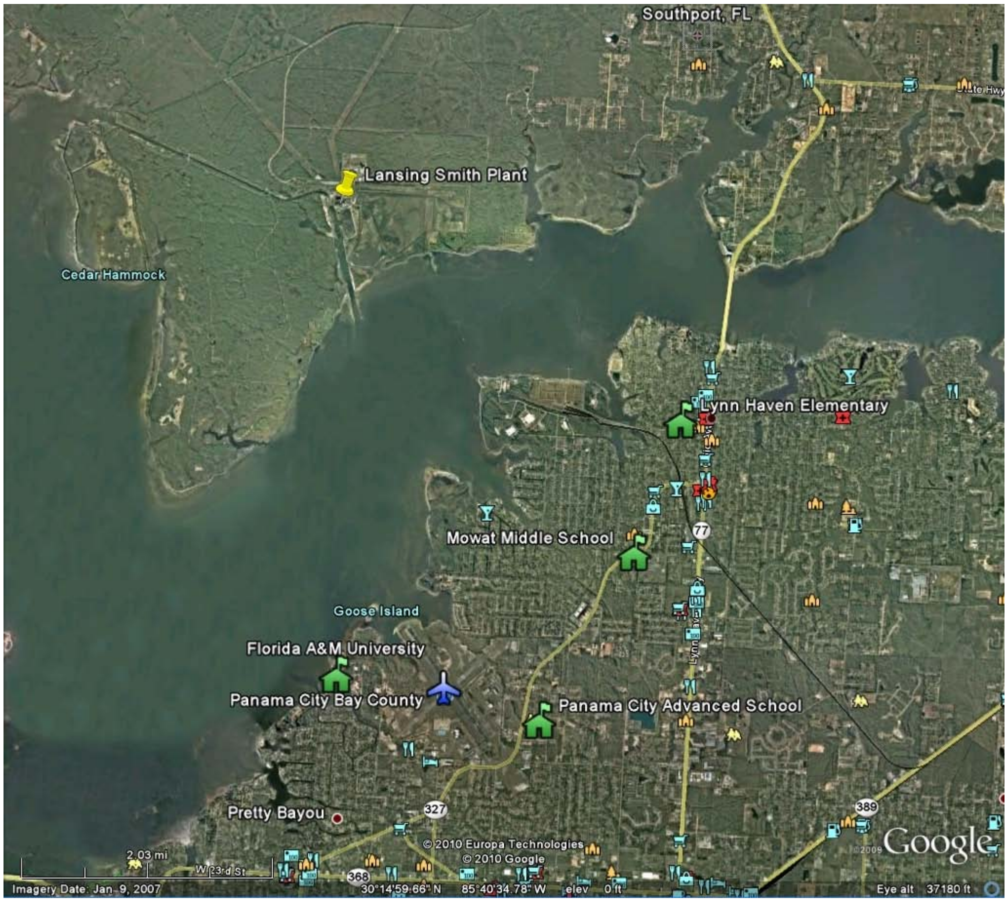


Figure 2.5: Lansing Smith Plant Critical Infrastructure Map

Table 2.5: Lansing Smith Plant Critical Infrastructure Within 5 Miles

Schools	Schools (Cont)	Nursing Homes
Florida A&M University 4000 Frankford Ave. Panama City, FL 32405	Hunter Academy 1101 Ohio Avenue Lynn Haven, FL 32444	None Identified
		Transportation
Panama City Advanced School 3332 Token Road Panama City, FL 32405		Lynn Haven Parkway (Hwy 77) St. Andrews Blvd (Hwy 390)
	Miscellaneous	
Mowat Middle School 1903 W. Hwy 390 Lynn Haven, FL 32444	Restaurants Places of Worship Businesses Residences	Panama City Bay County Airport
		Fire Stations
Lynn Haven Elementary 301 West 9th Street Lynn Haven, FL 32444		Lynn Haven Fire Department 1412 Pennsylvania Ave Lynn Haven, FL 32444

3.0 SUMMARY OF RELEVANT REPORTS, PERMITS AND INCIDENTS

3.1 SUMMARY OF REPORTS ON THE SAFETY OF THE MANAGEMENT UNIT(S)

Southern Company Generation, Hydro Services 2010 Inspection Report for GPC, Ash Pond Dike Report, March 22, 2010 (Appendix A, Doc 3: 2010 Inspection Report):

- "The inspection team did not see any conditions that posed an imminent threat to the safety of permanence of the ash pond dike or associated structures. The appearance of the dikes is much improved from the previous inspection. It is apparent that much work has gone into the clearing and repair of the dikes."
- Additional grass should be planted on all dike slopes (hydro seeded) for summer growth;
- Seepage found on the slope, near the toe, should be monitored along the area of the West Dike as part of weekly inspections;
- Progress reports from the 2009 inspection were included on this document.

Southern Company Generation, Hydro Services 209 Inspection Report for GPC, Ash Pond Dike Report, March 10, 2009 (Appendix A, Doc 4: 2009 Inspection Report):

- At the time of inspection the water level was at the crest. By the end of the day the level had been lowered, but concern about potential damage to the dike when the pond level is at the crest was noted;
- Other than the pond level, no other conditions that posed imminent threat to the safety of the dike were noted;
- The existence of large trees near the crest of the south and west dikes were noted as potential hazards should they be uprooted;
- The inspection team was not able to complete a thorough inspection due to heavy wooded vegetation along the downstream slopes. It was recommended to have all woody vegetation removed from embankment;
- The ash pond dike slopes appear steeper than what is typically recommended. It was also unclear of the material used for the embankments and it was recommended that these be inspected. It was recommended a storm routing analysis be completed;
- The crest of the dike requires some repair and grading to prevent ponding water and to direct stormwater runoff into the pond.

3.2 SUMMARY OF LOCAL, STATE AND FEDERAL ENVIRONMENTAL PERMITS

The Ash Pond facility is under regulation by the Florida Department of Environmental Protection. The discharges of the Ash Pond are permitted under the Federal National Pollutant Discharge Elimination Program (Permit # FL0002267).

3.3 SUMMARY OF SPILL/RELEASE INCIDENTS (IF ANY)

No spills or releases from the Ash Pond facilities have been noted by GPC for this site.

4.0 SUMMARY OF HISTORY OF CONSTRUCTION AND OPERATION

4.1 SUMMARY OF CONSTRUCTION HISTORY

4.1.1 Original Construction

Original construction information was not provided for this facility.

4.1.2 Significant Changes/Modifications in Design since Original Construction

There are multiple references describing some remedial work that needed to be done to the Ash Pond Dike. The figure below shows a cross section of the plans to remediate the dike (see Appendix A: Doc 05 – Remedial Work Dike Section). No documentation was provided on the construction or tests results of this work.

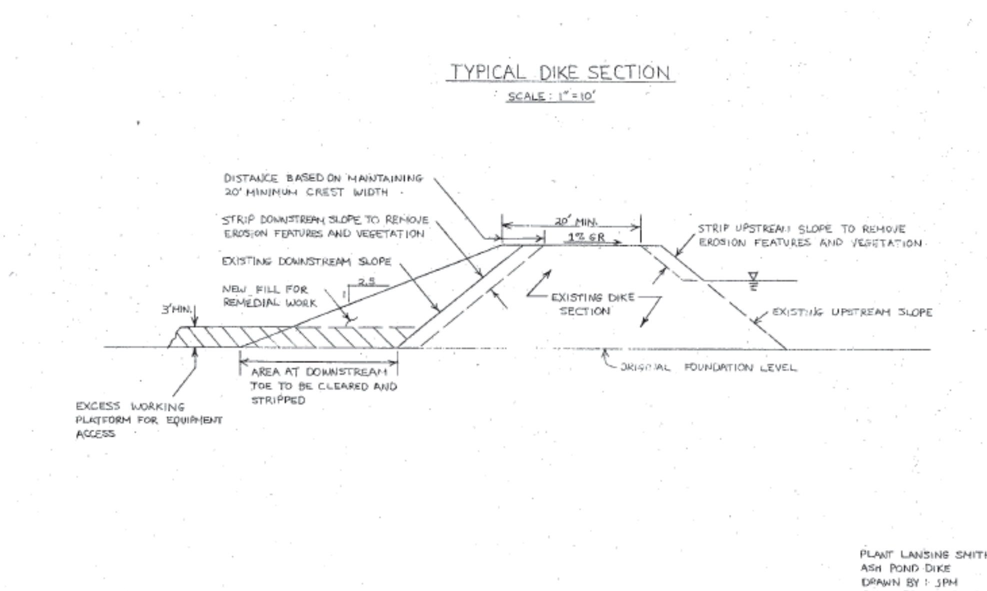


Figure 4.1.2 a: Ash Pond Impoundment Remedial Work Cross-section

4.1.3 Significant Repairs/Rehabilitation since Original Construction

No significant repairs/rehabilitation information was provided.

4.2 SUMMARY OF OPERATIONAL HISTORY

4.2.1 Original Operational Procedures

The ash pond was designed and operated for reservoir sedimentation and sediment storage of fly ash. Plant process waste water, coal combustion waste, coal pile stormwater runoff, and minimal stormwater runoff around the ash pond facility are discharged into the reservoir. Inflow water is treated through gravity settling and deposition, and the treated process water and stormwater runoff is discharged through a weir overflow outlet structure to the recycle canal.

4.2.2 Significant Changes in Operational Procedures since Original Startup

No documentation was provided describing any significant changes in Operating Procedures.

4.2.3 Current Operational Procedures

To the best of our knowledge, original operational procedures are in effect. In 1985 a dry ash disposal area was proposed because expansions of the ash pond had been denied multiple times by Florida's Department of Environmental Protection.

4.2.4 Other Notable Events since Original Startup

No additional information was provided.

5.0 FIELD OBSERVATIONS

5.1 PROJECT OVERVIEW AND ASSESSMENT

Dewberry personnel Michael Hanson, PE and Frederic Shmurak, PE performed a site visit on Tuesday, July 6, 2010. The site visit began at 9:00 AM. Weather was a cloudy, hot day. The overall visual assessment of the ash pond embankments were that they are in fair condition, but some maintenance items need to be addressed. Coal Combustion Dam Inspection Checklists created on July 6, 2010, by the two assessment engineers for the Lansing Smith Plant ash pond are provided in Appendix B, Document 1. A photo log and photographs from the site visit are provided in Appendix B, Documents 2 and 3.

5.2 EARTH EMBANKMENT DAM

5.2.1 Crest

The crest showed elevation irregularities and minor depressions. The crests were covered by graded aggregate base material, but need maintenance.

5.2.2 Upstream Slope

The upstream slopes are mostly vegetated with tall grasses and other wetland vegetation. No scarps, sloughs, depressions, bulging or other indications of slope instability or signs of erosion were observed.

5.2.3 Downstream Slope and Toe

There were signs of surficial sloughing particularly along the northeastern embankment downstream slope. Widespread rill erosion, surface sloughing, and downstream sediment deposition was found along downstream slopes. Wetlands and the recycle water channel are located along the downstream toe of the embankments.

Fig. 5.2.3-1. Rill erosion along downstream slope of west embankment.

Fig. 5.2.1-1. Water ponding on west embankment buttress

Fig. 5.2.3-2. Rip rap repair on downstream slope of north embankment.

Fig. 5.2.3-2. Recently fixed sloughing on west embankment.

5.2.4 Abutments and Groin Areas

The ash pond embankment consists of a combination of a dike and incised system; therefore the earthen embankment does not abut existing hillsides, rock outcrops or other raised topographic features.

5.3 OUTLET STRUCTURES

5.3.1 Overflow Structure

The out let s tructure w as properly di scharging f low f rom t he pond a nd vi sually appeared to be in good condition.

5.3.2 Outlet Conduit

The visual portion of the outlet conduit was functioning properly with no a pparent deterioration.

5.3.3 Emergency Spillway (If Present)

No emergency spillway is present.

5.3.4 Low Level Outlet

No low level outlet is present.

6.0 HYDROLOGIC/HYDRAULIC SAFETY

6.1 SUPPORTING TECHNICAL DOCUMENTATION

6.1.1 Floods of Record

No information was provided. The Fly Ash Pond is a diked embankment facility having a contributing drainage area equal to the surface area of the impoundment; therefore the impounded pool would not be anticipated to experience significant flood stages. It was recorded that the storm surge from the adjacent bay overtopped the dike crest and entered the pond sometime during the 1970's. No significant damage was reported.

6.1.2 Inflow Design Flood

According to FEMA Federal Guidelines for Dam Safety, the current practice in the design of dams is to use the Inflow Design Flood (IDF) that is deemed appropriate for the hazard potential of the dam and reservoir, and to design spillways and outlet works that are capable of safely accommodating the floodflow without risking the loss of the dam or endangering areas downstream from the dam to flows greater than the inflow. The recommended IDF or spillway design flood for a low hazard intermediate sized structure (See section 2.2), in accordance with the USACE Recommended Guidelines for Safety Inspection of Dams ER 1110-2-106 criteria is the 100-yr to ½ PMF (See Table 6.1.2).

Table 6.1.2: USACE Hydrologic Evaluation Guidelines Recommended Spillway Design floods

Hazard	Size	Spillway Design Flood
Low	Small	50 to 100-yr frequency
	Intermediate	100-yr to ½ PMF
	Large	½ PMF to PMF
Significant	Small	100-yr to ½ PMF
	Intermediate	½ PMF to PMF
	Large	PMF
High	Small	½ PMF to PMF
	Intermediate	PMF
	Large	PMF

The Probable Maximum Precipitation (PMP) is defined by American Meteorological Society as the theoretically greatest depth of precipitation for a given duration that is physically possible over a particular drainage area at a certain time of year. The National Weather Service (NWS) further states that in consideration of our limited knowledge of the complicated processes and interrelationships in storms, PMP values are identified as estimates. The NWS has published application procedures that can be used with PMP estimates to develop spatial and temporal characteristics of a Probable Maximum Storm (PMS). A PMS thus developed can be used with a precipitation-runoff simulation model to calculate a probable maximum flood (PMF) hydrograph.

In a hydrologic and hydraulic analysis report dated June 29, 2010 it was stated that the existing ash pond will handle both the 10-year and 100-year, 24-hour rainfall events, and that the low point top of dike elevations will not be exceeded; though freeboard particularly for the Northwest Cell is minimum. (See Appendix A: Doc 1: Hydrologic and Hydraulic Analysis Report.pdf). The 24-hour 10 square mile PMP depth is approximately 47 inches. In order to pass the ½ PMP, approximately 2 ft of freeboard must be present. It is reported that the low point of the dike crest is at elevation 20' and the normally operating pool is 17.5'; therefore adequate freeboard may exist for the ½ PMP.

6.1.3 Spillway Rating

No spillway rating was provided. The fly ash pond is a diked embankment facility having a contributing drainage area equal to the surface area of the impoundment; therefore the impounded pool would not be anticipated to experience significant changes in elevation. The outlet structure is an overflow weir and, given little change in the normal pool elevation, the resulting discharge rate is expected to be relatively constant.

6.1.4 Downstream Flood Analysis

No downstream flood analysis was provided.

6.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Supporting technical documentation is sufficient.

6.3 ASSESSMENT OF HYDROLOGIC/HYDRAULIC SAFETY

Adequate capacity and freeboard exists to safely pass the design storm.

7.0 STRUCTURAL STABILITY

7.1 SUPPORTING TECHNICAL DOCUMENTATION

7.1.1 Stability Analyses and Load Cases Analyzed

A stability analysis report for the ash pond dated April 2010, by Southern Company Generation Technical Services Earth Science and Environmental Engineering, provides information on the stability analysis results and is presented in Section 7.1.4 Factors of Safety and Base Stresses. Both steady state (normal) loading and earthquake loading conditions were analyzed. See Appendix A (Doc 6: Ash Pond Evaluation.pdf) for the complete report.

7.1.2 Design Properties and Parameters of Materials

A report for the Lansing Smith Plant ash pond was prepared by Southern Company Generation Technical Services Earth Science and Environmental Engineering in 2010. The 2010 Engineering Report includes documentation of the shear strength design properties for the ash pond embankments, which is included in this report and is presented in the following section; see Appendix A (Doc 6: Ash Pond Evaluation.pdf) for the complete report. An engineering report from MACTEC Engineering and Consulting, Inc. was also provided, dated March 23, 2010. This report shows the geotechnical results of soil samples provided by Southern Company.

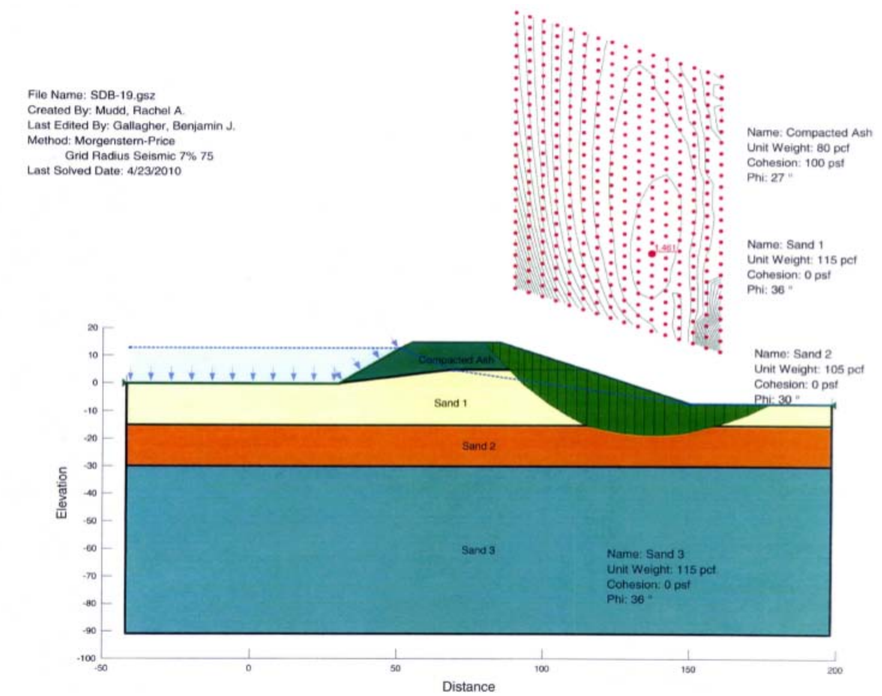
Test results showing the strength parameters of the embankments are presented below. The results present generally acceptable values for these types of materials.

Table 4a
Soil Properties for Stability Analysis North Embankment

Soil Description	Unit Weight (pcf)	Fiction Angle (degrees)	Cohesion (psf)
Dike Ash	80	27	100
Pond Ash	70	24	50
Embankment and Upper Foundation Sand	105	30	0

Table 4b
Soil Properties for Stability Analysis South Embankment

Soil Description	Unit Weight (pcf)	Fiction Angle (degrees)	Cohesion (psf)
Dike Ash	80	27	100
Pond Ash	70	24	50
Embankment and Upper Foundation Sand	115	36	0
Lower Foundation Sand	105	30	0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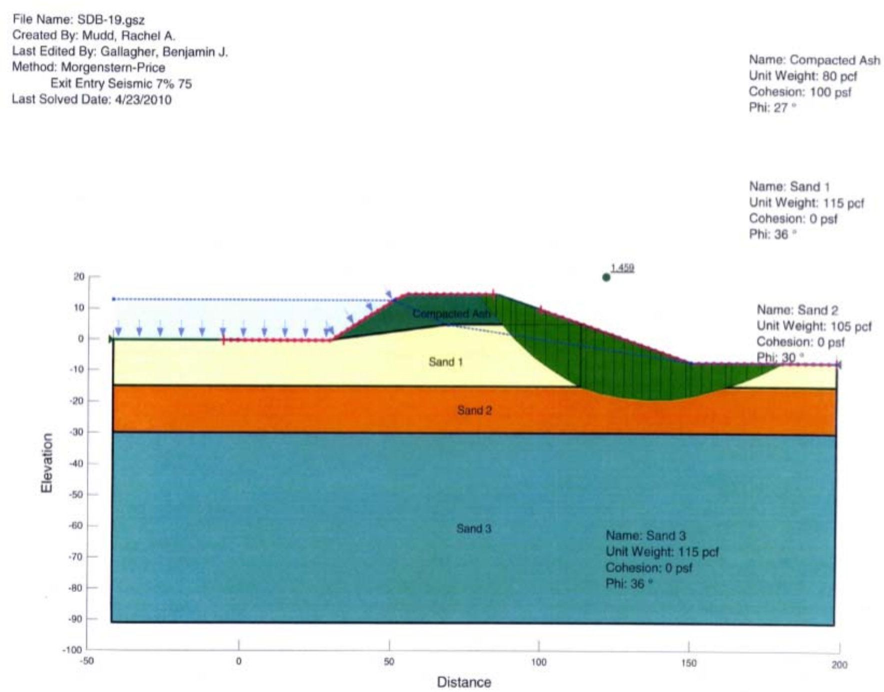
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75
Last Solved Date: 4/23/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Sand 1
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °
Name: Sand 2
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Compacted Ash
Sand 1
Sand 2
Sand 3
Name: Sand 3
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °
Elevation
Distance

Distance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Unit Weight: 80 pcf
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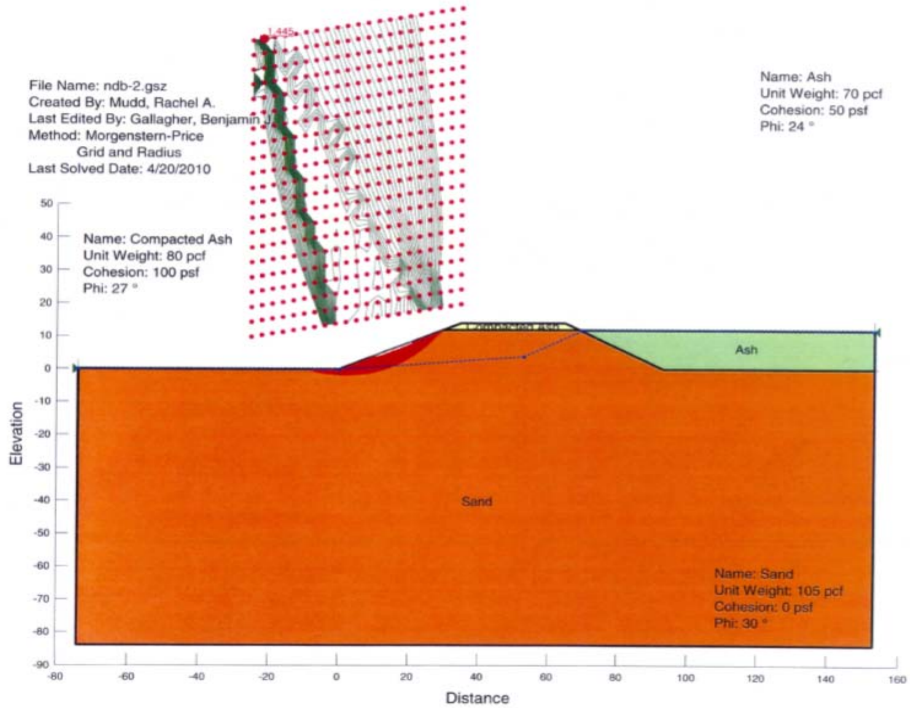
Phi: 27 °
Name: Sand 1
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °
1.459
Name: Sand 2
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Compacted Ash
Sand 1
Sand 2
Sand 3
Name: Sand 3
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °
Elevation
Distance

FINAL



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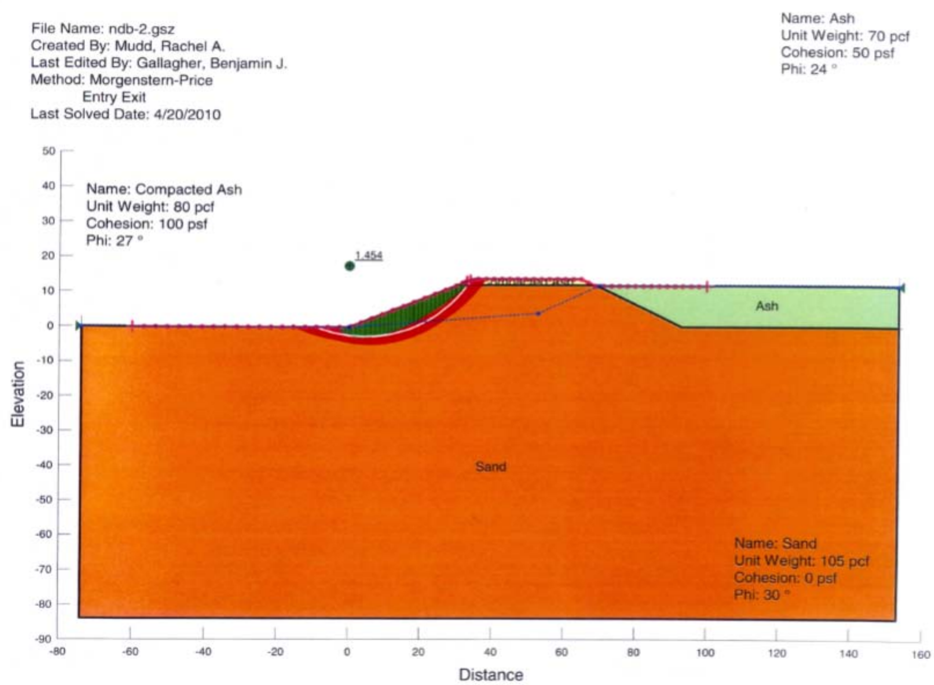
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid and Radius
Last Solved Date: 4/20/2010
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance



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Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
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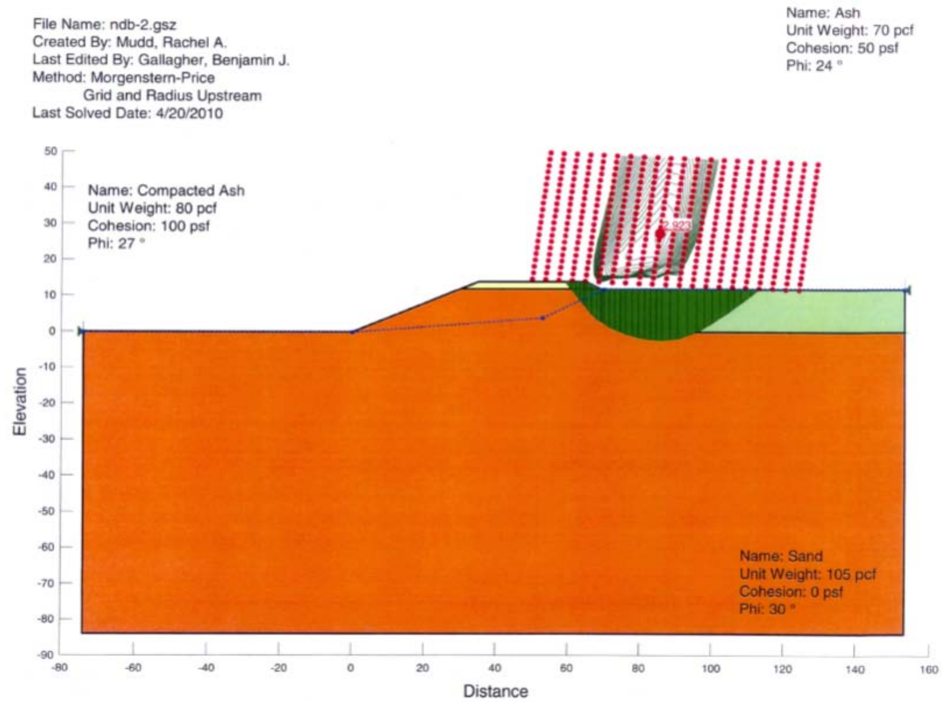
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
1.454
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance

FINAL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Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid and Radius Upstream
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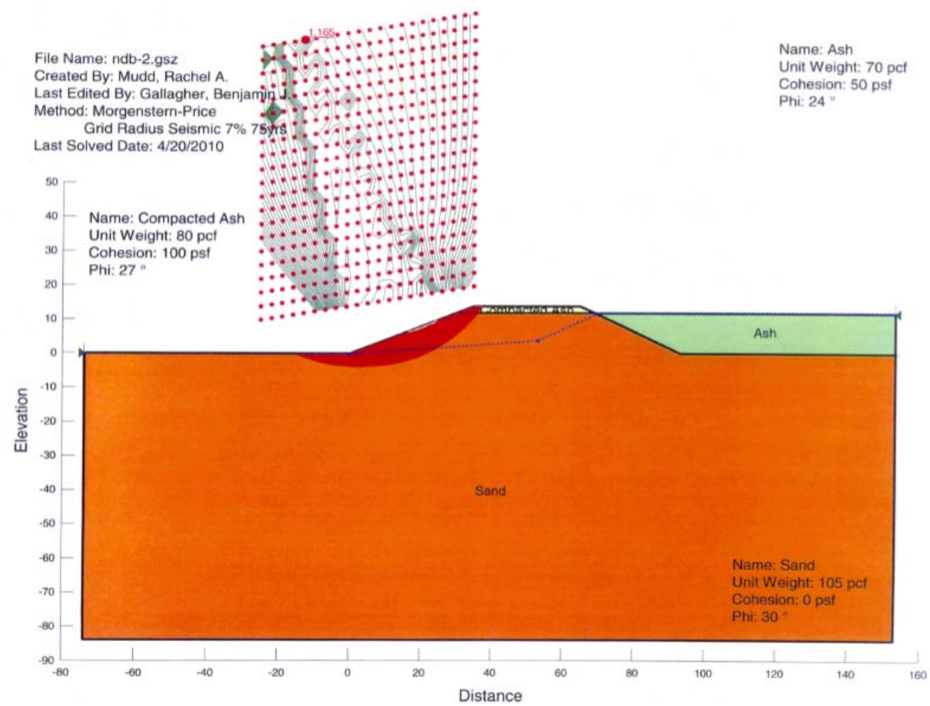
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance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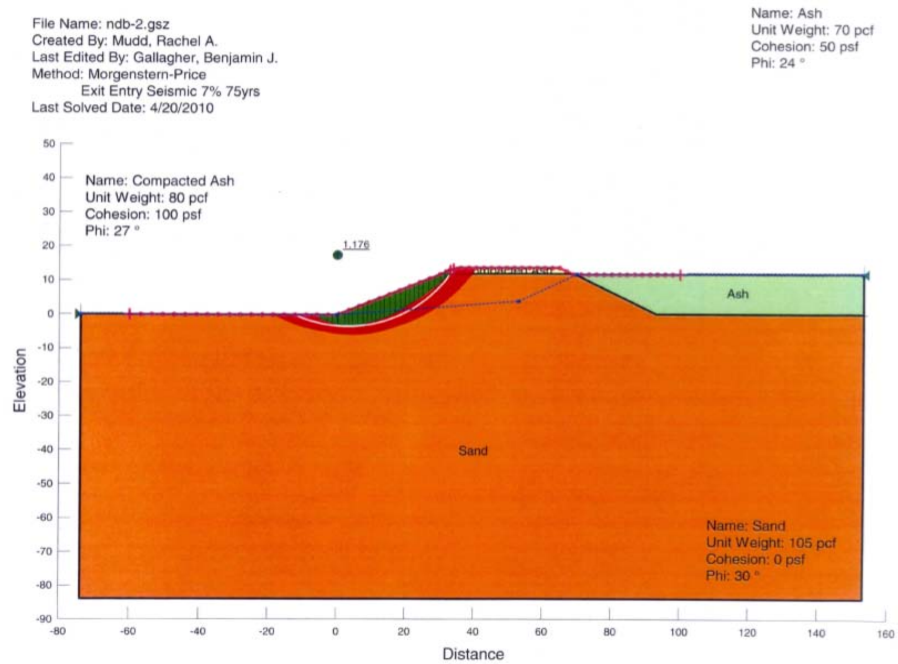
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75yrs
Last Solved Date: 4/20/2010
1.165
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Compacted Ash
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance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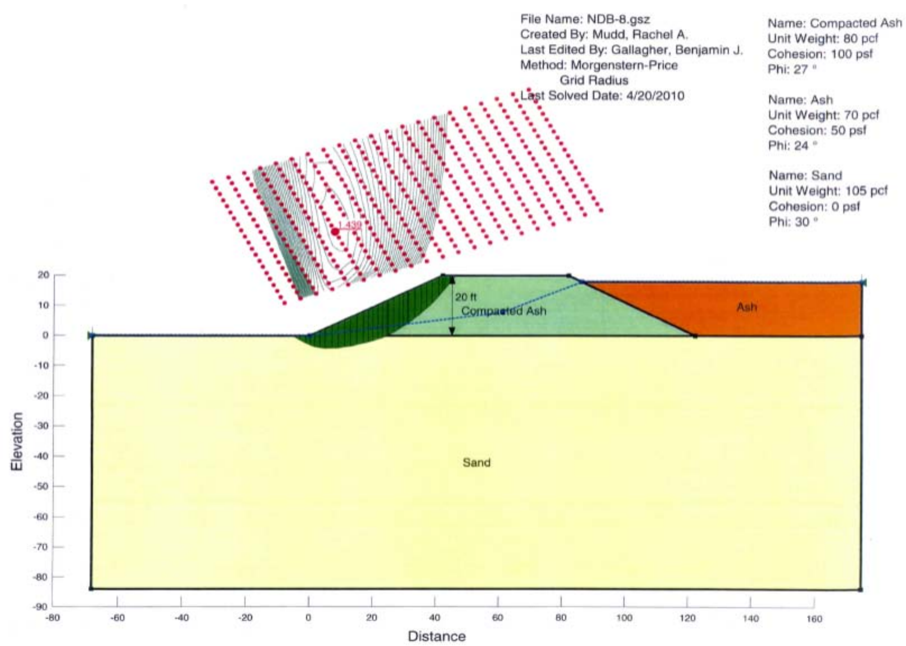
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry Seismic 7% 75yrs
Last Solved Date: 4/20/2010
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
1.176
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance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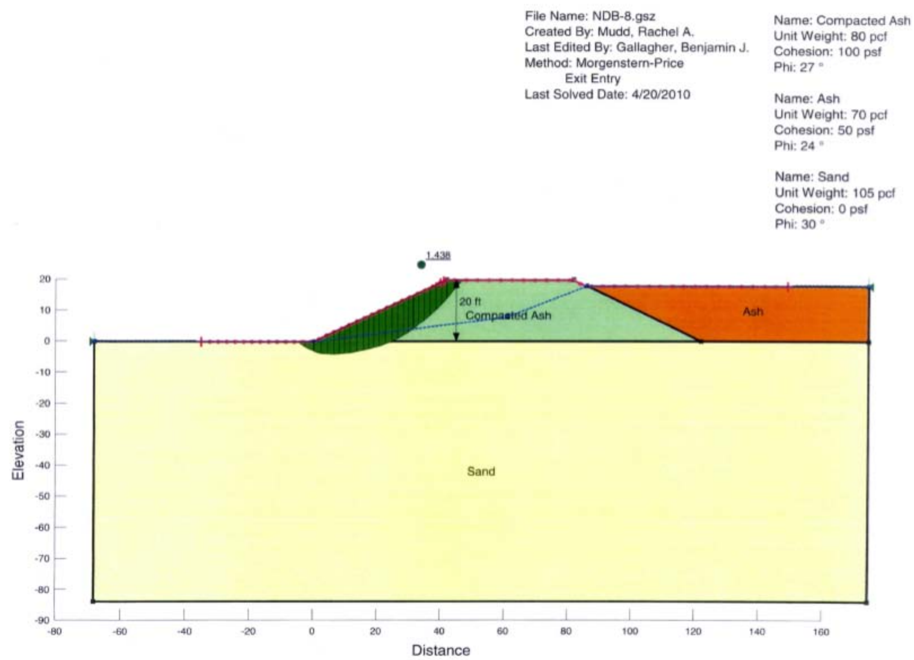
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius
Last Solved Date: 4/20/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance

FINAL



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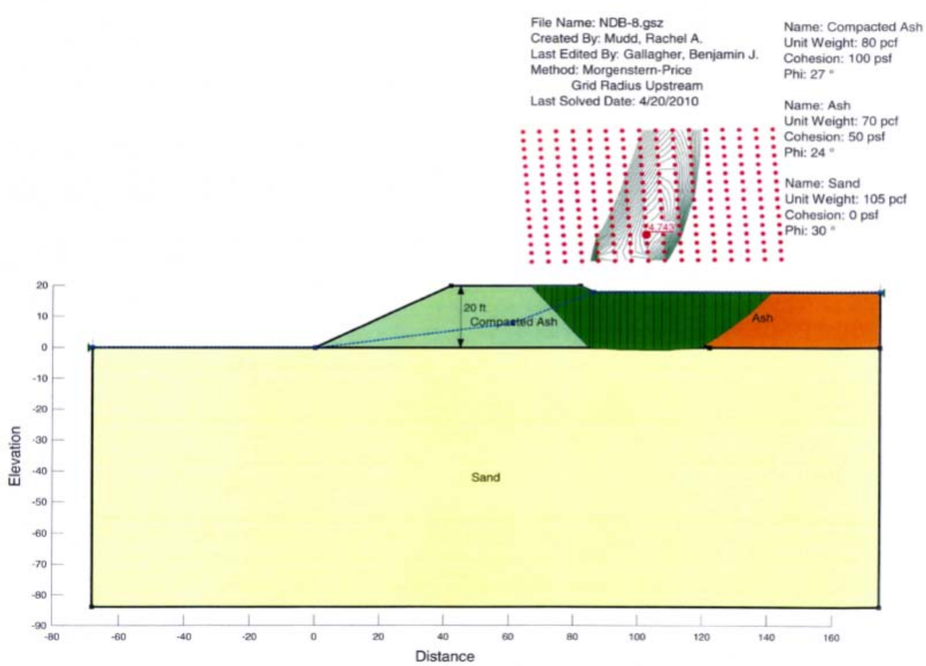
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry
Last Solved Date: 4/20/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
1.438
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance



File Name: NDB-8.gsz
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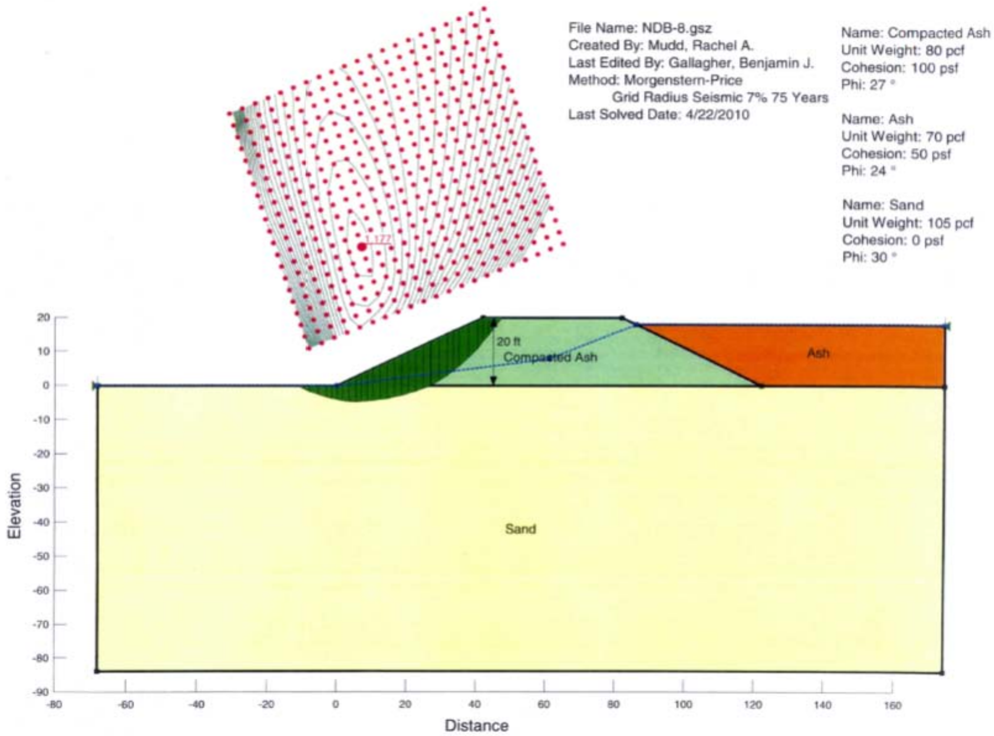
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Upstream
Last Solved Date: 4/20/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance

FINAL



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Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75 Years
Last Solved Date: 4/22/2010
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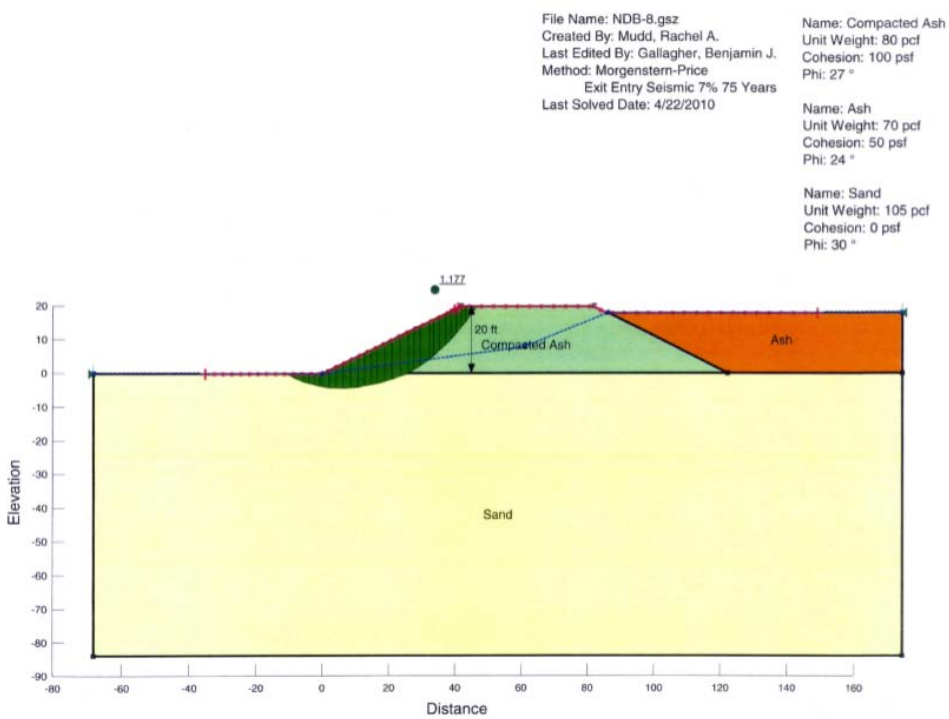
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance



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Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry Seismic 7% 75 Years
Last Solved Date: 4/22/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
1.177
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance

7.1.3 Uplift and/or Phreatic Surface Assumptions

Monitoring instrumentation devices have not been installed to verify water levels within the embankment. The assumed phreatic surfaces are shown on the figures in section 7.1.2 above and the depiction seems appropriate for these types of structures. No additional information was provided. The water level of the pond was stated to be 17.5'. This elevation was not verified.

7.1.4 Factors of Safety and Base Stresses

A stability analysis report for the ash pond dated April 2010, by Southern Company Generation Technical Services Earth Science and Environmental Engineering, provides information on the factors of safety and comments on that information as presented below. See Appendix A (Doc 6: Ash Pond Evaluation.pdf) for the complete report.

Table 5
Summary of Minimum Slope Stability Factors of Safety

Cross Section	**Analysis Condition**		
	Steady-State [1]		**Steady-State with Seismic [2]**
	Upstream	Downstream	
SDB-1	3.86	2.41	1.65
SDB-19	2.37	1.86	1.46
NDB-2	2.92	1.45	1.17
NDB-8	4.74	1.44	1.18

[1] Normally accepted industry standard minimum factor of safety = 1.5
[2] Normally accepted industry standard minimum factor of safety = 1.1

"The stability analysis results indicate all calculated minimum factors of safety are above generally accepted minimum factors of safety with the exception of the downstream slopes of the north embankment. Calculated factors of safety were 1.44 and 1.45, whereas the generally accepted minimum is 1.5.

***These lower factors of safety do not represent a condition of imminent or likely failure of the slopes.**" (Doc 6).*

7.1.5 Liquefaction Potential

Liquefaction studies were submitted by GPC (Southern Company Calculation TS-SM-ECS3389-100) as additional documentation concerning the potential for liquefaction of embankment and foundation soils and are included in Appendix C.

Documentation provided from Southern Company concluded that the foundation soil conditions do not appear susceptible to support liquefaction.
The following are some of the criteria and assumptions made for the liquefaction analysis:

> "The peak acceleration at the top of the dike is 0.078g as derived from the USGS-mapped, site-modified, short-period spectral acceleration at Plant Smith (7% chance of exceedance over 75 years, 1050-year return period).
>
> The design earthquake is a magnitude 5.55, as determined by the USGS mapped earthquake with a 7% probability of exceedance over 75 years and located within 300 kilometers of Plant Smith"

Based on historical information, we understand there is little evidence of liquefaction occurring at distances much greater than 100 kilometers from the earthquake source, with large magnitude earthquakes. The USGS online map of Quaternary Fault and Fold Database indicates the closest faults to Plant Smith are the Gulf-margin normal faults located at least 110 kilometers west of these faults, and that is it not clear that slip on these would occur seismically. They have a 'strikingly low historical seismicity'."

7.1.6 Critical Geological Conditions and Seismicity

No critical geologic conditions or seismic conditions are present at the site.

A Northwest Florida Hurricane Evacuation Study dated July 1999 states the following:

The coastal plain is generally flat and represents ancient sea bottoms and beaches. The underlying rock in the area began as lime accumulations from marine organisms or sedimentary deposits of silt, sand and clay. The lower Tertiary beds of limestone, clay, gravel and sand form thick alters toward the south and taper to the north. The Chipola formation and the Marianna and Ocala limestones have identifiable beds and are important water bearing formations. This complex of Tertiary limestones form the principle artesian aquifer in North west Florida. These sediments rest on a base of crystalline rock, which is from 2,500 to 4,000 feet below the land surface.

7.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Structural stability documentation is adequate.

7.3 ASSESSMENT OF STRUCTURAL STABILITY

The structural stability of the ash pond embankments are limited based on the following parameters:

- Surface sloughing has occurred in four areas along the northeast downstream slope of the embankment. One of those areas has been repaired with slush grouted rip-rap;
- There is evidence of some small animal burrows along the downstream embankment;
- Widespread rill erosion, surface sloughing and sediment deposition has occurred along downstream slope; and
- Irregular road along west dike downstream buttress with rutting and small surface depressions holding water.

Based on the previous assessment reports/inspections provided by GPC, the assessment of the ash pond in this report is generally consistent with historical observations. It is noted that the above conditions have been corrected since the site visit by USEPA representatives. The corrections have been documented by GPC.

8.0 MAINTENANCE AND METHODS OF OPERATION

8.1 OPERATIONAL PROCEDURES

Operational procedures are adequate. The facility is operated for reservoir sedimentation and sediment storage; specifically, fly ash and flue gas emission control residuals. Coal combustion process waste water and stormwater runoff from the facility are discharged into the reservoir, inflow water is treated through gravity settling and deposition, and treated process water and stormwater runoff is discharged through a weir overflow outlet structure into a water recycling canal.

8.2 MAINTENANCE OF THE DAM AND PROJECT FACILITIES

At the time of the site visit maintenance procedures needed to be improved. Embankments showed signs of recently mowed woody-stem vegetation. There was evidence of small animal burrows along the downstream dike. Not all deficiencies noted in the surveillance & monitoring program were corrected and documented, although there were signs of surficial sloughing that had been corrected and rip rap that was placed to prevent erosion.

Subsequent to the site visit, GPC developed and prepared a site specific "Ash Pond Maintenance Plan" that incorporates maintenance procedures that address the above issues.

8.3 ASSESSMENT OF MAINTENANCE AND METHODS OF OPERATION

8.3.1 Adequacy of Operational Procedures

Operational procedures are adequate.

8.3.2 Adequacy of Maintenance

Prior to the site visit the maintenance procedures were inadequate to maintain the ponds and dike system so that dike material was not released to the environment. A better program needed to be set in place. As noted above an Ash Pond Maintenance Plan has been developed and is now being implemented. This should result in adequate maintenance for the future.

9.0 SURVEILLANCE AND MONITORING PROGRAM

9.1 SURVEILLANCE PROCEDURES

Weekly Inspections:
It was stated from the Lansing Smith Plant weekly inspections are performed. A blank copy of the inspection formed is provided as Appendix A Doc 08: Weekly Inspection.pdf.

Annual Inspections:
Annual inspection reports were provided by GPC for 2009 and 2010. The 2010 Inspection Report can be found in Appendix A Doc 03: Smith Report 2010.pdf, while the 2009 Inspection Report can be found at Appendix A Doc 04: Smith Report 2009.pdf.

9.2 INSTRUMENTATION MONITORING

9.2.1 Instrumentation Plan

No embankment monitoring instrumentation devices (i.e. piezometers) were at the facility during the time of the inspection. Monitoring wells are on site, but are used for water quality purposes only.

9.2.2 Instrumentation Monitoring Results

No instrumentation monitoring data has been provided, as there are no piezometers for this purpose.

9.2.3 Evaluation

Not applicable.

9.3 ASSESSMENT OF SURVEILLANCE AND MONITORING PROGRAM

9.3.1 Adequacy of Inspection Program

Inspection program is adequate.

9.3.2 Adequacy of Instrumentation Monitoring Program

Not applicable.

Appendix A

ATTORNEY CLIENT PRIVILEGE
This correspondence/communication was prepared at the direction of legal counsel, and is privileged, protected and confidential under attorney work product doctrine.

Plant Smith
Hydrologic and Hydraulic Analysis Report
of the
Ash Pond and Outlet Structures

June 29, 2010

Objective

The objective of this work was to perform a storm water routing analysis, for both the 10 year and 100 year - 24 hour rainfall events, for all three cells of the ash pond and to evaluate the hydraulic adequacy of all outlet structures, weirs, pipes, and to evaluate the operation of the ash pond. The ash pond is divided into three ponds or cells. These ponds include the Northwest Pond, Southwest Pond, and East Pond. Specifics of this analysis were to evaluate the system of ponds individually as well as to evaluate the total ash ponds as a whole.

Assumptions/Input Data

Process flows and current operation of the ponds were supplied by the plant. Topographic survey and aerial mapping of the pond including under water soundings were performed and supplied by SCS Civil Field Services. All outlet structures, weirs and pipes in each pond were also located and surveyed by SCS Civil Field Services.

The pipes between ponds appear to be flowing well and clear and free of substantial sediments and debris. It was assumed that all pipes will continue to be maintained and functioning in proper order.

It is assumed that the outlet pipe through the East Dike into the recycle canal is a free outlet w/no tailwater condition.

Conditions Analyzed

10 year – 24 hour rainfall event with and without plant process flows.
100 year – 24 hour rainfall event with and without plant process flows.

The weir outlet structure of the East Pond contains three sections of stoplogs and two 14 inch dia. pipes. The top of stoplogs are assumed to be, as existing now, at approximately El 17. As for the two 14 inch pipes, each condition was evaluated with the pipes fully operative (opened), and non-operative (fully closed, or clogged).

GP-SM-#0014

Summary and Conclusion

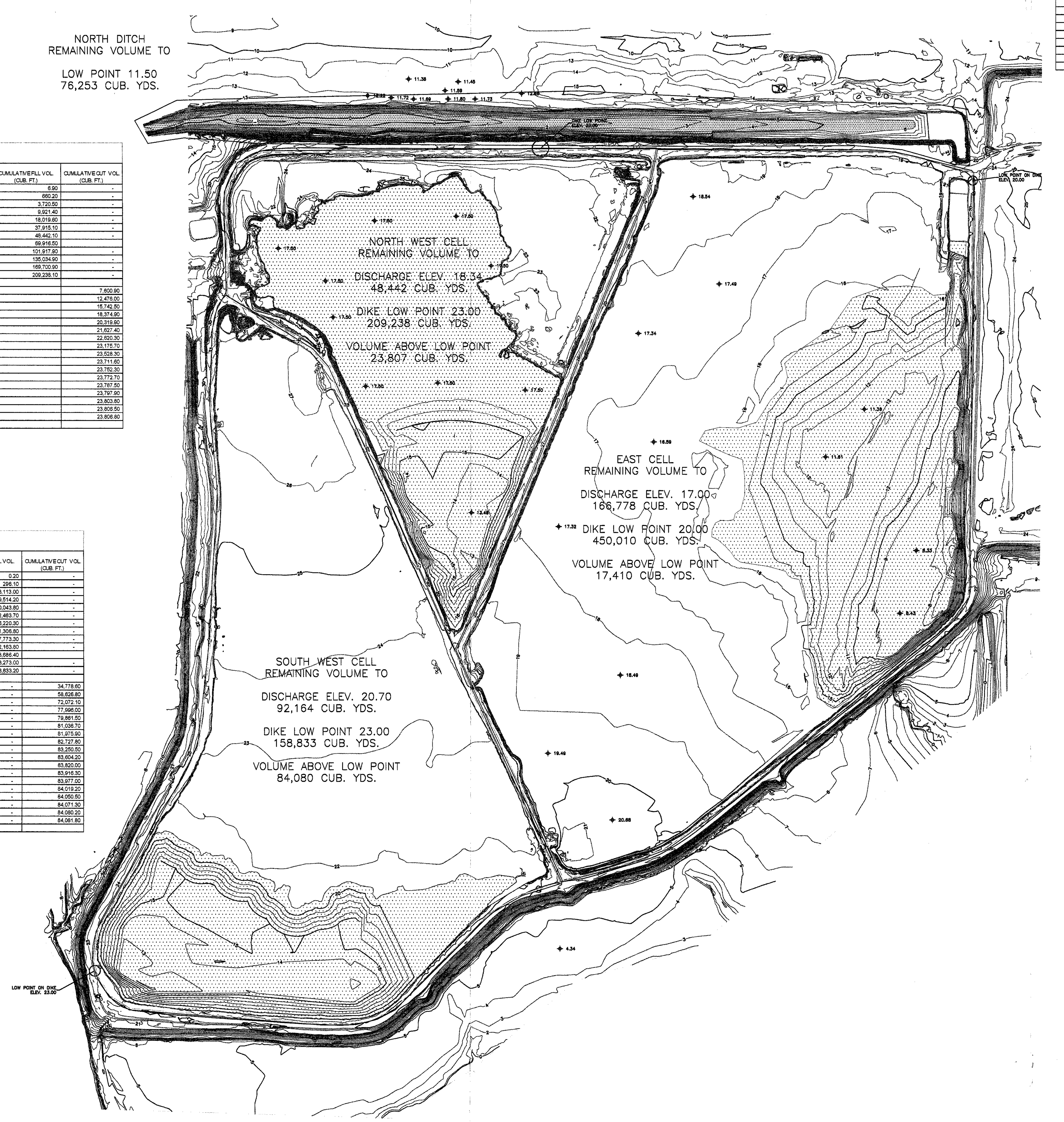
As shown in the summary tables, it was determined that for all conditions analyzed, and for the existing available stormwater storage capacity, that each pond with the current outlet structures and pipes in-place and functioning, will handle both the 10 year and 100 year - 24 hour rainfall events, and that the low point top of dike elevations will not be exceeded, though freeboard particularly for the Northwest Cell is very minimum.

It was also determined that as long as the East Pond discharge weir stays unsubmerged and free flowing, as it does for both storm events and for all conditions analyzed, the pool elevation of the East Cell is controlled by the weir and the two 14 inch pipes within the weir structure, and not the 48 inch dia. pipe below the weir that runs through the dike into the recycle canal.

It should be noted that in the Southwest Pond, the 100 storm event (EL 22.55) exceeds the swale (low point EL 22.28) that was constructed within the dike between the Southwest Cell and the East Cell.

This analysis only evaluates the hydrologic and hydraulic condition of the ash pond and does not contain recommendations for remedial repair or improvements.

PLANT SMITH ASH POND NORTH DITCH					
ELEV.		ELEV.	FILL BELOW 11.50 (CUB. FT.)	CUT ABOVE 11.50 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)
(2.26)	>	(2.00)	0.90	-	0.90
(2.00)	>	(1.00)	50.90	-	51.80
(1.00)	>	0.00	481.30	-	533.10
0.00	>	1.00	1,647.20	-	2,180.30
1.00	>	2.00	2,553.80	-	4,734.10
2.00	>	3.00	3,386.60	-	8,120.70
3.00	>	4.00	4,381.60	-	12,502.30
4.00	>	5.00	5,362.60	-	17,864.90
5.00	>	6.00	6,553.20	-	24,418.10
6.00	>	7.00	7,661.60	-	32,079.70
7.00	>	8.00	8,346.00	-	40,425.70
8.00	>	9.00	9,039.10	-	49,464.80
9.00	>	10.00	9,777.50	-	59,242.30
10.00	>	11.00	11,120.60	-	70,362.90
11.00	>	11.50	5,889.70	-	76,252.60



PLANT SMITH ASH POND NORTH WEST CELL						
ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
12.68	>	13.00	6.90	-	6.90	-
13.00	>	14.00	653.30	-	660.20	-
14.00	>	15.00	3,060.30	-	3,720.50	-
15.00	>	16.00	6,200.90	-	9,921.40	-
16.00	>	17.00	8,098.20	-	18,019.60	-
17.00	>	18.00	19,895.50	-	37,915.10	-
18.00	>	18.34	10,527.00	-	48,442.10	-
18.34	>	19.00	21,474.40		69,916.50	
19.00	>	20.00	32,001.40	-	101,917.90	-
20.00	>	21.00	33,117.00	-	135,034.90	-
21.00	>	22.00	34,666.00	-	169,700.90	-
22.00	>	23.00	39,537.20	-	209,238.10	-
23.00	>	24.00	-	7,600.90		7,600.90
24.00	>	25.00	-	4,875.10		12,476.00
25.00	>	26.00	-	3,266.50		15,742.50
26.00	>	27.00	-	2,632.40		18,374.90
27.00	>	28.00	-	1,945.00		20,319.90
28.00	>	29.00	-	1,307.50		21,627.40
29.00	>	30.00	-	992.90		22,620.30
30.00	>	31.00	-	555.40		23,175.70
31.00	>	32.00	-	352.60		23,528.30
32.00	>	33.00	-	183.30		23,711.60
33.00	>	34.00	-	40.70		23,752.30
34.00	>	35.00	-	20.40		23,772.70
35.00	>	36.00	-	14.80		23,787.50
36.00	>	37.00	-	10.40		23,797.90
37.00	>	38.00	-	5.90		23,803.80
38.00	>	39.00	-	2.70		23,806.50
39.00	>	39.93	-	0.30		23,806.80
	>					

PLANT SMITH ASH POND EAST CELL						
ELEV.		ELEV.	FILL BELOW 20.00 (CUB. FT.)	CUT ABOVE 20.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
5.57	>	6.00	3.20	-	3.20	-
6.00	>	7.00	189.60	-	192.80	-
7.00	>	8.00	853.80	-	1,046.60	-
8.00	>	9.00	2,821.30	-	3,867.90	-
9.00	>	10.00	5,874.20	-	9,742.10	-
10.00	>	11.00	7,579.70	-	17,321.80	-
11.00	>	12.00	10,648.80	-	27,970.60	-
12.00	>	13.00	17,044.10	-	45,014.70	-
13.00	>	14.00	21,851.50	-	66,866.20	-
14.00	>	15.00	24,694.50	-	91,560.70	-
15.00	>	16.00	29,262.90	-	120,823.60	-
16.00	>	**17.00**	45,953.90	-	**166,777.50**	-
17.00	>	18.00	76,570.20	-	243,347.70	
18.00	>	19.00	95,526.90	-	338,874.60	-
19.00	>	20.00	111,135.10	-	450,009.70	-
			-			
20.00	>	21.00	-	6,197.30		6,197.30
21.00	>	22.00	-	3,523.60		9,720.90
22.00	>	23.00	-	2,757.70		12,478.60
23.00	>	24.00	-	2,224.10		14,702.70
24.00	>	25.00	-	1,612.30		16,315.00
25.00	>	26.00	-	811.20		17,126.20
26.00	>	27.00	-	234.30		17,360.50
27.00	>	28.00	-	49.10		17,409.60
28.00	>	28.12	-	0.10		17,409.70

PLANT SMITH ASH POND SOUTH WEST CELL						
ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
11.91	>	12.00	0.20	-	0.20	-
12.00	>	13.00	295.90	-	296.10	-
13.00	>	14.00	2,816.90	-	3,113.00	-
14.00	>	15.00	6,401.20	-	9,514.20	-
15.00	>	16.00	10,529.60	-	20,043.80	-
16.00	>	17.00	12,419.90	-	32,463.70	-
17.00	>	18.00	13,756.60	-	46,220.30	-
18.00	>	19.00	15,086.50	-	61,306.80	-
19.00	>	20.00	16,466.50	-	77,773.30	-
20.00	>	20.70	14,390.50	-	92,163.80	-
20.70		21.00	6,522.60		98,686.40	
21.00	>	22.00	24,586.60	-	123,273.00	-
22.00	>	23.00	35,560.20	-	158,833.20	-
23.00	>	24.00	-	34,778.60	-	34,778.60
24.00	>	25.00	-	23,848.20	-	58,626.80
25.00	>	26.00	-	13,445.30	-	72,072.10
26.00	>	27.00	-	5,923.90	-	77,996.00
27.00	>	28.00	-	1,865.50	-	79,861.50
28.00	>	29.00	-	1,175.20	-	81,036.70
29.00	>	30.00	-	939.20	-	81,975.90
30.00	>	31.00	-	751.90	-	82,727.80
31.00	>	32.00	-	522.70	-	83,250.50
32.00	>	33.00	-	353.70	-	83,604.20
33.00	>	34.00	-	215.80	-	83,820.00
34.00	>	35.00	-	96.30	-	83,916.30
35.00	>	36.00	-	60.70	-	83,977.00
36.00	>	37.00	-	42.20	-	84,019.20
37.00	>	38.00	-	31.30	-	84,050.50
38.00	>	39.00	-	20.80	-	84,071.30
39.00	>	40.00	-	8.90	-	84,080.20
40.00	>	41.00	-	1.60	-	84,081.80

GRAPHIC SCALE

(IN FEET)
1 inch = 200 ft.

GRID COORDINATES NAD 83

FLORIDA STATE PLANE

NORTH ZONE

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC. 735 WEST 11TH STREET PANAMA CITY, FL. 32401 PHONE: (850) 763-7427.

5) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

6) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

7) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

AREAS OF REMAINING WATER VOLUME

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for

REV	DATE:

Gulf Power Company

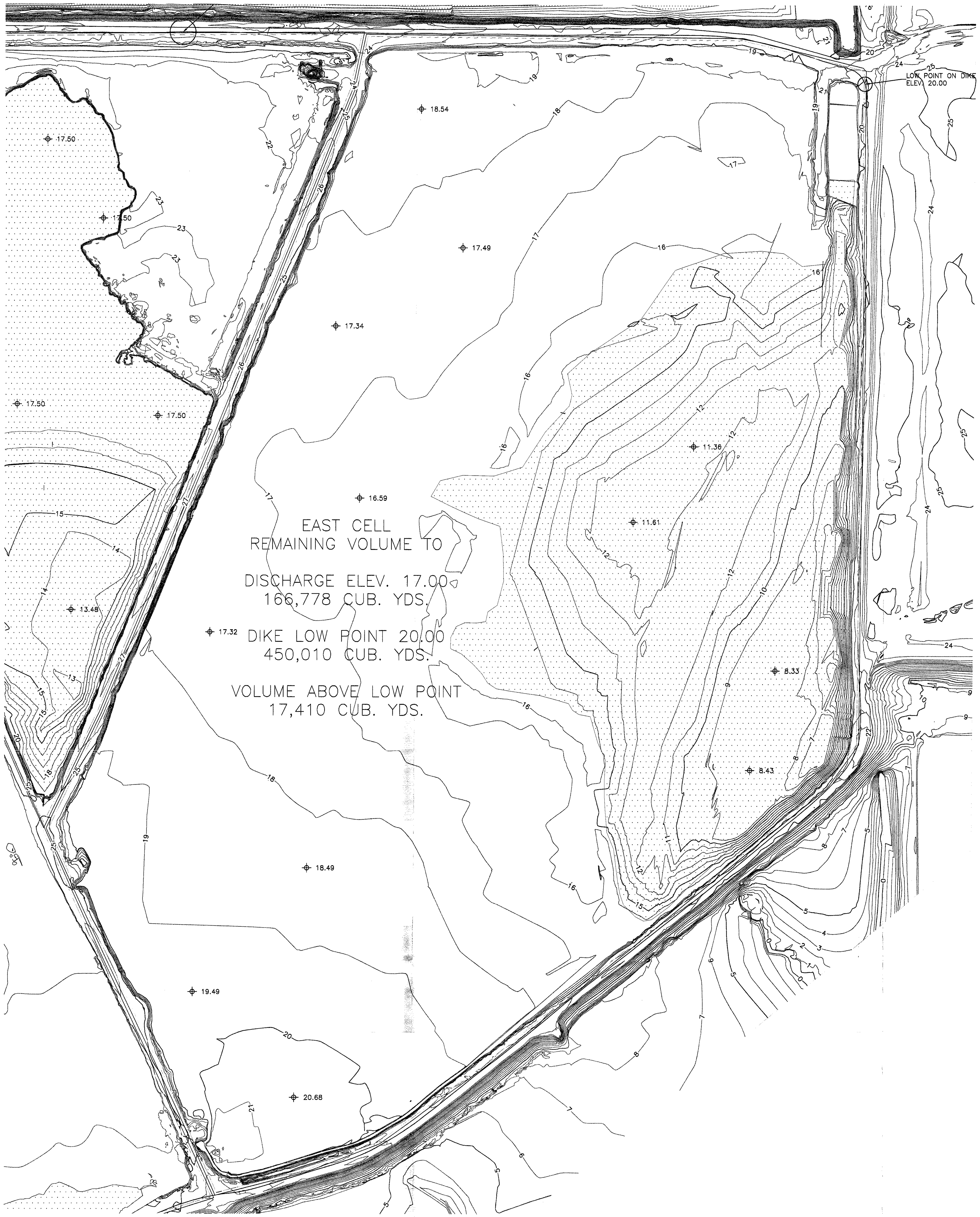
JOB: PLANT LANSING SMITH
DETAIL: ASH POND
TOPO AND VOLUME

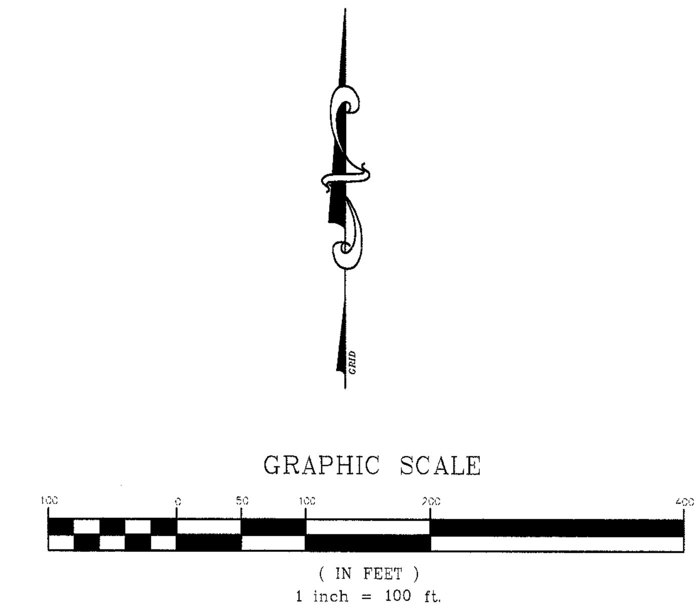
DRAWN: ENP CHECKED: DESIGNED:
APPROVED: DATE: 3/11/2010
APPROVED: DATE:

SCALE: AS NOTED B/M:
SHEET 1 OF 1 SHEETS
SUPERSEDES:

3727LAN REV 0

GP-SM-#0009





GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

PLANT SMITH ASH POND
EAST CELL

ELEV.		ELEV.	FILL BELOW 20.00 (CUB. FT.)	CUT ABOVE 20.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
5.57	>	6.00	3.20	-	3.20	-
6.00	>	7.00	189.60	-	192.80	-
7.00	>	8.00	853.80	-	1,046.60	-
8.00	>	9.00	2,821.30	-	3,867.90	-
9.00	>	10.00	5,874.20	-	9,742.10	-
10.00	>	11.00	7,579.70	-	17,321.80	-
11.00	>	12.00	10,648.80	-	27,970.60	-
12.00	>	13.00	17,044.10	-	45,014.70	-
13.00	>	14.00	21,851.50	-	66,866.20	-
14.00	>	15.00	24,694.50	-	91,560.70	-
15.00	>	16.00	29,262.90	-	120,823.60	-
16.00	>	**17.00**	45,953.90	-	**166,777.50**	-
17.00	>	18.00	76,570.20	-	243,347.70	
18.00	>	19.00	95,526.90	-	338,874.60	-
19.00	>	20.00	111,135.10	-	450,009.70	-
			-			
20.00	>	21.00	-	6,197.30		6,197.30
21.00	>	22.00	-	3,523.60		9,720.90
22.00	>	23.00	-	2,757.70		12,478.60
23.00	>	24.00	-	2,224.10		14,702.70
24.00	>	25.00	-	1,612.30		16,315.00
25.00	>	26.00	-	811.20		17,126.20
26.00	>	27.00	-	234.30		17,360.50
27.00	>	28.00	-	49.10		17,409.60
28.00	>	28.12	-	0.10		17,409.70

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

4) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

JOB PLANT LANSING SMITH
DETAIL ASH POND EAST CELL
TOPO AND VOLUME

REV	DATE:

DRAWN ENP CHECKED DESIGNED
APPROVED DATE 3/11/2010
APPROVED DATE

SCALE AS NOTED B/M
SHEET 1 OF 1 SHEETS
SUPERSEDES

3727LAN REV 0

GP-SM-#0010

ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
11.91	>	12.00	0.20	-	0.20	-
12.00	>	13.00	295.90	-	296.10	-
13.00	>	14.00	2,816.90	-	3,113.00	-
14.00	>	15.00	6,401.20	-	9,514.20	-
15.00	>	16.00	10,529.60	-	20,043.80	-
16.00	>	17.00	12,419.90	-	32,463.70	-
17.00	>	18.00	13,756.60	-	46,220.30	-
18.00	>	19.00	15,086.50	-	61,306.80	-
19.00	>	20.00	16,466.50	-	77,773.30	-
20.00	>	20.70	14,390.50	-	92,163.80	-
20.70		21.00	6,522.60		98,686.40	
21.00	>	22.00	24,586.60	-	123,273.00	-
22.00	>	23.00	35,560.20	-	158,833.20	-
23.00	>	24.00	-	34,778.60	-	34,778.60
24.00	>	25.00	-	23,848.20	-	58,626.80
25.00	>	26.00	-	13,445.30	-	72,072.10
26.00	>	27.00	-	5,923.90	-	77,996.00
27.00	>	28.00	-	1,865.50	-	79,861.50
28.00	>	29.00	-	1,175.20	-	81,036.70
29.00	>	30.00	-	939.20	-	81,975.90
30.00	>	31.00	-	751.90	-	82,727.80
31.00	>	32.00	-	522.70	-	83,250.50
32.00	>	33.00	-	353.70	-	83,604.20
33.00	>	34.00	-	215.80	-	83,820.00
34.00	>	35.00	-	96.30	-	83,916.30
35.00	>	36.00	-	60.70	-	83,977.00
36.00	>	37.00	-	42.20	-	84,019.20
37.00	>	38.00	-	31.30	-	84,050.50
38.00	>	39.00	-	20.80	-	84,071.30
39.00	>	40.00	-	8.90	-	84,080.20
40.00	>	41.00	-	1.60	-	84,081.80

PLANT SMITH ASH POND
SOUTH WEST CELL

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL. ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

4) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

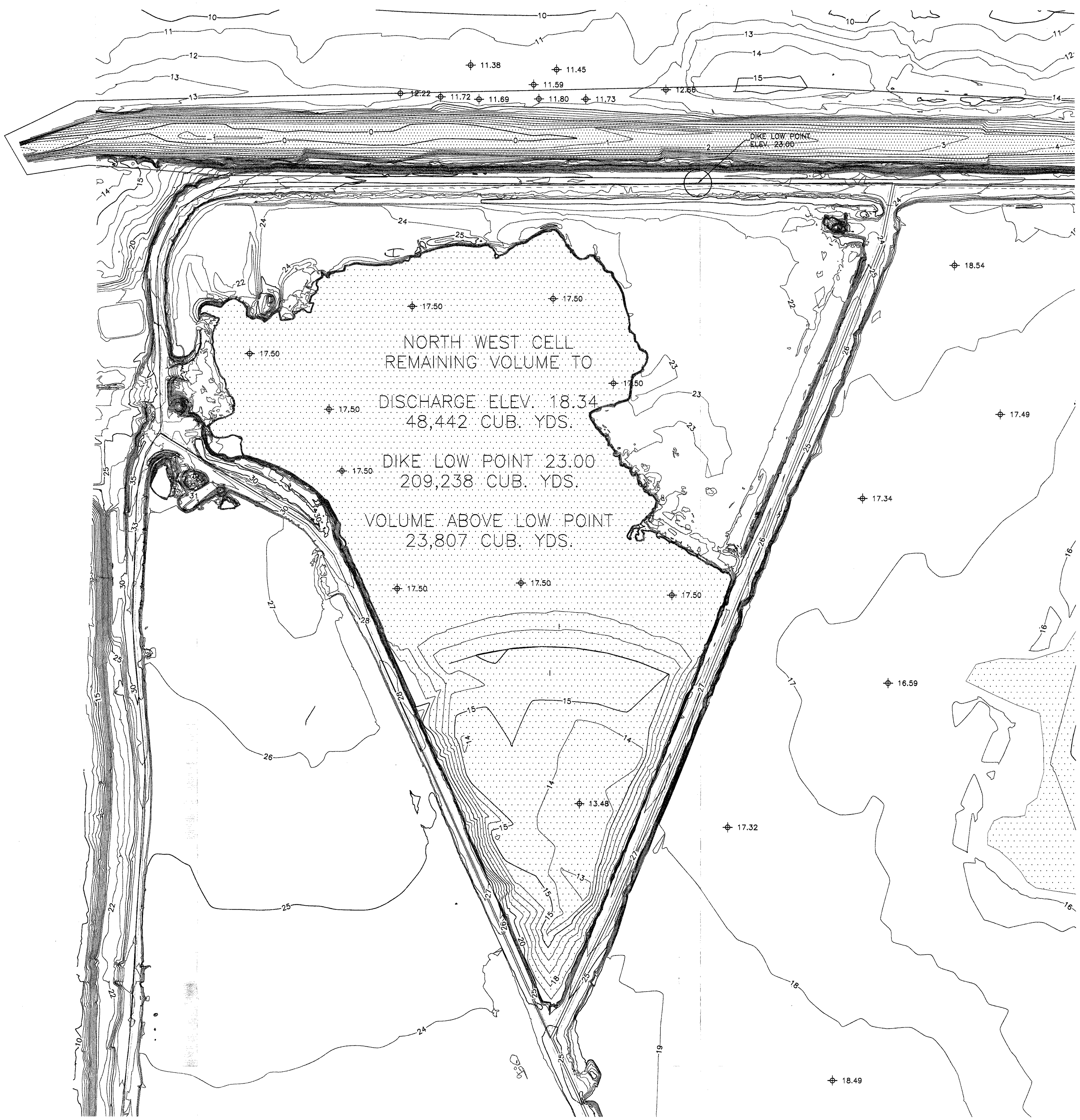
HYDROGRAPHIC/TOPOGRAPHIC SURVEY
Southern Company Services, Inc.
for

Gulf Power Company

JOB	PLANT LANSING SMITH
DETAIL	ASH POND SOUTH WEST CELL
	TOPO AND VOLUME
DRAWN	ENP
CHECKED	
DESIGNED	
APPROVED	
DATE	3/11/2010
SCALE	AS NOTED
B/M	
SHEET	1 OF 1 SHEETS
SUPERSEDES	
	3727LAN
REV	0

REV	DATE:

GP-SM-#0011



PLANT SMITH ASH POND NORTH WEST CELL						
ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
12.68	>	13.00	6.90	-	6.90	-
13.00	>	14.00	653.30	-	660.20	-
14.00	>	15.00	3,060.30	-	3,720.50	-
15.00	>	16.00	6,200.90	-	9,921.40	-
16.00	>	17.00	8,098.20	-	18,019.60	-
17.00	>	18.00	19,895.50	-	37,915.10	-
18.00	>	18.34	10,527.00	-	48,442.10	-
18.34	>	19.00	21,474.40		69,916.50	
19.00	>	20.00	32,001.40	-	101,917.90	-
20.00	>	21.00	33,117.00	-	135,034.90	-
21.00	>	22.00	34,666.00	-	169,700.90	-
22.00	>	23.00	39,537.20	-	209,238.10	-
23.00	>	24.00	-	7,600.90		7,600.90
24.00	>	25.00	-	4,875.10		12,476.00
25.00	>	26.00	-	3,266.50		15,742.50
26.00	>	27.00	-	2,632.40		18,374.90
27.00	>	28.00	-	1,945.00		20,319.90
28.00	>	29.00	-	1,307.50		21,627.40
29.00	>	30.00	-	992.90		22,620.30
30.00	>	31.00	-	555.40		23,175.70
31.00	>	32.00	-	352.60		23,528.30
32.00	>	33.00	-	183.30		23,711.60
33.00	>	34.00	-	40.70		23,752.30
34.00	>	35.00	-	20.40		23,772.70
35.00	>	36.00	-	14.80		23,787.50
36.00	>	37.00	-	10.40		23,797.90
37.00	>	38.00	-	5.90		23,803.80
38.00	>	39.00	-	2.70		23,806.50
39.00	>	39.93	-	0.30		23,806.80
	>					

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL. ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

5) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

AREAS OF REMAINING WATER VOLUME

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

JOB	PLANT LANSING SMITH
DETAIL	ASH POND NORTH WEST CELL
	TOPO AND VOLUME
SCALE	AS NOTED
B/M	
SHEET	1 OF 1 SHEETS
SUPERSEDES	
	3727LAN
REV	0

DRAWN	ENP	CHECKED	DESIGNED
APPROVED		DATE	3/11/2010
APPROVED		DATE	

REV	DATE:

GP-SM-#0012

Southern Company Generation
Hydro Services
Bin 10193
241 Ralph McGill Boulevard NE
Atlanta, Georgia 30308-3374
Tel 404.506.7033

SOUTHERN COMPANY
Energy to Serve Your World™

March 22, 2010

Plant Smith
Dam Safety Inspection
Ash Pond Dike Report

CONFIDENTIAL

Mr. Brian E. Heinfeld
Plant Manager
Gulf Power Co.
Plant Smith

Dear Mr. Heinfeld:

Attached is the 2010 Dam Safety Inspection Report for Plant Smith. This inspection was performed by R. D. Wood and H. H. Armitage of the SCG Hydro Services Group on February 10, 2010. The report includes a checklist and photographs of observations of site conditions made during the dam and dike inspections. We would like to thank Mr. Eddie Jackson for his hospitality and assistance during the inspection.

The inspection team did not see any conditions that posed an imminent threat to the safety or permanence of the ash pond dike or associated structures. The appearance of the dikes is much improved from the previous inspection. It is apparent that much work has gone into the clearing and repair of the dikes.

Three recommendations have come from this inspection:

#1 - Additional grass should be planted (hydro-seeded) on all dike slopes for summer growth. (This action will complete Previous Recommendation #1, see below)

#2 - Seepage found on the slope, near the toe, should be monitored along the area of the West Dike as part of weekly plant inspections. Any sloughing or loss of material observed during the weekly inspection should be reported to SCG Hydro Services immediately.

#3 - A sign should be placed at the granular stockpiles to mark them for "Emergency Dike Repair Use Only".

Following is a listing of <u>Previous Recommendations</u> from the 2009 inspection and their dispositions:

1. Trees and brush on the upstream and downstream of all dike slopes should be removed and slopes grassed and maintained. The process of tree removal and root ball repair should be done in accordance with the guidelines and procedures set forth in FEMA Publication #534, "Impacts of Plants on Earthen Dams", pages 6-1 through 6-12.

Disposition – Continues - Trees and brush on all slopes have been removed and soil repairs made. Establishment of grass cover (hydro-seeding) is to be done at the appropriate time.

2. A survey of the crest elevation on a 10-foot spacing should be performed to confirm the elevation and to aid in repair efforts.

   Disposition - Completed

3. Using the survey information the crest should be graded to direct drainage into the pond. Traffic ruts and potholes on the dike crest should be filled with soil and then graveled to prevent water from standing/ponding on the crest. Downstream slope erosion should also be repaired.

   Disposition - Continues – Repairs of the crest and slope erosion are in progress.

4. Construction techniques and materials used for original construction of the dike and for any subsequent repair should be evaluated for suitability and stability. This will require some drilling and sampling of the dike material plus surveying to determine the dike geometry.

   Disposition - Continues – Drilling has been completed. Evaluation of the dike construction and material used and the dike stability, is in progress.

5. Sufficient stockpiles of sand, gravel, and riprap should be maintained near the toe for emergency dike repairs. At a minimum, this should consist of two truckloads each of filter sand (902 – 4 – Fl. DOT Spec), #89 stone, #57 stone, and surge stone.

   Disposition – Completed, except for Recommendation #3 above.

6. After clearing of the dike slopes has been completed, another safety inspection should be performed to assess the areas which could not be properly observed during this visit.

   Disposition – Completed by this inspection.

7. A storm routing analysis of the pond should be done to determine the hydraulic adequacy of the outlet and the safe operating level.

   Disposition - Continues

Details of this inspection were discussed with Mr. Eddie Jackson at the conclusion of the inspection.

Should you have any questions, please contact me at 404-506-7273.

Sincerely,

Larry B. Wills
Principal Engineer - SCG Hydro Services

/rdw
Attachments

XC: **Gulf Power Company**

T. J. McCullough	(w/ attachment)
E. W. Jackson	(w/ attachment)
C. M. Largilliere	(w/ attachment)

Southern Company Services

E. B. Allison	(w/ attachment)
J. F. Crew	(w/ attachment)
J. C. Pegues	(w/ attachment)
H. H. Armitage	(w/ attachment)
R. D. Wood	(w/ attachment)
T. Sadler	(w/ attachment)

EWO: 4133 OM

T:\Core Projects\HYDRO\Quarterly Reports\Fossil Plants\2010\Smith\2010 SMITH Ash Dike Inspection Transmit.DOC

Plant Smith
2010 - Ash Dike Inspection
Dam Safety and Surveillance

Date of Inspection:	February 10, 2010	**Inspection by:**	H. H. Armitage - SCG R. D. Wood- SCG Eddie Jackson - Gulf Power
Weather:	Clear and Cold		
Temperature:	30's to 40's		
Rainfall (past 24 hrs):	< 0.5" on 2/9; > 2.0" on 2/8		

SUMMARY

Slopes and crest of the ash pond dikes looked good. *There were no conditions identified during this inspection that represented a threat to the safety or permanence of the various structures.* Tree stumps have been removed and disturbed areas repaired; brush has been removed down to toe at the wetlands, on all downstream slopes. Any erosion on dike slopes should be repaired and all slopes should be hydroseeded at the appropriate time. No animal burrows were noted. Drillers had just completed soil borings along the dike crest. At and beyond the toe of the dike slope can not be cleared due to presence of wetlands. Some trees at the toe will need to be left due to wetlands. The area of seepage found along the West Dike by this inspection, could not be seen during the 2009 inspection, due to the brush/undergrowth on the slope.

ADDITIONAL COMMENTS

Results of this inspection were discussed with Mr. Jackson at the conclusion of the inspection.

CURRENT RECOMMENDATIONS

No.	Description	Location	Photo No.
1	Plant (hydroseed) additional grass on all dike slopes for summer growth. (This will complete previous recommendation #1, see below)	All dikes.	**3, 5, 8 and 10**
2	Monitor seepage in this area of the West Dike as part of weekly plant inspection. Any sloughing or loss of material observed during the weekly inspection (or at anytime) should be reported to SCG Hydro Services immediately.	West Dike	**3 and 4**
3	Sign to be placed at granular stockpiles to mark them for "Emergency Dike Repair Use Only".	South end of the West Dike	**6**

PREVIOUS RECOMMENDATIONS

No.	Description	Location	Status Open/Closed
1	Trees and brush on the upstream and downstream of all dike slopes should be removed and slopes grassed and maintained. The process of tree removal and root ball repair should be done in accordance with the guidelines and procedures set forth in FEMA Publication #534, "Impacts of Plants on Earthen Dams", pages 6-1 through 6-12.	Most of the dike as typified in photos.	**Continues**
2	A survey of the crest elevation on a 10 foot spacing should be performed to confirm the elevation and to aid in repair efforts.	All of the perimeter dike.	**Completed**
3	Using the survey information the crest should be graded to direct drainage into the pond. Traffic ruts and potholes on the dike crest should be filled with soil and then gravelled to prevent water from standing/ponding on the crest. Downstream slope erosion should also be repaired.	All of the perimeter dike.	**Continues**
4	Construction techniques and materials used for original construction of the dike and for any subsequent repairs, should be evaluated for suitability and stability. This will require some drilling and sampling of the dike material plus surveying to determine the dike geometry.	All of the perimeter dike.	**Continues**
5	Sufficient stockpiles of sand, gravel and riprap should be maintained near the toe for emergency dike repairs. At a minimum, this should consist of two truckloads each of filter sand (902-4 FL. DOT Spec.), #89 stone, #57 stone and surge stone.		**Completed**
6	After clearing of the dike slopes has been completed, another safety inspection should be performed to assess the areas which could not be properly observed during this visit.		**Completed by this inspection.**
7	A storm routing analysis of the pond should be done to determine the hydraulic adequacy of the outlet and the safe operating level.		**Continues**

Plant Smith
2010 - Ash Dike Inspection
OBSERVATIONS FROM THIS INSPECTION -

I - Ash Pond - 'West' Section Embankment		Ash Pond Elev. ? '
	Observations - Comments	**Photograph No.**
1. Upstream Slope		
a. Condition	Good; Brush has been removed; 'berm' of ash has also been removed.	2
b. Erosion/Sloughing	*Yes (X) No ( )* Erosion due to steepness, ditch has been excavated in ash.	
2. Crest		
a. Condition	Generally good; still some variation in crest elevation; crest has been surveyed and soil borings made; there is none to minimal rutting from traffic.	1
3. Downstream Slope		
a. Condition	Generally good; brush and trees have been removed and root ball areas repaired; some rye grass beginning to grow; **Recommendation #1** - Plant (hydroseed) additional grass for summer growth. Some trees and brush at toe of slope must be left to avoid encroaching on wetlands.	3
b. Seepage/Wet Spots	*Yes (X) No ( )* Several areas of seepage up from toe about 2' to 3', very small flow along ~50' length of dike; **Recommendation #2** - Monitor this area as part of weekly plant inspection. Any sloughing or loss of material observed during the weekly inspection (or at anytime) should be reported to SCG Hydro Services immediately. See the attached aerial photo for location.	3 and 4
c. Erosion/Sloughing	*Yes (X) No ( )* Some erosion; mostly small rills. No sloughing.	3 and 4
4. Emergency Aggregate Stockpiles		
a. Available	*Yes (X) No ( )* **Recommendation #3** - Signs to be placed at granular stockpiles to mark them for "Emergency Dike Repair Use Only".	6

II - Ash Pond - Discharge Structure to Perimeter Ditch		
	Observations - Comments	**Photograph No.**
1. Structure		
a. Condition	Good; brush has been cleared.	12
b. Seepage/Wet Spots	*Yes ( ) No (X)*	
2. Downstream of Structure (Channel)		
a. Condition	Good; brush has been cleared.	12

III - Groundwater Monitoring Wells		
	Observations - Comments	**Photograph No.**
1. Outlet Channel		
a. Condition of Wells	Not inspected.	
b. Water Level Readings		
c. Other Comments	Samples taken by others annually.	

IV - Ash Pond - 'South' Section Embankment		
	Observations - Comments	**Photograph No.**
1. Upstream Slope		
a. Condition	Brush and trees have been removed; 'berm' of ash has also been removed.	9
b. Erosion/Sloughing	*Yes (X) No ( )* Erosion due to steepness in ash. Slope to be graded and grassed.	9
2. Crest		
a. Condition	Generally good; still some variation in crest elevation; crest has been surveyed and soil borings made; there is none to minimal rutting from traffic.	9
3. Downstream Slope		
a. Condition	Generally good; brush and trees have been removed and root ball areas repaired; some rye grass beginning to grow; **Recommendation #1** - Should plant (hydroseed) additional grass for summer growth. Some trees and brush at toe of slope must be left to avoid encroaching on wetlands.	5, 7, 8, 10 and 11
b. Seepage/Wet Spots	*Yes ( ) No (X)*	7
c. Erosion/Sloughing	*Yes ( ) No (X)* None noted.	
4. Emergency Aggregate Stockpiles		
a. Available	*Yes (X) No ( )* See Recommendation #3.	6

Plant Smith

2010 - Ash Dike Inspection

V - Ash Pond - 'East' Section Embankment		
	Observations - Comments	**Photograph No.**
1. Upstream Slope		
a. Condition	Generally good	12
b. Erosion/Sloughing	*Yes (X) No ( )* Due to steepness of ash.	
2. Crest		
a. Condition	Generally good; no rutting. (See I.2.a. above)	12
3. Downstream Slope		
a. Condition	No downstream slope due to higher natural ground.	

VI - Ash Pond - 'North' Section Embankment		
	Observations - Comments	**Photograph No.**
1. Upstream Slope		
a. Condition	Brush and trees have been removed; small 'berm' of ash has also been removed.	
b. Erosion/Sloughing	*Yes ( ) No (X)*	
2. Crest		
a. Condition	Good; road (crest) in good condition; well maintained due to ash hauling traffic.	13
3. Downstream Slope		
a. Condition	Good; slope is ~2:1 or 1.5:1down to perimeter ditch.	13
b. Seepage/Wet Spots	*Yes ( ) No (X)* None noted.	
c. Erosion/Sloughing	*Yes (X) No ( )* Some erosion due to clearing; no sloughing.	
4. Emergency Aggregate Stockpiles		
a. Available	*Yes ( ) No (X)*	

VII - Retention Pond		
	Observations - Comments	**Photograph No.**
1. Condition	Good; much vegetation growing in the pond. Height of the dike appears to be approximately 3 ft.	

VIII - DRY STACK		
	Observations - Comments	**Photograph No.**
1. Condition	*Good; only a cursory look was made.*	
2. Erosion/Sloughing	*Yes ( ) No ( )* Not observed.	

XIV - Additional Observation/Comments - General	
Observations - Comments	**Photograph No.**

Randall O. Wood

R. D. Wood - Sr. Eng. Geologist

SCG - Hydro Services

Plant Smith

2010 - Inspection Photographs - Feb. 10, 2010

(See the accompanying report attached)

Photo No.	Description	
1	West Ash Pond Dike - Showing cleared Crest and slopes, facing south. Grass beginning to grow.	
2	West Ash Pond Dike - Showing inside slope and ditch excavated in ash to aid drainage, facing south. Excavated ash to be cleared.	
3	West Ash Pond Dike - Showing downstream berm after clearing, facing south. Marshy area to the right and area of seepage circled.	
4	West Ash Pond Dike - Close-up of area of seepage circled in Photo 3 above.	

Plant Smith

2010 - Inspection Photographs - Feb. 10, 2010

(See the accompanying report attached)

Photo No.	Description	
5	South Ash Pond Dike - Showing cleared downstream slope, facing east. Some grass beginning to grow.	
6	South Ash Pond Dike - Emergency granular stockpiles. Additional stockpiles are located near the west side of the plant.	
7	South Ash Pond Dike - Toe of slope showing ~ 2' to 3' drop-off to wetlands/marsh, facing east.	
8	South Ash Pond Dike - Downstream slope showing ~2' to 3' drop-off to wetlands/marsh at toe, facing west.	

Plant Smith

2010 - Inspection Photographs - Feb. 10, 2010

(See the accompanying report attached)

Photo No.	Description	
9	South Ash Pond Dike - Showing Crest and erosion of upstream 'slope', facing east.	
10	South Ash Pond Dike - Downstream slope showing grass beginning to grow after clearing , facing west.	
11	South Ash Pond Dike - Downstream slope showing ~2' to 3' drop-off to wetlands/marsh at toe, facing southwest.	
12	Discharge Structure - Showing cleared area around structure, facing south. Area of the East Dike in the background (circled).	

Plant Smith

2010 - Inspection Photographs - Feb. 10, 2010

(See the accompanying report attached)

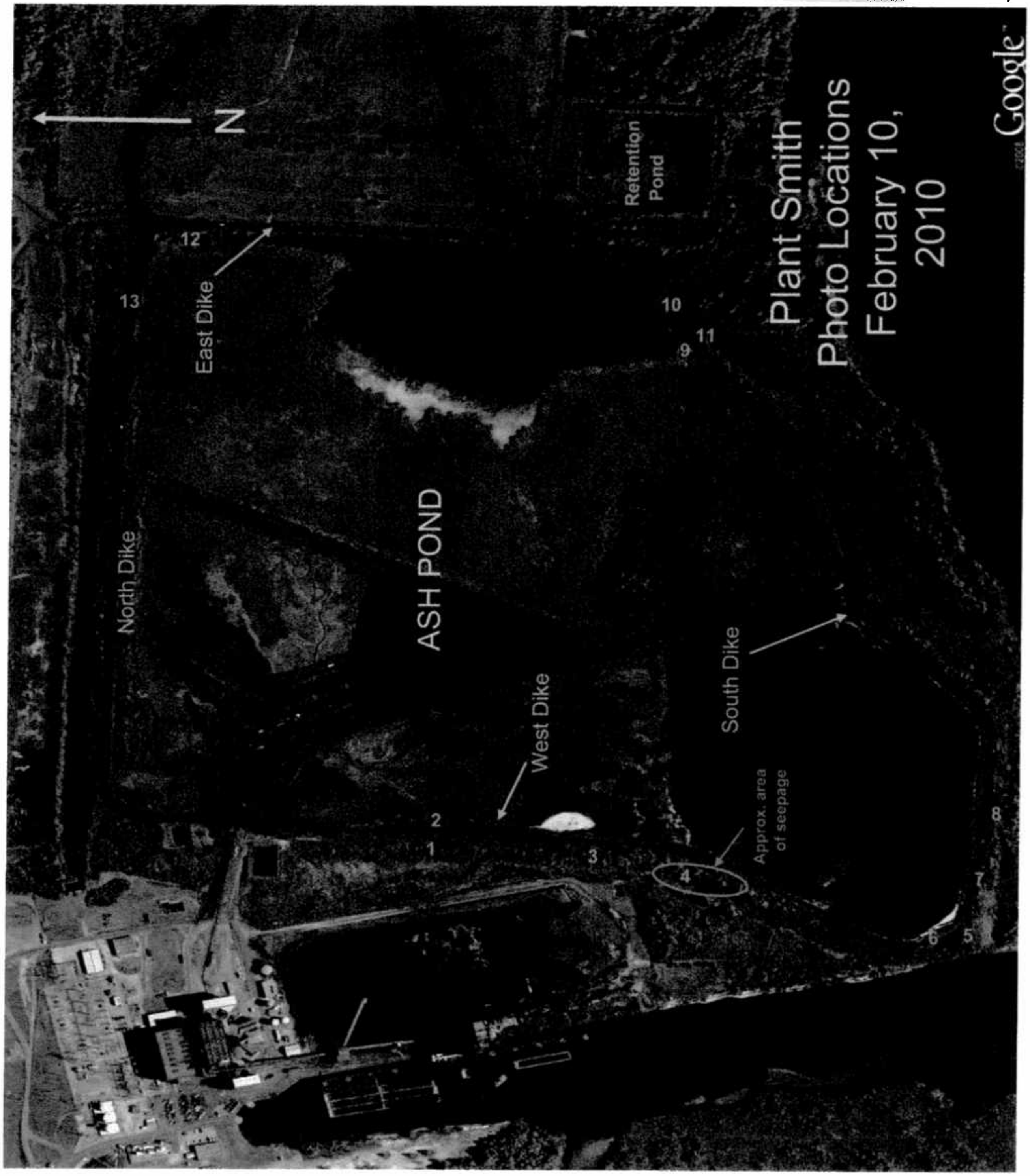
Photo No.	Description	
13	North Ash Pond Dike and Perimeter Ditch - Showing cleared dike and ditch, facing west, plant in the background.	

Plant Smith

2010 - Inspection Photographs - Feb. 10, 2010

(See the accompanying report attached)

Photo No.	Description	



Southern Company Generation
Hydro Services
Bin 10193
241 Ralph McGill Boulevard NE
Atlanta, Georgia 30308-3374
Tel 404.506.7033

SOUTHERN COMPANY
Energy to Serve Your World™

March 10, 2009

Plant Smith
Dam Safety Inspection
Ash Pond Dike Report

Mr. Brian E. Heinfeld
Plant Manager
Gulf Power Co.
Plant Smith

CONFIDENTIAL

Dear Mr. Heinfeld:

Attached is the 2009 Dam Safety Inspection Report for Plant Smith. This inspection was performed by R. D. Wood and G. J. Bruce of the SCG Hydro Services Group and J. A. Lippert of SCS ESEE, on January 14, 2009. The report includes a checklist and photographs of observations of site conditions made during the dam and dike inspections. We would like to thank Ms. Marie Largilliere, Mr. Tim Batyski, Mr. Jason Best, and Mr. Clayton Crum for their hospitality and assistance during the inspection.

On the day of this inspection the level of the water in the southwest area of the ash pond was at the crest of the dike, though by later in the day the water level had been lowered somewhat. This condition could have posed a danger to the ash pond dike. Other than this, the inspection team did not see any conditions that posed an imminent threat to the safety of the ash pond dike.

The existence of large trees near the crest of the West and South sections of the Dike could pose a serious risk should strong winds blow the trees over. The uprooting of the root ball could create a condition where the dike could be compromised by being partially or totally breached, thereby allowing the release of water and ash. Any release along this portion of the dike could flow to the canal and/or bay, which are at least 100 to 200 feet away at several locations.

The inspection team was not able to do as thorough an inspection as they would have liked due to the heavy vegetation on the dike slopes. In addition to preventing inspection of the dikes, woody brush and trees degrade the earth structure. For this reason it is standard industry practice to keep all woody vegetation off of earth dikes. Therefore, we recommend that trees and brush be removed from the dikes.

There are some questions that need to be answered before the safety of the ash pond can be determined. From a visual observation, the ash pond dike slopes appear somewhat steeper than what is generally accepted and it is not clear of what materials the dike is constructed. These issues should be investigated. It would also be prudent to perform a storm routing analysis on the pond to determine the hydraulic adequacy of the outlet and to determine the safe operating level.

There are some maintenance issues that need to be addressed. In addition to the removal of the trees and brush from the dike slopes, the crest of the dike requires some repair and grading to prevent ponding of water and to direct runoff into the pond. It would also be prudent to provide access around the toe of the dike for equipment and to stockpile granular filter materials at the toe for use in emergency repairs. It is our understanding that the implementation of these recommendations could depend on wetland permitting.

A detailed listing of these recommendations is included in the attached report. Tree removal, surveying, dike repair, storm routing and stability analysis should be planned and directed by a qualified engineer. SCG Hydro Services is available to talk over how to carry out the recommendations and will provide assistance in obtaining the engineering resources necessary to carry out the work and studies recommended.

Details of this inspection were discussed with Mr. Steven Ford at the conclusion of the inspection. We recommend that after clearing of the dike is complete, another safety inspection be performed to assess the areas which could not be properly observed during this visit.

Should you have any questions, please contact me at 404-506-7033.

Sincerely,

Joel Galt

Joel Galt
Hydro Services Supervisor

/rdw
Attachments
XC: **Gulf Power Company**
T. J. McCullough (w/ attachment)
S. L. Ford (w/ attachment)
C. M. Largilliere (w/ attachment)

Southern Company Services
E. B. Allison (w/ attachment)
J. A. Lippert (w/ attachment)
G. J. Bruce (w/ attachment)
R. D. Wood (w/ attachment)

T:\Core Projects\HYDRO\Quarterly Reports\Fossil Plants\2009\SMITH\09 SMITH Ash Dike Inspection\Transmit.DOC

Plant Smith
2009 - Ash Dike Inspection
Dam Safety and Surveillance

Date of Inspection:	January 14, 2009	**Inspection by:**	G. J. Bruce - SCG
Weather:	Clear and Cold		R. D. Wood- SCG
Temperature:	30's to 50's		J. A. Lippert-ESEE
Rainfall (past 24 hrs):	0.0"		

SUMMARY

The existence of large trees near the crest of the West and South sections of the Dike could pose a serious problem should strong winds blow the trees over. The uprooting of the root ball could create a condition where the dike could be compromised by being partially or totally breached thereby allowing the release of water and ash. Any release along this portion of the dike could flow to the canal and/or bay, which is approximately 100 to 200 feet away at several locations. A survey of the crest elevation, followed by grading and maintenance of the dike crest to prevent ponding of water and to direct surface drainage into the ash pond, should be done. The stability of the North and South Dikes should be evaluated. This will require some drilling and sampling of the dike material. It was difficult to see if there were any animal burrows or other damage, due to high and dense vegetation on the dike slopes. There were no stockpiles of sand, gravel and riprap available on site for emergency dike repairs. See the CURRENT RECOMMENDATIONS section below for additional details and references.

ADDITIONAL COMMENTS

Mr. Bruce, Mr. Lippert and Mr. Wood were escorted around the site by Ms. Marie Largilliere, Mr. Tim Batyski, Mr. Jason Best, and Mr. Clayton Crum. Their hospitality and assistance during the inspection were greatly appreciated.

The results of the inspection were discussed with Mr. Steven Ford at the conclusion of the inspection.

CURRENT RECOMMENDATIONS

No.	Description	Location	Photo No.
1	Trees and brush on the upstream and downstream of all dike slopes should be removed and slopes grassed and maintained. The process of tree removal and root ball repair should be done in accordance with the guidelines and procedures set forth in FEMA Publication #534, "Impacts of Plants on Earthen Dams", pages 6-1 through 6-12.	Most of the dike as typified in photos.	**1,2,3 and 5**
2	A survey of the crest elevation on a 10 foot spacing should be performed to confirm the elevation and to aid in repair efforts.	All of the perimeter dike.	
3	Using the survey information the crest should be graded to direct drainage into the pond. Traffic ruts and potholes on the dike crest should be filled with soil and then gravelled to prevent water from standing/ponding on the crest. Downstream slope erosion should also be repaired.	All of the perimeter dike.	**3,4 and 5**
4	Construction techniques and materials used for original construction of the dike and for any subsequent repairs, should be evaluated for suitability and stability. This will require some drilling and sampling of the dike material plus surveying to determine the dike geometry.	All of the perimeter dike.	
5	Sufficient stockpiles of sand, gravel and riprap should be maintained near the toe for emergency dike repairs. At a minimum, this should consist of two truckloads each of sand, #89 stone, #57 stone and surge stone.		
6	After clearing of the dike slopes has been completed, another safety inspection should be performed to assess the areas which could not be properly observed during this visit.		**2**
7	A storm routing analysis of the pond should be done to determine the hydraulic adequacy of the outlet and the safe operating level.		

PREVIOUS RECOMMENDATIONS

No.	Description	Location	Status Open/Closed
1	NONE		

Plant Smith

2009 - Ash Dike Inspection

OBSERVATIONS FROM THIS INSPECTION - 01/14/2009

I - Ash Pond - 'West' Section Embankment		Ash Pond Elev. XXX '
	Observations - Comments	Photograph No.
1. Upstream Slope		
a. Condition	Trees and brush growing on 'slope'; slightly steepened from lack of maintenance.	1
b. Erosion/Sloughing	Yes ( ) No (X)	n/a
2. Crest		
a. Condition	An ash berm has been created on the upstream edge of the crest by excavation of a ditch in the ash pond along the pond side of the dike. At several low points in the dike, this 'berm' may have been the only thing retaining water in the pond. The water level of the pond was high (i.e. very little freeboard) at the time of this inspection. An ash berm has also been created on the downstream edge of the crest, creating a 'U' shape to the crest. Erosion was noted at low points on the crest where rainfall is 'directed' to and has washed out the ash berm, causing the erosion of the crest and downstream slope.	3
3. Downstream Slope		
a. Condition	Hard to determine due to the high and dense vegetation.	2
b. Seepage/Wet Spots	Yes ( ) No ( ) Undetermined	n/a
c. Erosion/Sloughing	Yes (X) No ( ) Some erosion noted where runoff from crest is directed to low points, as described above in I.2.a.	4
4. Emergency Aggregate Stockpiles		
a. Available	Yes ( ) No (X)	n/a

II - Ash Pond - Discharge Structure to Perimeter Ditch		
	Observations - Comments	Photograph No.
1. Structure		
a. Condition	Good	n/a
b. Seepage/Wet Spots	Yes ( ) No (X)	n/a
2. Downstream of Structure (Channel)		
a. Condition	Channel appeared open; some vegetation.	n/a

III - Groundwater Monitoring Wells		
	Observations - Comments	Photograph No.
1. Outlet Channel		
a. Condition of Wells	Not observed.	7
b. Water Level Readings	Not available.	n/a
c. Other Comments	Samples are collected by an outside company.	n/a

IV - Ash Pond - 'South' Section Embankment		
	Observations - Comments	Photograph No.
1. Upstream Slope		
a. Condition	Trees and brush growing on 'slope'; slightly steepened from lack of maintenance.	5
b. Erosion/Sloughing	Yes ( ) No (X)	n/a
2. Crest		
a. Condition	Same conditions as described in Section I.2.a. above.	5
3. Downstream Slope		
a. Condition	Hard to determine due to high and dense vegetation.	7
b. Seepage/Wet Spots	Yes ( ) No ( ) Undetermined.	n/a
c. Erosion/Sloughing	Yes (X) No ( ) Some erosion noted where runoff from crest is directed to low points, as described above in I.2.a.	4
4. Emergency Aggregate Stockpiles		
a. Available	Yes ( ) No (X)	n/a

Plant Smith
2009 - Ash Dike Inspection

V - Ash Pond - 'East' Section Embankment

	Observations - Comments	Photograph No.
1. Upstream Slope		
a. Condition	*Generally good; ash berm along crest and slope with much high growth.*	6
b. Erosion/Sloughing	*Yes (X) No ( ) Some slight erosion.*	n/a
2. Crest		
a. Condition	*Generally good; mostly on natural ground. Needs to be graded to drain into the pond.*	n/a
3. Downstream Slope		
a. Condition	*No downstream slope due to higher natural ground.*	n/a
b. Seepage/Wet Spots	*Yes ( ) No ( ) n/a*	n/a
c. Erosion/Sloughing	*Yes ( ) No ( ) n/a*	n/a

VI - Ash Pond - 'North' Section Embankment

	Observations - Comments	Photograph No.
1. Upstream Slope		
a. Condition	*Generally good; ash berm along crest and slope with much high growth.*	n/a
b. Erosion/Sloughing	*Yes ( ) No ( )*	n/a
2. Crest		
a. Condition	*An ash berm has been created on the upstream edge of the crest. The water level of the pond was high at the time of this inspection. An ash berm has also been created on the downstream edge of the crest, creating a 'U' shape to the crest. Erosion was noted at low points in the upstream and downstream crest where rainfall is 'directed' to run and wash out the ash berm, causing erosion of the crest and downstream slope.*	n/a
3. Downstream Slope		
a. Condition	*Generally good; runoff runs into the adjoining drainage ditch. Generally low vegetation.*	n/a
b. Seepage/Wet Spots	*Yes ( ) No (X)*	n/a
c. Erosion/Sloughing	*Yes (X) No ( ) Slight to moderate erosion due to concentrated runoff from the crest.*	n/a
4. Emergency Aggregate Stockpiles		
a. Available	*Yes ( ) No (X)*	n/a

VII - Retention Pond

	Observations - Comments	Photograph No.
1. Condition	*Good; much vegetation growing in the pond. Height of the dike appears to be approximately 3 ft.*	9

VIII - DRY STACK

	Observations - Comments	Photograph No.
1. Condition	*Did not inspect.*	n/a
2. Erosion/Sloughing	*Yes ( ) No ( ) n/a*	n/a

XIV - Additional Observation/Comments - General

Observations - Comments	Photograph No.
1. The outfall from the swampy area along the toe of the South Dike was inspected at low tide. No problems were noted.	8

Randall O. Wood

R. D. Wood - Sr. Eng. Geologist

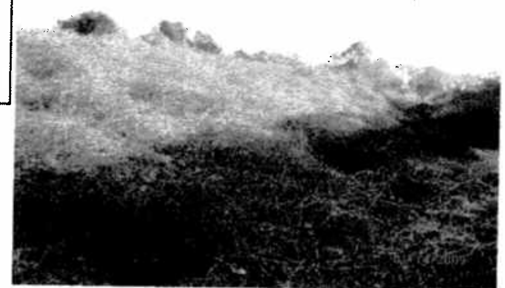
SCG - Hydro Services

Plant Smith

2009 - Inspection Photographs - January 14, 2009

(See the accompanying report attached)

Photo locations and direction of view are shown on the attached aerial photo.

Photo No.	Description	
1	Section of the West Dike showing vegetation, berms and difference in elevation (from low point), facing north. Ash Pond is to the right.	
2	Vegetation on the downstream slope of the South Dike. This condition made inspection of the downstream slopes extremely difficult and unsafe for inspection. Ash Pond is to the left.	
3	Crest of the South Dike showing vegetation on the upstream and downstream slopes, and the ash berms along both sides of the crest. Ash Pond is to the left.	
4	Erosion on the downstream slope from runoff at a low point in the South Dike. Crest should be graded to drain into the pond to prevent this.	

Plant Smith

2009 - Inspection Photographs - January 14, 2009

(See the accompanying report attached)

Photo locations and direction of view are shown on the attached aerial photo.

Photo No.	Description	
5	Trees and other vegetation along both sides of the crest of the South Dike. Ash Pond is to the left.	
6	East portion of dike on natural ground with the ash stack to the right, pond to the left.	
7	View from the South Dike looking out toward the bay, facing generally southeast. A monitoring well location is shown by the oval.	
8	Outfall from the swampy area along the toe of the South Dike into the bay, at low tide.	

Plant Smith

2009 - Inspection Photographs - January 14, 2009

(See the accompanying report attached)

Photo locations and direction of view are shown on the attached aerial photo.

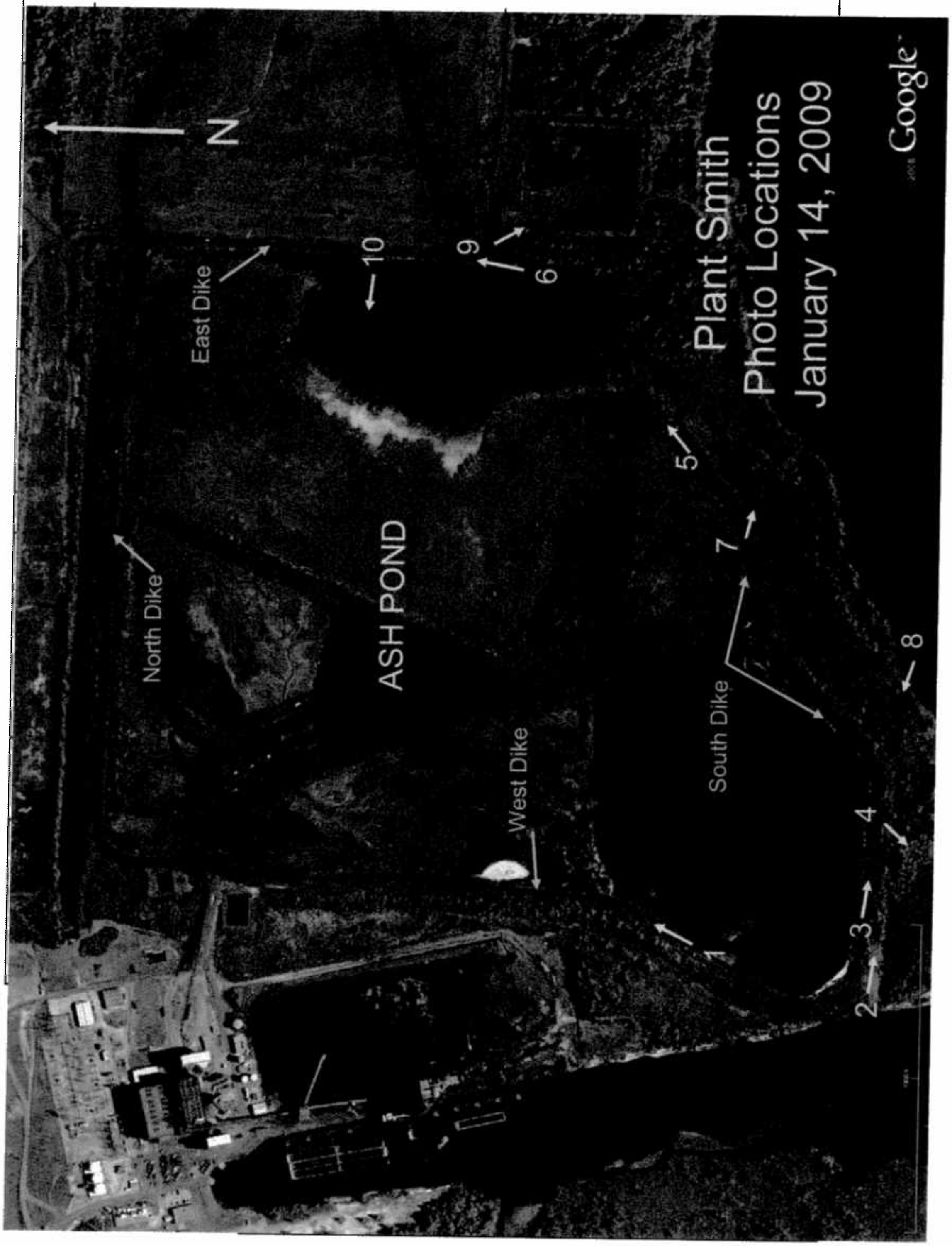
Photo No.	Description	
9	View across the retention pond, facing southeast.	
10	View across the ash pond, with the plant in the background. Facing northwest.	

Plant Smith

2009 - Inspection Photographs - January 14, 2009

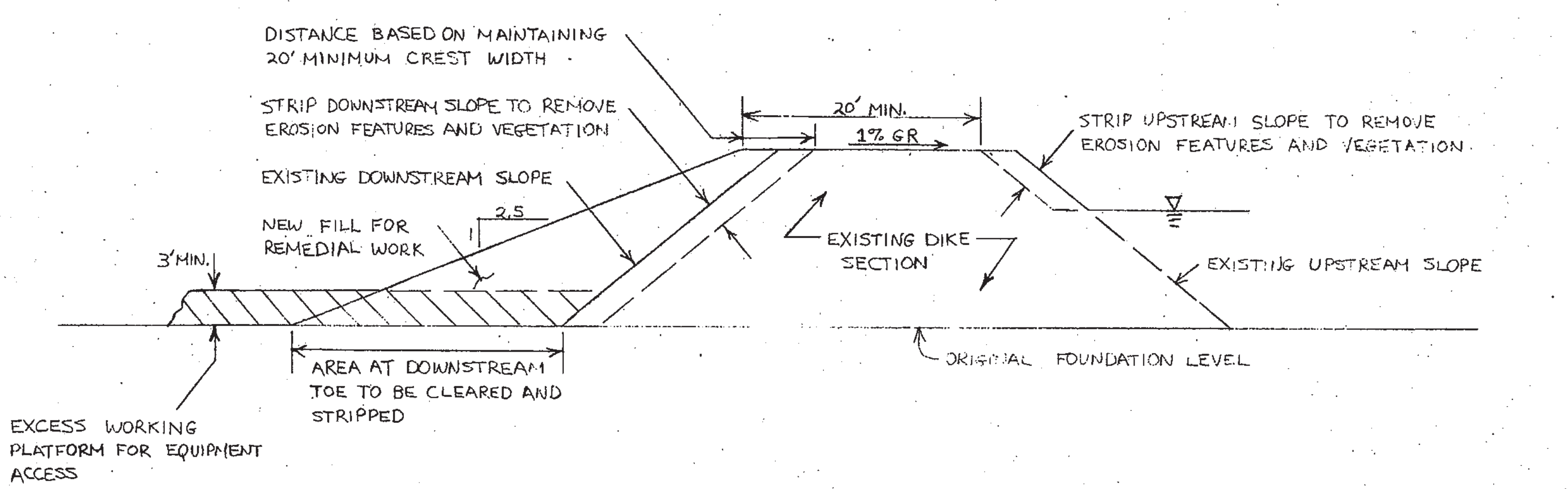
(See the accompanying report attached)
Photo locations and direction of view are shown on the attached aerial photo.

Photo No.	Description	



TYPICAL DIKE SECTION

SCALE : 1" = 10'



PLANT LANSING SMITH
ASH POND DIKE
DRAWN BY : JPM
REVIEWED BY : RMF

CONFIDENTIAL ATTORNEY-CLIENT PRIVILEGE

ASH POND EVALUATION

PLANT LANSING SMITH

PANAMA CITY, FLORIDA

ES 1840

Prepared By

Southern Company Generation
Technical Services
Earth Science and Environmental Engineering

April 2010

Originator: James C. Pegues — 4/23/10 Date

Reviewer: Rachel A. Mudd — 4/23/10 Date

Approval: ~~David~~ W. Morris — 4-23-10 Date

Revision No.	Date
0 – Report Issued for Use	04/23/2010

CONFIDENTIAL ATTORNEY-CLIENT PRIVILEGE

ASH POND EVALUATION

PLANT LANSING SMITH

PANAMA CITY, FLORIDA

ES 1840

Prepared By

Southern Company Generation
Technical Services
Earth Science and Environmental Engineering

April 2010

EXECUTIVE SUMMARY

The Earth Science & Environmental Engineering Department (ES&EE) of Southern Company Generation Technical Services has prepared this report to present geotechnical findings and analyses related to the assessment of the existing north and south ash pond dikes at Plant Lansing Smith north of Panama City, Florida. Included in this report is a discussion of the geotechnical exploration and findings, laboratory test results and stability analysis results.

In response to the recommendations presented in the 2009 annual inspection of the ash pond by Southern Company Hydro Services, this study focused on the north and south dikes of the ash pond. A total of ten borings were drilled along the north dike (noted as borings NDB-*), and nineteen were drilled along the south dike (SDB-*), including a portion of the southern end of what would be considered the west dike.

The borings found that much of the upper dike structure consists of ash, with ash depths as shallow as 2 feet and as deep as 25 feet. The deeper ash was generally encountered more often within the south dike borings, but ash was found to depths of about 20 feet along the north embankment as well. The borings encountered sands and silty sands immediately below the ash. It is difficult to distinguish between sands placed as fill or naturally placed sands, as the material is the same. In addition, some fat clays (i.e. highly plastic clays) were encountered at depth.

Standard penetration testing and split-spoon sampling were performed in each boring at regular depth intervals. In some borings, relatively intact Shelby tube samples were collected of the ash materials for the laboratory testing portion of this assessment. Due to the physical characteristics of the lower sands and silty sands, we were not able to obtain relatively intact Shelby tube samples of these materials.

Topographic survey information obtained by Southern Company Generation Civil Field Services (CFS) was used to develop representative cross-sections to assist in stability analyses. Stability analyses were evaluated for static, steady-state conditions and seismic loading. The stability analyses indicate all calculated minimum factors of safety are above generally accepted minimum factors of safety with the exception of the downstream slopes of the north embankment. Calculated factors of safety were 1.44 and 1.45, whereas the generally accepted minimum is 1.5.

These lower factors of safety do not represent a condition of imminent or likely failure of the slopes. Given the adjustment (downward) of shear strength parameters for the ash and the somewhat conservative assumptions for shear strength parameters for the sand (it was not possible to obtain intact samples of the sand for laboratory testing), one could reasonably argue that the calculated factors of safety are acceptable.

Additional discussion of our conclusions and recommendations can be found in the text of this report.

DOCUMENT REVIEW

A series of historic and recent documents were reviewed as a part of our evaluation of the ash pond. The reviewed documents included the 2009 and 2010 dam safety inspections performed by Hydro Services, and historic drawings retrieved from Documentum.

The 2009 Dam Safety Inspection report served as the guideline for this assessment. In addition to maintenance related items, one of the recommendations included in the 2009 report was for stability analyses to be performed on the North and South dikes of the facility. This report addresses and satisfies this recommendation.

A second recommendation was for a storm routing analysis to be performed to determine the hydraulic adequacy of the pond outlet(s) and the safe operating level of the pond. Storm routing is not addressed in this report, and is a function typically performed by Generation Civil Design. It is our understanding the storm routing evaluation will be reported later under separate cover by Civil Design.

ES&EE performed a search of applicable historic drawings in Documentum in an attempt to create a history of design and construction activities related to the ash pond. Little detailed information was found in the drawing database. However, Mr. Eddie Jackson (Plant Smith) directed us to Drawing No. Y-120 (Lansing Smith Steam Plant Unit 1, General Arrangement, Plant Site, dated February 16, 1965) which shows the ash pond in a similar configuration to the current layout. The ash pond layout shows a perimeter dike around the south, east and north sides of the ash pond. Notes and details on this drawing indicate an initial dike crest elevation at about EL 7 ft. As much of the surrounding topography was at about EL 4 ft to EL 5 feet, it is apparent initial dike heights were on the order of only a few feet. Details indicate initial dike crest widths varying from about 20 ft to 30 ft.

An earlier plant General Arrangement (Drawing No. D-13511, Lansing Smith Steam Plant – Unit #1, General Arrangement, Plant Site, dated October 1, 1963) shows a different ash pond layout, being somewhat circular in shape. Notes on this drawing reference dike crest elevations as follows: "Roadway on top of dike EL 9.0' North End, EL 4.5' South End, Ultimate Top of Dike EL 23.5'." This "ultimate" top of dike elevation generally reflects current top of dike elevation, with some slight variation.

FIELD EXPLORATION

General

Borings were completed in late-January and early-February, 2010. Boring locations were established in the field by an engineer from ES&EE. Actual boring coordinates were determined after drilling by the CFS Surveying Department.

Since underground utilities were not a concern along the ash pond dikes, hydroexcavation was not required (as is standard practice for utility clearance). Split-spoon sampling and standard penetration testing began in each boring at a depth of about 2.5 feet below the ground surface, and was performed at about 2.5-ft depth intervals in the upper 10 feet, and at 5-ft intervals below a depth of 10 feet. Also, Shelby tube samples were taken at select locations to obtain relatively intact samples for laboratory triaxial shear strength testing.

Original boring depths were planned to be on the order of 35 feet. However, due to the presence of lower SPT N-values at or near the planned termination depths, some borings were extended to depths of as much as about 65 feet to all an assessment of the deeper embankment foundation materials.

The soils obtained during split-spoon sampling were visually classified by a geotechnical engineer. It should be noted that since native soils were used to construct the lower reaches of the embankments, it is sometimes difficult to distinguish between fill materials and residual soils; therefore, the approximate interface of fill and native soil is not reflected on the boring records. Five borings were converted to temporary piezometers to allow for more accurate 24-hr (or later) water level readings. Upon the completion of the borings and water level measurements, the piezometer casings were removed and each borehole was filled with grout.

Discussion of the findings of the borings is presented in the following paragraphs for the north and south embankment sections.

North Embankment

Borings NDB-1 through NDB-10 were drilled along the north embankment to depths of about 36 feet to 56 feet. Boring NBD-1 was located on the east end of the north embankment, and subsequent boring numbers increase from east to west.

Ash was encountered at the ground surface in all borings, and the depth of ash varied, as shown in Table 1. In some instances, upper ash layers were separated by materials identified as brown sand.

Table 1
Ash Depths, North Embankment

Boring No.	Depth of Ash Below Ground Surface (ft)
NDB-1	14.5
NDB-2	2
NDB-3	4
NDB-4	9.5
NDB-5	7.5 (with sand from 2 to 4.5 ft)
NDB-6	4.5
NDB-7	19.5 (with sand from 4.5 to 7.5 ft)
NDB-8	19.5
NDB-9	7.5
NDB-10	19.5 (with sand from 2.5 to 4.5 ft, and from 7.5 to 14.5 ft)

The borings encountered very loose to medium dense sands below the ash. As some of these sands were encountered above the elevations indicated as natural grade on the historic drawings, it is apparent that some of the sand represents fill. Generally, any sands present above a depth of 10 feet (east end) to 15 feet (west end) likely represent fill materials placed during the initial ash pond development.

Borings NDB-3 and NDB-8 were converted to temporary piezometers to allow for measurement of groundwater levels after the completion of drilling. Water level measurements indicate a stabilized water level at the time of our exploration at about EL 11.5 to EL 12, or about 11 to 12 feet below the top of the embankment.

South Embankment

Borings SDB-1 through SDB-19 were drilled along the south and southwest embankment sections to depths of about 36 feet to 66 feet. Boring SBD-1 was located approximately 1000 feet north of the SW corner of the ash pond. Boring numbers in this area increased to the south (along the west embankment) and then to the east (along the south embankment), with boring SDB-19 located near what would be referenced as the south end of the east embankment.

As with the north embankment borings, ash was encountered at the ground surface in all borings, and the depth varied. Ash depths encountered in the south embankment borings are summarized in Table 2. In some instances, upper ash layers were separated by materials identified as brown sand.

Table 2
Ash Depths, South Embankment

Boring No.	Depth of Ash Below Ground Surface (ft)
SDB-1	24.5
SDB-2	19.5
SDB-3	4.5
SDB-4	7.5
SDB-5	4.5
SDB-6	19.5
SDB-7	24.5
SDB-8	19.5
SDB-9	9.5
SDB-10	19.5
SDB-11	19.5
SDB-12	16
SDB-13	7.5
SDB-14	4.5
SDB-15	9.5 (with sand from 4.5 to 7.5 ft)
SDB-16	4.5
SDB-17	4.5
SDB-18	2
SDB-19	9.5 (with sand from 4.5 to 7.5 ft)

Similar to the north embankment borings, very loose to medium dense sands were encountered below the ash. As some of these sands were encountered above the elevations indicated as natural grade on the historic drawings, it is apparent that some of the sand represents fill. Generally, any sands present above a depth of about 20 feet likely represent fill materials placed during the initial ash pond development. It should also be noted that boring SDB-2 encountered a layer of very soft fat clay from a depth of about 50 to 55 feet.

Relatively intact Shelby tube samples were collected from the ash in borings SDB-1, SDB-6, SDB-8 and SDB-11. All intact samples were taken from a depth of about 6 to 8 feet. The tubes were waxed sealed on both ends and securely stored until they were extruded and evaluated for possible strength testing. Strength testing, as discussed in the section that follows, was performed on the SDB-1 samples, and combined samples from SDB-6 and SDB-8.

Borings SDB-4, SDB-14 and SDB-19 were converted to temporary piezometers to allow for measurement of groundwater levels after the completion of drilling. Water level measurements indicate a stabilized water level at the time of our exploration at about EL 8 ft near the SW corner to EL 10 ft along the south and EL 12.5 ft at the easternmost end of the south embankment.

Laboratory Testing Results

Laboratory testing was performed on representative split-spoon samples and three of the Shelby tube samples. Due to a lack of sufficient sample in the tube from SDB-8, a combined sample was utilized from this boring (two test specimens) and SDB-6 (one test specimen) for consolidated-undrained triaxial shear testing.

Most of the selected samples were tested for basic index properties to characterize the soils and to confirm visual classifications. Tests include grain size analyses, Atterberg limits, natural moisture content and specific gravity. Due to organic smells in some of the deeper samples, organic content (measured as loss on ignition) were performed on some deeper samples. (Note: organic contents were low, and do not present a concern.) As stated above, triaxial shear strength testing was performed on Shelby tube samples collected in the ash.

Table 3 summarizes the laboratory test results from all selected samples.

Triaxial shear strength testing was performed using consolidated-undrained testing procedures with pore pressure measurements. This test methodology provides friction angles and cohesion values for undrained conditions (known as *total* values), as well as for drained conditions (known as *effective* strength values). Typically, the effective friction angle is higher than the total friction angle, while the reverse is true for cohesion.

The samples tested for this study revealed characteristics of sample dilatancy and negative pore pressure, resulting in lower effective friction angles. Dilatancy, normally a characteristic noted during triaxial testing of dense sands or overly consolidated clays (as well as some silts), occurs when the individual soil particles move up and over each other, resulting in a sample volume increase (generally, the sample volume decreases with compression during testing). This effect can also result in negative pore pressures. In addition, silts (the ash has the physical properties of silt) can be extremely difficult to sample and test without some sample disturbance, even under ideal laboratory preparation conditions. Such sample disturbance is well documented in published materials, and may account for erratic test results.

The test results obtained reflected higher total friction angles than effective, and much higher cohesion values than one would normally expect for a material of this type. Based on prior experience with ash materials and published literature, the decision was made to adjust the measured shear strength properties downward in the stability analysis models, as discussed in more detail in the section that follows.

Table 3
Laboratory Test Results

Boring	Depth (ft)	Percent Passing No. 200 Sieve	Atterberg Limits		Natural Moisture Content	Specific Gravity	Organic Content (loss on ignition, %)
			LL	PI			
SDB-1	6-8	92.6	NP	NP	97.6		
SDB-1	6-8	91.7	NP	NP	90.7		
SDB-2	5.5	79.2	NP	NP	78.2	2.17	
	10.5	91.2	NP	NP	76.4	2.22	
	20.5	13.6			27.5		
	30.5	4.9			18.8		
	40.5	17.1			23.4	2.64	
	50.5	60.0	55	29	34.1	2.68	
	60.5	29.3	25	1	26.8		
	65.5	30.0	NP	NP	24.2		
SDB-3	8.5	7.4			9.2		
	15.5	3.3	NP	NP	13.9		
	30.5	7.9	NP	NP	15.7		
	50.5	19.0	39	21	20.5	2.61	
	60.5	37.5			29.4		
SDB-5	35.5	16.1			23.0		1.5
	45.5	14.2			21.3		1.6
	55.5	10.5			19.5		0.8
SDB-8	6-8	92.6			97.6		
SDB-14	15.5	8.0	NP	NP	21.4	2.64	
	20.5	8.4	NP	NP	16.4		
NDB-1	5.5	50.5			59.9	2.26	
	20.5	5.4	NP	NP	17.5		
	35.5	11.5	33	11	28.4		
	45.5	18.7	NP	NP	25.0		
NDB-10	15.5	95.7			49.9	2.41	
	30.5	8.2	NP	NP	23.5		
	35.5	11.9	NP	NP	20.6		
	40.5	16.6	36	12	35.1		

ANALYSIS AND FINDINGS

As stated earlier, borings were drilled on both the north and south embankments of the ash pond, as recommended in the 2009 Dam Safety Inspection Report. Using the topographic survey performed by Civil Field Services in February 2010, representative cross-sections, two for the south embankment and two for the north, were developed for use in the stability analyses. Similarly, a representative stratigraphy was developed using our boring information. Cross-section reference is to the nearest boring. While all triaxial shear strength testing was performed on samples obtained from the south embankment, the same adjusted shear strength parameters for ash were used in the north embankment stability analyses.

Tables 4a and 4b summarize the strength values utilized in the stability analyses.

Table 4a
Soil Properties for Stability Analyses
North Embankment

Soil Description	Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
Dike Ash	80	27	100
Pond Ash	70	24	50
Embankment and Upper Foundation Sand	105	30	0

Table 4b
Soil Properties for Stability Analyses
South Embankment

Soil Description	Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
Dike Ash	80	27	100
Pond Ash	70	24	50
Embankment and Upper Foundation Sand	115	36	0
Lower Foundation Sand	105	30	0

Stability analyses were performed for current, steady-state conditions (upstream and downstream slopes) and pseudostatic seismic (downstream only). The water level as modeled is near the crest of the embankments (2-ft of freeboard), so a separate "high water" or "flood pool" condition was not modeled as an individual case. For the seismic analysis, the earthquake load was applied as a pseudstatic coefficient (K_h) of 0.08. This value is equal to the USGS-mapped, site-modified, short-period spectral acceleration for a 7 percent probability of exceedance over 75 years. Also, while rapid drawdown is a typical condition evaluated for impoundment structures, the method of operation for the Smith ash ponds suggests it may not be applicable at this site, and therefore is not reported.

Table 5 summarizes the minimum factors of safety obtained for each model at each cross-section.

Table 5
Summary of Minimum Slope Stability Factors of Safety

Cross-Section	Analysis Condition		
	Steady-State[1]		Steady-State with Seismic[2]
	Upstream	Downstream	
SDB-1	3.86	2.41	1.65
SDB-19	2.37	1.86	1.46
NDB-2	2.92	1.45	1.17
NDB-8	4.74	1.44	1.18

[1]Normally accepted industry standard minimum factor of safety = 1.5
[2]Normally accepted industry standard minimum factor of safety = 1.1

As can be seen in Table 5, the steady-state factors of safety for the downstream sections along the north embankment are slightly less than the recommended minimum factor of safety of 1.5. Additional discussion of these factors of safety is provided in the Conclusions and Recommendations section of this report.

CONCLUSIONS AND RECOMMENDATIONS

As recommended in the 2009 Dam Safety Inspection Report issued by Hydro Services, the Earth Science & Environmental Engineering Department of Southern Company Technical Services has performed a geotechnical exploration of the north and south embankments at the Plant Lansing Smith ash pond. The exploration was accomplished with standard penetration test borings in which both disturbed split-spoon samples and relatively intact Shelby tube samples were obtained for visual classification and/or laboratory testing. Index property tests were performed, as were triaxial shear strength tests. The laboratory data obtained was used in slope stability models to evaluate the minimum factors of safety of both embankments.

The stability analysis results indicate all calculated minimum factors of safety are above generally accepted minimum factors of safety with the exception of the downstream slopes of the north embankment. Calculated factors of safety were 1.44 and 1.45, whereas the generally accepted minimum is 1.5.

These lower factors of safety do not represent a condition of imminent or likely failure of the slopes. Given the adjustment (downward) of shear strength parameters for the ash and the somewhat conservative assumptions for shear strength parameters for the sand (it was not possible to obtain intact samples of the sand for laboratory testing), one could reasonably argue that the calculated factors of safety are acceptable. If one wished to increase these factors of safety through modification to the slopes, then the downstream slopes would need to be flattened by adding resisting weight at the toe and maintaining the general geometry of the top of the slopes. This could be problematic given the presence of the canal at the toe in this area. We would recommend delay of any consideration of slope modifications until after the proposed draft (and probably final) rules for CCB disposal facilities have been issued by EPA in the event other or further modifications to the current facility may be mandated. It would also be prudent to perform in-situ testing along the existing embankments using cone penetration test soundings to obtain what could result in more representative soil strength parameters if the decision is made to consider modifications or improvements.

An additional recommendation of the 2009 Dam Safety Inspection Report was storm routing analysis of the pond to determine the hydraulic capacity of the pond and its outlet structures, and to determine the safe operating level of the pond. As stated previously in this document, storm routing is not addressed in this report, and is a function typically performed by Generation Civil Design. It is our understanding the storm routing evaluation will be reported later under separate cover. We will review the findings of that study to see if it impacts any of our analyses, conclusions and recommendations. If necessary, modification will be made to our analyses and an amended report issued at that time.

Plant personnel have asked for a maintenance summary and/or checklist to use as a part of the operations and maintenance program for the ash pond. A formal stand-alone document will be prepared and issued once the storm routing study is complete. However, among the recommendations that will be included will be the maintenance related items addressed in the Hydro Services inspection reports of 2009 and 2010, including, but not limited to, the following:

- Vegetation on the embankment slopes should be regularly maintained. Trees and large brush should not be allowed to become established on the embankment slopes.
- Well established grass cover and/or other appropriate erosion control measures should be maintained on the embankment slopes to reduce the potential for surface erosion.
- Any erosion features that develop should be addressed in a timely manner to prevent their worsening.
- Any traffic-related ruts and/or potholes that develop on the embankment crests should be backfilled with soil and then surfaced with gravel to prevent standing/ponding water on the embankment crests.
- The surface of the roadway and embankment crest should be maintained so as to divert surface water runoff into the pond.

Plant Smith Weekly Dike Inspection Log

Weather:	Date of Inspection:
Temperature:	Inspection by:
Rainfall (past 24 hrs):	
Rainfall (past week):	Pond Elev.:

General Comments

I - Ash Pond - 'West' Section Dike

	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No c. Woody brush Yes / No d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No c. Erosion/Sloughing Yes / No d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	Good / Not Good

II - Ash Pond - Discharge Structure to Perimeter Ditch

	Observations - Comments
1. Structure	
a. Condition	
b. Seepage/Wet Spots Yes / No	
2. Downstream of Structure (Channel)	
a. Condition	

III - Ash Pond - 'South' Section Dike

	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No c. Woody brush Yes / No d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No c. Erosion/Sloughing Yes / No d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	*Good / Not Good*

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IV - Ash Pond - 'East' Section Dike	
	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream 'Slope' (**Note**: No 'downstream slope' due to higher natural ground.)	
a. Condition	
b. Erosion Yes / No	

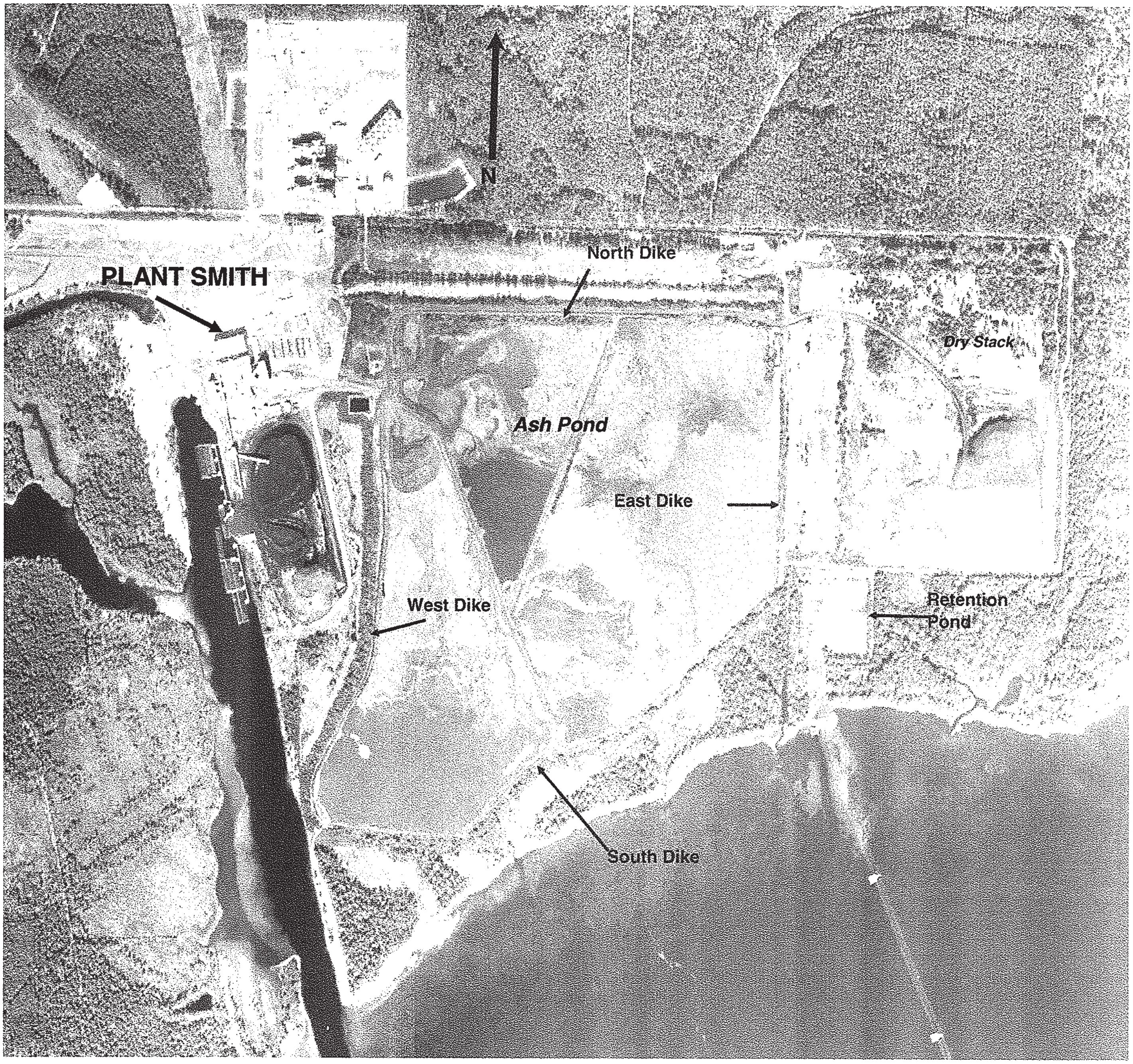
V - Ash Pond - 'North' Section Dike	
	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No	
c. Erosion/Sloughing Yes / No	
d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	*Good / Not Good*

VI - Retention Pond	
	Observations - Comments
1. Condition	

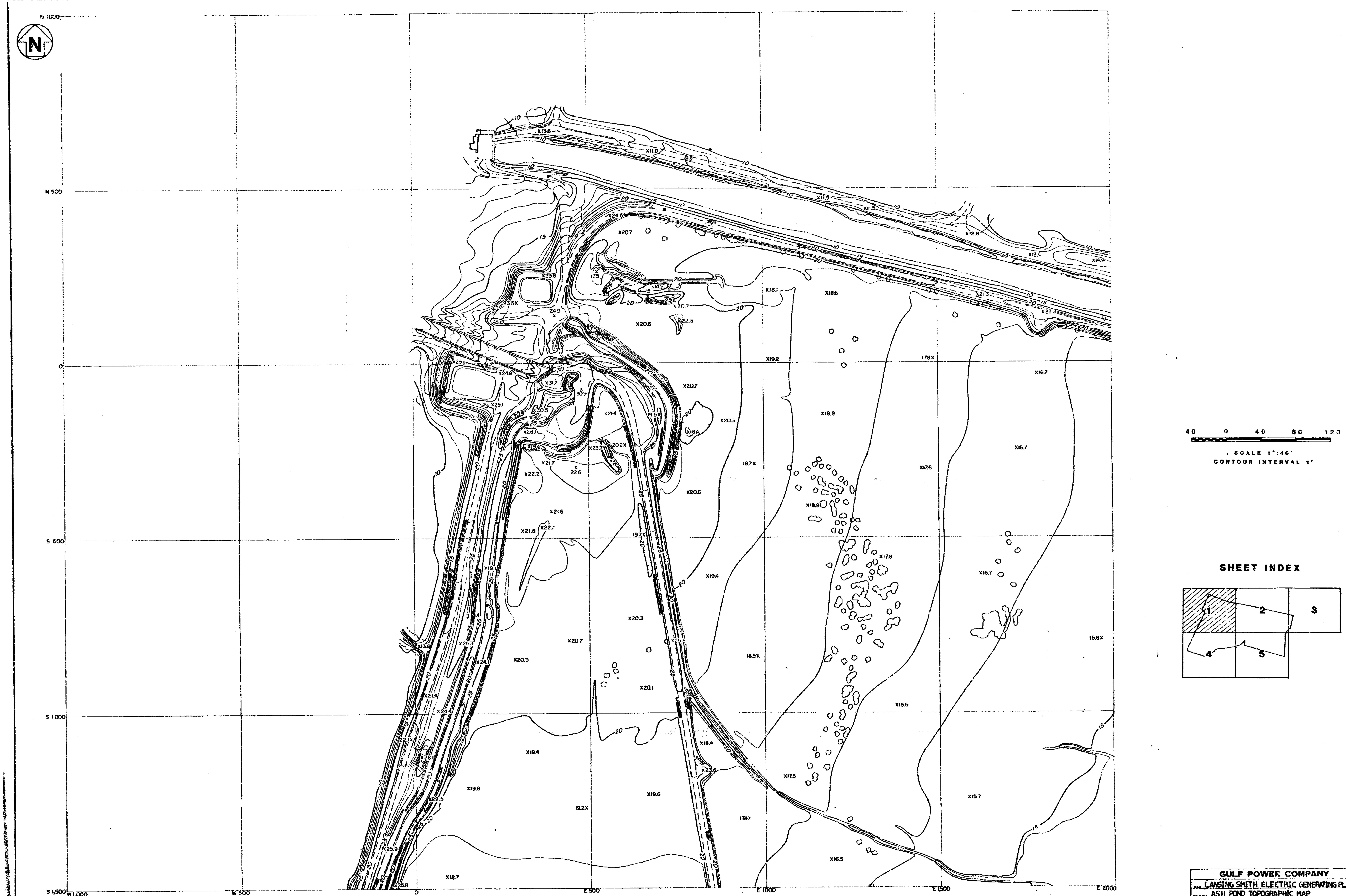
VII - DRY STACK	
	Observations - Comments
1. Condition	
c. Erosion/Sloughing Yes / No	

VIII - Additional Observation/Comments - General
Observations - Comments

DATE:


N
North Dike
PLANT SMITH
Dry Stack
Ash Pond
East Dike
West Dike
Retention
Pond
South Dike

Date: 6/29/2010



REV O	11-13-85	
APPROVED FOR CONSTRUCTION		

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP

SHEET 1 OF 5

DRAWN R.C.B. CHECKED E.E.P. DESIGN R.C.B.

APPROVED EEP DATE 11-13-85

APPROVED JW DATE 11-13-85

SCALE 1" = 40' JOB NO. SM85794

SHEET OF SHEETS

SUPERSEDES

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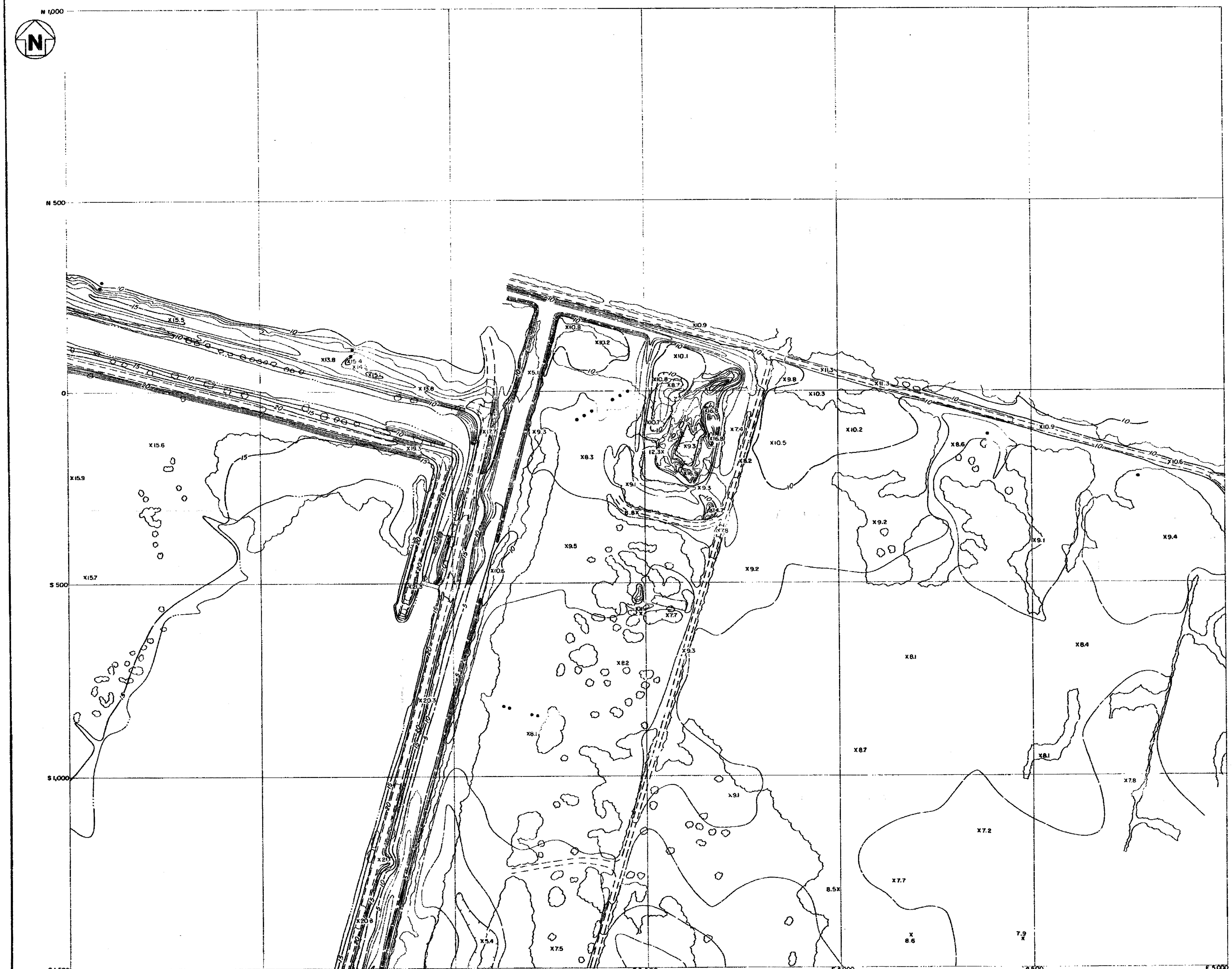
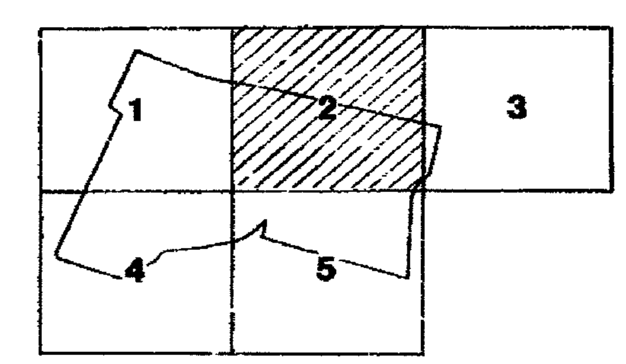


SHEET INDEX



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APPROVED FOR CONSTRUCTION		APPROVED EEP DATE 11-13-85
		APPROVED JW DATE 11-13-85

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP

SHEET 2 OF 5

SCALE 1":40' B/M JOB NO. SM95794

SHEET OF SHEETS

SUPERSEDES

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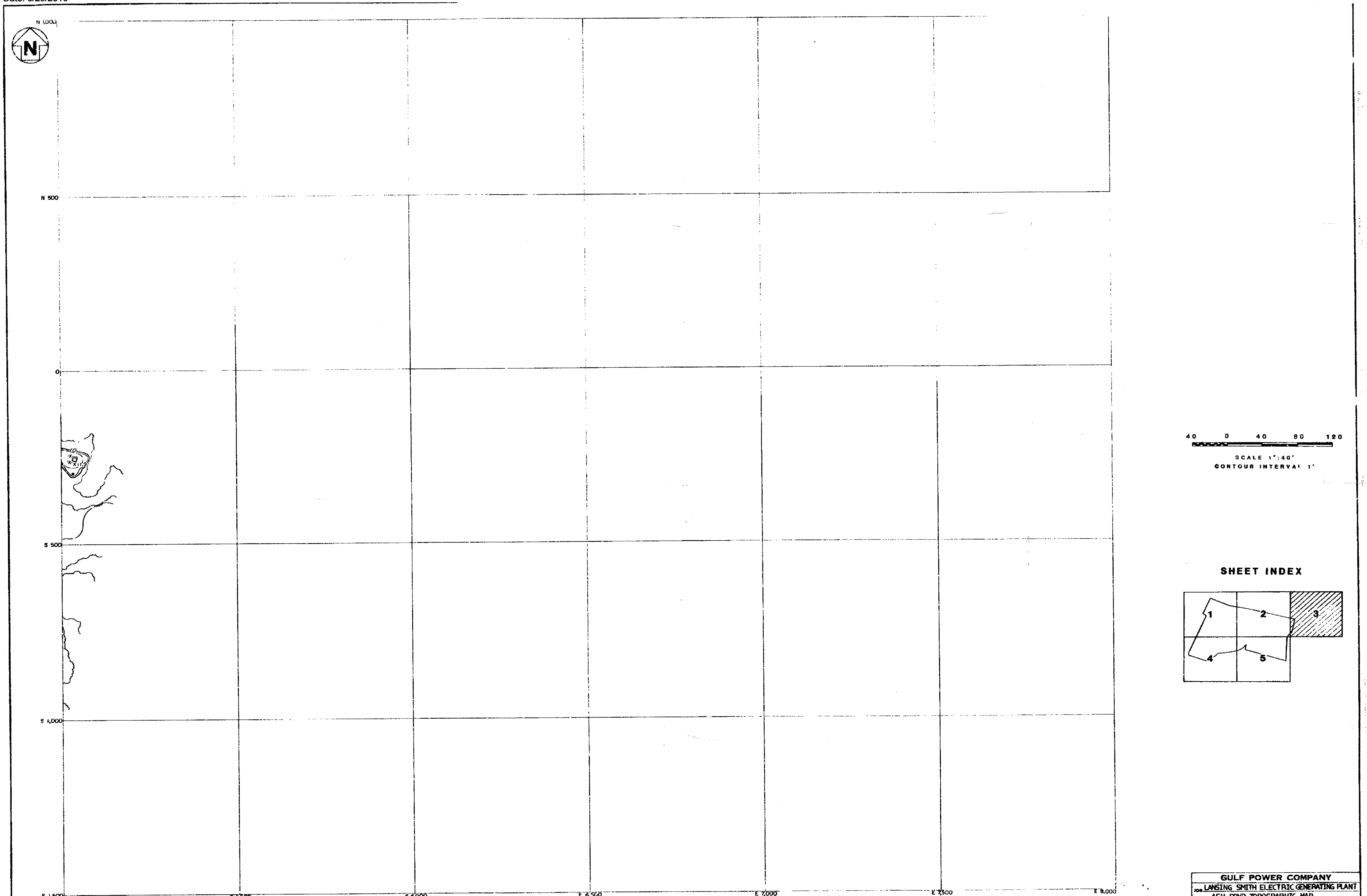

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APPROVED FOR CONSTRUCTION		APPROVED E.E.P. DATE 11-13-85
		APPROVED DATE 11-13-85

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP SHEET 3 OF 5

SCALE 1":40' JOB NO. SM85794

SHEET OF SHEETS

SUPERSEDES

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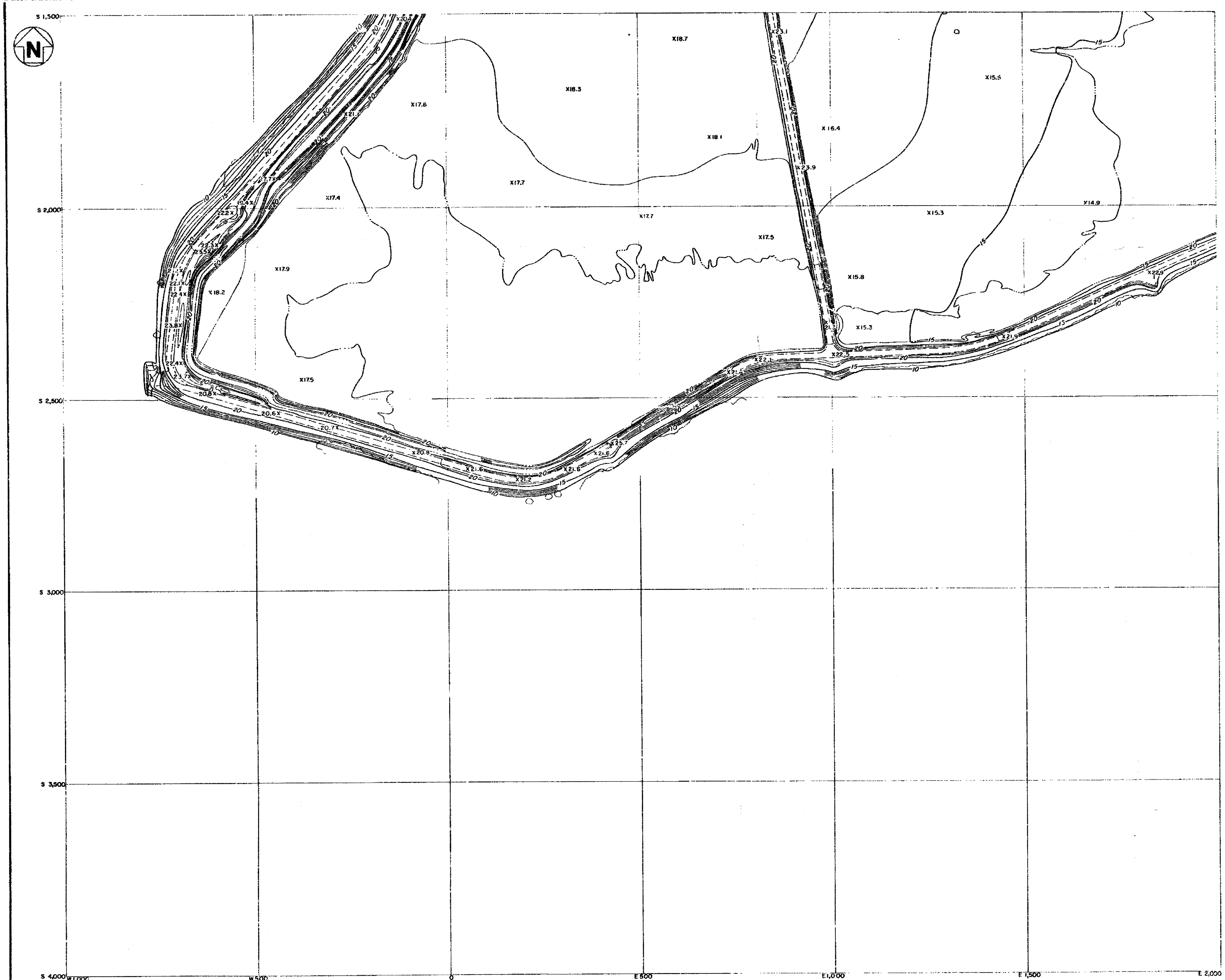
GP-SM-#0005

Date: 6/29/2010



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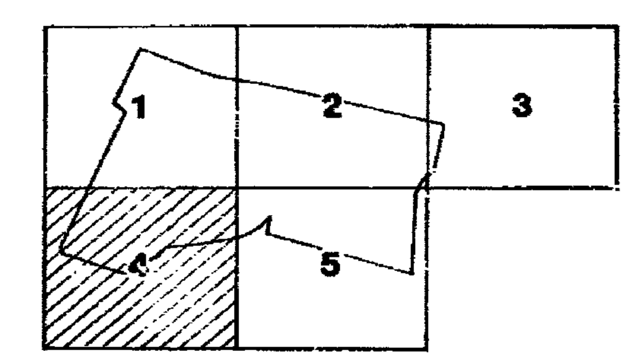
SCALE 1":40'

CONTOUR INTERVAL 1'

SHEET INDEX



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GP-SM-#0006

Date: 6/29/2010

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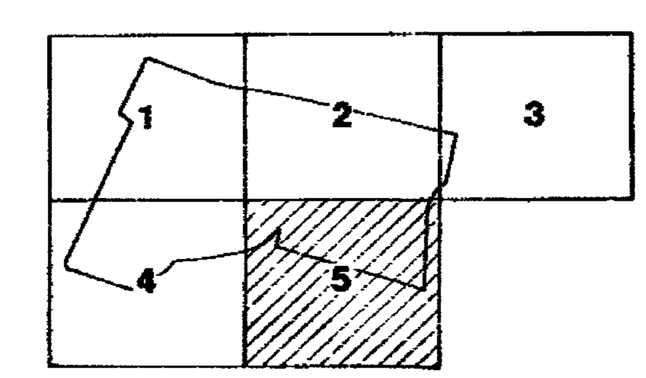
SCALE 1":40'

CONTOUR INTERVAL 1'

SHEET INDEX



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APPROVED FOR CONSTRUCTION		APPROVED EEP DATE 11-13-85
		DATE 11-13-85

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP

SHEET 5 OF 5

SCALE 1":40' JOB NO. SM85794

SHEET OF SHEETS

SUPERSEDES

D-31127.

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GRAPHIC SCALE

NOTES:

4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.
735 WEST 11TH STREET PANAMA CITY, FL. 32401 PHONE: (850) 763-7427.

5) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

6) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

7) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

AREAS OF REMAINING WATER VOLUME

GRID COORDINATES NAD 83

FLORIDA STATE PLANE
NORTH ZONE

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

REV	DATE:

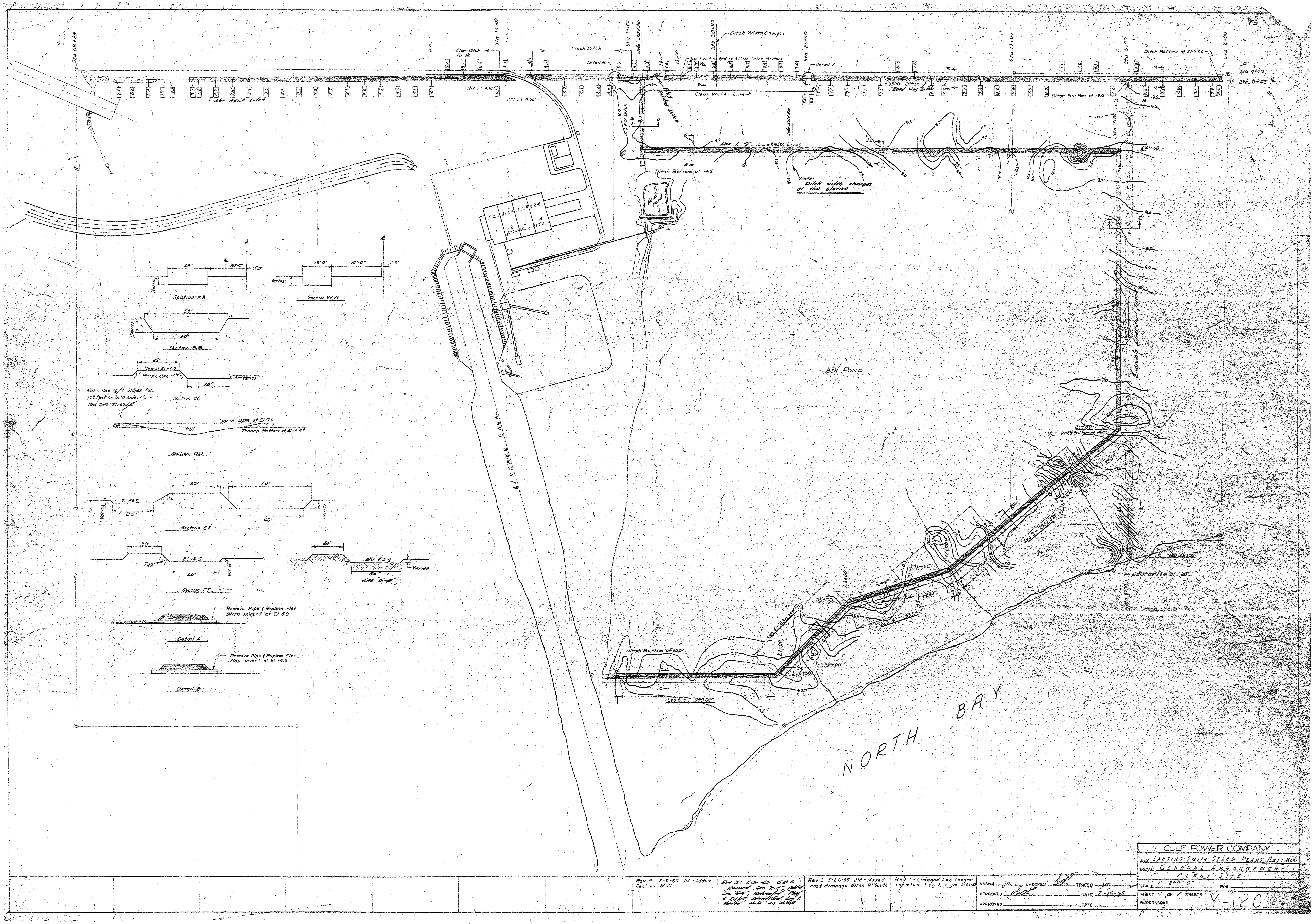
JOB: PLANT LANSING SMITH
DETAIL: ASH POND
TOPO AND VOLUME

DRAWN: ENP CHECKED: DESIGNED:
APPROVED: DATE: 3/11/2010
APPROVED: DATE:

SCALE: AS NOTED B/M:
SHEET 1 OF 1 SHEETS
SUPERSEDES:

3727LAN REV 0

GP-SM-#0008


GULF POWER COMPANY
JOB: LANSING SMITH STEAM PLANT UNIT No1
DETAIL: GENERAL ARRANGEMENT PLANT SITE
SCALE 1" = 200'-0"
SHEET 1 OF 1 SHEETS
Y-120
DRAWN jm CHECKED TRACED jm
DATE 2-16-65
Rev. 4 7-9-65 JM - Added Section WW
Rev. 2 5-26-65 JM - Moved road drainage ditch 8' South
Rev 1 - Changed Leg Lengths Located Leg 2 - jm 3-23-65
NORTH BAY
ASH POND
INTAKE CANAL
Clean Water Line
Clean Ditch
Ditch Width Changes
Detail A
Detail B
Section AA
Section WW
Section BB
Section CC
Section DD
Section EE
Section FF
Note: Use 1½/1 Slopes for 100 feet on both sides of the two streams
Remove Pipe & Replace Flat With Invert at El 5.0
Remove Pipe & Replace Flat With Invert at El +4.5
Ditch Bottom at +4.5
Ditch Bottom at -2.0'
Ditch Bottom at El +17.0
Ditch Bottom at +2.0'
Leg 6 - 960.00'

GP-SM-#0001

Appendix B

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Gulf Power - Lansing Smith Date: 6 July 2010

Unit Name: Ash Pond Operator's Name:

Unit I.D.: Hazard Potential Classification: High Significant Low

Inspector's Name: Frederic Shmurak & Michael Hanson - Dewberry

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly & Annual		18. Sloughing or bulging on slopes?	✓	
2. Pool elevation (operator records)?	17.5		19. Major erosion or slope deterioration?	✓	
3. Decant inlet elevation (operator records)? (Weir)	17.0		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	20.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?		N/A	Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?		N/A	From underdrain?		N/A
9. Trees growing on embankment? (If so, indicate largest diameter below)		✓	At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		N/A	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		N/A	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments
5.	East cell crest elev 20.0; Remaining cells crest elev 23.0
9.	Recently mowed woody stem vegetation; evidence of small animal burrows along D/S dike
11.	crest elev is irregular; minor depressions
18.	Three small sloughs (fourth retained w/ slush grouted rip-rap) along N.E D/S dike
19.	Widespread rill erosion, surface sloughing and D/S sediment deposition from D/S slopes. Irregular road along west dike D/S buttress w/ small surface depressions holding water.
23.	wetlands & recycle water channel located along D/S toes.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # FL0002267 INSPECTOR Dewberry
Date 6 JULY 2010

Impoundment Name Ash Pond
Impoundment Company GULF POWER
EPA Region IV
State Agency (Field Office) Addresss

Name of Impoundment
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New ________ Update ✓

	Yes	No
Is impoundment currently under construction?		✓
Is water or ccw currently being pumped into the impoundment?	✓	

IMPOUNDMENT FUNCTION: CCW Settlement & STORAGE

Nearest Downstream Town : Name LYNN HAVEN
Distance from the impoundment 1.6 miles SE
Impoundment
Location: Longitude N 85 Degrees 41 Minutes 51 Seconds
Latitude W 30 Degrees 15 Minutes 41 Seconds
State FL County BAY

Does a state agency regulate this impoundment? YES ______ NO ✓

If So Which State Agency? FL DEPT. of ENV. CONTROL for NPDES.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__✓__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

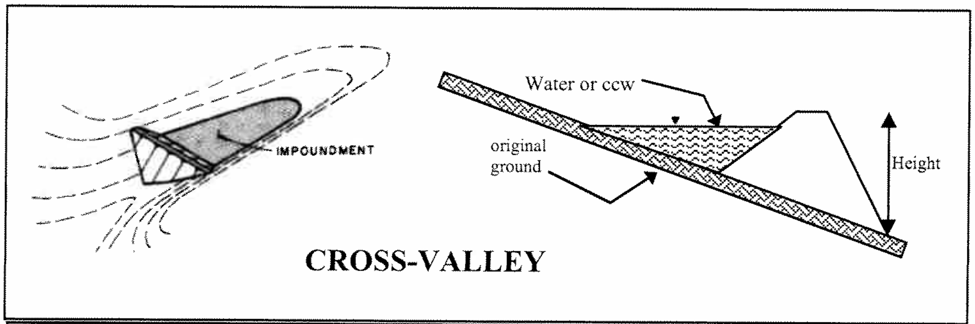
______ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

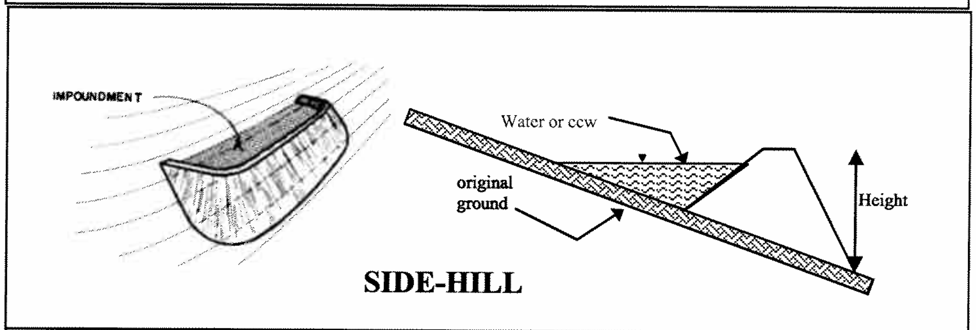
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

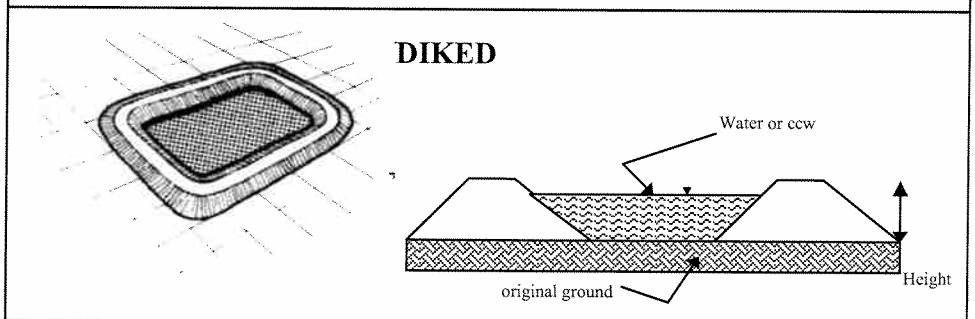
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

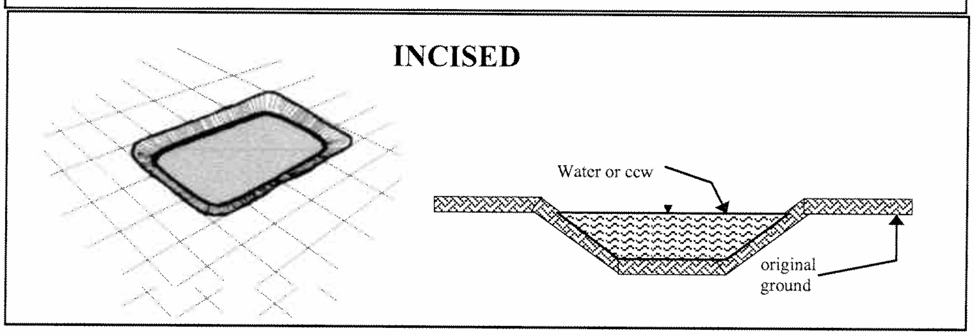
SIZE & LOCATION of EMBANKMENT

CONFIGURATION:









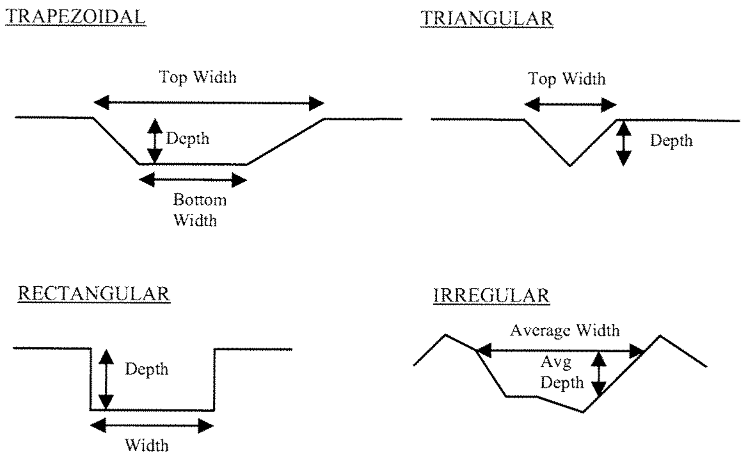
_____ Cross-Valley
_____ Side-Hill
__✓__ Diked
__✓__ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height 18 feet Embankment Material COAL ASH & SOIL
Pool Area 165 acres Liner NONE
Current Freeboard ± 2 feet Liner Permeability N/A

TYPE OF OUTLET (Mark all that apply)

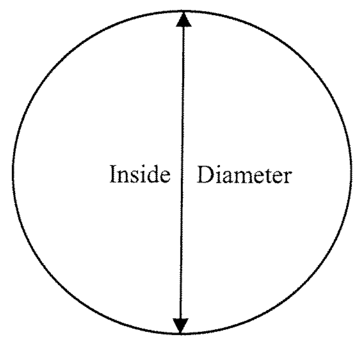
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
__✓__ Rectangular WEIR
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width



_____ **Outlet**

_____ inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ____________________

Is water flowing through the outlet? YES __✓__ NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) ______________________________

The Impoundment was Designed By Southern Company

Has there ever been a failure at this site? YES __________ NO ✓

If So When? ____________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ________ NO ✓

If So When? ______________________________

IF So Please Describe: ______________________________

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________ NO ✓

If so, which method (e.g., piezometers, gw pumping,...)? ____________________

If so Please Describe : ____________________

Job No. 50040902
Visit Date: 7/6/10

CCWI Safety Assessment
Gulf Power – Lansing Smith

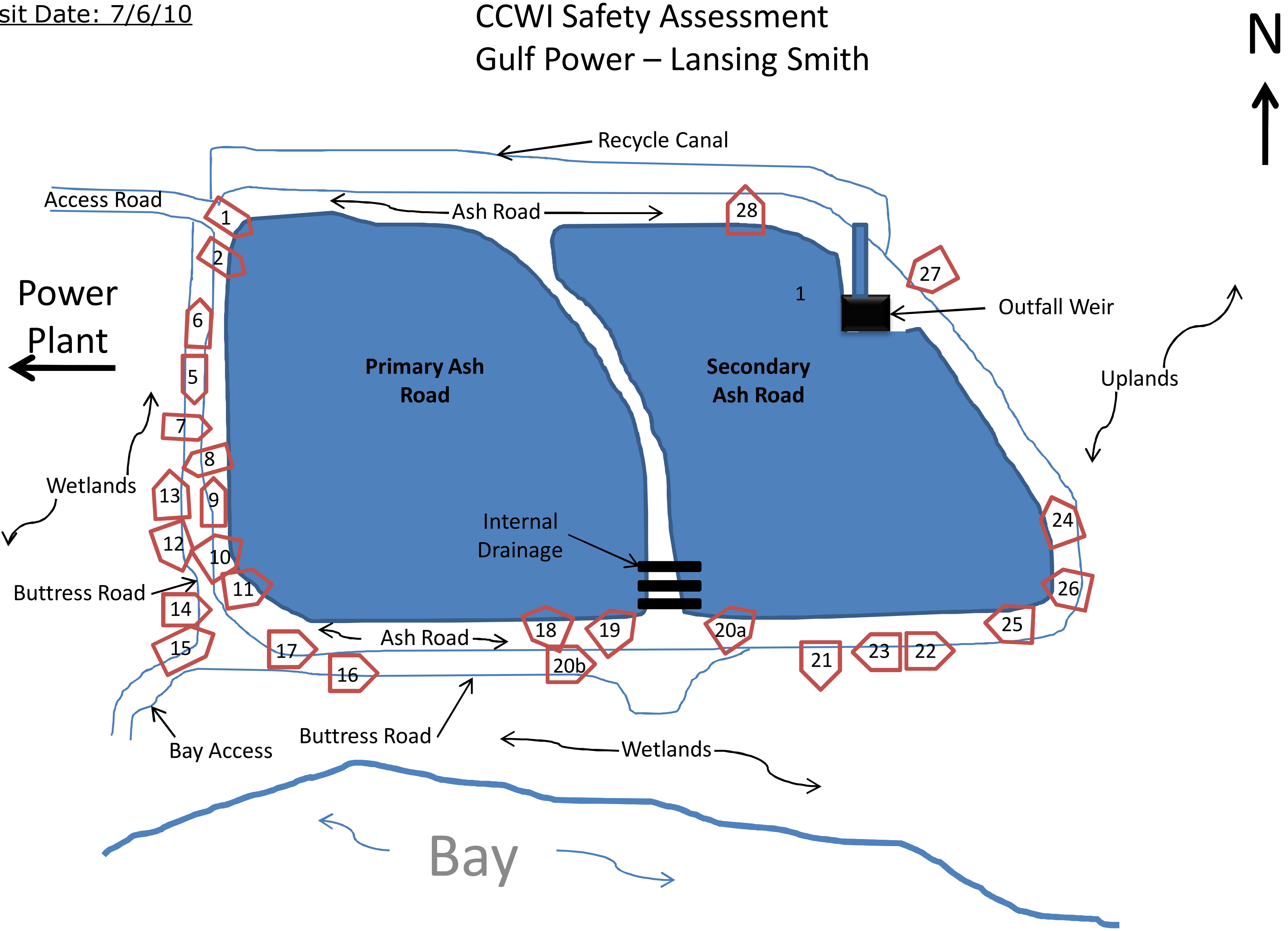


Photo 1
Ash Pond near North West Access Road - looking South East

Photo 2
Ash Pond near North West Access Road – looking South

Photo 5
Slope of West Embankment

Photo 6
West embankment buttress fill (Old road bed) ponding water

Photo 7
Rilling on slope of West embankment

Photo 8
Recently fixed Sloughing on West embankment

Photo 9
West embankment at South West corner of Ash Pond – looking North

Photo 10
Ash Pont at South West Corner – looking North East

Photo 11
Ash Pond at South West corner – looking South East

Photo 12
West embankment looking South

Photo 13
West embankment at South West corner – looking North note slope rilling

Photo 14
Emergency repair stockpile at South West corner of pond

Photo 15
Emergency repair stockpile at South West corner of pond

Photo 16
South embankment – looking East

Photo 17
Abandoned test well at top of banks on South embankment

Photo 18
Ash Pond at internal dike on South embankment - looking North West

Photo 19
Internal drainage near center of South embankment

Photo 20a
Ash Pond near center of South embankment – looking East

Photo 20b
South embankment near center

Photo 21
Wetlands and bay South of Ash Pond

Photo 22
South embankment – looking East

Photo 23
South embankment – looking West

Photo 24
East embankment – looking North - note inflow pipe from stormwater management facility

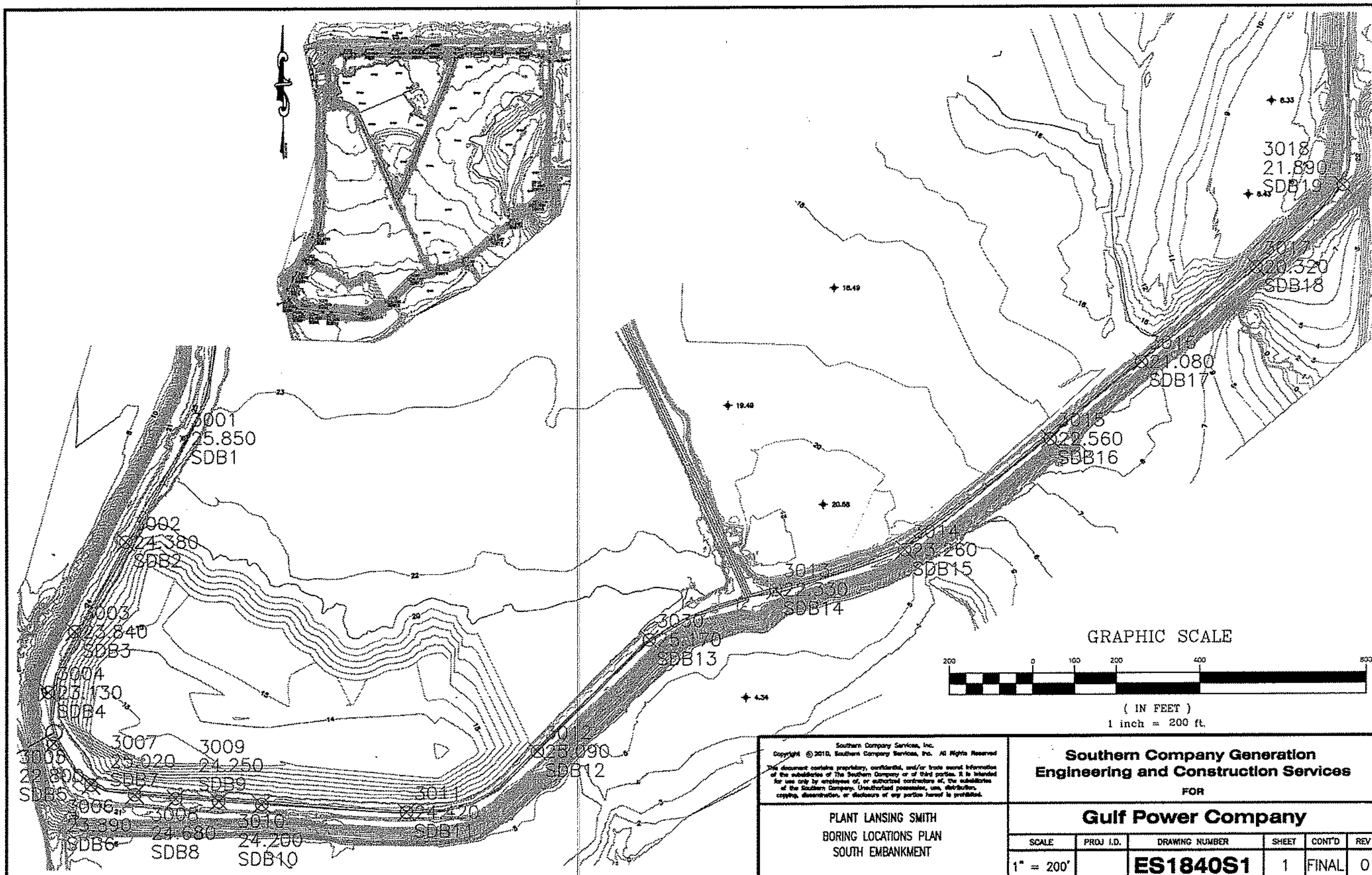
Photo 25
South embankment – looking West

Photo 26
Cattails recently trimmed on East embankment interior

Photo 27
Ash Pond outfall weir

Photo 28
Rip rap repair of North embankment near North East corner and adjacent to recycle canal

Appendix C



Southern Company Generation Engineering and Construction Services

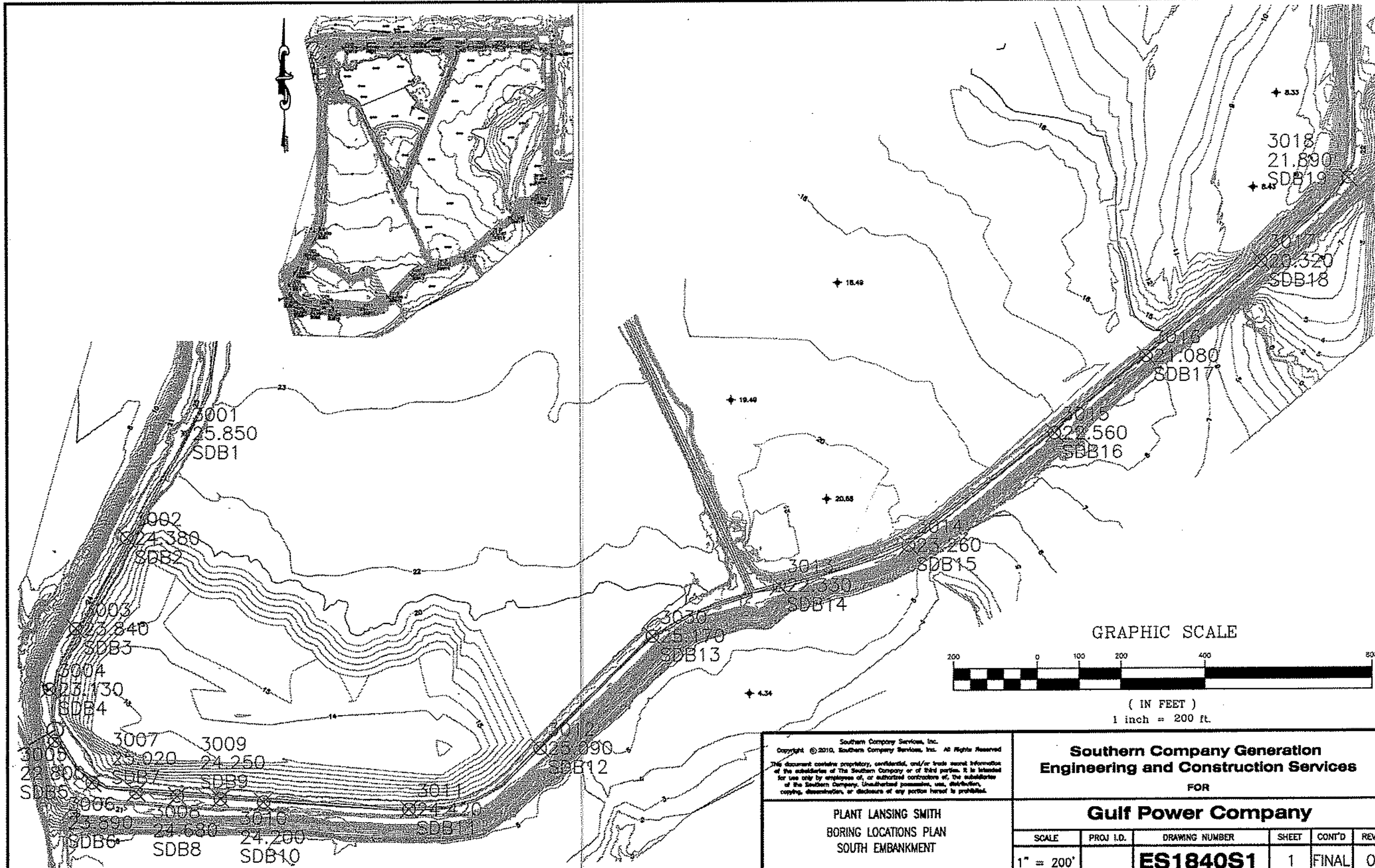
FOR

Gulf Power Company

PLANT LANSING SMITH
BORING LOCATIONS PLAN
SOUTH EMBANKMENT

SCALE	PROJ I.D.	DRAWING NUMBER	SHEET	CONT'D	REV
1" = 200'		ES1840S1	1	FINAL	0

Drawing name: T:\ESFE MAJOR PROJECTS\PROJECTS\SMITH\Smith 2010\ES1840 Smith ash pond dike\DWG\SECTIONS 3-18-10.dwg Apr 23, 2010 - 10:07am



PLANT LANSING SMITH
BORING LOCATIONS PLAN
SOUTH EMBANKMENT

Southern Company Generation Engineering and Construction Services
FOR
Gulf Power Company

SCALE	PROJ I.D.	DRAWING NUMBER	SHEET	CONT'D	REV
1" = 200'		ES1840S1	1	FINAL	0

Drawing name: T:\ESFE MAJOR PROJECTS\PROJECTS\SMITH\Smith 2010\ES1840 Smith ash pond dike\DWG\SECTIONS 3-18-10.dwg Apr 23, 2010 — 10:07am

SOUTHERN COMPANY

Engineering and Construction Services Calculation

Calculation Number: TS-SM-ECS3389-100

Project/Plant: Plant Smith Ash Pond	**Unit(s):**	**Discipline/Area:** Geotechnical
Title/Subject: Analysis of Liquefaction Potential for Ash Pond Dike and Foundation		
Purpose/Objective: Evaluate the potential for dike and foundation soils to liquefy under earthquake shaking		
System or Equipment Tag Numbers: NA	**Originator:** Benjamin J. Gallagher, P.E.	

Contents

Revision Record

Rev. No.	Description	Originator Initial / Date	Reviewer Initial / Date	Approver Initial / Date
0	Issued for Information	BJG/07-23-10		JCP/07-23-10

Notes:

Purpose of Calculation

Plant Smith is has two coal-fired units that produce ash as a combustion residual. Presently, the facility sluices ash to an on-site ash pond. The pond is contained by a ring dike made of compacted soil and ash. The purpose of this calculation is to evaluate the potential for liquefaction of the dike or foundation soils to occur during earthquake shaking.

Summary of Conclusions

SPT tests were generally performed at 5-foot increments throughout the borings. The liquefaction potential was analyzed at each SPT test and the results are summarized on the attached table. The analysis indicates all soils have a factor of safety against liquefaction of at least 1.2. The soils represented by four SPT test intervals had factors of safety of 1.2 to 1.3, and the remaining SPT intervals had factors of safety of 1.4 or greater. A factor of safety of greater than 1 indicates that liquefaction should not be triggered by the design earthquake. A variety of sources interpret these data differently. We understand the FERC considers a factor of safety of 1.1 acceptable. However, other sources recommend performing post-earthquake stability analyses with reduced strengths for some materials with factors of safety greater than 1. For example, the current MSHA Engineering And Design Manual: Coal Refuse Disposal Facilities recommends that earthquake-reduced strengths be applied to soil with factors of safety less than 1.4.

Based on the USGS Quaternary fault map, we don't believe there is evidence of significant seismic sources near the Plant. We believe that the probabilistic hazard data are conservative for this site and include contributions from distant seismic sources, such as the New Madrid Seismic Zone, that wouldn't likely trigger liquefaction at Plant Smith. Based on the limited number of samples subject to potential liquefaction (that is, factors of safety less than 1.4) and the conservative earthquake parameters, revisions to the pseudo-static dike stability analyses completed in April 2010 are not warranted at this time. However, we recommend that any future borings for structures at Plant Smith be screened for liquefaction potential due to the potential for variation in subsurface conditions.

Methodology

Liquefaction potential was assessed using procedures outlined in the 2004 paper by Idriss and Boulanger titled, "Semi-Empirical Procedures for Evaluating *Liquefaction Potential During Earthquakes*". The SPT test data collected for the recent slope stability study (ES 1840) was used to evaluate liquefaction potential. Supplemental information regarding SPT correction factors was obtained from the 2001 paper by Youd and Idriss " Liquefaction Resistance of Soils: Summary

Report From The 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils" and ASTM D 6066-04. The reported factor of safety is the ratio of the cyclic resistance ratio (CRR) to the cyclic stress ratio (CSR).

Criteria and Assumptions

The liquefaction analysis criteria:

1. The peak acceleration at the top of the dike is 0.078g as derived from the USGS-mapped, site-modified, short-period spectral acceleration at Plant Smith (7% chance of exceedance over 75 years, 1050-year return period).

2. The design earthquake is magnitude 5.55, as determined by the USGS mapped earthquake with a 7% probability of exceedance over 75 years and located within 300 kilometers of Plant Smith.

Based on historical information, we understand there is little evidence of liquefaction occurring at distances much greater than 100 kilometers from the earthquake source, even with large magnitude earthquakes. The USGS online map of Quaternary Fault and Fold Database indicates the closest faults to Plant Smith are the Gulf-margin normal faults located at least 110 kilometers west of the site. The USGS report indicates there is little evident of Quaternary slip on these faults, and that is it not clear that slip on these would occur seismically. They have a "strikingly low historical seismicity."

Design Inputs/References

1. SPT Test Borings, Ash Pond Evaluation (ES 1840), April 2010
2. USGS Probabilistic Earthquake Hazard Data for Plant Smith (N30.262, W85.696)

Body of Calculation

Attached

Plant Smith Ash Pond

Evaluation of Liquefaction Potential in SPT Test Borings

prepared by Ben Gallagher, 7/23/2010

	NDB-1		NDB-2		NDB-3		NDB-4		NDB-5		NDB-6		NDB-7		NDB-8		NDB-9		NDB-10	
Depth	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety
5	6	>5	7	>5	5	>5	11	>5	13	>5	12	>5	9	>5	11	>5	20	>5	8	>5
10	3	3.5	1	1.9	2	2.2	3	3.5	4	3.9	5	3.2	3	3.5	9	>5	4	2.8	7	4.0
15	9	>5	15	>5	5	3.1	1	1.6	2	2.0	1	1.6	0	2.0	6	4.8	2	2.0	2	>5
20	7	3.4	8	3.8	21	>5	13	>5	28	>5	14	>5	21	>5	21	>5	18	>5	10	>5
25	5	2.5	5	2.5	8	3.5	4	2.2	3	2.0	2	1.7	6	2.8	12	>5	5	2.5	11	>5
30	10	4.0	0	1.3	4	2.2	4	2.2	5	2.4	5	2.4	4	2.2	5	2.4	6	2.7	2	>5
35	0	1.4	11	4.2	2	1.7	6	2.7	4	2.2	3	1.9	3	1.9	5	2.4	1	1.5	7	>5
40	6	3.0					20	>5	1	1.6									0	1.4
45	12	>5							0	1.5									9	3.5
50									12	4.5									11	>5
55									15	>5										
60																				

	SDB-1		SDB-2		SDB-3		SDB-4		SDB-5		SDB-6		SDB-7		SDB-8		SDB-9		SDB-10	
Depth	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety
5	14	>5	10	>5	4	3.6	4	4.9	5	>5	5	>5	10	>5	9	>5	9	>5	20.0	>5
10	9	>5	15	>5	2	2.3	1	2.0	1	2.0	5	4.4	7	>5	8	>5	5	3.2	11.0	>5
15	5	4.1	2	2.6	6	3.5	1	1.8	4	2.7	13	>5	4	3.6	2	2.6	1	1.5	3.0	3.1
20	7	4.6	5	3.6	7	3.5	8	3.8	9	4.2	10	4.8	0	1.8	1	1.5	2	1.8	0.0	1.2
25	35	>5	10	>5	6	2.9	11	4.7	6	2.9	6	2.8	2	1.7	12	>5	5	2.5	4.0	2.2
30	16	>5	18	>5	9	3.7	4	2.2	5	2.5	3	1.9	5	2.4	4	2.2	8	3.3	4.0	2.2
35	2	1.7	2	1.7	2	1.8	0	1.4	0	1.4	1	1.5	5	2.4	4	2.1	5	2.4	6.0	2.6
40			0	1.8	0	1.5			0	1.5										
45			0	1.9	0	1.6			0	1.6										
50			0	2.0	5	3.4			8	3.4										
55			0	2.4	0	2.3			12	4.8										
60			2	2.9	7	4.5														
65			12	>5	11	>5														
70																				

	SDB-11		SDB-12		SDB-13		SDB-14		SDB-15		SDB-16		SDB-17		SDB-18		SDB-19	
Depth	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety	SPT N-value	Factor of Safety
5	6	>5	4	4.9	10	>5	25	>5	11	>5	6	4.6	14	>5	7	>5	15	>5
10	7	>5	4	3.9	18	>5	11	>5	17	>5	12	>5	4	3.0	1	2.0	12	>5
15	2	2.6	12	>5	4	2.7	0	1.5	17	>5	4	2.7	2	2.1	5	3.1	1	1.8
20	8	3.8	5	2.7	0	1.4	13	>5	15	>5	24	>5	17	>5	3	2.2	12	>5
25	17	>5	20	>5	5	2.6	4	2.4	2	1.9	4	2.3	9	3.9	5	2.6	2	1.8
30	0	1.3	0	1.3	1	1.6	11	4.5	4	2.3	5	2.5	0	1.4	0	1.4	0	1.4
35	3	1.9	2	1.7	17	>5	11	4.4	5	2.5	1	1.6	1	1.6	0	1.4	0	1.4
40	3	1.9											0	1.9				
45	22	>5											0	1.6				
50	11	4.2											2	2.0				
55													14	>5				
60																		

Note: Reported N-values are uncorrected field values

Factor of Safety = Cyclic Resistance Ratio (CRR) divided by the Cyclic Shear Stress Ratio (CSR)

This evaluation was performed following the using the procedures described by Idriss and Boulanger in the paper titled "Semi-emprical procedures for evaluating liquefaction potential during earthquakes " dated January 2004 and the journal article titled "Liquefaction Resistance of Soils: Summary report fromthe 1996 NCEER and 1998 NCEER/NSF Workshops on evaluation of liquefaction resistance of soils" by Youd and Idriss dated April 2001. A maximum acceleration value of 0.08 was selected based on the site-modified short-period spectral acceleration from 2002 USGS probabilistic maps for 7% exceedence over 75 years. USGS mapped earthquake probability indicated magnitude 5.55 earthquake for a return period of within 300km of the site (7%

TS-SM-ECS3389-100

Conterminous 48 States
2007 AASHTO Bridge Design Guidelines
AASHTO Spectrum for 7% PE in 75 years
Latitude = 30.262000
Longitude = -085.692000
Site Class B
Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	
0.0	0.022	PGA - Site Class B
0.2	0.049	Ss - Site Class B
1.0	0.029	S1 - Site Class B

Conterminous 48 States
2007 AASHTO Bridge Design Guidelines
Spectral Response Accelerations SDs and SD1
Latitude = 30.262000
Longitude = -085.692000
As = FpgaPGA, SDs = FaSs, and SD1 = FvS1
Site Class D - Fpga = 1.60, Fa = 1.60, Fv = 2.40
Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	
0.0	0.035	As - Site Class D
0.2	0.078	SDs - Site Class D
1.0	0.069	SD1 - Site Class D

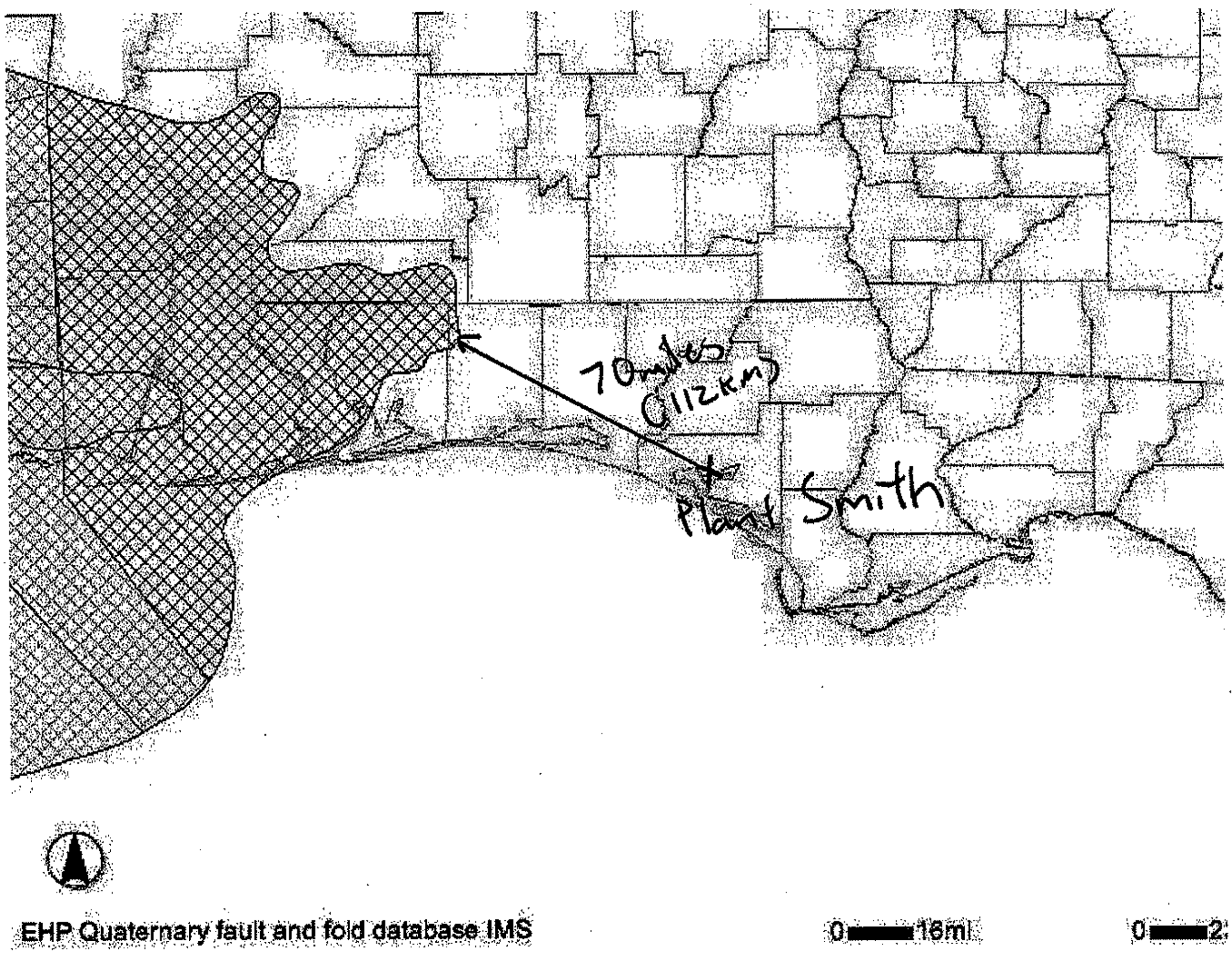
Plant Smith Ash Pond

Plant Smith Ash Pond

#USGS-NSHMP Earthquake probabilities in vicinity of -85.70_d_E
#Site x,y -85.700 30.260 Rmax= 300.0 km. Report on mean rates and Poisson Pr
#Rates below are annual; probabilities, however, correspond to time T

# M	Int_ARate	Cumul_ARate	Int_Prob	Cumul_Prob for T= 75.0 yrs
7.65	.82528E-06	.82528E-06	.61870E-04	.61870E-04
7.55	.53285E-06	.13581E-05	.39935E-04	.10186E-03
7.45	.43974E-05	.57554E-05	.32973E-03	.43154E-03
7.35	.80098E-05	.13765E-04	.60058E-03	.10319E-02
7.25	.43159E-05	.18081E-04	.32365E-03	.13552E-02
7.15	.80932E-05	.26175E-04	.60683E-03	.19612E-02
7.05	.16649E-04	.42823E-04	.12479E-02	.32066E-02
6.95	.69970E-05	.49820E-04	.52464E-03	.37295E-02
6.85	.13261E-04	.63080E-04	.99403E-03	.47199E-02
6.75	.24824E-04	.87904E-04	.18601E-02	.65712E-02
6.65	.10519E-04	.98424E-04	.78863E-03	.73546E-02
6.55	.19906E-04	.11833E-03	.14918E-02	.88354E-02
6.45	.37232E-04	.15556E-03	.27885E-02	.11599E-01
6.35	.15827E-04	.17139E-03	.11864E-02	.12772E-01
6.25	.49877E-04	.22127E-03	.37338E-02	.16458E-01
6.15	.37362E-04	.25863E-03	.27982E-02	.19210E-01
6.05	.70620E-04	.32925E-03	.52825E-02	.24391E-01
5.95	.29296E-04	.35854E-03	.21948E-02	.26532E-01
5.85	.92930E-04	.45147E-03	.69455E-02	.33294E-01
5.75	.70275E-04	.52175E-03	.52568E-02	.38375E-01
5.65	.13283E-03	.65459E-03	.99131E-02	.47908E-01
5.55	.56470E-04	.71106E-03	.42263E-02	.51932E-01
5.45	.17912E-03	.89018E-03	.13344E-01	.64583E-01
5.35	.22292E-03	.11131E-02	.16580E-01	.80092E-01
5.25	.27742E-03	.13905E-02	.20592E-01	.99036E-01
5.15	.00000E+00	.13905E-02	.00000E+00	.99036E-01
5.05	.34526E-03	.17358E-02	.25562E-01	.12207E+00

TS-SM-ECS3389-100



Earthquake Hazards Program

Database Search

Complete Report for Gulf-margin normal faults, Alabama and Florida (Class B) No. 2654

Brief Report ||Partial Report

citation for this record: **Wheeler, R.L., compiler, 1998, Fault number 2654, Gulf-margin normal faults, Alabama and Florida, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, http://earthquakes.usgs.gov/regional/qfaults, accessed 07/22/2010 03:19 PM.**

Synopsis	A belt of mostly seaward-facing normal faults borders the northern Gulf of Mexico in westernmost Florida, southwestern Alabama, southern Mississippi, all of Louisiana and southernmost Arkansas, and eastern and southern Texas (Ewing and Lopez, 1991 #2032). For the purposes of his compilation, the Gulf Coast faults are divided in four large groups because they number in the hundreds. To reflect regional differences in the characteristics of the faults, those in Florida and Alabama (described here) are evaluated together in a single group, as are those in Mississippi, those in Louisiana and Arkansas, and those in Texas. Because numerous individual faults are combined into a single group for this compilation, it is not possible to provide to provide digital information about the azimuth, length, and dip of each individual fault. The gulf-margin normal faults in Alabama and Florida are assigned as Class B structures because their low seismicity and because they may be decoupled from underlying crust, making it unclear if they can generate significant seismic ruptures that could cause damaging ground motion.
Name comments	
County(s) and State(s)	
AMS sheet(s)	Andalusia Mobile
Physiographic province(s)	
Reliability of location	Poor Compiled at 1:2,500,000 scale. *Comments:* Most of the area was evaluated with regional maps at scales of 1:2,500,000 because no individual faults have sufficient evidence of seismic slip to justify singling it out for attention here at a larger map scale. Faults in areas having abundant drill-hole data may be better located in the subsurface than at the surface.
Geologic setting	A belt of mostly seaward-facing normal faults borders the northern Gulf of Mexico. These gulf-margin faults face southwest in westernmost Florida, southwestern Alabama, and southern Mississippi; south in Louisiana and southernmost Arkansas; and southeast in eastern and southern Texas (Ewing and Lopez, 1991 #2032). In early to middle Mesozoic time, the opening of the Gulf of Mexico formed a south-facing, rifted, passive margin at the southern edge of North America (DuBar and others, 1991 #2010; Salvador, 1991 #2019; Salvador, 1991 #2020). Subsequently, the rifted margin was buried beneath the thick, Middle Jurassic, Louann Salt and an overlying, carbonate and clastic, marine sequence that continues to accumulate today. This post-rift sequence thickens seaward (Salvador, 1991 #2020). It is at least 2 km thick everywhere in the belt of gulf-margin normal faults. At the coastline, the sequence is at least 10 km thick west of the Mississippi River and at least 5 km thick farther east. Thicknesses exceed 12 km under coastal Texas and southern Louisiana and perhaps 16 km offshore Louisiana. Rapid deposition and the resulting enormous thickness of the post-rift sediments caused them to collapse and spread seaward. Salt flowed southward and pierced upward, and the overlying sediments extended on listric, normal, growth faults that flatten downward into detachments in the salt and in overpressured shales (Ewing, 1991 #1994; Nelson, 1991 #1995). These listric normal faults, their splays, and their antithetic and transfer faults make up the belt of gulf-margin normal faults described here. Regional fluctuations in the overall deposition rate divide the belt of gulf-margin faults into two parts with different main ages of faulting and different degrees of Quaternary faulting. (1) The interior zone of Ewing (1991 #1994) includes the entire belt except southern Louisiana, coastal Texas, and their offshore extensions. Triassic-Jurassic rifting and sedimentation, including deposition of the Louann Salt, led to Mesozoic growth faulting and salt tectonism. A line of large grabens approximates the landward limit of Jurassic salt, and Cenozoic faulting is sparse in the interior zone (Ewing, 1991 #1994; Salvador, 1991 #2019; Ewing and Lopez, 1991 #2032). (2) The Coastal

zone of Ewing (1991 #1994) covers southern Louisiana, coastal Texas, and their offshore extensions, and is separated from the Interior zone by the Early Cretaceous shelf edge (Ewing, 1991 #1994; Ewing and Lopez, 1991 #2032). Late Cretaceous and especially Cenozoic clastic sediments prograded southward led to abundant Cenozoic and continuing growth faulting and salt tectonism (for example DuBar and others, 1991 #2010, p. 584-585; Salvador, 1991 #2019). The post-rift sequence as a whole is at least 9-11 km thick throughout the Coastal zone (Salvador, 1991 #2020). Calculations show that the crustal load from rapid Quaternary sedimentation may aid Quaternary normal faulting and reactivate Tertiary faults of the Coastal zone by imposing extensional bending stresses on the post-rift sequence; older extensional stresses imposed by the Mesozoic sediment load have had time to relax (Nunn, 1985 #2215).

Epicenter maps show only sparse, low-magnitude seismicity within the fault belt (Engdahl, 1988 #1959; Stover and Coffman, 1993 #1986). The only damaging earthquakes reported through 1989 in this huge tract of land are four MMI VI earthquakes in westernmost Florida (1780), southern Louisiana (1930), and eastern Texas (1891, 1932) (Stover and Coffman, 1993 #1986). This level of seismicity is even less than that of sparsely seismic North and South Dakota, which together cover approximately the same area as the belt of gulf-margin faults and which had seven earthquakes of MMI VI since 1909 (Stover and Coffman, 1993 #1986). Furthermore, some of the sparse seismicity in the normal-fault belt may be artificially induced. Earthquakes of mbLg 3.4 and 3.9 and M of 4.0 and 4.7 in southeastern Texas and M 4.9 in southwestern Alabama may have been induced by extraction of oil and gas or injection of fluids for secondary recovery (Pennington and others, 1986 #1876; Chang and others, 1998 #1806; Gomberg and others, 1998 #1828; Gomberg and Wolf, 1999 #3440). Therefore, the natural seismicity rate in the normal-fault belt might be even less than the recent historical record would indicate.

The post-rift sequence and its belt of gulf-margin normal faults may be mechanically decoupled from the underlying crust. The stress field is extensional throughout the post-rift sequence in both the Interior and Coastal zones of the normal-fault belt, as determined mostly from drill-hole data that demonstrate fault slips and well-bore breakouts (Zoback and Zoback, 1991 #2006). The orientations of Shmin are radial to the Gulf of Mexico, in contrast to the east-northeast trends of SHmax that characterize most of North America east of the Rocky Mountains; the stress field in the crust beneath the thick post-rift sequence is unknown (Zoback and Zoback, 1991 #2006). Consistent with the stress field in the post-rift sequence, the normal-faulting focal mechanism of the 1997, M 4.9 earthquake in southwestern Alabama indicated south-southwest extension (Chang and others, 1998 #1806). The presence of the normal faults throughout the post-rift sequence from westernmost Florida to southern Texas (Ewing and Lopez, 1991 #2032) demonstrates that the sequence is sliding and extending seaward on detachments in weak salt and overpressured shales.

In summary, the belt of gulf-margin normal faults in from Florida through Texas has strikingly low historical seismicity; the stress field and seismogenic potential of the underlying crust are unknown; and, therefore, the ability of the fault belt to generate significant seismic ruptures that could cause damaging ground motion is unclear. Accordingly, the fault belt is assigned to class B.

Length (km) 0 km.

Comments:

Many faults are mapped, of widely varying lengths.

Average strike

Sense of movement Normal

Comments: In addition to the normal faults, a few strike-slip faults might form transtensional links between the normal faults.

Dip 0° - 90°, SW, NE

Comments: Dips vary, but faults are generally steeper in their upper parts and shallow downward. Dips are dominantly southwestward, with southwesterly and northeasterly dips paired in grabens.

Paleoseismology studies

Geomorphic expression Scarps and drainage, topographic, and tonal lineaments (DuBar and others, 1991 #2010).

Age of faulted surficial deposits Eocene to Holocene (Szabo and Copeland, 1988 #1946; DuBar and others, 1991 #2010).

Historic earthquake

Most recent prehistoric deformation Quaternary (<1.6 Ma)

Comments: A belt of mostly seaward-facing normal faults borders the northern Gulf of Mexico (Ewing and Lopez, 1991 #2032). Ewing (1991 #1994) and Ewing and Lopez (1991 #2032) divided the faults into an Interior zone and a Coastal zone, which are separated by a boundary that begins in southeastern Louisiana and runs westward across Louisiana and Texas approximately 100 km inland from the coast. In the Interior zone, which includes southwestern Alabama and westernmost Florida, little Quaternary slip is documented (DuBar and others, 1991 #2010, flure 3). However, probably many or most faults in the Interior zone have the potential for Quaternary to

TS-SM-ECS3389-100

present-day slip. As explained in "Geologic setting", it is unclear whether such slip was or is likely to occur seismically. In contrast, the Coastal zone contains more abundant evidence of Quaternary slip, but this slip may be even less likely to occur seismically than slip in the interior zone.

Recurrence Interval

Comments: Estimates of recurrence interval are premature because it is not yet clear whether these faults can generate significant tectonic earthquakes, as explained under "Geologic setting".

Slip-rate category Less than 0.2 mm/yr

Comments: The slip rate is unknown. However, a slip rate of 0.2 mm/yr would produce 320 m of slip during the 1,600,000 years of the Quaternary. It is unlikely that any single fault in the gulf-margin belt of normal faults has such a large Quaternary offset. Therefore, probably the long-term rate is less than 0.2 mm/yr.

Date and Compiler(s) 1998
Russell L. Wheeler, U.S. Geological Survey

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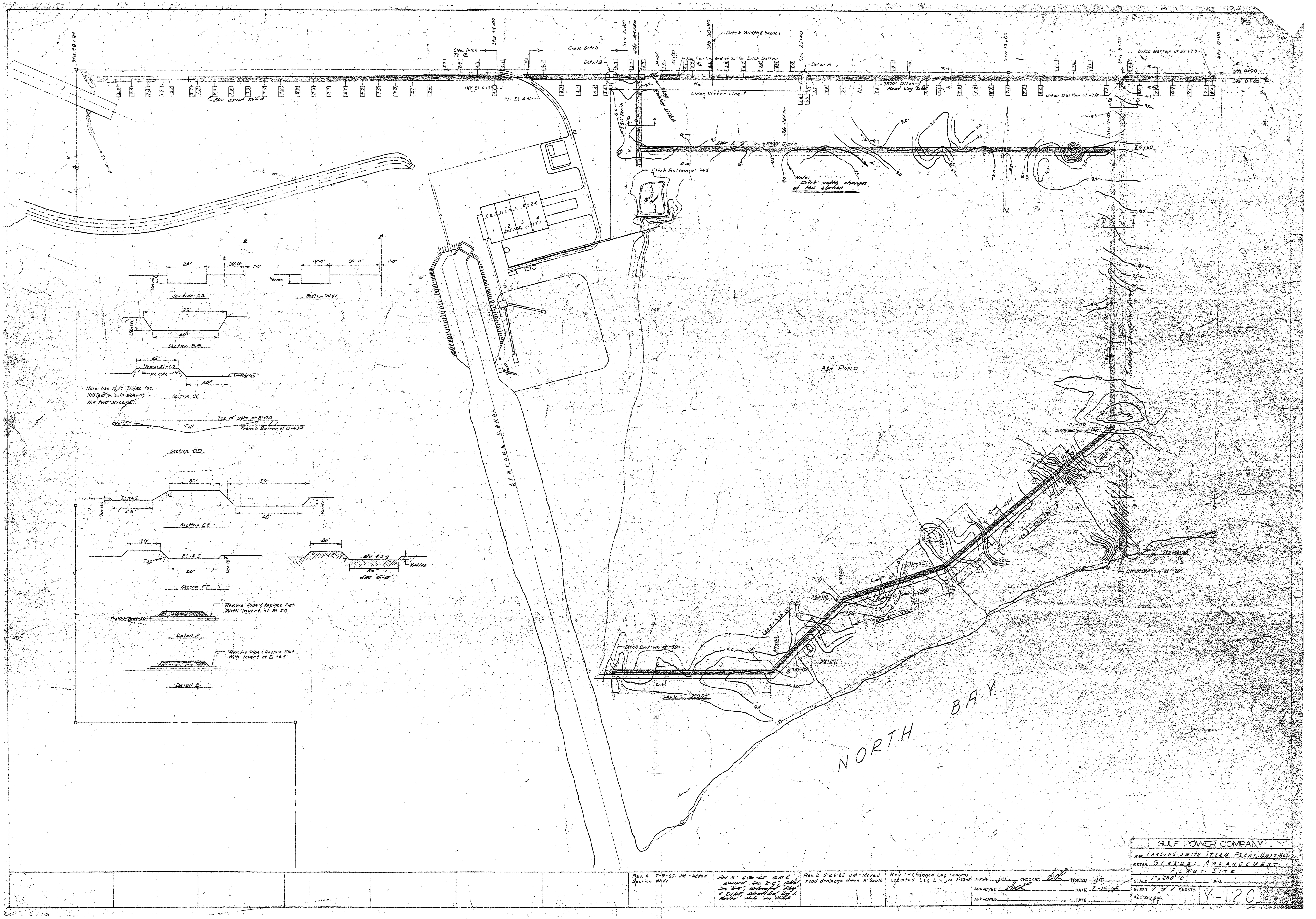
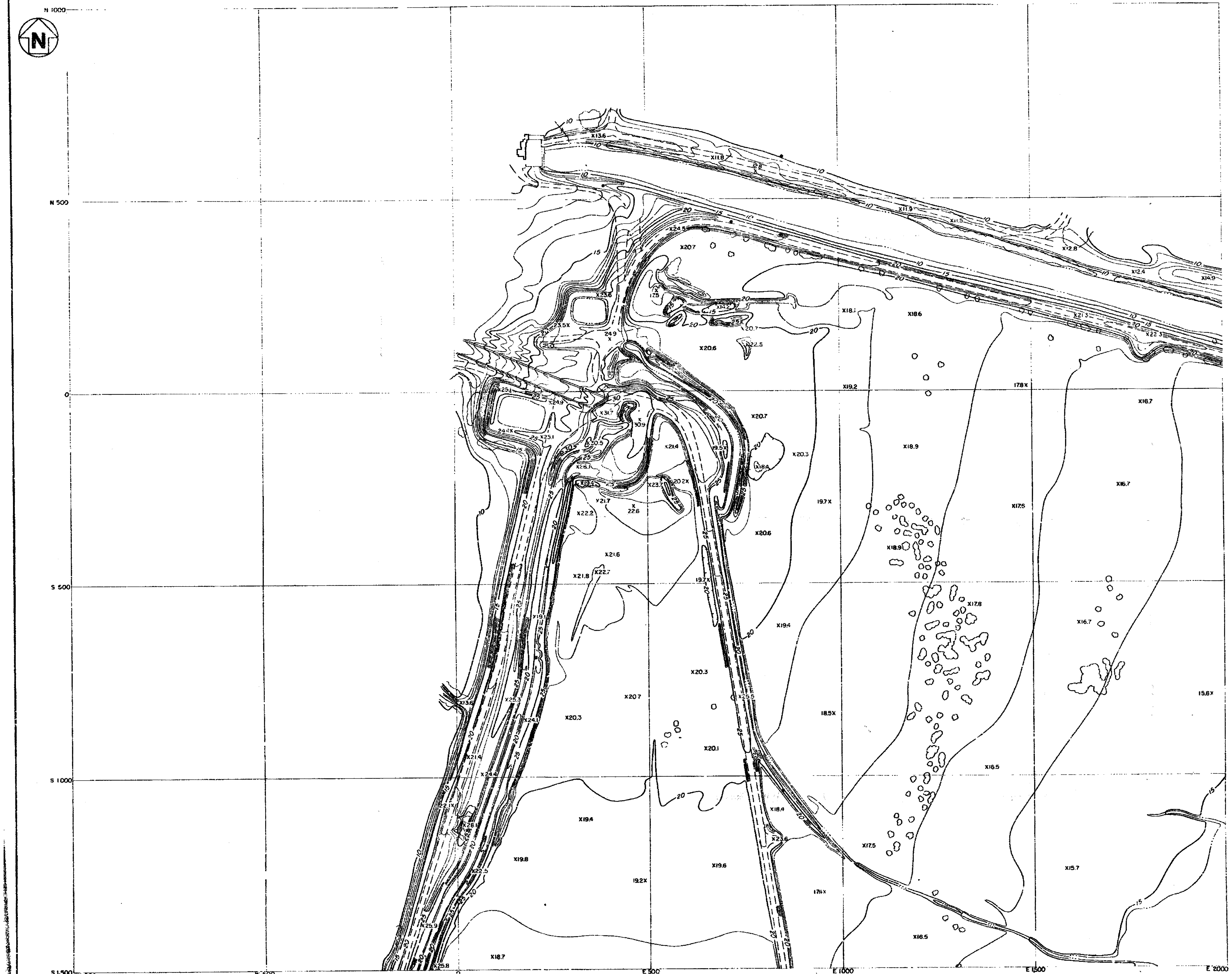


NORTH BAY
ASH POND
INTAKE CANAL
Clean Water Line
Clean Ditch
Ditch Width Changes
Detail A
Detail B
Ditch Bottom at +4.5
Note: Ditch width changes at this station
Section AA
Section WW
Section BB
Section CC
Note: Use 1½/1 Slopes for 100 feet on both sides of the two streams
Top of Dike at El +7.0
Fill
Trench Bottom at El +4.5
Section DD
Section EE
Section FF
Remove Pipe & Replace Flat With Invert at El 5.0
Detail A
Remove Pipe & Replace Flat With Invert at El +4.5
Detail B
To Canal
Sta 68+84
Sta 44+00
Sta 25+40
Sta 13+00
Sta 0+00
Leg 6 - 960.00'
Rev. 4 7-9-65 JM - Added Section WW
Rev 3: 6-30-65 G.O.L.
Rev 2 5-26-65 JM - Moved road drainage ditch 8' South
Rev 1 - Changed Leg Lengths Located Leg 2 - jm 3-23-65
GULF POWER COMPANY
JOB: LANSING SMITH STEAM PLANT UNIT No. 1
DETAIL: GENERAL ARRANGEMENT PLANT SITE
DRAWN jm
CHECKED
TRACED jm
APPROVED
DATE 2-16-65
SCALE 1" = 800'-0"
SHEET 1 OF 1 SHEETS
SUPERSEDES
Y-120

GP-SM-#0001

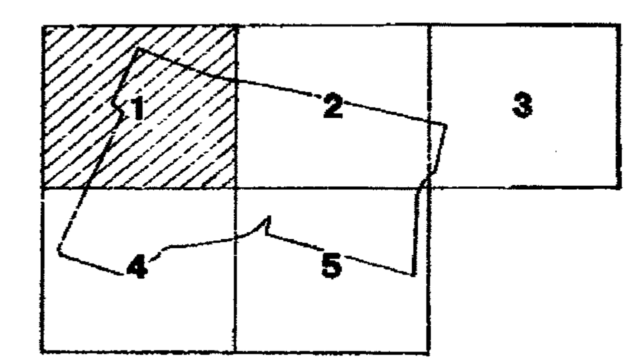


40 0 40 80 120

SCALE 1"=40'

CONTOUR INTERVAL 1'

SHEET INDEX



REV 0	11-13-85	
APPROVED FOR CONSTRUCTION		
DRAWN R.C.B.	CHECKED E.E.P.	DSGN R.C.B.
APPROVED EEL		DATE 11-13-85
APPROVED JW		DATE 11-13-85

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP

SHEET 1 OF 5

SCALE 1"=40' JOB NO. SM85794

SHEET OF SHEETS

SUPERSEDES

D-31123

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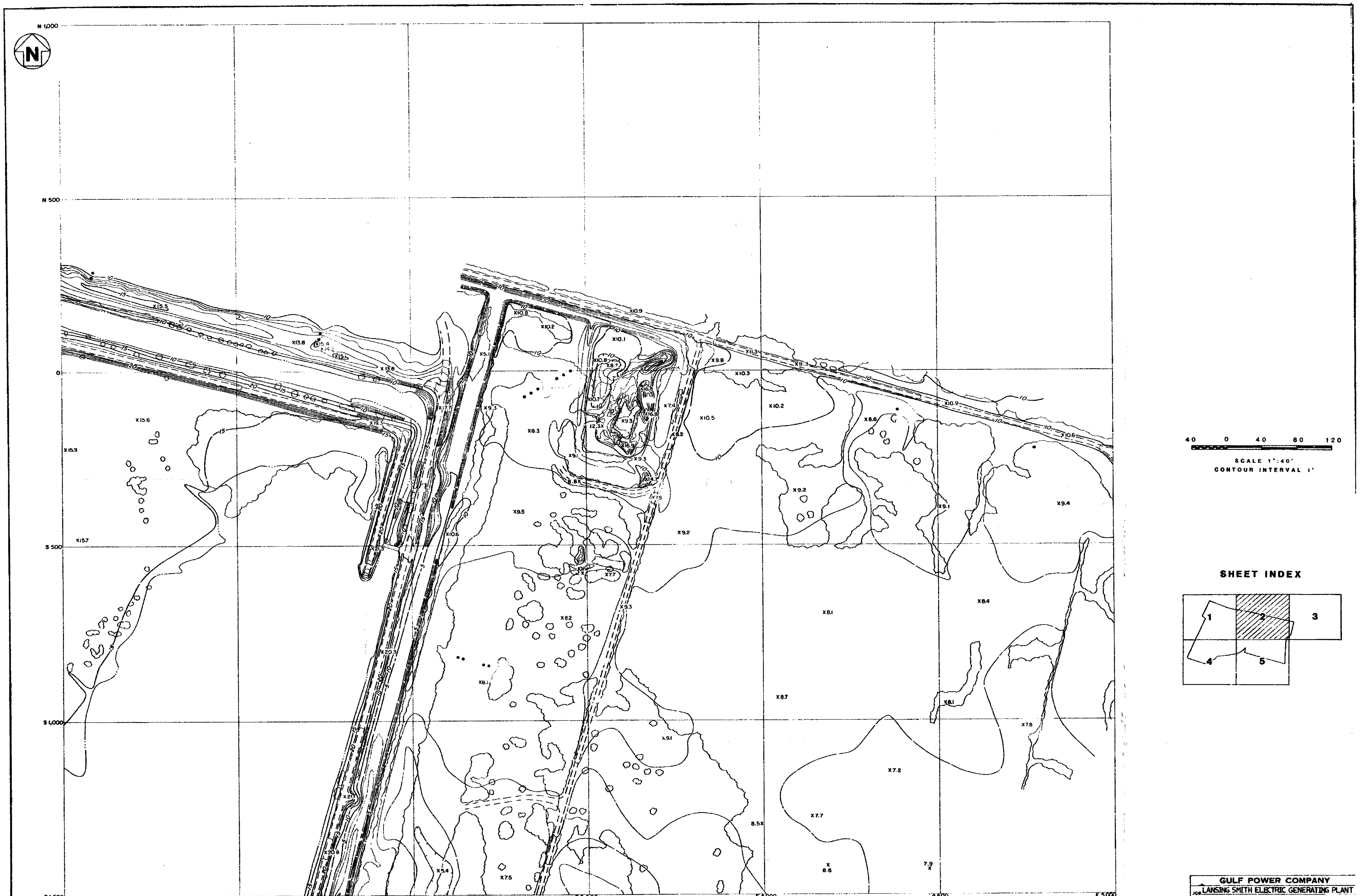

REV. O	11-13-85	
APPROVED FOR CONSTRUCTION		
DRAWN R.C.B. CHECKED E.E.P. R.C.B		
APPROVED EEP	DATE 11-13-85	
APPROVED JW	DATE 11-13-85	

GULF POWER COMPANY

JOB LANSING SMITH ELECTRIC GENERATING PLANT

DETAIL ASH POND TOPOGRAPHIC MAP SHEET 2 OF 5

SCALE 1":40' JOB NO. SM95794

SHEET OF SHEETS

SUPERSEDES

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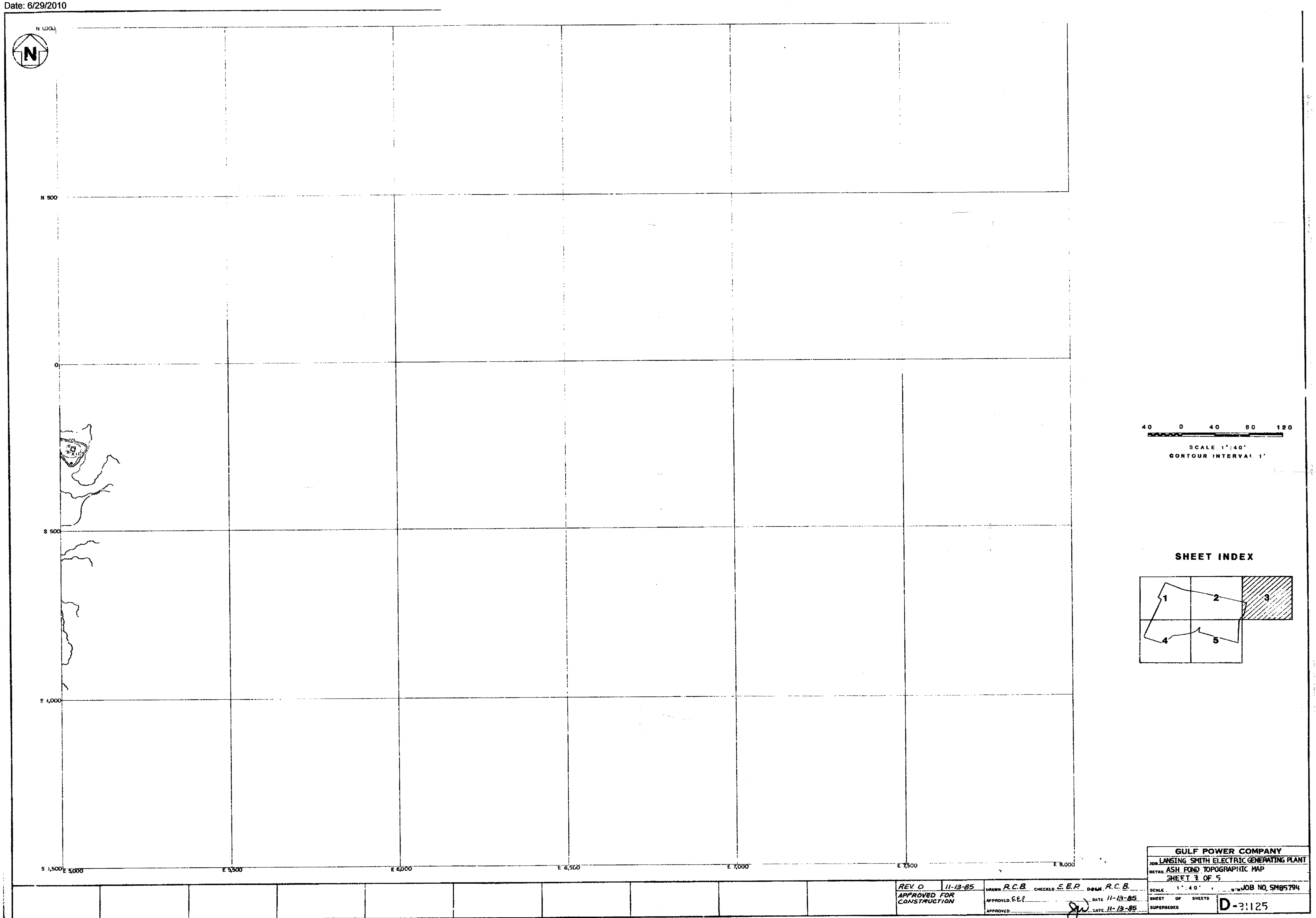

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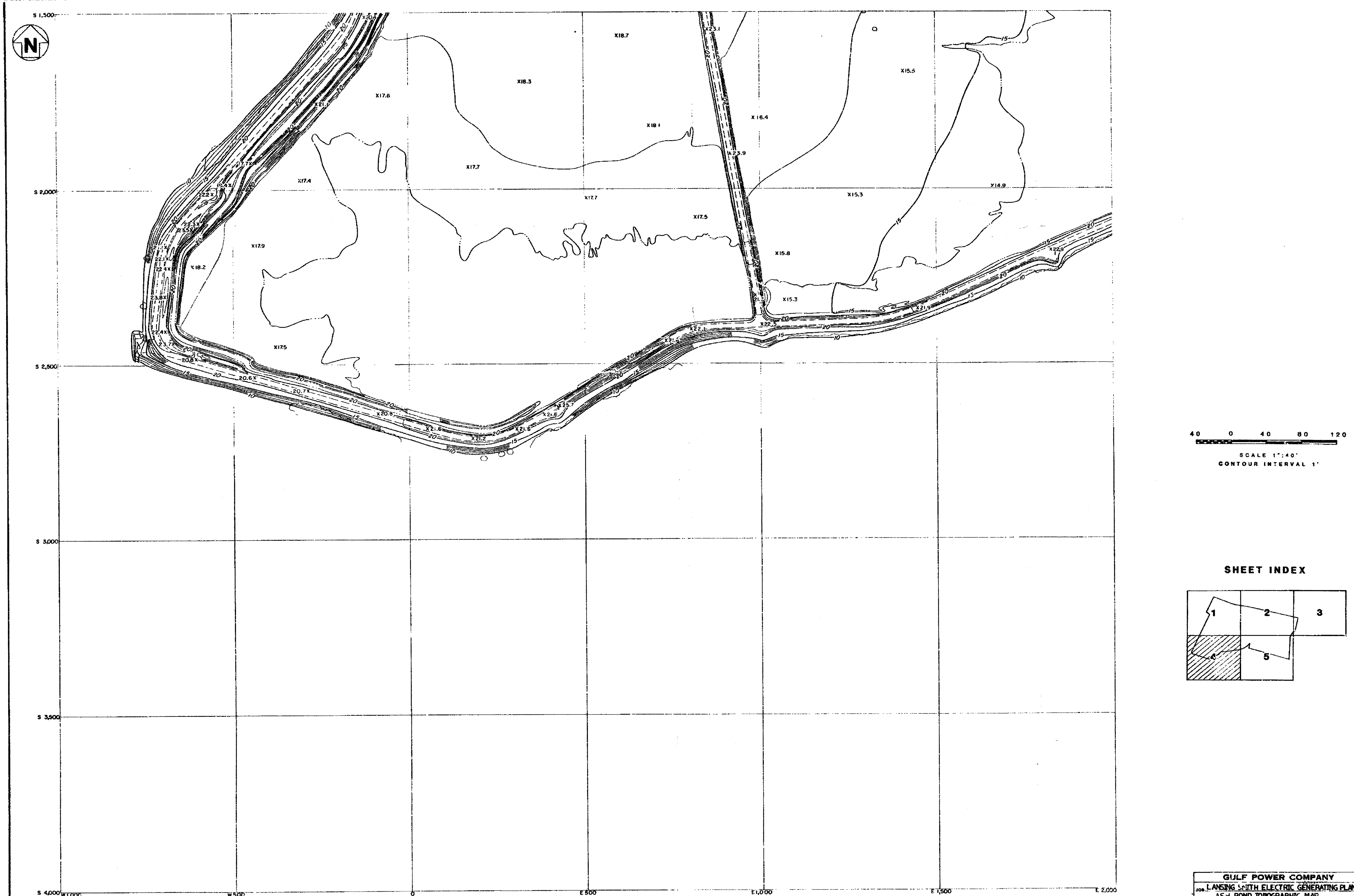

GULF POWER COMPANY	
JOB LANSING SMITH ELECTRIC GENERATING PLANT	
DETAIL ASH POND TOPOGRAPHIC MAP SHEET 4 OF 5	
SCALE 1":40'	JOB NO. SM857-4
SHEET OF SHEETS	
SUPERSEDES	D-31126

REV.	DATE	
REV. 0	11-13-85	APPROVED FOR CONSTRUCTION

DRAWN R.C.B. CHECKED E.E.P. DESIGN R.C.B.
APPROVED EEP DATE 11-13-85
APPROVED DATE 11-13-85

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GP-SM-#0006

Date: 6/29/2010

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APPROVED FOR CONSTRUCTION		APPROVED EEP DATE 11-13-85	JOB LANSING SMITH ELECTRIC GENERATING PLANT DETAIL ASH POND TOPOGRAPHIC MAP SHEET 5 OF 5
		DATE 11-13-85	SCALE 1":40' DWG JOB NO. SM85794
			SHEET OF SHEETS SUPERSEDES D-31127

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GP-SM-#0007

NOTES:

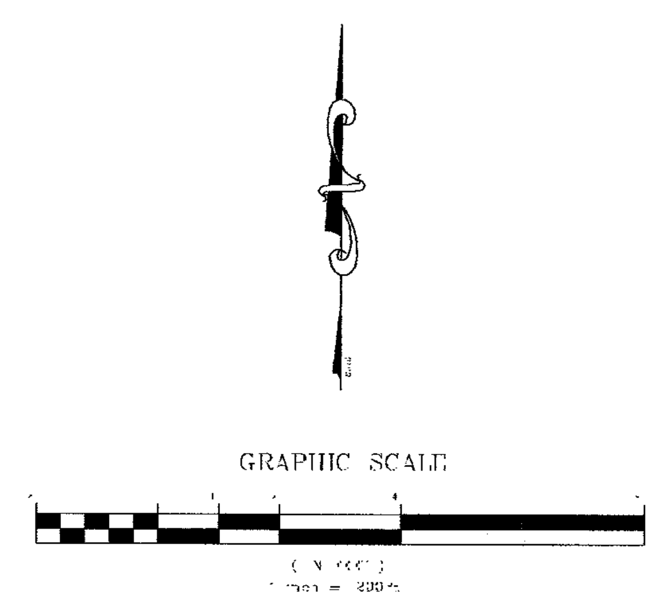
4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC. 735 WEST 11TH STREET PANAMA CITY, FL. 32401 PHONE: (850) 763-7427.

5) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

6) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

7) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

AREAS OF REMAINING WATER VOLUME



GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

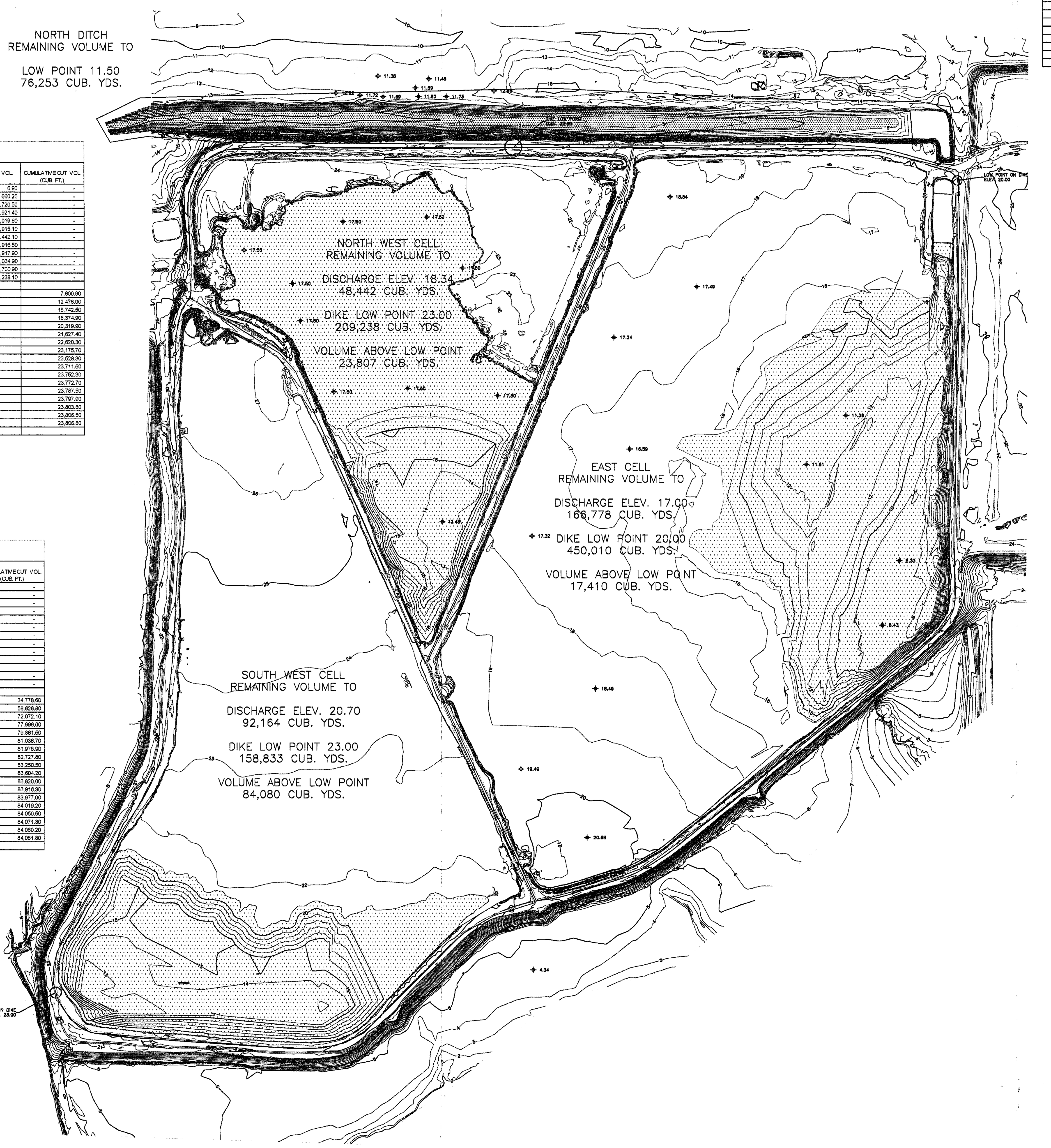
HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

JOB	PLANT LANSING SMITH
DETAIL	ASH POND
	TOPO AND VOLUME
SCALE	AS NOTED
B/M	
SHEET	1 OF 1 SHEETS
SUPERSEDES	
DRAWING NO.	**3727LAN**
REV	0
DRAWN	ENP
CHECKED	
DESIGNED	
APPROVED	
DATE	3/11/2010
APPROVED	
DATE	

REV	DATE:

GP-SM-#0008



PLANT SMITH ASH POND
NORTH DITCH

ELEV.		ELEV.	FILL BELOW 11.50 (CUB. FT.)	CUT ABOVE 11.50 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)
(2.26)	>	(2.00)	0.90	-	0.90
(2.00)	>	(1.00)	50.90	-	51.80
(1.00)	>	0.00	481.30	-	533.10
0.00	>	1.00	1,647.20	-	2,180.30
1.00	>	2.00	2,553.80	-	4,734.10
2.00	>	3.00	3,386.60	-	8,120.70
3.00	>	4.00	4,381.60	-	12,502.30
4.00	>	5.00	5,362.60	-	17,864.90
5.00	>	6.00	6,553.20	-	24,418.10
6.00	>	7.00	7,661.60	-	32,079.70
7.00	>	8.00	8,346.00	-	40,425.70
8.00	>	9.00	9,039.10	-	49,464.80
9.00	>	10.00	9,777.50	-	59,242.30
10.00	>	11.00	11,120.60	-	70,362.90
11.00	>	11.50	5,889.70	-	76,252.60

PLANT SMITH ASH POND
NORTH WEST CELL

ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
12.68	>	13.00	6.90	-	6.90	-
13.00	>	14.00	653.30	-	660.20	-
14.00	>	15.00	3,060.30	-	3,720.50	-
15.00	>	16.00	6,200.90	-	9,921.40	-
16.00	>	17.00	8,098.20	-	18,019.60	-
17.00	>	18.00	19,895.50	-	37,915.10	-
18.00	>	18.34	10,527.00	-	48,442.10	-
18.34	>	19.00	21,474.40		69,916.50	
19.00	>	20.00	32,001.40	-	101,917.90	-
20.00	>	21.00	33,117.00	-	135,034.90	-
21.00	>	22.00	34,666.00	-	169,700.90	-
22.00	>	23.00	39,537.20	-	209,238.10	-
23.00	>	24.00	-	7,600.90		7,600.90
24.00	>	25.00	-	4,875.10		12,476.00
25.00	>	26.00	-	3,266.50		15,742.50
26.00	>	27.00	-	2,632.40		18,374.90
27.00	>	28.00	-	1,945.00		20,319.90
28.00	>	29.00	-	1,307.50		21,627.40
29.00	>	30.00	-	992.90		22,620.30
30.00	>	31.00	-	555.40		23,175.70
31.00	>	32.00	-	352.60		23,528.30
32.00	>	33.00	-	183.30		23,711.60
33.00	>	34.00	-	40.70		23,752.30
34.00	>	35.00	-	20.40		23,772.70
35.00	>	36.00	-	14.80		23,787.50
36.00	>	37.00	-	10.40		23,797.90
37.00	>	38.00	-	5.90		23,803.80
38.00	>	39.00	-	2.70		23,806.50
39.00	>	39.93	-	0.30		23,806.80
	>					

PLANT SMITH ASH POND
EAST CELL

ELEV.		ELEV.	FILL BELOW 20.00 (CUB. FT.)	CUT ABOVE 20.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
5.57	>	6.00	3.20	-	3.20	-
6.00	>	7.00	189.60	-	192.80	-
7.00	>	8.00	853.80	-	1,046.60	-
8.00	>	9.00	2,821.30	-	3,867.90	-
9.00	>	10.00	5,874.20	-	9,742.10	-
10.00	>	11.00	7,579.70	-	17,321.80	-
11.00	>	12.00	10,648.80	-	27,970.60	-
12.00	>	13.00	17,044.10	-	45,014.70	-
13.00	>	14.00	21,851.50	-	66,866.20	-
14.00	>	15.00	24,694.50	-	91,560.70	-
15.00	>	16.00	29,262.90	-	120,823.60	-
16.00	>	**17.00**	45,953.90	-	**166,777.50**	-
17.00	>	18.00	76,570.20	-	243,347.70	
18.00	>	19.00	95,526.90	-	338,874.60	-
19.00	>	20.00	111,135.10	-	450,009.70	-
			-			
20.00	>	21.00	-	6,197.30		6,197.30
21.00	>	22.00	-	3,523.60		9,720.90
22.00	>	23.00	-	2,757.70		12,478.60
23.00	>	24.00	-	2,224.10		14,702.70
24.00	>	25.00	-	1,612.30		16,315.00
25.00	>	26.00	-	811.20		17,126.20
26.00	>	27.00	-	234.30		17,360.50
27.00	>	28.00	-	49.10		17,409.60
28.00	>	28.12	-	0.10		17,409.70

PLANT SMITH ASH POND
SOUTH WEST CELL

ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
11.91	>	12.00	0.20	-	0.20	-
12.00	>	13.00	295.90	-	296.10	-
13.00	>	14.00	2,816.90	-	3,113.00	-
14.00	>	15.00	6,401.20	-	9,514.20	-
15.00	>	16.00	10,529.60	-	20,043.80	-
16.00	>	17.00	12,419.90	-	32,463.70	-
17.00	>	18.00	13,756.60	-	46,220.30	-
18.00	>	19.00	15,086.50	-	61,306.80	-
19.00	>	20.00	16,466.50	-	77,773.30	-
20.00	>	20.70	14,390.50	-	92,163.80	-
20.70		21.00	6,522.60		98,686.40	
21.00	>	22.00	24,586.60	-	123,273.00	-
22.00	>	23.00	35,560.20	-	158,833.20	-
23.00	>	24.00	-	34,778.60	-	34,778.60
24.00	>	25.00	-	23,848.20	-	58,626.80
25.00	>	26.00	-	13,445.30	-	72,072.10
26.00	>	27.00	-	5,923.90	-	77,996.00
27.00	>	28.00	-	1,865.50	-	79,861.50
28.00	>	29.00	-	1,175.20	-	81,036.70
29.00	>	30.00	-	939.20	-	81,975.90
30.00	>	31.00	-	751.90	-	82,727.80
31.00	>	32.00	-	522.70	-	83,250.50
32.00	>	33.00	-	353.70	-	83,604.20
33.00	>	34.00	-	215.80	-	83,820.00
34.00	>	35.00	-	96.30	-	83,916.30
35.00	>	36.00	-	60.70	-	83,977.00
36.00	>	37.00	-	42.20	-	84,019.20
37.00	>	38.00	-	31.30	-	84,050.50
38.00	>	39.00	-	20.80	-	84,071.30
39.00	>	40.00	-	8.90	-	84,080.20
40.00	>	41.00	-	1.60	-	84,081.80

GRAPHIC SCALE

(IN FEET)
1 inch = 200 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.
735 WEST 11TH STREET PANAMA CITY, FL. 32401 PHONE: (850) 763-7427.

5) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

6) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

7) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

REV	DATE:

JOB PLANT LANSING SMITH
DETAIL ASH POND
TOPO AND VOLUME

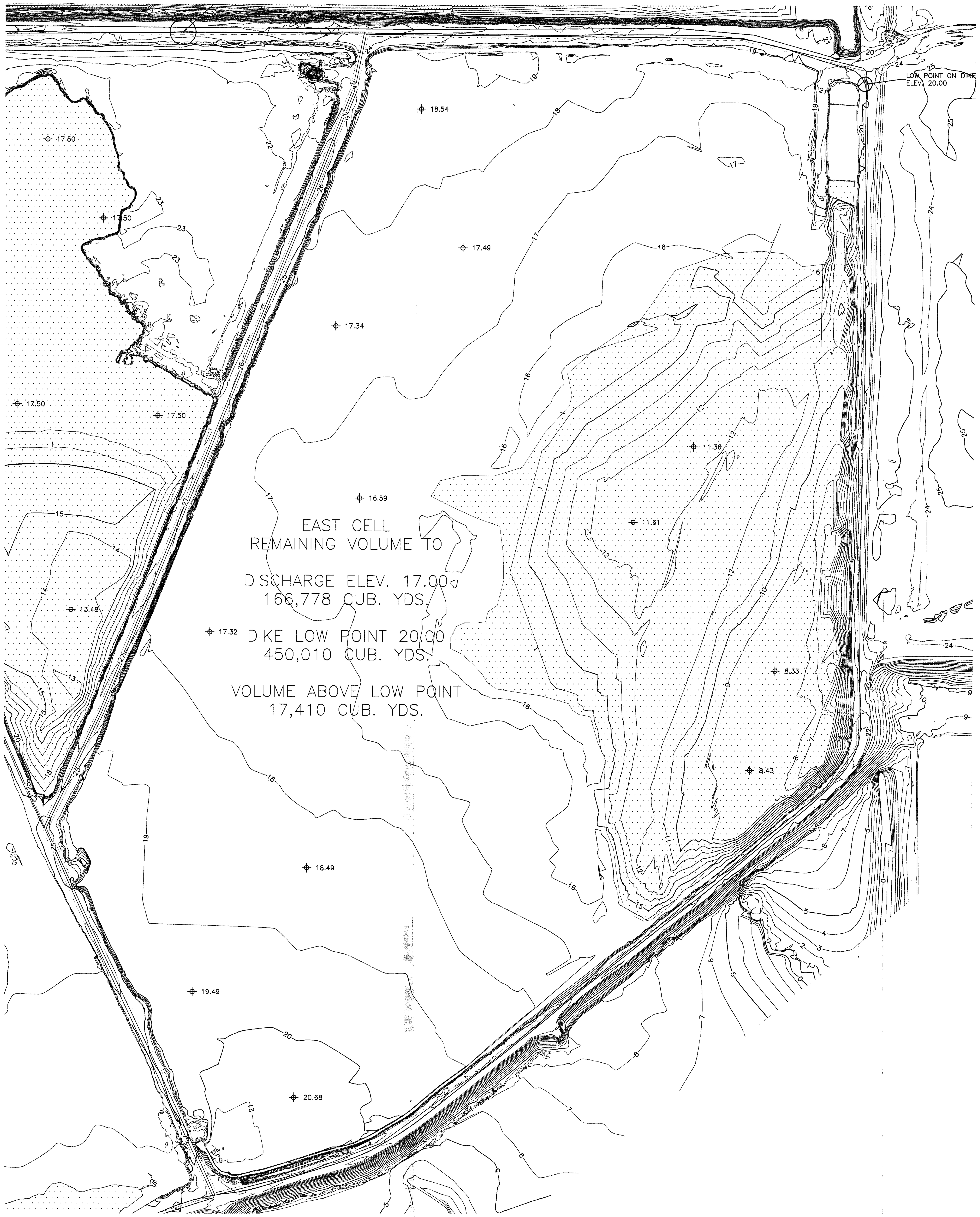
DRAWN ENP CHECKED DESIGNED
APPROVED DATE 3/11/2010
APPROVED DATE

SCALE AS NOTED B/M
SHEET 1 OF 1 SHEETS
SUPERSEDES

3727LAN

REV 0

GP-SM-#0009



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

PLANT SMITH ASH POND
EAST CELL

ELEV.		ELEV.	FILL BELOW 20.00 (CUB. FT.)	CUT ABOVE 20.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
5.57	>	6.00	3.20	-	3.20	-
6.00	>	7.00	189.60	-	192.80	-
7.00	>	8.00	853.80	-	1,046.60	-
8.00	>	9.00	2,821.30	-	3,867.90	-
9.00	>	10.00	5,874.20	-	9,742.10	-
10.00	>	11.00	7,579.70	-	17,321.80	-
11.00	>	12.00	10,648.80	-	27,970.60	-
12.00	>	13.00	17,044.10	-	45,014.70	-
13.00	>	14.00	21,851.50	-	66,866.20	-
14.00	>	15.00	24,694.50	-	91,560.70	-
15.00	>	16.00	29,262.90	-	120,823.60	-
16.00	>	**17.00**	45,953.90	-	**166,777.50**	-
17.00	>	18.00	76,570.20	-	243,347.70	
18.00	>	19.00	95,526.90	-	338,874.60	-
19.00	>	20.00	111,135.10	-	450,009.70	-
			-			
20.00	>	21.00	-	6,197.30		6,197.30
21.00	>	22.00	-	3,523.60		9,720.90
22.00	>	23.00	-	2,757.70		12,478.60
23.00	>	24.00	-	2,224.10		14,702.70
24.00	>	25.00	-	1,612.30		16,315.00
25.00	>	26.00	-	811.20		17,126.20
26.00	>	27.00	-	234.30		17,360.50
27.00	>	28.00	-	49.10		17,409.60
28.00	>	28.12	-	0.10		17,409.70

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF EAST CELL: 17.00 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

4) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for

Gulf Power Company

JOB PLANT LANSING SMITH
DETAIL ASH POND EAST CELL
TOPO AND VOLUME

SCALE AS NOTED B/M
SHEET 1 OF 1 SHEETS
SUPERSEDES
3727LAN REV 0

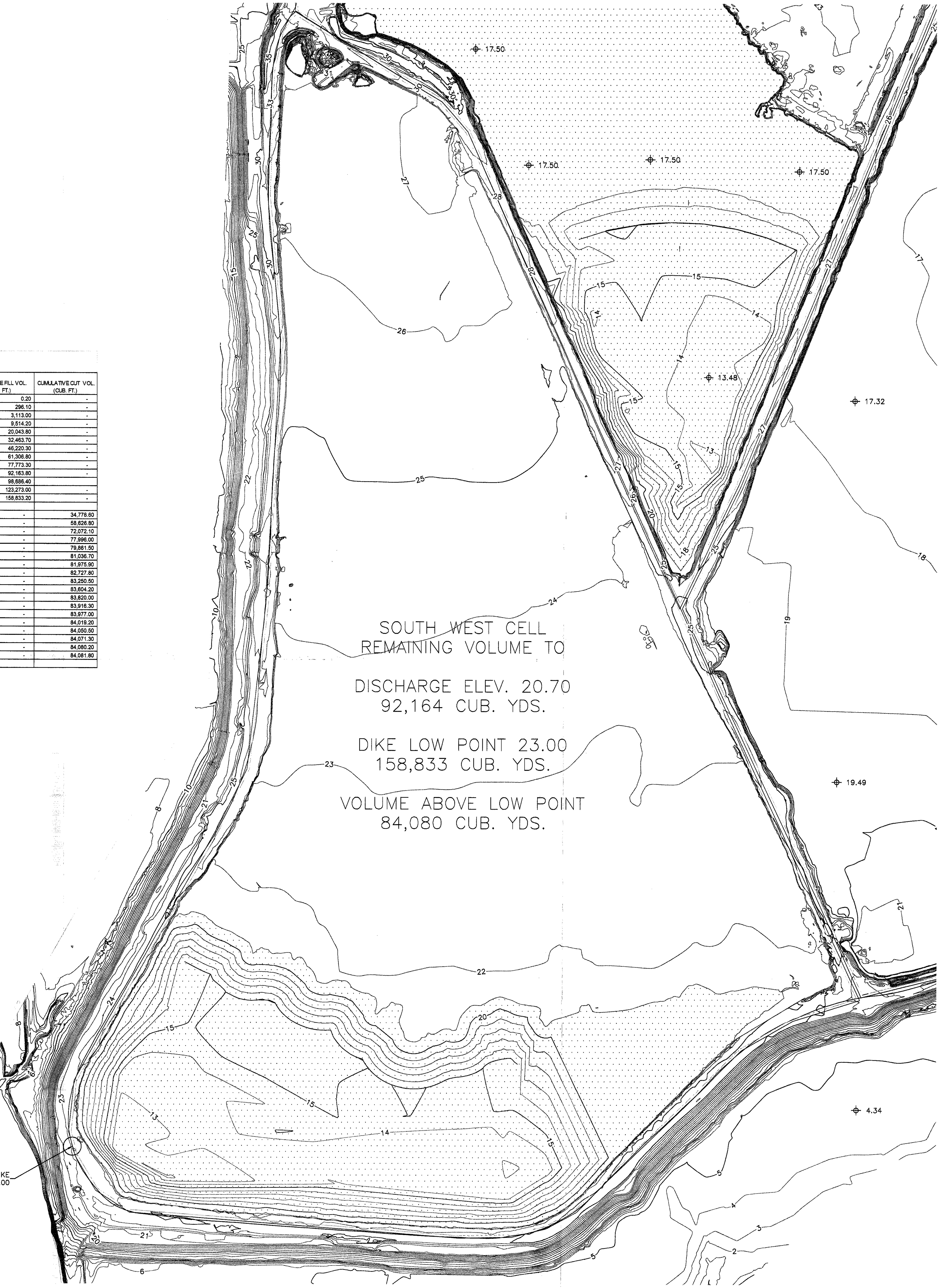
DRAWN ENP CHECKED DESIGNED
APPROVED DATE 3/11/2010
APPROVED DATE

REV DATE:

GP-SM-#0010

PLANT SMITH ASH POND
SOUTH WEST CELL

ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
11.91	>	12.00	0.20	-	0.20	-
12.00	>	13.00	295.90	-	296.10	-
13.00	>	14.00	2,816.90	-	3,113.00	-
14.00	>	15.00	6,401.20	-	9,514.20	-
15.00	>	16.00	10,529.60	-	20,043.80	-
16.00	>	17.00	12,419.90	-	32,463.70	-
17.00	>	18.00	13,756.60	-	46,220.30	-
18.00	>	19.00	15,086.50	-	61,306.80	-
19.00	>	20.00	16,466.50	-	77,773.30	-
20.00	>	20.70	14,390.50	-	92,163.80	-
20.70		21.00	6,522.60		98,686.40	
21.00	>	22.00	24,586.60	-	123,273.00	-
22.00	>	23.00	35,560.20	-	158,833.20	-
23.00	>	24.00	-	34,778.60	-	34,778.60
24.00	>	25.00	-	23,848.20	-	58,626.80
25.00	>	26.00	-	13,445.30	-	72,072.10
26.00	>	27.00	-	5,923.90	-	77,996.00
27.00	>	28.00	-	1,865.50	-	79,861.50
28.00	>	29.00	-	1,175.20	-	81,036.70
29.00	>	30.00	-	939.20	-	81,975.90
30.00	>	31.00	-	751.90	-	82,727.80
31.00	>	32.00	-	522.70	-	83,250.50
32.00	>	33.00	-	353.70	-	83,604.20
33.00	>	34.00	-	215.80	-	83,820.00
34.00	>	35.00	-	96.30	-	83,916.30
35.00	>	36.00	-	60.70	-	83,977.00
36.00	>	37.00	-	42.20	-	84,019.20
37.00	>	38.00	-	31.30	-	84,050.50
38.00	>	39.00	-	20.80	-	84,071.30
39.00	>	40.00	-	8.90	-	84,080.20
40.00	>	41.00	-	1.60	-	84,081.80



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF SOUTHWEST CELL: 20.70 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

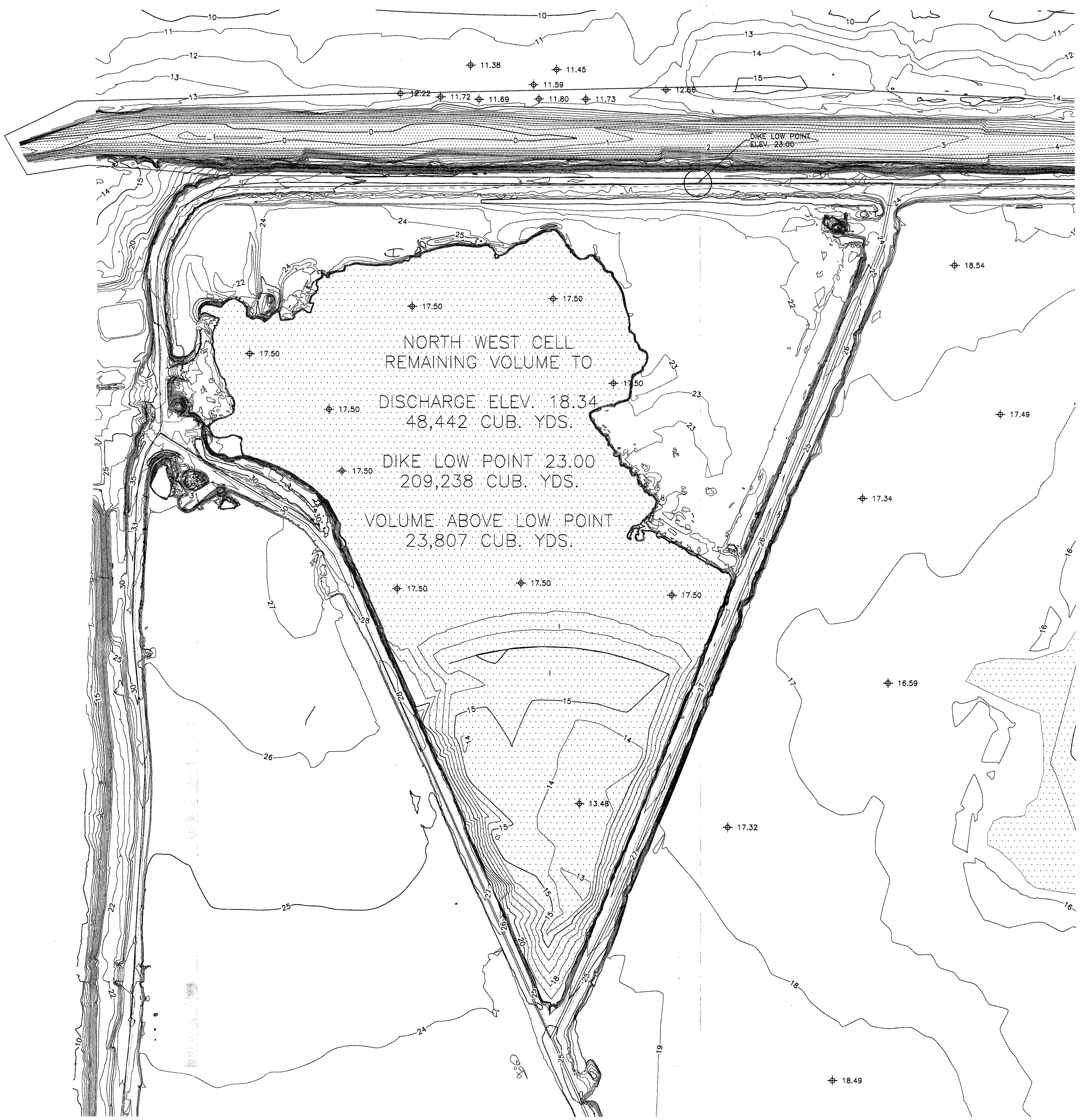
4) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

HYDROGRAPHIC/TOPOGRAPHIC SURVEY
Southern Company Services, Inc.
for
Gulf Power Company

JOB PLANT LANSING SMITH
DETAIL ASH POND SOUTH WEST CELL
TOPO AND VOLUME

REV	DATE:	DRAWN ENP	CHECKED	DESIGNED	SCALE AS NOTED	B/M
		APPROVED		DATE 3/11/2010	SHEET 1 OF 1 SHEETS	
		APPROVED		DATE	SUPERSEDES	3727LAN REV 0

GP-SM-#0011



PLANT SMITH ASH POND
NORTH WEST CELL

ELEV.		ELEV.	FILL BELOW 23.00 (CUB. FT.)	CUT ABOVE 23.00 (CUB. FT.)	CUMULATIVE FILL VOL. (CUB. FT.)	CUMULATIVE CUT VOL. (CUB. FT.)
12.68	>	13.00	6.90	-	6.90	-
13.00	>	14.00	653.30	-	660.20	-
14.00	>	15.00	3,060.30	-	3,720.50	-
15.00	>	16.00	6,200.90	-	9,921.40	-
16.00	>	17.00	8,098.20	-	18,019.60	-
17.00	>	18.00	19,895.50	-	37,915.10	-
18.00	>	18.34	10,527.00	-	48,442.10	-
18.34	>	19.00	21,474.40		69,916.50	
19.00	>	20.00	32,001.40	-	101,917.90	-
20.00	>	21.00	33,117.00	-	135,034.90	-
21.00	>	22.00	34,666,00	-	169,700.90	-
22.00	>	23.00	39,537.20	-	209,238.10	-
23.00	>	24.00	-	7,600.90		7,600.90
24.00	>	25.00	-	4,875.10		12,476.00
25.00	>	26.00	-	3,266.50		15,742.50
26.00	>	27.00	-	2,632.40		18,374.90
27.00	>	28.00	-	1,945.00		20,319.90
28.00	>	29.00	-	1,307.50		21,627.40
29.00	>	30.00	-	992.90		22,620.30
30.00	>	31.00	-	555.40		23,175.70
31.00	>	32.00	-	352.60		23,528.30
32.00	>	33.00	-	183.30		23,711.60
33.00	>	34.00	-	40.70		23,752.30
34.00	>	35.00	-	20.40		23,772.70
35.00	>	36.00	-	14.80		23,787.50
36.00	>	37.00	-	10.40		23,797.90
37.00	>	38.00	-	5.90		23,803.80
38.00	>	39.00	-	2.70		23,806.50
39.00	>	39.93	-	0.30		23,806.80
	>					

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GRID COORDINATES NAD 83
FLORIDA STATE PLANE
NORTH ZONE

AREAS OF REMAINING WATER VOLUME

NOTES:

1) SOUNDING, TOPOGRAPHICAL (FIELD AND AERIAL) DATA COLLECTED JANUARY 2010 BY CIVIL FIELD SERVICES SURVEY AND MAPPING GROUP PHONE: (205) 664-6209.

2) CONTOUR INTERVAL 1.0 FEET

3) CONTOURS AND VOLUMES WERE PRODUCED FROM DIGITAL TERRAIN MODEL

4) ELEVATION DATUM FOR VOLUME CALCULATION OF NORTHWEST CELL: 18.34 MSL.
ELEVATION USED TO CALCULATE REMAINING VOLUME; FROM DECEMBER 2000 VOLUME REPORT FROM BUCHANAN & HARPER, INC.

5) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

HYDROGRAPHIC/TOPOGRAPHIC SURVEY

Southern Company Services, Inc.
for
Gulf Power Company

REV	DATE:

JOB PLANT LANSING SMITH
DETAIL ASH POND NORTH WEST CELL
TOPO AND VOLUME

DRAWN ENP CHECKED DESIGNED
APPROVED DATE 3/11/2010
APPROVED DATE

SCALE AS NOTED B/M
SHEET 1 OF 1 SHEETS
SUPERSEDES

3727LAN REV 0

GP-SM-#0012

One Energy Place
Pensacola, FL 32520

GULF POWER
A SOUTHERN COMPANY

July 6, 2010

Stephen Hoffman
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington,D.C. 20460

Re: Documents Provided to EPA

Dear Mr. Shmurak:

This letter confirms the documents provided by Gulf Power Company to your contractor, Dewberry, during the inspection of Plant Smith's coal ash impoundment on July 6, 2010. We have affixed a unique identifying number to each document. The table below identifies all the documents provided to EPA during the inspection by those unique numbers.

DOCUMENT ID

GP-SM-#0001 through GP-SM-#00023

As requested, Gulf Power Company will provide within 10 days to Dewberry, the Annual Southern Company Dam Safety Inspection reports.

Further, it is Gulf Power's understanding that EPA has informed Dewberry to return, or destroy all submitted documents. Additionally, we have requested that the documents not be reproduced without notice to and approval from Gulf Power. Gulf Power also requests that written notice of such destruction and/or deletion be provided.

I trust this letter is consistent with your understanding of the documents Gulf Power has provided, including our claim of confidentiality and request for the return of all documents and notification of reproduction. Please advise me immediately if you should have any questions about any of the documents that have been provided.

Sincerely,

James O. Vick

James O. Vick
Director Environmental Affairs

cc: Russell A. Badders
Brian Heinfeld

Southern Company Services, Inc.
Post Office Box 2625
Birmingham, Alabama 35202
Telephone 205 870-6011

FILE COPY

Southern Company Services
the southern electric system

J. F. Goodwin
Manager
Hydro Projects

March 20, 1981

G. O. Layman
Gulf Power Company
Power Supply
General Office Building

GULF POWER COMPANY
PLANT LANSING SMITH
REMEDIAL WORK TO ASH POND DIKE
COMMENTS ON LABORATORY TEST DATA

A review of test data on mixtures of sand and ash materials has been made by the geotechnical section of this department. Testing of the samples was assigned by the geotechnical section and performed by Pensacola Testing Laboratory, Inc. Grain size distribution, Standard Proctor compaction, and direct shear tests were performed on samples of materials remolded to approximately 90% of Standard Proctor maximum density and at optimum moisture content Mixtures were made to a 50-50 ratio by volume to simulate the probable mixing operation in the field.

The following comments are offered based upon the results of testing performed on samples remolded to the above stated conditions:

1. <u>Mixture 1 - 50% Fly Ash and 50% Sand</u>

   The mixture of these two materials results in a fines content (#200 sieve) of approximately 33%. The angle of internal friction was measured to be 33^{o} for the cohesionless material. Optimum moisture content was determined to be 19.6%. If the material is placed at approximately optimum moisture, one should expect moderate to low workability during placement. If a dozer is used to place and compact the material, an in-place density level of 90% of Standard Proctor maximum density can probably be achieved.

2. <u>Mixture 2 - 50% Bottom Ash and 50% Sand</u>

   The mixture of these two materials results in a fines content of approximately 10%. The angle of internal friction was measured to be 37^{o} or greater for the cohesionless material. Optimum moisture content was determined to be 14.2%. If the material is placed at approximately optimum moisture, one should expect good workability of the material during placement.

3. <u>Mixture 3 - 50% Bottom Ash and 50% Fly Ash</u>

   The mixture of these two materials results in a fines content of approximately 40%. The angle of internal friction was measured to be 34^{o} for the cohesionless material. Optimum moisture content was determined to be 18.0%, but the maximum dry density is low relative to the other two mixtures. Workability of this mixture may not be that desirable. If a good stand of grass in not achieved, erosion may be a problem.

Mixture 2 of 50% bottom ash and 50% sand should offer the best workability during placement and compaction. If a dozer is used to compact this material, several complete coverages on each lift is made, and moisutre is maintained near optimum, then a satisfactory in-place density and strength should result. This prediction of performance also assumes that a satisfactory blend of these two materials is obtained prior to placement and compaction. Any significant deviation in the above stated mixture, placement, and compaction operation may result in an unsatisfactory fill to improve the downstream slope of the existing ash pond dike.

If you have any questions or comments, please contact us.

J F Goodwin

J. F. Goodwin
Manager
Hydro Projects

RMF/JPM/fhl

cc: Gulf Power Company
H. L. Witt
R. W. K. Czepluch
Southern Company Services
E. L. Williamson
M. C. Brickell
A. H. Gibson
S. H. Lawrence
J. C. Thornton
R. H. Smith

217 E. Brent Ln.
PENSACOLA, FLA.
Phone: 477-5100

PENSACOLA TESTING LABORATORIES, INC.

REPORT OF SUMMARY OF LAB TEST DATA

For GULF POWER COMPANY
P.O. BOX 1151
PENSACOLA, FLORIDA 32520

Report No. 55827 se
Date March 2, 1981
Purchase Order No.

Sample Identification
BOTTOM ASH, FLY ASH & SAND FROM SMITH PLANT

Sample SUBMITTED BY CLIENT, TESTED By J. SIMS & R. STRICKLIN Date 2-23-81

SAMPLE ID	MAX. DRY DENSITY PCF (ASTM D-698)	OPTIMUM MOISTURE %	ANGLE OF INTERNAL FRICTION	COHESION	REMOLDED DRY DENSITY
50% FLY ASH 50% SAND	100.8	19.6	34°	0	90.7
50% BOTTOM ASH 50% SAND	104.8	14.2	38°	0	94.4
50% BOTTOM ASH 50% FLY ASH	87.0	18.0	35°	0	78.3

NOTE: SAMPLES REMOLDED TO 90% OF MAX. DRY DENSITY (ASTM D-698) AND TESTED IN THE DIRECT SHEAR APPARATUS CONSOLIDATED DRAINED.

Reports to:

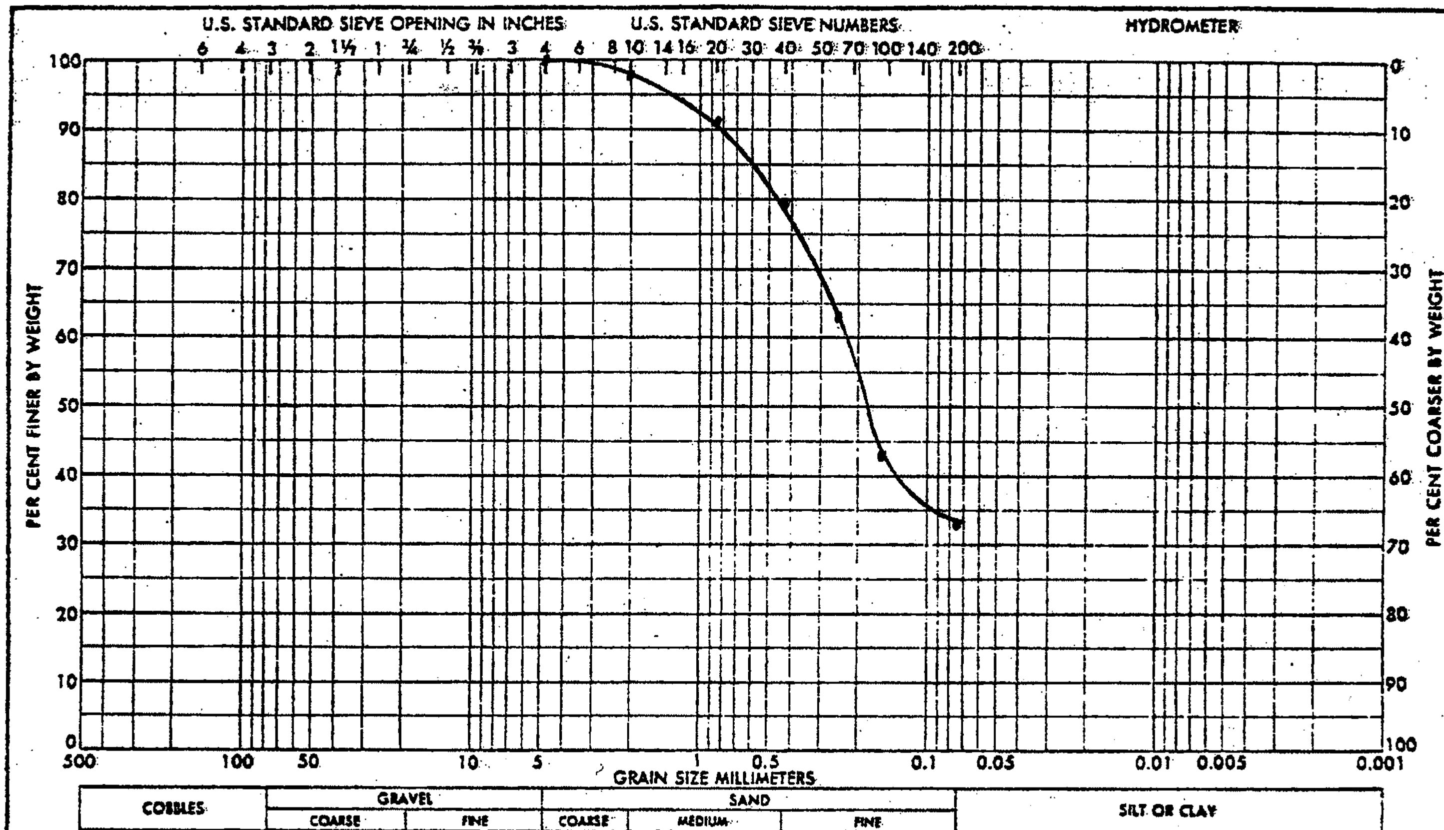
3- GULF POWER
ATTENTION: MR. RALPH CZEPLUCH

PENSACOLA TESTING LABORATORIES

By John D Sims

PENSACOLA TESTING LABORATORIES, INC.

REPORT NO. 55827

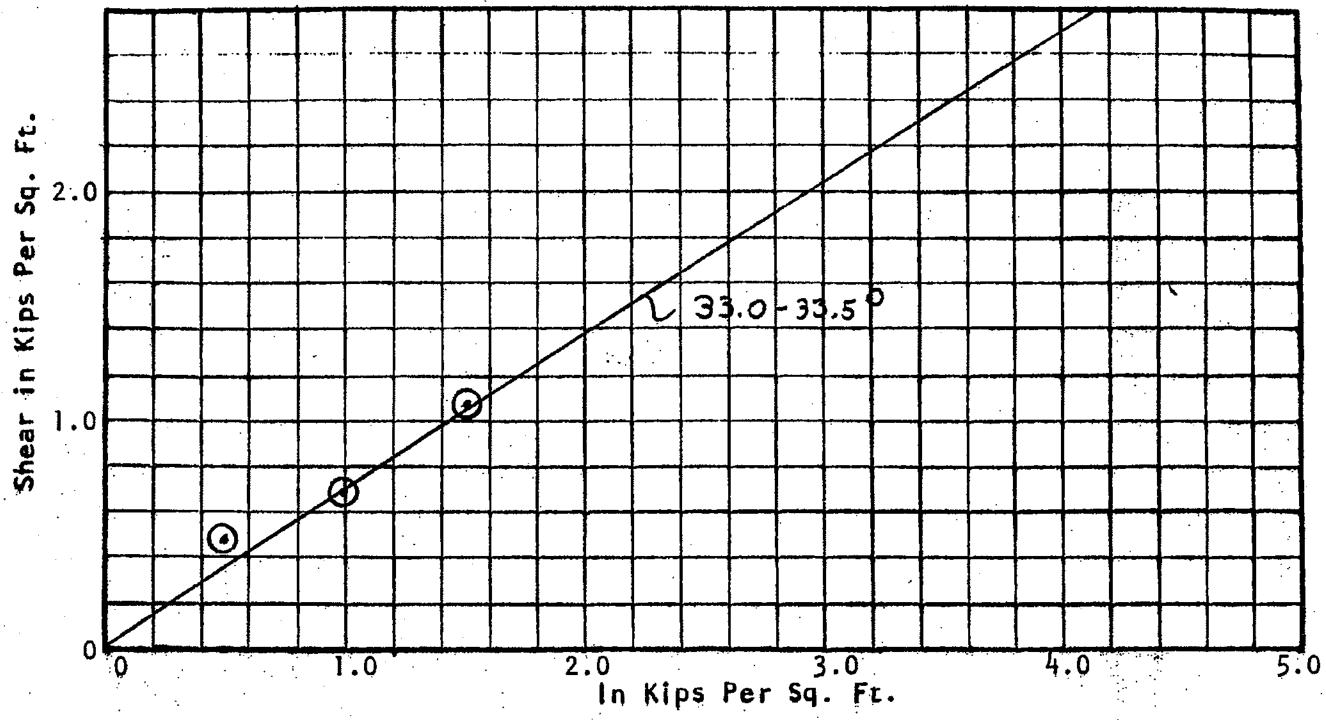


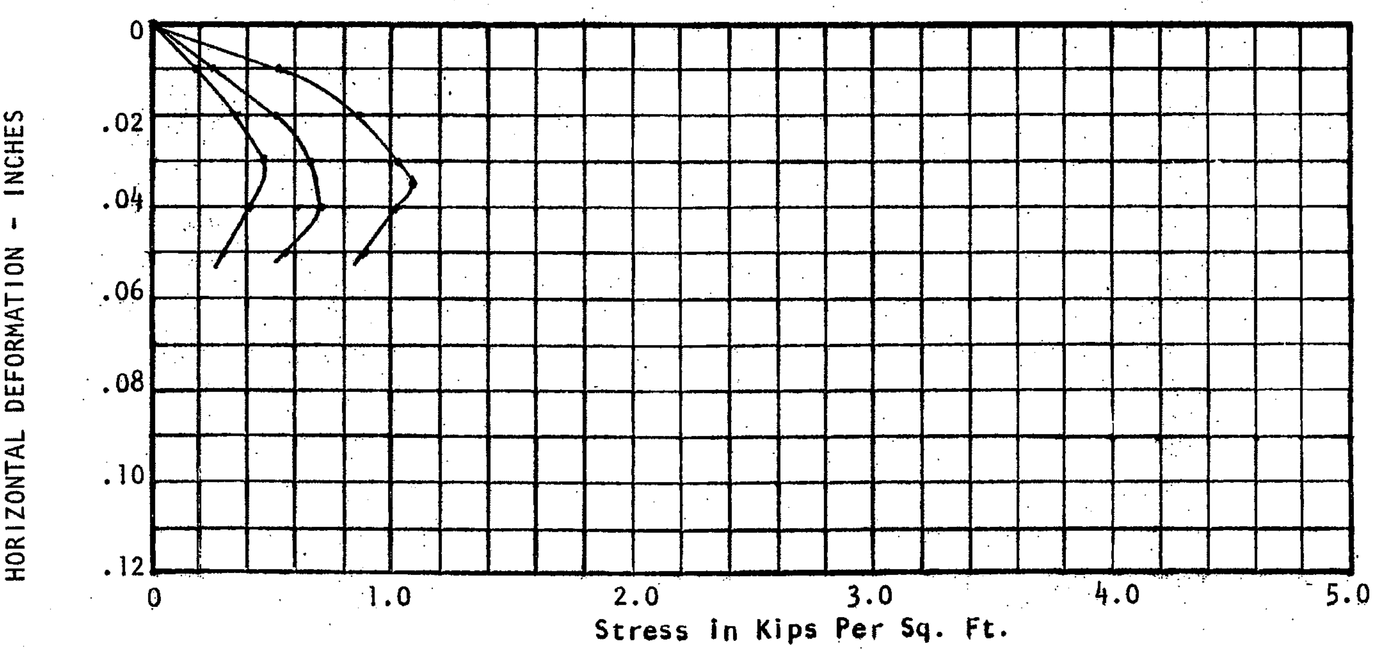
SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
		SMITH PLANT		-		
		50% FLY ASH				
		50% SAND				

PROJECT	GULF POWER COMPANY SMITH PLANT
AREA	
BORING NO.	
DATE	3/2/81

GRADATION CURVES

SIEVE SIZES:	#4	#10	#20	#40	#60	#100	#200
% PASSING:	100	97.9	90.6	79.8	62.8	43.2	33.0





STRESS-STRAIN CURVES

"Cohesion", C 0

Angle of Shear Resistance, Ø 34°

Dry Unit Weight, γ 90.7 = 90% ASTM D-698

Water Content, W 19.6

Void Ratio, e ______

DIRECT SHEAR TEST
GULF POWER CO. - SMITH PLANT - 50% FLY ASH, 50% SAND
(BY LOOSE VOLUME)

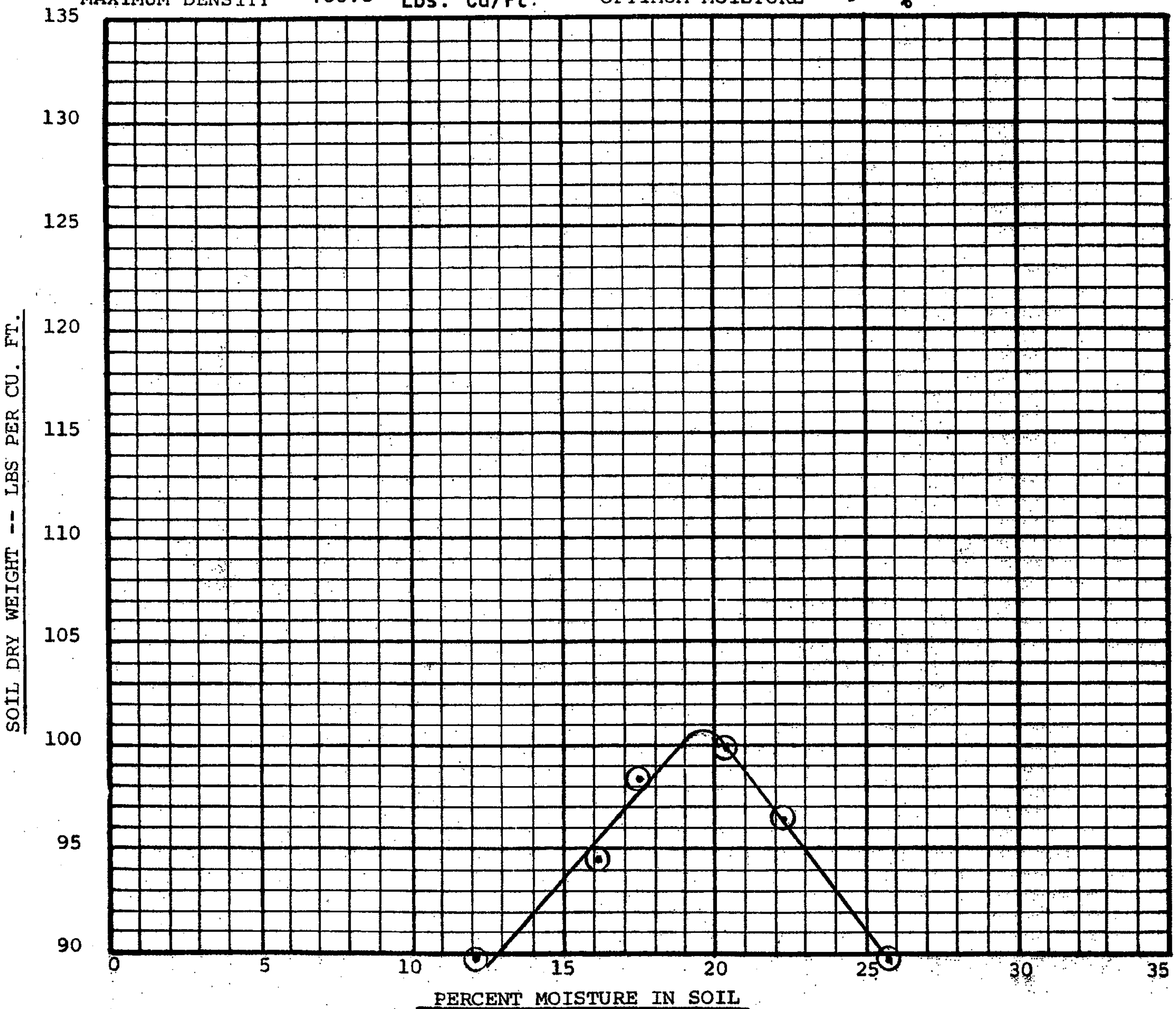
PENSACOLA TESTING LABORATORIES, INC

CHEMICAL ANALYSES – INSPECTIONS – TESTS

OFFICE AND LABORATORIES
217 East Brent Lane
Pensacola, Florida 32503
Phone: 477-5100

PROCTOR

PROJECT SMITH PLANT REPORT NO. 55827 bh
FOR GULF POWER COMPANY, P.O. BOX 1151, PENSACOLA, FL DATE 3/2/81
SAMPLE IDENTIFICATION 50% FLY ASH, 50% SAND (BY LOOSE VOLUME)
APPLICABLE SPECIFICATION ASTM D-698 ORDER NO.
SAMPLED AND TESTED BY CLIENT & J. SIMS DATE 2/23/81
MAXIMUM DENSITY 100.8 Lbs. Cu/Ft. OPTIMUM MOISTURE 19.6 %



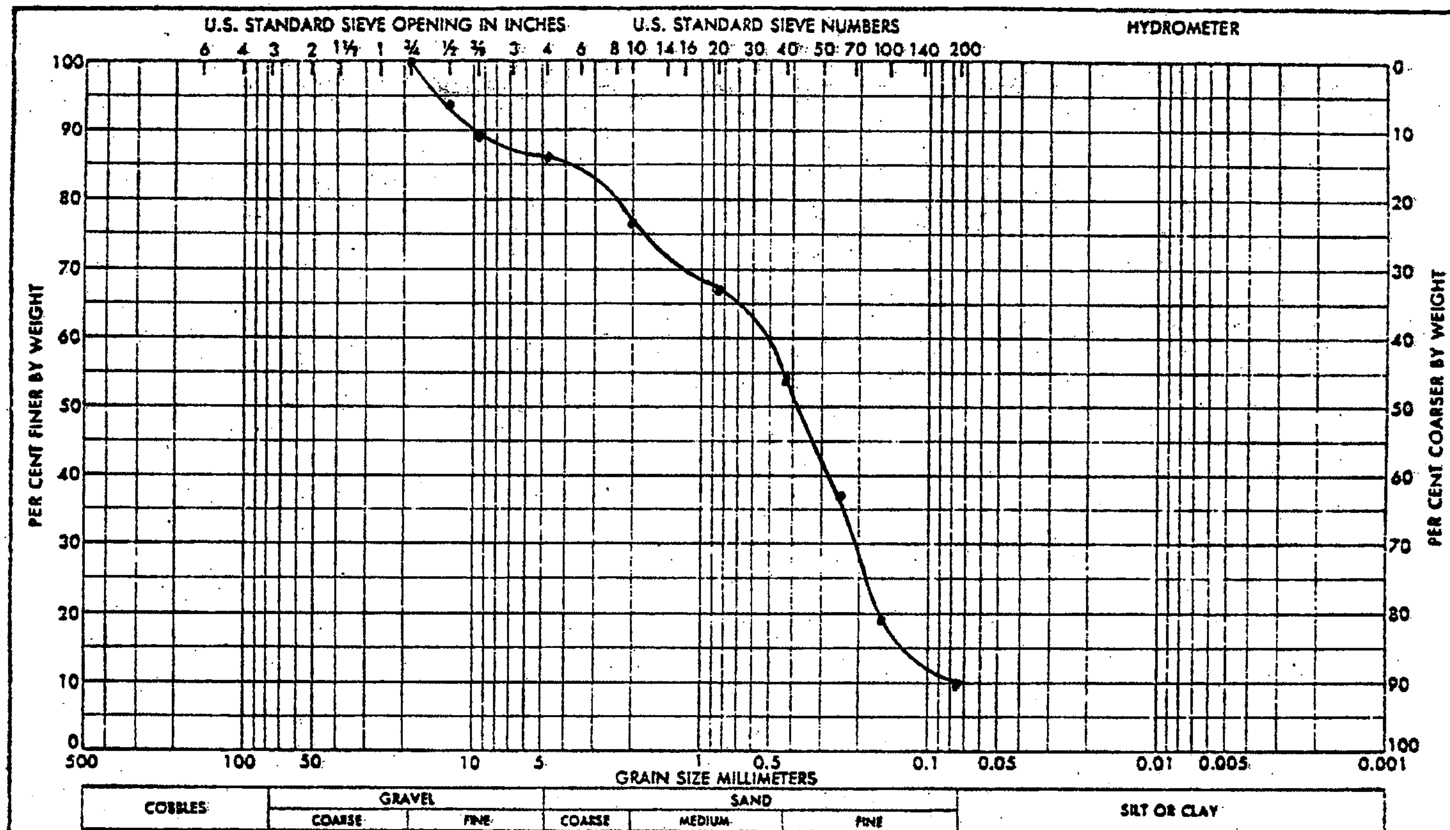
Reports to: 3-Gulf Power Co.

PENSACOLA TESTING LABORATORIES, INC.

By se John D Sims

PENSACOLA TESTING LABORATORIES, INC.

REPORT NO: 55827



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
		SMITH PLANT				
		50% BOTTOM ASH				
		50% SAND				

GRADATION CURVES

PROJECT GULF POWER COMPANY
SMITH PLANT, PANAMA CITY

AREA

BORING NO.

DATE March 2, 1981

SIEVE SIZES:	3/4",	½"	3/8"	#4,	#10,	#20,	#40,	#60,	#100,	#200
% PASSING:	100	94.3	89.8	85.5	76.9	66.9	54.2	37.0	19.7	10.0

PENSACOLA TESTING LABORATORIES, INC
CHEMICAL ANALYSES – INSPECTIONS – TESTS

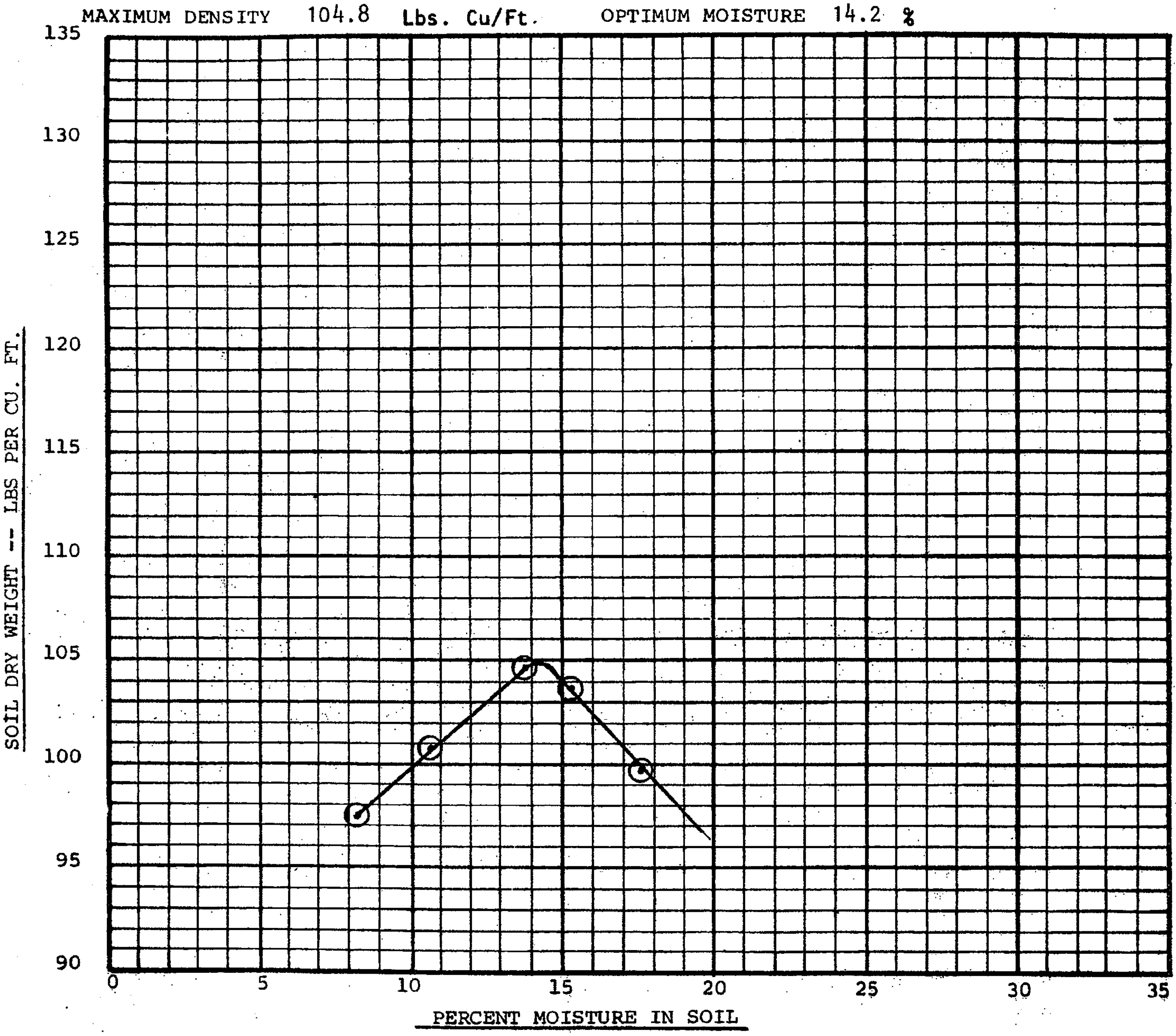
OFFICE AND LABORATORIES
217 East Brent Lane
Pensacola, Florida 32503
Phone: 477-5100

PROCTOR

PROJECT SMITH PLANT
FOR GULF POWER COMPANY, P.O. BOX 1151, PENSACOLA FLA.
SAMPLE IDENTIFICATION 50% BOTTOM ASH, 50% SAND (BY LOOSE VOC.)
APPLICABLE SPECIFICATION ASTM D-698
SAMPLED AND TESTED BY J. SIMS

REPORT NO. 55827 se
DATE March 2, 1981
ORDER NO.
DATE 2-23-81

MAXIMUM DENSITY 104.8 Lbs. Cu/Ft. OPTIMUM MOISTURE 14.2 %



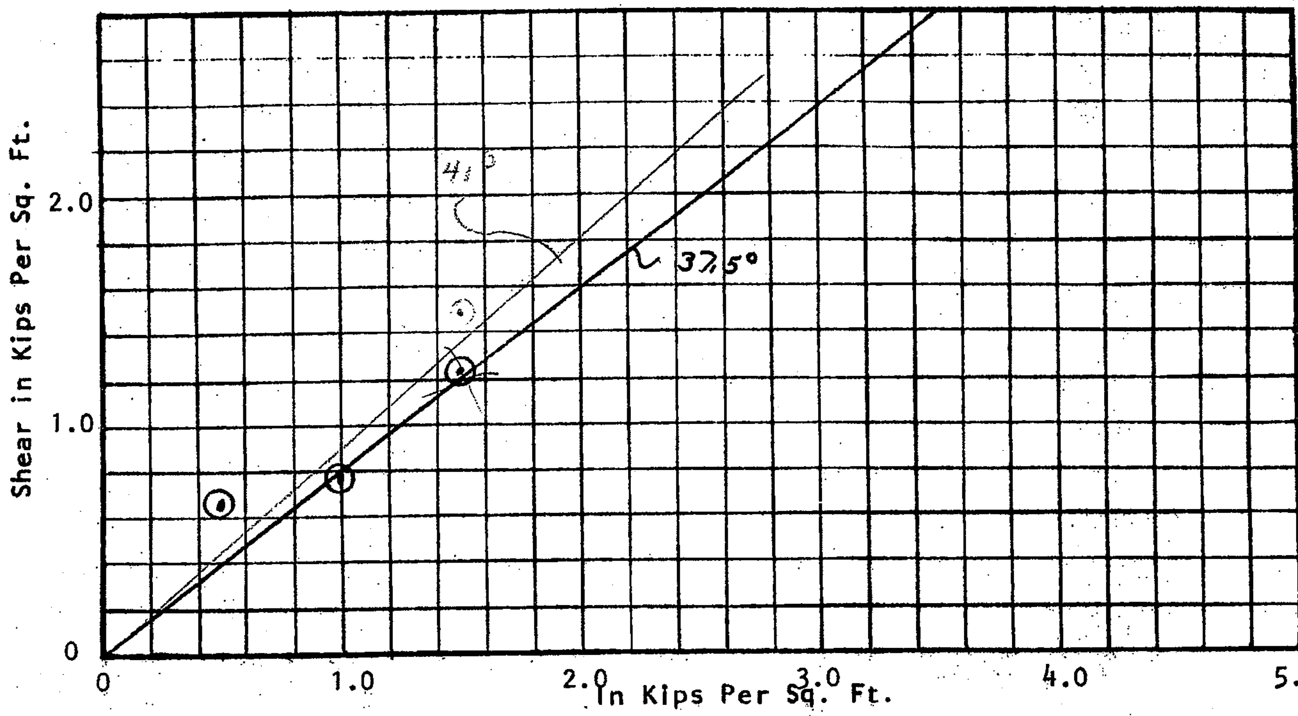
This report submitted for the exclusive use of the person, partnership, or corporation to who it is addressed, and neither the report nor the name of this laboratory nor of any members of its staff may be used in connection with the advertising or sale of any product or process without written authorization.

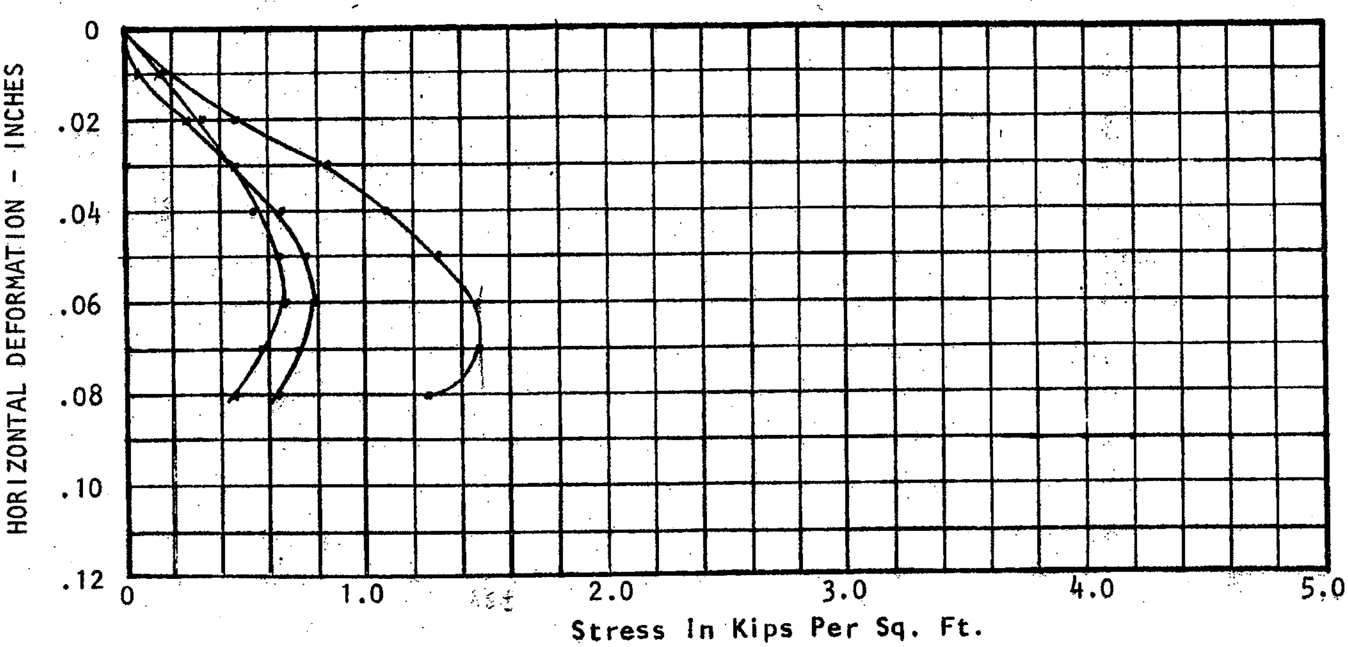
Reports to:

3 GULF POWER COMPANY
ATTN: MR. RALPH CZEPLUCH

PENSACOLA TESTING LABORATORIES, INC.

By John D Sims





STRESS-STRAIN CURVES

"Cohesion", C 0

Angle of Shear Resistance, Ø 38°

Unit Weight, γ 94.4 =90% ASTM D-698

Water Content, W 14.2

Void Ratio, e

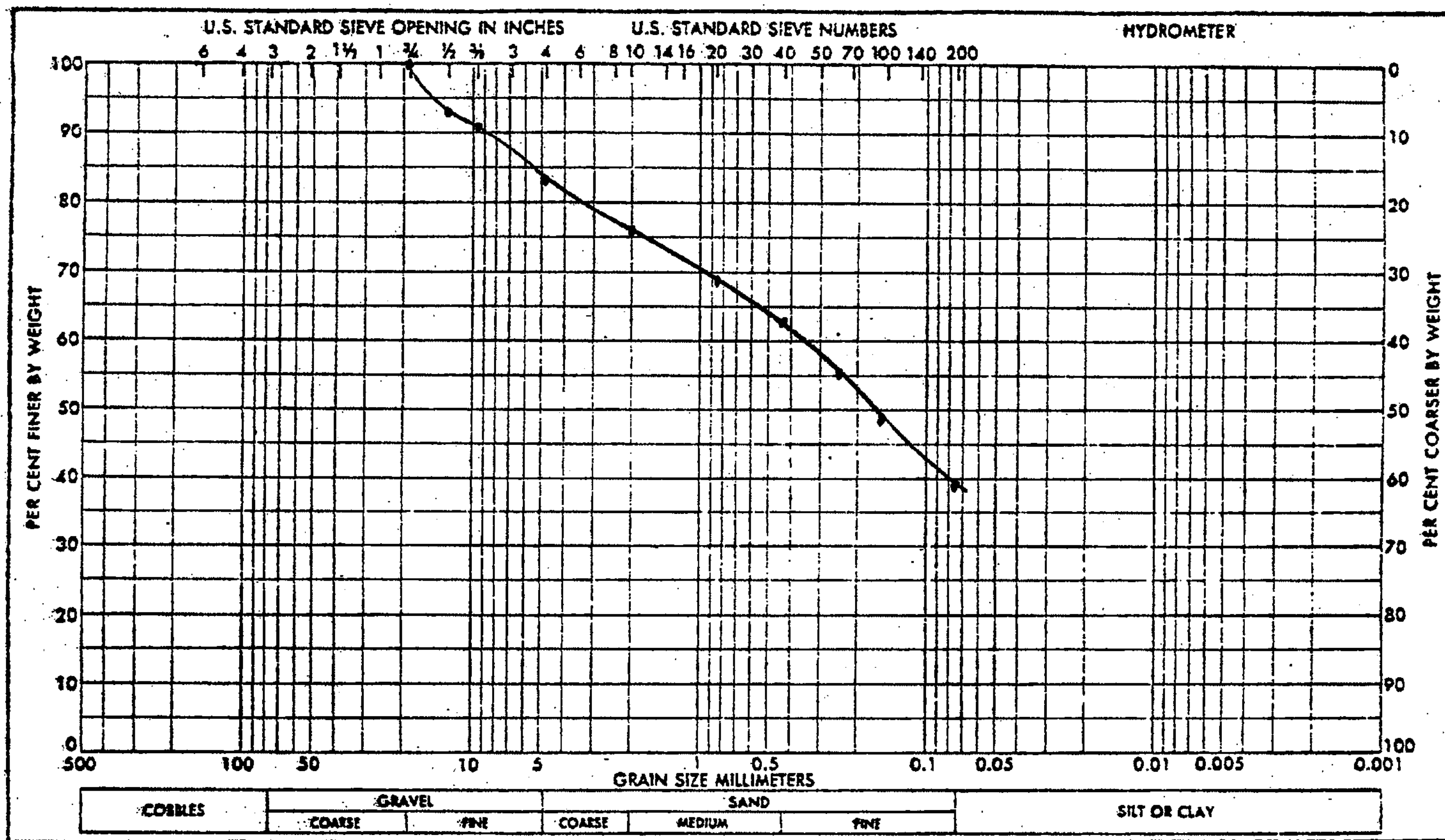
NOTE: SAMPLE SIEVED OVER #4 BEFORE TEST

DIRECT SHEAR TEST

GULF POWER COMPANY
SMITH PLANT - 50% BOTTOM ASH
50% SAND (BY LOOSE VOL

PENSACOLA TESTING LABORATORIES, INC.

REPORT NO. 55827



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
		SMITH PLANT				
		50% FLY ASH				
		50% BOTTOM ASH				

GRADATION CURVES

PROJECT GULF POWER CO.
SMITH PLANT

AREA

BORING NO.

DATE 3/2/81

SIEVE SIZES:	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#100	#200
% PASSING:	100	93.5	90.8	83.5	75.1	68.5	62.9	55.2	48.5	38.8

PENSACOLA TESTING LABORATORIES, INC
CHEMICAL ANALYSES – INSPECTIONS – TESTS

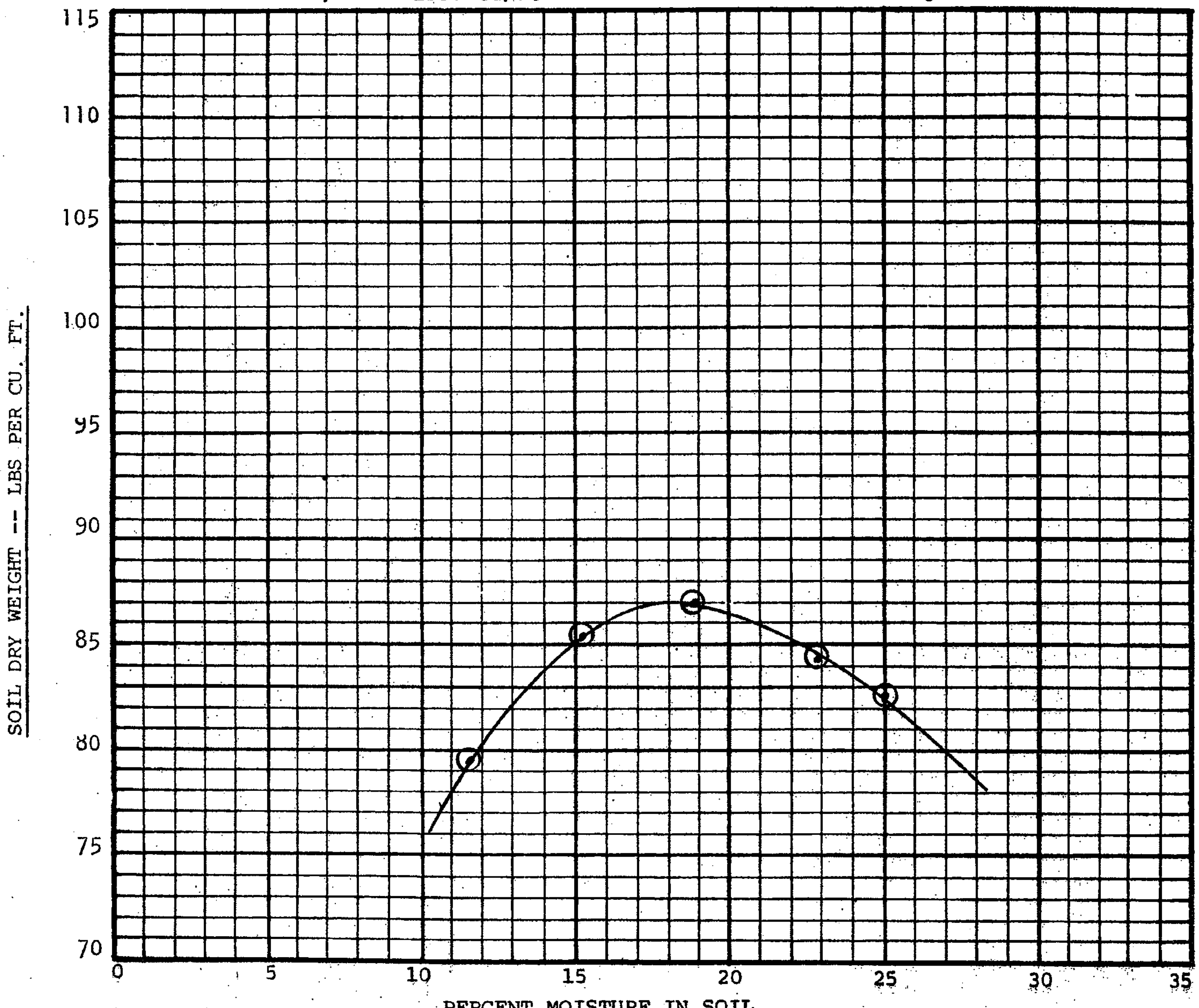
OFFICE AND LABORATORIES
217 East Brent Lane
Pensacola, Florida 32503
Phone: 477-5100

PROCTOR

PROJECT SMITH PLANT
FOR GULF POWER CO., P.O.BOX 1151, PENSACOLA, FL
SAMPLE IDENTIFICATION 50% FLY ASH, 50% BOTTOM ASH
APPLICABLE SPECIFICATION ASTM D-698
SAMPLED AND TESTED BY CLIENT AND J. SIMS

REPORT NO. 55827 bh
DATE 3/2/81
ORDER NO.
DATE 2/23/81

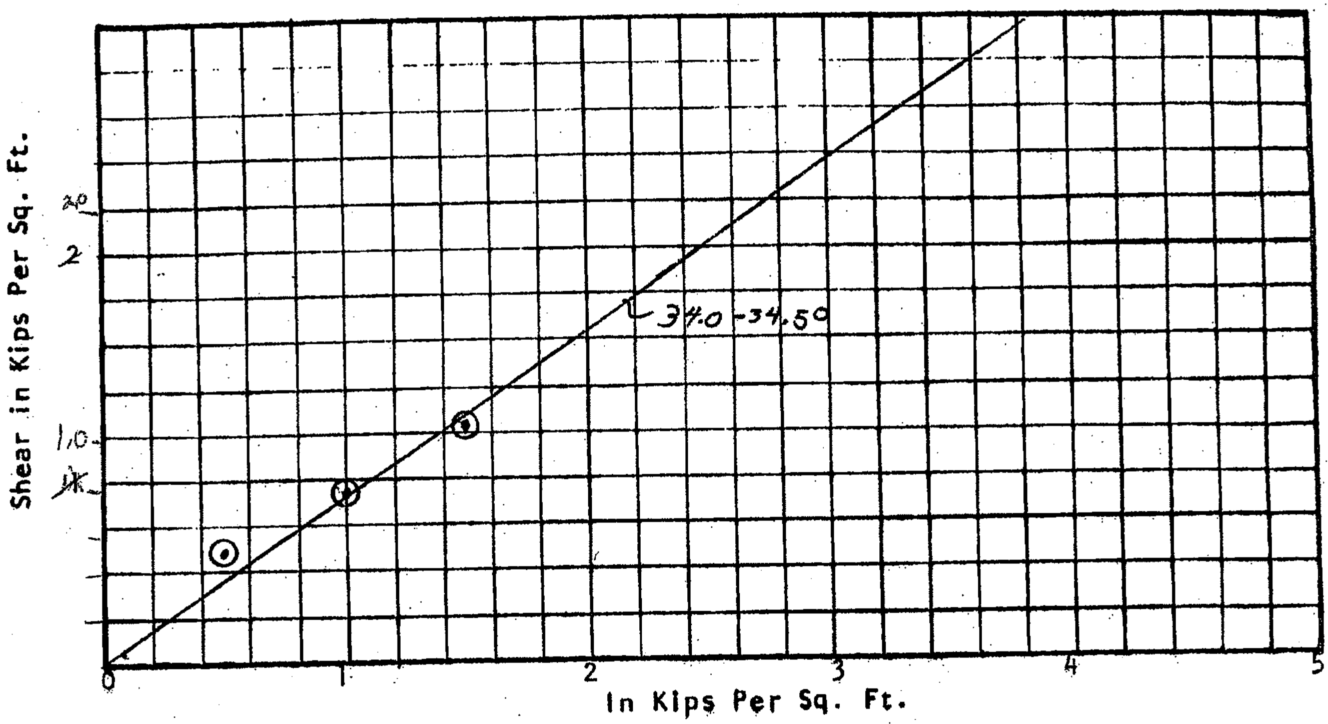
MAXIMUM DENSITY 87.0 Lbs. Cu/Ft. OPTIMUM MOISTURE 18.0 %

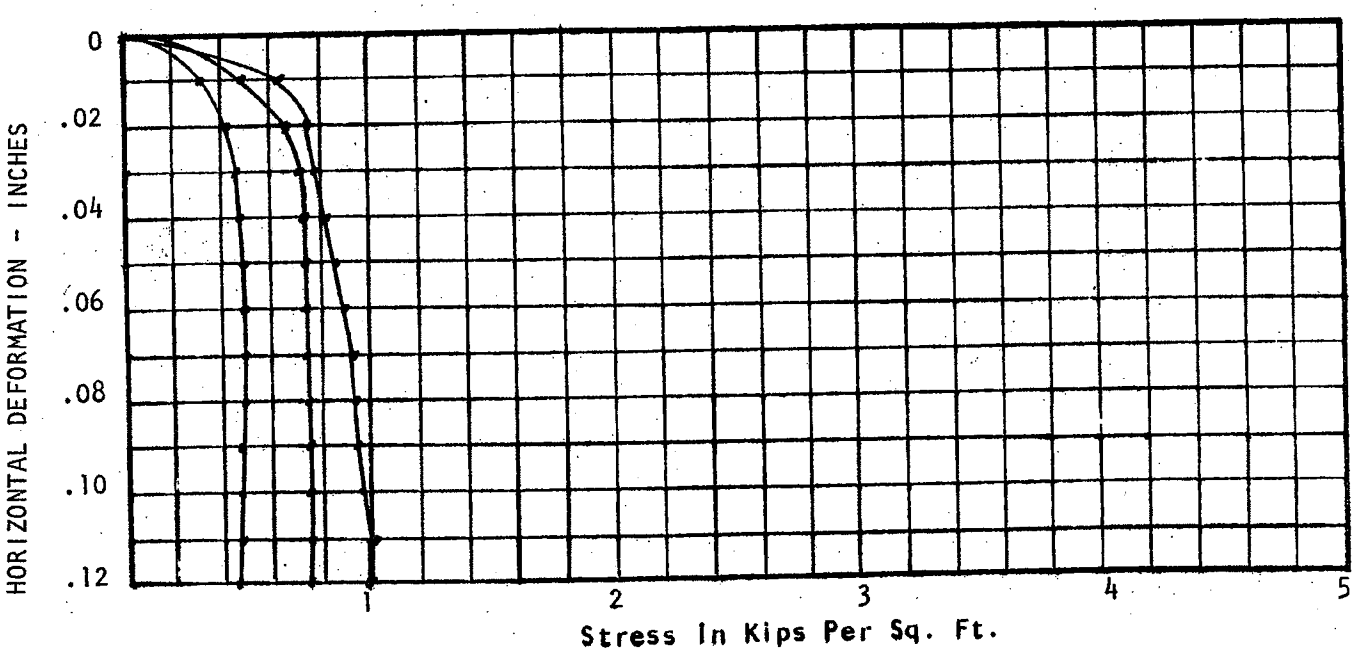


Reports to: Gulf Power Co.

PENSACOLA TESTING LABORATORIES, INC.

By John D Sims





STRESS-STRAIN CURVES

"Cohesion", C 0

Angle of Shear Resistance, Ø 35°

DRY Unit Weight, γ 78.3 (90% ASTM D-698)

Water Content, W 18.0

Void Ratio, e

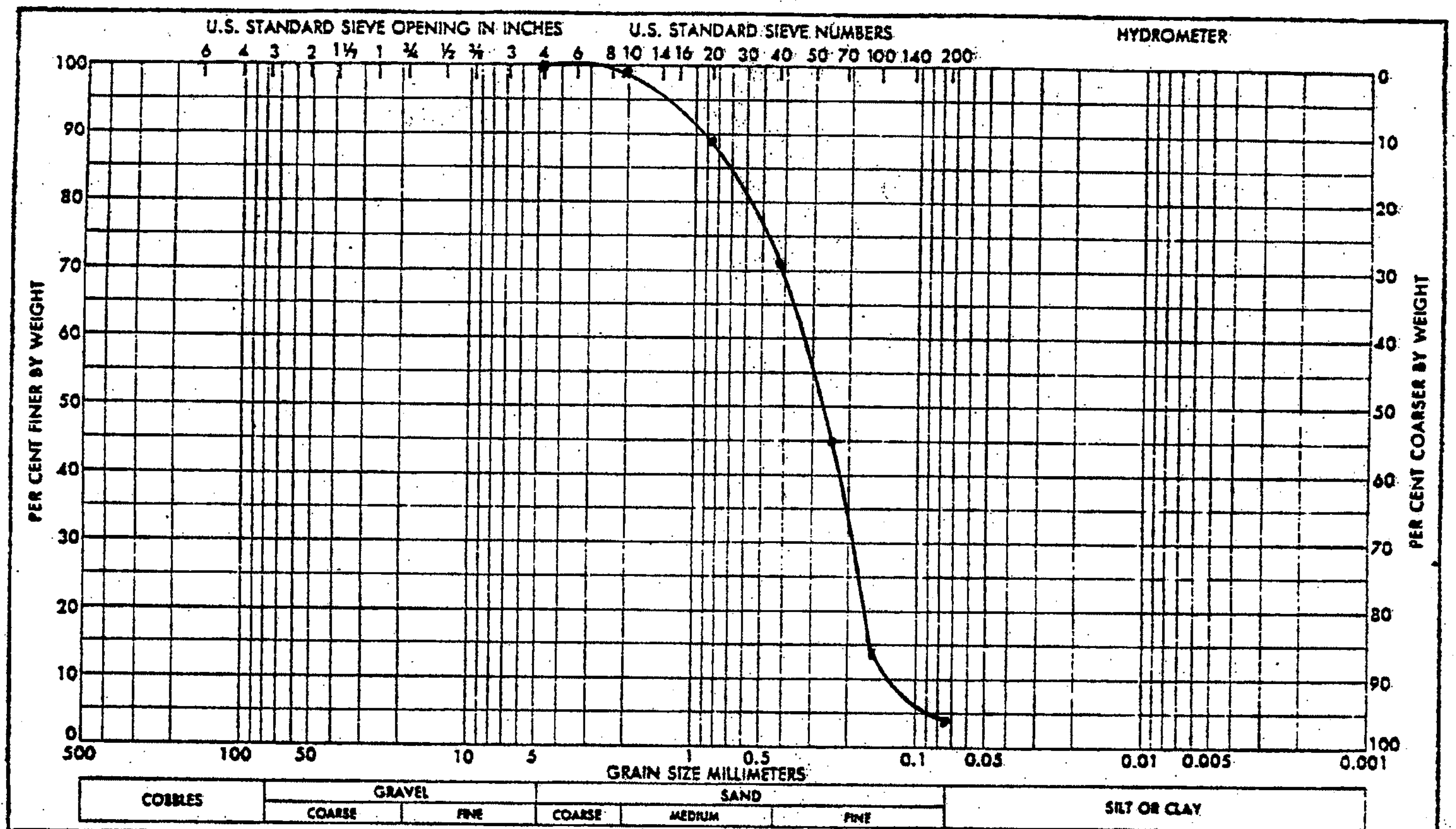
NOTE: SAMPLE SIEVED OVER #4 BEFORE TESTING

DIRECT SHEAR TEST

GULF POWER CO. - SMITH PLANT
50% FLY ASH, 50% BOTTOM ASH
(BY LOOSE VOLUME)

PENSACOLA TESTING LABORATORIES, INC.

REPORT NO: 55827



SAMPLE NO.	ELEV OF DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
		SMITH PLANT SAND				

GRADATION CURVES

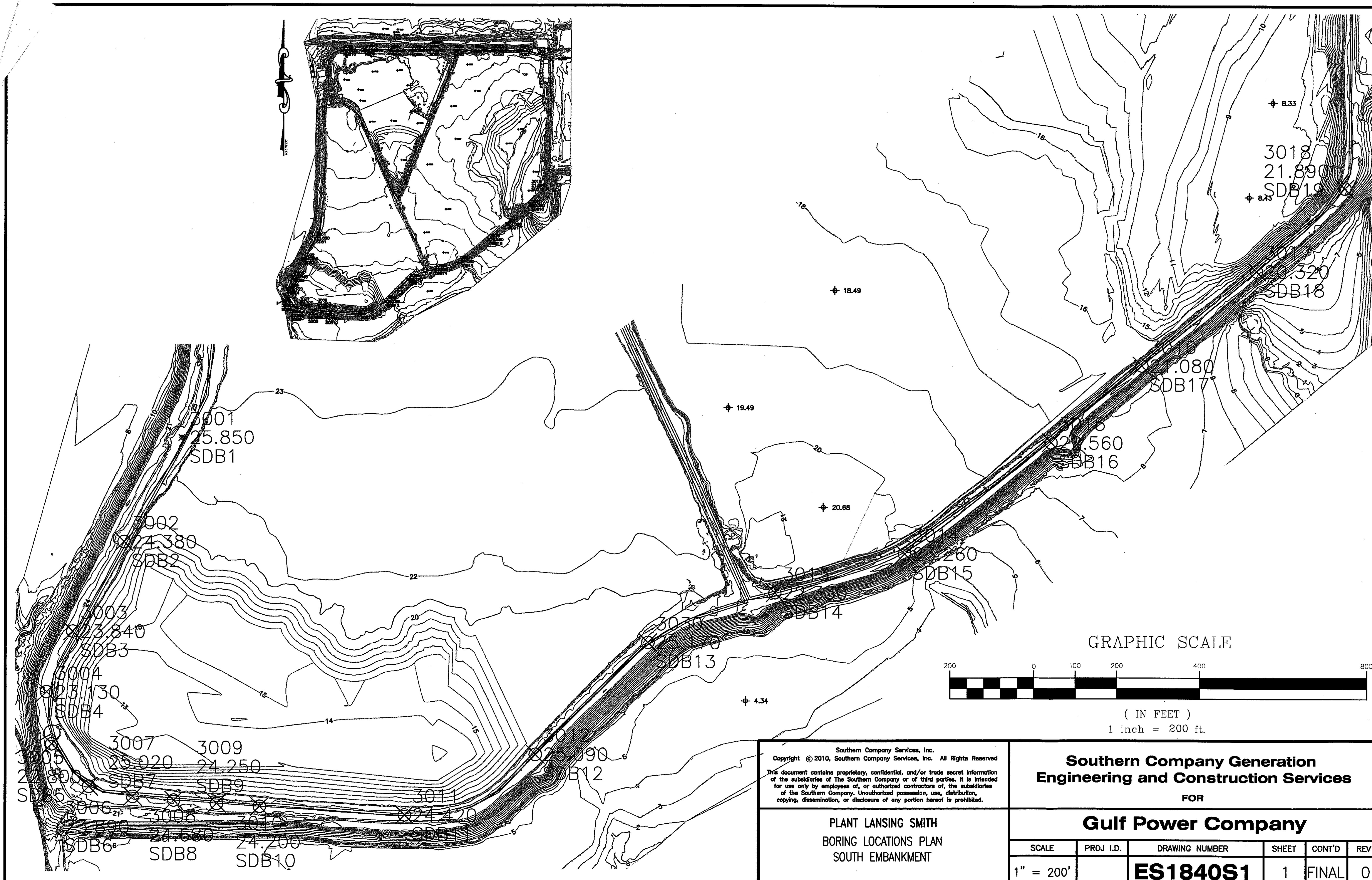
PROJECT GULF POWER COMPANY
SMITH PLANT, PANAMA CITY,

AREA

BORING NO.

DATE March 2, 1981

SIEVE SIZES:	# 4,	#10,	#20,	#40,	#60,	#100,	#200
% PASSING:	100	99.2	88.9	70.9	44.6	14.3	4.2



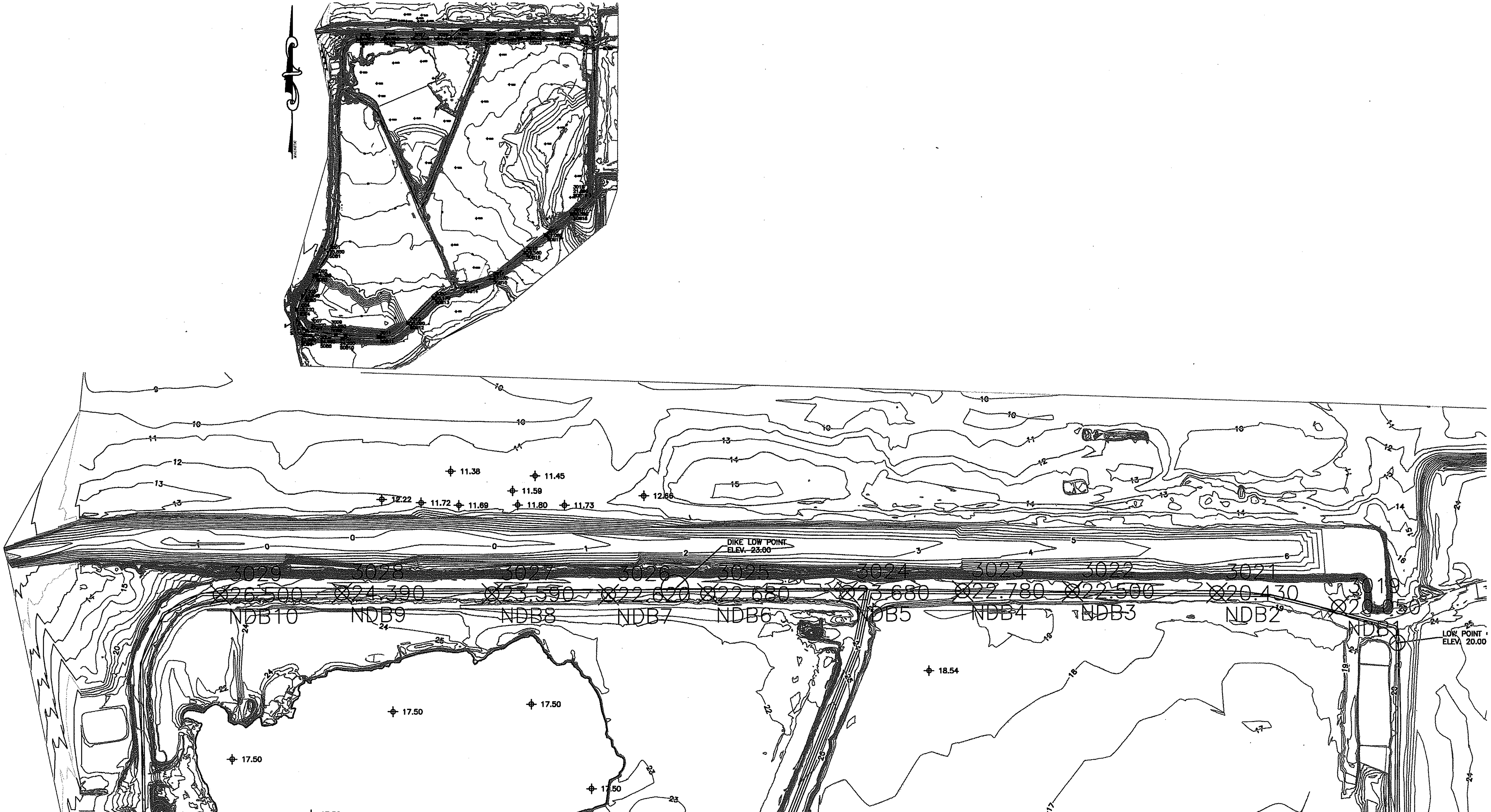
Southern Company Generation Engineering and Construction Services

FOR

Gulf Power Company

PLANT LANSING SMITH
BORING LOCATIONS PLAN
SOUTH EMBANKMENT

SCALE	PROJ I.D.	DRAWING NUMBER	SHEET	CONT'D	REV
1" = 200'		**ES1840S1**	1	FINAL	0



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Southern Company Generation Engineering and Construction Services

FOR

Gulf Power Company

PLANT LANSING SMITH
BORING LOCATIONS PLAN
NORTH EMBANKMENT

SCALE	PROJ I.D.	DRAWING NUMBER	SHEET	CONT'D	REV
1" = 200'		**ES1840S2**	2	FINAL	0

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/5/2010 **COMPLETED** 2/5/2010 **SURF. ELEV.** 20.1 **COORDINATES:** N 463,806.45 E 1,593,190.34
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 46 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Black, damp, no plasticity, Ash						
				SS -1	2.5-4.0	7-7-4 (11)	100	SG = 2.256. (MC = 59.9%; FC = 50.5%)
5				SS -2	4.5-6.0	2-2-2 (4)	100	
				SS -3	7.5-9.0	1-1-1 (2)	100	
10				SS -4	9.5-11.0	2-2-2 (4)	100	
15		**SP** - brown, moist, v loose to med dense, no plasticity	5.6	SS -5	14.5-16.0	5-2-7 (9)	100	
20		**SP-SM** - dark brown, moist, loose, medium to fine grain	0.6	SS -6	19.5-21.0	5-4-3 (7)	100	(MC = 17.5%; PL=NP; FC = 5.4%)
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike

LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP-SM - dark brown, moist, loose, medium to fine grain *(Con't)*		SS -7	24.5-26.0	5-2-3 (5)	100	
30				SS -8	29.5-31.0	5-4-6 (10)	100	
35		**SP-SC** - dark gray-brown, very moist, loose, medium to fine grain	-14.5	SS -9	34.5-36.0	WH-WH-WH (0)	100	(MC = 28.4%; LL = 33; PI=22; FC = 11.5%)
40				SS -10	39.5-41.0	2-3-3 (6)	100	
45		**SM** - brown, moist, medium dense, fine grain	-24.5	SS -11	44.5-46.0	3-5-7 (12)	100	(MC = 25%; PL=NP; FC = 18.7%)
			-26.0					
		Bottom of borehole at 46.0 feet.						
50								
55								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/23/10 10:52 - T:\ESEE MAJOR PROJECTS\PROJECTS\SMITH\SMITH 2010\ES1840_SMITH ASH POND DIKE\LOGS.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/7/2010 **COMPLETED** 2/7/2010 **SURF. ELEV.** 26.5 **COORDINATES:** N 463,831.86 E 1,590,826.98
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 51 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash	24.0					
		SP - brown, moist, medium dense, no plasticity	22.0	SS -1	2.5-4.0	5-6-5 (11)	100	
5		Gray, moist, no plasticity, Ash	19.0	SS -2	4.5-6.0	2-3-2 (5)	100	
		SP - brown, moist, v loose to med dense, no plasticity		SS -3	7.5-9.0	5-5-6 (11)	100	
10			12.0	SS -4	9.5-11.0	3-1-2 (3)	100	
15		Brown, moist, no plasticity, Ash	7.0	SS -5	14.5-16.0	3-1-1 (2)	100	SG = 2.411. (MC = 49.9%; FC = 95.7%)
20		**SP** - br/green, moist, v loose to med dense, no plasticity		SS -6	19.5-21.0	2-3-7 (10)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/green, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	5-5-6 (11)	100	
			-3.0					(MC = 23.5%; FC = 8.2%)
30		**SP-SM** - dark brown, moist, loose, no plasticity, medium to fine grain		SS -8	29.5-31.0	WH-1-1 (2)	100	
								(MC = 20.6%; PL=NP; FC = 11.9%)
35		Gray-brown, moist		SS -9	34.5-36.0	3-3-4 (7)	100	
			-13.0					(MC = 35.1%; LL = 36; PI=24; FC = 16.6%)
40		**SC** - gray-brown, wet, soft, medium plasticity, medium to fine grain		SS -10	39.5-41.0	WH-WH-WH (0)	100	
45				SS -11	44.5-46.0	7-3-6 (9)	100	
50			-24.5	SS -12	49.5-51.0	5-7-4 (11)	100	
		Bottom of borehole at 51.0 feet.						
55								

LOG OF TEST BORING

BORING NDB-2

SOUTHERN COMPANY

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/5/2010 **COMPLETED** 2/5/2010 **SURF. ELEV.** 20.4 **COORDINATES:** N 463,835.93 E 1,592,932.10
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash	18.4					
		SP - br/green, moist, v loose to med dense, no plasticity						
				SS -1	2.5-4.0	5-4-3 (7)	100	
5				SS -2	4.5-6.0	3-3-4 (7)	100	
				SS -3	7.5-9.0	2-1-1 (2)	100	
10				SS -4	9.5-11.0	1-WH-1 (1)	100	
15				SS -5	14.5-16.0	4-6-9 (15)	100	
20				SS -6	19.5-21.0	3-4-4 (8)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/green, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	2-2-3 (5)	100	
30				SS -8	29.6-31.1	WH-WH-WH (0)	100	
35			-15.6	SS -9	34.5-36.0	4-5-6 (11)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

BORING NDB-3

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/5/2010 **COMPLETED** 2/5/2010 **SURF. ELEV.** 22.5 **COORDINATES:** N 463,839.93 E 1,592,625.28
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** ______ **ANGLE** ______ **BEARING** ______
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** ______ **COMP.** ______ **DELAYED** 10.6 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		Gray, damp, no plasticity, Ash						
			18.5	SS-1	2.5-4.0	5-5-9 (14)	100	
5		**SP** - brown, moist, v loose to med dense, no plasticity		SS-2	4.5-6.0	4-2-3 (5)	100	
				SS-3	7.5-9.0	4-6-9 (15)	100	
10		▽		SS-4	9.5-11.0	2-1-1 (2)	100	
15				SS-5	14.5-16.0	1-2-3 (5)	100	
20				SS-6	19.5-21.0	5-10-11 (21)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	2-4-4 (8)	100	
30				SS -8	29.5-31.0	2-2-2 (4)	100	
35			-13.5	SS -9	34.5-36.0	2-1-1 (2)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/6/2010 **COMPLETED** 2/6/2010 **SURF. ELEV.** 22.8 **COORDINATES:** N 463,840.40 E 1,592,393.32
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	4-5-6 (11)	100	
5				SS -2	4.5-6.0	2-5-6 (11)	100	
				SS -3	7.5-9.0	1-1-2 (3)	100	
			13.3					
10		**SP** - br/green, moist, v loose to med dense, no plasticity		SS -4	9.5-11.0	2-2-2 (4)	100	
15				SS -5	14.5-16.0	WH-1-WH (1)	100	
20				SS -6	19.5-21.0	6-7-6 (13)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike

LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/green, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	3-3-1 (4)	100	
30				SS -8	29.5-31.0	2-2-2 (4)	100	
35			-13.2	SS -9	34.5-36.0	2-3-3 (6)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/6/2010 **COMPLETED** 2/6/2010 **SURF. ELEV.** 23.7 **COORDINATES:** N 463,836.87 E 1,592,150.07
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 56 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash	21.7					
		SP - brown, moist, medium dense, no plasticity	19.2	SS -1	2.5-4.0	10-13-6 (19)	100	
5		Gray, damp, no plasticity, Ash	16.2	SS -2	4.5-6.0	2-3-4 (7)	100	
		SP - br/tan, moist, v loose to med dense, no plasticity		SS -3	7.5-9.0	6-1-3 (4)	100	
10				SS -4	9.5-11.0	3-2-2 (4)	100	
15				SS -5	14.5-16.0	1-1-1 (2)	100	
20				SS -6	19.5-21.0	13-13-15 (28)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	2-1-2 (3)	100	
30				SS -8	29.5-31.0	3-2-3 (5)	100	
35				SS -9	34.5-36.0	2-1-3 (4)	100	
40				SS -10	39.5-41.0	1-WH-1 (1)	100	
45				SS -11	44.5-46.0	WH-WH-WH (0)	100	
50				SS -12	49.5-51.0	2-3-9 (12)	100	
55							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			-32.3	SS -13	54.5-56.0	9-6-9 (15)	100	
		Bottom of borehole at 56.0 feet.						
60								
65								
70								
75								
80								
85								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/6/2010 **COMPLETED** 2/6/2010 **SURF. ELEV.** 22.7 **COORDINATES:** N 463,834.23 E 1,591,854.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	6-8-5 (13)	100	
5		**SP** - brown, moist, v loose to med dense, no plasticity	18.2	SS -2	4.5-6.0	3-4-6 (10)	100	
				SS -3	7.5-9.0	3-3-3 (6)	100	
10				SS -4	9.5-11.0	3-2-1 (3)	100	
15				SS -5	14.5-16.0	WH-WH-1 (1)	100	
20				SS -6	19.5-21.0	5-7-7 (14)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	WH-1-1 (2)	100	
30				SS -8	29.5-31.0	WH-3-2 (5)	100	
35			-13.3	SS -9	34.5-36.0	2-2-1 (3)	100	
40		Bottom of borehole at 36.0 feet.						
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/7/2010 COMPLETED 2/7/2010 SURF. ELEV. 22.6 COORDINATES: N 463,832.41 E 1,591,645.19
CONTRACTOR SCS Field Services EQUIPMENT CME 55 METHOD Hollow Stem Auger
DRILLED BY S. Denty LOGGED BY G. Wilson CHECKED BY ANGLE BEARING
BORING DEPTH 36 ft. GROUND WATER DEPTH: DURING COMP. DELAYED
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	5-5-6 (11)	100	
			18.1					
5		**SP** - brown, moist, loose, no plasticity		SS -2	4.5-6.0	3-3-3 (6)	100	
			15.1					
		Gray, moist, no plasticity, Ash		SS -3	7.5-9.0	2-2-2 (4)	100	
10				SS -4	9.5-11.0	3-1-2 (3)	100	
15				SS -5	14.5-16.0	WH-WH-WH (0)	100	
			3.1					
20		**SP** - br/tan, moist, v loose to med dense, no plasticity		SS -6	19.5-21.0	7-9-12 (21)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	2-4-2 (6)	100	
30				SS -8	29.5-31.0	2-2-2 (4)	100	
35			-13.4	SS -9	34.5-36.0	2-1-2 (3)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
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55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/6/2010 **COMPLETED** 2/6/2010 **SURF. ELEV.** 23.6 **COORDINATES:** N 463,833.55 E 1,591,399.36
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** ____ **ANGLE** ____ **BEARING** ____
BORING DEPTH 51 ft. **GROUND WATER DEPTH: DURING** ____ **COMP.** ____ **DELAYED** 11.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	8-8-6 (14)	100	
5				SS -2	4.5-6.0	2-3-5 (8)	100	
				SS -3	7.5-9.0	8-7-6 (13)	100	
10				SS -4	9.5-11.0	3-2-2 (4)	100	
		▽						
15				SS -5	14.5-16.0	1-2-4 (6)	100	
			4.1					
20		**SP** - brown, moist, loose to med dense, no plasticity		SS -6	19.5-21.0	5-9-12 (21)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	4-5-7 (12)	100	
30				SS -8	29.5-31.0	3-2-3 (5)	100	
35			-12.4	SS -9	34.5-36.0	2-2-3 (5)	100	
40								
45								
50								
55		Bottom of borehole at 51.0 feet.						

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/7/2010 **COMPLETED** 2/7/2010 **SURF. ELEV.** 24.4 **COORDINATES:** N 463,835.25 E 1,591,082.74
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	5-9-7 (16)	100	
5				SS -2	4.5-6.0	6-9-15 (24)	100	
			16.9					
		SP - brown, moist, v loose to med dense, no plasticity		SS -3	7.5-9.0	3-2-3 (5)	100	
10				SS -4	9.5-11.0	1-2-1 (3)	100	
15				SS -5	14.5-16.0	1-1-1 (2)	100	
20				SS -6	19.5-21.0	5-8-10 (18)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	3-3-2 (5)	100	
30				SS -8	29.5-31.0	3-3-3 (6)	100	
35			-11.6	SS -9	34.5-36.0	WH-WH-1 (1)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
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55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 1/26/2010 **COMPLETED** 1/26/2010 **SURF. ELEV.** 25.9 **COORDINATES:** N 461,603.41 E 1,590,502.76
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** 12 ft. **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		ML - Dark gray, damp, no plasticity, fine grain, ASH		SS -1	2.5-4.0	4-7-9 (16)	100	
5				SS -2	4.5-6.0	4-5-7 (12)	100	
				UD -1	6.0-8.0		80	(MC = 90.7%; PL=NP; FC = 91.7%; Gravel = 0%; UW(d) = 40pcf) (Triaxial Test Performed) c' = 1.72 psi, effective phi = 44.0 degrees.
				SS -3	7.5-9.0	2-4-5 (9)	100	
10				SS -4	9.5-11.0	3-3-5 (8)	100	
		▼						
15				SS -5	14.5-16.0	2-2-3 (5)	100	
20				SS -6	19.5-21.0	2-3-4 (7)	100	
			1.4					
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, dense to very loose, no plasticity *(Con't)*		SS -7	24.5-26.0	12-18-17 (35)	100	
30				SS -8	29.5-31.0	5-7-9 (16)	100	
35			-10.2	SS -9	34.5-36.0	2-1-1 (2)	100	Organic odor in sample 34.5-36.0.
		Bottom of borehole at 36.0 feet.						
40								
45								
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55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/2/2010 **COMPLETED** 2/2/2010 **SURF. ELEV.** 24.2 **COORDINATES:** N 460,724.10 E 1,590,689.78
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	5-7-16 (23)	100	
5				SS -2	4.5-6.0	5-7-10 (17)	100	
				SS -3	7.5-9.0	3-4-7 (11)	100	
10				SS -4	9.5-11.0	2-4-7 (11)	100	
15				SS -5	14.5-16.0	2-1-2 (3)	100	
			4.7					
20		**SP** - gray, moist, very loose, no plasticity		SS -6	19.5-21.0	WH-WH-WH (0)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike

LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, very loose, no plasticity *(Con't)*		SS -7	24.5-26.0	3-1-3 (4)	100	
30				SS -8	29.5-31.0	WH-2-2 (4)	100	Samples change to BR with an organic odor @ 29.5.
35			-11.8	SS -9	34.5-36.0	4-2-4 (6)	100	
40		Bottom of borehole at 36.0 feet.						
45								
50								
55								

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/3/2010 **COMPLETED** 2/3/2010 **SURF. ELEV.** 24.4 **COORDINATES:** N 460,704.86 E 1,591,035.58
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 51 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	5-4-4 (8)	100	
5				SS -2	4.5-6.0	3-2-2 (4)	100	
				UD -1	6.0-8.0		50	
				SS -3	7.5-9.0	3-3-4 (7)	100	
10				SS -4	9.5-11.0	2-4-2 (6)	100	
15				SS -5	14.5-16.0	WH-1-1 (2)	100	
20		**SP** - gray/tan/br, moist, v. loose to med dense, no plasticity	4.9	SS -6	19.5-21.0	3-3-5 (8)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray/tan/br, moist, v. loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	7-7-10 (17)	100	
30				SS -8	29.5-31.0	WR-WR-WR (0)	100	Samples change to BR with an organic odor @ 29.5.
35				SS -9	34.5-36.0	3-1-2 (3)	100	
40				SS -10	39.5-41.0	3-2-1 (3)	100	
45				SS -11	44.5-46.0	6-10-12 (22)	100	
50			-26.6	SS -12	49.5-51.0	5-5-6 (11)	100	
55		Bottom of borehole at 51.0 feet.						

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/3/2010 **COMPLETED** 2/3/2010 **SURF. ELEV.** 25.1 **COORDINATES:** N 460,849.17 E 1,591,348.74
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	1-1-2 (3)	100	
5				SS -2	4.5-6.0	2-2-2 (4)	100	
				SS -3	7.5-9.0	3-3-3 (6)	100	
10				SS -4	9.5-11.0	2-1-1 (2)	100	
15			9.1	SS -5	14.5-16.0	4-9-3 (12)	100	
		SP - br/tan, moist, v loose to med dense, no plasticity						
20				SS -6	19.5-21.0	5-3-2 (5)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	8-11-9 (20)	100	
30				SS -8	29.5-31.0	WH-WH-WH (0)	100	
35			-10.9	SS -9	34.5-36.0	WH-WH-2 (2)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
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55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/3/2010 **COMPLETED** 2/3/2010 **SURF. ELEV.** 25.2 **COORDINATES:** N 461,115.90 E 1,591,617.65
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	3-3-1 (4)	100	
5				SS -2	4.5-6.0	4-6-9 (15)	100	
			17.7					
		SP - br/tan, moist, v loose to med dense, no plasticity		SS -3	7.5-9.0	3-9-12 (21)	100	
10				SS -4	9.5-11.0	3-4-11 (15)	100	
15				SS -5	14.5-16.0	3-2-2 (4)	100	
20				SS -6	19.5-21.0	WH-WH-WH (0)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike

LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	4-3-2 (5)	100	
30				SS -8	29.5-31.0	WH-WH-1 (1)	100	
35				SS -9	34.5-36.0	4-8-9 (17)	100	
			-10.8					
		Bottom of borehole at 36.0 feet.						
40								
45								
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55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/3/2010 **COMPLETED** 2/3/2010 **SURF. ELEV.** 22.3 **COORDINATES:** N 461,235.12 E 1,591,921.88
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 12.6 ft. after 96 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	16-24-50 (74)	100	
5		**SP** - br/tan, moist, v loose to med dense, no plasticity	17.8	SS -2	4.5-6.0	8-12-13 (25)	100	
				SS -3	7.5-9.0	4-9-10 (19)	100	
10				SS -4	9.5-11.0	2-1-1 (2)	100	
		▼						
15		**SP-SM** - light brown, moist, very loose, medium to fine grain	7.8	SS -5	14.5-16.0	WR-WR-WR (0)	100	SG = 2.641. (MC = 21.4%; PL=NP; FC = 8%)
20		Medium dense		SS -6	19.5-21.0	5-7-6 (13)	100	(MC = 16.4%; PL=NP; FC = 8.4%)
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP-SM - light brown, moist, very loose, medium to fine grain *(Con't)*		SS -7	24.5-26.0	3-2-2 (4)	100	
30				SS -8	29.5-31.0	3-5-6 (11)	100	
35			-13.7	SS -9	34.5-36.0	4-5-6 (11)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/3/2010 **COMPLETED** 2/3/2010 **SURF. ELEV.** 23.3 **COORDINATES:** N 461,328.25 E 1,592,233.03
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	5-6-6 (12)	100	
			18.8					
5		**SP** - br/tan, moist, loose, no plasticity		SS -2	4.5-6.0	2-3-6 (9)	100	
			15.8					
		Gray, damp, no plasticity, Ash		SS -3	7.5-9.0	7-10-7 (17)	100	
			13.8					
10		**SP** - br/tan, moist, v. loose to med dense, no plasticity		SS -4	9.5-11.0	7-9-8 (17)	100	
15				SS -5	14.5-16.0	3-6-11 (17)	100	
20				SS -6	19.5-21.0	3-5-10 (15)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v. loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	WH-WH-2 (2)	100	
30				SS -8	29.5-31.0	WH-2-2 (4)	100	
35			-12.7	SS -9	34.5-36.0	WH-2-3 (5)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/4/2010 **COMPLETED** 2/4/2010 **SURF. ELEV.** 22.6 **COORDINATES:** N 461,594.53 E 1,592,582.70
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	2-6-5 (11)	100	
			18.1					
5		**SP** - br/tan, moist, very loose to med dense, no plasticity		SS -2	4.5-6.0	2-3-3 (6)	100	
				SS -3	7.5-9.0	2-7-6 (13)	100	
10				SS -4	9.5-11.0	4-4-5 (9)	100	
15				SS -5	14.5-16.0	2-2-2 (4)	100	
20				SS -6	19.5-21.0	6-13-11 (24)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, very loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	2-2-2 (4)	100	
30				SS -8	29.5-31.0	3-3-2 (5)	100	
35			-13.4	SS -9	34.5-36.0	WH-WH-1 (1)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/4/2010 **COMPLETED** 2/4/2010 **SURF. ELEV.** 21.1 **COORDINATES:** N 461,779.10 E 1,592,801.56
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 56 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	11-10-7 (17)	100	
			16.6					
5		**SP** - gray/tan/br, moist, v. loose to med dense, no plasticity		SS -2	4.5-6.0	3-4-7 (11)	100	
				SS -3	7.5-9.0	3-3-2 (5)	100	
10				SS -4	9.5-11.0	1-1-1 (2)	100	
15				SS -5	14.5-16.0	1-1-1 (2)	100	
20				SS -6	19.5-21.0	7-12-5 (17)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray/tan/br, moist, v. loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	4-4-5 (9)	100	
30				SS -8	29.5-31.0	WH-WH-WH (0)	100	
35				SS -9	34.5-36.0	WH-WH-1 (1)	100	
40		**SC** - br/green, moist, very soft, no plasticity	-18.4	SS -10	39.5-41.0	WH-WH-WH (0)	100	
45		**SP** - tan/gray, moist, v. loose to med dense, no plasticity	-23.4	SS -11	44.5-46.0	WH-WH-WH (0)	100	
50				SS -12	49.5-51.0	WH-1-1 (2)	100	
55							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike

LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			-34.9	SS -13	54.5-56.0	5-7-7 (14)	100	
		Bottom of borehole at 56.0 feet.						
60								
65								
70								
75								
80								
85								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/4/2010 **COMPLETED** 2/4/2010 **SURF. ELEV.** 20.3 **COORDINATES:** N 462,004.37 E 1,593,077.05
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** ____ **ANGLE** ____ **BEARING** ____
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** ____ **COMP.** ____ **DELAYED** ____
NOTES ____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash	18.3					
		SP - br/tan, moist, v loose to loose, no plasticity						
				SS -1	2.5-4.0	12-5-6 (11)	100	
5				SS -2	4.5-6.0	1-1-2 (3)	100	
				SS -3	7.5-9.0	2-1-1 (2)	100	
10				SS -4	9.5-11.0	WH-WH-WH (0)	100	
15				SS -5	14.5-16.0	3-3-2 (5)	100	
20				SS -6	19.5-21.0	4-2-1 (3)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to loose, no plasticity *(Con't)*		SS -7	24.5-26.0	3-3-2 (5)	100	
30				SS -8	29.5-31.0	WH-WH-WH (0)	100	
35			-15.7	SS -9	34.5-36.0	WH-WH-WH (0)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/4/2010 **COMPLETED** 2/4/2010 **SURF. ELEV.** 21.9 **COORDINATES:** N 462,202.56 E 1,593,286.97
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 9.4 ft. after 72 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	20-11-8 (19)	100	
			17.4					
5		**SP** - br/tan, moist, medium dense, no plasticity		SS -2	4.5-6.0	4-4-7 (11)	100	
			14.4					
		Gray, damp, no plasticity, Ash		SS -3	7.5-9.0	4-5-7 (12)	100	
		▽	12.4					
10		**SP** - br/tan, moist, v loose to med dense, no plasticity		SS -4	9.5-11.0	2-2-9 (11)	100	
15				SS -5	14.5-16.0	WH-WH-1 (1)	100	
20				SS -6	19.5-21.0	4-5-7 (12)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - br/tan, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	WH-1-1 (2)	100	
30				SS -8	29.5-31.0	WH-WH-WH (0)	100	Samples change to BR with an organic odor @ 29.5.
35			-14.1	SS -9	34.5-36.0	WH-WH-WH (0)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 1/26/2010 **COMPLETED** 1/26/2010 **SURF. ELEV.** 24.4 **COORDINATES:** N 461,354.03 E 1,590,365.23
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** ____ **ANGLE** ____ **BEARING** ____
BORING DEPTH 66 ft. **GROUND WATER DEPTH: DURING** ____ **COMP.** 12.4 ft. **DELAYED** ____
NOTES ____

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
	ML - gray, wet, no plasticity, ASH		SS -1	2.5-4.0	5-3-3 (6)	100	
5			SS -2	4.5-6.0	5-6-8 (14)	100	SG = 2.172. (MC = 78.2%; PL=NP; FC = 79.2%)
			SS -3	7.5-9.0	4-5-8 (13)	100	
10			SS -4	9.5-11.0	3-6-11 (17)	100	SG = 2.219. (MC = 76.4%; PL=NP; FC = 91.2%)
15			SS -5	14.5-16.0	2-1-1 (2)	100	
20	**SC** - dark brown, moist, loose, no plasticity, medium to fine grain	4.9	SS -6	19.5-21.0	3-2-3 (5)	100	(MC = 27.5%; PL=NP; FC = 13.6%)
25		-0.1				100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, medium dense, medium to fine grain *(Con't)*		SS -7	24.5-26.0	5-4-6 (10)	100	
								(MC = 18.8%; FC = 4.9%)
30				SS -8	29.5-31.0	5-9-9 (18)	100	
35		**SC** - dark brown, moist, very loose, medium to fine grain	-10.1	SS -9	34.5-36.0	1-1-1 (2)	100	
								SG = 2.643. (MC = 23.4%; FC = 17.1%)
40				SS -10	39.5-41.0	WH-WH-WH (0)	100	
45				SS -11	44.5-46.0	WH-WH-WH (0)	100	
								SG = 2.681. (MC = 34.1%; LL = 55; PI=29; FC = 60%)
50		**CH** - light brown, moist, very soft, medium plasticity	-25.1	SS -12	49.5-51.0	WH-WH-WH (0)	100	
55			-30.1				100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SM - light brown, moist, very loose, low plasticity, fine grain *(Con't)*		SS -13	54.5-56.0	WH-WH-WH (0)	100	
60				SS -14	59.5-61.0	WH-WH-2 (2)	100	(MC = 26.8%; LL = 25; PI=24; FC = 29.3%)
65		Light gray brown, medium dense, no plasticity	-41.6	SS -15	64.5-66.0	3-4-8 (12)	100	(MC = 24.2%; PL=NP; FC = 30%)
		Bottom of borehole at 66.0 feet.						
70								
75								
80								
85								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 1/27/2010 **COMPLETED** 1/27/2010 **SURF. ELEV.** 23.8 **COORDINATES:** N 461,139.87 E 1,590,242.76
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 66 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		ML - damp, no plasticity, fine grain, ASH						
				SS -1	2.5-4.0	3-2-2 (4)	100	
			19.3					
5		**SP-SM** - brown, moist, very loose, no plasticity, medium to fine grain		SS -2	4.5-6.0	2-1-2 (3)	100	
								(MC = 9.2%; FC = 7.4%)
				SS -3	7.5-9.0	2-1-1 (2)	100	
10				SS -4	9.5-11.0	2-1-1 (2)	100	
			9.3					(MC = 19.9%; PL=NP; FC = 3.3%)
15		**SP** - brown, moist, loose, no plasticity, medium to fine grain, sand sized metal fragments and trace clay in sample		SS -5	14.5-16.0	3-3-3 (6)	100	
			4.3					
20		**SP-SM** - brown, moist, very loose to loose, no plasticity, medium to fine grain		SS -6	19.5-21.0	5-4-3 (7)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP-SM - brown, moist, very loose to loose, no plasticity, medium to fine grain *(Con't)*		SS -7	24.5-26.0	8-3-3 (6)	100	
								(MC = 15.7%; PL=NP; FC = 7.9%)
30				SS -8	29.5-31.0	5-4-5 (9)	100	
35				SS -9	34.5-36.0	WH-WH-2 (2)	100	
40				SS -10	39.5-41.0	WH-WH-WH (0)	100	
45				SS -11	44.5-46.0	WH-WH-WH (0)	100	
			-25.7					SG = 2.613. (MC = 20.5%; LL = 39; PI=18; FC = 19%)
50		**SC** - gray, moist, very loose, low plasticity, medium to fine grain		SS -12	49.5-51.0	WH-3-2 (5)	100	
55							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SC - gray, moist, very loose, low plasticity, medium to fine grain *(Con't)*		SS -13	54.5-56.0	WH-WH-WH (0)	100	
			-35.7					(MC = 29.4%; FC = 37.5%)
60		**SM** - brown, moist, loose to med dense, no plasticity, fine grain		SS -14	59.5-61.0	WH-3-4 (7)	100	
65			-42.2	SS -15	64.5-66.0	4-5-6 (11)	100	
		Bottom of borehole at 66.0 feet.						
70								
75								
80								
85								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 1/28/2010 **COMPLETED** 1/28/2010 **SURF. ELEV.** 23.1 **COORDINATES:** N 460,995.33 E 1,590,180.20
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES ALL SAMPLES LOST

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		Black, damp, medium stiff, no plasticity, Ash						
				SS -1	2.5-4.0	3-2-3 (5)	100	
5				SS -2	4.5-6.0	3-1-2 (3)	100	
			15.6					Organic odor in samples 7.5-36.
		SP - brown, moist, v. loose to loose, no plasticity		SS -3	7.5-9.0	WH-WH-1 (1)	100	
10				SS -4	9.5-11.0	WH-WH-WH (0)	100	
15				SS -5	14.5-16.0	WH-WH-1 (1)	100	
20				SS -6	19.5-21.0	4-4-4 (8)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - brown, moist, v. loose to loose, no plasticity *(Con't)*		SS -7	24.5-26.0	5-5-6 (11)	100	
30				SS -8	29.5-31.0	3-2-2 (4)	100	
35			-12.9	SS -9	34.5-36.0	1-WH-WH (0)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/23/10 10:53 - T:\ESEE MAJOR PROJECTS\PROJECTS\SMITH\SMITH 2010\ES1840_SMITH ASH POND DIKE\LOGS.GPJ

BORING SDB-5

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/1/2010 **COMPLETED** 2/1/2010 **SURF. ELEV.** 22.8 **COORDINATES:** N 460,871.34 E 1,590,192.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 56 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	2-2-4 (6)	100	
			18.3					
5		**SP** - moist, very loose to m dense, no plasticity		SS -2	4.5-6.0	2-2-2 (4)	100	
				SS -3	7.5-9.0	WH-WH-1 (1)	100	
10				SS -4	9.5-11.0	1-1-WH (1)	100	
15				SS -5	14.5-16.0	WH-WH-4 (4)	100	
20				SS -6	19.5-21.0	4-4-5 (9)	100	
25							100	

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - moist, very loose to m dense, no plasticity *(Con't)*		SS -7	24.5-26.0	3-3-3 (6)	100	
			-6.7					Samples change to BR with an organic odor @ 29.5.
30				SS -8	29.5-31.0	4-2-3 (5)	100	
								% Loss on Ingnition = 1.5%. (MC = 23%; FC = 16.1%)
35		**SC** - dark gray, very loose, medium to fine grain		SS -9	34.5-36.0	WH-WH-WH (0)	100	
40				SS -10	39.5-41.0	WH-WH-WH (0)	100	
								% Loss on Ignition = 1.6%. (MC = 21.3%; FC = 14.2%)
45				SS -11	44.5-46.0	WH-WH-WH (0)	100	
50				SS -12	49.5-51.0	WH-3-5 (8)	100	
			-28.2					
								% Loss on Ignition = 0.8%.
55		**SP-SC** - dark gray, medium dense, medium to					100	(MC = 19.5%; FC = 10.5%)

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		fine grain	-33.2	SS -13	54.5-56.0	4-5-7 (12)	100	
		Bottom of borehole at 56.0 feet.						
60								
65								
70								
75								
80								
85								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/1/2010 **COMPLETED** 2/1/2010 **SURF. ELEV.** 23.9 **COORDINATES:** N 460,771.33 E 1,590,281.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 14.9 ft. after 144 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	2-2-3 (5)	100	
5				SS -2	4.5-6.0	1-2-2 (4)	100	
				UD -1	6.0-8.0		100	
				SS -3	7.5-9.0	3-2-2 (4)	100	
10				SS -4	9.5-11.0	2-2-3 (5)	100	
15	▽			SS -5	14.5-16.0	3-4-9 (13)	100	
			4.4					
20		**SP** - gray, moist, loose to v loose, no plasticity		SS -6	19.5-21.0	3-4-6 (10)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, loose to v loose, no plasticity *(Con't)*		SS -7	24.5-26.0	3-3-3 (6)	100	
30				SS -8	29.5-31.0	WH-WH-3 (3)	100	Samples change to BR with an organic odor @ 29.5.
35			-12.1	SS -9	34.5-36.0	WH-WH-1 (1)	100	
40		Bottom of borehole at 36.0 feet.						
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/2/2010 **COMPLETED** 2/2/2010 **SURF. ELEV.** 25.0 **COORDINATES:** N 460,747.71 E 1,590,386.33
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	4-5-7 (12)	100	
5				SS -2	4.5-6.0	3-4-4 (8)	100	
				SS -3	7.5-9.0	3-3-4 (7)	100	
10				SS -4	9.5-11.0	2-3-3 (6)	100	
15				SS -5	14.5-16.0	3-2-2 (4)	100	
20				SS -6	19.5-21.0	1-WH-WH (0)	100	
			0.5					
25		**SP** - gray, moist, v loose to loose, no plasticity					100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, v loose to loose, no plasticity *(Con't)*		SS -7	24.5-26.0	WH-WH-2 (2)	100	
30				SS -8	29.5-31.0	WH-2-3 (5)	100	Samples change to BR with an organic odor @ 29.5.
35			-11.0	SS -9	34.5-36.0	2-1-4 (5)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/2/2010 **COMPLETED** 2/2/2010 **SURF. ELEV.** 24.7 **COORDINATES:** N 460,738.70 E 1,590,484.15
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS -1	2.5-4.0	4-4-6 (10)	100	
5				SS -2	4.5-6.0	4-4-3 (7)	100	
				UD -1	6.0-8.0		100	(MC = 97.6%; PL=NP; FC = 97.6%; UW(d) = 43pcf) c' = 3.86 psi, effective phi = 38.6 degrees, c = 6.19 psi, total phi = 41.6 degrees.
				SS -3	7.5-9.0	3-3-5 (8)	100	
10				SS -4	9.5-11.0	1-3-4 (7)	100	
15				SS -5	14.5-16.0	1-1-1 (2)	100	
20		**SP** - gray, moist, v loose to med dense, no plasticity	5.2	SS -6	19.5-21.0	WH-WH-1 (1)	100	Samples change to BR with an organic odor @ 19.5.
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, v loose to med dense, no plasticity *(Con't)*		SS -7	24.5-26.0	7-6-6 (12)	100	
30				SS -8	29.5-31.0	3-2-2 (4)	100	
35			-11.3	SS -9	34.5-36.0	2-2-2 (4)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

BORING SDB-9

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DATE STARTED 2/2/2010 **COMPLETED** 2/2/2010 **SURF. ELEV.** 24.3 **COORDINATES:** N 460,731.12 E 1,590,586.95
CONTRACTOR SCS Field Services **EQUIPMENT** CME 55 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** G. Wilson **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gray, damp, no plasticity, Ash						
				SS-1	2.5-4.0	6-4-5 (9)	100	
5				SS-2	4.5-6.0	3-2-6 (8)	100	
				SS-3	7.5-9.0	3-2-3 (5)	100	
			14.8					
10		**SP** - gray, moist, loose, no plasticity		SS-4	9.5-11.0	2-2-3 (5)	100	
15				SS-5	14.5-16.0	1-WH-1 (1)	100	
20				SS-6	19.5-21.0	WH-WH-2 (2)	100	
25							100	

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Smith Ash Pond Dike
LOCATION Plant Smith

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SP - gray, moist, loose, no plasticity *(Con't)*		SS -7	24.5-26.0	7-2-3 (5)	100	
30				SS -8	29.5-31.0	3-3-5 (8)	100	
35			-11.8	SS -9	34.5-36.0	3-3-2 (5)	100	
		Bottom of borehole at 36.0 feet.						
40								
45								
50								
55								

MACTEC

March 23, 2010

Ms. Rachel Mudd, P.E.
Southern Company Services
42 Inverness Center Parkway
Bin B426
Birmingham, AL 35242

Telephone No.: (205) 992-5860
E-mail: ramudd@southernco.com

Subject: **Laboratory Test Results**
Plant Smith-Ash Pond
Southport, Florida
SCS Project No: ECS3389
MACTEC Project No. 6189-10-9004

Ms. Mudd:

At your request, MACTEC Engineering & Consulting Services, Inc. (MACTEC) has performed CU Triaxial Tests with pore pressure measurements and classification tests (grain size, hydrometer, and Atterberg limit test) on soil samples delivered to our Birmingham office by Southern Company on Wednesday - February 24, 2010 and Friday February 26, 2010. We understand that the soil samples provided were collected by Southern Company from various ash pond dikes within the Plant Smith property limits and transported to MACTEC's laboratory.

The samples consisted of three intact samples (IS) and twenty-six standard penetration tests (SPT) samples. Two of the three IS samples were designated by Southern Company for CU Triaxial Testing and the third was sent as a backup. Sufficient sample was not obtained from one of the IS assigned for testing (SDB-8), so we had to use the backup.

The CU Triaxial tests were performed in general accordance with ASTM D-4767, Atterberg limits tests were performed in general accordance with ASTM D-4318, grain size distributions were performed in general accordance with ASTM D-422, ASTM D-854 & ASTM D-1140, the natural moisture content test was performed in accordance with ASTM D-2216, and the organic content was performed in general accordance with ASTM D-2974. See attached test results.

We appreciate the opportunity to assist you and look forward to serving you again. If you have any questions regarding the test results, please call.

Sincerely,

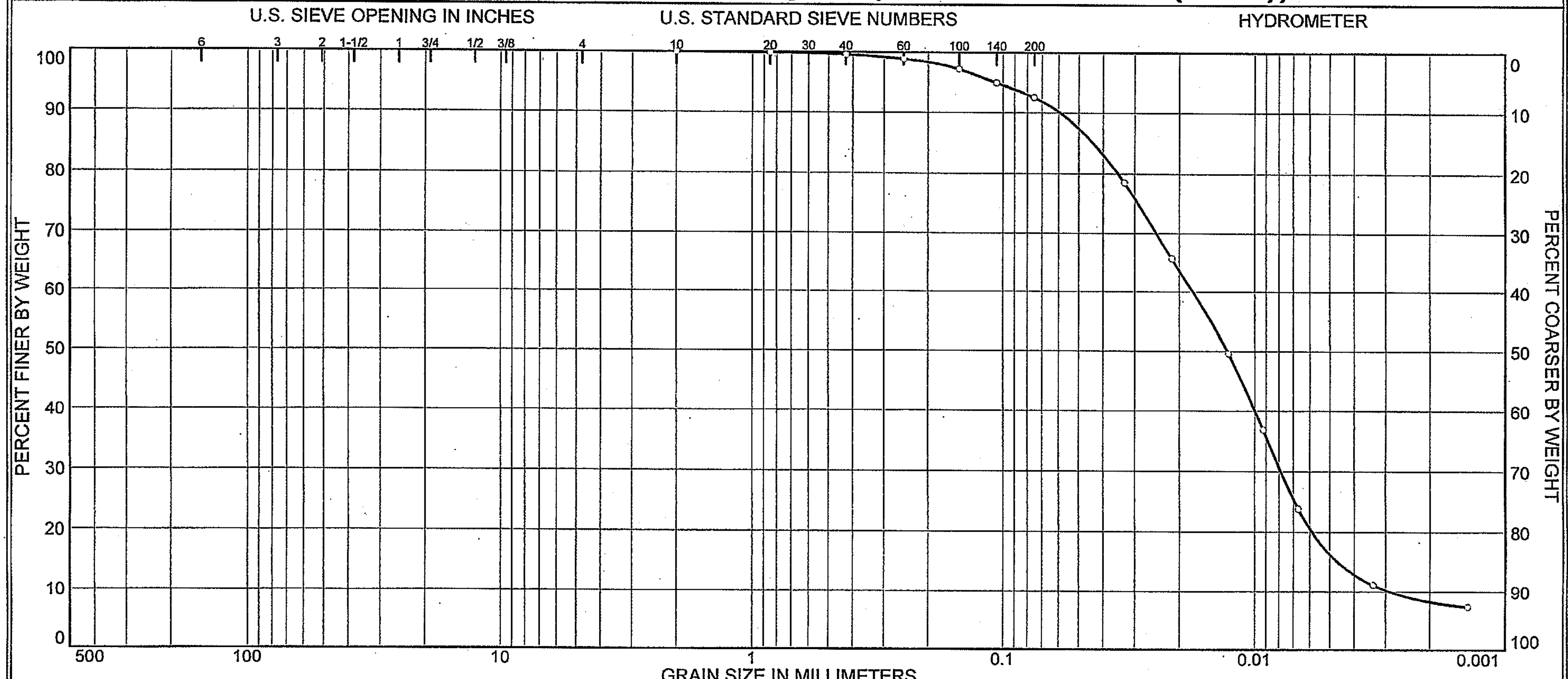
MACTEC ENGINEERING AND CONSULTING, INC.

Chris Garrett, E.I.T.
Staff Professional

Luther H. Boudra, P.E.
Senior Principal Engineer

Attachments: Laboratory Test Results

Particle Size Distribution Report (ASTM D6913-04 (2009))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.0	0.4	7.0	76.3	16.3

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	SDB-1	UD	6-8 ft	2/26/10	ML	Dark Gray Silt (Fly Ash)	97.6	NV	NP

Client

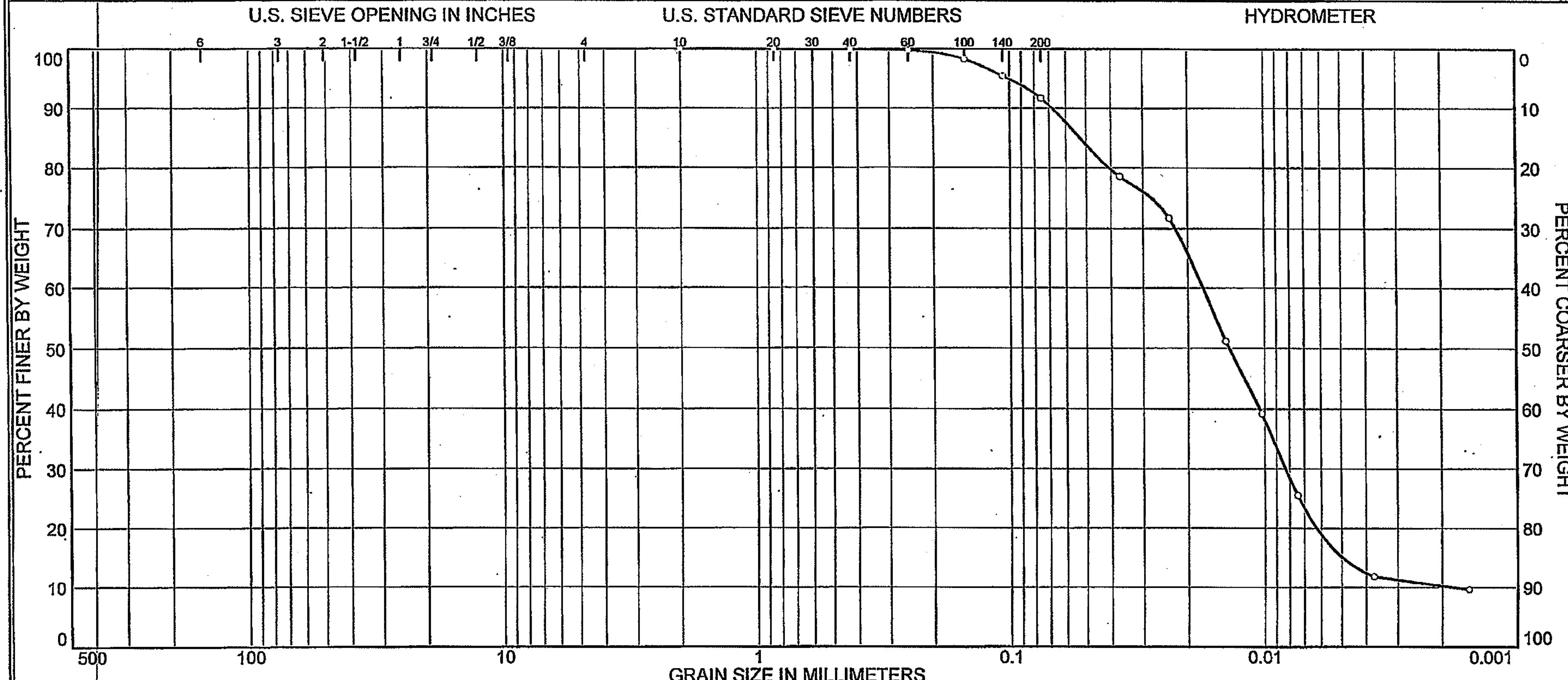
Project Plant Smith Ash Pond

Project No. 6189-09-9046 | Lab No. 10093

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422-63 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	0.0	0.0	0.0	0.1	8.2	76.5	15.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	SDB-1	UD	6-8 ft	2/26/10	ML	Dark Gray Silt (Fly Ash)	90.7	NV	NP

Client
Project Plant Smith Ash Pond

Project No. 6189-09-9046 10092

MACTEC ENGINEERING AND CONSULTING, INC.

O Tested By: EH Reviewed By: JW JW

MACTEC

SPECIFIC GRAVITY OF SOILS

ASTM D854-06

Project No.	6189-09-9046	**Tested By**	EH
Project Name	Plant Smith Ash Pond	**Test Date**	3/19/2010
Boring No.	SDB-1	**Reviewed By**	JW
Sample No.	UD	**Review Date**	3/23/2010
Sample Depth	6-8 ft	**Lab No.**	10092
Sample Description	Fly Ash		

Pan No. C-15

Tare No.	B-6
Tare Mass, gram	223.71
Dry Soil + Tare Mass, grams	258.81
Mass of oven-dried soil, grams, M_s	35.10
Mass of pycnometer with water at test temperature (T), grams, $M_{pw,t}$	339.69
Mass of pycnometer, water and soil, grams, $M_{pws,t}$	359.02
Test Temperature, °C , T_t	24.3
Specific Gravity at test temperature, M_s / [$M_{pw,t}$ - ($M_{pws,t}$ - M_s)], G_t	2.226
Temperature Coefficient, K	0.99902
SPECIFIC GRAVITY @ 20°C: $G_{20}\,{}^{o}C = K*G_t$	**2.22**

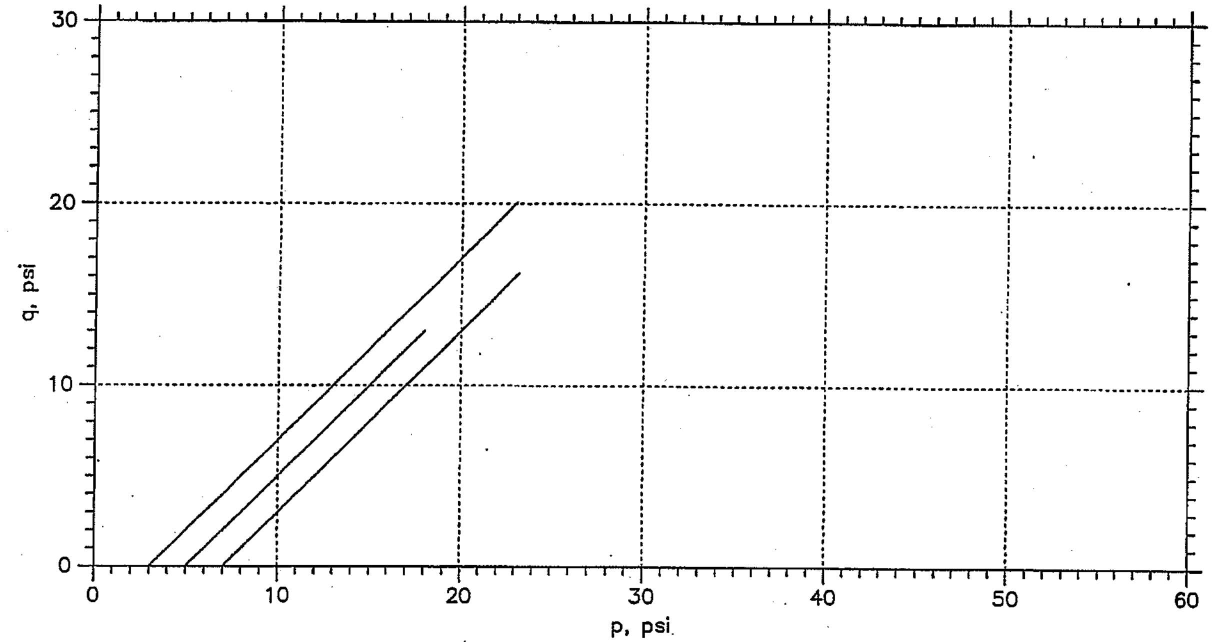
PREPARATION METHOD: [ ] Method A, Wet [x] Method B, Dry

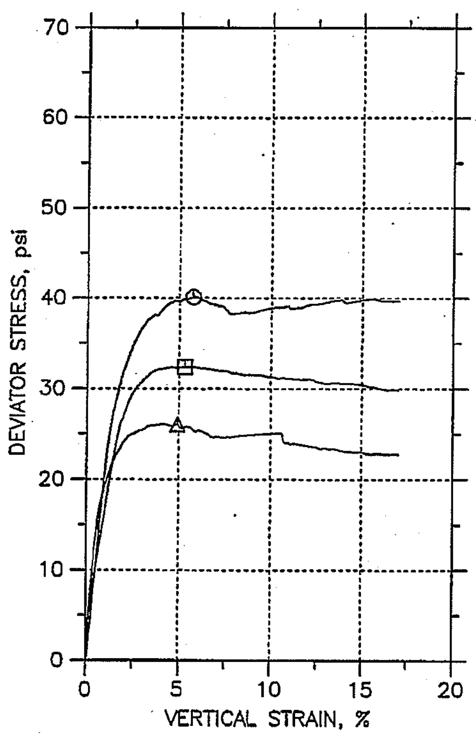
EQUIPMENT USED	I.D	Calibrated Mass, g	Measured Mass, g	Difference, g
SCALE	418			
OVEN	144			
THERMOMETER	2866			
PYCNOMETER	2053	90.28	90.28	0

Difference should be less than 0.06 g, or use a different pycnometer.

REMARKS:

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

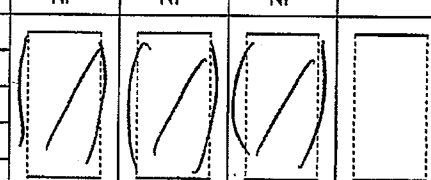




Symbol		○	△	□	
Sample No.		UD	UD	UD	
Test No.		10092.1	10092.2	10092.3	
Depth		6-8 ft	6-8 ft	6-8 ft	
Initial	Diameter, in	2.86	2.849	2.874	
	Height, in	5.964	5.939	5.541	
	Water Content, %	98.2	113.0	107.1	
	Dry Density, pcf	43.4	39.27	40.39	
	Saturation, %	99.4	99.2	97.8	
	Void Ratio	2.19	2.53	2.43	
Before Shear	Water Content, %	98.3	113.3	109.0	
	Dry Density, pcf	43.55	39.42	40.53	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	2.18	2.52	2.42	
	Back Press., psi	75.99	102.	112.	
Ver. Eff. Cons. Stress, psi		3.002	4.996	7.004	
Shear Strength, psi		20.04	13.01	16.18	
Strain at Failure, %		5.76	4.93	5.33	
Strain Rate, %/min		0.03	0.03	0.03	
B-Value		0.96	0.96	0.96	
Measured Specific Gravity		2.22	2.22	2.22	
Liquid Limit		NP	NP	NP	
Plastic Limit		NP	NP	NP	

MACTEC

Project: Plant Smith Ash Pond
Location: SDB-1
Project No.: 6189099046
Boring No.: SDB-1
Sample Type: Undisturbed
Description: Dark Gray Silt (Fly Ash)
Remarks: ASTM D4767-04



Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

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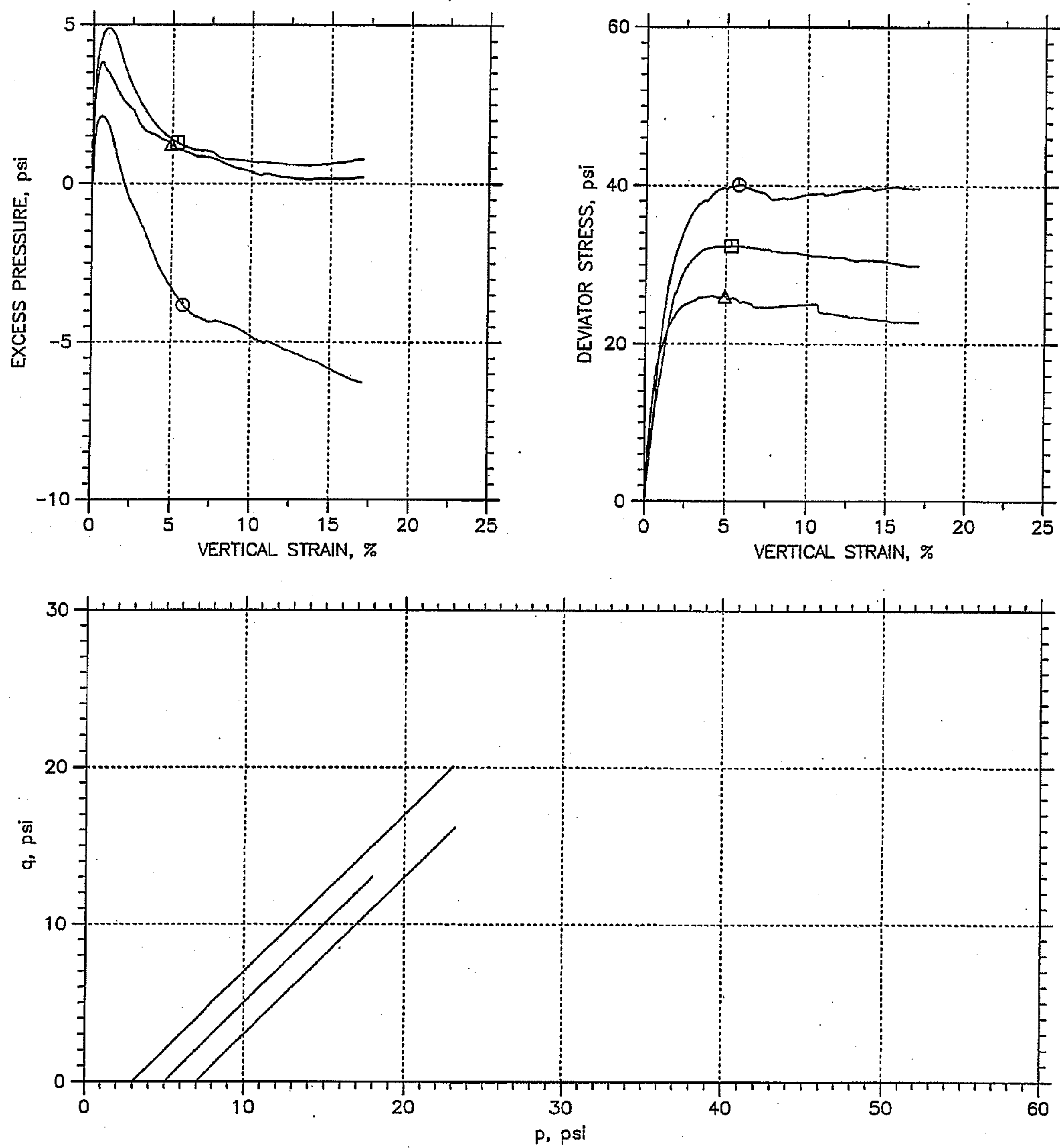
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

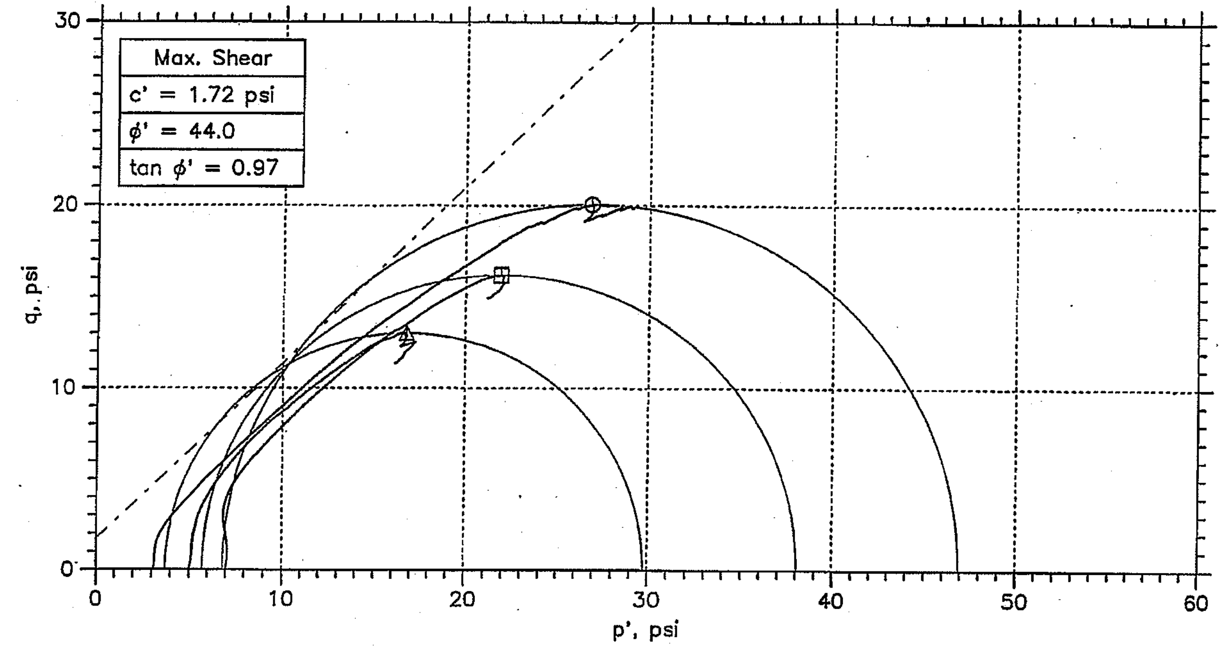


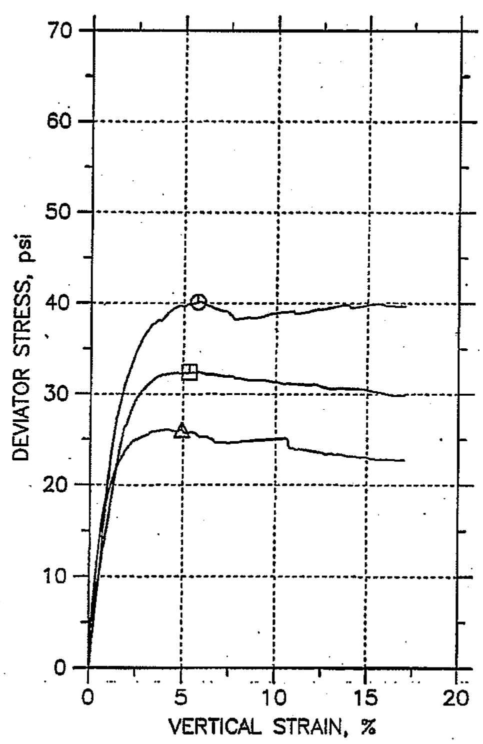
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	UD	10092.1	6-8 ft	JW	2/26/10			10092.1_2581.dat
△	UD	10092.2	6-8 ft	JW	UD			10092.2_2582.dat
⊡	UD	10092.3	6-8 ft	JW	2/26/10			10092.3_2583.dat

MACTEC			
	Project: Plant Smith Ash Pond	Location: SDB-1	Project No.: 6189099046
	Boring No.: SDB-1	Sample Type: Undisturbed	
	Description: Dark Gray Silt (Fly Ash)		
	Remarks: ASTM D4767-04		

Wed, 24-MAR-2010 14:28:45

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

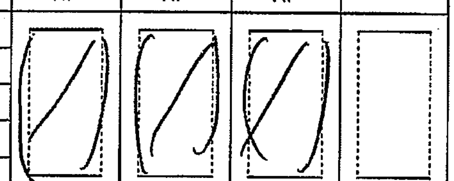




Symbol		○	△	⊡	
Sample No.		UD	UD	UD	
Test No.		10092.1	10092.2	10092.3	
Depth		6-8 ft	6-8 ft	6-8 ft	
Initial	Diameter, in	2.86	2.849	2.874	
	Height, in	5.964	5.939	5.541	
	Water Content, %	98.2	113.0	107.1	
	Dry Density, pcf	43.4	39.27	40.39	
	Saturation, %	99.4	99.2	97.8	
	Void Ratio	2.19	2.53	2.43	
Before Shear	Water Content, %	98.3	113.3	109.0	
	Dry Density, pcf	43.55	39.42	40.53	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	2.18	2.52	2.42	
	Back Press., psi	75.99	102.	112.	
Ver. Eff. Cons. Stress, psi		3.002	4.996	7.004	
Shear Strength, psi		20.04	13.01	16.18	
Strain at Failure, %		5.76	4.93	5.33	
Strain Rate, %/min		0.03	0.03	0.03	
B-Value		0.96	0.96	0.96	
Measured Specific Gravity		2.22	2.22	2.22	
Liquid Limit		NP	NP	NP	
Plastic Limit		NP	NP	NP	

MACTEC

Project: Plant Smith Ash Pond
Location: SDB-1
Project No.: 6189099046
Boring No.: SDB-1
Sample Type: Undisturbed
Description: Dark Gray Silt (Fly Ash)
Remarks: ASTM D4767-04



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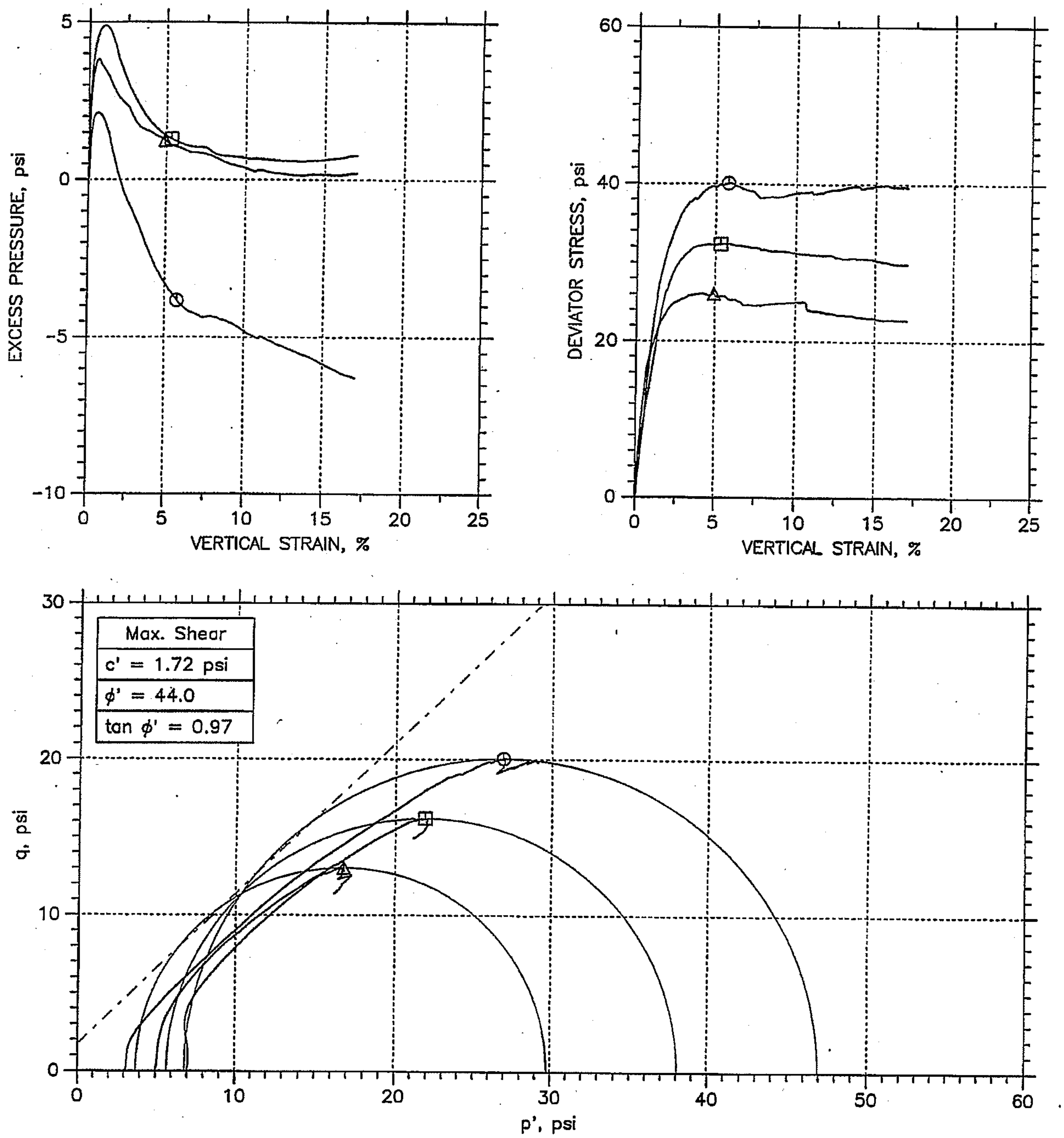
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD	10092.1	6-8 ft	JW	2/26/10			10092.1_2581.dat
△	UD	10092.2	6-8 ft	JW	UD			10092.2_2582.dat
□	UD	10092.3	6-8 ft	JW	2/26/10			10092.3_2583.dat

MACTEC			
	Project: Plant Smith Ash Pond	Location: SDB-1	Project No.: 6189099046
	Boring No.: SDB-1	Sample Type: Undisturbed	
	Description: Dark Gray Silt (Fly Ash)		
	Remarks: ASTM D4767-04		

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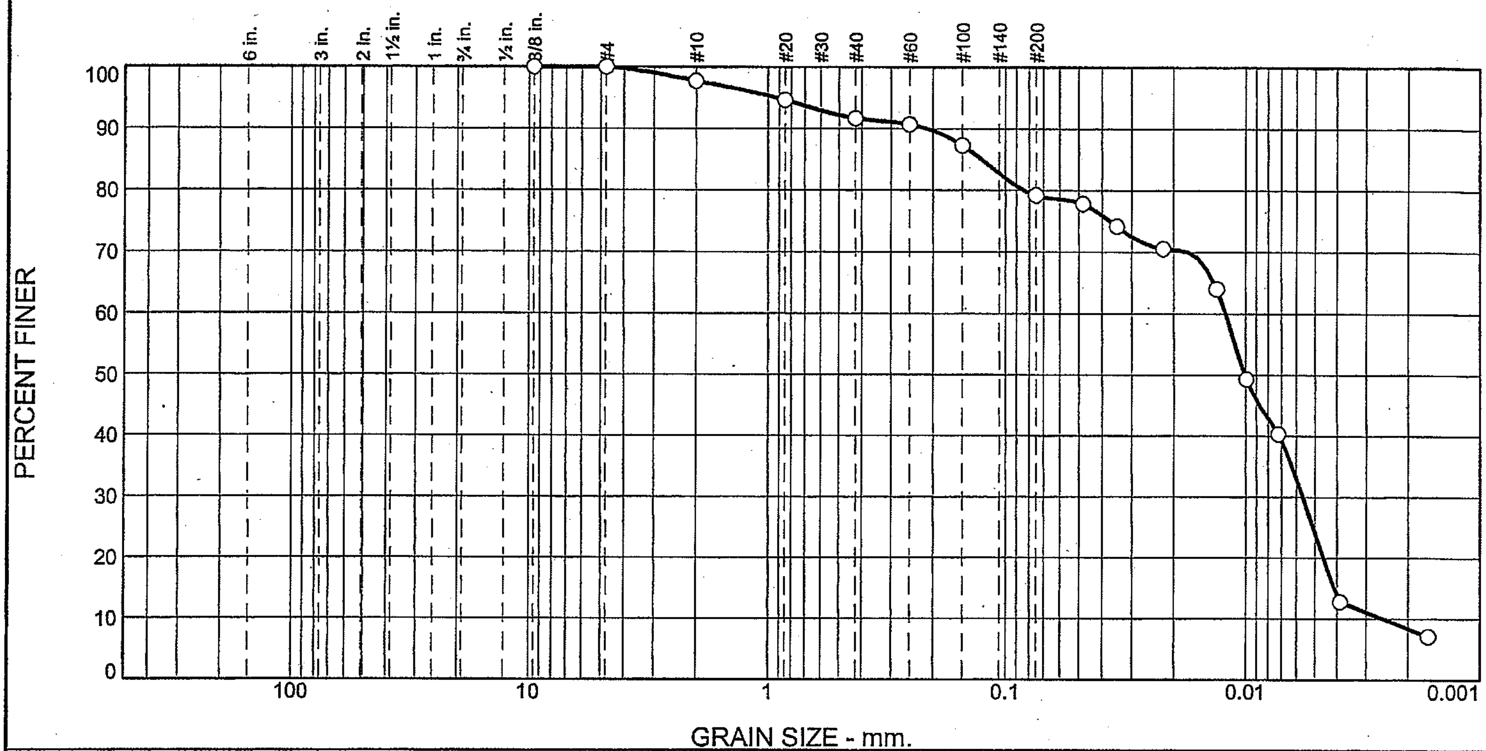
Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.3	6.1	12.4	55.0	24.2

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	97.7		
#20	94.7		
#40	91.6		
#60	90.7		
#100	87.3		
#200	79.2		
0.0480 mm.	77.8		
0.0345 mm.	74.2		
0.0222 mm.	70.5		
0.0132 mm.	64.0		
0.0099 mm.	49.3		
0.0072 mm.	40.3		
0.0039 mm.	12.8		
0.0016 mm.	7.1		

* (no specification provided)

Material Description

Gray Ash

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NP **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.2115 D_{85}= 0.1254 D_{60}= 0.0122
D_{50}= 0.0101 D_{30}= 0.0056 D_{15}= 0.0041
D_{10}= 0.0025 C_u= 4.80 C_c= 1.03

Remarks

Percent Natural Moisture: 78.2%
Specific Gravity: 2.172

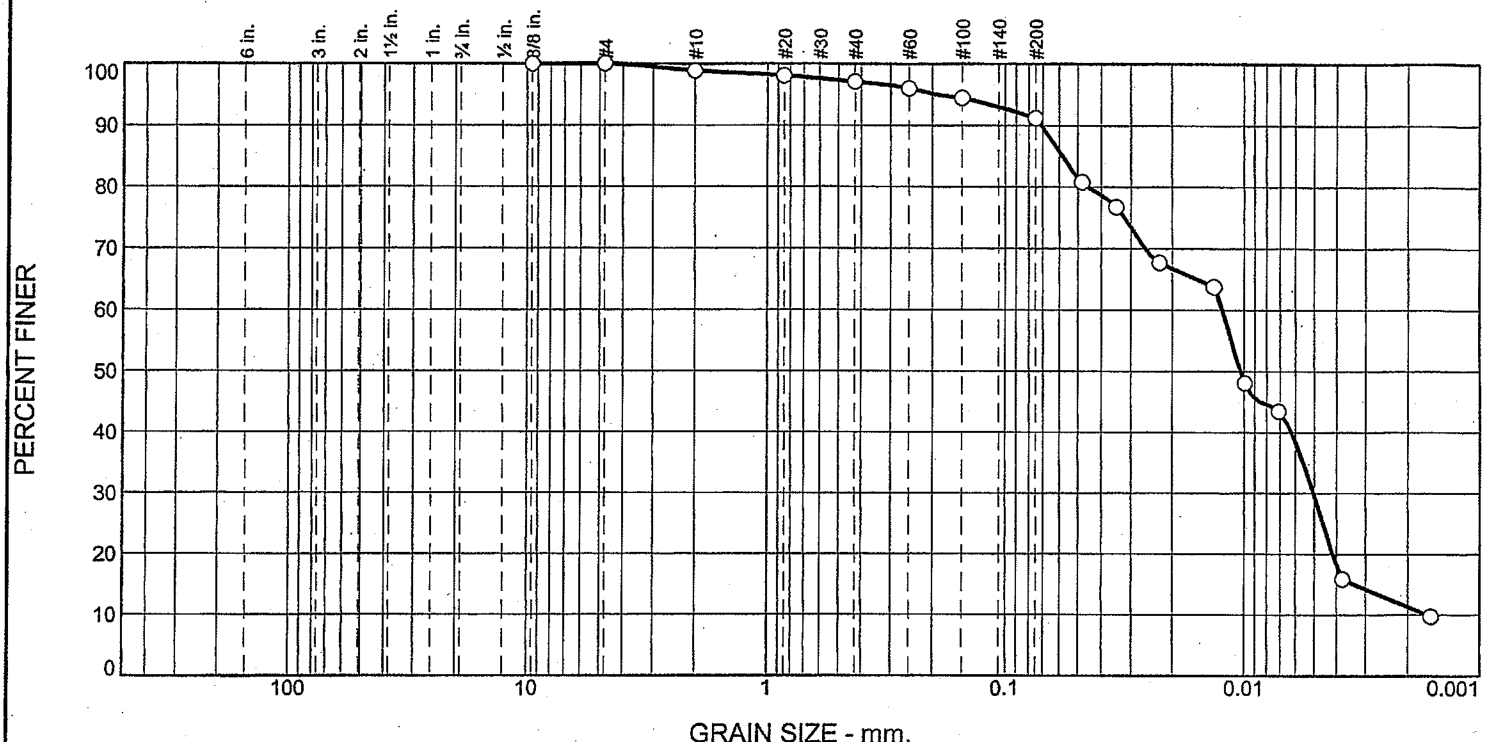
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rami Sukhwani
Title:

Source of Sample: Boring No.: SDB-2 **Depth:** 4.5'-6.0' **Date Sampled:**
Sample Number: SS-2

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	1.8	5.9	61.5	29.7

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	98.9		
#20	98.1		
#40	97.1		
#60	96.0		
#100	94.5		
#200	91.2		
0.0479 mm.	80.8		
0.0345 mm.	76.7		
0.0227 mm.	67.7		
0.0133 mm.	63.8		
0.0099 mm.	48.0		
0.0071 mm.	43.5		
0.0038 mm.	15.9		
0.0016 mm.	9.7		

* (no specification provided)

Material Description

Gray Ash

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=**

Coefficients

D_{90}= 0.0708 D_{85}= 0.0581 D_{60}= 0.0123
D_{50}= 0.0104 D_{30}= 0.0050 D_{15}= 0.0033
D_{10}= 0.0017 C_u= 7.44 C_c= 1.24

Remarks

Percent Natural Moisture: 76.4%
Specific Gravity: 2.219

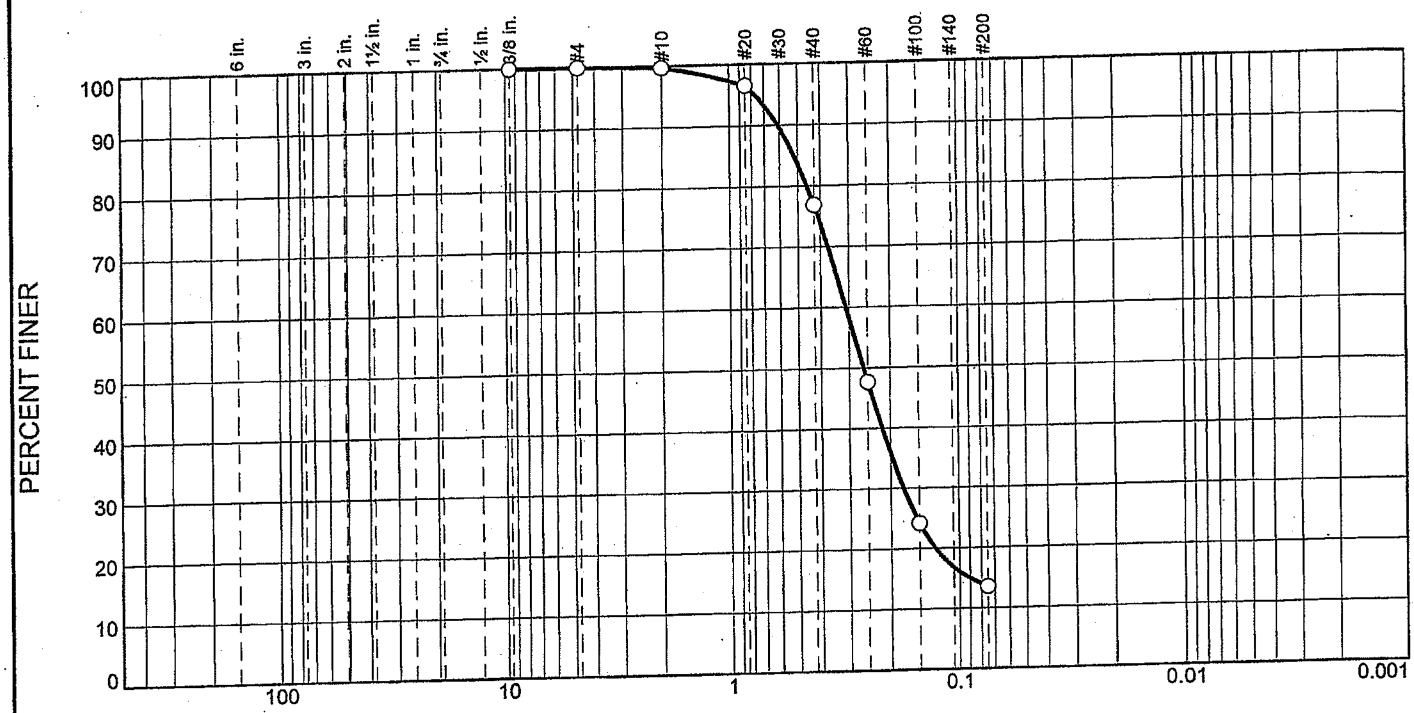
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rajni Sukhwani
Title:

Source of Sample: Boring No.: SDB-2 **Depth:** 9.5'-11.0' **Date Sampled:**
Sample Number: SS-4

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	22.8	63.3	13.6	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	96.5		
#40	76.9		
#60	47.6		
#100	24.2		
#200	13.6		

* (no specification provided)

Material Description

Dark Brown Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SC AASHTO (M 145)=

Coefficients

D_{90}= 0.6102 D_{85}= 0.5192 D_{60}= 0.3100
D_{50}= 0.2607 D_{30}= 0.1755 D_{15}= 0.0901
D_{10}= C_u= C_c=

Remarks

Percent Moisture: 27.5%

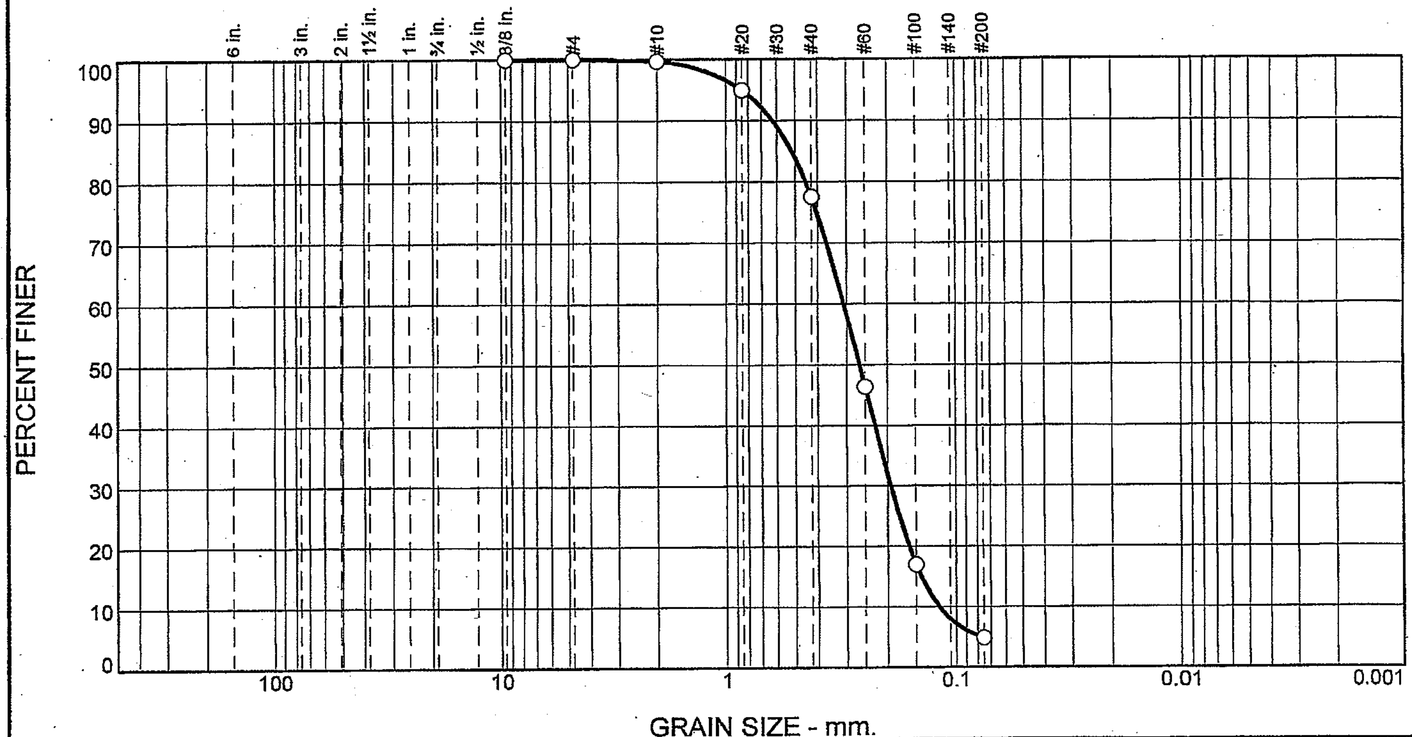
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hart
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SDB-2 **Depth:** 19.5'-21.0' **Date Sampled:**
Sample Number: SS-6

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 JAX, FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	22.2	72.6	4.9	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	95.0		
#40	77.5		
#60	46.4		
#100	17.0		
#200	4.9		

* (no specification provided)

Material Description

Brown Medium to Fine SAND with a Trace of Clay

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP AASHTO (M 145)=

Coefficients

D_{90}= 0.6251 D_{85}= 0.5175 D_{60}= 0.3088
D_{50}= 0.2642 D_{30}= 0.1934 D_{15}= 0.1423
D_{10}= 0.1191 C_u= 2.59 C_c= 1.02

Remarks

Percent Natural Moisture: 18.8%
F.M.=1.38

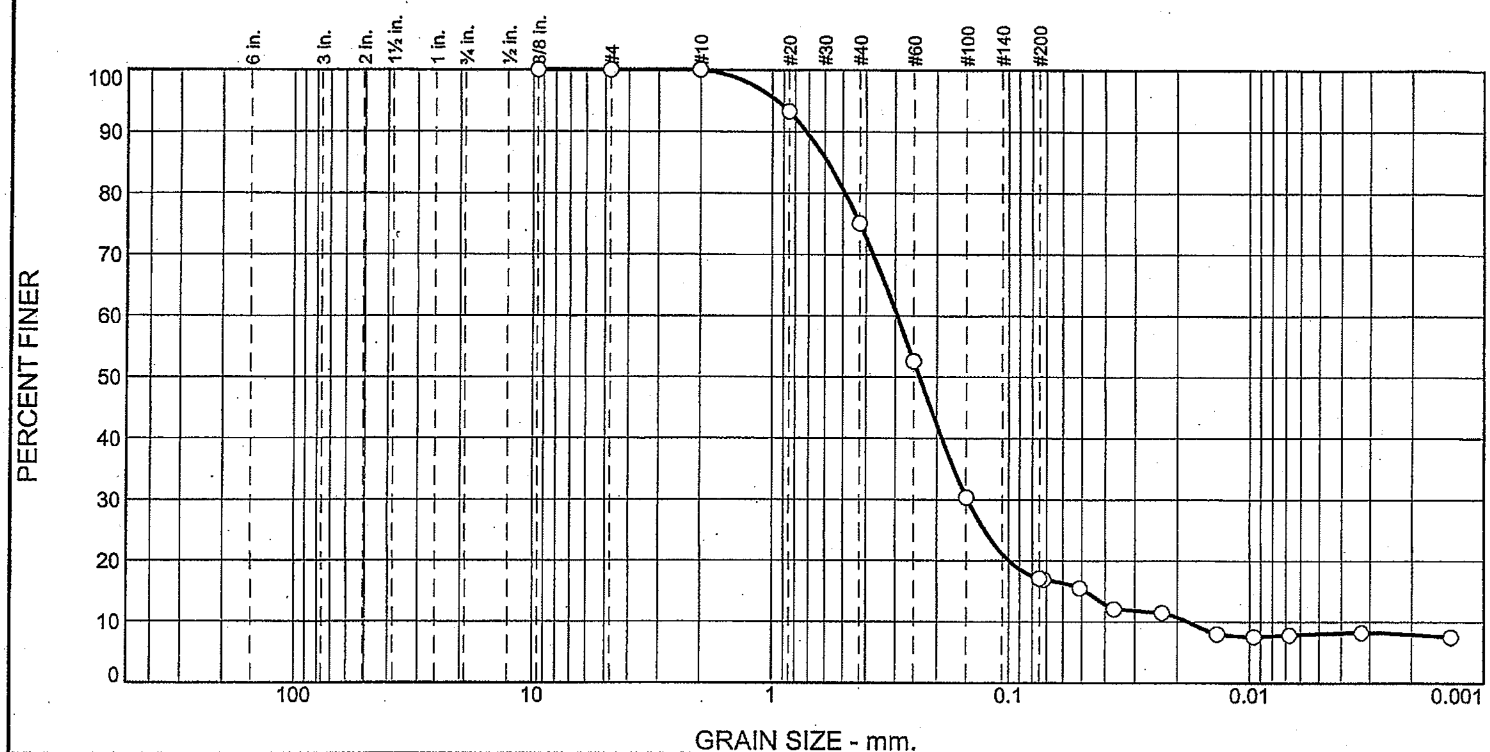
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: M Gallo
Title: Project Engineer 3/16/10

Source of Sample: Boring No.: SDB-2 **Depth:** 29.5'-31.0' **Date Sampled:**
Sample Number: SS-8

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	24.9	58.0	9.1	8.0

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	93.3		
#40	75.1		
#60	52.6		
#100	30.4		
#200	17.1		
0.0717 mm.	16.9		
0.0510 mm.	15.5		
0.0366 mm.	12.1		
0.0232 mm.	11.4		
0.0136 mm.	8.0		
0.0096 mm.	7.5		
0.0067 mm.	7.8		
0.0033 mm.	8.2		
0.0014 mm.	7.5		

* (no specification provided)

Material Description

Dark Brown Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.7153 D_{85}= 0.5812 D_{60}= 0.2942
D_{50}= 0.2367 D_{30}= 0.1485 D_{15}= 0.0483
D_{10}= 0.0181 C_u= 16.26 C_c= 4.14

Remarks

Percent Natural Moisture: 23.4%
Specific Gravity: 2.643

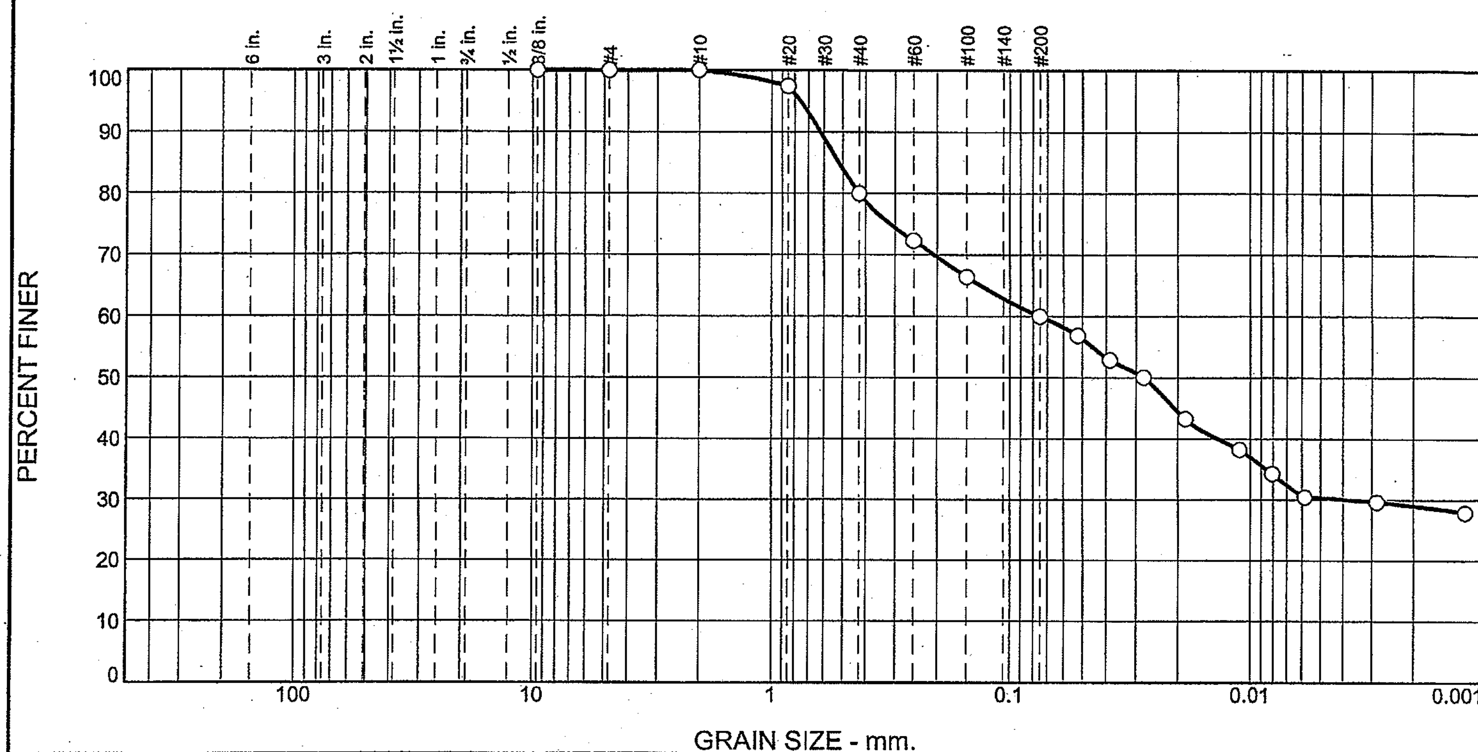
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rajni Sukhwani
Title:

Source of Sample: Boring No.: SDB-2 **Depth:** 39.5'-41.0' **Date Sampled:**
Sample Number: SS-10

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 Jax FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	20.0	20.0	29.7	30.3

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	97.4		
#40	80.0		
#60	72.2		
#100	66.4		
#200	60.0		
0.0523 mm.	56.8		
0.0384 mm.	52.8		
0.0278 mm.	50.0		
0.0186 mm.	43.2		
0.0111 mm.	38.2		
0.0081 mm.	34.3		
0.0058 mm.	30.5		
0.0029 mm.	29.6		
0.0012 mm.	27.9		

* (no specification provided)

Material Description

Light Brown Very Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 26 LL= 55 PI= 29

Classification

USCS (D 2487)= CH AASHTO (M 145)= A-7-6(15)

Coefficients

D_{90}= 0.6211 D_{85}= 0.5194 D_{60}= 0.0754
D_{50}= 0.0279 D_{30}= 0.0038 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 34.1%
Specific Gravity: 2.681

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Rajni Sukhwani

Title:

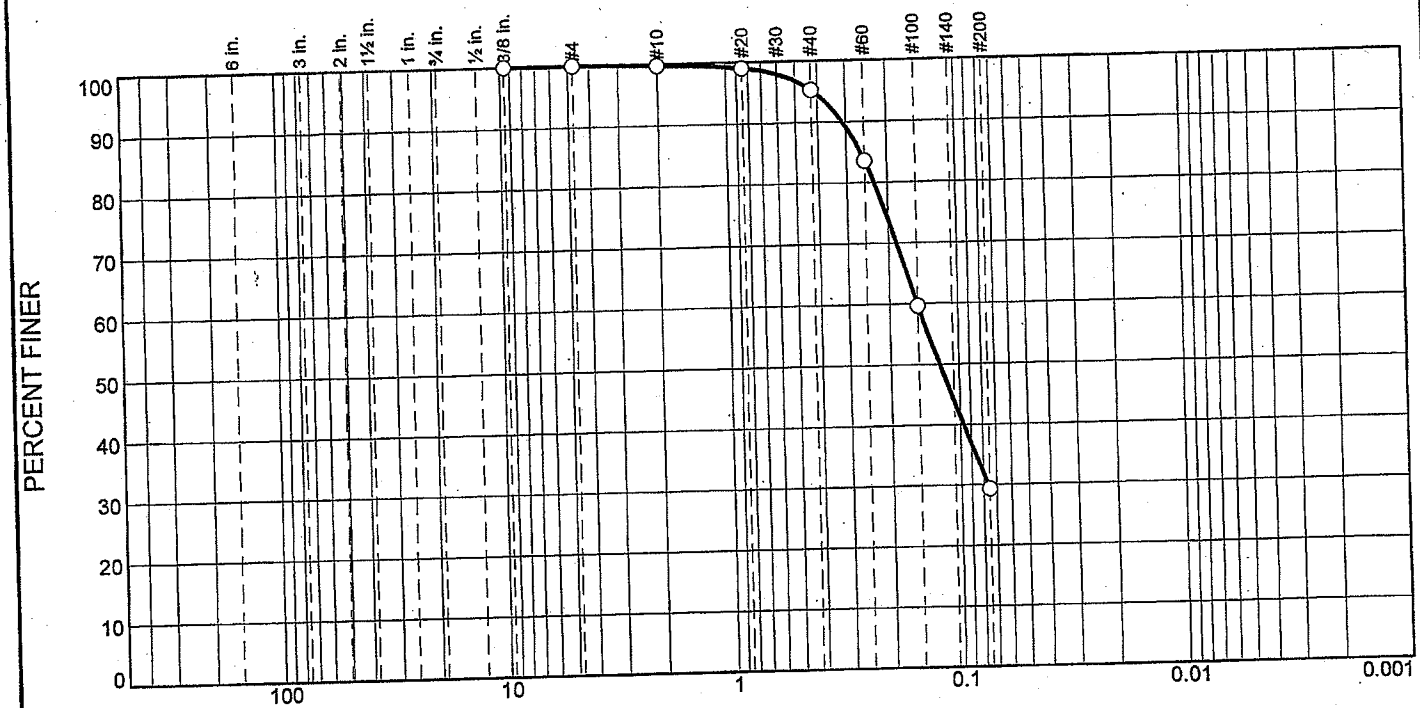
Source of Sample: Boring No.: SDB-2 **Depth:** 49.5'-51.0' **Date Sampled:**

Sample Number: SS-12

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	4.5	66.0	29.3	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.8		
#20	99.0		
#40	95.3		
#60	83.6		
#100	59.6		
#200	29.3		

* (no specification provided)

Material Description

Light Brown Silty Fine SAND

Atterberg Limits (ASTM D 4318)

PL= 24 LL= 25 PI= 1

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3103 D_{85}= 0.2604 D_{60}= 0.1511
D_{50}= 0.1221 D_{30}= 0.0762 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 26.8%
F.M.=0.54

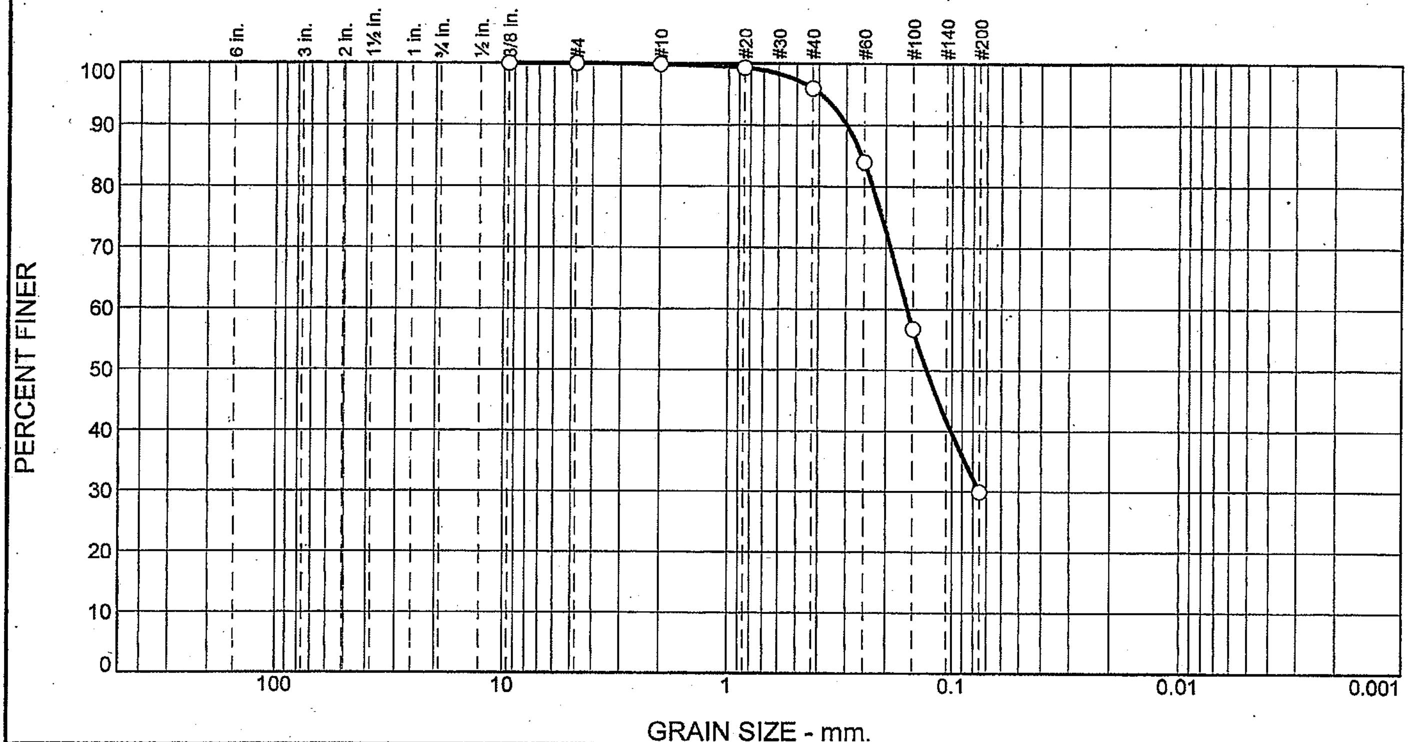
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Mich Hul
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SDB-2 **Depth:** 59.5'-61.0' **Date Sampled:**
Sample Number: SS-14

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX. FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	3.9	66.0	30.0	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.9		
#20	99.3		
#40	96.0		
#60	84.0		
#100	56.8		
#200	30.0		

* (no specification provided)

Material Description

Light Gray Brown Silty Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.2987 D_{85}= 0.2564 D_{60}= 0.1594
D_{50}= 0.1303 D_{30}= 0.0750 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 24.2%
F.M.=0.55

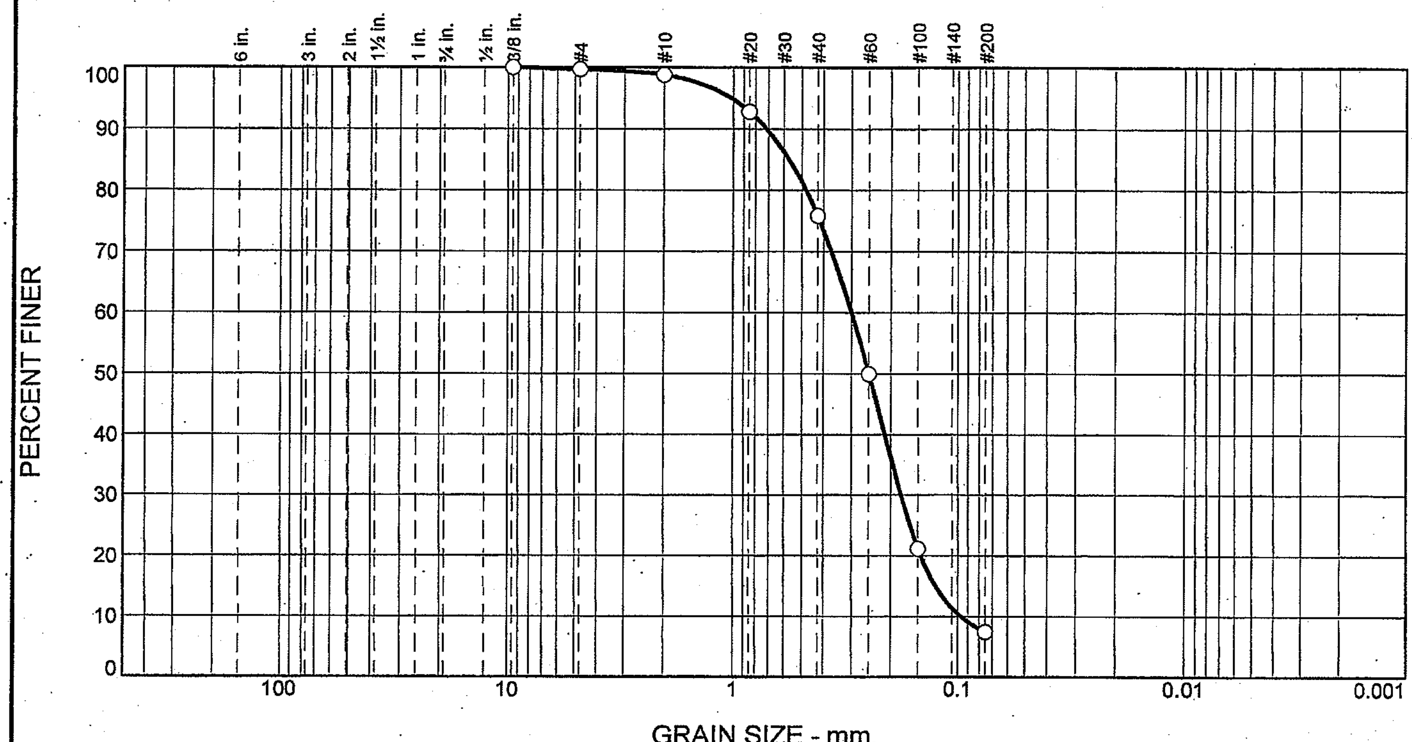
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hol
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SDB-2 **Depth:** 64.5'-66.0' **Date Sampled:**
Sample Number: SS-15

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX. FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.9	23.0	68.4	7.4	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.7		
#10	98.8		
#20	92.8		
#40	75.8		
#60	49.9		
#100	21.1		
#200	7.4		

* (no specification provided)

Material Description

Gray-Brown Slightly Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 0.7151 D_{85}= 0.5695 D_{60}= 0.2996
D_{50}= 0.2503 D_{30}= 0.1791 D_{15}= 0.1256
D_{10}= 0.0970 C_u= 3.09 C_c= 1.10

Remarks

Percent Natural Moisture: 9.2%

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Michael Hof

Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SBD-3 **Depth:** 7.5'-9.0' **Date Sampled:**

Sample Number: SS-3

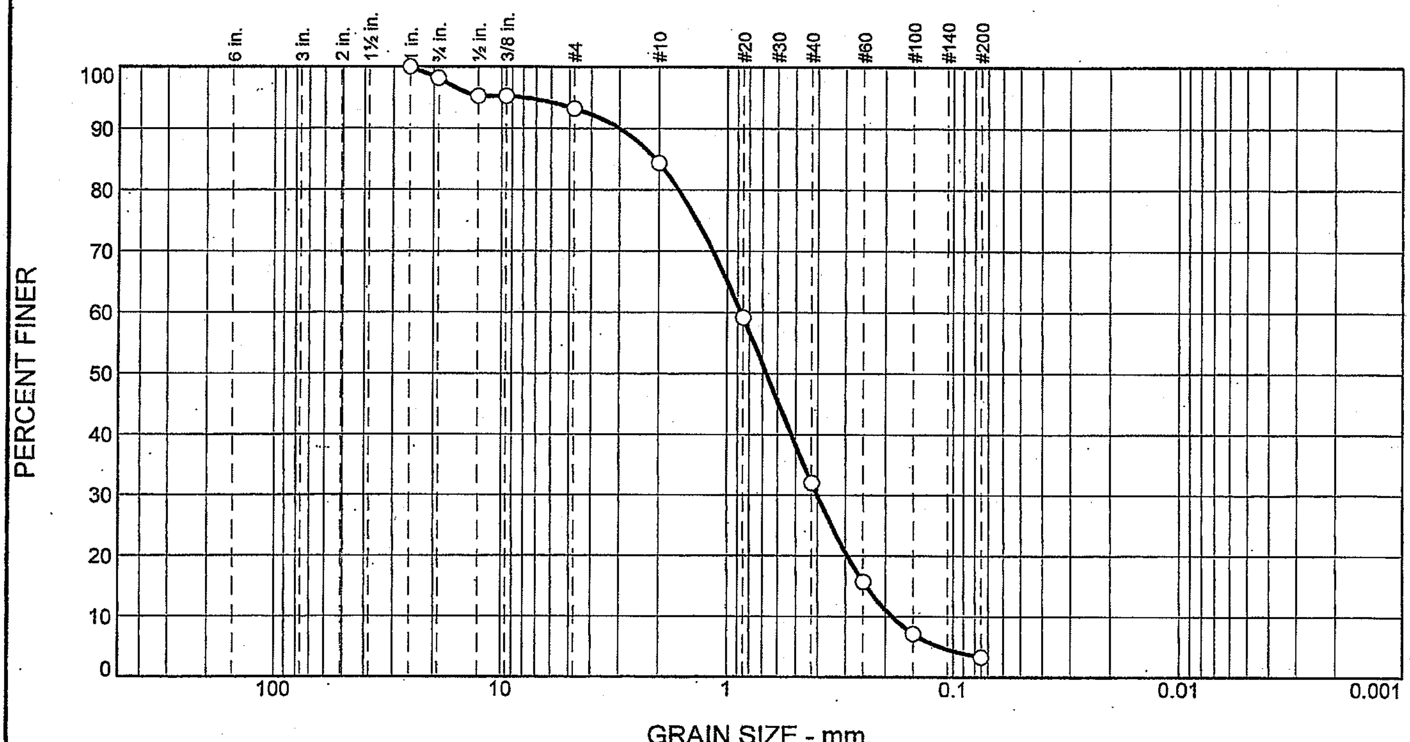
MACTEC ENGINEERING AND CONSULTING, INC.

Client: Southern Company

Project: Plant Smith Ash Pond

Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	5.0	8.8	52.3	28.8	3.3	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1	100.0		
3/4	98.2		
1/2	95.2		
3/8"	95.2		
#4	93.2		
#10	84.4		
#20	59.1		
#40	32.1		
#60	15.7		
#100	7.2		
#200	3.3		

* (no specification provided)

Material Description

Brown Medium to Fine SAND with Sand Sized Metal Fragments and a Trace of Clay

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NP **PI=** NP

Classification

USCS (D 2487)= SP **AASHTO (M 145)=**

Coefficients

D_{90}= 2.9831 D_{85}= 2.0697 D_{60}= 0.8696
D_{50}= 0.6725 D_{30}= 0.4014 D_{15}= 0.2424
D_{10}= 0.1864 C_u= 4.66 C_c= 0.99

Remarks

Percent Natural Moisture: 13.9%
F.M.=2.82

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Mick Hol

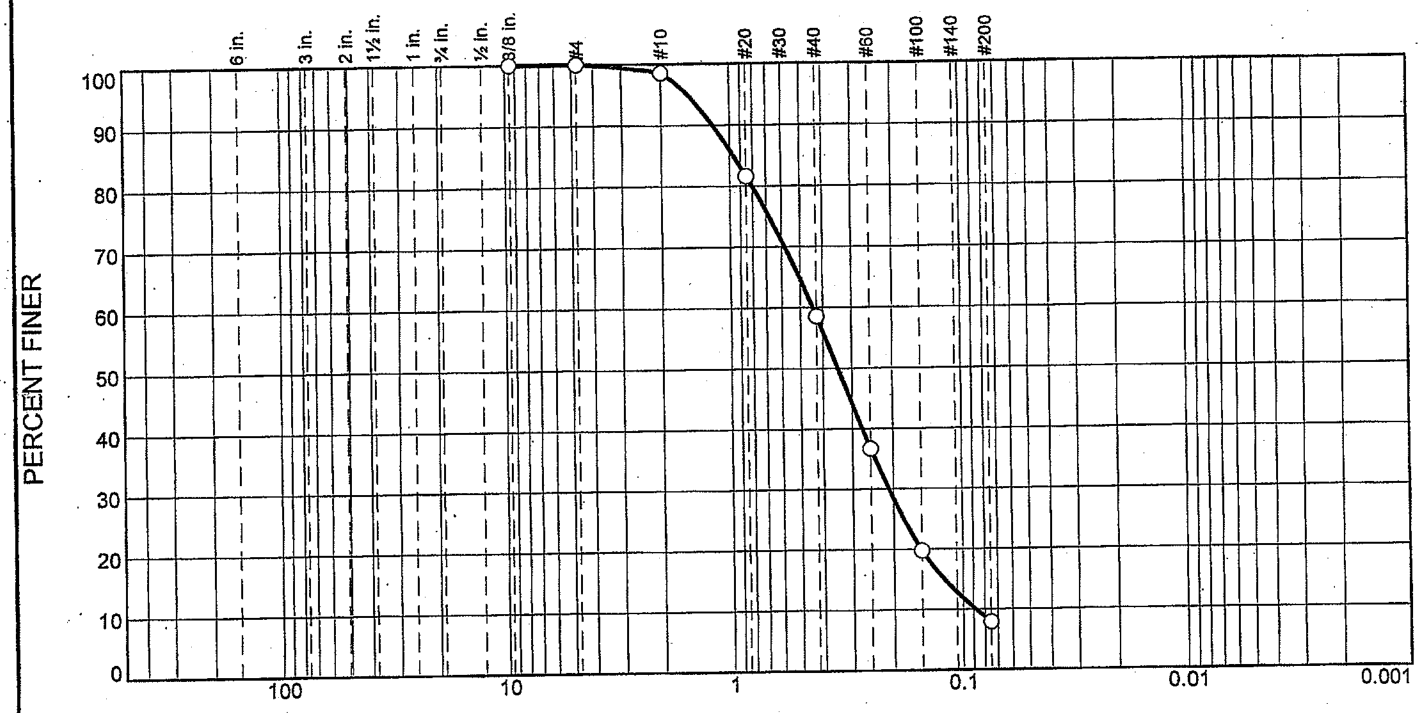
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SBD-3 **Depth:** 14.5'-16.0' **Date Sampled:**
Sample Number: SS-5

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX. FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.4	40.1	50.6	7.9	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	98.6		
#20	81.6		
#40	58.5		
#60	36.7		
#100	19.8		
#200	7.9		

* (no specification provided)

Material Description

Dark Brown Slightly Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 1.1858 D_{85}= 0.9651 D_{60}= 0.4412
D_{50}= 0.3449 D_{30}= 0.2092 D_{15}= 0.1206
D_{10}= 0.0880 C_u= 5.02 C_c= 1.13

Remarks

Percent Natural Moisture: 15.7%
F.M.=1.76

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Mitchell Hol

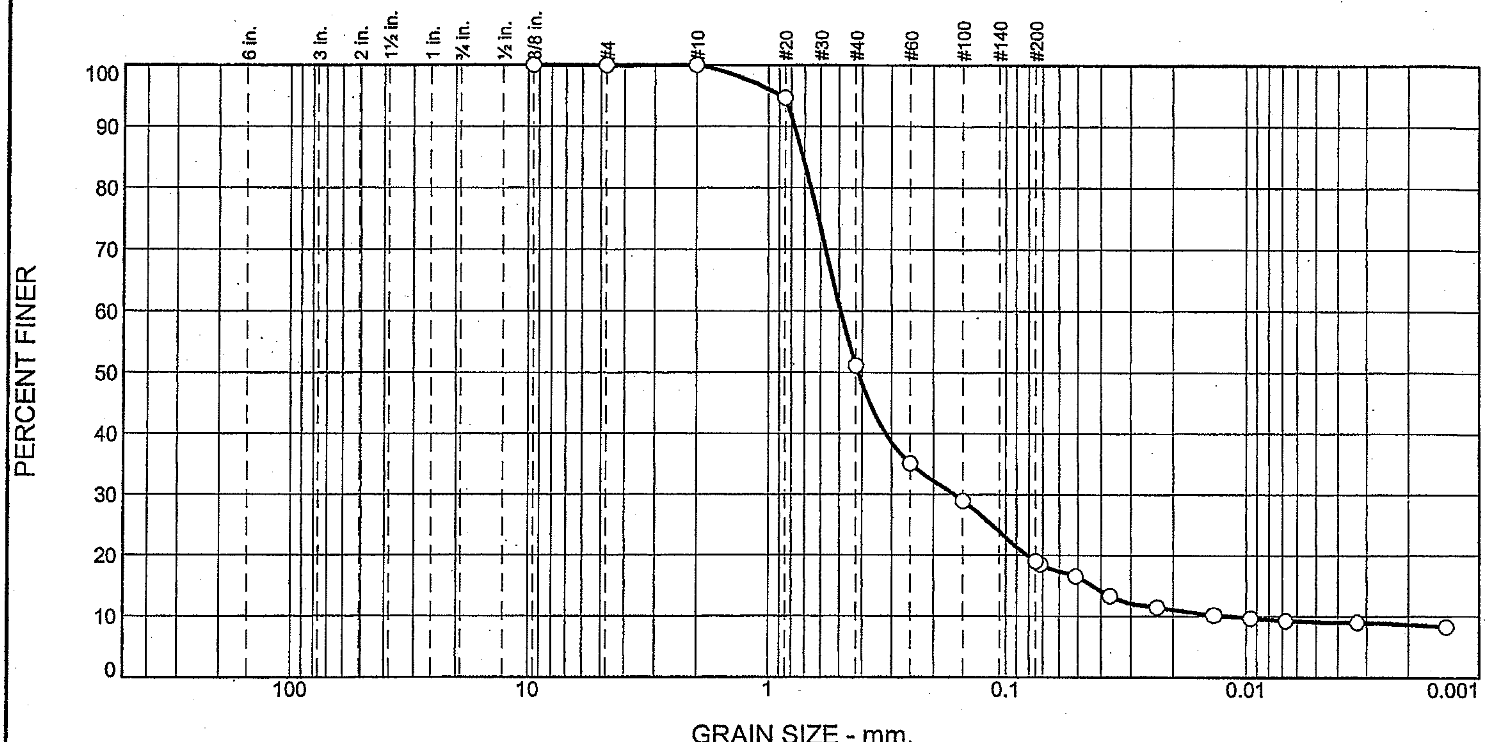
Title: Project Engineer 3/10/10

Source of Sample: Boring No.: SBD-3 **Depth:** 29.5'-31.0' **Date Sampled:**
Sample Number: SS-8

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	48.9	32.1	9.9	9.1

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	94.7		
#40	51.1		
#60	35.1		
#100	29.0		
#200	19.0		
0.0715 mm.	18.5		
0.0510 mm.	16.5		
0.0366 mm.	13.3		
0.0233 mm.	11.4		
0.0135 mm.	10.2		
0.0096 mm.	9.7		
0.0068 mm.	9.3		
0.0033 mm.	9.0		
0.0014 mm.	8.3		

* (no specification provided)

Material Description

Gray Medium to Fine Clayey SAND

Atterberg Limits (ASTM D 4318)

PL= 18 LL= 39 PI= 21

Classification

USCS (D 2487)= SC AASHTO (M 145)= A-2-6(0)

Coefficients

D_{90}= 0.7731 D_{85}= 0.7103 D_{60}= 0.4927
D_{50}= 0.4158 D_{30}= 0.1634 D_{15}= 0.0433
D_{10}= 0.0122 C_u= 40.35 C_c= 4.44

Remarks

Percent Natural Moisture: 20.5%
Specific Gravity: 2.613

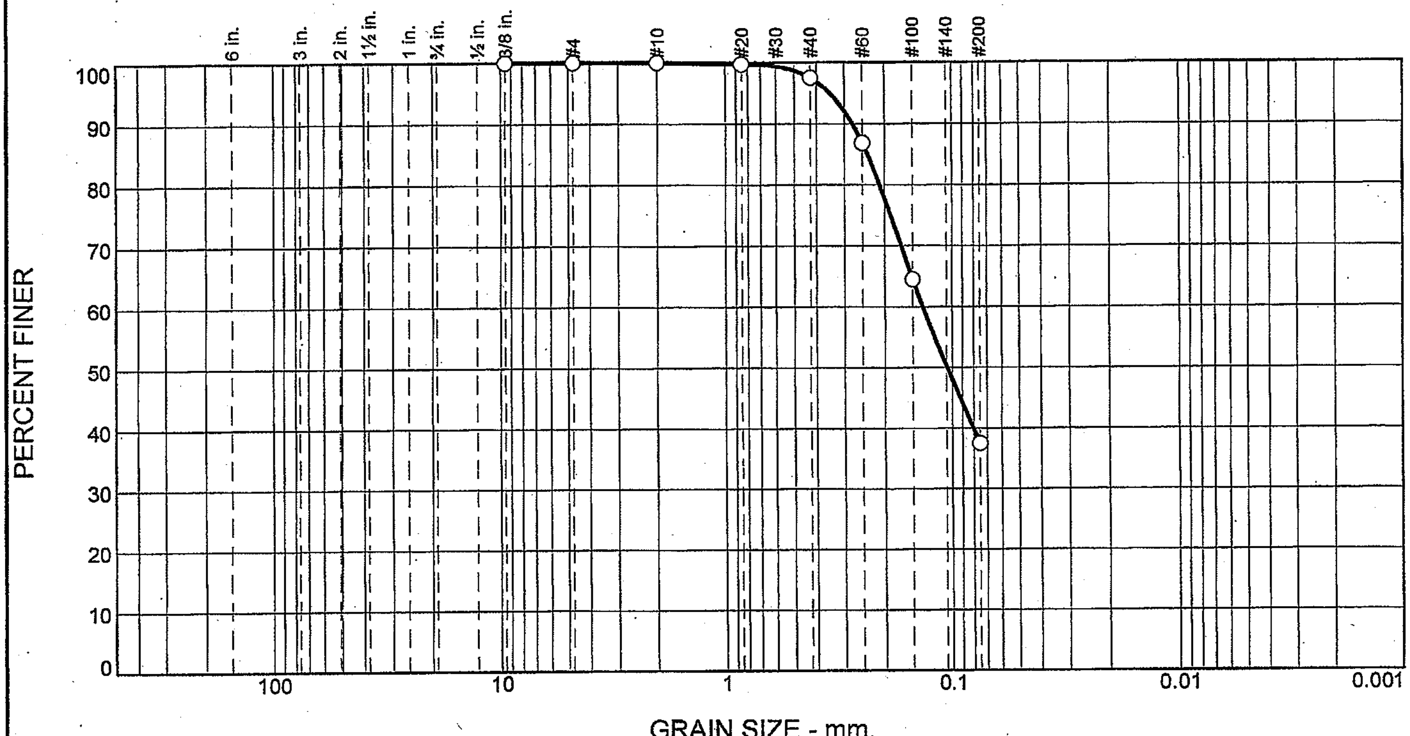
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rajni Sukhwani
Title:

Source of Sample: Boring No.: SBD-3 **Depth:** 49.5'-51.0' **Date Sampled:**
Sample Number: SS-12

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.5	60.0	37.5	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	97.5		
#60	86.9		
#100	64.5		
#200	37.5		

* (no specification provided)

Material Description

Light Brown Very Silty Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 0.2765 D_{85}= 0.2375 D_{60}= 0.1354
D_{50}= 0.1055 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 29.4%

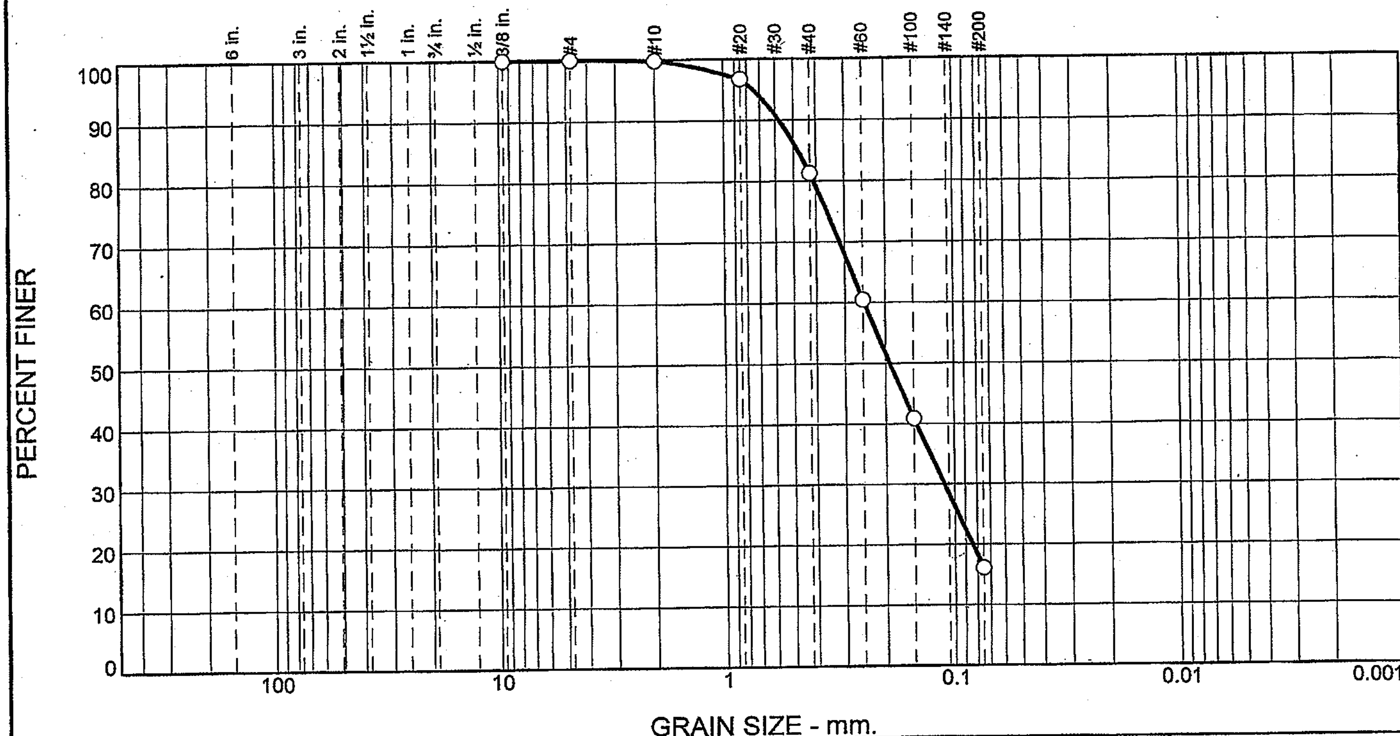
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hot
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SBD-3 **Depth:** 59.5'-61.0' **Date Sampled:**
Sample Number: SS-14

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 JAX, FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	18.5	65.2	16.1	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.8		
#20	96.7		
#40	81.3		
#60	60.4		
#100	40.9		
#200	16.1		

* (no specification provided)

Material Description

Dark Gray Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SC AASHTO (M 145)=

Coefficients

D_{90}= 0.5767 D_{85}= 0.4779 D_{60}= 0.2473
D_{50}= 0.1916 D_{30}= 0.1111 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 23.0%
Percent Loss on Ignition: 1.5%
F.M.=1.02

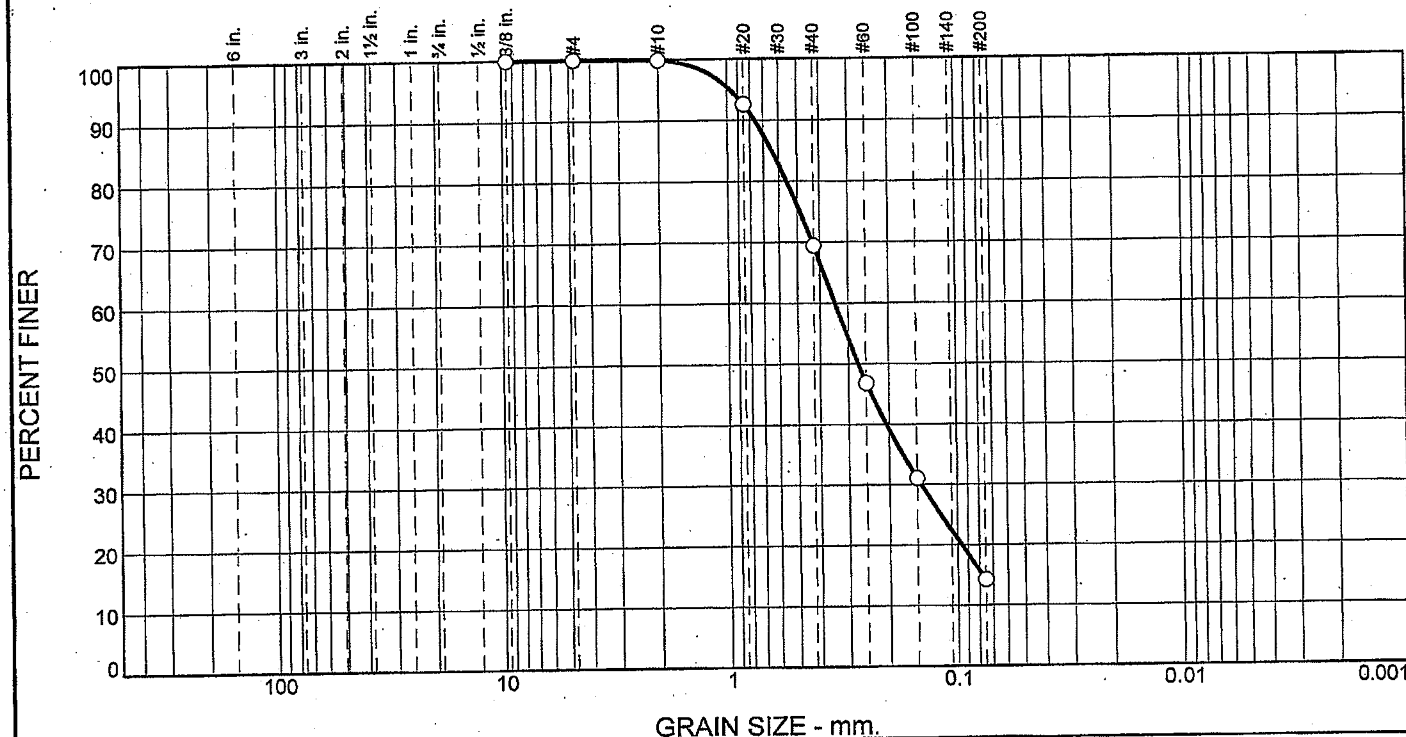
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: [illegible]
Title: Project Engineer 3/11/10

Source of Sample: Boring No.: SBD-5 **Depth:** 34.5'-36.0' **Date Sampled:**
Sample Number: SS-9

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 JAX, FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	30.5	55.2	14.2	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.9		
#20	92.6		
#40	69.4		
#60	46.8		
#100	31.1		
#200	14.2		

* (no specification provided)

Material Description

Dark Gray Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SC AASHTO (M 145)=

Coefficients

D_{90}= 0.7629 D_{85}= 0.6418 D_{60}= 0.3428
D_{50}= 0.2714 D_{30}= 0.1441 D_{15}= 0.0775
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 21.3%
Percent Loss on Ignition: 1.6%
F.M.=1.35

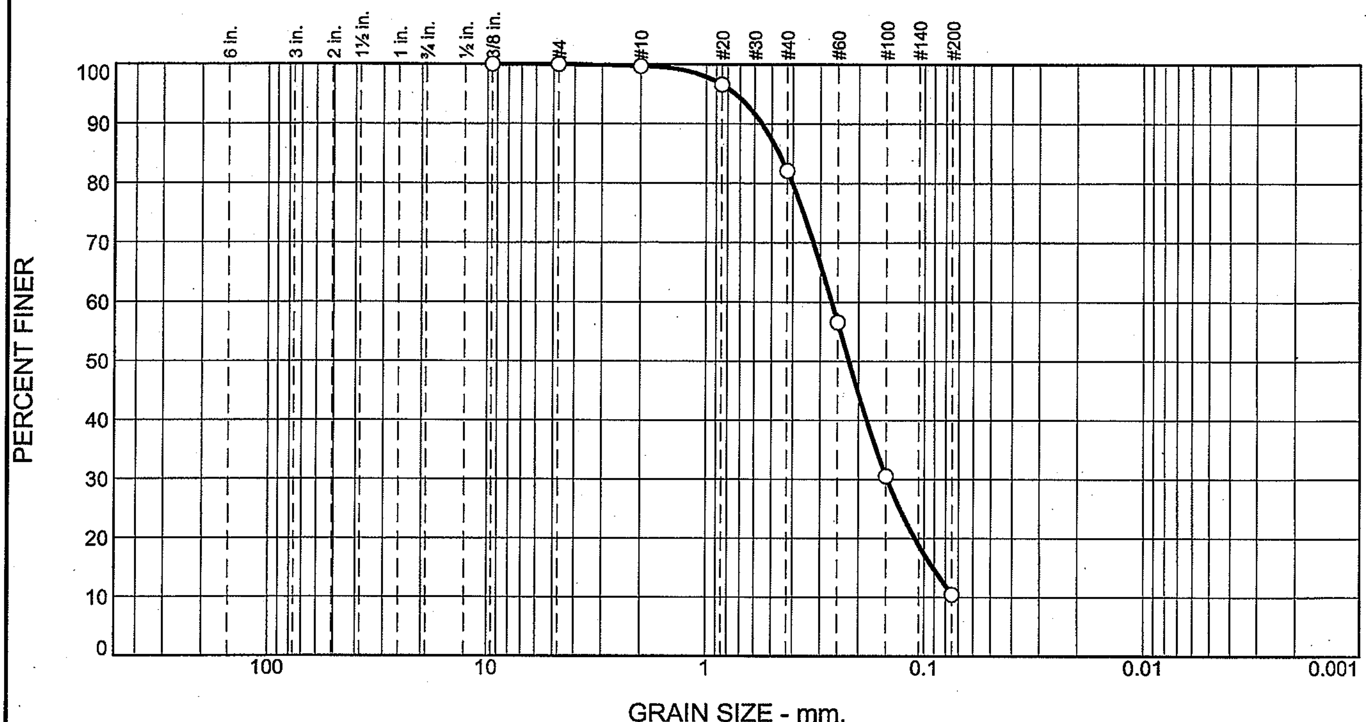
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hof
Title: Project Engineer 3/11/10

Source of Sample: Boring No.: SBD-5 **Depth:** 44.5'-46.0' **Date Sampled:**
Sample Number: SS-11

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	17.6	71.6	10.5	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	**Percent Finer**	**Spec.* (Percent)**	**Pass? (X=Fail)**
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	96.6		
#40	82.1		
#60	56.6		
#100	30.6		
#200	10.5		

* (no specification provided)

Material Description

Dark Gray Slightly Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP-SC **AASHTO (M 145)=**

Coefficients

D_{90}= 0.5542 D_{85}= 0.4620 D_{60}= 0.2661
D_{50}= 0.2215 D_{30}= 0.1479 D_{15}= 0.0913
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 19.5%
Percent Loss on Ignition: 0.8%

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By:

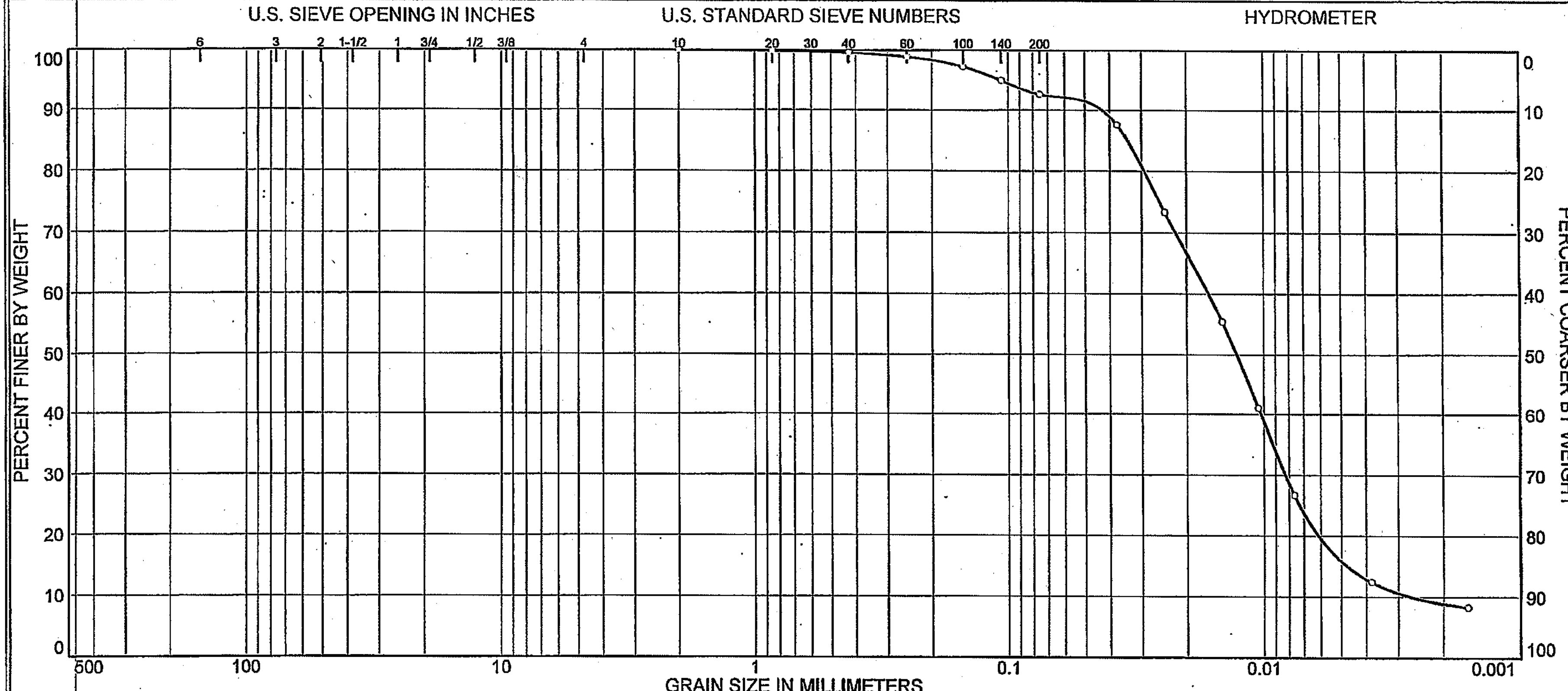
Title:

Source of Sample: Boring No.: SBD-5 **Depth:** 54.5'-56.0' **Date Sampled:**
Sample Number: SS-13

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Particle Size Distribution Report (ASTM D422-63 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	0.0	0.0	0.0	0.4	7.0	76.8	15.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	SDB-8	UD	6-8 ft	2/26/10	ML	Dark Gray Silt (Fly Ash)	97.6	NV	NP

Client

Project Plant Smith Ash Pond

Project No. 6189-09-9046 10093

MACTEC ENGINEERING AND CONSULTING, INC.

O Tested By: EH Reviewed By: JW

MACTEC

SPECIFIC GRAVITY OF SOILS

ASTM D854-06

Project No.	6189-09-9046	**Tested By**	EH
Project Name	Plant Smith Ash Pond	**Test Date**	3/19/2010
Boring No.	SDB-8	**Reviewed By**	JW
Sample No.	UD	**Review Date**	3/23/2010
Sample Depth	6-8 ft	**Lab No.**	10093
Sample Description	Fly Ash		

Pan No. V-4

Tare No.	B-7
Tare Mass, gram	219.71
Dry Soil + Tare Mass, grams	254.63
Mass of oven-dried soil, grams, M_s	34.92
Mass of pycnometer with water at test temperature (T), grams, $M_{pw,t}$	348.22
Mass of pycnometer, water and soil, grams, $M_{pws,t}$	367.02
Test Temperature, °C , T_t	24.1
Specific Gravity at test temperature, M_s / [$M_{pw,t}$ - ($M_{pws,t}$ - M_s)], G_t	2.166
Temperature Coefficient, K	0.99907
SPECIFIC GRAVITY @ 20°C: $G_{20\,^oC} = K*G_t$	**2.16**

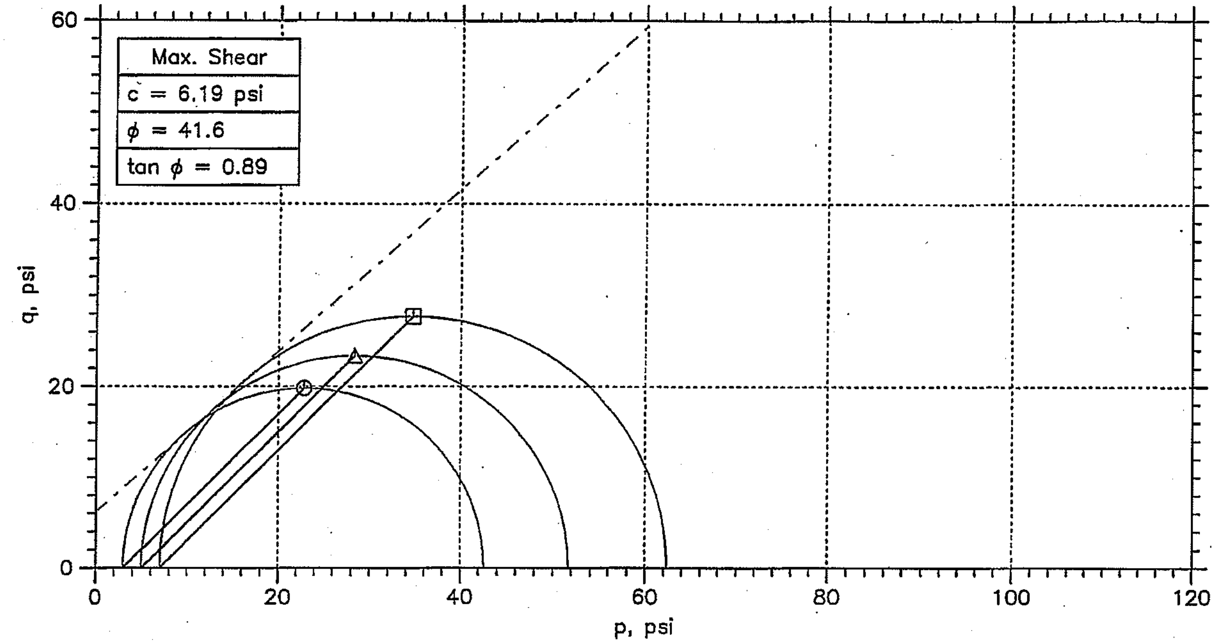
PREPARATION METHOD: [ ] Method A, Wet [x] Method B, Dry

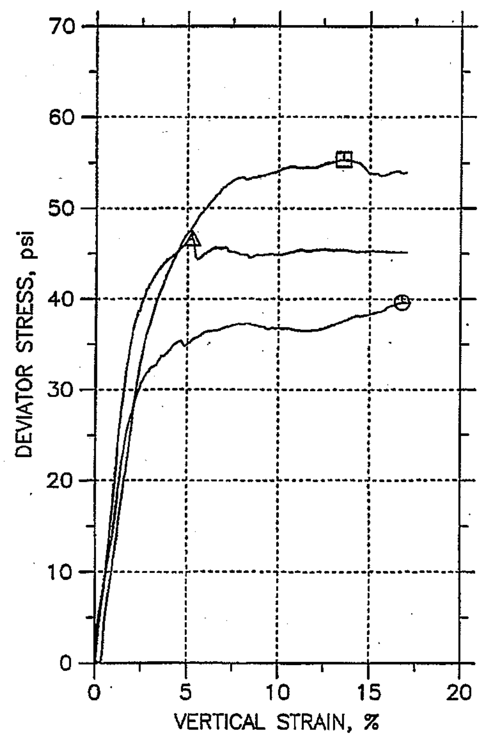
EQUIPMENT USED	I.D.	Calibrated Mass, g	Measured Mass, g	Difference, g
SCALE	418			
OVEN	144			
THERMOMETER	2866			
PYCNOMETER	1956	99.38	99.38	**0**

Difference should be less than 0.06 g, or use a different pycnometer.

REMARKS:

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

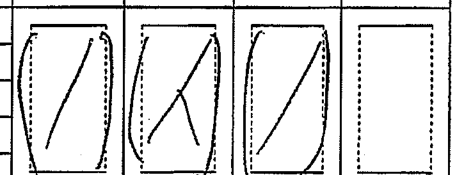




Symbol		○	△	□	
Sample No.		UD	UD	UD	
Test No.		10094.1	10093.2	10093.3	
Depth		6-8 ft	6-8 ft	6-8 ft	
Initial	Diameter, in	2.793	2.856	2.856	
	Height, in	5.828	5.977	5.965	
	Water Content, %	97.4	99.7	99.6	
	Dry Density, pcf	43.41	42.18	43.15	
	Saturation, %	99.9	98.0	101.3	
	Void Ratio	2.11	2.2	2.13	
Before Shear	Water Content, %	97.1	101.4	97.2	
	Dry Density, pcf	43.53	42.27	43.52	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	2.1	2.19	2.1	
	Back Press., psi	110.	94.	124.	
Ver. Eff. Cons. Stress, psi		2.999	4.994	7.	
Shear Strength, psi		19.79	23.33	27.68	
Strain at Failure, %		16.8	5.28	13.6	
Strain Rate, %/min		0.03	0.03	0.03	
B-Value		0.96	0.96	0.96	
Measured Specific Gravity		2.16	2.16	2.16	
Liquid Limit		NP	NP	NP	
Plastic Limit		NP	NP	NP	

MACTEC

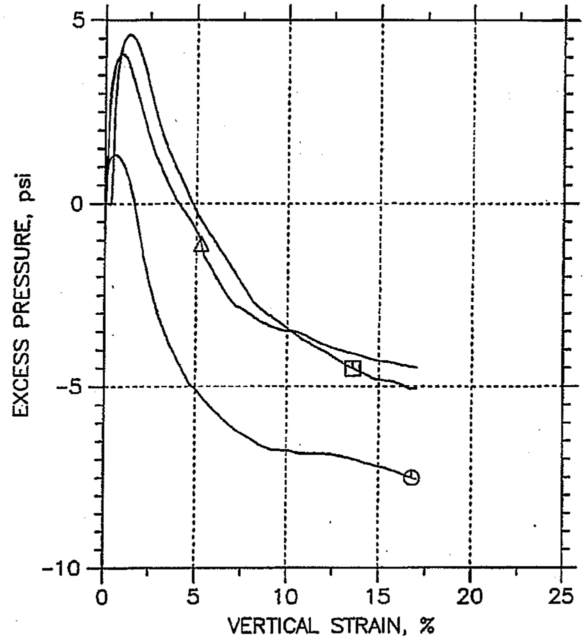
Project: Plant Smith Ash Pond
Location: SDB-6/8
Project No.: 6189099046
Boring No.: SDB-6/8
Sample Type: Undisturbed

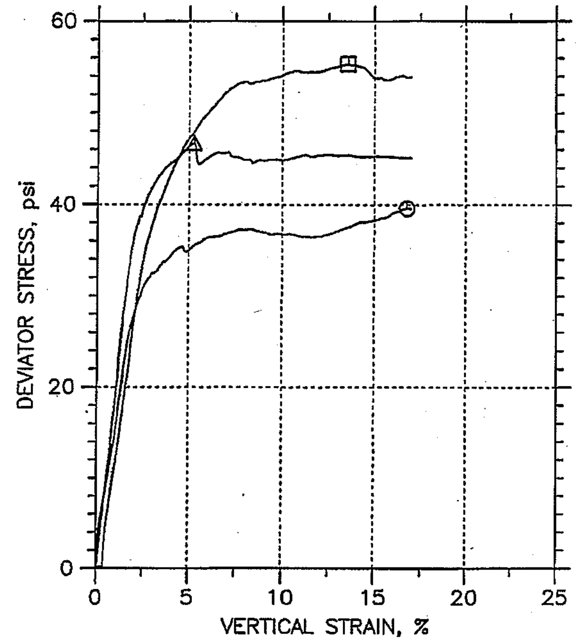


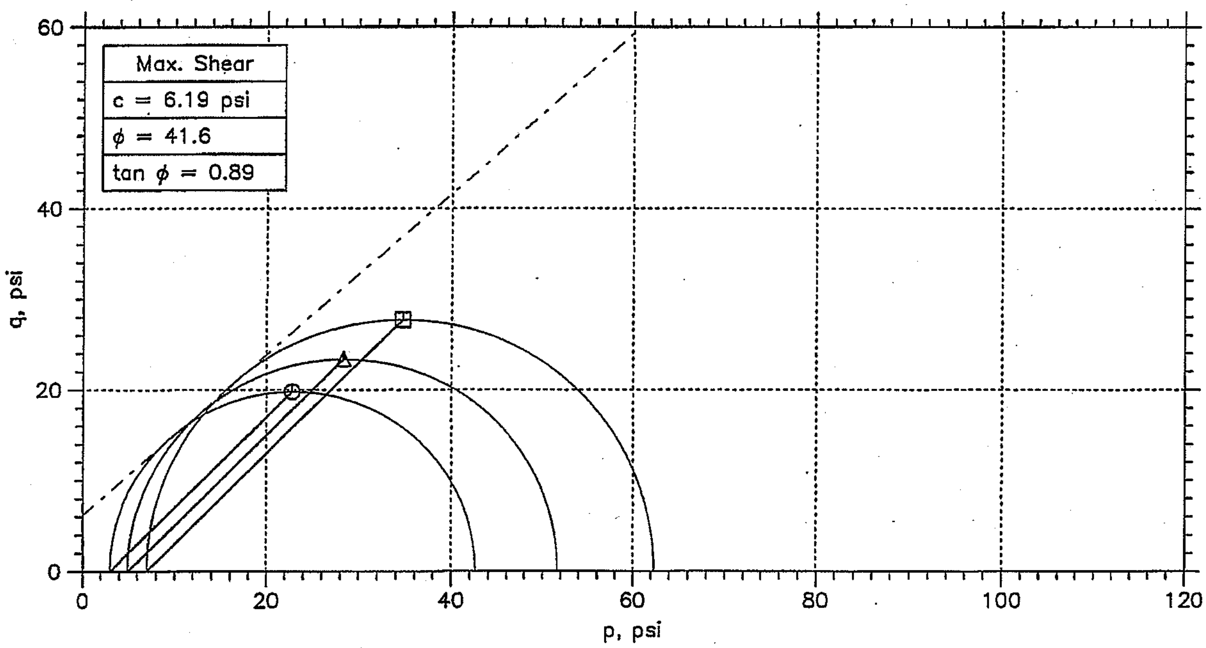
Description: Dark Gray Silt (Fly Ash)
Remarks: ASTM D4767-04. Specimen 10094.1 was from SDB-6 and 10093.2 & 10093.3 from SDB-8.
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 26-MAR-2010 10:19:17

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







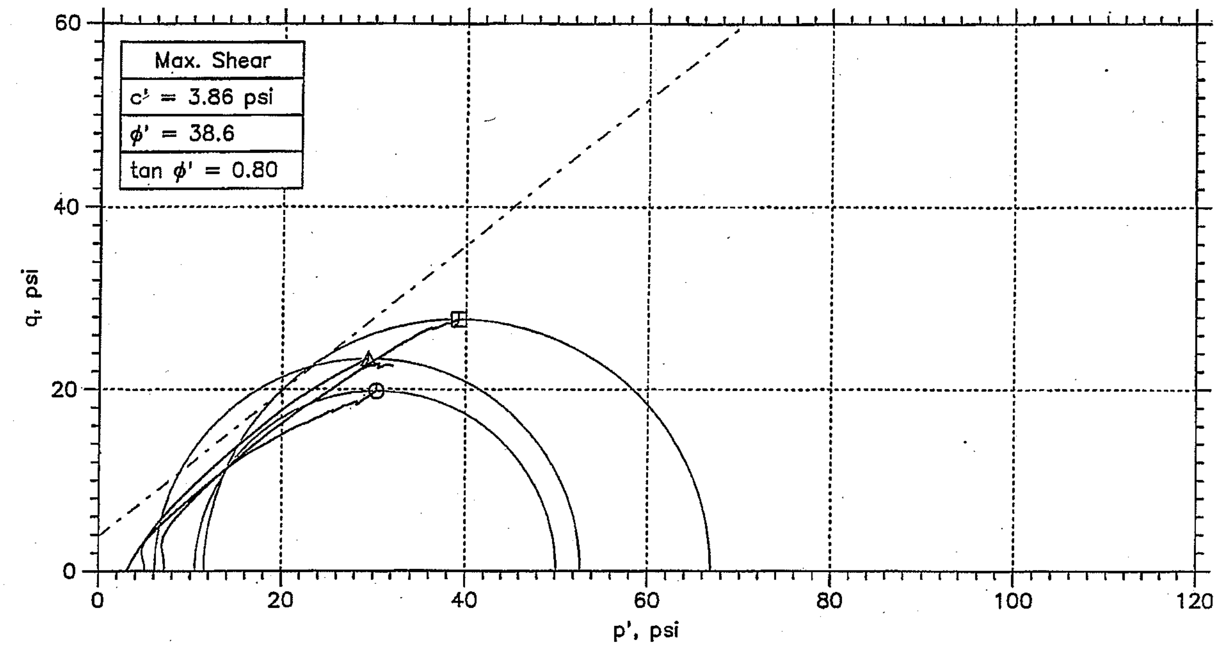
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊕	UD	10094.1	6-8 ft	JW	2/26/10			10094.1_2547.dat
△	UD	10093.2	6-8 ft	JW	2/26/10			10093.2_2580.dat
⊞	UD	10093.3	6-8 ft	JW	2/26/10			10093.3_2547.dat

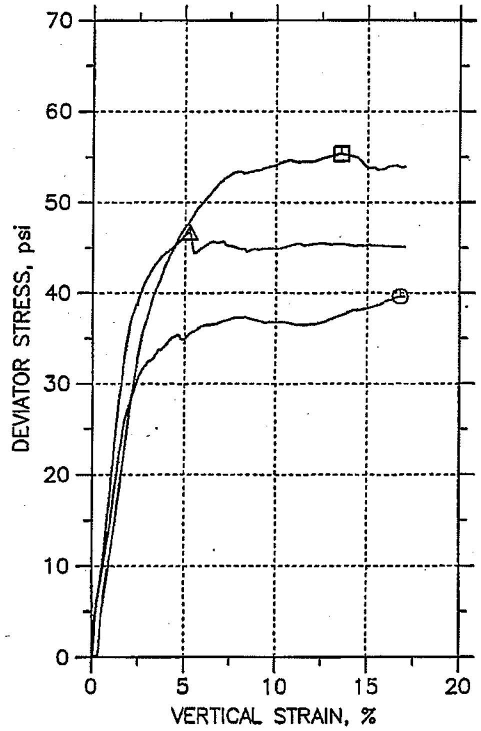
MACTEC

Project: Plant Smith Ash Pond	Location: SDB-6/8	Project No.: 6189099046
Boring No.: SDB-6/8	Sample Type: Undisturbed	
Description: Dark Gray Silt (Fly Ash)		
Remarks: ASTM D4767-04. Specimen 10094.1 was from SDB-6 and 10093.2 & 10093.3 from SDB-8.		

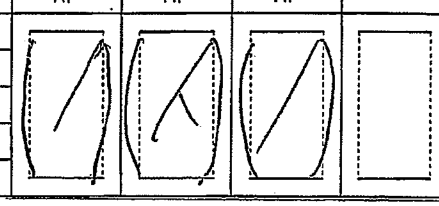
Fri, 26-MAR-2010 10:19:17

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Symbol	○	△	□	
	Sample No.	UD	UD	UD	
	Test No.	10094.1	10093.2	10093.3	
	Depth	6-8 ft	6-8 ft	6-8 ft	
Initial	Diameter, in	2.793	2.856	2.856	
Initial	Height, in	5.828	5.977	5.965	
Initial	Water Content, %	97.4	99.7	99.6	
Initial	Dry Density, pcf	43.41	42.18	43.15	
Initial	Saturation, %	99.9	98.0	101.3	
Initial	Void Ratio	2.11	2.2	2.13	
Before Shear	Water Content, %	97.1	101.4	97.2	
Before Shear	Dry Density, pcf	43.53	42.27	43.52	
Before Shear	Saturation*, %	100.0	100.0	100.0	
Before Shear	Void Ratio	2.1	2.19	2.1	
Before Shear	Back Press., psi	110.	94.	124.	
	Ver. Eff. Cons. Stress, psi	2.999	4.994	7.	
	Shear Strength, psi	19.79	23.33	27.68	
	Strain at Failure, %	16.8	5.28	13.6	
	Strain Rate, %/min	0.03	0.03	0.03	
	B-Value	0.96	0.96	0.96	
	Measured Specific Gravity	2.16	2.16	2.16	
	Liquid Limit	NP	NP	NP	
	Plastic Limit	NP	NP	NP	

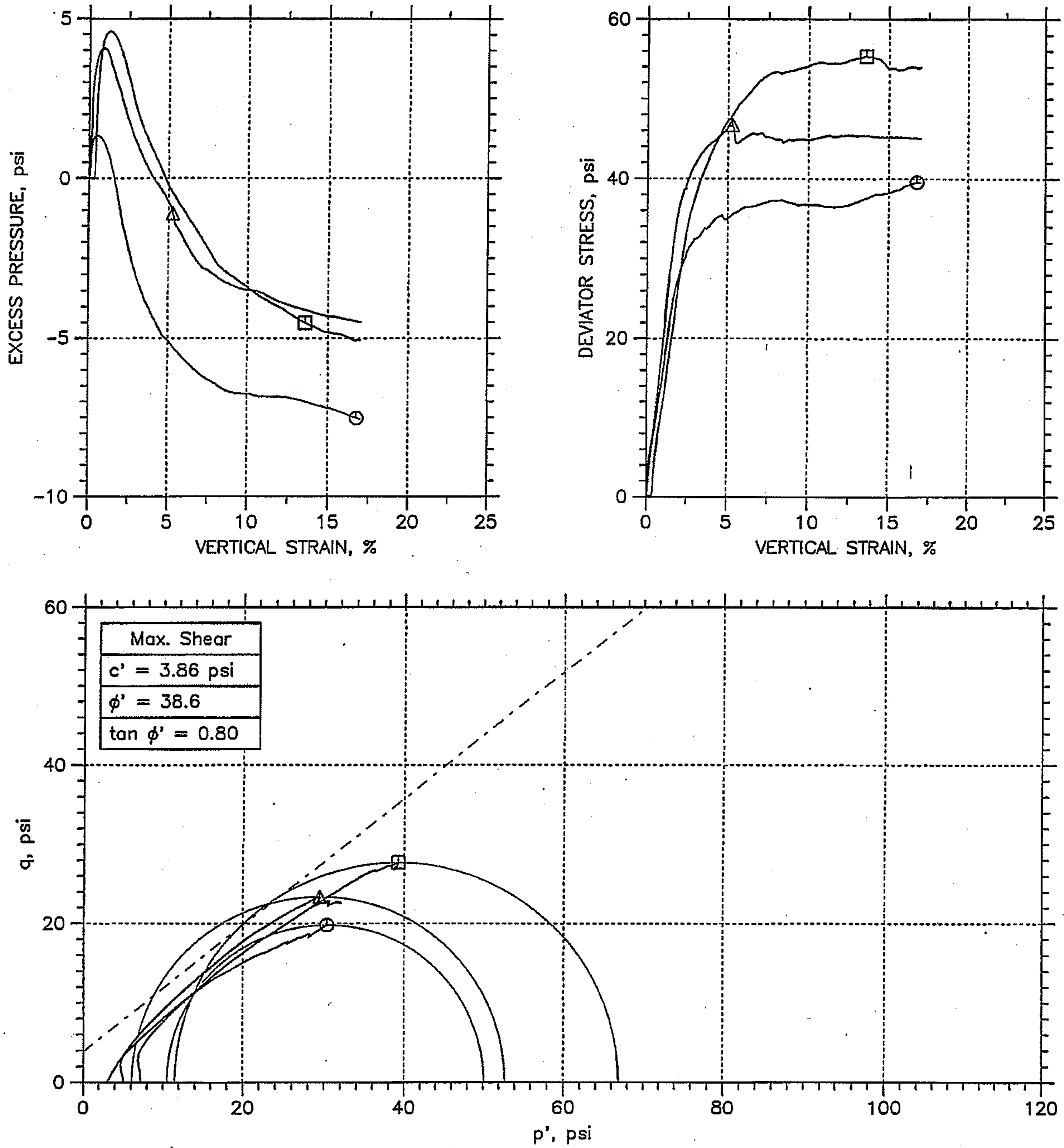


MACTEC

Project: Plant Smith Ash Pond
Location: SDB-6/8
Project No.: 6189099046
Boring No.: SDB-6/8
Sample Type: Undisturbed
Description: Dark Gray Silt (Fly Ash)
Remarks: ASTM D4767-04. Specimen 10094.1 was from SDB-6 and 10093.2 & 10093.3 from SDB-8.
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 26-MAR-2010 10:18:58

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



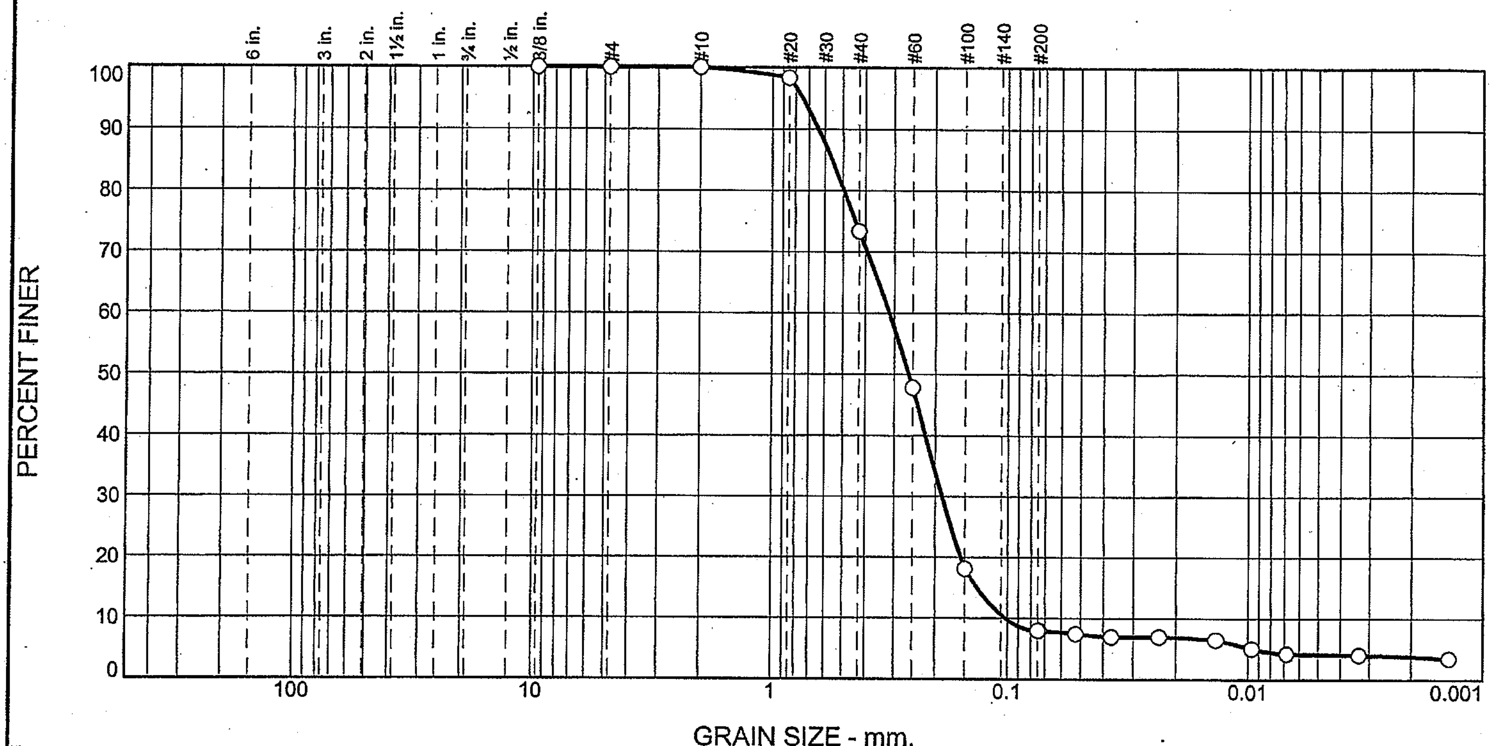
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	UD	10094.1	6-8 ft	JW	2/26/10			10094.1_2547.dat
△	UD	10093.2	6-8 ft	JW	2/26/10			10093.2_2580.dat
⊡	UD	10093.3	6-8 ft	JW	2/26/10			10093.3_2547.dat

MACTEC

Project: Plant Smith Ash Pond	Location: SDB-6/8	Project No.: 6189099046
Boring No.: SDB-6/8	Sample Type: Undisturbed	
Description: Dark Gray Silt (Fly Ash)		
Remarks: ASTM D4767-04. Specimen 10094.1 was from SDB-6 and 10093.2 & 10093.3 from SDB-8.		

Fri, 26-MAR-2010 10:18:58

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	26.6	65.4	3.8	4.2

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	98.3		
#40	73.4		
#60	47.8		
#100	18.1		
#200	8.0		
0.0737 mm.	8.0		
0.0523 mm.	7.5		
0.0371 mm.	7.0		
0.0234 mm.	7.0		
0.0136 mm.	6.5		
0.0096 mm.	5.1		
0.0068 mm.	4.2		
0.0033 mm.	4.0		
0.0014 mm.	3.4		

* (no specification provided)

Material Description

Dark Gray Slightly Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NP **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.6368 D_{85}= 0.5588 D_{60}= 0.3154
D_{50}= 0.2598 D_{30}= 0.1876 D_{15}= 0.1336
D_{10}= 0.1022 C_u= 3.08 C_c= 1.09

Remarks

Percent Natural Moisture: 21.4%
Specific Gravity: 2.641

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Rajni Sukhwani

Title:

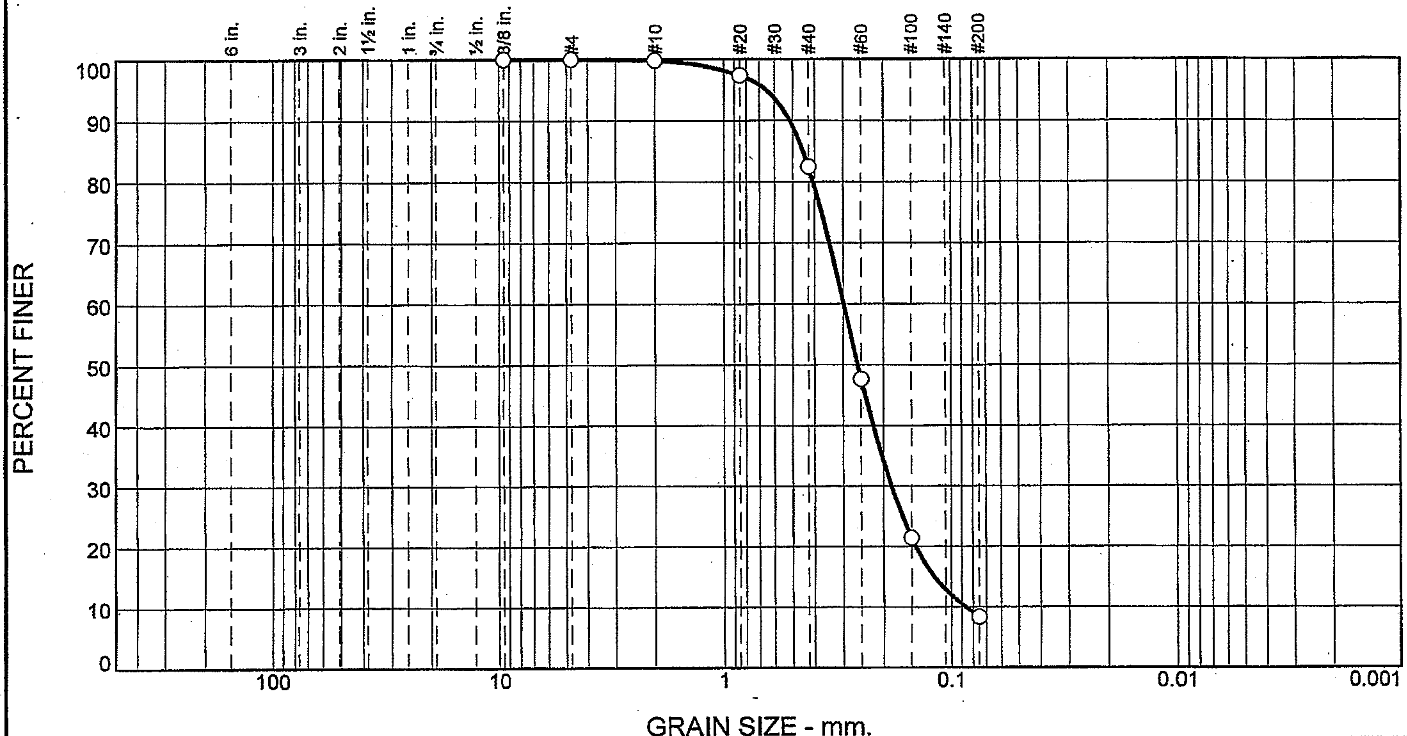
Source of Sample: Boring No.: SBD-14 **Depth:** 14.5'-16.0' **Date Sampled:**

Sample Number: SS-5

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	17.3	74.1	8.4	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.8		
#20	97.4		
#40	82.5		
#60	47.7		
#100	21.4		
#200	8.4		

* (no specification provided)

Material Description

Light Brown Slightly Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-3

Coefficients

D_{90}= 0.5142 D_{85}= 0.4485 D_{60}= 0.2985
D_{50}= 0.2589 D_{30}= 0.1841 D_{15}= 0.1189
D_{10}= 0.0868 C_u= 3.44 C_c= 1.31

Remarks

Percent Natural Moisture: 16.4%
F.M.=1.26

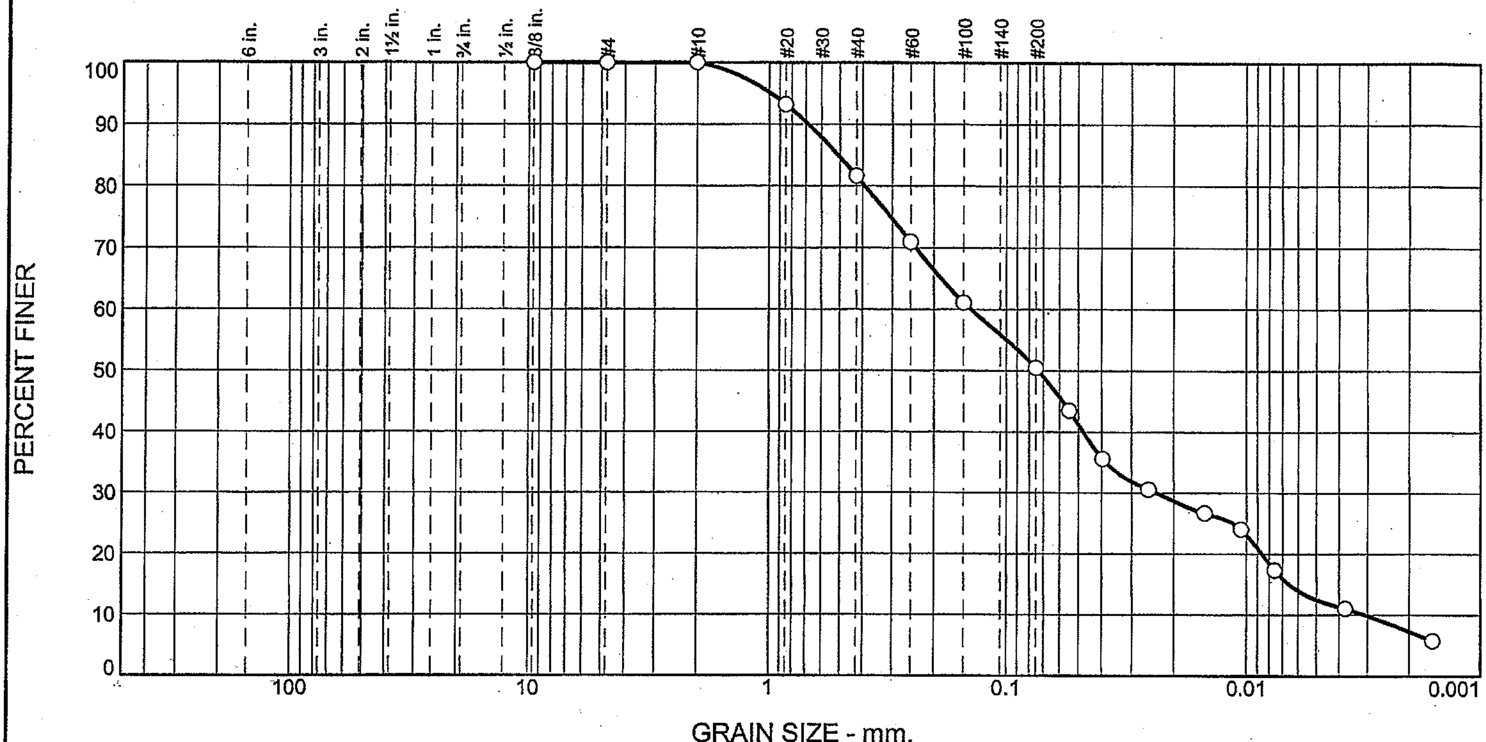
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hot
Title: Project Engineer 3/12/10

Source of Sample: Boring No.: SBD-14 **Depth:** 19.5'-21.0' **Date Sampled:**
Sample Number: SS-6

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX. FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	18.4	31.1	38.0	12.5

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	93.2		
#40	81.6		
#60	70.9		
#100	61.1		
#200	50.5		
0.0546 mm.	43.5		
0.0396 mm.	35.6		
0.0254 mm.	30.6		
0.0149 mm.	26.7		
0.0105 mm.	24.0		
0.0076 mm.	17.4		
0.0037 mm.	11.0		
0.0016 mm.	5.8		

* (no specification provided)

Material Description

Gray Ash

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.6825 D_{85}= 0.5092 D_{60}= 0.1401
D_{50}= 0.0732 D_{30}= 0.0236 D_{15}= 0.0065
D_{10}= 0.0031 C_u= 45.64 C_c= 1.29

Remarks

Percent Natural Moisture: 59.9%
Specific Gravity: 2.256

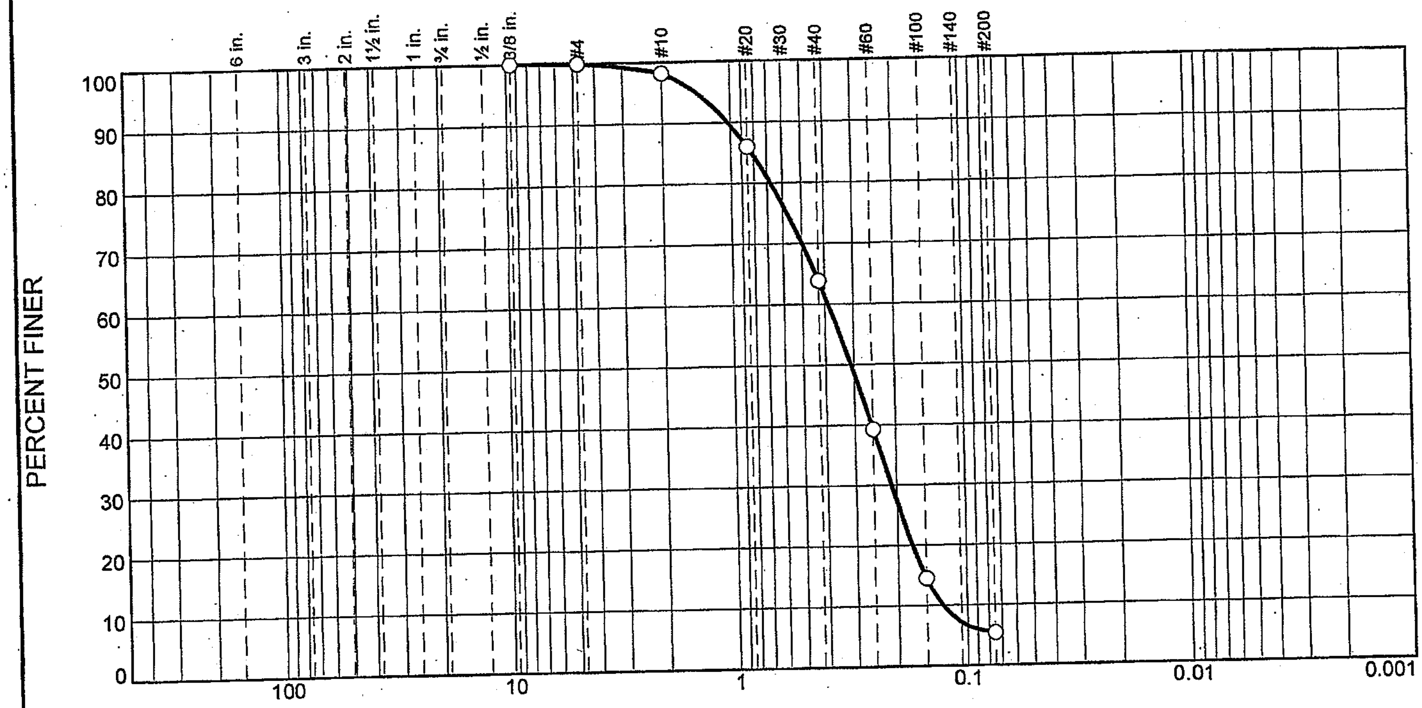
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rajni Subhwani
Title:

Source of Sample: Boring No.: NBD-1 **Depth:** 4.5'-6.0' **Date Sampled:**
Sample Number: SS-2

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **Jax FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.8	34.3	58.5	5.4	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	98.2		
#20	86.0		
#40	63.9		
#60	39.3		
#100	14.5		
#200	5.4		

* (no specification provided)

Material Description

Dark Brown Slightly Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-3

Coefficients

D_{90}= 1.0285 D_{85}= 0.8168 D_{60}= 0.3869
D_{50}= 0.3098 D_{30}= 0.2101 D_{15}= 0.1521
D_{10}= 0.1274 C_u= 3.04 C_c= 0.90

Remarks

Percent Natural Moisture: 17.5%

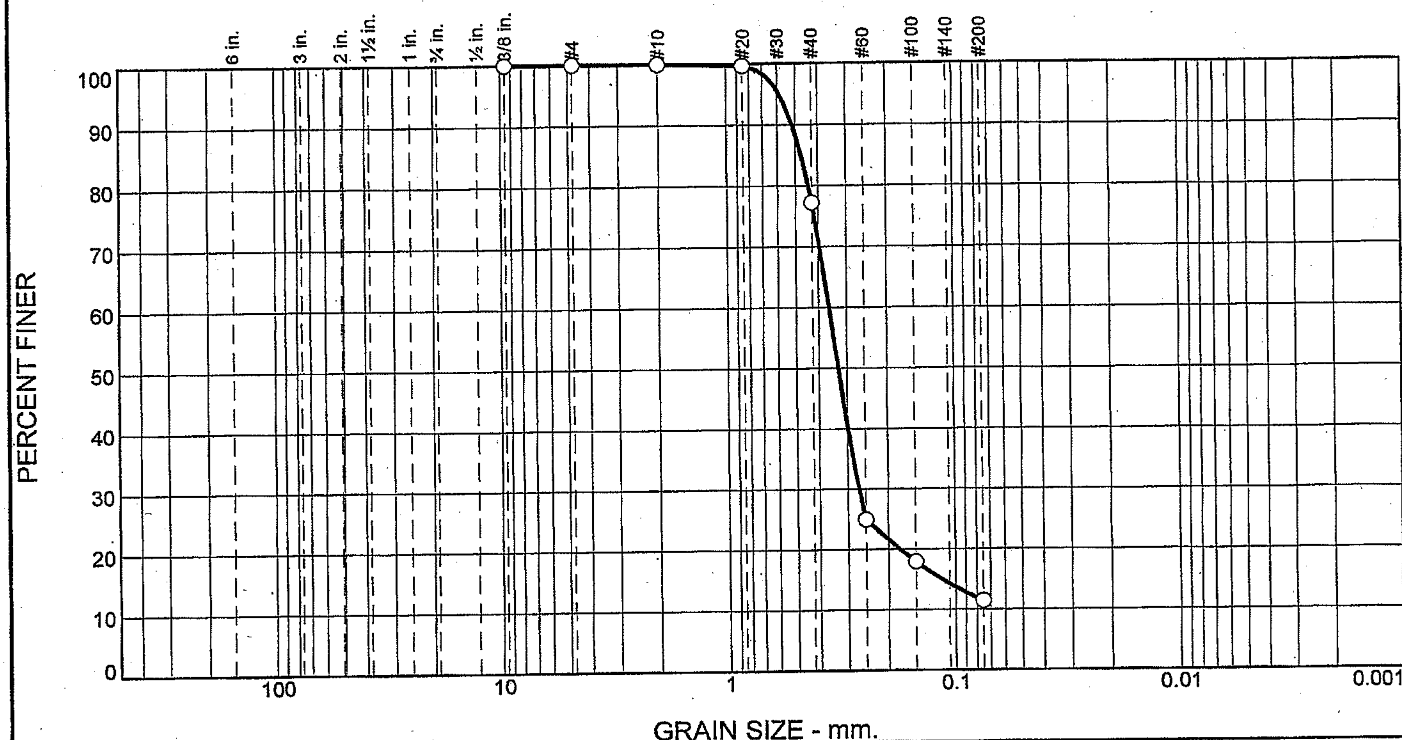
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: [signature]
Title: Project Engineer

Source of Sample: Boring No.: NBD-1 **Depth:** 19.5'-21.0' **Date Sampled:**
Sample Number: SS-6

MACTEC ENGINEERING AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 JAX, FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	22.8	65.7	11.5	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	77.2		
#60	25.0		
#100	18.0		
#200	11.5		

* (no specification provided)

Material Description

Dark Gray-Brown Slightly Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= 22 LL= 33 PI= 11

Classification

USCS (D 2487)= SP-SC AASHTO (M 145)= A-2-6(0)

Coefficients

D_{90}= 0.5156 D_{85}= 0.4716 D_{60}= 0.3582
D_{50}= 0.3274 D_{30}= 0.2679 D_{15}= 0.1144
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 28.4%

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Michael Hal

Title: Project Engineer.

Source of Sample: Boring No.: NBD-1 **Depth:** 34.5'-36.0' **Date Sampled:**

Sample Number: SS-9

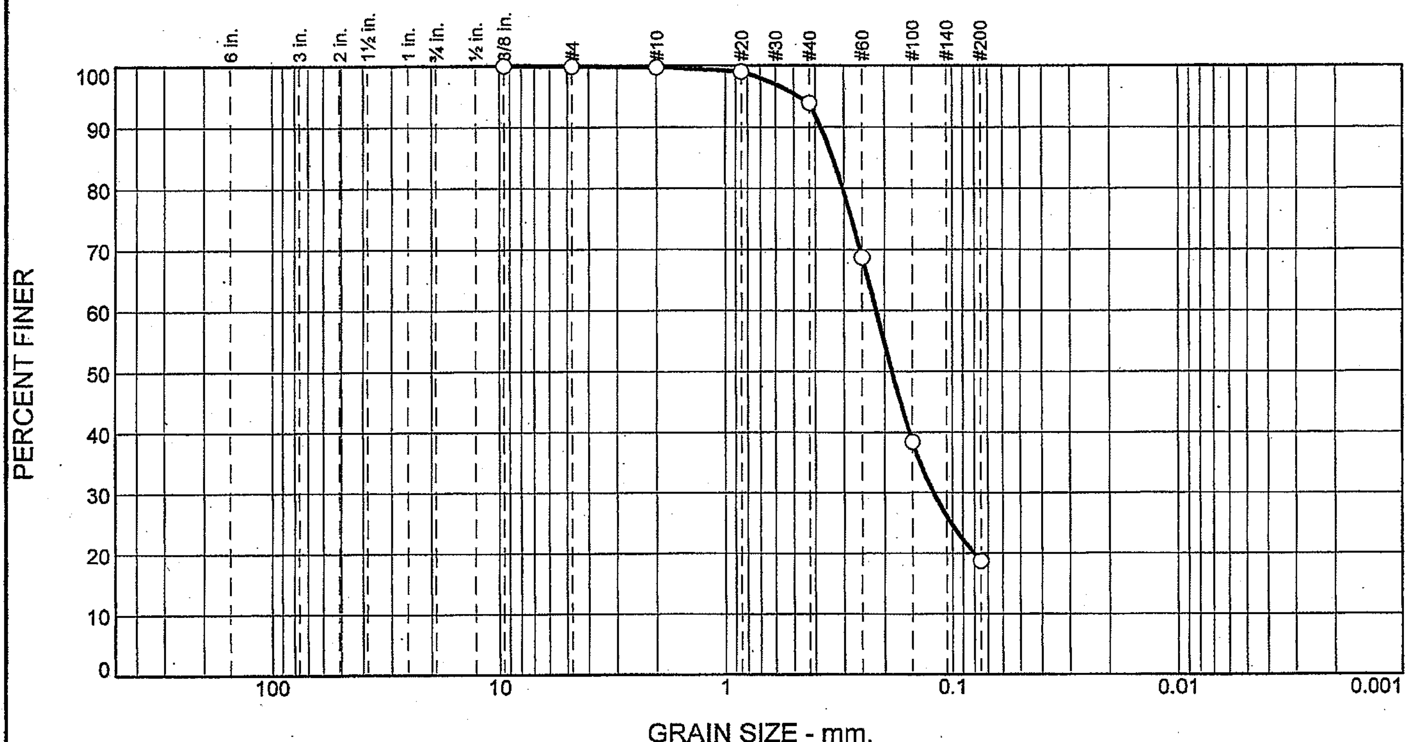
MACTEC ENGINEERING AND CONSULTING, INC.

Client: Southern Company

Project: Plant Smith Ash Pond

Project No: 6189099046 JAX, FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	5.8	75.2	18.7	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.9		
#10	99.7		
#20	99.0		
#40	93.9		
#60	68.7		
#100	38.4		
#200	18.7		

* (no specification provided)

Material Description

Brown Silty Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3781 D_{85}= 0.3363 D_{60}= 0.2176
D_{50}= 0.1854 D_{30}= 0.1215 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 25.0%
F.M.=0.86

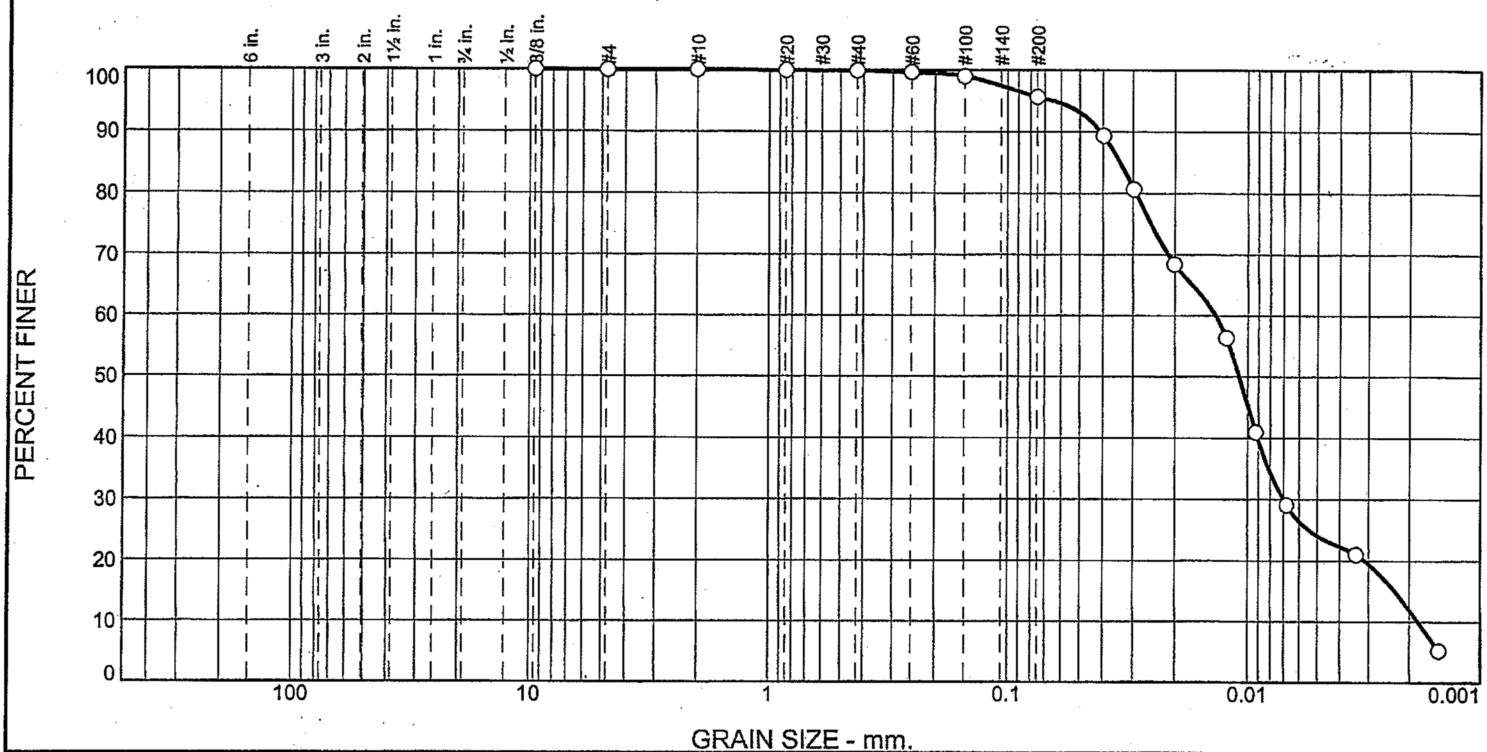
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hol
Title: Project Engineer

Source of Sample: Boring No.: NBD-1 **Depth:** 44.5'-46.0' **Date Sampled:**
Sample Number: SS-11

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	4.1	71.6	24.1

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.6		
#100	99.0		
#200	95.7		
0.0396 mm.	89.3		
0.0296 mm.	80.6		
0.0200 mm.	68.4		
0.0123 mm.	56.3		
0.0092 mm.	40.9		
0.0068 mm.	29.1		
0.0034 mm.	21.0		
0.0015 mm.	5.2		

* (no specification provided)

Material Description

Brown CLAY with a Trace of Sand

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.0409 D_{85}= 0.0339 D_{60}= 0.0135
D_{50}= 0.0108 D_{30}= 0.0070 D_{15}= 0.0023
D_{10}= 0.0018 C_u= 7.37 C_c= 1.98

Remarks

Percent Natural Moisture: 49.9%
Specific Gravity: 2.411

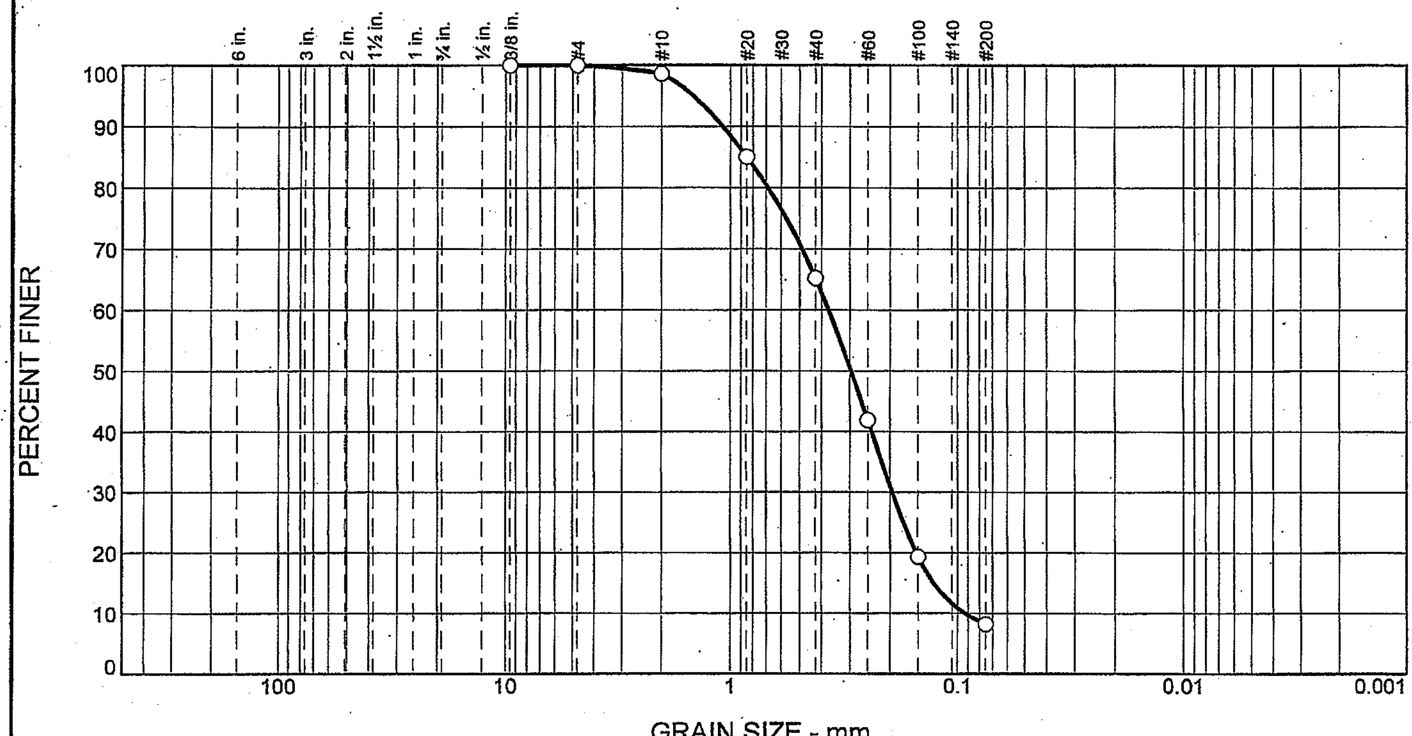
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Rajni Sukhwani
Title:

Source of Sample: Boring No.: NBD-10 **Depth:** 14.5'-16.0' **Date Sampled:**
Sample Number: SS-5

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 Jax FL.

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.4	33.4	57.0	8.2	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	98.6		
#20	85.1		
#40	65.2		
#60	41.9		
#100	19.4		
#200	8.2		

* (no specification provided)

Material Description

Dark Brown Slightly Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-3

Coefficients

D_{90}= 1.0772 D_{85}= 0.8478 D_{60}= 0.3724
D_{50}= 0.2967 D_{30}= 0.1954 D_{15}= 0.1280
D_{10}= 0.0926 C_u= 4.02 C_c= 1.11

Remarks

Percent Natural Moisture: 23.5%
F.M.=1.63

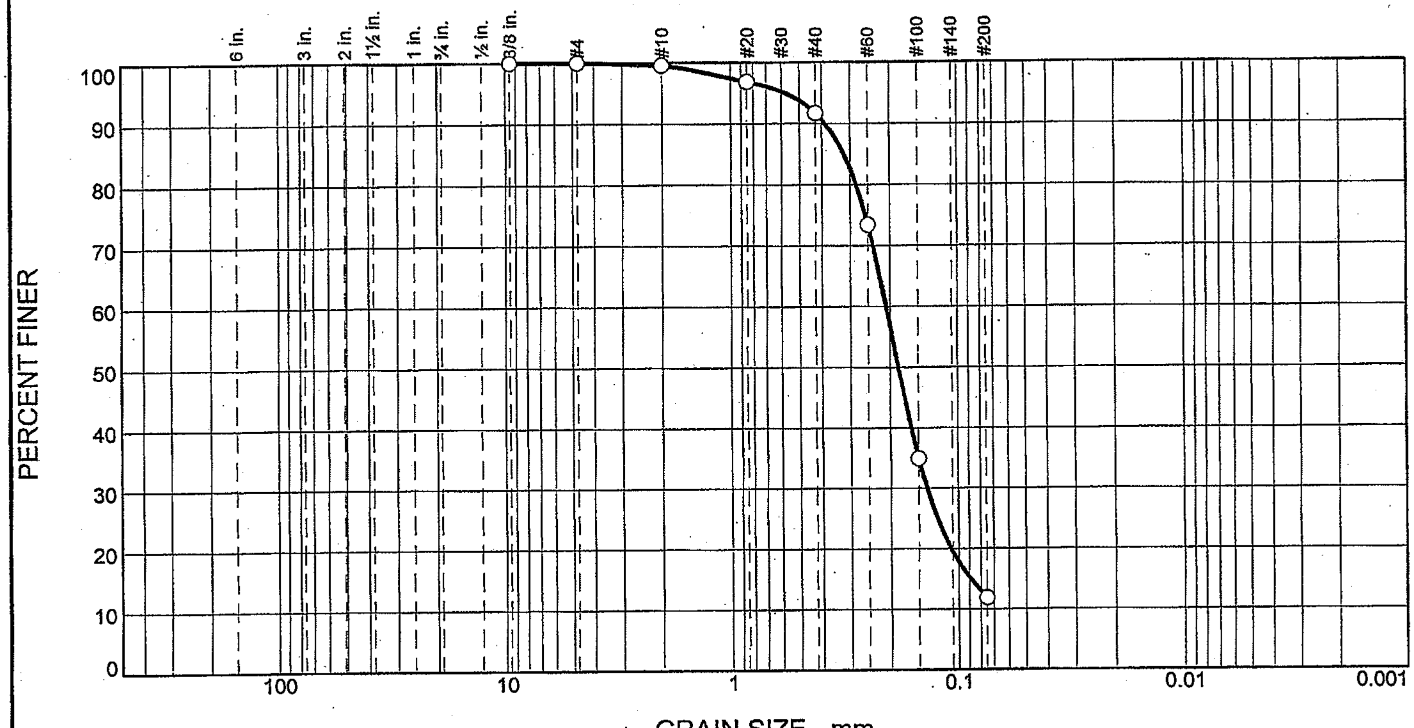
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Michael Hal
Title: Project Engineer

Source of Sample: Boring No.: NBD-10 **Depth:** 29.5'-31.0' **Date Sampled:**
Sample Number: SS-8

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	7.9	79.8	11.9	

Test Results (ASTM D 422 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.6		
#20	96.8		
#40	91.7		
#60	73.4		
#100	34.9		
#200	11.9		

* (no specification provided)

Material Description

Gray-Brown Slightly Silty Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3861 D_{85}= 0.3193 D_{60}= 0.2079
D_{50}= 0.1837 D_{30}= 0.1379 D_{15}= 0.0886
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 20.6%

Date Received: 3-2-10 **Date Tested:** 3-8-10

Tested By: MC

Checked By: Mich H

Title: Project Engineer

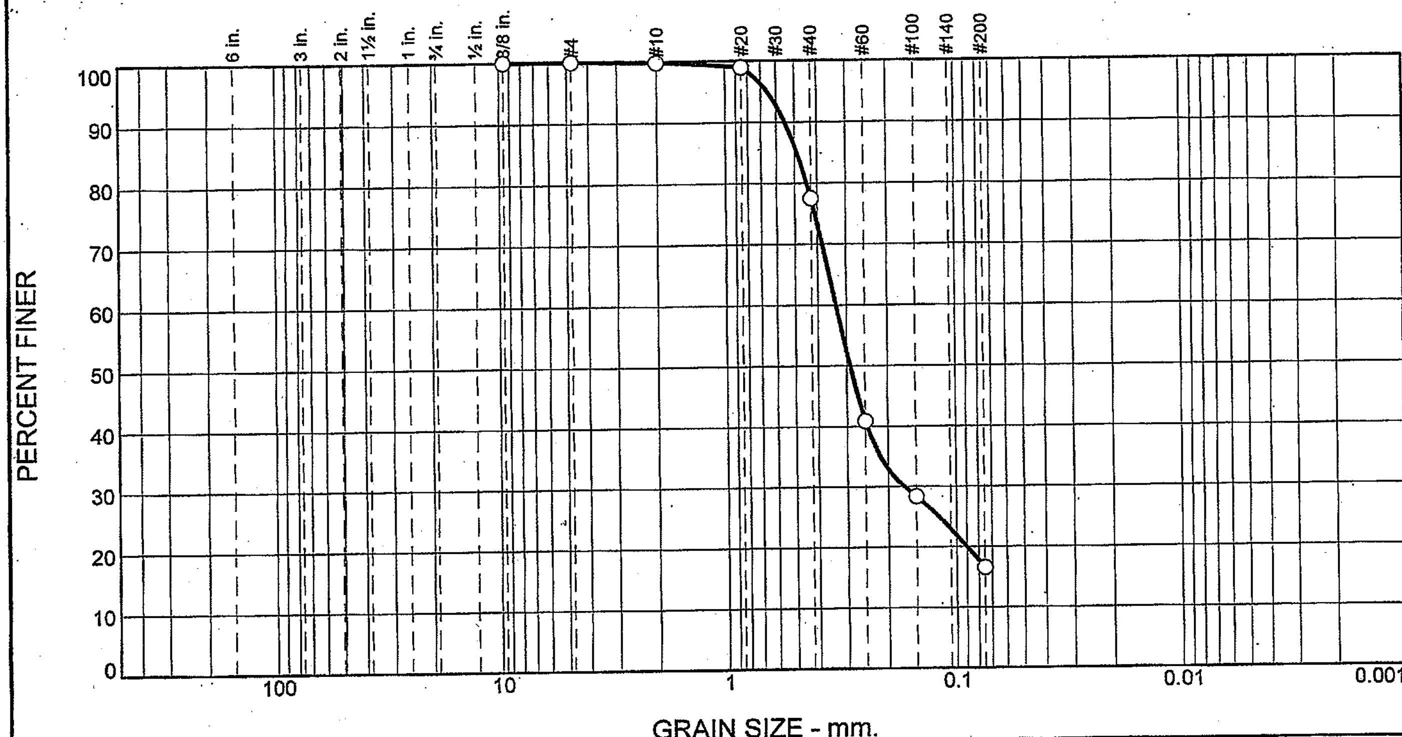
Source of Sample: Boring No.: NBD-10 **Depth:** 34.5'-36.0' **Date Sampled:**

Sample Number: SS-9

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	22.4	60.9	16.6	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	99.9		
#20	99.0		
#40	77.5		
#60	40.9		
#100	28.4		
#200	16.6		

* (no specification provided)

Material Description

Gray-Brown Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= 24 LL= 36 PI= 12

Classification

USCS (D 2487)= SC AASHTO (M 145)= A-2-6(0)

Coefficients

D_{90}= 0.5508 D_{85}= 0.4879 D_{60}= 0.3330
D_{50}= 0.2905 D_{30}= 0.1695 D_{15}=
D_{10}= C_u= C_c=

Remarks

Percent Natural Moisture: 35.1%
F.M.=1.27

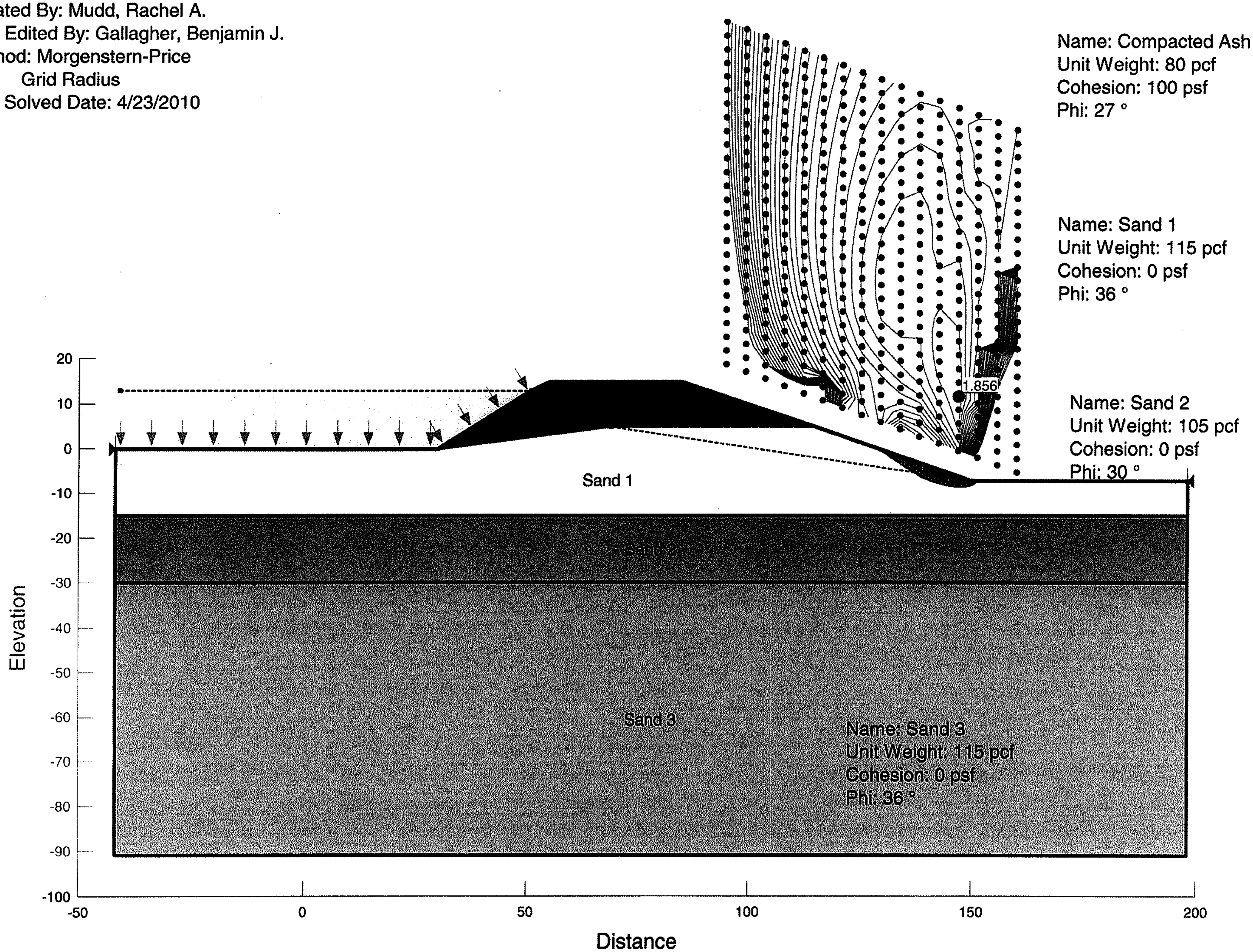
Date Received: 3-2-10 **Date Tested:** 3-8-10
Tested By: MC
Checked By: Mitchell Hul
Title: Project Engineer

Source of Sample: Boring No.: NBD-10 **Depth:** 39.5'-41.0' **Date Sampled:**
Sample Number: SS-10

MACTEC ENGINEERING. AND CONSULTING, INC.

Client: Southern Company
Project: Plant Smith Ash Pond
Project No: 6189099046 **JAX, FL.**

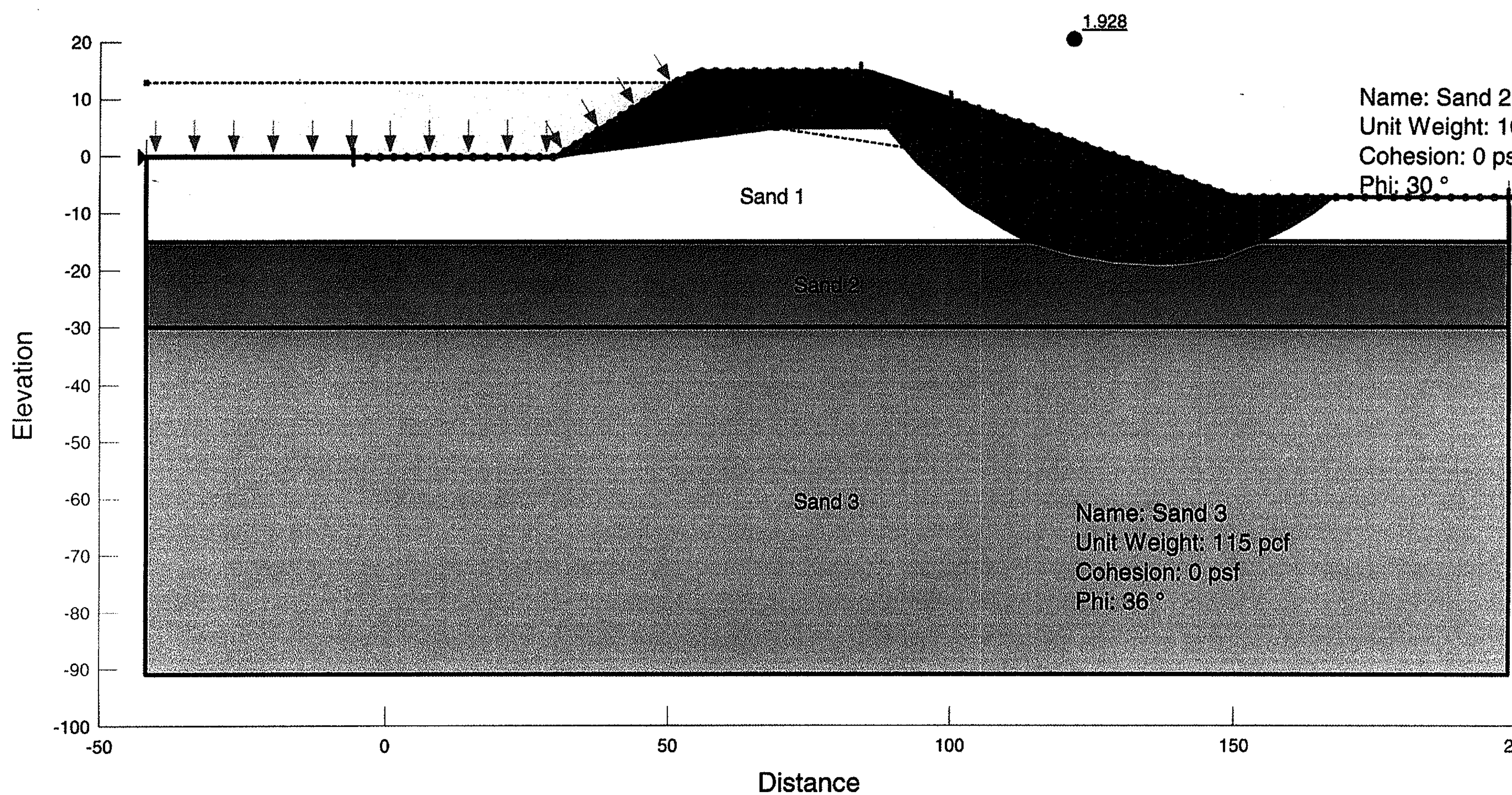
File Name: SDB-19.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius
Last Solved Date: 4/23/2010



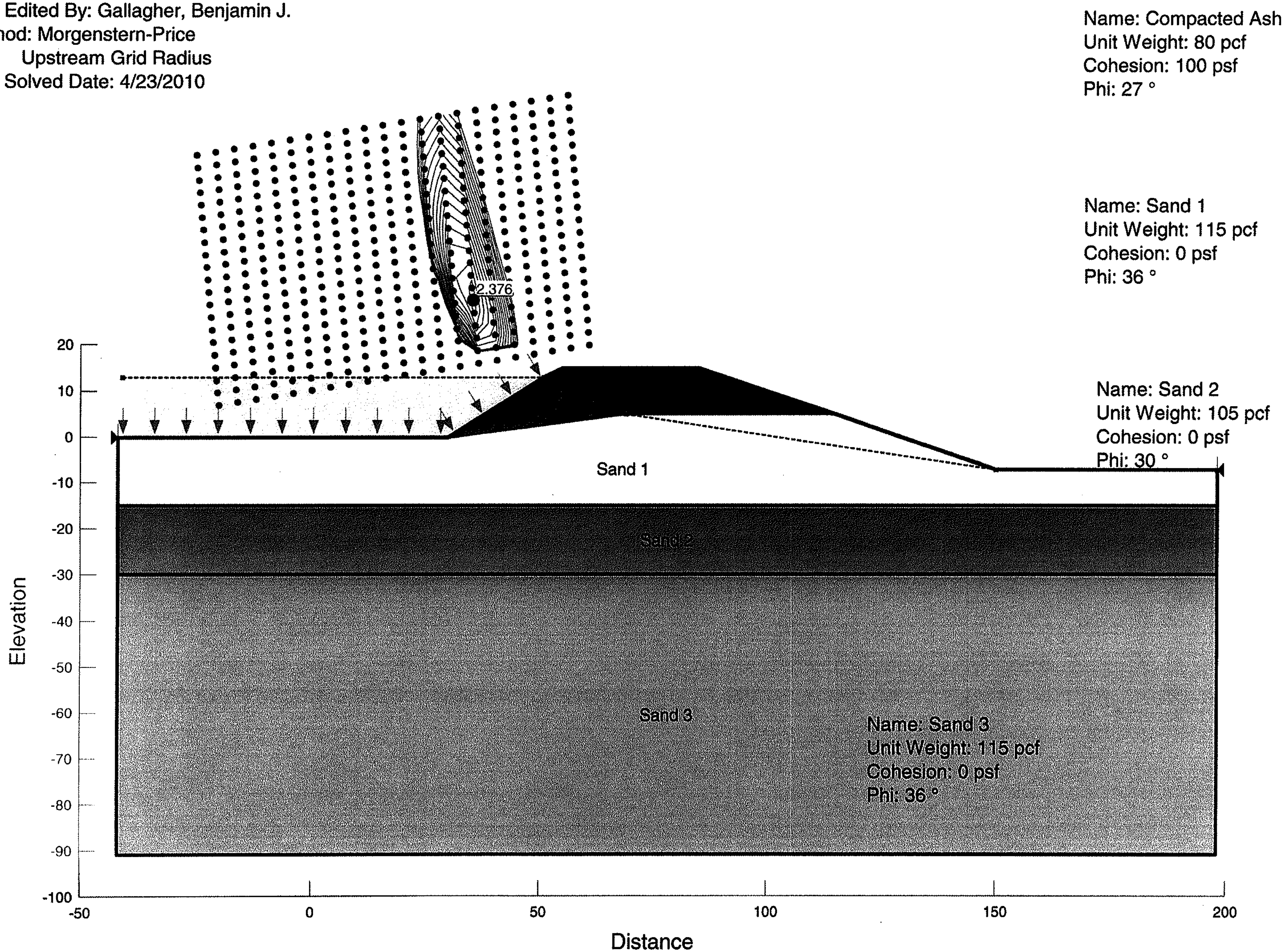
File Name: SDB-19.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry
Last Solved Date: 4/20/2010

Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °

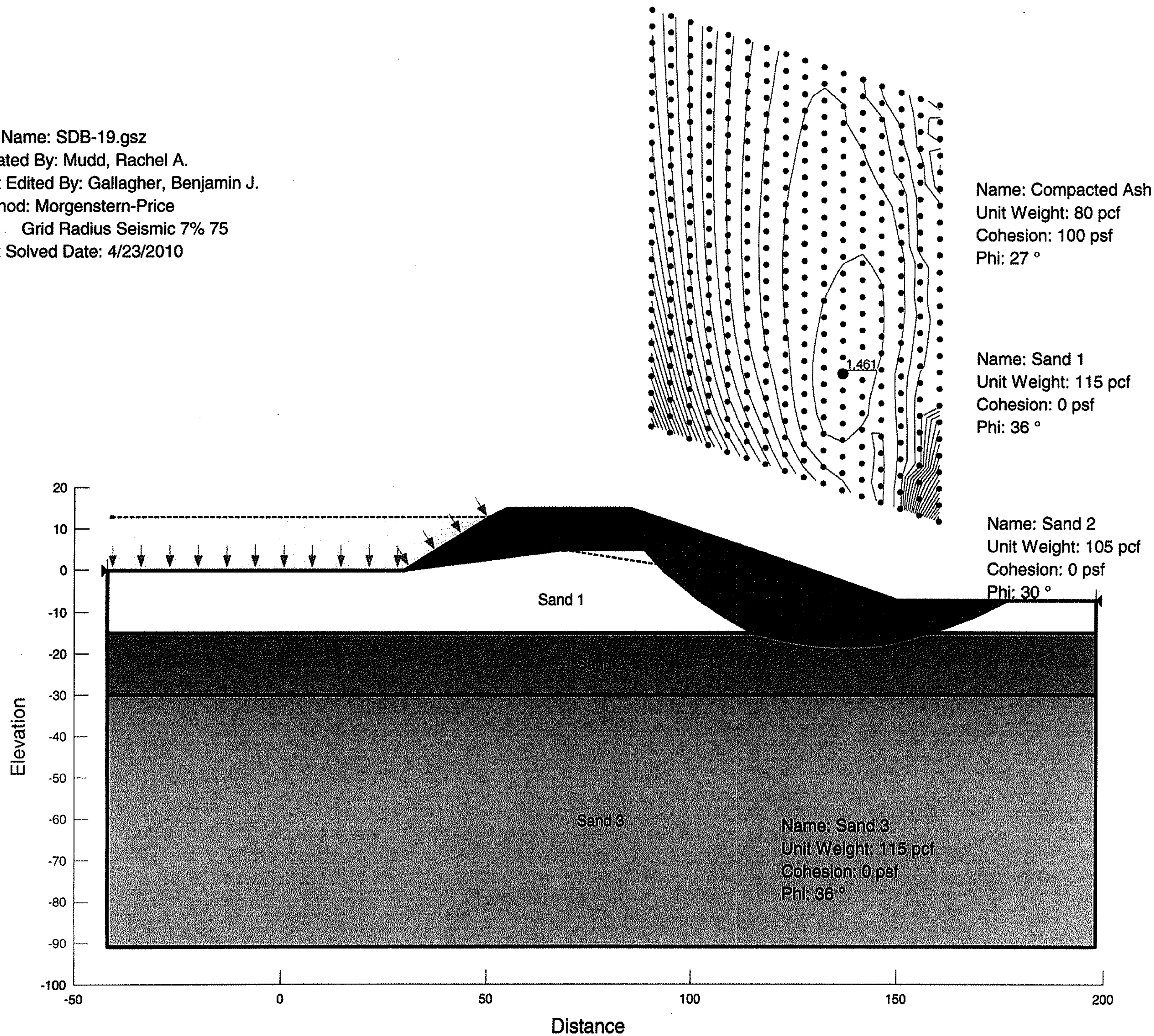
Name: Sand 1
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °



File Name: SDB-19.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Upstream Grid Radius
Last Solved Date: 4/23/2010



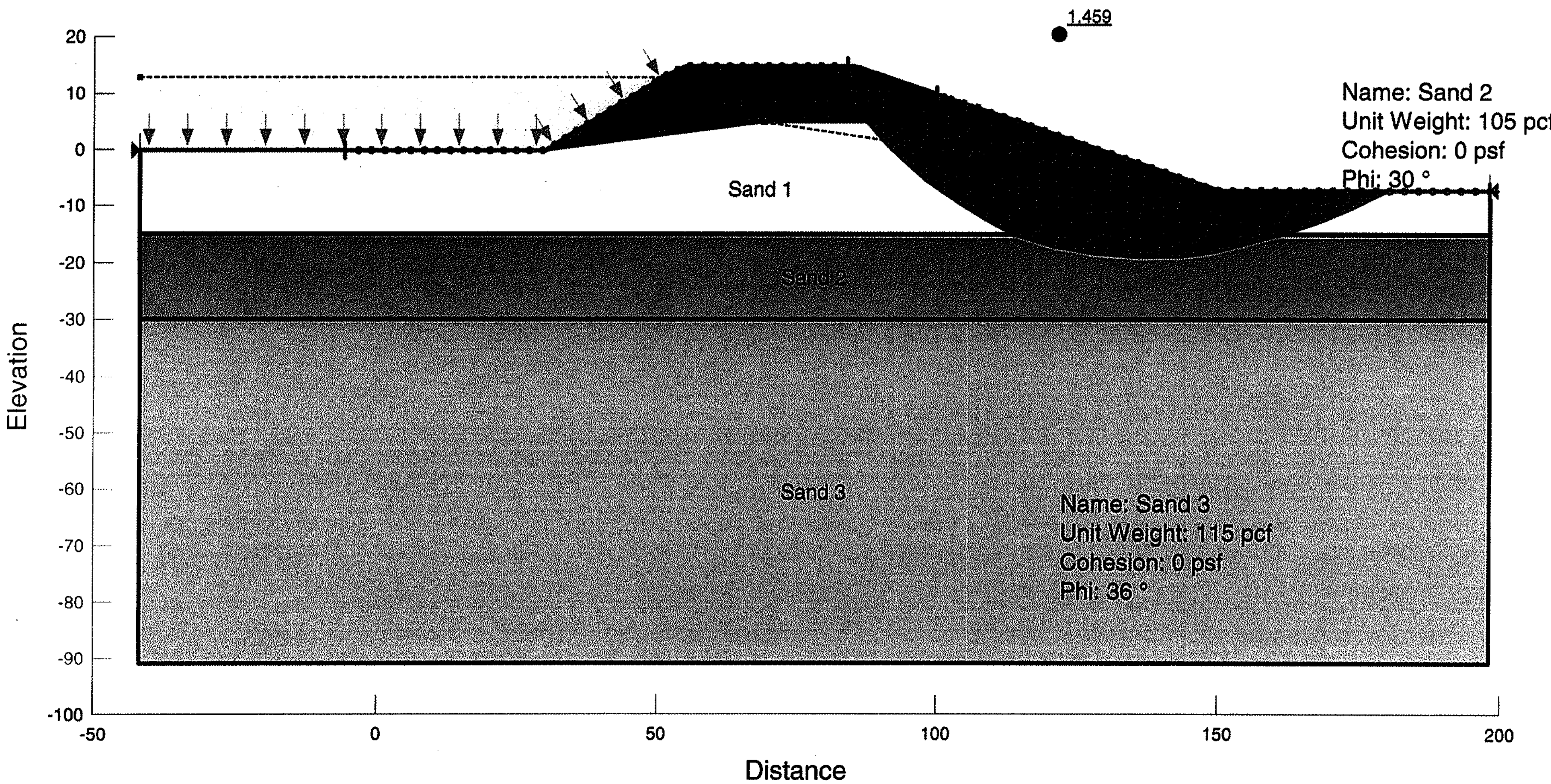
File Name: SDB-19.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75
Last Solved Date: 4/23/2010

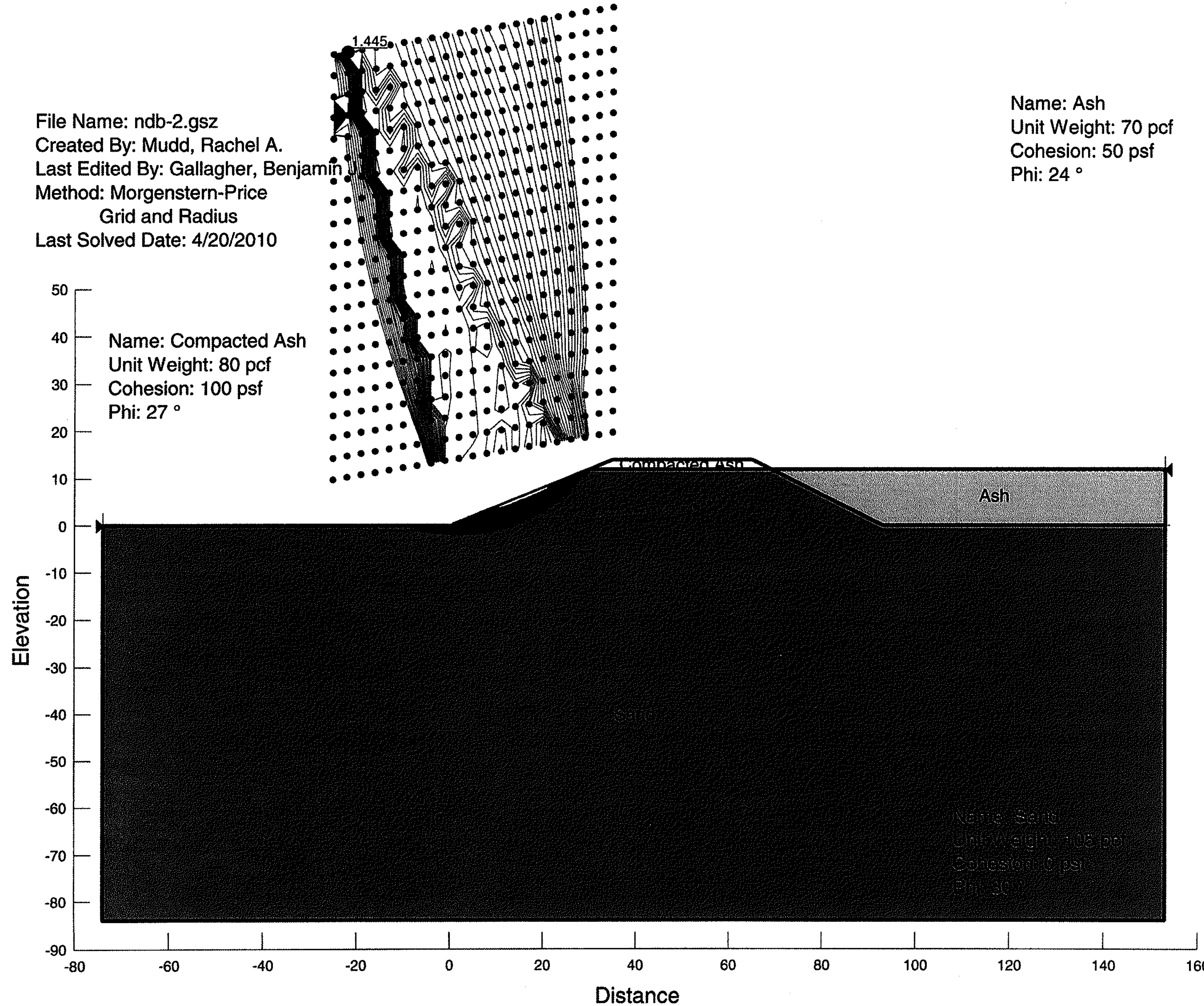


File Name: SDB-19.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry Seismic 7% 75
Last Solved Date: 4/23/2010

Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °

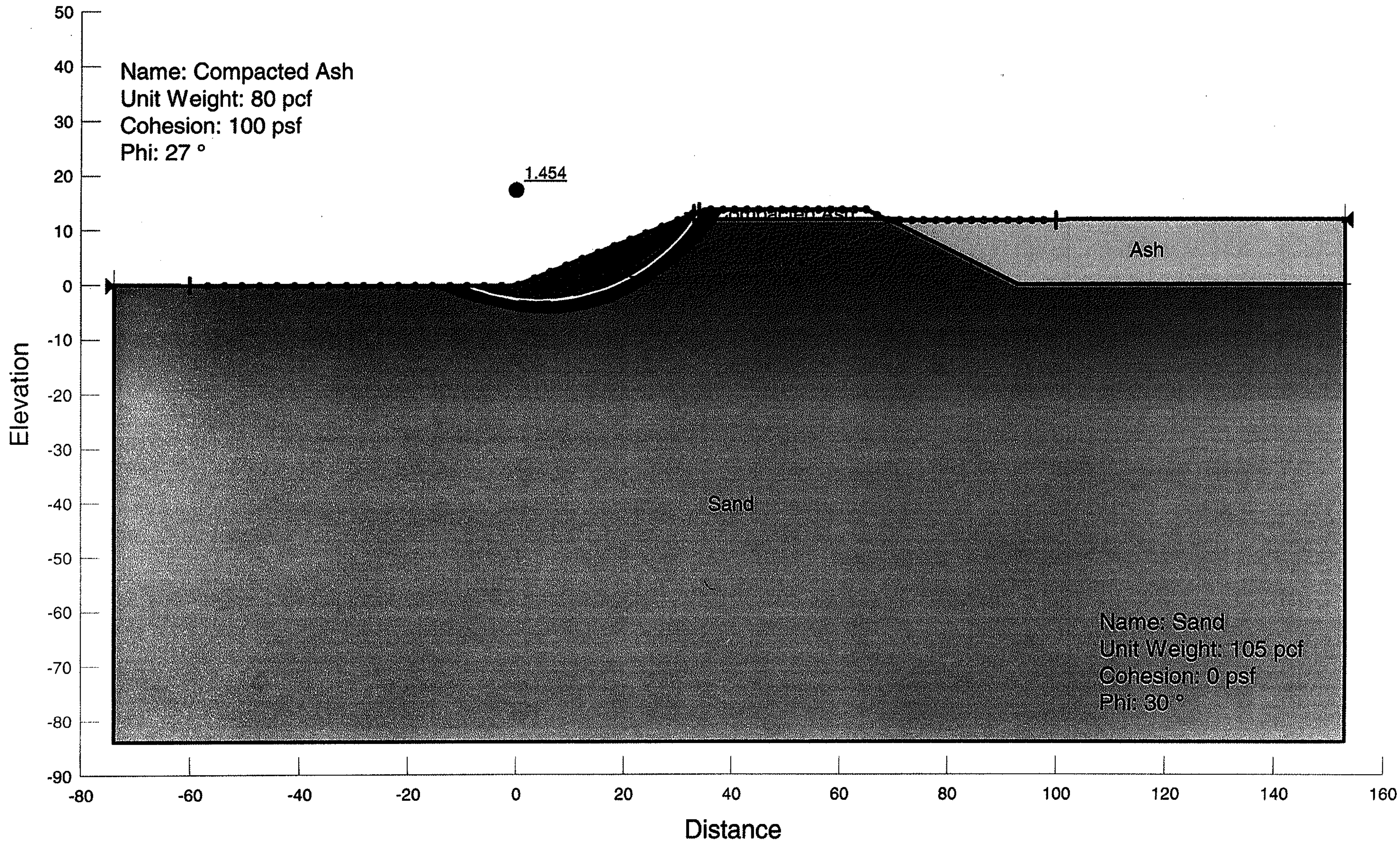
Name: Sand 1
Unit Weight: 115 pcf
Cohesion: 0 psf
Phi: 36 °



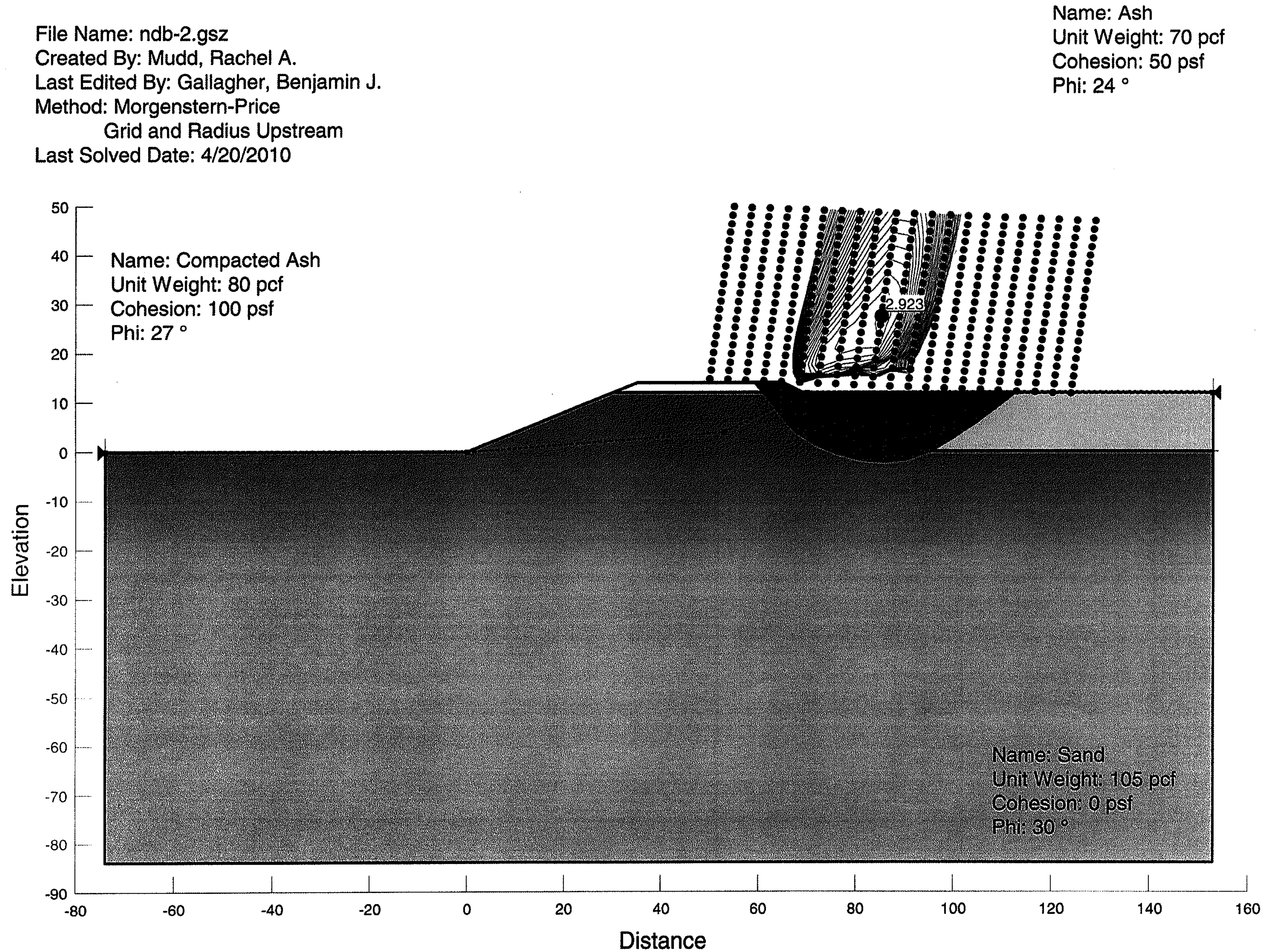

File Name: ndb-2.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid and Radius
Last Solved Date: 4/20/2010
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
1.445
Compacted Ash
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160
Distance

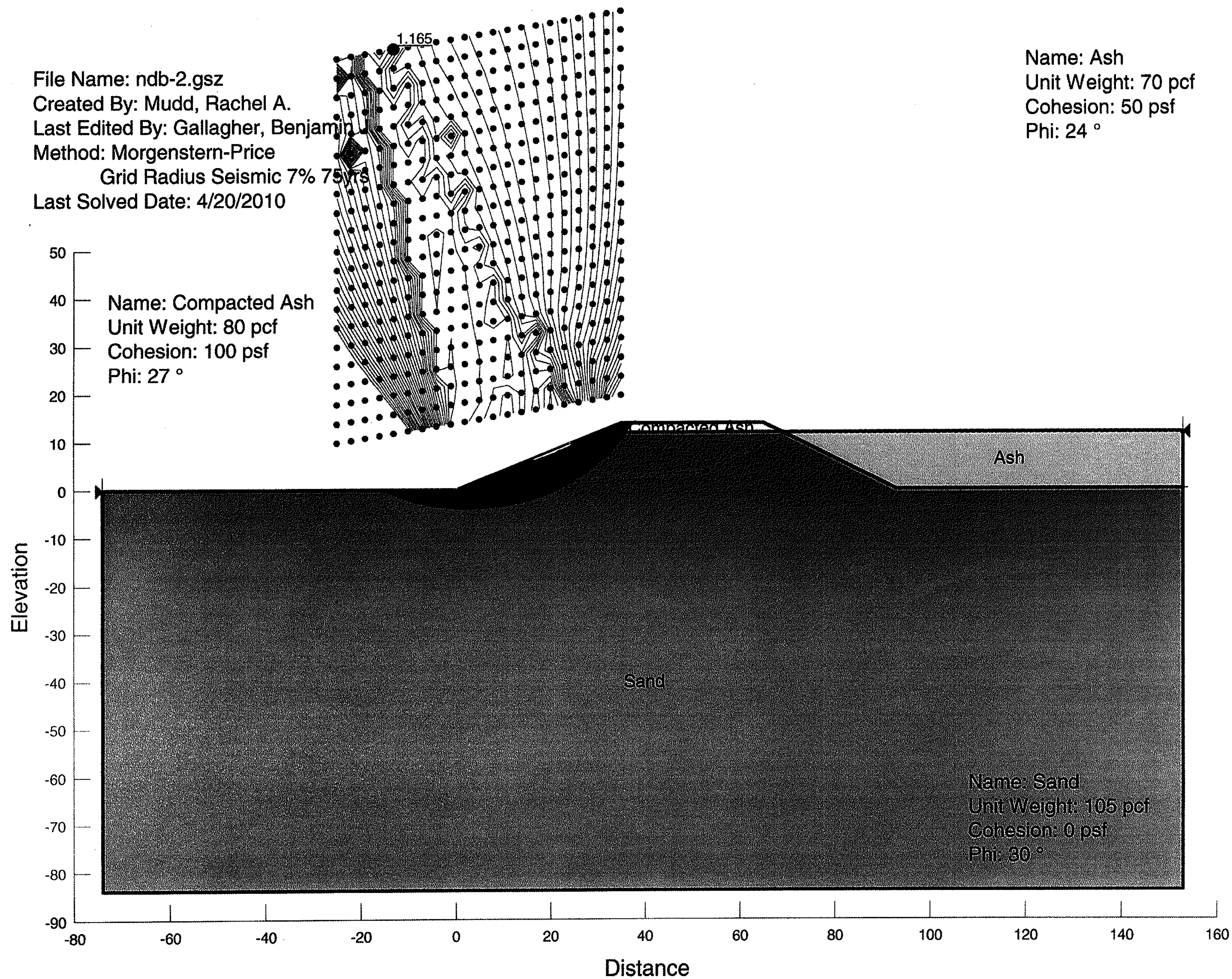
File Name: ndb-2.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Entry Exit
Last Solved Date: 4/20/2010

Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °



File Name: ndb-2.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid and Radius Upstream
Last Solved Date: 4/20/2010

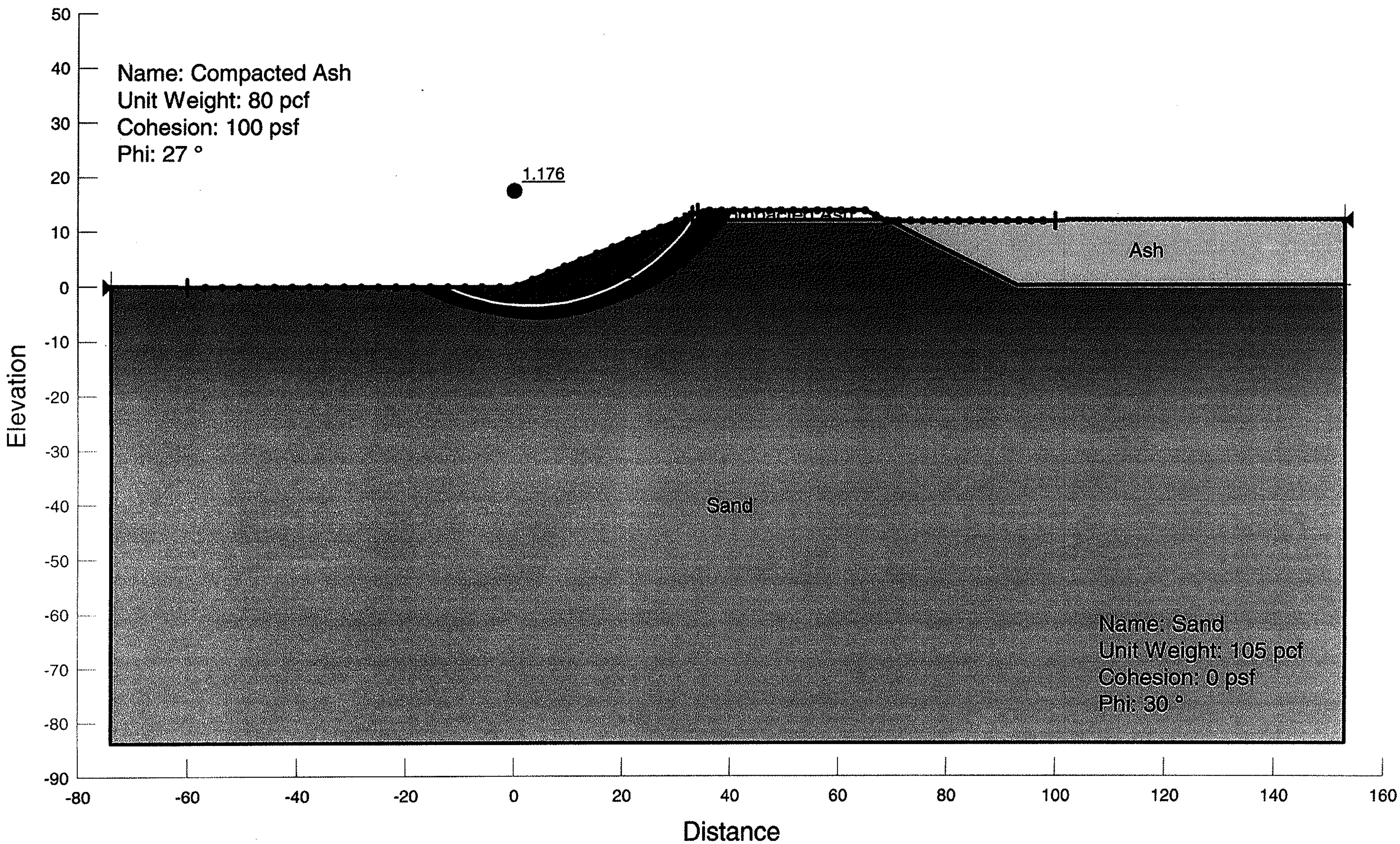


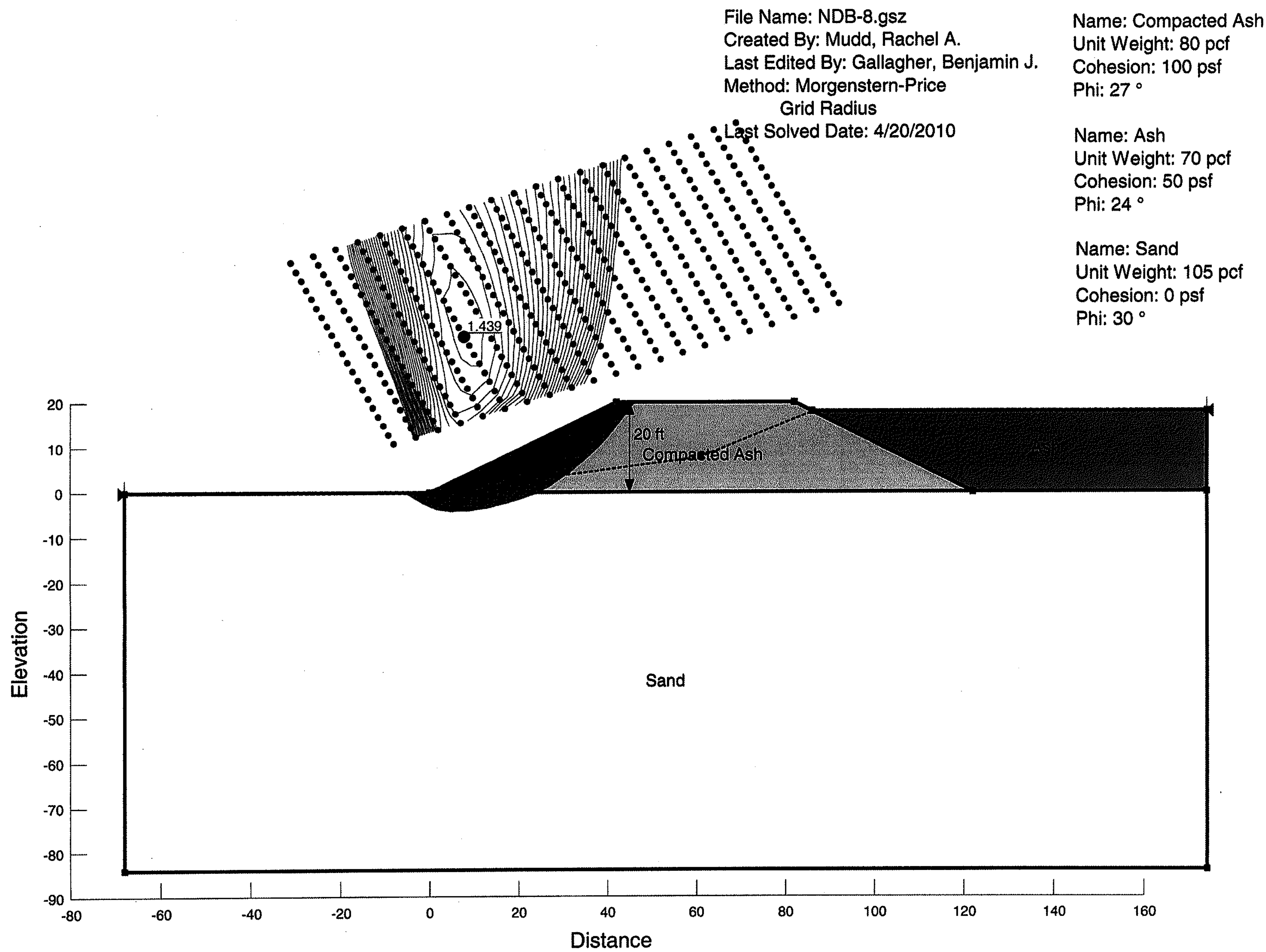


File Name: ndb-2.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75yrs
Last Solved Date: 4/20/2010
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
1.165
Compacted Ash
Ash
Sand
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
Elevation
Distance
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160

File Name: ndb-2.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry Seismic 7% 75yrs
Last Solved Date: 4/20/2010

Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °



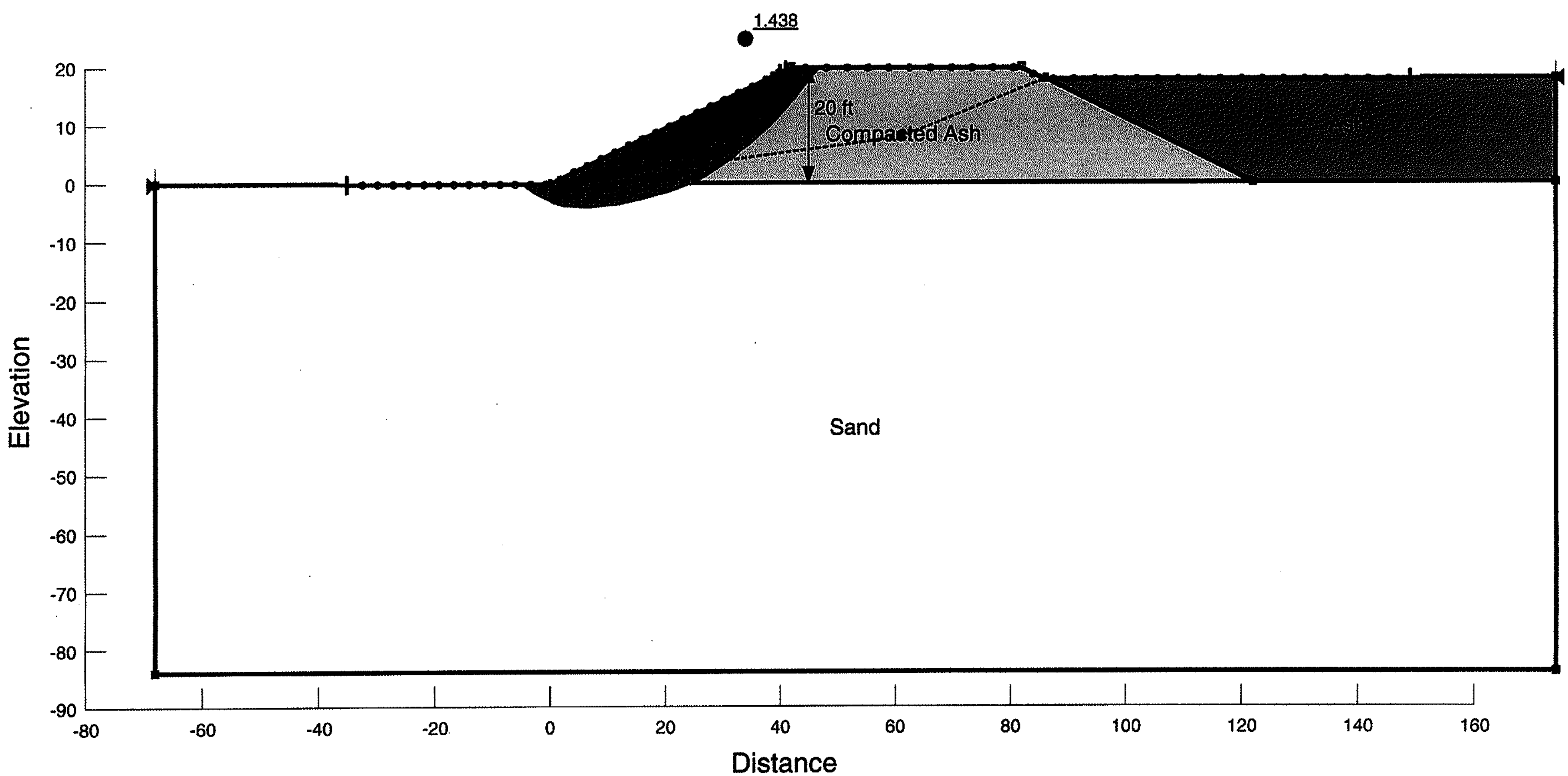

File Name: NDB-8.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius
Last Solved Date: 4/20/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
1.439
20 ft
Compacted Ash
Sand
Elevation
Distance
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160

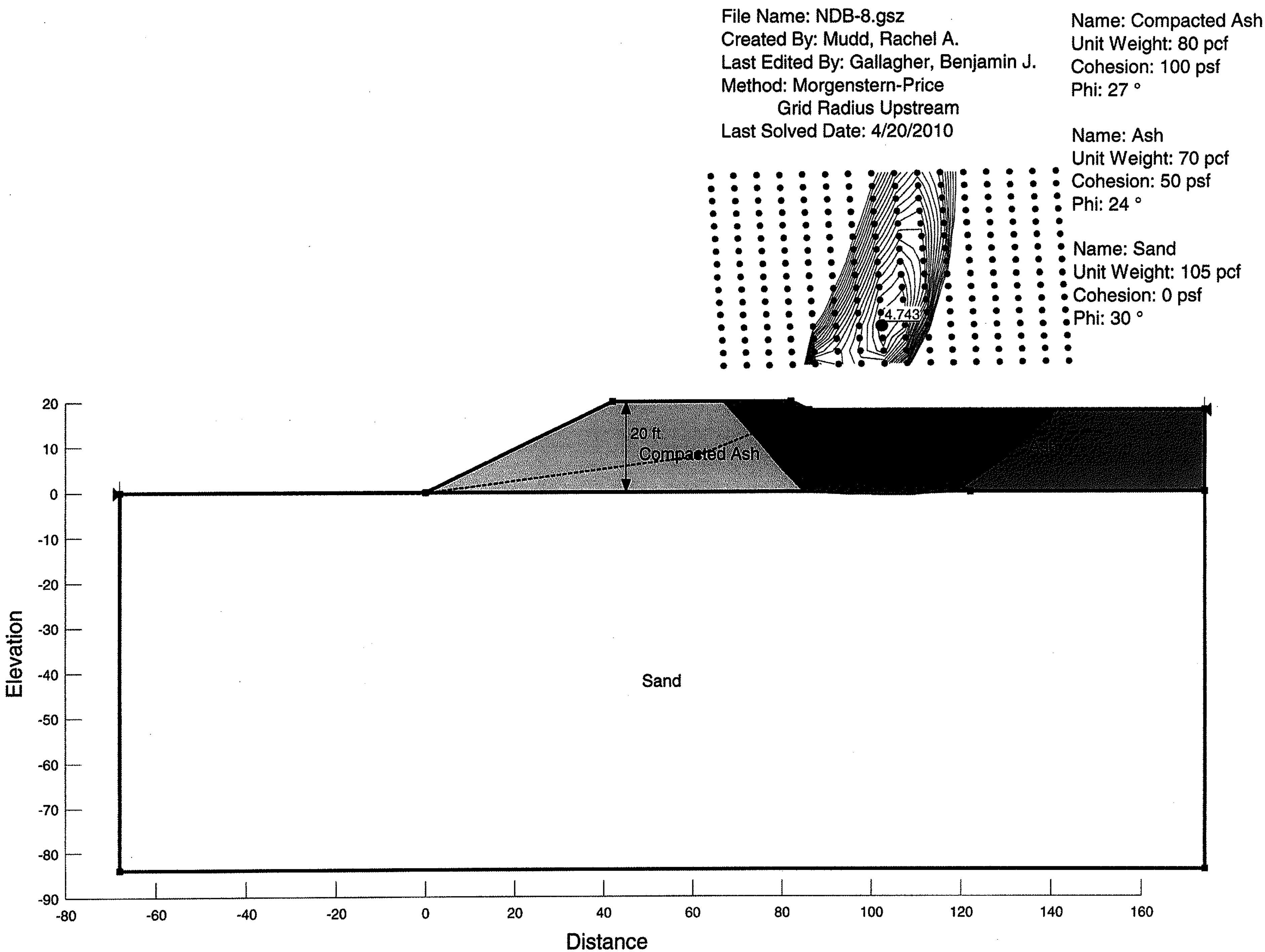
File Name: NDB-8.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry
Last Solved Date: 4/20/2010

Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °

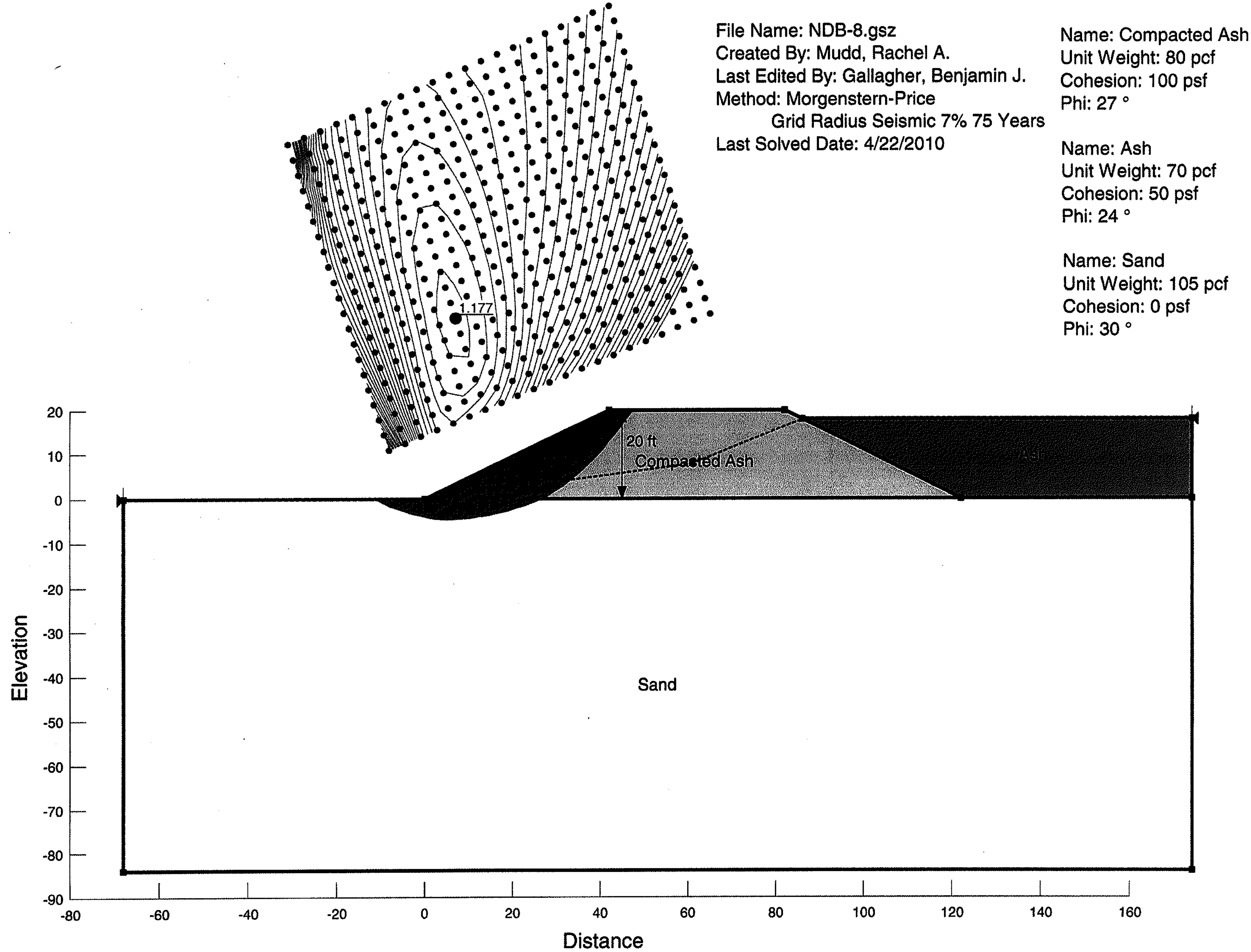
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °

Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °





File Name: NDB-8.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Upstream
Last Solved Date: 4/20/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
4.743
20 ft
Compacted Ash
Sand
Elevation
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160
Distance



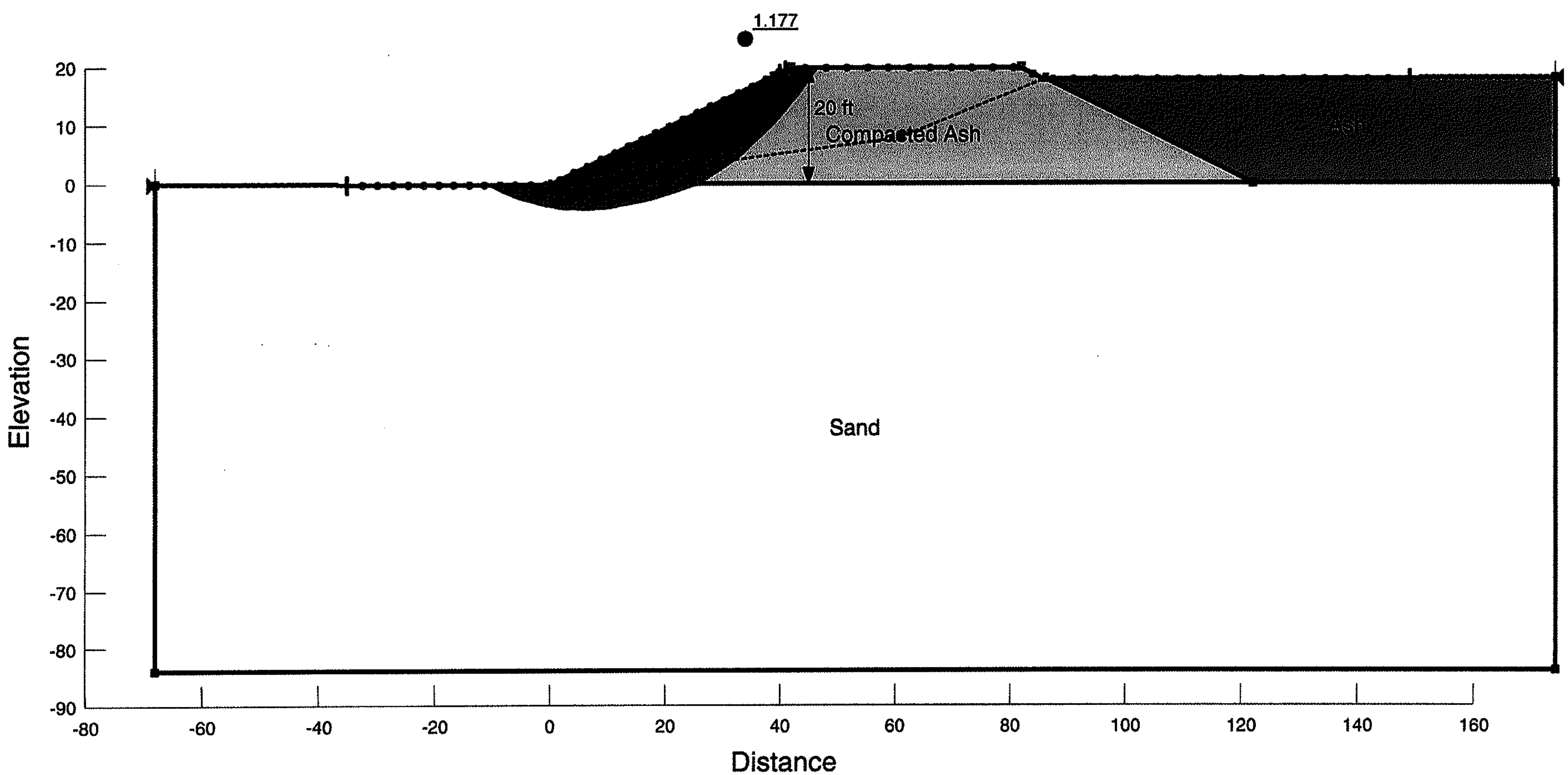
File Name: NDB-8.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Grid Radius Seismic 7% 75 Years
Last Solved Date: 4/22/2010
Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °
Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °
Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °
1.177
20 ft
Compacted Ash
Ash
Sand
Elevation
Distance
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160

File Name: NDB-8.gsz
Created By: Mudd, Rachel A.
Last Edited By: Gallagher, Benjamin J.
Method: Morgenstern-Price
Exit Entry Seismic 7% 75 Years
Last Solved Date: 4/22/2010

Name: Compacted Ash
Unit Weight: 80 pcf
Cohesion: 100 psf
Phi: 27 °

Name: Ash
Unit Weight: 70 pcf
Cohesion: 50 psf
Phi: 24 °

Name: Sand
Unit Weight: 105 pcf
Cohesion: 0 psf
Phi: 30 °



Southern Company Services, Inc.
Post Office Box 2625
Birmingham, Alabama 35202
Telephone 205 870-6011

FILE COPY

Southern Company Services
the southern electric system

J. F. Goodwin
Manager
Hydro Projects

July 28, 1980

Mr. G. O. Layman
Gulf Power Company
Power Supply
General Office

PLANT LANSING SMITH
EXISTING ASH POND DIKE
RECOMMENDATIONS FOR REMEDIAL WORK

This department has been requested to make recommendations for remedial work to the slopes of the existing ash pond dike. An inspection of the dike on July 9, 1980, by Mr. Joel Miller of the geotechnical section, found the dike slopes to have extensive erosion through the fill and some large undesirable vegetation growing on the slopes. Standing water at the downstream toe along the south and west sides of the dike was observed. A canal along the east side and a spillway channel along the north side of the dike exists.

The dike was constructed of a slightly silty fine to medium sand for the initial construction. Along the west and south sides of the dike, a layer of bottom ash has been added to the top of the dike to increase its height. Based on Gulf Power Company Drawing No. C-4177, the downstream slope of the dike ranges from the 1.0 to 1.5 horizontal to 1.0 vertical. The height of the dike is typically no greater than fifteen feet.

The recommendations for remedial work may be divided into two sections along the dike. A section from approximately Sta. 20+00 to Sta. 83+00 shall be recommended for placing additional fill and grassing on the downstream slope and grassing of the upstream slope. The other section, from approximately Sta. 90+00 to Sta. 116+00, shall be recommended for cutting back and grassing the downstream slope and placing additional fill where needed and grassing of the upstream slope. The eastern portion of the dike from approximately Sta. 1+00 to 20+00 has future plans for redevelopment and extention of the dike; thus, this area is not under consideration for remedial work at this time.

STA. 20+00 to Sta. 83+00

The section of the dike from approximately Sta. 20+00 to Sta 83+00 shall have remedial work performed in such a manner as shown on the attached sketch. The sketch shows the upstream and downstream slope to be stripped to remove the erosion features and vegetation. Also, the downstream toe area where new fill is to be placed should be cleared and stripped of vegetation.

The new fill for remedial work shall be placed on the prepared downstream slope as shown on the sketch. The new fill shall be constructed to a slope of 2.5 horizontal to 1.0 vertical. After the upstream and downstream slopes have been stripped, fill shall be placed on the downstream slope such that a twenty foot minimum crest width is obtained. Due to the standing water existing at the downstream toe of the dike, the initial lifts of fill may be utilized as a working platform for the equipment. This platform should extend beyond the toe of the new fill. It should aid in the access of equipment for dumping, spreading, compacting, and maneuvering during the placement operation. Gulf Power Company has indicated that a borrow source west of the plant site would be utilized. The material should consist of a slightly silty fine to medium sand.

Placing the new fill along the downstream slope may proceed as follows:

1. A backhoe or gradall should strip the upstream and downstream slopes of erosion features and vegetation by working from the crest. The stripped material would be cleaned up the slope and loaded to trucks which would transport the material to spoil areas. Working from the crest would allow only one-way traffic along the top of the dam.

2. The stripping operation from the crest of the dam shall proceed ahead of the placement operation.

3. The placement operation should proceed along the downstream toe, and placed to the lines and grades as shown on the attached sketch. Placing the new fill to a slope of 2.5 horizontal to 1.0 vertical should give adequate safety against sliding if the new fill is placed as recommended.

4. Working from the downstream toe and after the area ahead of placement has been stripped, the new fill can be placed by utilizing a dozer for spreading and tracking in the material. Trucks may be used for hauling the material to the point of placement where it would be dumped for spreading and compacting.

5. The dozer should spread the material into loose lifts not to exceed twelve inches. Two complete coverages with the dozer on each lift of new fill should be performed. The lower lifts of material can be placed in horizontal sections, but the upper lifts may be placed and compacted by working the dozer up and down the slope.

6. Upon completion of remedial work to the upstream and downstream slopes, these slopes shall be grassed for the purpose of preventing erosion.

STA. 90+00 to STA. 116+00

The section of the dike from approximately 90+00 to Sta. 116+00 shall have remedial work performed in a manner to remove the erosion features and obtain a satisfactory stand of grass. The recommendations for remedial work along this section of the dike are as follows:

1. A backhoe or gradall should lay back the downstream slope by working from the crest. Laying the slope back to 2.0 horizontal to 1.0 vertical would accomodate grassing and maintenance more easily. This work would occur down at the toe near the pool level of the spillway channel and proceed up the slope to the crest.

2. Where the crest width is diminished to less than twenty feet due to the excavation along the downstream slope, fill may be placed on the upstream slope to maintain the twenty foot crest width.

3. This additional fill to the upstream slope should be placed with a dozer to spread and track in the material to a satisfactory crest width. Along this section of the dike, the final allowable crest width after excavation is left to the discretion of Gulf Power Company.

4. Upon completion of remedial work to the upstream and downstream slopes, these slopes shall be grassed for the purpose of preventing erosion.

GENERAL CONSIDERATIONS

The top two to three feet of fill along the west and south sections of the dike consists of bottom ash material. This material was added after initial construction to increase the height of the dike. It is recommended that the finer borrow material be mixed with this upper layer of bottom ash. This coarse grained ash material offers a path of seepage when the pool level rises to the level of the ash. By mixing the finer grained sand with the bottom ash, a more well-graded soil matrix will be achieved which should reduce the permeability of this layer in the dike.

The use of ash from the ash pond as a source of fill material could be a potential area for borrow. The problem with using the ash is that it would be saturated at depth below the pond surface. This ash material would have to be excavated from the pond, stockpiled and allowed to drain to a satisfactory moisture level, and then hauled to the point of placement. This sequence of work would require double handling of the ash material, which would increase the placement cost. Also, some amount of time would be involved for allowing the ash to drain prior to placement, and the material would vary in grain size, workability, strength and erosion potential. The mixing of ash with the finer borrow material would create another handling problem to the placement operation. Mixing of the materials prior to placement creates an additional operation that could increase the cost of the remedial work.

Certain section of the ash pond dike shall require additional fill to the top of the dike to increase the freeboard of the dike. It is recommended that a maximum two foot freeboard be established from approximately Sta. 20+00 to 116+00. Even with an increase in height, the lines, grades, minimum crest width, etc., after the remedial shall be maintained as stated above.

Discussions with Mr. Van Peavy of the Civil & Architectural Department were made concerning the erosion control of the slopes. Mr. Peavy recommended that grassing of the upstream and downstream slopes, after the remedial work has been completed, should be a satisfactory method of erosion control. Attached is a set of specifications for grassing which Mr. Peavy suggests be utilized for obtaining a sufficient of grass.

J. F. Goodwin
by RHF

JPM/fhl

Attachments

cc: Gulf Power Company
W. K. Czepluch w/attachment
Southern Company Services
M. C. Brickell
A. H. Gibson
S. H. Lawrence
R. H. Smith
E. L. Williamson
E. E. Peavy w/attachment

5.4 Grassing

The work specified in this section consists of the establishing of a stand of grass on areas called for by seeding, seeding and mulching or sodding. At the direction of the Project Superintendent, the Contractor might be directed to protect certain areas with a nylon net and paper covering until root growth is well advanced. The product used shall be Hold-Gro, as manufactured by Gulf States Paper Corporation, or equal and shall be designed for the season of placement.

It is the intent of these Specifications that a stand of grass be established such that there is a live, healthy grass plant not more than three inches apart in any direction at the time of the end of the contract or after 60 days from the time of planting, whichever is longer.

5.4.1 Grassing by Seeding

5.4.1.1 Materials

5.4.1.1.1 Seed - Grass seed shall be a mixture of equal parts of bermuda seed and Pensacola bahia, except that during the winter months, if so directed by the Purchaser's representative, rye grass seed or other approved winter cover crop seed may be substituted for the bermuda seed. The two types of seed used shall be thoroughly dry-mixed immediately before sowing. Seed which has become wet or moldy shall not be used.

The bermuda seed shall be hulled seed. The Pensacola bahia seed shall be scarified seed, having a minimum active germination of 40 percent and a total germination of 85 percent. All seed shall meet the requirements of the Florida State Department of Argriculture and all applicable State Laws, and shall be approved by the Purchaser's representative before being sown.

5.4.1.1.2 Fertilizer - Commercial fertilizers shall comply with the State Fertilizer Laws.

The numeral designations for fertilizer indicate the minimum percentages (respectively) of (1) total nitrogen, (2) available phosphoric acid, and (3) water-soluble potash, contained in the fertilizer.

The chemical designation shall be 8-8-8 for dry fertilizer. If liquid fertilizer is used, it must first be approved by the Purchaser's representative and in any case, the total nitrogen content shall not exceed 12 percent.

5.4.1.1.3 Water - The water used in the grassing operations may be obtained from any approved spring, pond, lake, stream or municipal water system. The water shall be free of excess and harmful chemicals, acids, alkalies, or any substance which might be harmful to plant growth. Salt water shall not be used.

5.4.1.1.4 Dolomitic Limestone - The designation "fertilizer" shall include the application of dolomitic limestone where directed by the Purchaser's representative.

5.4.1.2 Equipment - The equipment such as fertilizer spreader, seed spreader, disc, rollers and water wagons, shall be of the kind and size as approved by the Purchaser's representative.

5.4.1.3 Construction Methods

5.4.1.3.1 General - Fertilizing or seeding operations will not be permitted when wind velocities exceed 15 miles per hour. Seed shall be sown only when the soil is moist and in proper condition to induce growth. No seeding shall be done when the ground is frozen, unduly wet or otherwise not in a tillable condition.

Whenever an area has been graded and deemed suitable by the Project Superintendent it shall be made ready and grassed in accordance with these Specifications. Grassing shall be incorporated into the project at the earliest practical time in the life of the contract.

5.4.1.3.2 Sequence of Operations - The several operations involved in the work shall proceed in the following sequence: Fertilizing (and/or application of limestone) and preparation of the ground, spreading of mulch (where called for), seeding, cutting in mulch where called for, rolling and application of Hold-Gro or approved equal, where called for.

5.4.1.3.3 Preparation of Area to be Seeded - The ground over which the seed is to be sown shall be prepared by disk-harrowing and thoroughly pulverizing the soil to a suitable depth. The prepared soil shall be loose and reasonably smooth. It shall be reasonably of free of large clods, roots, and other material which will interfere with the work or subsequent mowing and maintenance operations. No subsequent operations shall be commenced until the Project Superintendent has approved the condition of the prepared areas.

5.4.1.3.4 Application of Fertilizer - The fertilizer and/or limestone shall be spread uniformly over the area to be grassed, at the rate of 800 to 1,000 pounds per acre, or as may otherwise be called for on the drawings. On steep slopes or other areas where machine-spreading may not be practicable, the spreading may be done by hand. Immediately after the fertilizer is spread it shall be mixed with the soil to a depth of approximately four inches.

5.4.1.3.5 Seeding - While the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Unless shown otherwise on the drawings the rate of spread for the permanent type seed mixture shall be 100 pounds per acre.

When so directed by the Project Superintendent, seed of an approved quick-growing species of grass, such as rye, Italian rye, millet, or other cereal grass, shall be spread in conjunction with the permanent type seed mixture. The type of quick-growing seed used shall be appropriate to provide an early ground cover during the particular season when planting is done. The rate of spread shall be 30 pounds per acre unless otherwise designated by the Engineer.

5.4.1.3.6 Mulching - When mulching is called for, approximately two inches, loose thickness, of the mulch material shall then be applied uniformly over the seeded area, and the mulch material cut into the soil with the equipment specified, so as to produce a loose mulched thickness of three to four inches. Care shall be exercised that the materials are not cut too deeply into the soil.

The mulch material shall be dry straw or hay consisting of oat, rye or wheat straw, or of pangola, plant coastal bermuda, or bahia grass hay. No green mulch may be used.

5.4.1.3.7 Rolling - Immediately after completion of the seeding, the entire grassed or mulched area shall be rolled thoroughly with the equipment specified. At least two trips over the entire area will be required.

5.4.1.3.8 Watering - The seeded areas shall be watered so as to provide optimum growth conditions for the establishment of the grass. In no case, however, shall the period of maintaining such moisture be less than two weeks after the planting.

5.4.1.3.9 Surface Protection - Where called for, a protective cover (such as Hold-Gro or approved equal) shall be installed in accordance with the manufacturer's recommendations.

5.4.1.3.10 Maintenance - The Contractor shall, at his expense, maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded area as may be necessary. The Purchaser's representative at any time, may require replanting of any areas in which the establishment of the grass stand does not appear to be developing satisfactorily.

If a planted area must be replanted due to the Contractor's negligence, carelessness, or failure to provide routine maintenance of such area, such replacement shall be at the Contractor's expense. If replanting is necessary due to factors determined to be beyond the control of the Contractor, payment for replacement will be made under the appropriate contract pay items.

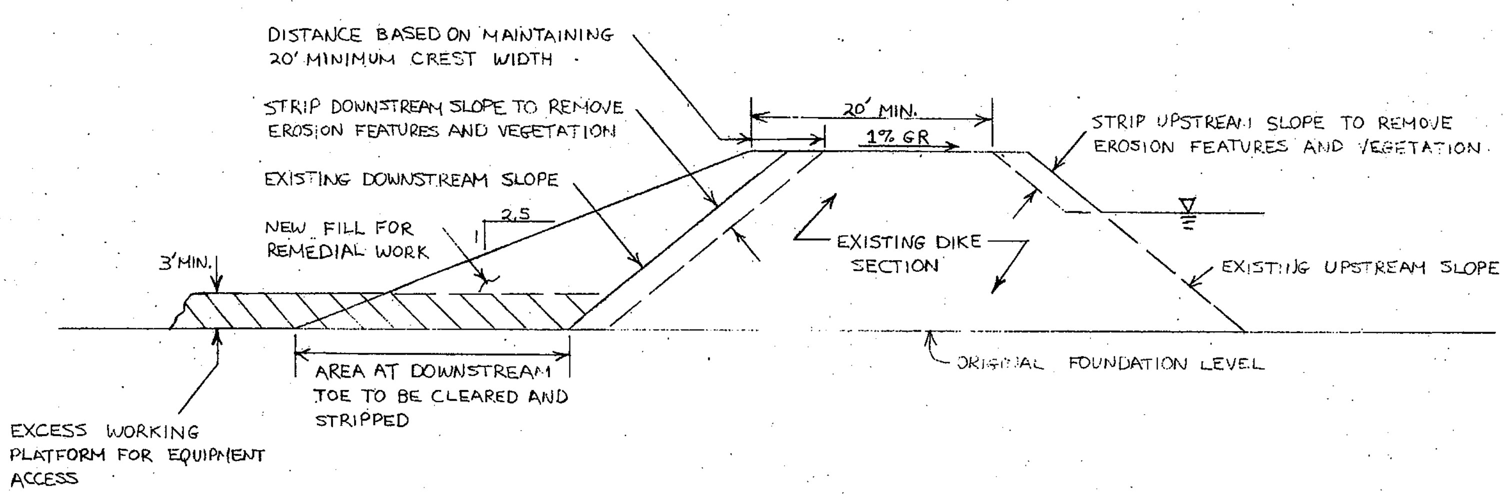
5.4.2 <u>Grassing by Sodding</u>

5.4.2.1 <u>Materials</u>

5.4.2.1.1 Sod - Sod shall be of bahia grass and shall be well matted with roots. The sod shall be taken up in commercial-size blocks, preferably 12-inch by 12-inch. The sod shall be sufficiently thick to secure a dense stand of live grass. The sod shall be live, fresh and uninjured, at the time of planting. It shall be planted as soon as possible after being dug and shall be shaded and kept moist from the time it is dug until it is planted. The sod shall be approved by the Project Superintendent before it is placed.

TYPICAL DIKE SECTION

SCALE: 1" = 10'



PLANT LANSING SMITH
ASH POND DIKE
DRAWN BY: JPM
REVIEWED BY: RMF

ATTORNEY CLIENT PRIVILEGE
This correspondence/communication was prepared at the direction of legal counsel, and is privileged, protected and confidential under attorney work product doctrine.

Plant Smith
Hydrologic and Hydraulic Analysis Report
of the
Ash Pond and Outlet Structures

June 29, 2010

Objective

The objective of this work was to perform a storm water routing analysis, for both the 10 year and 100 year - 24 hour rainfall events, for all three cells of the ash pond and to evaluate the hydraulic adequacy of all outlet structures, weirs, pipes, and to evaluate the operation of the ash pond. The ash pond is divided into three ponds or cells. These ponds include the Northwest Pond, Southwest Pond, and East Pond. Specifics of this analysis were to evaluate the system of ponds individually as well as to evaluate the total ash ponds as a whole.

Assumptions/Input Data

Process flows and current operation of the ponds were supplied by the plant. Topographic survey and aerial mapping of the pond including under water soundings were performed and supplied by SCS Civil Field Services. All outlet structures, weirs and pipes in each pond were also located and surveyed by SCS Civil Field Services.

The pipes between ponds appear to be flowing well and clear and free of substantial sediments and debris. It was assumed that all pipes will continue to be maintained and functioning in proper order.

It is assumed that the outlet pipe through the East Dike into the recycle canal is a free outlet w/no tailwater condition.

Conditions Analyzed

10 year – 24 hour rainfall event with and without plant process flows.
100 year – 24 hour rainfall event with and without plant process flows.

The weir outlet structure of the East Pond contains three sections of stoplogs and two 14 inch dia. pipes. The top of stoplogs are assumed to be, as existing now, at approximately El 17. As for the two 14 inch pipes, each condition was evaluated with the pipes fully operative (opened), and non-operative (fully closed, or clogged).

Summary and Conclusion

As shown in the summary tables, it was determined that for all conditions analyzed, and for the existing available stormwater storage capacity, that each pond with the current outlet structures and pipes in-place and functioning, will handle both the 10 year and 100 year - 24 hour rainfall events, and that the low point top of dike elevations will not be exceeded, though freeboard particularly for the Northwest Cell is very minimum.

It was also determined that as long as the East Pond discharge weir stays unsubmerged and free flowing, as it does for both storm events and for all conditions analyzed, the pool elevation of the East Cell is controlled by the weir and the two 14 inch pipes within the weir structure, and not the 48 inch dia. pipe below the weir that runs through the dike into the recycle canal.

It should be noted that in the Southwest Pond, the 100 storm event (EL 22.55) exceeds the swale (low point EL 22.28) that was constructed within the dike between the Southwest Cell and the East Cell.

This analysis only evaluates the hydrologic and hydraulic condition of the ash pond and does not contain recommendations for remedial repair or improvements.

Ponds Without Process Flows and 14" Discharge Pipes at Weir Closed														
	10 Year Max Water Elevation(ft)	100 Year Max Water Elevation(ft)	10 Year Outlet Culvert Max HGL(ft)	100 Year Outlet Culvert Max HGL(ft)	10 Year Storm Flow(cfs)	100 Year Storm Flow(cfs)	Drainage Basin Area(Ac)	*Top of Dike(MSL ft)	10 Year Freeboard(ft)	100 Year Freeboard(ft)	10 Year Outlet Culvert Design Flow (cfs)	100 Year Outlet Culvert Design Flow (cfs)	10 Year Outlet Culvert Peak Flow (cfs)	100 Year Outlet Culvert Peak Flow (cfs)
Northwest Cell	19.88	20.4			263	377.08	33.9	23	3.12	2.6				
Southwest Cell	21.71	21.99	15.19	18.47	408.88	586.23	52.7	23	1.29	1.01	80.4	80.4	183.31	222.09
East Cell	18.51	18.9			601.28	862.08	77.5	20	1.49	1.1				

Ponds With Process Flows and 14" Discharge Pipes at Weir Closed														
	10 Year Max Water Elevation(ft)	100 Year Max Water Elevation(ft)	10 Year Outlet Culvert Max HGL(ft)	100 Year Outlet Culvert Max HGL(ft)	**10 Year Storm Flow(cfs)	**100 Year Storm Flow(cfs)	Drainage Basin Area(Ac)	*Top of Dike(MSL ft)	10 Year Freeboard(ft)	100 Year Freeboard(ft)	10 Year Outlet Culvert Design Flow(cfs)	100 Year Outlet Culvert Design Flow(cfs)	10 Year Outlet Culvert Peak Flow(cfs)	100 Year Outlet Culvert Peak Flow(cfs)
Northwest Cell	22.32	22.68			263	377.08	33.9	23	0.68	0.32				
Southwest Cell	21.52	22.55	18.21	18.93	408.88	586.23	52.7	23	1.48	0.45	80.4	80.4	219.07	227.32
East Cell	18.78	19.26			601.28	862.08	77.5	20	1.22	0.74				

*Southwest Cell Emergency spillway at El. 22.28	
**Additional Process Flows(cfs)	
Northwest Cell	65
Southwest Cell	2.03
East Cell	5.4

Normal Pool Elevations	
Northwest Cell	18.34
Southwest Cell	20.7
East Cell	17.00

Ponds Without Process Flows and 14" Discharge Pipes at Weir Open

	10 Year Max Water Elevation(ft)	100 Year Max Water Elevation(ft)	10 Year Outlet Culvert Max HGL(ft)	100 Year Outlet Culvert Max HGL(ft)	10 Year Storm Flow(cfs)	100 Year Storm Flow(cfs)	Drainage Basin Area(Ac)	*Top of Dike(MSL ft)	10 Year Freeboard(ft)	100 Year Freeboard(ft)	10 Year Outlet Culvert Design Flow (cfs)	100 Year Outlet Culvert Design Flow (cfs)	10 Year Outlet Culvert Peak Flow (cfs)	100 Year Outlet Culvert Peak Flow (cfs)
Northwest Cell	19.88	20.4	15.19	18.47	263	377.08	33.9	23	3.12	2.6	80.4	80.4	183.31	222.09
Southwest Cell	21.71	21.99			408.88	586.23	52.7	23	1.29	1.01				
East Cell	18.37	18.79			601.28	862.08	77.5	20	1.63	1.21				

Ponds With Process Flows and 14" Discharge Pipes at Weir Open

	10 Year Max Water Elevation(ft)	100 Year Max Water Elevation(ft)	10 Year Outlet Culvert Max HGL(ft)	100 Year Outlet Culvert Max HGL(ft)	**10 Year Storm Flow(cfs)	**100 Year Storm Flow(cfs)	Drainage Basin Area(Ac)	*Top of Dike(MSL ft)	10 Year Freeboard(ft)	100 Year Freeboard(ft)	10 Year Outlet Culvert Design Flow(cfs)	100 Year Outlet Culvert Design Flow(cfs)	10 Year Outlet Culvert Peak Flow(cfs)	100 Year Outlet Culvert Peak Flow(cfs)
Northwest Cell	22.32	22.68	18.21	18.93	263	377.08	33.9	23	0.68	0.32	80.4	80.4	219.07	227.32
Southwest Cell	21.52	22.55			408.88	586.23	52.7	23	1.48	0.45				
East Cell	18.7	19.2			601.28	862.08	77.5	20	1.3	0.8				

*Southwest Cell Emergency spillway at El. 22.28

**Additional Process Flows(cfs)	
Northwest Cell	65
Southwest Cell	2.03
East Cell	5.4

Normal Pool Elevations	
Northwest Cell	18.34
Southwest Cell	20.7
East Cell	17.00

Plant Smith Weekly Dike Inspection Log

Weather:	Date of Inspection:
Temperature:	Inspection by:
Rainfall (past 24 hrs):	
Rainfall (past week):	Pond Elev.:

General Comments

I - Ash Pond - 'West' Section Dike

	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No	
c. Erosion/Sloughing Yes / No	
d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	Good / Not Good

II - Ash Pond - Discharge Structure to Perimeter Ditch

	Observations - Comments
1. Structure	
a. Condition	
b. Seepage/Wet Spots Yes / No	
2. Downstream of Structure (Channel)	
a. Condition	

III - Ash Pond - 'South' Section Dike

	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No	
c. Erosion/Sloughing Yes / No	
d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	*Good / Not Good*

GP-SM-#0015

IV - Ash Pond - 'East' Section Dike	
	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream 'Slope' (**Note**: No 'downstream slope' due to higher natural ground.)	
a. Condition	
b. Erosion Yes / No	

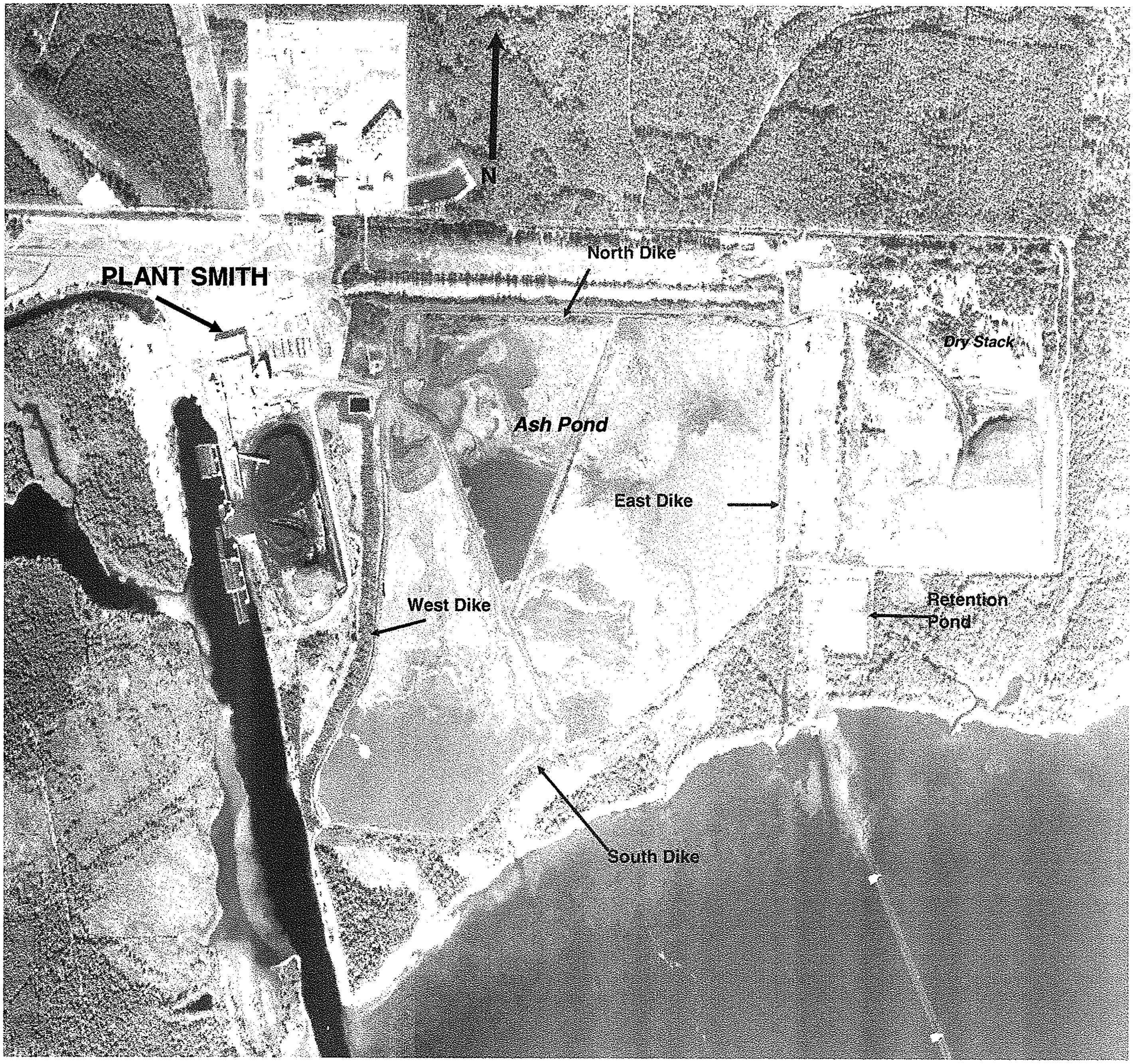
V - Ash Pond - 'North' Section Dike	
	Observations - Comments
1. Upstream Slope	
a. Condition	
b. Erosion/Sloughing Yes / No	
c. Woody brush Yes / No	
d. Burrows Yes / No	
2. Crest	
a. Condition	
b. Bare Areas Yes / No	
c. Rutting Yes / No	
3. Downstream Slope	
a. Condition	
b. Seepage/Wet Spots Yes / No	
c. Erosion/Sloughing Yes / No	
d. Burrows Yes / No	
4. Emergency Aggregate Stockpiles	
a. Available/Condition Yes / No	*Good / Not Good*

VI - Retention Pond	
	Observations - Comments
1. Condition	

VII - DRY STACK	
	Observations - Comments
1. Condition	
c. Erosion/Sloughing Yes / No	

VIII - Additional Observation/Comments - General
Observations - Comments

DATE:


N
North Dike
PLANT SMITH
Dry Stack
Ash Pond
East Dike
West Dike
Retention Pond
South Dike

Plant Smith Ash Pond Dike Emergency Response Plan

1.0 Purpose

Safe operation of water retaining structures is required to ensure public safety, environmental safety, and to protect Company assets. A coordinated, pre-planned, effective emergency response is crucial to lessen the danger to public and environmental safety and to minimize the risk to Company assets. This procedure sets forth guidelines for emergency response in the event of a dike breach and ensures compliance with the Southern Company Generation Safety Procedure for Dams and Dikes (GEN-1003).

2.0 General Information

Definitions

Toe – the junction of the downstream slope or surface with the original ground surface

Water retaining structure – an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage: dam, dike

Water control structure – structure appurtenant to a water retaining structure that allows conveyance of water, controls the direction or rate of discharge or maintains a prescribed water elevation, such as a spillway gate or discharge structure

Crest – top of dam

Dam Safety Engineer – Individual determined by the Hydro Services Principal Engineer responsible for condition assessment of dams and the General Manager – Hydro to be qualified to conduct dam safety inspections and evaluations based on education, experience or other qualifications

This guideline applies to the dikes of the Plant Smith ash pond which is comprised of three distinct ash ponds, surrounded by dikes.

3.0 Emergency Response

In the event of ash pond dike breach, the following notifications should be made:

Brian Heinfeld – Plant Manager	Linc: 15*6107	Cell: 888-521-0897
Tim Clark – Compliance/Eng	Linc: 15*5019	Cell: 205-438-3498
Roy Childers – Operations	Linc: 15*1102	Cell: 251-331-1104

Marie Largilliere – Compliance	Linc: 15*3490	Cell: 850-338-2909
Tim Batyski – Fuels	Linc: 15*8059	Cell: 850-338-8059
Ted McCoullough – Generation	Linc: 15*1151	Cell: 877-249-6721
Sandy Sims – Public Affairs		Cell: 850-376-8440
Jim Vick – Env Affairs	Linc: 15*6311	Cell: 850-982-6204

The Fuels department will make the initial attempt to repair any leakage. If outside of normal working hours, a minimum of two HCEOs will need to be called out for any breach events.

SCG Hydro Services maintains two dam safety referral phone numbers, one each for the Atlanta and Birmingham offices. Each office will maintain an on-call roster so that an engineer is available for response at all times. The referral phone number will connect with a recorded message that provides the caller with the name and contact information for the Engineer on Duty at the time. The referral phone number and the contact information for the individual Dam Safety Engineers will be included on cards distributed to the SCG plants. These cards shall be posted in the Control Room and other conspicuous locations as designated by the plant manager.

Contact Numbers for Hydro Services
Internal: 8-506-6005
External: (404) 506-6005

4.0 Emergency Equipment

In conjunction with the designated plant management team, equipment present at the plant location for loading or moving material (or other uses) may be utilized, as necessary, to respond to emergency conditions at the ash pond dikes.

Equipment at the plant available for use is as follows:

Caterpillar Backhoe
Caterpillar 844 Tractor (Rubber Tire)
Caterpillar D10 Dozer
Dresser 970 Tractor (Rubber Tire)

After assessment of situation, additional equipment may be needed and can be secured from the following vendors:

Gulf Coast Utility Contractors: (850) 265-9166
Thompson Caterpillar: (850) 785-4007
Thompson Caterpillar Rental: (850) 235-9624

5.0 Emergency Supplies

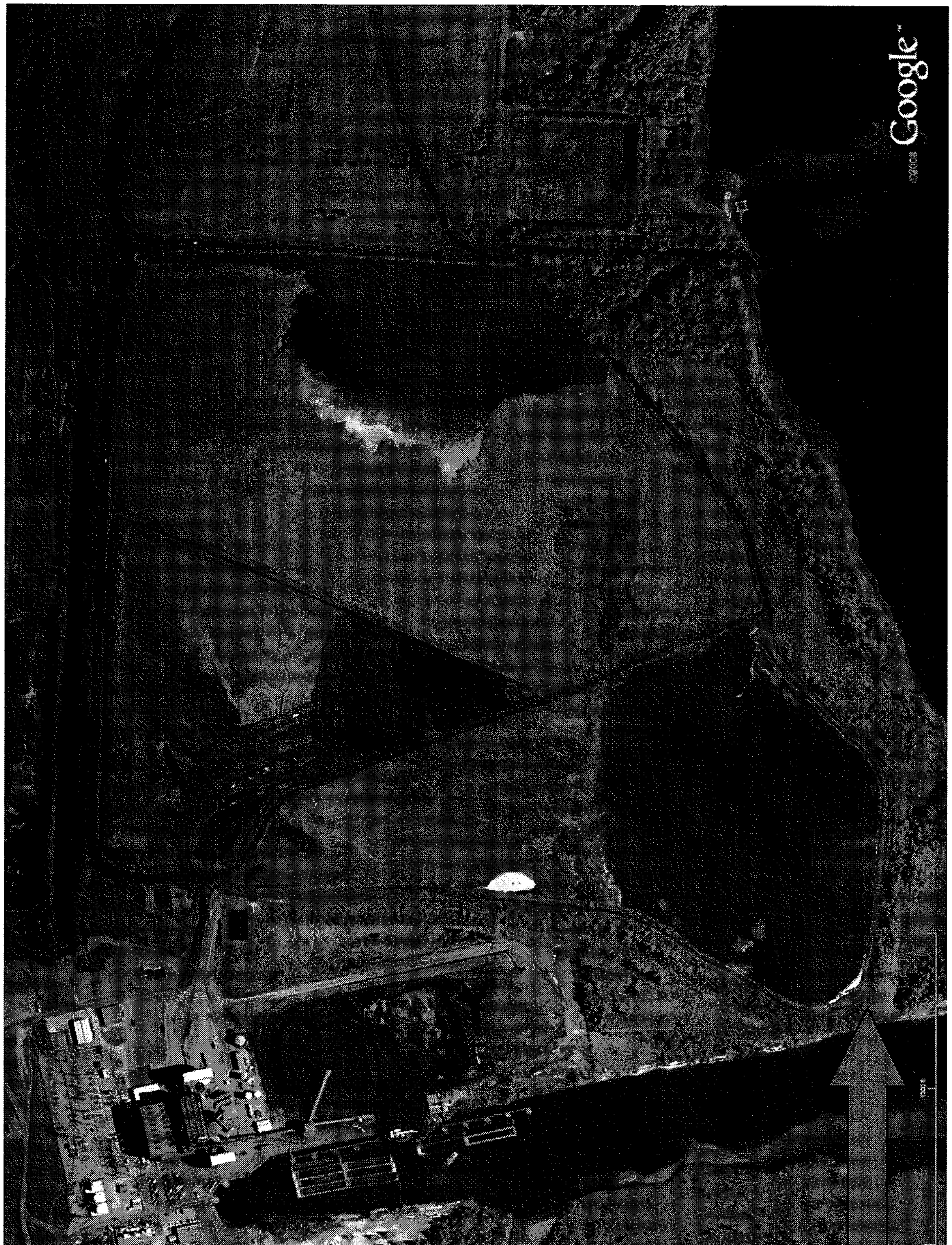
In order to be able to deal with boils or large seeps in a timely manner, granular materials for constructing filters should be stockpiled at earth embankments. These stockpiles should be located as near to the toe of the embankment as practical so that the material can readily be moved to any location along the toe of the dam. The amounts and specifications for material to be stockpiled at each location will be determined by SCG Hydro Services. These stockpiles should be protected with a silt fence or safety fence enclosure and should be labeled "Emergency Filter Stockpile, Emergency Use Only".

The emergency stockpile for the plant is presently located at the northeast corner of the coal pile. See attachment A.

6.0 Summary

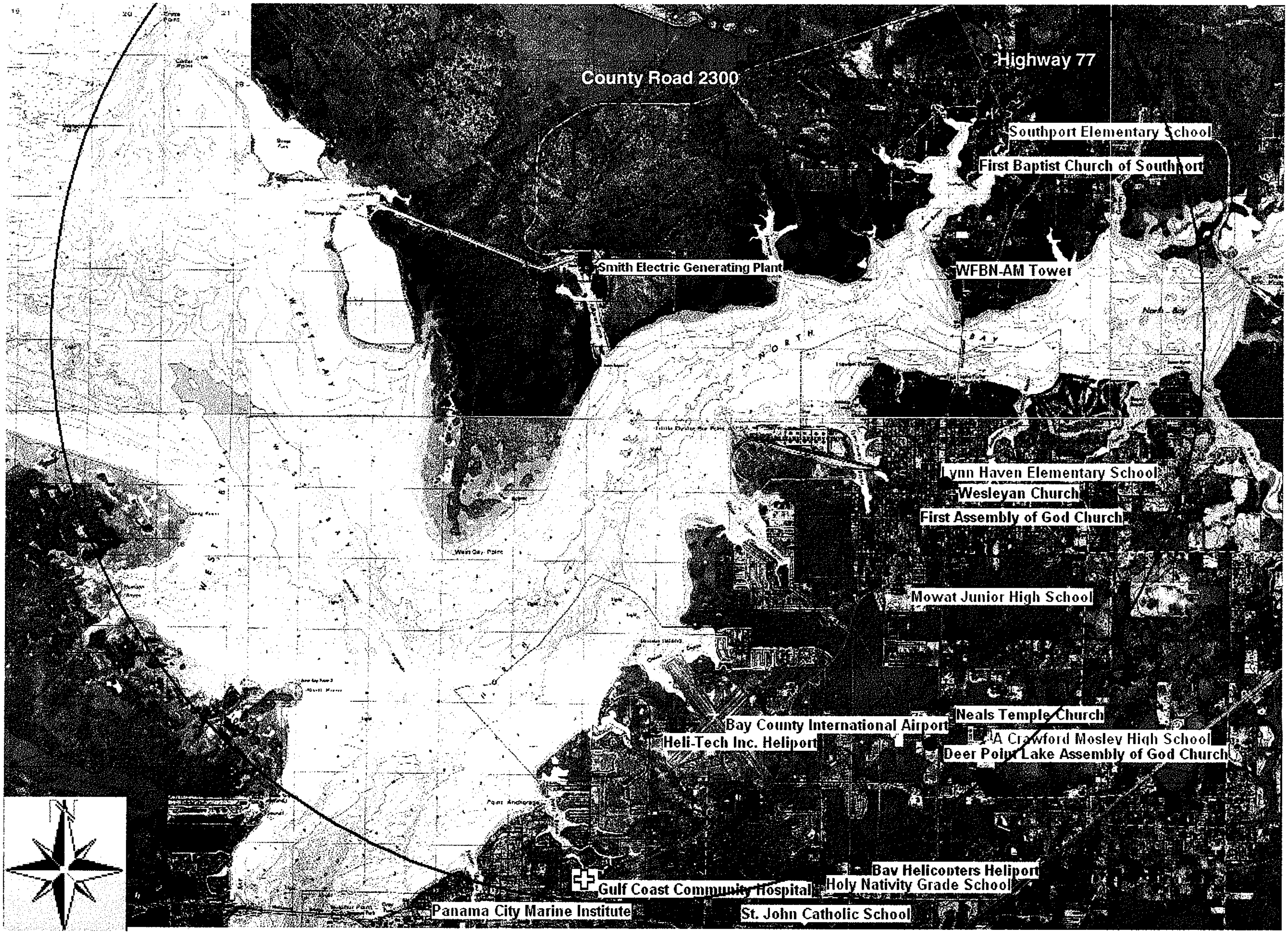
With safety our most important factor, we must keep in mind that the ash pond represents a significant environmental responsibility. Any emergency situation that may arise must be given our utmost attention. Communication and teamwork will be critical to mitigate potential issues. SCG Hydro Services will instrumental in our response plan and they must be notified immediately in the case of an event.

Attachment A



Emergency Stockpile

Plant Smith- Five Mile Radius



GP-SM-#0019

Gulf Power

June 14, 1996

Mr. Jack McNulty
Florida Department of Environmental Protection
160 Governmental Center
Pensacola, Florida 32501-5794

Re: Plant Smith Ash Landfill

Dear Mr. McNulty:

This letter follows up our June 10, 1996 telephone conversation which concerned the ash landfill at Gulf Power's Plant Smith. As you are aware, a construction permit for the landfill was issued by the Department in 1985 (copy attached). Ash at Plant Smith is sluiced to an ash pond from where it is periodically removed and transported to the landfill. The landfill was designed to consist of 15 ground level cells with two additional cell layers on top. The cells are constructed on an as needed basis.

To date, 10 landfill cells have been completed and we are currently selecting a contractor to build the remaining 5 ground level cells. Specifications for this project were prepared by David Hardin, an engineer with Gulf Power, and Joel Miller, a professional engineer registered in Florida (P.E. number 34410). Mr. Miller is with Southern Company Services in Birmingham, Alabama.

We would like to request a minor change to the cell construction sequence. The original sequence is as shown in Attachment A and the new sequence is as in Attachment B. Cells 11 and 12 will be constructed in 1996 and 13, 14 and 15 will be built in 1997.

The 1985 construction permit required a cell liner to consist of a minimum of one foot of clay with a maximum permeability of 1×10^{-7} cm/sec. In 1986 Gulf received permission from the Department to use attapulgite as a substitute for bentonite clay (see attached letter from Tom Moody dated June 16, 1986). Presently we are considering the use of three types of liners, all of which must meet the permit required permeability. The first option is a 12 inch clay liner, the second an HDPE liner and the third is a Geosynthetic Clay Liner (GCL). I understand that you have already received manufacturer information for the HDPE and GCL liners.

Mr. Jack McNulty
June 14, 1996
Page Two

If the Department agrees, we would like the option to use any one of the three liners. Bids have been received which include a cost estimate for each of the liner options; however, final selection of a contractor is being postponed until word is received that the Department concurs. Therefore, we respectfully request a response from the Department as soon as possible.

An application for renewal of the Smith NPDES Permits was submitted to FDEP in Tallahassee on August 30, 1995 and a preliminary draft was recently received. Gulf submitted comments on the draft permit on May 21, 1996. We request that operation of the landfill be incorporated into the new NPDES Permit.

Your assistance with this project is greatly appreciated. If you have any questions, please contact me at 444-6127.

Sincerely,

Rachel Terry

Rachel Terry
Environmental Affairs Specialist

Attachments

cc: D. C. Hardin
S. H. Houston
J. A. Tucker
J. O. Vick

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

GULF POWER COMPANY
BAY COUNTY
ASH DISPOSAL LANDFILL

CONSTRUCTION PERMIT

NO. IC03-79961

DATE OF ISSUANCE

November 12, 1985

DATE OF EXPIRATION

January 1, 1988

Robert V. Kriegel
District Manager

DER FORM PERM 11-42

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT
160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501-5794

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ROBERT V. KRIEGEL
DISTRICT MANAGER

PERMITTEE:

Gulf Power Company

I.D. Number: 1003P02800
Permit/Certification Number: IC03-79961
Date of Issue: NOV 12 1985

Expiration Date: January 1, 1988
County: Bay
Latitude/Longitude: 30°15'58"N/85°15'58"W
Section/Township/Range: 36/2S/15W
Project: Ash Disposal Landfill

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-4 and 17-6. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Construction of a 72 acre ash landfill at the Lansing Smith Electric Generating Plant.

Construction shall be in accordance with the modified application submitted September 19, 1985 with drawing D-31114 revised September 17, 1985, except as modified by the conditions of this permit.

PERMITTEE:
Gulf Power Company

I.D. Number: 1003P02800
Permit/Certification Number: IC03-79961
Date of Issue: NOV 12 1985

Expiration Date: January 1, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

PERMITTEE:
Gulf Power Company

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GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. A description of and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

PERMITTEE:
Gulf Power Company

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GENERAL CONDITIONS:

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurement;
- the person responsible for performing the sampling or measurement;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

PERMITTEE:
Gulf Power Company

I.D. Number: 1003P02800
Permit/Certification Number: IC03-79961
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GENERAL CONDITIONS:

14. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

15. The Department shall be notified and prior approval shall be obtained of any changes or revisions made during construction.

16. Three ground water monitoring wells (MW) shall be established as indicated on the plans and/or described below under the supervision of the Northwest Florida Water Management District. The following designations shall be used for ground water monitoring identification purposes for all future reference and analyses reports:

West	LF 1
Center	LF 2
East	LF 3

17. Construction of monitoring well(s) and collection of samples shall be in accordance with EPA recommended methods as contained in Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (EPA/530/SW-611). All wells shall be 2" in diameter and deep enough to insure that groundwater samples can be obtained with the groundwater table at its lowest point and shall be protected from damage and destruction. The necessary water well construction permits shall be obtained from the Northwest Florida Water Management District.

18. The monitoring wells after installation and settling, shall be pumped as necessary to obtain representative background samples. The samples shall be analyzed for the following parameters:

Storet Code	Parameter
1027	Cadmium
1034	Chromium
1055	Manganese
1105	Aluminum
1045	Iron
1067	Nickel
945	Sulfates
400	pH

PERMITTEE:
Gulf Power Company

I.D. Number: 1003P02800
Permit/Certification Number: IC03-79961
Date of Issue: NOV 12 1985

Expiration Date: January 1, 1988

SPECIFIC CONDITIONS:

19. The attached form 17-1.216(2) shall be reproduced by the permittee and used for future submittals. A separate report is required for each monitoring well. All analyses and reports on the monitoring of water quality required by this permit shall be submitted to the Northwest District Office.

20. Results of all analyses shall be submitted in writing to the Northwest District Office, Department of Environmental Regulation, 160 Governmental Center, Pensacola, Florida 32501-5794, with the Certificate of Completion required by Condition 26.

21. The permanent identification number for this facility is 1003P02800. Please cite this number on all reports and correspondence concerning this facility.

22. In the event that ground water monitoring shows violations of the applicable ground water quality standards, the permittee shall arrange for a confirmation resampling within 15 days of receipt of laboratory results. If this resampling confirms the ground water contamination, permittee shall arrange for a meeting with the District within 15 days and shall be prepared to discuss at this meeting a corrective action plan as set forth in Florida Administrative Code Rule 17-4.245(7).

23. A minimum one foot clay liner with a maximum permeability of 1×10^{-7} cm/sec compacted to 90% of proctor shall be constructed as indicated in the plans.

24. In-situ compaction testing of the liner shall be conducted upon completion of each cell and data forwarded to the Department. Areas that fail to meet the minimum requirements shall be repaired before ash is placed in the cell.

25. Laboratory permeability testing shall be performed and results submitted to the Department for each source of liner material. These tests shall be performed at each change of lithology at any one source.

26. The permittee shall retain the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to the permit application and associated documents and shall execute an Industrial Wastewater Facilities Certificate of Completion of Construction - DER FORM 17-1.204(3) (attached).

PERMITTEE:
Gulf Power Company

I.D. Number: 1003P02800
Permit/Certification Number: IC03-79961
Date of Issue: NOV 12 1985

Expiration Date: January 1, 1988

SPECIFIC CONDITIONS:

27. Upon completion of construction, the continued operation of this landfill will be incorporated into the industrial wastewater operation permit for the plant. A separate permit will not be issued for this landfill.

28. Permittee shall not commence any site work until Department permit 030799631 is issued.

Expiration Date:

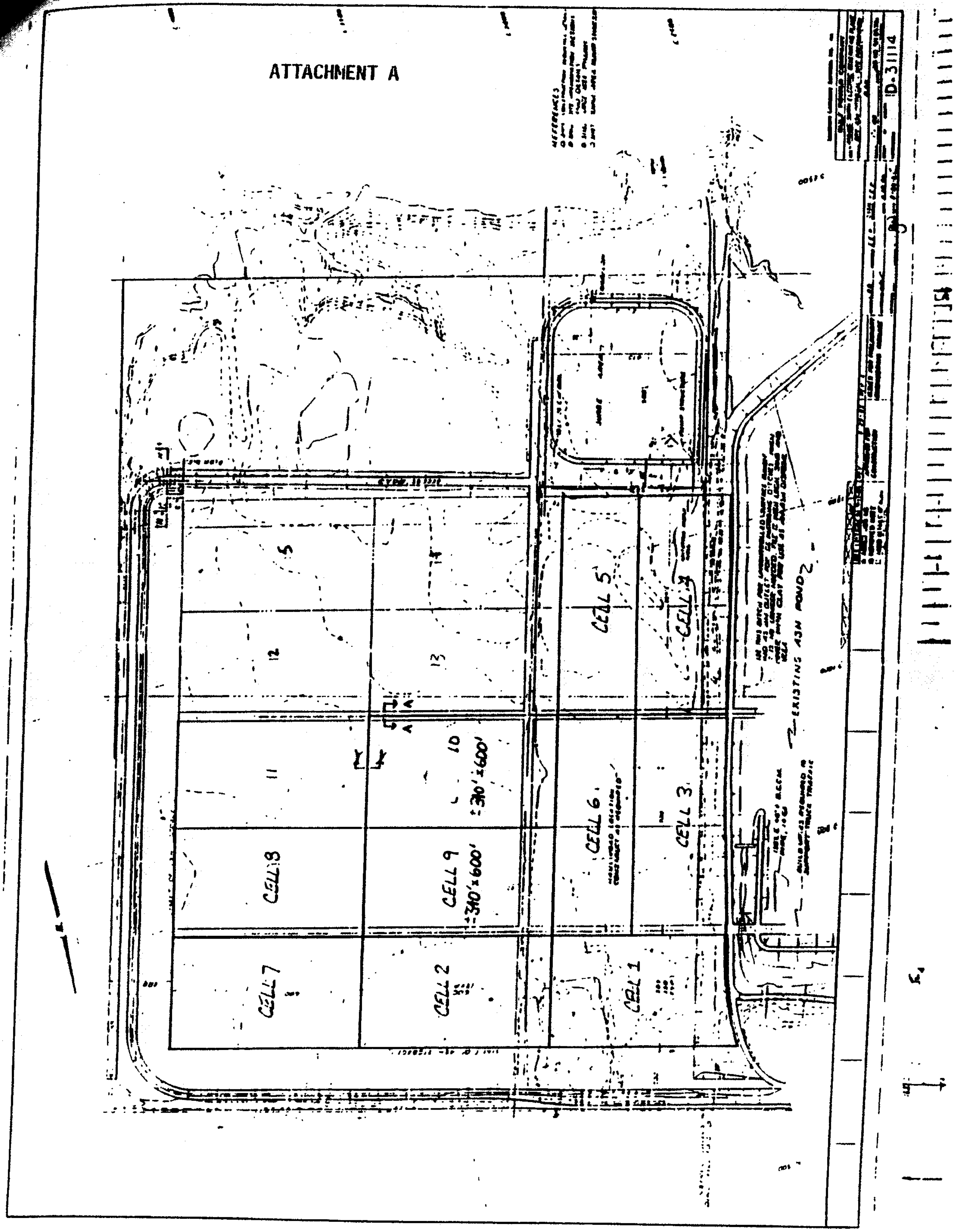
January 1, 1988

Issued this 12th day of Nov, 1985.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

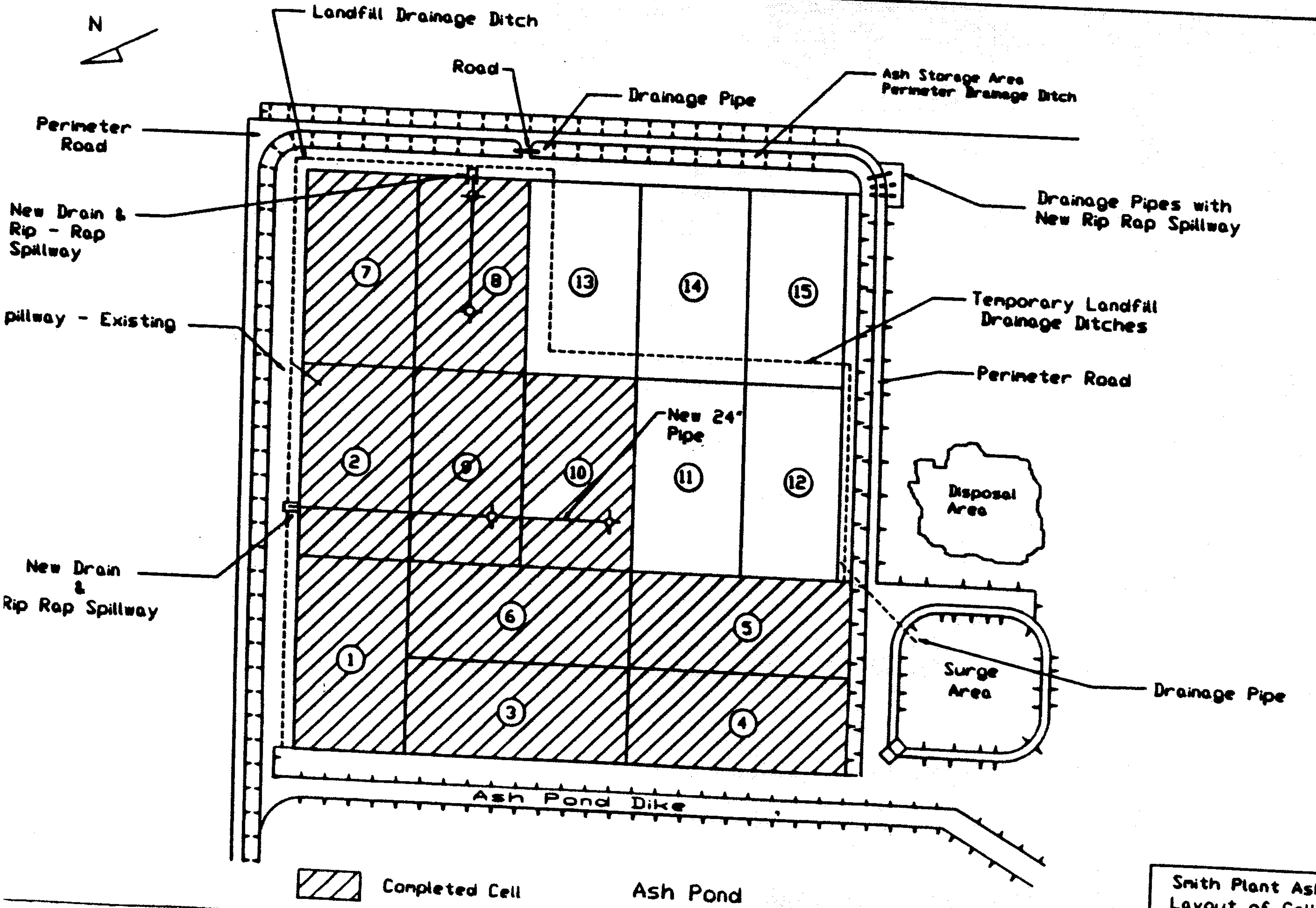
ROBERT V. KRIEGEL
District Manager

ATTACHMENT A



05.115.2

ATTACHMENT B



Smith Plant Ash Landfill
Layout of Cells 11 & 12

25.ILS.2
(F)

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT

160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501-5794

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ROBERT V. KRIEGEL
DISTRICT MANAGER

June 16, 1986

Mr. Jim Vick
Environmental Licensing Engineer
Gulf Power Company
Post Office Box 1151
Pensacola, Florida 32520-1151

Dear Mr. Vick:

Your letter of June 4 asks permission to use attapulgite clay as a substitute for bentonite clay at the Lansing Smith ash landfill.

As long as the performance specifications set forth in permit IC03-79961 are met, we have no objections to this substitution.

Sincerely,

Thomas W. Moody

Thomas W. Moody, P.E.
Special Programs Supervisor

TWM/tmf

2nd AMENDMENT TO THE FACT SHEET
AT THE TIME OF PROPOSED PERMIT ISSUANCE

DATE: December 1, 2009

PERMIT NUMBER: FL0002267

PERMITTEE: Gulf Power Company (GPC)
Lansing Smith Power Plant

1. Changes to the Draft Permit and Fact Sheet

The following changes include the permittee's requests to revise the Draft Permit. The permittee requested the changes through a letter, dated November 16, 2009.

Permit:

a. Amendment to Fact Sheet, Section 1.b. The permittee noted that the through-screen velocity listed in the draft permit and amendment to fact sheet was not representative of facility activities. The Department agreed that the listed velocity was more reflective of the bar screen velocity, and not representative of actual through-screen velocity at the intake structure and updated the administrative record to reflect this change.

b. Page 3, I.A.1. The Department noted a typographical error in the proposed permit. The units for the effluent limitations for "total recoverable lead" and "total recoverable nickel" in 62-302.530, F.A.C. are specified as "ug/L". The permit incorrectly stated "mg/L" for each and was updated to reflect this change.

c. Page 9, I.B.5. The permittee noted that the incorrect units were included for "Zinc, Total Recoverable" and "126 Priority Pollutants". The Department agreed that according to 40 CFR 423, the units should be "mg/L" and the sampling requirements in the permit were updated to reflect this change.

d. Page 8, I.B.1. The Department noted a typographical error in the proposed permit. The units for the effluent limitation for "total recoverable copper" in 40 CFR 423.12(b)(5) are specified as "mg/L". The permit incorrectly stated "ug/L" and was updated to reflect this change.

e. Page 9, I.B.5. The Department noted a typographical error in the proposed permit. 40 CFR 423.11(a) specifies that "residual oxidants" should be monitored instead of "residual chlorine" in instances where intake water contains bromides. Because the intake water for the Unit 3 cooling tower is comprised of the discharge from the once-through cooling water system, which is considered marine waters, free available oxidants is a more appropriate effluent limitation than free available chlorine for Internal Outfall I-017. The permit document was updated to reflect this change.

f. Page 15, I.C.13. The permittee noted that in the comments on the draft permit that incorrect dates were given to the Department regarding the wet weather detention volume certification for the ash pond. The permittee requested that the dates be updated to allow for more time to complete the survey and submitted the appropriate dates to the Department. The Department agreed upon the dates and the permit was updated to reflect this change.

Fact Sheet:

Changes as described above to the draft permit are hereby noted as corresponding changes to the Fact Sheet where applicable.

2. **Comments by USEPA Region IV Requesting Changes to the Draft Permit and Fact Sheet**

No comments were received from EPA regarding the draft permit and fact sheet.

3. **Other Comments**

No comments were received from the public or from other governmental agencies.

STATE OF FLORIDA
INDUSTRIAL WASTEWATER FACILITY PERMIT

PERMITTEE:
Gulf Power Company

PERMIT NUMBER: FL0002267-011 (Major)
FILE NUMBER: FL0002267-011-IW1S
ISSUANCE DATE: **December 2, 2009**
EXPIRATION DATE: **December 1, 2014**

RESPONSIBLE OFFICIAL:
James O. Vick
One Energy Place
Pensacola, Florida 32520-1
(850) 444-6429

FACILITY:

Gulf Power Company
Lansing Smith Power Plant
Bay County Road 2300
Southport, FL 32409
Bay County
Latitude: 30°16' 7.38" N Longitude: 85°42' 3.95" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and applicable rules of the Florida Administrative Code (F.A.C.) and constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System. This permit does not constitute authorization to discharge wastewater other than as expressly stated in this permit. The above named permittee is hereby authorized to operate the facilities in accordance with the documents attached hereto and specifically described as follows:

FACILITY DESCRIPTION:
The facility is an electric generating plant with a total nameplate rating of 924 megawatts (MW). The existing facility consists of two fossil fuel-fired steam generators (Units 1 and 2), two gas-fired combined-cycle combustion turbine electrical generators each with a duct-fired heat recovery steam generator (Unit 3) and two combustion turbines. Unit 3 is regulated under the Florida Electrical Power Plant Siting Act. Units 1 and 2 use pulverized coal as the primary fuel with distillate fuel oil as a "back-up" fuel.

The Unit 3 steam condenser cooling system uses a closed-loop cooling tower to provide cooling water to the steam condenser and cooling system. Cooling tower make-up water is taken from the existing discharge canal used for Units 1 and 2. In the event that both Units 1 and 2 are not operating, the facility may pump up to 7.2 MGD of makeup water to Unit 3 from behind the Unit 1 and 2 intake screens to the Unit 3 make-up water intake located in the discharge canal.

WASTEWATER TREATMENT:
Once-through cooling water (OTCW), cooling tower blowdown, and overflow from the ash pond discharge to the discharge canal. OTCW discharges without treatment. Wastewater streams that are routed to the cooling tower basin and thus discharged via cooling tower blowdown to the discharge canal are (1) evaporative cooler blowdown; and (2) clean drain effluent from the turbine/boiler building. The cooling tower blowdown valve will be closed during chlorination until chlorine residual concentration decreases to an acceptable concentration.

All other wastewaters from the operation of Units 1 and 2 are discharged to the ash pond. Wastewater streams that discharge to the ash pond include boiler blowdown, water treatment filter backwash, air preheater wash, ash and pyrite sluice, coal pile runoff, yard runoff, treated metal cleaning waste, treated demineralizer regeneration waste, treated domestic wastewater, and other minor process and non-process waste streams. Demineralizer regeneration waste is neutralized and allowed to settle in a retention pond prior to discharge to the ash pond. Metal cleaning waste is neutralized in pipe and is chemically precipitated and allowed to settle in a retention pond prior to discharge to the ash pond. Domestic wastewater receives secondary treatment in an extended aeration package treatment plant prior to on-site recycling at the ash pond. Demineralizer waste composed of (1) green sand filter backwash; (2) multimedia filter backwash; and (3) reverse osmosis concentrate will be routed to an existing stormwater sump to be discharged to the existing ash ponds.

Boiler blowdown from the two heat recovery steam generators (HRSGs) is routed to the main yard sump to be discharged to the existing ash ponds. Gas turbine and equipment waste are drained to the oil-water separator, from which wastewater will be drained to the site wastewater sump before being pumped to the existing ash ponds. Transformer enclosure drains are used to drain and release collected stormwater to the site run-off water system. Chemical cleaning waste streams are diverted to the existing on-site metals cleaning pond for disposal.

EFFLUENT DISPOSAL:

Surface Water Discharge D-001: An existing 273.6 MGD Daily Maximum Flow permitted discharge to Warren Bayou, Class II Waters (WBID 1061A). The point of discharge is located approximately at latitude 30°16' 24" N, longitude 85°43' 15" W.

Surface Water Discharge D-00D: An existing 0.01 MGD Daily Maximum Flow permitted discharge to Alligator Bayou, Class III Marine Waters (WBID 1026). The point of discharge is located approximately at latitude 30°16' 04" N, longitude 85°42'03" W.

Internal Outfall I-015: An existing permitted discharge to the ash pond.

Internal Outfall I-017: An existing permitted discharge to the discharge canal, thence to Warren Bayou.

Internal Outfall I-01C: An existing permitted discharge to the discharge canal leading to Outfall D-001.

Internal Outfall I-01A: An existing 0.0075 MGD Annual Average Daily Flow permitted discharge to ash pond.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions set forth in this Cover Sheet and Part I through Part IX on pages 1 through 32 of this permit.

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Once-Through Non-Contact Cooling Water, Ash Pond Overflow, and Cooling Tower Blowdown** from **Outfall D-001** to Warren Bayou. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max Max	Report Report	Daily Maximum Monthly Average	Hourly	Pump Logs	INT-2	
Temp. Diff. between Intake and Discharge	Deg F	Max Max	Report 18	Daily Maximum Monthly Average	4/Day	Calculated	OTH-1	April-Sept See I.A.4
		Max Max	Report 20	Daily Maximum Monthly Average				Oct.-March See I.A.4
pH	s.u.	Min Max	6.5 8.5	Daily Minimum Daily Maximum	Weekly	Grab	EFF-2	
Oxidants, Total Residual	mg/L	Max	0.01 0.01	Daily Maximum Monthly Average	Weekly	Grab	EFF-2	See I.A.6
Oil and Grease	mg/L	Max	5.0 5.0	Daily Maximum Monthly Average	Monthly	Grab	EFF-2	
Copper, Total Recoverable	ug/L	Max	3.7 3.7	Daily Maximum Monthly Average	Annually	8-hr TPC	EFF-2	See I.A.7
Iron, Total Recoverable	mg/L	Max	0.3 0.3	Daily Maximum Monthly Average	Annually	8-hr TPC	EFF-2	See I.A.7
Lead, Total Recoverable	ug/L	Max	8.5 8.5	Daily Maximum Monthly Average	Annually	8-hr TPC	EFF-2	See I.A.7
Nickel, Total Recoverable	ug/L	Max	8.3 8.3	Daily Maximum Monthly Average	Annually	8-hr TPC	EFF-2	See I.A.7
Chronic Whole Effluent Toxicity, 7-Day IC25 (Americamysis bahia)	percent	Min	100	Single Sample	Quarterly	24-hr TPC[1]	EFF-2	See I.A.10
Chronic Whole Effluent Toxicity, 7-Day IC25 (Menidia beryllina)	percent	Min	100	Single Sample	Quarterly	24-hr TPC[1]	EFF-2	See I.A.10

2. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.A.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
INT-2	Once-through cooling water circulator pumps logs.
OTH-1	The difference between the temperature at the Once-through cooling water condenser inlet and Once-through cooling water discharge structure.
EFF-2	Immediately downstream of the center of the second roadway embankment across the discharge canal downstream of the discharge structure.

3. The discharge shall not contain components that settle to form putrescent deposits or float as debris, scum, oil, or other matter. *[62-302.500(1)(a)]*

[1] Either 8-hour manual composite composed of 16 aliquots or 24-hour automatic composite.

4. The cooling water intake and discharge shall be monitored simultaneously four times per day at approximately six hour intervals over a 24-hour time period. The temperature rise shall be calculated for each temperature intake and discharge measurement and the daily temperature rise for any one day shall be the average of all temperature rise values for that day.

5. Continuous chlorination of the cooling water intake is authorized by this permit.

6. Total Residual Oxidant (TRO) means the value obtained using the amperometric titration method for total residual chlorine. Testing for TRO by titration shall be conducted according to the amperometric method, as specified in Section 4500-Cl D, Standard Methods for the Examination of Water and Wastewater, 19th Edition (or most current edition).

7. The actual limit for the total recoverable metals (Copper, Iron, Lead, and Nickel) shall be the water quality standards set forth in Rule 62-302.530, F.A.C. for Class II waters as specified here or the concentration of the intake cooling water, whichever is greater. If the Outfall D-001 composite sample exceeds the intake concentration (and the intake concentration exceeds the water quality standard), the concentration of a minimum of five (5) additional subsamples shall be analyzed from the original intake and outfall composites. The results shall be evaluated using the "student's t-test" comparing discharge concentrations with the intake concentrations. Unless the discharge concentration exceeds the intake concentration at the 95% confidence level, the facility shall be in compliance with the limitation.

   The permittee shall conduct monitoring for the total recoverable metals (Copper, Iron, Lead, and Nickel) while chlorination of the intake water is in process.

8. The permittee shall maintain the current intake through-screen velocity such that the existing maximum velocity is not exceeded.

9. The permittee shall maintain current traveling screen practices at Units 1 and 2 so as to assure that the screens are cycled twice during each 24 hours of continuous operation unless precluded by repair/maintenance requirements.

10. The permittee shall develop a plan in accordance with the schedule in Condition VII.4 to help return live fish, shellfish, and other aquatic organisms collected or trapped on the intake screens to their natural habitat. Other material shall be removed from the intake screens and disposed of in accordance with all existing Federal, State and/or Local laws and regulations that apply to waste disposal. Such material shall not be returned to the receiving waters.

11. The permittee shall comply with the following requirements to evaluate chronic whole effluent toxicity of the discharge from outfall D-001.

    a. Effluent Limitation
       (1) In any routine or additional follow-up test for chronic whole effluent toxicity, the 25 percent inhibition concentration (IC25) shall not be less than 100% effluent. *[62-302.530(61) and (1)(b), F.A.C.]*
       (2) For acute whole effluent toxicity, the 96-hour LC50 shall not be less than 100% effluent in any test. *[62-302.500(1)(a)4. and 62-4.241(1)(a), F.A.C.]*

    b. Monitoring Frequency
       (1) Routine toxicity tests shall be conducted once every three months, the first starting within 60 days of the issuance date of this permit and lasting for the duration of this permit.
       (2) Upon completion of four consecutive valid routine tests that demonstrate compliance with the effluent limitation in 11.a.(1) above, the permittee may submit a written request to the Department for a reduction in monitoring frequency to once every six months. The request shall include a summary of the data and the complete bioassay laboratory reports for each test used to demonstrate compliance. The Department shall act on the request within 45 days of receipt. Reductions in monitoring shall only become effective upon the Department's written confirmation that the facility has completed four

consecutive valid routine tests that demonstrate compliance with the effluent limitation in 11.a.(1) above.

(3) If a test within the sequence of the four is deemed invalid based on the acceptance criteria in EPA-821-R-02-014, but is replaced by a repeat valid test initiated within 21 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive valid tests for the purpose of evaluating the reduction of monitoring frequency..

c. Sampling Requirements

(1) For each routine test or additional follow-up test conducted, a total of three 24-hour composite samples of final effluent shall be collected and used in accordance with the sampling protocol discussed in EPA-821-R-02-013, Section 8.

(2) The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

(3) Samples for routine and additional follow-up tests shall not be collected on the same day.

d. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: **100%, 50%, 25%, 12.5%**, and **6.25%** final effluent.

(2) The permittee shall conduct 7-day survival and growth chronic toxicity tests with a mysid shrimp, **Americamysis (Mysidopsis) bahia**, Method 1007.0, and an inland silverside, **Menidia beryllina,** Method 1006.0, concurrently.

(3) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms**, 3rd Edition, EPA-821-R-02-014. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

(4) The control water and dilution water used shall be artificial sea salts as described in EPA-821-R-02-014, Section 7.2. The test salinity shall be determined as follows:

(a) For the **Americamysis bahia** bioassays, the effluent shall be adjusted to a salinity of 20 parts per thousand (ppt) with artificial sea salts. The salinity of the control/dilution water (0% effluent) shall be 20 ppt. If the salinity of the effluent is greater than 20 ppt, no salinity adjustment shall be made to the effluent and the test shall be run at the effluent salinity. The salinity of the control/dilution water shall match the salinity of the effluent.

(b) For the **Menidia beryllina** bioassays, if the effluent salinity is less than 5ppt, the salinity shall be adjusted to 5 ppt with artificial sea salts. The salinity of the control/dilution water (0% effluent) shall be 5 ppt. If the salinity of the effluent is greater than 5 ppt, no salinity adjustment shall be made to the effluent and the test shall be run at the effluent salinity. The salinity of the control/dilution water shall match the salinity of the effluent.

(c) If the salinity of the effluent requires adjustment, a salinity adjustment control should be prepared and included with each bioassay. The salinity adjustment control is intended to identify toxicity resulting from adjusting the effluent salinity with artificial sea salts. To prepare the salinity adjustment control, dilute the control/dilution water to the salinity of the effluent and adjust the salinity of the salinity adjustment control at the same time and to the same salinity that the salinity of the effluent is adjusted using the same artificial sea salts.

e. Quality Assurance Requirements

(1) A standard reference toxicant (SRT) quality assurance (QA) chronic toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or initiated no more than 30 days before the date of each routine or additional follow-up test conducted. Additionally, the SRT test must be conducted concurrently if the test organisms are obtained from outside the test laboratory unless the test organism supplier provides control chart data from at least the last five monthly chronic toxicity tests using the same reference toxicant and test conditions. If the organism supplier provides the required SRT data, the organism supplier's SRT data and the test laboratory's monthly SRT-QA data shall be included in the reports for each companion routine or additional follow-up test required.

(2) If the mortality in the control (0% effluent) exceeds 20% for either species in any test or any test does not meet "test acceptability criteria", the test for that species (including the control) shall be invalidated and the test repeated. Test acceptability criteria for each species are defined in EPA-821-R-02-014, Section 14.12 (**Americamysis bahia**) and Section 13.12 (**Menidia beryllina**). The repeat test shall begin within 21 days after the last day of the invalid test.

(3) If 100% mortality occurs in all effluent concentrations for either species prior to the end of any test and the control mortality is less than 20% at that time, the test (including the control) for that species shall be terminated with the conclusion that the test fails and constitutes non-compliance.

(4) Routine and additional follow-up tests shall be evaluated for acceptability based on the observed dose-response relationship as required by EPA-821-R-02-014, Section 10.2.6., and the evaluation shall be included with the bioassay laboratory reports.

f. Reporting Requirements

(1) Results from all required tests shall be reported on the Discharge Monitoring Report (DMR) as follows:
   (a) Routine and Additional Follow-up Test Results: The calculated IC25 for each test species shall be entered on the DMR.

(2) A bioassay laboratory report for each routine test shall be prepared according to EPA-821-R-02-013, Section 10, Report Preparation and Test Review, and mailed to the Department at the address below within 30 days after the last day of the test.

(3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-013, Section 10, and mailed within 30 days after the last day of the second valid additional follow-up test.

(4) Data for invalid tests shall be included in the bioassay laboratory report for the repeat test.

(5) The same bioassay data shall not be reported as the results of more than one test.

(6) All bioassay laboratory reports shall be sent to:
Florida Department of Environmental Protection
Northwest District Office
160 Governmental Center
Pensacola, Florida 32502-5794

g. Test Failures

(1) A test fails when the test results do not meet the limits in 11.a.(1).

(2) Additional Follow-up Tests:
   (a) If a routine test does not meet the chronic toxicity limitation in 11.a.(1) above, the permittee shall notify the Department at the address above within 21 days after the last day of the failed routine test and conduct two additional follow-up tests according to 11.d. on each species that failed the test on each species that failed the test in accordance with 11.d.
   (b) The first test shall be initiated within 28 days after the last day of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of two valid additional follow-up tests are completed.
   (c) The first additional follow-up test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5%, and 6.25% effluent. The permittee may modify the dilution series in the second additional follow-up test to more accurately bracket the toxicity such that at least two dilutions above and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be analyzed according to the procedures in EPA-821-R-02-014.

(3) In the event of three valid test failures (whether routine or additional follow-up tests) within a 12-month period, the permittee shall notify the Department within 21 days after the last day of the third test failure.
   (a) The permittee shall submit a plan for correction of the effluent toxicity within 60 days after the last day of the third test failure.
   (b) The Department shall review and approve the plan before initiation.
   (c) The plan shall be initiated within 30 days following the Department's written approval of the plan.
   (d) Progress reports shall be submitted quarterly to the Department at the address above.

(e) During the implementation of the plan, the permittee shall conduct quarterly routine whole effluent toxicity tests in accordance with 11.d. Additional follow-up tests are not required while the plan is in progress. Following completion or termination of the plan, the frequency of monitoring for routine and additional follow-up tests shall return to the schedule established in 11.b.(1). If a routine test is invalid according to the acceptance criteria in EPA-821-R-02-013, a repeat test shall be initiated within 21 days after the last day of the invalid routine test.

(f) Upon completion of four consecutive, valid routine tests that demonstrate compliance with the effluent limitation in 11.a.(1) above, the permittee may submit a written request to the Department to terminate the plan. The plan shall be terminated upon written verification by the Department that the facility has passed at least four consecutive valid routine whole effluent toxicity tests. If a test within the sequence of the four is deemed invalid, but is replaced by a repeat valid test initiated within 21 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive valid tests for the purpose of terminating the plan.

(4) If chronic toxicity test results indicate greater than 50% mortality within 96 hours in an effluent concentration equal to or less than the effluent concentration specified as the acute toxicity limit in 11.(b)(2), the Department may revise this permit to require acute definitive whole effluent toxicity testing.

(5) The additional follow-up testing and the plan do not preclude the Department taking enforcement action for acute or chronic whole effluent toxicity failures.

[62-4.241, 62-620.620(3)]

12. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Emergency Overflow Discharge** from **Outfall D-00D** to the intake canal. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max	Report	Daily Maximum	Per discharge	Calculated	EFF-5	
Duration of Discharge	min	Max	Report	Daily Maximum	Per discharge	Estimated	EFF-5	
Oil and Grease	mg/L	Max	5.0 5.0	Monthly Average Daily Maximum	Twice Per discharge	Grab[2]	EFF-5	
Solids, Total Suspended	mg/L	Max Max	30 100	Monthly Average Daily Maximum	Twice Per discharge	Grab[2]	EFF-5	
pH	s.u.	Min Max	6.5 8.5	Daily Minimum Daily Maximum	Twice Per discharge	Grab[2]	EFF-5	

13. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.A.11. and as described below:

Monitoring Site Number	Description of Monitoring Site
EFF-5	The main yard sump at the nearest accessible point prior to discharge.

14. The discharge shall not contain components that settle to form putrescent deposits or float as debris, scum, oil, or other matter. *[62-302.500(1)(a)]*

[2] Samples shall be taken at the start and completion of discharge.

15. The discharge from this outfall is intermittent, therefore, flow measurement or sampling is required only during periods of discharge.

16. All due diligence will be taken to not discharge air pre-heater and precipitator wash wastes during times of discharge from this outfall.

B. Internal Outfalls

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Metal Cleaning Wastewater from I-015** to the Ash Pond. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGAL	Max Max	Report Report	Monthly Average Daily Maximum	Per occurrence	Calculated	EFF-3	See I.B.4
Copper, Total Recoverable	mg/L	Max Max	1.0 1.0	Monthly Average Daily Maximum	Per occurrence	Composite[3]	EFF-3	
Iron, Total Recoverable	mg/L	Max Max	1.0 1.0	Monthly Average Daily Maximum	Per occurrence	Composite[3]	EFF-3	

2. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.B.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
EFF-3	Discharge from metal cleaning waste treatment pond prior to discharge to the ash pond.

3. Metal cleaning wastes shall mean any chemical cleaning compounds, rinse waters, or any other waterborne residues derived from chemical cleaning any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air pre-heater cleaning.

4. For one cleaning during a month, the same value for average and daily maximum shall be reported. For two or more cleanings during a month the average batch volume shall be reported as the monthly average and the maximum batch volume shall be reported as the maximum.

5. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Cooling Tower Blowdown** from **I-017** to the Discharge Canal, thence to Warren Bayou. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes

[3] The composite shall consist of aliquots collected once per hour throughout the period of the discharge event.

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max Max	Report Report	Monthly Average Daily Maximum	Hourly	Pump Logs	EFF-7	
Oxidants, Free Available (FAO)	mg/L	Max Max	0.2 0.5	Daily Average Daily Maximum	Per application	Multiple Grab	EFF-7	
Chromium, Total Recoverable	mg/L	Max Max	0.2 0.2	Monthly Average Daily Maximum	Quarterly	Grab	EFF-7	
Zinc, Total Recoverable	mg/L	Max Max	1.0 1.0	Monthly Average Daily Maximum	Quarterly	Grab	EFF-7	
126 priority pollutants	mg/L	Max Max	<MDL <MDL	Monthly Average Daily Maximum	Annually	Grab or Calculation	EFF-7 EFF-7	See I.B.9

6. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.B.5. and as described below:

Monitoring Site Number	Description of Monitoring Site
EFF-7	The end of the discharge structure leading from the cooling tower exit and prior to being discharged to the discharge canal.

7. The time of sampling shall be immediately after the opening of the blowdown valve and prior to being discharged into the discharge canal at point EFF-7.

8. Cooling tower blowdown shall be minimized to the degree allowed by best engineering practices.

9. The permittee shall, within 30 days of permit issuance and yearly thereafter, provide certification that the 126 priority pollutants (as listed in 40 CFR Part 423, Appendix A) are below the method detection limits (MDL) for the applicable analytical methods required under permit condition I.C.1 in the cooling tower blowdown as a result of the addition of any maintenance chemicals. Compliance shall be demonstrated by one of the three methods:

   Method 1: Sampling at a frequency of not less than once per year for all priority pollutants referenced above with submission of analysis results with each certification.

   Method 2: Submission of certification(s) from the manufacturer that each product used contains no priority pollutants. Such submission is required only once for each product used, unless subsequent changes in the product formulation occur or the product is obtained from a different source. Certifications for all products in use shall be maintained on site.

   Method 3: Calculations to assure that if priority pollutants are contained in any product(s), no discharge of any individual priority pollutant can occur at concentrations greater than detectable levels using analytical methods in 40 CFR Part 136 due to dilution within the cooling water system.

   The certification shall be in the following form: "I certify that no priority pollutants at concentrations greater than detectable levels using analytical methods in 40 CFR Part 136 are being discharged from any maintenance chemicals added to the cooling towers. Compliance is demonstrated by Method____."

10. Neither free available oxidants (FAO), total residual oxidants (TRO), nor any other Department-approved biocide shall be discharged from any tower for more than two hours in any one day. No more than one tower

shall discharge FAO, TRO or other biocide at one time. Samples shall be taken when chlorine or Department-approved chlorine-based product is in use. TRO monitoring shall be adequate to document compliance with this requirement. Chlorine shall not be used in conjunction with any other biocide during treatment of any one cooling tower.

11. Multiple grabs for TRO shall be defined as once per five minutes during TRO discharge periods of 30 minutes or less and once per 15 minutes for periods exceeding 30 minutes with no less than four analyses during the period of TRO discharge (sampling shall be continued until the end of the TRO discharge).

12. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Ash Pond Overflow** from **I-01C** to the Discharge Canal leading to Outfall D-001. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max Max	Report Report	Monthly Average Daily Maximum	Daily	Meter[4]	EFF-4	
pH	s.u.	Min Max	6.0 9.0	Daily Minimum Daily Maximum	Weekly	Grab	EFF-4	
Solids, Total Suspended	mg/L	Max Max	30.0 100.0	Monthly Average Daily Maximum	Weekly	Grab	EFF-4	
Oil and Grease	mg/L	Min Max	15.0 20.0	Monthly Average Daily Maximum	Weekly	Grab	EFF-4	
Arsenic, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Cadmium, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Chromium, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	See I.B.15
Copper, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Iron, Total Recoverable	mg/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Lead, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Mercury, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Nickel, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Selenium, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Zinc, Total Recoverable	ug/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Radium 226 + Radium 228, Total	pCi/L	Max	Report	Daily Maximum	Semi-Annually[5]	24-hr TPC	EFF-4	
Nitrite plus Nitrate, Total (as N)	mg/L	Max	Report	Monthly Average	Monthly	Grab	EFF-4	
Nitrogen, Ammonia, Total (as N)	mg/L	Max	Report	Monthly Average	Monthly	Grab	EFF-4	
Nitrogen, Kjeldahl, Total (as N)	mg/L	Max	Report	Monthly Average	Monthly	Grab	EFF-4	
Nitrogen, Total	mg/L	Max	Report	Monthly Average	Monthly	Grab	EFF-4	

[4] Flow meters shall be calibrated at least once a year in accordance with the manufacturer recommendations. Calibration records shall be maintained on-site in accordance with Section VI.2 of this permit.
[5] Samples shall be taken during the first half and second half of the calendar year and shall be taken a minimum of 4 months apart when possible depending on the frequency of the ash pond overflow.

Nitrogen, Total, Monthly Loading	lbs/ month	Max	Report	Monthly Total	Monthly	Calculated	EFF-4	
Nitrogen Total, Annual Loading	lbs/ year	Max	Report	12-Month Rolling Total	Monthly	Calculated	EFF-4	

13. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.B.12. and as described below:

Monitoring Site Number	Description of Monitoring Site
EFF-4	Ash pond discharge parshall flume.

14. The discharge from this outfall is intermittent; therefore, flow measurement or sampling is required only during periods of discharge.

15. If the total chromium level exceeds 50 µg/L, the permittee shall resample and Chromium VI analysis shall be performed and reported.

16. The permittee shall not discharge wash water from both Unit 1 and Unit 2 air pre-heaters to the ash pond at the same time. There shall be a minimum of 14 days between discharges of wash water from the air pre-heaters to the ash pond.

17. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge **Domestic Wastewater Treatment Plant Effluent** from **I-01A** to the Ash Pond. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max	0.0075	Annual Average	5 Days/Week	Meter	FLW-1	See I.B.19
BOD, Carbonaceous 5 day, 20C	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Monthly	Grab	OUI-6	
Solids, Total Suspended	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Monthly	Grab	OUI-6	
pH	s.u.	Min Max	6.0 8.5	Single Sample Single Sample	5 Days/Week	Grab	OUI-6	
Coliform, Fecal	#/100mL	Max	See I.B.20		Monthly	Grab	OUI-6	See I.B.20
Chlorine, Total Residual	mg/L	Min	0.5	Single Sample	5 Days/Week	Grab	OUI-6	See I.B.21
Percent Capacity, (TMADF/Permitted Capacity) x 100	percent	Max	Report	Monthly Total	Monthly	Calculated	OTH-2	
BOD, Carbonaceous 5 day, 20C (Influent)	mg/L	Max	Report	Monthly Average	Monthly	Grab	INF-1	See I.B.22
Solids, Total Suspended (Influent)	mg/L	Max	Report	Monthly Average	Monthly	Grab	INF-1	See I.B.22

18. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.B.17. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-1	Flow-meter and totalizer for domestic effluent.
OUI-6	Effluent wet well.
OTH-2	Calculated value.
INF-1	Domestic influent monitoring location.

19. The ultrasonic flow meter shall be utilized to measure flow and calibrated at least annually. *[62-601.200(17) and 62-601 .500(6)].*

20. The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed 200 per 100 mL of reclaimed water sample. The geometric mean of the fecal coliform values for a minimum of 10 samples of reclaimed water, each collected on a separate day during a period of 30 consecutive days (monthly), shall not exceed 200 per 100 mL of sample. No more than 10 percent of the samples collected (the 90th percentile value) during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 mL of sample. Any one sample shall not exceed 800 fecal coliform values per 100 mL of sample. *Note*: To report the 90th percentile value, list the fecal coliform values obtained during the month in ascending order. Report the value of the sample that corresponds to the 90th percentile (multiply the number of samples by 0.9). For example, for 30 samples, report the corresponding fecal coliform number for the 27th value of ascending order. *[62-610.410 and 62-600.440(4)(c)]*

21. A minimum of 0.5 mg/L total residual chlorine must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-610.410 and 62-600.440(4)(b)]*

22. Influent samples shall be collected so that they do not contain digester supernatant or return activated sludge, or any other plant process recycled waters. *[62-601.500(4)]*

C. Other Limitations and Monitoring and Reporting Requirements

1. The sample collection, analytical test methods, and method detection limits (MDLs) applicable to this permit shall be conducted using a sufficiently sensitive method to ensure compliance with applicable water quality standards and effluent limitations and shall be in accordance with Rule 62-4.246, Chapters 62-160 and 62-601, F.A.C., and 40 CFR 136, as appropriate. The list of Department established analytical methods, and corresponding MDLs (method detection limits) and PQLs (practical quantitation limits), which is titled "FAC 62-4 MDL/PQL Table (April 26, 2006)" is available at http://www.dep.state.fl.us/labs/library/index.htm. The MDLs and PQLs as described in this list shall constitute the minimum acceptable MDL/PQL values and the Department shall not accept results for which the laboratory's MDLs or PQLs are greater than those described above unless alternate MDLs and/or PQLs have been specifically approved by the Department for this permit. Any method included in the list may be used for reporting as long as it meets the following requirements:

   a. The laboratory's reported MDL and PQL values for the particular method must be equal or less than the corresponding method values specified in the Department's approved MDL and PQL list;

   b. The laboratory reported MDL for the specific parameter is less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Parameters that are listed as "report only" in the permit shall use methods that provide an MDL, which is equal to or less than the applicable water quality criteria stated in 62-302, F.A.C.; and

   c. If the MDLs for all methods available in the approved list are above the stated permit limit or applicable water quality criteria for that parameter, then the method with the lowest stated MDL shall be used.

   When the analytical results are below method detection or practical quantitation limits, the permittee shall report the actual laboratory MDL and/or PQL values for the analyses that were performed following the instructions on the applicable discharge monitoring report.

Where necessary, the permittee may request approval of alternate methods or for alternative MDLs or PQLs for any approved analytical method. Approval of alternate laboratory MDLs or PQLs are not necessary if the laboratory reported MDLs and PQLs are less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Approval of an analytical method not included in the above-referenced list is not necessary if the analytical method is approved in accordance with 40 CFR 136 or deemed acceptable by the Department. *[62-4.246, 62-160]*

2. The permittee shall provide safe access points for obtaining representative influent and effluent samples which are required by this permit. *[62-620.320(6)]*

3. Monitoring requirements under this permit are effective on the first day of the second month following permit issuance. Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements, if any. During the period of operation authorized by this permit, the permittee shall complete and submit to the Department Discharge Monitoring Reports (DMRs) in accordance with the frequencies specified by the REPORT type (i.e. monthly, toxicity, quarterly, semiannual, annual, etc.) indicated on the DMR forms attached to this permit. Monitoring results for each monitoring period shall be submitted in accordance with the associated DMR due dates below.

REPORT Type on DMR	Monitoring Period	Due Date
Monthly or Toxicity	first day of month - last day of month	28th day of following month
Quarterly	January 1 - March 31 April 1 - June 30 July 1 - September 30 October 1 - December 31	April 28 July 28 October 28 January 28
Semiannual	January 1 - June 30 July 1 - December 30	July 28 January 28
Annual	January 1 - December 31	January 28

DMRs shall be submitted for each required monitoring period including months of no discharge. The permittee shall make copies of the attached DMR form(s) and shall submit the completed DMR form(s) to the Department by the twenty-eighth (28th) of the month following the month of operation at the address specified below:

Florida Department of Environmental Protection
Wastewater Compliance Evaluation Section, Mail Station 3551
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

[62-620.610(18)]

4. Unless specified otherwise in this permit, all reports and other information required by this permit, including 24-hour notifications, shall be submitted to or reported to, as appropriate, the Department's Northwest District Office at the address specified below:

Florida Department of Environmental Protection
Northwest District Office
160 Governmental Center
Pensacola, Florida 32502-5794

Phone Number - (850) 595-8300
FAX Number - (850) 595-8417 (All FAX copies shall be followed by original copies.)

[62-620.305]

5. All reports and other information shall be signed in accordance with the requirements of Rule 62-620.305, F.A.C. *[62-620.305]*

6. If there is no discharge from the facility on a day when the facility would normally sample, the sample shall be collected on the day of the next discharge. *[62-620.320(6)]*

7. Any bypass of the treatment facility which is not included in the monitoring specified in sections I.A, I.B, I.C, or I.D, is to be monitored for flow and all other required parameters. For parameters other than flow, at least one grab sample per day shall be monitored. Daily flow shall be monitored or estimated, as appropriate, to obtain reportable data. All monitoring results shall be reported on the appropriate DMR.

8. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid. The permittee shall dispose of all known PCB equipment, articles, and wastes in accordance with 40 CFR 761. The permittee shall certify each time that this disposal has been accomplished.

9. Discharge of uncontaminated storm water, intake screen backwash water, turbine oil cooler water, and hydrogen generator cooler water is permitted without limitations or monitoring requirements, except that there shall be no discharge of floating oil.

10. Discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act to any waste stream which ultimately may be released to waters of the State is prohibited unless specifically authorized elsewhere in this permit. This requirement is not applicable to products used for lawn and agricultural purposes or to the use of herbicides if used in accordance with labeled instructions and any applicable State permit.

    A permit revision from the Department shall be required prior to the use of any biocide or chemical additive used in the cooling system (except chlorine as authorized elsewhere in this permit) or any other portion of the treatment system which may be toxic to aquatic life. The permit revision request shall include:

    a. Name and general composition of biocide or chemical
    b. Frequencies of use
    c. Quantities to be used
    d. Proposed effluent concentrations
    e. Acute and/or chronic toxicity data (laboratory reports shall be prepared according to Section 12 of EPA document no. EPA-821-R-02-012 EP entitled, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters for Freshwater and Marine Organisms, or most current addition.)
    f. Product data sheet
    g. Product label

    The Department shall review the above information to determine if a major or minor permit revision is necessary. Discharge associated with the use of such biocide or chemical is not authorized without a permit revision by the Department. Permit revisions shall be processed in accordance with the requirements of Chapter 62-620, F.A.C.

11. Discharge of any waste resulting from the combustion of toxic, hazardous, or metal cleaning wastes to any waste stream which ultimately discharges to waters of the State is prohibited, unless specifically authorized elsewhere in this permit. The discharge of plant ash transport water, resulting from the combustion of on-specification used oil as authorized under the Resource Conservation and Recovery Act and 40 CFR Part 266, via the ash pond shall be an authorized discharge of this permit.

12. The permittee shall periodically survey all ash pond dikes and toe areas for structural integrity. No later than January 31, 2010, and annually thereafter, the permittee shall certify that no breaches or structural defects resulting in the discharges to surface waters of the State were observed during the previous calendar year. In the event that such defect(s) exists and results in potential discharge to surfaces waters of the State, the

permittee shall notify the Department within fifteen (15) days of becoming aware of the situation and provide a proposed course of corrective action and implementation schedule.

13. The permittee shall not store coal, soil, or other similar erodable materials in a manner in which runoff is uncontrolled, or conduct construction activities in a manner which produces uncontrolled runoff. No later than January 31, 2011, the permittee shall certify that the ash pond provides the necessary minimum wet weather detention volume to contain the combined volume for all direct rainfall and all rainfall runoff to the pond resulting from the 10-year, 24-hour rainfall event and maximum dry weather plant waste flows which could occur during a 24-hour period. This volume shall be calculated between the top of the sediment level and the minimum overflow discharge elevation (stop logs, weirs, etc.) on the ash pond effluent structure to the return channel. [Note: A valve discharge pipe below the elevation of the top-most stop log may be provided to allow the minimum necessary flow of ash sluice recycle to the return channel during periods of the low ash pond water level.] If the permittee can demonstrate that the recycle canal provides acceptable treatment volume, this additional detention volume can be included. All data necessary to support this certification shall be submitted with the certification to the Department.

    No later than December 31, 2012, the permittee shall again certify that the ash pond provides the minimum wet weather volume as specified above based on a physical survey of the pond and shall provide a summary of the calculations to support the certification.

14. The Permittee shall notify the Department in writing at least 14 days before transferring make up water to Unit 3 from the Units 1 and 2 intakes, if practical.

15. The permittee is authorized to use the anti-scalant maintenance chemical Belclene 200 (Belclene) in the Unit 3 cooling tower subject to the following conditions:
    a. Belclene shall not be used simultaneously with other biocides approved for use;
    b. Belclene shall be applied to treat the Unit 3 cooling tower via continuous feed at a feed concentration not to exceed 10 ppm;
    c. Beclene shall not be used unless both Units 1 and 2 are circulating water through their once-through cooling water systems to the discharge canal; and
    d. The facility shall maintain a record of Belclene 200 usage including start and end dates, daily feed concentration, discharge canal flow rate, and Unit 3 cooling tower blowdown flow rate.

16. The permittee is authorized to use the following other chemicals and biocides in the service water systems and other plant water systems:

Chemical Name	System Used
Ammonia	Boiler water system
Chlorine Gas	Units 1 and 2 once-through cooling water system
Ferrous Sulfate	Units 1 and 2 once-through cooling water system
Foamtrol 1440	Unit 3 cooling tower
Glutaraldehyde 25% and 50%	Units 1, 2, and 3 service water systems
Hydrazine	Boiler water system
SC-2000	Units 1, 2, and 3 service water systems
Sodium Hypochlorite 12.5%	Unit 3 cooling tower
Sulfuric Acid	Ash pond - in area of ash sluice discharge pipe

17. The permittee shall re-submit a plan of study titled "Proposed Monitoring Study at Smith Electric Generating Plant" and shall submit the results of the study in accordance with the schedule in Section VII.

II. DOMESTIC RESIDUALS REQUIREMENTS

1. The method of residuals use or disposal by this facility is transport to any DEP permitted residuals management facility (RMF) or disposal in a Class I or II solid waste landfill.

2. The permittee shall be responsible for proper treatment, management, use, and land application or disposal of its residuals. *[62-640.300(5)]*

3. The permittee shall not be held responsible for treatment, management, use, or land application violations that occur after its residuals have been accepted by a permitted residuals management facility with which the source facility has an agreement in accordance with Rule 62-640.880(1)(c), F.A.C., for further treatment, management, use or land application. *[62-640.300(5)]*

4. Disposal of residuals, septage, and other solids in a solid waste disposal facility, or disposal by placement on land for purposes other than soil conditioning or fertilization, such as at a monofill, surface impoundment, waste pile, or dedicated site, shall be in accordance with Chapter 62-701, F.A.C. *[62-640.100(6)(k)3 & 4]*

5. The permittee shall keep hauling records to track the transport of residuals to a residuals management facility. The hauling records shall contain the following information:

<u>Source Facility</u>	<u>Residuals Management Facility or Treatment Facility</u>
1. Date and Time Shipped	1. Date and Time Received
2. Amount of Residuals Shipped	2. Amount of Residuals Received
3. Degree of Treatment (if applicable)	3. Name and ID Number of Source Facility
4. Name and ID Number of Residuals Management Facility or Treatment Facility	4. Signature of Hauler
5. Signature of Responsible Party at Source Facility	5. Signature of Responsible Party at Residuals Management Facility or Treatment Facility
6. Signature of Hauler and Name of Hauling Firm	

These records shall be kept for five years and shall be made available for inspection upon request by the Department. A copy of the hauling records information maintained by the source facility shall be provided upon delivery of the residuals to the residuals management facility or treatment facility. The permittee shall report to the Department within 24 hours of discovery any discrepancy in the quantity of residuals leaving the source facility and arriving at the residuals management facility or treatment facility. *[62-640.880(4)]*

6. Storage of residuals or other solids at the permitted facility shall require prior written notification to the Department. *[62-640.300(4)]*

III. COMBUSTION BY-PRODUCTS MANAGEMENT REQUIREMENTS

1. Combustion by-products produced by the operation of the Lansing Smith Power Plant: ash, non-hazardous metal cleaning wastewater sludge, and other solid waste approved by the Department shall be disposed of in the on-site 72 acre solid waste management facility permitted through this permit or to another appropriate solid waste management facility permitted by the Department.

2. The disposal of combustion by-products in the on-site solid waste management facility permitted by the this permit shall be in accordance with the construction application, submitted September 19, 1985, Drawing D-31114 revised September 17, 1985, FDEP letter June 19, 1996 and the requirements of Chapter 62-701, F.A.C., except as modified by <u>Evaluation of Solid Waste Management Practices and Requirements for the Florida Electric Utility Industry</u>.

3. A copy of the engineering drawings, plans, reports, construction permit, and supporting information shall be kept at this landfill at all times for reference and inspections.

4. Small amounts of accumulated debris that has been removed from the plant's cooling water intake screens, consisting mainly of vegetation, may be placed in a central location near the ash landfill.

5. In no event shall any solid waste other than combustion by-products or other materials approved by the Department be disposed of on the plant site other than in areas specifically designated in the application.

6. The solid waste management facility was constructed in phases. The liner beneath the ground level cells consists of either of the following two construction materials:

   a. Minimum 1 foot clay liner with maximum permeability of 1x10-7 cm/sec compacted to 90% of Proctor, or

   b. 60 mil HPDE liner and geosynthetic clay liner

7. The final cover system, including the drainage soil, top soil and seeding, shall be completed within 180 days after the final waste deposit date.

8. Final closure of the facility shall comply with the provisions of Rules 62-701.600 through 62-701.620, FAC, except as modified by Evaluation of Solid Waste Management Practices and Requirements for the Florida Electric Utility Industry and any additional requirements in effect at the time wastes cease to be accepted by the facility.

9. Surface water runoff shall be controlled during operation under this permit and shall comply with FAC Chapter 62-302 at the site boundary.

IV. GROUND WATER REQUIREMENTS

1. Compliance with water quality standards of Rule 62-520.420, F.A.C. and as contained in Rules 62-550.310 and 62-550.320, F.A.C, shall be met. Beyond the southern edge of the zone of discharge, applicable surface water criteria in accordance with 62-302, F.A.C., shall also be met.

   The zone of discharge for this project shall extend horizontally to the former property line and along the discharge canal right of way or mean high water line as depicted on the attached map and vertically from the land surface to the top of the Intracoastal Formation at approximately -20 ft mean sea level. *[62-520.200(26)] [62-520.465]*

2. Monitoring wells are exempt from compliance with secondary drinking water standards unless the Department determines that compliance with one or more secondary standards is necessary to protect groundwater used or reasonably like to be used as a potable water source. *[62-520.520(1)]*

3. Any new or replacement wells shall be of an appropriate diameter so as to provide reliable and representative water quality results. They shall have appropriate screen length and shall be constructed in accordance with the guidelines provided on Attachment 2. Sieve analyses shall be submitted and shall be used for proper well design. Required well construction permits shall be obtained from the Northwest Florida Water Management District. Upon installation and after settling, new wells shall be properly developed. Upon completion of construction of new wells, lithologic logs, "as installed" diagrams and descriptions of well development shall be submitted to the Department.

   A registered Florida land surveyor shall locate all wells and the coordinates shall be reported in accordance with Rule 62-701.510(3), F.A.C. Existing wells not used in the approved monitoring network for collection of samples or water elevation data shall be properly maintained or shall be properly abandoned in accordance with Rule 62-532.500(4), F.A.C. Appropriate well abandonment permits shall be obtained from the Northwest Florida Water Management District. *[62-710.510(3)(d)1 and 62-632.500(4)]*

4. The water quality network shall consist of the monitoring wells designated below (one background, four compliance, and four detection). The groundwater monitoring network is graphically represented on Attachment 1. The following designations shall be used for groundwater monitoring identification purposes in all future analysis reports:

Monitoring Well ID	Alternate Well Name and/or Description of Monitoring Location	Latitude			Longitude			Depth (Feet)	Aquifer Monitored	New or Existing
		°	'	"	°	'	"			
MWB-1	Formerly known as LB-1, WAFR Site Number 29224, Location northwest of landfill	30	16	17	85	41	7	14	Surficial	Existing
MWC-1	Formerly known as LC-1, WAFR Site Number 29233 Location Southeast of Ash Landfill	30	15	57	85	40	57	15	Surficial	Existing
MWC-5	Formerly known as M-5, WAFR Site Number 138 Location 900 ft S of NE property corner	30	16	8	85	40	56	20	Surficial	Existing
MWI-10	New well located approximately 1800 ft. west of southeastern corner of ash landfill.								Surficial	New
MWI-12A	Formerly known as 9-12A, WAFR Site Number 134 Location 500 ft S of SW corner of Ash Landfill	30	15	51	85	41	16	15	Surficial	Existing
MWI-3A	Formerly known as 9-3A, WAFR Site Number 137 Location 500 ft S of SW corner of Ash Pond	30	15	36	85	41	50	15	Surficial	Existing
MWI-7	Formerly known as 9-7, WAFR Site Number 135 Location 200 ft S of Ash Pond	30	15	43	85	41	38	27	Surficial	Existing
MWI-9	Formerly known as 9-9, WAFR Site Number 136 Location 400 ft S of SE corner of Ash Pond	30	15	48	85	41	27	18	Surficial	Existing

MWC = Compliance; MWB = Background; MWI = Intermediate; MWP =Piezometer

[62-520.600]

5. All groundwater monitoring wells identified in Permit Condition III.4 shall be sampled annually for parameters listed below, except for that MWC-5 shall remain in the monitoring network for water level elevation measurements only:

Field Parameters	Laboratory Parameters
Static water level in wells before purging	Aluminum, Total Recoverable (001104)
Specific conductivity	Arsenic, Total Recoverable (050094)
pH	Cadmium, Total Recoverable (050099)
Dissolved oxygen	Chloride
Turbidity	Chromium, Total Recoverable (050101)
Temperature	Copper, Total Recoverable (050102)
Oxidation –Reduction Potential (046480)	Iron, Total Recoverable (050103)
Colors and sheens (by observation)	Lead, Total Recoverable (050110)
	Manganese, Total Recoverable (050106)
	Mercury, Total Recoverable (071901)
	Nickel, Total Recoverable (050109)
	Selenium, Total Recoverable (050112)
	Sodium, Total Recoverable (050108)

Field Parameters	Laboratory Parameters
	Sulfates
	Zinc, Total Recoverable (050117)
	Total Dissolved Solids (TDS)
	Total Suspended Solids (TSS)

6. The limit for Total Recoverable Sodium at monitoring well MWC-1 shall be "Report".

7. Water levels in each monitoring well shall be measured in a single day. During well sampling, water levels shall be measured on the sample day and recorded prior to evacuating the wells or collecting samples. Water level, top of well casing and land surface elevations at each well site, at a precision of plus or minus 0.01 feet NGVD, shall be reported on each analysis report. Prior to sampling, the field parameters of Rule 62-701.730(4)(b), F.A.C., shall be stabilized from each well. Sampling and purging methods in the SOPs, as allowed in Chapter 62-160, F.A.C. must be used.

8. All analyses of samples shall be conducted using approved State and federal analytical methods with detection limits at or below the maximum allowable concentrations for all parameters, whenever possible.

9. Background water quality shall be sampled and analyzed in accordance with the provisions of Rule 62-701.510(6)(b), F.A.C. All background and detection wells shall be sampled and analyzed at least once prior to permit renewal for those parameters listed in Condition III.5 above.

10. A permit modification request to delete specific laboratory or field parameters must contain a demonstration that these parameters are not reasonable expected to be in or derived from the waste which was received or disposed of at the facility.

11. Rainfall at the site shall be measured on a daily basis and the results submitted with the semi-annual reports.

12. The results of each set of annual groundwater analyses shall be submitted separate cover, no later than February 15 and August 15 each year, commencing with the February 15, 2010 report. *[62-701.730(4)(b), 62-701.510(6) & (8), permit application received December 23, 2008 and subsequent incompleteness information]*

13. The results of each set of annual groundwater analyses may be submitted electronically on diskettes or compact disc media readable by a Microsoft Windows computer. The Department may use electronic tools (e.g. Validator) to conduct data quality review and compliance checking. Electronic laboratory data must be submitted in a specific format called at tab-delimited text file with the first line of the file being the data field names. (Note: Microsoft Excel produces this file format when the "Save As" and "Text (Tab Delimited)" options are selected.)

The following data fields must be present in the data:	
Analytical Method	Analytical Result
Analytical Result Units	Appropriate Data Qualifiers (as listed in Chapter 62-160, F.A.C.)
Date of Analysis	Date of Preparation (if applicable)
Date of Sampling	Detection Limit of the Analysis
DOH Certification Number of the Laboratory	Facility Identification Number
Matrix (Aqueous, Drinking Water, Saline/Estuarine, or Solids)	Parameter Name (Name of the Compound Analyzed for/Test Performed)
STORET Parameter Code (as provided by the Department's Bureau of Solid and Hazardous Waste; must be six digits: e.g. 039430 for Isodrin)	Test site ID

Future Changes to data filed requirements by the Department do not require a permit modification. All dates are to be submitted in MM/DD/YYYY HH:MM:SS format (e.g. 05/04/1955 17:18:00 for May 4, 1955 5:18:00 p.m.) A sample of an acceptable data format will be posted to the Bureau of Laboratories web site, http://www.floridadep.org/labs/software.

The submittal shall also include laboratory reports, Chain of Custody sheets, field data sheets, Water Sampling Logs (attached), groundwater contour maps, a summary of any water quality standards or minimum criteria that are exceeded and any other required documents. These reports may be submitted electronically in portable document format (PDF) in lieu of a paper copy. If a specific document has a requirement to be signed and sealed, an original signed and sealed paper copy must also be submitted unless it is specifically permitted by law or rule to be signed electronically. *[62-701.510(6) and (8)(a),(b) & (d)]*

14. If at any time it is determined that any well in the routine monitoring system is not functioning properly and is not providing representative water quality samples, the permittee shall have the wells evaluated, redeveloped, or replaced such that representative samples will be obtained during the next required routine sampling event.

    Any well which must be redeveloped should be surged with formation water or a surge block only. Wells which still produce sediment and high turbidity should be considered for replacement. Wells with high turbidity should be evaluated using the procedures called for in Rule 62-520.300(9), F.A.C.

    Any well requiring replacement shall be designed and completed by methods in Sections 5 and 6 of the Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA/600/4-89/034, March 1991. *[62-701.510 and 62-522]*

15. Attachment 3, DEP Form 62-522.900(2), shall be reproduced by the permittee and shall be used for water quality data submittals. All water quality monitoring reports required by this permit shall be submitted to:

    Department of Environmental Protection
    Northwest District Office
    Solid Waste Section
    160 Governmental Center, Suite 308
    Pensacola, Florida 32502

    The Department FDEP Permit Number FL0002267 and the Department PA File Number FL0002267-006-1W1S for this facility shall be recorded on each report. The Test Site Number and Well Name shall be sued on each report to identify the sampling point. A master list of analyses parameter STORET codes is provided by **Attachment 4.** STORET codes not provided in Attachment 4 are provided next to the listed laboratory parameters. The appropriate STORET code shall be listed in the extreme left column of the forms for each parameter. *[62-701.510 and 62-522]*

16. A complete sampling record shall be provided for each sampling point. This record shall include:
    a. Water level;
    b. Total depth of the well;
    c. Volume of water in the well;
    d. Volume of water removed;
    e. Stabilization documentation including:
        (1) pH
        (2) Conductivity
        (3) Temperature
        (4) Turbidity
        (5) Dissolved oxygen
    f. Time interval of purging;
    g. Time sample is taken; and
    h. Device(s) used for purging (including discharge rate) and sampling.

    The permittee may wish to reproduce and use Attachment 5 (DEP-SOP-001/01 Form FD 9000-24) for reporting this information. Sampling methodologies must be capable of measuring concentrations of constituents at or below the maximum concentrations allowed, whenever possible. *[62-701.510 and 62-522]*

17. In the event that water quality monitoring shows a violation of the applicable water quality standards, the permittee shall arrange for a confirmation resampling within 30 days after the permittee's receipt of laboratory results. In the event that the permittee chooses not to conduct the reconfirmation sampling, the Department shall consider the initial analysis to be representative of the current water quality conditions at this facility. If the initial results demonstrate or the resampling confirms the groundwater contamination, the permittee shall notify the Department in writing within 14 days of this finding.

    Upon notification by the Department, the permittee shall initiate evaluation monitoring in accordance with Rule 62-701.510(7), F.A.C.

18. All water quality monitoring required by this permit shall be in accordance with Rule 62-520.300, F.A.C. and Rule 62-4.256, F.A.C., and shall be carried out under the requirements of DEP-SOP-001/01 (February 1, 2004) FS 2000 or applicable Standard Operating Procedures (SOPs) in accordance with Chapter 62-160, F.A.C. (effective April 9, 2002). Requirements for these plans may be obtained from the Department's Environmental Assessment Section at (850) 488-2796.

19. A written technical report ("Two-Year Technical Report") shall be prepared and submitted to the Department every two years and updated at the time of permit renewal. The report shall be prepared by a qualified professional and shall contain but not be limited to the following items:
    a. Tables and graphs of water quality data, hydrographic data for all monitoring wells and rainfall data.
    b. A comparison of water quality results between the background well and downgradient sampling points. Note linear or other trends where quality is being improved or degraded.
    c. A summary of all violations of applicable water standards.
    d. Groundwater potentiometric maps for each sampling event.
    e. An evaluative discussion of any data that is thought to be inconsistent or suspect and corrective measures taken or planned.
    f. A summary of the physical condition of the monitoring system. This should be based on visual observation, sampling records, and water quality data.
    g. A survey map of all monitoring wells and piezometers.

The technical report shall be submitted under separate cover, no later than January 28th, commencing with the 2011 report. *[62-701.510(9)(b)]*

20. If water quality monitoring demonstrates contaminants are detected and confirmed in compliance wells in concentrations which exceed both background levels and Department water quality standards or criteria, the permittee shall notify the Department within 14 days of this finding and shall initiate corrective actions. Evaluation monitoring shall continue according to the requirements of Rule 62-701.510(7)(a), F.A.C.

    The permittee shall initiate and complete corrective actions in accordance with Chapter 62-780, F.A.C., within the manner and timeframes specified therein and provide a site assessment report in accordance with Rule 62-780.600, F.A.C., that meet the objectives of said Rule within the manner and timeframes specified therein. *[62-701.510(7)(b)2]*

V. ADDITIONAL LAND APPLICATION REQUIREMENTS

1. Advisory signs shall be posted around the portion of the industrial site in which reclaimed water is used and at the main entrances to the industrial site to notify employees at the industrial site and the public of the nature of the reclaimed water use. *[62-610.658(1)]*

2. There shall be readily identifiable "non-potable" or "do not drink" notices, marking, or coding on application/distribution facilities and appurtenances. *[62-610.660(2)]*

3. When the three-month average daily flow for the most recent three consecutive months exceeds 50 percent of the permitted capacity of the treatment plant or reuse and disposal systems, the permittee shall submit to the Department a capacity analysis report. This initial capacity analysis report shall be submitted within 180 days after the last day of the last month of the three-month period referenced above. The capacity analysis report shall be prepared in accordance with Rule 62-600.405, F.A.C. *[62-600.405(4)]*

4. The application to renew this permit shall include a detailed operation and maintenance performance report prepared in accordance with Rule 62-600.735, F.A.C. *[62-600.735(1)]*

VI. OPERATION AND MAINTENANCE REQUIREMENTS

1. During the period of operation authorized by this permit, the wastewater facilities shall be operated under the supervision of a person who is qualified by formal training and/or practical experience in the field of water pollution control. *[62-620.320(6)]*

2. The on-site domestic facility shall have a Class C or higher operator 1 hour/day for 5 days/week and one visit each weekend. The lead/chief operator for the domestic facility must be a Class C operator, or higher.

3. The permittee shall maintain the following records and make them available for inspection on the site of the permitted facility.

    a. Records of all compliance monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, including, if applicable, a copy of the laboratory certification showing the certification number of the laboratory, for at least three years from the date the sample or measurement was taken;

    b. Copies of all reports required by the permit for at least three years from the date the report was prepared;

    c. Records of all data, including reports and documents, used to complete the application for the permit for at least three years from the date the application was filed;

d. A copy of the current permit;

e. A copy of any required record drawings; and

f. Copies of the logs and schedules showing plant operations and equipment maintenance for three years from the date of the logs or schedules.

[62-620.350]

VII. SCHEDULES

1. The following improvement actions shall be completed according to the following schedule. The Best Management Practices/Pollution Prevention (BMP3) Plan shall be prepared and implemented in accordance with Part VII of this permit.

Improvement Action	Completion Date
1. Continue implementing the existing BMP3 Plan	Issuance date of permit

[62-620.320(6)]

2. The permittee shall submit an amended plan of study titled "Proposed Monitoring Study at Smith Electric Generating Plant" within 30 days of permit issuance. The permittee shall submit the amended plan to the Department at the following address:

   Florida Department of Environmental Protection
   Industrial Wastewater Section, Mail Station 3545
   2600 Blair Stone Road
   Tallahassee, Florida 32399-2400

3. The permittee shall continue implementing the amended plan of study titled "Proposed Monitoring Study at Smith Electric Generating Plant", dated April 14, 2009 for at least one year after the issuance date of the permit. Until the amended plan of study is approved by the Department, the permittee shall sample bi-weekly and per a Department-approved parameter and location list. The permittee shall submit the summarized results within 45 days of completion of the plan of study or no later than 180 days before the expiration date of the permit, whichever is first, to the Department at the address in Condition VII.2.

4. Within six months of the effective date of this permit, the permittee shall schedule a meeting with the Department to discuss the contents of the aquatic organism return plan in accordance with Condition I.A.10 and shall submit the plan to the Department within 12 months of the effective date of this permit. The plan shall be implemented within 24 months subsequent to approval by the Department.

VIII. BEST MANAGEMENT PRACTICES/STORMWATER POLLUTION PREVENTION PLANS

1. General Conditions

In accordance with Section 304(e) and 402(a)(2) of the Clean Water Act (CWA) as amended, 33 U.S.C. §§ 1251 et seq., and the Pollution Prevention Act of 1990, 42 U.S.C. §§ 13101-13109, the permittee must develop and implement a plan for utilizing practices incorporating pollution prevention measures. References to be considered in developing the plan are "Criteria and Standards for Best Management Practices Authorized Under Section 304(e) of the Act," found at 40 CFR 122.44 Subpart K and the Storm Water Management Industrial Activities Guidance Manual, EPA/833-R92-002 and other EPA documents relating to Best Management Practice guidance.

a. Definitions
   (1) The term "pollutants" refers to conventional, non-conventional and toxic pollutants.
   (2) Conventional pollutants are: biochemical oxygen demand (BOD), suspended solids, pH, fecal coliform bacteria and oil & grease.

(3) Non-conventional pollutants are those which are not defined as conventional or toxic.
(4) Toxic pollutants include, but are not limited to: (a) any toxic substance listed in Section 307(a)(1) of the CWA, any hazardous substance listed in Section 311 of the CWA, or chemical listed in Section 313(c) of the Superfund Amendments and Reauthorization Act of 1986; and (b) any substance (that is not also a conventional or non-conventional pollutant except ammonia) for which EPA has published an acute or chronic toxicity criterion.
(5) "Significant Materials" is defined as raw materials; fuels; materials such as solvents and detergents; hazardous substances designated under Section 101(14) of CERCLA; and any chemical the facility is required to report pursuant to EPCRA, Section 313; fertilizers; pesticides; and waste products such as ashes, slag and sludge.
(6) "Pollution prevention" and "waste minimization" refer to the first two categories of EPA's preferred hazardous waste management strategy: first, source reduction and then, recycling.
(7) "Recycle/Reuse" is defined as the minimization of waste generation by recovering and reprocessing usable products that might otherwise become waste; or the reuse or reprocessing of usable waste products in place of the original stock, or for other purposes such as material recovery, material regeneration or energy production.
(8) "Source reduction" means any practice which: (a) reduces the amount of any pollutant entering a waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal; and (b) reduces the hazards to public health and the environment associated with the release of such pollutant. The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control. It does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a pollutant through a process or activity which itself is not integral to, or previously considered necessary for, the production of a product or the providing of a service.
(9) "BMP3" means a Best Management Practices Pollution Prevention Plan incorporating the requirements of 40 CFR § 125, Subpart K, plus pollution prevention techniques, except where other existing programs are deemed equivalent by the permittee. The permittee shall certify the equivalency of the other referenced programs.
(10) The term "material" refers to chemicals or chemical products used in any plant operation (i.e., caustic soda, hydrazine, degreasing agents, paint solvents, etc.). It does not include lumber, boxes, packing materials, etc.

2. Best Management Practices/Pollution Prevention Plan

The permittee shall develop and implement a BMP3 plan for the facility, which is the source of wastewater and storm water discharges, covered by this permit. The plan shall be directed toward reducing those pollutants of concern which discharge to surface waters and shall be prepared in accordance with good engineering and good housekeeping practices. For the purposes of this permit, pollutants of concern shall be limited to toxic pollutants, as defined above, known to the discharger. The plan shall address all activities which could or do contribute these pollutants to the surface water discharge, including process, treatment, and ancillary activities.

a. Signatory Authority & Management Responsibilities

The BMP3 plan shall be signed by permittee or their duly authorized representative in accordance with rule 62-620.305(2)(a) and (b). The BMP3 plan shall be reviewed by plant environmental/engineering staff and plant manager. Where required by Chapter 471-(P.E.) or Chapter 492 (P.G.) Florida Statutes, applicable portions of the BMP3 plant shall be signed and sealed by the professional(s) who prepared them.

A copy of the plant shall be retained at the facility and shall be made available to the permit issuing authority upon request.

The BMP3 plan shall contain a written statement from corporate or plant management indicating management's commitment to the goals of the BMP3 program. Such statements shall be publicized or made known to all facility employees. Management shall also provide training for the individuals responsible for implementing the BMP3 plan.

b. BMP3 Plan Requirements

(1) Name & description of facility, a map illustrating the location of the facility & adjacent receiving waters, and other maps, plot plans or drawings, as necessary;
(2) Overall objectives (both short-term and long-term) and scope of the plan, specific reduction goals for pollutants, anticipated dates of achievement of reduction, and a description of means for achieving each reduction goal;
(3) A description of procedures relative to spill prevention, control & countermeasures and a description of measures employed to prevent storm water contamination;
(4) A description of practices involving preventive maintenance, housekeeping, recordkeeping, inspections, and plant security; and
(5) The description of a waste minimization assessment performed in accordance with the conditions outlined in condition c below, results of the assessment, and a schedule for implementation of specific waste reduction practices.

c. Waste Minimization Assessment

The permittee is encouraged but not required to conduct A waste minimization assessment (WMA) for this facility to determine actions that could be taken to reduce waste loading and chemical losses to all wastewater and/or storm water streams as described in this permit.

If the permittee elects to develop and implement a WMA, information on plan components can be obtained forms the Department's Industrial Wastewater website, or from:

Florida Department of Environmental Protection
Industrial Wastewater Section, Mail Station 3545
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
(850) 245-8589
(850) 245-8669 – Fax

d. Best Management Practices & Pollution Prevention Committee Recommended:

A Best Management Practices Committee (Committee) should be established to direct or assist in the implementation of the BMP3 plan. The Committee should be comprised of individuals within the plant organization who are responsible for developing the BMP3 plan and assisting the plant manager in its implementation, monitoring of success, and revision. The activities and responsibilities of the Committee should address all aspects of the facility's BMP3 plan. The scope of responsibilities of the Committee should be described in the plan.

e. Employee Training

Employee training programs shall inform personnel at all levels of responsibility of the components & goals of the BMP3 plan and shall describe employee responsibilities for implementing the plan. Training shall address topics such as good housekeeping, materials management, record keeping & reporting, spill prevention & response, as well as specific waste reduction practices to be employed. Training should also disclose how individual employees may contribute suggestions concerning the BMP3 plan or suggestions regarding Pollution Prevention. The plan shall identify periodic dates for such training.

f. Plan Development & Implementation

The BMP3 plan shall be developed and implemented 6 months after the effective date of this permit, unless any later dates are specified in this permit. Any portion of the WMA which is ongoing at the time of development or implementation shall be described in the plan. Any waste reduction practice which is recommended for implementation over a period of time shall be identified in the plan, including a schedule for its implementation.

g. Submission of Plan Summary & Progress/Update Reports

(1) Plan Summary: Not later than 2 years after the effective date of the permit, a summary of the BMP3 plan shall be developed and maintained at the facility and made available to the permit issuing authority upon request. The summary should include the following: a brief description of the plan, its implementation process, schedules for implementing identified waste reduction practices, and a list of all waste reduction practices being employed at the facility. The results of waste minimization assessment studies already completed as well as any scheduled or ongoing WMA studies shall be discussed.

(2) Progress/Update Reports: Annually thereafter for the duration of the permit progress/update reports documenting implementation of the plan shall be maintained at the facility and made available to the permit issuing authority upon request. The reports shall discuss whether or not implementation schedules were met and revise any schedules, as necessary. The plan shall also be updated as necessary and the attainment or progress made toward specific pollutant reduction targets documented. Results of any ongoing WMA studies as well as any additional schedules for implementation of waste reduction practices shall be included.

(3) A timetable for the various plan requirements follows:

Timetable for BMP3 Plan Requirements:

REQUIREMENT	TIME FROM EFFECTIVE DATE OF THIS PERMIT
Progress/Update Reports	3 years, and then annually thereafter

The permittee shall maintain the plan and subsequent reports at the facility and shall make the plan available to the Department upon request.

h. Plan Review & Modification

If following review by the Department, the BMP3 plan is determined insufficient, the permittee will be notified that the BMP3 plan does not meet one or more of the minimum requirements of this Part. Upon such notification from the Department, the permittee shall amend the plan and shall submit to the Department a written certification that the requested changes have been made. Unless otherwise provided by the Department, the permittee shall have 30 days after such notification to make the changes necessary.

The permittee shall modify the BMP3 plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to waters of the State or if the plan proves to be ineffective in achieving the general objectives of reducing pollutants in wastewater or storm water discharges. Modifications to the plan may be reviewed by the Department in the same manner as described above.

IX. OTHER SPECIFIC CONDITIONS

A. Specific Conditions Applicable to All Permits

1. Where required by Chapter 471 or Chapter 492, F.S., applicable portions of reports that must be submitted under this permit shall be signed and sealed by a professional engineer or a professional geologist, as appropriate. *[62-620.310(4)]*

2. Drawings, plans, documents or specifications submitted by the permittee, not attached hereto, but retained on file at the Department's Northwest District Office, are made a part hereof.

3. This permit satisfies Industrial Wastewater program permitting requirements only and does not authorize operation of this facility prior to obtaining any other permits required by local, state or federal agencies.

4. The permittee shall provide verbal notice to the Department's Northwest District Office as soon as practical after discovery of a sinkhole or other karst feature within an area for the management or application of wastewater, or wastewater sludges. The permittee shall immediately implement measures appropriate to control the entry of contaminants, and shall detail these measures to the Department's Northwest District Office in a written report within 7 days of the sinkhole discovery. *[62-620.320(6)]*

B. Specific Conditions Related to Existing Manufacturing, Commercial, Mining, and Silviculture Wastewater Facilities or Activities

1. Existing manufacturing, commercial, mining, and silvicultural wastewater facilities or activities that discharge into surface waters shall notify the Department as soon as they know or have reason to believe:

   a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following levels;
   (1) One hundred micrograms per liter,
   (2) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2, 4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter for antimony, or
   (3) Five times the maximum concentration value reported for that pollutant in the permit application; or

   b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following levels;
   (1) Five hundred micrograms per liter,
   (2) One milligram per liter for antimony, or
   (3) Ten times the maximum concentration value reported for that pollutant in the permit application.

   [62-620.625(1)]

C. Specific Conditions Related to Domestic Wastewater Facilities

1. Screenings and grit removed from the domestic wastewater facilities shall be collected in suitable containers and hauled to a Department approved Class I landfill or to a landfill approved by the Department for receipt/disposal of screenings and grit. *[62-701.300(1)(a)]*

D. Duty to Reapply

1. The permittee shall apply for renewal of this permit such that the Department receives the application at least 180 days before the expiration date of the permit using the appropriate forms listed in Rule 62-620.910, F.A.C., including submittal of the appropriate processing fee set forth in Rule 62-4.050, F.A.C. The existing permit shall not expire until the Department has taken final action on the application renewal in accordance with the provisions of 62-620.335(3) and (4), F.A.C.

   180 days prior to expiration date: Month, Day, Year

E. Reopener Clauses

1. The permit shall be revised, or alternatively, revoked and reissued in accordance with the provisions contained in Rules 62-620.325 and 62-620.345 F.A.C., if applicable, or to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2) and 307(a)(2) of the Clean Water Act (the Act), as amended, if the effluent standards, limitations, or water quality standards so issued or approved:

   a. Contains different conditions or is otherwise more stringent than any condition in the permit/or;

   b. Controls any pollutant not addressed in the permit.

   The permit as revised or reissued under this paragraph shall contain any other requirements then applicable.

2. The permit may be reopened to adjust effluent limitations or monitoring requirements should future Water Quality Based Effluent Limitation determinations, water quality studies, DEP approved changes in water quality standards, EPA established Total Maximum Daily Loads (TMDLs), or other information show a need for a different limitation or monitoring requirement.

3. The Department or EPA may develop a TMDL during the life of the permit. Once a TMDL has been established and adopted by rule, the Department shall revise this permit to incorporate the final findings of the TMDL.

4. The permit shall be reopened for revision as appropriate to address new information that was not available at the time of this permit issuance or to comply with requirements of new regulations, standards, or judicial decisions relating to CWA 316(b).

X. GENERAL CONDITIONS

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are binding and enforceable pursuant to Chapter 403, Florida Statutes. Any permit noncompliance constitutes a violation of Chapter 403, Florida Statutes, and is grounds for enforcement action, permit termination, permit revocation and reissuance, or permit revision. *[62-620.610(1)]*

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviations from the approved drawings, exhibits, specifications or conditions of this permit constitutes grounds for revocation and enforcement action by the Department. *[62-620.610(2)]*

3. As provided in Subsection 403.087(6), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor authorize any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit or authorization that may be required for other aspects of the total project which are not addressed in this permit. *[62-620.610(3)]*

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. *[62-620.610(4)]*

5. This permit does not relieve the permittee from liability and penalties for harm or injury to human health or welfare, animal or plant life, or property caused by the construction or operation of this permitted source; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. The permittee shall take all reasonable steps to minimize or prevent any discharge, reuse of reclaimed water, or residuals use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. *[62-620.610(5)]*

6. If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee shall apply for and obtain a new permit. *[62-620.610(6)]*

7. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control, and related appurtenances, that are installed and used by the permittee to achieve compliance with the conditions of this permit. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to maintain or achieve compliance with the conditions of the permit. *[62-620.610(7)]*

8. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit revision, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. *[62-620.610(8)]*

9. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, including an authorized representative of the Department and authorized EPA personnel, when applicable, upon presentation of credentials or other documents as may be required by law, and at reasonable times, depending upon the nature of the concern being investigated, to:

a. Enter upon the permittee's premises where a regulated facility, system, or activity is located or conducted, or where records shall be kept under the conditions of this permit;

b. Have access to and copy any records that shall be kept under the conditions of this permit;

c. Inspect the facilities, equipment, practices, or operations regulated or required under this permit; and

d. Sample or monitor any substances or parameters at any location necessary to assure compliance with this permit or Department rules.

[62-620.610(9)]

10. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data, and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except as such use is proscribed by Section 403.111, F.S., or Rule 62-620.302, F.A.C. Such evidence shall only be used to the extent that it is consistent with the Florida Rules of Civil Procedure and applicable evidentiary rules. *[62-620.610(10)]*

11. When requested by the Department, the permittee shall within a reasonable time provide any information required by law which is needed to determine whether there is cause for revising, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also provide to the Department upon request copies of records required by this permit to be kept. If the permittee becomes aware of relevant facts that were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be promptly submitted or corrections promptly reported to the Department. *[62-620.610(11)]*

12. Unless specifically stated otherwise in Department rules, the permittee, in accepting this permit, agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard. *[62-620.610(12)]*

13. The permittee, in accepting this permit, agrees to pay the applicable regulatory program and surveillance fee in accordance with Rule 62-4.052, F.A.C. *[62-620.610(13)]*

14. This permit is transferable only upon Department approval in accordance with Rule 62-620.340, F.A.C. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department. *[62-620.610(14)]*

15. The permittee shall give the Department written notice at least 60 days before inactivation or abandonment of a wastewater facility or activity and shall specify what steps will be taken to safeguard public health and safety during and following inactivation or abandonment. *[62-620.610(15)]*

16. The permittee shall apply for a revision to the Department permit in accordance with Rules 62-620.300, F.A.C., and the Department of Environmental Protection Guide to Permitting Wastewater Facilities or Activities Under Chapter 62-620, F.A.C., at least 90 days before construction of any planned substantial modifications to the permitted facility is to commence or with Rule 62-620.325(2), F.A.C., for minor modifications to the permitted facility. A revised permit shall be obtained before construction begins except as provided in Rule 62-620.300, F.A.C. *[62-620.610(16)]*

17. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The permittee shall be responsible for any and all damages which may result from the changes and may be subject to enforcement action by the Department for penalties or revocation of this permit. The notice shall include the following information:

a. A description of the anticipated noncompliance;

b. The period of the anticipated noncompliance, including dates and times; and

c. Steps being taken to prevent future occurrence of the noncompliance.

[62-620.610(17)]

18. Sampling and monitoring data shall be collected and analyzed in accordance with Rule 62-4.246 and Chapters 62-160, 62-601, and 62-610, F.A.C., and 40 CFR 136, as appropriate.

   a. Monitoring results shall be reported at the intervals specified elsewhere in this permit and shall be reported on a Discharge Monitoring Report (DMR), DEP Form 62-620.910(10), or as specified elsewhere in the permit.

   b. If the permittee monitors any contaminant more frequently than required by the permit, using Department approved test procedures, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

   c. Calculations for all limitations which require averaging of measurements shall use an arithmetic mean unless otherwise specified in this permit.

   d. Except as specifically provided in Rule 62-160.300, F.A.C., any laboratory test required by this permit shall be performed by a laboratory that has been certified by the Department of Health Environmental Laboratory Certification Program (DOH ELCP). Such certification shall be for the matrix, test method and analyte(s) being measured to comply with this permit. For domestic wastewater facilities, testing for parameters listed in Rule 62-160.300(4), F.A.C., shall be conducted under the direction of a certified operator.

   e. Field activities including on-site tests and sample collection shall follow the applicable standard operating procedures described in DEP-SOP-001/01 adopted by reference in Chapter 62-160, F.A.C.

   f. Alternate field procedures and laboratory methods may be used where they have been approved in accordance with Rules 62-160.220, and 62-160.330, F.A.C.

   [62-620.610(18)]

19. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule detailed elsewhere in this permit shall be submitted no later than 14 days following each schedule date. *[62-620.610(19)]*

20. The permittee shall report to the Department's Northwest District Office any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance including exact dates and time, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

   a. The following shall be included as information which must be reported within 24 hours under this condition:
      (1) Any unanticipated bypass which causes any reclaimed water or effluent to exceed any permit limitation or results in an unpermitted discharge,
      (2) Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,
      (3) Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and
      (4) Any unauthorized discharge to surface or ground waters.

   b. Oral reports as required by this subsection shall be provided as follows:
      (1) For unauthorized releases or spills of treated or untreated wastewater reported pursuant to subparagraph (a)4. that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to the STATE WARNING POINT TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24

hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information to the State Warning Point:
(a) Name, address, and telephone number of person reporting;
(b) Name, address, and telephone number of permittee or responsible person for the discharge;
(c) Date and time of the discharge and status of discharge (ongoing or ceased);
(d) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater);
(e) Estimated amount of the discharge;
(f) Location or address of the discharge;
(g) Source and cause of the discharge;
(h) Whether the discharge was contained on-site, and cleanup actions taken to date;
(i) Description of area affected by the discharge, including name of water body affected, if any; and
(j) Other persons or agencies contacted.

(2) Oral reports, not otherwise required to be provided pursuant to subparagraph b.1 above, shall be provided to the Department's Northwest District Office within 24 hours from the time the permittee becomes aware of the circumstances.

c. If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department's Northwest District shall waive the written report.

[62-620.610(20)]

21. The permittee shall report all instances of noncompliance not reported under Permit Conditions IX. 17, 18 or 19 of this permit at the time monitoring reports are submitted. This report shall contain the same information required by Permit Condition IX.20 of this permit. *[62-620.610(21)]*

22. Bypass Provisions.

a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment works.

b. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless the permittee affirmatively demonstrates that:
(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
(3) The permittee submitted notices as required under Permit Condition IX. 22. b. of this permit.

c. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least 10 days before the date of the bypass. The permittee shall submit notice of an unanticipated bypass within 24 hours of learning about the bypass as required in Permit Condition IX. 20. of this permit. A notice shall include a description of the bypass and its cause; the period of the bypass, including exact dates and times; if the bypass has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

d. The Department shall approve an anticipated bypass, after considering its adverse effect, if the permittee demonstrates that it will meet the three conditions listed in Permit Condition IX. 22. a. 1 through 3 of this permit.

e. A permittee may allow any bypass to occur which does not cause reclaimed water or effluent limitations to be exceeded if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Permit Condition IX. 22. a. through c. of this permit.

[62-620.610(22)]

23. Upset Provisions.

a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee.
   (1) An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, careless or improper operation.
   (2) An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of upset provisions of Rule 62-620.610, F.A.C., are met.

b. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:
   (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
   (2) The permitted facility was at the time being properly operated;
   (3) The permittee submitted notice of the upset as required in Permit Condition IX.5. of this permit; and
   (4) The permittee complied with any remedial measures required under Permit Condition IX. 5. of this permit.

c. In any enforcement proceeding, the burden of proof for establishing the occurrence of an upset rests with the permittee.

d. Before an enforcement proceeding is instituted, no representation made during the Department review of a claim that noncompliance was caused by an upset is final agency action subject to judicial review.

[62-620.610(23)]

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENTOF
ENVIRONMENTAL PROTECTION

Janet G. Llewellyn

Janet G. Llewellyn
Director
Division of Water Resource Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
(850) 245-8336

Attached:

Attachment 1 – Plant Smith Potentiometric Map
Attachment 2 – Basic Monitor Well Design in a Water Table Aquifer
Attachment 3 – Groundwater Monitoring Report
Attachment 4 – Rule 62-701.510(8)(a) Groundwater Monitoring Parameters
Attachment 5 – Form FD 9000-24: Groundwater Sampling Log
Attachment 6 – Final DMRs

September 19, 1985

Mr. Richard Fancher
Dredge & Fill Supervisor
Northwest District
Department of Environmental Regulation
160 Governmental Center
Pensacola, Florida 32501

Dear Mr. Fancher:

LANSING SMITH DRY FLY ASH DISPOSAL AREA

Please find attached a revised scope document and a revised plan view drawing (D-31114) of the proposed Lansing Smith Ash Disposal Area. This material replaces the support material that accompanied our July 25, 1985 permit application modification which was a revision to the original ash pond expansion permit applied for in December, 1983.

The major changes from the July 25th submittal are the same as those that were submittted to Mr. Tom Moody for his review by Jim Vick's letter of August 28, 1985. With reference to the attached scope document, the revised sections are 2.0, 3.7, 3.7.1 and 3.11.3. As you will note in Section 3.11.3 of the Scope Document, Gulf will be installing intermediate ground-water monitoring wells south of each of the first three cells. In order that we may start collecting background data from these wells, Gulf proposes to install these wells as soon as possible, but no later than the end of October of this year.

I sincerely hope that the modifications contained herein are acceptable to the Department and that a dredge and fill permit can be issued as expeditiously as possible. If you have any questions or comments please contact Jim Vick of my staff at 434-8311.

Sincerely,

JOV:sat

GP-SM-#0021

1.0 SCOPE

The existing ash pond at Gulf Power Company's Lansing Smith Electric Generating Plant occupies approximately 165 acres and has been in service for about 20 years. The pond has very little storage area left.

On December 16, 1983, Gulf Power (Gulf) proposed to expand the ash pond and submitted applications for a construction permit and a dredge and fill permit to the Florida Department of Environmental Regulation (DER). In April of 1984 the DER denied both of the permits stating that Gulf was unable to provide "reasonable assurance" that potential surface and/or groundwater contamination would not result in a violation of DER's rules and regulations.

After an extensive sampling program and several meetings with DER staff, the DER affirmed their earlier denial stating that "reasonable assurance" against a violation of standards still had not been provided.

During this period, Gulf began investigating other alternatives to provide for the future storage of ash. Several alternatives were examined with particular attention being given to two criteria. These were: 1) providing a means of storing the ash that would provide the DER with reasonable assurance that the operation would not violate DER standards or rules, and 2) providing the greatest volume of ash storage per acre of land.

In late 1984, Gulf concluded, based upon the above criteria, that the best alternative to the previously proposed ash pond expansion, was to establish a dry ash disposal area utilizing the ash out of the existing ash pond in the same area as that of the proposed expansion. Gulf feels that this means of storing ash will provide the DER with "reasonable assurance" of environmental compliance and will extend the useful life of the area by more than five times compared to the useful life of the proposed wet pond.

2.0 GENERAL PROJECT DESCRIPTION

The dry ash disposal area will be immediately east of the existing ash pond (See attached Drawing D-31114). .The north and east toe of the disposal area will be a minimum of 200 feet from the north and east property line, respectively.

The existing drainage ditch on the east side of the ash pond will be re-routed to the north and east sides of the new disposal area. This drainage ditch will be constructed by operating a machine between two excavations, with the material removed being used to construct an all-weather road for use as an inspection road and an access road to the controlled rainfall runoff surge area and pump location.

The dry ash disposal will be done in phases and the working area will be confined to a small portion of the total disposal area. Each portion is called a "cell". Each phase will be approximately ten (10) feet in height and Phase I will be completed before Phase II begins. Prior to the start of each cell, a bentonite/clay liner will be constructed. Each cell will contain approximately one year's production of ash. When a cell is completed, all surfaces will be stabilized against erosion by wind or water, and uncontrol- led rainfall run-off from the area will be allowed to sheet flow from the site.

During the period when a cell is being constructed, it will be isolated by the use of drainage ditches and soil berms so that rainfall run-off is routed to a surge area having a sump with pumps, where it will then be pumped to the existing ash pond. There will be two electrically operated pumps and a diesel powered backup pump to create a redundant system.

Phase I will be composed of 15 cells while Phases II and III will have 12 cells each.

3.0 DETAILED PROJECT DESCRIPTION

3.1 Conceptual Design

The disposal area will be constructed in cells. Each cell will contain the ash production from approximately one year's generation. It will occupy a volume measuring approximately 600 feet by 330 feet by 10 feet. All slopes will be three horizontal to one vertical.

The cells will be filled sequentially with all cells being finished in Phase I before Phase II is begun.

All slopes and surfaces will be stabilized by the establishment and maintenance of a grass cover and by proper ditching to preclude erosion by wind or water.

Slopes and surfaces of a temporary nature will be stabilized by the use of suitable erosion prevention material.

Surfaces will be sloped and ditches constructed such that no water from an active cell (controlled runoff), except that which exceeds the 10-year, 24-hour rainfall event, will exit the site. Rainfall run-off from a cell which has been stabilized will be uncontrolled and will not contribute to the flow into the surge area for controlled runoff, which in combination with the sump pumps will be sized for two cells only. It is anticipated that a maximum of two cells will be active at any given time.

3.2 Surge Area and Sump Pumps

A surge area in combination with two electrical pumps and a diesel backup pump of sufficient capacities will be constructed at the southwest corner of the disposal area. The most feasible combination of surge area and pump capacities will be determined based upon the ability to handle controlled rainfall runoff that would result from the 10-year 24-hour storm event. The surge area and pump will also be sized such that the controlled runoff resulting from the 10 year-24 hour event would be pumped out completely in a time period not to exceed 24 hours. This controlled runoff will be pumped across the existing eastern ash pond dike into the ash pond. Any rainfall-associated flows in excess of the 10-year 24-hour storm will be discharged to the existing drainage ditch south of the proposed sump pump structure.

3.3 Drainage Ditches

The existing drainage ditch now located just east of the ash pond dike will be re-routed north of the dry ash disposal area to the northeast corner of the disposal area, where it will then turn south along the east side.

Material from this ditch will be used to construct a road.

Another ditch running from west to east will be constructed, starting near the sump pump structure and paralleling the access road on the south side of the disposal area. Both of these ditches will carry only uncontrolled run-off.

Smaller, local ditches will be constructed around the active cells and controlled rain water from these ditches will be routed to the surge area and sump where it will be pumped to the ash pond.

3.4 Piping

There will be a pipe culvert under the road at the southeast corner of the disposal area. This culvert will drain uncontaminated rainfall runoff from the disposal area site. The culvert will discharge the runoff into a system designed to facilitate sheet flow and prevent any erosion.

3.5 Roads

There will be a road around three sides of the disposal area. A road will be constructed on the east and south sides of the disposal area and tie into an already existing road on the north side.

3.6 Excavation

In order to assure that the structural integrity of the liner remains sound, the disposal area will be cleared and grubbed. Additionally, all stumps will be removed and stripping will only occur as necessary to insure the liner's integrity.

3.7 Construction of Liner

A twelve (12) inch thick clay/bentonite liner will be constructed in two six (6) inch lifts. The liner will be constructed in such a manner as to achieve an overall permeability rate of 10^7 cm/sec.

3.7.1 Quality Control

Quality control of the liner will be accomplished by testing for percent compaction and permeability tests. The permeability tests will be performed on representative undisturbed samples in the laboratory. Field density tests will be conducted as each of the six inch lifts are constructed. The maximum allowable percentage of failures for percent compaction tests shall be 10% for the total area being tested. Percent compaction will be correlated to laboratory permeability tests to ensure design permeability rates.

3.8 Placing of Ash

The cells will be filled in lifts conducive to compaction by the equipment being used to haul and spread the material. Slopes will be no steeper than three horizontal to one vertical. During the course of filling the cells, care will be taken to prevent wind and water erosion of the ash, with such steps as watering, compacting, covering, or grading of the top surface being employed as necessary.

3.9 Compaction of Ash

The ash will be compacted as necessary to achieve the maximum utilization of each cell at the most economical cost.

3.10 Stabilization of Ash

When a cell of a phase is complete, all surfaces will be topped with approximately six (6) inches of soil and grassed, using a mixture of Pensacola Bahia, Bermuda, or rye grass, (whichever is seasonally appropriate) with the required mulching, fertilizer and holding agent to guarantee a good stand of grass.

3.11 Environmental Design Considerations

3.11.1 Rainfall Runoff (See Section 3.2).

3.11.1.1 Controlled Rainfall Runoff

All rainfall runoff resulting from any storm event up to but not exceeding the 10-year 24-hour storm that comes in contact with any active or exposed cell, shall be collected and pumped to the existing ash pond. The surge area shall be pumped completely down within 24 hours so as to prevent any ponding of water.

3.11.1.2 Uncontrolled Rainfall Runoff

All rainfall runoff, other than that falling on active cells, shall be collected and by means of ditches and routed through a concrete culvert into a system that will facilitate sheet runoff and prevent erosion.

3.11.2 Groundwater

The proposed dry ash landfill at Lansing Smith is located east of the existing ash pond. This area was investigated by the Soil Conservation Service which mapped four distinct soil types beneath the proposed dry ash landfill.

Cells 1 through 12 are located on top of sands (Pottsburg and Leon Sands) which have a measured permeability range of 1.41×10^{-2} to 4.23×10^{-3} cm/sec (rapid permeability) and a clay content of less than 10%. These sands have no recorded flooding frequency, and the highest wet-season water table is approximately 1 foot below the surface. Drilling data indicates an average water table of slightly more than 2 feet below the surface.

Parts of cells 13, 14 and 15 are located on top of sands and loamy sands (Rutlege and Bayvi sands) which display a permeability range of 1.41×10^{-2} to 4.23×10^{-3} cm/sec (rapid permeability) and to 3 to 9% clay content. Normal water table is approximately 2 feet below the surface.

The operation of a dry ash disposal area with a liner will reduce groundwater impacts, as compared to a wet ash disposal facility (pond). This is mainly due to the dry ash facility not operating under hydraulic head pressures as in an ash pond. When constructed and operated in lieu of a wet ash pond, a dry ash disposal area should:

(1) Reduce the volume of infiltration through the ash. The only water available for infiltration in a dry facility is direct rainfall, and a substantial percentage of this water will be surface runoff.

(2) Increase the time required for infiltration to take place through the ash.

(3) Alleviate the steep, radial hydraulic gradients that an ash pond would create in this area.

(4) Reduce the rate of possible leachate movement if it enters the regional groundwater flow. Regional hydraulic gradients are much lower than gradients created from a pond. There should be no radial flow to the east or north of the disposal area.

In order to reduce any chance of the water table coming in contact with the bottom of the dry ash disposal area, Gulf will observe the following:

a. Minimize or avoid excavation of the in situ sands.

b. Keep the water level in the existing ash pond to a minimum.

c. Compact the ash as much as feasibly possible.

d. Seal and grass a cell after completion as soon as possible.

e. Ensure collection of controlled runoff and pump the surge area dry as quickly as possible.

For more information on the geology and groundwater characteristics of this area, please refer to the Lansing Smith Electric Generating Plant Groundwater Monitoring Plan (Plan) which was submitted to the DER in February 1984. The Plan, which has been approved by DER, provides for the monitoring of the groundwater very near to the proposed dry ash disposal area. For the locations of these wells please refer to drawing D-3113 in the Attachment.

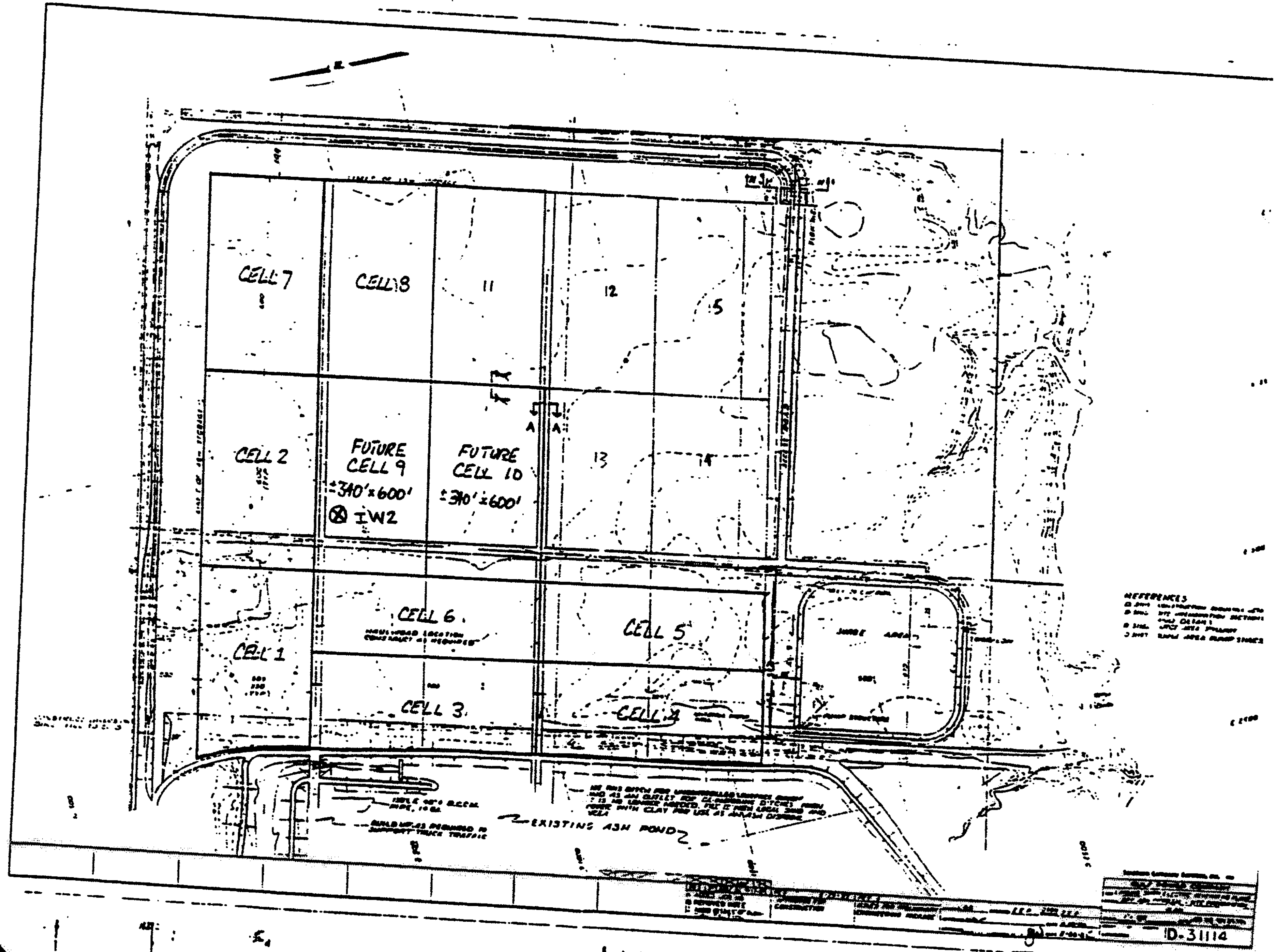
3.11.3 Intermederate Groundwater Monitoring Wells

Prior to the development of the first three cells, an intermediate groundwater monitoring well will be installed due south of each cell approximately fifty (50) feet downgradient of the centerline of the haul road.

3.11.4 Fugitive Emissions

Watering of the haul roads and of the ash cells shall be performed as necessary to minimize all fugitive emissions.

(E) 25.1L5.2



CELL 7
CELL 8
11
12
15
CELL 2
FUTURE CELL 9
±340'x600'
IW2
FUTURE CELL 10
±340'x600'
A
A
13
14
CELL 6
CELL 5
CELL 1
CELL 3
CELL 4
EXISTING ASH POND
REFERENCES
D-31114

BUCHANAN & HARPER, INC.
Engineering ~ Planning ~ Surveying ~ Landscape Architecture

735 West 11th Street ~ Panama City, Florida 32401

Telephone: (850) 763-7427 ~ Fax: (850) 784-2120

March 27, 2009

Via Email & U.S. Mail
rmmarkey@southernco.com

Mike Markey
Supervisor of Land & Water Programs
Gulf Power Company
One Engergy Place
Pensacola, FL 32520-0328

Re: Lansing Smith Generating Plant
B&H Job No.: 8142.04

Dear Mr. Markey:

We have completed the quantity surveys at the Lansing Smith Generating Plant. The measurements of each pond were obtained on March 13 through March 17, 2009.

As requested, we have determined the unfilled volume of each pond. We calculated the volume between the top of berm and the top of ash as well as the volume between the invert elevation of the outfall pipes and the top of ash.

The following are the results of our measurements:

Southwest Ash Pond
Volume below pipe invert = 51,654 cubic yards.
Volume within dike = 382,760 cubic yards.

Middle Ash Pond
Volume below pipe invert = 20,923 cubic yards
Volume within dike = 346,737 cubic yards.

East Ash Pond
Volume below weir = 205,130 cubic yards.
Volume within dike = 1,041,268 cubic yards.

Should you have any questions, please call.

Sincerely,

W. Todd Tindell

W. Todd Tindell, P.L.S.

Enc.

WTT/cfh

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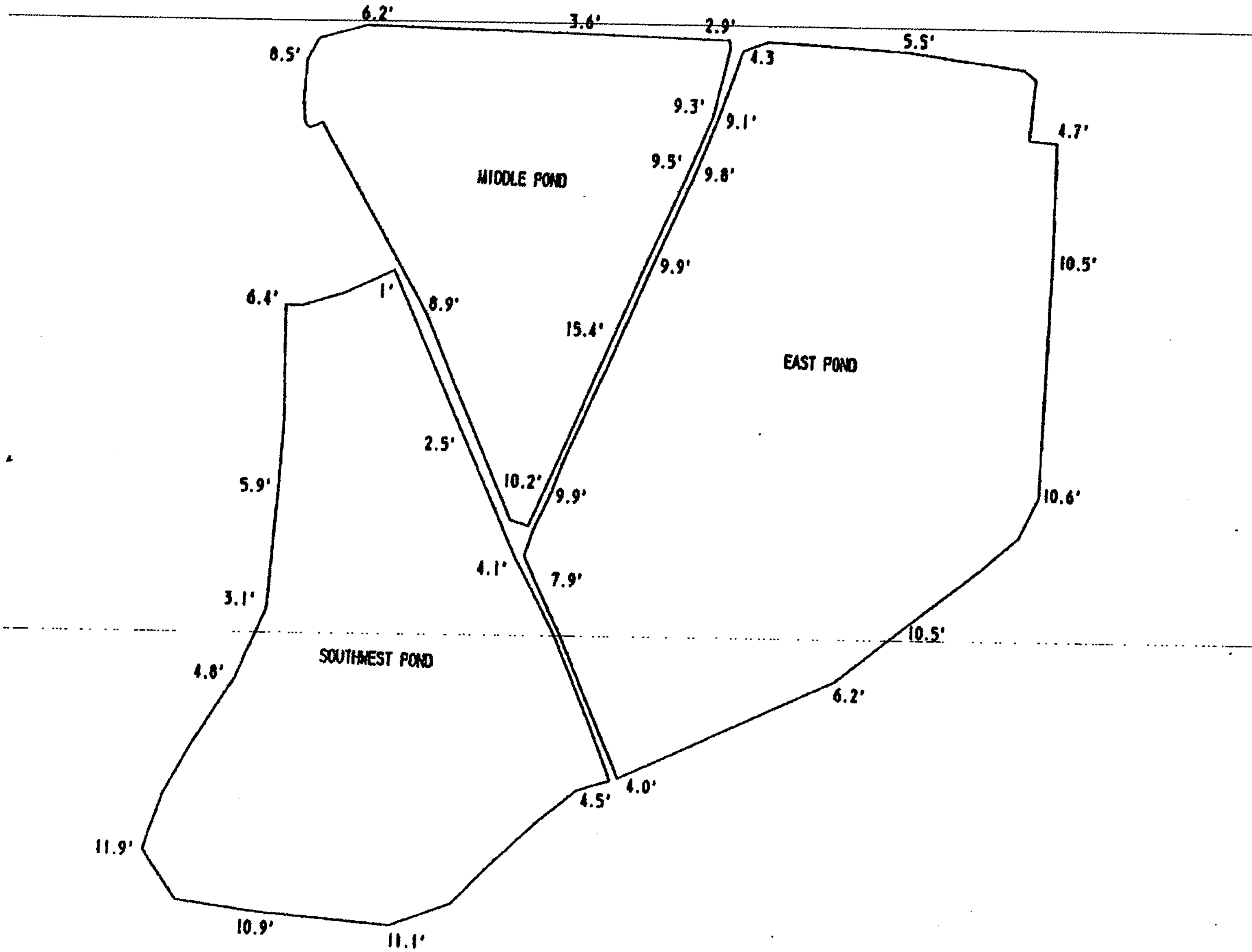
Attachment 'A'
Lansing Smith Generating Plant

HEIGHT OF BERM ABOVE ASH



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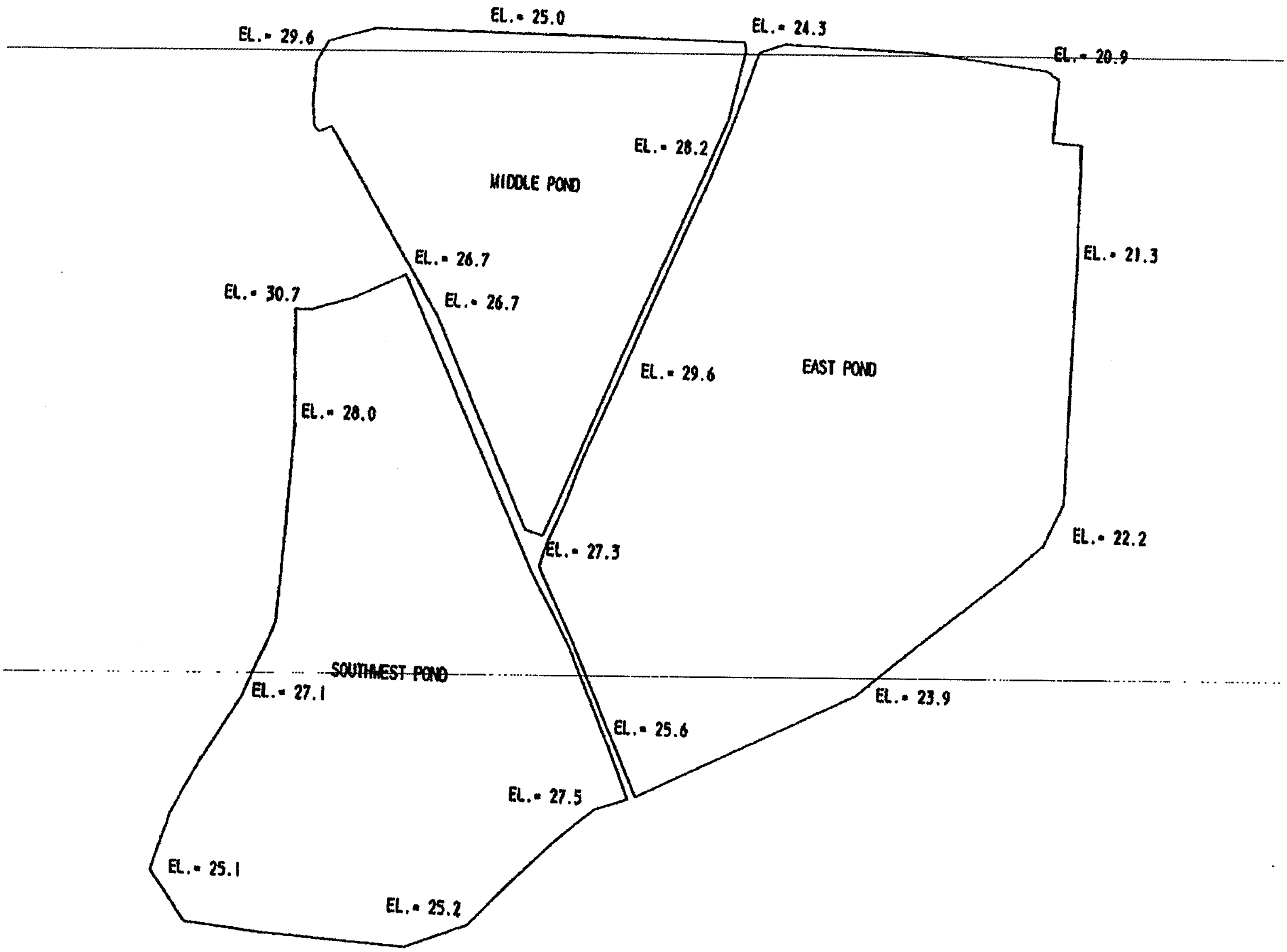
Attachment 'B'
Lansing Smith Generating Plant

TOP OF BERM ELEVATIONS



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Florida Department of Environmental Protection
Northwest District
160 Governmental Center, Suite 308
Pensacola, Florida 32502-5794

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Solid Waste Inspection Report

1. **Inspection Report:**

_____Complaint _____Routine _____Follow-up

_____Field Observation __X__Other

Facility/ Owner's Name: Gulf Power-Lansing-Smith Electric Generating Plant

Location: 4300 County Road 2300, Southport, Florida 32409

On-Site Contact and Phone: C. Marie Largilliere(850)522-3490
CMLARGIL@southernco.com

County: Bay

Inspection Date: February 5, 2009

Inspector: Thomas Dillard-FDEP Environmental Specialist

2. **Type of Facility:** Combustion by-product storage area and ash ponds

3. **Narrative:**

On February 5, 2009, an inspection was conducted at the Lansing-Smith Plant in Southport. Those that participated in the inspection included: Susan Kennedy - Gulf Power Environmental Affairs Specialist; Marie Largilliere- Team Leader - Compliance - Gulf Power Lansing-Smith Plant; Mark Sumner -FDEP Industrial Waste Water Environmental Specialist and Thomas Dillard, FDEP Environmental Specialist.

Lansing-Smith utilizes three separate pond structures. One pond for fly ash, one for bottom ash and one pond that receives both pond effluent flows prior to discharge into a common canal leading to a permitted NPDES discharge point.

Ash removed from both ash ponds during annual pond maintenance is deposited in the clay lined combustion by-products storage area. This repository area is designed for three levels of fifteen cells for a total of forty five cells. Each cell is

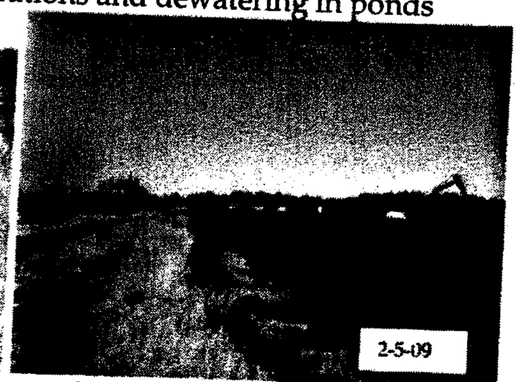
Wet ash dewatering was observed in the immediate area of the ash removal with liquids running back into ash ponds.

The facility has two active drinking water wells but Department personnel say they are well away from plant northward. Drinking water wells are regulated by the Department's Drinking water program.

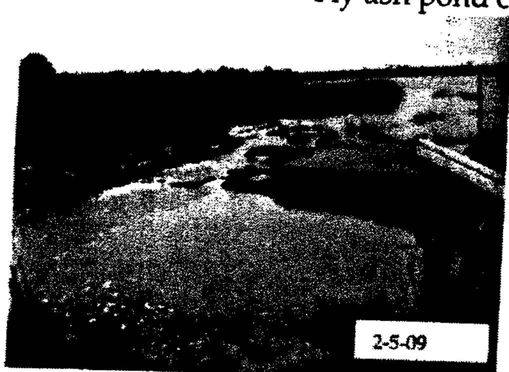
Groundwater monitoring reports are reviewed by Department personnel and they will address any compliance issues associated with those reports.

4. <u>Photos:</u>

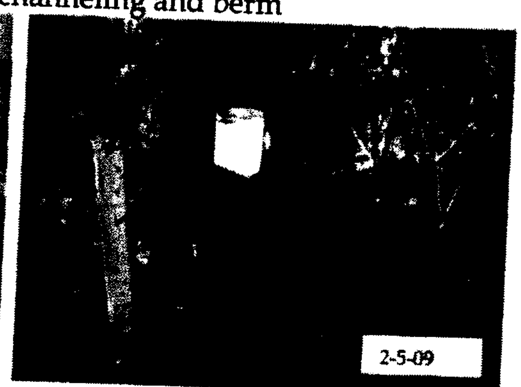
Ash removal maintenance operations and dewatering in ponds



Fly ash pond channeling and berm



South end of fly ash pond



Unsecured Monitoring well

Smith Ash Pond Certification 2000

One Energy Place
Pensacola, Florida 32520

850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 20, 2000

Mr. Michael Hatcher, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, Florida 32399-2400

Dear Mr. Hatcher:

NPDES Permit FL0002267 - 2001 Plant Smith Ash Pond Certification

This letter serves to certify that, as required by Condition I.E.12 (on page 11) of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2000 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Also, as required by Condition I.E.14 (on page 11) of the permit, a physical survey of the ash pond was completed in December 2000 and a bound copy of those calculations is attached. According to the survey, the pond currently has 348,954 cubic yards of available detention volume. After allowing for the total 24 hour wet and dry weather flows going to the pond as well as for the total amount of ash projected to be sent to the pond, there will still be an additional 45,845 cubic yards of detention volume available (see page two of this letter).

If you have any questions or need additional information, please contact Rachel Terry at (850) 444-6127.

Sincerely,

Rachel Terry for Jim Vick

James O. Vick
Manager of Environmental Affairs

Attachments

cc: Harold Keels
Joe Neese
Tracy Reeder-Scully
Rachel Terry
Valerie Wade

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 13, 2001

Mr. Michael Hatcher, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, Florida 32399-2400

Dear Mr. Hatcher:

NPDES Permit FL0002267 - 2002 Plant Smith Ash Pond Certification

This letter serves to certify that, as required by Condition I.E.12 (on page 11) of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2001 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Using the December 2000 ash pond physical survey as the starting point and accounting for all of the ash sent to the pond in 2001 as well as for all of the ash removed from the pond in 2001, attached are the calculations for the present available detention volume. As you will note, currently there is buffer space of 34,049 cubic yards available in the pond beyond the minimum required detention volume.

If you have any questions or need additional information, please contact Rachel Terry at (850) 444-6127.

Sincerely,

Rachel Terry / for Jim Vick

James O. Vick
Manager of Environmental Affairs

Attachments

cc: Mike Sarab
Marie Largilliere
Joe Neese
Rachel Terry

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

2.3.10.1
2002

ENG 10-5-6
Smith Ash
Pond
Certificati
2002 f

GULF POWER
A SOUTHERN COMPANY

December 23, 2002

Mr. Hazim Tamimi, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, Florida 32399-2400

Dear Mr. Tamimi:

NPDES Permit FL0002267, Rev. A - 2003 Plant Smith Ash Pond Certification

This letter serves to certify that, as required by Condition I.E.12 (on page 11) of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2002 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Using data from the December 2000 ash pond physical survey as the starting point and accounting for all ash sluiced to the pond in 2001 and 2002 as well as for all of the ash removed from the pond during that same time period, attached are the calculations for the current available detention volume. As you will note, based on these numbers, there is currently buffer space of 233,517 cubic yards available in the pond beyond the minimum required detention volume.

If you have any questions or need additional information, please contact Rachel Terry at (850) 444-6127.

Sincerely,

Rachel Terry / for Jim Vick

James O. Vick
Manager of Environmental Affairs

Attachments

cc: Mike Sarab
Marie Largilliere
Joe Neese
Rachel Terry

SMITH 2003 ASH POND CERTIFICATION

I	Available Volume based on December 2000 Ash Pond Physical Survey:	348,954 yd^3
II	Total Ash to Pond in 2001: (978,096 tons coal)(6.24% ash)(2000 lbs./ton) (ft^3/80 lbs.)($yd^3/27ft^3$)	56,512 yd^3
III	Total Ash Removed from Pond in 2001:	121,889 yd^3
IV	Total Ash to Pond in 2002: (786,481 tons coal)(6.85% ash)(2000 lbs./ton) (ft3/80 lbs.)(yd3/27ft3) Note: includes an estimate for December 2002	49,883 yd^3
V	Total Ash Removed from Pond in 2002:	174,882 yd^3
VI	Total Detention Volume Required for Certifying Pond in 2003:	
	1. Total Projected Ash to Pond in 2003: (856,550 tons coal)(6.85% ash)(2000 lbs./ton) (ft^3/80 lbs.)($yd^3/27ft^3$) Note: ash content is an estimated average based on 2002 data	54,327 yd^3
	2.Total 24 Hour Wet & Dry Weather Flows to Ash Pond:	251,485 yd^3
		305,812 yd^3
VII	Remaining Detention Buffer Area in Pond	233,517 yd^3

Intracompany Correspondence

2NG 10-5-6
Smith Ash Pon
Certification
2002

GULF POWER
A SOUTHERN COMPANY

Date: December 11, 2002

To: Rachel Terry

From: Marie Largilliere

Subject: 2002 Ash Pond Dike Inspection

This letter is to certify that no breaches or structural defects that resulted in discharges to surface waters of the State occurred in 2002, based on my plant event knowledge and periodic visual inspections.

This letter serves to satisfy conditions outlined under Item B, #12 on page 11 of the Plant Smith NPDES Permit No. FL0002267 Rev.A.

C. Marie Largilliere
C. Marie Largilliere
Team Leader of Compliance
Plant Lansing Smith
Gulf Power Company

ENG 10-5-6
Smith Ash
Pond

Certification
Year 20.

Terry, Rachel Allen

From: Savage, Floyd E.
Sent: Tuesday, December 10, 2002 10:58 AM
To: Terry, Rachel Allen
Subject: RE: Smith Ash Pond

Rachel. My Records Show 121,888.80 For 2001 And 174,881.50 For 2002. Total For Both Is 296,770.30.
Floyd

-----Original Message-----
From: **Terry, Rachel Allen**
Sent: Tuesday, December 10, 2002 10:37 AM
To: Savage, Floyd E.
Subject: Smith Ash Pond
Importance: High

Floyd,

It is time to recertify the Smith ash pond's available storage volumes. Would you please send me the total amount of ash removed from the Smith ash pond in **2001** and how much in **2002**? Are there plans to do any removal in 2003?

The number I submitted for Smith in December 2001 was 46,248 cubic yards removed. But this past August I understand that the actual amount removed in 2001 was 121,888 cubic yards (from an e-mail from Valerie Wade in which she indicated she spoke to you). That being the case, I need to go back and make adjustments to my last year's numbers. Please verify as the bottom line is I want this year's certification to reflect, as accurately as possible, how much storage space is available in the pond.

I apologize for the short time frame but I need this information no later than Dec. 16th in order to get it signed and submitted.

Thanks,
Rachel

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 17, 2003

Mr. Hazim Tamimi, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, Florida 32399-2400

Dear Mr. Tamimi:

NPDES Permit FL0002267, Rev. A - 2004 Plant Smith Ash Pond Certification

This letter serves to certify that, as required by Condition I.E.12 (on page 11) of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2003 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Using data from the December 2000 ash pond physical survey as the starting point and accounting for all ash sluiced to the pond in 2001, 2002, and 2003 as well as for all of the ash removed from the pond during that same time period, attached are the calculations for the current available detention volume. As you will note, based on these numbers, there is currently buffer space of 184,653 cubic yards available in the pond beyond the minimum required for 2004.

If you have any questions or need additional information, please contact Rachel Terry at (850) 444-6127 or Mike Markey at (850) 444-6573.

Sincerely,

James O. Vick

James O. Vick
Manager of Environmental Affairs

Attachments

cc: Johnny Howze
Mike Kyhos
Marie Largilliere
Mike Markey
Rachel Terry

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

Dec, 2004

GULF POWER
A SOUTHERN COMPANY

Mr. Allen Hubbard, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Hubbard:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspection in 2004 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Additionally, as required by Condition I.E.14, this letter serves to certify that the ash pond provides the necessary minimum wet weather detention volume to contain the combined volume for all direct rainfall and all rainfall runoff to the pond resulting from the 10-year, 24-hour rainfall event and maximum dry weather plant waste flows which could occur during a 24-hour period. Using data from an ash pond physical survey conducted in September 2004 and a physical survey of the ash recycle canal conducted in 2001, attached are the calculations for the current available detention volume. Based on these numbers, there is currently buffer space of 22,843 cubic yards available in the pond beyond the minimum required for 2005.

If you have any questions or need additional information, please contact Mike Kyhos at (850) 444-6144.

Sincerely,

James O. Vick
Environmental Affairs Director

Cc: Marie Largilliere
Johnny Howze
Mike Markey
Mike Kyhos

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

05

GULF POWER
A SOUTHERN COMPANY

Mr. Allen Hubbard, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Hubbard:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2005 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

Additionally, as required by Condition I.E.14, this letter serves to certify that the ash pond provides the necessary minimum wet weather detention volume to contain the combined volume for all direct rainfall and all rainfall runoff to the pond resulting from the 10-year, 24-hour rainfall event and maximum dry weather plant waste flows which could occur during a 24-hour period. Using data from an ash pond physical survey conducted in September 2004 and a physical survey of the ash recycle canal conducted in 2001, attached are the calculations for the current available detention volume. Based on these numbers, there is currently buffer space of 18,843 cubic yards available in the pond beyond the minimum required for 2006.

If you have any questions or need additional information, please contact Mike Kyhos at (850) 444-6144.

Sincerely,

James O. Vick
Environmental Affairs Director

Cc: Marie Largilliere
Johnny Howze
Mike Markey
Mike Kyhos

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 20, 2006

Mr. Marc Harris
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Harris:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2006 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

If you have any questions or need additional information, please contact Susan Kennedy at (850) 444-6153.

Sincerely,

James O. Vick
Environmental Affairs Director

One Energy Place
Pensacola, Florida 32520

850.505.5111

GULF POWER
A SOUTHERN COMPANY

December 20, 2007

Mr. Marc Harris
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

CERTIFIED MAIL - #7006 2150 0000 9239 1674

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Harris:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2007 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

If you have any questions or need additional information, please contact Susan Kennedy at (850) 444-6153.

Sincerely,

James O. Vick
Environmental Affairs Director

Cc: Marie Largilliere – Plant Smith
Cedric Estelle – Plant Smith
Mike Markey – Gulf Environmental

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 17, 2008

Mr. Marc Harris
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

CERTIFIED MAIL - #7008 1830 0002 2587 7099

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Harris:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2008 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

If you have any questions or need additional information, please contact Susan Kennedy at (850) 444-6153.

Sincerely,

James O. Vick
Environmental Affairs Director

Cc: Marie Largilliere – Plant Smith
Tim Clark – Plant Smith
Mike Markey – Gulf Environmental

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

December 23, 2009

Mr. Marc Harris
Florida Department of Environmental Protection
2600 Blair Stone Road
Mail Station 3545
Tallahassee, FL 32399-2400

CERTIFIED MAIL - # 7009 1680 0001 7427 5300

Re: Ash Pond Certification for Plant Smith (NPDES Permit FL0002267)

Dear Mr. Harris:

This letter serves to certify that, as required by Condition I.E.13 of the above referenced permit, the Plant Smith ash pond dike and toe areas were periodically inspected in 2009 for structural integrity. There were no breaches or structural defects observed that resulted in a discharge to surface waters of the United States.

If you have any questions or need additional information, please contact Susan Kennedy at (850) 444-6153.

Sincerely,

James O. Vick
Environmental Affairs Director

Cc (electronic): Tim Clark – Plant Smith
Marie Largilliere – Plant Smith
Jora Maxwell – Plant Smith
Roger Danley – Plant Smith
Mike Markey – Gulf Power
Kevin Beaty – Gulf Power