CLECO POWER LLC
DOLET HILLS POWER STATION

ASH BASINS NO. 1 AND NO. 2
MANSFIELD, LA

Demonstration for a Site-Specific Alternative to Initiation of Closure Deadline for the Coal Combustion Residuals Rule

INDEX AND CERTIFICATION

Cleco Power LLC
Dolet Hills Power Station, Mansfield, LA
Ash Basins No. 1 and No. 2
Demonstration for a Site-Specific Alternative to Initiation of Closure Deadline
Project No. 01-20-0221

REPORT INDEX

CERTIFICATION

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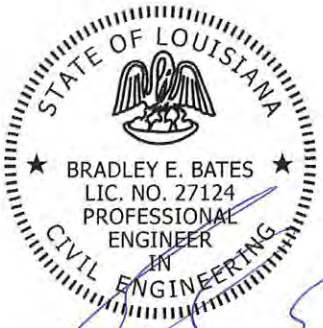

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CHAPTER 1.0

Executive Summary and Introduction

November 30, 2020

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EXECUTIVE SUMMARY

Cleco Power LLC (Cleco) submits this request to the United States Environmental Protection Agency (EPA) for approval of a site-specific alternative deadline to initiate closure pursuant to 40 C.F.R. § 257.103(f)(2)—"Permanent Cessation of a Coal-Fired Boiler(s) by a Date Certain"—for Ash Basins Nos. 1 and 2 (hereinafter referred to as Ash Basins 1 and 2) located at the Dolet Hills Power Station (DHPS) in Mansfield, Louisiana. Ash Basin 1 is 33.18 acres, and Ash Basin 2 is 33.5 acres. Both Ash Basins are used to manage CCR and non-CCR wastestreams.

As this demonstration describes, the DHPS Unit 1 boiler will cease generation of coal-fired energy by no later than October 17, 2023. In the meantime, Ash Basins 1 and 2 must continue to receive CCR and non-CCR wastestreams due to a lack of on-site and off-site alternative disposal capacity.[1] Accordingly, Cleco is requesting approval of an alternative deadline to initiate closure so Ash Basins 1 and 2 may continue to receive CCR and non-CCR wastestreams after April 11, 2021, and complete closure by no later than October 17, 2023.

[1] Note that a CCR landfill is also located onsite. As discussed in Chapter 4.0, this unit is currently in compliance with the CCR rule's requirements. The CCR landfill is not within the scope of this demonstration.

INTRODUCTION

DHPS is located in Mansfield, Louisiana. Currently, DHPS utilizes Ash Basins 1 and 2 to manage CCR and non-CCR wastestreams. The CCR wastestreams are bottom ash and economizer ash, which are wet sluiced to the impoundments. The non-CCR wastestreams are demineralizer and pretreatment drains, demineralizer regeneration waste, pretreatment clarifier blowdown, and several wastewater streams regulated by the facility's LPDES permit.

On August 28, 2020, EPA revised the CCR rule to require all unlined surface impoundments to cease receipt of waste and initiate closure by April 11, 2021.[2] The CCR rule also includes, however, site-specific alternative deadlines for surface impoundments to cease receipt of waste and initiate closure.[3] One of these alternative closure provisions provides a closure extension if a coal-fired boiler(s) at a facility will cease operation by a date certain, but a surface impoundment must continue to be used due the lack of on-site and off-site alternative disposal capacity for CCR and/or non-CCR wastestreams.[4] Surface impoundments that qualify for this extension and are larger than 40 acres must complete closure, and the boiler must cease coal-fired energy production, by October 17, 2028.[5] Qualifying surface impoundments that are 40 acres or smaller must complete closure, and the boiler must cease coal-fired energy production, by October 17, 2023.[6]

DHPS Unit 1 will cease generating coal-fired electricity, and Cleco will complete closure of Ash Basins 1 and 2, by no later than October 17, 2023. Prior to the cessation of coal-fired

2 40 C.F.R. § 257.101(a)(1).
3 *Id.* § 257.103(f).
4 *Id.* § 257.103(f)(2).
5 *Id.* § 257.103(f)(2)(iv)(B).
6 *Id.* § 257.103(f)(2)(iv)(A).

generation, Ash Basins 1 and 2 must continue to receive the CCR and non-CCR wastestreams discussed above given the lack of alternative on-site and off-site disposal capacity. Accordingly, Cleco is requesting a site-specific extension for Ash Basins 1 and 2 to cease receipt and initiate closure and complete closure by no later than October 17, 2023.

In accordance with 40 C.F.R. § 257.103(f)(2)(v), this demonstration includes the following:

1. A narrative explaining the options considered to obtain alternative capacity for CCR and non-CCR wastestreams both on and off-site;[7]
2. A risk management plan describing the measures that will be taken to expedite any required corrective action;[8] and
3. A closure plan required by § 257.102(b) and a narrative that specifies and justifies the date by which Cleco intends to cease receipt of waste into Ash Basins 1 and 2 to meet the closure deadline.[9]

In addition, this demonstration also includes all the information listed in § 257.103(f)(2)(v)(C) to certify and demonstrate that DHPS is in compliance with all other requirements of the CCR rule.[10]

[7] *Id.* § 257.103(f)(2)(v)(A). The purpose of this narrative is to demonstrate the criteria in § 257.103(f)(2)(i) have been met.
[8] *Id.* § 257.103(f)(2)(v)(B).
[9] *Id.* § 257.103(f)(2)(v)(D).
[10] This additional information also addresses the CCR landfill located at DHPS, which is also in compliance with the CCR rule.

CHAPTER 2.0

Documentation of No Alternative Disposal Capacity

November 30, 2020

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DOCUMENTATION OF NO ALTERNATIVE DISPOSAL CAPACITY

1.0 Overview

To qualify for the "Permanent Cessation of a Coal-Fired Boiler(s) by a Date Certain" (Permanent Cessation) alternative closure deadline, owners and operators must demonstrate that they must continue disposing CCR and/or non-CCR wastestreams in a surface impoundment after April 11, 2021 due to the lack of on-site or off-site alternative disposal capacity.[1] The provision is clear that "[i]ncreases in costs or the inconvenience of existing capacity is not sufficient to support qualification under this section."[2] EPA makes it equally clear that owners and operators seeking to qualify for the Permanent Cessation alternative closure deadline are not required to develop alternative disposal capacity given the impending cessation of coal-fired generation.[3] As EPA states, "it would be illogical to require these facilities to construct new capacity to manage CCR and non-CCR wastestreams."[4] This is consistent with EPA's statement in the preamble to the 2015 final CCR rule in which it stated that "the owner or operator does not need to demonstrate any efforts to develop alternative capacity because of the impending closure of the power plant itself."[5]

The following sections (1) describe the CCR and non-CCR wastestreams that are currently disposed in the Dolet Hills Power Station (DHPS) Ash Basins 1 and 2, (2) discuss the options Cleco considered to obtain on-site and off-site alternative disposal capacity for these wastestreams, and (3) explain why these wastestreams must continue to be disposed in Ash Basins 1 and 2 after April 11, 2021.

1 40 C.F.R. § 257.103(f)(2)(i).
2 *Id.*
3 85 Fed. Reg. 53,516, 53,547 (Aug. 28, 2020).
4 *Id.*
5 80 Fed. Reg. 21,302, 21,424 (Apr. 17, 2015).

2.0 Current Disposal of CCR Wastestreams and Non-CCR Wastestreams

Ash Basins 1 and 2 currently receive bottom ash and economizer ash from DHPS Unit 1, both of which are CCR wastestreams. Bottom ash is the ash residue left when lignite fuel is burned in the plant's main boiler. This bottom ash falls to the bottom of the boiler furnace and is collected in the "bottom ash hopper." This wastestream is sent to Ash Basins 1 and 2 via bottom ash sumps and sluice piping. Economizer ash is the residue ash that is carried out of the top of the main boiler furnace by the boiler exhaust flue gas flow. This residue ash is deposited or falls out of the flue gas steam as the gas passes over the economizer section of the main boiler. Economizer ash is collected in hoppers and removed by the "economizer ash system." This wastestream is combined with the bottom ash in the bottom ash hopper and sent to Ash Basins 1 and 2 via the bottom ash sluice pumps and piping .

Ash Basins 1 and 2 also receive demineralizer and pretreatment drains, demineralizer regeneration waste, pretreatment clarifier blowdown, and several wastewater streams regulated by the facility's LPDES permit. These wastestreams, which Cleco characterizes as non-CCR wastestreams, are treated in and discharged through Ash Basins 1 and 2.

3.0 Options Considered for On-Site and/or Off-Site Alternative Disposal Capacity for CCR Wastestreams

Ash Basins 1 and 2 currently receive wet-sluiced bottom ash and economizer ash from DHPS Unit 1. EPA recognized in the preamble to the Part A final rule that "the disposal options for sluiced or wet handled CCR are greatly limited compared to the operations available for dry handled CCR."[6] Cleco considered several alternative disposal options for this wastestream. Consistent with EPA's statement, however, none of these options are viable. Additionally, since

[6] 85 Fed. Reg. at 54,541.

Unit 1 will cease coal-fired energy production by a date certain, the CCR rule does not require Cleco to create alternative disposal capacity for these wastestreams.[7]

Cleco considered disposing the bottom ash and economizer ash sluice in the onsite CCR landfill.[8] However, because free liquids cannot be placed in the CCR landfill, the bottom ash and economizer ash sluice stream must first be treated in Ash Basins 1 and 2 for removal of free water before ultimately being transferred to the CCR landfill. Therefore, utilizing the landfill as alternative disposal capacity is not a viable option.

Cleco also considered disposing the bottom ash and economizer ash in other on-site impoundments or other on-site tanks. However, there are no tanks or other impoundments available to receive these wastestreams. DHPS's piping network and sluicing infrastructure does not allow for wastestreams to pump anywhere (on-site or off-site) other than Ash Basins 1 and 2. Additionally, the other impoundments at DHPS are neither (1) permitted by the Louisiana Department of Environmental Quality (LDEQ) to receive bottom ash and economizer ash, nor (2) compliant with the CCR rule's liner requirements. Table 1 below provides specific information for why these other onsite impoundments are not viable options for alternative disposal capacity for the CCR wastestreams.

[7] *See id.* at 53,547 ("Since the coal-fired boiler will shortly cease power generation, it would be illogical to require these facilities to construct new capacity to manage CCR and non-CCR wastestreams."); *see also* 80 Fed. Reg. at 21,424 ("[T]he owner or operator does not need to demonstrate any efforts to develop alternative capacity because of the impending closure of the power plant itself.").

[8] As described in Chapter 4.0 of this demonstration, the CCR landfill is currently in compliance with the CCR rule's requirements.

Table 1

Impoundment	**Why Impoundment Is Not Option For Alternative Disposal Capacity**
Secondary Ash Pond	• Does not have liner that meets CCR rule requirements. • Intended to be used for water treatment only. • Not intended to be used for disposal. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021.
Landfill Runoff Pond/Landfill Surface Impoundment	• Does not have liner that meets CCR rule requirements. • Designed to receive stormwater runoff from the landfill and leachate from the landfill's leachate collection system and was not engineered to receive additional capacity. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021.
Secondary Surge Pond	• Does not have liner that meets CCR rule requirements. • Was not designed for permanent disposal of solid waste. • Intended for FGD wastewater. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021. • Pond is not designed to be discharged frequently. o No discharge structures are present. Portable pumps are used in the event of a discharge.
Primary Surge Pond	• Does not have liner that meets CCR rule requirements. • Intended for FGD wastewater. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021. • Pond is not designed to be discharged frequently. o No discharge structures are present. Portable pumps are used in the event of a discharge.

Auxiliary Surge Pond	• Does not have liner that meets CCR rule requirements. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021. • Pond is not designed to be discharged frequently. o No discharge structures are present. Portable pumps are used in the event of a discharge.
Metal Cleaning Waste Pond	• Does not have liner that meets CCR rule requirements. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021. • Pond is not designed to be discharged frequently. o No discharge structures are present. Portable pumps are used in the event of a discharge.
Plant Discharge Collection Pond	• Does not have liner that meets CCR rule requirements. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021.
Lignite Pile Runoff Basin	• Does not have liner that meets CCR rule requirements. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021. • Designed to receive stormwater runoff from the lignite storage pile and was not engineered to receive additional capacity.
Limestone Area Runoff Pond	• Does not have liner that meets CCR rule requirements. • Not engineered as a solid waste disposal impoundment. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021.

Makeup Water Pond	• Does not have liner that meets CCR rule requirements. • Not engineered as a solid waste disposal impoundment. • Stores makeup water supply for DHPS. Disposal of CCR and non-CCR wastestreams would be counterproductive to the purpose of the pond. This would increase water treatment necessary to use the water for cooling water, boiler water, etc., which would pose the issue of where to dispose of the material being settled out of the water prior to use in the plant. • LPDES permit modifications would be required, which is not feasible by April 11, 2021. • LDEQ solid waste permit modifications would be required, which is not feasible by April 11, 2021.

Cleco also considered utilizing temporary storage tanks as an option for alternative disposal capacity. However, the volume of bottom ash sluice flow—approximately 1.8 million gallons per day (MGD)—is too large for this to be a viable option. In addition, tanks currently located at DHPS lack the needed storage capacity and infrastructure for removal of accumulated solids. In light of these factors, disposing the bottom ash and economizer ash from Unit 1 in other impoundments or tanks is not a viable option.

Cleco also considered transporting the bottom ash and economizer ash off-site via trucks and/or pipelines. EPA recognized the infeasibility of this option in the preamble to the final CCR rule, when it stated that "while it is possible to transport dry ash off-site to [an] alternate disposal facility[,] that is simply not feasible for wet-generated CCR."[9] EPA further recognized that facilities cannot "immediately convert to dry handling systems."[10]

For trucking, the volume of bottom ash and economizer ash sluice flow—approximately 1.8 MGD—is too large for trucking to be a viable option. Additionally, there are no facilities within a reasonable distance from DHPS that is able to accept the CCR wastestreams. Further,

[9] 80 Fed. Reg. at 21,423.
[10] *Id.*

such a project would require a significant number of trucks per day, which would cause substantial stress to road infrastructure and would also result in increased risk and liability. There is also no existing infrastructure onsite that is needed for loading tankers.

With respect to the piping option, DHPS Unit 1's piping network and sluicing infrastructure does not allow for bottom ash and economizer ash to be transported off-site. And since DHPS Unit 1 will cease coal-fired energy generation in the near future, it would be "illogical" for Cleco to create new capacity to manage these wastestreams.[11] As EPA stated in the final CCR rule, an owner or operator of such units "does not need to demonstrate any efforts to develop alternative capacity because of the impending closure of the power plant itself."[12]

Despite Cleco's efforts to obtain on-site and off-site alternative disposal capacity for the bottom ash and economizer ash that is currently wet-sluiced in Ash Basins 1 and 2, no other options are currently available. Additionally, since Unit 1 will cease coal-fired energy generation in the near future, it would be "illogical" for Cleco to create new capacity to manage these wastestreams.[13] As a result, Cleco must continue to dispose this wastestream in Ash Basins 1 and 2 after April 11, 2021.

4.0 Options Considered for On-Site and/or Off-Site Alternative Disposal Capacity for Non-CCR Wastestreams

Ash Basins 1 and 2 also receive demineralizer and pretreatment drains, demineralizer regeneration waste, pretreatment clarifier blowdown, and several wastewater streams regulated by the facility's LPDES permit. These wastewater flows are directed to the bottom ash sump and sent to Ash Basins 1 and 2 for treatment and discharge.

[11] 85 Fed. Reg. at 53,547.
[12] 80 Fed. Reg. at 21,424.
[13] 85 Fed. Reg. at 53,547.

Cleco considered disposing these non-CCR wastestreams in tanks or other impoundments. However, there are no tanks or other impoundments available to receive and treat them, since the piping that would be required to divert these wastestreams to other impoundments does not exist. In addition, the other on-site impoundments are not able to treat these non-CCR wastestreams due to the lack of a process in place for removing settled materials and the lack of sufficient storage capacity. Further, even if there were other on-site impoundments that could receive these wastestreams, as reflected in Table 1, state permit modifications would be necessary to allow the non-CCR wastestreams to be sent to other impoundments.

With respect to tanks, there are currently no tanks on-site that could be used for storing these wastestreams. Cleco also considered utilizing temporary storage tanks as an option for alternative disposal capacity. However, the significant volume of the non-CCR wastestreams—288,000 gallons per day—is too large for this to be a viable option. In light of these factors, disposing these non-CCR wastestreams in other impoundments or tanks at DHPS is not a viable option.

Cleco also considered transporting these non-CCR wastestreams off-site via trucking and/or piping. For trucking, the significant volume of the non-CCR wastestreams—288,000 gallons per day—is too large for this to be a viable option. Additionally, there are no facilities within a reasonable distance from DHPS that is able to accept the non-CCR wastestreams. Further, such a project would require a significant number of trucks per day, which would cause substantial stress to road infrastructure and would also result in increased risk and liability. There is also no existing infrastructure onsite that is needed for loading tankers.

With respect to the piping option, DHPS Unit 1's piping network and sluicing infrastructure does not allow for the non-CCR wastestreams to be transported off-site. And since

DHPS Unit 1 will cease coal-fired energy generation in the near future, it would be "illogical" for Cleco to create new capacity to manage these non-CCR wastestreams.[14] As EPA stated in the final CCR rule, an owner or operator of such units "does not need to demonstrate any efforts to develop alternative capacity because of the impending closure of the power plant itself."[15]

Despite Cleco's efforts to obtain on-site and off-site alternative disposal capacity for the non-CCR wastestreams that are currently disposed in Ash Basins 1 and 2, no other options are currently available. Additionally, since Unit 1 will cease coal-fired energy generation in the near future, it would be "illogical" for Cleco to create new capacity to manage the non-CCR wastestreams.[16] As a result, Cleco must continue to dispose these non-CCR wastestreams in Ash Basins 1 and 2 after April 11, 2021.

[14] 85 Fed. Reg. at 53,547.
[15] 80 Fed. Reg. at 21,424.
[16] 85 Fed. Reg. at 53,547.

CHAPTER 3.0

Risk Mitigation Plan

November 30, 2020

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Appendices

1.0 INTRODUCTION

The United States Environmental Protection Agency's (EPA) Coal Combustion Residuals (CCR) Rule includes two site-specific alternative deadlines for owners and operators to initiate closure of their CCR surface impoundments.[1] One of these alternative closure deadlines allows qualifying CCR surface impoundments to continue receiving CCR and/or non-CCR wastestreams if the owner or operator permanently ceases operation of a coal-fired boiler(s) and completely close said impoundment(s) by a date certain.[2]

To qualify for the "permanent cessation of a coal-fired boiler(s)" alternative closure deadline, the CCR Rule requires owners and operators to develop risk mitigation plans.[3] The purpose of these risk mitigation plans is to demonstrate that "[p]otential risks to human health and the environment from the continued operation of the CCR surface impoundment have been adequately mitigated."[4]

Pursuant to this requirement, Cleco Power LLC (Cleco) has developed this Risk Mitigation Plan (Plan) for Ash Basin No. 1 and No. 2 (Ash Basins 1 and 2) at the Dolet Hills Power Station (DHPS) (**Figure A-1, Appendix A**). In accordance with 40 C.F.R. § 257.103(f)(2)(v)(B)(1)–(3), this Plan describes the measures Cleco will take to expedite any required corrective action and includes the following elements:

- A discussion of any physical or chemical measures a facility can take to limit any future releases to groundwater during operation;
- A discussion of the surface impoundments' groundwater monitoring data and any found exceedances; the delineation of the plume (if necessary based on the groundwater monitoring data); identification of any nearby receptors that might be exposed to current or future groundwater contamination; and how such exposures could be promptly mitigated; and
- A plan to expedite and maintain the containment of any contaminant plume that is either present or identified during continued operation of the unit.

2.0 FACILITY INFORMATION

DHPS is a 650 MW facility located at 963 Power Plant Road, Mansfield, Louisiana 71052. The surface impoundments in service at DHPS are Ash Basins 1 and 2. Ash Basin 1 is approximately 33.18 acres, and Ash Basin 2 is approximately 33.5 acres. Ash Basins 1 and 2 are roughly contiguous to each other, separated by the non-CCR unit Secondary Pond (**Figure A-2 in Appendix A**). The Louisiana Department of Environmental Quality (LDEQ) Waste Permits Division has permitted Ash Basins 1 and 2 to operate pursuant to Permit No. P-0037.

1 40 C.F.R. § 257.103(f).
2 *Id.* § 257.103(f)(2).
3 *Id.* § 257.103(f)(2)(v)(B).
4 *Id.* § 257.103(f)(2)(ii).

The wastestreams disposed in Ash Basins 1 and 2 are on-site generated wastes only. Primary inflow to the impoundments is bottom-ash-laden sluice water from the DHPS ash handling system. Thus, the primary solid waste collected in the impoundments is settled ash particles.

Two types of ash are disposed in Ash Basins 1 and 2: bottom ash and economizer ash. Bottom ash is the ash residue left when the lignite fuel is burned in the plant's main boiler. This residue ash, or bottom ash, falls to the bottom of the boiler furnace and is collected in the "bottom ash hopper." Economizer ash is a residue ash that is carried out of the top of the main boiler furnace by the boiler exhaust flue gas flow. This residue ash is deposited or falls out of the flue gas steam as the gas passes over the economizer section of the main boiler. Economizer ash is combined with the bottom ash in the bottom ash hopper and sent to Ash Basins 1 and 2 via the bottom ash sluice pumps and piping.

Other inflows include water purification flush effluent from the chemical sump and several wastewater streams regulated by the facility's LPDES permit.

3.0 MEASURES TO LIMIT ANY FUTURE RELEASES TO GROUNDWATER—40 C.F.R § 257.103(f)(2)(v)(B)(1)

The CCR rule requires the Plan to include a discussion of "any physical or chemical measures a facility can take to limit any future releases to groundwater during operation."[5] To date, groundwater monitoring conducted at DHPS has not detected any releases to groundwater from Ash Basins 1 and 2. Cleco prioritizes the safety and protection of the community and the environment and its continued compliance with EPA and LDEQ regulations for the operation of Ash Basins 1 and 2 since their construction demonstrates this commitment.

Review of the groundwater monitoring program for Ash Basins 1 and 2 indicates that implementation of assessment monitoring or implementation of corrective action measures to address groundwater quality for the units have not been required. The Ash Basins 1 and 2 groundwater monitoring programs are separate and not a multi-unit groundwater monitoring program. These units comply with the CCR rule, as well as requirements of their LDEQ-issued solid waste permit.

The LDEQ Waste Permits Division oversees permitting of solid waste facilities and the LDEQ-approved solid waste permit also includes measures to construct and operate units in a manner which safeguards against adversely impacting groundwater quality. The measures to continue to limit any future releases to groundwater include continuation of the state and federal groundwater monitoring programs in place and continued adherence to the EPA CCR Rule and LDEQ-approved solid waste permit. Additional actions that limit future releases beyond continued routine groundwater monitoring include application of non-recirculated, once-through water for sluicing of ash to the impoundment which minimizes concentration of solids in the impoundment water. Also there are the impoundment operational measures, integrity inspections of the physical status of the impoundments' perimeter levees, maintenance of vegetation growth on the perimeter levees, adequate freeboard protection,

[5] 40 C.F.R. § 257.103(f)(2)(v)(B)(1).

stormwater controls, routine removal of settled materials, facility security measures, and emergency response plan measures.

The emergency response plan which is included in the LDEQ-approved solid waste permit, is an organized, planned, coordinated set of procedures that are followed in the event of a fire, explosion, natural disaster, or discharge or release of chemical substances into the environment that could endanger human health or the environment.[6] The emergency response plan is also reviewed and approved by the Louisiana Office of State Fire Marshal prior to LDEQ issuance of the solid waste permit. A website link for this document is provided here. The emergency response plan includes:

- Fire Response Plan - Includes steps employees are to take after discovery of a fire.
- Fire Response Equipment On-site - Listing of fire response equipment on site Locations of fire extinguishers throughout the plant
- Chemical/Toxic Gas Release Response Plan - Provides the guidelines for responding to an event including items such as assessment of the situation, assignment of personnel for stopping the release, if possible, and initiating action to limit the impact of the release.
- Tornado Response Plan - This includes actions to take during times of inclement weather to mitigate potential damage to the plant.
- Bomb Threat Response Plan - Provides guidelines for assessment of a bomb threat situation and making an immediate action decision.
- First Aid/Medical Emergencies.
- Physical Plant Security - Contains visitor guidelines, use of ID badges, locking and securing of facilities.
- Contact Information for External Emergency, Cleco, and BEC Internal – Includes listing of management staff to be notified of events and to be involved in a response.
- Spill Response contacts - Includes agency contacts.
- Spill Control and Decontamination Equipment On-Site – Includes a listing of spill control and decontamination equipment on site locations of equipment such as pads, pigs, and shovels.

4.0 GROUNDWATER IMPACTS, RECEPTORS, AND POTENTIAL EXPOSURE MITIGATION— 40 C.F.R. § 257.101(f)(2)(v)(B)(2)

The CCR rule requires the Plan to include a "discussion of the surface impoundment's groundwater monitoring data and any found exceedances; the delineation of the plume (if necessary based on the groundwater monitoring data); identification of any nearby receptors that might be exposed to current or future groundwater contamination; and how such exposures could be promptly mitigated."[7] To satisfy this requirement, the following sections discuss (1) the Ash Basin 1 and 2 groundwater monitoring well networks, (2) the most recent groundwater monitoring data, (3) nearby receptors, and (4) how potential groundwater impacts to nearby receptors could be promptly mitigated.

6 Louisiana Administrative Code (LAC) 33:VII. Solid Waste.

7 40 C.F.R. § 257.103(f)(2)(v)(B)(2).

4.1 GROUNDWATER MONITORING WELL NETWORK

Pursuant to 40 C.F.R. § 257.91, DHPS has groundwater monitoring well systems to evaluate the groundwater quality conditions near Ash Basins 1 and 2. The separate groundwater monitoring systems consist of newly installed monitoring wells plus monitoring wells installed 30 plus years ago to conduct groundwater monitoring required by DHPS's LDEQ solid waste permits. In total, the monitoring well networks include twelve monitoring wells, all of which are located in the uppermost water bearing zone beneath Ash Basins 1 and 2 (Zone 4).

Additional information about the monitoring well network is included in the October 17, 2017 Groundwater Certification Report, which is included as **Appendix B** and is also available here. The Report includes a map showing the well locations (Appendix A, Figure A-2), a table of monitoring well construction details (Appendix B, Table 1), and well construction diagrams and drilling logs.

4.2 GROUNDWATER MONITORING AND EVALUATION—40 C.F.R § 257.103(f)(2)(v)(B)(2)

Groundwater sampling events are conducted by Cleco-approved contract personnel in accordance with 40 C.F.R. § 257.93. Semi-annual detection monitoring sampling events are typically conducted in June and October. The most recent annual groundwater report was posted on January 31, 2019. This report is included in **Appendix C** and is also available here. To date, groundwater monitoring for Ash Basins 1 and 2 has not detected evidence of any releases to groundwater.

4.2.1 Field Methods

Field methods for groundwater sampling follow industry protocol and are detailed in the annual report.

4.2.2 Analytical Results

Groundwater samples are collected from the monitoring wells at Ash Basins 1 and 2 for analysis of the CCR rule detection monitoring parameters: pH, boron, calcium, chloride, fluoride, sulfate, and total dissolved solids (TDS). The analyses are performed in accordance with EPA-approved analytical methods. These results are included in the annual report.

4.2.3 Statistical Evaluation

Statistical evaluations of groundwater data are performed in accordance with 40 C.F.R. § 257.93(f). The Certification of Statistical Methodology was posted on October 17, 2017. A copy of this Certification is included as **Appendix D** and is also available here. Several detection monitoring parameters exhibit sufficient variation over time to warrant performing statistical evaluations using intrawell limit-based

tests. Intrawell tests are comparisons of data within the same well[8] that use intrawell prediction limits. Intrawell limit-based tests are recommended when there is evidence of natural spatial variability in groundwater quality, particularly among unimpacted upgradient wells.

4.2.4 Groundwater Monitoring Conclusions

Cleco has conducted sufficient detection monitoring sampling events in accordance with 40 C.F.R. §§ 257.93 and .94. Potentiometric surface evaluation for both Ash Basins 1 and 2 indicates consistent groundwater flow to the west. Statistical evaluations of data conducted pursuant to 40 C.F.R. § 257.93 indicate that no confirmed statistically significant increases (SSIs) over background levels of appendix III constituents have been generated in downgradient wells.

4.3 RECEPTORS

Water supply in DeSoto Parish is predominantly from surface water, with considerably less contribution from groundwater. The estimated 2010 water usage in DeSoto parish was 4.65 million gallons per day (MGD) from groundwater and 31.89 MGD from surface water.[9] Industrial use is the largest consumer of both water supply sources. Toledo Bend Reservoir, which supplies the water for power generation at DHPS, is the primary source of water supply in DeSoto parish. As shown in Appendix E, Figure E-1, there are no industrial, power generation, domestic, or public supply water wells within a 1-mile radius of Ash Basins 1 and 2.

4.3.1 Groundwater Use

The current and potential use of groundwater resources in the vicinity of DHPS were evaluated by querying the Louisiana Department of Natural Resources (LDNR) SONRIS registered water well data base. All registered water wells identified within a one-mile and a two-mile radius of DHPS are included in **Figure E-1, Appendix E.**

A total of 182 LDNR registered water wells were identified within a 15,000-feet (greater than two-mile) radius of Ash Basins 1 and 2. Usage descriptions of water wells identified in the LDNR data base search are as follows:

- 4 domestic water wells (all greater than 1 mile; within a 1-mile to 2-mile radius distance away);
- 0 public supply water wells;
- 0 industrial water wells;

[8] U.S. EPA, 2009. "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, March 2009," EPA 530/R-09-007, EPA Office of Resource Conservation and Recovery.

[9] Prakken, L.B. and V.E. White, Water Resources of DeSoto Parish, Fact Sheet 2013-3107, United States Geological Survey in cooperation with the Louisiana Department of Transportation and Development (2014).

- 0 irrigation water wells;
- 0 recovery water wells;
- 0 rig supply wells (2 wells were never completed and were plugged and abandoned);
- 66 dewatering water wells (associated with Dolet Hills Lignite Company); and
- 99 monitoring/observation/piezometer wells (primarily associated with either DHPS or DeSoto Parish Police Jury Mundy Landfill).

Seventy-three of these wells are registered as plugged and abandoned, and 14 are registered as excavated.

There are no domestic water wells within a 1-mile radius of DHPS. No registered public supply, industrial and/or irrigation water wells were identified within a two-mile radius of DHPS.

There are no completed rig supply water wells within 15,000 feet of Ash Basins 1 and 2. The water well locations map (**Figure E-1, Appendix E**) shows numerous oil and gas drilling locations near DHPS. These are distinguished by their regular square footprints with gravel/rock surfaces. These drilling sites were active recently during the Hayneville Shale development in DeSoto Parish. Normal operational procedures for oil and gas exploration include the addition of a rig supply well at the drilling location to supply water for personnel and for drilling activities. Pipelines have routed water to each drilling location during past and recent exploration activities in the area. These observations further indicate that shallow water bearing units in this area have insufficient yield to provide adequate water supply.

4.3.2 Industrial Water Use at DHPS

As listed above, there were no registered industrial or rig supply wells within a one-mile radius of Ash Basins 1 and 2. DHPS obtains water for its operations from surface water via pipeline from Toledo Bend Reservoir, located west of DHPS. Water is routed to the Makeup Pond located west of DHPS and then transferred via pipeline to operational areas of DHPS. Water is discharged via pipeline to the Red River, located east of the power station. The locations of the pipelines are shown in **Figures E-2, Appendix E**. The absence of water supply at DHPS from a groundwater source required the utilization of surface water resources from Toledo Bend Reservoir.

4.3.3 Surface Water at DHPS

The nearest surface water body is Mundy Bayou, located west of DHPS. Mundy Bayou is included in Subsegment 100606 of "*Bayou Pierre—From Rolling Lake Bayou to Red River*". This subsegment covers a large area and has the following

designated uses:

- Primary contact recreation,
- Secondary contact recreation,
- Drinking water supply,
- Agriculture, and
- Fish and wildlife propagation.[10]

The groundwater flow direction in the upper water-bearing zone determines the pathway for potential releases from the ash basins to potential surface water receptors of a potential release to groundwater. However, the upper water-bearing zone is discontinuous and provides no hydraulic connection between Ash Basins 1 and 2 and downgradient areas, thus eliminating any potential exposure pathway between a potential release from the ash basins to down-gradient potential water well receptors.

Stormwater discharge and potential groundwater seepage to surface water downgradient of Ash Basins 1 and 2 is monitored by Final Outfall 002, under LPDES Permit No. LA0062600 and by stormwater Outfall 014 under LPDES Multi-sector General Permit LAR05N188. Cleco maintains compliance with these permits, thus safeguarding the water quality of the receiving water body, Mundy Bayou.

4.4 MITIGATION OF POTENTIAL IMPACT TO NEARBY RECEPTORS

Cleco has strategically positioned the LDEQ-approved ash basins monitoring well network and the LPDES-related surface water outfalls to detect potential releases from the facility prior to potential impacting any potential receptors, including Mundy Bayou. Future potential impacts may be addressed by groundwater mitigation measures that include groundwater withdrawal or immobilization technologies, such as permeable reactive barriers (PRB) and/or groundwater cutoff walls. These measures are discussed in detail in the following section.

5.0 CONTAINMENT OF CONTAMINANT PLUME—40 C.F.R § 257.103(f)(2)(v)(B)(3)

As part of the Plan, the CCR rule requires the inclusion of a "plan to expedite and maintain the containment of any contaminant plume that is either present or identified during the continued operation of the unit."[11] The "purpose of this plan is to demonstrate that a plume can be fully contained and to define how this could be accomplished in the most accelerated timeframe feasible to prevent further spread and eliminate any potential for exposures."[12] According to EPA, this "plan will be based on relevant site data, which may include groundwater chemistry, the variability of local hydrogeology, groundwater elevation and

10 LAC 33:IX. Water Quality.

11 40 C.F.R. § 257.103(f)(2)(v)(B)(3).

12 85 Fed. Reg. 53,516, 53,549 (Sept. 28, 2020).

flow rates, and the presence of any surface water features that would influence rate and direction of contamination movement"[13]

Ash Basins 1 and 2 are currently subject to the CCR rule's detection monitoring program.[14] As discussed above, groundwater quality data has not identified any SSIs over background levels for any appendix III constituents. Therefore, neither assessment monitoring nor corrective measures are currently warranted for Ash Basins 1 and 2.[15]

Although Cleco has not to date identified a contaminant plume associated with Ash Basins 1 and 2, Cleco must have a plan in place to expedite and contain any plume that may be identified during the continued operation of Ash Basins 1 and 2. A remedy would ultimately be selected through the assessment of corrective measures process. This selection would be based on a number of factors, including the specific constituents of concern, plume migration characteristics, and a plume stability analysis.

Selecting short-term measures to expeditiously contain any future containment plume would be a fact- and constituent-specific process. There are several options that would likely be considered. While this list is not exclusive, these options include:

- Groundwater Withdrawal;
- Permeable Reactive Barrier; and
- Groundwater Cutoff Wall.

Additionally, Monitored Natural Attenuation is included in this discussion as an important adjunct remedial measure to be applied during or after one of the selected short-term measures listed above to address any recalcitrant groundwater quality impacts that the primary remedy cannot efficiently mitigate.

The following sections discuss these strategies in further detail.

5.1 Groundwater Withdrawal

Groundwater withdrawal as a potential corrective measure includes the extraction of impacted groundwater by either a series of groundwater pumping wells, horizontal wells, or trenches. These are used to hydraulically control and remove impacted groundwater and thus limit plume expansion and/or off-site migration.

The installation of a groundwater withdrawal system normally includes the following key actions:

- Selection and installation of groundwater withdrawal system consisting of vertical recovery well(s), horizontal well(s), or trench(es);

13 *Id.*
14 40 C.F.R. § 257.94.
15 *See id.* § 257.94–.98.

- Determination of horizontal and vertical plume containment and determination of pumping rates necessary to allow capture of CCR impacted groundwater;
- Treatment system designed to manage extracted groundwater, which may include modification to the existing Louisiana Pollutant Discharge Elimination System (LPDES) permit, including treatment prior to discharge, if necessary; and
- Operation and maintenance (O&M) of the selected withdrawal and treatment system.

The first step in designing a groundwater withdrawal is to refine the hydrogeologic Conceptual Site Model (CSM) with the necessary hydrogeologic detail to specify well spacing, screen placement, screen length, pumping rates and operational pressures. This may require one or more of the following:

- Pumping tests to determine zone of influence, storativity, and hydraulic conductivity in orthogonal directions, and to calculate horizontal anisotropy;
- Slug tests at distributed locations to establish degree of heterogeneity;
- Vertical pumping tests to measure vertical hydraulic conductivity and calculate vertical anisotropy;
- Laboratory permeability tests of low permeability units to measure vertical anisotropy within aquitards;
- Numerical groundwater flow modeling to facilitate evaluation of pumping tests and optimize placement of groundwater withdrawal wells; and/or
- Numerical groundwater fate and transport modeling to predict effectiveness of plume capture, rates of plume degradation, and changes in concentration of contaminants of concern (COCs) in extracted groundwater over time

The evaluation outlined above will indicate the optimal combination of vertical and/or horizontal wells, their completion specifications, and groundwater treatment system requirements. The evaluation will also provide guidance on the long-term or short-term advantages, disadvantages, costs (including installation and O&M costs), and viability of the groundwater withdrawal system.

5.2 Permeable Reactive Barrier (PRB)

Permeable Reactive Barrier (PRB) is an *in situ* chemical treatment or immobilization technology that includes application of reactive or immobilizing agents, either by emplacement in subsurface trenches or injected through temporary wells. The trench or injected zone creates a barrier designed to intercept the contaminant plume, provide adequate flow paths providing sufficient residence time in contact with reactive media, and immobilize the contaminant(s) or transform them into environmentally acceptable chemical species to attain

remediation concentration goals downgradient of the barrier.[16]

To be effective, PRB technology must be specifically designed to address:

- Geochemical properties of groundwater, including oxidation-reduction potential, dissolved oxygen, pH, fraction of organic carbon, and ionic species relevant to the desired transformation or immobilization of contaminants; and
- Hydrogeologic parameters controlling groundwater flow lines and average linear velocity of groundwater within and around the PRB under the expected range of hydrogeologic conditions, including changes in water table elevation and in both horizontal and vertical hydraulic gradients.

PRB design must be tailored to site conditions, and its effectiveness will vary depending on site hydrogeology and geochemistry. The purpose of a PRB is to prevent downgradient expansion of a groundwater plume. Reactive media are available to address a variety of dissolved metal groundwater plumes. Zero-valent iron has been shown to effectively immobilize CCR constituents, including arsenic, chromium, cobalt, molybdenum, selenium and sulfate, but it has not been proven effective for boron, antimony, or lithium.[17]

Two general configurations of PRBs have been designed and successfully applied in specific hydrogeologic settings:

- Continuous PRBs extend across the entire width of the contaminant plume and are not intended to change the direction of groundwater flow. Some degree of hydraulic mounding upgradient of the PRB is typically expected in response to decreased groundwater flow velocity within the PRB. The width of the PRB remains constant assuming constant groundwater flow velocity across the width of the plume, but the depth (or height) of the PRB can vary if it is designed to key into an aquitard unit underlying the impacted water-bearing unit. The purpose of keying into an aquitard unit is to prevent the plume from vertically evading the PRB.
- Funnel-and-gate PRBs utilize barrier cut-off walls constructed at opposing angles to the groundwater flow direction to funnel the contaminant plume toward a relatively short PRB gate, flanked by the funnel barrier walls. Some funnel-and-gate systems have several PRB gates separated by funnel barrier walls. The funnel-and-gate design increases groundwater flow velocity, and the thickness of the PRB must ensure sufficient residence time. The length of the PRB must prevent horizontal short-circuiting of the

16 Electric Power Research Institute (EPRI), 2006. Groundwater Remediation of Inorganic Constituents at Coal Combustion Product Management Sites, Overview of Technologies, Focusing on Permeable Reactive Barriers, Electric Power Research Institute, Palo Alto, CA, Final Report 1012584, October 2006.

17 *Id.*

groundwater plume. The purpose of the funnel-and-gate design is to minimize opportunities for the groundwater plume to evade the PRB either horizontally or vertically.

Site access, plume dimensions and plume chemistry affect the system configurations for PRBs, and therefore the design of PRB systems requires detailed aquifer and groundwater plume investigations as noted above. In addition, laboratory studies, including batch studies and column studies using samples of site groundwater and matrix soil, are needed to determine the effectiveness of the selected reactive media at the site.[18]

5.3 Groundwater Cutoff Wall

The use of cutoff walls alone, without a PRB component, is another corrective measure that has often been used in attempts to control and/or isolate impacted groundwater. Cutoff walls are trenched and consist of lower permeability materials compared to the water-bearing unit to prevent or limit horizontal and vertical migration of potentially impacted groundwater. The slurry trench method requires excavating a trench and backfilling it with a soil-bentonite mixture. Soils excavated while trenching are often utilized in the mixing process. The trench is temporarily supported with bentonite slurry that is pumped into the trench as it is excavated. Excavation for cutoff walls is conducted with conventional hydraulic excavators, hydraulic excavators equipped with specialized booms to extend their reach (*i.e.*, long-stick excavators), or chisels and clamshells, depending upon the depth of the trench and the material to be excavated.

The technical feasibility of a cutoff wall depends on:

- The presence of an effective aquiclude, or low permeability lower confining unit, to provide a hydraulic seal preventing vertical migration.
- Hydrogeologic characteristics that will prevent the contaminant plume from laterally evading the cutoff wall.

5.4 Monitored Natural Attenuation (MNA)

Monitored Natural Attenuation (MNA) will be evaluated with detailed hydrogeological and geochemical analysis as a potential remedial option. If implemented, it is anticipated that it would include source control measures, through application of the USEPA's tiered approach to MNA:[19]

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18 *Id.*

19 USEPA, Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. Directive No. 9200.0-17P. Washington, D.C.: EPA, Office of Solid Waste and Emergency Response (1999); USEPA, Monitored Natural Attenuation of Inorganic Contaminants in Ground Water, Volume 1 — Technical Basis for Assessment. EPA/600/R-07/139. National Risk Management Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio (Oct. 2007); USEPA, Use of

- Demonstrate that the area of groundwater impacts is not expanding;
- Evaluate mechanisms and rates of attenuation;
- Evaluate aquifer potential to attenuate the mass of constituents in groundwater and that the immobilized constituents are stable and will not desorb and remobilize;
- Implement/augment the current monitoring program based on the mechanisms of attenuation; and
- Establish contingency path forward with corrective measure remedies in the event MNA not perform adequately.

5.5 Expedited Mitigation Path

An estimated timeline for expedited mitigation of a potential release to groundwater from Ash Basin 1 and/or 2 has been developed based on current hydrogeologic characterization, review of potential receptors, and mitigation alternatives. Cleco's groundwater monitoring well network is positioned to detect any potential release from Ash Basins 1 and 2 and site hydrogeologic characterization indicates that groundwater withdrawal is a leading potential corrective measure that can be implemented expeditiously.

The current Conceptual Site Model (CSM) of the site hydrogeology was developed to establish a groundwater monitoring program for the unit. The CSM will be reviewed and refined to allow for transition from a groundwater quality monitoring phase to a potential corrective action phase. This may include CSM refinement activities to further understand heterogeneity and anisotropy in three dimensions, in support of remedial alternatives evaluation and corrective measure design, including:

- Additional aquifer testing, including pumping test(s) and slug tests,
- Higher horizontal and vertical resolution of geological and chemical data, and
- Numerical modeling of the fate and transport of constituents of concern potentially migrating along routes of exposure

The CSM will be refined to the extent necessary to safeguard potential receptors identified in this plan.

Groundwater withdrawal may be achieved by extraction of impacted groundwater by a series of groundwater pumping wells; either vertical recovery well(s), horizontal well(s), or trenche(s). The selected groundwater withdrawal design will be used to hydraulically control and remove impacted groundwater and thus limit

Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites. Directive No. 9283.1-36 (Aug. 2015).

plume expansion and/or off-site migration. The estimated timeframes for mitigation activities are presented in the following table.

Mitigation Activity Description	Timeframe (Working Days)	Accumulated Duration (Working Days)
Groundwater Quality Monitoring Prequalification of Consultants/Contractors Conceptual Site Model Refinement	Ongoing/current	0
Release Discovery Requiring Mitigation	0	0
Design of Groundwater Withdrawal System	15-20	20
Drilling Contractor Selection	10	30
Equipment/Materials Procurement/Delivery	20	50
Treatment System Alternatives Design	20	70
Review Potential Need to Modify current LPDES Permit Submit Potential Modification Request Application to LDEQ Monthly Progress Reports Posted to CCR Website until startup		
Drilling Contractor Mobilization to Field	10	80
Groundwater Withdrawal System Installation, Development, Completion	15-20	100
Treatment System Implementation Discharge Piping Installation	20	120
System Operation	10	130
Progress Report Posted to CCR Website Progress Reports Continue (Quarterly First Year) Operation & Maintenance of Mitigation Measures Continues		

Notes:

Please note that the Progress Reports are beyond those reporting requirements listed per 40 C.F.R. § 257.106, .107.

This schedule is an estimate for an expedited implementation of corrective action. Potential delays related to such unforeseen events such as weather, COVID-19, etc. may affect this estimated schedule.

SECTION 4.0

Submittal of Additional Information To Demonstrate Compliance with the CCR Rule

November 30, 2020

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Appendix

1.0 INTRODUCTION

The United States Environmental Protection Agency's (EPA) Coal Combustion Residuals (CCR) Rule includes two site-specific alternative deadlines for owners and operators to initiate closure of their CCR surface impoundments.[1] One of these alternative closure deadlines allows qualifying CCR surface impoundments to continue receiving CCR and/or non-CCR wastestreams if the owner or operator permanently ceases operation of a coal-fired boiler(s) by a date certain.[2]

To qualify for the "permanent cessation of a coal-fired boiler(s)" alternative closure deadline, the CCR Rule requires owners and operators to submit additional information regarding the unit.[3] Pursuant to this requirement, Cleco Power LLC (Cleco) has compiled the additional information for Ash Basins No. 1 and No. 2 (Ash Basins 1 and 2) at the Dolet Hills Power Station (DHPS).

The additional information is also provided for the Fly Ash/Scrubber Sludge Landfill and Surface Impoundment (Landfill) for DHPS. Note, however, that the Landfill is not within the scope of this demonstration.

2.0 ADDITIONAL INFORMATION

To demonstrate that the criteria in 40 C.F.R. § 257.103(f)(2)(iii) has been met, Cleco is submitting the following information as required by 40 C.F.R. § 257.103(f)(2)(v)(C).

2.1 Owners Certification of Compliance – 40 C.F.R. § 257.103(f)(2)(v)(C)(1)

The owner's certification of compliance pursuant to 40 C.F.R. § 257.103(f)(2)(v)(C)(1) for the CCR units is included in **Appendix A**.

2.2 Ash Basins – Visual Representation of Hydrogeologic Information – 40 C.F.R. § 257.103(f)(2)(v)(C)(2)

Cleco DHPS has attached the following items for the Ash Basins to this demonstration:

- Maps of groundwater monitoring well locations in relation to the CCR units (**Appendix B**);
- Well construction diagrams and drilling logs for all groundwater monitoring wells (**Appendix C); and**
- Maps that characterize the direction of groundwater flow accounting for seasonal variations (**Appendix D**).

1 40 C.F.R. § 257.103(f).
2 *Id.* § 257.103(f)(2).
3 *Id.*§ 257.103(f)(2)(iii).

2.3 Ash Basins – Groundwater Monitoring Results – 40 C.F.R. § 257.103(f)(2)(v)(C)(3)

The summary tables of groundwater monitoring results at each groundwater monitoring well through 2019 for the Ash Basins are included in **Appendix E**.

2.4 Ash Basins – Description of Site Hydrogeology including Stratigraphic Cross Sections – § 257.103(f)(2)(v)(C)(4)

A description of the site hydrogeology and stratigraphic cross sections of the site for the Ash Basins are included as **Appendix F**.

2.5 Ash Basins – Corrective Measures Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(5)

An assessment of corrective measures for the Ash Basins is not currently required.

2.6 Ash Basin – Remedy Selection Progress Report – 40 C.F.R. § 257.103(f)(2)(v)(C)(6)

An assessment of corrective measures and the resulting remedy selection progress report for the Ash Basins are not currently required.

2.7 Ash Basins – Structural Stability Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(7)

Pursuant to 40 C.F.R. § 257.73(d), the structural stability assessments for the units were prepared in October 2016 and are included in **Appendix G.** The website link is provided for Ash Basin 1 here and for Ash Basin 2 here.

2.8 Ash Basins – Safety Factor Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(8)

Pursuant to 40 C.F.R. § 257.73(e), the safety factor assessment for the units were prepared in October 2016 and are included in **Appendix H.** The website link for Ash Basin 1 is provided here and for Ash Basin 2 is provided here.

2.9 Landfill – Visual Representation of Hydrogeologic Information – 40 C.F.R. § 257.103(f)(2)(v)(C)(2)

Cleco DHPS has attached the following items for the Landfill to this demonstration:

- Maps of groundwater monitoring well locations in relation to the CCR unit (**Appendix I**);
- Well construction diagrams and drilling logs for all groundwater monitoring wells (**Appendix J**); and
- Maps that characterize the direction of groundwater flow accounting for seasonal variations (**Appendix K**).

2.10 Landfill – Groundwater Monitoring Results – 40 C.F.R. § 257.103(f)(2)(v)(C)(3)

The summary tables of groundwater monitoring results at each groundwater monitoring well through 2019 for the Landfill are included in **Appendix L.**

2.11 Landfill – Description of Site Hydrogeology including Stratigraphic Cross Sections – 40 C.F.R. § 257.103(f)(2)(v)(C)(4)

A description of the site hydrogeology and stratigraphic cross sections of the Landfill are included as **Appendix M**.

2.12 Landfill – Corrective Measures Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(5)

An assessment of corrective measures for the Landfill is not currently required.

2.13 Landfill – Remedy Selection Progress Report – 40 C.F.R. § 257.103(f)(2)(v)(C)(6)

An assessment of corrective measures and the resulting remedy selection progress report for the Landfill are not currently required.

2.14 Landfill – Structural Stability Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(7)

The CCR rule does not require a structural stability assessment for CCR landfills.

2.15 Landfill – Safety Factor Assessment – 40 C.F.R. § 257.103(f)(2)(v)(C)(8)

The CCR rule does not require a safety factor assessment for CCR landfills.

CHAPTER 5.0

Documentation of Closure Plan Timeframe

November 30, 2020

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Appendices

I. Overview

To qualify for the alternative closure requirements delineated at 40 C.F.R. § 257.103(f)(2)—"Permanent Cessation of a Coal-Fired Boiler(s) by a Date Certain"—an owner or operator must submit a closure plan required by 40 C.F.R. § 257.102(b), along with a narrative specifying and justifying the date by which they intend to cease receipt of waste into a CCR surface impoundment to meet the alternative closure deadlines.[1] The purpose of submitting the closure plan and narrative is to "demonstrate that the owner or operator can meet the closure timeframes listed in 40 C.F.R. § 257.103(f)(2)(iv)."[2]

The Dolet Hills Power Station (DHPS) Ash Basin No. 1 is 33.18 acres. DHPS Ash Basin No. 2 is 33.5 acres. Because they are smaller than 40 acres, Cleco must cease operation of the DHPS Unit 1 boiler and complete closure of Ash Basins Nos. 1 and 2 (hereinafter Ash Basins 1 and 2) by no later than October 17, 2023.[3] To meet the October 17, 2023 closure deadline, DHPS Unit 1 will cease generation of coal-fired energy and Ash Basins 1 and 2 will cease receipt of wastestreams by no later than December 2021. The closure plan for the Ash Basin 1 is included as **Appendix A** and is also available here. The closure plan for the Ash Basin 2 is included as **Appendix B** and is also available here. These documents are collectively referred to herein as "the Closure Plans."[4]

[1] 40 C.F.R. § 257.103(f)(2)(v)(D).
[2] *Id.*
[3] *Id.* § 257.103(f)(2)(iv)(A).
[4] Upon approval of this demonstration, Cleco will amend the Closure Plans in accordance with 40 C.F.R. § 257.102(b)(2)(3)(ii)(A).

II. Closure-In-Place Process

Pursuant to the Closure Plans, Cleco will close Ash Basins 1 and 2 by leaving CCR material in place (closure-in-place). The closure-in-place process requires the installation of a final cover system that meets the criteria delineated at 40 C.F.R. § 257.102(d). Prior to installing the final cover system, Cleco will (1) eliminate free liquids from Ash Basins 1 and 2 by removing liquid wastes or solidifying remaining wastes and waste residues, and (2) stabilize remaining wastes sufficiently to support the final cover systems.[5] These activities will take approximately three months and will be completed in approximately April 2022.

Once stabilized, Cleco will backfill, compact, and grade Ash Basins 1 and 2 so they will drain to the DHPS "Secondary Pond." The purpose of these activities is to accomplish the following:

1. Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;
2. Prevent future impoundment of water; and
3. Provide for slope stability to protect against sloughing or movement of the final cover system.[6]

These activities will take approximately two months and will be completed in approximately June 2022.

Once Ash Basins 1 and 2 are backfilled and graded, Cleco will place the final cover systems over the maximum extents of the Ash Basins to minimize infiltration and cap erosion.[7] This will

[5] Closure Plans at 4-1; 40 C.F.R § 257.102(d)(2)(i)–(ii).
[6] Closure Plans at 4-2; 40 C.F.R. § 257.102(d)(1)(i)–(iii).
[7] Closure Plans at 4-2; 40 C.F.R. § 257.102(d)(3).

involve installing an infiltration layer, an erosion layer, drainage features, and erosion control measures.[8] Following the installation of these features, Ash Basins 1 and 2 will be seeded.[9] These activities will take approximately six months and will be completed in approximately December 2022.

Once the final cover systems are installed, they will be inspected by the Louisiana Department of Environmental Quality (LDEQ) and certified by a professional engineer.[10] These activities will be completed in January or February 2023.

Table 1 below summarizes the closure tasks, the approximate time each task will likely require, and the approximate completion date for each task. These approximate timeframes include time for unexpected delays resulting from unforeseen circumstances, such as weather events. Cleco has included as **Appendix C** an Addendum that will incorporate this approximate project timeline into the Closure Plans currently located on Cleco's CCR website upon EPA's approval of this demonstration.

8 Closure Plans at 5-1, Table 5-1.
9 *Id.*
10 *Id.*

Table 1. DHPS Ash Basins Nos. 1 and 2 Closure Plan Schedule

Closure Activity	Working Days Needed	Approx. Completion Date
Preparation for Closure		
Permitting/Design	120	August 2021
Send Notice of Intent to Close to LDEQ	20	September 2021
Bid Process/Contract Award	45	November 2021
Final Placement of Wastestreams/Cessation of Coal-Fired Generation	-	December 2021
Closure Construction		
Commence Construction/Mobilization	30	January 2022
Dewatering/Stabilization	90	April 2022
Grading/Backfill of Bottom Ash Pond	60	June 2022
Final Cover Installation and LDEQ Inspections	180	December 2022
Certifying Inspection by a P.E.	20	January 2023
Site Clean-Up/Demobilization	10	January/February 2023
Closure Completion		**January/February 2023**
Submit Notification of Completion of Closure	20	January/February 2023

CHAPTER 3.0

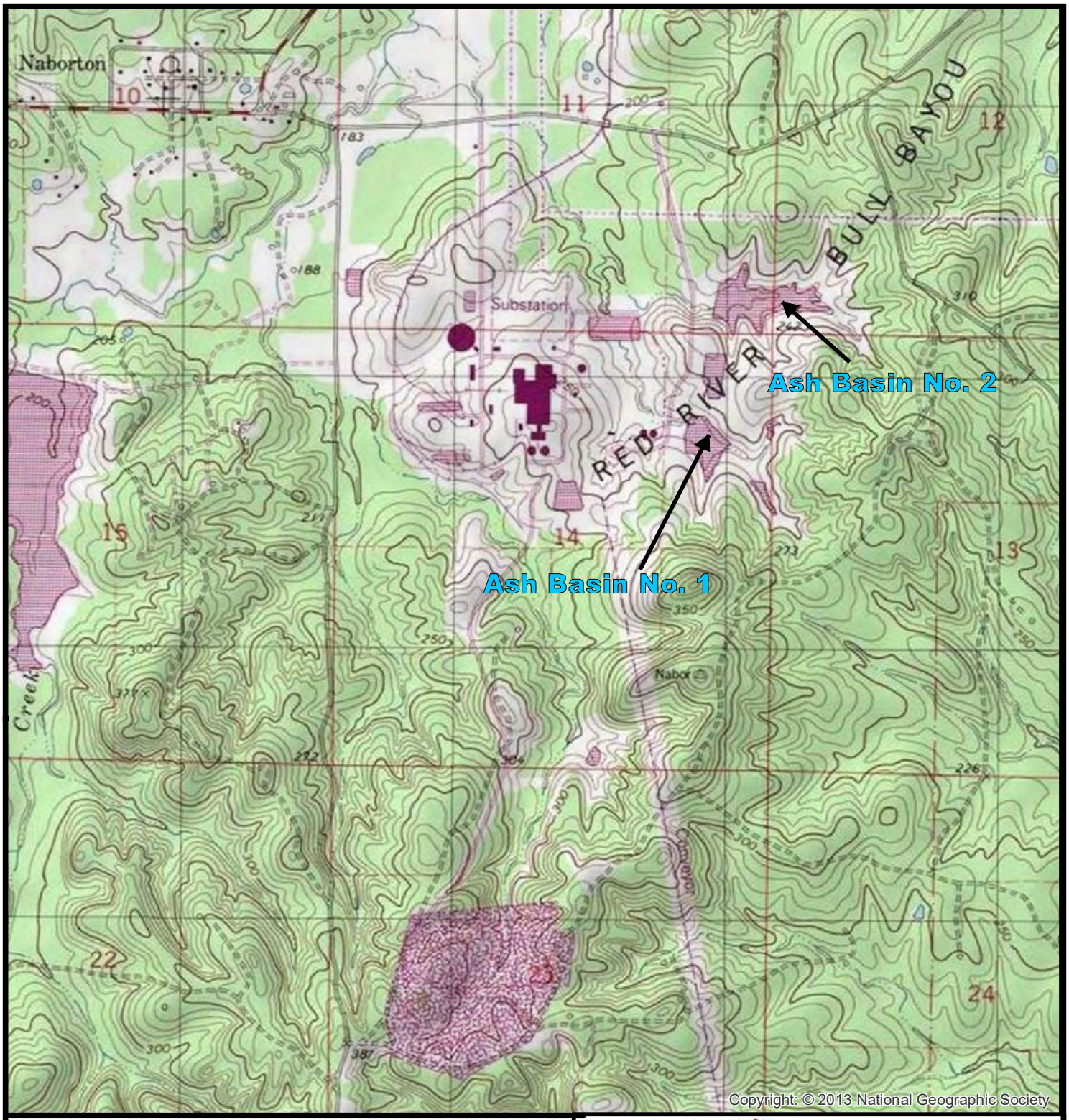
Appendices

A Figures
B Monitoring Well Network Certification
C 2019 Annual Groundwater Report
D Certification of Statistical Methodology
E Water Use Survey

November 30, 2020

APPENDIX A

FIGURES



N
W E
S

0 500 1,000 2,000 3,000 4,000
Feet

Note:

Base map taken from U.S.G.S. Quadrangle "Bayou Pierre lake, LA" at a scale of 1:24,000.

CLECO Corporation

Dolet Hills Power Station

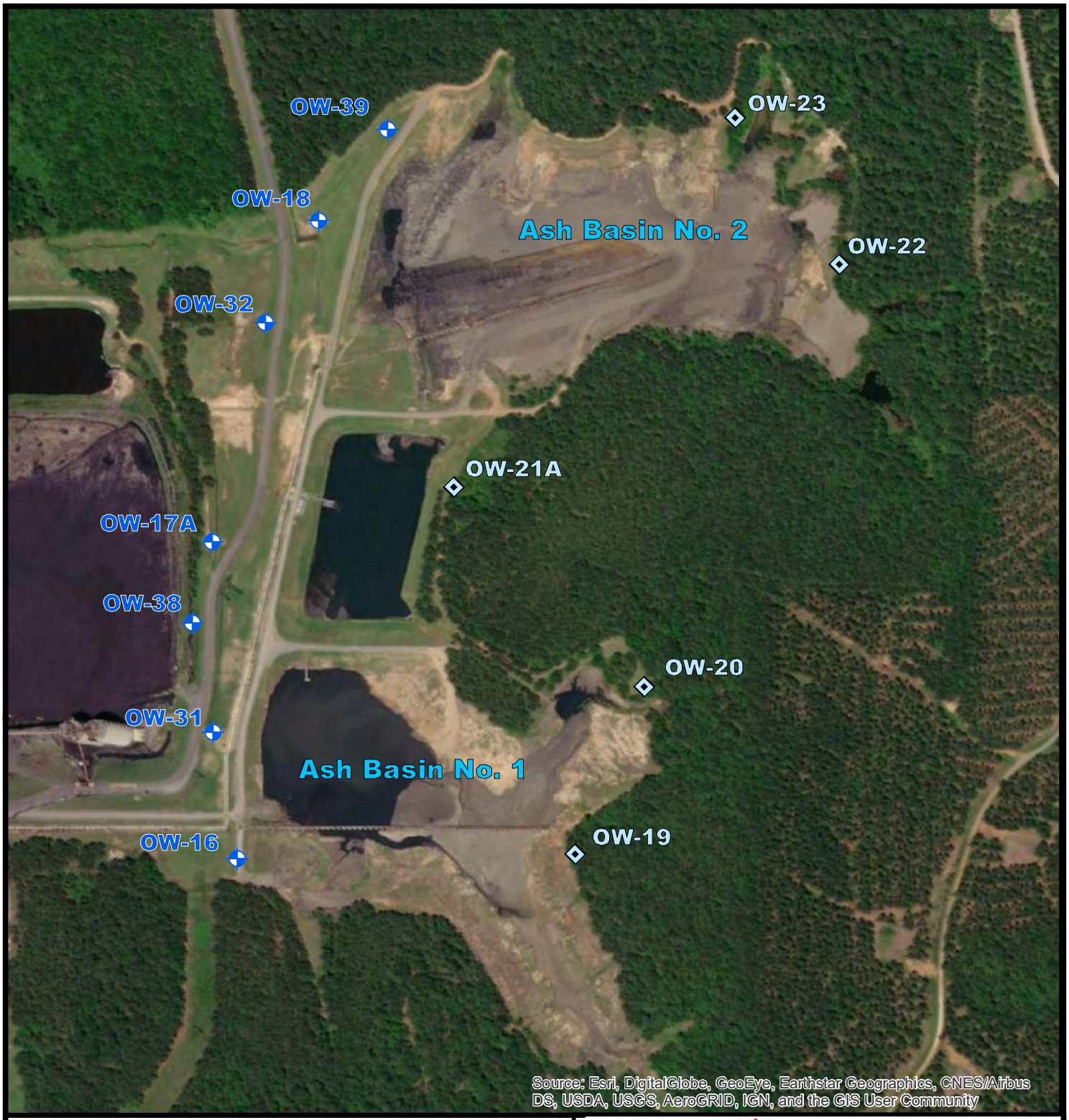
Site Location Map

De Soto Parish

E·A·G·L·E
ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	10/30/20
Dwg. No.:	01-20-0221-APP-A-1

Figure A-1



N
W E
S

Legend

- Zone 4 Background Monitoring Well Location
- Zone 4 Complioance Monitoring Well Location

0 200 400 800 1,200 1,600 Feet

CLECO Corporation

Dolet Hills Power Station

Monitoring Wells Location Map

De Soto Parish

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	10/30/20
Dwg. No.:	01-20-0221-APP-A-2

Figure A-2

APPENDIX B

MONITORING WELL NETWORK CERTIFICATION

CLECO

DOLET HILLS POWER STATION
MANSFIELD, LOUISIANA

ASH BASINS MONITORING WELL NETWORK CERTIFICATION

MONITORING WELL NETWORK

1.0 Introduction

The U.S. Environmental Protection Agency (EPA) published a final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The rule applies to the Cleco Power LLC Dolet Hills Power Station (DHPS). A site location map is provided in Figure 1. DHPS has two permitted impoundments that accept CCR: Ash Basin No. 1 and Ash Basin No. 2, as shown in Figure 2.

The CCR Rule, 40 CFR Subpart D-Standards for the Disposal of CCRs, Section §257.91 requires a groundwater monitoring system that consists of sufficient number of wells at appropriate locations and depths based on site-specific technical information, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of both background groundwater, and groundwater passing the boundary of the CCR unit; and
- Monitor potential contaminant pathways.

The groundwater monitoring system for the DHPS Ash Basins meets those requirements, as described below.

2.0 Site Hydrogeology Summary

Geologic evaluation of the near-surface stratigraphy underlying DHPS indicates the presence of four distinct permeable zones. These are referred to as Zone 1, Zone 2, Zone 3, and Zone 4 corresponding with descending depth at the site. Borehole geophysical logging at the site revealed distinctive characteristics for these zones in the subsurface. Correlation of these zones to the regional stratigraphic descriptions (Murray, 1948) suggests that Zone 1 correlates with the Dolet Hills formation, and Zones 2, 3, and 4 correlate with sandy units of the Naborton formation. Evaluation of the geophysical logs indicated distinctive marker beds that included these permeable zones as well as the Chemard Lake lignite lentil, minor lignite beds, and the less permeable deposits of the underlying Porters Creek formation. The Chemard Lake lignite was not present in the area of the solid waste surface impoundments.

The Paleocene Dolet Hills formation consists of very fine- to fine-grained, gray, relatively clean, massive quartz sands (Snider, 1982 and Murray, 1948). Locally some sands are fine- to medium-grained and have some clay and silt lenses. The Dolet Hills formation contains sands that range from 120 to 160 feet in thickness (Snider, 1982). The Dolet Hills formation is transitional with the underlying Naborton formation.

The Paleocene Naborton formation underlies the Dolet Hills sands in the study area. The Naborton formation consists chiefly of gray and buff sandy, clayey lignitic silts containing some lignitic clay and lignite beds (Page and Preé, 1964). The formation contains large limonitic and calcareous concretions. The thickness ranges between 140 to 170 feet and the average thickness is about 160 feet (Snider, 1982).

Underlying the Naborton formation is the Porters Creek formation. The Paleocene Porters Creek formation consists of lignitic and limey shales and clays with occasional calcareous concretions. The formation averages in thickness from 500 to 600 feet. The contact with the overlying Naborton formation is transitional from silty clays into sands and silts and is usually chosen below the least dominantly sandy unit in drill cuttings and on geophysical logs (Murray, 1948).

Murray, G.E., 1948. Geology of DeSoto and Red River Parishes, Geological Bulletin No. 25, Louisiana Geological Survey, Baton Rouge, Louisiana.

Page, L.V. and H.L. Preé, Jr., 1964. Water Resources of DeSoto Parish Louisiana, Geological Survey Water-Supply Paper 1774, United States Geological Survey, United States Government Printing Office, Washington D.C.

Snider, J.L., 1982. Premining Hydrology of the Lignite Area in Southeastern DeSoto Parish, Louisiana, Water Resources Technical Report No. 29, United States Geological Survey, Louisiana Department of Transportation and Development, Baton Rouge, Louisiana.

3.0 Groundwater Monitoring System

Groundwater monitoring wells have been installed in the uppermost, laterally continuous water bearing zone present beneath the CCR impoundments at DHPS (Zone 4). It should be noted that Zones 1, 2, and 3 are not present in these areas and have been eroded away. The background monitoring well network has been installed upgradient of the Ash Basins. Monitoring well information is included in Table 1, and the monitoring well locations are provided in Figure 2.

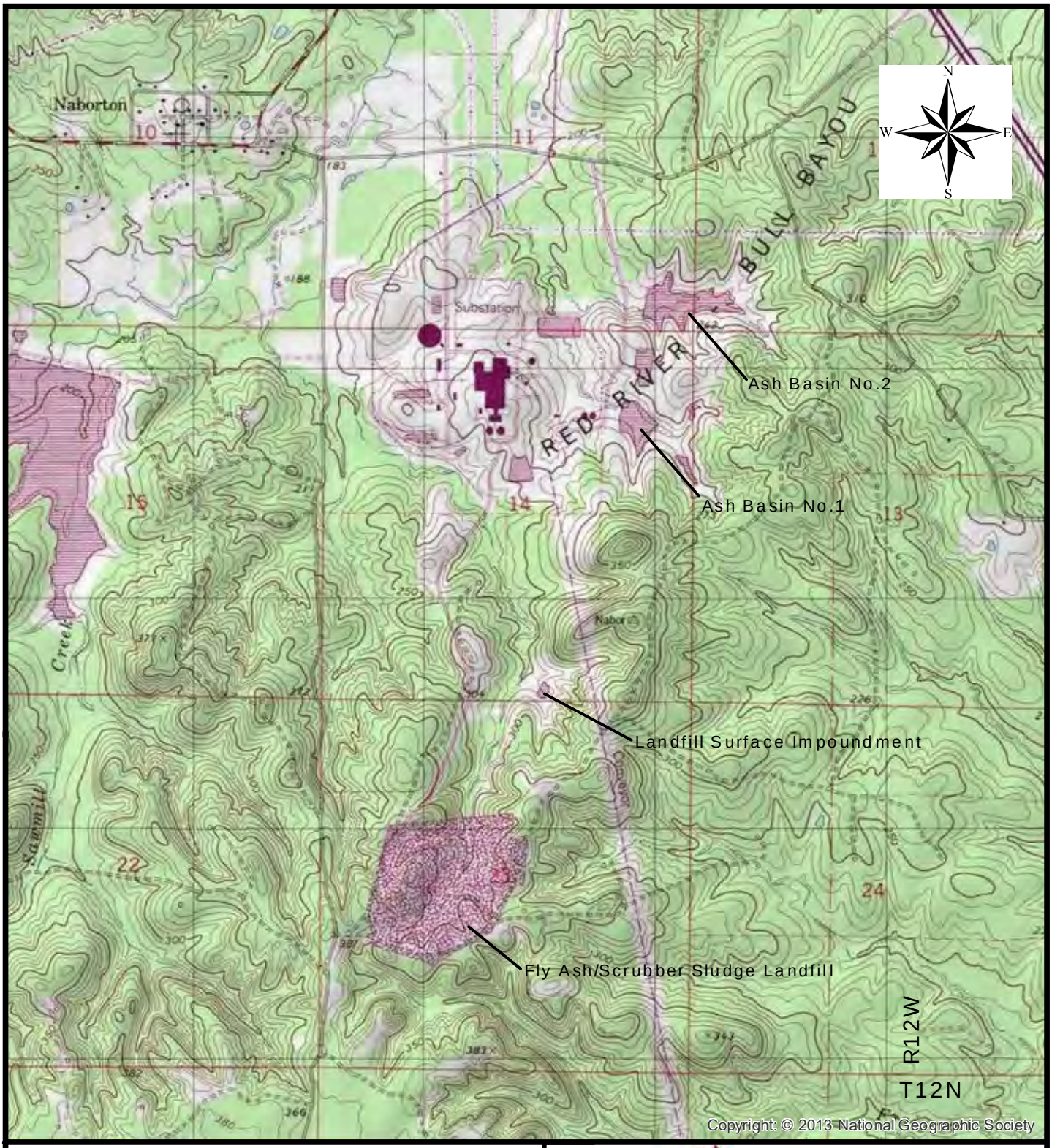
CERTIFICATION

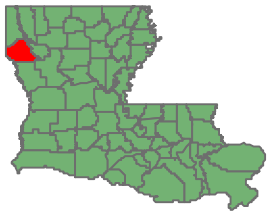
I hereby certify that the groundwater monitoring system described in this report for the Dolet Hills Power Station, owned and operated by Cleco Power, LLC, has been designed and constructed to meet the requirements of the Coal Combustion Residual Rule 40 CFR §257.91. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.

_____, P.E.

Date: 3/7/17

Louisiana Registration No.: 27124





0 750 1,500 3,000 4,500 Feet

Note:

U.S.G.S. Quadrangle "Bayou Pierre Lake, LA" at scale 1:24,000

CLECO Corporation

Dolet Hills Power Station

Site Location Map

DeSoto Parish, Louisiana

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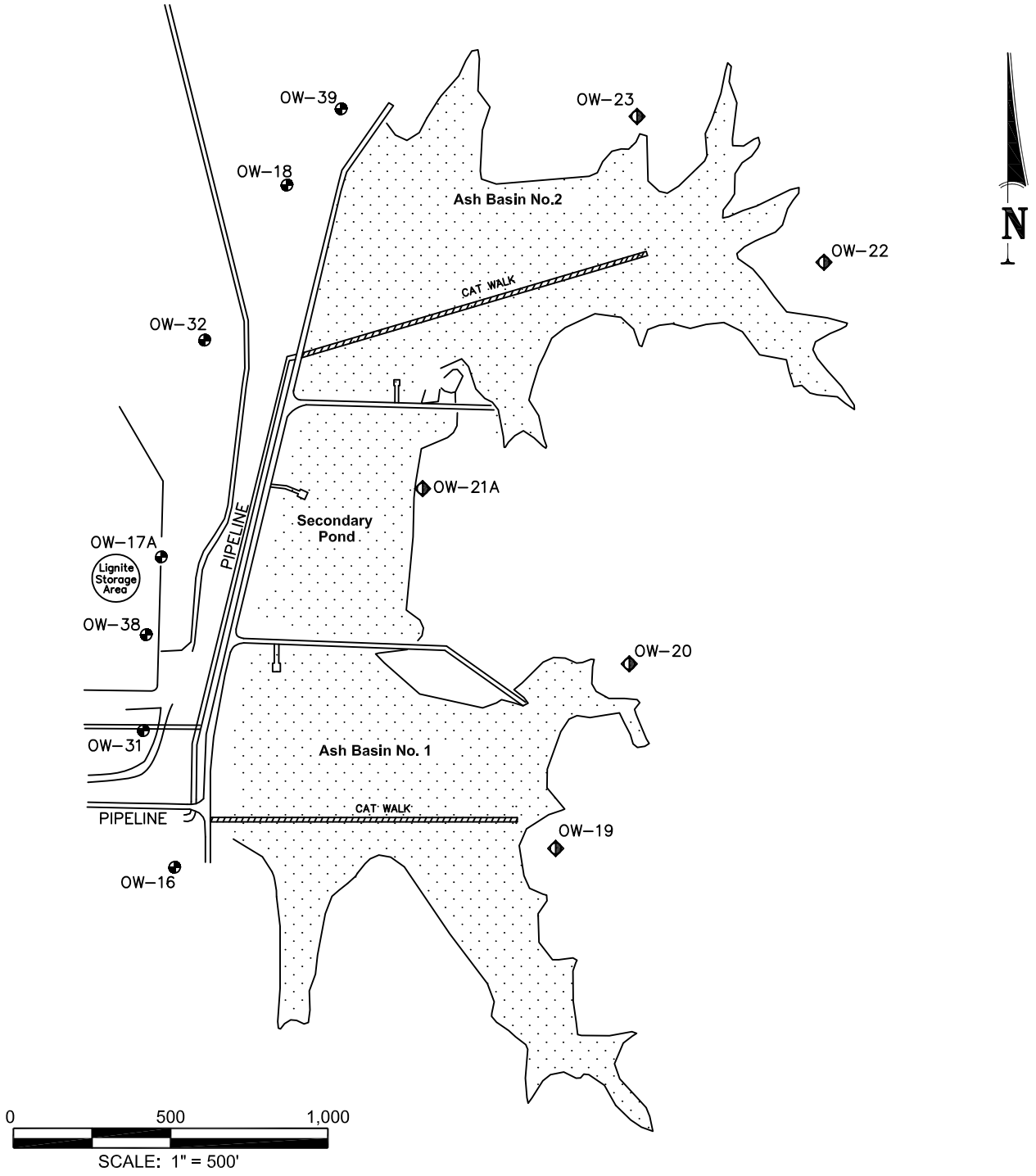
Approved:	JM
Date:	3/23/17
Dwg. No.:	01-17-0168-C001

FIGURE 1



Legend

- OW–16 — Zone 4 Compliance Monitoring Well Location
- OW–23 — Zone 4 Background Monitoring Well Location
- Permitted Facility

CLECO Corporation

Dolet Hills Power Station

Zone 4 Monitoring Wells Location Map

DeSoto Parish, Louisiana

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Date:	10/4/16
Dwg. No.:	01-16-0159-A004

Figure 2

Table 1
Monitoring Well Information

Well Number	OW-16	OW-17A	OW-18	OW-19	OW-20	OW-21A
Up or Down Gradient	D	D	D	U	U	U
Latitude (dd°mm'ss")	32°03'26"	32°03'36"	32°03'47"	32°03'26"	32°01'52"	32°01'56"
Longitude (dd°mm'ss")	93°31'52"	93°31'53"	93°31'49"	93°31'52"	93°33'31"	93°33'41"
Casing Elevation (ft NGVD)	254.95	231.57	218.44	260.01	258.84	244.40
Well Depth (ft bgs)	41.95	45.32	31.51	34.12	31.8	31.9
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	217.97	194.13	194.17	230.98	234.39	219.93
Bottom of Screen (ft NGVD)	207.97	184.13	184.17	220.98	224.39	209.93
Casing Diameter & Material	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC

Well Number	OW-22	OW-23	OW-31	OW-32	OW-38	OW-39
Up or Down Gradient	U	U	D	D	D	D
Latitude (dd°mm'ss")	32°02'07"	32°02'10"	32°01'51"	32°02'05"	32°01'55"	32°02'10"
Longitude (dd°mm'ss")	93°33'22"	93°33'31"	93°33'51"	93°33'48"	93°33'50"	93°33'44"
Casing Elevation (ft NGVD)	256.98	255.55	221.71	237.65	221.60	228.96
Well Depth (ft bgs)	31.1	38.42	29.54	29.98	37.3	32.5
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	234.19	224.57	199.11	214.7	192.36	203.69
Bottom of Screen (ft NGVD)	224.19	214.57	189.11	204.7	182.36	193.69
Casing Diameter & Material	4" PVC	4" PVC	2" PVC	2" PVC	2" PVC	2" PVC

APPENDIX C

2019 ANNUAL GROUNDWATER MONITORING REPORT

CLECO POWER LLC
DOLET HILLS POWER STATION

ASH BASINS NO. 1 AND NO. 2
MANSFIELD, LA

2019 Annual Groundwater Monitoring Report for the Coal Combustion Residuals Rule

January 2020

TABLE OF CONTENTS

Figures

Tables

1.0 INTRODUCTION

Cleco Power LLC (Cleco) hereby presents the 2019 Annual Groundwater Monitoring report for Ash Basins No. 1 and No. 2 at the Dolet Hills Power Station (DHPS) located in Mansfield, Louisiana (Figure 1). This report summarizes groundwater sampling and analysis activities completed in accordance with applicable portions of the U.S. Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) Rule.

2.0 FACILITY INFORMATION

Cleco owns and operates the DHPS located at 963 Power Plant Road, Mansfield, Louisiana 71052. The Ash Basins in service at the plant have been permitted to operate by the Louisiana Department of Environmental Quality (LDEQ) Waste Permits Division. The materials deposited in these facilities are non-hazardous, on-site-generated materials only.

As required by the CCR Rule part §257.90, DHPS has a groundwater monitoring well system to evaluate the groundwater quality conditions near the Ash Basins. The monitoring system consists of newly installed monitoring wells and monitoring wells installed previously to conduct groundwater monitoring required by DHPS's LDEQ approved solid waste permits. A total of twelve monitoring wells have been installed per applicable portions of §257.91. The uppermost water bearing zone that is laterally continuous beneath the Ash Basins is referred to as Zone 4. Locations of the monitoring wells can be found on Figure 2, and a table of monitoring well construction details can be found in Table 1.

3.0 FIELD ACTIVITIES

Groundwater sampling events were conducted by Cleco approved contract personnel in accordance with applicable portions of §257.93. Semi-annual detection monitoring sampling events were conducted in June and October 2019, while additional voluntary baseline sampling events were conducted in March and August 2019.

The depth-to-water below the top of each well casing was measured and recorded prior to purging and sampling each well during each sampling event. Water levels were measured to the nearest 0.01 foot from the top of casing using an electronic water level indicator. Total depth of each well was also measured to confirm that the screened interval was open to groundwater flow. Water level measurements were recorded in groundwater sampling forms. The water level measurements were subtracted from the top of casing elevations to obtain the groundwater elevations.

Groundwater purging and sampling activities were conducted using electric submersible pumps. These activities were conducted in accordance with applicable portions of Sections 6.1, 6.2, 6.3 and 8.1.4 of the *Standard Guide for Sampling Groundwater Monitoring Wells* (ASTM International, Publication D4448). Non-dedicated sampling equipment which came into contact with groundwater samples was decontaminated prior to sampling each well to reduce the potential for cross-contamination. Groundwater samples were collected by filling the sample containers directly from the disposable tubing connected to the pump or from a disposable bailer. Care was taken to minimize agitation of the samples. Samples were placed in laboratory-provided plastic containers with appropriate preservatives, per Section 9 of ASTM D4448. Samples were properly preserved on ice in the field and shipped to Pace Analytical Services, LLC of St. Rose, Louisiana, for analysis of the CCR groundwater detection monitoring parameters by the following methods: chloride, fluoride and sulfate by 300.0; total dissolved solids by 2540C; and metals by 6020. Full chain-of-custody protocols were observed

during sample collection, transportation, and analysis. Sample shipment/transport procedures were conducted per Sections 9.9 through 9.11 of ASTM D4448.

4.0 GROUNDWATER FLOW EVALUATION

Zone 4 is the most suitable water-bearing zone to monitor groundwater quality at the Ash Basins. The potentiometric surface maps prepared for Zone 4 (Figures 3 through 6) indicate that groundwater flow in Zone 4 mimics the topography of the site. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow.

Groundwater flow rate was evaluated using the groundwater flow equation, $v = [k(dh/dl)] / n_e$. For this equation, v is groundwater flow velocity in ft/day, k is hydraulic conductivity in ft/day, dh/dl is hydraulic gradient in ft/ft, and n_e is effective porosity (unitless).

For Zone 4, hydraulic conductivity (k) values ranging from 2.0E-07 to 1.4E-02 ft/day were assumed based on slug tests completed at the site. Hydraulic gradient (dh/dl) values are listed below based on potentiometric surface maps completed for Zone 4. An effective porosity (n_e) of 0.2 was assumed based on the soil types of Zone 4 (Fetter, 2001). Using these values, estimated groundwater flow rates (v) are listed below.

Date	Hydraulic Gradient (feet/feet)	Estimated Groundwater Flow Velocity (feet/day)
March 2019	0.01 to 0.07	1.0E-8 to 4.9E-3
June 2019	0.01 to 0.07	1.0E-8 to 4.9E-3
August 2019	0.01 to 0.06	1.0E-8 to 4.2E-3
October 2019	0.01 to 0.06	1.0E-8 to 4.2E-3

It is important to note that this is an advective rate and does not take into account potential hydrogeological heterogeneities such as adsorption, biodegradation, dispersion, or other retarding factors in the groundwater flow in this zone. Additionally, variations in the advective flow may occur due to potential lateral geological heterogeneities.

5.0 ANALYTICAL RESULTS

Groundwater samples collected at the Ash Basins were analyzed for the CCR Rule detection monitoring parameters pH, boron, calcium, chloride, fluoride, sulfate, and total dissolved solids (TDS) using appropriate EPA approved analytical methods. Results show frequent detections of all parameters in both up- and downgradient monitoring wells at the Ash Basins. Analytical results are provided in Table 2.

6.0 STATISTICAL EVALUATION

Statistical evaluations of groundwater data have been performed per applicable portions of §257.93.f. The goal of the statistical evaluation is to determine if there is statistically significant evidence to show that facility operations may have adversely affected groundwater quality. Statistical evaluations are conducted to determine if there are any statistically significant increases (SSIs) between groundwater quality upgradient and groundwater quality downgradient of the Ash Basins.

Due to statistically significant variation found in upgradient monitoring well data, all detection monitoring parameters were statistically evaluated using intrawell prediction limits. Intrawell tests are

within well comparisons. In the case of limit-based tests, historical data from within a given monitoring well for a given parameter are used to construct a limit. Compliance points are compared to the limit to determine whether a change is occurring on a per-well/per-parameter basis. Normal distributions of data values use parametric methods. Non-normal distributions use non-parametric methods, in which case, the prediction limit is based on the highest value in the background data set.

Intrawell limit-based tests are recommended when there is evidence of spatial variation in groundwater quality, particularly among upgradient monitoring wells, as it is inappropriate to pool those data across monitoring wells for the purpose of creating interwell limits for comparison with compliance monitoring well data. Intrawell tests may be used at both new and existing facilities. Data used in the intrawell limit-based tests were screened for outliers, which, if found, were removed from the background data set prior to constructing limits for each well/parameter pair.

Verification resampling for SSIs is only conducted for SSIs generated in downgradient wells via intrawell methodology. Intrawell statistics have been performed on all wells; however, since the goal of the statistical evaluation is to determine if there is statistically significant evidence to show that facility operations may have adversely affected groundwater quality downgradient of the facilities, only downgradient wells are subject to verification resampling.

Intrawell statistical analysis of the October 2019 data generated an SSI for sulfate in upgradient monitoring well OW-22. No SSIs were generated in downgradient wells at the Ash Basins.

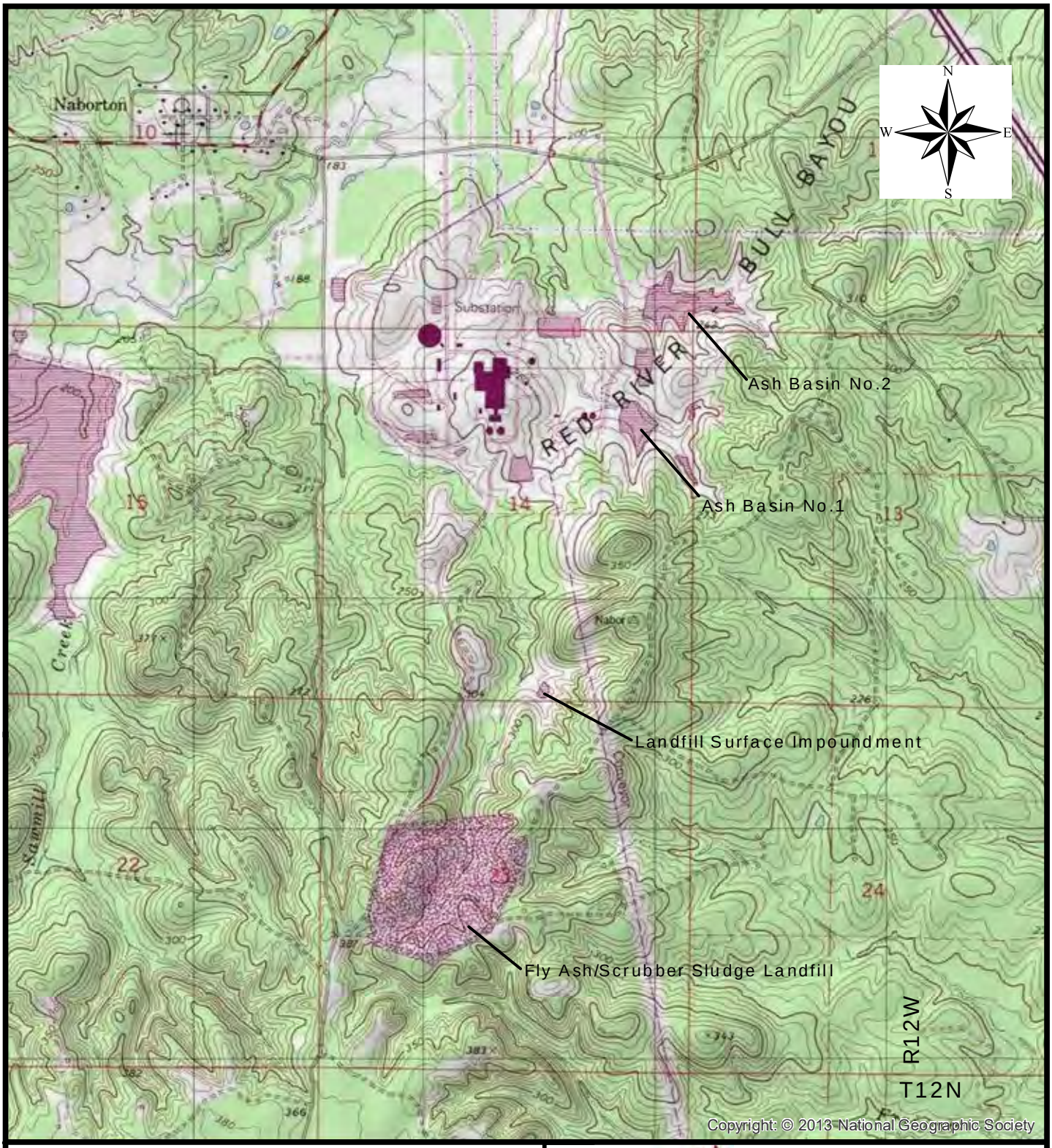
7.0 CONCLUSIONS AND RECOMMENDATIONS

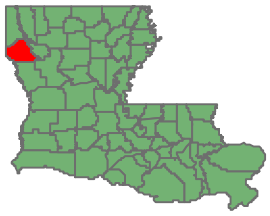
- Cleco DHPS has a monitoring well system to monitor groundwater quality at Ash Basins No. 1 and No. 2 per applicable portions of §257.91. The network consists of five upgradient and seven downgradient monitoring wells.
- Cleco conducted sufficient detection monitoring sampling events, per applicable portions of §257.93 and §257.94.
- Potentiometric surface evaluation at the Ash Basins indicates consistent groundwater flow to the west.
- Statistical evaluations of data conducted per applicable portions of §257.93 indicate that no SSIs have been generated in downgradient wells.
- Semi-annual detection monitoring sampling events are tentatively scheduled for May and September of 2020. Data generated during these sampling events will be included in the next annual report.

8.0 CERTIFICATION

I hereby certify this annual groundwater monitoring report for Cleco Power LLC. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.

	27124
Signature	**PE Registration Number**
Bradley E. Bates	*Professional Engineer*
Name	**Title**
Eagle Environmental Services, Inc.	*12/16/2019*
Company	**Date**





0 750 1,500 3,000 4,500 Feet

Note:

U.S.G.S. Quadrangle "Bayou Pierre Lake, LA" at scale 1:24,000

CLECO Corporation

Dolet Hills Power Station

Site Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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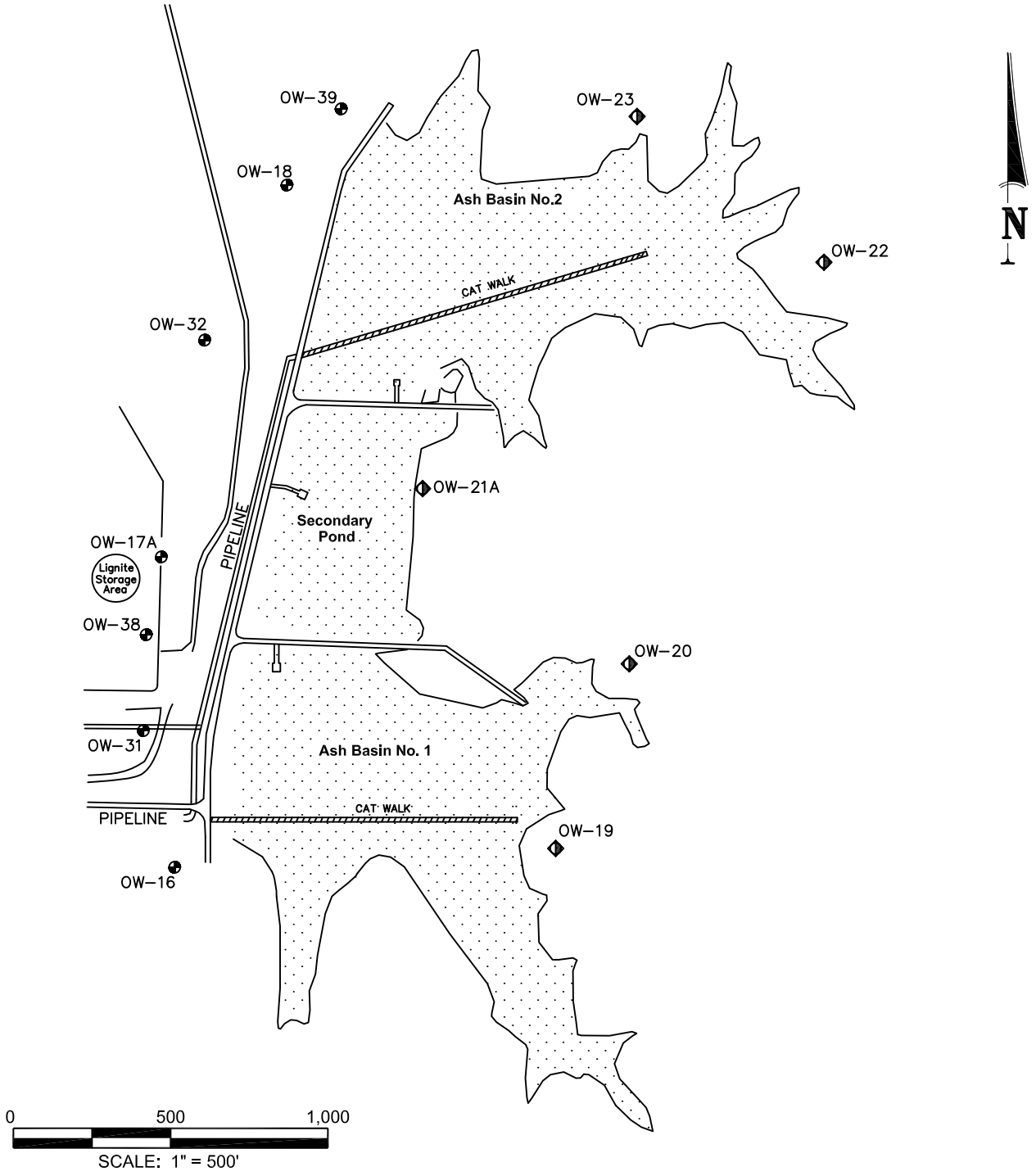
Approved:	JM
Date:	3/23/17
Dwg. No.:	01-17-0168-C001

FIGURE 1



Legend

- OW–16 — Zone 4 Compliance Monitoring Well Location
- OW–23 — Zone 4 Background Monitoring Well Location
- Permitted Facility

CLECO Corporation

Dolet Hills Power Station

Zone 4 Monitoring Wells Location Map

DeSoto Parish, Louisiana

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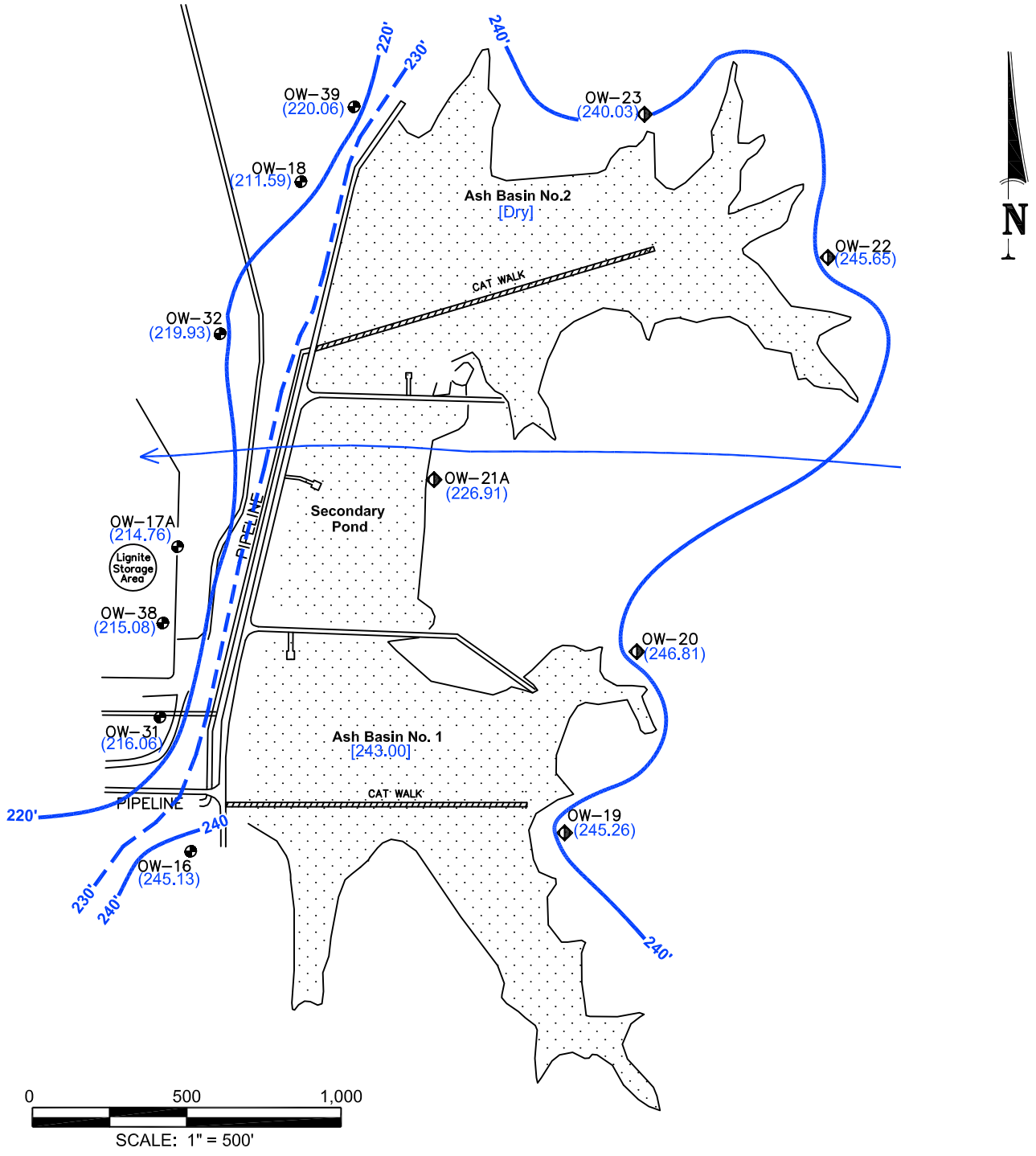
Date:	10/4/16
Dwg. No.:	01-16-0159-A004

Figure 2



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(245.26)	Potentiometric Surface Elevation (ft. NGVD)
[243.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

Potentiometric Surface Map
March 2019

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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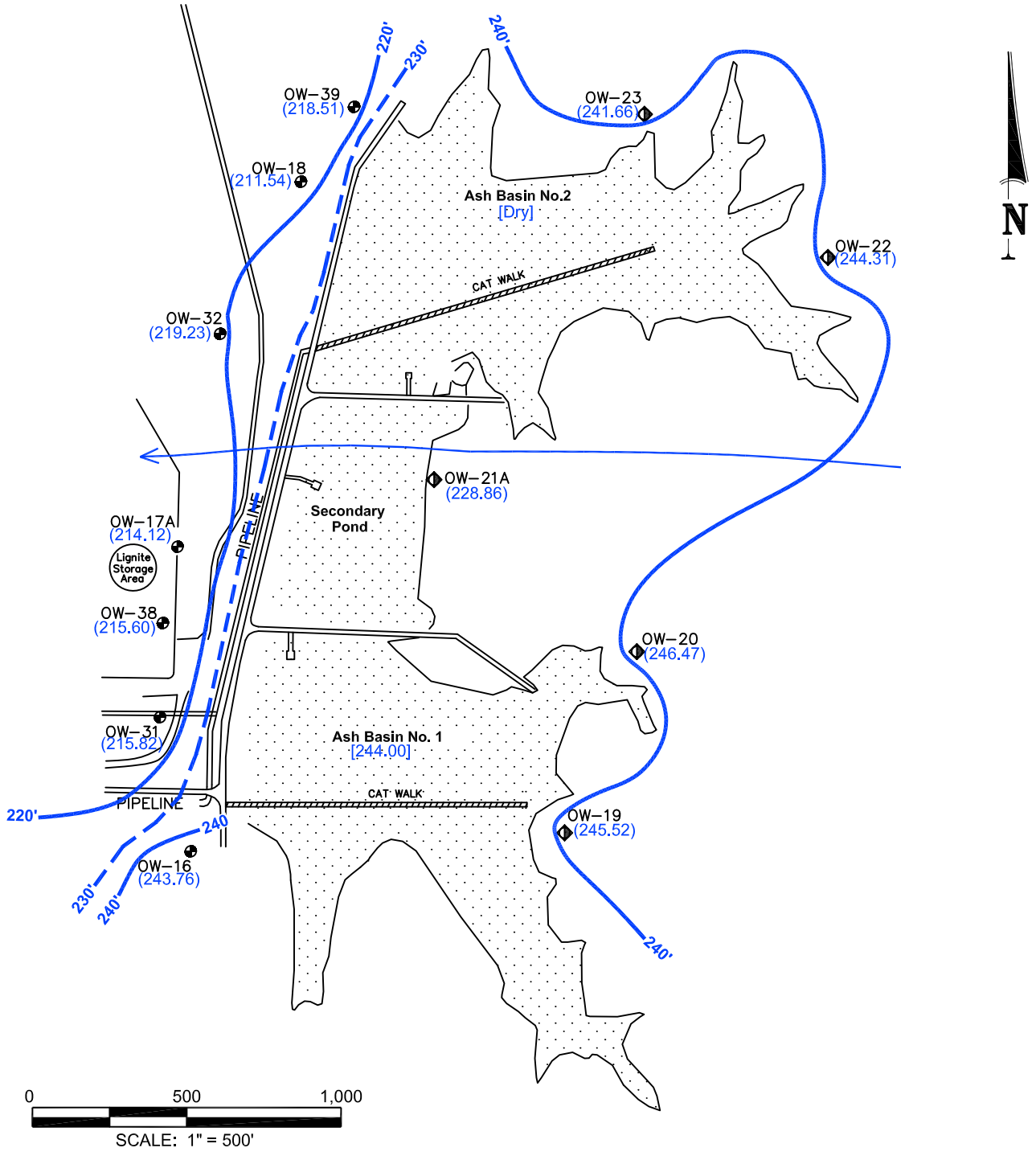
Approved:	JM
Date:	4/23/19
Dwg. No.:	01-19-0168-A001

Figure 3



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(243.76)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

Potentiometric Surface Map
June 2019

DeSoto Parish, Louisiana

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Date:	6/26/19
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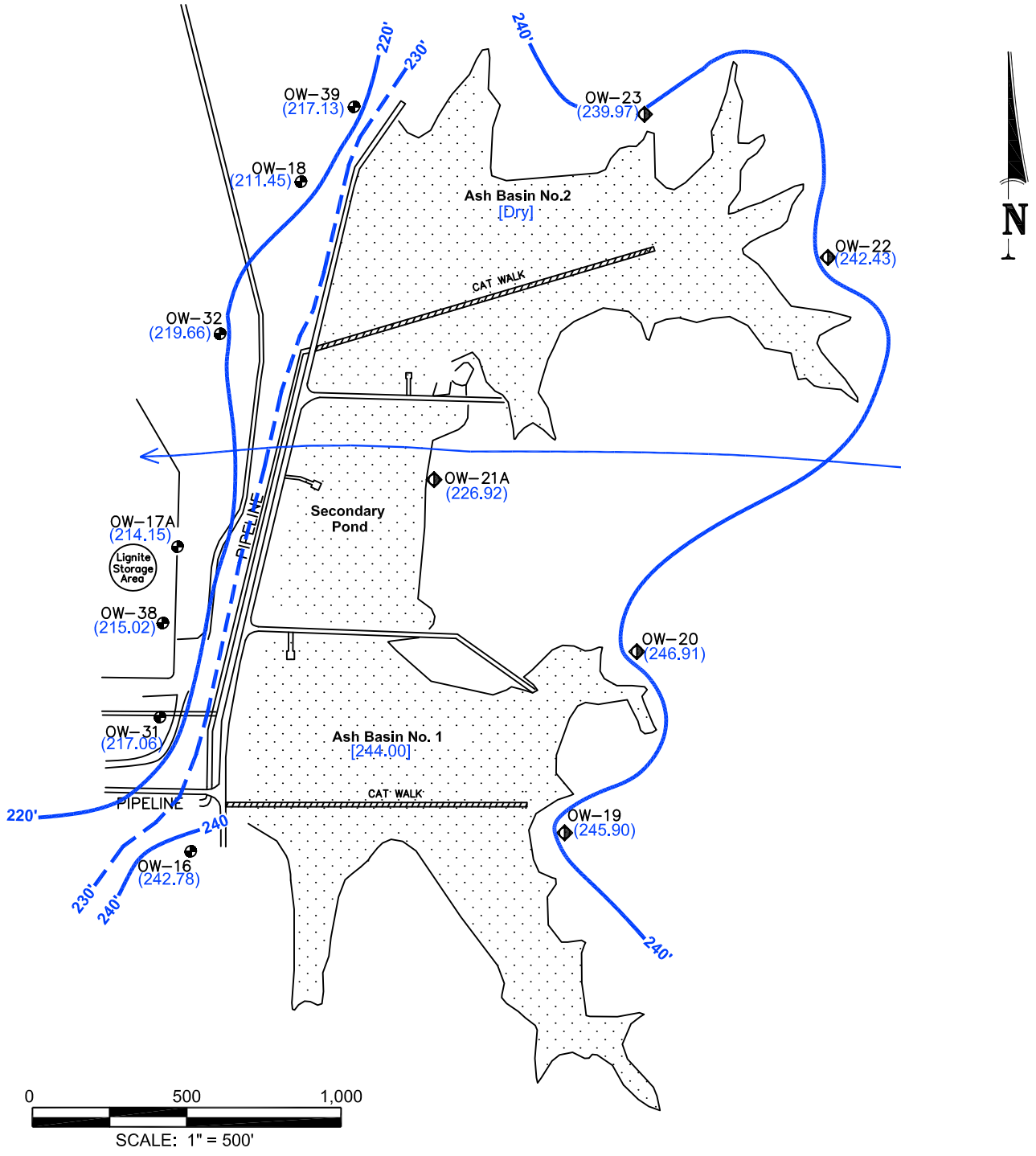
Figure 4



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(242.78)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

Potentiometric Surface Map
August 2019

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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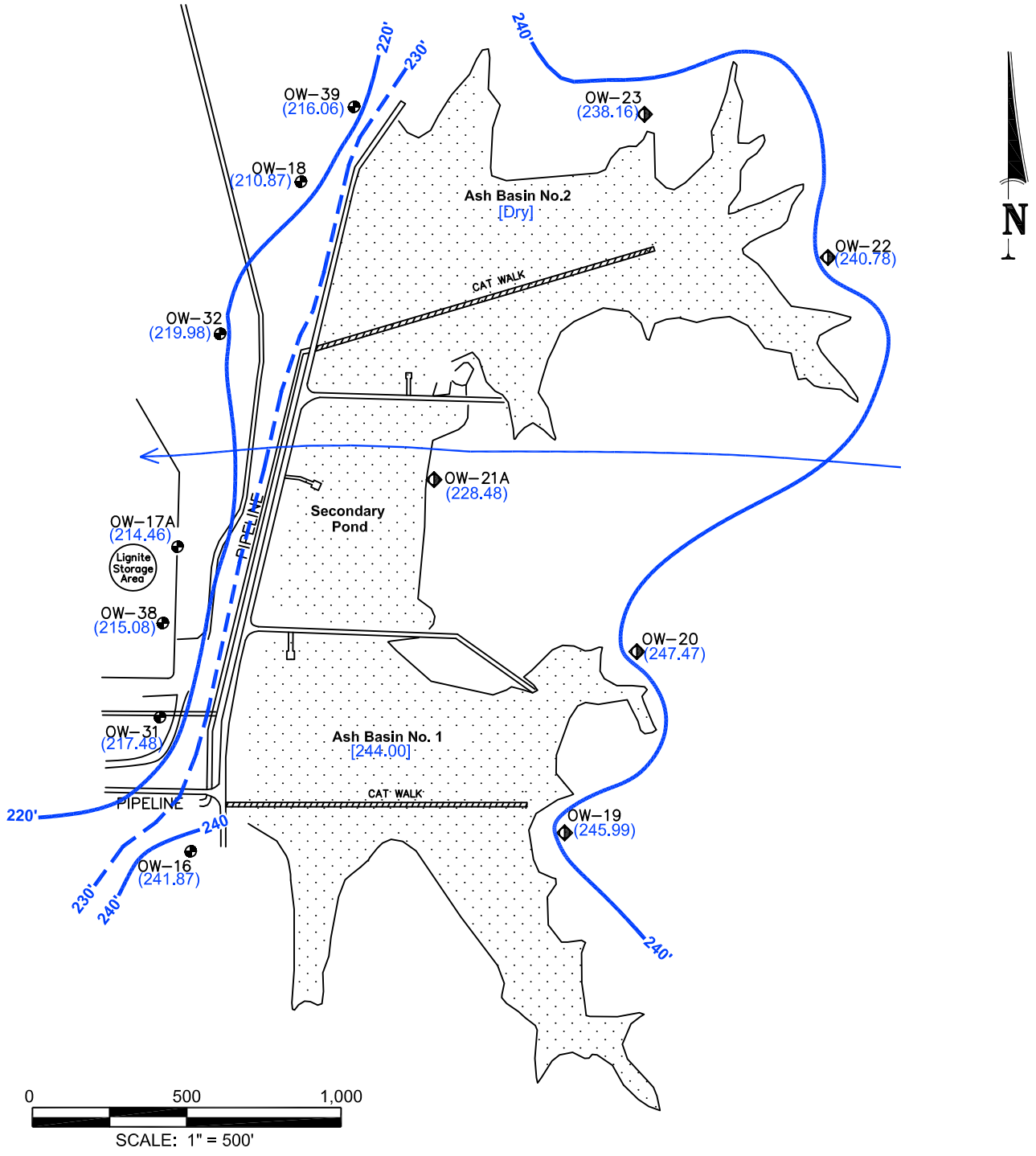
Date:	9/23/19
Dwg. No.:	01-19-0168-C001

Figure 5



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.87)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

Potentiometric Surface Map
October 2019

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

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Date:	11/19/19
Dwg. No.:	01-19-0168-D001

Figure 6

Table 1
Monitoring Well Information

Well Number	OW-16	OW-17A	OW-18	OW-19	OW-20	OW-21A
Up or Down Gradient	D	D	D	U	U	U
Ash Basin Unit Monitored	AB No. 1	AB No. 1	AB No. 2	Both	Both	Both
Latitude (dd°mm'ss")	32°03'26"	32°03'36"	32°03'47"	32°03'26"	32°01'52"	32°01'56"
Longitude (dd°mm'ss")	93°31'52"	93°31'53"	93°31'49"	93°31'52"	93°33'31"	93°33'41"
Casing Elevation (ft NGVD)	254.95	231.57	218.44	260.01	258.84	244.40
Well Depth (ft bgs)	42.0	45.3	31.5	34.1	31.8	31.9
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	217.97	194.13	194.17	230.98	234.39	219.93
Bottom of Screen (ft NGVD)	207.97	184.13	184.17	220.98	224.39	209.93
Casing Diameter & Material	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC

Well Number	OW-22	OW-23	OW-31	OW-32	OW-38	OW-39
Up or Down Gradient	U	U	D	D	D	D
Ash Basin Unit Monitored	Both	Both	AB No. 1	AB No. 2	AB No. 1	AB No. 2
Latitude (dd°mm'ss")	32°02'07"	32°02'10"	32°01'51"	32°02'05"	32°01'55"	32°02'10"
Longitude (dd°mm'ss")	93°33'22"	93°33'31"	93°33'51"	93°33'48"	93°33'50"	93°33'44"
Casing Elevation (ft NGVD)	256.98	255.55	221.71	237.65	221.60	228.96
Well Depth (ft bgs)	31.1	38.4	29.5	30.0	37.3	32.5
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	234.19	224.57	199.11	214.7	192.36	203.69
Bottom of Screen (ft NGVD)	224.19	214.57	189.11	204.7	182.36	193.69
Casing Diameter & Material	4" PVC	4" PVC	2" PVC	2" PVC	2" PVC	2" PVC

CLECO

Table 2
2019 Analytical Data Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/Date		Boron (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	pH (S.U.)	Sulfate (mg/l)	TDS (mg/l)
OW-16	3/19/19	1	490	353	0.12	7.88	2,820	4,680
	6/4/19	1.2	664 / 580*	322	0.22	6.76	2,700	4,760
	8/6/19	1.1	657	344	0.11	7.11	2,860	4,870
	10/8/19	1.1	632	320	0.18	6.57	2,640	4,660
OW-17A	3/19/19	2.1	67.6	990	0.13	7.9	31.3	1,890
	6/4/19	2.3	80.4	922	0.19	7.72	31.8	1,940
	8/6/19	2	71.5	760	0.16	7.07	35.3	2,010
	10/8/19	1.9	69.1	769	0.2	7.12	29.7	1,780
OW-18	3/19/19	0.17	8.9	32.7	0.48	8.57	<1	295
	6/4/19	0.15	11.3	37.5	0.5	6.97	<1	330
	8/6/19	0.14	12.7	39.5	0.35	7.54	<1	355
	10/8/19	0.11	11.7	37.2	0.4	6.51	<1	220
OW-19 (BG)	3/19/19	0.33	13.1	121	0.25	8.15	49.8	575
	6/4/19	0.49	13.7	125	0.29	7.25	34	690
	8/6/19	0.4	12.3	91.4	0.22	7.71	26	605
	10/8/19	0.31	10.7	77	0.28	6.79	22	330
OW-20 (BG)	3/19/19	0.22	118	145	0.4	8.43	481	995
	6/4/19	0.2	130	154	0.17	5.99	562	1,140
	8/6/19	0.2	153	171	<0.1	6.63	650	1,240
	10/8/19	0.22	163	168	<0.10	5.66	659	1,160
OW-21A (BG)	3/19/19	0.32	387	812	<0.1	7.77	1,270	3,180
	6/4/19	0.45	432	695	0.12	6.55	984	3,120
	8/6/19	0.41	315	631	<0.1	7.45	966	3,260
	10/8/19	0.33	366	549	0.1	6.64	955	2,540
OW-22 (BG)	3/19/19	0.16	153	170	0.25	8.01	340	1,230
	6/4/19	0.12	157	189	0.16	7.26	460	1,360
	8/6/19	0.12	159	177	0.14	7.85	496	1,470
	10/8/19	0.12	167	171	<0.10	6.95	550	1,420
OW-23 (BG)	3/19/19	1.8	260	489	0.12	7.95	1,820	3,700
	6/4/19	1.5	300	472	0.11	7.58	1710	3,820
	8/6/19	1.5	222	497	<0.1	7.88	1,790	3,900
	10/8/19	1.3	228	467	0.13	6.84	1,680	3,700
OW-31	3/19/19	3	81.9	2.6	0.23	7.85	<1	2,480
	6/4/19	2.8	95.2	1,330	0.23	7.55	<1	2,550
	8/6/19	2.9	90	1,370	0.18	7.87	<1	2,670
	10/8/19	2.4	81.4	1,350	0.19	7.05	<1	2,290
OW-32	3/19/19	2.2	622	557	<0.1	7.47	2,770	6,260
	6/4/19	1.7	562	445	<0.10	6.2	3,870	6,370
	8/6/19	1.7	489	469	<0.1	7.22	3,570	6,570
	10/8/19	1.6	579	514	<0.10	6.25	3,810	6,110
OW-38	3/19/19	2	18.1	206	0.51	8.44	6	745
	6/4/19	2.1	18.5	188	0.54	7.68	5.1	720
	8/6/19	2.2	19.7	199	0.49	7.28	1.1	830
	10/8/19	2	18.8	194	0.5	7.52	3.3	305
OW-39	3/19/19	0.85	556	947	0.2	7.83	31.2	7,260
	6/4/19	0.74	535	1,350	0.3	7.31	3,220	7,440
	8/6/19	0.76	433	1,400	<0.1	7.62	3,140	7,380
	10/8/19	0.7	545	1,400	0.25	6.72	3,030	6,920

* 7/17/19 resampling result.

Notes:
mg/l = milligrams per liter
S.U. = standard units

APPENDIX D

CERTIFICATION OF STATISTICAL METHODOLOGY

CLECO

DOLET HILLS POWER STATION
MANSFIELD, LOUISIANA

CERTIFICATION OF STATISTICAL METHODOLOGY

STATISTICAL ANALYSIS

Statistical evaluations of groundwater monitoring data for the permitted Coal Combustion Residuals (CCR) facilities will be performed using prediction limits per §257.93.F. These statistical evaluations will be conducted per performance criteria outlined in applicable portions of §275.93.G and the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (U.S. Environmental Protection Agency, March, 2009). The number of samples collected, the frequency of collection, and the management of non-detect data will be consistent with the statistical method selected. The data set to be considered in the statistical analysis will include data generated from the implementation of the CCR groundwater monitoring program.

The goal of the statistical evaluation is to determine if there is statistically significant evidence to show that facility operations may have adversely affected groundwater quality downgradient of the CCR facility. As shown in the decision logic flowchart for detection monitoring (Figure 1), an evaluation of upgradient well data will be performed first before determining which statistical evaluation approach will be selected. If the background wells are not impacted by a release from any CCR facility and have groundwater quality statistically similar to downgradient wells (assuming no impacts from the CCR facility in the downgradient wells), then interwell statistical evaluation will be performed. If the initial sampling results indicate that background groundwater is statistically dissimilar to downgradient groundwater, then intrawell statistical evaluation will be performed. These techniques are discussed below.

- Interwell statistical evaluations involve an upgradient/downgradient comparison to determine if there are any statistically significant increases (SSIs) between groundwater quality upgradient and groundwater quality downgradient of the CCR facility. Interwell prediction limits will be constructed from the upgradient well data and based on the distribution of that data for each parameter. If the assumption of normality is not rejected for the upgradient data set, then a parametric prediction limit will be calculated. If the assumption of normality is rejected for the upgradient data set, then a non-parametric prediction limit will be calculated, in which case, the prediction limit will be based on the highest value in the upgradient data set. The most recent result for each downgradient well for each parameter will be compared to the applicable prediction limit.

- Intrawell statistical evaluations are within well comparisons. In the case of intrawell prediction limits, historical data from within a given well for a given parameter will be used to construct a limit. Compliance points will be compared to the limit to determine whether a change is occurring on a per-well/per-parameter basis. If the assumption of normality is not rejected for the background data set, then a parametric prediction limit will be calculated. If the assumption of normality is rejected for the background data set, then a non-parametric prediction limit will be calculated, in which case, the prediction limit will be based on the highest value in the background data set. (Note that both upper and lower prediction limits will be used for intrawell evaluations of pH.)

  Intrawell limit-based tests are recommended when there is evidence of natural spatial variability in groundwater quality, particularly among unimpacted upgradient wells, as it is inappropriate to pool those data across wells for the purpose of creating interwell limits

for comparison with downgradient well data. Intrawell tests may be used at both new and existing facilities. Data used in intrawell limit-based tests will be screened for outliers, which, if found, will be removed from the background data set prior to constructing limits for each well/parameter pair.

An integral part of using prediction limits for statistical evaluation of groundwater data is the selection of a verification resampling strategy. For the Cleco Power, LLC sites, a 1/2 verification resampling strategy will be used to lower the site-wide false positive rate (SWFPR). Verification resampling is mathematically incorporated into the prediction limit calculations, which improves statistical power while maintaining the SWFPR. Note that in the event intrawell statistical evaluations are performed that verification resampling for SSIs will only be conducted for SSIs generated in downgradient wells. Intrawell statistics will be performed on all wells; however, since the goal of the statistical evaluation is to determine if there is statistically significant evidence to show that facility operations may have adversely affected groundwater quality downgradient of the CCR facility, only downgradient wells will be subject to verification resampling.

In the event that SSIs are reported, verification resampling will be conducted for the appropriate well/parameter pairs. If SSIs are confirmed through verification resampling, the timelines listed in either §257.94.E.1 or §257.94.E.2 will be followed.

CERTIFICATION

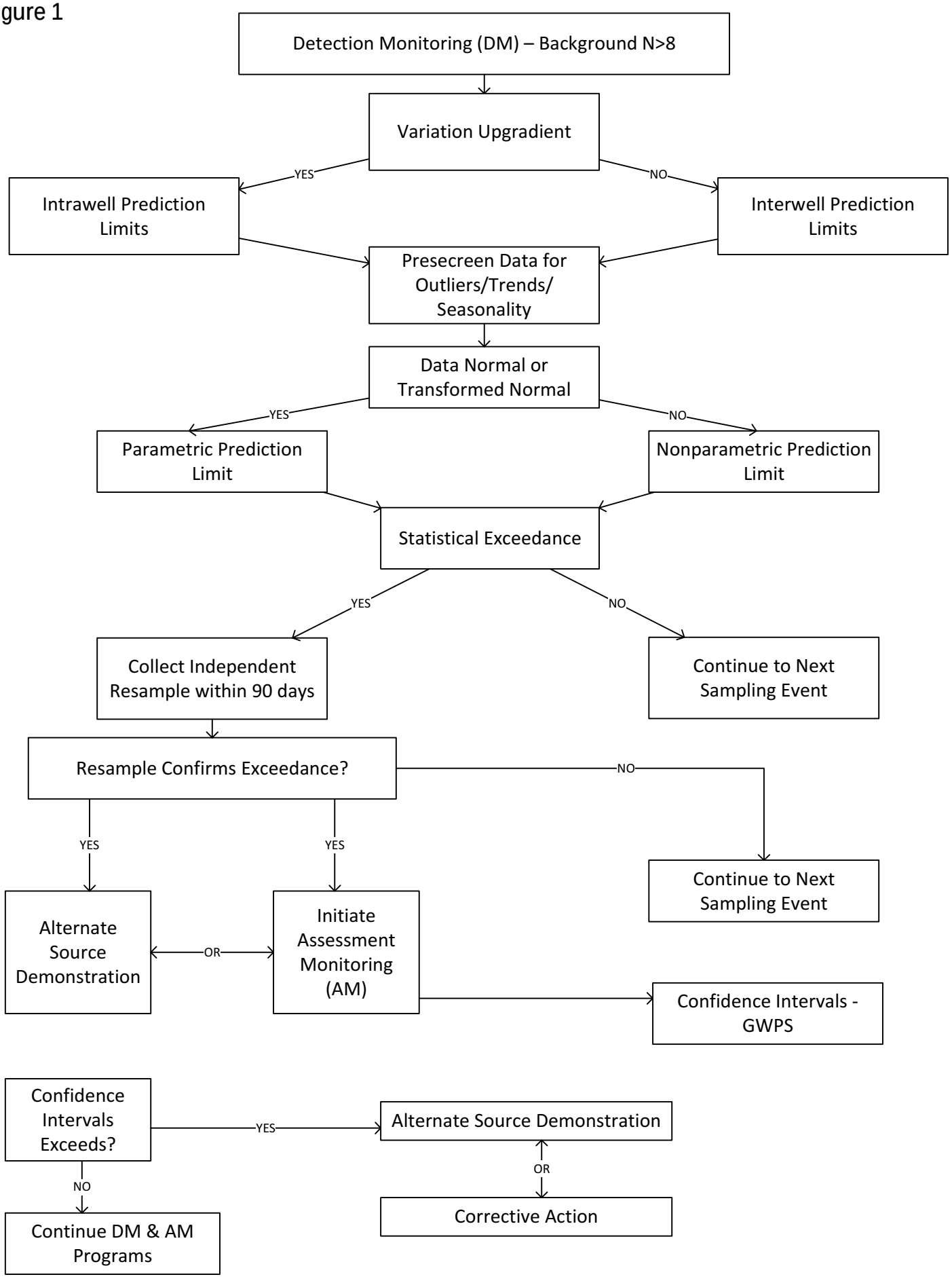
I hereby certify that the selected statistical methodology as described above is appropriate for evaluating the groundwater monitoring data for the CCR management areas at the Cleco Power, LLC Dolet Hills Power Station. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.

_____, P.E.

Date: 10/12/17

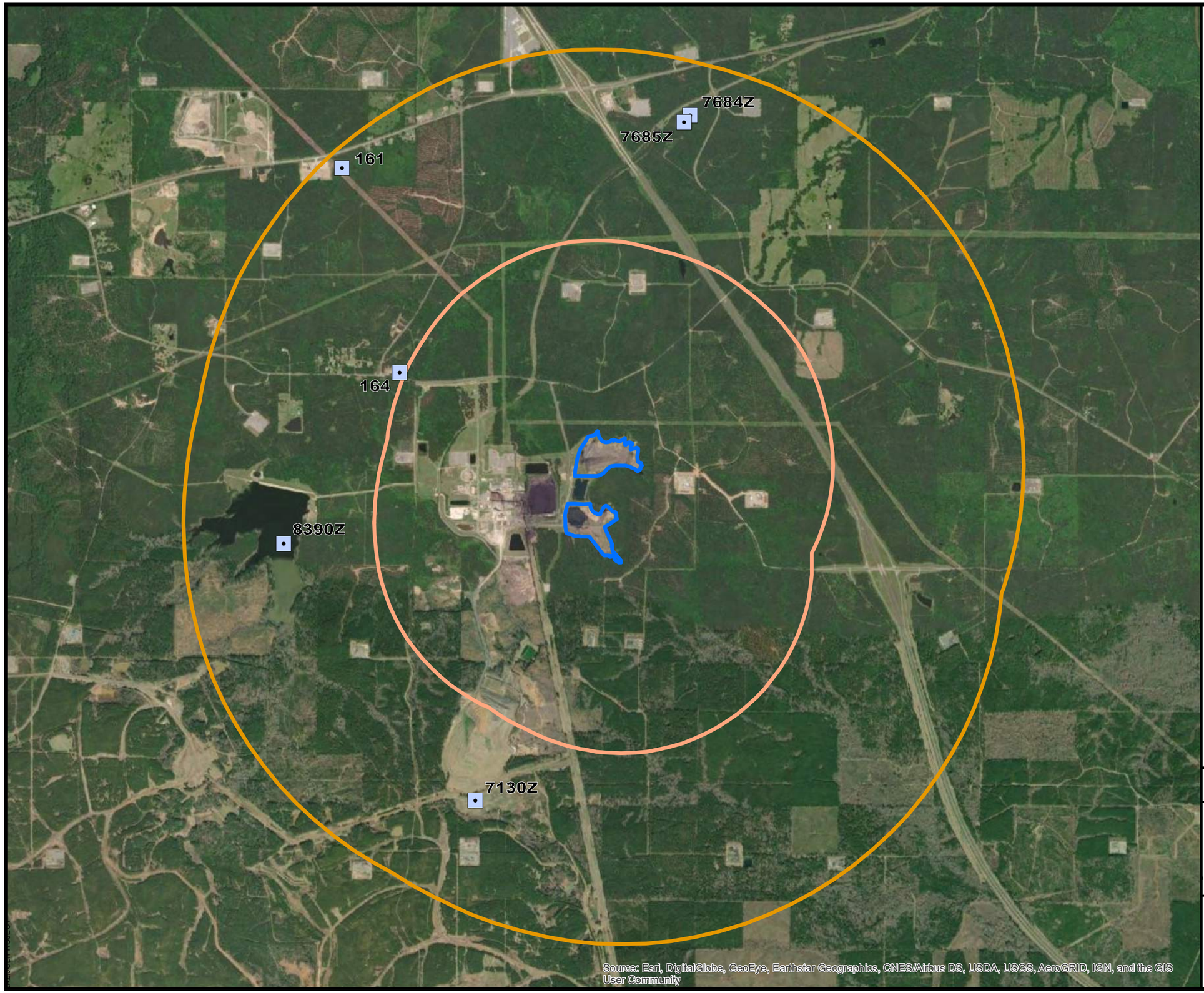
Louisiana Registration No.: 27124

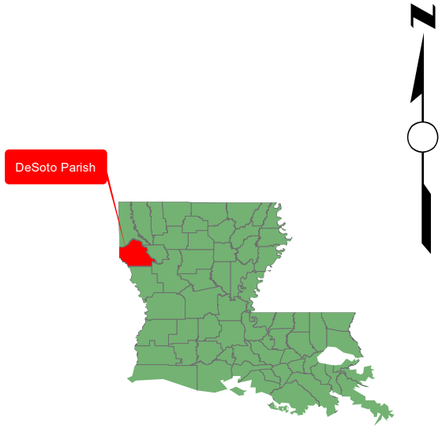
Figure 1


Detection Monitoring (DM) – Background N>8
Variation Upgradient
YES
NO
Intrawell Prediction Limits
Interwell Prediction Limits
Presecreen Data for Outliers/Trends/ Seasonality
Data Normal or Transformed Normal
YES
NO
Parametric Prediction Limit
Nonparametric Prediction Limit
Statistical Exceedance
YES
NO
Collect Independent Resample within 90 days
Continue to Next Sampling Event
Resample Confirms Exceedance?
NO
YES
YES
Continue to Next Sampling Event
Alternate Source Demonstration
OR
Initiate Assessment Monitoring (AM)
Confidence Intervals - GWPS
Confidence Intervals Exceeds?
YES
Alternate Source Demonstration
OR
NO
Corrective Action
Continue DM & AM Programs

APPENDIX E

WATER USE SURVEY





N

Legend

- Domestic Well
- Ash Basins
- One Mile Radius
- Two Mile Radius

Reference

Registered water well data from Louisiana SONRIS data source in 2020.

Feet
0 1,500 3,000 6,000

CLECO Corporation

Dolet Hills Power Station

Domestic Wells within Two Mile Radius of Ash Basins

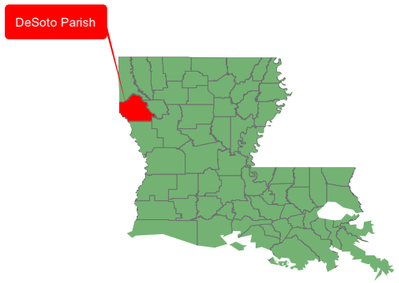
DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	10/16/20
Dwg. No.:	01-20-0221-APP-E-1

Figure E-1

Dolet Hills Power Station



N

Legend

- Intake Pipeline
- Makeup Pipeline
- Discharge Pipeline

0 1 2 4 6 Miles

CLECO Corporation

Dolet Hills Power Station

Pipeline Locations Map

DeSoto Parish, Louisiana

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Checked:	RS
Approved:	RS
Date:	11/5/20
Dwg. No.:	01-20-0221-APP-E-2

Figure E-2

Water Well Survey Results

Please note: Discrepancies are common between the former Louisiana Department of Transportation and Development (LDOTD) database and the current LDNR database regarding the exact locations of the permitted water wells. The locations of some water wells may appear to be in error due to rounding of latitude and longitude positions or other sources of inaccuracy. Another consideration is that this database only includes registered water wells, and usage description information is only as accurate as was provided by the owners/drillers. No attempt was made to confirm the exact locations of wells located a distance beyond a one-mile radius of the Ash Basins at DHPS or the underlying geologic units.

CHAPTER 4.0

Appendices

A Owner's Certification
B Ash Basins - Monitoring Well Information/Monitoring Well Network Certification
C Ash Basins - Soil Boring Logs
D Ash Basins - Potentiometric Surface Maps
E Ash Basins - Groundwater Quality Data
F Ash Basins - Site Hydrogeology and Geologic Cross Sections
G Ash Basins - Structural Stability Assessment
H Ash Basins - Safety Factor Assessment
I Landfill - Monitoring Well Information/Monitoring Well Network Certification
J Landfill - Soil Boring Logs
K Landfill - Potentiometric Surface Maps
L Landfill - Groundwater Quality Data
M Landfill - Site Hydrogeology and Geologic Cross Sections

November 30, 2020

CLECO

APPENDIX A

OWNER'S CERTIFICATION

OWNER'S CERTIFICATION OF COMPLIANCE
40 C.F.R. § 257.103(f)(2)(v)(C)(1)

I hereby certify that, based on the information provided to me by and inquiry of the persons immediately responsible for compliance with the CCR rule, the Dolet Hills Power Station (DHPS) facility, including the Ash Basins 1 and 2, is in compliance with 40 C.F.R. Part 257, Subpart D—Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. Cleco's CCR Rule Compliance Website is up-to-date and contains all necessary documentation and notifications.

Shane Hilton — 11-4-20

Shane Hilton
President, Cleco Power LLC

Date

APPENDIX B

ASH BASINS 1 AND 2

MONITORING WELL INFORMATION / MONITORING WELL NETWORK CERTIFICATION

CLECO

DOLET HILLS POWER STATION
MANSFIELD, LOUISIANA

ASH BASINS MONITORING WELL NETWORK CERTIFICATION

MONITORING WELL NETWORK

1.0 Introduction

The U.S. Environmental Protection Agency (EPA) published a final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The rule applies to the Cleco Power LLC Dolet Hills Power Station (DHPS). A site location map is provided in Figure 1. DHPS has two permitted impoundments that accept CCR: Ash Basin No. 1 and Ash Basin No. 2, as shown in Figure 2.

The CCR Rule, 40 CFR Subpart D-Standards for the Disposal of CCRs, Section §257.91 requires a groundwater monitoring system that consists of sufficient number of wells at appropriate locations and depths based on site-specific technical information, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of both background groundwater, and groundwater passing the boundary of the CCR unit; and
- Monitor potential contaminant pathways.

The groundwater monitoring system for the DHPS Ash Basins meets those requirements, as described below.

2.0 Site Hydrogeology Summary

Geologic evaluation of the near-surface stratigraphy underlying DHPS indicates the presence of four distinct permeable zones. These are referred to as Zone 1, Zone 2, Zone 3, and Zone 4 corresponding with descending depth at the site. Borehole geophysical logging at the site revealed distinctive characteristics for these zones in the subsurface. Correlation of these zones to the regional stratigraphic descriptions (Murray, 1948) suggests that Zone 1 correlates with the Dolet Hills formation, and Zones 2, 3, and 4 correlate with sandy units of the Naborton formation. Evaluation of the geophysical logs indicated distinctive marker beds that included these permeable zones as well as the Chemard Lake lignite lentil, minor lignite beds, and the less permeable deposits of the underlying Porters Creek formation. The Chemard Lake lignite was not present in the area of the solid waste surface impoundments.

The Paleocene Dolet Hills formation consists of very fine- to fine-grained, gray, relatively clean, massive quartz sands (Snider, 1982 and Murray, 1948). Locally some sands are fine- to medium-grained and have some clay and silt lenses. The Dolet Hills formation contains sands that range from 120 to 160 feet in thickness (Snider, 1982). The Dolet Hills formation is transitional with the underlying Naborton formation.

The Paleocene Naborton formation underlies the Dolet Hills sands in the study area. The Naborton formation consists chiefly of gray and buff sandy, clayey lignitic silts containing some lignitic clay and lignite beds (Page and Preé, 1964). The formation contains large limonitic and calcareous concretions. The thickness ranges between 140 to 170 feet and the average thickness is about 160 feet (Snider, 1982).

Underlying the Naborton formation is the Porters Creek formation. The Paleocene Porters Creek formation consists of lignitic and limey shales and clays with occasional calcareous concretions. The formation averages in thickness from 500 to 600 feet. The contact with the overlying Naborton formation is transitional from silty clays into sands and silts and is usually chosen below the least dominantly sandy unit in drill cuttings and on geophysical logs (Murray, 1948).

Murray, G.E., 1948. Geology of DeSoto and Red River Parishes, Geological Bulletin No. 25, Louisiana Geological Survey, Baton Rouge, Louisiana.

Page, L.V. and H.L. Preé, Jr., 1964. Water Resources of DeSoto Parish Louisiana, Geological Survey Water-Supply Paper 1774, United States Geological Survey, United States Government Printing Office, Washington D.C.

Snider, J.L., 1982. Premining Hydrology of the Lignite Area in Southeastern DeSoto Parish, Louisiana, Water Resources Technical Report No. 29, United States Geological Survey, Louisiana Department of Transportation and Development, Baton Rouge, Louisiana.

3.0 Groundwater Monitoring System

Groundwater monitoring wells have been installed in the uppermost, laterally continuous water bearing zone present beneath the CCR impoundments at DHPS (Zone 4). It should be noted that Zones 1, 2, and 3 are not present in these areas and have been eroded away. The background monitoring well network has been installed upgradient of the Ash Basins. Monitoring well information is included in Table 1, and the monitoring well locations are provided in Figure 2.

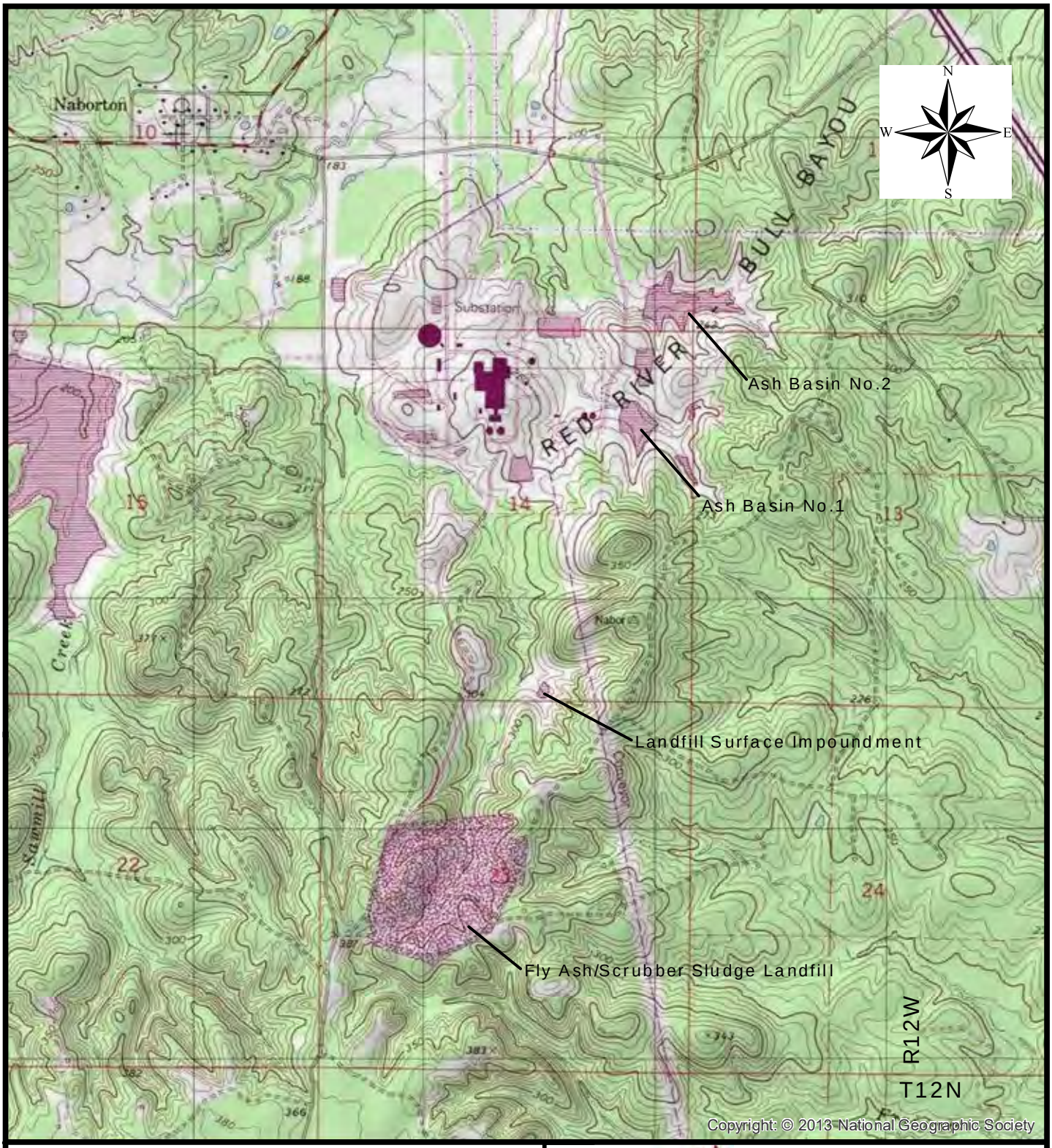
CERTIFICATION

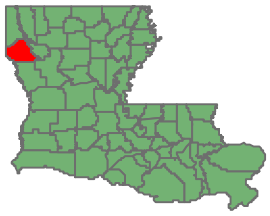
I hereby certify that the groundwater monitoring system described in this report for the Dolet Hills Power Station, owned and operated by Cleco Power, LLC, has been designed and constructed to meet the requirements of the Coal Combustion Residual Rule 40 CFR §257.91. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.

_____, P.E.

Date: 3/7/17

Louisiana Registration No.: 27124





0 750 1,500 3,000 4,500 Feet

Note:

U.S.G.S. Quadrangle "Bayou Pierre Lake, LA" at scale 1:24,000

CLECO Corporation

Dolet Hills Power Station

Site Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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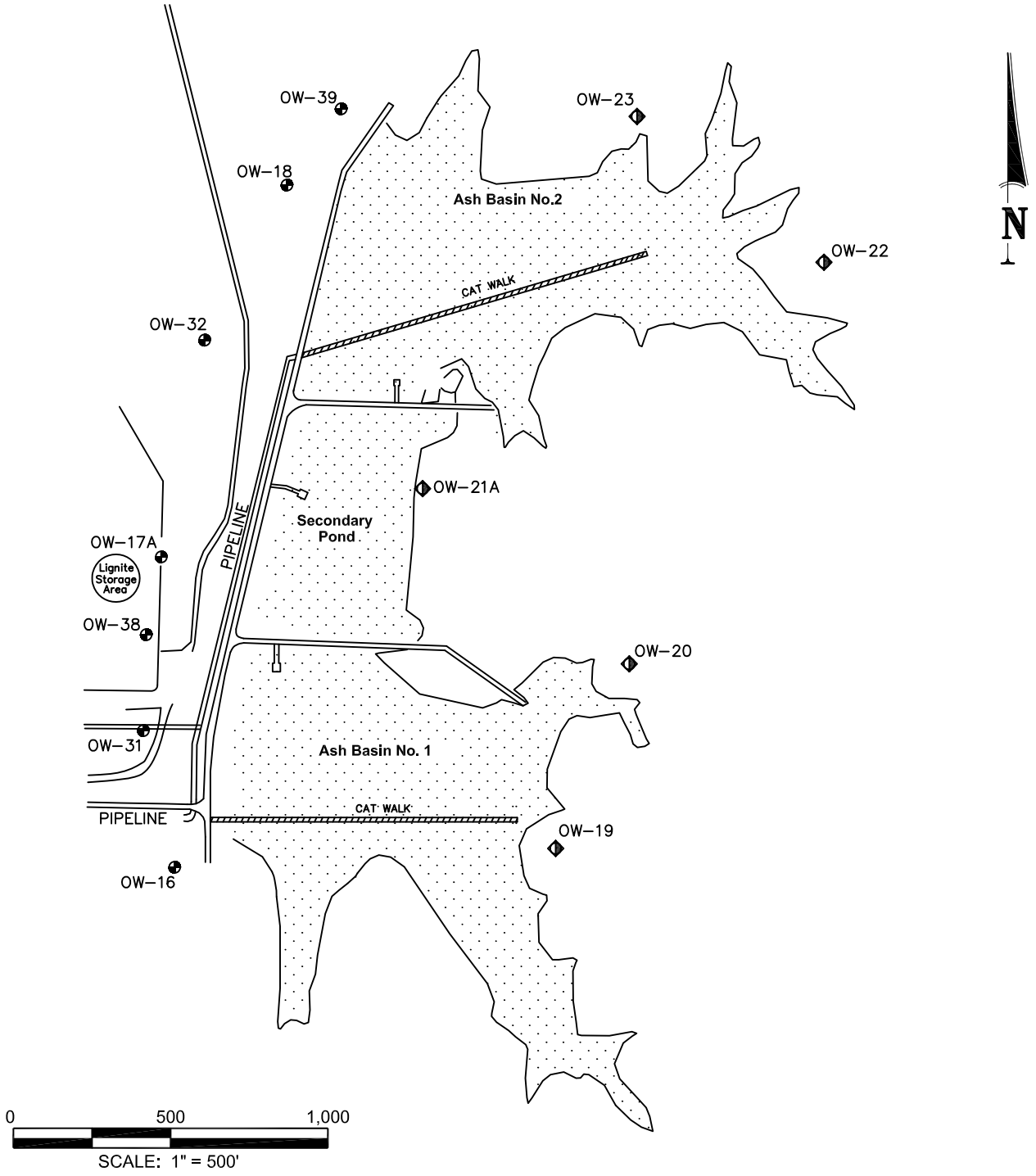
Checked:	RS
Approved:	JM
Date:	3/23/17
Dwg. No.:	01-17-0168-C001

FIGURE 1



Legend

- OW–16 — Zone 4 Compliance Monitoring Well Location
- OW–23 — Zone 4 Background Monitoring Well Location
- Permitted Facility

CLECO Corporation

Dolet Hills Power Station

Zone 4 Monitoring Wells Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	10/4/16
Dwg. No.:	01-16-0159-A004

Figure 2

Table 1
Monitoring Well Information

Well Number	OW-16	OW-17A	OW-18	OW-19	OW-20	OW-21A
Up or Down Gradient	D	D	D	U	U	U
Latitude (dd°mm'ss")	32°03'26"	32°03'36"	32°03'47"	32°03'26"	32°01'52"	32°01'56"
Longitude (dd°mm'ss")	93°31'52"	93°31'53"	93°31'49"	93°31'52"	93°33'31"	93°33'41"
Casing Elevation (ft NGVD)	254.95	231.57	218.44	260.01	258.84	244.40
Well Depth (ft bgs)	41.95	45.32	31.51	34.12	31.8	31.9
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	217.97	194.13	194.17	230.98	234.39	219.93
Bottom of Screen (ft NGVD)	207.97	184.13	184.17	220.98	224.39	209.93
Casing Diameter & Material	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC

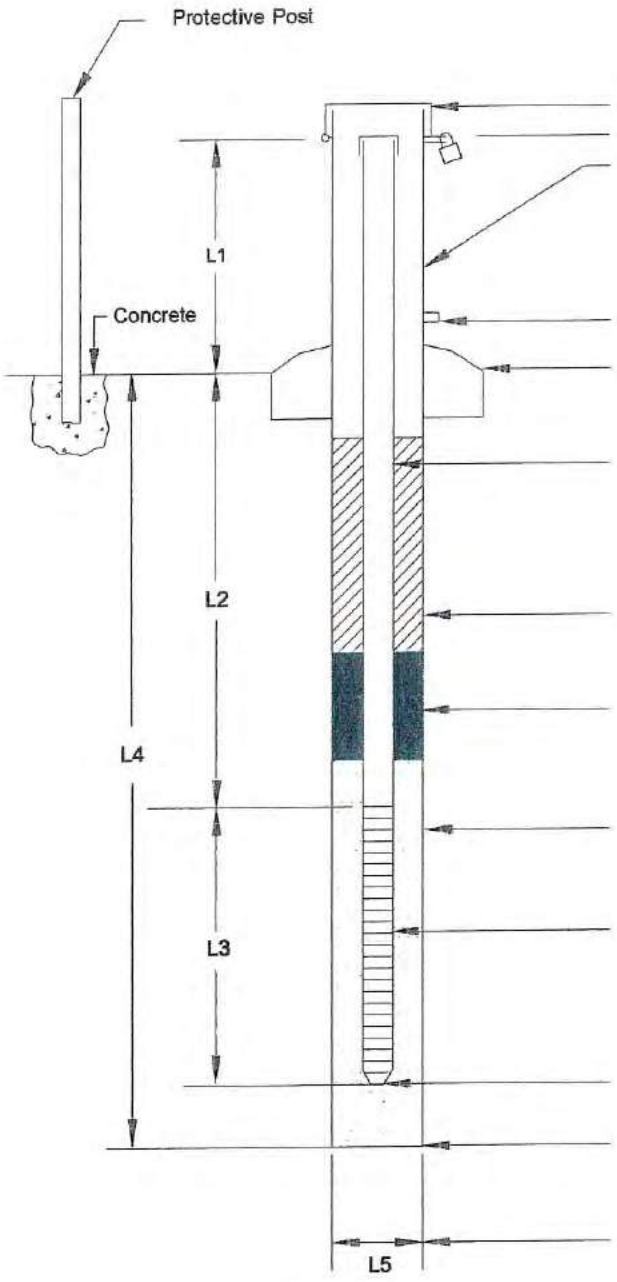
Well Number	OW-22	OW-23	OW-31	OW-32	OW-38	OW-39
Up or Down Gradient	U	U	D	D	D	D
Latitude (dd°mm'ss")	32°02'07"	32°02'10"	32°01'51"	32°02'05"	32°01'55"	32°02'10"
Longitude (dd°mm'ss")	93°33'22"	93°33'31"	93°33'51"	93°33'48"	93°33'50"	93°33'44"
Casing Elevation (ft NGVD)	256.98	255.55	221.71	237.65	221.60	228.96
Well Depth (ft bgs)	31.1	38.42	29.54	29.98	37.3	32.5
Screen Length (ft)	10	10	10	10	10	10
Top of Screen (ft NGVD)	234.19	224.57	199.11	214.7	192.36	203.69
Bottom of Screen (ft NGVD)	224.19	214.57	189.11	204.7	182.36	193.69
Casing Diameter & Material	4" PVC	4" PVC	2" PVC	2" PVC	2" PVC	2" PVC

APPENDIX C

ASH BASINS 1 AND 2

MONITORING WELLS DETAILS AND SOIL BORING LOGS

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	254.95 ft NGVD
Protective Casing and Concrete	neat cement
Casing Material	
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	31.95'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	41.95'
Depth To Bottom Of Filter Sand	41.95'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: **OW-16**

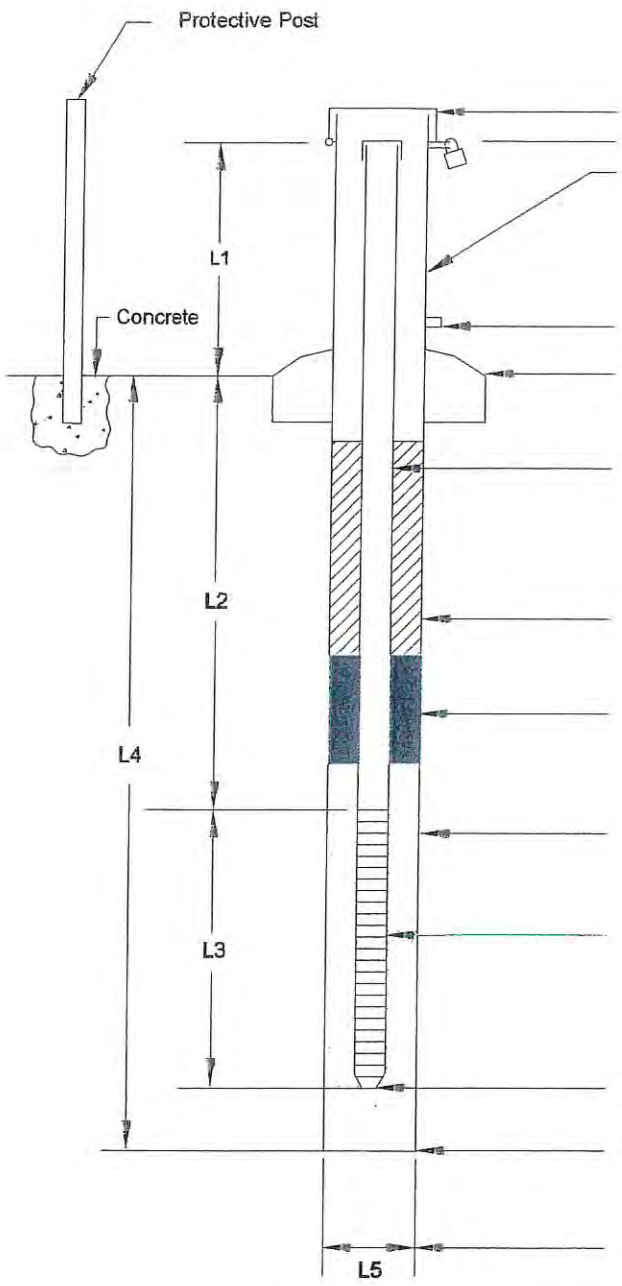
Diagram Not To Scale

L1 = 5.03 Ft
L2 = 31.95 Ft
L3 = 10 Ft
L4 = 41.95 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de016

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	231.57 ft NGVD
Protective Casing and Concrete	
Casing Material	neat cement
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	35.32'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	45.32'
Depth To Bottom Of Filter Sand	45.32'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: **OW-17A**

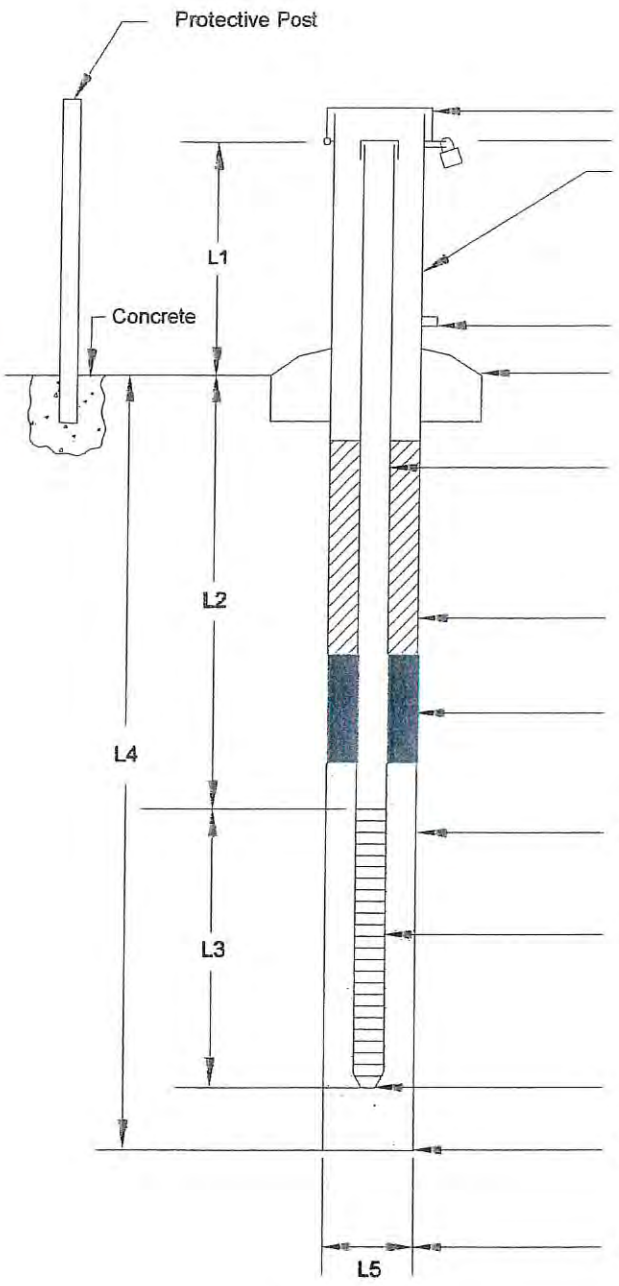
Diagram Not To Scale

L1 = 2.12 Ft
L2 = 35.32 Ft
L3 = 10 Ft
L4 = 45.32 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de017

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	218.44 ft NGVD
Protective Casing and Concrete	
Casing Material	neat cement
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	21.51'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	31.51'
Depth To Bottom Of Filter Sand	31.51'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: **OW-18**

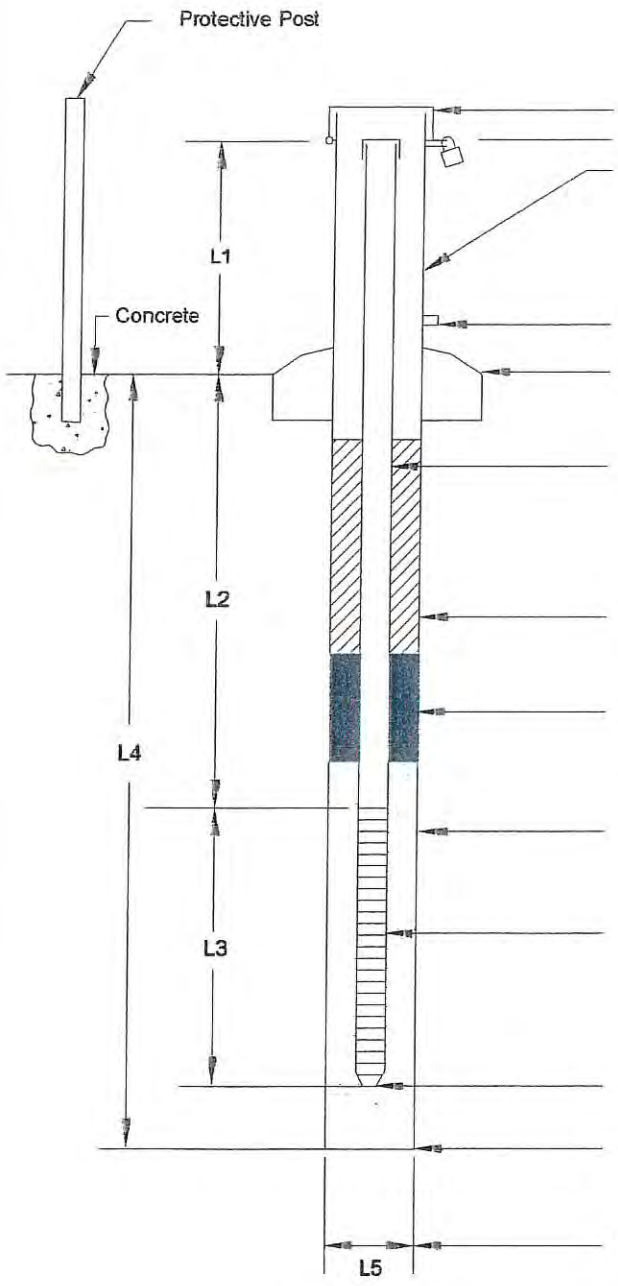
Diagram Not To Scale

L1 = 2.76 Ft
L2 = 21.51 Ft
L3 = 10 Ft
L4 = 31.51 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de018

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	260.01 ft NGVD
Protective Casing and Concrete	neat cement
Casing Material	
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	24.12'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	34.12'
Depth To Bottom Of Filter Sand	34.12'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: OW-19

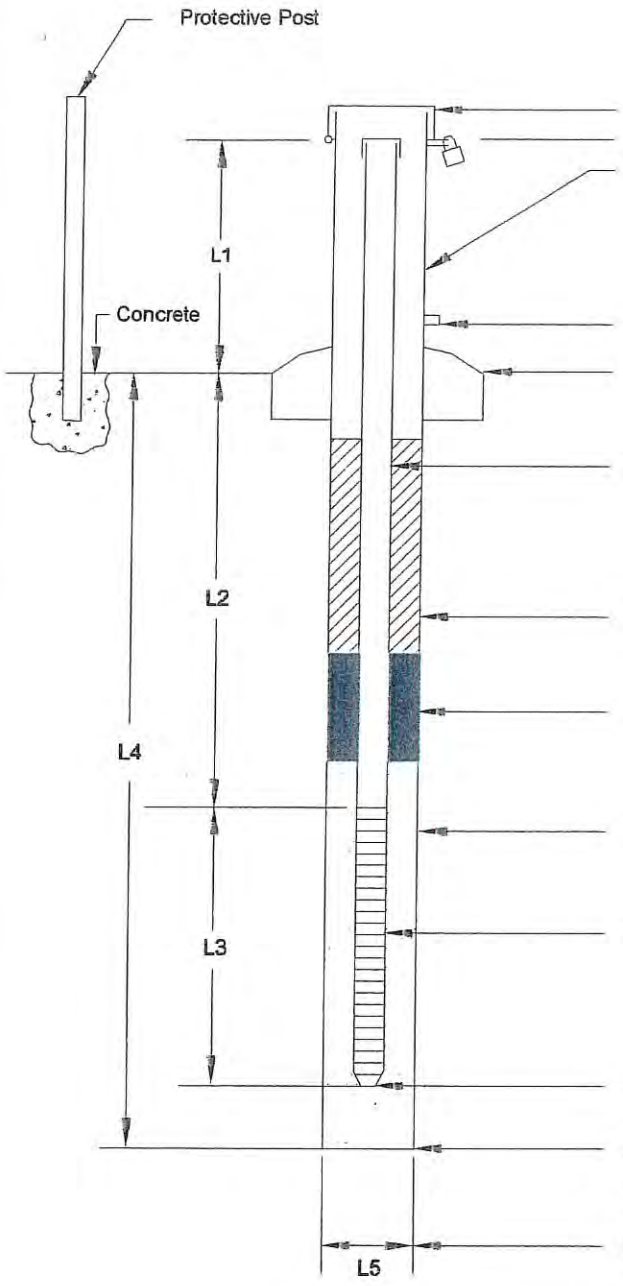
Diagram Not To Scale

L1 = 4.91 Ft
L2 = 24.12 Ft
L3 = 10 Ft
L4 = 34.12 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de019

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	258.84 ft NGVD
Protective Casing and Concrete	neat cement
Casing Material	
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	21.80'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	31.80'
Depth To Bottom Of Filter Sand	31.80'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: **OW-20**

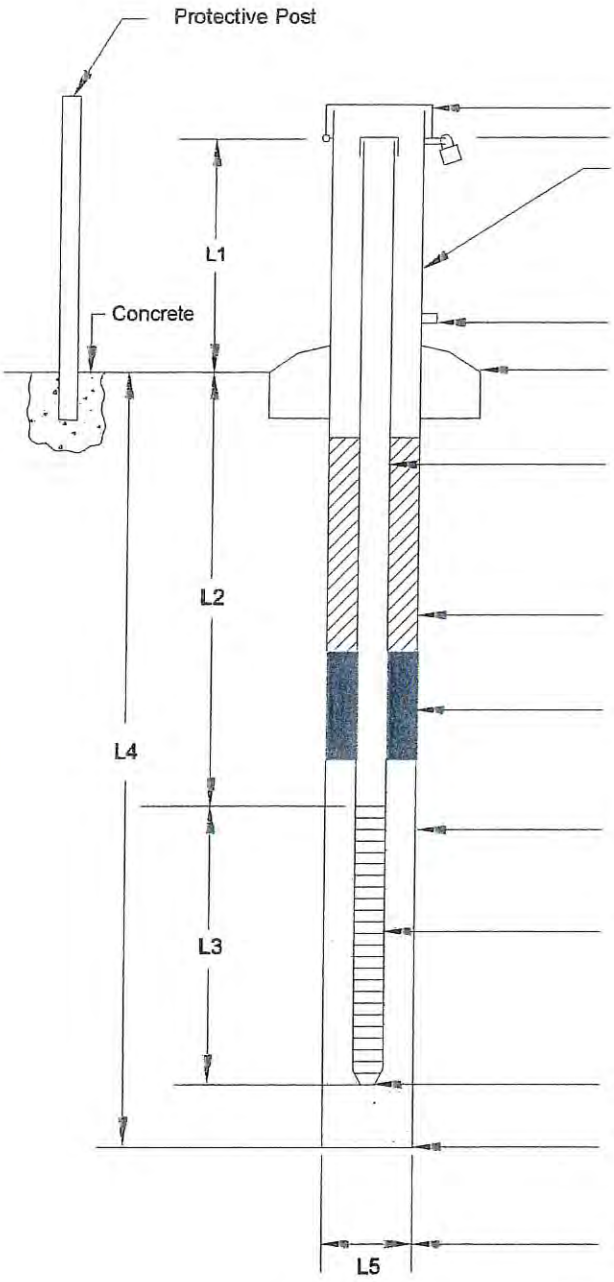
Diagram Not To Scale

L1 = 2.65 Ft
L2 = 21.80 Ft
L3 = 10 Ft
L4 = 31.80 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de020

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	244.40 ft NGVD
Protective Casing and Concrete	
Casing Material	neat cement
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	21.90'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	31.90'
Depth To Bottom Of Filter Sand	31.90'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: OW-21

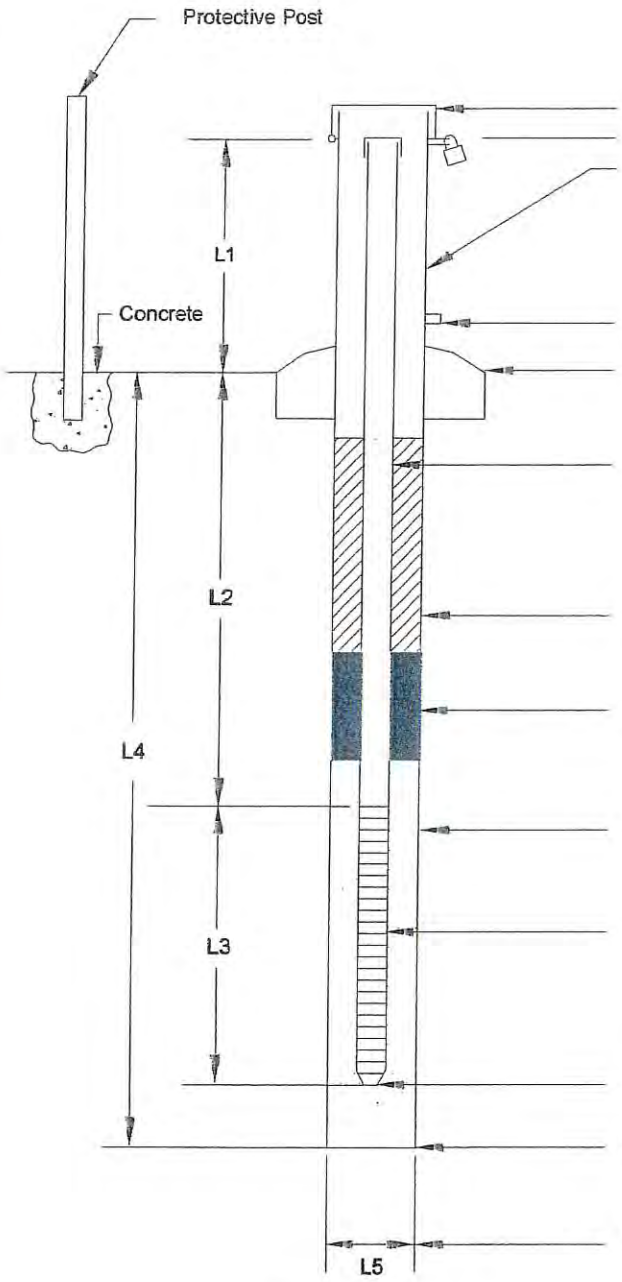
Diagram Not To Scale

L1 = 2.57 Ft
L2 = 21.90 Ft
L3 = 10 Ft
L4 = 31.90 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de021

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	256.98 ft NGVD
Protective Casing and Concrete	
Casing Material	neat cement
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	21.10'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	31.10'
Depth To Bottom Of Filter Sand	31.10'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: OW-22

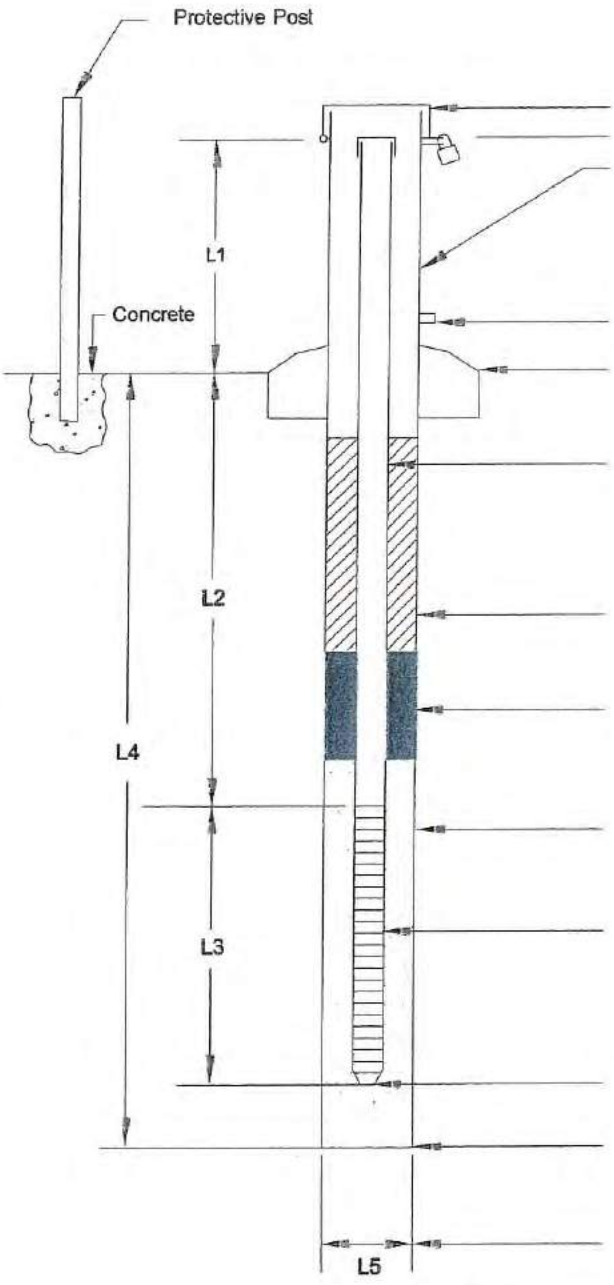
Diagram Not To Scale

L1 = 1.69 Ft
L2 = 21.10 Ft
L3 = 10 Ft
L4 = 31.10 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de022

Monitoring Well Construction Diagram
Above Grade Well



Cross-Sectional View

Lockable Cap	
Casing Elevation	255.55 ft NGVD
Protective Casing and Concrete	neat cement
Casing Material	
Casing Diameter	8"
Casing Length	4"
Pad Dimensions	4'x4'
Height Above Ground	flush
Drain with Threaded Plug	
Concrete Slab	
Well Casing	
Material	PVC
Diameter	4"
Joint Type	flush thread
Length	28.42'
Backfill Around Casing	
Material	neat cement
Seal	
Type Of Seal	bentonite
Filter Pack	
Type Of Filter	sand pack
Well Screen	
Screen Material	PVC
Diameter	4"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	38.42'
Depth To Bottom Of Filter Sand	38.42'
Diameter Of Borehole	10"

Project: Dolet Hills Power Station

Project No: 01-0008

Monitoring Well: OW-23

Diagram Not To Scale

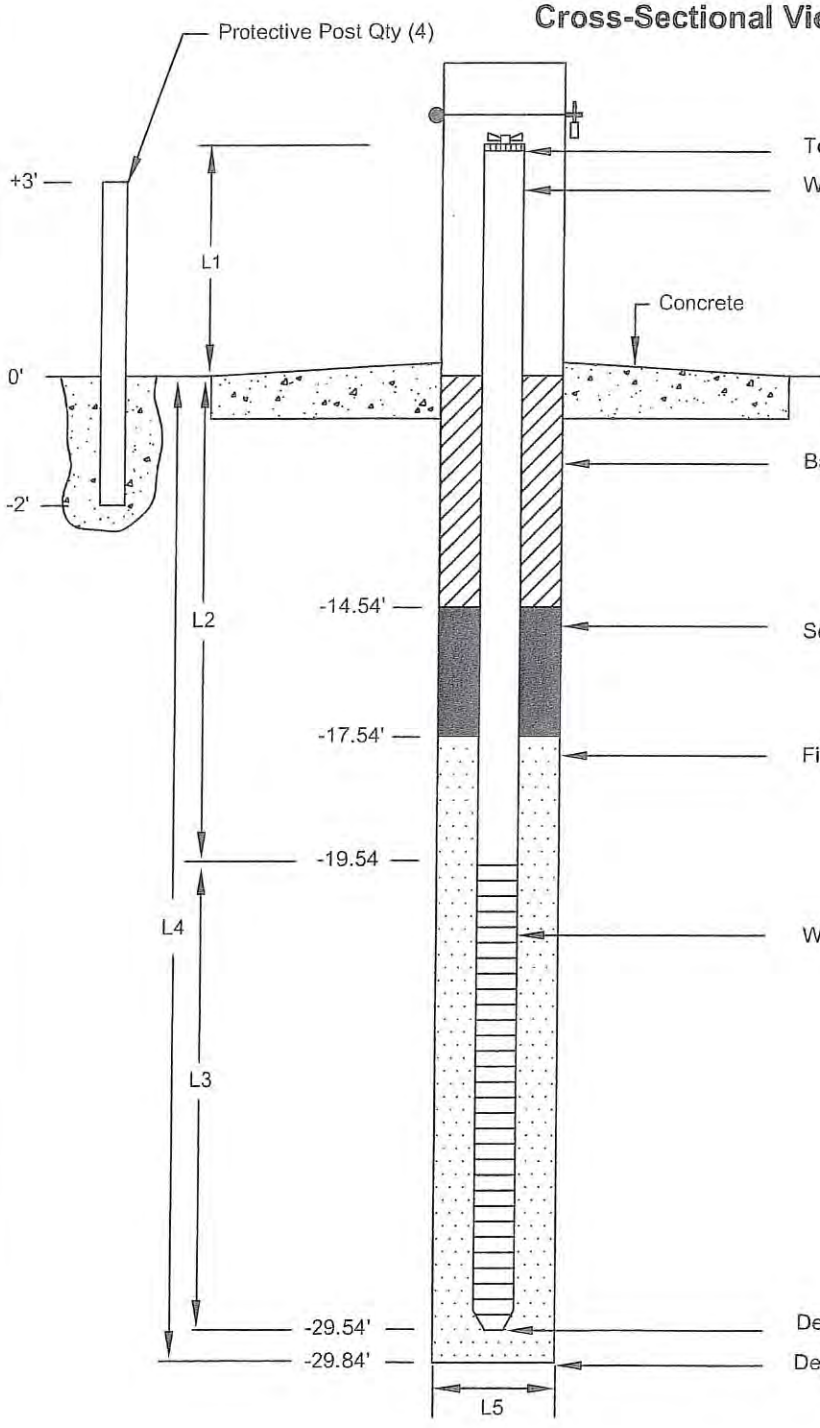
L1 = 2.56 Ft
L2 = 28.42 Ft
L3 = 10 Ft
L4 = 38.42 Ft
L5 = 0.83 Ft

CLECO

File No: 01-0008-de023

Monitoring Well - OW-31

Monitoring Well Construction Diagram
Above Grade Well
Cross-Sectional View



Top of Casing	221.71 Ft. NGVD
Well Casing	
Material	PVC
Diameter	2"
Joint Type	Flush Thread
Length	22.6'
Ground Surface	218.65 Ft. NGVD
Backfill Around Casing	
Material	Cement-Bentonite Grout
Thickness	14.54' Thick
Seal	
Type Of Seal	Bentonite Pellet Crumbles
Thickness	3'
Filter Pack	
Type Of Filter	Sand Pack with
Distance Above Screen	2' Fine Sand
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	29.54' bgs
Depth To Bottom Of Filter Sand	29.84' bgs

Project: Cleco - Dolet Hills

Project No: 01-09-0057

Monitoring Well: **OW-31**

Diagram Not To Scale

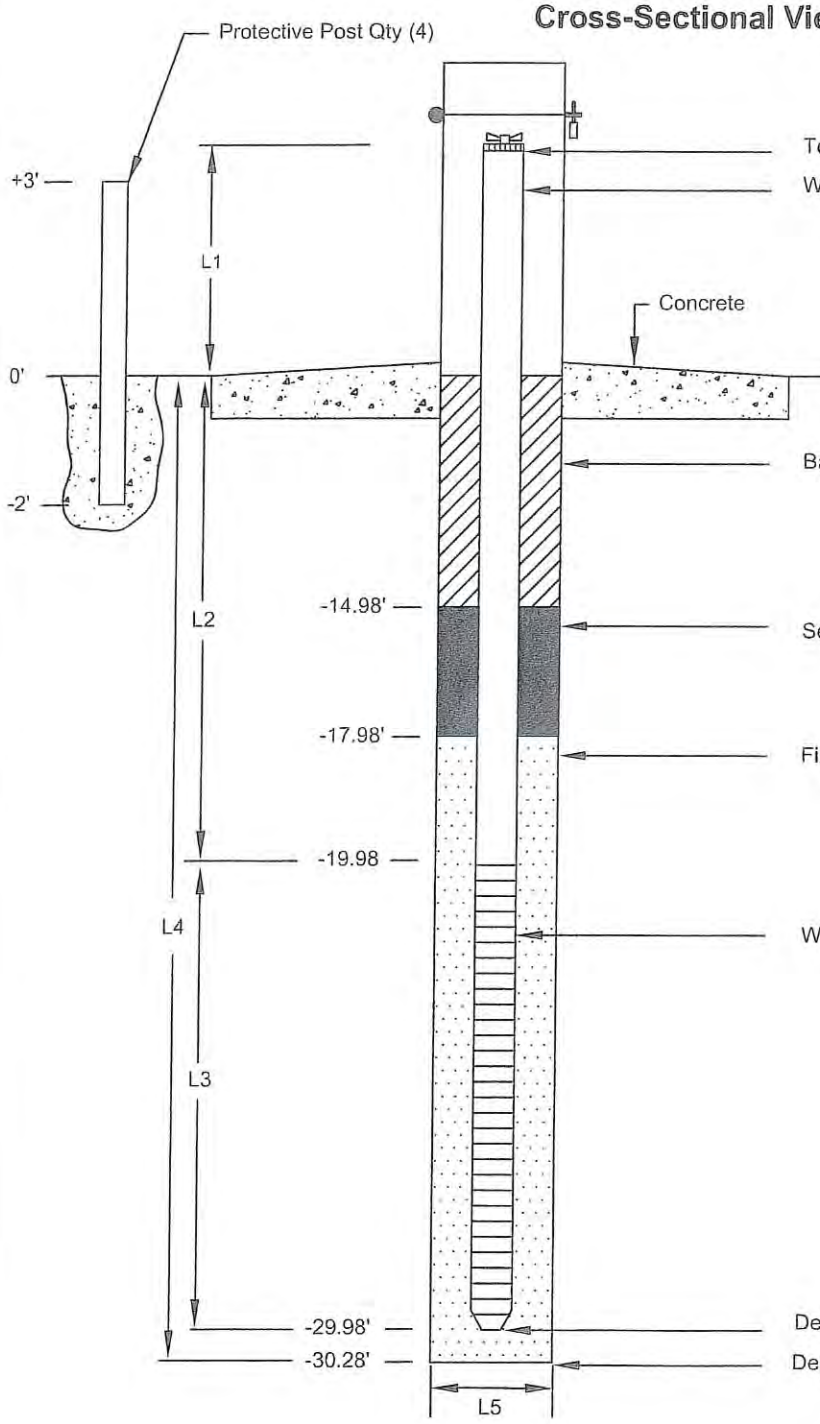
L1 = 3.06 Ft
L2 = 19.54 Ft
L3 = 10 Ft
L4 = 29.84 Ft
L5 = 0.667 Ft.

CLECO

File No: 01-09-0057-B001

Monitoring Well - OW-32

Monitoring Well Construction Diagram
Above Grade Well
Cross-Sectional View



Top of Casing	237.65 Ft. NGVD
Well Casing	
Material	PVC
Diameter	2"
Joint Type	Flush Thread
Length	22.95'
Ground Surface	234.68 Ft. NGVD
Backfill Around Casing	
Material	Cement-Bentonite Grout
Thickness	14.98' Thick
Seal	
Type Of Seal	Bentonite Pellet Crumbles
Thickness	3'
Filter Pack	
Type Of Filter	Sand Pack with
Distance Above Screen	2' Fine Sand
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	29.98' bgs
Depth To Bottom Of Filter Sand	30.28' bgs

Project: Cleco - Dolet Hills

Project No: 01-09-0057

Monitoring Well: **OW-32**

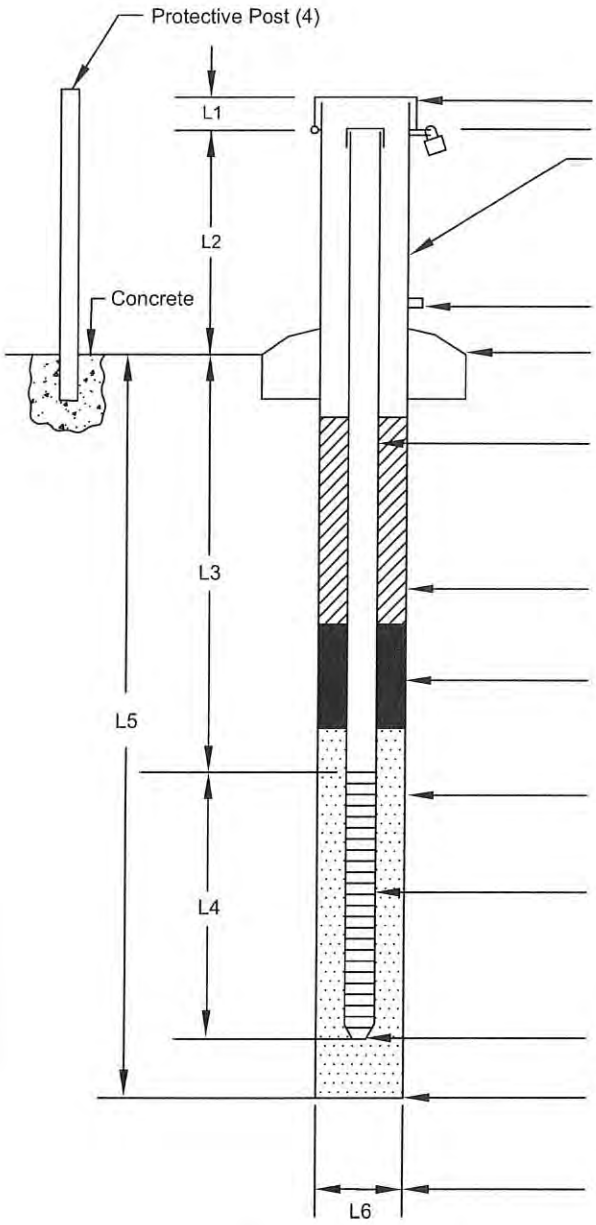
Diagram Not To Scale

L1 = 2.97 Ft
L2 = 19.98 Ft
L3 = 10 Ft
L4 = 30.28 Ft
L5 = 0.667 Ft.

CLECO

File No: 01-09-0057-B002

Monitoring Well Construction Diagram
Above Grade Well
OW-38



Cross-Sectional View

Lockable Cap	
Casing Elevation	221.60 ft NAVD88
Protective Casing and Concrete	
Casing Material	neat cement
Casing Diameter	8"
Casing Length	1.7'
Pad Dimensions	3'x3'
Height Above Ground	1.7'
Drain with Threaded Plug	
Concrete Slab Elevation	219.66 ft NAVD 88
Well Casing	
Material	PVC
Diameter	2"
Joint Type	flush thread
Length	27.3'
Backfill Around Casing	
Material	neat cement
Thickness	22.0'
Seal	
Type Of Seal	bentonite
Thickness	3'
Filter Pack	
Type Of Filter	sand pack
Distance Above Screen	2'
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	37.3'
Depth To Bottom Of Filter Sand	40'
Diameter Of Borehole	8"

Project: Dolet Hills Power Station

Project No: 01-16-0161

Monitoring Well: **OW-38**

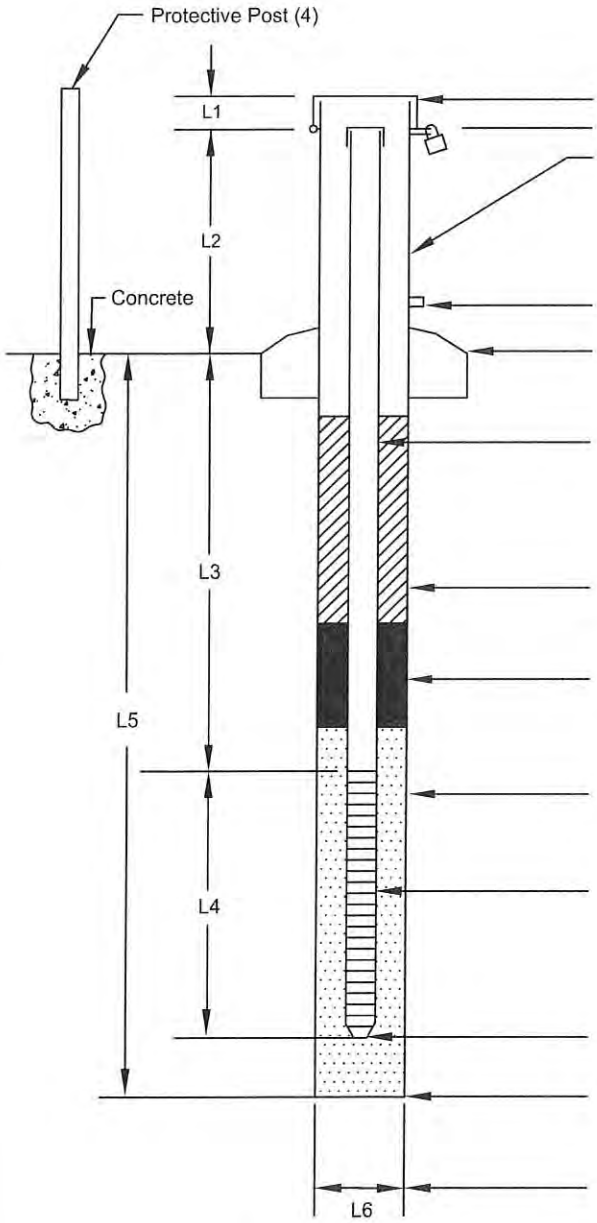
Diagram Not To Scale

L1 = 0.25 Ft
L2 = 1.7 Ft
L3 = 27.3 Ft
L4 = 10 Ft
L5 = 40 Ft
L6 = 0.75 Ft

CLECO

File No: 01-16-0161-OW-38

Monitoring Well Construction Diagram
Above Grade Well
OW-39



Lockable Cap	
Casing Elevation	228.96 ft NAVD88
Protective Casing and Concrete	neat cement
Casing Material	
Casing Diameter	8"
Casing Length	2.3'
Pad Dimensions	3'x3'
Height Above Ground	2.3'
Drain with Threaded Plug	
Concrete Slab Elevation	226.19 ft NAVD 88
Well Casing	
Material	PVC
Diameter	2"
Joint Type	flush thread
Length	22.5'
Backfill Around Casing	
Material	neat cement
Thickness	17.5'
Seal	
Type Of Seal	bentonite
Thickness	3'
Filter Pack	
Type Of Filter	sand pack
Distance Above Screen	2'
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Of Monitoring Well	32.5'
Depth To Bottom Of Filter Sand	35'
Diameter Of Borehole	8"

Cross-Sectional View

Project: Dolet Hills Power Station

Project No: 01-16-0161

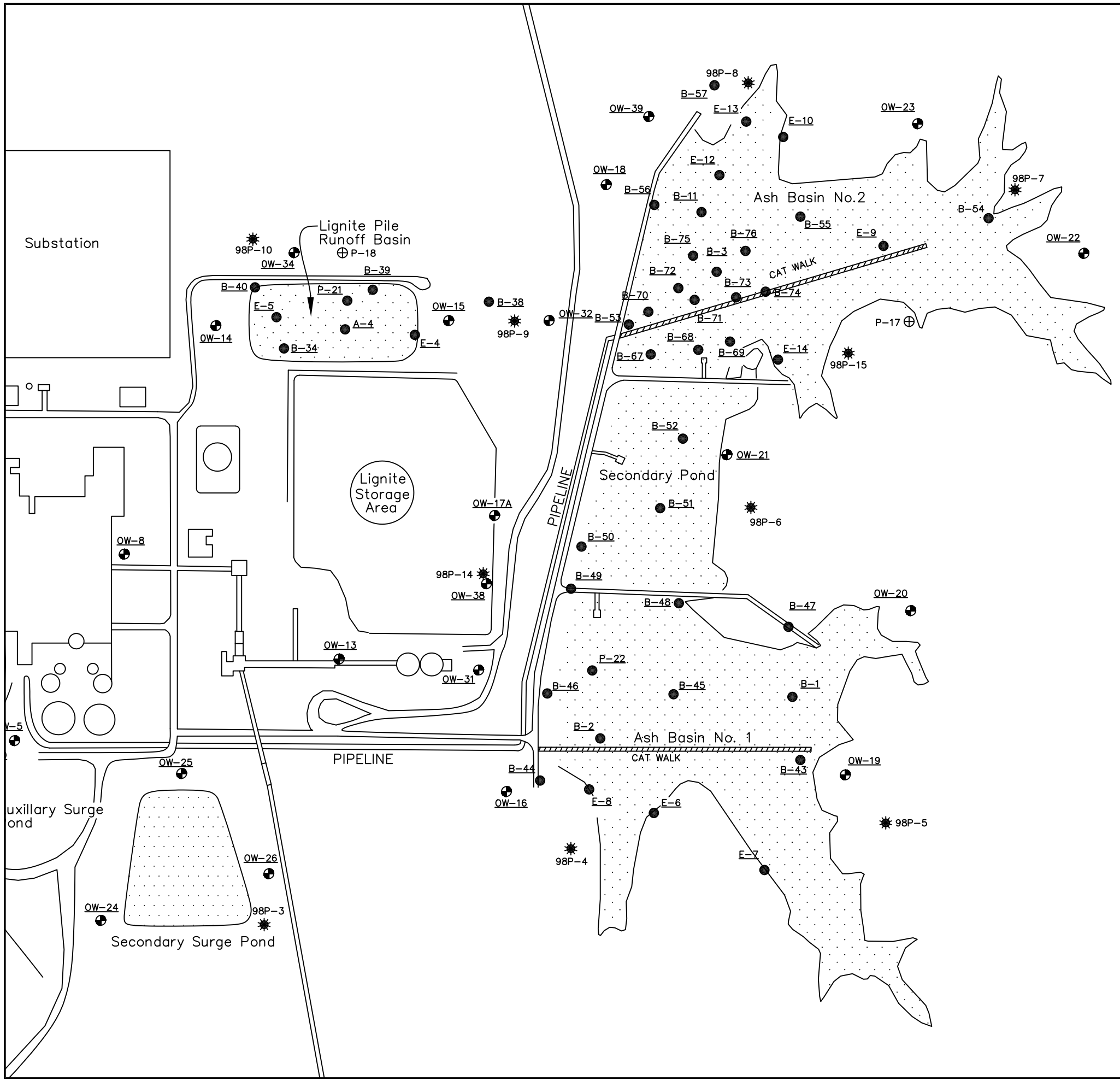
Monitoring Well: **OW-39**

Diagram Not To Scale

L1 = 0.25 Ft
L2 = 2.3 Ft
L3 = 22.5 Ft
L4 = 10 Ft
L5 = 35 Ft
L6 = 0.75 Ft

CLECO

File No: 01-16-0161-OW-39



CLECO Corporation

Dolet Hills Power Station

Soil Boring Locations

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	08/30/18
Dwg. No.:	01-20-0221-APP-C-1

Figure C-1

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**OW-16**
TOTAL DEPTH:	**40 feet**
TOP OF CASING ELEV.:	**254.95 Ft NGVD**
GROUND SURFACE ELEV.:	**251.3 Ft NGVD**

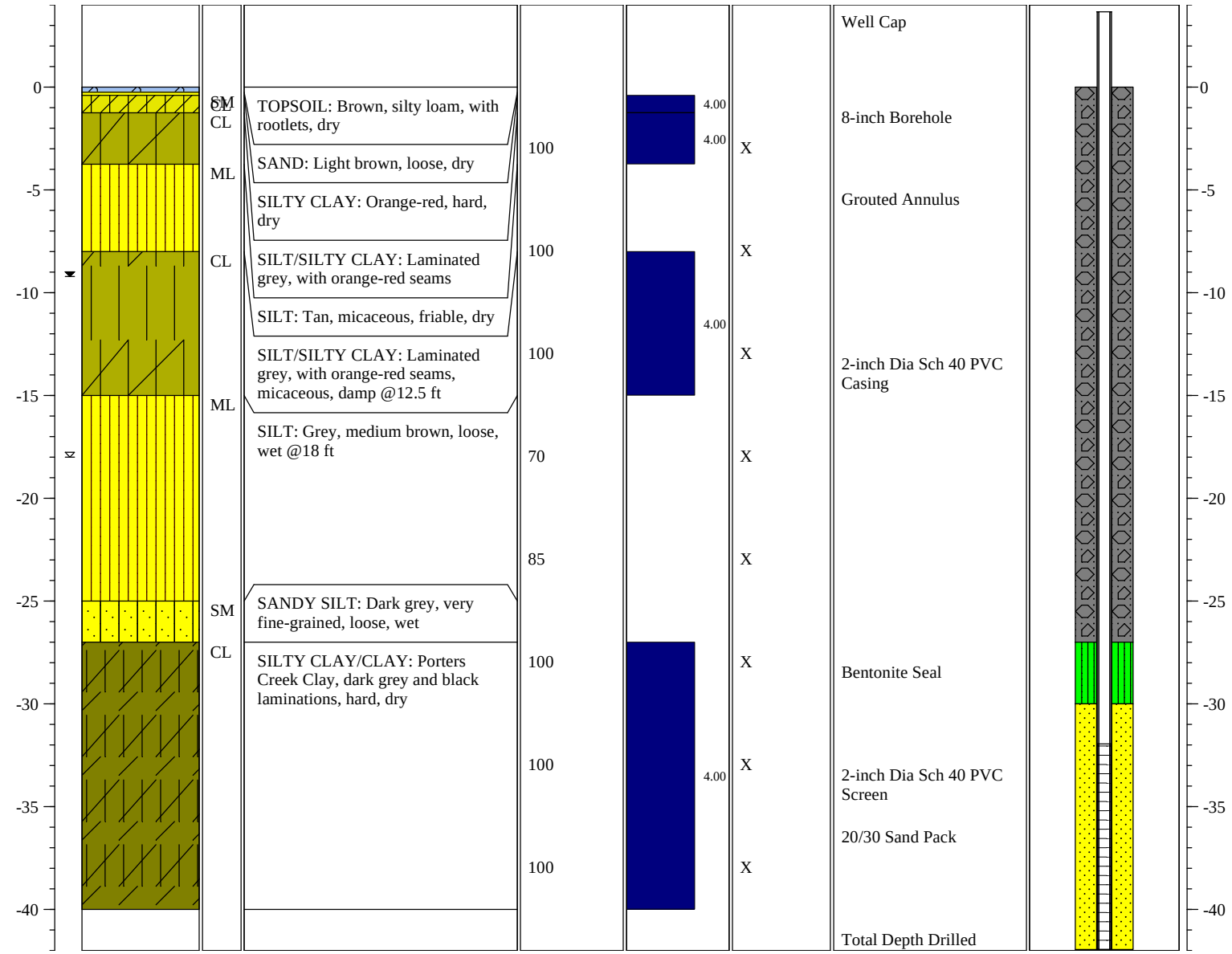
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/31/2018**

Notes:

▽ Water level during drilling: 18 ft bgs

▼ Water level in completed well: 9.22 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		SM	TOPSOIL: Brown, silty loam, with rootlets, dry	100	4.00	X	Well Cap	
-5		CL	SAND: Light brown, loose, dry	100	4.00	X	8-inch Borehole	
-10		ML	SILTY CLAY: Orange-red, hard, dry	100		X	Grouted Annulus	
-15		CL	SILT/SILTY CLAY: Laminated grey, with orange-red seams	100	4.00	X		
-20		ML	SILT: Tan, micaceous, friable, dry	100		X	2-inch Dia Sch 40 PVC Casing	
-25			SILT/SILTY CLAY: Laminated grey, with orange-red seams, micaceous, damp @12.5 ft	70		X		
-30			SILT: Grey, medium brown, loose, wet @18 ft	85		X		
-35		SM	SANDY SILT: Dark grey, very fine-grained, loose, wet	100		X	Bentonite Seal	
-40		CL	SILTY CLAY/CLAY: Porters Creek Clay, dark grey and black laminations, hard, dry	100	4.00	X	2-inch Dia Sch 40 PVC Screen	
				100		X	20/30 Sand Pack	
				100		X	Total Depth Drilled	



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
6100 Perkins Road Baton Rouge, Louisiana 70808
(504) 766-3073

DATE: 2/16-2/18/98

COMPANY: Eagle Environmental

HOLE NO: DW-16

AREA: Dolet Hills Power Plant

PARISH: DeSoto STATE: LOUISIANA

SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: 254.95

INITIAL RUN

T.D. LOGGED: 40.5 FT.

PROBE TYPE/SER NO.: Gamma (API), resistivity (8 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 40.5 FT.

PROBE TYPE/SER NO.: Gamma (cps), sp resistance, calliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE): As indicated below OHMS

WELL DATA

T.D. Logged: 40.5 FT. T.D. of Well: 41.0 FT.

Driller: None Bit Size:

Type Fluid in Hole: Groundwater Casing Size: 4 inch PVC

Fluid Level: FT. Bottom Hole Temp.: °F

Resistivity: OHM-M

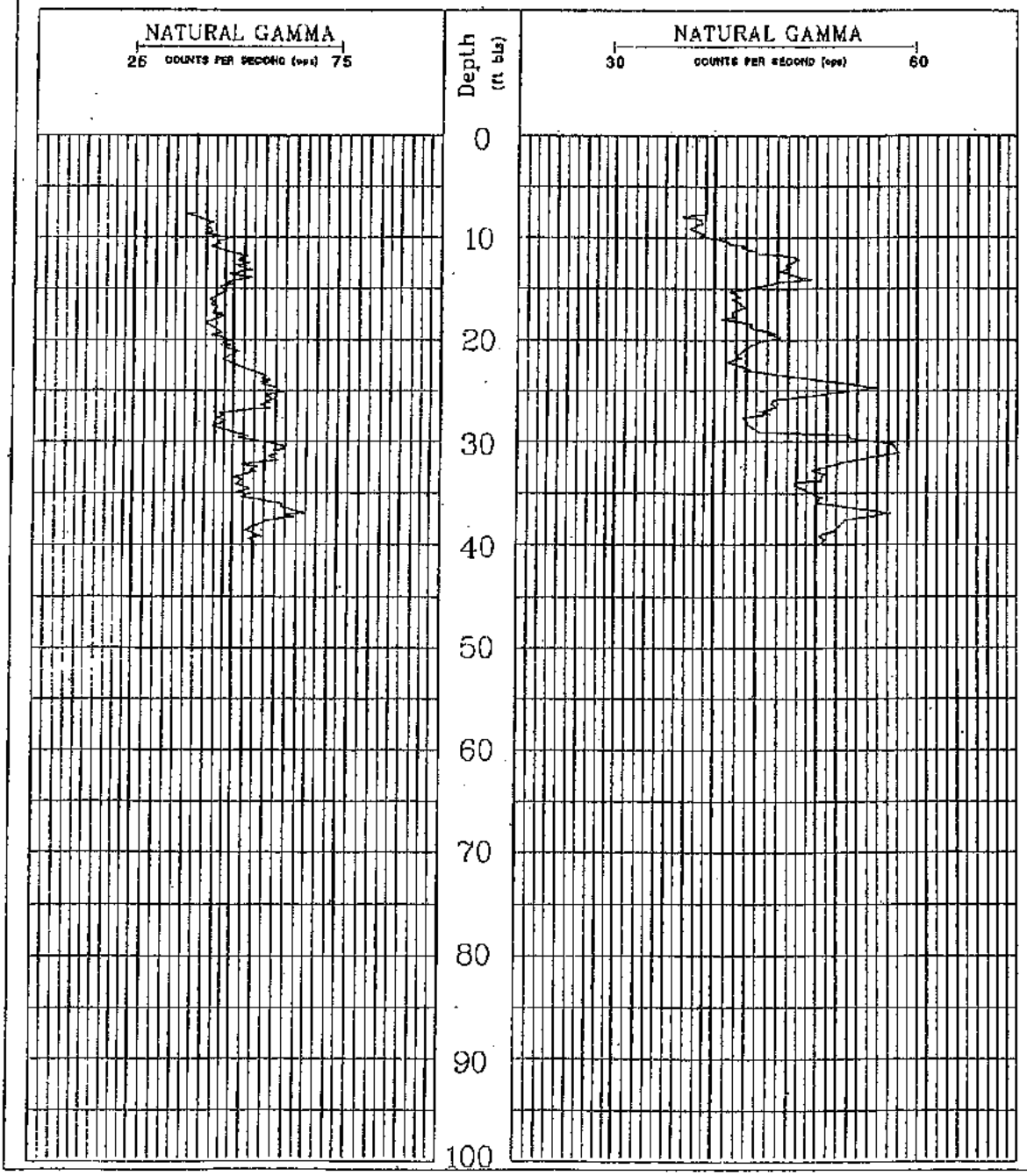
Density: LOG TIME

Minutes

Viscosity: Temp.: °F Start: Stop: Total:

Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray cps)



SOIL BORING LOG

BORING/WELL NO.:	**OW-17A**
TOTAL DEPTH:	**45 feet**
TOP OF CASING ELEV.:	**231.57 Ft NGVD**
GROUND SURFACE ELEV.:	**229.45 Ft NGVD**

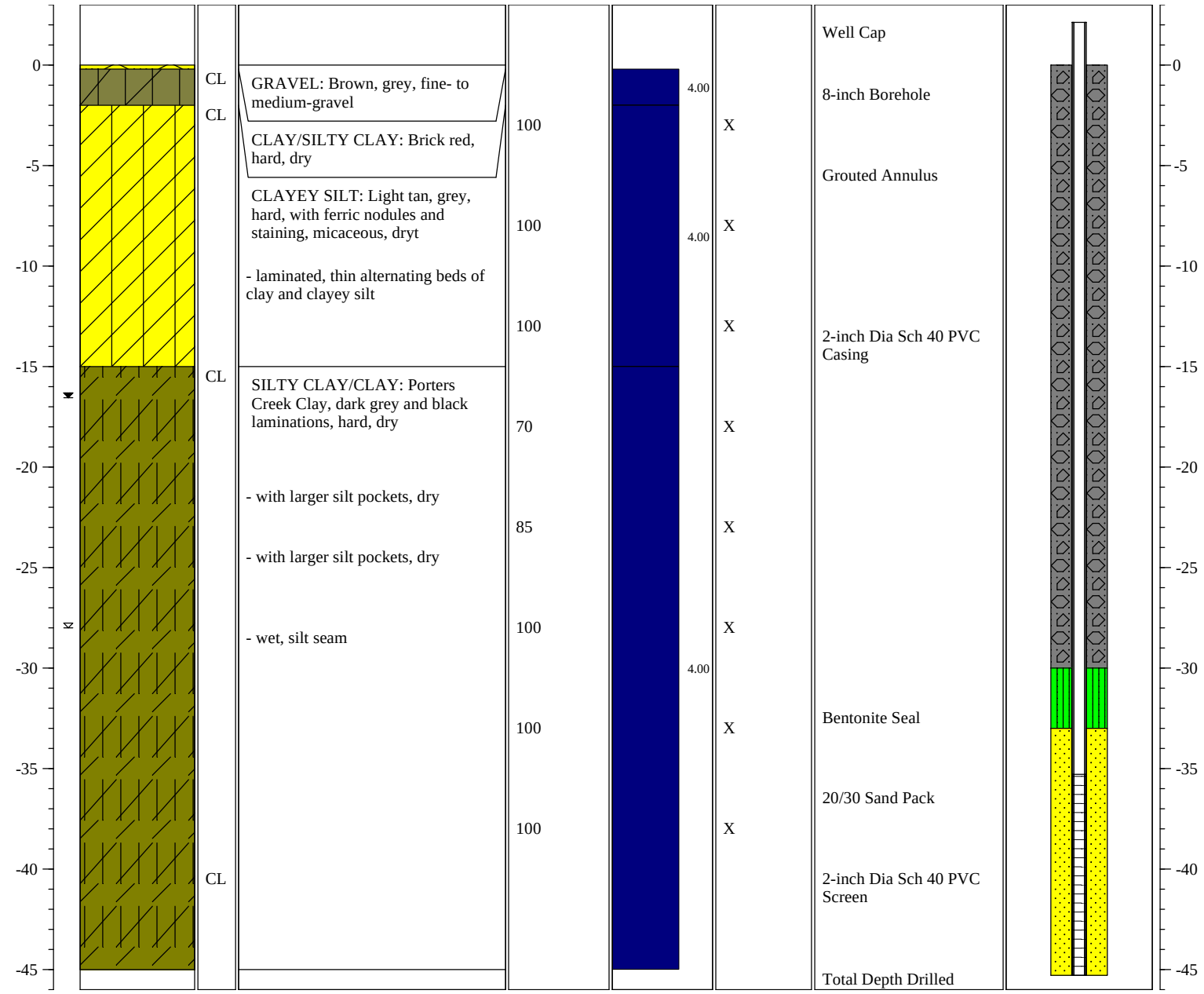
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/31/2018**

Notes:

Water level during drilling: 28 ft bgs

Water level in completed well: 16.55 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
[illegible] Perkins Road, Baton Rouge, Louisiana 70808
(504) 769-[illegible]

DATE: 7-22-96

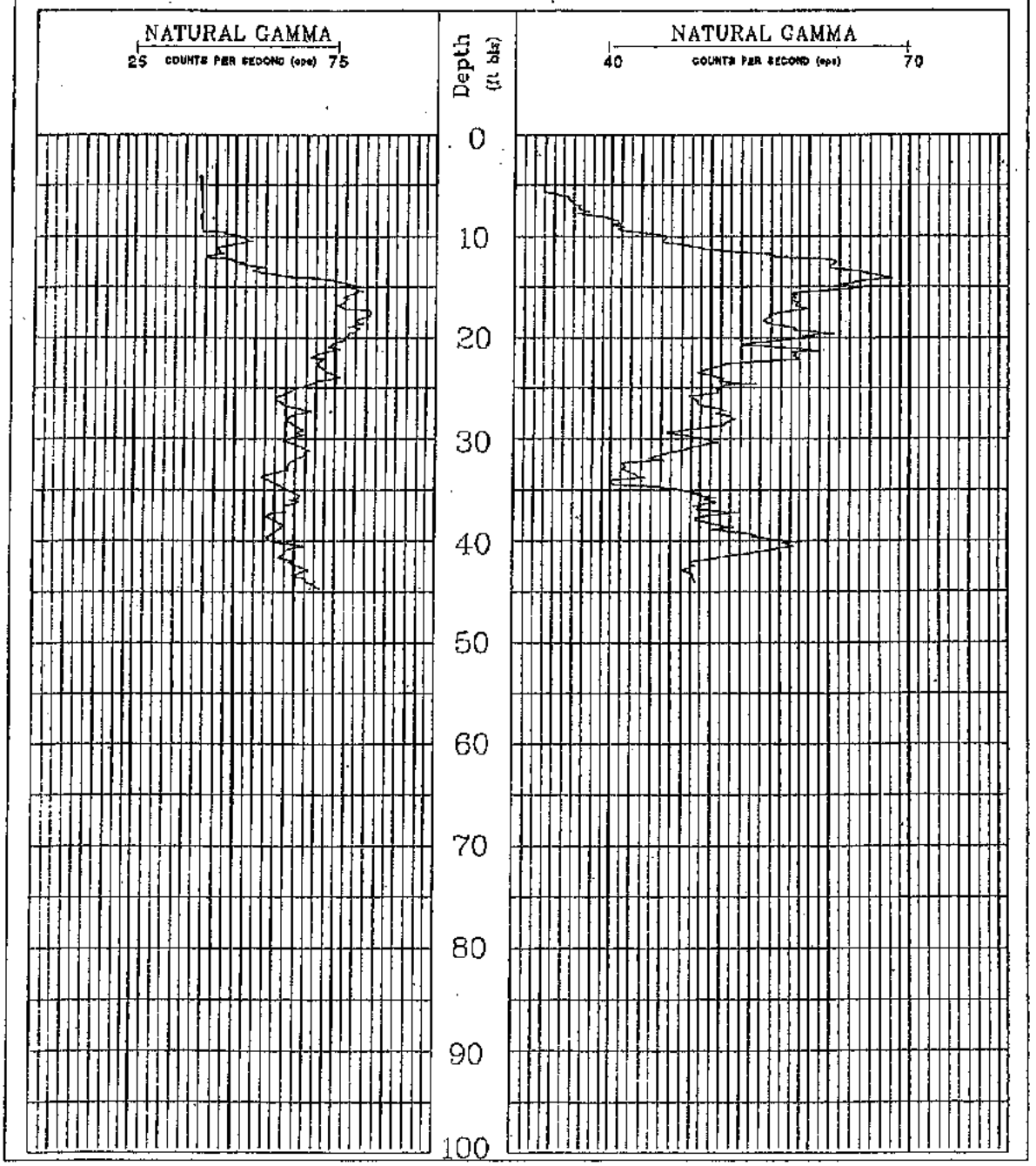
COMPANY: Eagle Environmental	
HOLE NO: OW-17	
AREA: Dolette Hills Power Plant	
PARISH: DeSoto	STATE: LOUISIANA
SECTION:	TOWNSHIP: RANGE: LOG MEASURED FROM:

INITIAL RUN	RERUNS
T.D. LOGGED: 31.5 FT.	T.D. LOGGED: 25.5 FT.
PROBE TYPE/SER. NO: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged: 44.5 FT.	T.D. Drilled: FT.
Driller: None	Bit Size:
Type Fluid in Hole: Groundwater	Casing Size: 4 inch PVC
Fluid Level: FT.	Bottom Hole Temp: °F
Resistivity: OHM-M	LOG TIME
Density:	Minutes: Start / Stop / Total
Viscosity: Temp °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS
Run 1 (gamma ray cps)
Run 2 (gamma ray api)



SOIL BORING LOG

BORING/WELL NO.:	**OW-18**
TOTAL DEPTH:	**30 feet**
TOP OF CASING ELEV.:	**218.44 Ft NGVD**
GROUND SURFACE ELEV.:	**215.4 Ft NGVD**

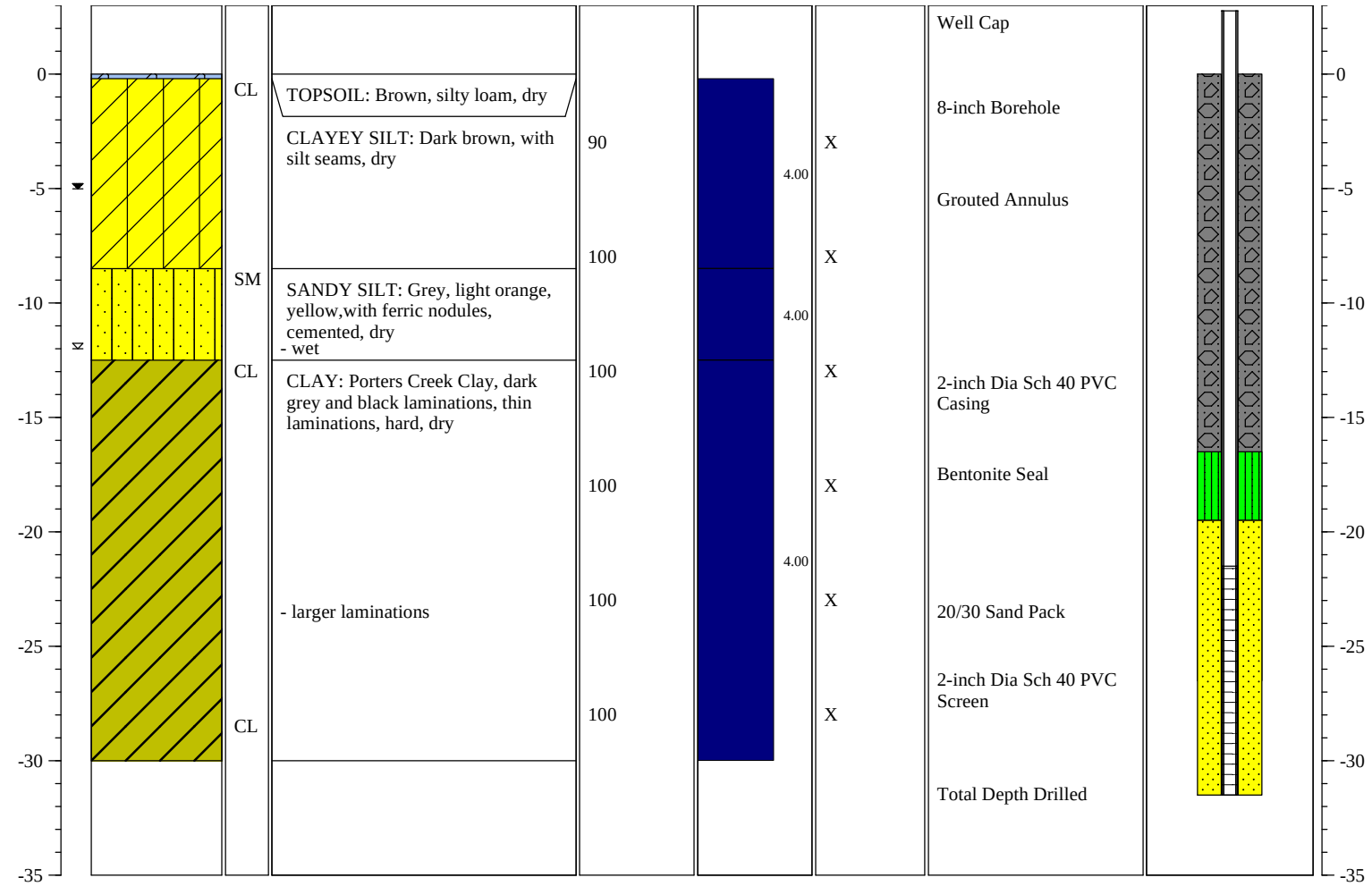
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/31/2018**

Notes:

Water level during drilling: 12.5 ft bgs

Water level in completed well: 5.02 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0 to -5		CL	TOPSOIL: Brown, silty loam, dry	90	4.00	X	Well Cap	
			CLAYEY SILT: Dark brown, with silt seams, dry				8-inch Borehole	
-5 to -10		SM	SANDY SILT: Grey, light orange, yellow,with ferric nodules, cemented, dry	100	4.00	X	Grouted Annulus	
			- wet					
-10 to -15		CL	CLAY: Porters Creek Clay, dark grey and black laminations, thin laminations, hard, dry	100	4.00	X	2-inch Dia Sch 40 PVC Casing	
-15 to -20				100	4.00	X	Bentonite Seal	
-20 to -25			- larger laminations	100	4.00	X	20/30 Sand Pack	
-25 to -30		CL		100	4.00	X	2-inch Dia Sch 40 PVC Screen	
-30 to -35							Total Depth Drilled	



ICON ENVIRONMENTAL SERVICES

BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
11810 Perkins Road, Baton Rouge, Louisiana 70810
(504) 769-3075

DATE: 2/16-2/18/98

COMPANY: Eagle Environmental
HOLE NO: OW-18
AREA: Dolet Hills Power Plant
PARISH: DeSoto
STATE: LOUISIANA
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: 218.44

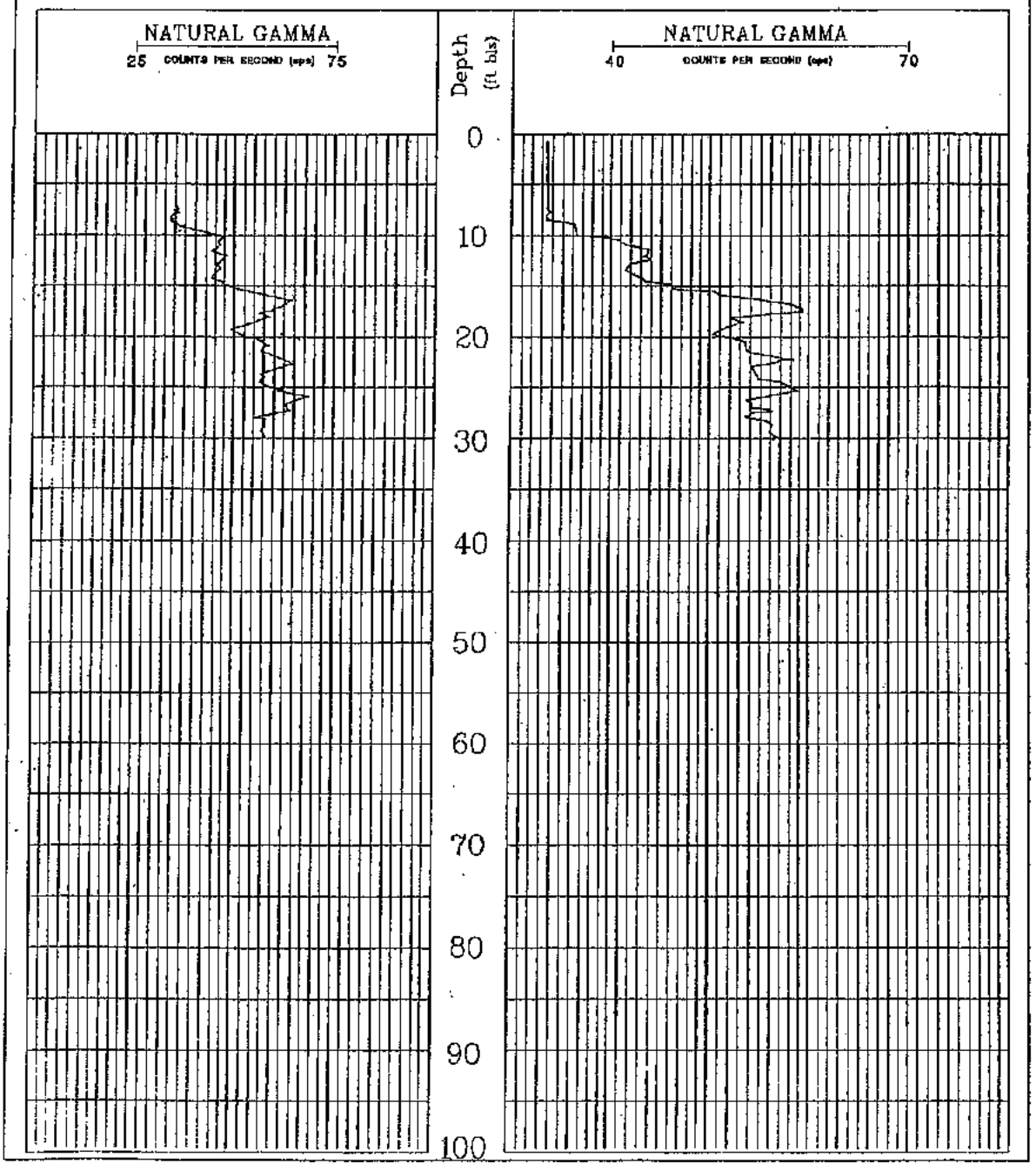
WELL DATA

T.D. Logged: 30.5 FT.
T.D. of Well: 31.5 FT.
Driller: None
Bit Size:
Type Fluid in Hole: Groundwater
Casing Size: 4 inch PVC
Fluid Level: FT.
Bottom Hole Temp: °F
Resistivity: OHM-M
Density:
Viscosity: Temp: °F
Witnessed By: Ray Sturdivant

LOG TIME: Start / Stop / Minutes Total

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray cps)

INITIAL RUN	RERUNS
T.D. LOGGED: 30.5 FT.	T.D. LOGGED: 30.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN	RESISTANCE (FULL SCALE): As indicated below OHMS



SOIL BORING LOG

BORING/WELL NO.:	**OW-19**
TOTAL DEPTH:	**40 feet**
TOP OF CASING ELEV.:	**260.01 Ft NGVD**
GROUND SURFACE ELEV.:	**256.6 Ft NGVD**

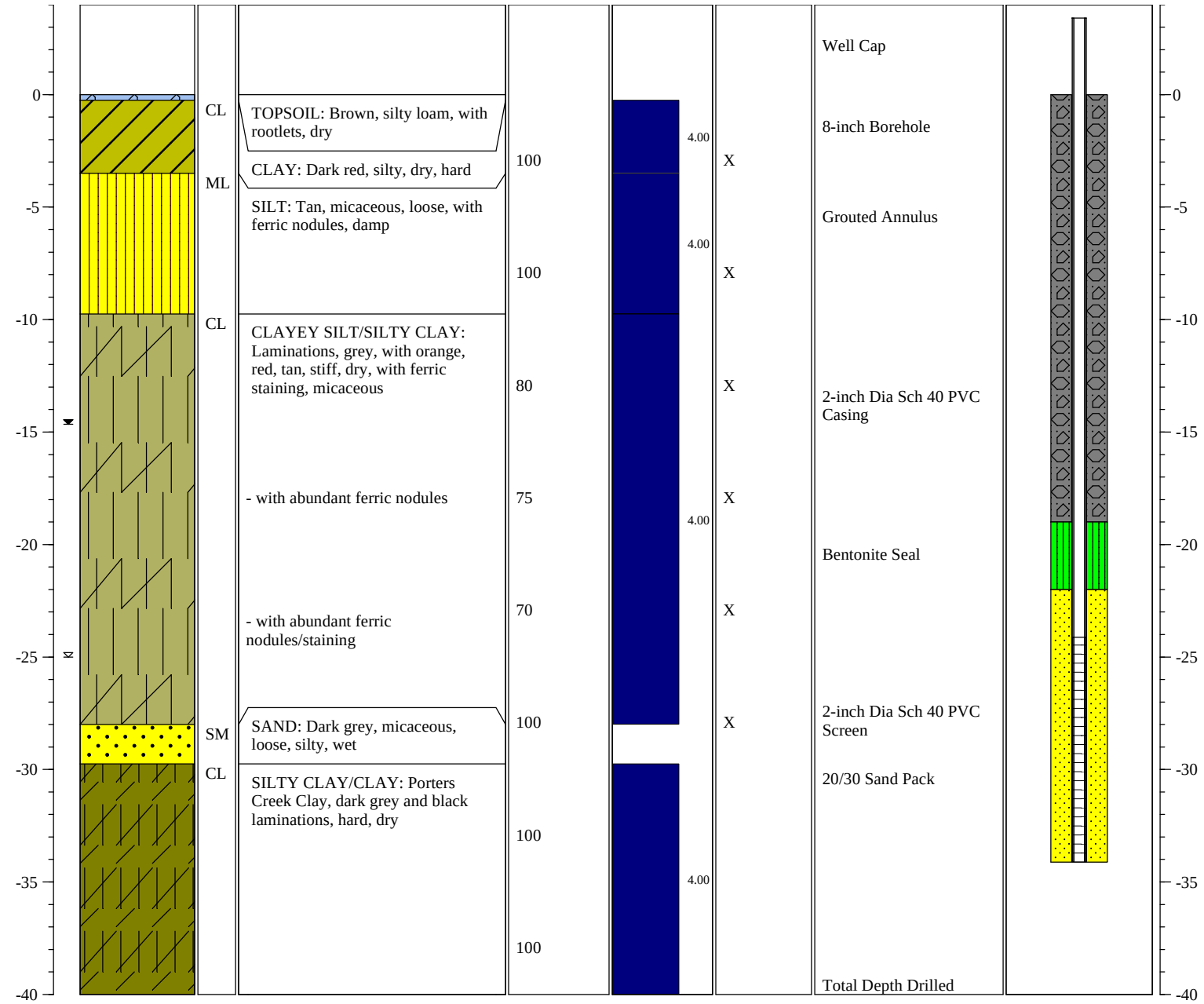
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/31/2018**

Notes:

Water level during drilling: 25 ft bgs

Water level in completed well: 14.65 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc
5080 Perkins Road, Baton Rouge Louisiana 70808
(504) 769-2073

ICON ENVIRONMENTAL SERVICES

DATE: 7-22-96

COMPANY: Eagle Environmental

HOLE NO: OW-19

AREA: Dolette Hills Power Plant

PARISH: DeSoto STATE: LOUISIANA

SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM:

WELL DATA

T.D. Logged: 31.5 FT. T.D. Drilled: FT.

Driller: None BH Size:

Type Fluid in Hole: Groundwater Casing Size: 4 inch PVC

Fluid Level: FT. Bottom Hole Temp. °F

Resistivity: OHM-M

Density: LOG TIME

Viscosity: Temp. °F Minutes: Start, Stop, Total

Witnessed By: Ray Sturdivant

INITIAL RUN

T.D. LOGGED: 31.5 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 25.5 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

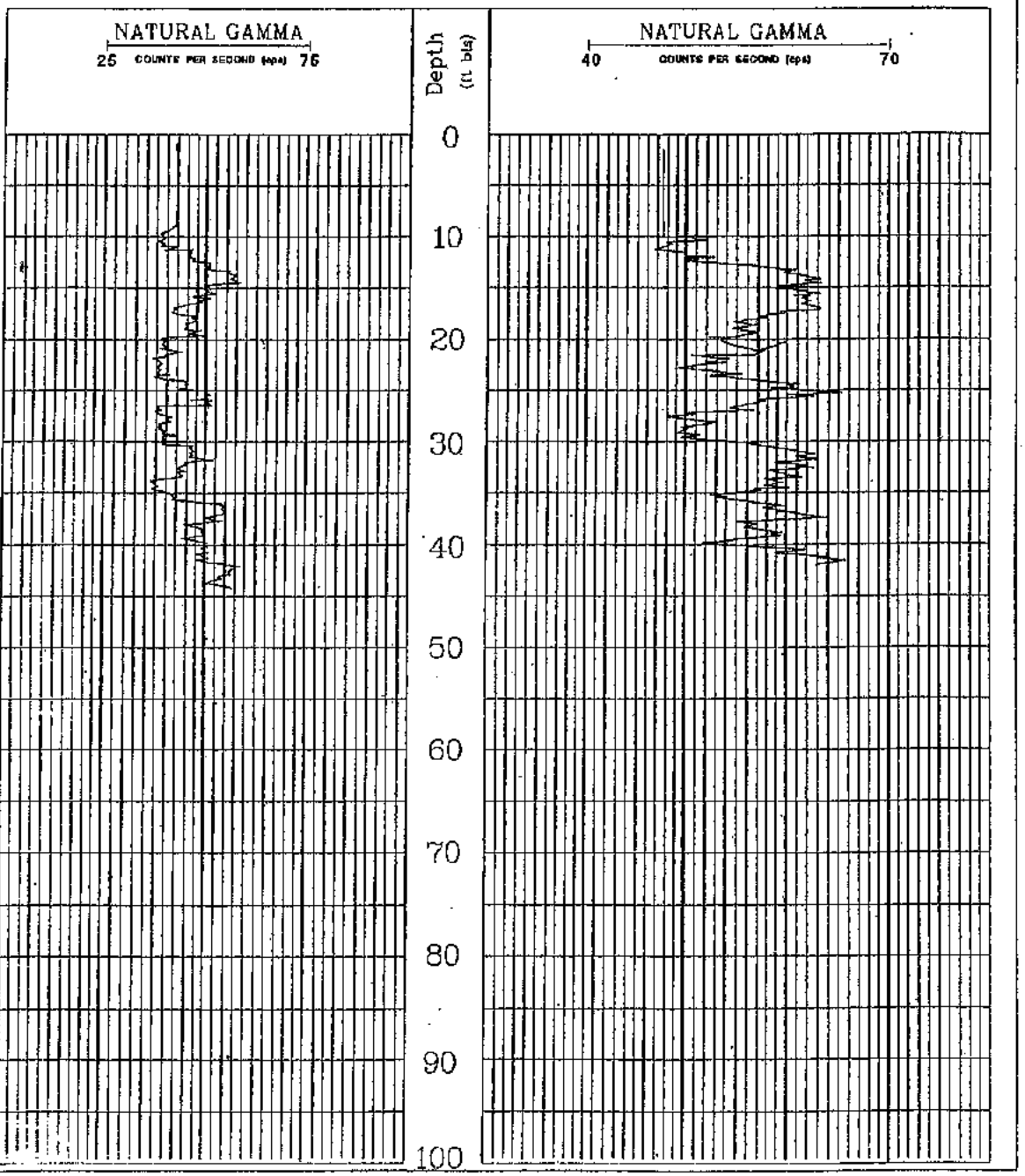
LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE): As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray api)



SOIL BORING LOG

BORING/WELL NO.:	**OW-20**
TOTAL DEPTH:	**30 feet**
TOP OF CASING ELEV.:	**258.84 Ft NGVD**
GROUND SURFACE ELEV.:	**255.1 Ft NGVD**

CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**6/1/2018**

Notes:

Water level during drilling: 18.5 ft bgs

Water level in completed well: 12.15 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		CL	TOPSOIL: Brown, silty loam, with rootlets, dry				Well Cap	
-5			CLAYEY SILT/SILTY CLAY: Laminations, grey, with orange, red, tan, stiff, dry, with ferric staining	100		X	8-inch Borehole	
-10				100	3.00	X	Grouted Annulus	
			- Fe cemented silts/clays, dark red	90		X		
-15		ML	SILT: Tan, grey, light brown, loose, with ferric nodules, damp				2-inch Dia Sch 40 PVC Casing	
			CLAYEY SILT/SILTY CLAY: Laminations, grey, with orange, red, tan, stiff, dry, with ferric staining - wet	90	4.00	X	Bentonite Seal	
-20		CL			4.00			
		CL	SILTY CLAY/CLAY: Porters Creek Clay, dark grey and black laminations, hard, dry	100		X		
-25					4.00		2-inch Dia Sch 40 PVC Screen	
				100		X	20/30 Sand Pack	
-30								
-35							Total Depth Drilled	

BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc
5080 Florida Road, Baton Rouge, Louisiana 70806
(504) 769-2073

DATE: 2/16-2/18/98

COMPANY: Eagle Environmental
HOLE NO: OW-20
AREA: Dolet Hills Power Plant
PARISH: DeSoto STATE: LOUISIANA
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: 258.84

WELL DATA

T.D. Logged: 30.5 FT. T.D. of Well: 31.8 FT.
Driller: None Bit Size:
Type Fluid in Hole: Groundwater Casing Size: 4 inch PVC
Fluid Level: FT. Bottom Hole Temp.: °F
Resistivity: OHM-M
Density:
Viscosity: Temp. °F

LOG TIME: Start: Stop: Minutes Total:
Witnessed By: Ray Sturdivant

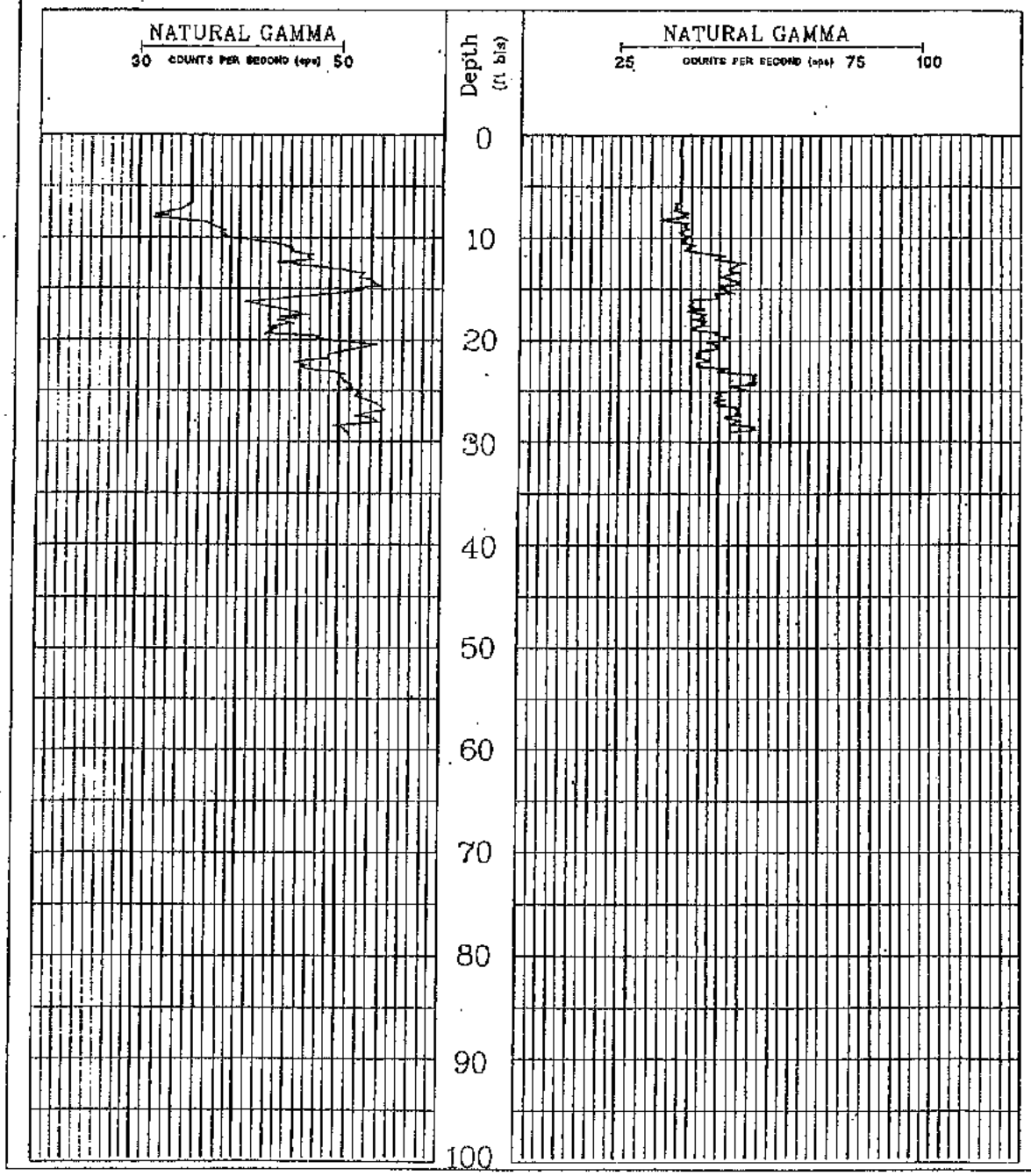
OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray cps)

INITIAL RUN

T.D. LOGGED: 30.5 FT.
PROBE TYPE/SER. NO: Gamma (API) resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 30.5 FT.
PROBE TYPE/SER. NO: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE): As indicated below OHMS



SOIL BORING LOG

BORING/WELL NO.:	**OW-21A**
TOTAL DEPTH:	**30 feet**
TOP OF CASING ELEV.:	**244.40 Ft NGVD**
GROUND SURFACE ELEV.:	**241.9 Ft NGVD**

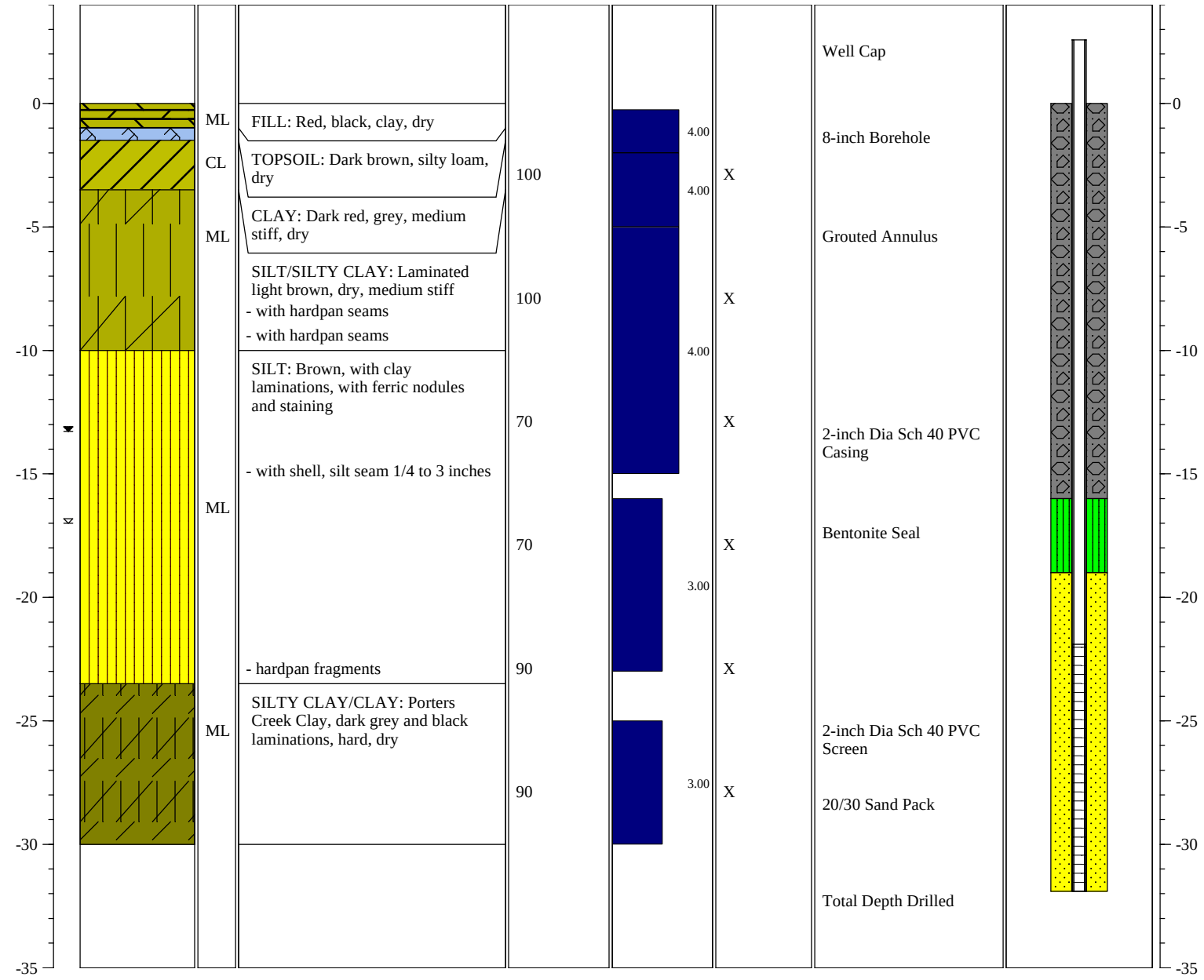
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**6/1/2018**

Notes:

Water level during drilling: 17 ft bgs

Water level in completed well: 13.28 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5615G Perkins Road, Baton Rouge, Louisiana 70808
(504) 769-2075

DATE: 2/16-2/16/98

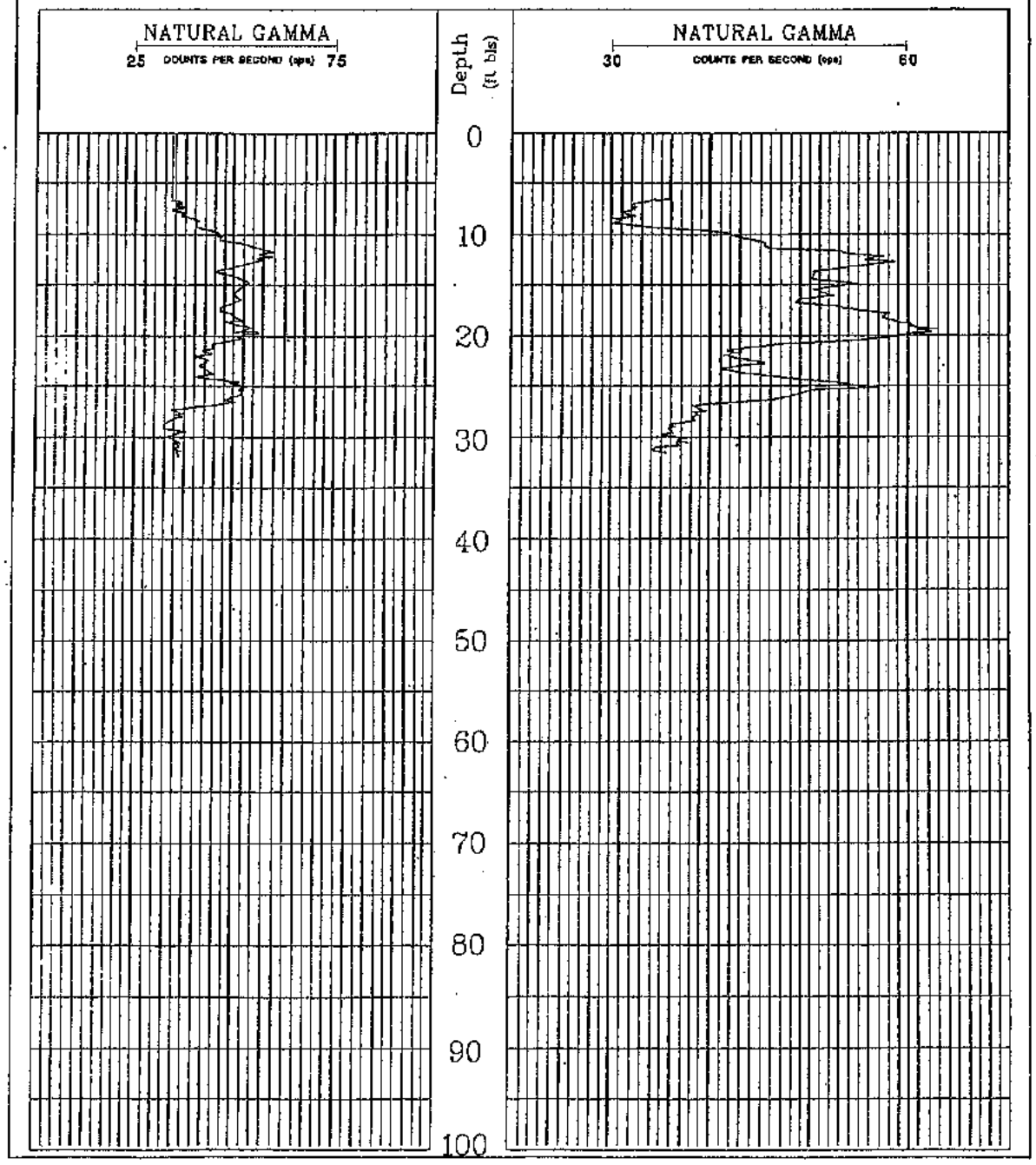
COMPANY: Eagle Environmental
HOLE NO: OW-21
AREA: Dolet Hills Power Plant
PARISH: DeSoto STATE: LOUISIANA
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: 244.40

INITIAL RUN	RERUNS
T.D. LOGGED: 32.5 FT.	T.D. LOGGED: 32.5 FT.
PROBE TYPE/SER. NO: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged: 32.5 FT.	T.D. of Well: 31.0 FT.
Driller: None	Hole Size:
Type Fluid in Hole: Groundwater	Casing Size: 4 inch PVC
Fluid Level: FT	Bottom Hole Temp. °F
Resistivity: OHM-M	LOG TIME
Density:	Minutes: Start / Stop / Total
Viscosity: Temp. °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray cps)



SOIL BORING LOG

BORING/WELL NO.:	**OW-22**
TOTAL DEPTH:	**30 feet**
TOP OF CASING ELEV.:	**256.98 Ft NGVD**
GROUND SURFACE ELEV.:	**252.7 Ft NGVD**

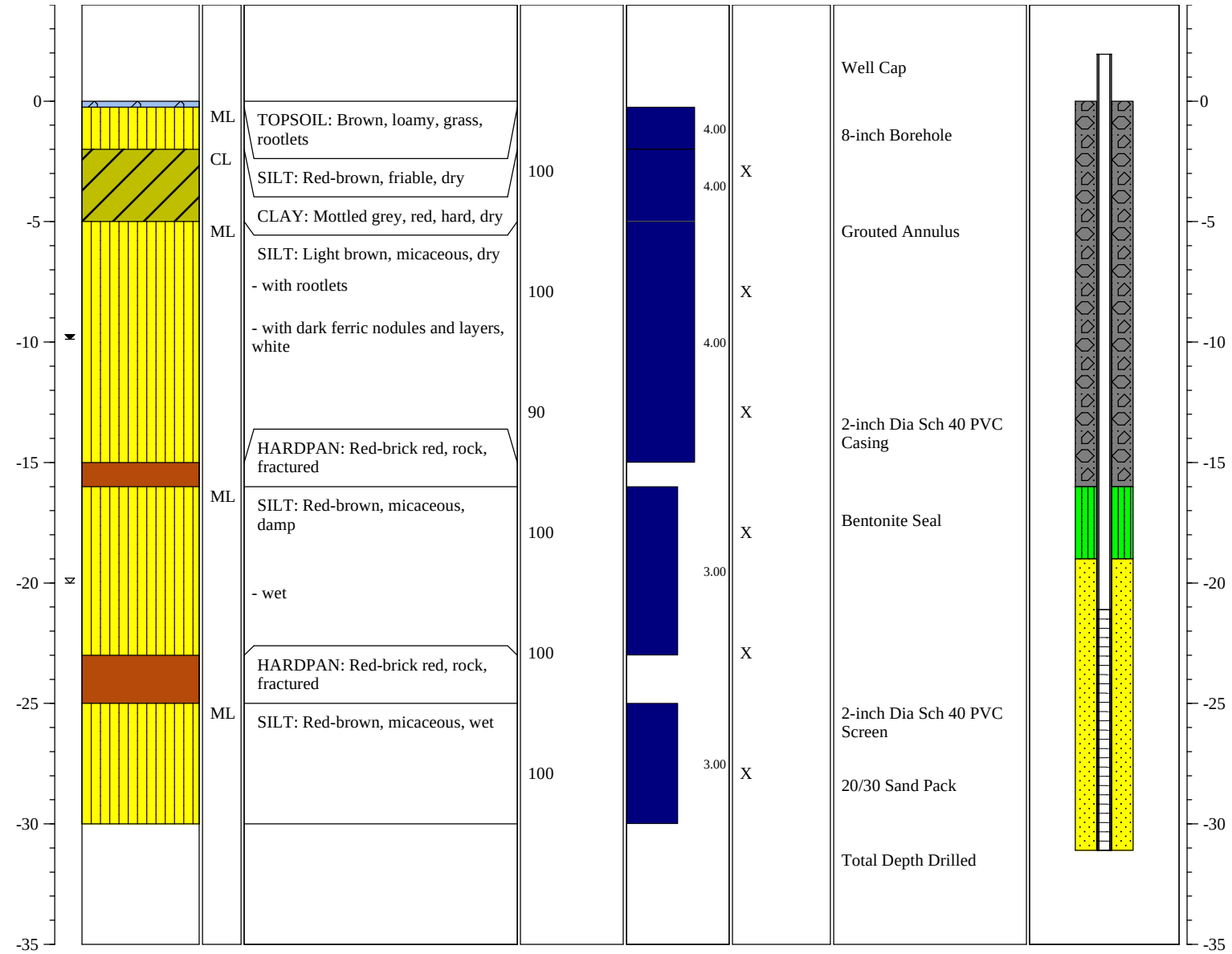
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/30/2018**

Notes:

Water level during drilling: 20 ft bgs

Water level in completed well: 9.88 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5080 Perkins Road, Baton Rouge, Louisiana 70808
(504) 769-3074

ICON ENVIRONMENTAL SERVICES

DATE: 7-22-96

COMPANY: Eagle Environmental

HOLE NO.: OW-22

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM:

WELL DATA

T.D. Logged: 30.5 FT. | T.D. Drilled: FT.

Driller: None | Bit Size:

Type Fluid in Hole: Groundwater | Casing Size: 4 inch PVC

Fluid Level: FT. | Bottom Hole Temp.: °F

Resistivity: OHM-M | LOG TIME

Density: | Minutes — Start / Stop / Total

Viscosity: Temp. °F | Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps)
Run 2 (gamma ray api)

INITIAL RUN

T.D. LOGGED: 31.6 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 25.5 FT.

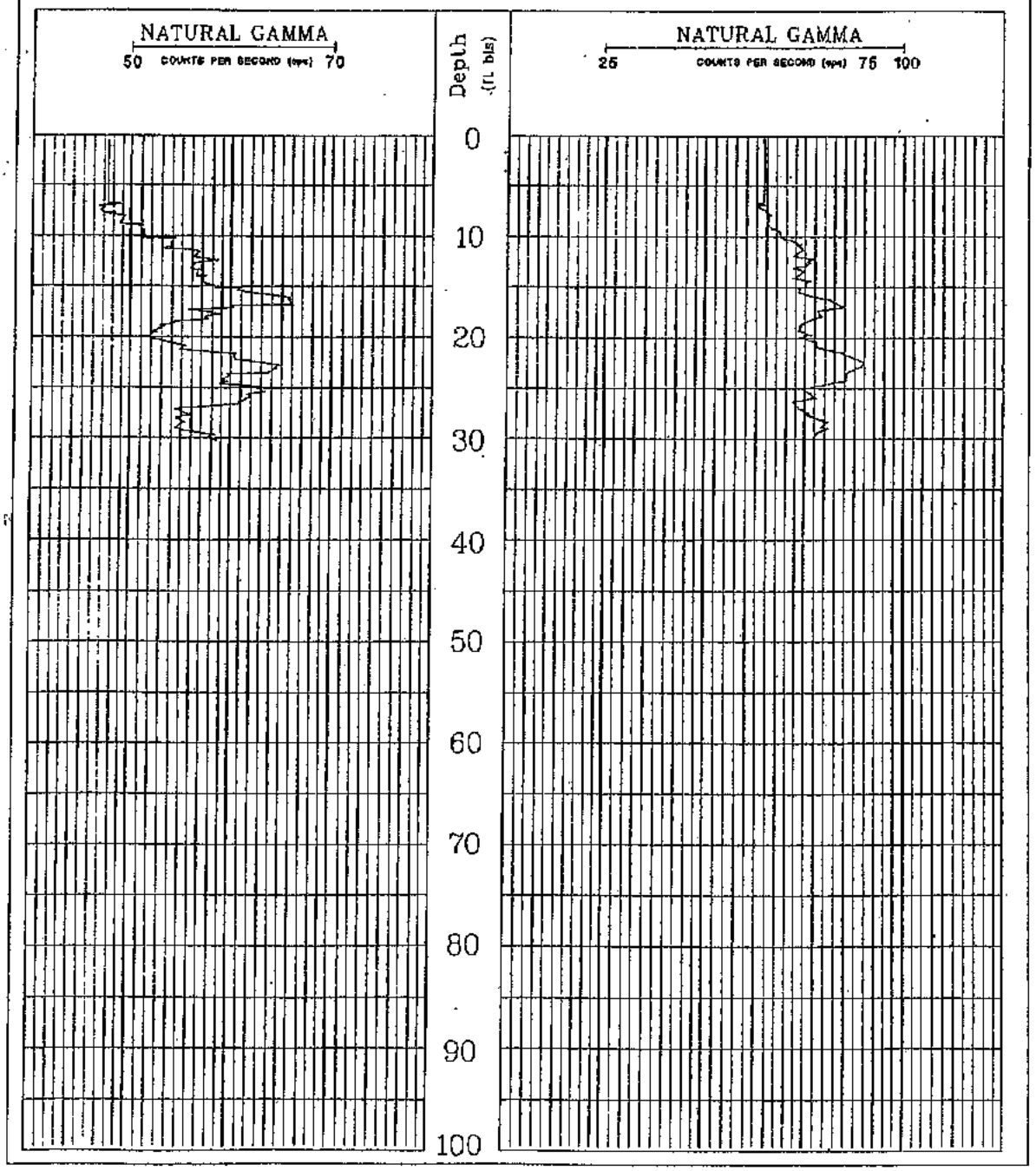
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE): As indicated below OHMS



SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**OW-23**
TOTAL DEPTH:	**40 feet**
TOP OF CASING ELEV.:	**255.55 Ft NGVD**
GROUND SURFACE ELEV.:	**252.33 Ft NGVD**

CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**Ash Basins**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**DPT**
PROJECT NO.:	**01-18-0184**	SAMPLING METHODS:	**DPT**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/30/2018**

Notes:

Water level during drilling: 28 ft bgs

Water level in completed well: 13.81 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0 to -40		ML	SILT: Light brown, micaceous, dry	100	4.00	X	Well Cap	
			- light brown, with silt seams				8-inch Borehole	
-5							Grouted Annulus	
		CL	CLAYEY SILT: Red-brwon, friable, dry	100	4.00	X		
		ML	SILT: Laminated light and dark brown, micaceous, dry		4.00			
-10		CL	CLAYEY SILT: Dark orange, soft, damp		4.00			
		ML		100	4.00	X	2-inch Dia Sch 40 PVC Casing	
			SILT: Laminated light and dark brown, micaceous, friable, dry					
-15		CL	SILT/SILTY CLAY: Laminated light grey and dark brown, micaceous, dry	100	4.00	X		
-20								
		CL	SILTY CLAY/CLAY: Porters Creek Clay, Laminated black and grey, stiff, dry	100		X		
-25							Bentonite Seal	
			- wet	100		X		
-30					4.00			
				100		x	20/30 Sand Pack	
-35							2-inch Dia Sch 40 PVC Screen	
				100		x		
-40							Total Depth Drilled	

BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5040 Perkins Road, Baton Rouge, Louisiana 70808
(504) 769-2075

ICON ENVIRONMENTAL SERVICES

DATE: 7-22-96

COMPANY: Eagle Environmental
HOLE NO: OW-23
AREA: Dolette Hills Power Plant
PARISH: DeSoto
STATE: LOUISIANA
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM:

WELL DATA

T.D. Logged: 34.5 FT.
T.D. Drilled: FT.
Driller: None
Bit Size:
Type Fluid in Hole: Groundwater
Casing Size: 4 inch PVC
Fluid Level: FT
Bottom Hole Temp.: °F
Resistivity: OHM-M

LOG TIME

Minutes
Start: Stop: Total:
Witnessed By: Ray Sturdivant

Density:
Viscosity: Temp. °F

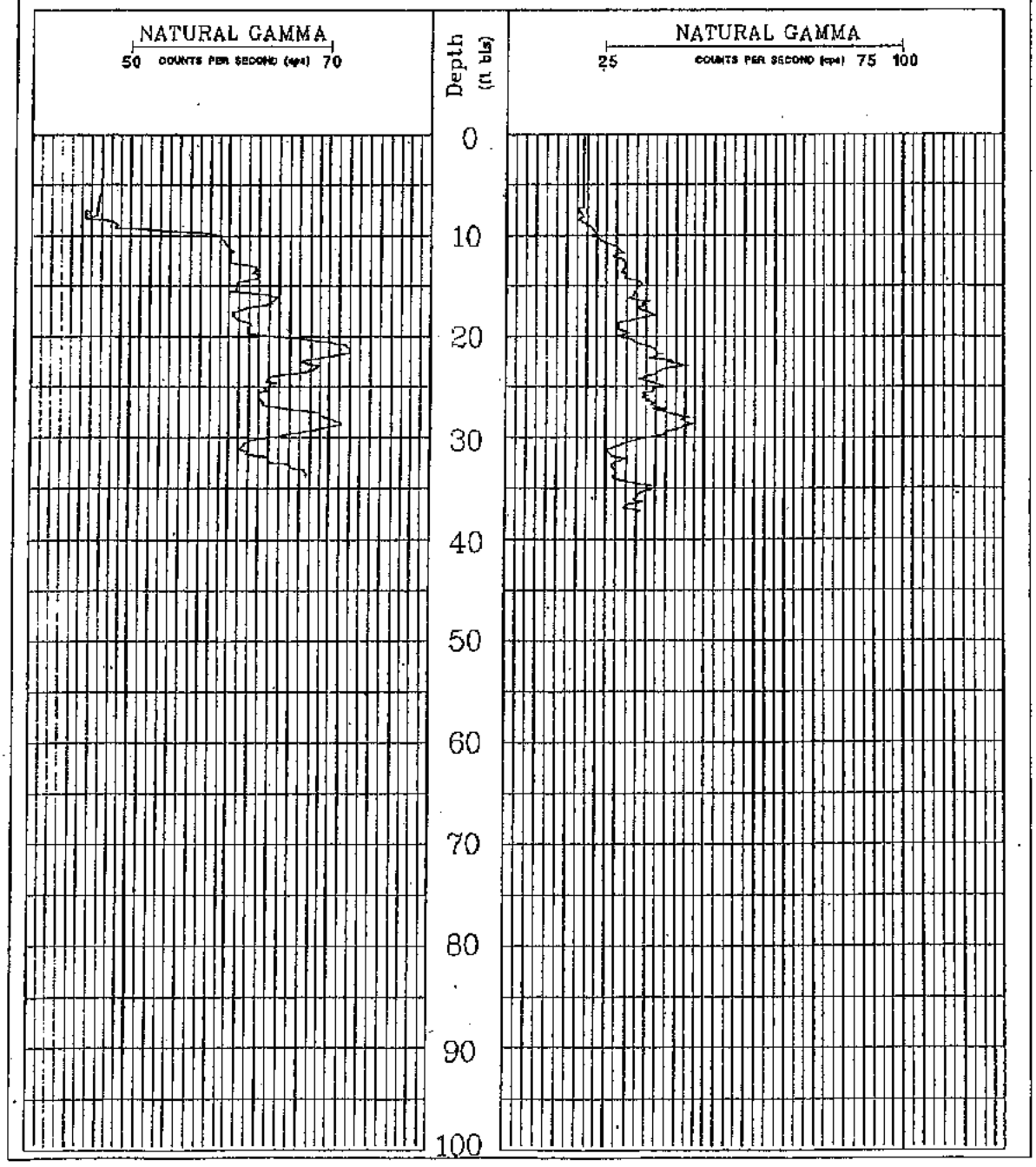
OTHER SERVICES / REMARKS
Run 1 (gamma ray cps)
Run 2 (gamma ray api)

INITIAL RUN

T.D. LOGGED: 31.5 FT.
PROBE TYPE/SER. NO: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 25.5 FT.
PROBE TYPE/SER. NO: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS



SOIL BORING LOG

BORING/WELL NO.:	**OW-31**
TOTAL DEPTH:	**31 feet**
TOP OF CASING ELEV.:	**221.71 Ft NGVD**
GROUND SURFACE ELEV.:	**218.6 Ft NGVD**

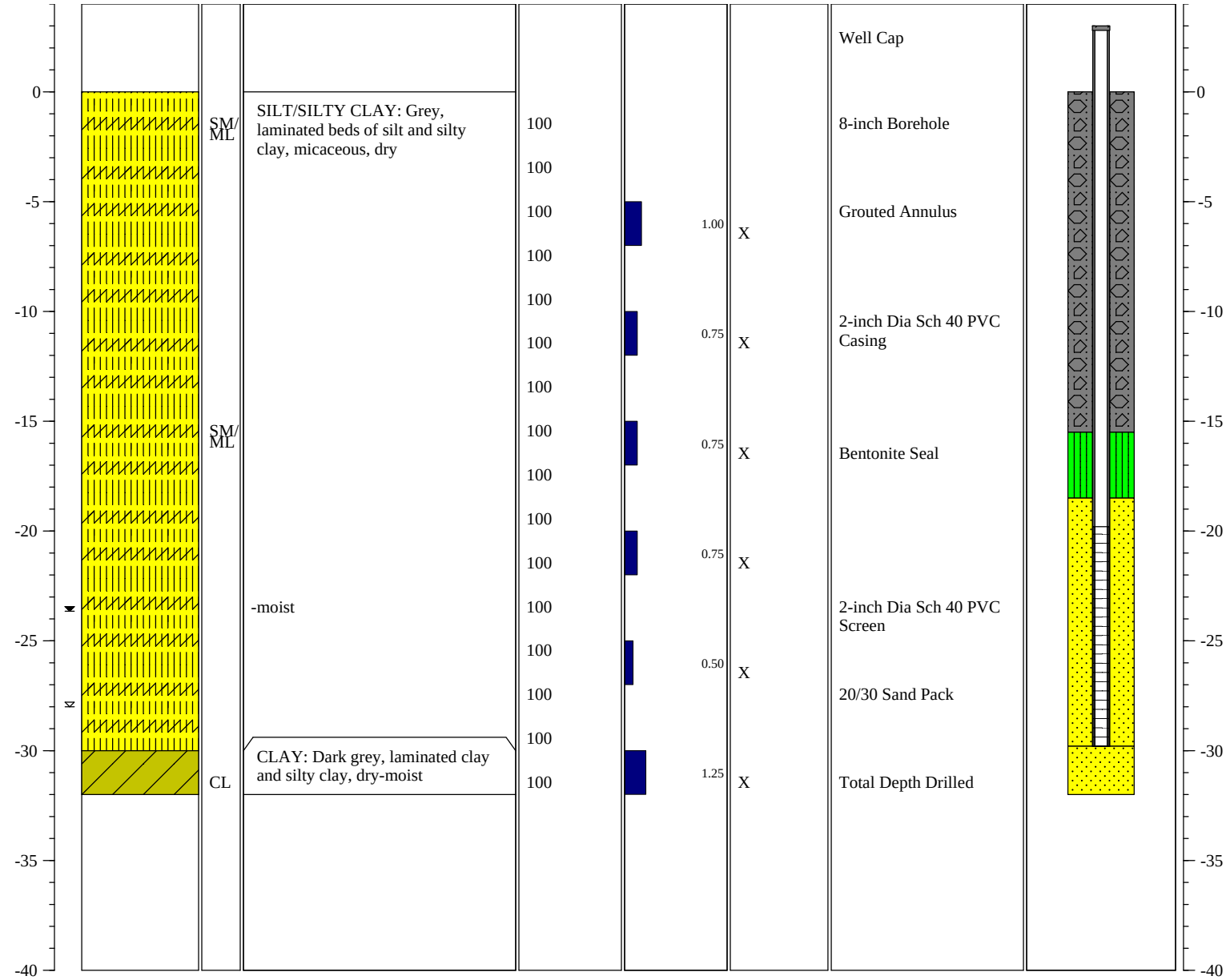
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Walker-Hill Environmental**
PROJECT:	**SW Permitting**	DRILLER:	**M. Bates**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-09-0057**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**6/09/2009**

Notes:

▽ Water level during drilling: 26 ft bgs

▼ Water level in completed well: 23.65 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0							Well Cap	
-5		SM/ML	SILT/SILTY CLAY: Grey, laminated beds of silt and silty clay, micaceous, dry	100	1.00	X	8-inch Borehole	
-10				100	0.75	X	Grouted Annulus	
-15		SM/ML		100	0.75	X	2-inch Dia Sch 40 PVC Casing	
-20				100	0.75	X	Bentonite Seal	
-25			-moist	100	0.50	X	2-inch Dia Sch 40 PVC Screen	
-30		CL	CLAY: Dark grey, laminated clay and silty clay, dry-moist	100	1.25	X	20/30 Sand Pack	
-35							Total Depth Drilled	
-40								



SOIL BORING LOG

BORING/WELL NO.:	**OW-32**
TOTAL DEPTH:	**31 feet**
TOP OF CASING ELEV.:	**237.65 Ft NGVD**
GROUND SURFACE ELEV.:	**234.7 Ft NGVD**

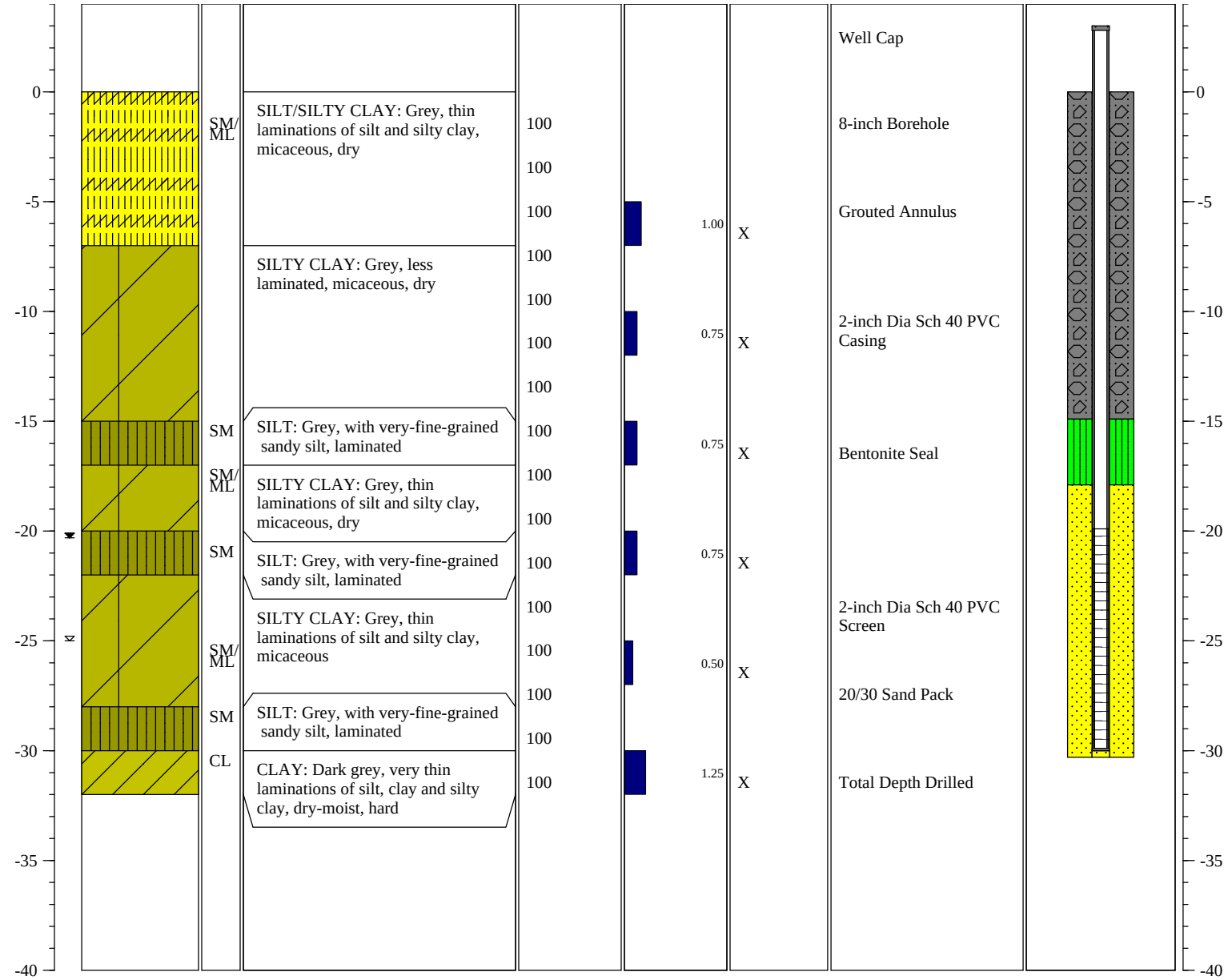
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Walker-Hill Environmental**
PROJECT:	**SW Permitting**	DRILLER:	**M. Bates**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-09-0057**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**6/08/2009**

Notes:

Water level during drilling: 25 ft bgs

Water level in completed well: 20.31 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0 to -5		SM/ML	SILT/SILTY CLAY: Grey, thin laminations of silt and silty clay, micaceous, dry	100			Well Cap	
				100			8-inch Borehole	
				100	1.00	X	Grouted Annulus	
-5 to -10			SILTY CLAY: Grey, less laminated, micaceous, dry	100				
				100	0.75	X	2-inch Dia Sch 40 PVC Casing	
				100				
-10 to -15		SM	SILT: Grey, with very-fine-grained sandy silt, laminated	100	0.75	X	Bentonite Seal	
		SM/ML	SILTY CLAY: Grey, thin laminations of silt and silty clay, micaceous, dry	100				
-15 to -20				100				
		SM	SILT: Grey, with very-fine-grained sandy silt, laminated	100	0.75	X		
-20 to -25			SILTY CLAY: Grey, thin laminations of silt and silty clay, micaceous	100			2-inch Dia Sch 40 PVC Screen	
		SM/ML		100	0.50	X		
				100			20/30 Sand Pack	
-25 to -30		SM	SILT: Grey, with very-fine-grained sandy silt, laminated	100				
		CL	CLAY: Dark grey, very thin laminations of silt, clay and silty clay, dry-moist, hard	100	1.25	X	Total Depth Drilled	
-30 to -40								



SOIL BORING LOG

BORING/WELL NO.:	**OW-38**
TOTAL DEPTH:	**40 feet**
TOP OF CASING ELEV.:	**221.60 Ft NGVD**
GROUND SURFACE ELEV.:	**219.66 Ft NGVD**

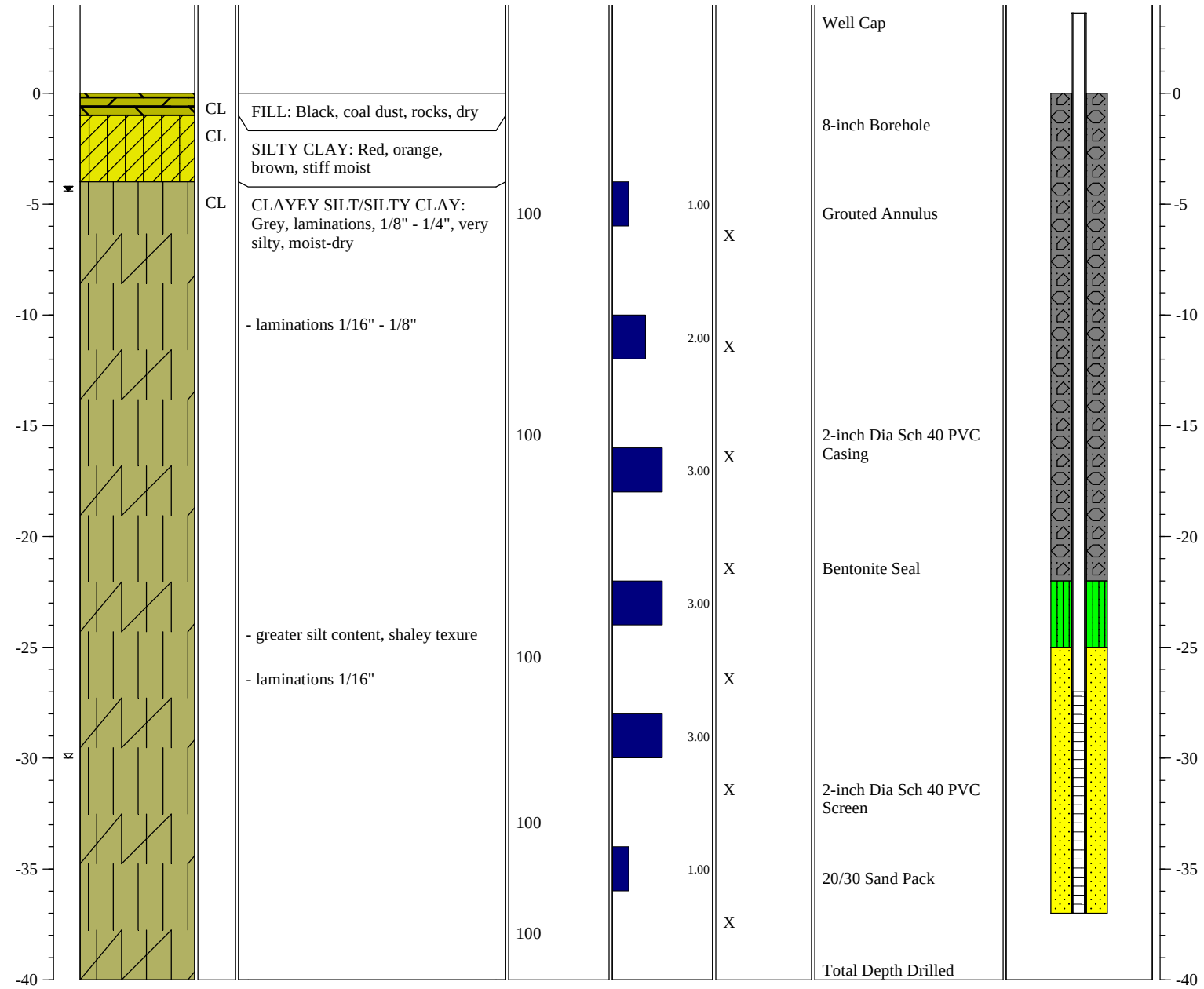
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Walker-Hill Environmental**
PROJECT:	**SW Permitting**	DRILLER:	**R LaBrosse**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**RotoSonic**
PROJECT NO.:	**01-16-0161**	SAMPLING METHODS:	**RotoSonic**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/24/2016**

Notes:

Water level during drilling: 30 ft bgs

Water level in completed well: 4.4 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



SOIL BORING LOG

BORING/WELL NO.:	**OW-39**
TOTAL DEPTH:	**35 feet**
TOP OF CASING ELEV.:	**228.96 Ft NGVD**
GROUND SURFACE ELEV.:	**226.19 Ft NGVD**

CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Walker-Hill Environmental**
PROJECT:	**SW Permitting**	DRILLER:	**R LaBrosse**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**RotoSonic**
PROJECT NO.:	**01-16-0161**	SAMPLING METHODS:	**RotoSonic**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**6/13/2016**

Notes:

Water level during drilling: 20 ft bgs

Water level in completed well: 4.4 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION

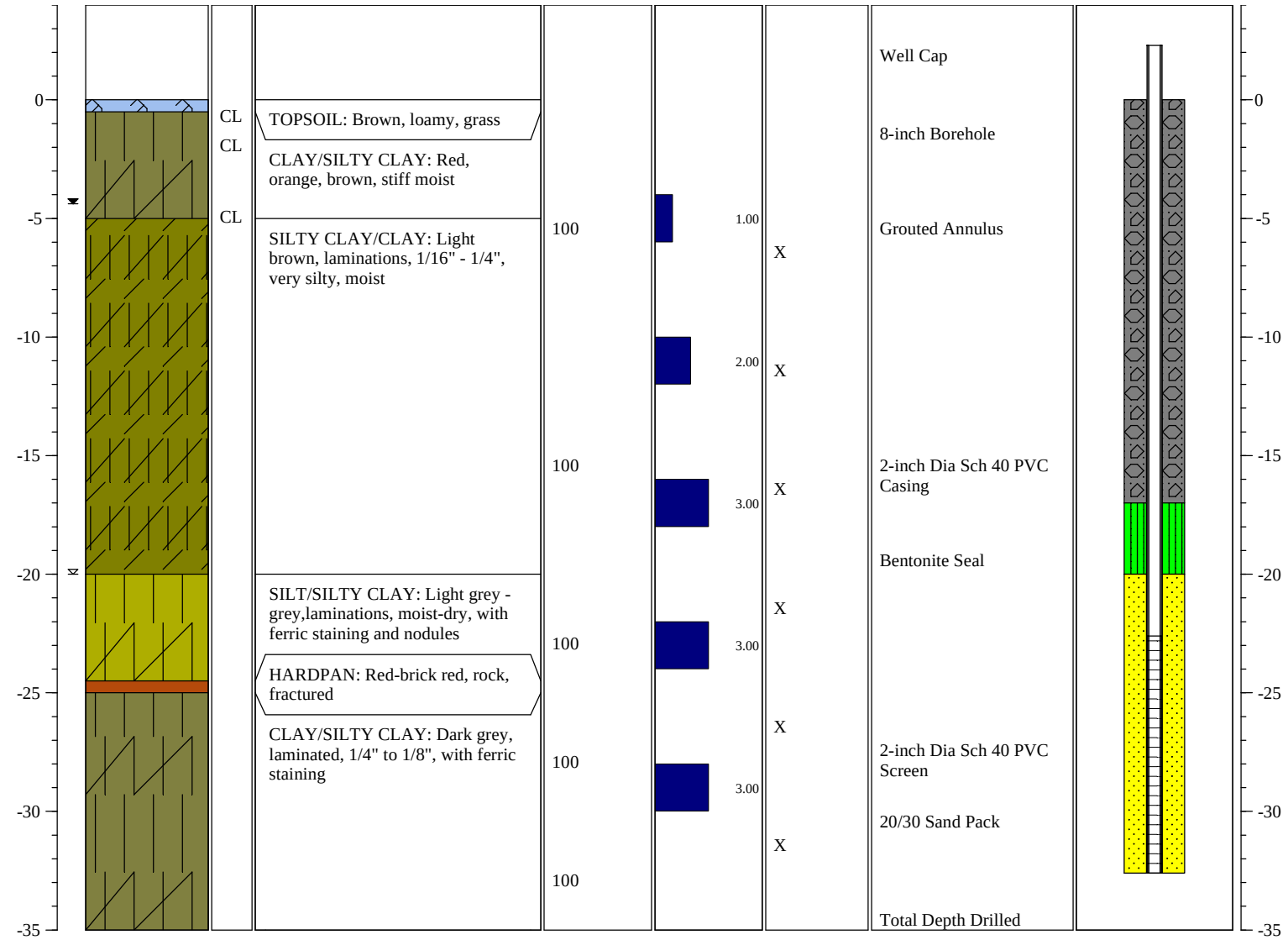


TABLE M-1
SUMMARY OF SOIL BORING LOGS
CONVENTIONALLY LOGGED

CLECO POWER, L.L.C.
DOLET HILLS POWER STATION

FACILITY	BORING NO.	SURFACE ELEVATION	TOTAL DEPTH	TYPE OF LOG
ASH BASIN NO. 1 (P-0037)	P-22	225.41	50	CONVENTIONAL
	B-1	245.04	28	CONVENTIONAL
	B-2	237.05	21	CONVENTIONAL
	B-43	237.33	40.5	CONVENTIONAL
	B-44	244.97	46	CONVENTIONAL
	B-45	229.74	36	CONVENTIONAL
	B-46	226.36	35	CONVENTIONAL
	B-47	260.32	70	CONVENTIONAL
	B-48	248.27	60	CONVENTIONAL
	B-49	232.00	45	CONVENTIONAL
	B-50	231.02	80	CONVENTIONAL
	E-6	248.42	15	CONVENTIONAL
	E-7	252.01	15	CONVENTIONAL
	E-8	250.45	15	CONVENTIONAL
ASH BASIN NO. 2 (P-0037)	B-3	220.52	8	CONVENTIONAL
	B-53	255.09	45.5	CONVENTIONAL
	B-54	238.2	50.5	CONVENTIONAL
	B-55	218.97	30.5	CONVENTIONAL
	B-56	216.64	35.5	CONVENTIONAL
	B-57	248.9	45.5	CONVENTIONAL
	B-67	229.97	20	CONVENTIONAL
	B-68	229.44	20	CONVENTIONAL
	B-69	238.64	20	CONVENTIONAL
	B-70	245.46	20	CONVENTIONAL
	B-71	226.94	20	CONVENTIONAL
	B-72	224.98	20	CONVENTIONAL
	B-73	234.14	20	CONVENTIONAL
	B-74	228.24	20	CONVENTIONAL
	B-75	216.84	20	CONVENTIONAL
	B-76	216.54	20	CONVENTIONAL
	E-9	244.44	15	CONVENTIONAL
	E-10	240.40	15	CONVENTIONAL
	E-11	214.49	30	CONVENTIONAL
	E-12	231.27	40	CONVENTIONAL
	E-13	237.79	50	CONVENTIONAL
	E-14	237.37	15	CONVENTIONAL

FACILITY	BORING NO.	SURFACE ELEVATION	TOTAL DEPTH	TYPE OF LOG
SECONDARY POND (P-0037)	B-51	248.67	45.5	CONVENTIONAL
	B-52	255.99	45	CONVENTIONAL
SURGE PONDS (P-0038)	B-14	240.38	75	CONVENTIONAL
	B-15	230.59	40	CONVENTIONAL
	B-58	220.44	20	CONVENTIONAL
	A-1	231.07	10	CONVENTIONAL
	A-2	219.0	10	CONVENTIONAL
	A-3	229.37	10	CONVENTIONAL
AUXILIARY SURGE POND (P-0038)	B-59	232.79	30	CONVENTIONAL
	B-60	232.09	25	CONVENTIONAL
METAL CLEANING WASTE POND (P-0039)	B-61	228.64	28.5	CONVENTIONAL
	B-62	227.79	25	CONVENTIONAL
(LOCATED NEAR LANDFILL)	MW-5	257.74	20	CONVENTIONAL
(LOCATED NEAR LANDFILL)	MW-9	255.87	20	CONVENTIONAL
PLANT DISCHARGE COLLECTION POND (P-0040)	P-15	243.53	50	CONVENTIONAL
	B-63	234.93	35	CONVENTIONAL
	B-64	234.98	35	CONVENTIONAL
LIGNITE PILE RUNOFF POND (P-0041)	P-21	202.43	50	CONVENTIONAL
	B-34	209.88	35	CONVENTIONAL
	B-39	204.38	35	CONVENTIONAL
	E-4	209.21	20	CONVENTIONAL
	E-5	216.02	15	CONVENTIONAL
	A-4	202.59	10	CONVENTIONAL
	B-38	224.07	35	CONVENTIONAL
	B-40	232.45	45	CONVENTIONAL

BORING NO. P-22

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 1
SURFACE ELEVATION:	225.41' — TOTAL DEPTH: 50.0'
LOCATION:	N 497,800 ; E 1,670,780
DEPTH TO GROUNDWATER LEVEL:	20.0' — DATE: 05-21-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_p POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-4} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1	(100)	1.2 / 0.9	21.6 / 104	38	20			73	CL	Medium, Silty CLAY, Some Fine Sand and Iron Ore, Gray and Brown	0	225.41
	ST-2	(100)	2.0	19.4 / 109	32	15	0.31; 0.18	100	61		- Grades to Stiff and Orange, Gray and Brown		
5	ST-3	(100)	3.5 / 0.6	20.1 / 114	38	16		44	31		5.0'	5	220.41
	ST-4	(50)	4.5	26.2 / 113	47	24				SC	Medium Dense, Clayey Fine SAND, Trace Silt, Trace Iron Ore, Tan and Gray		
10	SS-5	8-22-25 (100)	4.5							CL	7.0' Hard, Silty CLAY, Trace Iron Ore, Orange and Gray 8.0'	10	217.41
	PIT-6	(100)	4.5 / 5.5	23.2 / 104	47	23	0.65; 0.17		100	CL/ CH	Hard, Silty CLAY, Trace Fine Sand, Orange and Gray (Porters Creek Formation Clays)		
15	SS-7	19-24-30 (100)	4.5								- Grades to Dark Dark Gray	15	
20	PIT-8	(100)	4.5									20	
25	SS-9	21-33-41 (100)	4.5									25	
30	SS-10	28-31-50 (100)	4.5	24.9 / 102	51	27						30	
35	SS-11	30-36-57 (100)	4.5									35	
40	SS-12	29-31-48 (100)	4.5									40	
45	SS-13	24-29-52 (100)	4.5	25.8 / 101								45	
50												50	175.41

End of Boring at 50.0'
Water Level at 20.0' 05-23-80

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING P-22

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-1 (PERCOLATION)

SHEET 1 OF 1

PROJECT: DOLET HILLS POWER PLANT
CLIENT: SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE: ASH BASIN NO. 1
SURFACE ELEVATION: 245.04' | TOTAL DEPTH: 23.0'
LOCATION: N 497,700 ; E 1,671,550
DEPTH TO GROUNDWATER LEVEL: 15.0' | DATE: 10-15-80
DRILLED BY: SOUTHWESTERN LABORATORIES
LOGGED BY: SOUTHWESTERN LABORATORIES
TESTED BY: SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR S/SPOON (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-4} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0												0	245.04
											Soil Conditions Between 0.0' and 12.5' Are Similar to Those in Pilot Auger Boring B-1 Drilled for Percolation Tests	5	
10												10	
											12.5'		232.54
15	SS-1	36-49-48 (100)		21.3					25	SM	Very Dense, Silty Fine SAND, Gray, Tan and Orange	15	
	SS-2	30-41-51 (100)											
20	SS-3	13-19-31 (100)									← Grades to Light Gray	20	
	SS-4	28-34-60 (100)		21.1					19				
25											End of Boring at 23.0' Water Level at 15.0' on 12-17-80	25	222.04
30												30	
35												35	
40												40	
45												45	
50												50	

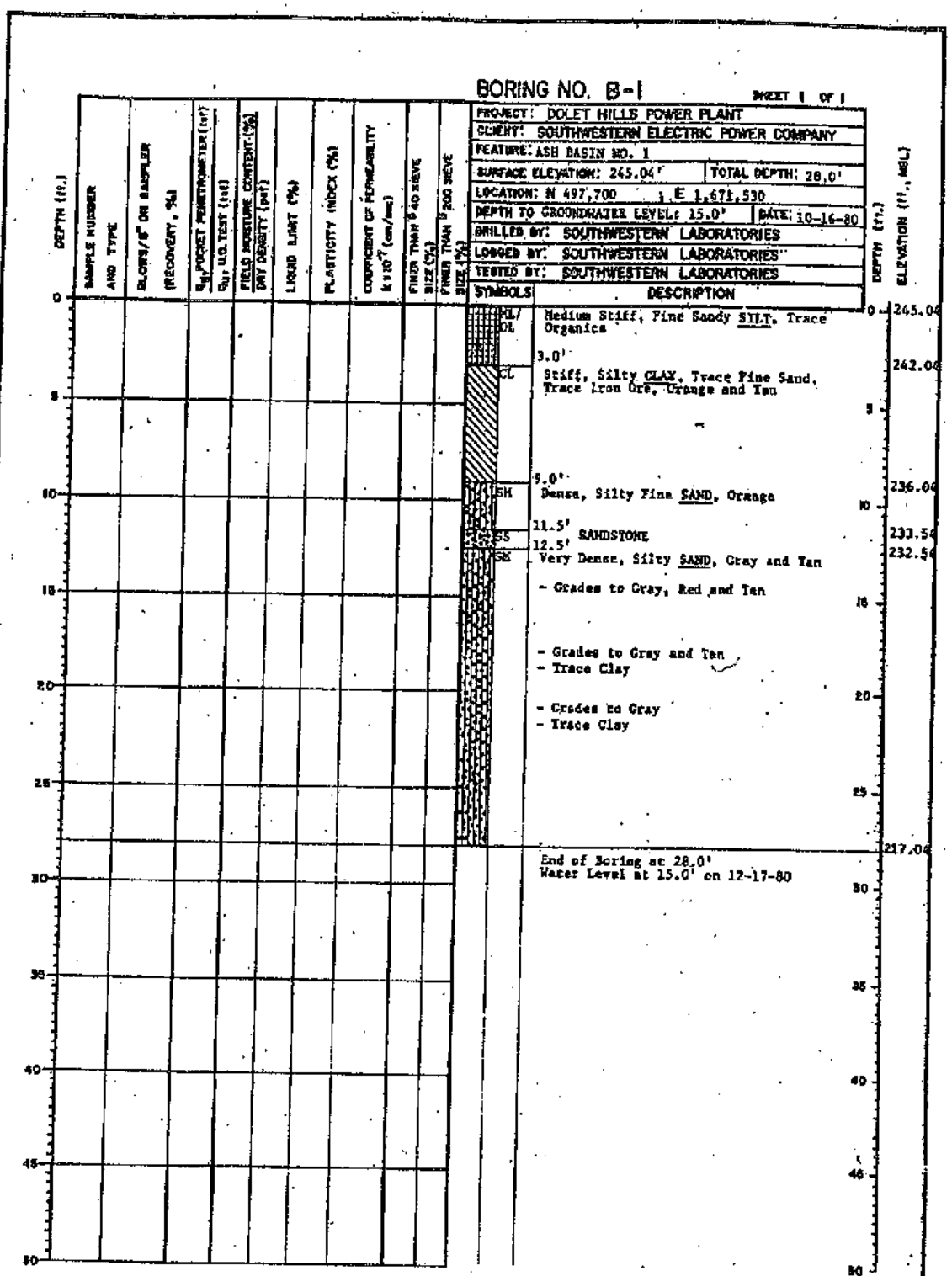
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-H-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-1 (PERCOLATION)

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



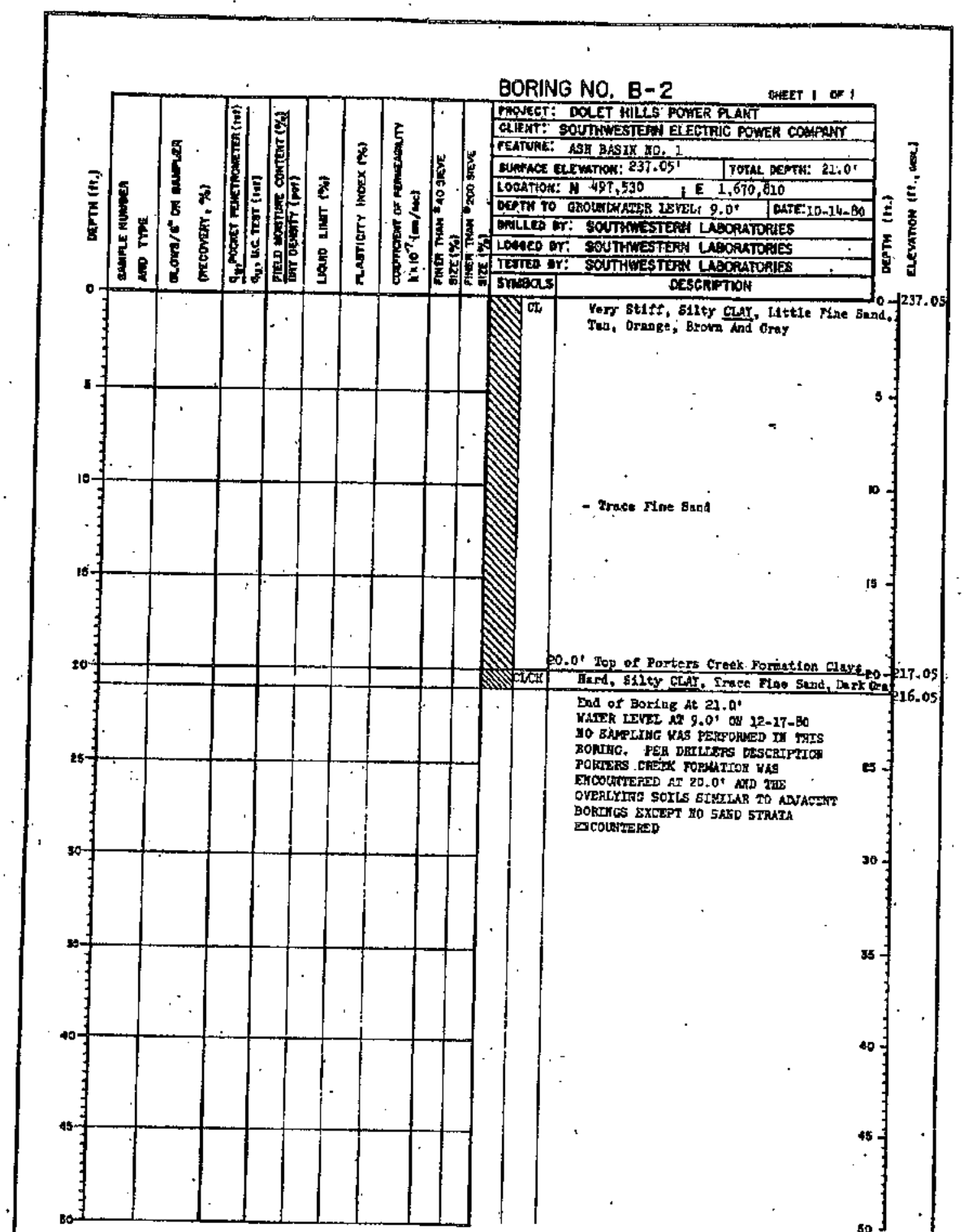
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.H. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-1

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



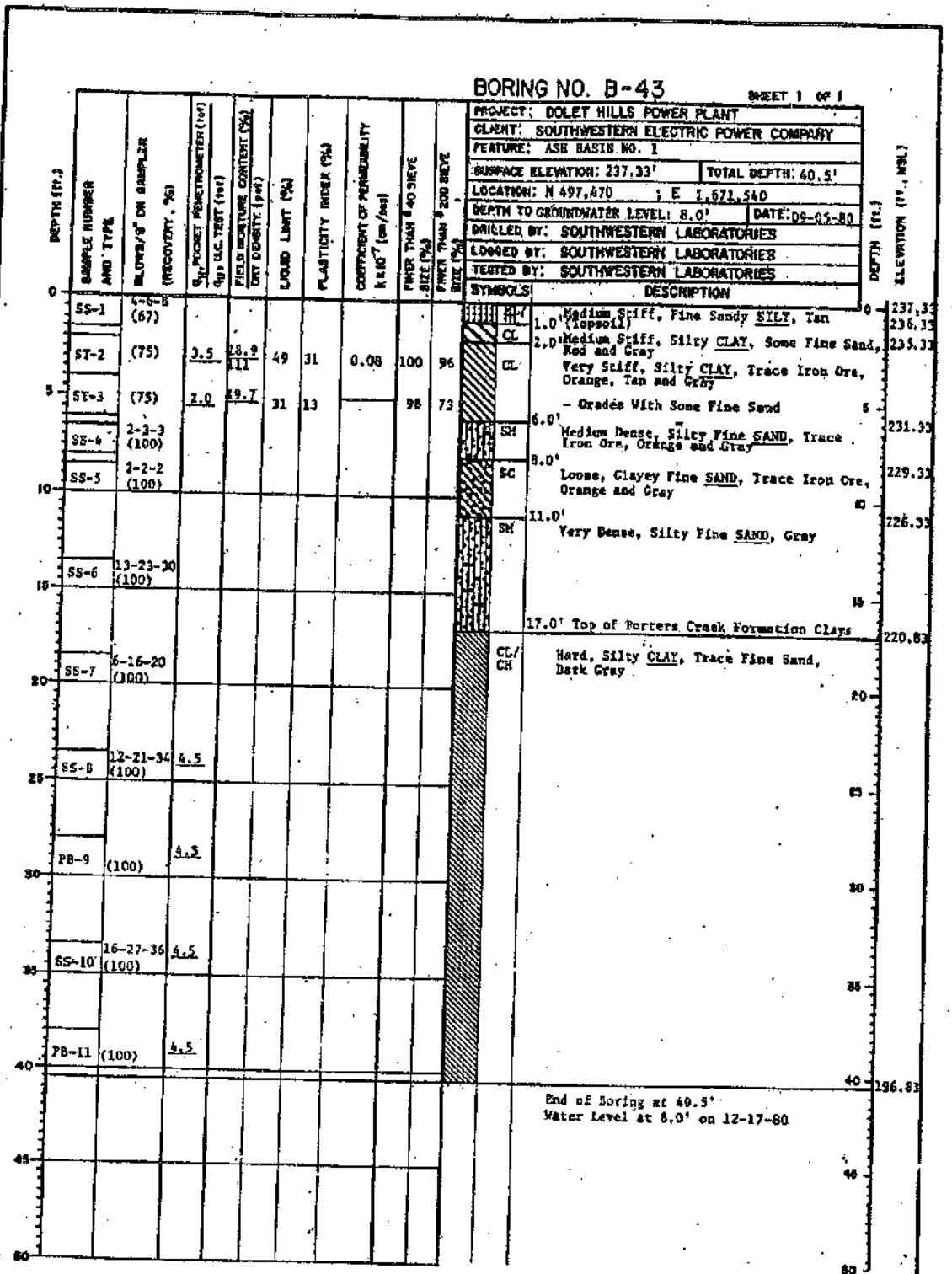
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-2

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



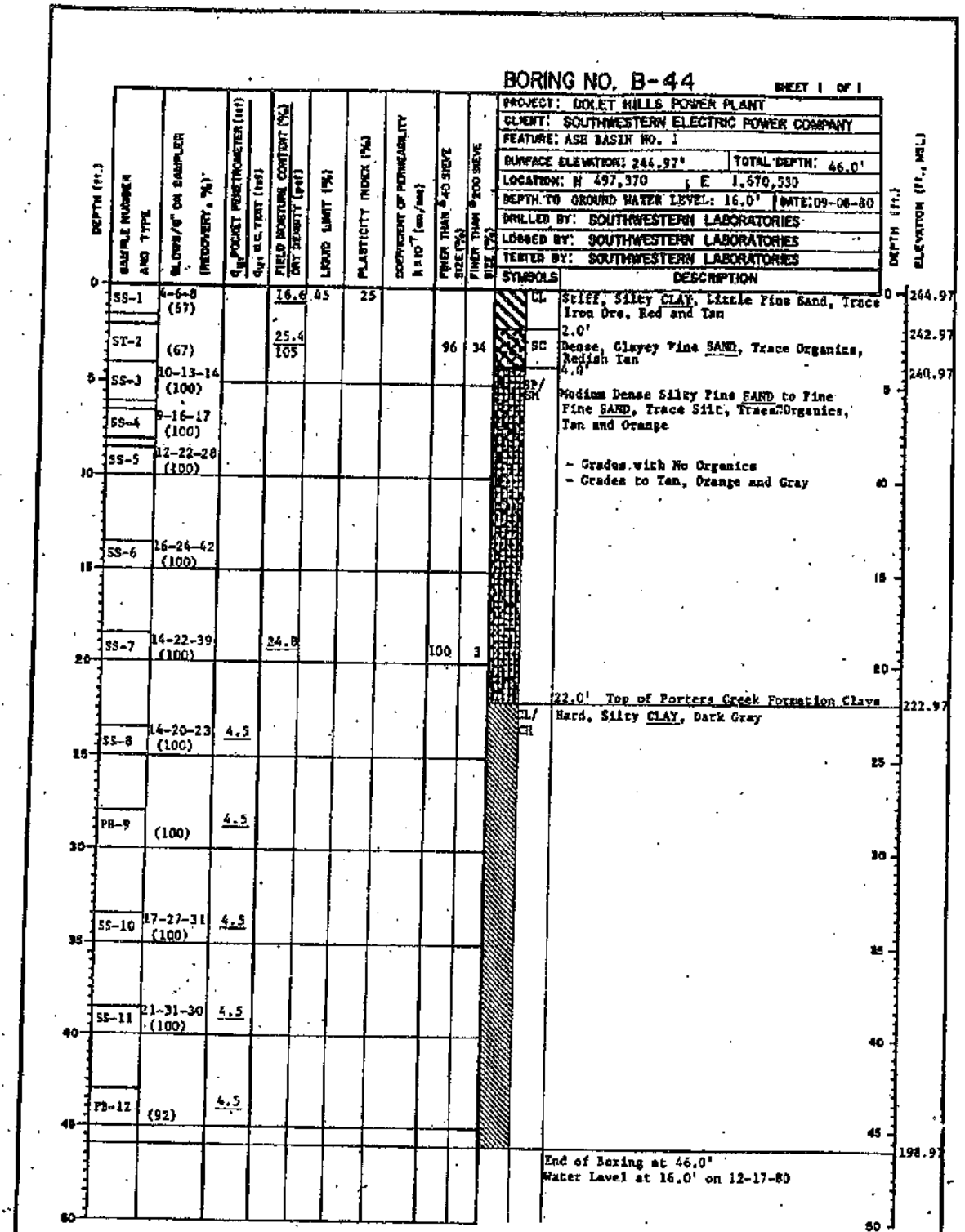
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-16-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-43

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 6803-02



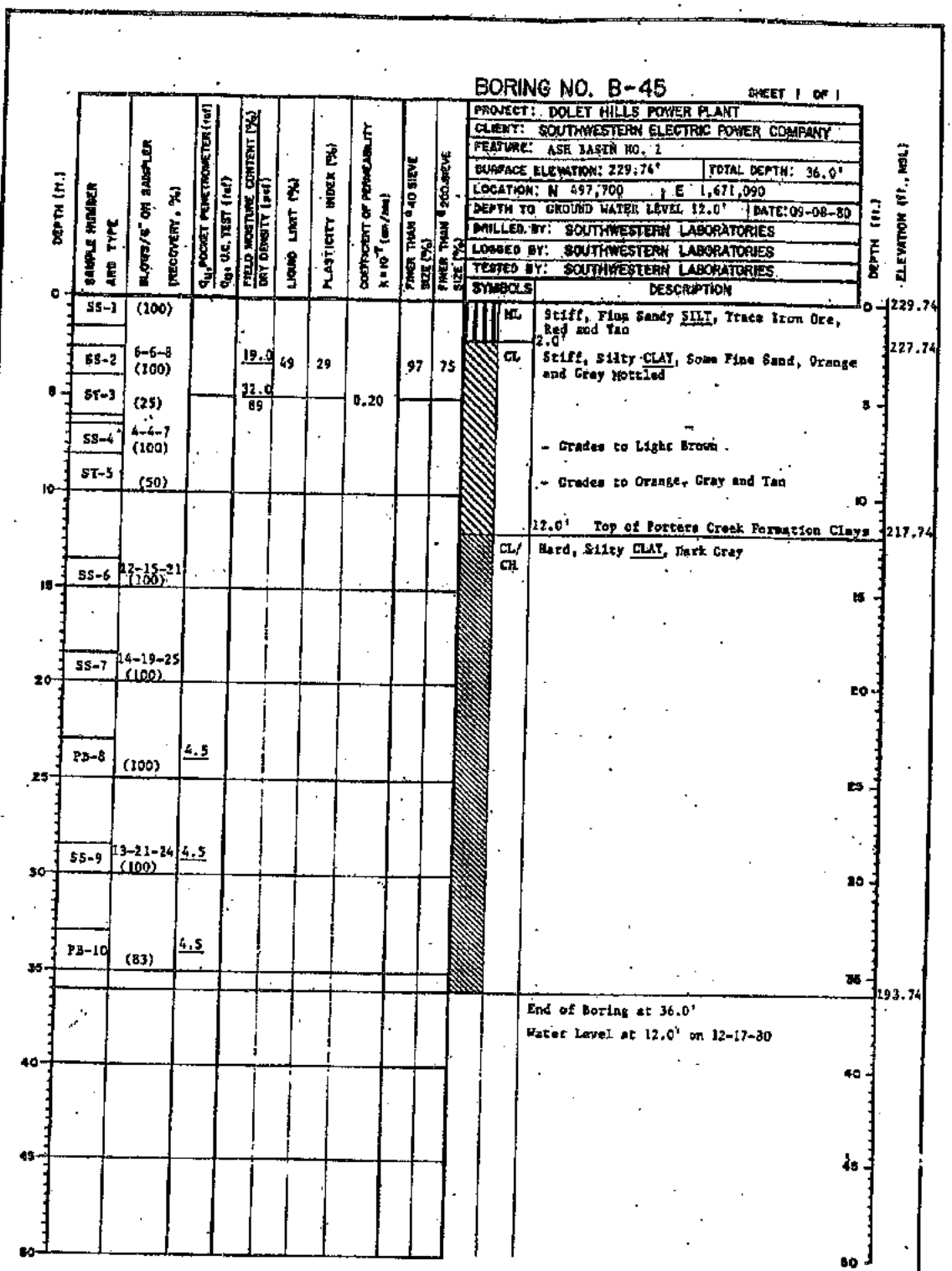
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-44

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.K. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-45

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-46

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 1
SURFACE ELEVATION: 226.36'	TOTAL DEPTH: 35.0'
LOCATION: N 497,680 ; E 1,670,530	
DEPTH TO GROUND WATER LEVEL: 8.0'	DATE: 09-09-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	PASSING #40 SIEVE (%)	PASSING #200 SIEVE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	SS-1	5-5-5 (78)		14.7	29	10				SM/CL	Stiff, Fine Sandy SILT, Tan, Trace Organics	0	226.36
											1.0' Stiff, Silty CLAY, and Fine Sand, Gray		225.36
	SS-2	(88)								CL	2.0' and red		224.36
5	SS-3	5-10-14 (100)								CL	Very Stiff, Silty CLAY, Little Fine Sand, Orange, Tan and Mottled	5	
	SS-4	16-11-21 (100)											
	SS-5	16-13-20 (100)									- Grades to Hard	10	
											12.0' Top of Porters Creek Formation Clays		214.36
15	SS-6	14-17-24 (100)								CH	Hard, Silty CLAY, Dark Gray	15	
20	SS-7	16-22-29 (100)										20	
25	PB-8	(100)	4.5 / 5.9	22.0 / 100	59	40						25	
30	SS-9	(100)	4.5									30	
35	PB-10	(93)	4.5								End of Boring at 35.0' Water level at 8.0' on 12-17-80	35	191.36
40												40	
45												45	
50												50	

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.K. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-46

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-47

SHEET 1 OF 2

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 1
SURFACE ELEVATION: 260.32'	TOTAL DEPTH: 70.0'
LOCATION: N 497,960	E 1,672,510
DEPTH TO GROUNDWATER LEVEL: 25.0'	DATE: 09-04-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_u, POCKET PENETROMETER (tsf) q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k in cm/sec	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	SS-1	4-6-7 (67)								ML/CL	Stiff, Fine Sandy SILT, Trace Organics, Tan (Topsoil)	0	260.32
											1.0'		
	ST-2	(100)		25.8 / 97	71	51		99	95	CH	Stiff, Silty CLAY, Trace Fine Sand, Orange and Gray		
5	SS-3	4-6-9 (100)										5	
	ST-4	(67)		28.3 / 95	54	33	0.37	100	99				
	SS-5	7-10-13 (100)									- Grades to Very Stiff		
10												10	
	ST-6	(58)											
15												15	
	SS-7	3-7-12 (100)											
20										CL	17.0' Very Stiff, Silty CLAY, With Lignitic Clay Seams, Dark Brown	20	243.32
	SS-8	14-20-26 (100)								CL	21.0' Hard, Silty CLAY, Trace Fine Sand, Orange, Tan and Dark Gray		239.32
25												25	
	SS-9	15-23-40 (100)								ML	27.0' Hard, Fine Sandy SILT, Orange, Tan and Gray With Some Black Clayey SILT Lenses		233.32
30												30	
	SS-10	16-26-29 (100)		33.0				96	65				
35												35	
	SS-11	23-33-33 (67)								SM	37.0' Very Dense, Silty Fine SAND, Gray		223.32
40												40	
	SS-12	21-30-39 (72)											
45												45	
											47.0' Top of Porters Creek Formation Clays		213.32
	SS-13	18-27-46 (100)								CL/CH	Hard, Silty CLAY, Trace Fine Sand, Dark Gray		
50												50	

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-47

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-47(CONT'D) SHEET 2 OF 2

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 1
SURFACE ELEVATION:	260.32' — TOTAL DEPTH: 70.0'
LOCATION:	N 497,960 ; E 1,671,510
DEPTH TO GROUNDWATER LEVEL:	25.0' — DATE: 09-04-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_p, POCKET PENETROMETER (tsf) / q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
50										CL/CH		50	210.32
55												55	
60	PB-14	(80)										60	
65												65	
70	PB-15	(94)	4.5								End of Boring at 70.0' Water Level at 25.0' on 12-17-80	70	190.32
75												75	
80												80	
85												85	
90												90	
95												95	
100												100	

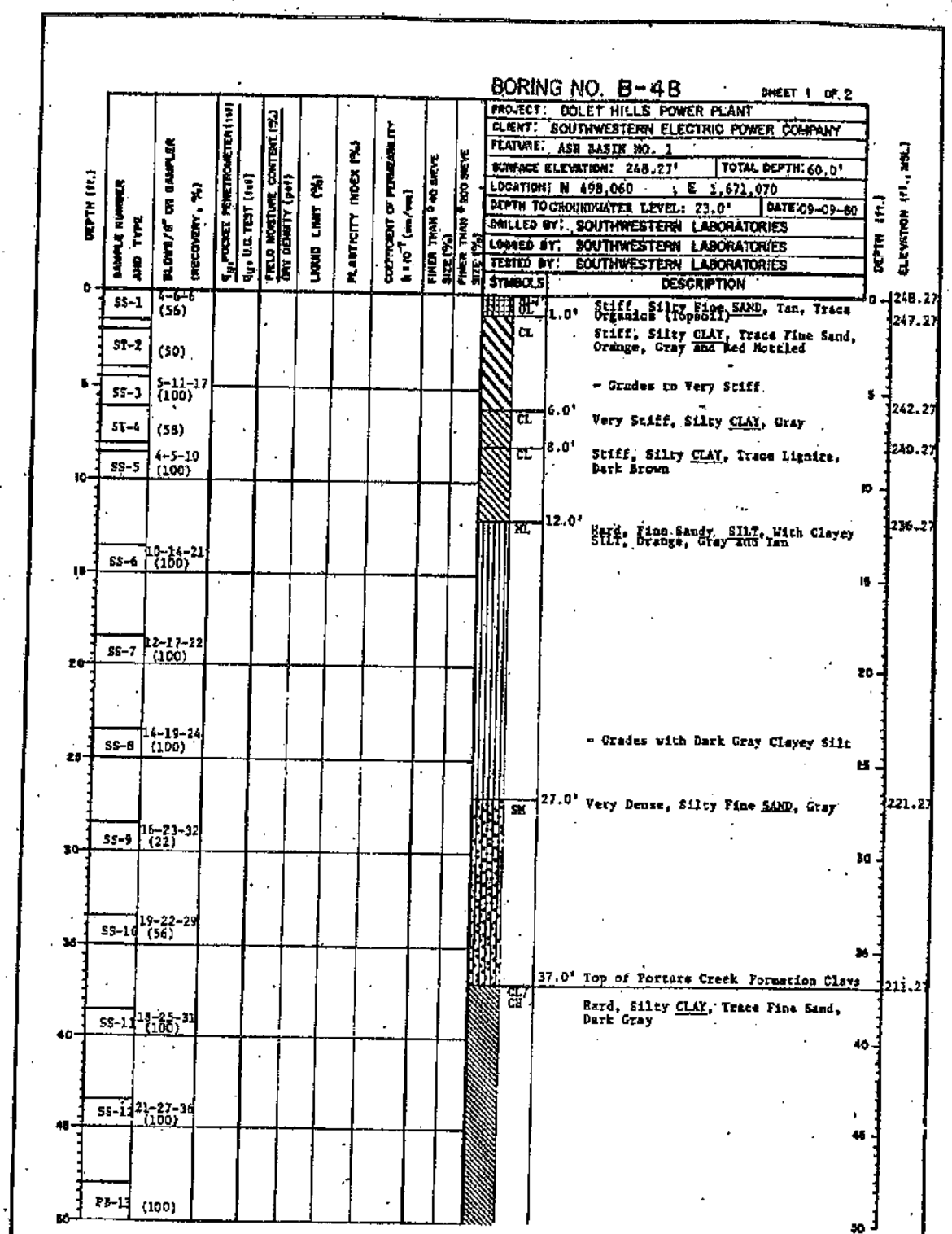
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-47(CONT'D)

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-48

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-48(CONT'D) SHEET 2 OF 2

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 1
SURFACE ELEVATION: 248.27'	TOTAL DEPTH: 60.0'
LOCATION: N 498,060	E 1,671,070
DEPTH TO GROUNDWATER LEVEL: 23.0'	DATE: 09-09-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u, POCKET PENETROMETER (tsf) q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-7}$ (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
50										CL/CH		50	198.27
55												55	
60	P3-14	(100)	4.5								End of Boring at 60.0' Water Level at 23.0' on 12-17-80	60	188.27
65												65	
70												70	
75												75	
80												80	
85												85	
90												90	
95												95	
100												100	

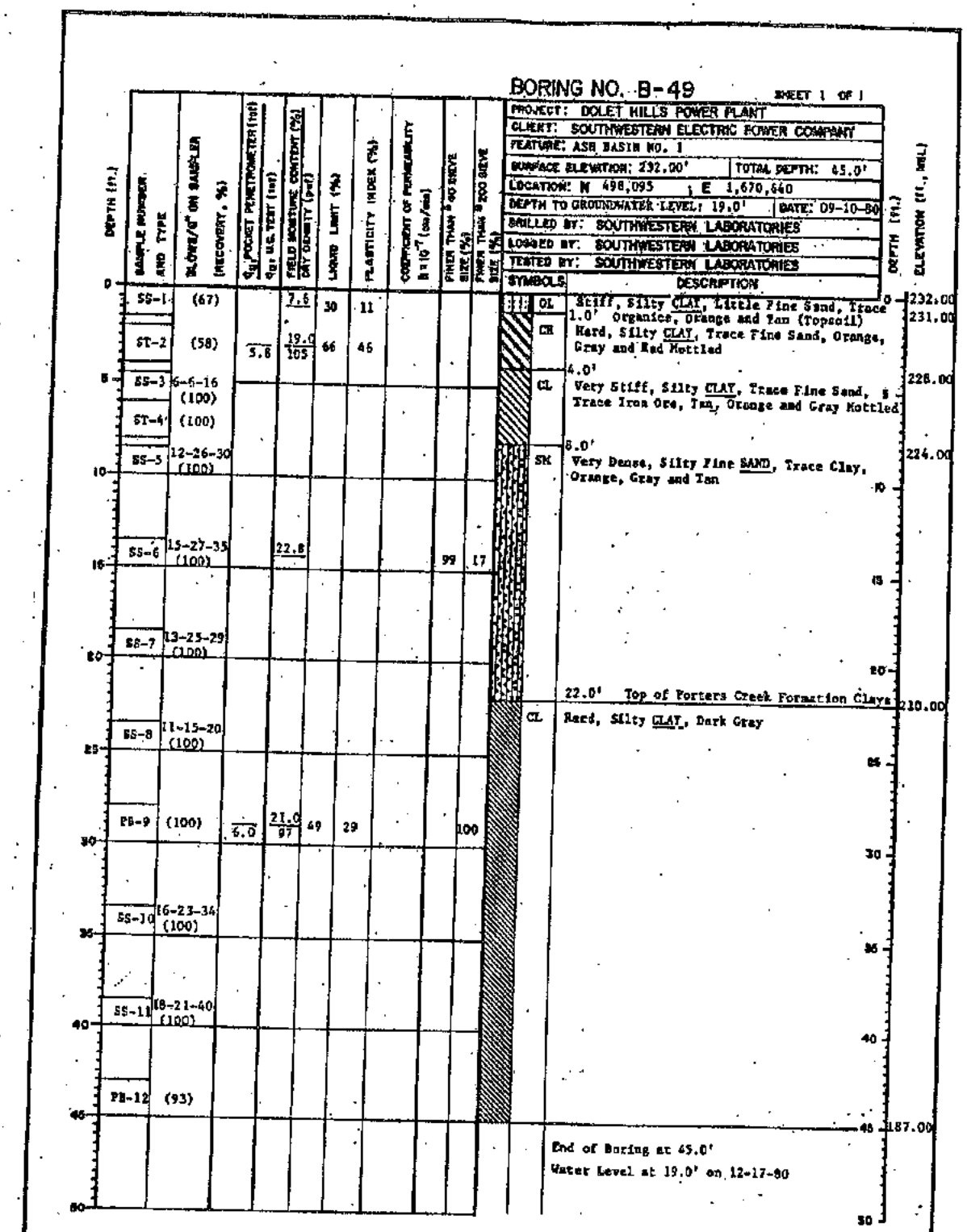
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-48(CONT'D)

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



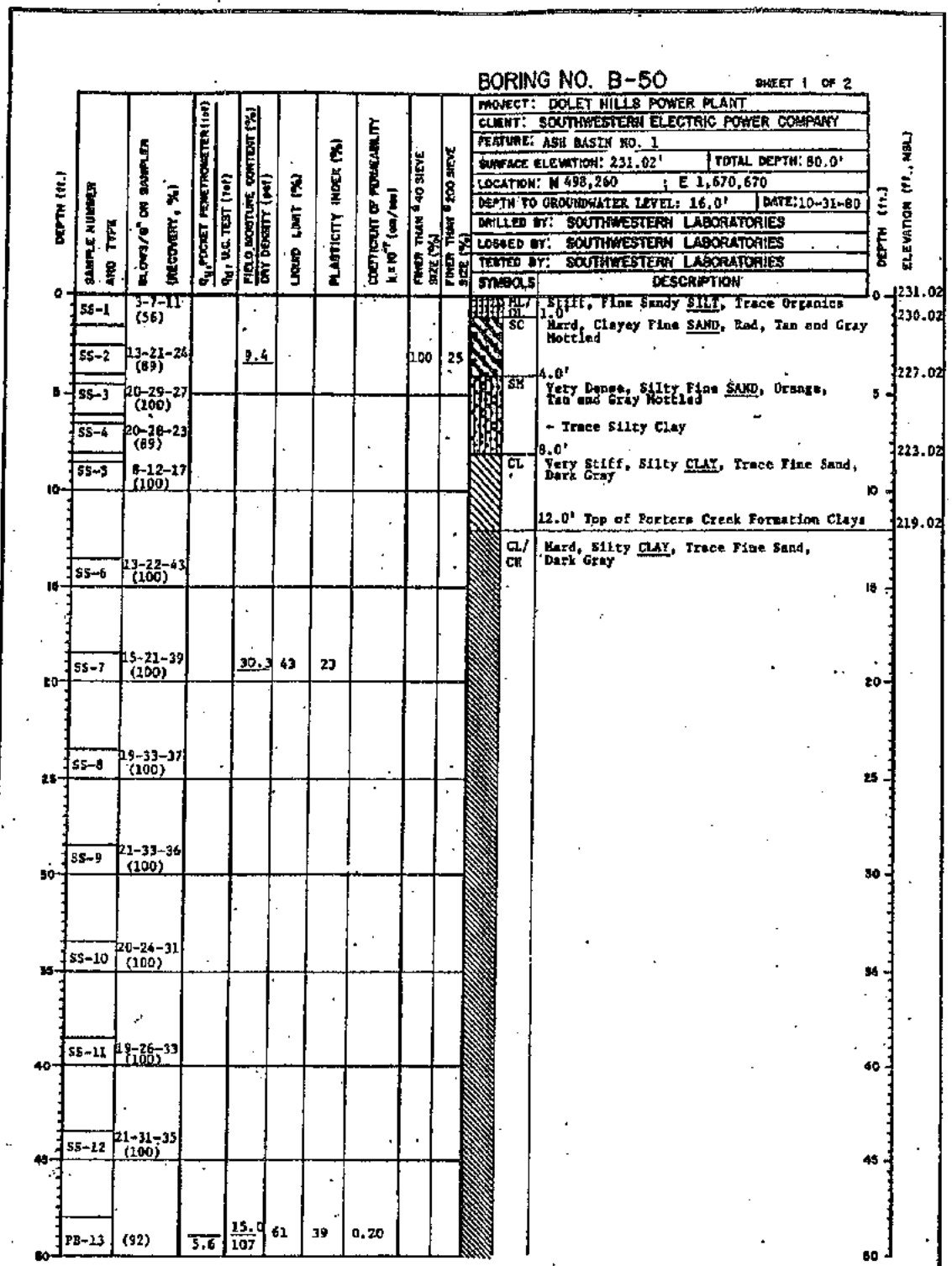
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-49

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



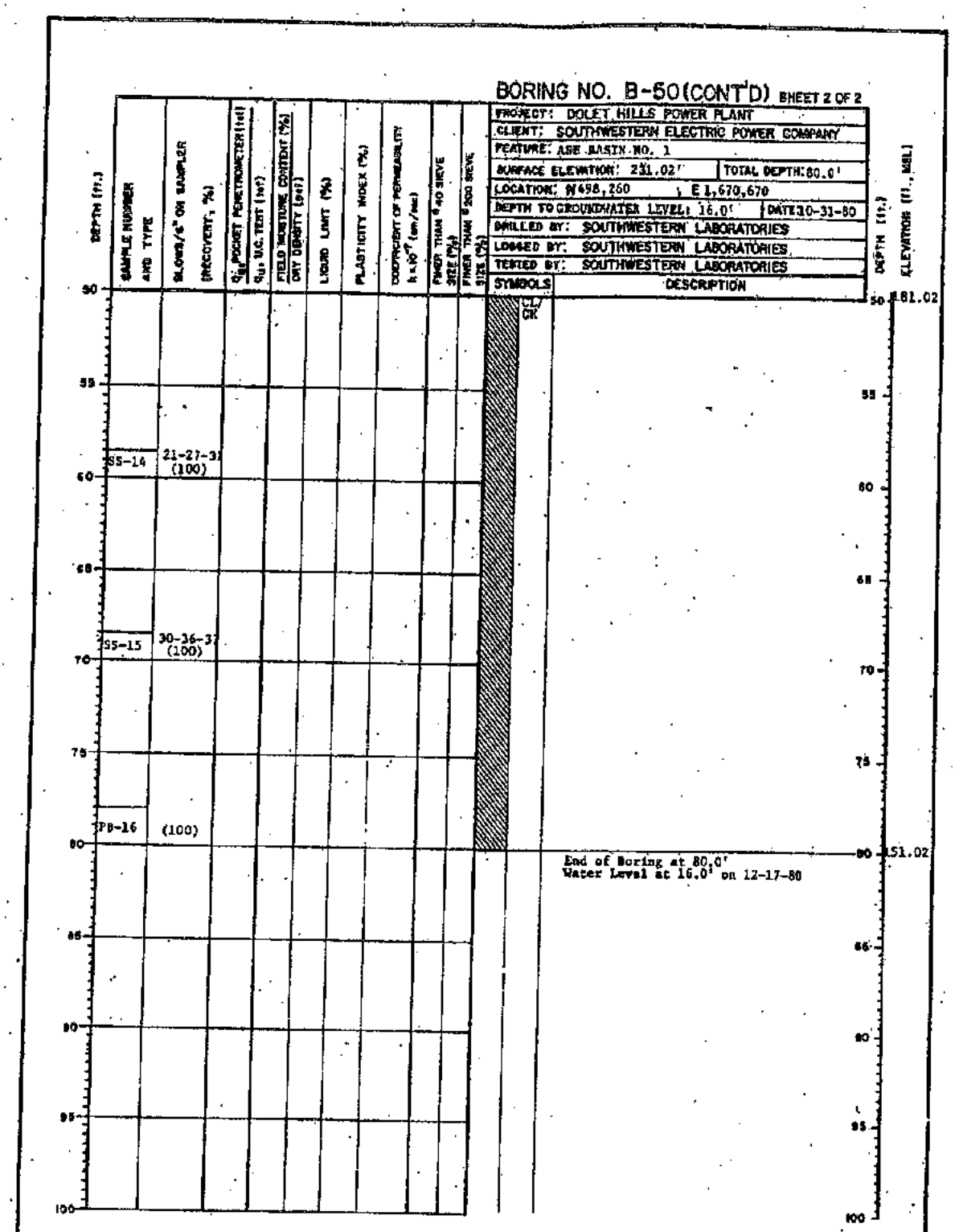
REVISION	DATE PREPARED by	DESCRIPTION
0	09-14-84 S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-50

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



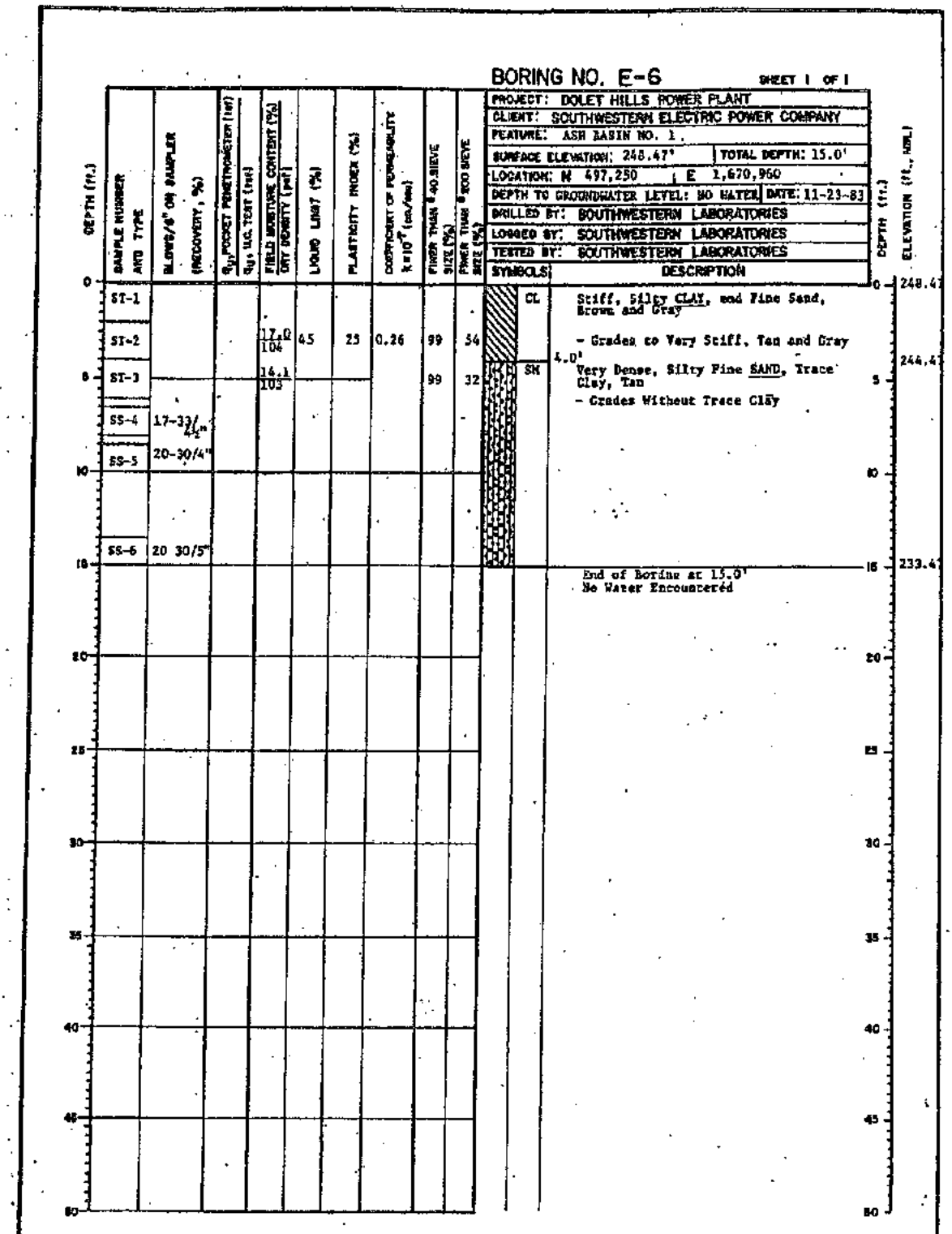
REVISION	DATE / PREPARED BY	DESCRIPTION
0	01-14-84 / S.N. VARADHU	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-50(CONT'D)

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



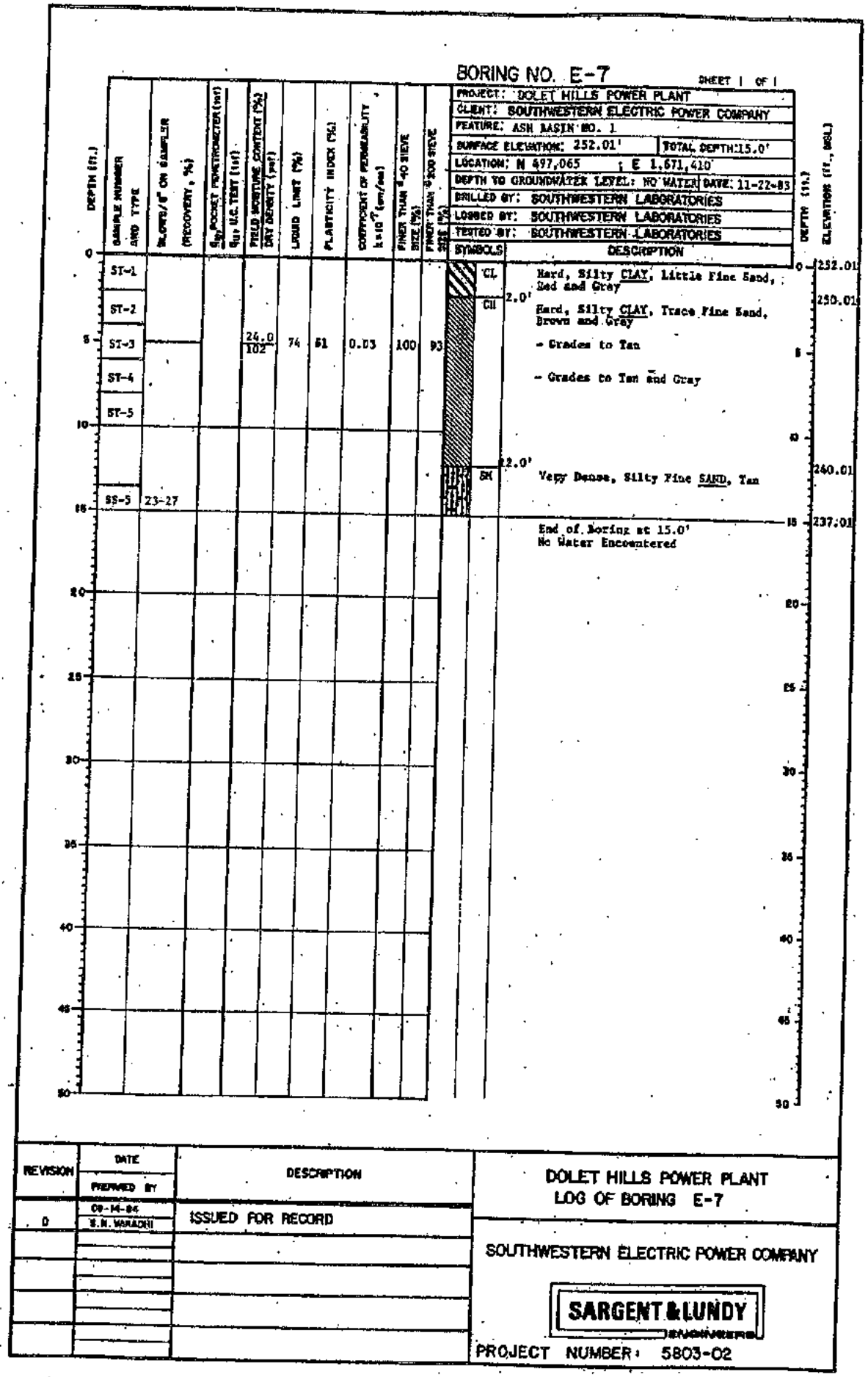
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADH	ISSUED FOR RECORD.

DOLET HILLS POWER PLANT
LOG OF BORING E-6

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



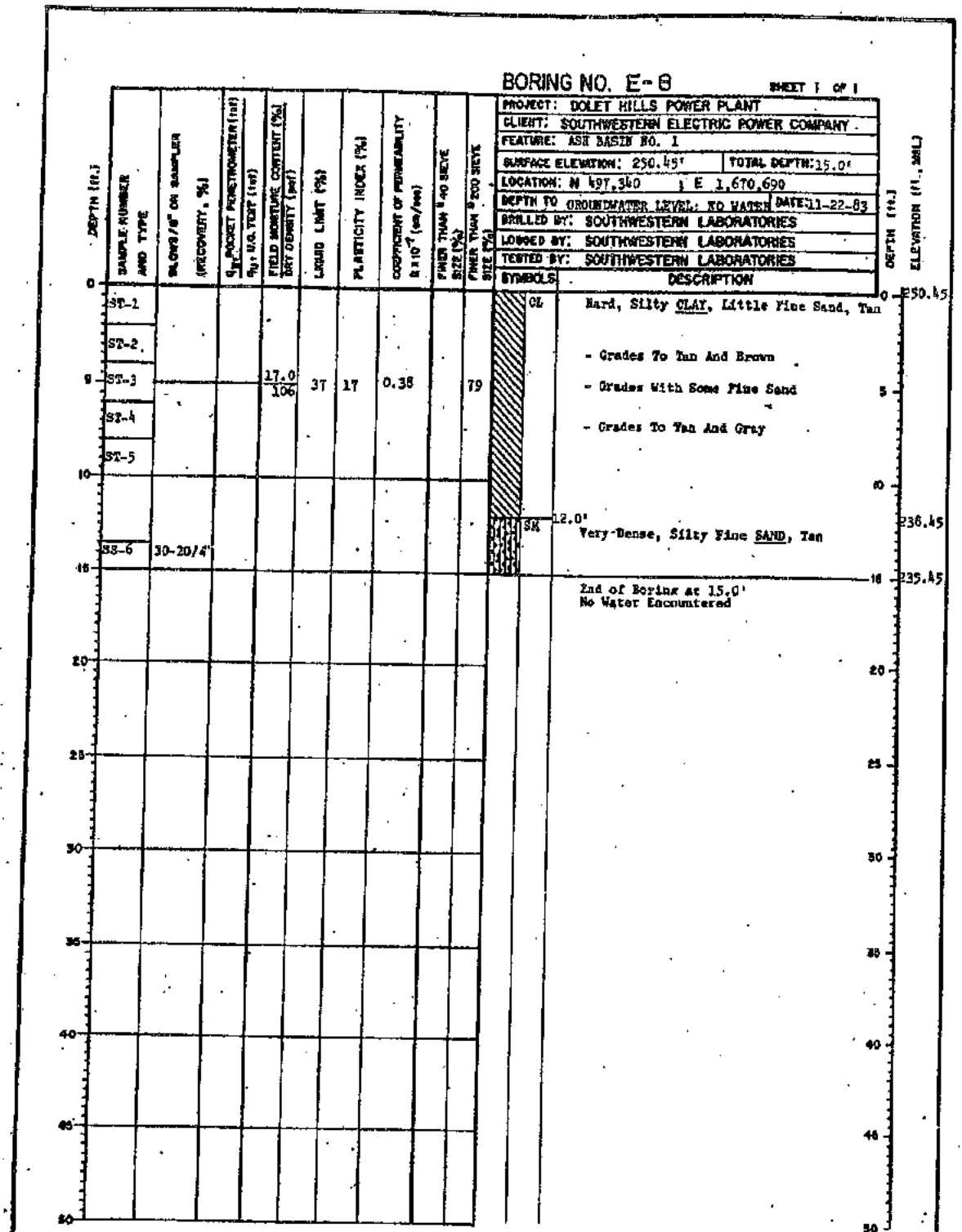
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. WARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-7

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



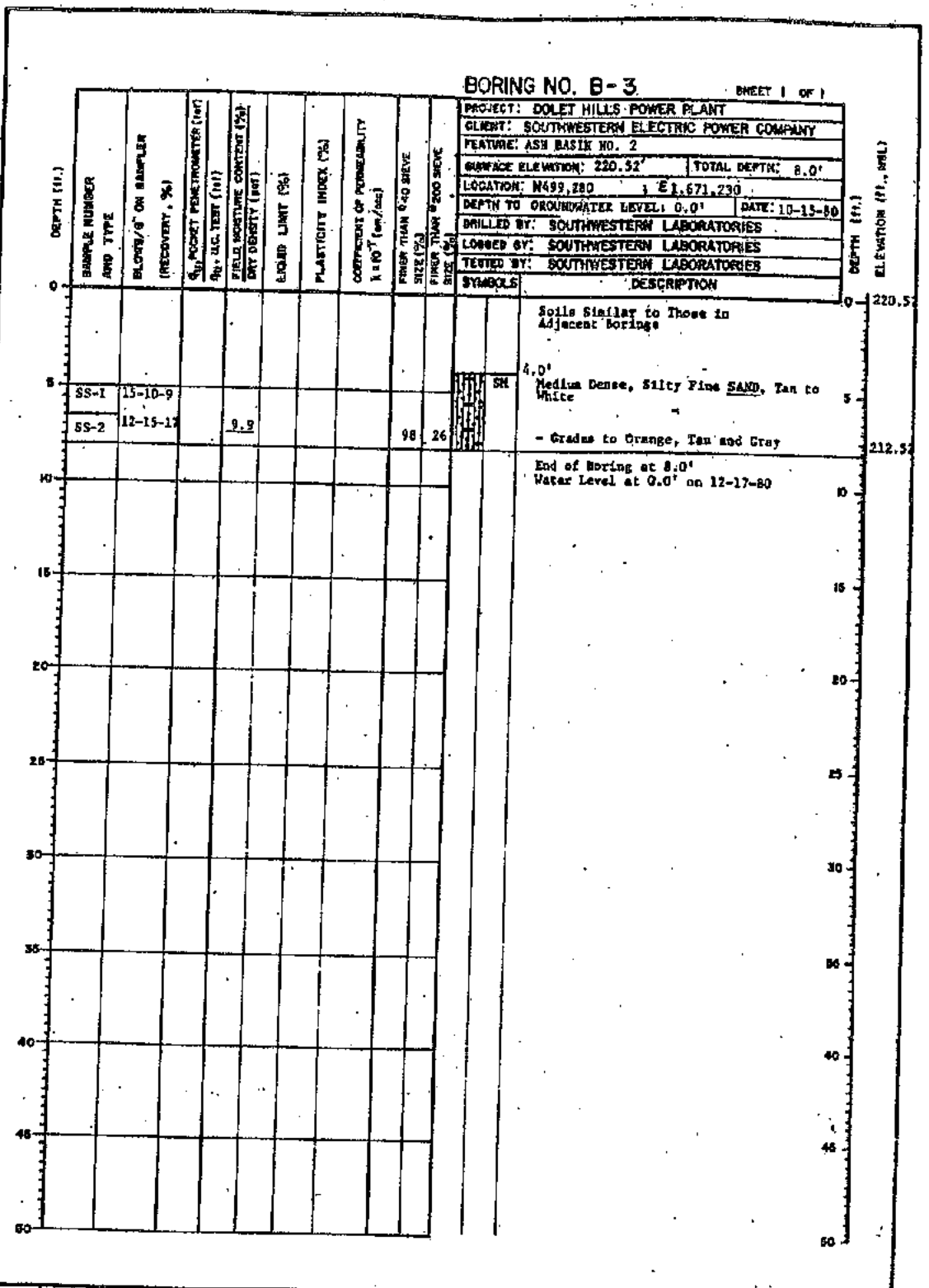
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-8

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



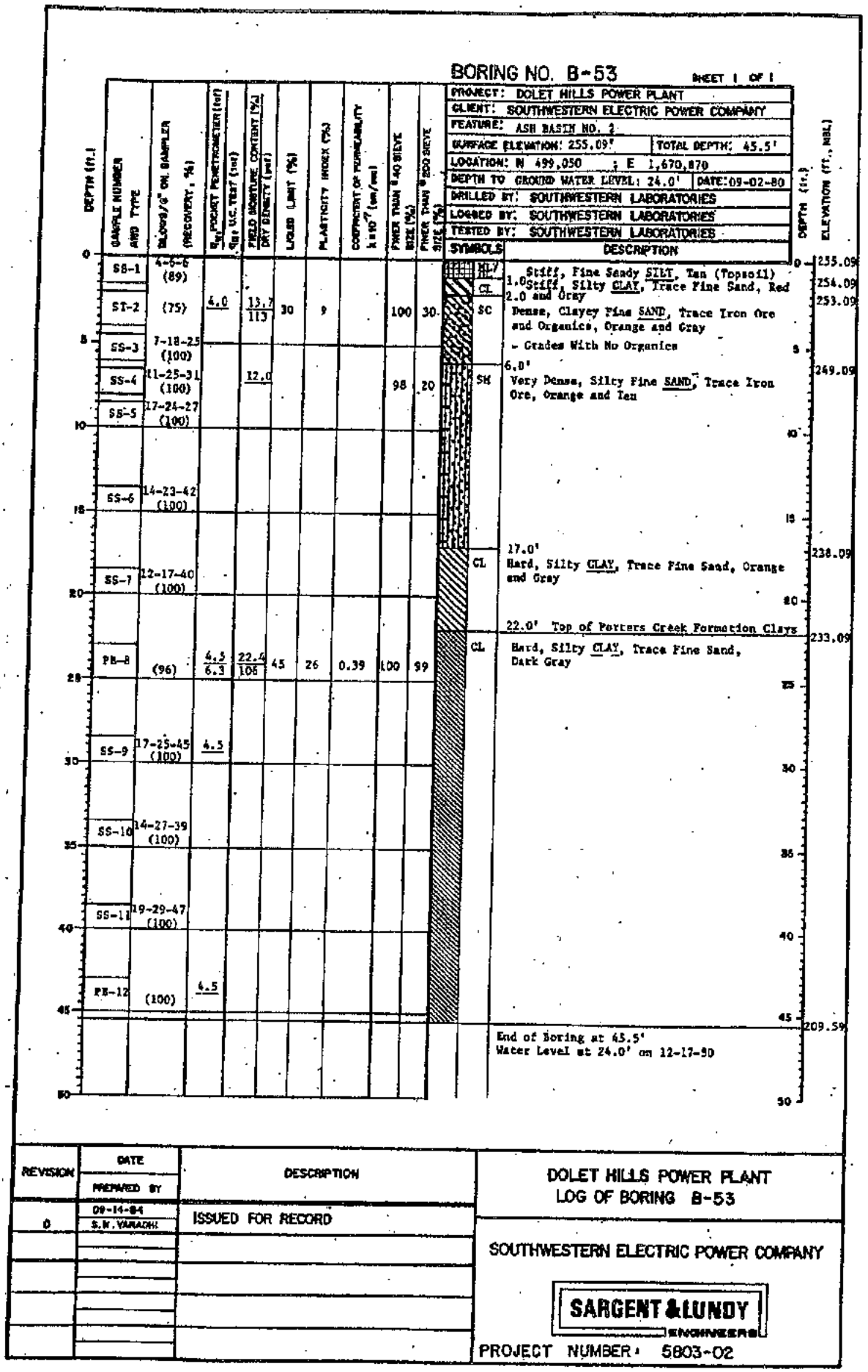
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADE	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-3

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



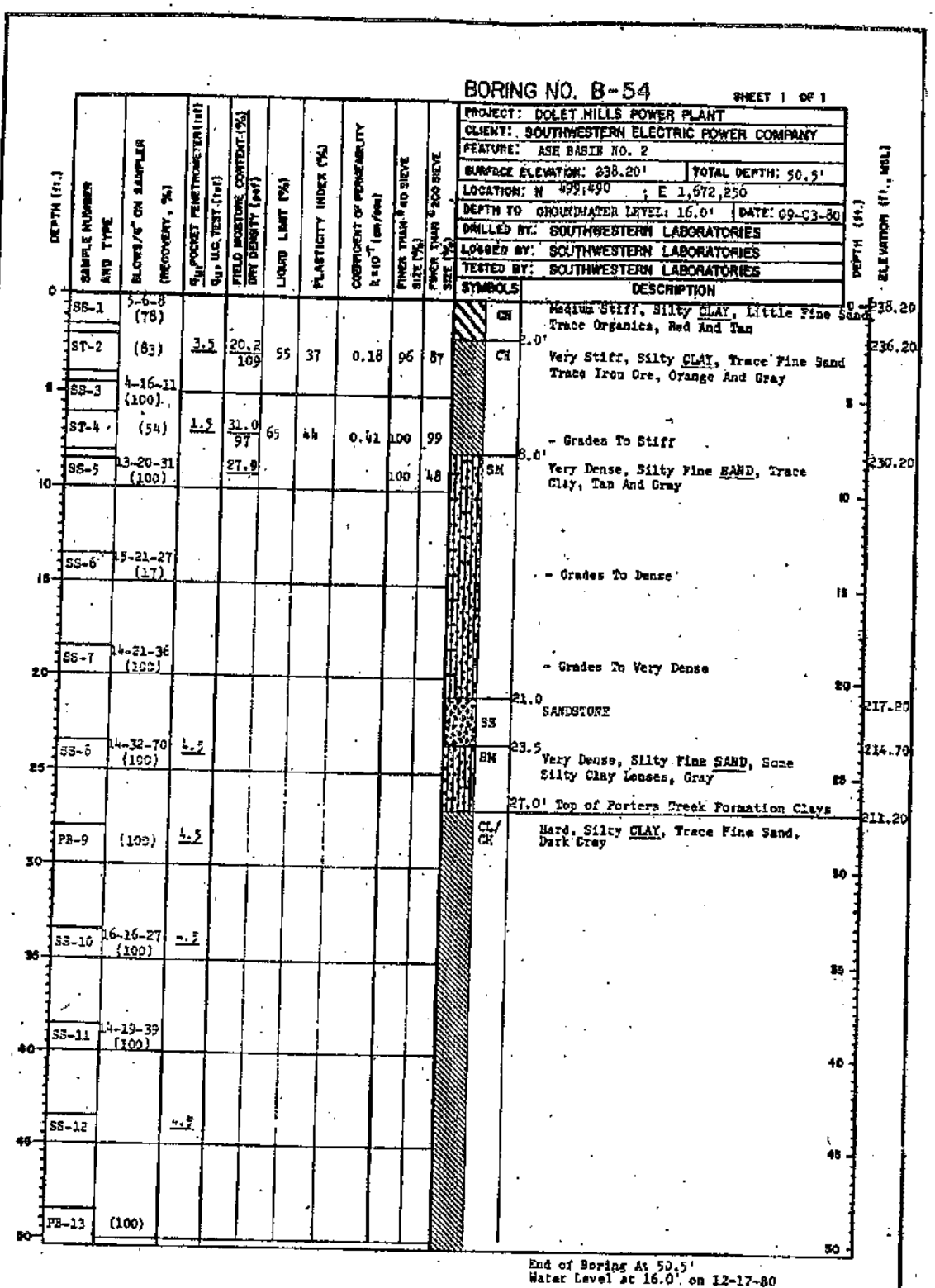
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-53

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



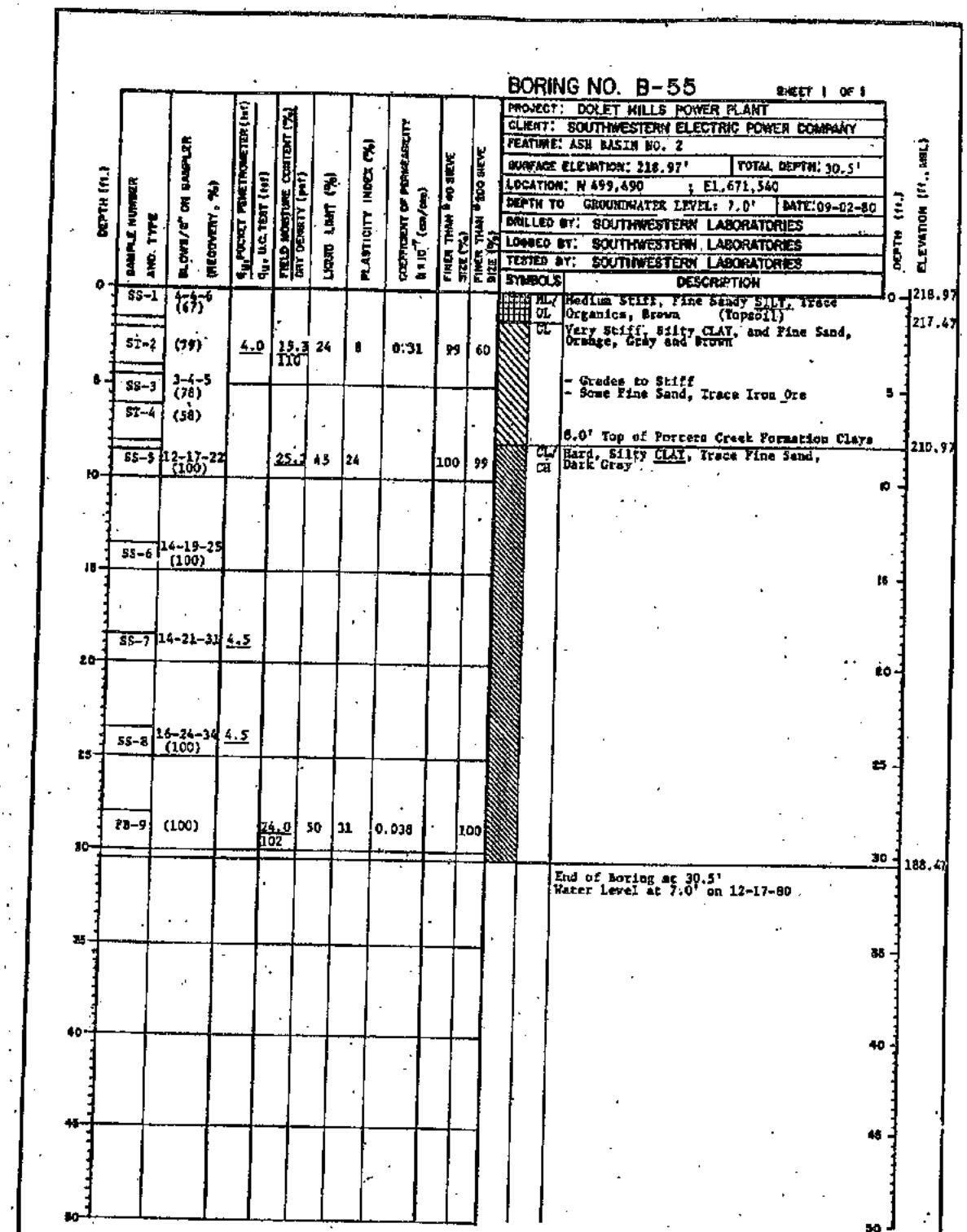
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-54

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 S.H. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-55

SOUTHWESTERN ELECTRIC POWER COMPANY

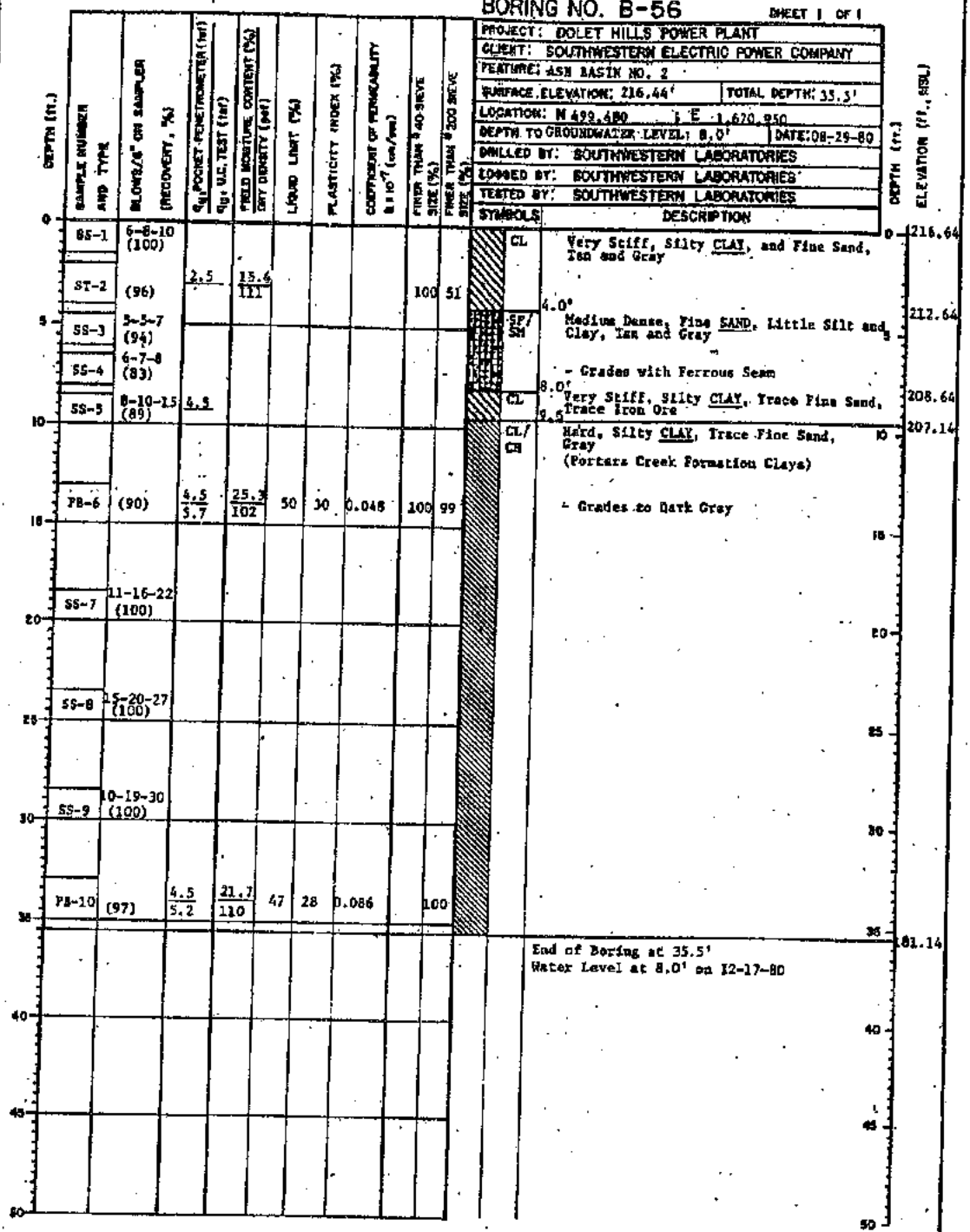
SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-56

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	216.44' — TOTAL DEPTH: 35.5'
LOCATION:	N 499,480 E 1,670,950
DEPTH TO GROUNDWATER LEVEL:	8.0' — DATE: 08-29-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES



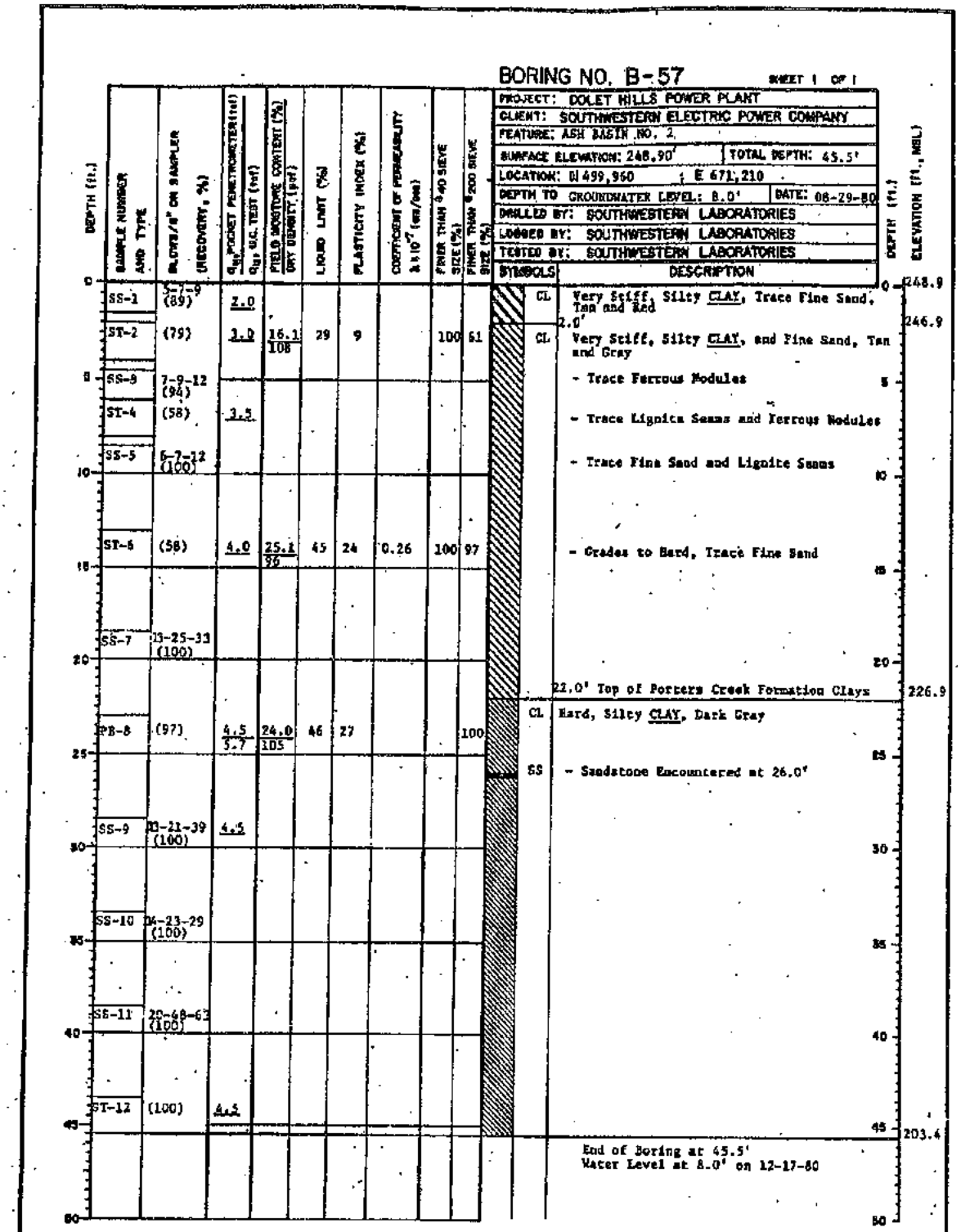
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.H. VAUGHN	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-56

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



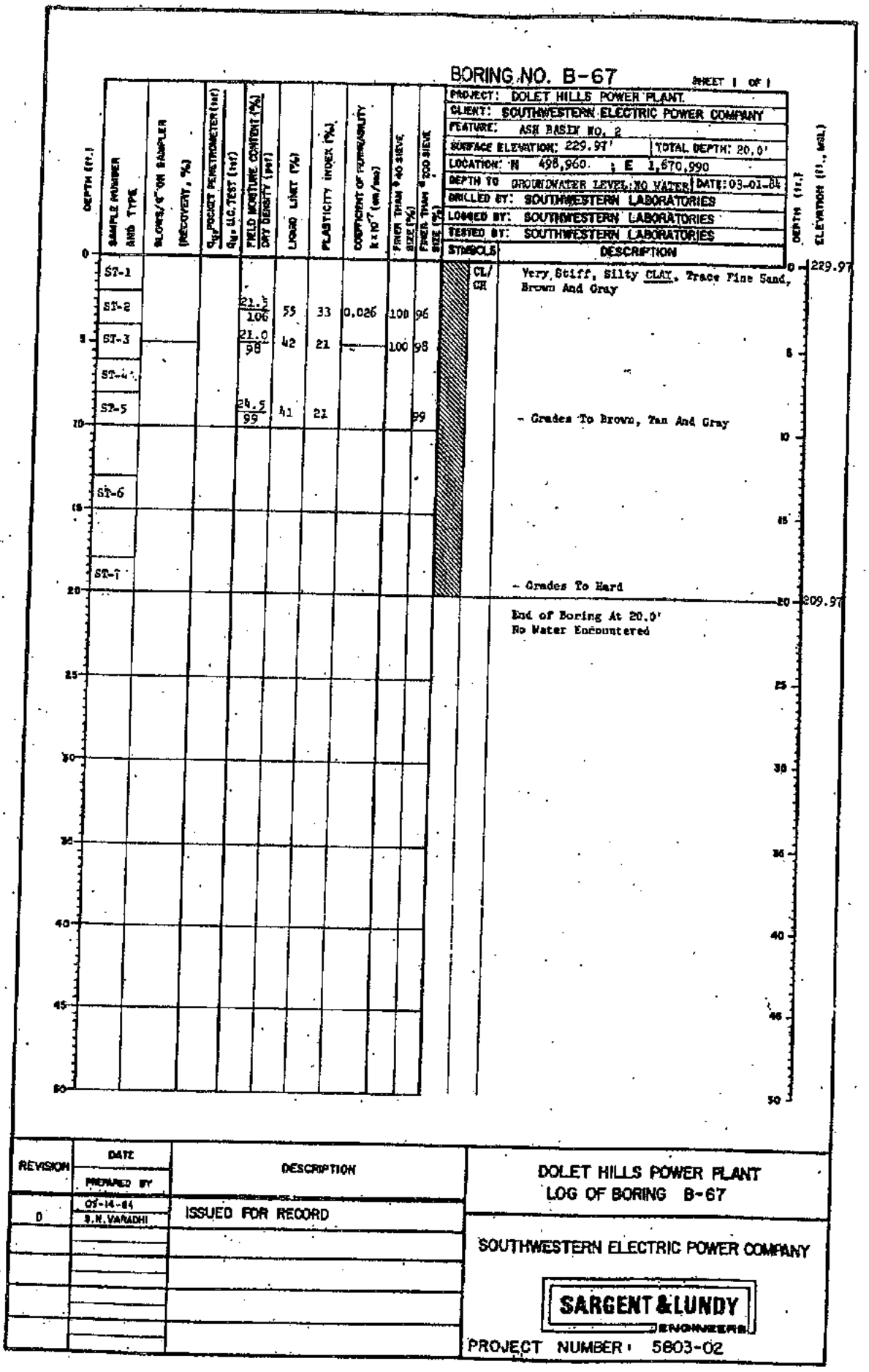
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.K. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-57

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



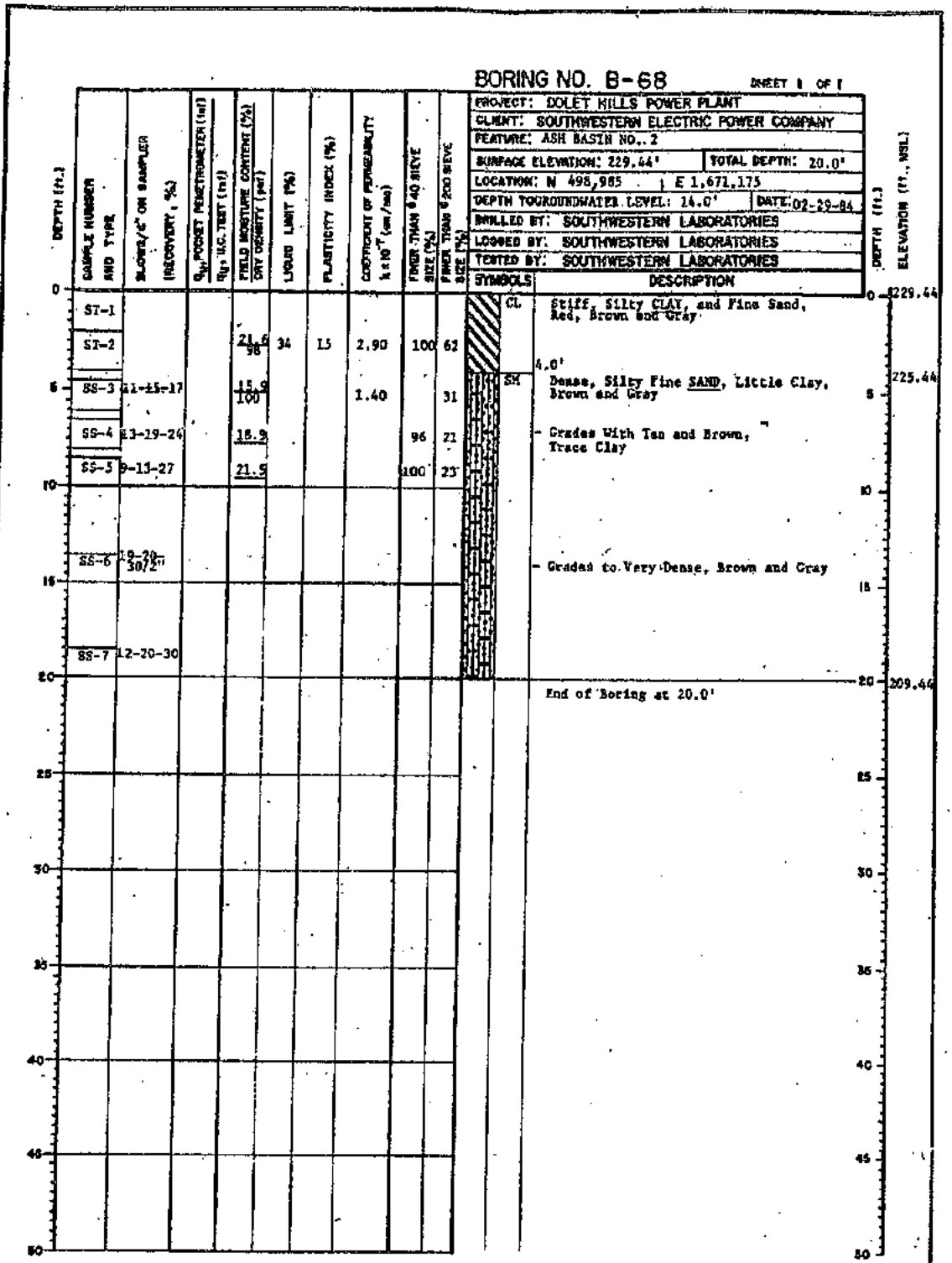
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / B.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-67

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



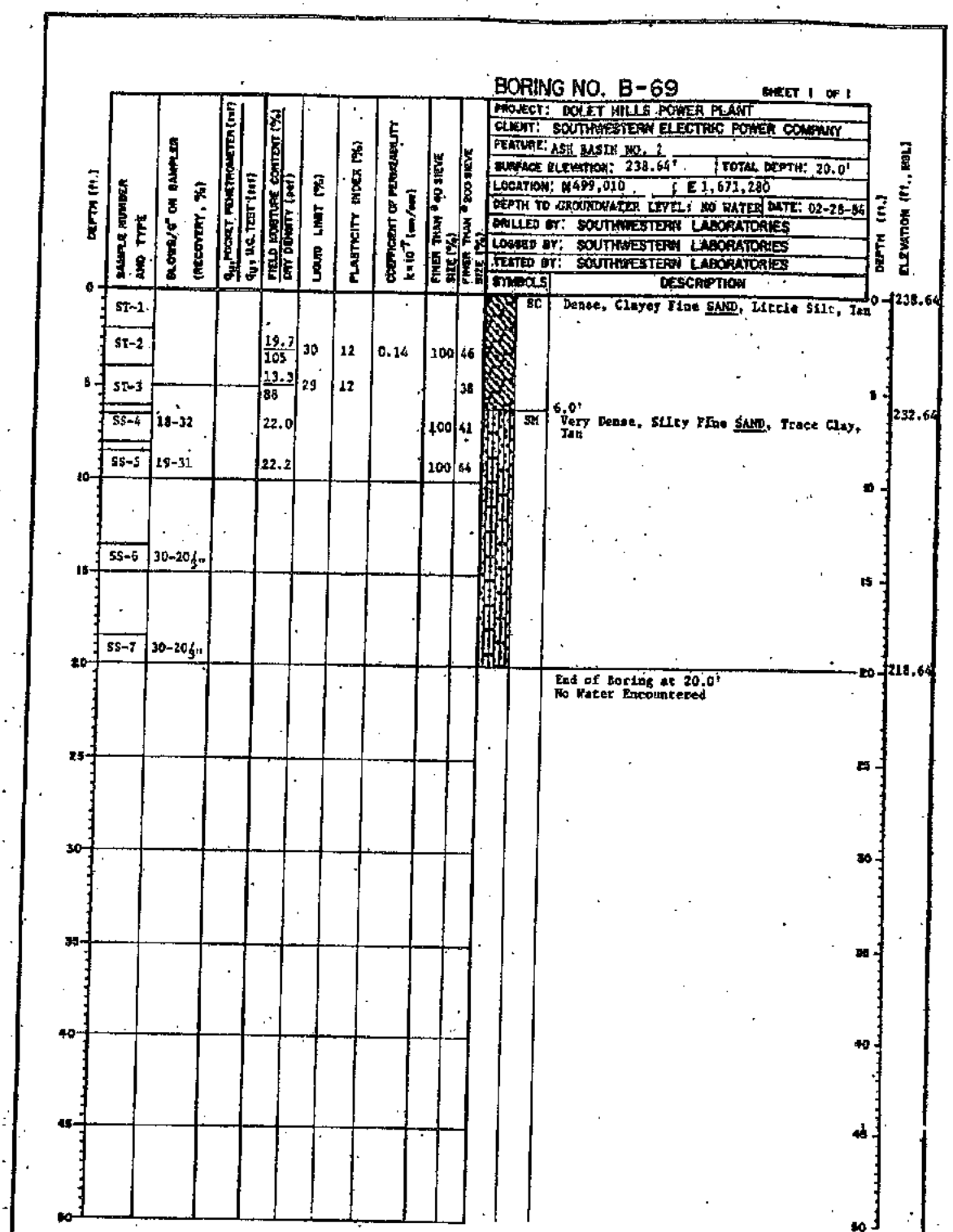
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.R. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-68

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



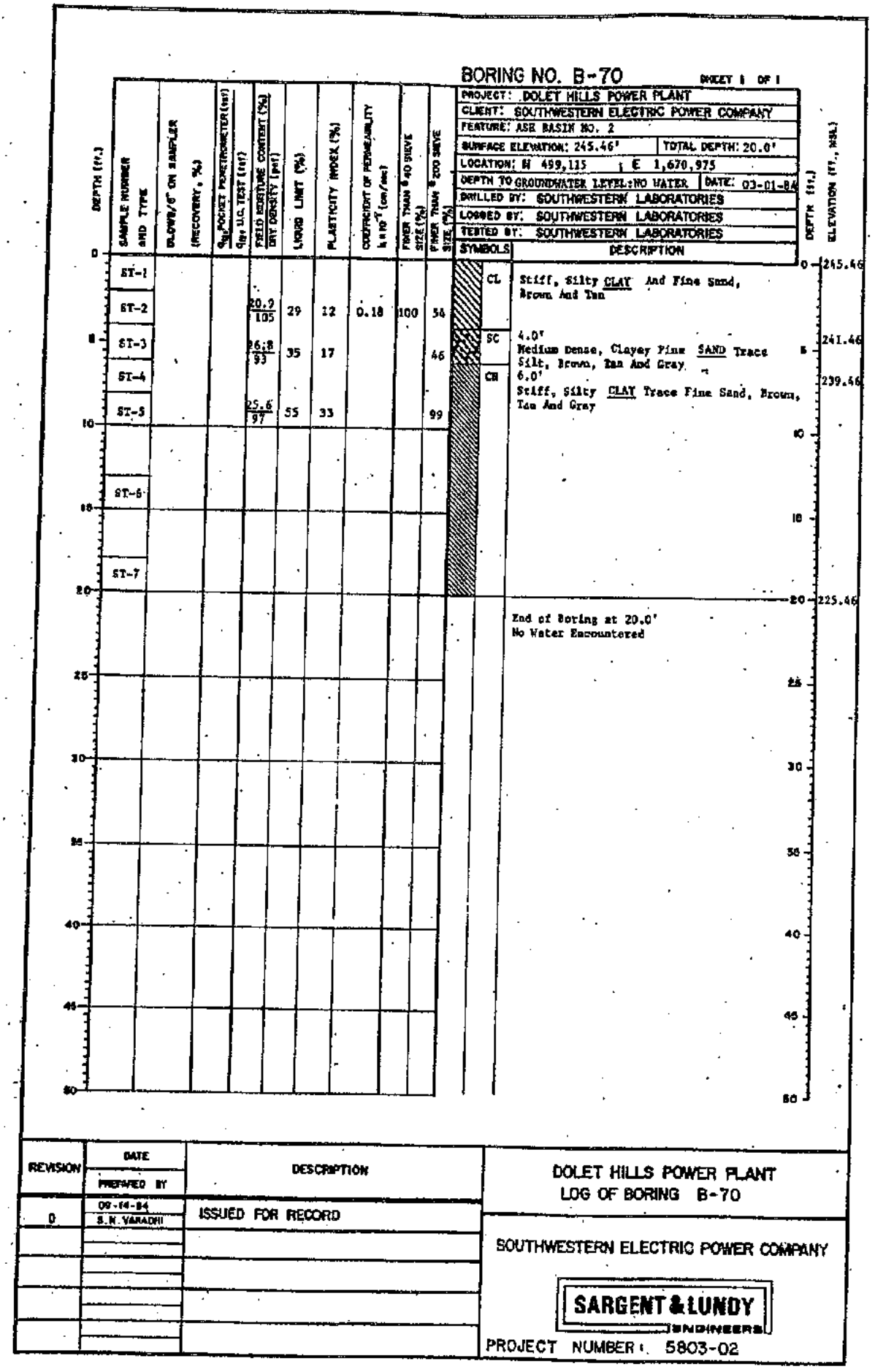
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-69

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-70

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-71

SHEET 1 OF 1

PROJECT: DOLET HILLS POWER PLANT
CLIENT: SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE: ASH BASIN NO. 2
SURFACE ELEVATION: 226.94 | TOTAL DEPTH: 20.0'
LOCATION: N 499,130 ; E 1,671,150
DEPTH TO GROUNDWATER LEVEL 8.0' | DATE: 03-01-84
DRILLED BY: SOUTHWESTERN LABORATORIES
LOGGED BY: SOUTHWESTERN LABORATORIES
TESTED BY: SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER RECOVERY, %	%qu POCKET PENETROMETER (tsf) / qu U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10⁻⁷ (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1			21.4 / 93	23	6		100	20	SC	Medium Dense, Clayey FINE SAND, Little Silt, Brown	0	226.94
	ST-2			19.3 / 100	26	9	90.0	100	36		- Grades to Brown and Gray		
5	ST-3											5	
	SS-4	11-20-30/3¼"		20.7	23	6		100	24		- Grades to Very Dense		
											8.0		218.94
10	SS-5	16-25-25/3¼"		24.4				100	23	SM	Very Dense, Silty Fine SAND, Brown And Gray	10	
	SS-6	13-22-28/5"									- Trace Clay	15	
20	SS-7	14-20-30/3½"									End of Boring at 20.0'	20	206.94
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	

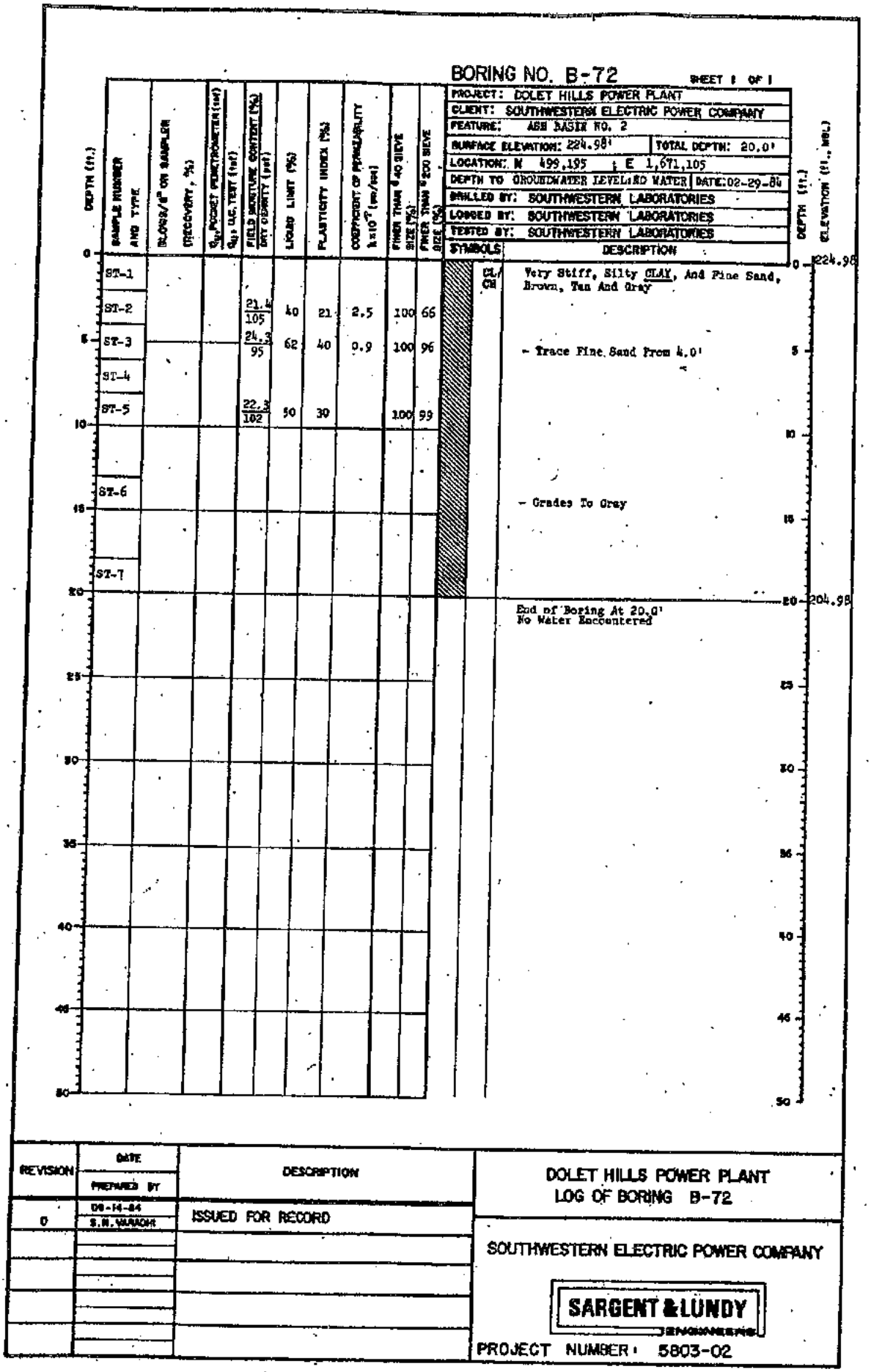
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.K. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-71

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



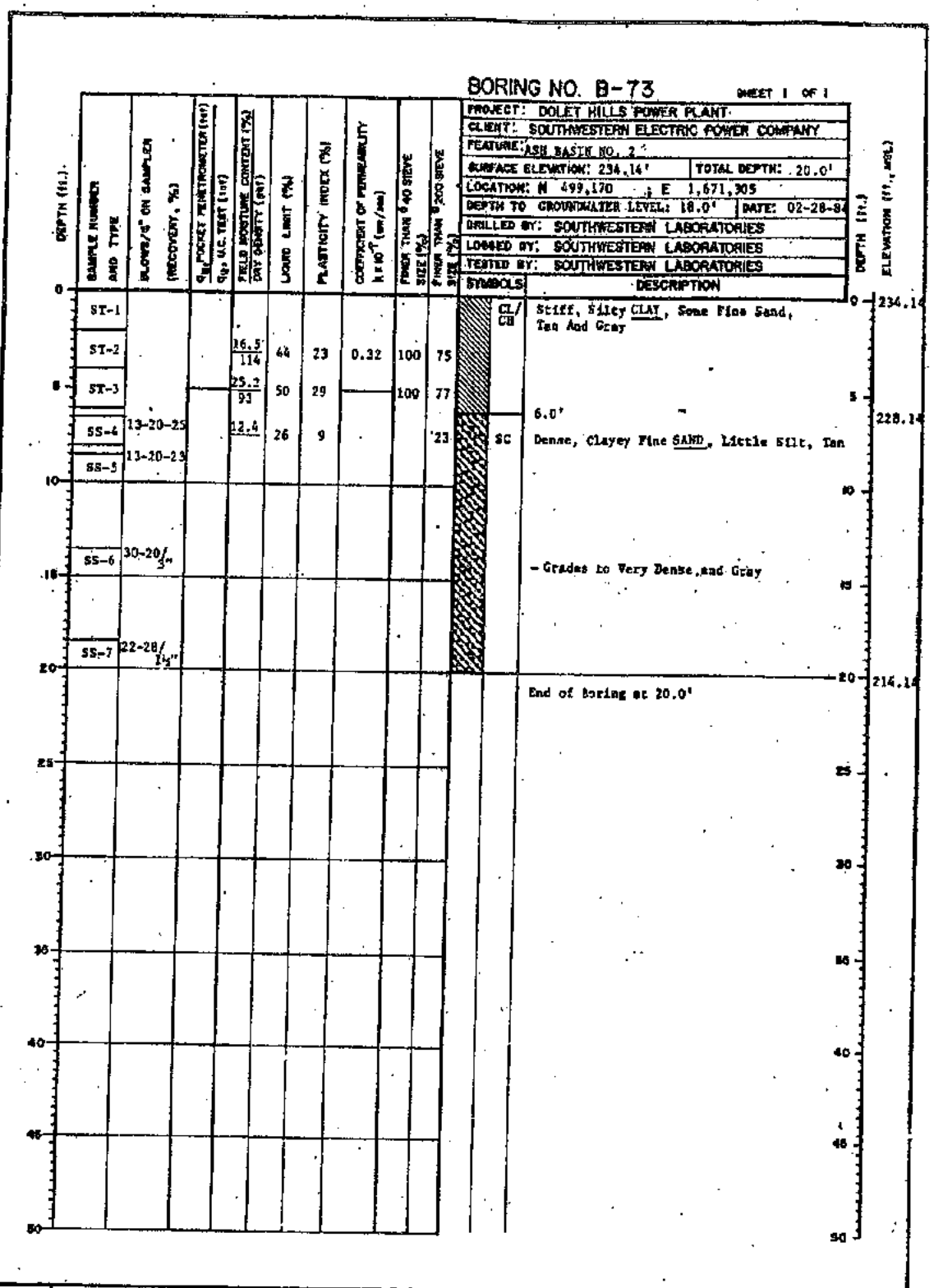
REVISION	DATE PREPARED BY	DESCRIPTION
0	06-14-84 S.N. VARADH	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-72

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



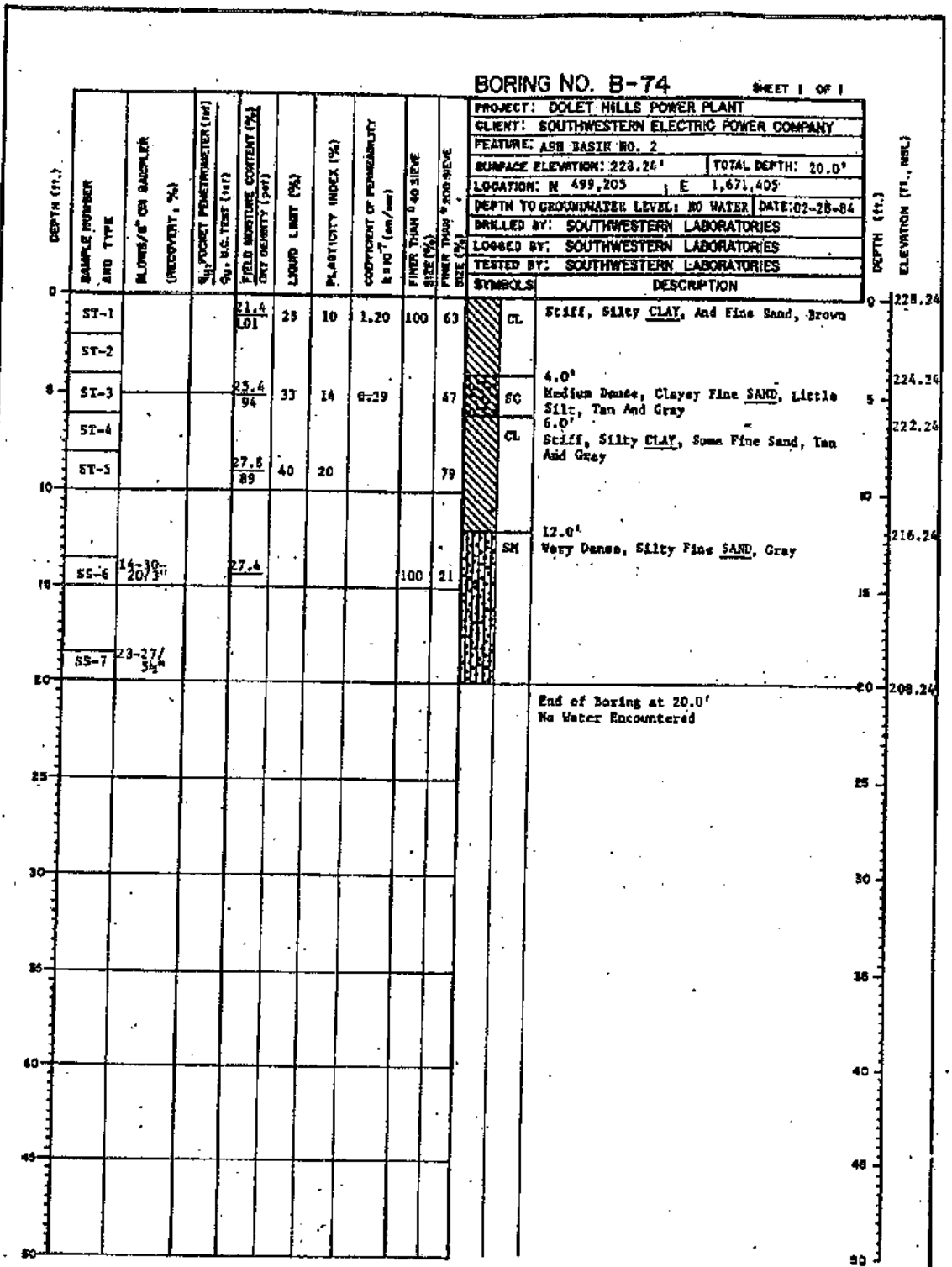
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-73

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / B.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-74

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-75

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	216.84' — TOTAL DEPTH: 20.0'
LOCATION:	N 499,340 ; E 1,671,140
DEPTH TO GROUNDWATER LEVEL:	6.0' — DATE: 02-29-84
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u/POCKET PENETROMETER (tsf) / q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-7}$ (cm/sec)	PASSING #40 SIEVE SIZE (%)	PASSING #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0												0	216.84
	ST-1									CL	Stiff, Silty CLAY, Some Fine Sand, Brown		
	ST-2			22.4 / 89	34	15	9.5*	100	70				
5	ST-3			27.1 / 95	34	16	0.18		93		- And Fine Sand	5	
	ST-4												
	ST-5			20.8 / 97	46	25			57		- Grades to Gray		
10												10	
	ST-6												
15												15	
	ST-7												
20											End of Boring At 20.0'	20	196.84
											*Sample Disturbed		
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	
55													
60													

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-75

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 6803-02

BORING NO. B-76

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	216.54' — TOTAL DEPTH: 20.0'
LOCATION:	N 499,350 ; E 1,671,340
DEPTH TO GROUNDWATER LEVEL:	6.0' — DATE: 02-29-84
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	S_u POCKET PENETROMETER (tsf) q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-4}$ (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1									CL/CE	Stiff, Silty CLAY, Trace Fine Sand, Brown And Gray	0	216.54
	ST-2			28.2 / 93	56	35	0.065	100	98		- Grades to Brown, Tan And Gray		
5	ST-3			26.8 / 92	43	22			99		- Grades to Very Stiff And Brown	5	
	ST-4												
	ST-5			23.8 / 101	47	26			100		- Grades to Gray		
10												10	
	ST-6												
15												15	
	ST-7												
20												20	196.54
											End of Boring at 20.0'		
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-76

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. E-9

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	244.44' — TOTAL DEPTH: 15.0'
LOCATION:	N 499,380 ; E 1,671,860
DEPTH TO GROUNDWATER LEVEL:	8.0' — DATE: 11-21-83
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1									CL	Very Stiff, Silty CLAY, Some Fine Sand, Tan	0	244.44
	ST-2												
5	ST-3			23.0 / 94	47	27	0.61	98	72		- Grades To Tan And Gray	5	
	ST-4												
	ST-5												
10										SM	8.0' Very Dense, Silty Fine SAND, Trace Clay, Gray	10	236.44
	ST-6	19-31											
15											End of Boring At 15.0'	15	229.44
20												20	
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-9

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. E-10

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	240.40' — TOTAL DEPTH: 15.0'
LOCATION:	N 499,790 ; E 1,671,475
DEPTH TO GROUNDWATER LEVEL:	NO WATER — DATE: 11-18-83
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	S_{tsf} POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-4}$ (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION
0	ST-1									CL	Hard, Silty CLAY, Trace Fine Sand, Tan
	ST-2										
5	ST-3		—	23.0 / 94	43	23	0.38	100	94		
	ST-4										
	ST-5										
10											
	SS-6	18-32									- Grades to Gray
15											End of Boring at 15.0' No Water Encountered
20											
25											
30											
35											
40											
45											
50											

DEPTH (ft.) — ELEVATION (ft., MSL)

0 — 240.40

15 — 225.04

REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.R. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-10

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. E-11

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION: 214.49'	TOTAL DEPTH: 30.0'
LOCATION: N 499,480	E 1,671,180
DEPTH TO GROUNDWATER LEVEL: 10.0'	DATE: 11-21-83
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf)	q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-7}$ (cm/sec)	PASSING #40 SIEVE SIZE (%)	PASSING #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1										SC	Very Stiff, Fine Sandy CLAY, Brown and Gray	0	214.49
	ST-2													
5	ST-3		1.9		15.4 / 116	36	11			47		4.0' Grades to Red and Brown Between 4.0' and 6.0'	5	210.49
	ST-4											6.0'		208.49
	ST-5				27.0	27	10			52	CL	8.5' Very Stiff, Silty CLAY, Trace Fine Sand, Brown And Gray		205.99
10													10	
	ST-6				15.0 / 116			0.66	100	98		- Grades to Gray		
15													15	
	SS-7	26-22/5"										18.0' Top of Porters Creek Formation Clays		196.49
20											CL/CH	Hard, Silty CLAY, Trace Fine Sand, Dark Gray	20	
	SS-8	29-21												
25													25	
	SS-9	27-23/5"												
30												End of Boring At 30.0' Perched Water at 10.0'	30	184.49
35													35	
40													40	
45													45	
50													50	

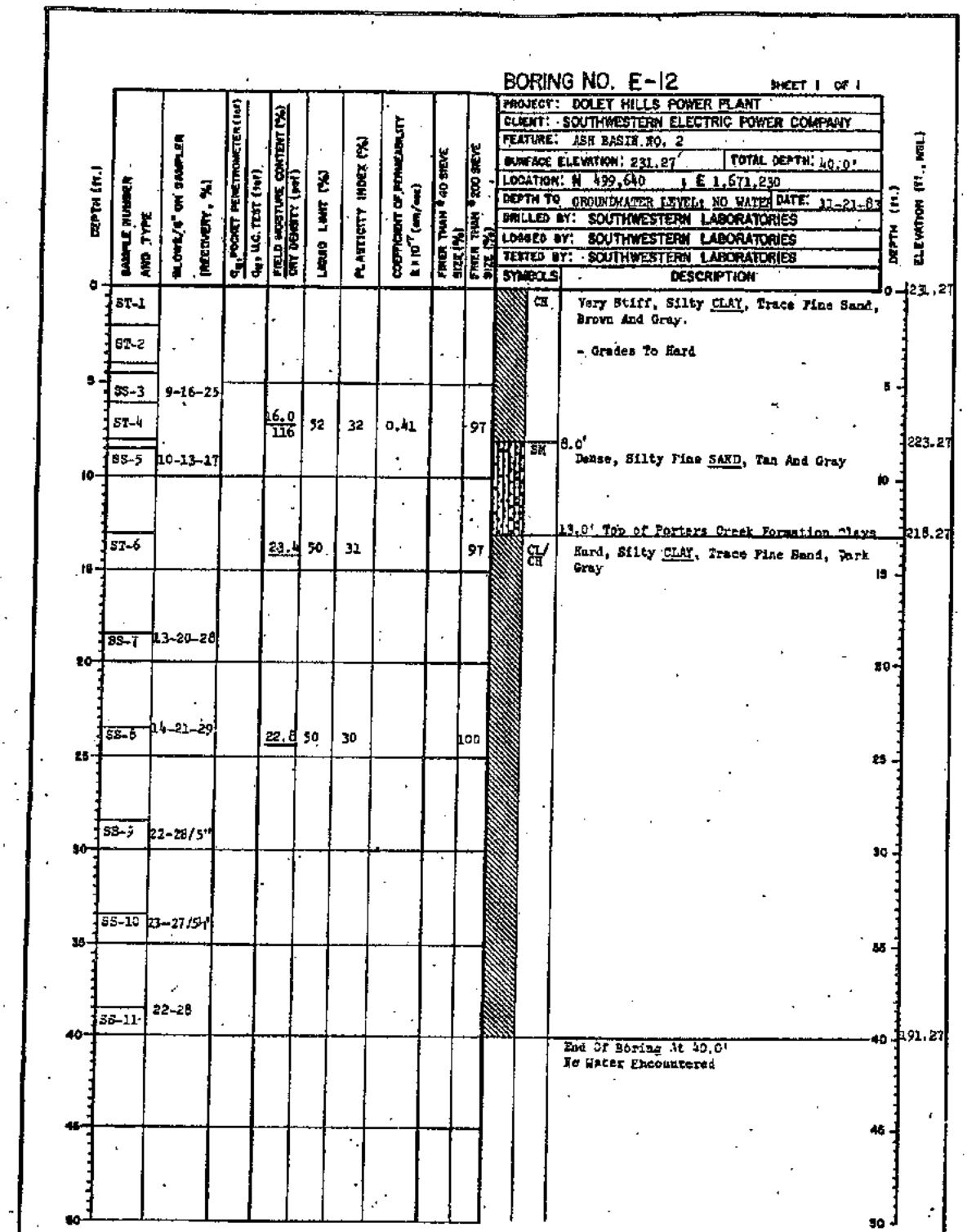
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-11

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



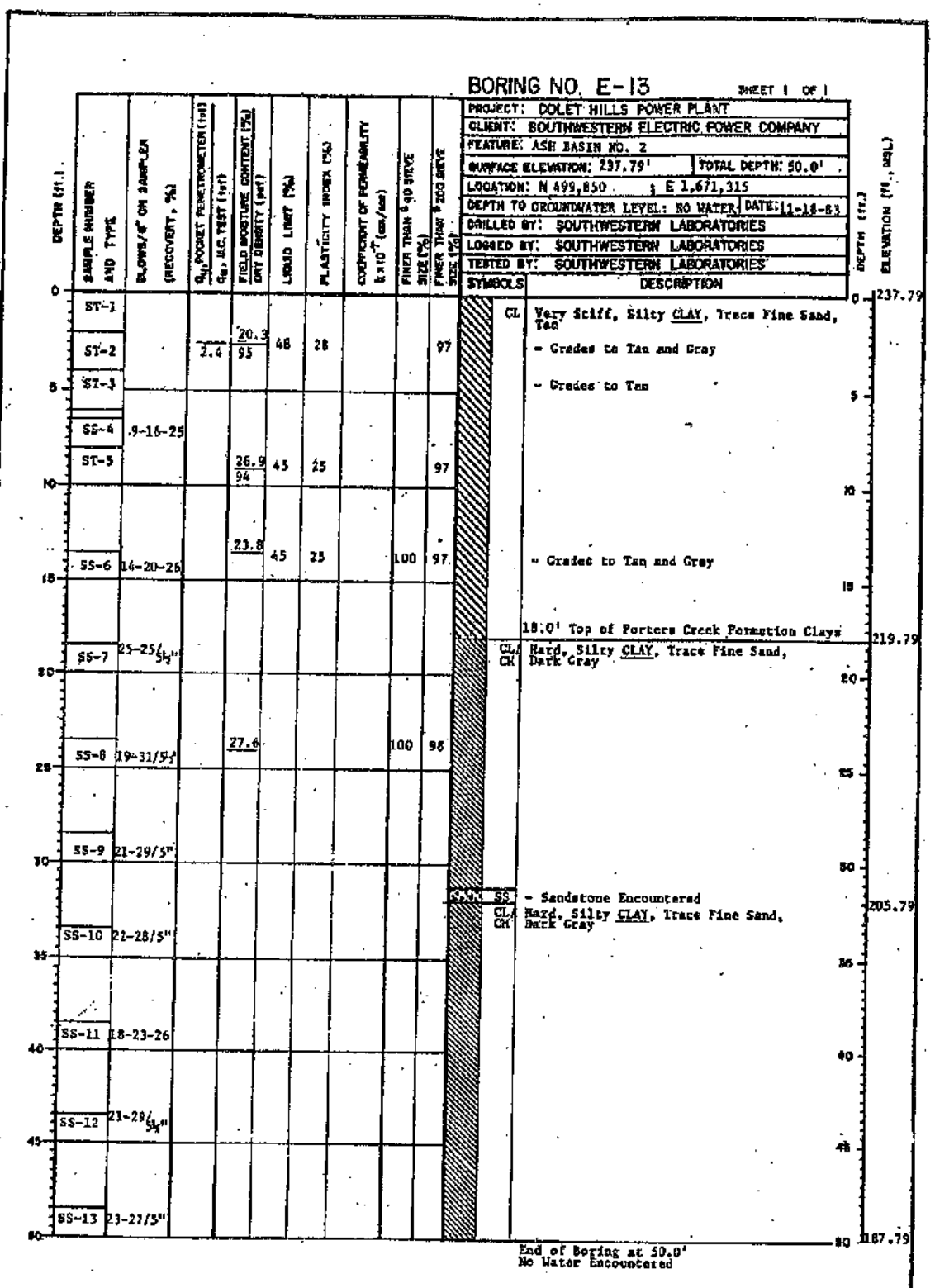
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-12

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 B.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-13

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. E-14

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	ASH BASIN NO. 2
SURFACE ELEVATION:	237.37' — TOTAL DEPTH: 15.0'
LOCATION:	N 498,950 ; E 1,671,460
DEPTH TO GROUNDWATER LEVEL:	NO WATER — DATE: 11-21-83
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6"ON SAMPLER (RECOVERY, %)	q_{pp} POCKET PENETROMETER (tsf) q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY $k \times 10^{-7}$ (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1									CL	Hard, Silty CLAY, and Fine Sand, Tan	0	237.37
	ST-2		2.4	11.0 / 104	38	19	0.41	98	51				
5	ST-3							99	12	SP/SM	4.0' Very Dense, Silty Fine SAND, Tan	5	233.37
	SS-4	30-20/3"						100	27				
10	SS-5	30-20/3"										10	
15	SS-6	27-23/3"									End of Boring at 15.0' No Water Encountered	15	222.37
20												20	
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	

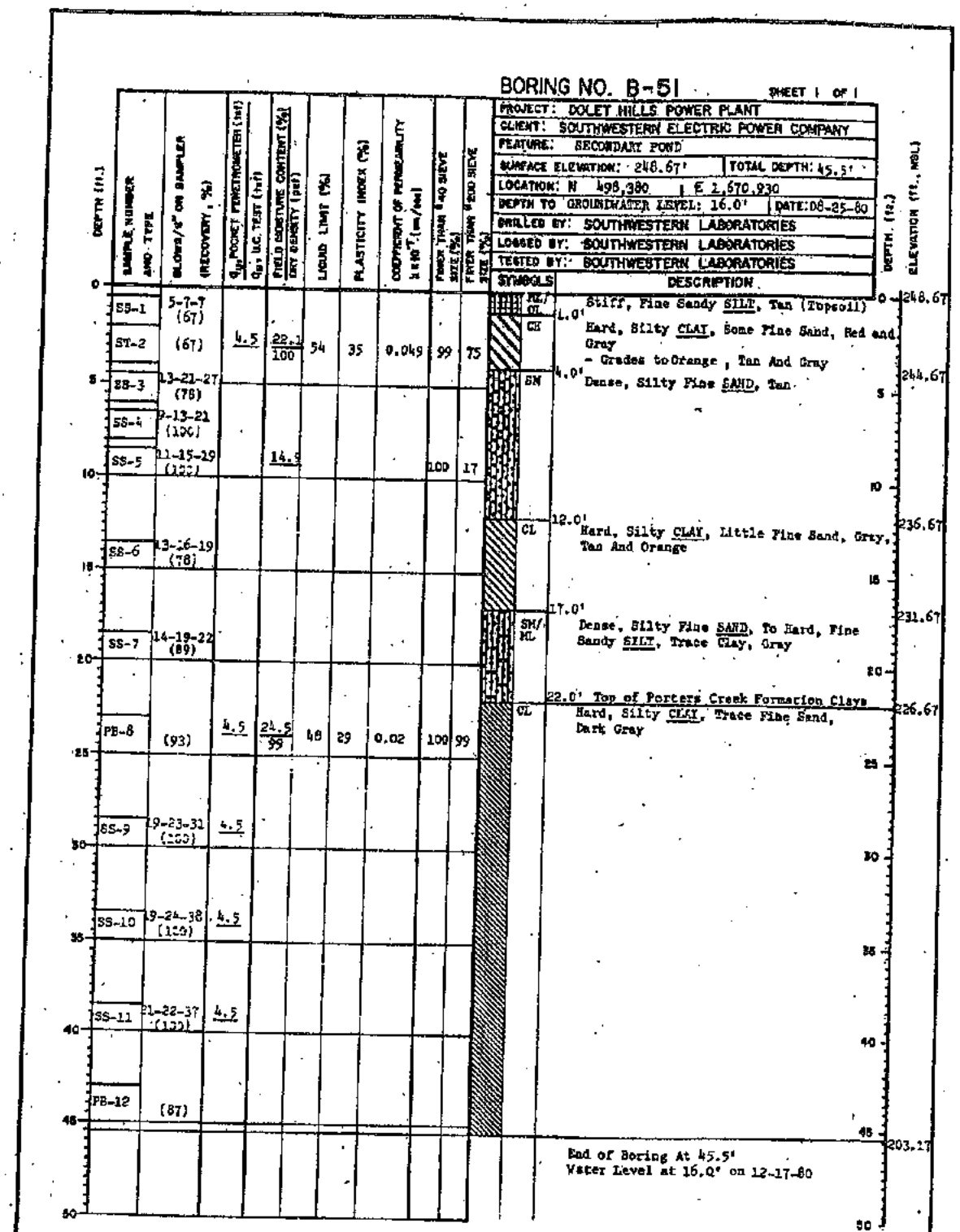
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-14

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-51

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-52

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	SECONDARY POND
SURFACE ELEVATION:	255.99' — TOTAL DEPTH: 45.0'
LOCATION:	N. 498,650 ; E. 1,671,110
DEPTH TO GROUNDWATER LEVEL:	19.0' — DATE: 08-25-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_{ur} U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k cm/sec	PASSING #40 SIEVE SIZE (%)	PASSING #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	SS-1	4-6-8 (67)								ML/OL	Stiff, Fine Sandy SILT, Tan (Topsoil)	0	255.99
	ST-2	(83)	4.5	22.9 / 102	50	32		99	90	CL/CH	1.0' Very Stiff, Silty CLAY, Trace Fine Sand, Red And Gray		254.99
5	SS-3	2-16-16 (100)								SM	4.0' Dense, Silty Fine SAND, Trace Clay, Orange, Tan And Gray	5	251.99
	ST-4	(90)	4.5								- Grades with clay lenses between 6.0' and 8.0'		
	SS-5	1-12-19 (100)									- Grades to Tan and Gray		
10												10	
	SS-6	16-21-19 (100)		14.7				100	23			15	
	SS-7	10-13-14 (100)								CL/ML	17.0'		238.99
20												20	
	SS-8	13-25-47 (100)								CL	22.0' Top of Porters Creek Formation Clays Hard, Silty CLAY, Dark Gray		233.99
25												25	
	PB-9	(100)	4.5	27.2 / 81	47	28			100				
30												30	
	SS-10	17-22-35 (100)											
35												35	
	SS-11	15-27-38 (100)	4.5										
40												40	
	PB-12	(100)	4.5										
45												45	210.99
											End of Boring At 45.0' Water Level at 19.0' on 12-17-80		
50												50	

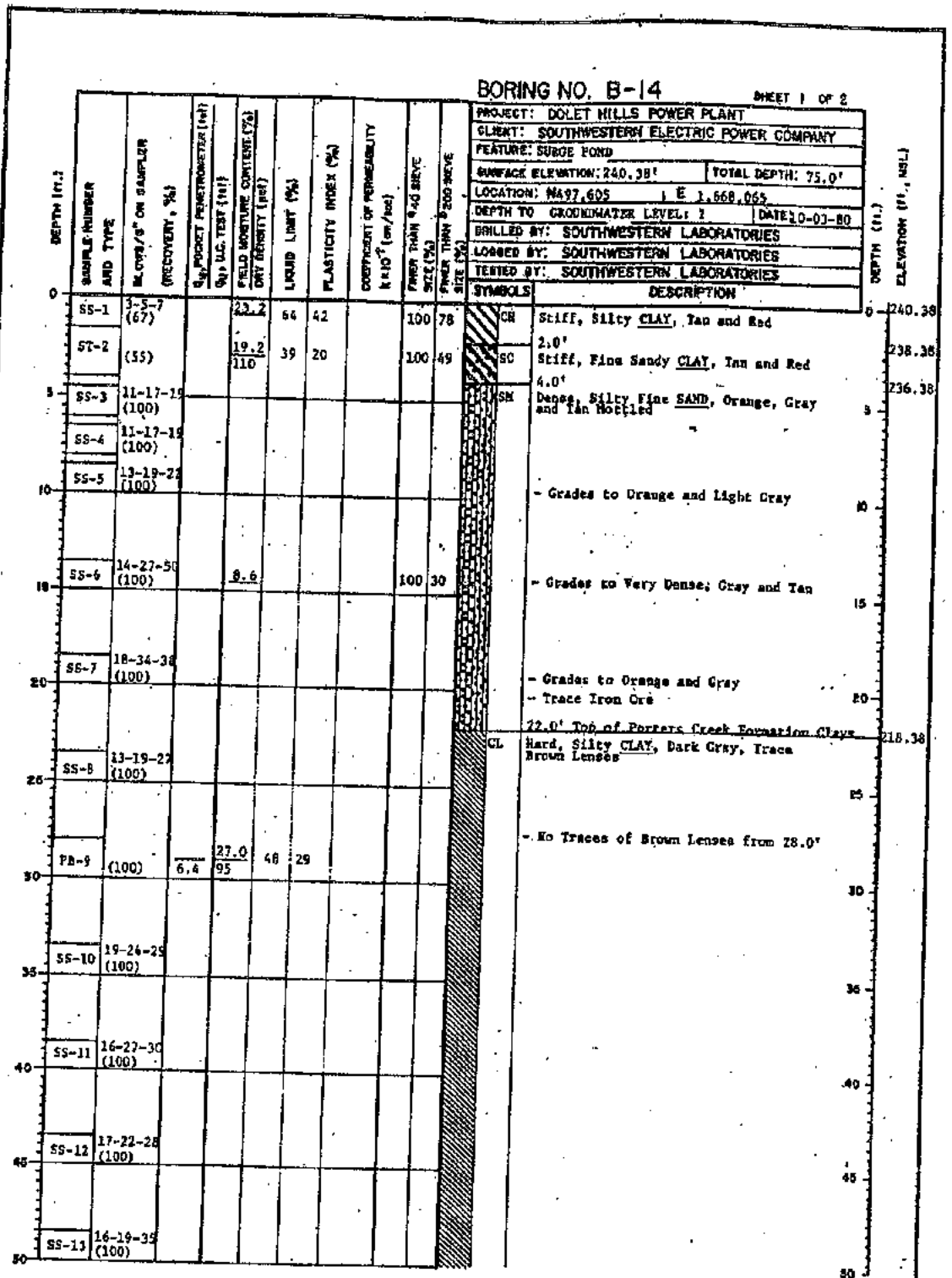
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-52

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. YARADKI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-14

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-14 (CONT'D) SHEET 2 OF 2

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	SURGE POND
SURFACE ELEVATION: 240.38'	TOTAL DEPTH: 75.0'
LOCATION: N 497,605 ; E 1,668,065	
DEPTH TO GROUNDWATER LEVEL: ?	DATE 10-03-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_p POCKET PENETROMETER (tsf) q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	ELEVATION (ft. MSL)
50										CL		190.38
55												185
60	SS-14	19-25-34 (100)	4.5									180
65												175
70	SS-15	22-27-37 (100)	4.5									170
75	FB-16	(87)	4.5								End of Boring at 75.0' Water Bailed to 14.0' on 10-03-80 Hole Caved In at 5.0' and No Water Encountered At This Level on 12-17-80	165.38
80												160
85												155
90												150
95												145
100												140

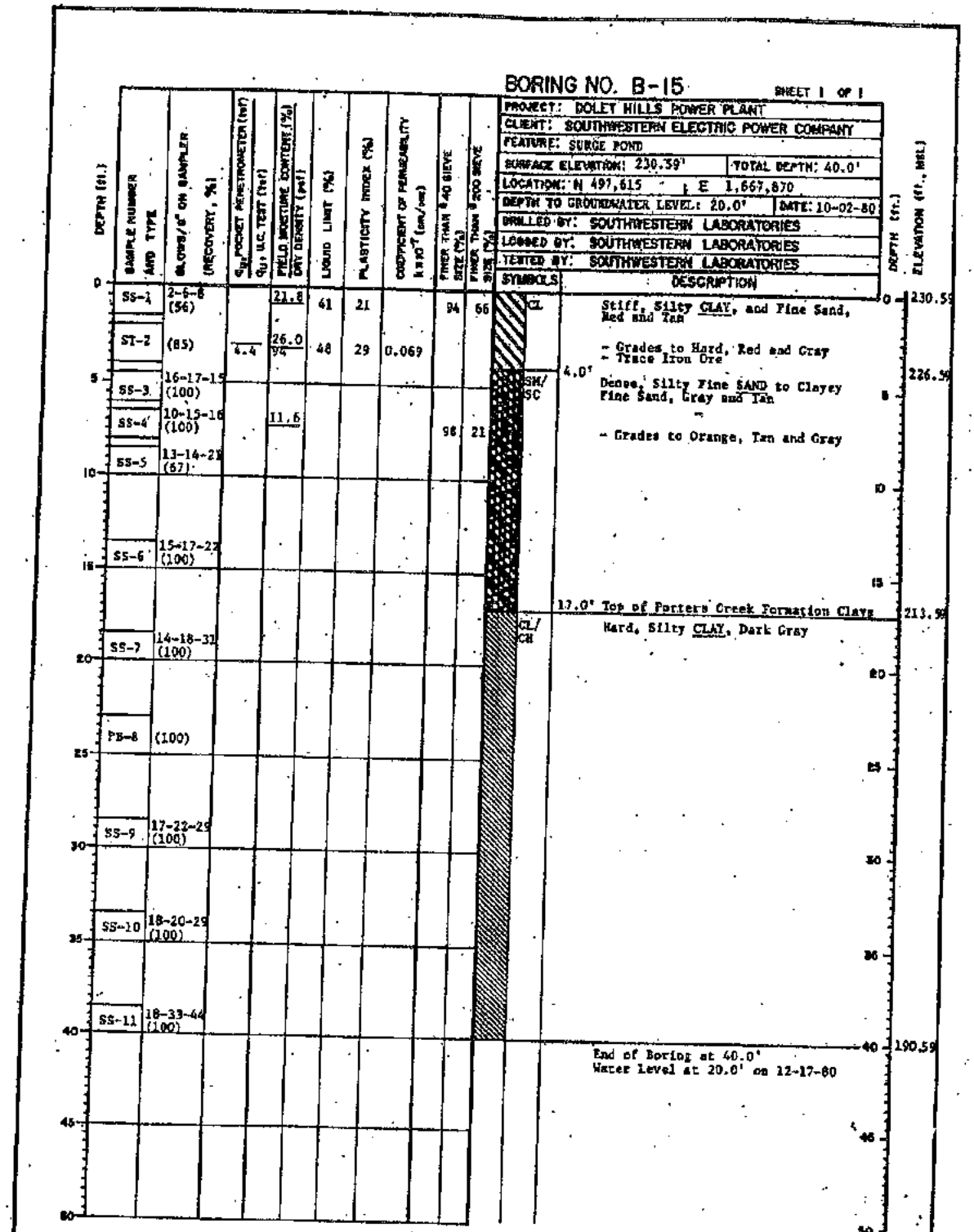
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-14 (CONT'D)

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-15

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-58

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	SURGE POND
SURFACE ELEVATION: 220.44'	TOTAL DEPTH: 20.0'
LOCATION: N 497,470 ; E 1,667,870	
DEPTH TO GROUNDWATER LEVEL: NO WATER	DATED 2-23-84
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_u, U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	PERCENT FINER THAN #40 SIEVE SIZE (%)	PERCENT FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1									CL	Medium Stiff, Silty CLAY, Trace Fine Sand, Brown and Gray	0	220.44
	ST-2		0.8	23.4 / 96	47	27	0.60	100	99				
5	ST-3			23.7 / 93	45	25	0.77		99			5	
	ST-4												
	ST-5												
10												10	
											12.0' Top of Porters Creek Formation Clays		208.44
	ST-6									CL/CH	Hard, Silty CLAY, Trace Fine Sand, Dark Gray		
15												15	
	ST-7												
20											End of Boring at 20.0' No Water Encountered	20	200.44
25												25	
30												30	
35												35	
40												40	
45												45	
50												50	

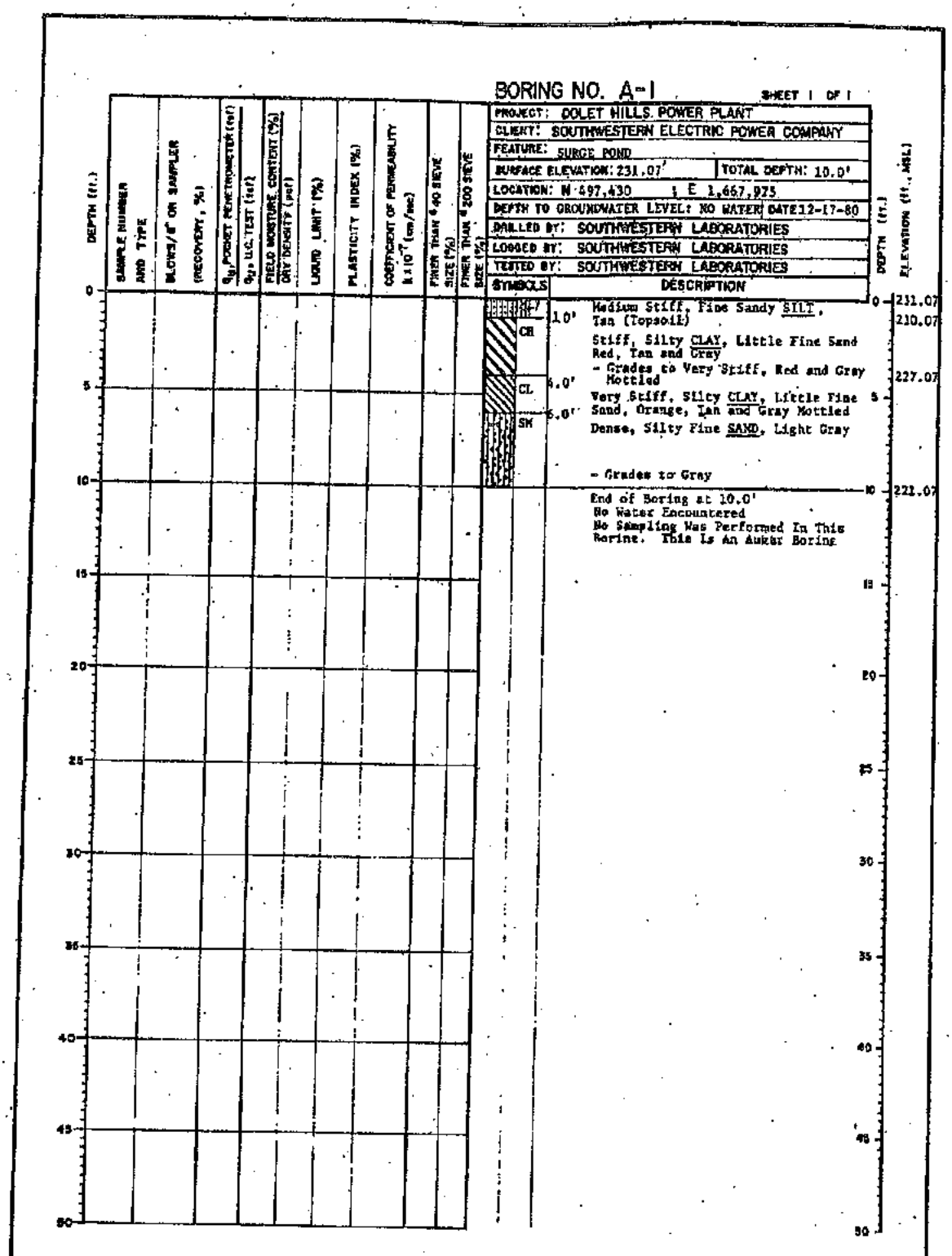
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-58

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



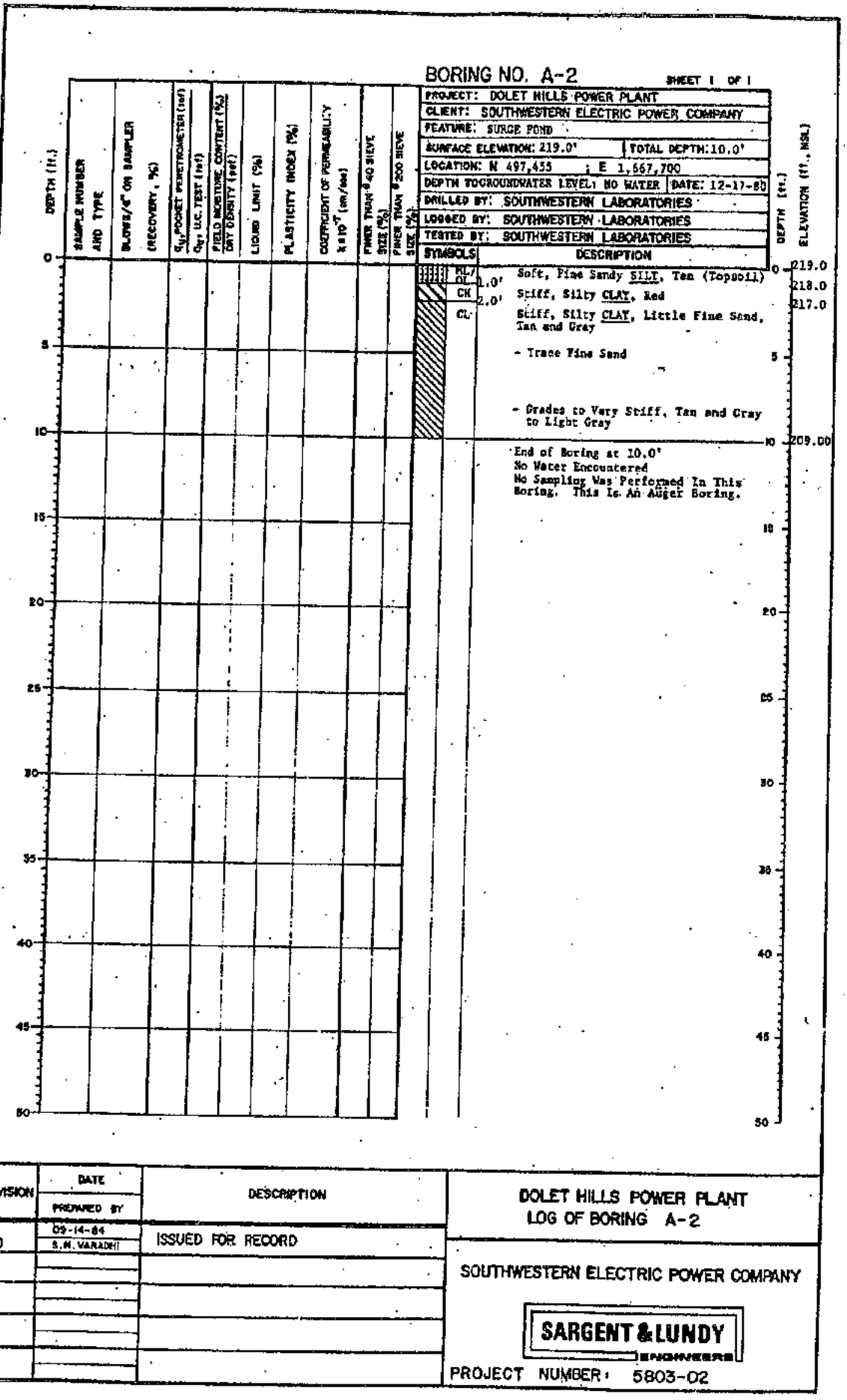
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-16-94 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING A-1

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



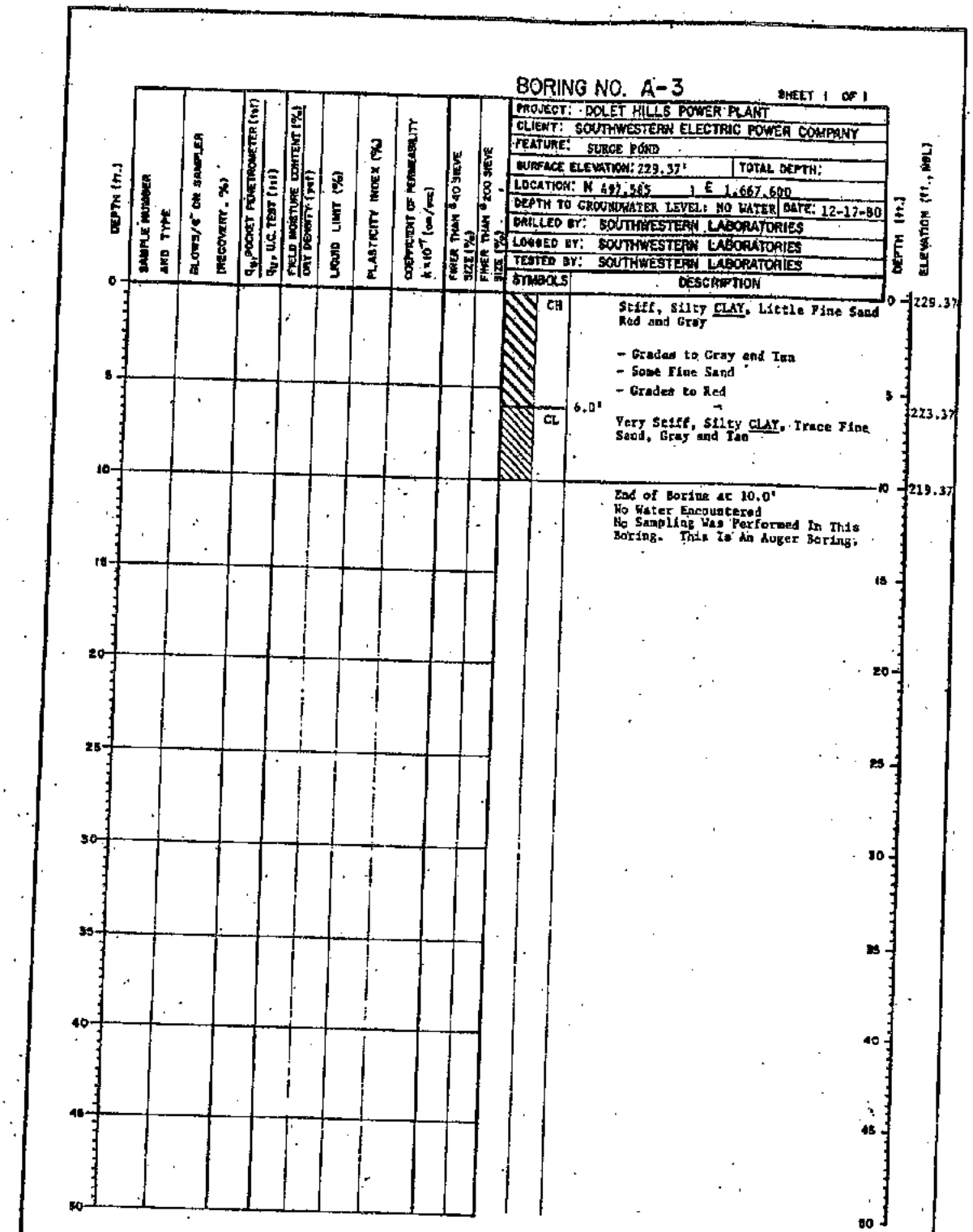
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING A-2

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



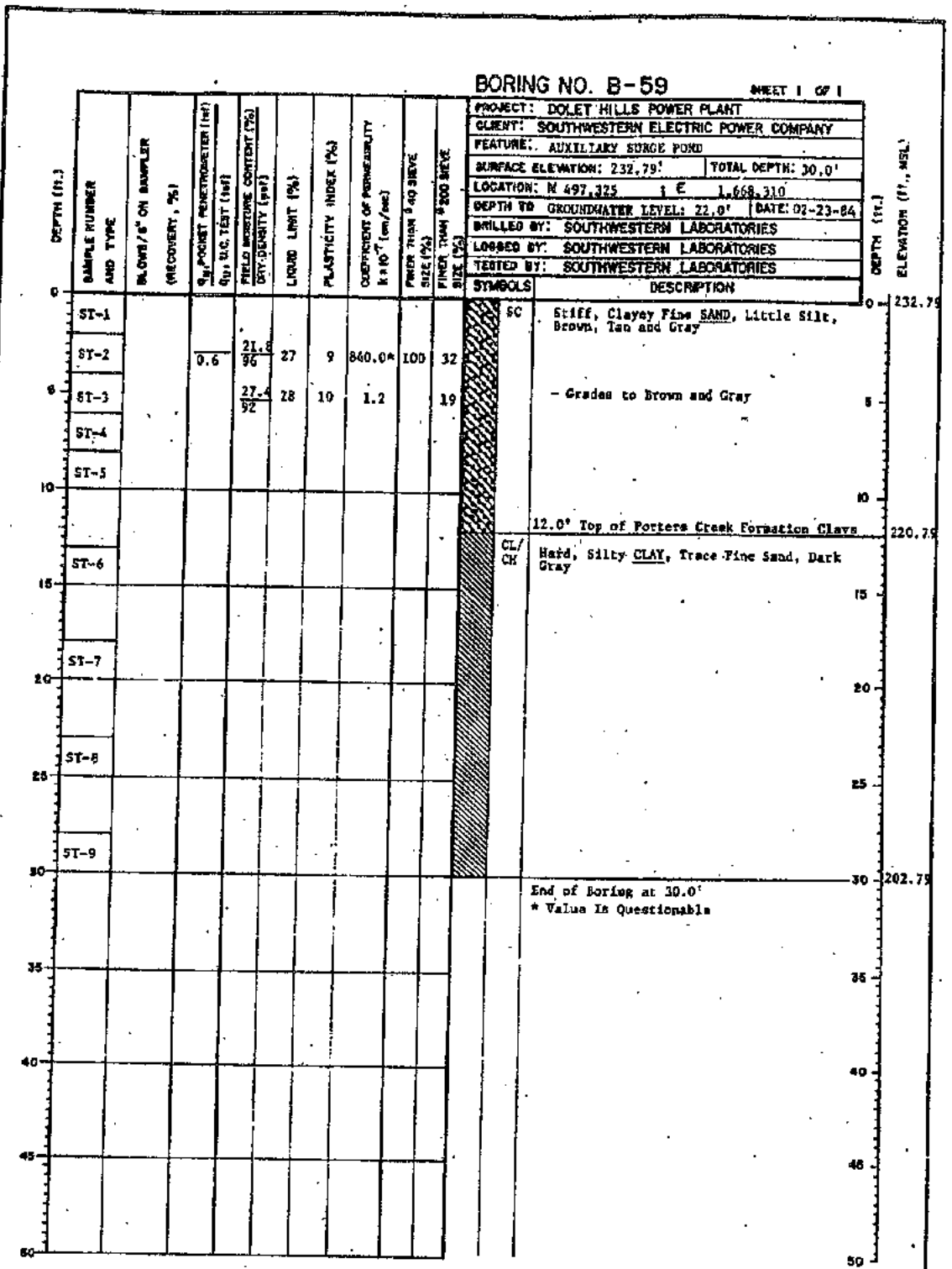
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VAIDHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING A-3

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



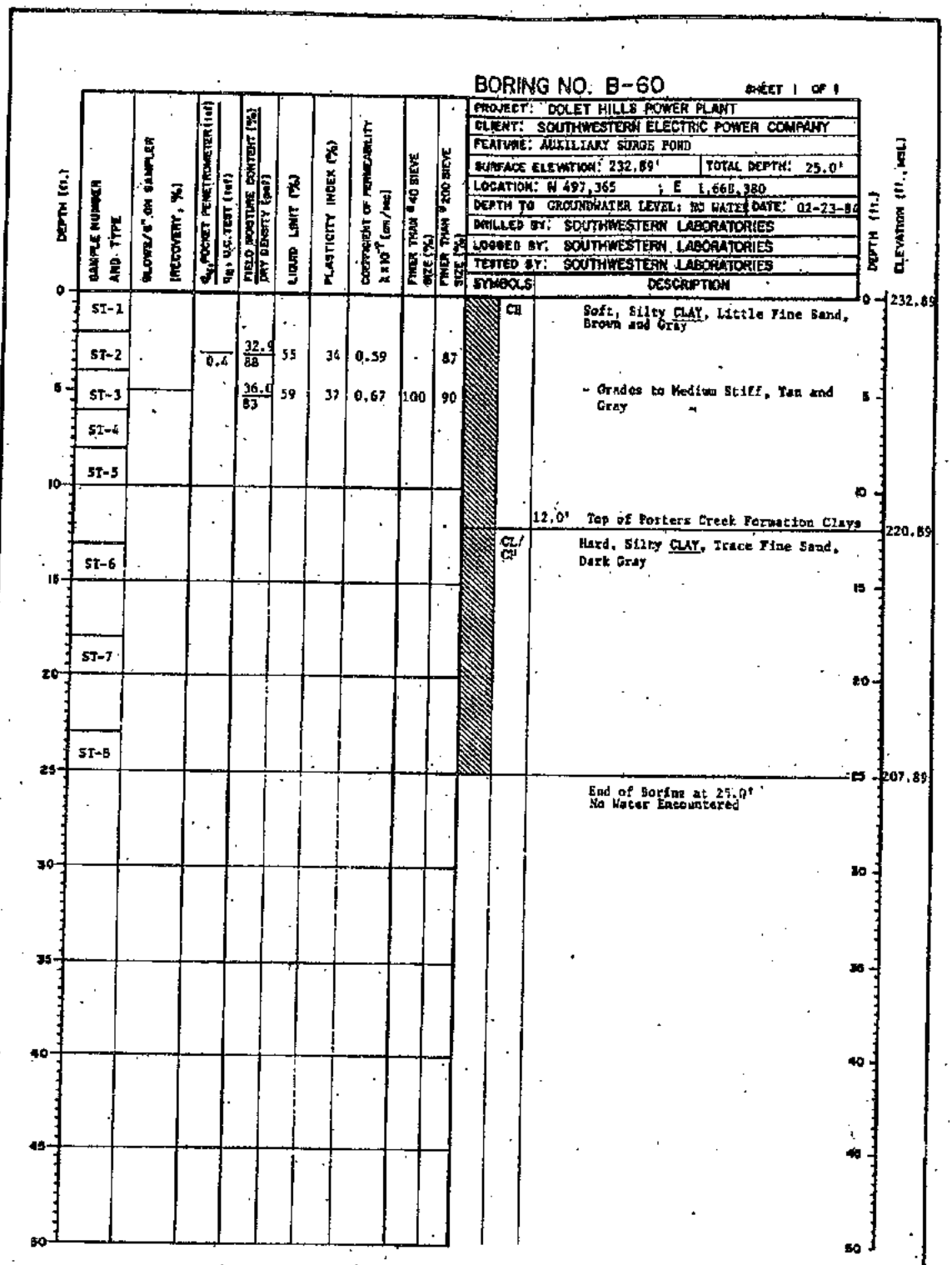
REVISION	DATE PREPARED BY	DESCRIPTION
0	09-14-84 S.N. VARADHI	ISSUED FOR RECORD.

DOLET HILLS POWER PLANT
LOG OF BORING B-59

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-60

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-61

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	METAL CLEANING WASTE POND
SURFACE ELEVATION:	228.64' — TOTAL DEPTH: 28.5'
LOCATION:	N498,125 E1,667,530
DEPTH TO GROUNDWATER LEVEL:	25.0' — DATE: 03-08-84
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" OR SAMPLER (RECOVERY, %)	q_p POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x 10^{-7} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	ST-1									CH	Stiff, Silty CLAY, Trace Fine Sand, Tan and Gray	0	228.64
	ST-2		1.1	30.0 / 88	60	38	0.62	100	95				
	ST-3			21.0 / 96	64	42	0.038		100			5	
	ST-4												
	ST-5											10	
	ST-6												
	ST-7											20	
25	SS-8	50/10½"										25	
	SS-9	50/0"									28.5' Top of Porters Creek Formation Clays End of Boring at 28.5'		200.14
30												30	
35												35	
40												40	
45												45	
50												50	

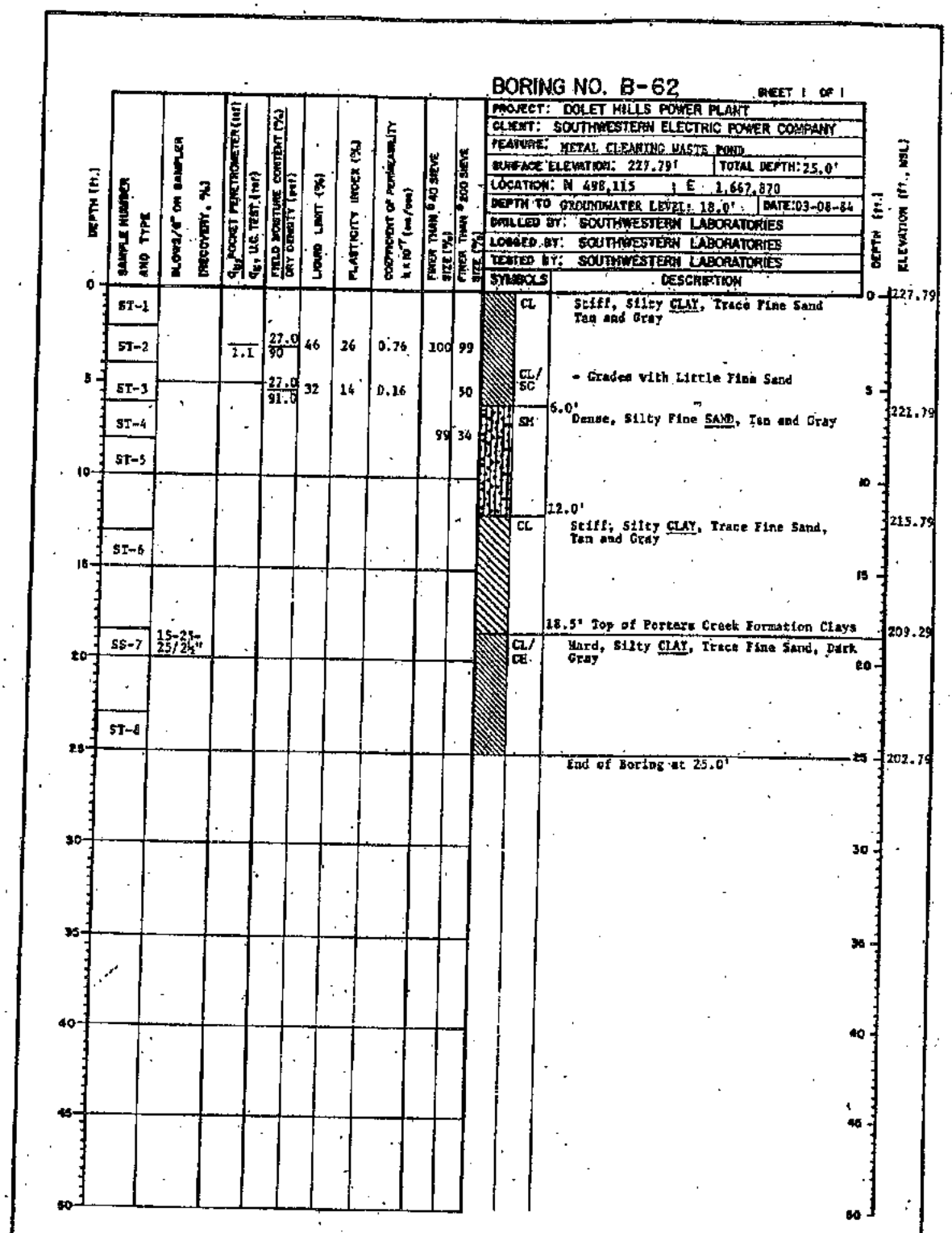
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-61

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



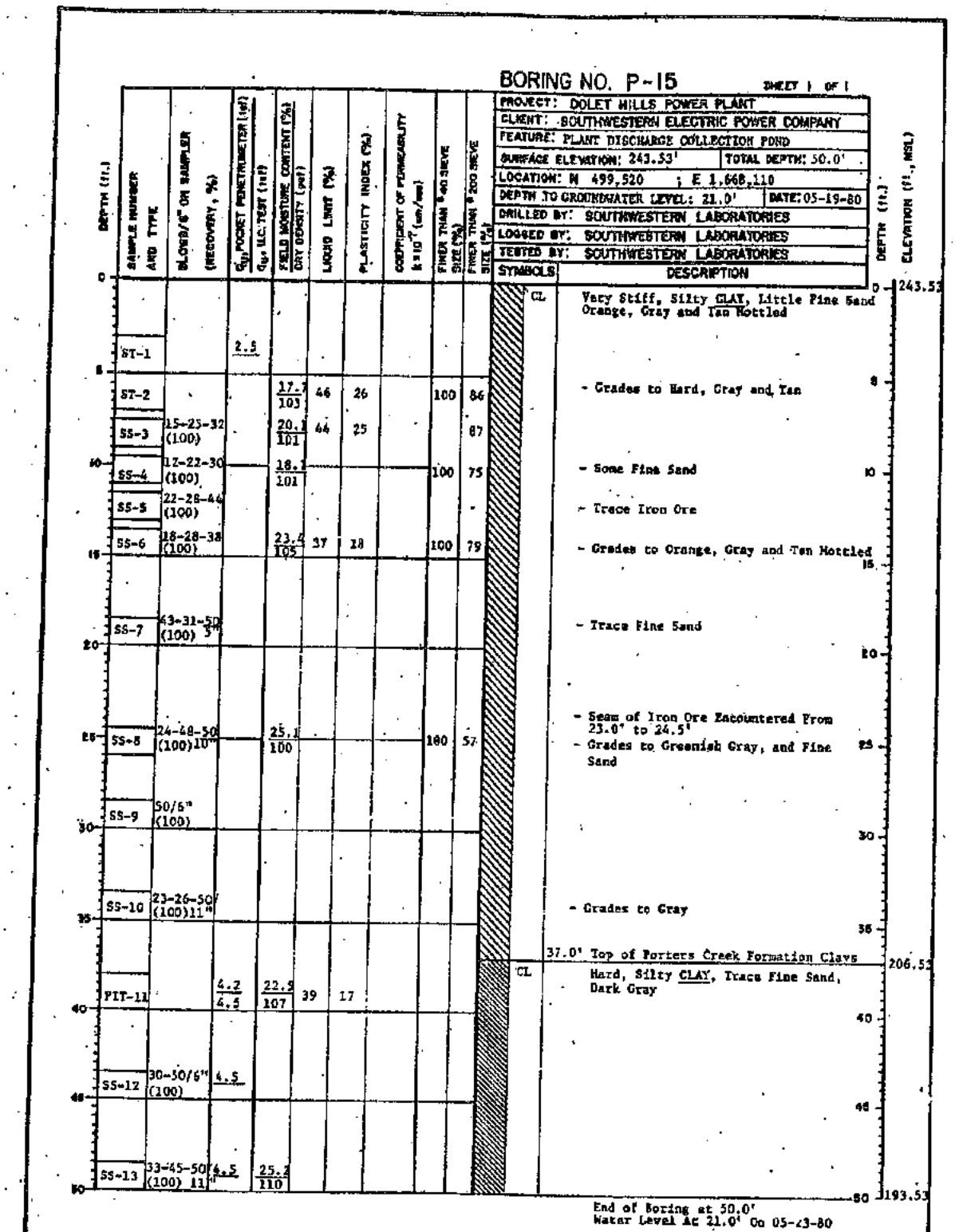
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-62

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



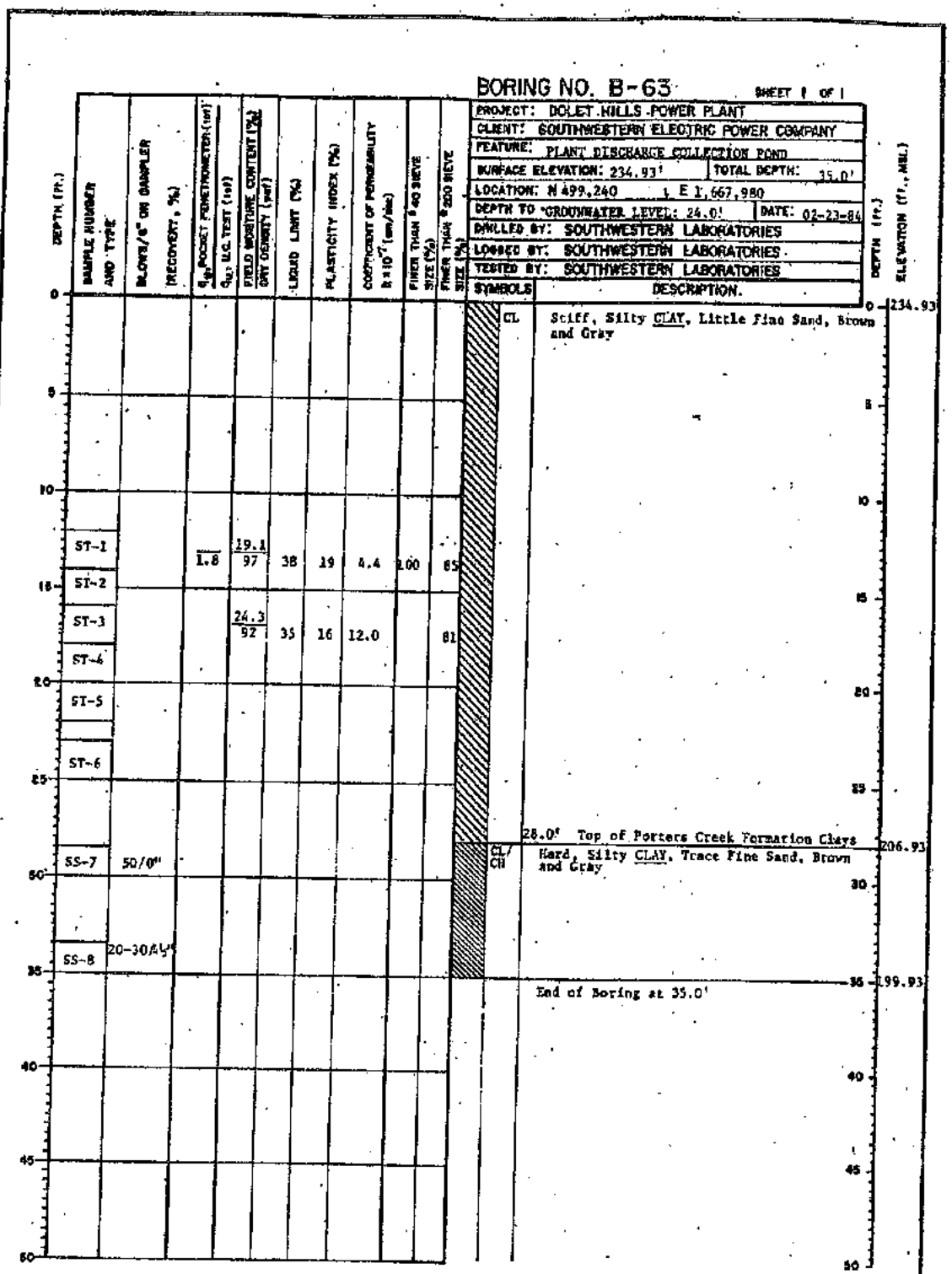
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING P-15

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



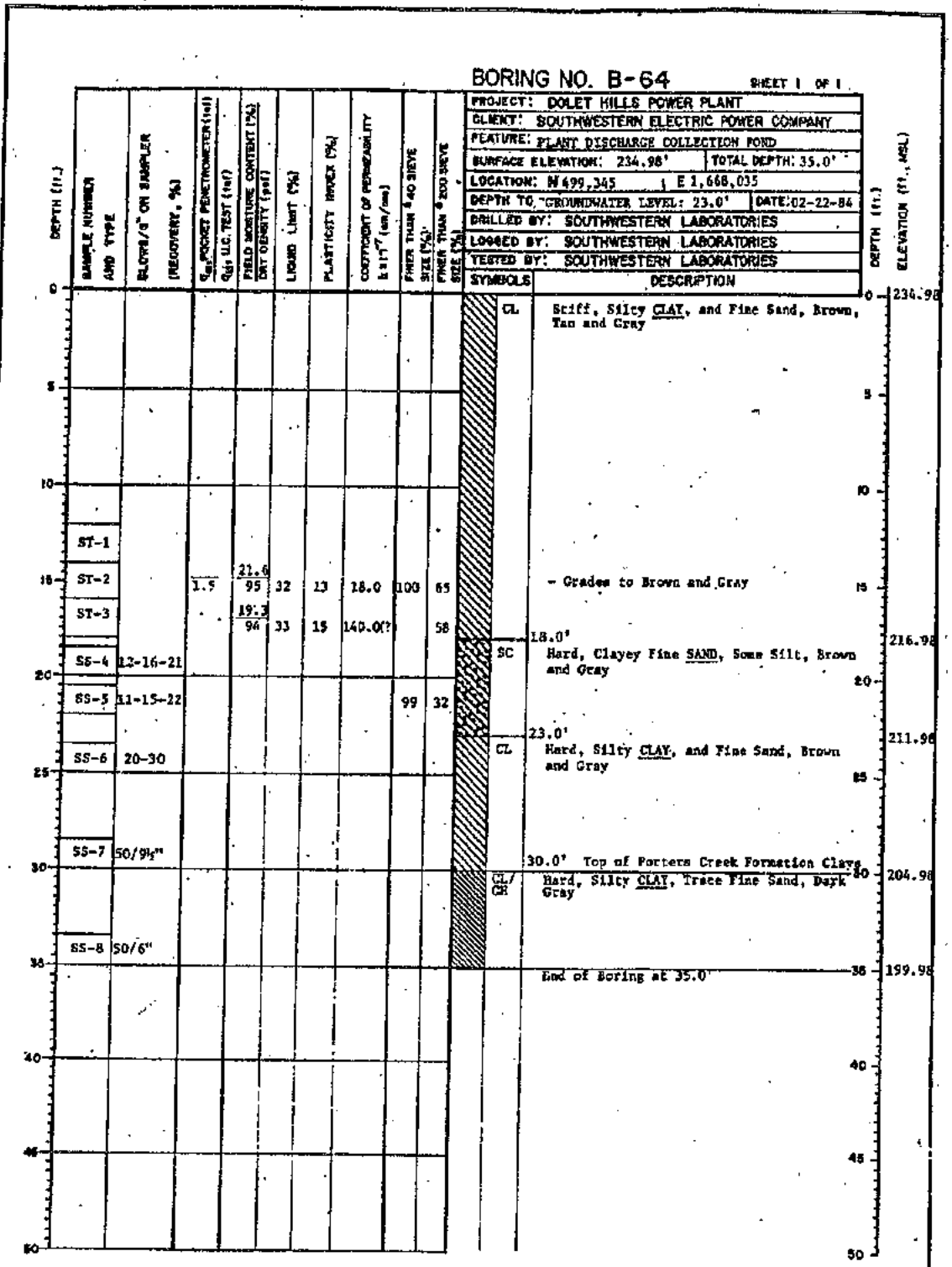
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.H. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-63

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



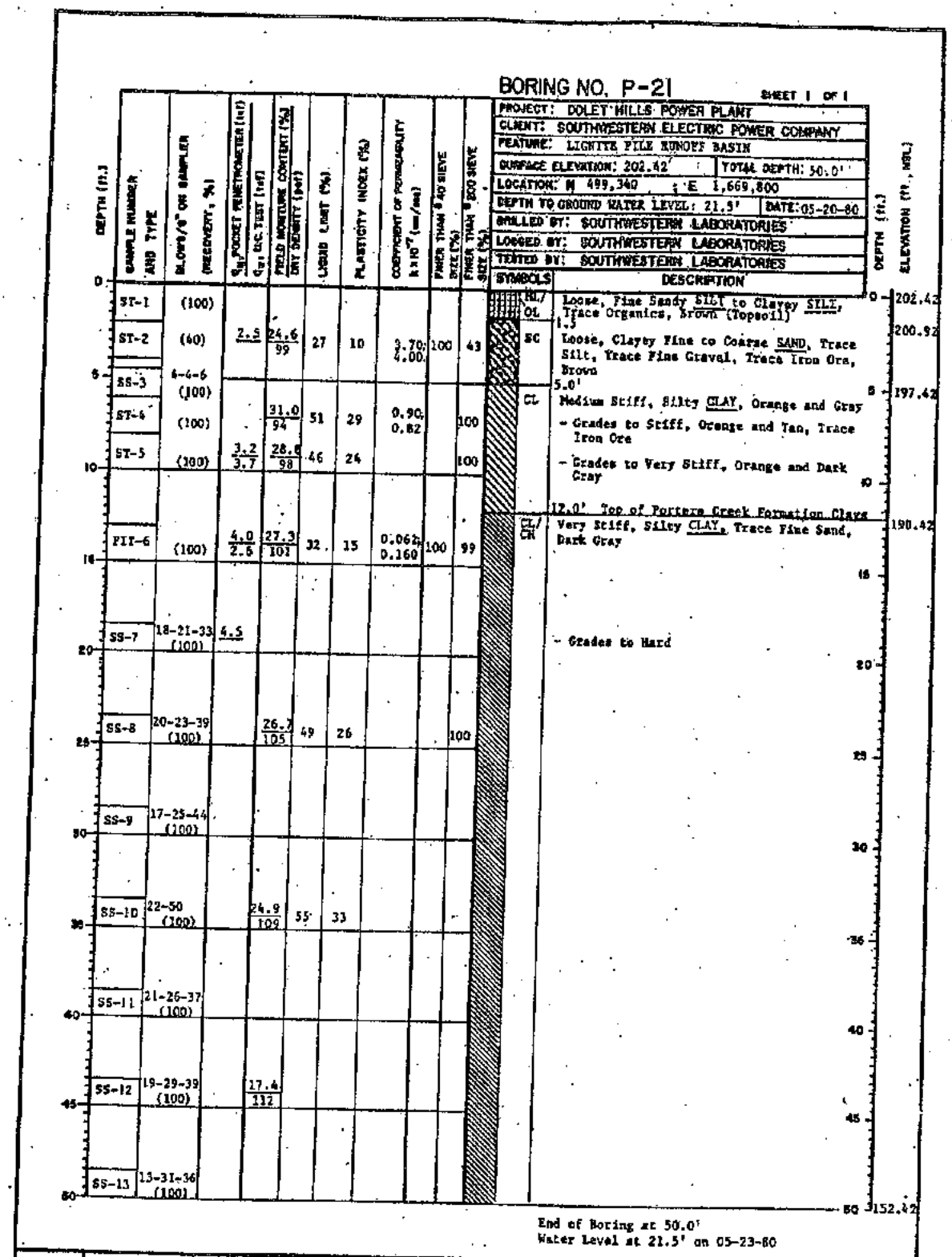
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-64

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING P-21

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

BORING NO. B-34

SHEET 1 OF 1

PROJECT:	DOLET HILLS POWER PLANT
CLIENT:	SOUTHWESTERN ELECTRIC POWER COMPANY
FEATURE:	LIGNITE PILE RUNOFF BASIN
SURFACE ELEVATION: 209.88'	TOTAL DEPTH: 35.0'
LOCATION: N 498,950	E 1,669,530
DEPTH TO GROUNDWATER LEVEL: 16.0'	DATE: 09-11-80
DRILLED BY:	SOUTHWESTERN LABORATORIES
LOGGED BY:	SOUTHWESTERN LABORATORIES
TESTED BY:	SOUTHWESTERN LABORATORIES

DEPTH (ft.)	SAMPLE NUMBER AND TYPE	BLOWS/6" ON SAMPLER (RECOVERY, %)	q_u POCKET PENETROMETER (tsf) / q_u U.C. TEST (tsf)	FIELD MOISTURE CONTENT (%) / DRY DENSITY (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COEFFICIENT OF PERMEABILITY k x10^{-4} (cm/sec)	FINER THAN #40 SIEVE SIZE (%)	FINER THAN #200 SIEVE SIZE (%)	SYMBOLS	DESCRIPTION	DEPTH (ft.)	ELEVATION (ft., MSL)
0	SS-1	4-5-10 (44)								CH	Very Stiff, Silty CLAY, Trace Fine Sand, Orange and Gray Mottled	0	209.88
	ST-2	(75)		23.1 / 84	61	41	0.13		100		- Grades to Orange, Tan and Gray		
5	SS-3	8-10-17 (100)										5	
	SS-4	9-16-22 (100)											
	SS-5	8-20-27 (100)										10	
10											13.0' Top of Porters Creek Formation Clays		196.88
	SS-6	15-26-40 (100)	4.5							CL/CH	Hard, Silty CLAY, Dark Gray	15	
15													
	PB-7	(100)	4.5									20	
20													
	SS-8	19-24-26 (100)	4.5									25	
25													
	SS-9	17-26-29 (100)	4.5									30	
30													
	PB-10	(92)	4.5									35	174.88
35											End of Boring at 35.0' Water Level at 16.0' on 12-17-80		
40												40	
45												45	
50												50	

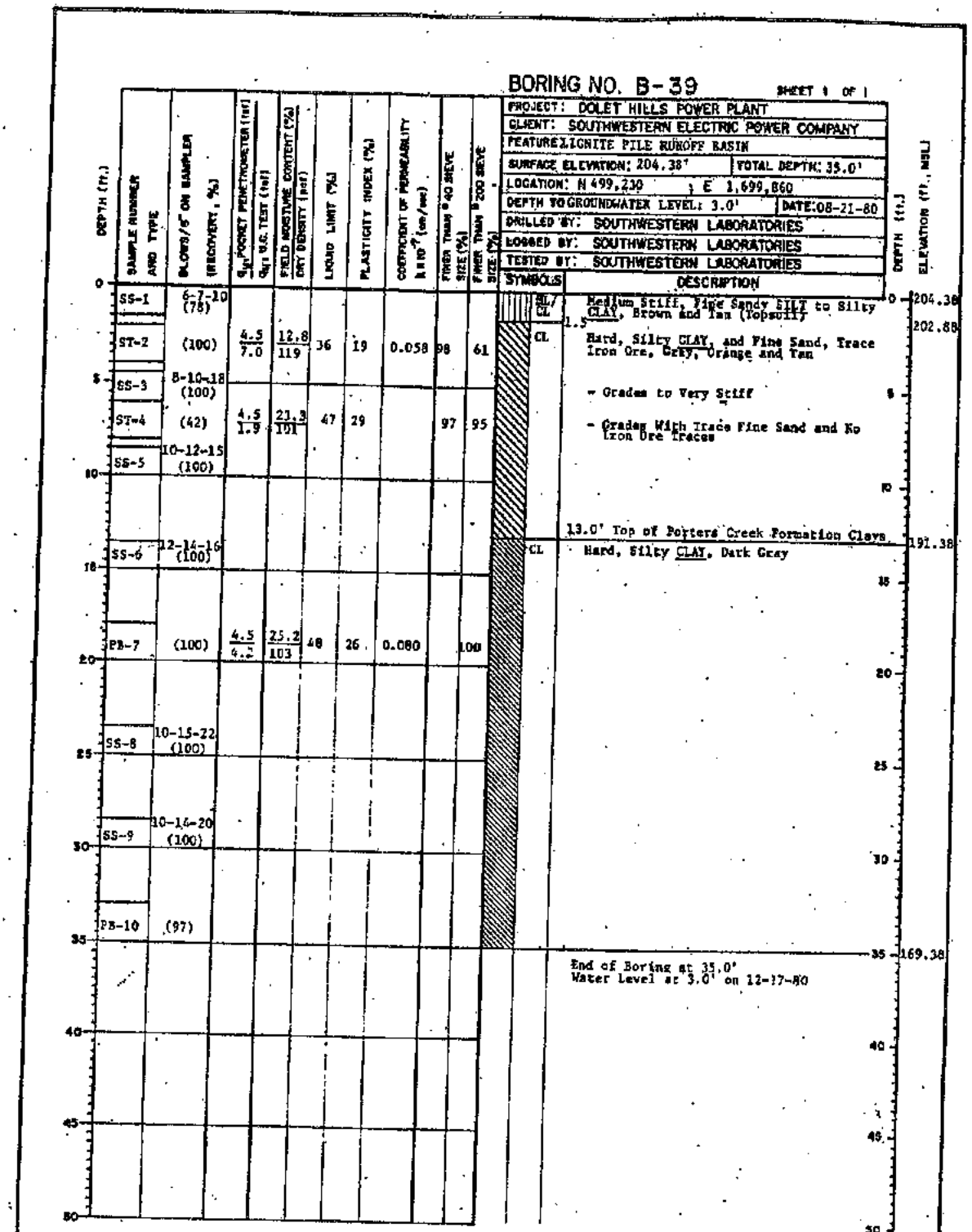
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.M. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-34

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



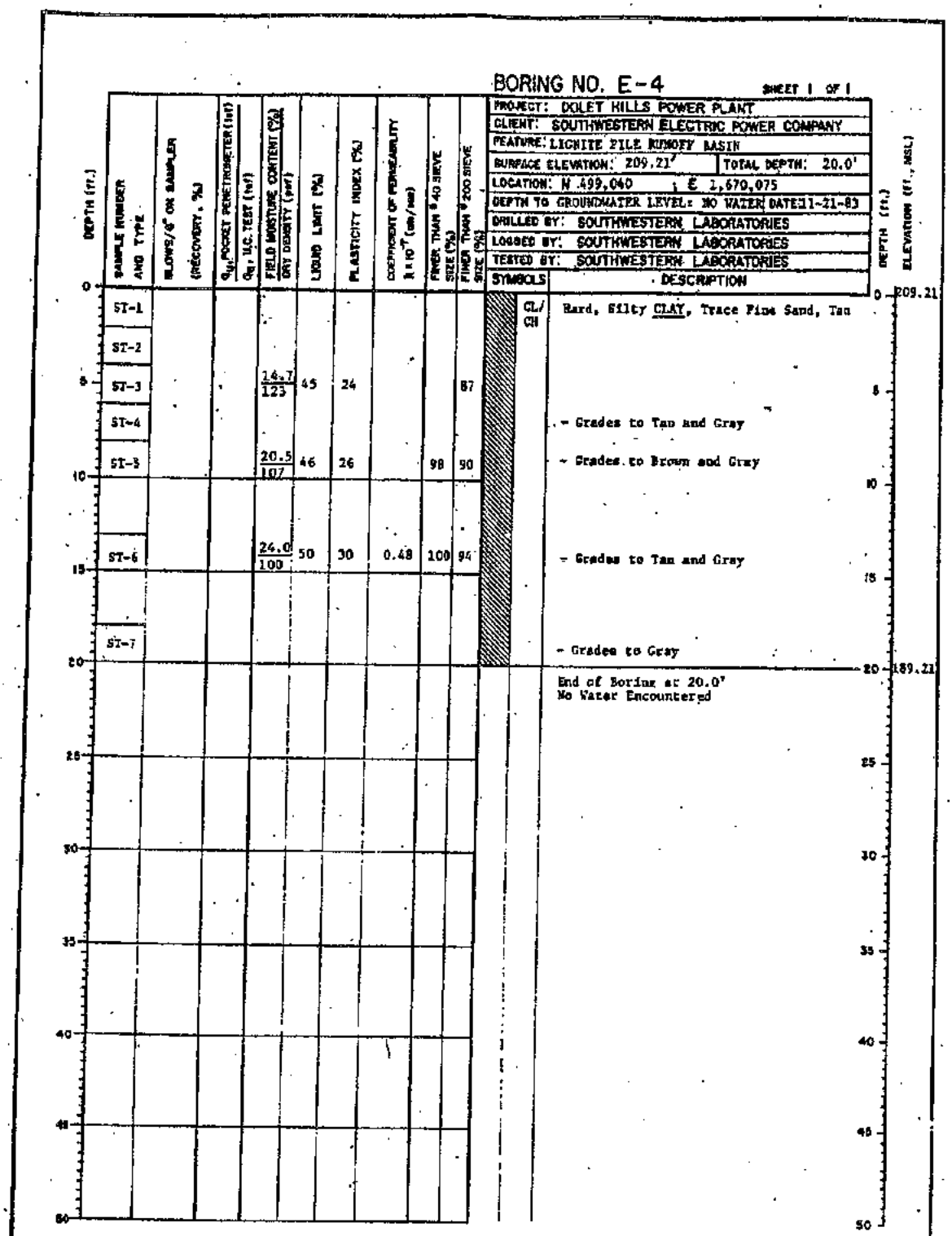
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-39

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



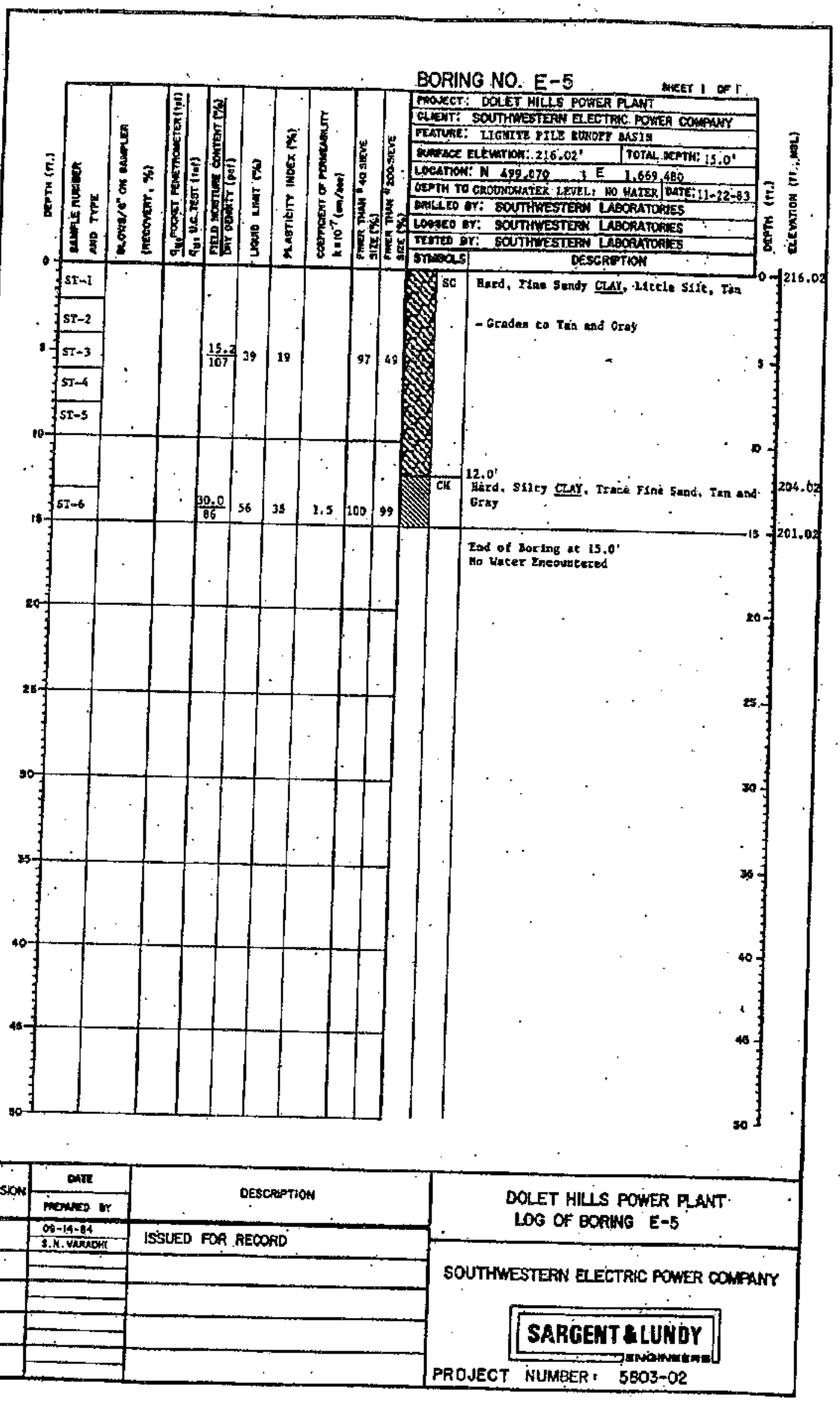
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-4

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



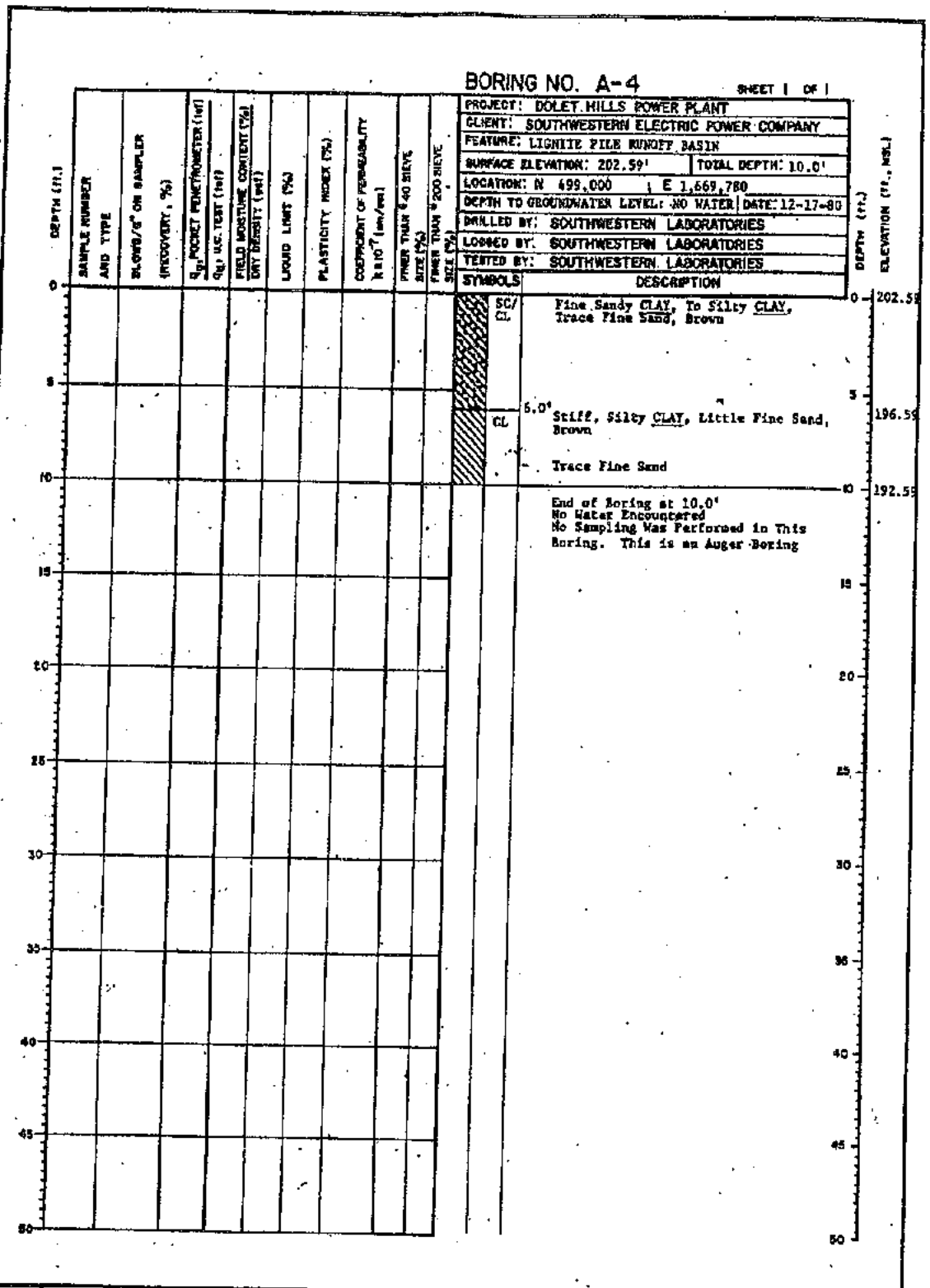
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING E-5

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



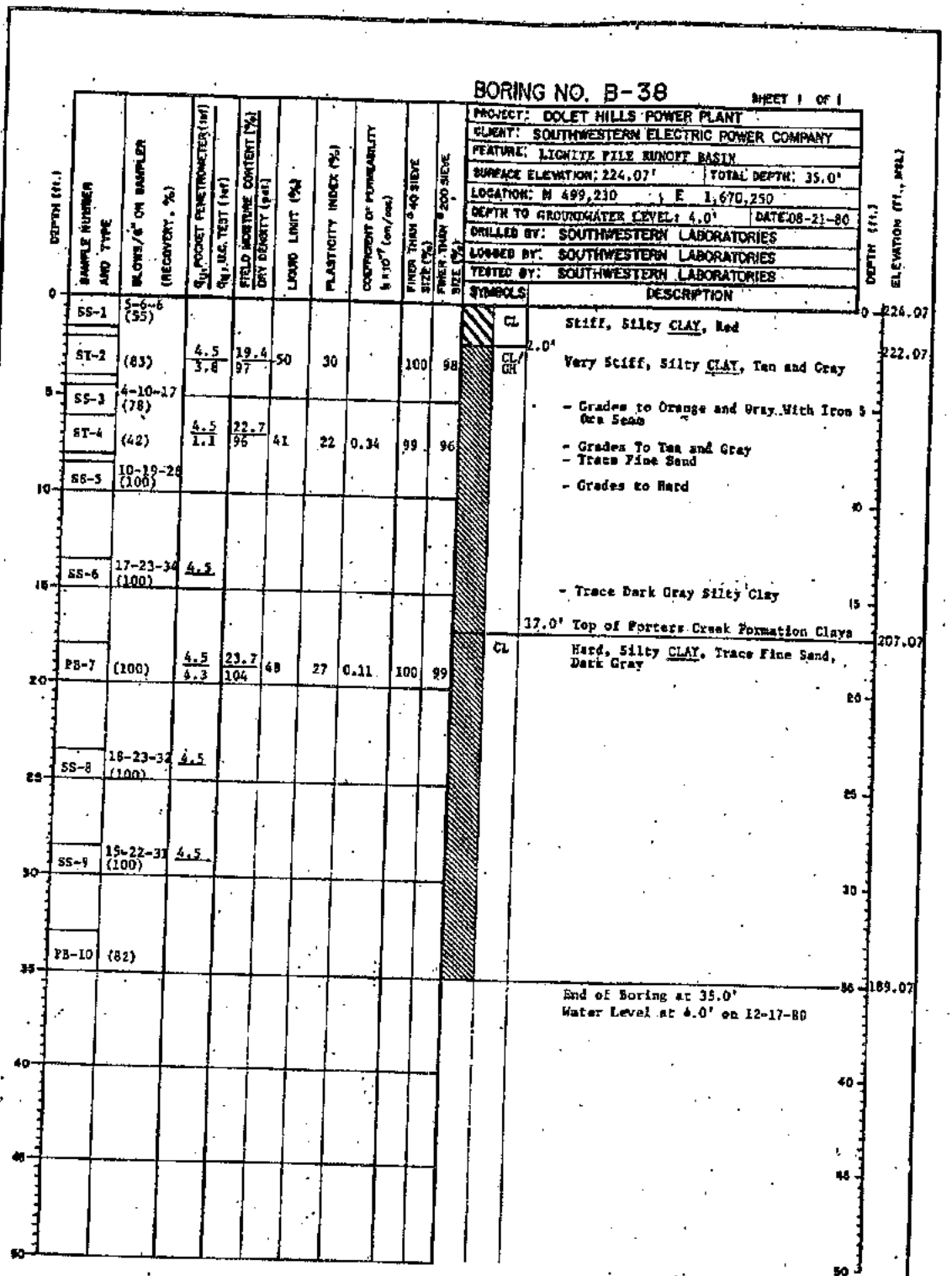
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARACHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING A-4

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



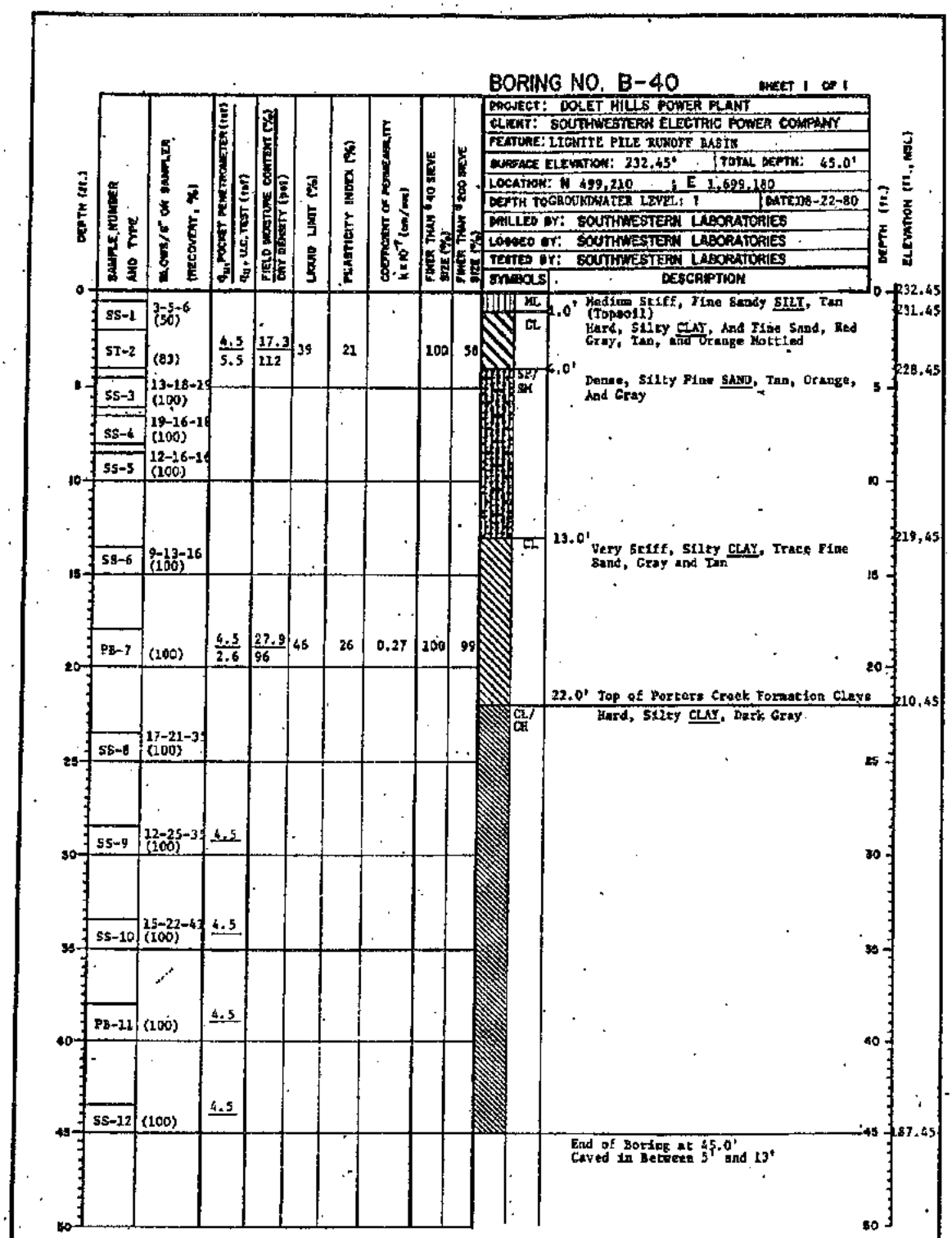
REVISION	DATE / PREPARED BY	DESCRIPTION
0	09-14-84 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-38

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02



REVISION	DATE / PREPARER BY	DESCRIPTION
0	09-16-80 / S.N. VARADHI	ISSUED FOR RECORD

DOLET HILLS POWER PLANT
LOG OF BORING B-40

SOUTHWESTERN ELECTRIC POWER COMPANY

SARGENT & LUNDY ENGINEERS

PROJECT NUMBER: 5803-02

Appendix C-2
Soil Test Results

Table C-1 (Page 1 of 2)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 1

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k,cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
P-22	ST-1	1.0-3.0				73	38	18	20	CL	21.6	104		1.9
	ST-2	3.0-5.0			100	61	32	17	15	CL	19.4	109	3.1×10^{-8} ;	
	ST-3	5.0-7.0		100	44	31	38	22	16	SC	20.1	114	1.8×10^{-8}	1.3
	ST-4	7.0-9.0					47	23	24	CL	26.7	113		
	PIT-6	13.0-15.0				100	47	24	23	CL	23.2	104	6.5×10^{-6};	11.0
	SS-10	33.5-35.0					51	24	27	CH	24.9	102	1.7×10^{-8}	
	SS-12	48.5-50.0									25.8	101		
B-1	SS-2	14.5-16.0				25				SM	21.3			
	SS-4	21.5-23.0				19				SM	21.1			
B-43	ST-2	2.0-4.0			100	96	49	18	31	CL	18.9	108		
	ST-3	4.0-6.0			98	73	31	18	13	CL	19.7	111	0.8×10^{-8}	
B-44	SS-1	0-1.5					45	20	25	CL	16.6			
	ST-2	2.0-4.0		98	96	34				SC	25.4	105		
	SS-7	18.5-20.0			100	3				SP	24.8			

Table C-1 (Page 2 of 2)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 1

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (K,cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-45	SS-2	2.5-4.0		100	97	75	49	20	29	CL	19.0			
	ST-3	4.0-6.0								CL	32.0	89	2.0×10^{-8}	
B-46	SS-1	0-1.5					29	19	10	CL	14.7			
	PB-8	23.0-25.5					59	19	40	CH	22.0	100		11.9
B-47	ST-2	2.0-4.0			99	95	71	20	51	CH	25.8	97		
	ST-4	6.0-8.0			100	99	54	21	33	CH	28.3	95	3.7×10^{-8}	
	SS-10	33.5-35.0			96	65				ML	33.0			
B-49	SS-1	0-1.5					30	19	11	CL	7.6			
	ST-2	2.0-4.0					66	20	46	CH	19.6	105		11.7
	SS-6	13.5-15.0			99	17				SM	22.8			
	PB-9	28.0-30.0				100	49	20	29	CL	21.0	97		12.1
B-50	SS-2	2.5-4.0			100	25				SC	9.4			
	SS-7	18.5-20.0					43	20	23	CL	30.3			
	PB-13	48.0-50.0					61	22	39	CH	15.0	107	2.0×10^{-8}	11.2
E-6	ST-2	2.0-4.0	100	99	99	54	45	20	25	CL	17.0	104	2.6×10^{-8}	
	ST-3	4.0-6.0		100	99	32				SM	14.1	103		
E-7	ST-3	4.0-6.0			100	93	74	23	51	CH	24.0	102	0.3×10^{-8}	
E-8	ST-3	4.0-6.0				79	37	20	17	CL	17.0	106	3.8×10^{-8}	

Table C-2 (Page 1 of 4)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 2

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (K,cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-3	SS-2	6.5-8.0			98	26				SM	9.9			
B-7	SS-2	14.5-16.0			100	54				SM	24.6			
B-53	ST-2	2.0-4.0			100	30	30	21	9	SC	13.7	113		
	SS-4	6.5-8.0			98	28				SM	12.0			
	PB-8	23.0-25.0			100	99	45	19	26	CL	22.0	101		
B-54	ST-2	2.0-4.0			96	87	53	18	37	CH	22.4 26.0	106 96	3.9x10^{-8}	12.6
	ST-4	6.0-8.0			100	99	65	21	44	CH	20.2 32.0	109 90	1.8x10^{-8}	
	SS-5	8.5-10.0			100	48				SM	31.0 27.9	97	4.1x10^{-8}	
B-55	ST-2	2.0-4.0			99	60	25	17	8	CL	15.0	108		
	SS-5	8.5-10.0			100	99	45	21	24	CL	15.3 25.3	110	3.1x10^{-8}	
	PB-9	28.0-30.0			100	100	50	19	31	CL-CH	24.0 24.0	105 102	3.8x10^{-9}	

Table C-2 (Page 2 of 4)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 2

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability [K, cm/sec]	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-56	ST-2	2.0-4.0			100	51				CL	15.4	111		
	PB-6	13.0-15.0			100	99	50	20	30	CL-CH	25.0	99		11.5
											25.3	102	4.8×10^{-9}	
	PB-10	33.0-35.5			100	100	47	19	28	CL	21.7	110	8.6×10^{-9}	10.4
B-57	ST-2	2.0-4.0			100	61	29	20	9	CL	16.1	108		
	ST-6	13.0-15.0			100	97	45	21	24	CL	25.1	96	2.6×10^{-8}	
	PB-8	23.0-25.0			100	100	46	19	27	CL	24.0	105		11.5
B-9	ST-3	4.0-6.0			98	72	47	20	27	CL	23.0	94	6.1×10^{-8}	
B-10	ST-3	4.0-6.0			100	94	43	20	23	CL	23.0	94	3.8×10^{-8}	
B-11	ST-3	4.0-6.0				47	30	19	11	SC	15.4	116		3.8
	ST-5	8.0-10.0				52	27	17	10	CL	27.0			
	ST-6	13.0-15.0			100	98				CL	15.0	116	6.6×10^{-8}	
B-12	ST-4	6.0-8.0				97	52	20	32	CH	16.0	116	4.1×10^{-8}	
	ST-6	13.0-15.0				97	50	19	31	CL-CH	23.4			
	ST-8	23.5-25.0				100	50	20	30	CL-CH	22.8			
B-13	ST-2	2.0-4.0				97	48	20	28	CL	20.3	95		4.8
	ST-5	8.0-10.0				97	45	20	25	CL	26.9	94		
	SS-6	13.5-15.0			100	97	45	20	25	CL	23.8			
	SS-8	23.5-25.0			100	98				CL	27.6			

Table C-2 (Page 3 of 4)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 2

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability - (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-14	ST-2	2.0-4.0	100	99	98	51	38	19	19	CL	11.0	104	4.1×10^{-8}	4.9
	ST-3	4.0-6.0	100	100	99	12				SP-SM				
	ST-4	8.5-10.0	100	100	100	27				SM				
B-67	ST-2	2.0-4.0			100	96	55	22	33	CH	21.5	106	2.6×10^{-9}	
	ST-3	4.0-6.0			100	98	42	21	21	CL	21.0	98		
	ST-5	8.0-10.0				99	41	20	21	CL	24.5	99		
B-68	ST-2	2.0-4.0			100	42	34	19	15	CL	21.6	98	2.9×10^{-7}	
	SS-3	4.5-6.0				31				SM	15.9	100	1.4×10^{-7}	
	SS-4	6.5-8.0	98	97	96	21				SM	18.9			
	SS-5	8.5-10.0			100	23				SM	21.5			
B-69	ST-2	2.0-4.0			100	46	30	18	12	SC	19.7	105	1.4×10^{-8}	
	ST-3	4.0-6.0				38	29	17	12	SC	13.3	88		
	SS-4	6.5-8.0			100	41				SM	22.0			
	SS-5	8.5-10.0			100	44				SM	22.2			
B-70	ST-2	2.0-4.0			100	54	29	17	12	CL	20.9	105	1.8×10^{-8}	
	ST-3	4.0-6.0				46	35	18	17	SC	24.8	93		
	ST-5	8.0-10.0				99	55	22	33	CH	29.4	97		

Table C-2 (Page 4 of 4)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO ASH BASIN - 2

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-71	ST-1	0.0-2.0			100	20	23	17	6	SC	21.4	91		
	ST-2	2.0-4.0			100	34	26	17	9	SC	19.3	100	9.0×10^{-5}	
	SS-4	6.5-8.0			100	24	23	17	6	SC	20.7	-		
	SS-5	8.5-10.0			100	23	-	-	-	SM	24.4	-		
B-72	ST-2	2.0-4.0			100	66	40	19	21	CL	21.4	105	2.5×10^{-7}	
	ST-3	4.0-6.0			100	96	62	22	40	CH	24.3	95	9.0×10^{-8}	
	SS-4	8.5-10.0			100	99	50	20	30	CL-CH	22.3	102		
B-73	ST-2	2.0-4.0			100	75	44	21	23	CL	16.5	113.5	3.2×10^{-8}	
	ST-3	4.0-6.0			100	77	50	21	29	CL-CH	25.2	93		
	SS-4	6.5-8.0				23	26	17	9	SC	12.4	-		
B-74	ST-1	0.0-2.0			100	63	28	18	10	CL	21.4	101	1.2×10^{-7}	
	ST-3	4.0-6.0				47	33	19	14	SC	25.4	94	2.9×10^{-8}	
	ST-4	8.0-10.0				79	40	20	20	CL	27.8	89		
	SS-6	13.5-15.0			100	21	-	-	-	SCorSM	27.4	-		
B-75	ST-2	2.0-4.0			100	70	34	19	15	CL	22.4	89	9.5×10^{-7} (disturbed)	
	ST-3	4.0-6.0				53	34	18	16	CL	27.1	95	1.8×10^{-8}	
	ST-5	8.0-10.0				57	46	21	25	CL	20.8	97		
B-76	ST-2	2.0-4.0			100	98	56	21	35	CH	28.2	93	6.5×10^{-9}	
	ST-3	4.0-6.0				99	43	21	22	CL	26.8	92		
	ST-5	8.0-10.0				100	47	21	26	CL	23.8	101		

Table C-3
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO SECONDARY POND

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-51	ST-2	2.0-4.0			99	75	54	19	35	CH	24.0 22.1	101 100	4.9×10^{-9}	
	SS-5	13.5-15.0			100	17				SM	14.9			
	PB-8	23.0-25.0			100	99	48	19	29	CL	25.0 24.5	98 99	2.0×10^{-8}	
B-52	ST-2	2.0-4.0			99	90	50	18	32	CL-CH	22.9	101		
	SS-6	13.5-15.0			100	23				SM	14.7			
	PB-9	28.0-30.0			100	100	47	19	28	CL	27.2	81		

Table C-4
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO
SURGE AND AUXILIARY SURGE PONDS

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve								
B-14	SS-1	0-1.5			100	78	64	22	42	CH	23.2			
	ST-2	2.0-4.0			100	49	39	19	20	SC	49.2	110		
	SS-6	13.5-15.0			100	30				SM	8.6			
	PS-9	27.0-30.0					48	19	29	CL	27.0	95		12.9
B-15	SS-1	0-1.5	98	96	94	66	41	20	21	CL	21.8			
	ST-2	2.0-4.0					48	19	29	CL	26.0	94	6.9×10^{-9}	8.9
	SS-4	6.5-8.0			98	71				SMorSC	11.6			
	Bag Sample	0-2.0		98		91	62	20	42	CH	31.0	86	1.9×10^{-8}	
B-58	ST-2	2.0-4.0			100	99	47	20	27	CL	23.4	96	6.0×10^{-8}	1.6
	ST-3	4.0-6.0				99	45	20	25	CL	23.7	93	7.7×10^{-8}	
B-59	ST-2	2.0-4.0			100	32	27	18	9	SC	21.8	96	8.4×10^{-5} *	1.2
	ST-3	4.0-6.0				19	28	18	10	SC	27.4	92	1.2×10^{-7}	
B-60	ST-2	2.0-4.0				87	55	21	34	CH	32.9	88	5.9×10^{-8}	0.8
	ST-3	4.0-6.0			100	90	59	22	37	CH	36.0	83	6.7×10^{-8}	

* Questionable

Table C-5
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO METAL CLEANING WASTE POND

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k,cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-61	ST-2	2.0-4.0			100	95	60	22	38	CH	30.0	88	6.2×10^{-8}	2.3
	ST-3	4.0-6.0				100	64	22	42	CH	21.0	96	3.8×10^{-9}	
B-62	ST-2	2.0-4.0			100	99	46	20	26	CL	27.0	90	7.6×10^{-9}	2.2
	ST-3	4.0-6.0				50	32	18	14	CL-SC	27.0	91	1.6×10^{-8}	
	ST-4	6.0-8.0		100	99	34	-	-	-	SMorSC (1)	10.2	-		

Table C-6
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO PLANT DISCHARGE COLLECTION POND

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
P-15	ST-2	5.0-7.0			100	86	46	20	26	CL	17.7	103		
	SS-3	7.5-9.0				87	44	19	25	CL	20.1	101		
	SS-4	9.5-11.0			100	75				CL	18.7	101		
	SS-6	13.5-15.0			100	79	37	19	18	CL	23.4	105		
	SS-8	24.5-26.0			100	57				CL	25.1	100		
	PIT-11	38.0-40.0					39	22	17	CL	22.5	107		9.1
	SS-13	48.5-50.0								CL	25.2	110		
B-63	ST-1	12.0-14.0			100	85	38	19	19	CL	19.1	97	4.4×10^{-7}	3.7
	ST-3	16.0-18.0				81	35	19	16	CL	24.3	92	1.2×10^{-6}	
B-64	ST-2	14.0-16.0			100	65	32	19	13	CL	21.6	95	1.8×10^{-6}	3.1
	ST-3	16.0-18.0				58	33	18	15	CL	19.3	94	1.4×10^{-5} (1)	
	SS-5	20.5-22.0		100	99	32	-	-	-	SC	*	-		

Table C-7 (Page 1 of 2)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO LIGNITE PILE RUNOFF BASIN

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k, cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
P-21	ST-2	2.0-4.0			100	43	27	17	10	SC	24.6	99	3.7×10^{-7}; 4.0×10^{-7}	
	ST-4	6.0-8.0				100	51	22	29	CH	31.0	94	9.0×10^{-8}; 8.2×10^{-8}	
	ST-5	8.0-10.0				100	46	22	24	CL	25.8	98		7.4
	PIT-6	13.0-15.0			100	99	32	17	15	CL	27.3	101	6.2×10^{-9}; 1.6×10^{-8}	
	SS-8	23.5-25.0				100	49	23	26	CL	26.7	105		5.3
	SS-10	33.5-35.0					55	22	33	CH	24.9	109		
	SS-12	43.5-45.0									17.4	112		
B-34	ST-2	2.0-4.0				100	61	20	41	CH	23.1	94	1.3×10^{-8}	
B-38	ST-2	2.0-4.0			100	98	50	20	30	CL-CH	19.4	97		7.7
	ST-4	6.0-8.0			99	96	41	19	22	CL	22.7	96	3.4×10^{-8}	2.3
	FS-7	18.0-20.0			100	99	48	21	27	CL	23.7	104	1.1×10^{-8}	8.6
B-39	ST-2	2.0-4.0			98	61	36	17	19	CL	12.8	119	5.8×10^{-9}	14.1
	ST-4	6.0-8.0			97	95	47	18	29	CL	23.3	101		3.9
	FS-7	18.0-20.0			100	100	48	22	26	CL	25.2	103	8.0×10^{-9}	8.4

Table C-7 (Page 2 of 2)
SUMMARY OF LABORATORY TEST RESULTS OF
SOIL BORING SAMPLES RELATED TO LIGNITE PILE RUNOFF BASIN

Boring Number	Sample Number	Sample Depth (Ft)	Particle Size Analysis (% Passing)				Atterberg Limits			Unified Soil Classification System	Water Content (%)	Dry Unit Weight (Pcf)	Laboratory Permeability (k,cm/sec)	Unconfined Compressive Strength q_u (Ksf)
			No. 4 Sieve	No.10 Sieve	No. 40 Sieve	No. 200 Sieve	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)					
B-40	ST-2	2.0-4.0			100	58	39	18	21	CL	17.3	112		11.0
	PB-7	18.0-20.0			100	99	46	20	26	CL	27.9	96	2.7×10^{-8}	5.3
E-4	ST-3	4.0-6.0				87	45	21	24	CL	14.7	123		
	ST-5	8.0-10.0	100	99	98	90	46	20	26	CL	20.5	107		
	ST-6	13.0-15.0			100	94	30	20	10	CL-CH	24.0	100	4.8×10^{-8}	
E-5	ST-3	4.0-6.0	100	99	97	49	39	20	19	SC	15.2	107		
	ST-6	13.0-15.0			100	99	56	21	35	CH	30.0	86	1.5×10^{-7}	

BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-4

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN

T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

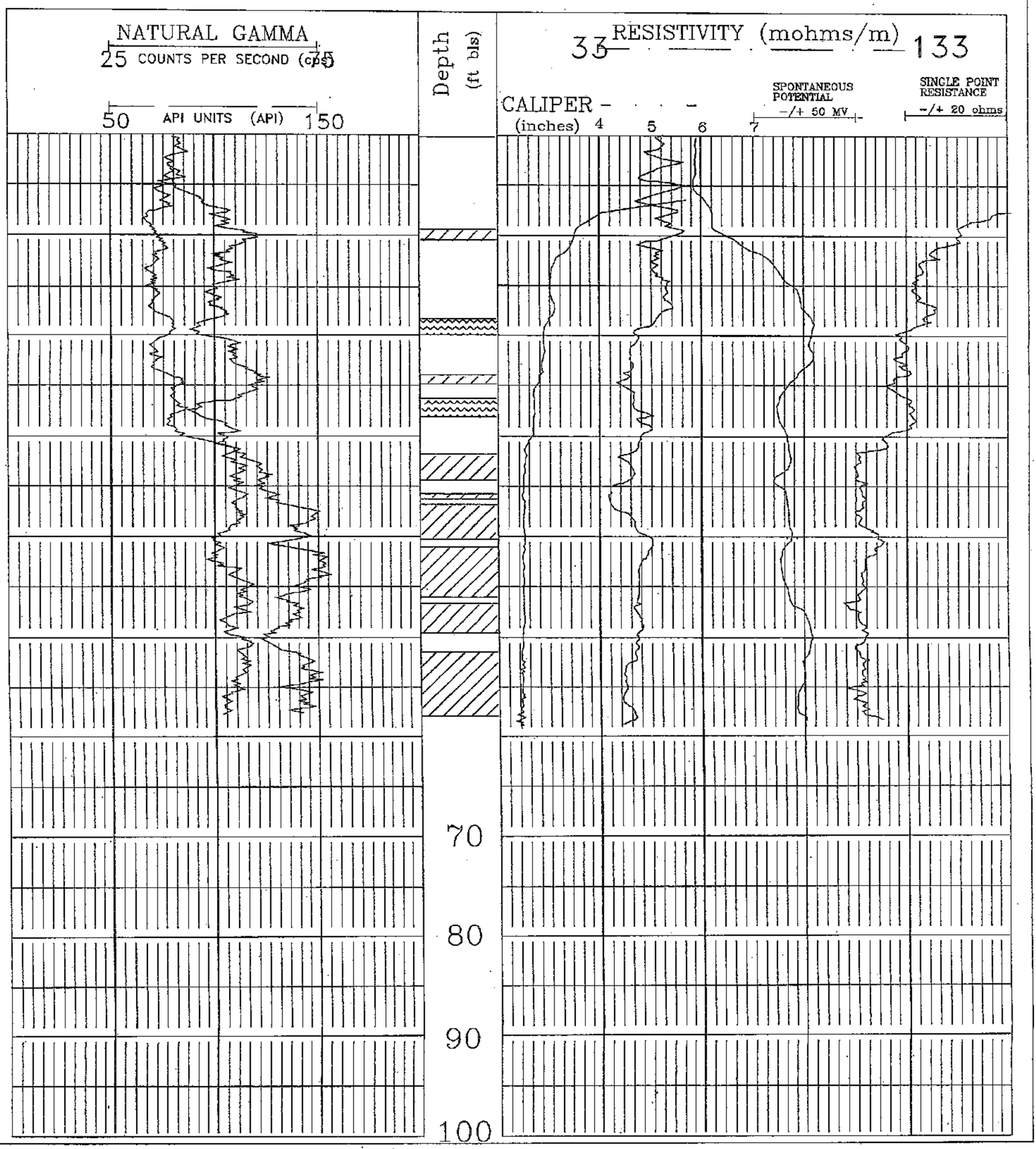
RERUNS

T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.
Driller: Charles Drilling | Bit Size: 4.25"
Type Fluid in Hole: Groundwater | Casing Size: Open Hole
Fluid Level FT. | Bottom Hole Temp. °F
Resistivity OHM-M | LOG TIME
Density | Start Stop Minutes Total
Viscosity Temp. °F | Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-5

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

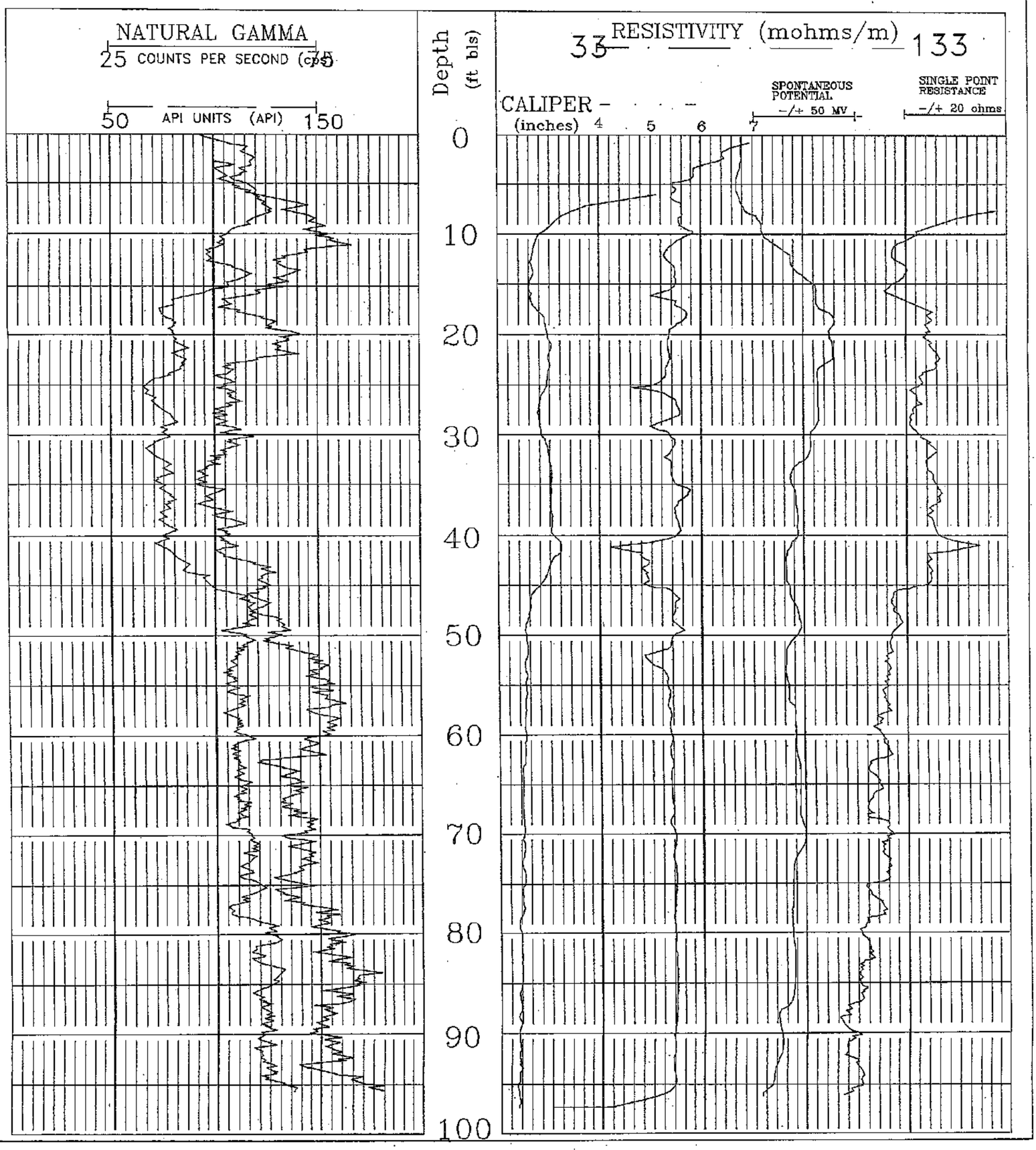
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN	RERUNS
T.D. LOGGED: 58.5 FT.	T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT.	T.D. Drilled FT.
Driller: Charles Drilling	Bit Size: 4.25"
Type Fluid in Hole: Groundwater	Casing Size: Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start / Stop / Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-5

AREA: Dolet Hills Power Plant

PARISH: DeSoto

STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

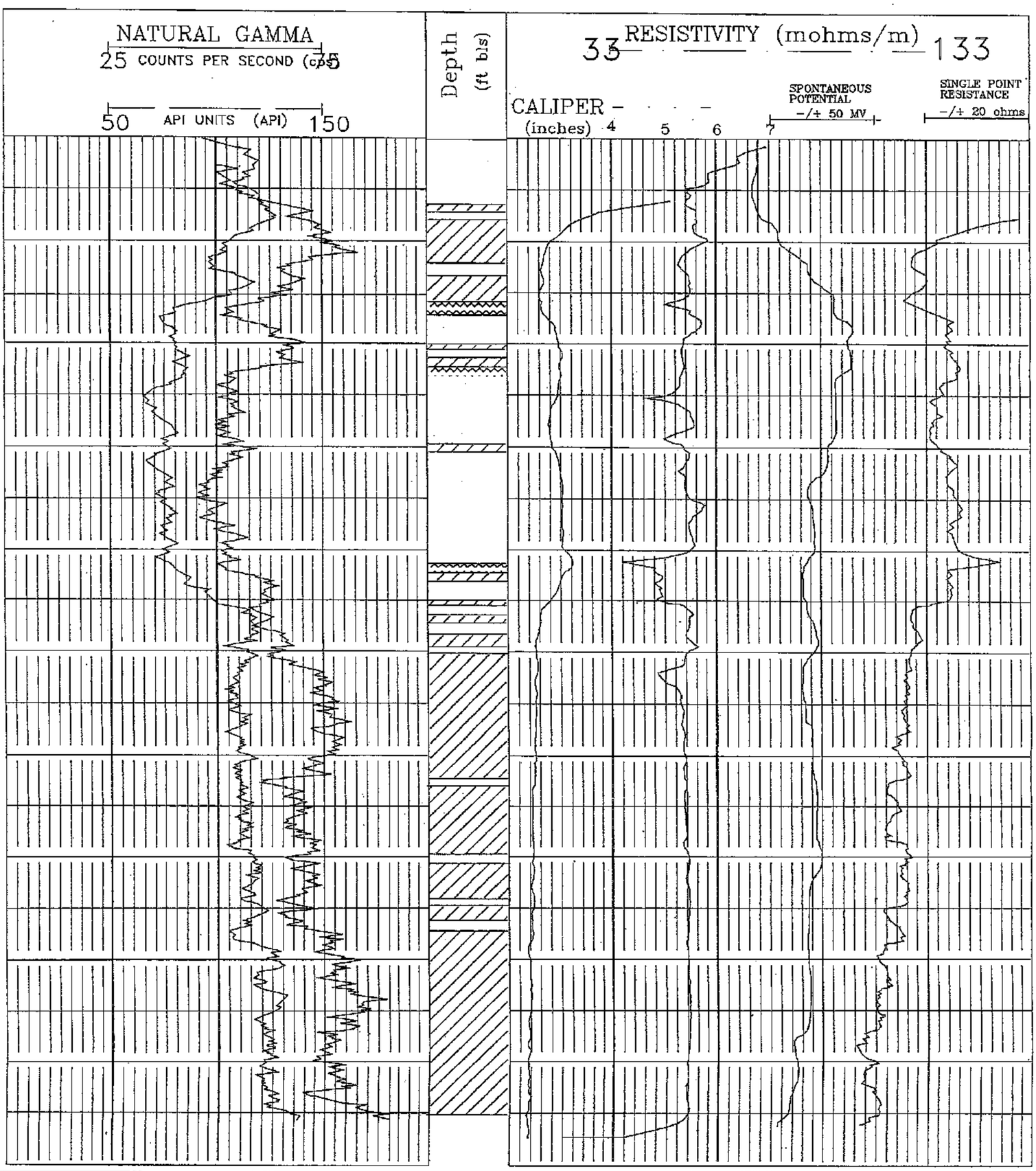
WELL DATA

T.D. Logged FT.	T.D. Drilled FT.
Driller Charles Drilling	Bit Size 4.25"
Type Fluid in Hole Groundwater	Casing Size Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start / Stop / Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 58.5 FT.	T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:

Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-6

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

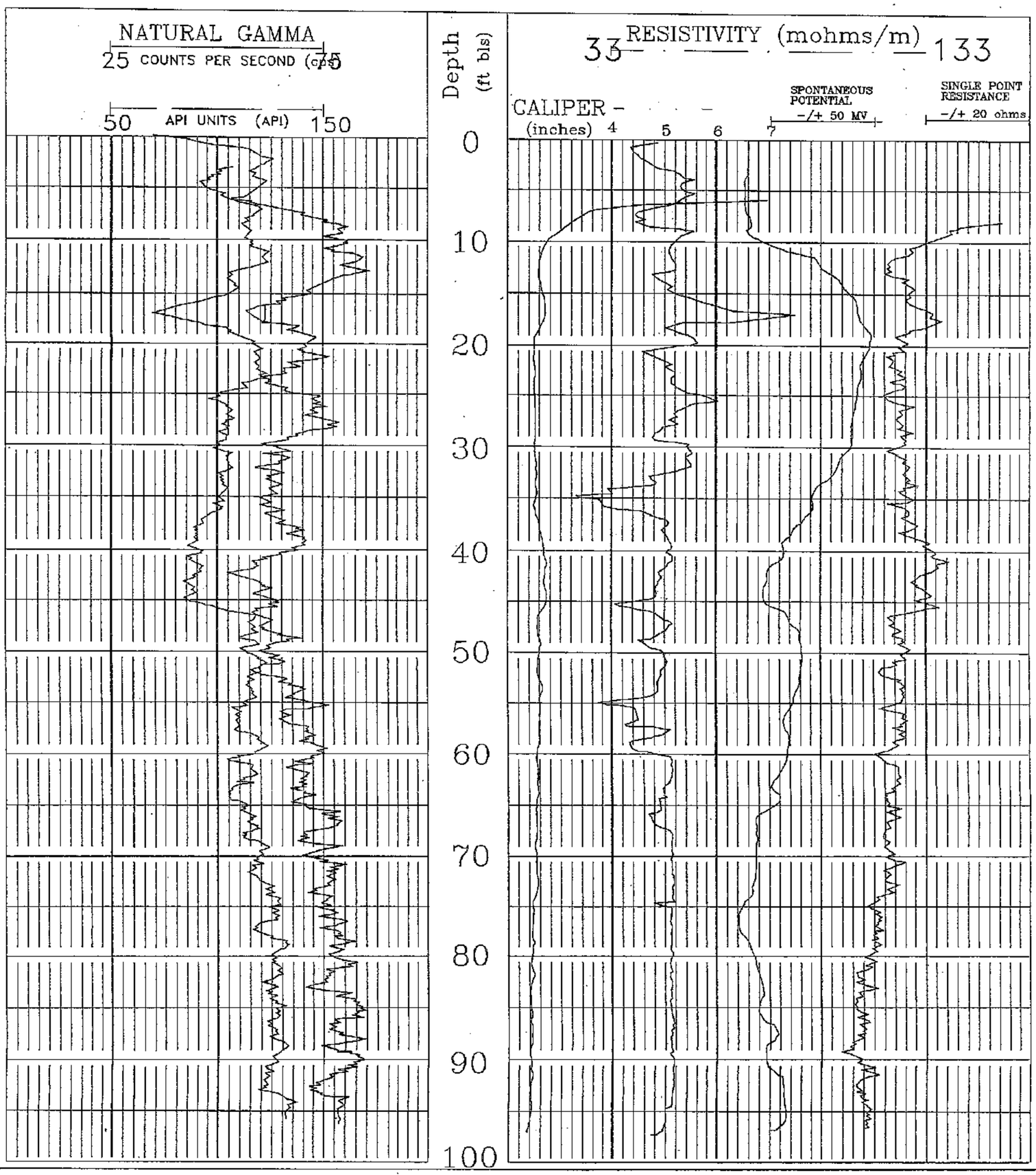
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged: 96 FT.	T.D. Drilled: 98 FT.
Driller: Charles Drilling	Bit Size: 4.25"
Type Fluid in Hole: Groundwater	Casing Size: Open Hole
Fluid Level: FT.	Bottom Hole Temp.: °F
Resistivity: OHM-M	LOG TIME
Density:	Minutes: Start / Stop / Total
Viscosity: Temp. °F	Witnessed By: Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 96 FT.	T.D. LOGGED: 96 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES
ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-6

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

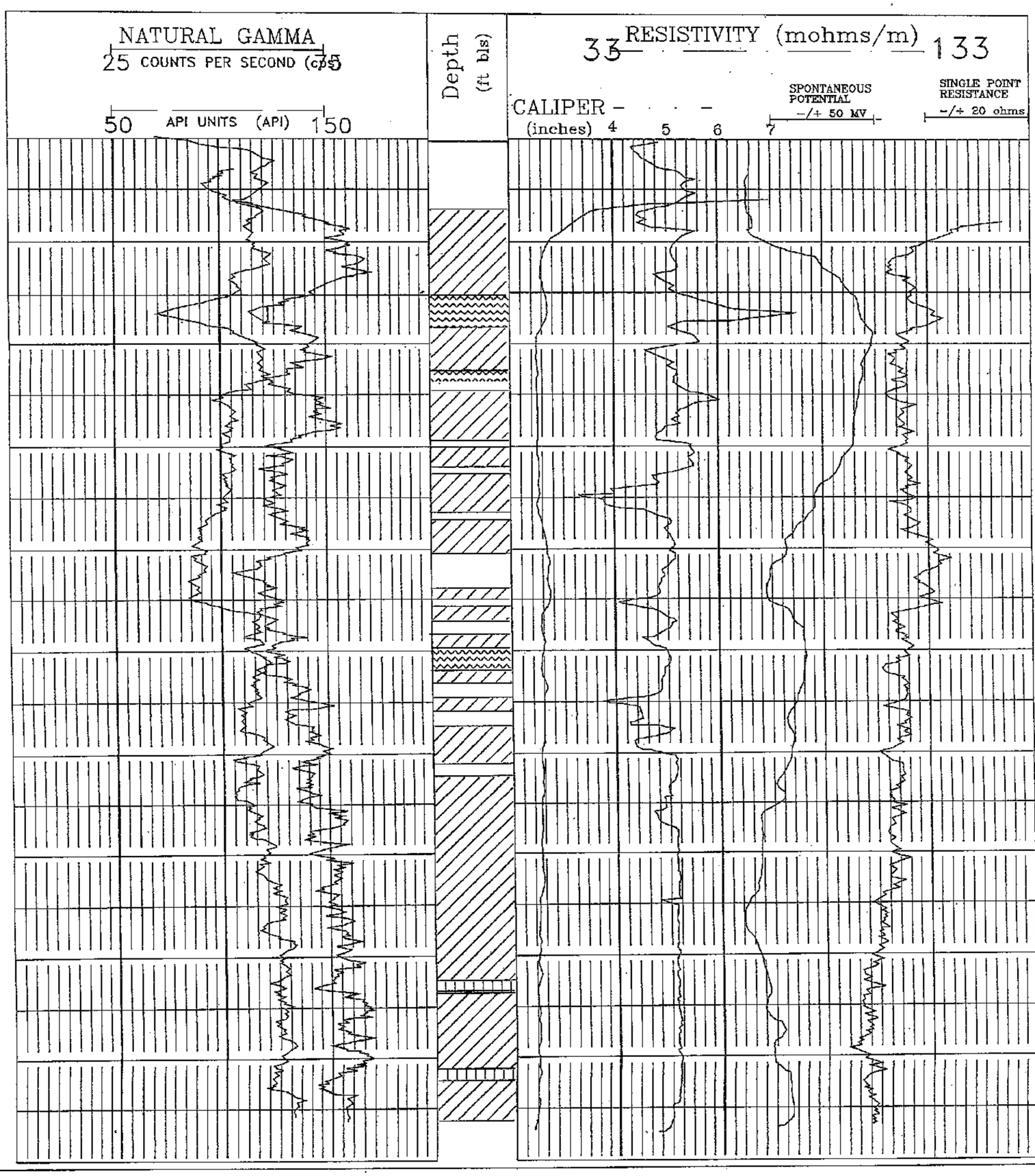
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged	96 FT.	T.D. Drilled	98 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	FT.	Bottom Hole Temp.	°F
Resistivity	OHM-M	LOG TIME	
Density		Start / Stop / Total	Minutes
Viscosity / Temp.	°F	Witnessed By:	Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 96 FT.	T.D. LOGGED: 96 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES
ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-7

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged	98 FT.	T.D. Drilled	98 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	FT.	Bottom Hole Temp.	°F
Resistivity	OHM-M	LOG TIME	
Density		Start / Stop / Minutes Total	
Viscosity	Temp. °F	Witnessed By:	Ray Sturdivant

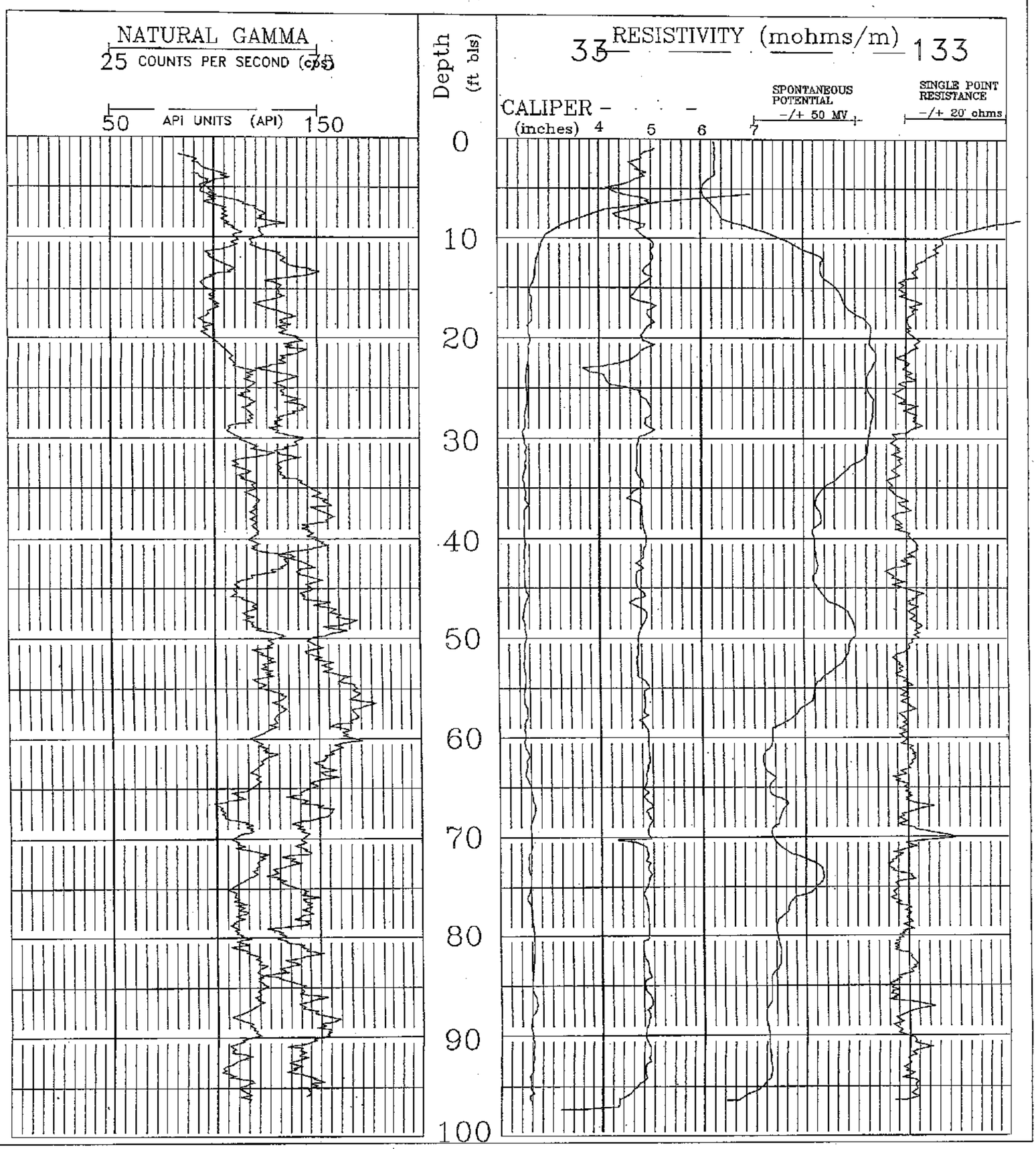
INITIAL RUN

T.D. LOGGED: 96.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 96.5 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-7

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

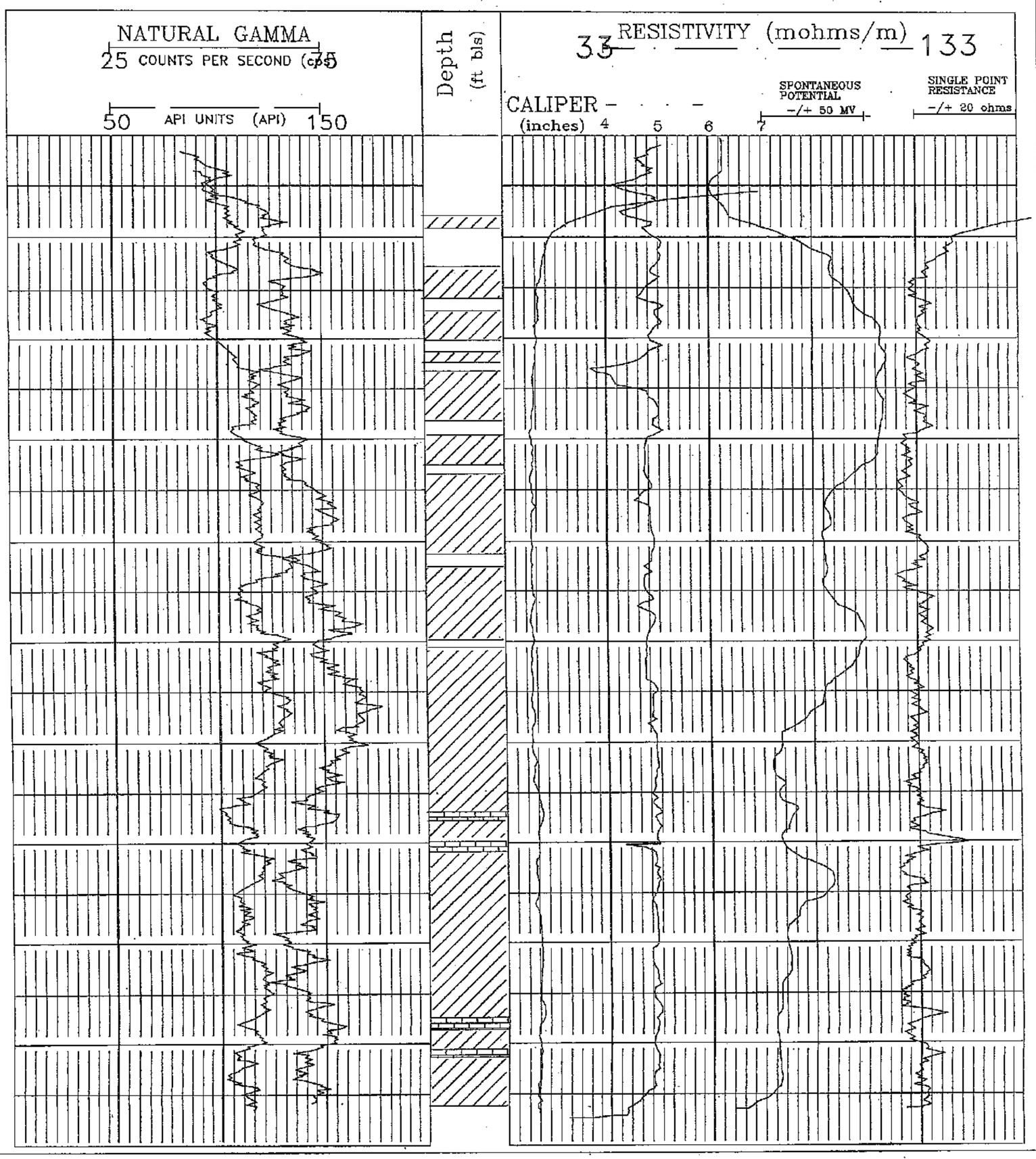
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged	98 FT.	T.D. Drilled	98 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	FT.	Bottom Hole Temp.	°F
Resistivity	OHM-M	LOG TIME	
Density		Start / Stop / Total	Minutes
Viscosity	Temp. °F	Witnessed By:	Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 96.5 FT.	T.D. LOGGED: 96.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-8

AREA: Dolet Hills Power Plant

PARISH: DeSoto STATE: LOUISIANA

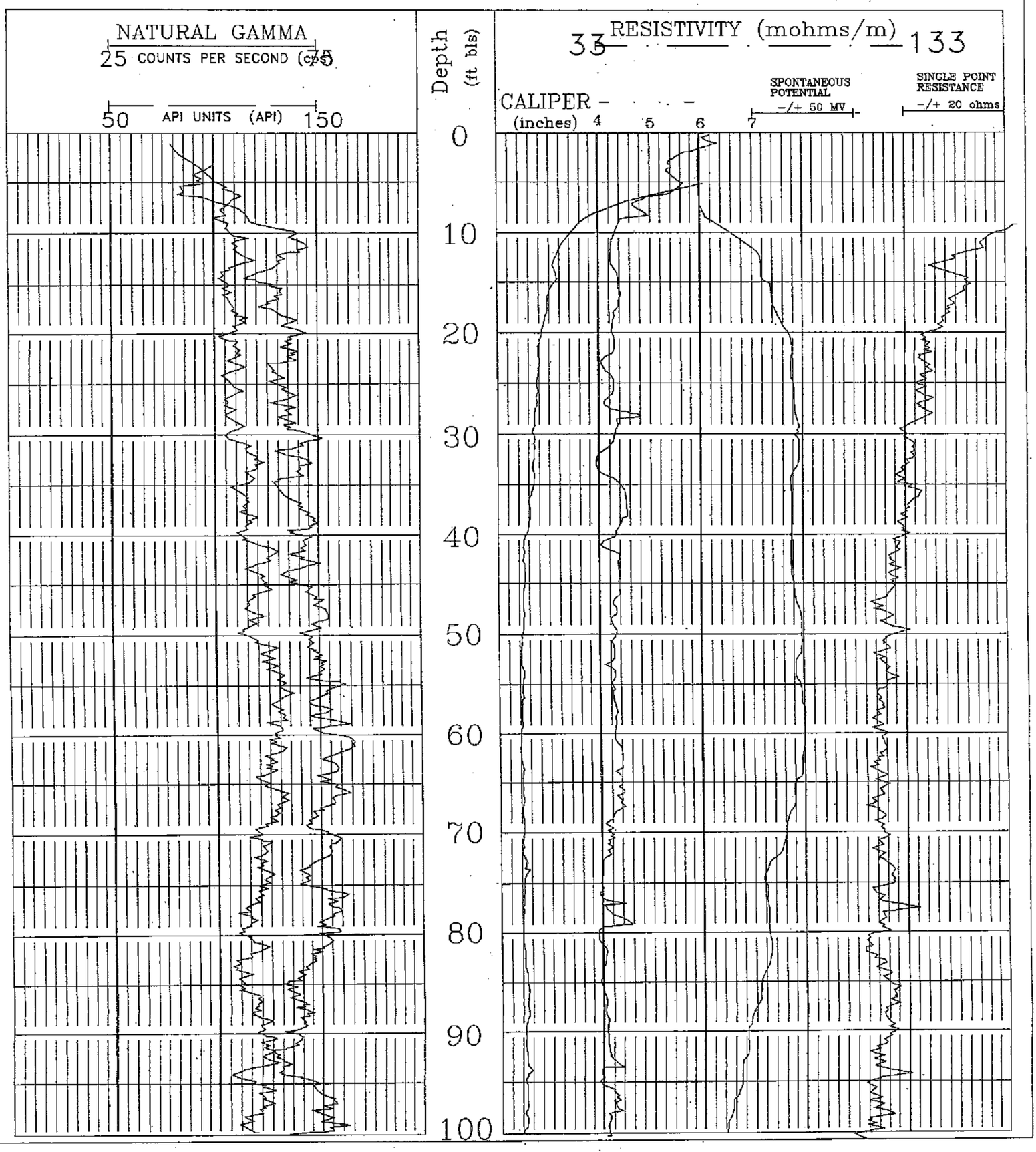
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged	107 FT.	T.D. Drilled	109 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	FT.	Bottom Hole Temp.	°F
Resistivity	OHM-M	LOG TIME	
Density		Start / Stop / Minutes Total	
Viscosity	Temp. °F	Witnessed By:	Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 107 FT.	T.D. LOGGED: 107 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-8

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged	107 FT.	T.D. Drilled	109 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	FT.	Bottom Hole Temp.	°F
Resistivity	OHM-M	LOG TIME	
Density		Start / Stop / Total	Minutes
Viscosity / Temp.	°F	Witnessed By:	Ray Sturdivant

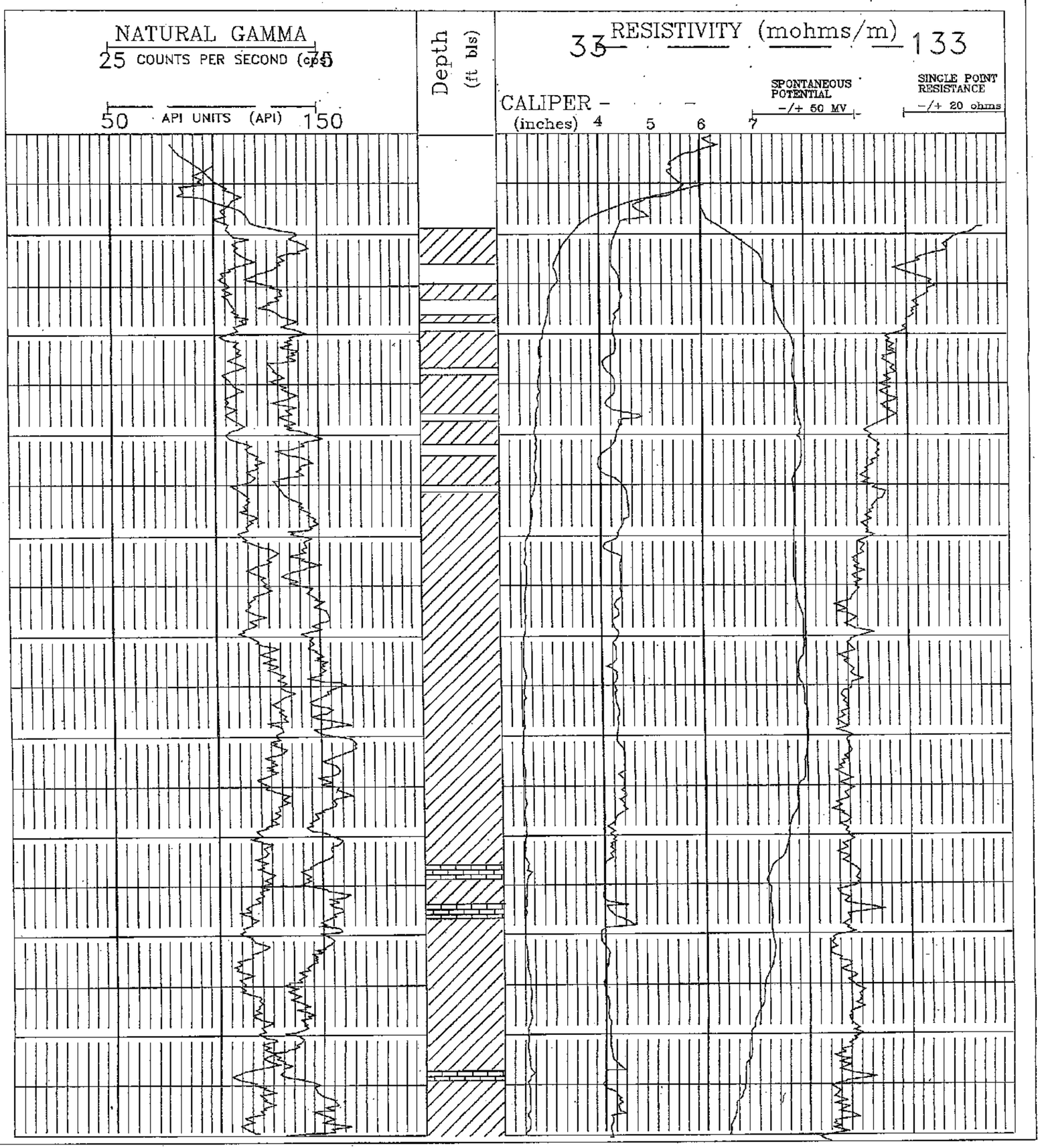
INITIAL RUN

T.D. LOGGED: 107 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 107 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

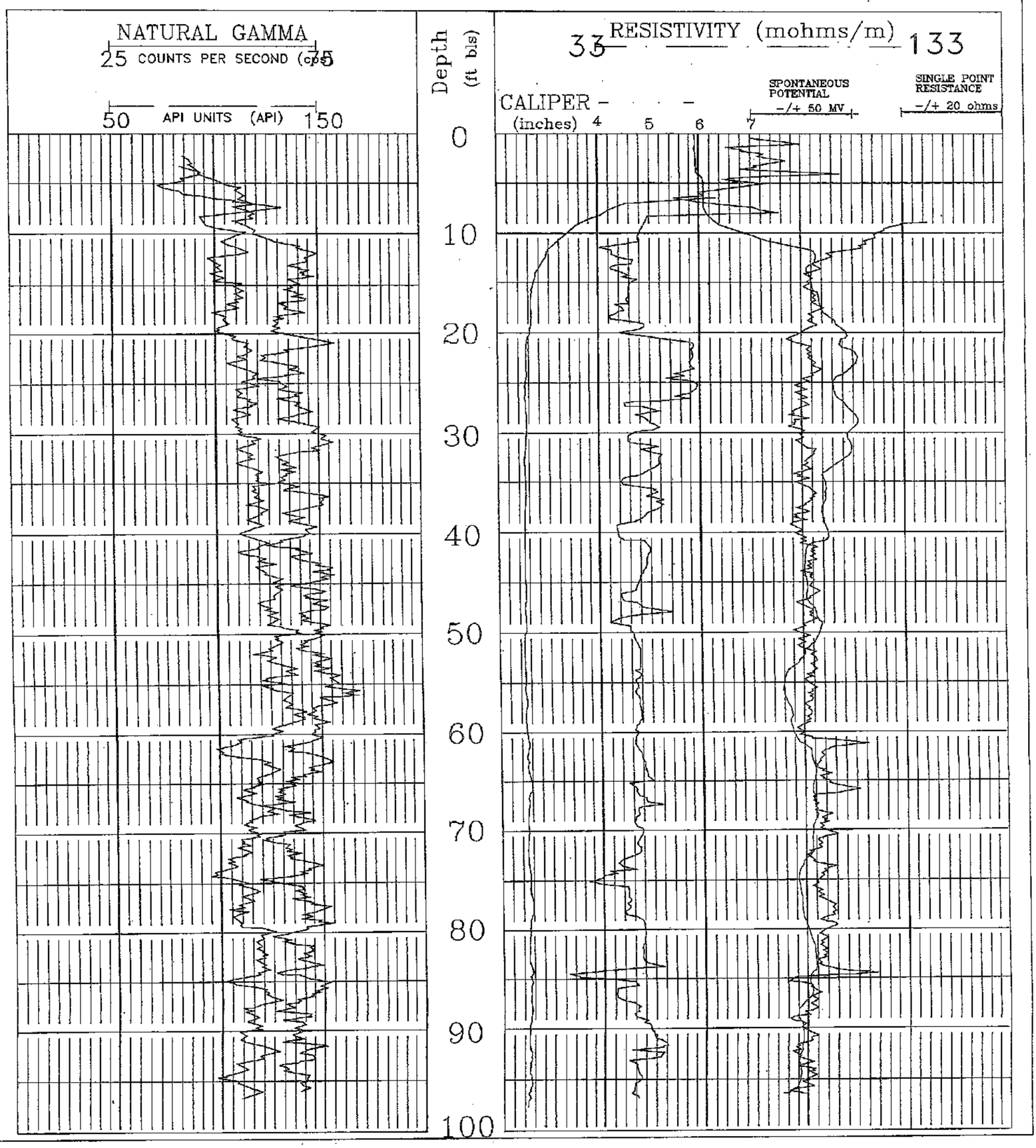
COMPANY: Eagle Environmental	
HOLE NO.: P-9	
AREA: Dolet Hills Power Plant	
PARISH: DeSoto	STATE: LOUISIANA
SECTION:	TOWNSHIP: / RANGE: / LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged 97.5 FT.	T.D. Drilled 100 FT.
Driller Charles Drilling	Bit Size 4.25"
Type Fluid in Hole Groundwater	Casing Size Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start / Stop / Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

INITIAL RUN	RERUNS
T.D. LOGGED: 97.5 FT.	T.D. LOGGED: 97.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-9

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

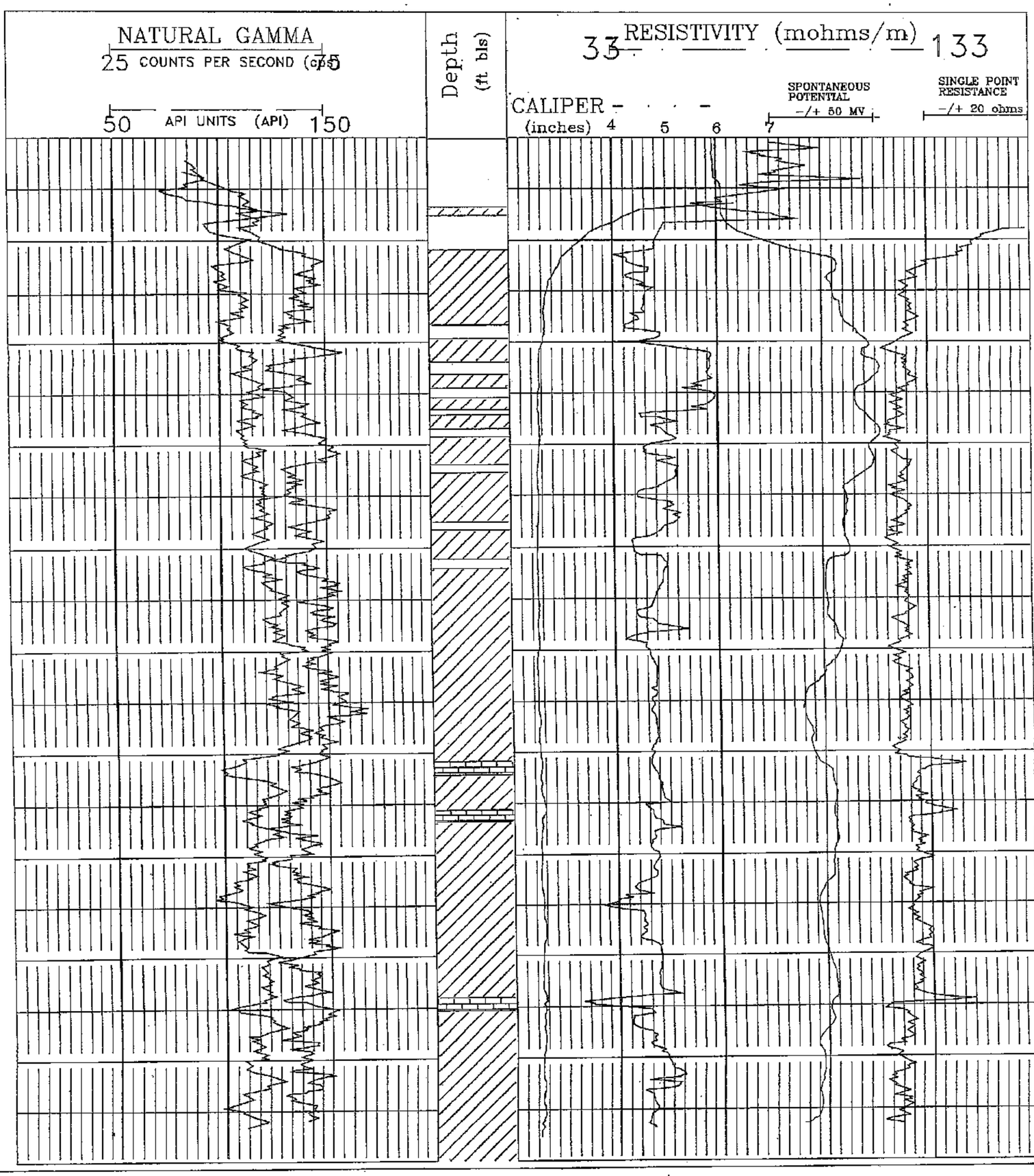
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN	RERUNS
T.D. LOGGED: 97.5 FT.	T.D. LOGGED: 97.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged 97.5 FT.	T.D. Drilled 100 FT.
Driller Charles Drilling	Bit Size 4.25"
Type Fluid in Hole Groundwater	Casing Size Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Start / Stop / Minutes Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

ICON ENVIRONMENTAL SERVICES

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-14

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.

Driller: Charles Drilling | Bit Size: 4.25"

Type Fluid in Hole: Groundwater | Casing Size: Open Hole

Fluid Level FT. | Bottom Hole Temp. °F

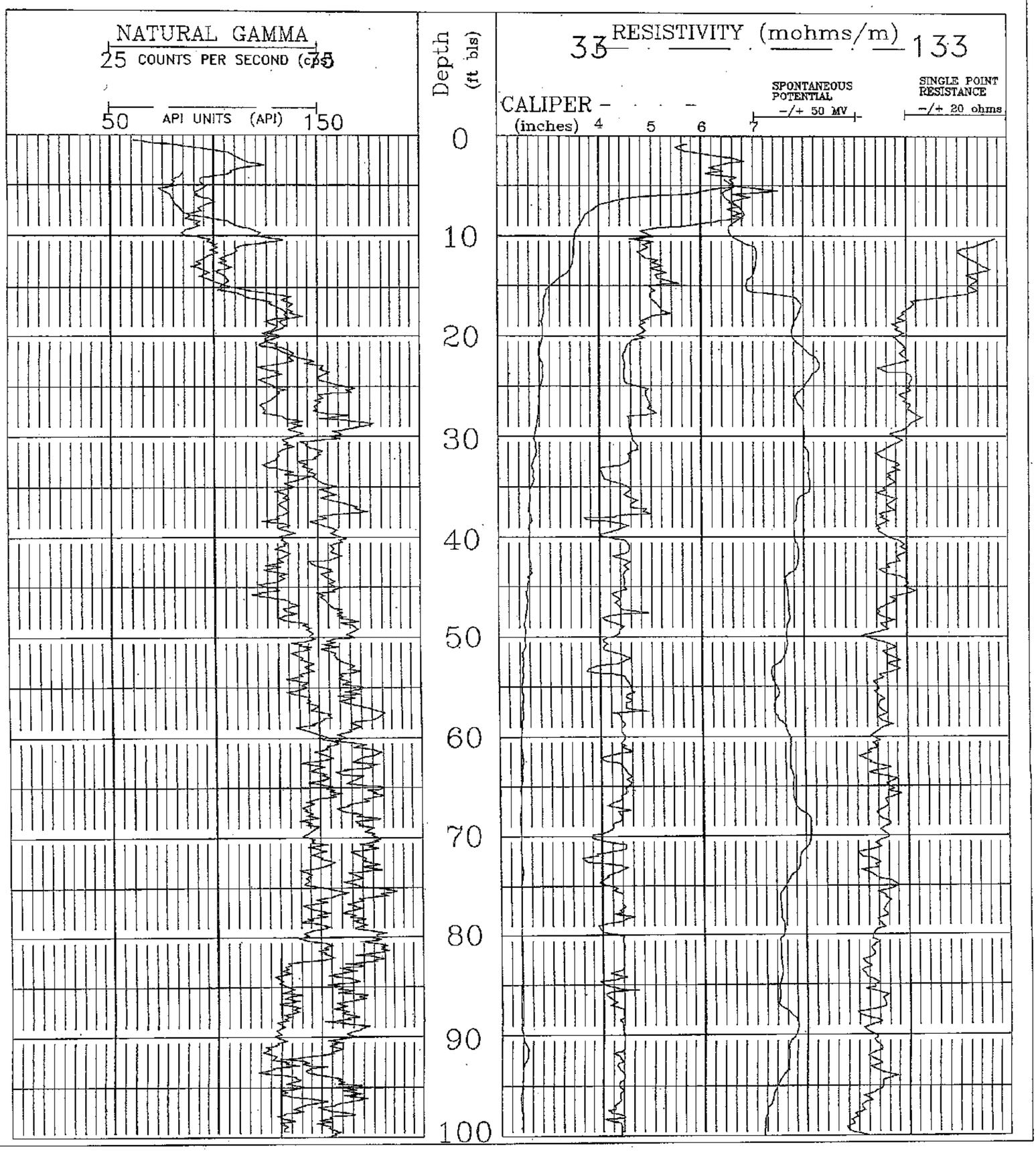
Resistivity OHM-M | LOG TIME

Density | Minutes: Start / Stop / Total

Viscosity | Temp. °F | Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (8 arm caliper)

INITIAL RUN	RERUNS
T.D. LOGGED: 107 FT.	T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-14

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.

Driller: Charles Drilling | Bit Size: 4.25"

Type Fluid in Hole: Groundwater | Casing Size: Open Hole

Fluid Level FT. | Bottom Hole Temp. °F

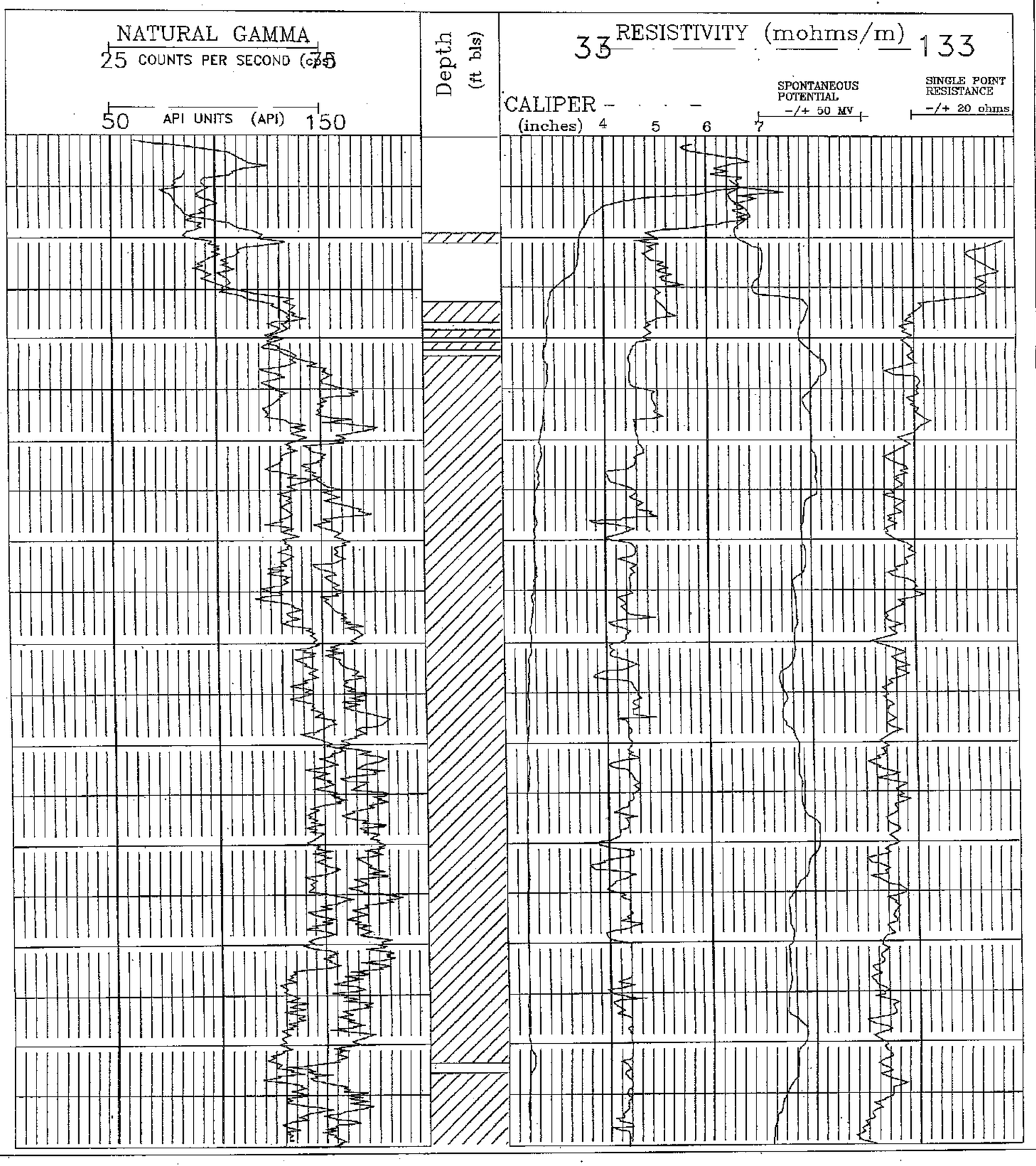
Resistivity OHM-M | LOG TIME

Density | Minutes: Start / Stop / Total

Viscosity | Temp. °F | Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)

INITIAL RUN	RERUNS
T.D. LOGGED: 107 FT.	T.D. LOGGED: 58.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-15

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

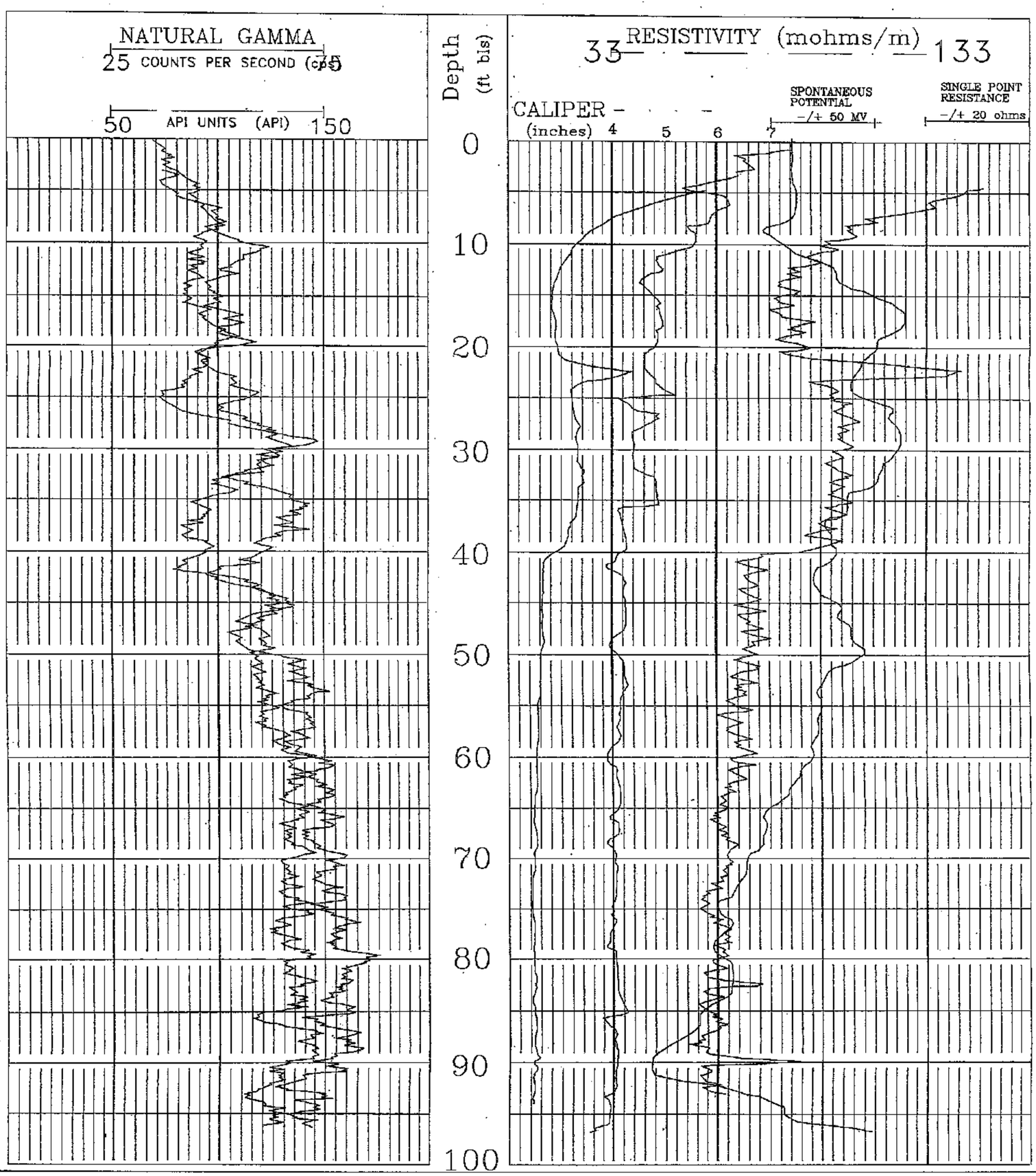
SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN	RERUNS
T.D. LOGGED: 97 FT.	T.D. LOGGED: FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT.	T.D. Drilled FT.
Driller: Charles Drilling	Bit Size: 4.25"
Type Fluid in Hole: Groundwater	Casing Size: Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start / Stop / Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-15

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN

T.D. LOGGED: 97 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.

Driller: Charles Drilling | Bit Size: 4.25"

Type Fluid in Hole: Groundwater | Casing Size: Open Hole

Fluid Level FT. | Bottom Hole Temp. °F

Resistivity OHM-M

Density

Viscosity Temp. °F

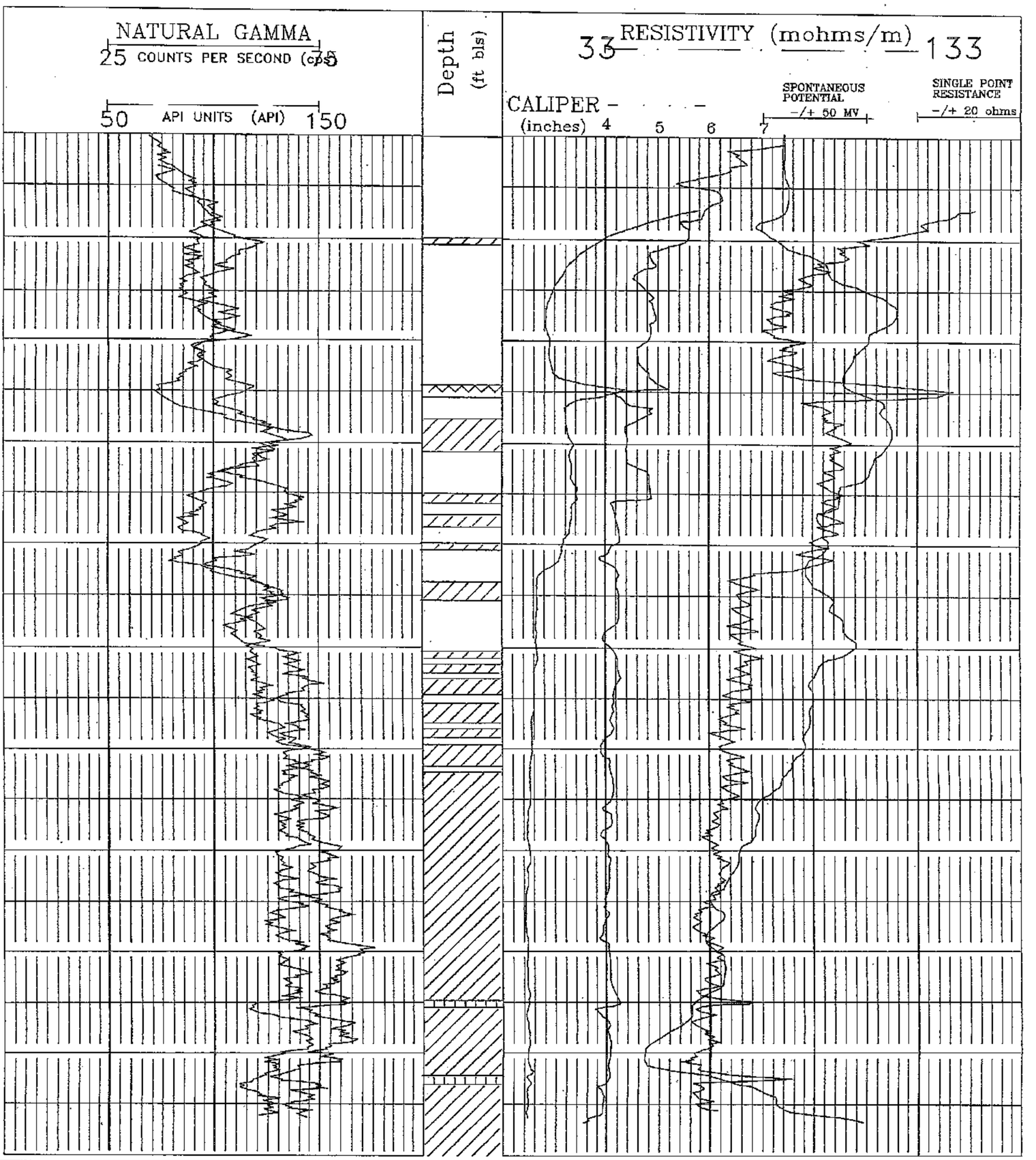
LOG TIME

	Start	Stop	Minutes Total

Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:

Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-16

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN

T.D. LOGGED: 87 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.

Driller: Charles Drilling | Bit Size: 4.25"

Type Fluid in Hole: Groundwater | Casing Size: Open Hole

Fluid Level FT. | Bottom Hole Temp. °F

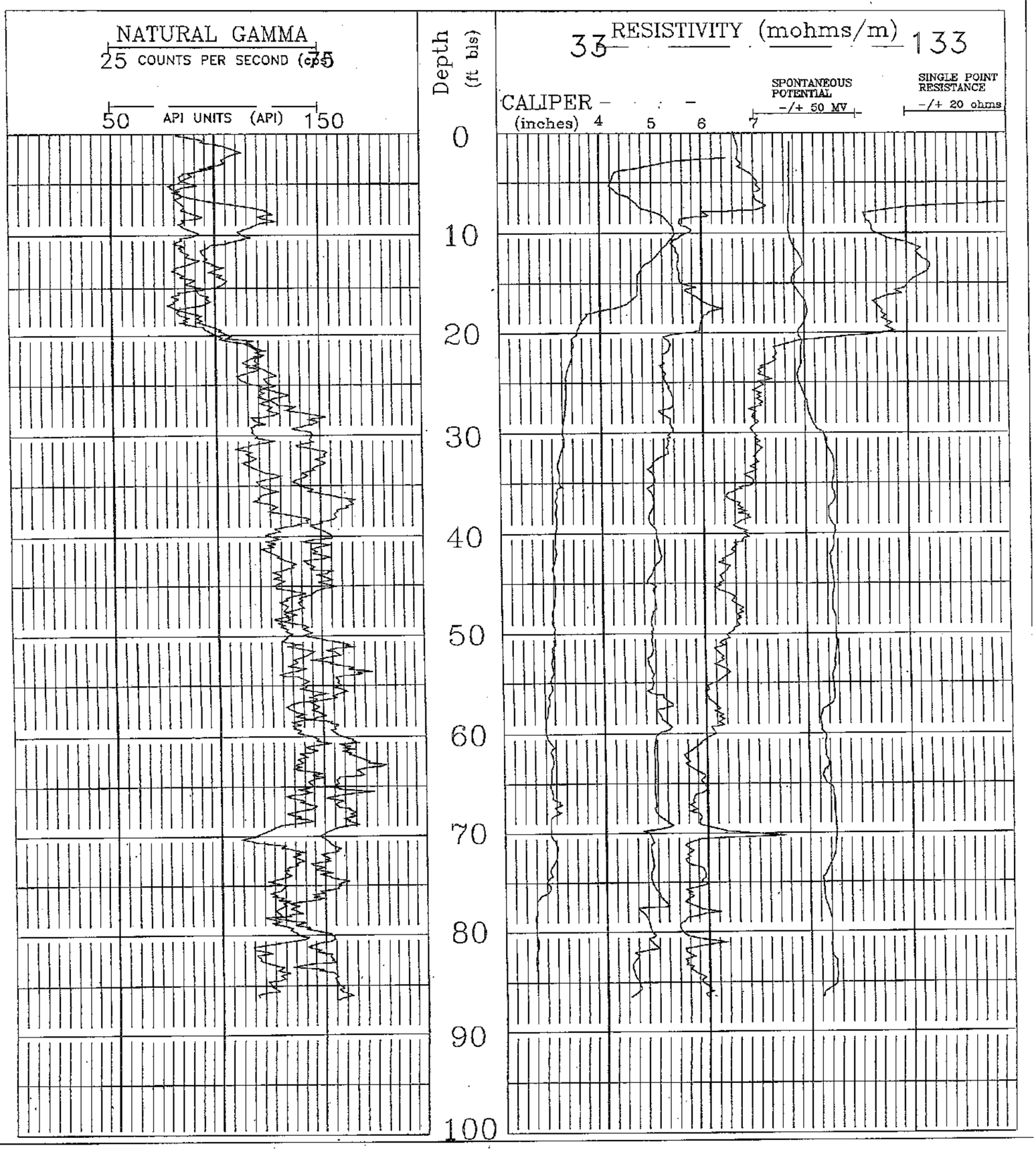
Resistivity OHM-M | LOG TIME

Density | Start Stop Minutes Total

Viscosity Temp. °F | Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:

Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-16

AREA: Dolet Hills Power Plant

PARISH: DeSoto | STATE: LOUISIANA

SECTION: | TOWNSHIP: | RANGE: | LOG MEASURED FROM: Grade

INITIAL RUN

T.D. LOGGED: 87 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT. | T.D. Drilled FT.

Driller: Charles Drilling | Bit Size: 4.25"

Type Fluid in Hole: Groundwater | Casing Size: Open Hole

Fluid Level FT. | Bottom Hole Temp. °F

Resistivity OHM-M

Density

Viscosity Temp. °F

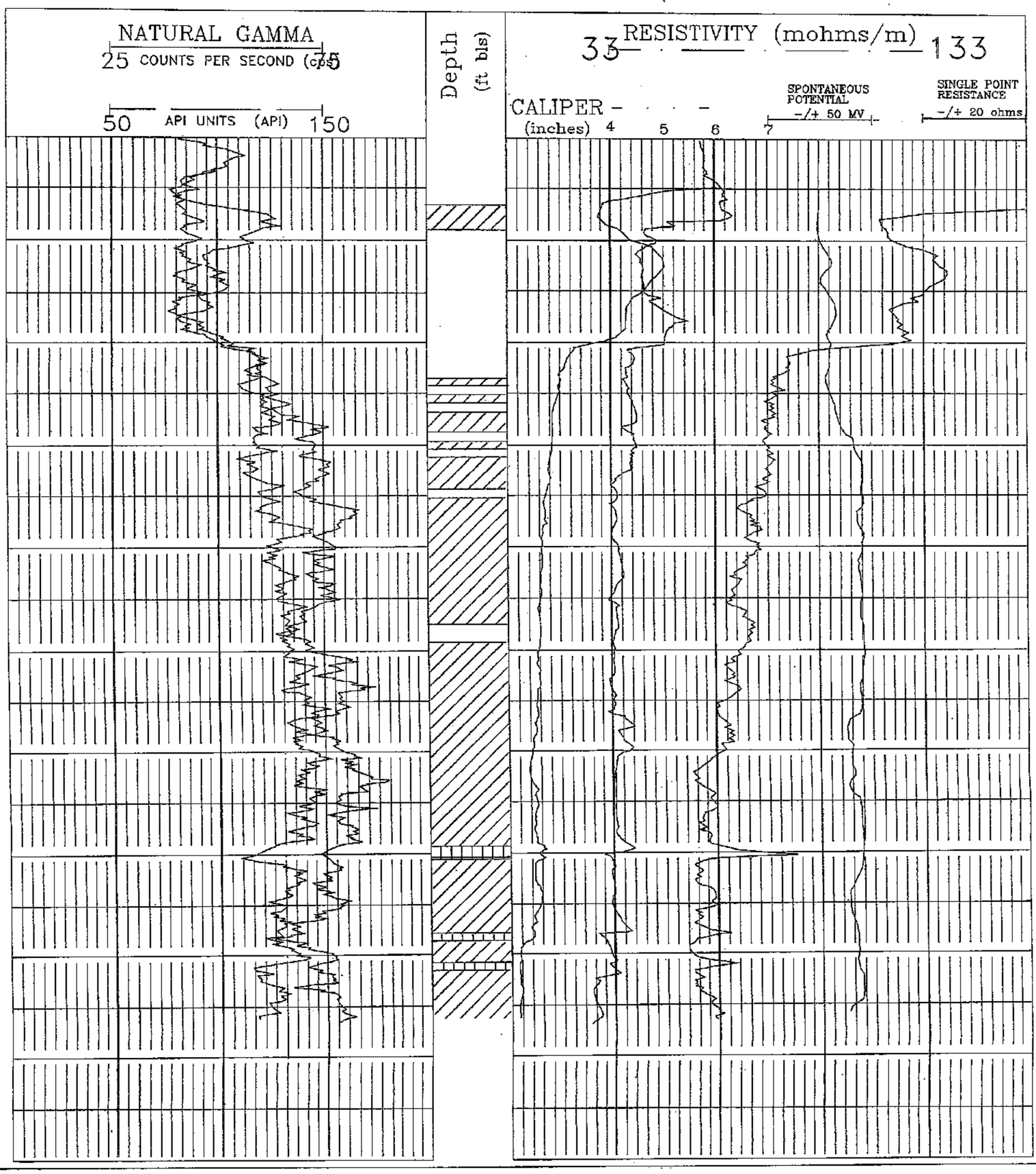
LOG TIME

	Start	Stop	Minutes Total

Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:

Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

COMPANY: Eagle Environmental

HOLE NO.: P-17

AREA: Dolet Hills Power Plant

PARISH: DeSoto STATE: LOUISIANA

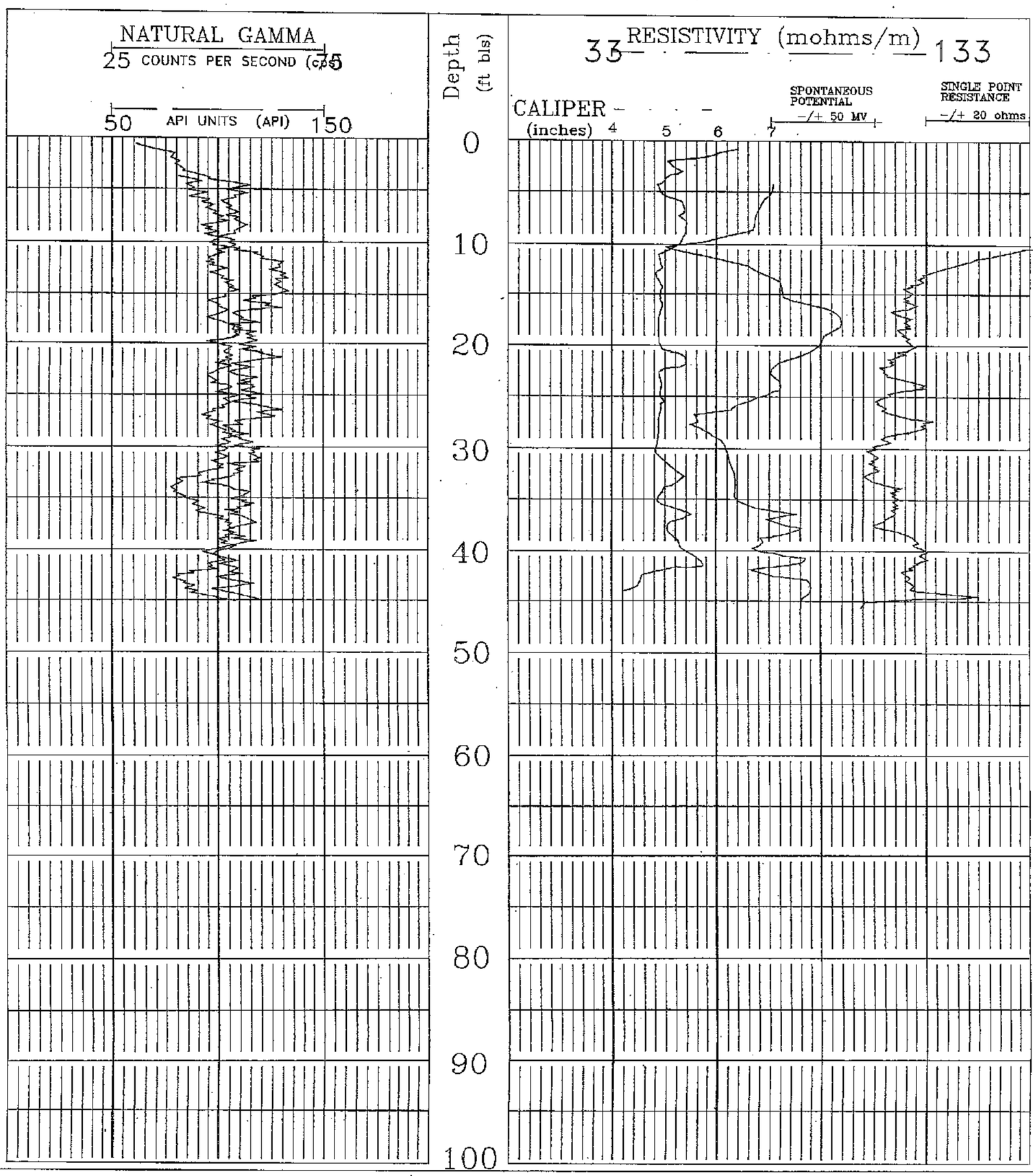
SECTION: TOWNSHIP: RANGE: LOG MEASURED FROM: Grade

INITIAL RUN	RERUNS
T.D. LOGGED: 45 FT.	T.D. LOGGED: 45 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT.	T.D. Drilled FT.
Driller Charles Drilling	Bit Size 4.25"
Type Fluid in Hole Groundwater	Casing Size Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start Stop Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE:

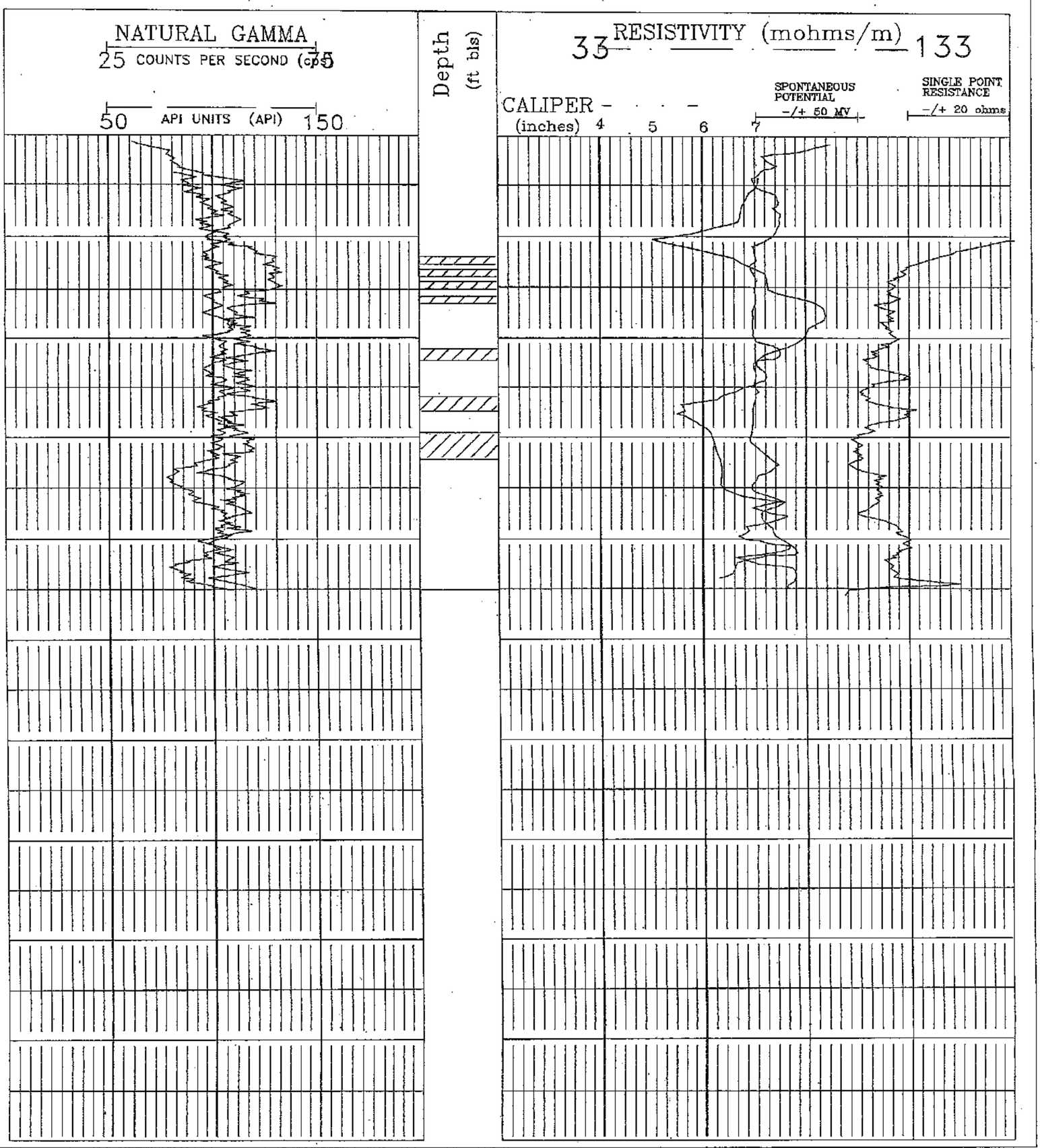
COMPANY: Eagle Environmental	
HOLE NO.: P-17	
AREA: Dolet Hills Power Plant	
PARISH: DeSoto	STATE: LOUISIANA
SECTION:	TOWNSHIP:
RANGE:	LOG MEASURED FROM: Grade

INITIAL RUN	RERUNS
T.D. LOGGED: 45 FT.	T.D. LOGGED: 45 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

WELL DATA

T.D. Logged FT.	T.D. Drilled FT.
Driller Charles Drilling	Bit Size 4.25"
Type Fluid in Hole Groundwater	Casing Size Open Hole
Fluid Level FT.	Bottom Hole Temp. °F
Resistivity OHM-M	LOG TIME
Density	Minutes: Start / Stop / Total
Viscosity Temp. °F	Witnessed By: Ray Sturdivant

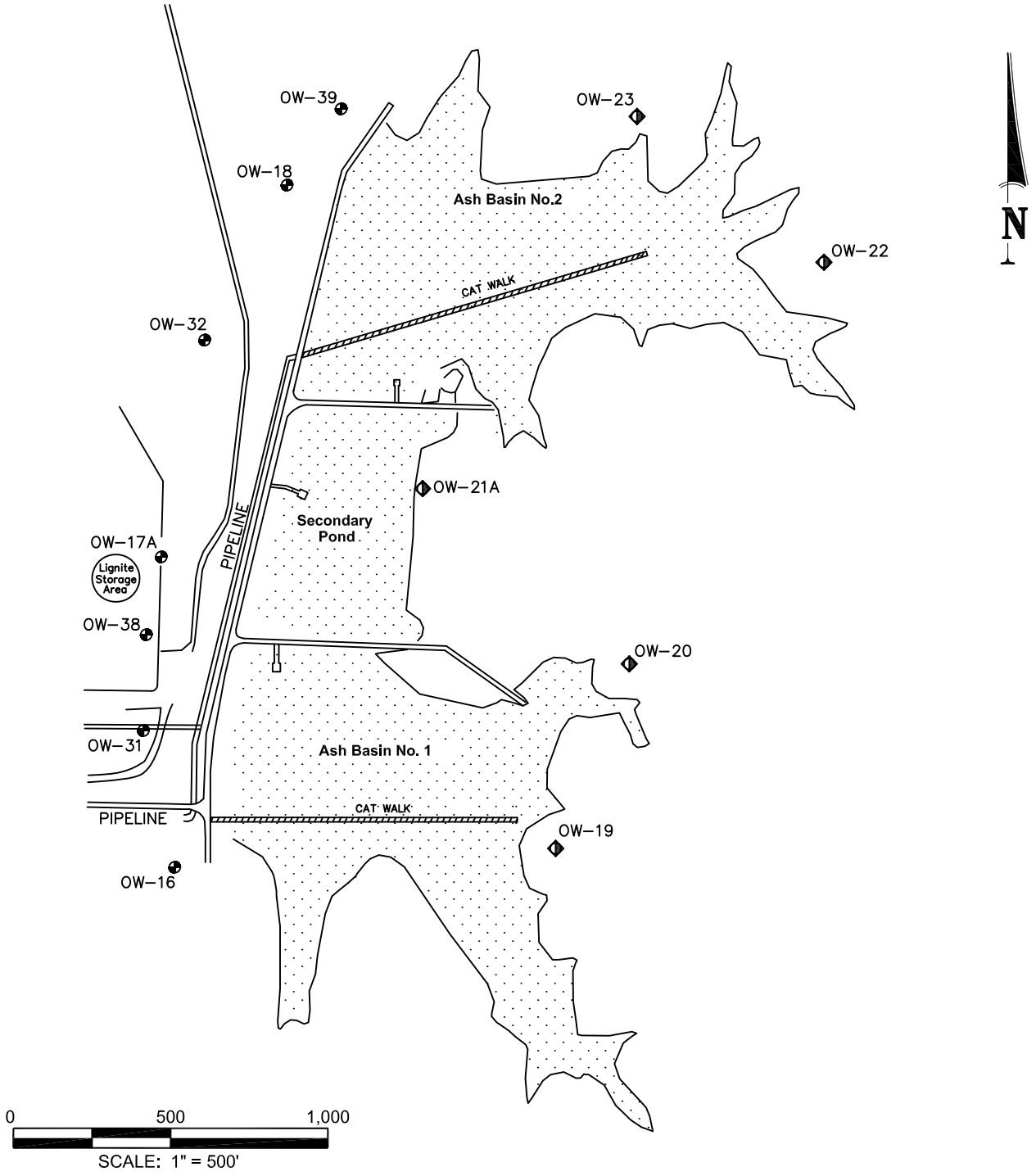
OTHER SERVICES / REMARKS:
Run 1 (gamma ray cps, sp, spr)
Run 2 (gamma ray api, 6" resistivty)
Run 3 (3 arm caliper)



APPENDIX D

ASH BASINS 1 AND 2

POTENTIOMETRIC SURFACE MAPS



Legend

- OW–16 — Zone 4 Compliance Monitoring Well Location
- OW–23 — Zone 4 Background Monitoring Well Location
- Permitted Facility

CLECO Corporation

Dolet Hills Power Station

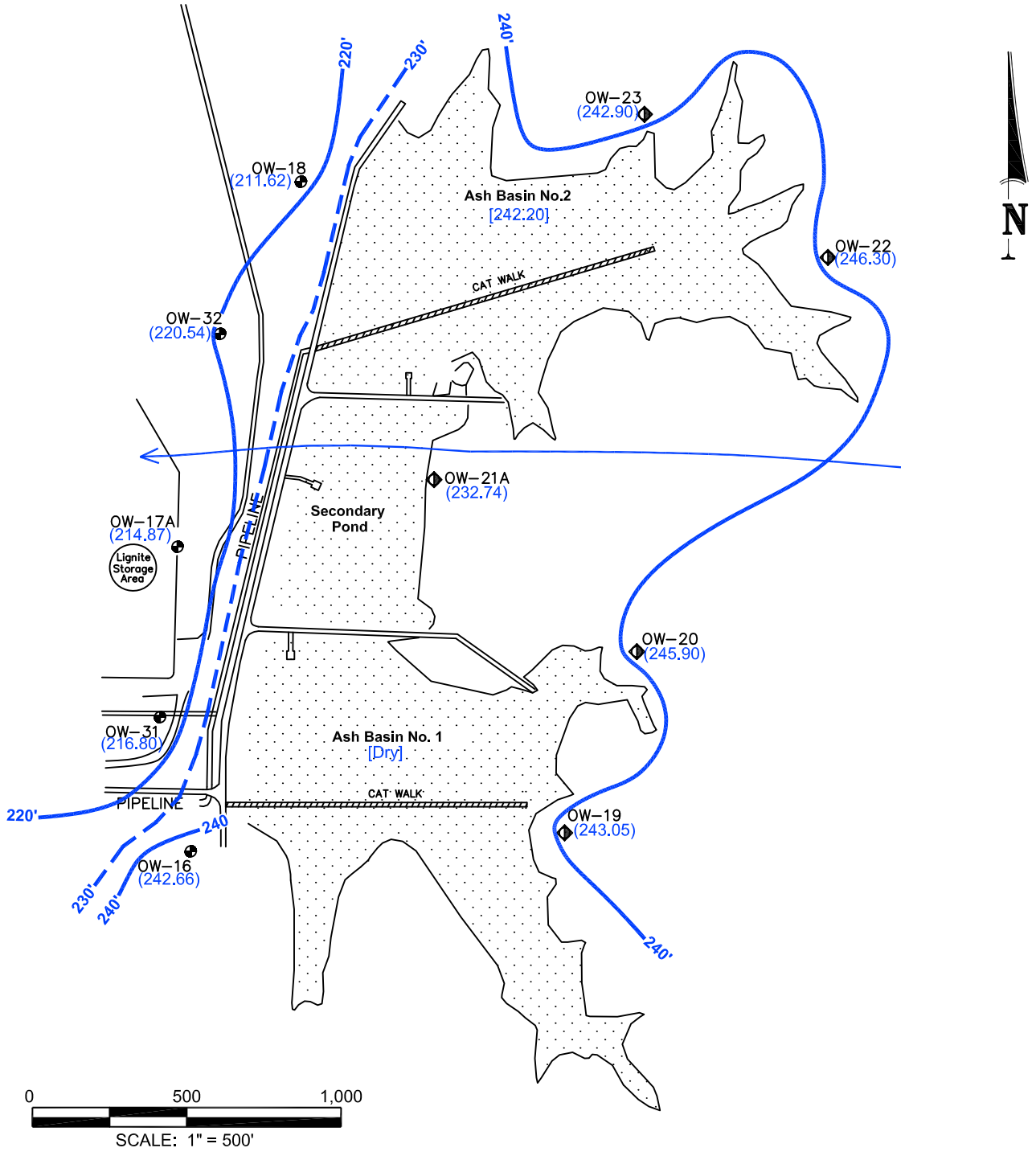
Zone 4 Monitoring Wells Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	10/4/16
Dwg. No.:	01-20-0221-APP-D-1

Figure D-1



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(242.66)	Potentiometric Surface Elevation (ft. NGVD)
[242.20]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

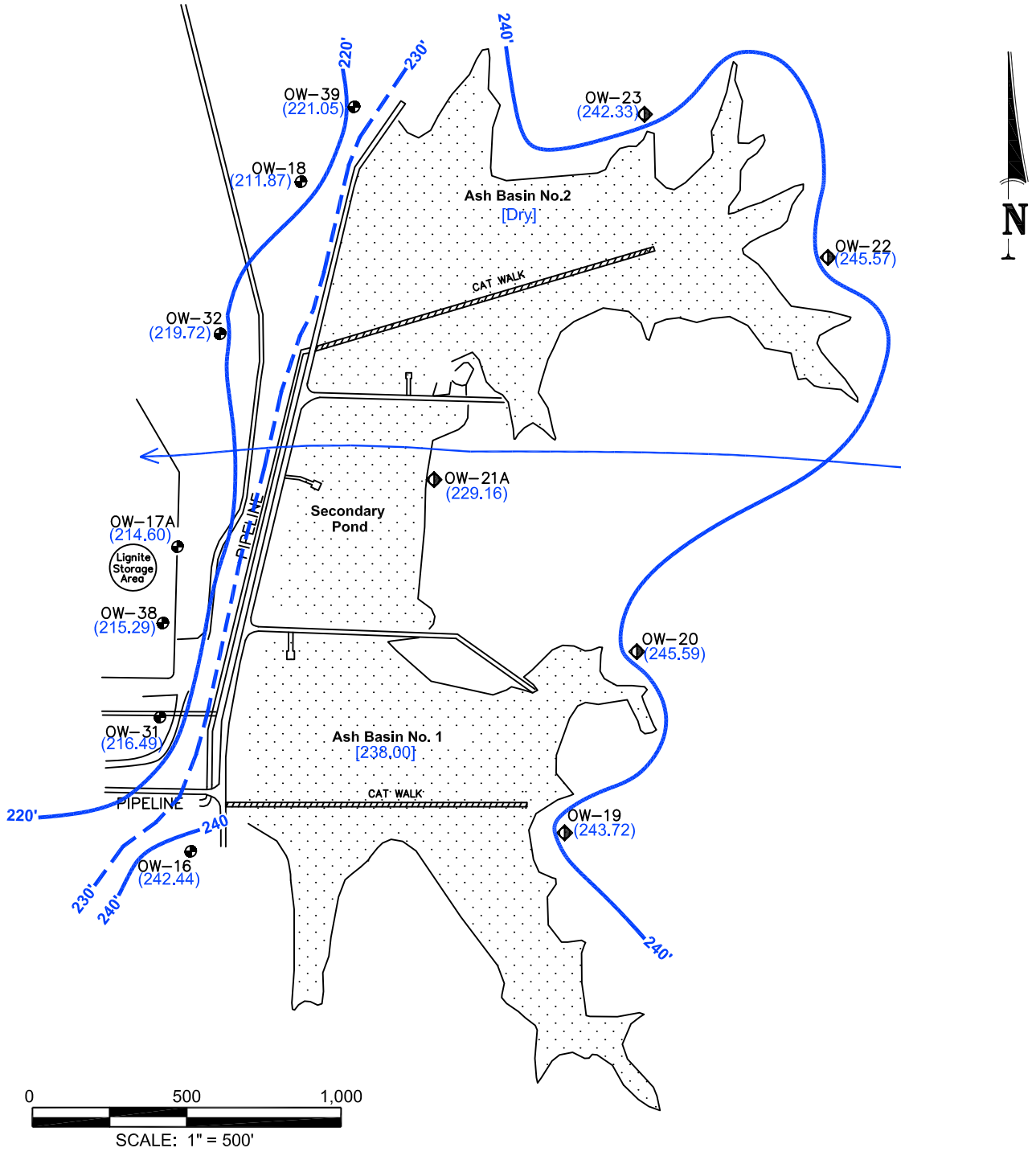
Potentiometric Surface Map
May 2016

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	10/11/16
Dwg. No.:	01-20-0221-APP-D-2

Figure D-2



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(242.44)	Potentiometric Surface Elevation (ft. NGVD)
[238.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

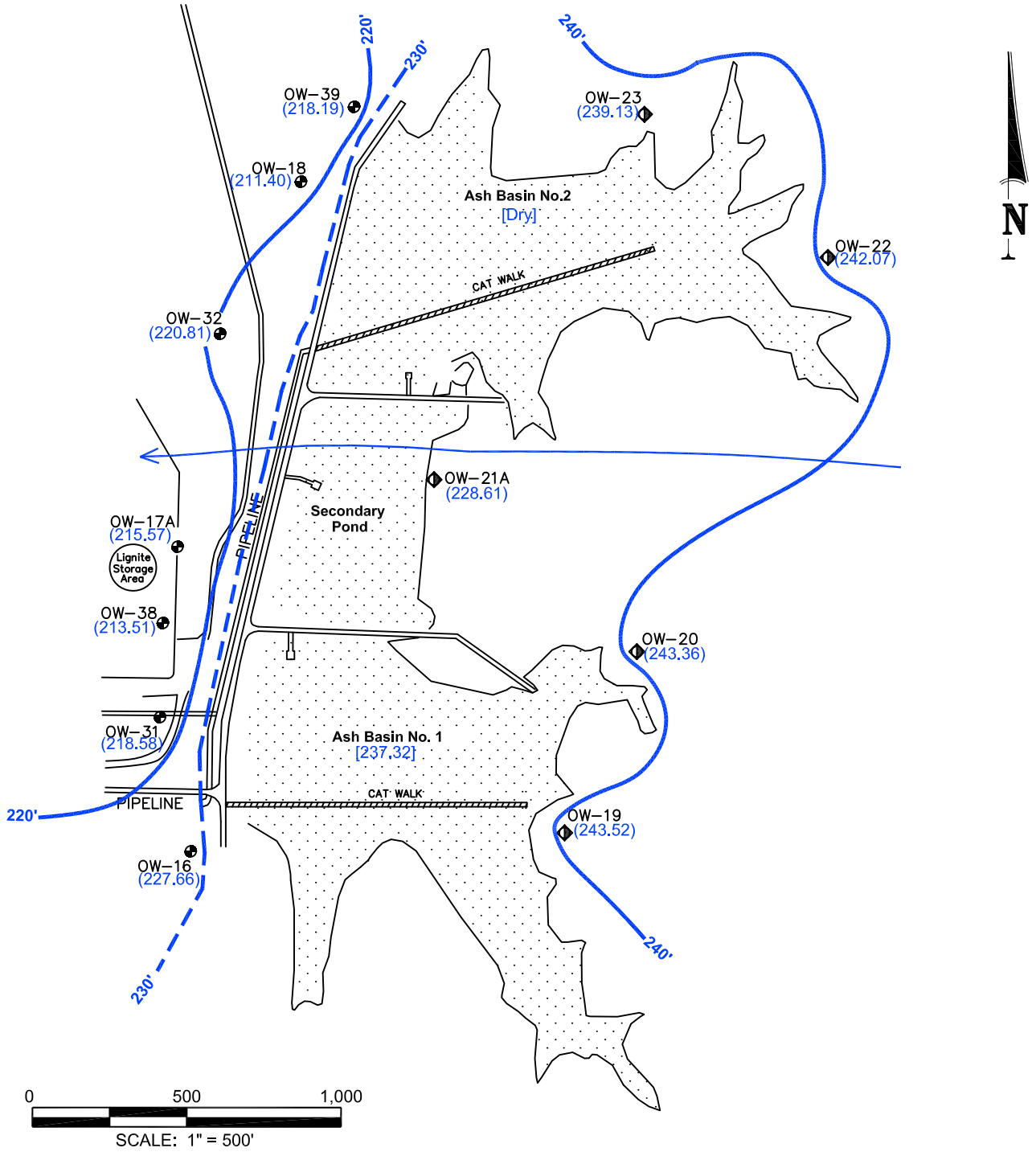
Potentiometric Surface Map
June 2016

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	10/11/16
Dwg. No.:	01-20-0221-APP-D-3

Figure D-3



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(227.66)	Potentiometric Surface Elevation (ft. NGVD)
[237.32]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

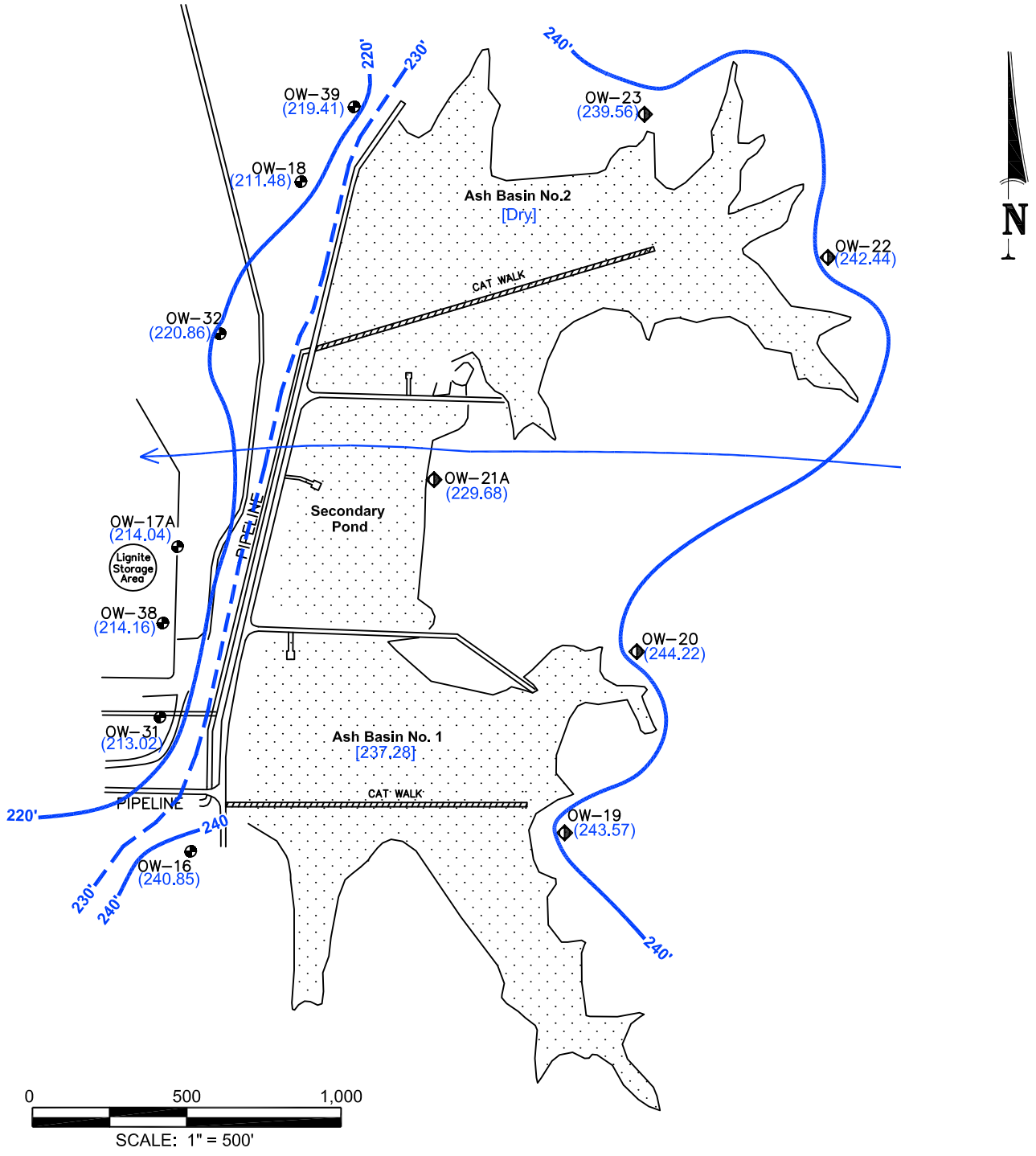
Potentiometric Surface Map
November 2016

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	1/13/17
Dwg. No.:	01-20-0221-APP-D-4

Figure D-4



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(240.85)	Potentiometric Surface Elevation (ft. NGVD)
[237.28]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

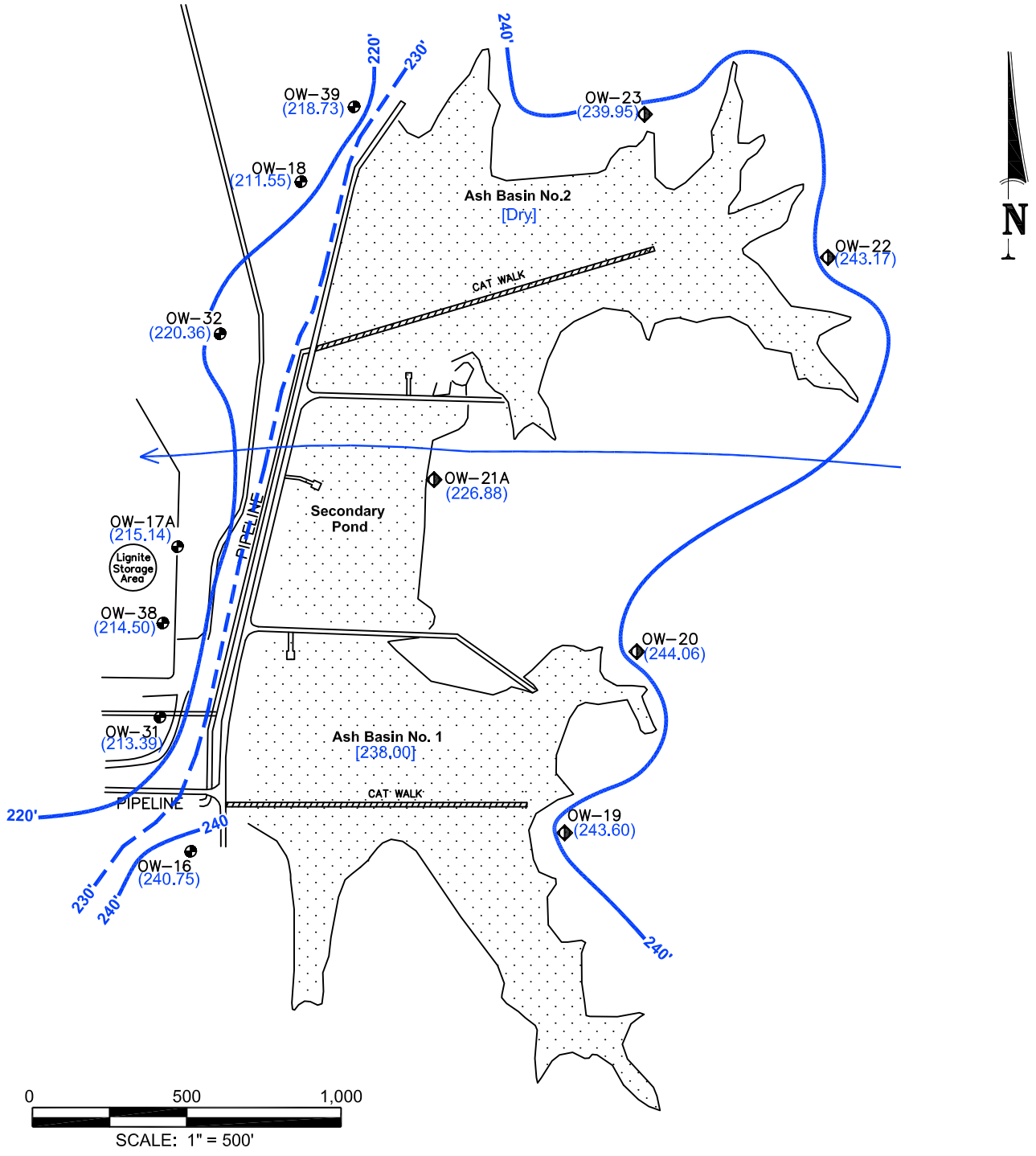
Potentiometric Surface Map December 2016

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	1/13/17
Dwg. No.:	01-20-0221-APP-D-5

Figure D-5



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(243.60)	Potentiometric Surface Elevation (ft. NGVD)
[238.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

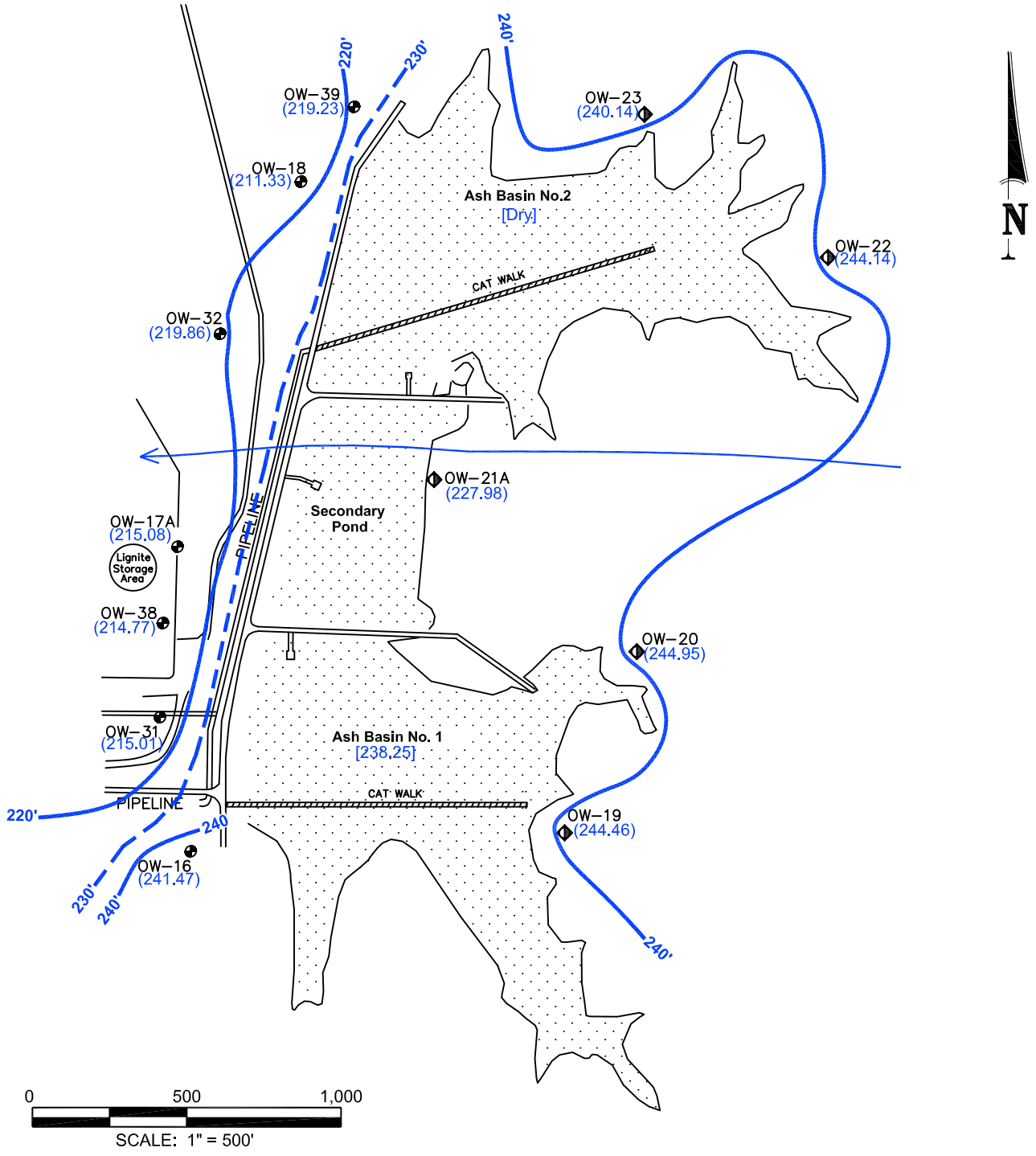
Potentiometric Surface Map
January 2017

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	3/3/17
Dwg. No.:	01-20-0221-APP-D-6

Figure D-6



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(244.46)	Potentiometric Surface Elevation (ft. NGVD)
[238.25]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

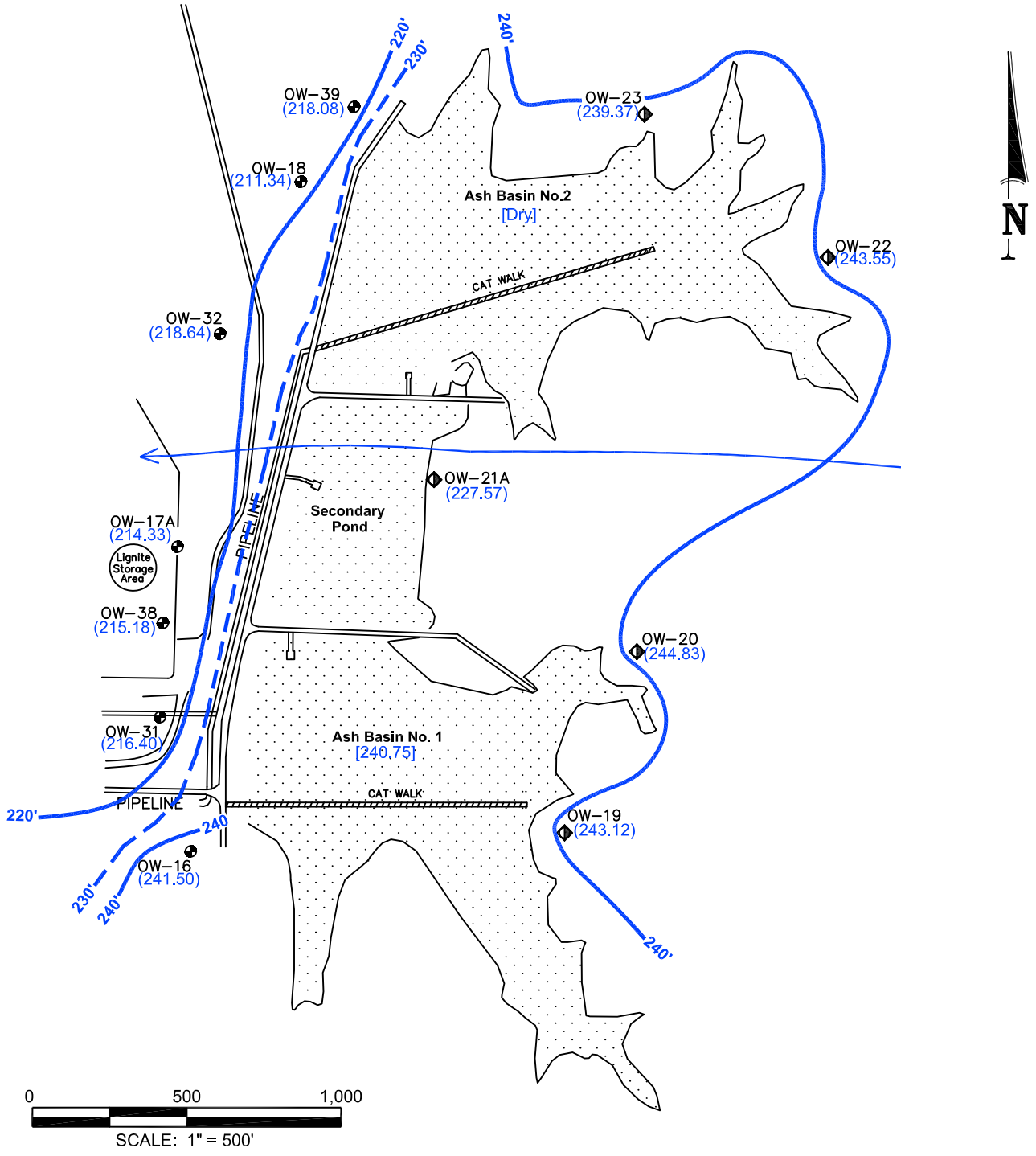
Potentiometric Surface Map
February 2017

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	3/3/17
Dwg. No.:	01-20-0221-APP-D-7

Figure D-7



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.50)	Potentiometric Surface Elevation (ft. NGVD)
[240.75]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

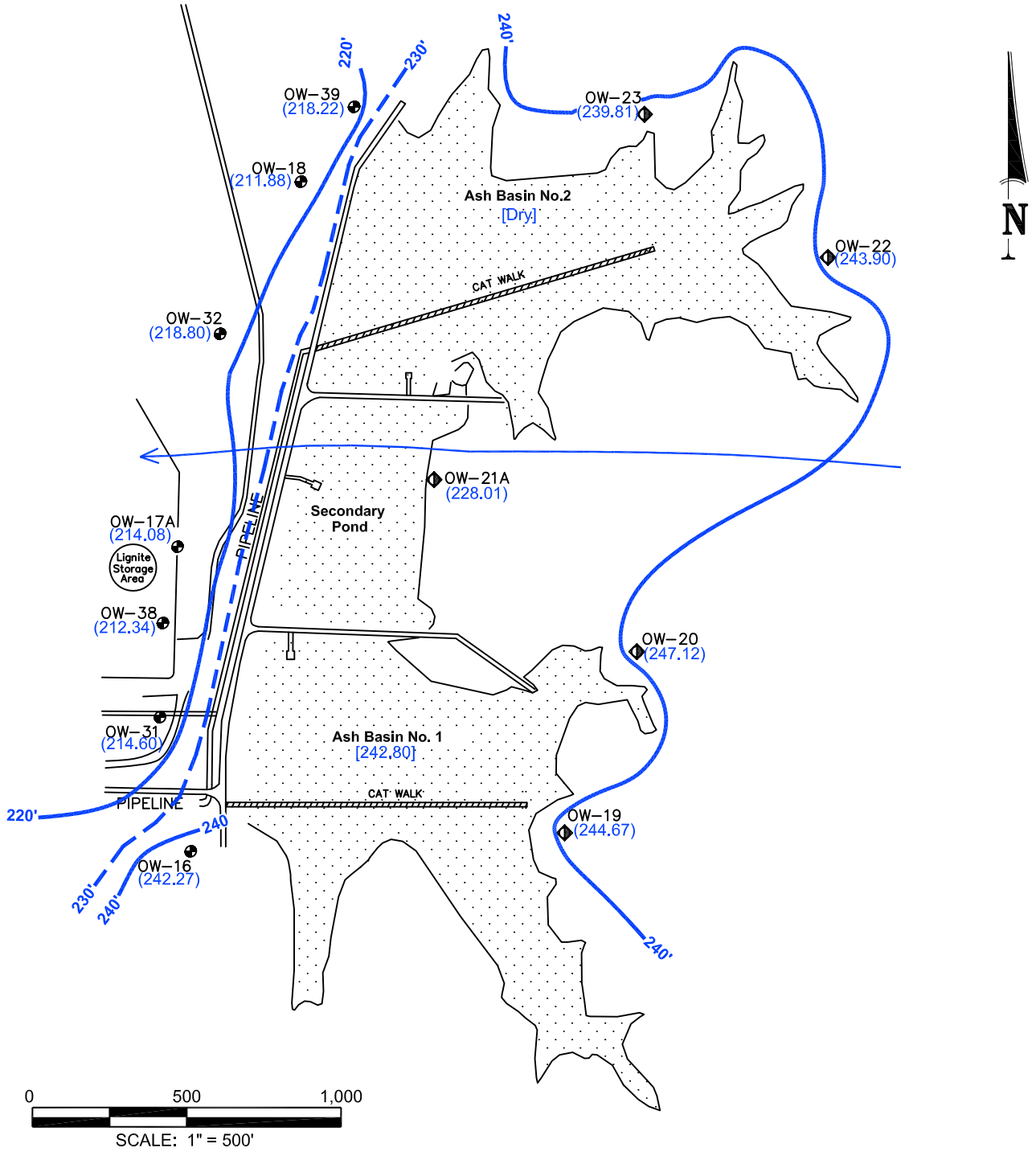
Potentiometric Surface Map
May 2017

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	6/22/17
Dwg. No.:	01-20-0221-APP-D-8

Figure D-8



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(242.27)	Potentiometric Surface Elevation (ft. NGVD)
[242.80]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

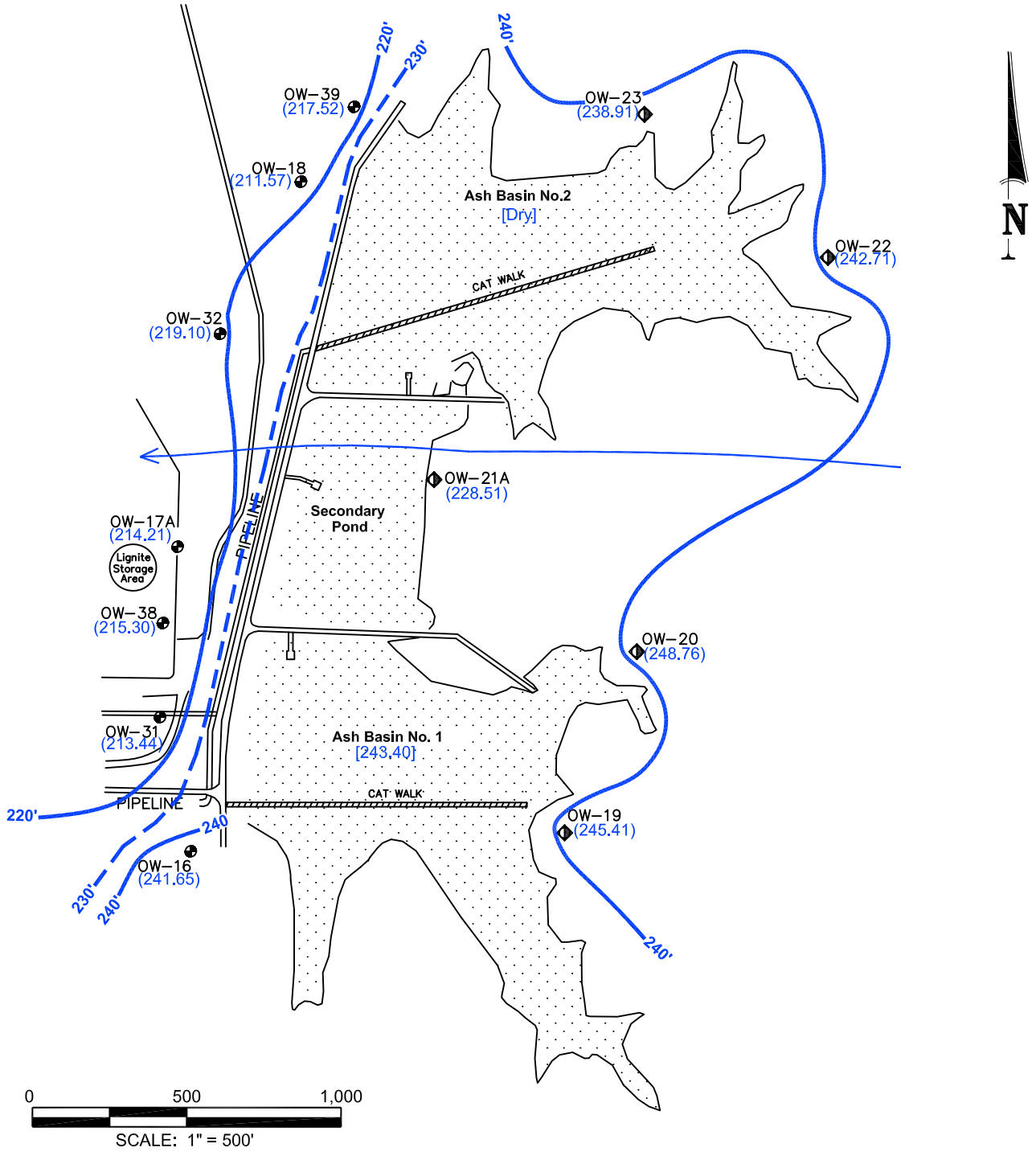
Potentiometric Surface Map
June 2017

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	8/1/17
Dwg. No.:	01-20-0221-APP-D-9

Figure D-9



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.65)	Potentiometric Surface Elevation (ft. NGVD)
[243.40]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

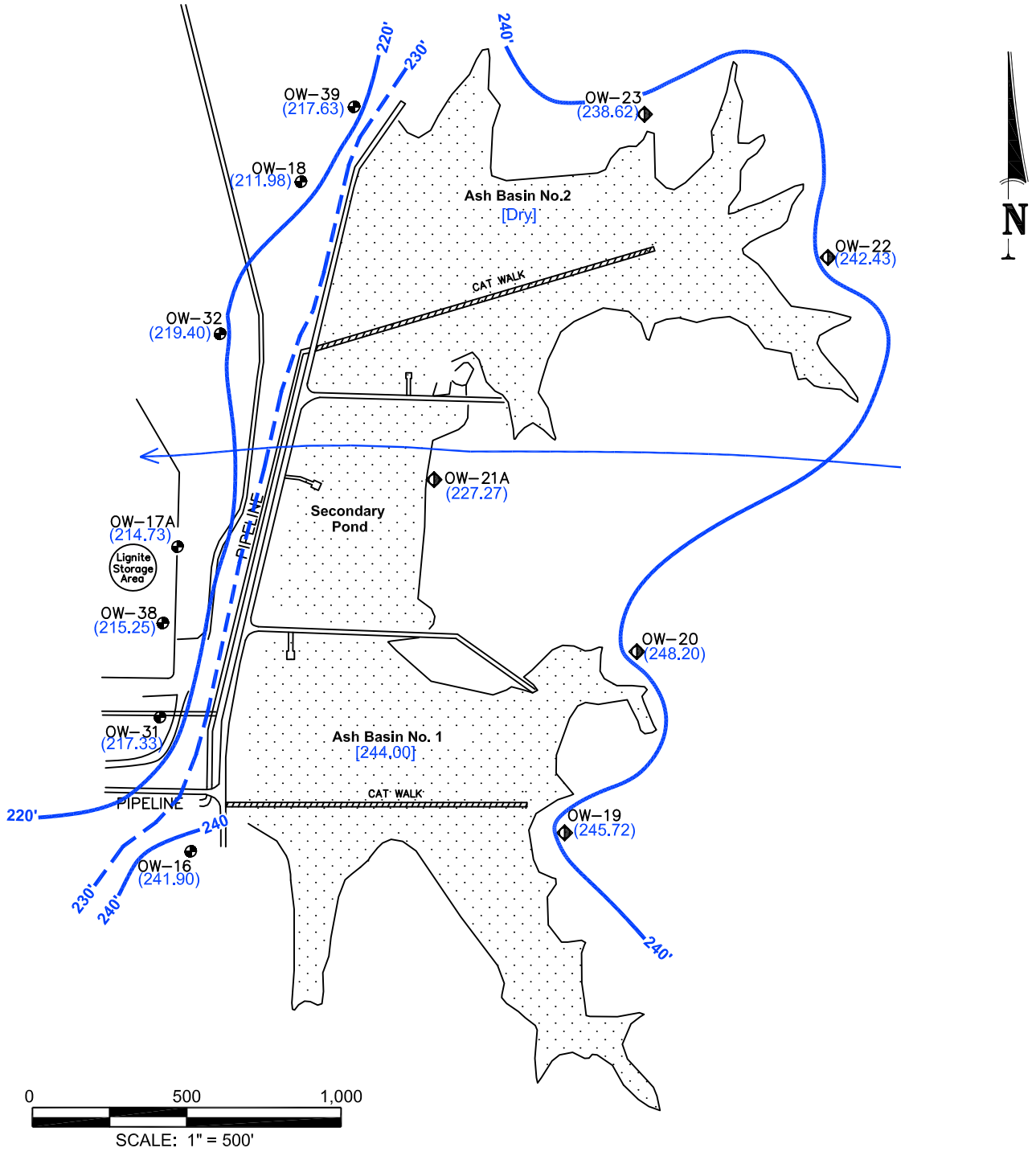
Potentiometric Surface Map
July 2017

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	8/10/17
Dwg. No.:	01-20-0221-APP-D-10

Figure D-10



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.90)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

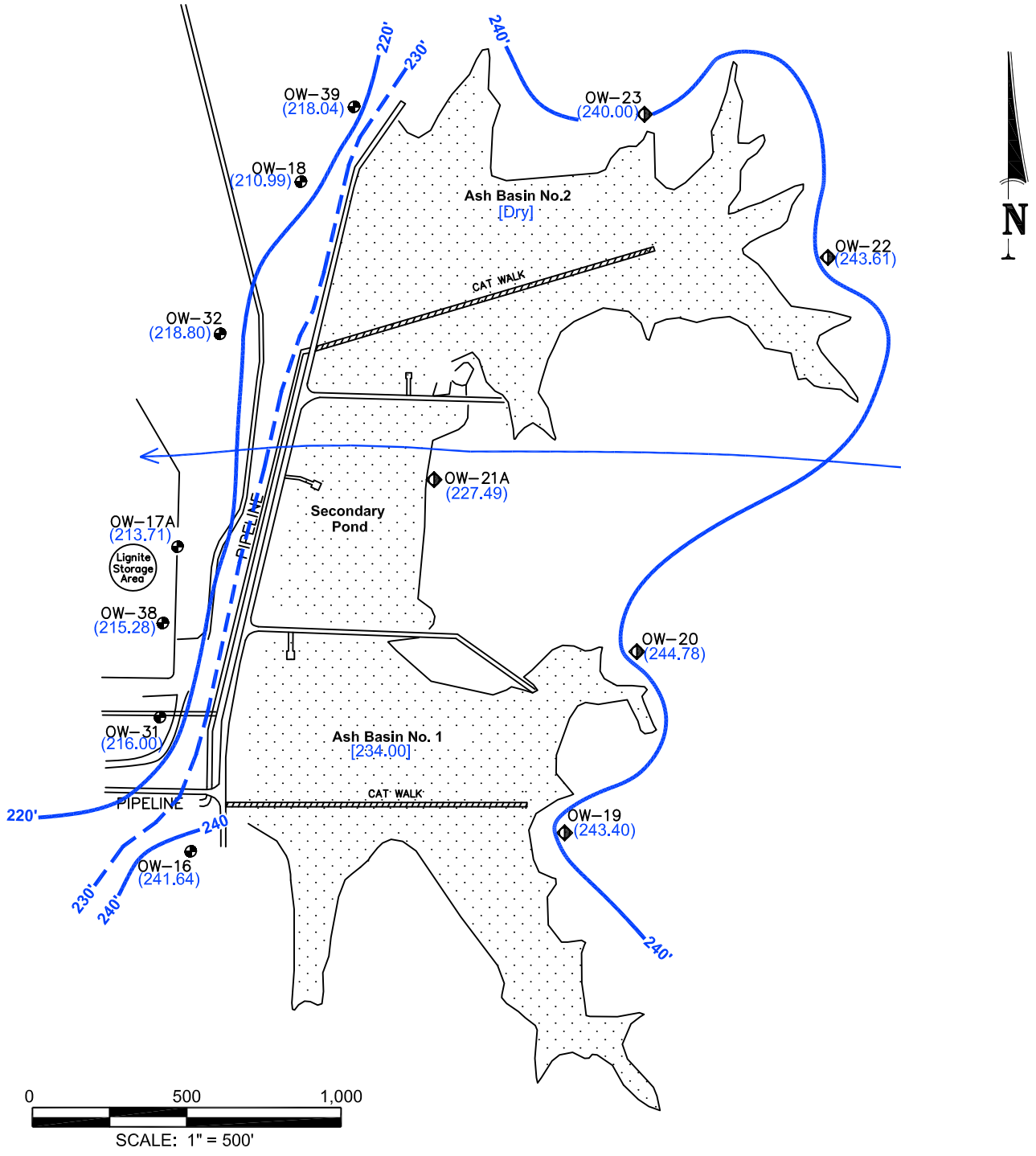
Potentiometric Surface Map
August 2017

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	9/12/17
Dwg. No.:	01-20-0221-APP-D-11

Figure D-11



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(244.78)	Potentiometric Surface Elevation (ft. NGVD)
[234.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

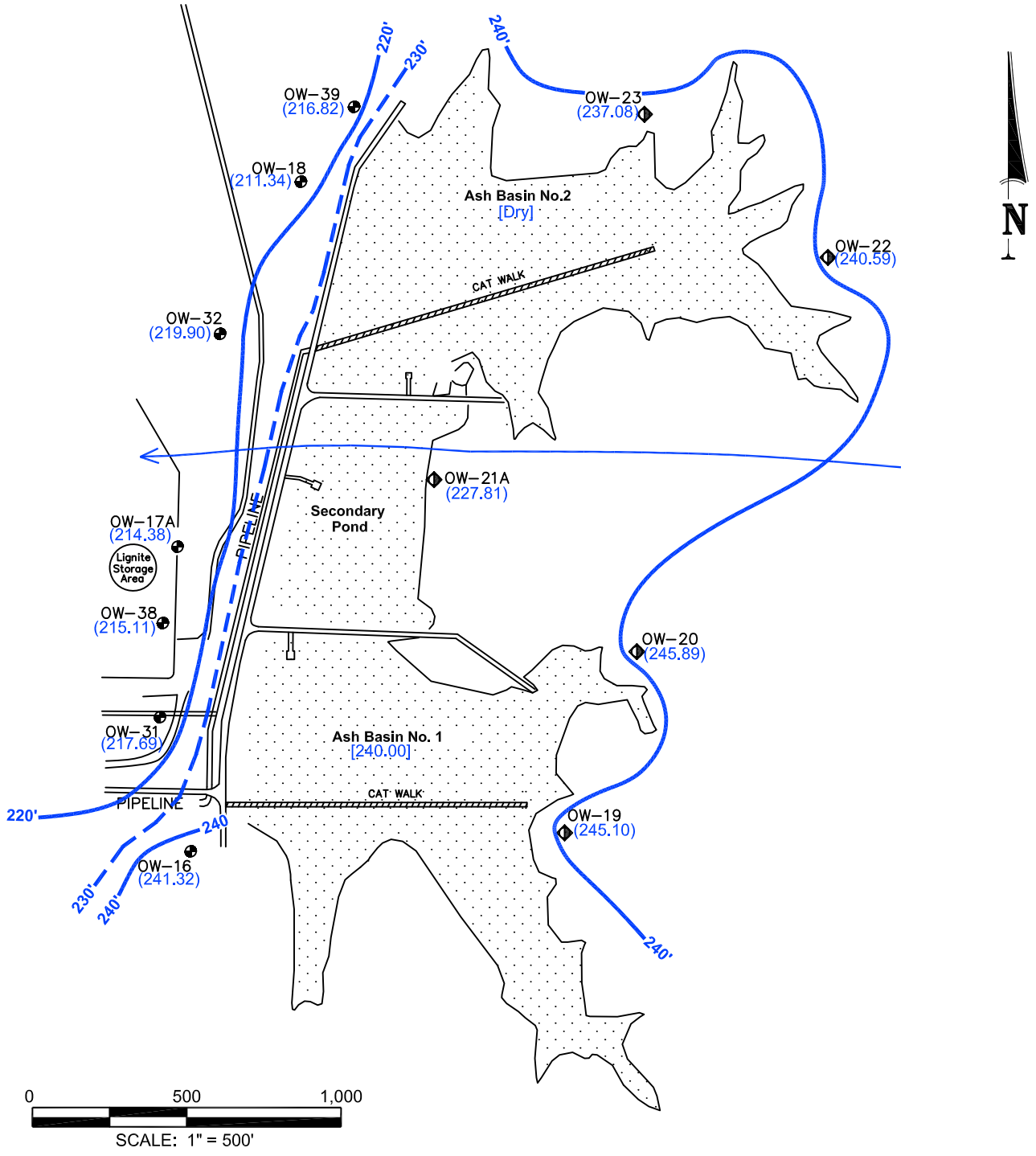
Potentiometric Surface Map
May 2018

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	6/4/18
Dwg. No.:	01-20-0221-APP-D-12

Figure D-12



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.32)	Potentiometric Surface Elevation (ft. NGVD)
[240.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

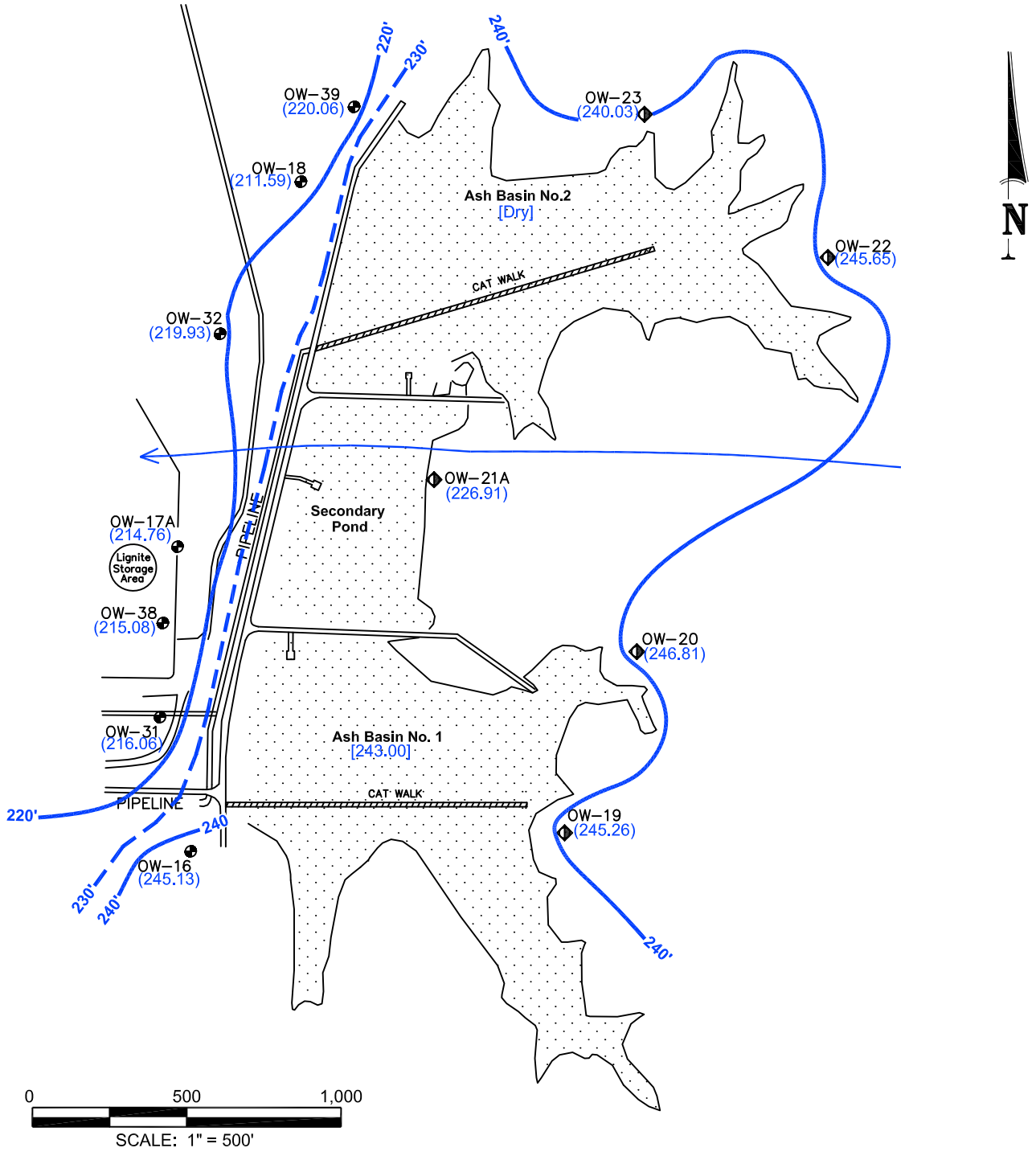
Potentiometric Surface Map
September 2018

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	11/12/18
Dwg. No.:	01-20-0221-APP-D-13

Figure D-13



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(245.26)	Potentiometric Surface Elevation (ft. NGVD)
[243.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

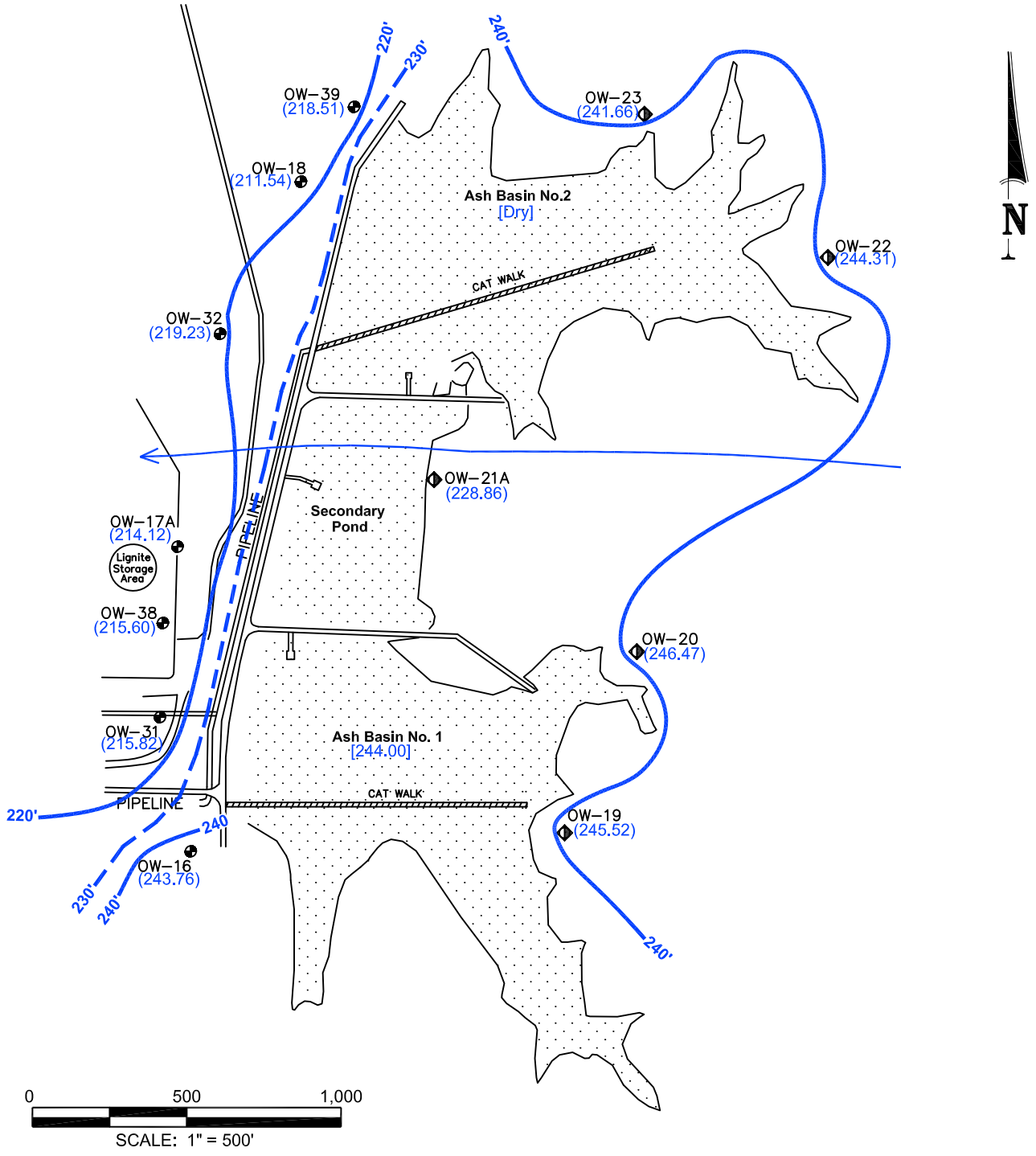
Potentiometric Surface Map
March 2019

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	4/23/19
Dwg. No.:	01-20-0221-APP-D-15

Figure D-15



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(243.76)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

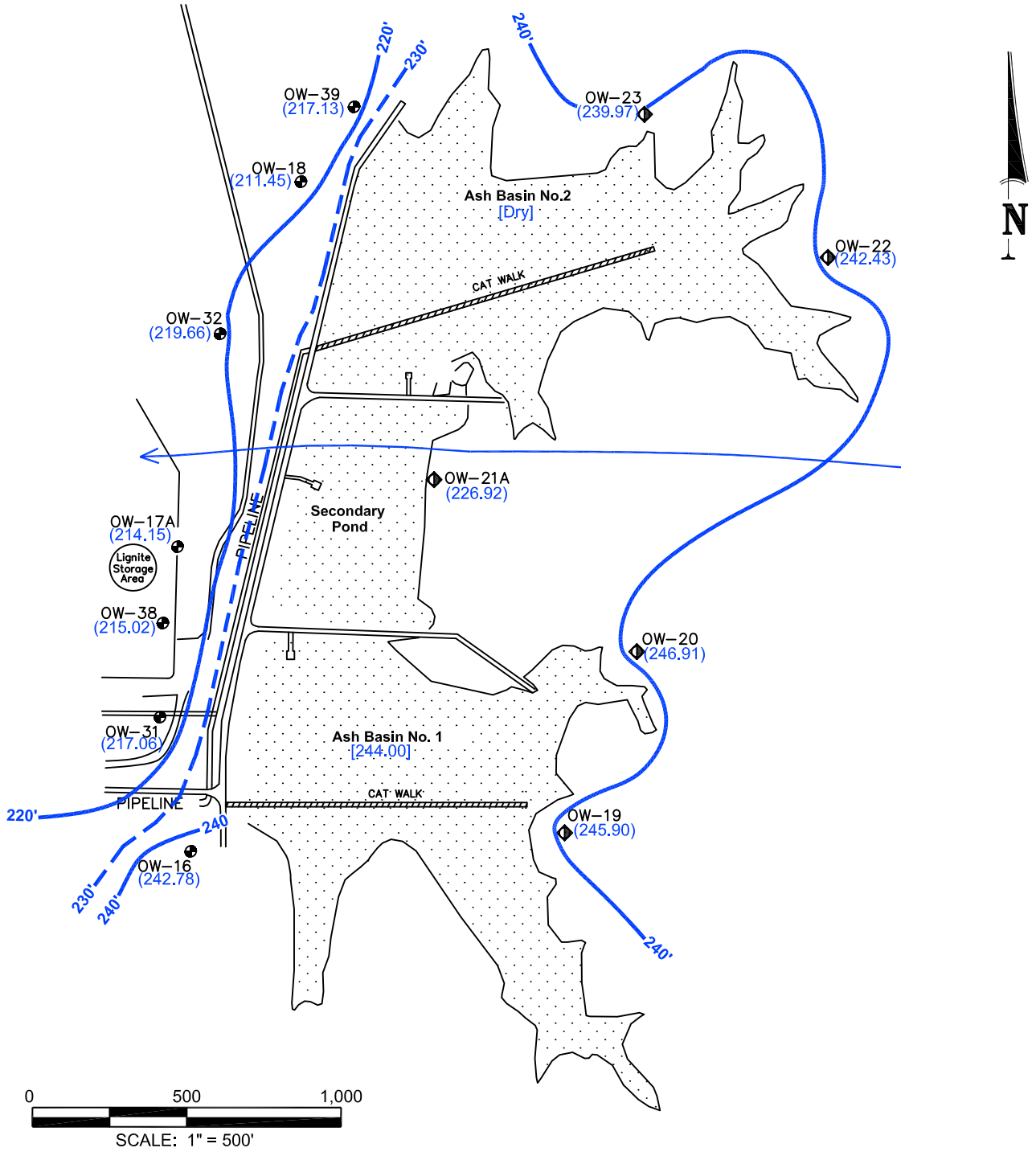
Potentiometric Surface Map
June 2019

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	6/26/19
Dwg. No.:	01-20-0221-APP-D-14

Figure D-14



Legend

OW-16	Zone 4 Compliance Monitoring Well Location
OW-23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(242.78)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

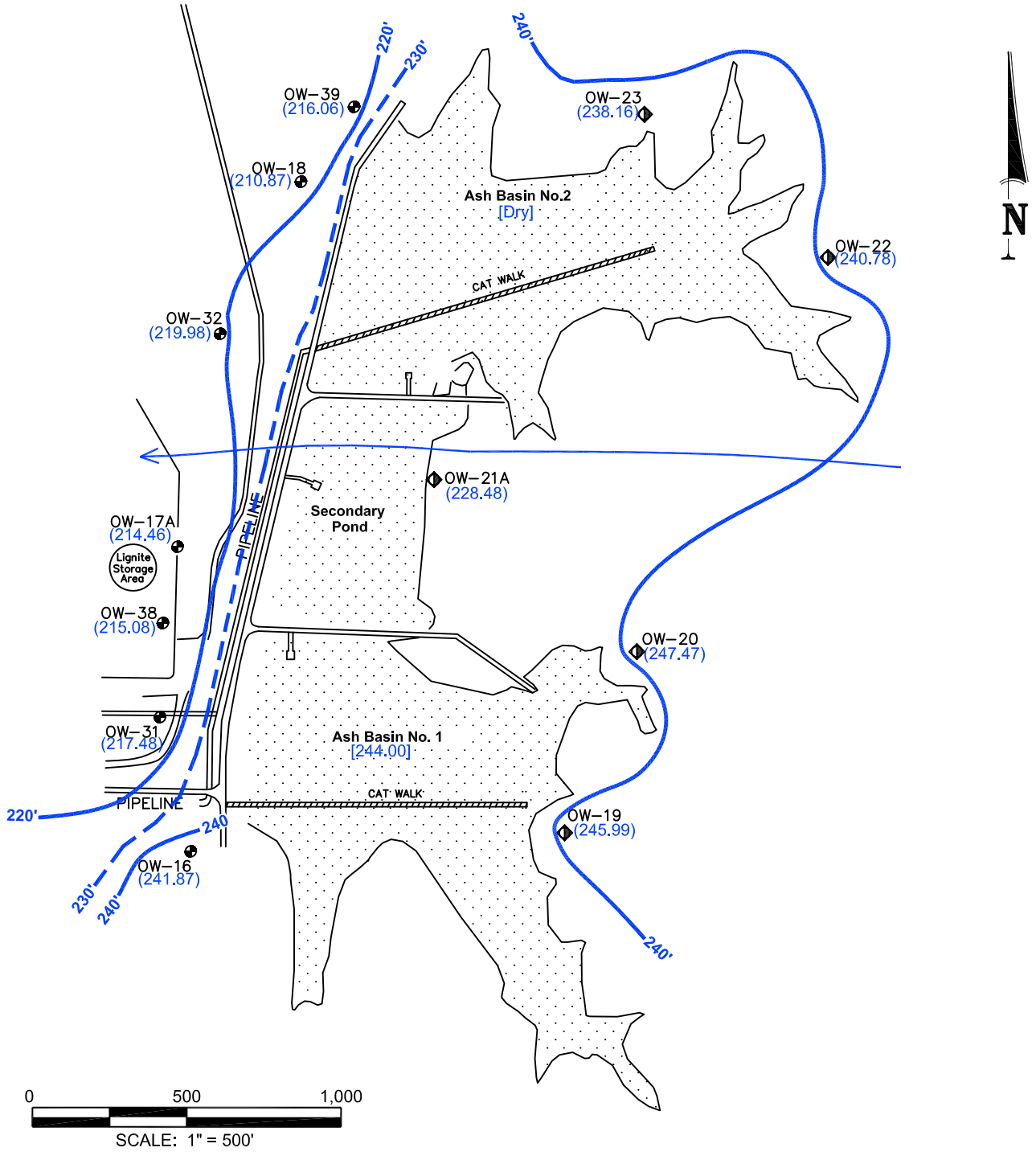
Potentiometric Surface Map
August 2019

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	9/23/19
Dwg. No.:	01-20-0221-APP-D-16

Figure D-16



Legend

OW–16	Zone 4 Compliance Monitoring Well Location
OW–23	Zone 4 Background Monitoring Well Location
	Permitted Facility
(241.87)	Potentiometric Surface Elevation (ft. NGVD)
[244.00]	Surface Water Elevation (ft. NGVD)
240'	Potentiometric Surface Elevation Contour Line (ft. NGVD)
	Inferred Groundwater Flow Direction

CLECO Corporation

Dolet Hills Power Station

Potentiometric Surface Map
October 2019

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	11/19/19
Dwg. No.:	01-20-0221-APP-D-17

Figure D-17

APPENDIX E

ASH BASINS 1 AND 2

GROUNDWATER QUALITY DATA

Table 2
May 2016 Analytical Summary

Parameter/Well/ Date	MCL	OW-16	OW-17A	OW-18	OW-19 (BG)	OW-20 (BG)	OW-21A (BG)	OW-22 (BG)	OW-23 (BG)	OW-31	OW-32
		5/4/16	5/4/16	5/4/16	5/5/16	5/5/16	5/5/16	5/4/16	5/4/16	5/4/16	5/4/16
Detection Monitoring Parameters											
Boron (mg/l)	NA	1.1	1.9	0.18	0.58	0.27	0.41	0.16	1.4	2.9	1.8
Calcium (mg/l)	NA	471	66.4	10.2	32.3	152	444	139	272	90.2	548
Chloride (mg/l)	NA	252	896	31.4	301	164	614	163	437	1,340	434
Fluoride (mg/l)	4	<0.5	0.21	0.5	<0.5	0.16	0.18	0.14	0.25	<0.5	1.4
pH (S.U.)	NA	6.82	7.48	7.3	7.33	6.84	6.68	7.47	7.16	7.29	6.69
Sulfate (mg/l)	NA	2,150	27.1	1.6	141	691	1,050	298	1,800	4	4,130
TDS (mg/l)	NA	4,340	1,980	260	985	1,240	3,380	1,090	3,900	2,560	7,090
Assessment Monitoring Parameters											
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.002	0.0015	0.0044	0.0015	<0.001	<0.001	<0.001	<0.001	0.0075	<0.001
Barium (mg/l)	2	0.035	0.43	0.13	0.23	0.029	0.028	0.05	0.018	0.95	0.014
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001	0.013
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.33	0.14	0.043	0.18	0.081	0.39	0.11	0.41	0.14	1.1
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.546	0.885	0.557	0.331	0.139	0.793	0.209	-0.139	1.53	0
Radium-228 (pCi/l)	5	1.12	1.14	0.0717	1.41	0.98	0.861	0.31	0.412	3.62	2.4

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 3
June 2016 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 6/22/16	OW-17A 6/22/16	OW-18 6/22/16	OW-19 (BG) 6/22/16	OW-20 (BG) 6/22/16	OW-21A (BG) 6/22/16	OW-22 (BG) 6/22/16	OW-23 (BG) 6/22/16	OW-31 6/22/16	OW-32 6/22/16	OW-38 6/22/16	OW-39 6/22/16
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.3	2.1	0.22	0.5	0.27	0.45	0.17	1.5	3.2	2.3	1.4	0.58
Calcium (mg/l)	NA	573	87.2	10.2	28.2	179	426	161	286	111	672	12.4	303
Chloride (mg/l)	NA	252	724	33.7	215	152	672	158	419	1,250	446	95.1	808
Fluoride (mg/l)	4	0.22	0.22	0.37	0.2	0.12	0.13	0.17	0.27	0.1	<0.1	0.49	<0.1
pH (S.U.)	NA	7.72	8.38	7.5	8.1	6.96	7.97	8.2	7.5	8.66	7.54	8.48	7.56
Sulfate (mg/l)	NA	2,160	24.7	5	124	587	954	268	1,530	<1	3,770	34.9	1,960
TDS (mg/l)	NA	4,460	1,980	285	920	1,470	3,640	1,200	3,800	2,720	7,160	540	5,420
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	0.0018	0.001	<0.001	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0021	0.0032	0.0078	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	<0.001	0.0057	0.0075
Barium (mg/l)	2	0.039	0.53	0.31	0.19	0.04	0.027	0.058	0.023	1	0.016	0.079	0.21
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0015	<0.003	<0.003
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.004	<0.004
Chromium (mg/l)	0.1	0.0013	0.0055	0.016	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0043	0.024
Cobalt (mg/l)	NA	0.0019	0.004	0.0096	<0.001	0.0022	0.0019	<0.001	<0.001	<0.001	0.0048	0.0013	0.02
Lead (mg/l)	0.015	<0.001	0.0078	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.012	0.015
Lithium (mg/l)	NA	0.38	0.16	0.054	0.17	0.083	0.39	0.1	0.44	0.15	0.92	0.026	0.27
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.012	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.466	0.85	1.01	0.532	0.0596	0.276	0	0.222	2.06	0.962	0.219	2
Radium-228 (pCi/l)	5	1.6	1.36	2.39	0.637	0.623	1.02	0.662	1.58	2.76	1.82	0.42	3.03

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 4
November 2016 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 11/17/16	OW-17A 11/17/16	OW-18 11/17/16	OW-19 (BG) 11/17/16	OW-20 (BG) 11/17/16	OW-21A (BG) 11/17/16	OW-22 (BG) 11/17/16	OW-23 (BG) 11/17/16	OW-31 11/17/16	OW-32 11/17/16	OW-38 11/17/16	OW-39 11/17/16
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	2	0.14	0.41	0.23	0.41	0.19	1.4	2.9	1.8	1.9	0.8
Calcium (mg/l)	NA	494	73.6	8.9	20.9	91.5	362	138	251	84.2	514	17.3	380
Chloride (mg/l)	NA	262	922	35.9	192	123	753	159	538	1,380	523	175	1,340
Fluoride (mg/l)	4	1.3	0.26	0.25	0.23	0.22	0.76	0.11	0.29	0.24	1.6	0.2	0.55
pH (S.U.)	NA	6.76	7.27	7	7.11	6.19	6.7	7.36	7.24	7.36	6.82	7.81	6.75
Sulfate (mg/l)	NA	2,350	38.4	2.7	106	440	969	352	1,760	9	4,230	3.4	2,810
TDS (mg/l)	NA	1,880	270	275	850	1,030	3,520	1,200	4,100	2,820	6,780	1,940	6,580
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0018	0.0015	0.0061	<0.001	<0.001	<0.001	<0.001	<0.001	0.0052	<0.001	0.0067	0.0067
Barium (mg/l)	2	0.034	0.49	0.31	0.14	0.058	0.026	0.047	0.018	0.95	0.014	0.12	0.062
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	0.005
Cobalt (mg/l)	NA	0.0012	<0.001	0.0025	<0.001	0.001	0.0019	<0.001	<0.001	<0.001	0.012	<0.001	0.01
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0028
Lithium (mg/l)	NA	0.32	0.15	0.042	0.14	0.077	0.35	0.1	0.39	0.14	0.81	0.048	0.29
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0078	0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.238	1.75	1.17	0.403	0.285	-0.087	0.382	0.389	1.52	0.3	0.44	0.807
Radium-228 (pCi/l)	5	0.829	1.1	1.08	0.433	0.351	0.812	-0.117	0.431	2.95	1.37	-0.000359	2.61

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 5
December 2016 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 12/6/16	OW-17A 12/6/16	OW-18 12/6/16	OW-19 (BG) 12/6/16	OW-20 (BG) 12/6/16	OW-21A (BG) 12/6/16	OW-22 (BG) 12/6/16	OW-23 (BG) 12/6/16	OW-31 12/6/16	OW-32 12/6/16	OW-38 12/6/16	OW-39 12/6/16
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	1.9	0.13	0.37	0.25	0.38	0.12	1.3	3	1.7	1.3	0.65
Calcium (mg/l)	NA	501	69.2	8.2	19.5	115	336	120	223	84.2	478	15.5	318
Chloride (mg/l)	NA	269	756	34.1	174	134	748	176	470	1,340	501	124	1,020
Fluoride (mg/l)	4	0.34	0.19	0.27	0.23	0.21	0.74	0.16	0.37	0.21	1.7	0.53	0.48
pH (S.U.)	NA	5.68	6.16	6.01	7.11	6.64	6.83	6.6	5.92	6.74	5.69	6.91	6.24
Sulfate (mg/l)	NA	2,420	38.3	3.5	99.9	506	821	234	1,660	7.9	3,900	48.4	2,580
TDS (mg/l)	NA	4,980	2,070	325	820	1,160	3,540	1,100	3,990	2,700	7,000	765	6,430
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0013	0.0015	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0045	<0.001	0.005	0.004
Barium (mg/l)	2	0.032	0.47	0.068	0.15	0.035	0.023	0.048	0.017	0.93	0.017	0.091	0.053
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (mg/l)	NA	0.0015	<0.001	<0.001	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	0.0077	<0.001	0.0048
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.32	0.14	0.041	0.14	0.073	0.34	0.086	0.36	0.13	0.74	0.028	0.26
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0038	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.34	1.01	0.139	0.297	0	1.02	0.239	0.596	1.02	0.198	0.449	0.532
Radium-228 (pCi/l)	5	0.562	1.29	0.533	0.817	0.00524	0.517	-0.0807	0.644	2.62	3.36	-0.402	1.06

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 6
January 2017 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 1/4/17	OW-17A 1/4/17	OW-18 1/4/17	OW-19 (BG) 1/4/17	OW-20 (BG) 1/4/17	OW-21A (BG) 1/4/17	OW-22 (BG) 1/4/17	OW-23 (BG) 1/4/17	OW-31 1/4/17	OW-32 1/4/17	OW-38 1/4/17	OW-39 1/4/17
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	1.9	0.22	0.39	0.24	0.36	0.15	1.3	2.7	1.8	1.4	0.67
Calcium (mg/l)	NA	531	75	10.3	21.9	91	364	142	269	92.2	538	18	377
Chloride (mg/l)	NA	277	834	32.9	179	120	663	170	496	1,340	496	132	1,070
Fluoride (mg/l)	4	0.25	0.18	0.31	0.21	0.18	0.1	0.12	0.41	0.21	<0.10	0.44	0.55
pH (S.U.)	NA	5.97	7.38	7.05	7.13	6.06	6.09	7.49	7.33	7.2	6.69	7.62	7.01
Sulfate (mg/l)	NA	2,410	34.9	<1	101	381	932	282	1,930	<100	3,930	28.3	3,110
TDS (mg/l)	NA	4,930	2,000	360	820	1,050	3,580	1,150	4,140	2,720	7,150	840	6,900
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.002	0.0014	0.0051	0.0018	<0.001	<0.001	<0.001	<0.001	0.0055	<0.001	0.0073	0.0044
Barium (mg/l)	2	0.034	0.48	0.15	0.16	0.029	0.03	0.055	0.021	0.96	0.017	0.11	0.053
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001	<0.001	<0.001	0.0011	<0.001	<0.001	0.0012
Cobalt (mg/l)	NA	0.0013	<0.001	<0.001	0.0018	<0.001	0.0042	<0.001	<0.001	<0.001	<0.001	<0.001	0.0043
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.36	0.14	0.04	0.14	0.074	0.35	0.096	0.38	0.13	0.81	0.029	0.28
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0031	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.749	0.476	0.485	0	0	0.205	0	0.139	2.38	0.524	-0.156	0.673
Radium-228 (pCi/l)	5	0.6	1.17	0.724	0.757	0.605	0.409	0.178	0.564	3.21	1.14	0.797	0.905

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 7
February 2017 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 2/7/17	OW-17A 2/7/17	OW-18 2/7/17	OW-19 (BG) 2/7/17	OW-20 (BG) 2/7/17	OW-21A (BG) 2/7/17	OW-22 (BG) 2/7/17	OW-23 (BG) 2/7/17	OW-31 2/7/17	OW-32 2/7/17	OW-38 2/7/17	OW-39 2/7/17
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.2	2	0.18	0.4	0.26	0.41	0.14	1.5	3.1	1.9	1.5	0.67
Calcium (mg/l)	NA	562	71	10.1	20.8	76.9	441	128	242	97.5	636	18.5	385
Chloride (mg/l)	NA	266	725	32.9	166	108	628	166	484	1,310	499	135	1,040
Fluoride (mg/l)	4	0.25	0.19	0.31	0.2	0.17	1.1	0.17	0.44	0.22	<0.10	0.47	0.45
pH (S.U.)	NA	5.74	6.53	6.2	6.99	5.85	5.89	7.51	6.47	6.51	5.6	7	6.69
Sulfate (mg/l)	NA	2,390	28.1	2	93.2	321	942	261	1,800	2.9	3,800	13.8	2,740
TDS (mg/l)	NA	5,010	2,080	420	860	935	3,550	1,180	4,060	2,760	7,020	875	6,820
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (mg/l)	0.01	0.0019	0.0015	0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0045	<0.0010	0.0061	0.0025
Barium (mg/l)	2	0.034	0.45	0.055	0.1	0.023	0.033	0.043	0.019	0.96	0.029	0.1	0.051
Beryllium (mg/l)	0.004	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cadmium (mg/l)	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chromium (mg/l)	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	0.0011
Cobalt (mg/l)	NA	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023
Lead (mg/l)	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (mg/l)	NA	0.38	0.14	0.041	0.13	0.072	0.38	0.1	0.42	0.14	0.9	0.035	0.32
Mercury (mg/l)	0.002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum (mg/l)	NA	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Selenium (mg/l)	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium (mg/l)	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Radium-226 (pCi/l)	5	0.143	1.63	-0.211	0.275	0.0765	0.314	0.354	0.338	2.51	0.129	0.28	-0.312
Radium-228 (pCi/l)	5	1.04	0.983	0.0665	0.495	0.187	1.56	0.222	0.306	3.21	0.982	0.0797	0.861

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 8
May 2017 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 5/10/17	OW-17A 5/10/17	OW-18 5/10/17	OW-19 (BG) 5/10/17	OW-20 (BG) 5/10/17	OW-21A (BG) 5/10/17	OW-22 (BG) 5/10/17	OW-23 (BG) 5/10/17	OW-31 5/10/17	OW-32 5/10/17	OW-38 5/10/17	OW-39 5/10/17
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	1.9	0.18	0.37	0.27	0.37	0.16	1.4	3.1	1.9	1.7	0.7
Calcium (mg/l)	NA	498	60.9	9.8	19.6	61.6	358	135	238	91.2	518	17.8	368
Chloride (mg/l)	NA	260	757	30.2	166	89.6	562	153	447	1,310	482	161	1,200
Fluoride (mg/l)	4	0.18	0.4	0.5	0.27	0.28	0.1	0.12	0.41	0.22	1.2	0.51	0.35
pH (S.U.)	NA	6.59	7.22	6.89	7.13	6.99	6.54	7.03	7	7.14	6.28	7.79	6.68
Sulfate (mg/l)	NA	2,410	26.5	1.4	93.9	262	1,040	304	1,740	<1	3,840	8.7	3,050
TDS (mg/l)	NA	4,800	1,890	305	775	765	3,280	1,180	3,920	2,520	6,720	780	7,120
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0016	0.0011	0.0039	<0.001	<0.001	<0.001	<0.001	<0.001	0.0073	<0.001	0.0044	0.0018
Barium (mg/l)	2	0.029	0.4	0.13	0.11	0.024	0.026	0.051	0.016	0.94	0.013	0.12	0.035
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	<0.001	0.001	<0.001	<0.001	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	0.0055
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.36	0.14	0.041	0.14	0.06	0.41	0.11	0.43	0.13	0.87	0.046	0.31
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.664	1.28	0.376	0.274	0.109	0.201	0.478	0.153	1.65	-0.049	0.349	0.156
Radium-228 (pCi/l)	5	0.788	1.48	0.614	0.402	-0.0841	0.453	0.698	0.211	4.67	2.03	0.176	0.995

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 9
June 2017 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 6/19/17	OW-17A 6/19/17	OW-18 6/19/17	OW-19 (BG) 6/19/17	OW-20 (BG) 6/19/17	OW-21A (BG) 6/19/17	OW-22 (BG) 6/19/17	OW-23 (BG) 6/19/17	OW-31 6/19/17	OW-32 6/19/17	OW-38 6/19/17	OW-39 6/19/17
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	2	0.15	0.39	0.31	0.37	0.16	1.4	2.8	1.8	1.8	0.72
Calcium (mg/l)	NA	543	71.9	9.7	19.7	93.9	361	141	247	96.1	530	19	399
Chloride (mg/l)	NA	280	777	38.9	163	106	652	161	451	1,340	492	169	1,190
Fluoride (mg/l)	4	0.23	0.2	0.29	0.23	0.19	0.12	0.16	0.64	0.25	1.4	0.51	0.35
pH (S.U.)	NA	6.6	7.38	6.96	7.33	6.75	6.74	7.42	7.31	7.25	6.49	7.78	6.61
Sulfate (mg/l)	NA	2,380	25.4	3.3	83.2	358	920	261	1,600	2.9	3,670	8.1	2,930
TDS (mg/l)	NA	5,240	1,970	300	765	960	3,680	1,220	4,000	2,700	6,960	850	7,240
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0013	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.0021	<0.001	0.0047	0.0044
Barium (mg/l)	2	0.028	0.48	0.17	0.11	0.038	0.024	0.056	0.016	0.97	0.014	0.13	0.061
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	0.0089
Cobalt (mg/l)	NA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.012
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.0054
Lithium (mg/l)	NA	0.34	0.14	0.041	0.13	0.057	0.35	0.099	0.38	0.12	0.79	0.048	0.31
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00026	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0046	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.641	1.52	0.548	0.912	0.295	0.55	0.254	0.731	1.79	0.809	0.533	0.628
Radium-228 (pCi/l)	5	0.777	1.52	0.592	0.889	0.531	0.251	0.337	0.397	3.43	0.94	0.702	2.24

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 10
July 2017 Analytical Summary

Parameter/Well/ Date	MCL	OW-38 7/20/17	OW-39 7/20/17
Detection Monitoring Parameters			
Boron (mg/l)	NA	1.8	0.67
Calcium (mg/l)	NA	21.2	485
Chloride (mg/l)	NA	170	1,050
Fluoride (mg/l)	4	0.52	0.26
pH (S.U.)	NA	7.29	6.35
Sulfate (mg/l)	NA	15.6	3,020
TDS (mg/l)	NA	845	7,180
Assessment Monitoring Parameters			
Antimony (mg/l)	0.006	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0048	0.0015
Barium (mg/l)	2	0.17	0.041
Beryllium (mg/l)	0.004	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001
Chromium (mg/l)	0.1	0.0068	<0.001
Cobalt (mg/l)	NA	0.0034	0.0068
Lead (mg/l)	0.015	0.0035	<0.001
Lithium (mg/l)	NA	0.056	0.31
Mercury (mg/l)	0.002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0082	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.699	0.686
Radium-228 (pCi/l)	5	0.633	0.536

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 11
August 2017 Analytical Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/ Date	MCL	OW-16 8/21/17	OW-17A 8/21/17	OW-18 8/21/17	OW-19 (BG) 8/21/17	OW-20 (BG) 8/21/17	OW-21A (BG) 8/21/17	OW-22 (BG) 8/21/17	OW-23 (BG) 8/21/17	OW-31 8/21/17	OW-32 8/21/17	OW-38 8/21/17	OW-39 8/21/17
Detection Monitoring Parameters													
Boron (mg/l)	NA	1.1	2	0.13	0.33	0.23	0.37	0.14	1.4	2.9	1.9	1.9	0.71
Calcium (mg/l)	NA	485	67.5	8.9	17.5	154	367	132	225	91.4	556	18.2	439
Chloride (mg/l)	NA	287	811	39.1	140	174	750	182	490	1,260	572	182	1,240
Fluoride (mg/l)	4	0.52	0.32	0.42	0.34	0.2	0.33	0.28	0.35	0.35	0.37	0.61	0.8
pH (S.U.)	NA	7.01	7.31	7.01	7.68	6.26	6.95	7.66	7.54	7.1	6.64	7.62	6.99
Sulfate (mg/l)	NA	2,430	26.4	4.9	77.7	707	820	277	1,660	15.7	3,870	23.2	3,100
TDS (mg/l)	NA	4,880	1,990	280	680	1,560	3,720	1,190	4,260	2,800	7,540	900	7,400
Assessment Monitoring Parameters													
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	<0.001	0.0015	0.0044	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	0.0053	0.0013
Barium (mg/l)	2	0.033	0.47	0.22	0.11	0.047	0.024	0.056	0.013	1	0.012	0.14	0.034
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	<0.001	0.0023	<0.001	0.0045	<0.001	<0.001	<0.001	<0.001	0.0099	<0.001	0.0074
Lead (mg/l)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.33	0.14	0.04	0.13	0.091	0.35	0.098	0.36	0.13	0.76	0.05	0.3
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0091	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.668	1.46	0.801	0.714	0.462	0.718	0.346	0	2.16	0.307	0.897	0.427
Radium-228 (pCi/l)	5	0.755	0.896	0.225	0.384	1.38	0.928	0.54	0.301	3.18	1.28	0.662	0.732

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 12
October 2017 Analytical Summary

Parameter/Well/ Date	MCL	OW-17A	OW-31	OW-32	OW-38
		10/5/17	10/5/17	10/5/17	10/5/17
Detection Monitoring Parameters					
Chloride (mg/l)	NA			597	
Fluoride (mg/l)	4	0.43			0.5
Sulfate (mg/l)	NA		10.1		
TDS (mg/l)	NA			7,030	

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 2
2018 Analytical Data Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/Date		Boron (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	pH (S.U.)	Sulfate (mg/l)	TDS (mg/l)
OW-16	3/7/18	1.1	579	305	0.22	7.29	2,950	5,160
	5/10/18	1.4	669	279	0.13	6.83	2,570	4,770
	7/18/18	1.1	586	304	0.11	7.53	2,800	4,840
	9/25/18	1.1	546	309	0.18	7.38	2,680	4,680
OW-17A	3/8/18	1.9	78.5	776	0.21	8.07	20.8	2,000
	5/10/18	2.6	67.1	761	0.19	7.18	15.8	1,820
	7/17/18	2.5	71.4	804	0.2	7.96	14.9	1,880
	9/25/18	2	74.5	811	0.19	7.37	37	1,900
OW-18	3/8/18	0.19	9.9	30.9	0.42	8.06	<1	310
	5/10/18	0.18	10.9	34.2	0.39	7.22	1.1	410
	7/17/18	0.17	12.4	36.5	0.37	7.78	<1	360
	9/25/18	0.15	11.6	34.9	0.37	7.37	0.564	365
OW-19 (BG)	3/7/18	0.29	16.2	120	0.25	8.03	60.6	685
	5/10/18	0.55	15.6	131	0.23	7.91	48.8	715
	7/18/18	0.36	16.4	115	0.23	7.35	54.3	755
	9/25/18	0.29	15.4	109	0.24	7.52	53.4	555
OW-20 (BG)	3/7/18	0.24	87.4	117	0.14	7.88	399	885
	5/10/18	0.31	162	137	<0.1	6.88	463	1,040
	7/18/18	0.23	160	176	0.29	6.53	715	1,480
	9/25/18	0.23	201	186	<0.1	7.29	716	1,200
OW-21A (BG)	3/7/18	0.35	372	589	0.11	7.31	1,090	3,200
	5/10/18	0.45	477	565	<0.1	7.23	1,020	3,320
	7/18/18	0.33	352	503	<0.1	7.15	1,160	3,220
	9/25/18	0.35	361	723	<0.1	7.22	901	3,340
OW-22 (BG)	3/8/18	0.17	146	170	0.25	7.68	346	1,230
	5/10/18	0.16	140	156	0.12	7.42	303	1,180
	7/18/18	0.16	140	175	<0.1	7.89	305	1,180
	9/26/18	0.14	145	183	0.15	7.53	320	1,170
OW-23 (BG)	3/8/18	1.3	250	466	<0.1	7.86	1,820	3,740
	5/10/18	1.8	314	458	<0.1	7.65	1,700	3,960
	7/18/18	1.5	263	487	<0.1	7.95	1,810	3,760
	9/25/18	1.4	262	473	0.17	7.54	1,720	3,700
OW-31	3/8/18	2.9	99	1,340	0.19	7.88	3.6	2,840
	5/10/18	2.8	90.5	1,440 / 1,370*	0.19	7.73	2.2	2,580
	7/17/18	3.2	95	<1	0.16	8.01	<1	2,460
	9/25/18	2.9	97.1	1,380	0.22	7.33	1.24	2,590
OW-32	3/8/18	1.8	528	480	<0.1	7.37	4,260	6,930
	5/10/18	1.7	538	512	<0.1	6.89	3,980	6,470
	7/17/18	2	571	506	1.2	7.17	4,040	6,170
	9/25/18	1.7	661	531	<0.1	7.08	4,020	6,080
OW-38	3/8/18	1.8	21.2	178	0.51	8.49	13.5	860
	5/10/18	1.6	20	174	0.49	7.99	11.8	865
	7/17/18	2	21	191	0.53	8.47	10.3	810
	9/25/18	2.1	20.6	188	0.51	7.34	12	740
OW-39	3/8/18	0.66	450	1,350	0.26	7.61	3,530	7,380
	5/10/18	0.69	431	1,340	0.23	7.33	3,130	7,060
	7/17/18	0.77	456	1,340	0.16	7.53	3,160	7,080
	9/25/18	0.69	439	1,350	0.33	7.41	3,240	7,860 / 7,060**

* 6/14/18 resampling result.

** 11/16/18 resampling result

Notes:
mg/l = milligrams per liter
S.U. = standard units

CLECO

Table 2
2019 Analytical Data Summary

Cleco Dolet Hills Power Station
Ash Basins

Parameter/Well/Date		Boron (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	pH (S.U.)	Sulfate (mg/l)	TDS (mg/l)
OW-16	3/19/19	1	490	353	0.12	7.88	2,820	4,680
	6/4/19	1.2	664 / 580*	322	0.22	6.76	2,700	4,760
	8/6/19	1.1	657	344	0.11	7.11	2,860	4,870
	10/8/19	1.1	632	320	0.18	6.57	2,640	4,660
OW-17A	3/19/19	2.1	67.6	990	0.13	7.9	31.3	1,890
	6/4/19	2.3	80.4	922	0.19	7.72	31.8	1,940
	8/6/19	2	71.5	760	0.16	7.07	35.3	2,010
	10/8/19	1.9	69.1	769	0.2	7.12	29.7	1,780
OW-18	3/19/19	0.17	8.9	32.7	0.48	8.57	<1	295
	6/4/19	0.15	11.3	37.5	0.5	6.97	<1	330
	8/6/19	0.14	12.7	39.5	0.35	7.54	<1	355
	10/8/19	0.11	11.7	37.2	0.4	6.51	<1	220
OW-19 (BG)	3/19/19	0.33	13.1	121	0.25	8.15	49.8	575
	6/4/19	0.49	13.7	125	0.29	7.25	34	690
	8/6/19	0.4	12.3	91.4	0.22	7.71	26	605
	10/8/19	0.31	10.7	77	0.28	6.79	22	330
OW-20 (BG)	3/19/19	0.22	118	145	0.4	8.43	481	995
	6/4/19	0.2	130	154	0.17	5.99	562	1,140
	8/6/19	0.2	153	171	<0.1	6.63	650	1,240
	10/8/19	0.22	163	168	<0.10	5.66	659	1,160
OW-21A (BG)	3/19/19	0.32	387	812	<0.1	7.77	1,270	3,180
	6/4/19	0.45	432	695	0.12	6.55	984	3,120
	8/6/19	0.41	315	631	<0.1	7.45	966	3,260
	10/8/19	0.33	366	549	0.1	6.64	955	2,540
OW-22 (BG)	3/19/19	0.16	153	170	0.25	8.01	340	1,230
	6/4/19	0.12	157	189	0.16	7.26	460	1,360
	8/6/19	0.12	159	177	0.14	7.85	496	1,470
	10/8/19	0.12	167	171	<0.10	6.95	550	1,420
OW-23 (BG)	3/19/19	1.8	260	489	0.12	7.95	1,820	3,700
	6/4/19	1.5	300	472	0.11	7.58	1710	3,820
	8/6/19	1.5	222	497	<0.1	7.88	1,790	3,900
	10/8/19	1.3	228	467	0.13	6.84	1,680	3,700
OW-31	3/19/19	3	81.9	2.6	0.23	7.85	<1	2,480
	6/4/19	2.8	95.2	1,330	0.23	7.55	<1	2,550
	8/6/19	2.9	90	1,370	0.18	7.87	<1	2,670
	10/8/19	2.4	81.4	1,350	0.19	7.05	<1	2,290
OW-32	3/19/19	2.2	622	557	<0.1	7.47	2,770	6,260
	6/4/19	1.7	562	445	<0.10	6.2	3,870	6,370
	8/6/19	1.7	489	469	<0.1	7.22	3,570	6,570
	10/8/19	1.6	579	514	<0.10	6.25	3,810	6,110
OW-38	3/19/19	2	18.1	206	0.51	8.44	6	745
	6/4/19	2.1	18.5	188	0.54	7.68	5.1	720
	8/6/19	2.2	19.7	199	0.49	7.28	1.1	830
	10/8/19	2	18.8	194	0.5	7.52	3.3	305
OW-39	3/19/19	0.85	556	947	0.2	7.83	31.2	7,260
	6/4/19	0.74	535	1,350	0.3	7.31	3,220	7,440
	8/6/19	0.76	433	1,400	<0.1	7.62	3,140	7,380
	10/8/19	0.7	545	1,400	0.25	6.72	3,030	6,920

* 7/17/19 resampling result.

Notes:
mg/l = milligrams per liter
S.U. = standard units

APPENDIX F

ASH BASINS 1 AND 2

SITE HYDROGEOLOGY AND GEOLOGIC CROSS SECTIONS

SITE HYDROGEOLOGY AND GEOLOGIC CROSS SECTIONS

HYDROGEOLOGIC SETTING

Ash Basins No. 1 and No. 2 (Ash Basins 1 and 2) were constructed by placement of engineered earthen berms along the eastern edge of natural erosional valley surfaces. Unlike many conventional impoundments where the ash basins were excavated to create horizontal surfaces, minimal further excavation was done at Ash Basins 1 and 2. Instead, they were constructed to utilize the existing natural topographic depression. The ash basins were primarily constructed over a massive marine clay (Porters Creek clay) with thickness approaching 600 feet. The Porters Creek clay is not a potable source of water for DeSoto Parish, as freshwater is not available at depth within or below the Porters Creek clay. The water-bearing zone currently monitored for groundwater quality is not laterally continuous beneath the site. It consists of thin lenses with limited lateral extent, representing remnants of the lower Naborton Formation and near surface Porters Creek clay. Predominately permeable soils of the Naborton Formation have been eroded away prior to site development and do not transmit groundwater.

SITE GEOLOGY

DHPS straddles geologic formations of Eocene and Paleocene age that include, in ascending order of deposition:

- The Porters Creek clay of the Midway Group, overlain by
- The Naborton Formation of the Wilcox Group, and
- The Dolet Hills sand of the Wilcox Group.

The dominant structural feature in northwest Louisiana is the Sabine Uplift, which is an asymmetrical dome that extends from northwestern Louisiana into East Texas. The Sabine Uplift is located north of DHPS. Dipping and folded geologic units south of the DHPS manifest the structural influence of the Sabine Uplift.

The Paleocene Porters Creek clay is a marine clay that is composed primarily of light to dark grey to black lignitic and limy shale and clay with minor glauconitic, micaceous sand lenses. The Porters Creek clay is a massive regional formation extending from Tennessee to East Texas. Regionally, the Porters Creek clay and other Paleocene formations associated with the marine clay comprise the Midway confining unit. The Porters Creek clay generally yields no potable freshwater (USGS, 1964), and it is not considered a potable source of fresh groundwater for DeSoto Parish. The thickness of the Porters Creek clay approaches 600 feet at DHPS. The ash basins were primarily constructed on top of the Porters Creek clay.

The Eocene Naborton Formation is composed primarily of lignitic fine-grained sand, clay, and silt. The Naborton Formation is part of the Carrizo-Wilcox aquifer system. In DeSoto Parish, the Carrizo aquifers have been eroded away and only the less productive Wilcox portions of the Carrizo-Wilcox aquifer system remain. The aquifer is confined (artesian) to semi-confined, except in areas where the Naborton Formation is exposed in outcrops, creating an unconfined (water table) aquifer. Only discontinuous remnants of the partially eroded Naborton Formation are present in the vicinity of the ash basins, and the Naborton Formation is absent in many areas of the ash basin units.

Geologic cross-sections included in **Appendix F** traverse the site along lines shown in **Figure G-1**, **Appendix G**, and illustrate the heterogeneous stratigraphy and variable depths of permeable zones underlying the site. Soil boring logs used in constructing the cross sections represent 68 soil borings completed in the vicinity of the Ash Basins, and are included in **Appendix C**. **Figure C-1** in **Appendix C** shows the soil boring logs, including both conventional soil boring logs and geophysical logs.

DHPS is partly underlain by four distinct permeable zones that are referred to as Zones 1, 2, 3, and 4. Zone 1 correlates with the main sand bed of the Dolet Hills sand, and Zones 2, 3, and 4 correlate with the minor sand beds of the Naborton Formation.

The Dolet Hills sand transmits freshwater and is regionally mostly a massive bedded sand. Based on site-specific data collected at the facility, the Dolet Hills sand is not present in the vicinity of the Ash Basins as it has been eroded away by natural processes.

Compared to the Dolet Hills sand, Zones 2, 3, and 4 of the Naborton Formation represent relatively thin sand beds, separated vertically by clay or lignite beds that contribute to low hydraulic conductivities in conjunction with the fine-grained, silty texture of the sand beds. The portion of the Naborton Formation underlying the footprint of the power plant is relatively thin due to partial erosion. In the vicinity of the Ash Basins, erosion has completely removed the Dolet Hills sand (Zone 1) and the Naborton Formation sands (Zones 2, 3, and 4) . Zone 4 of the Naborton Formation is considered the uppermost water-bearing zone in the vicinity of the Ash Basins although it is not laterally continuous in that area.

GROUNDWATER FLOW EVALUATION

Zone 4 is the most suitable water-bearing zone to monitor groundwater quality at the Ash Basins. The potentiometric surface maps prepared for Zone 4 (**Appendix D**) indicate that groundwater flow in Zone 4 mimics the topography of the site. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow.

The groundwater flow velocity is an average linear flow velocity that is calculated using the groundwater flow equation, $v = [k(dh/dl)] / n_e$. For this equation, v is groundwater flow velocity in ft/day, k is hydraulic conductivity in ft/day, dh/dl is hydraulic gradient in ft/ft, and n_e is effective porosity (nondimensional).

For Zone 4, hydraulic conductivity (k) values ranging from 2.0E-07 to 1.4E-02 ft/day were assumed based on slug tests completed at the site. Hydraulic gradient (dh/dl) values are listed below based on potentiometric surface maps completed for Zone 4. An effective porosity (n_e) of 0.2 was assumed based on the soil types of Zone 4 (Fetter, 2001).

Using these values, estimated groundwater flow rates (v) are listed below.

Date	Hydraulic Gradient (feet/feet)	Estimated Groundwater Flow Velocity (feet/day)
March 2019	0.01 to 0.07	1.0E-8 to 4.9E-3
June 2019	0.01 to 0.07	1.0E-8 to 4.9E-3
August 2019	0.01 to 0.06	1.0E-8 to 4.2E-3
October 2019	0.01 to 0.06	1.0E-8 to 4.2E-3

It is important to note that this is an advective rate and does not account for potential geological heterogeneities which may cause significant variability in geochemical and hydrogeologic parameters including adsorption, biodegradation, dispersion, fraction of organic carbon, and other retarding factors affecting groundwater fate and transport in this zone. Additionally, lateral geological heterogeneities may cause variations in advective flow.

UPPERMOST WATER BEARING ZONE CHARACTERIZATION

A summary of results of the uppermost water-bearing characterization include the following:

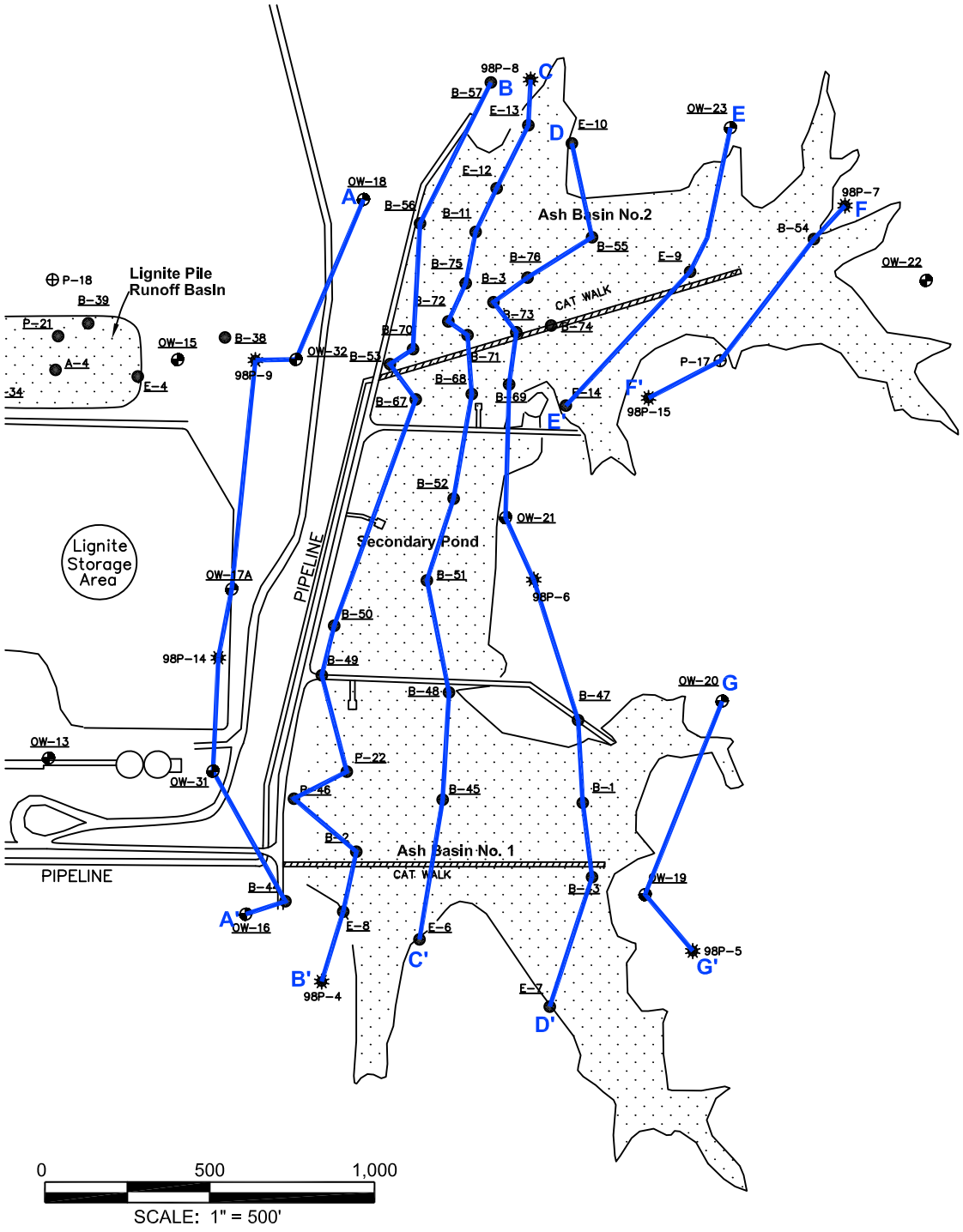
- The ash basins were primarily constructed over a massive marine clay (Porters Creek clay) with thickness approaching 600 feet, which is not a potable source of water for DeSoto Parish. Neither the Porters Creek clay nor the underlying water-bearing units transmit fresh groundwater.
- The uppermost water-bearing zone that is currently monitored is not laterally continuous and consists of remnant thin deposits of the lower Naborton Formation and near surface Porters Creek clay. Predominately permeable soils of the Naborton Formation have been eroded away prior to site development and do not transmit groundwater.
- The absence of a usable uppermost aquifer required Cleco DHPS to monitor the water-bearing zone, found primarily in the Porters Creek clay, which comprises the Midway confining unit in DeSoto Parish.
- The water quantity yield of the thin, laterally discontinuous uppermost water-bearing unit is minimal, rendering the zone unusable for development.
- Water use in the vicinity of the Ash Basins is restricted to surface water. Groundwater is neither an available nor reliable resource for industrial, power generation, domestic, or public supply in the vicinity of the Ash Basins. DHPS receives surface water from Toledo Bend for power generation use, as groundwater is not available for this purpose. Review of groundwater use indicates that groundwater is not usable at DHPS.
- Numerous oil & gas exploration locations for the Haynesville Shale and other plays are located in the vicinity of the Ash Basins and these locations convey surface water to the drilling location by pipeline rather than using groundwater. Groundwater is not usable for this purpose in the Ash Basins area.
- Groundwater quality is generally poor with naturally high total dissolved solids, chlorides, and sulfates due to the marine depositional environment of the Porters Creek clay and the lignitic nature of the lower Naborton Formation.

Cleco concludes that the lower Naborton Formation and the clays of the Porters Creek clay at Ash Basins 1 and 2 are not usable aquifers due to their severe limitations as a groundwater resource arising from its laterally discontinuous nature, low well yield potential, and undesirable water quality. However, groundwater monitoring is conducted per applicable portions of 40 C.F.R. § 257.93.

REFERENCES

Fetter, C.W., 2001. Applied Hydrogeology. 4th Edition, Prentice Hall, Upper Saddle River.

Heath, R.C., 1989, Basic ground-water hydrology: U.S. Geological Survey Water Supply Paper 2220, 84 p



Legend

OW-22	Zone 4 Monitoring Well Location
P-17	Zone 4 Piezometer Location
	Permitted Facility
A——A'	Transect Location

CLECO Corporation

Dolet Hills Power Station

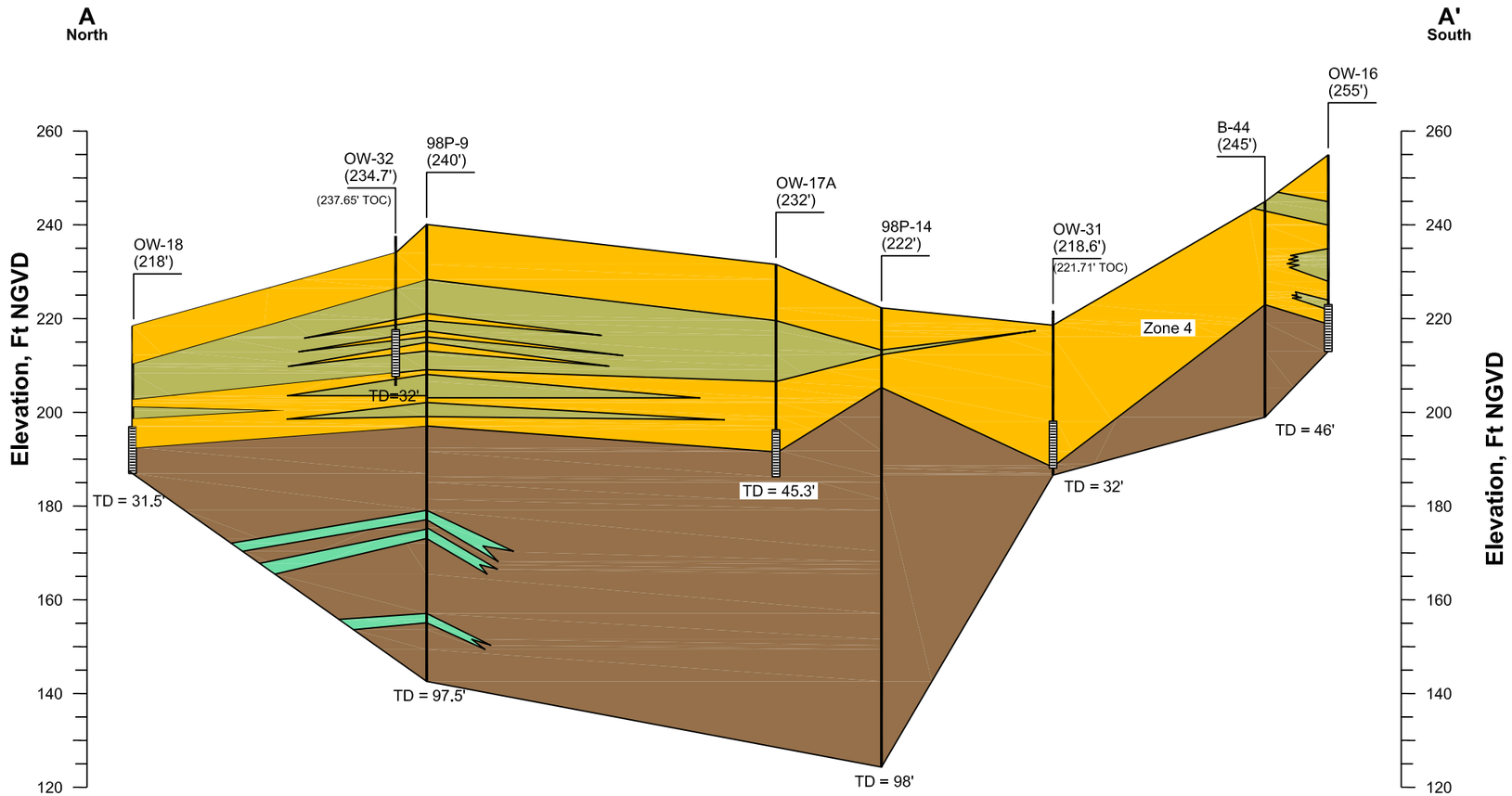
Geologic Cross Sections Transect Locations

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-1

Figure F-1



Section A-A'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'

Legend

- Silty Sand / Clayey Sand / Clayey Silt
- Silty Clay / Clay (Naborton)
- Silty Clay / Clay (Porters Creek)
- Sandstone / Claystone
- Screen Interval
- (255') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between borings are inferred. Actual conditions may vary.

CLECO Corporation

Dolet Hills Power Station

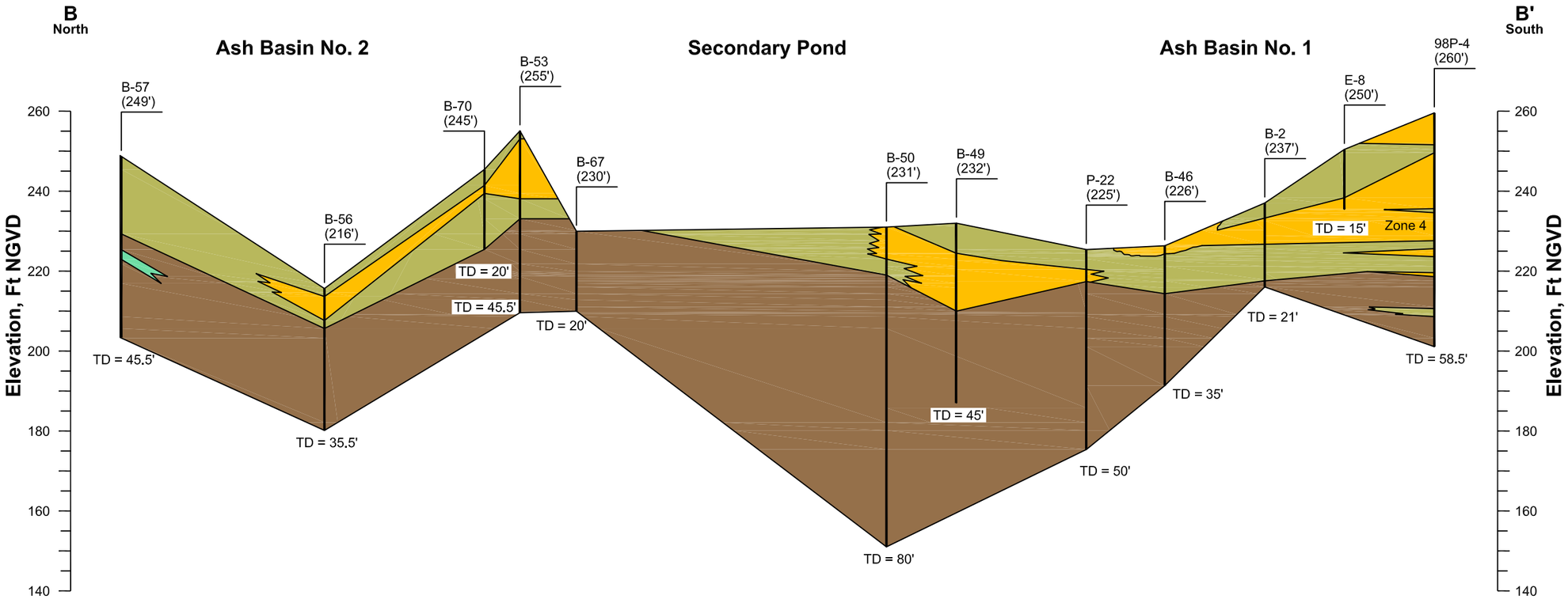
Geologic Cross Section A-A'

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-2

Figure F-2



Section B-B'

Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'

Legend

- Silty Sand / Clayey Sand / Clayey Silt
- Silty Clay / Clay (Naborton)
- Silty Clay / Clay (Porters Creek)
- Sandstone / Claystone
- Screen Interval
- (249') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between borings are inferred. Actual conditions may vary.

Secondary Basin, Ash Basin No. 1 & Ash Basin No. 2

CLECO Corporation

Dolet Hills Power Station

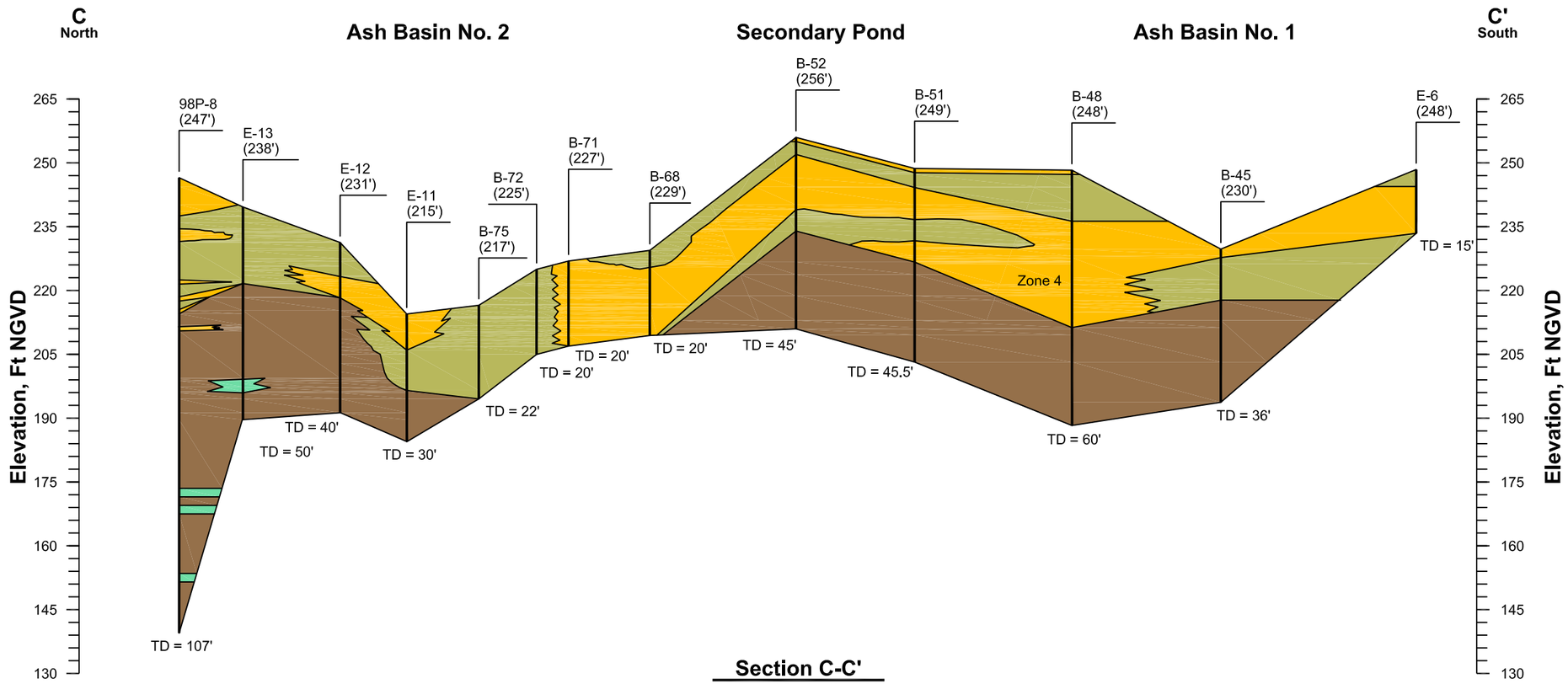
Geologic Cross Section B-B'

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-3

Figure F-3



Section C-C'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'

Legend

- Silty Sand / Clayey Sand / Clayey Silt
- Silty Clay / Clay (Naborton)
- Silty Clay / Clay (Porters Creek)
- Sandstone / Claystone
- Screen Interval
- (238') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between borings are inferred. Actual conditions may vary.

Secondary Basin, Ash Basin No. 1 & Ash Basin No. 2

CLECO Corporation

Dolet Hills Power Station

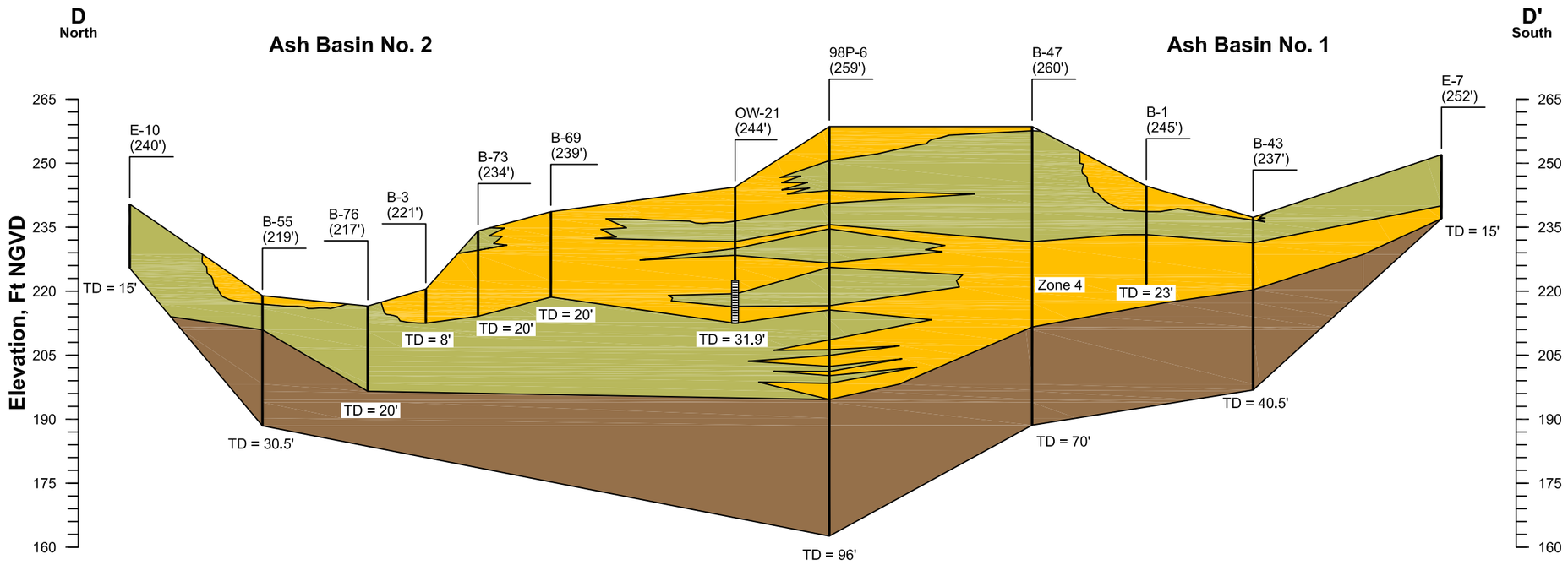
Geologic Cross Section C-C'

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-4

Figure F-4



Section D-D'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'

Legend

- Silty Sand / Clayey Sand / Clayey Silt
- Silty Clay / Clay (Naborton)
- Silty Clay / Clay (Porters Creek)
- Sandstone / Claystone
- Screen Interval
- (240') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between borings are inferred. Actual conditions may vary.

Ash Basin No. 1 & Ash Basin No. 2

CLECO Corporation

Dolet Hills Power Station

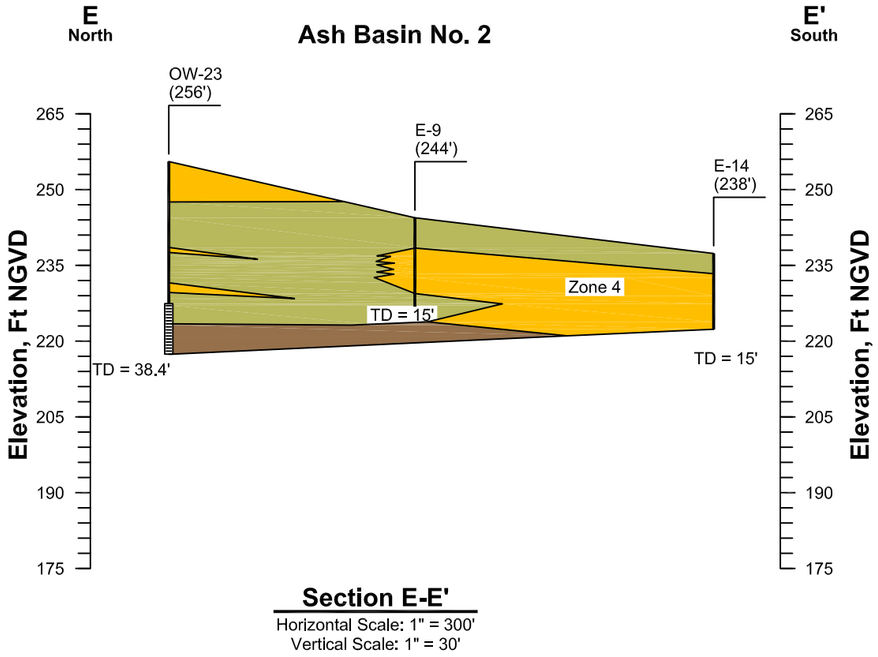
Geologic Cross Section D-D'

De Soto Parish, Louisiana

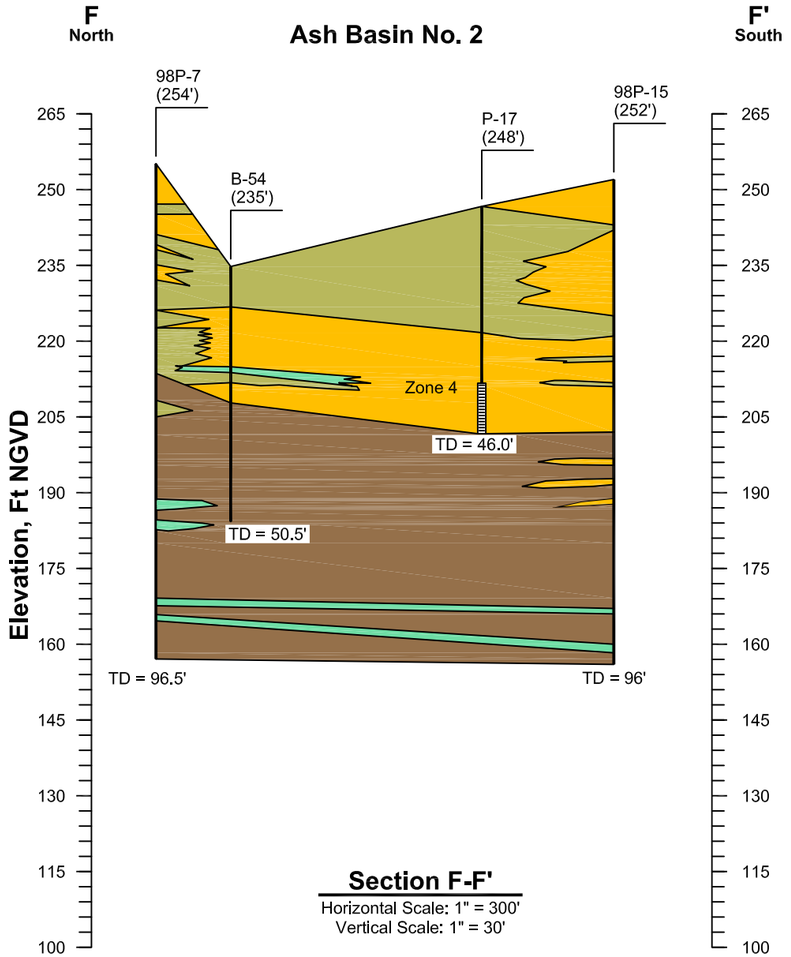
E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-5

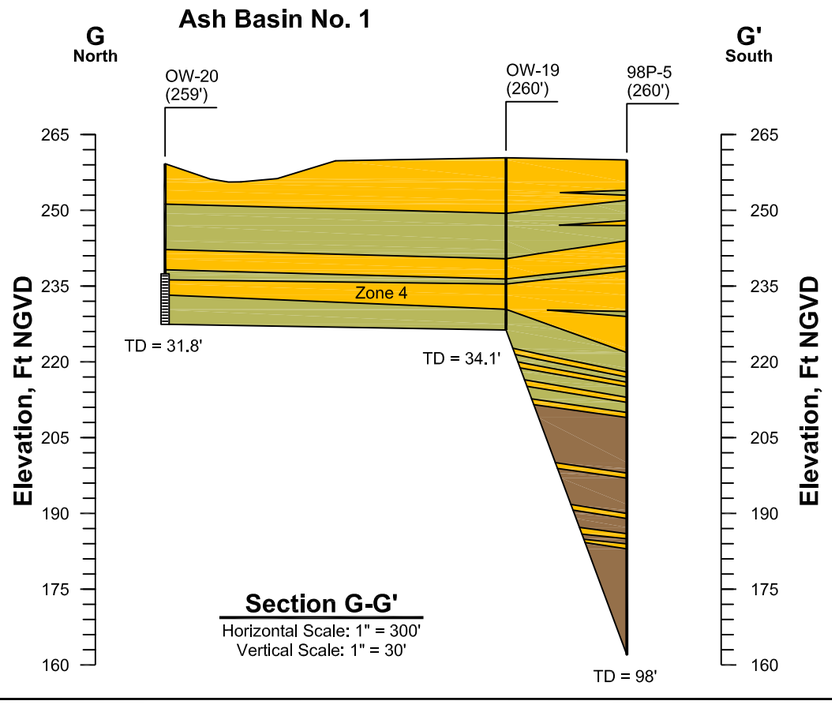
Figure F-5



Section E-E'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'



Section F-F'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'



Section G-G'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 30'

Legend

- Silty Sand / Clayey Sand / Clayey Silt
- Silty Clay / Clay (Naborton)
- Silty Clay / Clay (Porters Creek)
- Sandstone / Claystone
- Screen Interval
- (202') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between borings are inferred. Actual conditions may vary.

Ash Basin No. 1 & Ash Basin No. 2

CLECO Corporation

Dolet Hills Power Station

Geologic Cross Sections E-E', F-F', & G-G'

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	RS
Date:	11/9/20
Dwg. No.:	01-20-0221-APP-F-6

Figure F-6

APPENDIX G

ASH BASINS 1 AND 2

STRUCTURAL STABILITY ASSESSMENT

OCTOBER 2016

CLECO POWER LLC
DOLET HILLS POWER STATION

STRUCTURAL STABILITY ASSESSMENT:

ASH BASIN No. 1

Prepared By:

Providence Engineering and Environmental Group LLC
1201 Main Street
Baton Rouge, Louisiana 70802

(225) 766-7400

www.providenceeng.com

Project Number 002-185

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1.0 INTRODUCTION

Providence was contracted by Cleco Power LLC (Cleco) to conduct a structural stability assessment of Ash Basin No. 1 at Cleco's Dolet Hills Power Station. Recent Coal Combustion Residual (CCR) regulations at 40 CFR 257.73(d)(1) established requirements for owners and operators to conduct a structural stability assessment by a qualified professional engineer to document whether the design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. This assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- A single spillway or a combination of spillways designed, operated, and maintained to adequately manage flow during a 100-year flood for a low hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

The Cleco Dolet Hills Power Station is located approximately 8 miles southeast of Mansfield, DeSoto Parish, LA. A site location map showing the Dolet Hills Power Station is included as **Figure 1**.

This structural stability assessment pertains to Ash Basin No. 1 utilized for the Unit 1 coal-fired generation unit. A site map for Ash Basin No. 1 is included as **Figure 2**. Providence reviewed the construction drawings and operational plan, and reviewed the inspection and maintenance procedures with Cleco for Ash Basin No. 1.

2.0 STRUCTURAL STABILITY

Stable Foundations and Abutments

Providence modeled a short-term slope stability analysis for the pond using a scenario where the facility allows the pond to fill to the freeboard level for Ash Basin No. 1. This scenario represents the flood/heavy rainfall conditions. The new

elevation was determined using 2.5 feet of freeboard from the lowest levee crown elevation for this pond.

Based on the results of the slope stability analysis, the following minimum factors of safety were obtained:

Table 1 Short-Term Factor of Safety

Surface Impoundment	Section Number	Soil Boring No.	Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 1	Section 1	B-1	251.5	Spencer Method Circular Failure	2.78

The calculated short-term static factor of safety under maximum surcharge pool loading conditions is greater than 1.40, therefore the safety factor is adequate.

The normal operating water level in Ash Basin No. 1 ranges from 230 to 330 feet NAVD 88. These levels are significantly lower than the modeled flooded/heavy rainfall conditions.

The interior and exterior slopes of the perimeter levees are on a three horizontal to one vertical and were compacted during the construction of the levees.

Adequate Slope Protection to Protect Against Surface Erosion, Wave Action, and Adverse Effects of Sudden Drawdown

The levees have adequate slope protection against surface erosion, wave action, and adverse effects of a sudden drawdown. The levees have a minimum three-foot thick layer of clay on the interior, exterior, and crest of the levee. Vegetation is adequate on the top of the levee where it may be exposed to the elements. As part of Cleco's operational plan, they inspect the levees weekly for any erosion due to weather, animals, or other elements and promptly correct any deficiencies.

Dikes Mechanically Compacted to a Density Sufficient to Withstand the Range of Loading Conditions in the CCR Unit

The dikes were mechanically compacted to a density sufficient to withstand the range of loading conditions for the daily operation of the unit.

A Single Spillway or a Combination of Spillways Designed, Operated, and Maintained to Adequately Manage Flow During a 100-Year Flood for a Low Hazard Potential CCR Surface Impoundment

Ash Basin No. 1 captures and retains rainfall runoff from drainage areas upstream of the basin dike. Ash Basin No. 1 is provided with a weir box and an auxiliary spillway. Normally, runoff from the drainage area of Ash Basin No. 1 is captured in the basin, mixed with sluice water, and drained at a slow rate via the weir box.

Because the drainage area of the Ash Basin No. 1 is large, an auxiliary spillway is provided for the basin to protect against overflow of the dikes during a period of high runoff when the basin has ash at the high ash elevation level. The crest elevation of the auxiliary spillway is set so that overflow of the spillway will not occur for runoffs equal to or less than the 50-year, 24-hour runoff. The spillway is designed to discharge excess rainfall due to a 100-year, 24-hour rainfall event occurring with the basin at a maximum operating water level. The elevation of the top of the dike for the Ash Basin No.1 was selected to provide 2 feet of interior freeboard above the maximum 100-year rainfall event water level.

The clear water that is discharged is pumped back or recirculated to the plant by the ash recirculation pumps and used again to sluice ash.

The Natural Resource Conservation Service (NRCS) Technical Release-55 (TR-55) rain distribution for a 100-year, 24-hour rain event would cause a precipitation depth of 10.5 inches. Based on the operating water levels and the discharge system in the pond, the facility would adequately manage the rainfall for a 100-year flood event.

Hydraulic Structures Underlying the Base of the CCR Unit or Passing Through the Dike of the CCR Unit that Maintain Structural Integrity and Are Free of Significant Deterioration, Deformation, Distortion, Bedding Deficiencies, Sedimentation, and Debris Which May Negatively Affect the Operation of the Hydraulic Structure

As part of the structural evaluation, Providence was asked to determine the presence of any culverts or pipes buried in the levees of the Ash Basin No. 1. Based on the survey of the pond levees, several site inspections, review of solid waste permit files, and discussions with Cleco personnel, Providence determined that the following culverts/pipes exist within the levees surrounding the Ash Basin No. 1:

- 36” corrugated metal pipe that drains the Ash Basin No. 1.
- 4” HDPE pipe that runs from the sanitary sewer system to the Ash Basin No. 1.
- 4” carbon steel pipe for the previously operated sanitary sewer line that was cut and capped at both ends and left in place along the western levee of Ash Basin No. 1.
- 4” carbon steel pipe for the high pressure service water line was cut and capped at both ends and left in place in several locations along the western levee of Ash Basin No. 1.
- 12” HDPE Bottom Ash Sump Line was cut and left in place in several locations along the western levee of Ash Basin No. 1 along the crest. The HDPE pipe was capped off and replaced with a steel pipe above ground.

These drain pipes are in satisfactory condition and do not pose a threat to the levee system. These pipes have maintained their structural integrity and are free from

significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris. None of the known pipes lead to offsite locations on the surface or to public drainage systems or waterways or pose any significant risks to Cleco as a result of their operation.

For CCR Units with Downstream Slopes Which Can Be Inundated by the Pool of an Adjacent Water Body, such as a River, Stream or Lake, Downstream Slopes that Maintain Structural Stability During Low Pool of the Adjacent Water Body or Sudden Drawdown of the Adjacent Water Body

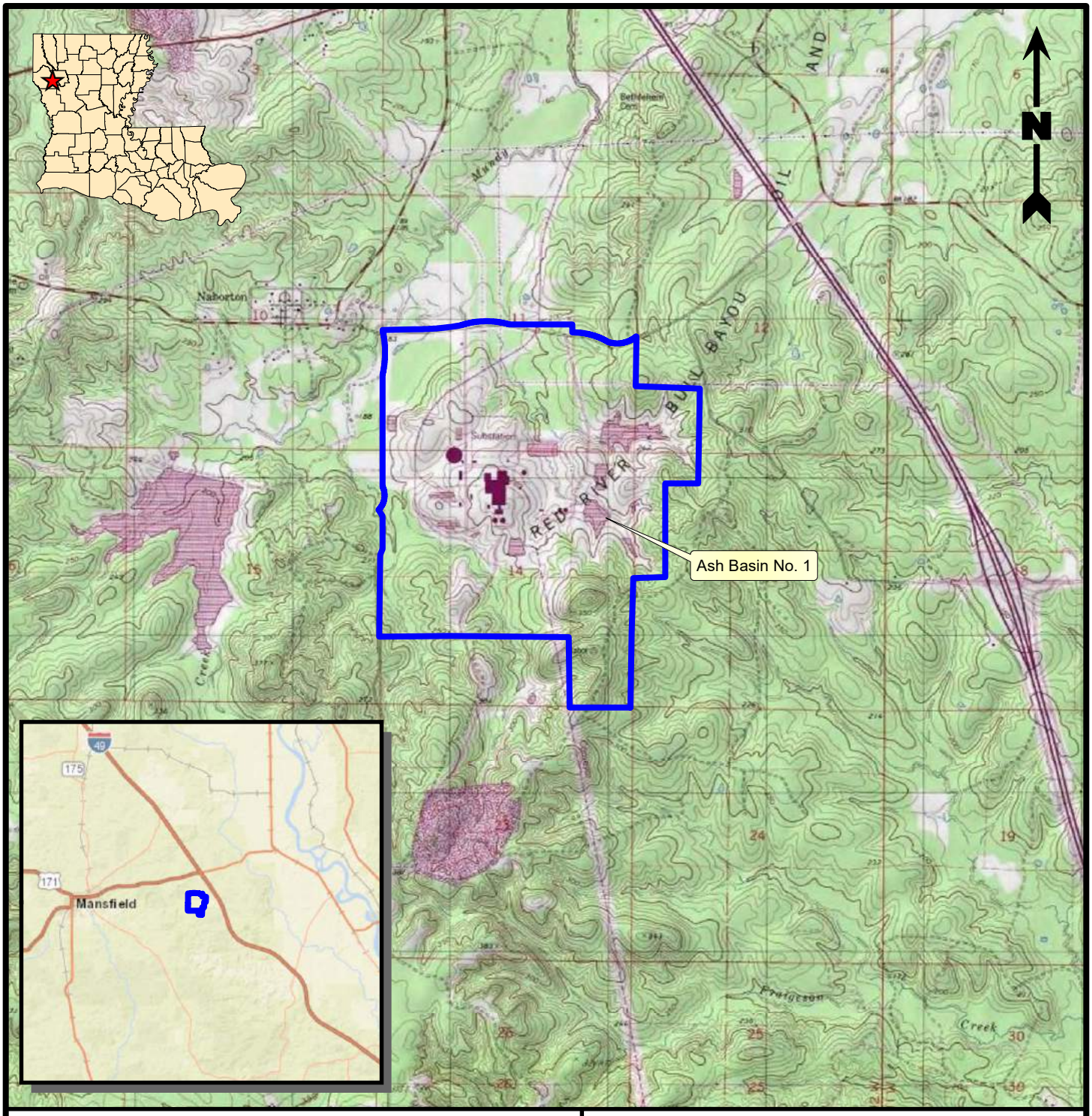
The levees do not get inundated by surface waters from adjacent features.

3.0 CONCLUSION

Based on the results from the structural stability assessment, Ash Basin No. 1's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. Ash Basin No. 1 meets the requirements at 257.73(d)(1) of the CCR regulations. **Appendix A** contains a P.E. Certification that attests to this assessment.

FIGURE 1

SITE LOCATION MAP



3,000 1,500 0 3,000 Feet

Legend

Facility Boundary

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "Lena, LA", "Boyce, LA", "Jericho, LA", and "Gardner, LA".

Site Location Map

Structural Stability Assessment - Ash Basin No. 1
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

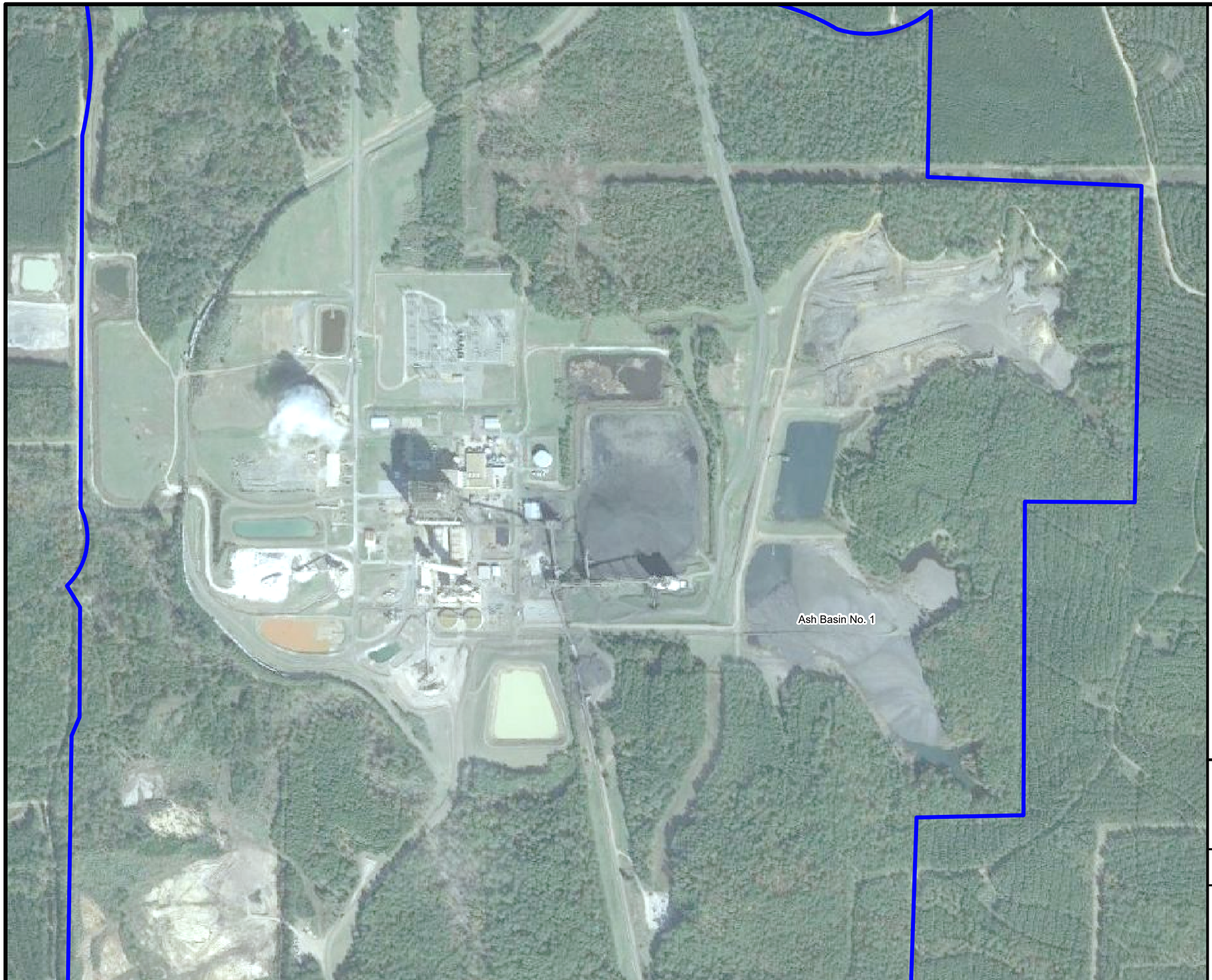
PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number	002-185
Drawing Number	002-185-A022
1	Figure

FIGURE 2

SITE MAP



N

Legend

Facility Boundary

Reference

Base map comprised of Google Earth aerial imagery from 11/06/12.

600 300 0 600
Feet

Site Map

Structural Stability Assessment - Ash Basin No. 1
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number 002-185

Drawing Number 002-185-B023

2
Figure

APPENDIX A

P.E. CERTIFICATION

CLECO BRAME ENERGY CENTER
ASH BASIN NO. 1
CCR STRUCTURAL STABILITY ASSESSMENT

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I have performed a structural stability assessment for Cleco's Dolet Hills Power Station Ash Basin No. 1 in accordance with the 40 CFR 257.73(d)(1) CCR requirements. This structural stability assessment has determined that Ash Basin No. 1's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. It has been designed, constructed, operated, and maintained with:

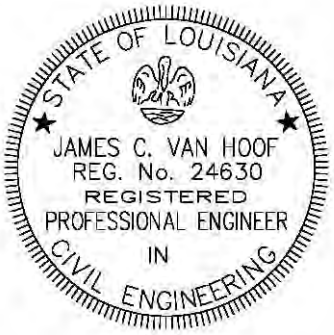
- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- A single spillway or a combination of spillways designed, operated, and maintained to adequately manage rainfall during a 100-year flood for a low hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

James C. Van Hoof
Name

24630 **LA**
Registration No. State

James C. Van Hoof, P.E.
Signature

10/16/16
Date



(Seal)

OCTOBER 2016

CLECO POWER LLC
DOLET HILLS POWER STATION

STRUCTURAL STABILITY ASSESSMENT: ASH BASIN No. 2

Prepared By:

Providence Engineering and Environmental Group LLC
1201 Main Street
Baton Rouge, Louisiana 70802

(225) 766-7400

www.providenceeng.com

Project Number 002-185

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1.0 INTRODUCTION

Providence was contracted by Cleco Power LLC (Cleco) to conduct a structural stability assessment of Ash Basin No. 2 at Cleco's Dolet Hills Power Station. Recent Coal Combustion Residual (CCR) regulations at 40 CFR 257.73(d)(1) established requirements for owners and operators to conduct a structural stability assessment by a qualified professional engineer to document whether the design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. This assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- A single spillway or a combination of spillways designed, operated, and maintained to adequately manage flow during a 100-year flood for a low hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

The Cleco Dolet Hills Power Station is located approximately 8 miles southeast of Mansfield, DeSoto Parish, LA. A site location map showing the Dolet Hills Power Station is included as **Figure 1**.

This structural stability assessment pertains to Ash Basin No. 2 utilized for the Unit 1 coal-fired generation unit. A site map for Ash Basin No. 2 is included as **Figure 2**. Providence reviewed the construction drawings and operational plan, and reviewed the inspection and maintenance procedures with Cleco for Ash Basin No. 2.

2.0 STRUCTURAL STABILITY

Stable Foundations and Abutments

Providence modeled a short-term slope stability analysis for the pond where the facility allows the pond to fill to the freeboard level for Ash Basin No. 2. This

scenario represents the flood/heavy rainfall conditions. The new elevation was determined using 2.5 feet of freeboard from the lowest levee crown elevation for this pond.

Based on the results of the short-term slope stability analysis, the following minimum factors of safety were obtained:

Table 1 Short-Term Factors of Safety

Surface Impoundment	Section Number	Soil Boring No.	Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 2	Section 2	B-5 and B-6	242.5	Spencer Method Circular Failure	2.64

The calculated short-term static factor of safety under maximum surcharge pool loading conditions is greater than 1.40, therefore the safety factor is adequate.

The normal operating water level in Ash Basin No. 2 ranges from 225 to 240.5 feet NAVD 88. These levels are significantly lower than the modeled flooded/heavy rainfall conditions.

The interior and exterior slopes of the perimeter levees are on a three horizontal to one vertical and were compacted during the construction of the levees.

Adequate Slope Protection to Protect Against Surface Erosion, Wave Action, and Adverse Effects of Sudden Drawdown

The levees have adequate slope protection against surface erosion, wave action, and adverse effects of a sudden drawdown. The levees have a minimum three-foot thick layer of clay on the interior, exterior, and crest of the levee. Vegetation is adequate on the top of the levee where it may be exposed to the elements. As part of Cleco's operational plan, they inspect the levees weekly for any erosion due to weather, animals, or other elements and promptly correct any deficiencies.

Dikes Mechanically Compacted to a Density Sufficient to Withstand the Range of Loading Conditions in the CCR Unit

The dikes were mechanically compacted to a density sufficient to withstand the range of loading conditions for the daily operation of the unit.

A Single Spillway or a Combination of Spillways Designed, Operated, and Maintained to Adequately Manage Flow During a 100-Year Flood for a Low Hazard Potential CCR Surface Impoundment

Ash Basin No. 2 captures and retains rainfall runoff from drainage areas upstream of the basin dike. Ash Basin No. 2 is provided with a weir box and an auxiliary

spillway. Normally, runoff from the drainage area of Ash Basin No. 2 is captured in the basin, mixed with sluice water, and drained at a slow rate via the weir box. Because the drainage area of the Ash Basin No. 2 is large, an auxiliary spillway is provided for the basin to protect against overflow of the dikes during a period of high runoff when the basin has ash at the high ash elevation level. The crest elevation of the auxiliary spillway is set so that overflow of the spillway will not occur for runoffs equal to or less than the 50-year, 24-hour runoff. The spillway is designed to discharge excess rainfall due to a 100-year, 24-hour rainfall event occurring with the basin at a maximum operating water level. The elevation of the top of the dike for the Ash Basin No. 2 was selected to provide 2 feet of interior freeboard above the maximum 100-year rainfall event water level.

The clear water that is discharged is pumped back or recirculated to the plant by the ash recirculation pumps and used again to sluice ash.

The Natural Resource Conservation Service (NRCS) Technical Release-55 (TR-55) rain distribution for a 100-year, 24-hour rain event would cause a precipitation depth of 10.5 inches. Based on the operating water levels and the discharge system in the pond, the facility would adequately manage the rainfall for a 100-year flood event.

Hydraulic Structures Underlying the Base of the CCR Unit or Passing Through the Dike of the CCR Unit That Maintain Structural Integrity and are Free of Significant Deterioration, Deformation, Distortion, Bedding Deficiencies, Sedimentation, And Debris Which May Negatively Affect the Operation of the Hydraulic Structure

As part of the structural evaluation, Providence was asked to determine the presence of any culverts or pipes buried in the levees of the Ash Basin No. 2. Based on the survey of the pond levees, several site inspections, review of solid waste permit files, and discussions with Cleco personnel, Providence determined that the following culverts/pipes exist within the levees surrounding the Ash Basin No. 2:

- 36” corrugated metal pipe that drains the Ash Basin No.2.
- 4” carbon steel pipe for the high pressure service water line was cut and capped at both ends and left in place in several locations along the western levee of Ash Basin No.2.
- 42” concrete pipe located between Ash Basin No.2 and the Secondary Pond. This pipe drains some of the storm water from the wooded area east of the Secondary Pond.
- 12” HDPE Bottom Ash Sump Line was cut and left in place in several locations along the western levee of Ash Basin No.2 along the crest. The HDPE pipe was capped off and replaced with a steel pipe above ground.

The 42” concrete pipe located between Ash Basin No. 2 and the Secondary Pond intercepts storm water from the wooded area east of the Secondary Pond and

routes it to a ditch west of the Ash Basin No. 2 which drains offsite. This pipe is completely embedded in the levee separating the Ash Basin No. 2 and the Secondary Pond. This concrete pipe does not traverse under the Ash Basin No. 2 or the Secondary Pond. This pipe is in a stable setting of compacted fill so movement or failure is highly unlikely, but if a failure were to occur, it poses minimal risks to Cleco based on the elevation of the pipe in the levee in relation to the elevation of the bottom of Ash Basin No. 2. Providence subcontracted to Compliance Envirosystems (CES) to place a camera within the total length of the concrete pipe to examine the integrity of the pipe. CES placed the camera in the concrete pipe on September 15, 2016 and the pipe was in satisfactory condition for the entire length of the pipe.

There are no risks for offsite impacts associated with the other pipes mentioned above with the exception of the 42" concrete pipe and those risks are minimal.

For CCR Units with Downstream Slopes Which Can Be Inundated by the Pool of an Adjacent Water Body, such as a River, Stream, or Lake, Downstream Slopes that Maintain Structural Stability During Low Pool of the Adjacent Water Body or Sudden Drawdown of the Adjacent Water Body

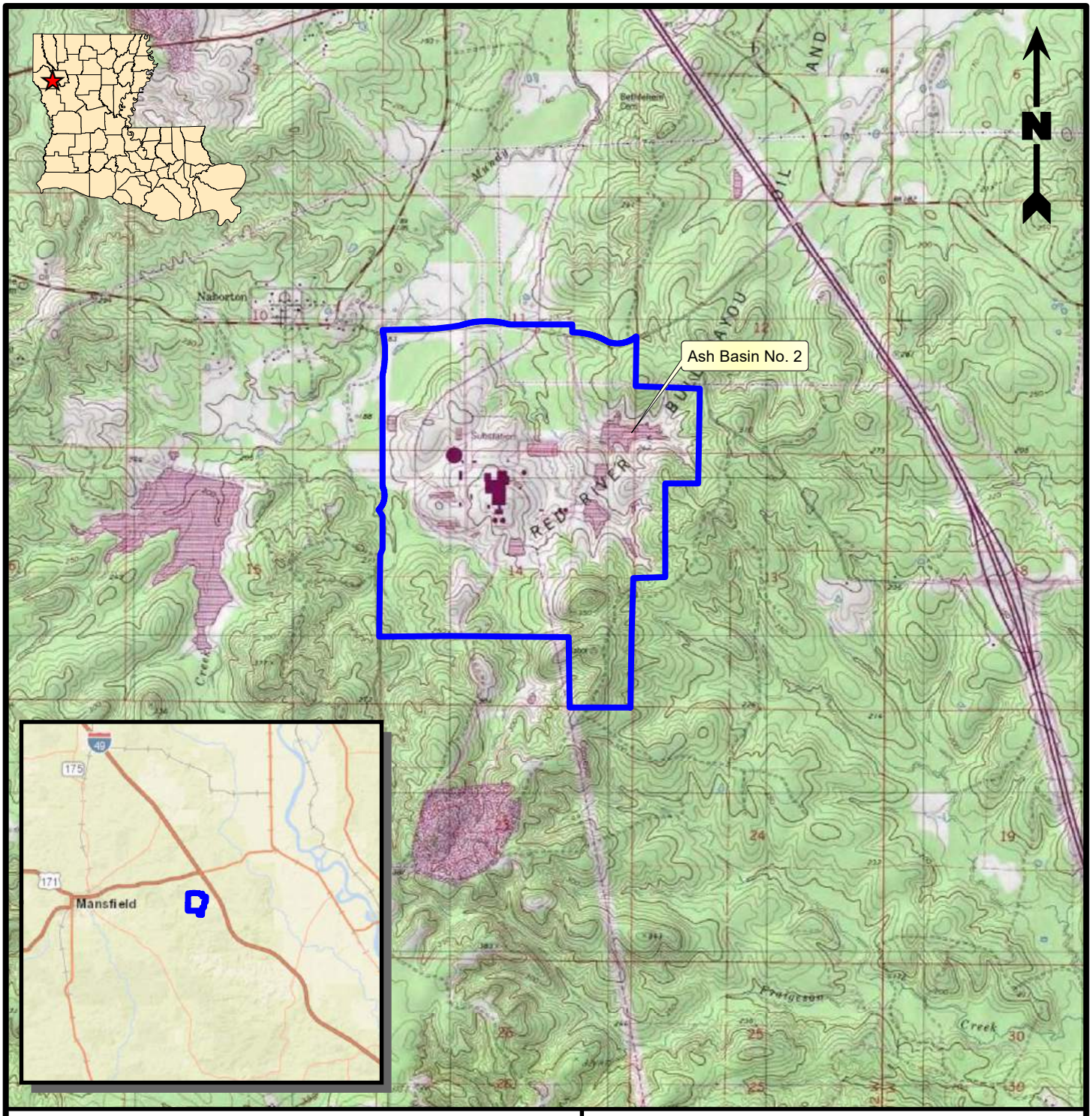
The levees do not get inundated by surface waters from adjacent features.

3.0 CONCLUSION

Based on the results from the structural stability assessment, Ash Basin No. 2's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. Ash Basin No. 2 meets the requirements at 257.73(d)(1) of the CCR regulations. **Appendix A** contains a P.E. Certification that attests to this assessment.

FIGURE 1

SITE LOCATION MAP



2,000 1,000 0 2,000 4,000 Feet

Legend

Facility Boundary

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "Lena, LA", "Boyce, LA", "Jericho, LA", and "Gardner, LA".

Site Location Map

Structural Stability Assessment - Ash Basin No. 2
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number: 002-185

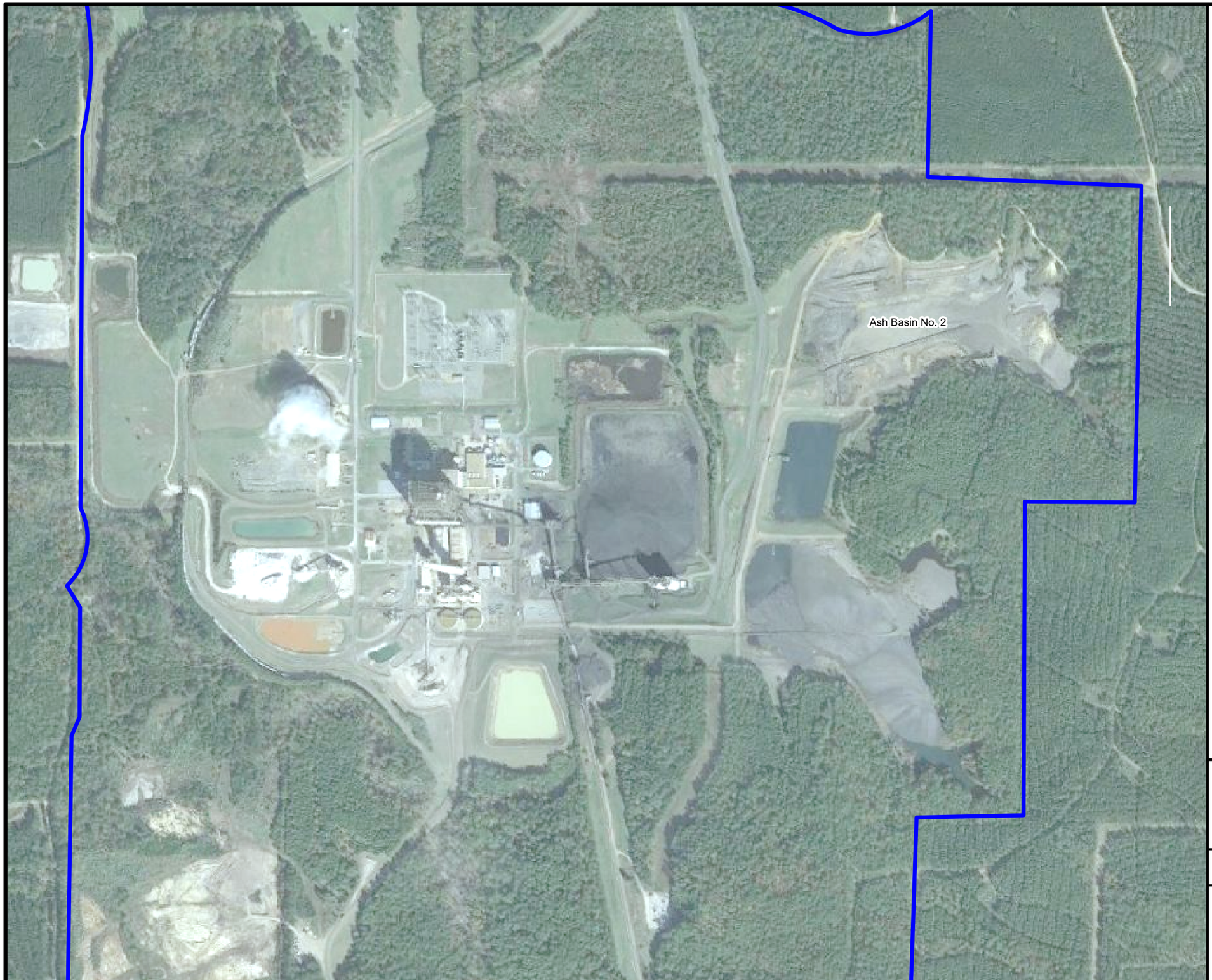
Drawing Number: 002-185-A024

1 Figure

Providence Engineering and Environmental Group LLC

FIGURE 2

SITE MAP



N

Legend

Facility Boundary

Reference

Base map comprised of Google Earth aerial imagery from 11/06/12.

600 300 0 600
Feet

Site Map

Structural Stability Assessment - Ash Basin No. 2
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number 002-185

Drawing Number 002-185-B025

2
Figure

APPENDIX A

P.E. CERTIFICATION

CLECO DOLET HILLS POWER STATION
ASH BASIN NO. 2
CCR STRUCTURAL STABILITY ASSESSMENT

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I have performed a structural stability assessment for Cleco's Dolet Hills Power Station Ash Basin No. 2 in accordance with the 40 CFR 257.73(d)(1) CCR requirements. This structural stability assessment has determined that Ash Basin No. 2's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. It has been designed, constructed, operated, and maintained with:

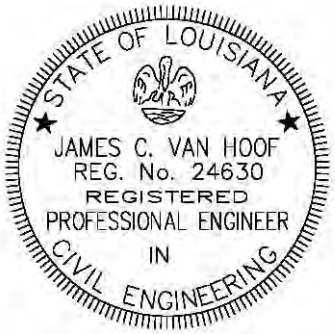
- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- A single spillway or a combination of spillways designed, operated, and maintained to adequately manage rainfall during a 100-year flood for a low hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

James C. Van Hoof
Name

24630 **LA**
Registration No. State

James C. Van Hoof, P.E.
Signature

10/16/2016
Date



(Seal)

APPENDIX H

ASH BASINS 1 AND 2

SAFETY FACTOR ASSESSMENT

OCTOBER 2016

CLECO POWER LLC
DOLET HILLS POWER STATION

SAFETY FACTOR ASSESSMENT:

ASH BASIN No. 1

Prepared By:

Providence Engineering and Environmental Group LLC
1201 Main Street
Baton Rouge, Louisiana 70802

(225) 766-7400

www.providenceeng.com

Project Number 002-185

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1.0 INTRODUCTION

Providence was contracted by Cleco Power LLC (Cleco) to conduct safety factor assessments of Ash Basin No. 1 at Cleco's Dolet Hills Power Station. Recent Coal Combustion Residual (CCR) regulations at 40 CFR 257.73(e)(1) established requirements for owners and operators to conduct safety factor assessments to document whether the calculated factors of safety for the Ash Basin No. 1 achieve the minimum safety factors specified below:

- The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
- The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.
- The calculated seismic factor of safety must equal or exceed 1.00.
- For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

The Cleco Dolet Hills Power Station is located approximately 8 miles southeast of Mansfield, DeSoto Parish, LA. A site location map showing the Dolet Hills Power Station is included as **Figure 1**. This safety factor assessment pertains to Ash Basin No. 1 utilized for the Unit 1 coal-fired generation unit. A site map for Ash Basin No. 1 is included as **Figure 2**.

2.0 FACTORS OF SAFETY

Providence performed a structural stability analysis (slope stability analysis) for the western levee for Ash Basin No. 1. The location of Ash Basin No. 1 is shown in **Figure 2**. This analysis required a review of the original permit and construction drawings for Ash Basin No. 1, a detailed topographic survey of the perimeter levees of Ash Basin No. 1, and installation of borings in the perimeter levees to determine the structural properties of these levees.

Providence mobilized to the Dolet Hills Power Station in March of 2016 to install a geotechnical boring in the perimeter levee of Ash Basin No .1. Geotechnical testing Laboratory, Inc. installed 1 boring in 2016 for Ash Basin No. 1. A soil profile was generated for the section along the Ash Basin that shows the results of the geotechnical boring and the laboratory analysis. Based on the geotechnical results, **Table 1** shows the soil profile for this section and the characteristics used for the slope stability modeling.

Table 1 Subsurface Soil Classification and Parameters

	Soil	Depth (ft)	Unit Wt. (lb/ft^3)	Cohesion (lb/ft^2)	Friction Angle(Φ)
Ash Basin No. 1 Section 1 B-1	**CL-CH**	22.0	109	1,000	-
	CH	11.0	109	730	-
	CH	5.0	111	1,000	-
	CL-CH	22.0	115	1,200	-

The slope stability analysis uses the strength of the soil material of which the levee is made of and subgrade to assess levee stability in accordance to the existing conditions. The Spencer Method for slope stability was used since it is the most conservative approach. The Spencer Method is a general method of slices developed on the basis of limit equilibrium. It requires satisfying equilibrium of forces and moments acting on individual blocks. The blocks are created by dividing the soil above the slip surface by dividing planes. Deep failure analysis evaluates the potential of the levees to fail through the bottom of the levees into the existing native soils. The analysis was based upon the following assumptions and input parameters.

- The subgrade stratigraphy was modeled using soil profile from the completed soil boring at the site with the soil profile condition at this section for this pond through the levee system. (**Table 1**).
- The height and exterior slope of the levee was determined based on actual field surveys and previously permitted design data and the bottom elevation and the interior slope of the levee below the water line was determined based on the previously permitted design provided by Cleco.
- The input parameters used in our analyses were based upon results from geotechnical investigations conducted for this slope stability analysis. **Appendix A** includes a copy of the geotechnical results as provided by the geotechnical contractor.
- The fill material in the pond was assumed to be water for Ash Basin No. 1. Maximum water elevation in Ash Basin No. 1 is 251.5 feet NAVD 88.

The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50

Providence modeled Ash Basin No. 1 under the long-term, maximum storage to the freeboard level for the surface impoundment. Based on the results of the slope stability analysis, the following minimum factor of safety was obtained:

Table 2 Long-Term Factor of Safety

Surface Impoundment	Section Number	Soil Boring No.	Maximum Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 1	Section 2	B-5 and B-6	242.5	Spencer Method Circular Failure	1.59

The calculated long-term static factor of safety under maximum storage pool loading conditions is greater than 1.50, therefore this safety factor is adequate.

Results of the long-term slope stability analysis and model input parameters can be found in **Appendix A**.

The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40

Providence modeled the ponds using a short-term scenario where the facility allows the pond to fill to the freeboard level for Ash Basin No. 1 surface impoundment. This scenario represents the flood/heavy rainfall conditions. The new elevation was determined using 2.5 feet of freeboard from the lowest levee crown elevation for each pond.

Based on the results of the short-term slope stability analysis, the following minimum factor of safety was obtained:

Table 3 Short-Term Factor of Safety

Surface Impoundment	Section Number	Soil Boring No.	Maximum Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 1	Section 1	B-1	251.5	Spencer Method Circular Failure	2.78

The calculated short-term static factor of safety under maximum surcharge pool loading conditions is greater than 1.40, therefore this safety factor is adequate.

Results of the short-term slope stability analysis and model input parameters can be found in **Appendix A**.

The calculated seismic factor of safety must equal or exceed 1.00

The Dolet Hills Power Station is not located in a seismic area. The Louisiana Geological Survey and the United States Geological Survey classifies the entire state of Louisiana as a low seismic risk area. This low seismic risk classification

denotes that the levels of horizontal shaking that have a 2 in 100 chance of being exceed in in a 50-year period range from 0-8% g where g is the acceleration of a falling object due to gravity. The nearest published fault system to the Dolet Hills Power Station is approximately 26 miles away. Therefore, the calculated seismic factor of safety is not applicable to Ash Basin No. 1.

For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.2

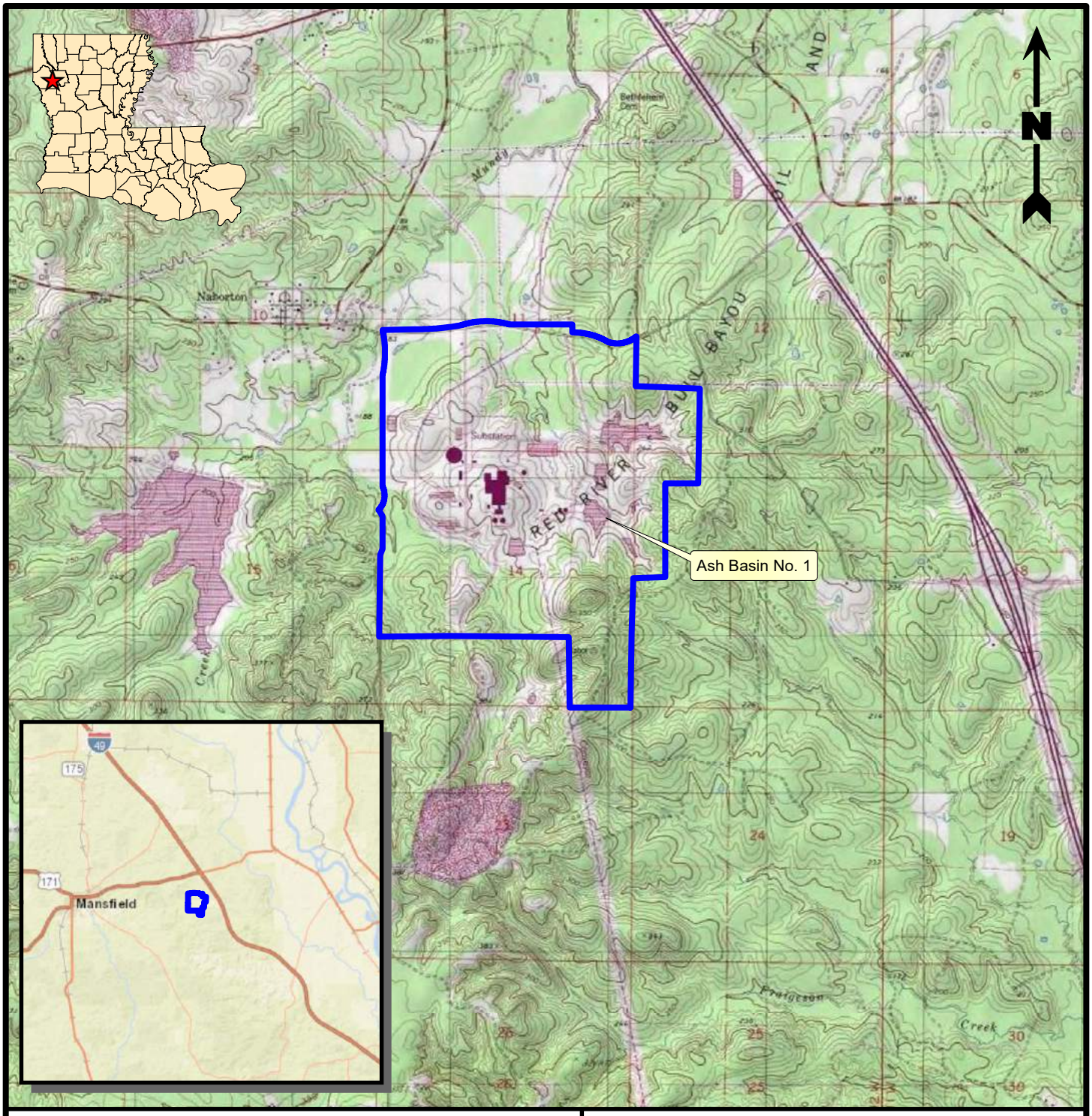
The clay soils found in the Ash Basin No. 1 levees are not subject to liquefaction.

3.0 CONCLUSIONS

Based on the results from the safety factor analysis, the existing levee design for Ash Basin No. 1 achieves the minimum safety factor requirements of the 40 CFR 257.73(e)(1) CCR regulations. Results of the safety factor analysis and model input parameters can be found in **Appendix A**. **Appendix B** contains a P.E. Certification that attests to the safety factor assessment.

FIGURE 1

SITE LOCATION MAP



3,000 1,500 0 3,000 Feet

Legend

Facility Boundary

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "Lena, LA", "Boyce, LA", "Jericho, LA", and "Gardner, LA".

Site Location Map

Safety Factor Assessment - Ash Basin No. 1
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

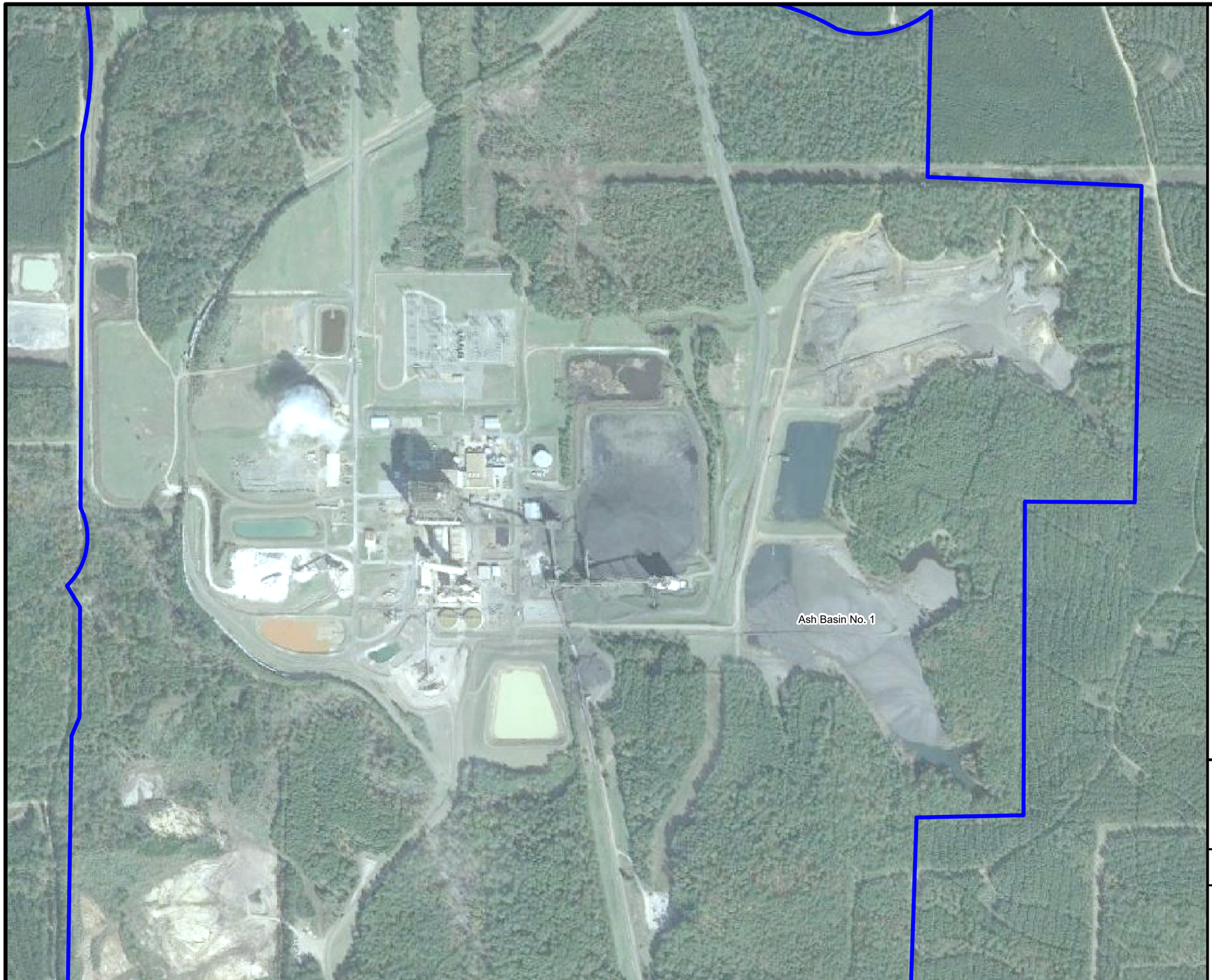
PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number	002-185
Drawing Number	002-185-A018
1	Figure

FIGURE 2

SITE MAP



N

Legend

Facility Boundary

Reference

Base map comprised of Google Earth aerial imagery from 11/06/12.

600 300 0 600
Feet

Site Map

Safety Factor Assessment - Ash Basin No. 1
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number 002-185

Drawing Number 002-185-B019

2
Figure

APPENDIX A

SLOPE STABILITY ANALYSIS

APS Engineering and Testing

October 16, 2016

PROVIDENCE
1201 Main Street
Baton Rouge, LA 70802

Attn: Mr. Gary Leonards, P.E.

Re: Slope Stability Analysis of Ash Basin 1
Cleco Dolet Hills Power Station
Mansfield, Louisiana

Dear Mr. Leonards:

APS Engineering and Testing, LLC has completed slope stability analysis of Ash Basin 1 located at Cleco Dolet Hills Power Station in Mansfield, Louisiana. Authorization to proceed with this work was received from **Mr. Gary Leonards** via email on July 18, 2016. Our analysis was performed based on the soil boring log data provided by the client. Our scope of services included performing landside stability of the existing levee with maximum ash slurry elevation, as requested by the client. This report provides the stability analysis results of Ash Basin 1.

Background

Ash Basin 1 at the Dolet Hills Power Station was constructed in 1984. The facility went into operation in 1985 when the coal fired boiler system (Unit #1) came on line. The bottom ash is sluiced to Ash Basin 1. The Ash Basin 1 is an existing unit that is essential component for the management of solid residuals generated at the Dolet Hills Power Station.

TABLE 1.0

Levee at	Soil boring data used*	Boring Depth (Feet)	Average Top of Levee Elevation (feet, NAVD88)	Max Ash Slurry Elevation (feet, NAVD88)
Ash Basin -1	B-1	60	254.0	251.5

*This data was obtained from Report No.: 03-16-039 prepared by Geotechnical Testing Laboratory (GTL), Inc.,

Ash Slurry Properties

Cohesion (psf)	20 (assumed)
Unit Weight (pcf)	75.0 (provided by client)

Assumptions and Observations:

- Soil layers are horizontal with uniform thickness.
- Soil layers encountered in Levee Centerline boring were used for the analysis.
- Cross section profiles were extended horizontally on the land side, whenever the failure plane passes the limits.

Slope Stability Analysis Results

Slope stability analysis was performed using Spencer method for both short term and long term conditions as requested by the client. Changes in slopes, structural loadings, and other conditions may affect the results of slope stability analysis. Factors of safety (FoS) obtained from slope stability analysis results do meet 1.50 according to HSDRRS guidelines for steady water level conditions.

TABLE 2.0

Soil Type	Phi	Cohesion (psf)
Silt (ML)	28°	0
Clay (CL/CH)	28°	0
Sand (SP / SM)	37°	0

TABLE 3.0

Stability Check	Flood Side Slurry Elevation	Condition	Factor of Safety	Recommended FoS
Ash Basin-1	251.5	Short Term	2.68	1.50
Ash Basin-1	251.5	Long Term	1.59	1.50

Based on the results presented in the above table, Ash Basin 1 meets minimum required factor of safety for both short term and long term conditions with the projected maximum Ash Slurry Elevations. This is based on the soil boring data provided by the client.

Liquefaction

The clay soils present at the project site are not susceptible to liquefaction.

If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,
APS ENGINERING AND TESTING, LLC

Sairam Eddanapudi, P.E.
Project Manager

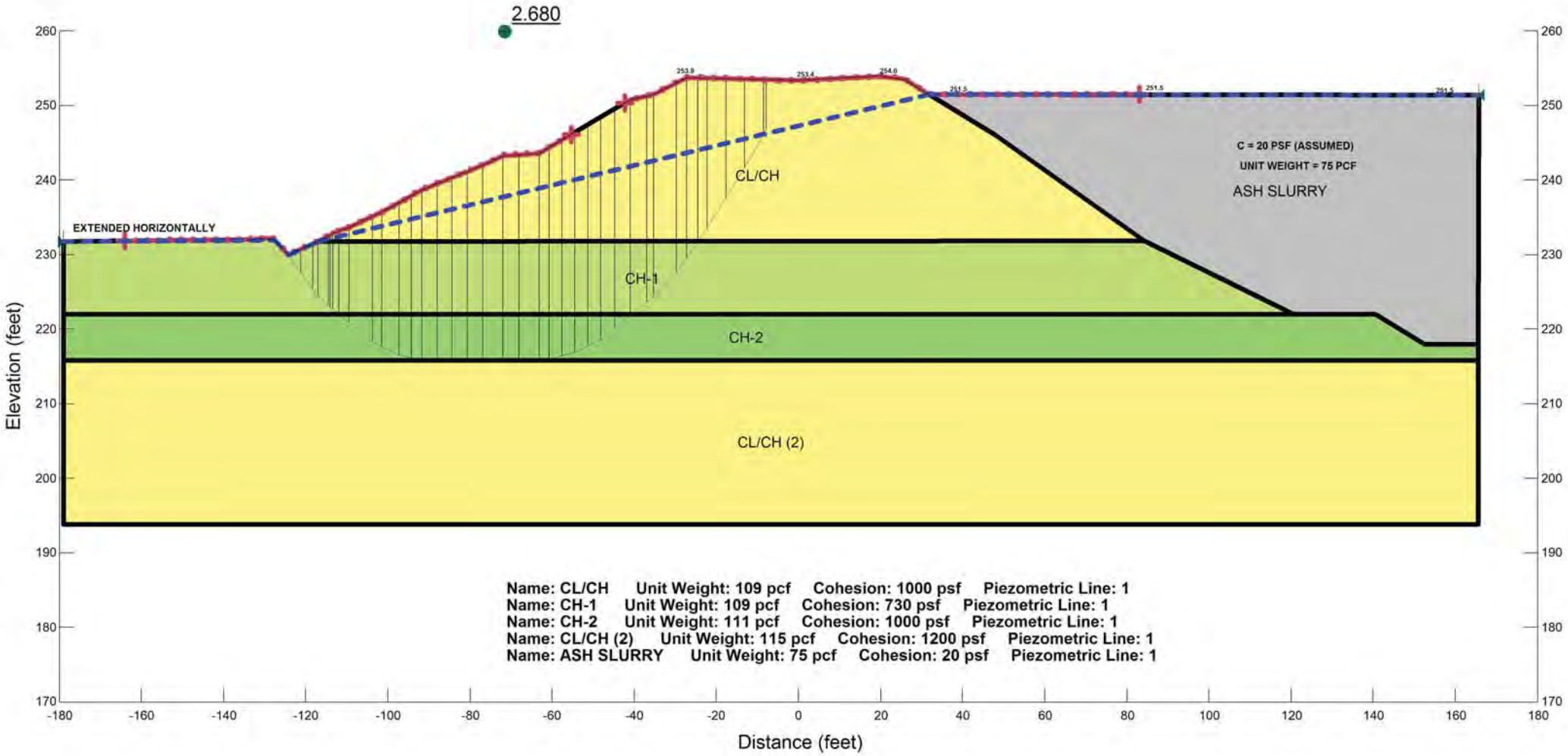
Sergio Aviles, P.E.
President

Attachments

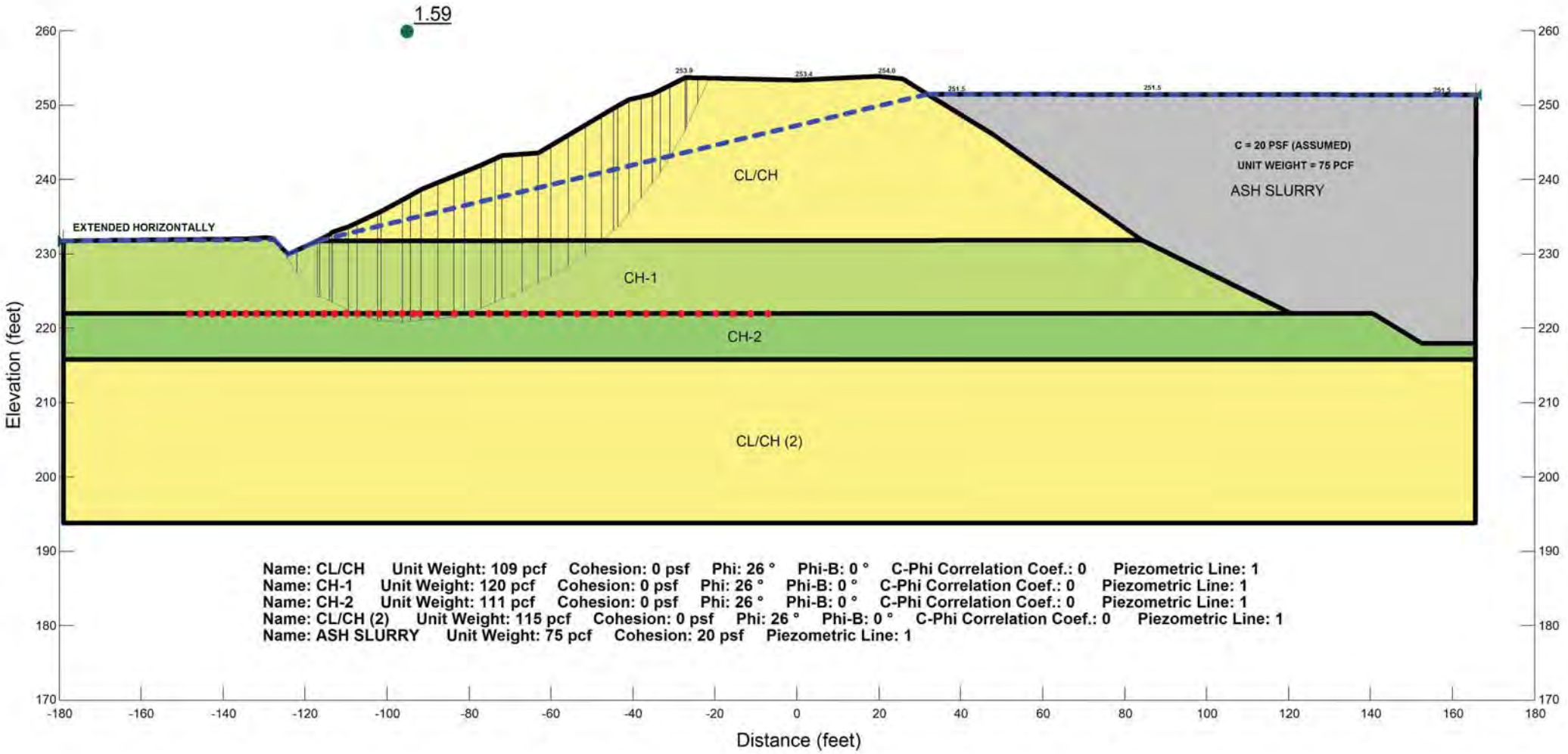
Boring Location Plan
Slope Stability Analysis Results

ASH BASIN 1

CLECO DOLET HILLS POWER STATION
ASH BASIN 1
SHORT TERM SLOPE STABILITY ANALYSIS
SOIL BORING B-1 DATA (FROM GTL REPORT NO.: 03-16-039)



CLECO DOLET HILLS POWER STATION
ASH BASIN 1
LONG TERM SLOPE STABILITY ANALYSIS (S-CASE)
SOIL BORING B-1 DATA (FROM GTL REPORT NO.: 03-16-039)



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Name: CH-2 Unit Weight: 111 pcf Cohesion: 0 psf Phi: 26 ° Phi-B: 0 ° C-Phi Correlation Coef.: 0 Piezometric Line: 1
Name: CL/CH (2) Unit Weight: 115 pcf Cohesion: 0 psf Phi: 26 ° Phi-B: 0 ° C-Phi Correlation Coef.: 0 Piezometric Line: 1
Name: ASH SLURRY Unit Weight: 75 pcf Cohesion: 20 psf Piezometric Line: 1

APPENDIX B

P.E. CERTIFICATION

CLECO BRAME ENERGY CENTER
ASH BASIN NO. 1
CCR SAFETY FACTOR ASSESSMENT

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I have performed a safety factor assessment for Cleco's Dolet Hills Power Station Ash Basin No. 1 in accordance with the 40 CFR 257.73(e)(1) CCR requirements. This safety factor assessment has determined that Ash Basin No. 1 has met the following requirements:

- The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
- The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

And that these requirements were not applicable based on the findings:

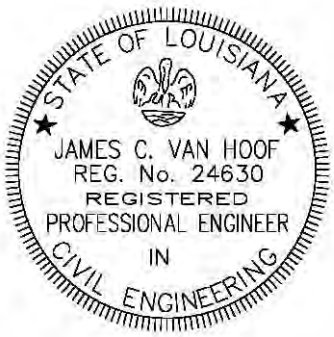
- The calculated seismic factor of safety must equal or exceed 1.00.
- For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

James C. Van Hoof
Name

24630 **LA**
Registration No. State

James C. Van Hoof, P.E.
Signature

10/17/2016
Date



(Seal)

OCTOBER 2016

CLECO POWER LLC
DOLET HILLS POWER STATION

SAFETY FACTOR ASSESSMENT:

ASH BASIN No. 2

Prepared By:

Providence Engineering and Environmental Group LLC
1201 Main Street
Baton Rouge, Louisiana 70802

(225) 766-7400

www.providenceeng.com

Project Number 002-185

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1.0 INTRODUCTION

Providence was contracted by Cleco Power LLC (Cleco) to conduct safety factor assessments of Ash Basin No. 2 at Cleco's Dolet Hills Power Station. Recent Coal Combustion Residual (CCR) regulations established requirements for owners and operators to conduct safety factor assessments to document whether the calculated factors of safety for the Fly Ash Pond achieve the minimum safety factors specified below:

- The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
- The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.
- The calculated seismic factor of safety must equal or exceed 1.00.
- For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

The Cleco Dolet Hills Power Station is located approximately 8 miles southeast of Mansfield, DeSoto Parish, LA. A site location map showing the Dolet Hills Power Station is included as **Figure 1**. This safety factor assessment pertains to Ash Basin No. 2 utilized for the Unit 1 coal-fired generation unit. A site map for Ash Basin No. 2 is included as **Figure 2**.

2.0 FACTORS OF SAFETY

Providence performed a structural stability analysis (slope stability analysis) for the western levee for Ash Basin No. 2. The location of the Ash Basin No. 2 is shown in **Figure 2**. This analysis required a review of the original permit and construction drawings for the Ash Basin No. 2, a detailed topographic survey of the perimeter levees of Ash Basin No. 2, and installation of borings in the perimeter levees to determine the structural properties of these levees.

Providence mobilized to the Dolet Hills Power Station in March of 2016 to install geotechnical borings in the perimeter levees of the Ash Basin No. 2. Geotechnical testing Laboratory, Inc. installed 2 borings in 2016 for Ash Basin No. 2 spaced according to data that needed to be acquired. Soil profiles were generated for sections along the Ash Basin that shows the results of the geotechnical borings and the laboratory analysis. Based on the geotechnical results, **Table 1** shows the soil profiles for each section and the characteristics used for the slope stability modeling.

Table 1 Subsurface Soil Classification and Parameters

Ash Basin No. 2 Section 2 B-5 and B-6	Soil	Depth (ft)	Unit Wt. (lb/ft^3)	Cohesion (lb/ft^2)	Friction Angle(Φ)
	CL-CH	18.0	112	940	-
	CL	15.0	120	1,000	-
	CL-CH	27.0	118	2,000	-

The slope stability analysis uses the strength of the soil material of which the levee is made of and subgrade to assess levee stability in accordance to the existing conditions. The Spencer Method for slope stability was used since it is the most conservative approach. The Spencer method is a general method of slices developed on the basis of limit equilibrium. It requires satisfying equilibrium of forces and moments acting on individual blocks. The blocks are created by dividing the soil above the slip surface by dividing planes. Deep failure analysis evaluates the potential of the levees to fail through the bottom of the levees into the existing native soils. The analysis was based upon the following assumptions and input parameters.

- The subgrade stratigraphy was modeled using soil profiles from completed soil borings at the site with the soil profile condition at each section for the pond through the levee system. (**Table 1**).
- The height and exterior slope of the levees were determined based on actual field surveys and previously permitted design data and the bottom elevation and the interior slope of the levees below the water line was determined based on the previously permitted design provided by Cleco.
- The input parameters used in our analyses were based upon results from geotechnical investigations conducted for this slope stability analysis. **Appendix A** includes a copy of the geotechnical results as provided by the geotechnical contractor.
- The fill material in the pond was assumed to be water for Ash Basin No. 2. Maximum water elevation in Ash Basin No. 2 is 242.5 feet NAVD 88.

The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50

Providence modeled Ash Basin No. 2 under the long-term, maximum storage to the freeboard level for the surface impoundment. Based on the results of the slope stability analysis, the following minimum factor of safety was obtained:

Table 2 Long-Term Factor of Safety

Surface Impoundment	Section Number	Soil Boring No.	Maximum Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 2	Section 2	B-5 and B-6	242.5	Spencer Method Circular Failure	1.53

The calculated long-term static factor of safety under maximum storage pool loading conditions is greater than 1.50, therefore this safety factor is adequate.

Results of the long-term slope stability analysis and model input parameters can be found in **Appendix A**.

The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40

Providence modeled the ponds using a scenario where the facility allows the pond to fill to the freeboard level for Ash Basin No. 2 surface impoundment. This scenario represents the flood/heavy rainfall conditions. The new elevation was determined using 2.5 feet of freeboard from the lowest levee crown elevation for the pond.

Based on the results of the slope stability analysis, the following minimum factors of safety were obtained:

Table 3 Short-Term Factor of Safety

Surface Impoundment	Section Number	Soil Boring No.	Maximum Water Elevation (feet NAVD 88)	Analysis	Factor of Safety
Ash Basin No. 2	Section 2	B-5 and B-6	242.5	Spencer Method Circular Failure	2.74

The calculated short-term static factor of safety under maximum surcharge pool loading conditions is greater than 1.40, therefore this safety factor is adequate.

Results of the short-term slope stability analysis and model input parameters can be found in **Appendix A**.

The calculated seismic factor of safety must equal or exceed 1.00

The Dolet Hills Power Station is not located in a seismic area. The Louisiana Geological Survey and the United States Geological Survey classifies the entire state of Louisiana as a low seismic risk area. This low seismic risk classification

denotes that the levels of horizontal shaking that have a 2 in 100 chance of being exceed in in a 50-year period range from 0-8% g where g is the acceleration of a falling object due to gravity. The nearest published fault system to the Dolet Hills Power Station is approximately 26 miles away. Therefore, the calculated seismic factor of safety is not applicable to Ash Basin No. 2.

For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.2

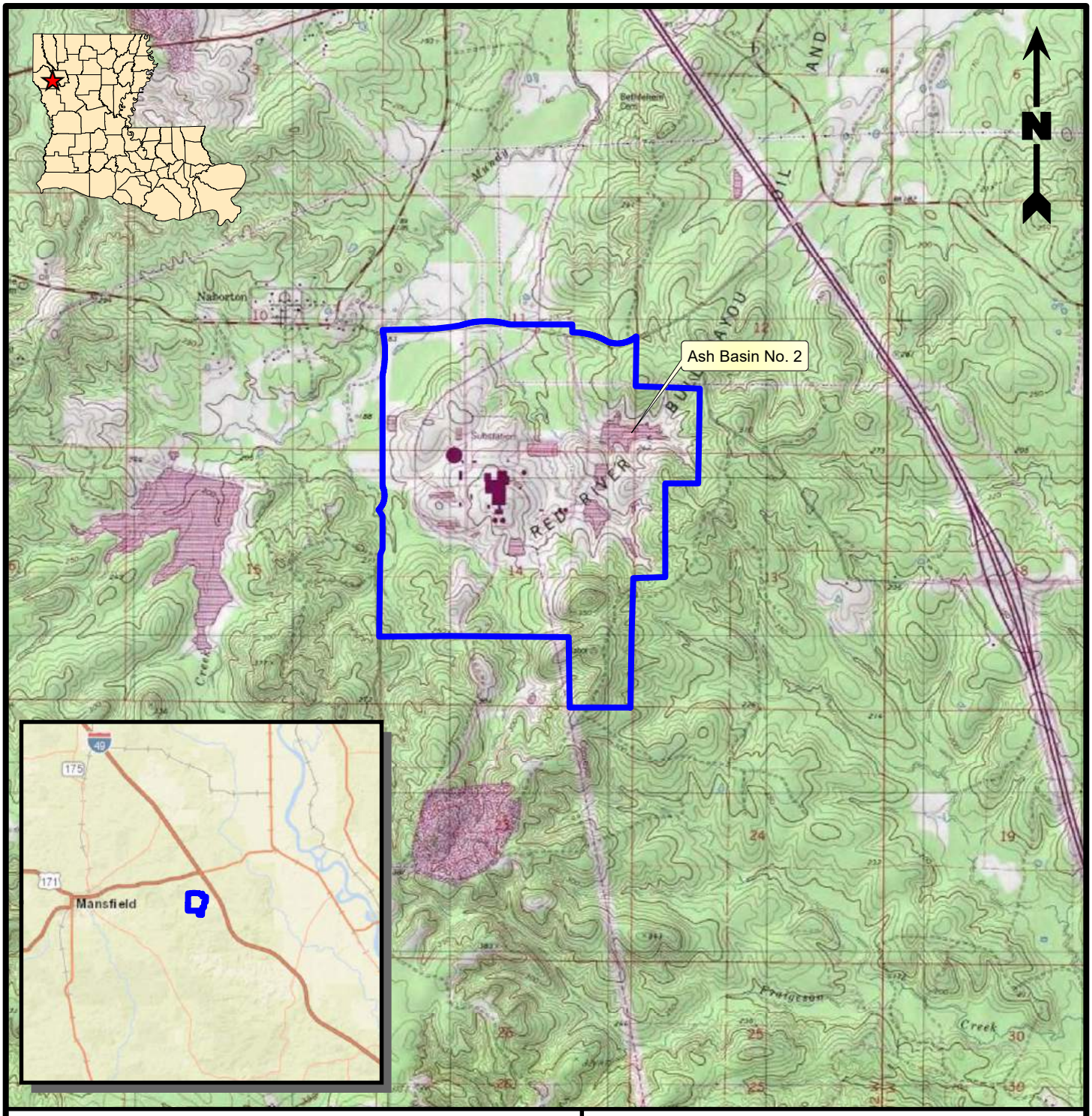
The clay soils found in the Ash Basin No. 2 levees are not subject to liquefaction.

3.0 CONCLUSIONS

Based on the results from the safety factor analysis, the existing levee design for Ash Basin No. 2 achieves the minimum safety factor requirements of the 40 CFR 257.73(e)(1) CCR regulations. Results of the safety factor analysis and model input parameters can be found in **Appendix A**. **Appendix B** contains a P.E. Certification that attests to the safety factor assessment.

FIGURE 1

SITE LOCATION MAP



2,000 1,000 0 2,000 4,000 Feet

Legend

Facility Boundary

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "Lena, LA", "Boyce, LA", "Jericho, LA", and "Gardner, LA".

Site Location Map

Safety Factor Assessment - Ash Basin No. 2
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

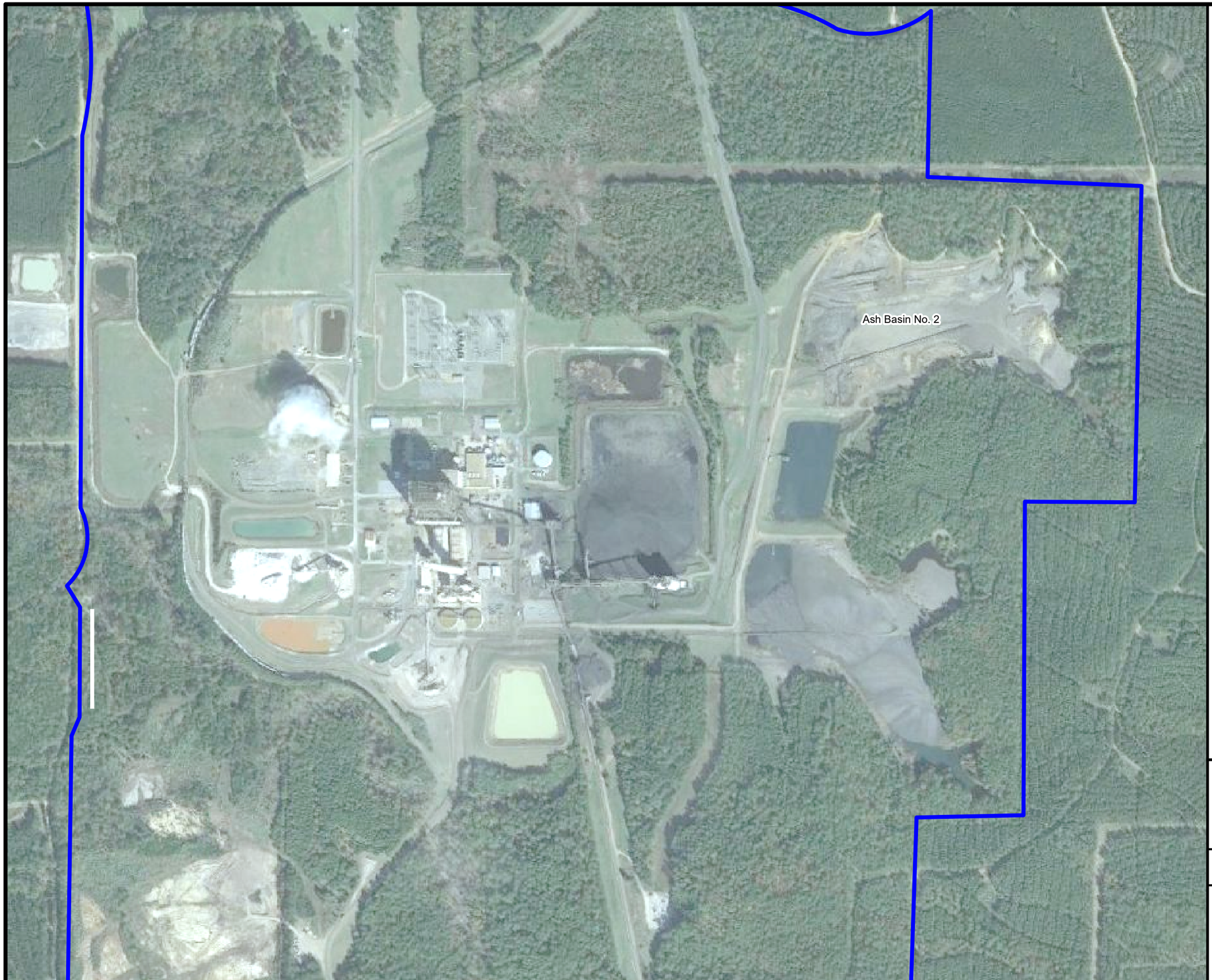
PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number	002-185
Drawing Number	002-185-A020
1	Figure

FIGURE 2

SITE MAP



N

Legend

Facility Boundary

Reference

Base map comprised of Google Earth aerial imagery from 11/06/12.

600 300 0 600
Feet

Site Map

Safety Factor Assessment - Ash Basin No. 2
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMM	10/04/16
Checked By	LMH	10/04/16
Approved By	CVH	10/04/16

Project Number 002-185

Drawing Number 002-185-B021

2
Figure

APPENDIX A

SLOPE STABILITY ANALYSIS

APS Engineering and Testing

October 16, 2016

PROVIDENCE
1201 Main Street
Baton Rouge, LA 70802

Attn: Mr. Gary Leonards, P.E.

Re: Slope Stability Analysis of Ash Basin 2
Cleco Dolet Hills Power Station
Mansfield, Louisiana

Dear Mr. Leonards:

APS Engineering and Testing, LLC has completed slope stability analysis of Ash Basin 2 located at Cleco Dolet Hills Powesr Station in Mansfield, Louisiana. Authorization to proceed with this work was received from **Mr. Gary Leonards** via email on July 18, 2016. Our analysis was performed based on the soil boring log data provided by the client. Our scope of services included performing landside stability of the existing levee with maximum ash slurry elevation, as requested by the client. This report provides the stability analysis results of Ash Basin 2.

Background

Ash Basin 2 at the Dolet Hills Power Station was constructed in 1984. The facility went into operation in 1985 when the coal fired boiler system (Unit #1) came on line. The bottom ash is sluiced to Ash Basin 2. Ash Basin 2 is an existing unit that is essential component for the management of solid residuals generated at the Dolet Hills Power Station.

TABLE 1.0

Levee at	Soil boring data used*	Boring Depth (Feet)	Average Top of Levee Elevation (feet, NAVD88)	Max Ash Slurry Elevation (feet, NAVD88)
Ash Basin-2	B-5 & B-6	60	245.0	242.5

*This data was obtained from Report No.: 03-16-039 prepared by Geotechnical Testing Laboratory (GTL), Inc.,

Ash Slurry Properties

Cohesion (psf)	20 (assumed)
Unit Weight (pcf)	75.0 (provided by client)

Assumptions and Observations:

- Soil layers are horizontal with uniform thickness.
- Soil layers encountered in Levee Centerline boring were used for the analysis.
- Cross section profiles were extended horizontally on the land side, whenever the failure plane passes the limits.

Slope Stability Analysis Results

Slope stability analysis was performed using Spencer method for both short term and long term conditions as requested by the client. Changes in slopes, structural loadings, and other conditions may affect the results of slope stability analysis. Factors of safety (FoS) obtained from slope stability analysis results do meet 1.50 according to HSDRRS guidelines for steady water level conditions.

TABLE 2.0

Soil Type	Phi	Cohesion (psf)
Silt (ML)	28°	0
Clay (CL/CH)	23°	0
Sand (SP / SM)	33° - 37°	0

TABLE 3.0

Stability Check	Flood Side Slurry Elevation (feet, NAVD88)	Condition	Factor of Safety	Recommended FoS
Ash Basin-2	242.5	Short Term	2.64	1.50
Ash Basin 2	242.5	Long Term	1.53	1.50

Based on the results presented in the above table, Ash Basin 2 meets minimum required factor of safety for both short term and long term conditions with the projected maximum Ash Slurry Elevations. This is based on the soil boring data provided by the client.

Liquefaction

The clay soils present at the project site are not susceptible to liquefaction.

If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,
APS ENGINEERING AND TESTING, LLC

Sairam Eddanapudi, P.E.
Project Manager

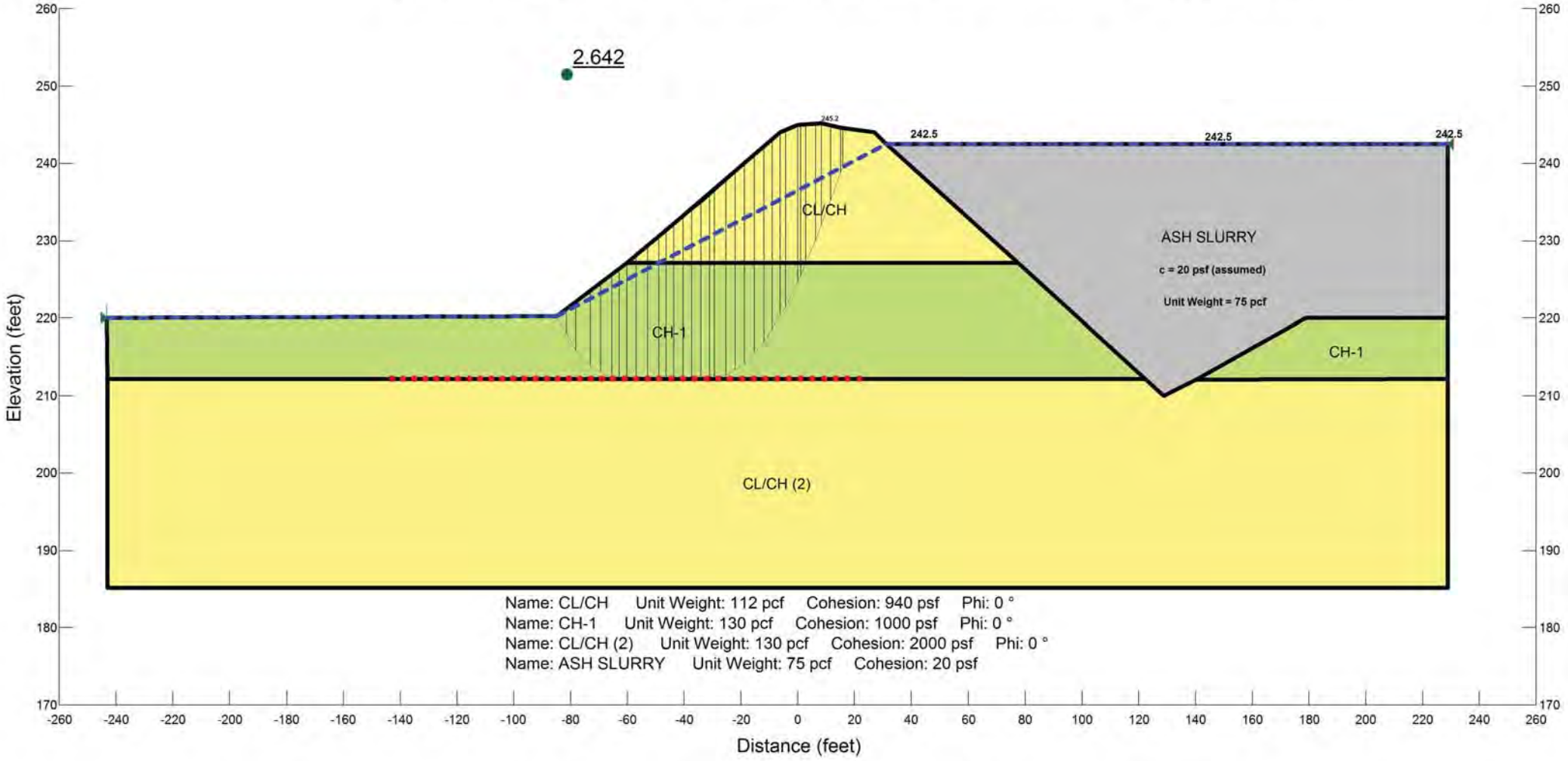
Sergio Aviles, P.E.
President

Attachments

Boring Location Plan
Slope Stability Analysis Results

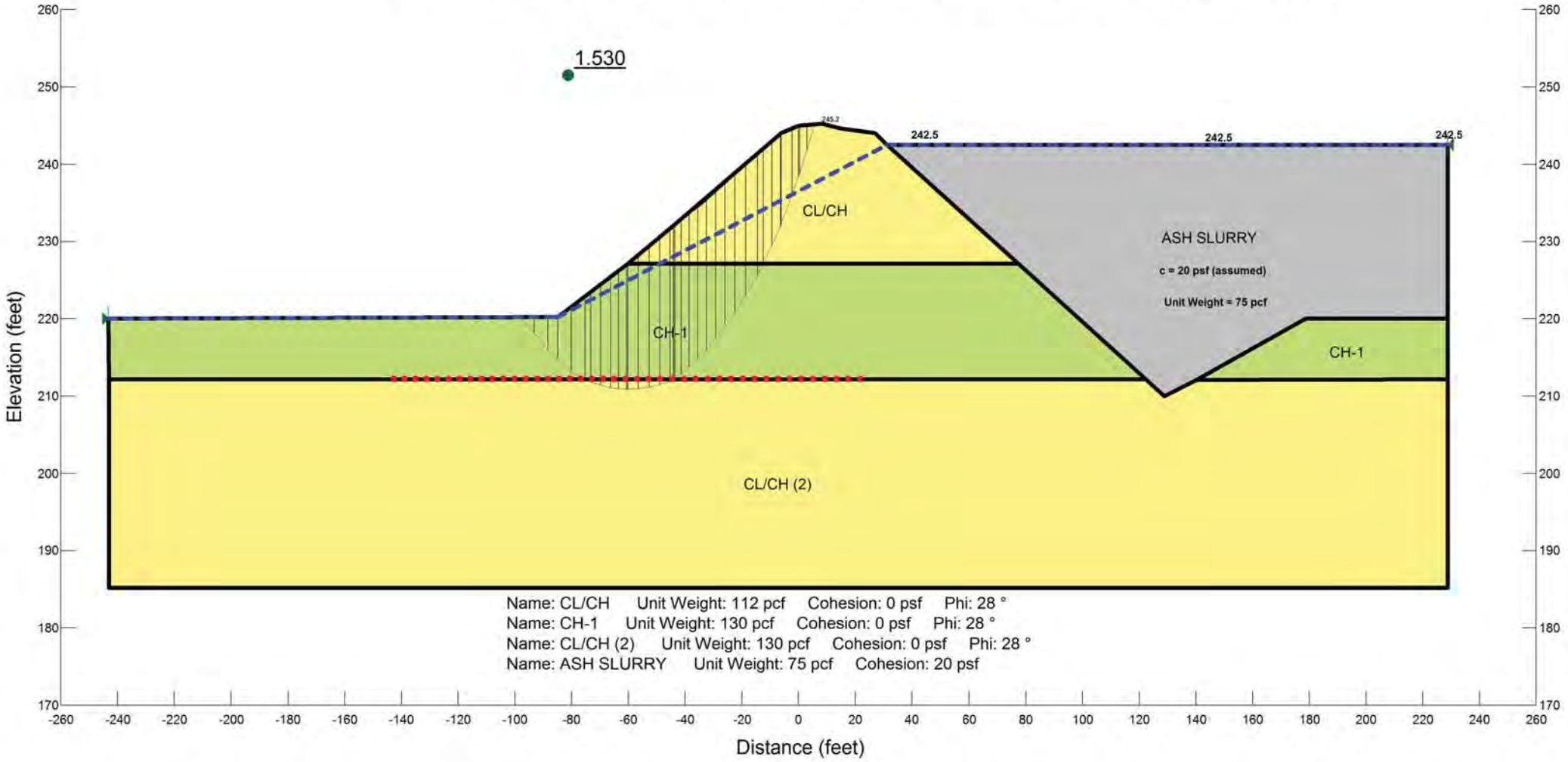
ASH BASIN 2

CLECO DOLET HILLS POWER STATION
ASH BASIN 2
SHORT TERM SLOPE STABILITY ANALYSIS
SOIL BORINGS B-5 & B-6 DATA (FROM GTL REPORT NO.: 03-16-039)



Name: CL/CH Unit Weight: 112 pcf Cohesion: 940 psf Phi: 0 °
Name: CH-1 Unit Weight: 130 pcf Cohesion: 1000 psf Phi: 0 °
Name: CL/CH (2) Unit Weight: 130 pcf Cohesion: 2000 psf Phi: 0 °
Name: ASH SLURRY Unit Weight: 75 pcf Cohesion: 20 psf

CLECO DOLET HILLS POWER STATION
ASH BASIN 2
LONG TERM SLOPE STABILITY ANALYSIS (S-CASE)
SOIL BORINGS B-5 & B-6 DATA (FROM GTL REPORT NO.: 03-16-039)



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Name: CL/CH (2) Unit Weight: 130 pcf Cohesion: 0 psf Phi: 28 °
Name: ASH SLURRY Unit Weight: 75 pcf Cohesion: 20 psf

APPENDIX B

P.E. CERTIFICATION

CLECO BRAME ENERGY CENTER
ASH BASIN NO. 2
CCR SAFETY FACTOR ASSESSMENT

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I have performed a safety factor assessment for Cleco's Dolet Hills Power Station Ash Basin No. 2 in accordance with the 40 CFR 257.73(e)(1) CCR requirements. This safety factor assessment has determined that Ash Basin No. 2 has met the following requirements:

- The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
- The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

And that these requirements were not applicable based on the findings:

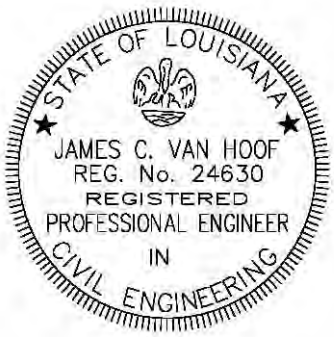
- The calculated seismic factor of safety must equal or exceed 1.00.
- For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

James C. Van Hoof
Name

24630 **LA**
Registration No. State

James C. Van Hoof, P.E.
Signature

10/17/2016
Date

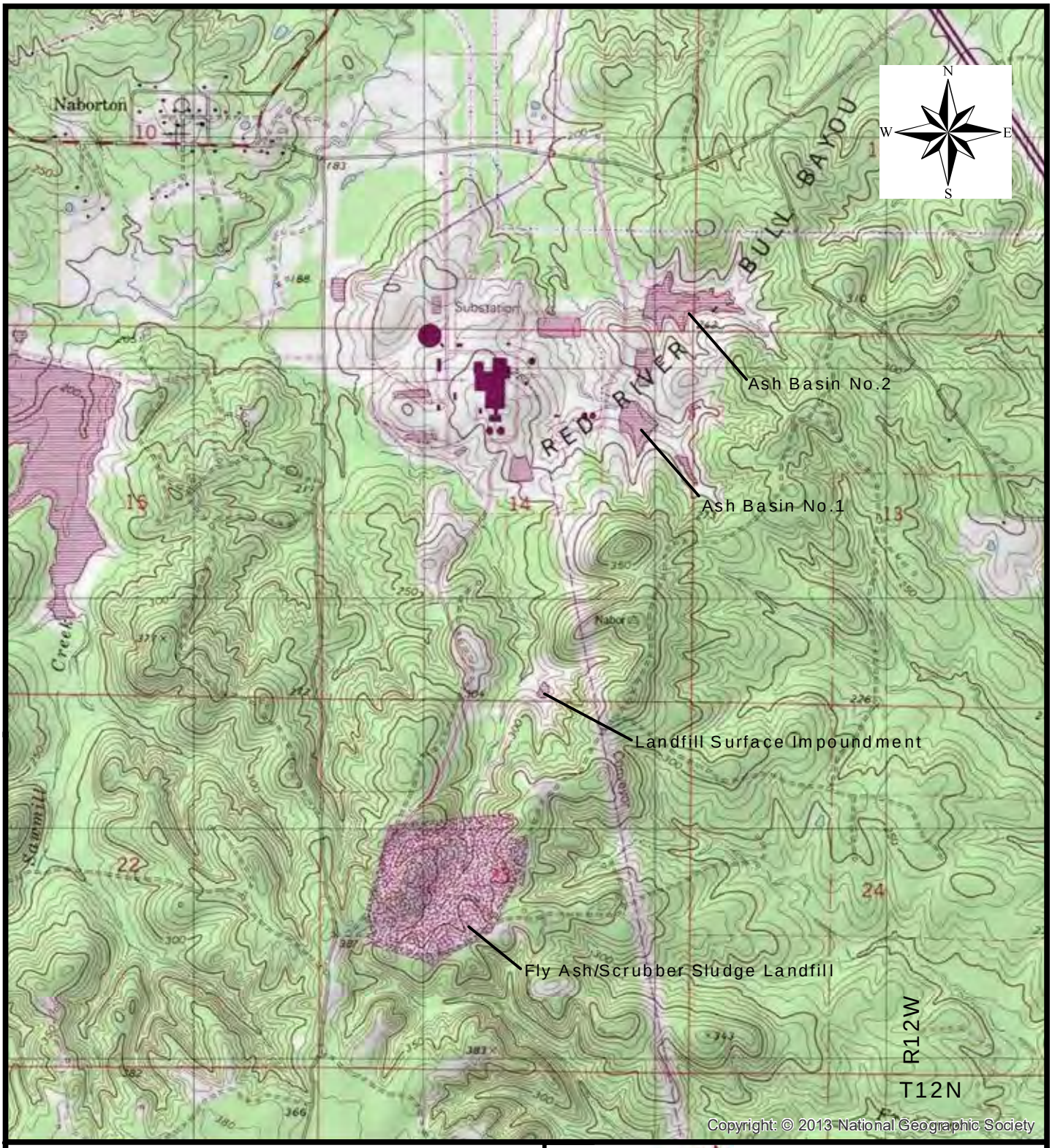


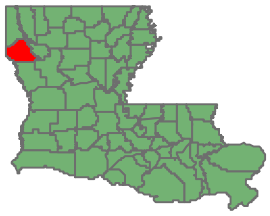
(Seal)

APPENDIX I

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

MONITORING WELL INFORMATION / MONITORING WELL NETWORK CERTIFICATION





0 750 1,500 3,000 4,500 Feet

Note:

U.S.G.S. Quadrangle "Bayou Pierre Lake, LA" at scale 1:24,000

CLECO Corporation

Dolet Hills Power Station

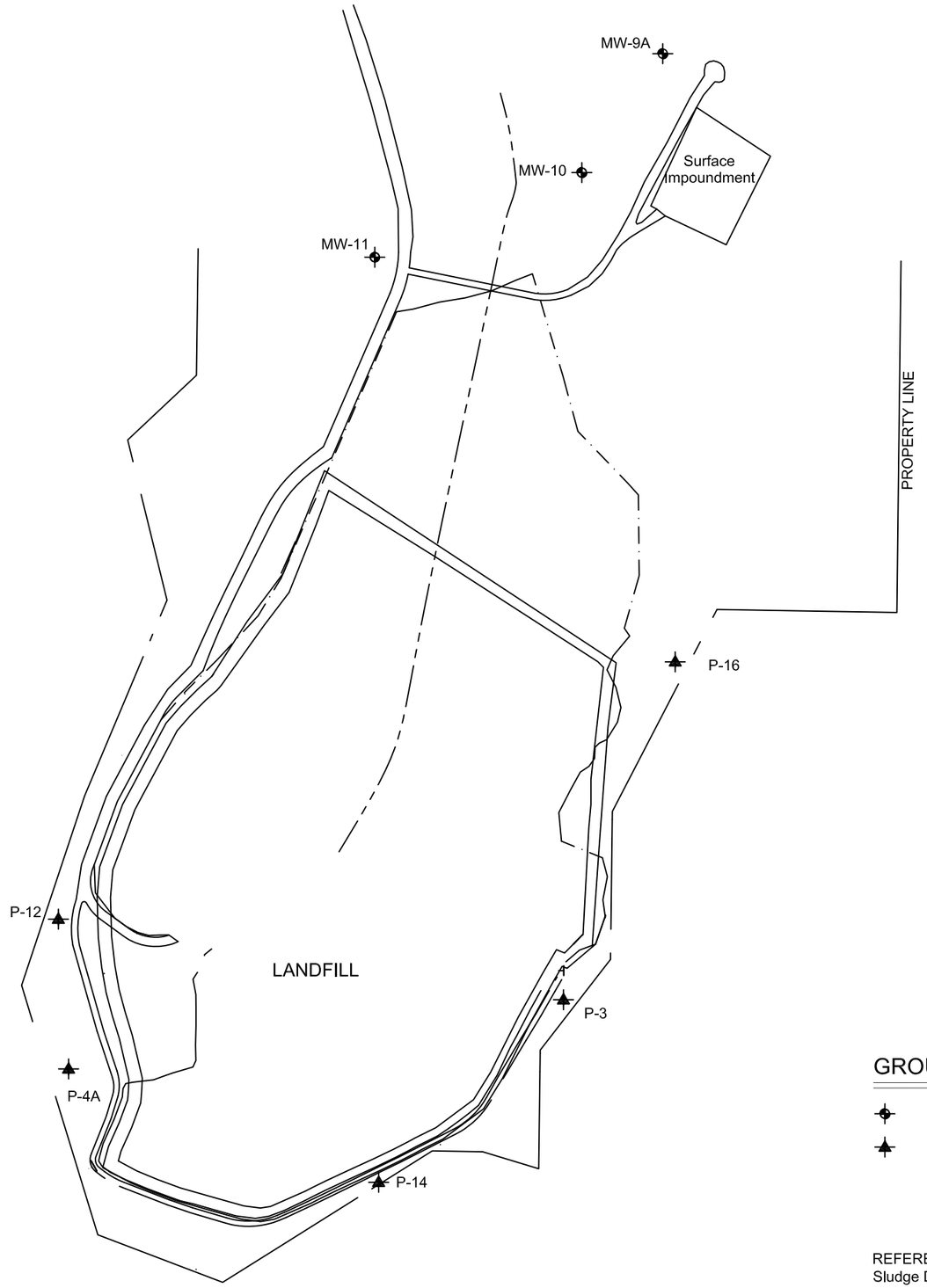
Site Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	JM
Date:	3/23/17
Dwg. No.:	01-17-0168-C001

FIGURE 1



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

Monitoring Well Location Map

De Soto Parish, Louisiana

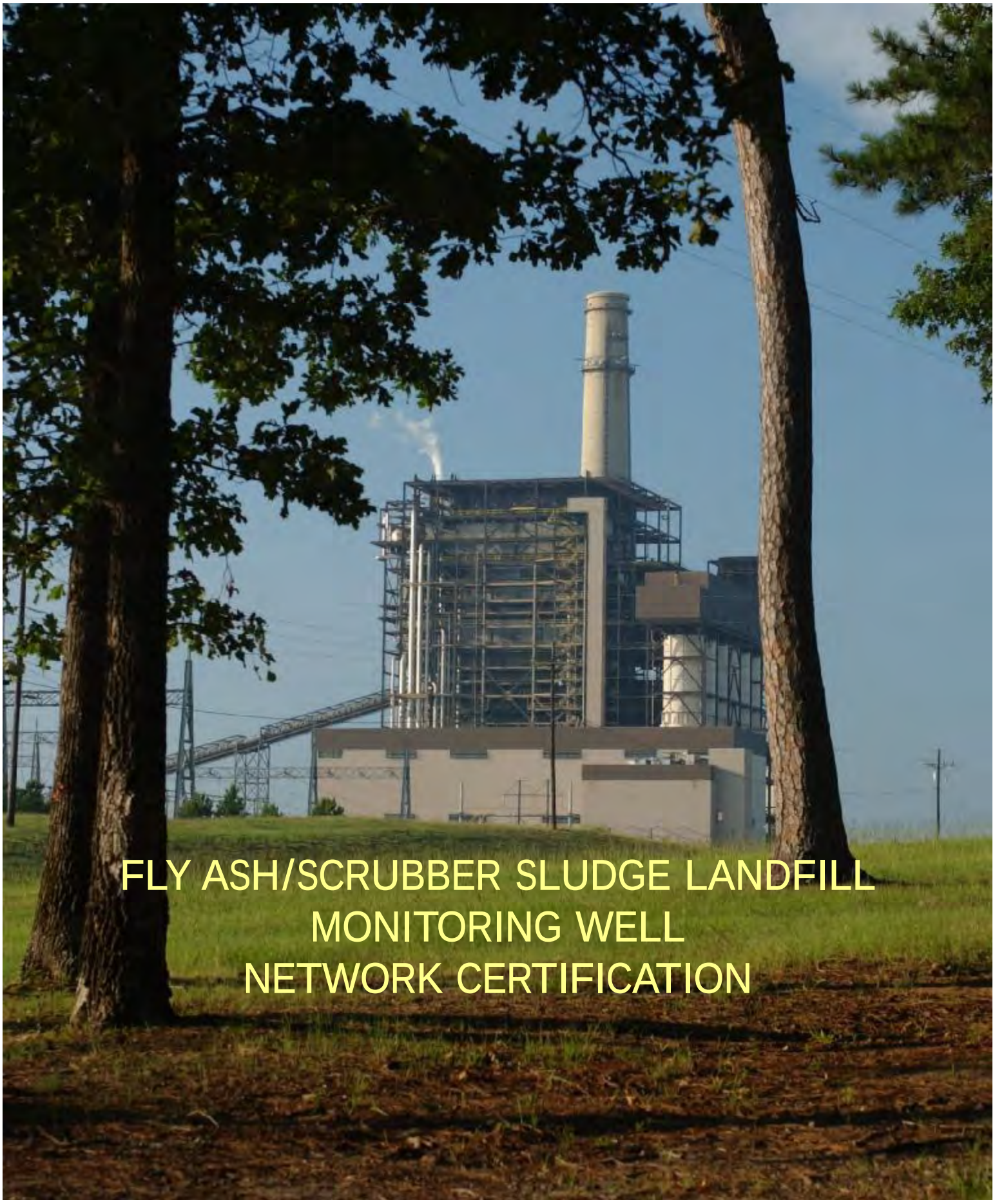
E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A005

Figure 2

CLECO

DOLET HILLS POWER STATION
MANSFIELD, LOUISIANA



FLY ASH/SCRUBBER SLUDGE LANDFILL MONITORING WELL NETWORK CERTIFICATION

MONITORING WELL NETWORK

1.0 Introduction

The U.S. Environmental Protection Agency (EPA) published a final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The rule applies to the Cleco Power LLC Dolet Hills Power Station (DHPS). A site location map is provided in Figure 1. The Fly Ash/Scrubber Sludge Landfill (Figure 2) accepts CCR waste.

The CCR Rule, 40 CFR Subpart D-Standards for the Disposal of CCRs, Section §257.91 requires a groundwater monitoring system that consists of sufficient number of wells at appropriate locations and depths based on site-specific technical information, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of both background groundwater, and groundwater passing the boundary of the CCR unit; and
- Monitor potential contaminant pathways.

The groundwater monitoring system for the DHPS landfill meets those requirements, as described below.

2.0 Site Hydrogeology Summary

Geologic evaluation of the near-surface stratigraphy underlying DHPS indicates the presence of four distinct permeable zones. These are referred to as Zone 1, Zone 2, Zone 3, and Zone 4 corresponding with descending depth at the site. Borehole geophysical logging at the site revealed distinctive characteristics for these zones in the subsurface. Correlation of these zones to the regional stratigraphic descriptions (Murray, 1948) suggests that Zone 1 correlates with the Dolet Hills formation, and Zones 2, 3, and 4 correlate with sandy units of the Naborton formation. Evaluation of the geophysical logs indicated distinctive marker beds that included these permeable zones as well as the Chemard Lake lignite lentil, minor lignite beds, and the less permeable deposits of the underlying Porters Creek formation. The Chemard Lake lignite was not present in the area of the solid waste surface impoundments.

The Paleocene Dolet Hills formation consists of very fine- to fine-grained, gray, relatively clean, massive quartz sands (Snider, 1982 and Murray, 1948). Locally some sands are fine- to medium-grained and have some clay and silt lenses. The Dolet Hills formation contains sands that range from 120 to 160 feet in thickness (Snider, 1982). The Dolet Hills formation is transitional with the underlying Naborton formation.

The Paleocene Naborton formation underlies the Dolet Hills sands in the study area. The Naborton formation consists chiefly of gray and buff sandy, clayey lignitic silts containing some lignitic clay and lignite beds (Page and Preé, 1964). The formation contains large limonitic and calcareous concretions. The thickness ranges between 140 to 170 feet and the average thickness is about 160 feet (Snider, 1982).

Underlying the Naborton formation is the Porters Creek formation. The Paleocene Porters Creek formation consists of lignitic and limey shales and clays with occasional calcareous concretions. The formation averages in thickness from 500 to 600 feet. The contact with the overlying Naborton formation is transitional from silty clays into sands and silts and is usually chosen below the least dominantly sandy unit in drill cuttings and on geophysical logs (Murray, 1948).

Murray, G.E., 1948. Geology of De Soto and Red River Parishes, Geological Bulletin No. 25, Louisiana Geological Survey, Baton Rouge, Louisiana.

Page, L.V. and H.L. Preé, Jr., 1964. Water Resources of De Soto Parish Louisiana, Geological Survey Water-Supply Paper 1774, United States Geological Survey, United States Government Printing Office, Washington D.C.

Snider, J.L., 1982. Premining Hydrology of the Lignite Area in Southeastern De Soto Parish, Louisiana, Water Resources Technical Report No. 29, United States Geological Survey, Louisiana Department of Transportation and Development, Baton Rouge, Louisiana.

3.0 Groundwater Monitoring System

Groundwater monitoring wells have been installed in the uppermost, laterally continuous water bearing zone present beneath the CCR landfill at DHPS (Zone 3). The background monitoring well network has been installed upgradient of the landfill. Monitoring well information is included in Table 1, and the monitoring well locations are provided in Figure 2.

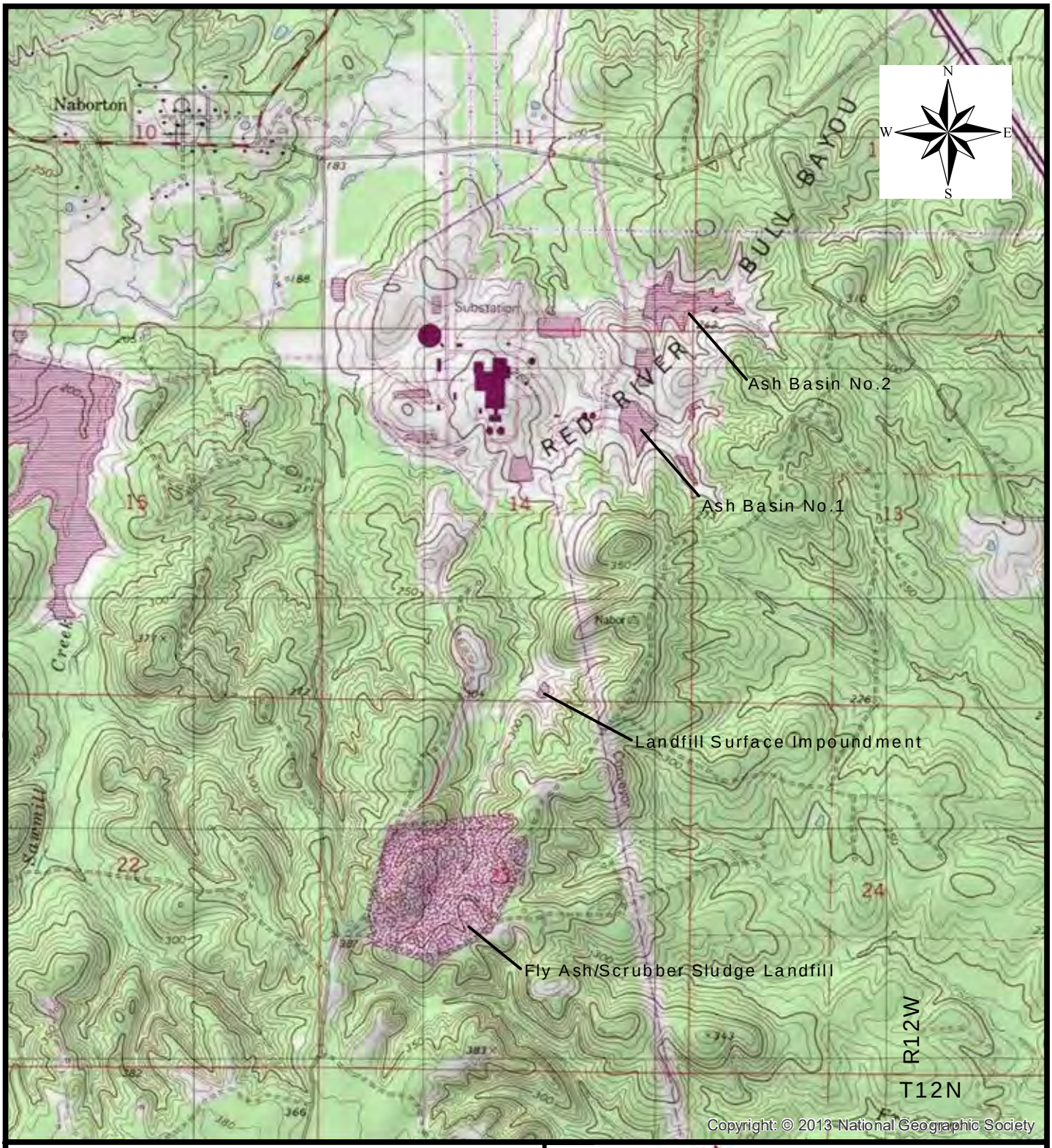
CERTIFICATION

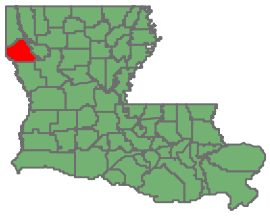
I hereby certify that the groundwater monitoring system described in this report for the Dolet Hills Power Station, owned and operated by Cleco Power, LLC, has been designed and constructed to meet the requirements of the Coal Combustion Residual Rule 40 CFR §257.91. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.

_____, P.E.

Date: 3/7/17

Louisiana Registration No.: 27124





0 750 1,500 3,000 4,500 Feet

Note:

U.S.G.S. Quadrangle "Bayou Pierre Lake, LA" at scale 1:24,000

CLECO Corporation

Dolet Hills Power Station

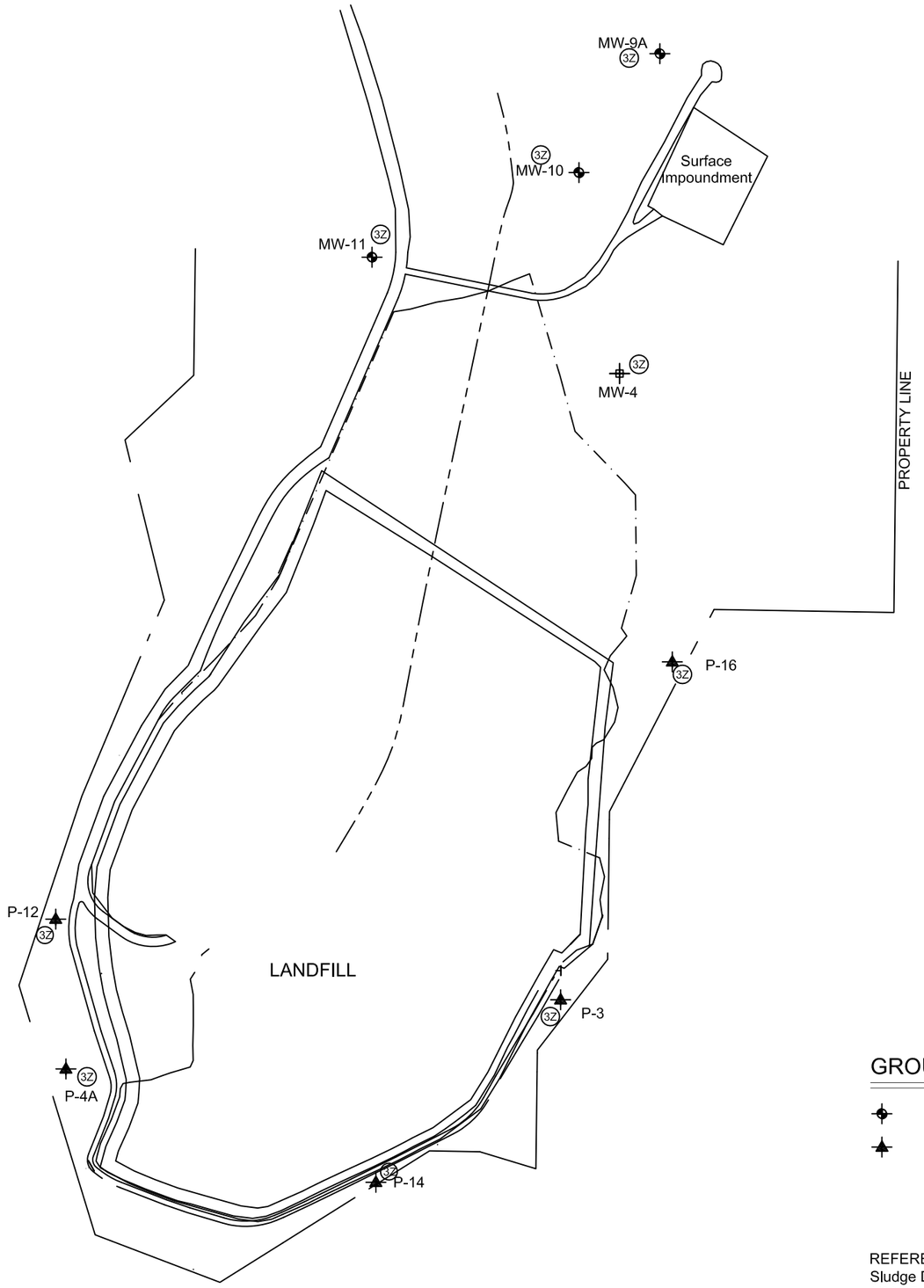
Site Location Map

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	RS
Approved:	JM
Date:	3/23/17
Dwg. No.:	01-17-0168-C001

FIGURE 1



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- ZONE 3 PIEZOMETER

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

Monitoring Well Location Map

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	1/26/17
Dwg. No.:	01-17-0168-A005

Figure 2

Table 1
Monitoring Well Information

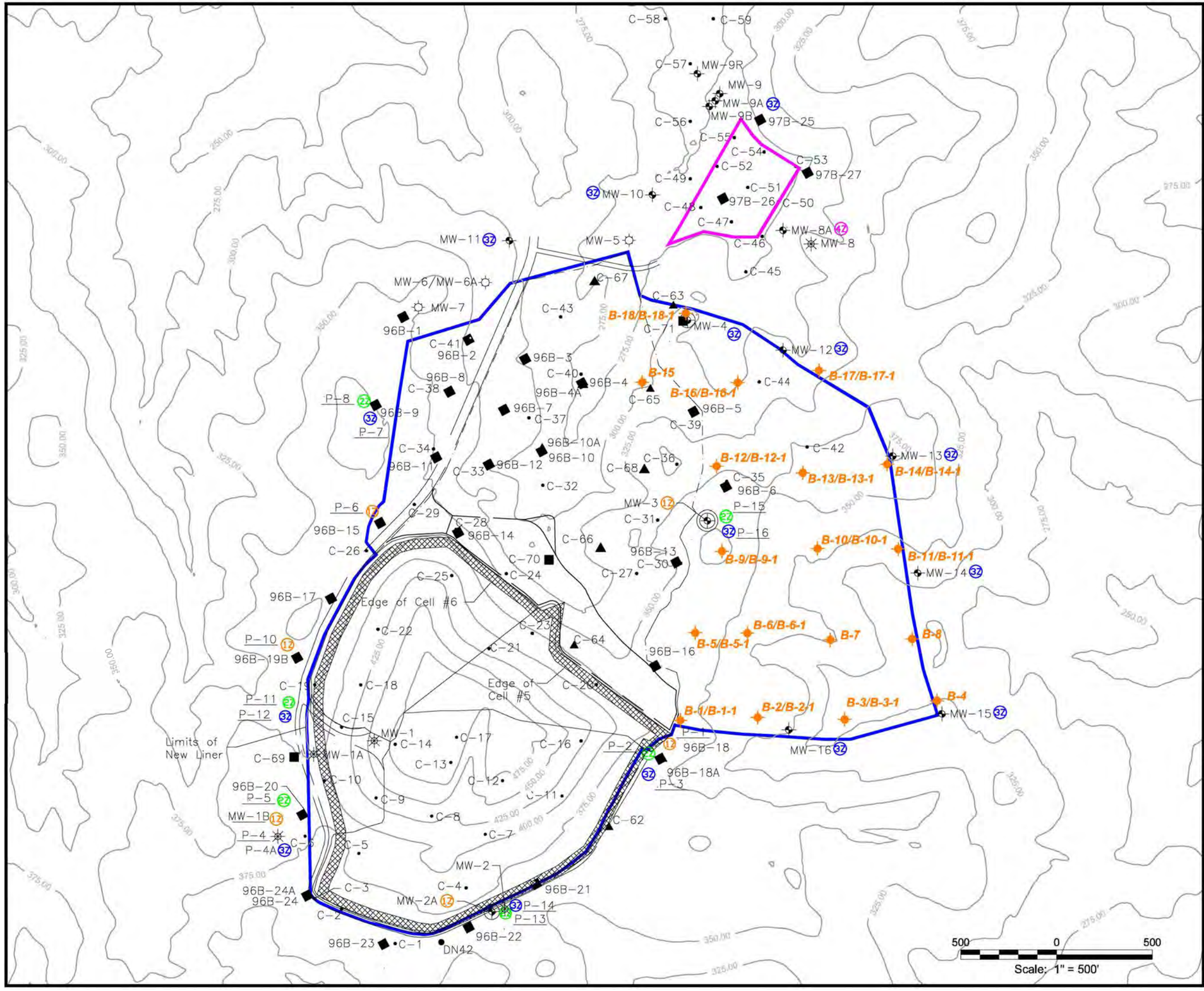
Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Well Number	P-3	P-4A	P-12	P-14	P-16	MW-9A	MW-10	MW-11
Gradient Position	Up	Up	Up	Up	Up	Down	Down	Down
Date Installed	Aug 1996	Nov 2012	Jul 1997	Jul 1997	Jun 1997	May 2010	May 2010	May 2010
Latitude (dd°mm'ss")	32°00'43.1"	32°00'41.1"	32°00'46.0"	32°00'36.3"	32°00'55.7"	32°01'18.5"	32°01'13.9"	32°01'10.7"
Longitude (dd°mm'ss")	93°34'05.3"	93°34'25.6"	93°34'27.4"	93°34'13.4"	93°34'00.5"	93°34'00.7"	93°34'04.7"	93°34'13.7"
Casing Elevation (ft NGVD)	361.68	382.00	378.45	367.16	371.07	254.98	252.80	301.73
Well Depth (ft bgs)	121	160	150	139	110	25	17	39
Screen Length (ft)	10	10	10	10	10	10	10	10
Top of Screen (ft NGVD)	248	229	235	235	269	237	243	269
Bottom of Screen (ft NGVD)	238	219	225	225	259	227	233	259
Casing Diameter & Material	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC

APPENDIX J

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

MONITORING WELL DETAILS AND SOIL BORING LOGS



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Piezometer Location
- Proposed Landfill Expansion Boring Location
- Zone 1 Piezometer/Monitor Well
- Zone 2 Piezometer/Monitor Well
- Zone 3 Piezometer/Monitor Well
- Zone 4 Piezometer/Monitor Well
- Existing Elevation Contour, NAVD88, Feet

Monitoring Zones

Zone	Existing Well/Piezometer
12	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9/MW-1B)
27	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
32	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9, MW-12, MW-13, MW-14, MW-15, MW-16
42	MW-8A

Notes

1. P-9 was converted MW-1B.
2. Downgradient detection monitoring wells - MW-9A, MW-10, and MW-11.
3. Upgradient monitoring wells - P-3, P-4, P-12, P-14, and P-16.

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill, Soil Borings, Monitor Wells, and Piezometer Locations, drawing no: 01-10-0079-A003, figure no: 13, dated: 07/20/10. Contours comprised of USACE/FEMA, elevation contours, dated 2003.

Plan View

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

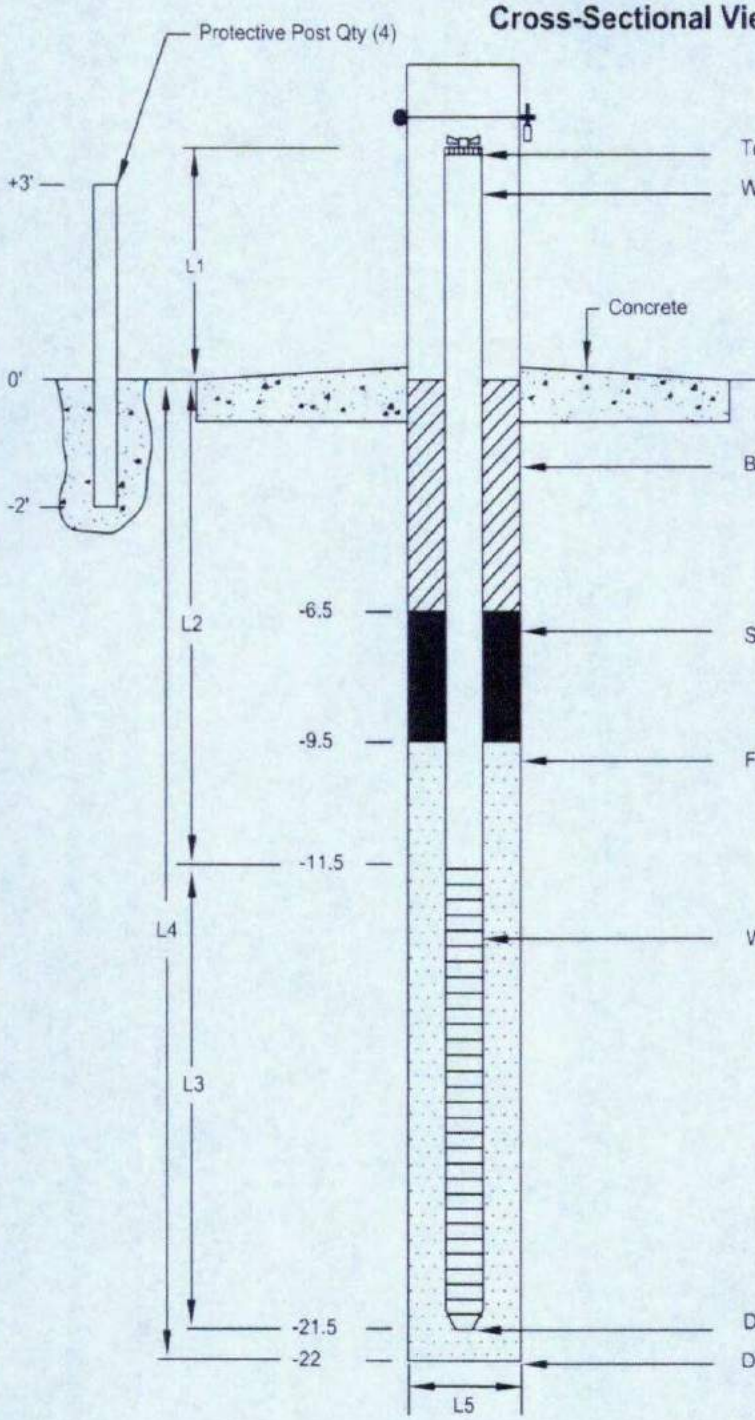
Drawn By	LMH	08/07/20
Checked By	LMH	08/07/20
Approved By	EKSw	08/07/20
Project Number	002-255-002	
Drawing Number	002-255-002-B001	

J-1
Attachment

MONITORING WELL AND PIEZOMETER SCHEMATICS

Monitoring Well - MW-9A

Monitoring Well Construction Diagram
Above Grade Well
Cross-Sectional View



Top of Casing	254.98 Ft. NGVD
Well Casing	
Material	PVC
Diameter	2"
Joint Type	Flush Thread
Length	14.68'
Ground Surface	251.8 Ft. NGVD
Backfill Around Casing	
Material	Cement-Bentonite Grout
Thickness	6.5' Thick
Seal	
Type Of Seal	Bentonite Pellet Crumbles
Thickness	3'
Filter Pack	
Type Of Filter	Sand Pack with
Distance Above Screen	2'
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Monitoring Well	21.5' bgs
Depth To Bottom Of Filter Sand	22' bgs

Project: Cleco - Dolet Hills

Project No: 01-10-0079

Monitoring Well: **MW-9A**

Diagram Not To Scale

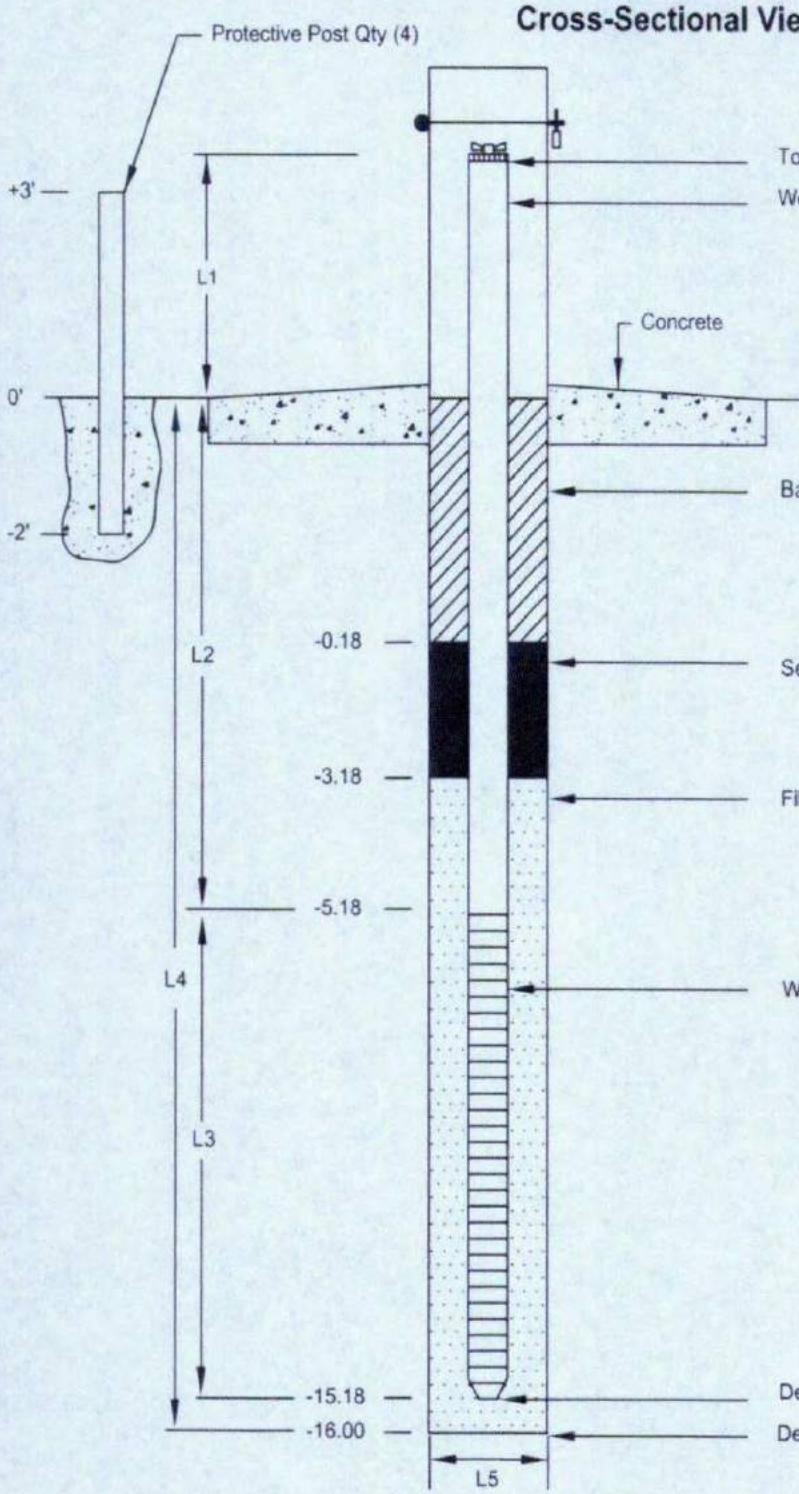
L1 = 3.18 Ft
L2 = 11.5 Ft
L3 = 10 Ft
L4 = 21.5 Ft
L5 = 0.667 Ft.

CLECO

File No: 01-10-0079-B008

Monitoring Well - MW-10

Monitoring Well Construction Diagram
Above Grade Well
Cross-Sectional View



Top of Casing	252.80 Ft. NGVD
Well Casing	
Material	PVC
Diameter	2"
Joint Type	Flush Thread
Length	8.28'
Ground Surface	249.70 Ft. NGVD
Backfill Around Casing	
Material	Cement-Bentonite Grout
Thickness	0.18' Thick
Seal	
Type Of Seal	Bentonite Pellet Crumbles
Thickness	3'
Filter Pack	
Type Of Filter	Sand Pack with
Distance Above Screen	2' Fine Sand
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Monitoring Well	15.18' bgs
Depth To Bottom Of Filter Sand	16' bgs

Project: Cleco - Dolet Hills

Project No: 01-10-0079

Monitoring Well: **MW-10**

Diagram Not To Scale

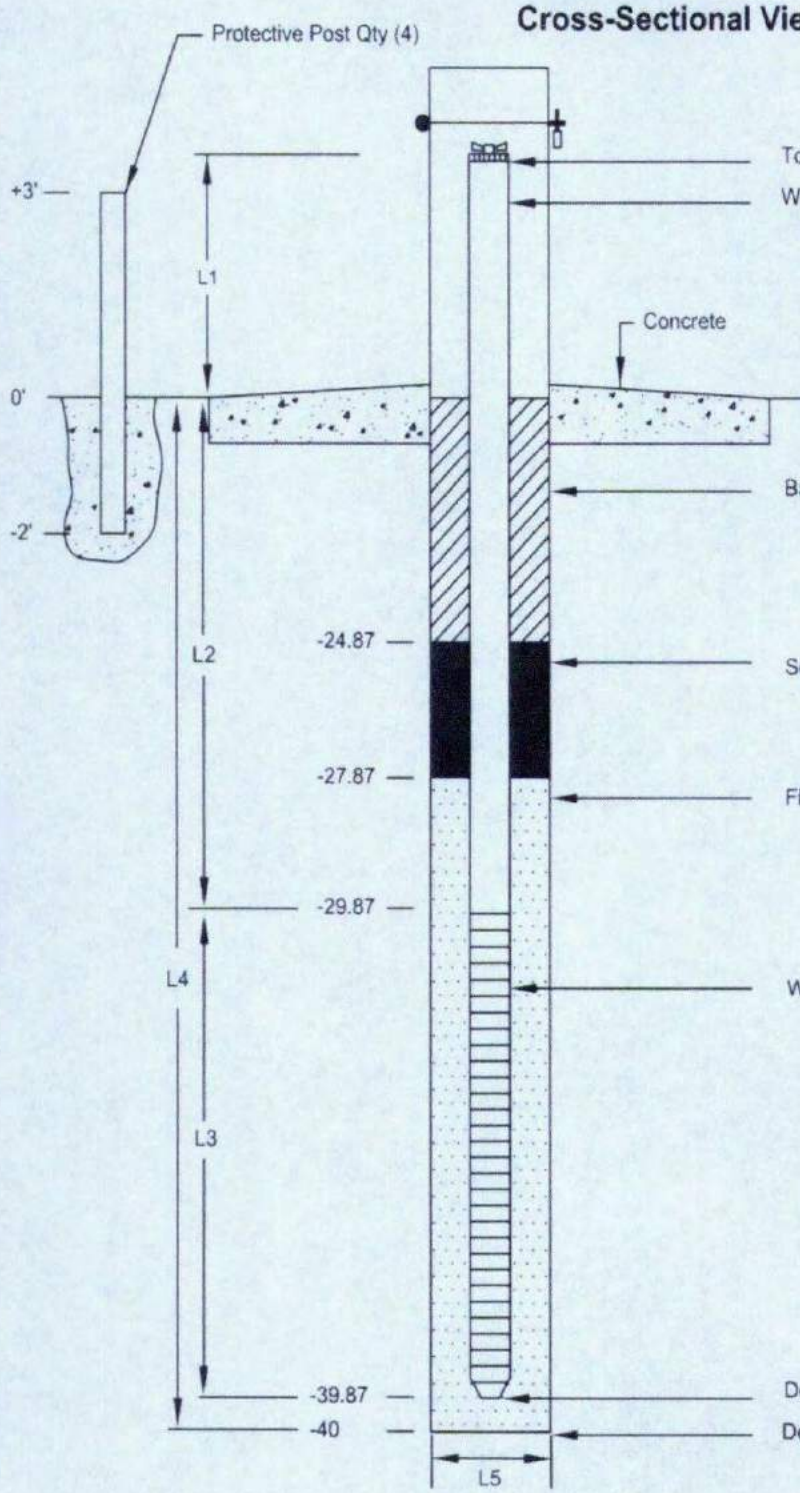
L1 = 3.10 Ft
L2 = 5.18 Ft
L3 = 10 Ft
L4 = 9.25 Ft
L5 = 0.667 Ft.

CLECO

File No: 01-10-0079-B004

Monitoring Well - MW-11

Monitoring Well Construction Diagram
Above Grade Well
Cross-Sectional View



Top of Casing	301.73 Ft. NGVD
Well Casing	
Material	PVC
Diameter	2"
Joint Type	Flush Thread
Length	33.5'
Ground Surface	298.10 Ft. NGVD
Backfill Around Casing	
Material	Cement-Bentonite Grout
Thickness	24.87' Thick
Seal	
Type Of Seal	Bentonite Pellet Crumbles
Thickness	3'
Filter Pack	
Type Of Filter	Sand Pack with
Distance Above Screen	2' Fine Sand
Well Screen	
Screen Material	PVC
Diameter	2"
Length	10'
Slot Size	.010"
Depth To Bottom Monitoring Well	39.87' bgs
Depth To Bottom Of Filter Sand	40' bgs

Project: Cleco - Dolet Hills

Project No: 01-10-0079

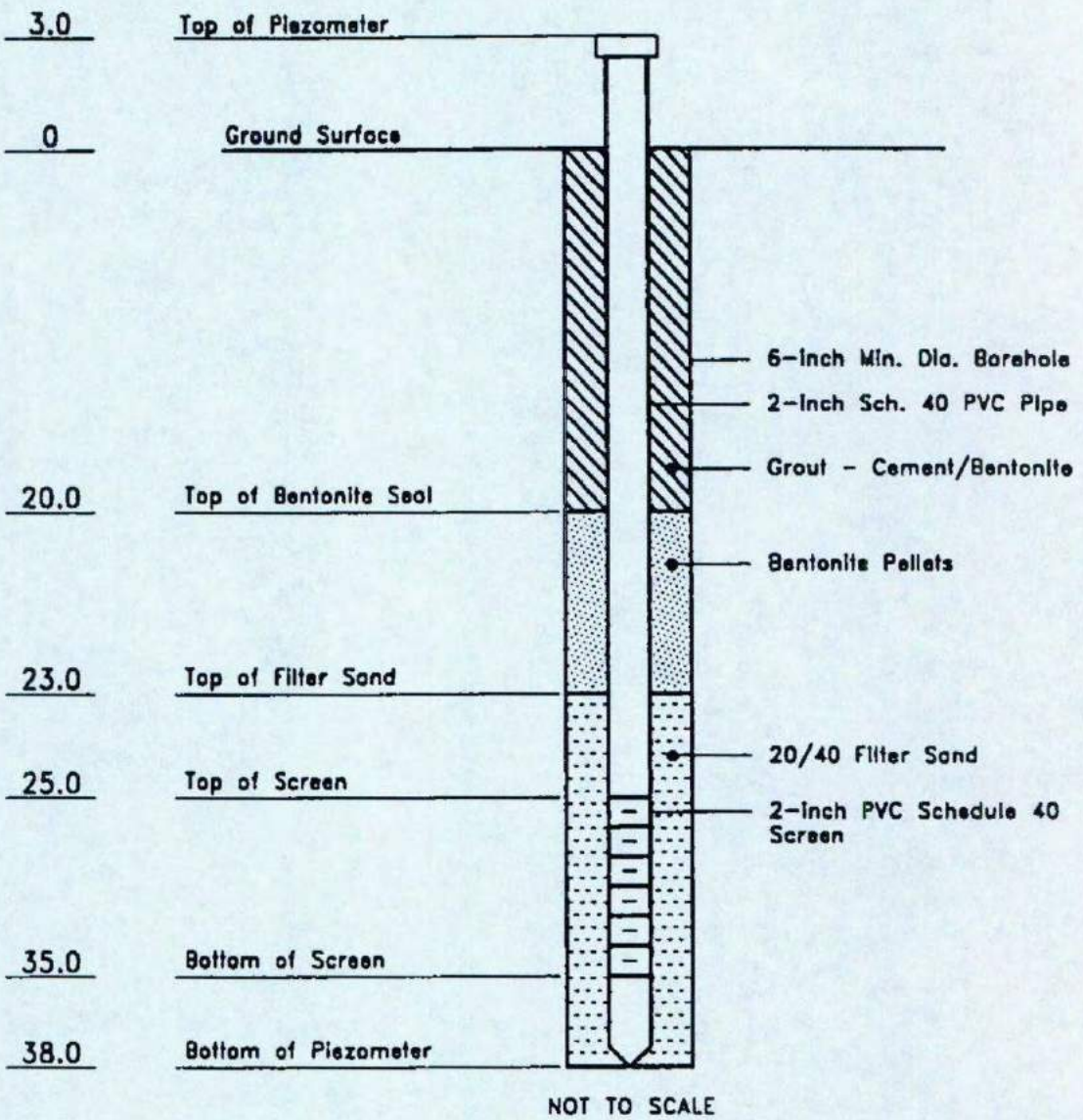
Monitoring Well: **MW-11**

Diagram Not To Scale

L1 = 3.63 Ft
L2 = 29.87 Ft
L3 = 10 Ft
L4 = 40 Ft
L5 = 0.667 Ft.

CLECO

File No: 01-10-0079-B005



PIEZOMETER P-18-Z1 (P-1)

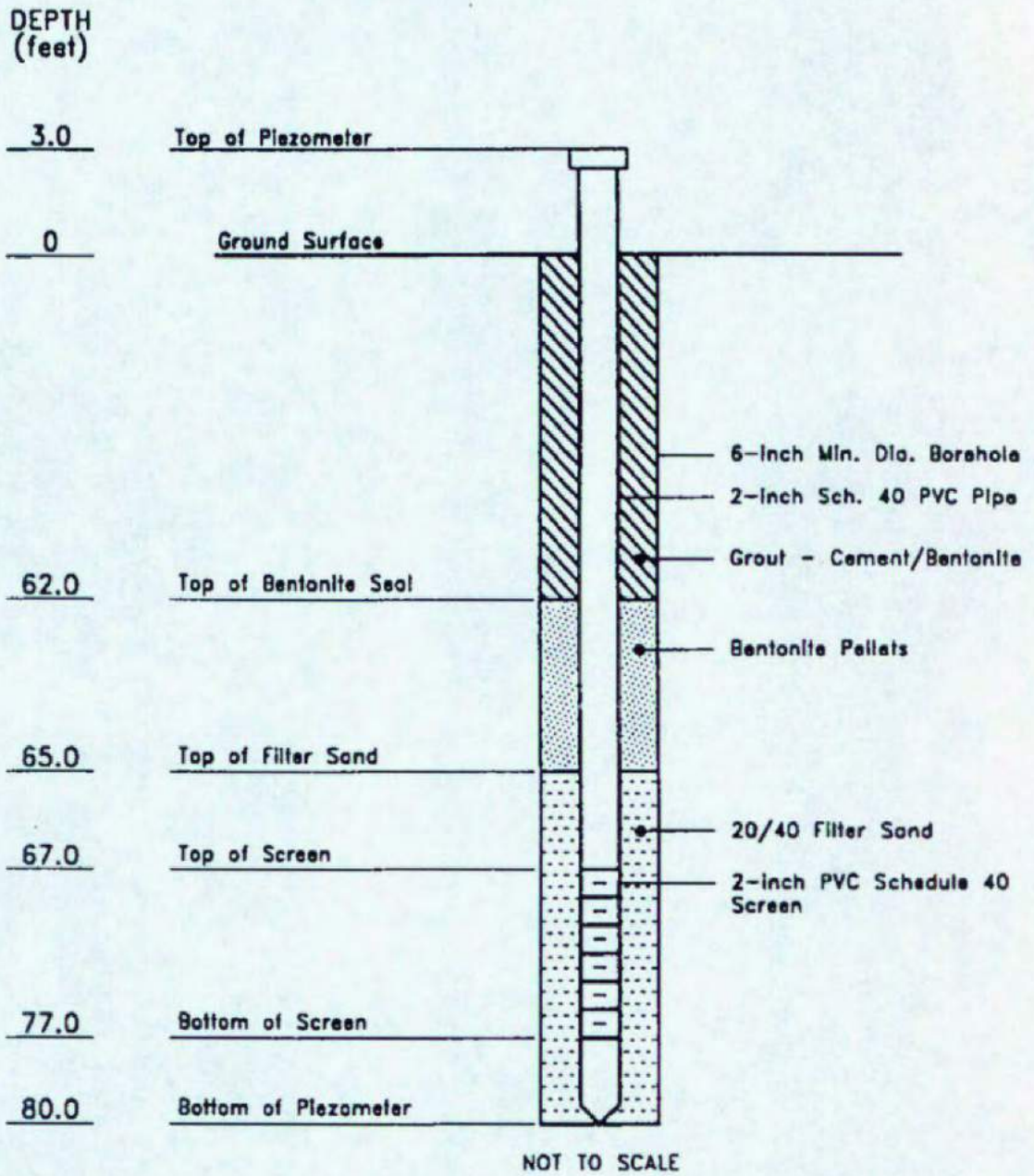
Date Installed : 8-01-96

-11-96.PLT

C:\96-1030\P

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



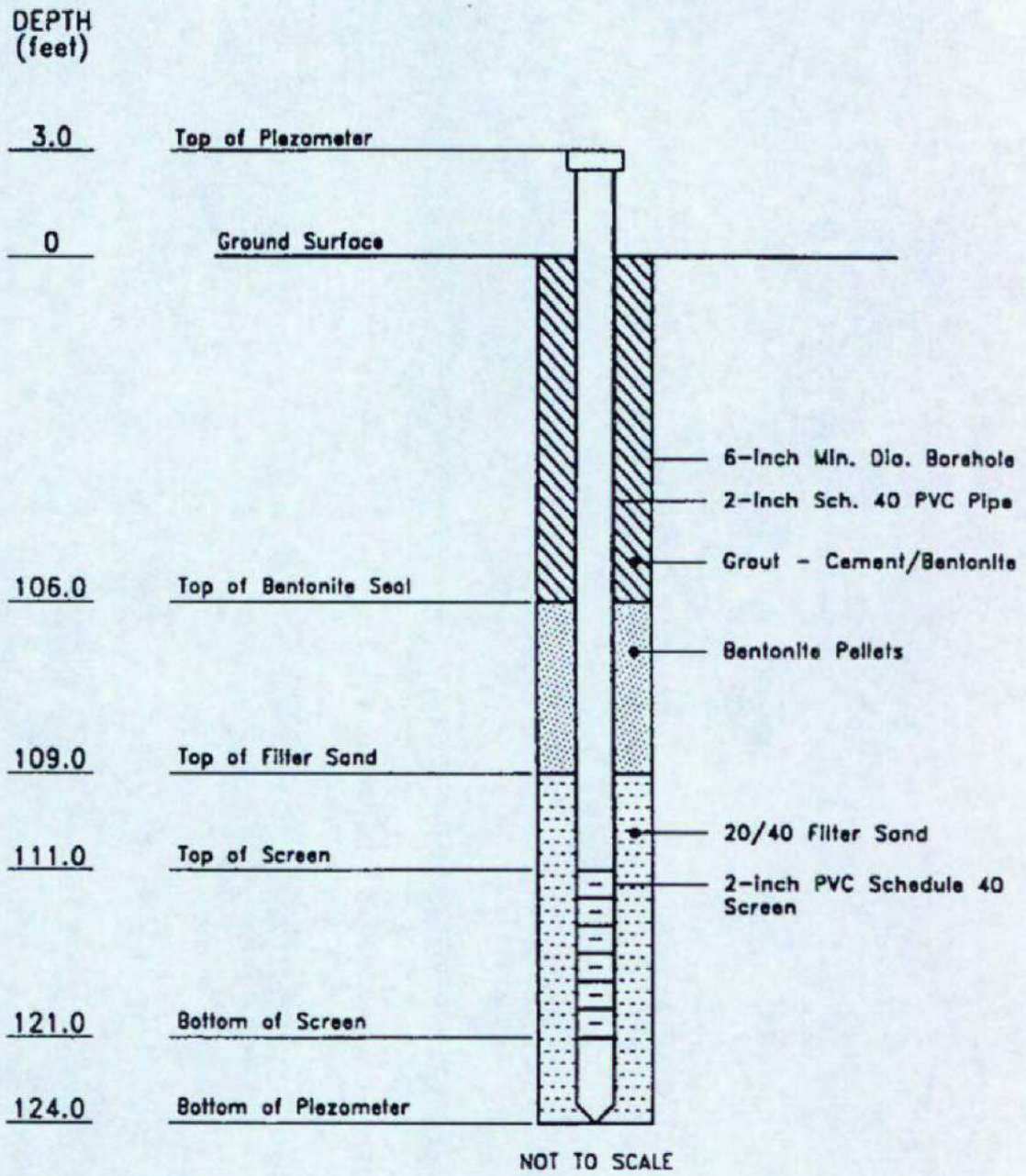
PIEZOMETER P-18-Z2 (P-2)

Date Installed : 8-01-96

C:\96-1030\P-11-96.PLT

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



PIEZOMETER P-18-Z3 (P-3)

Date Installed : 8-01-96

-11-96.PLT

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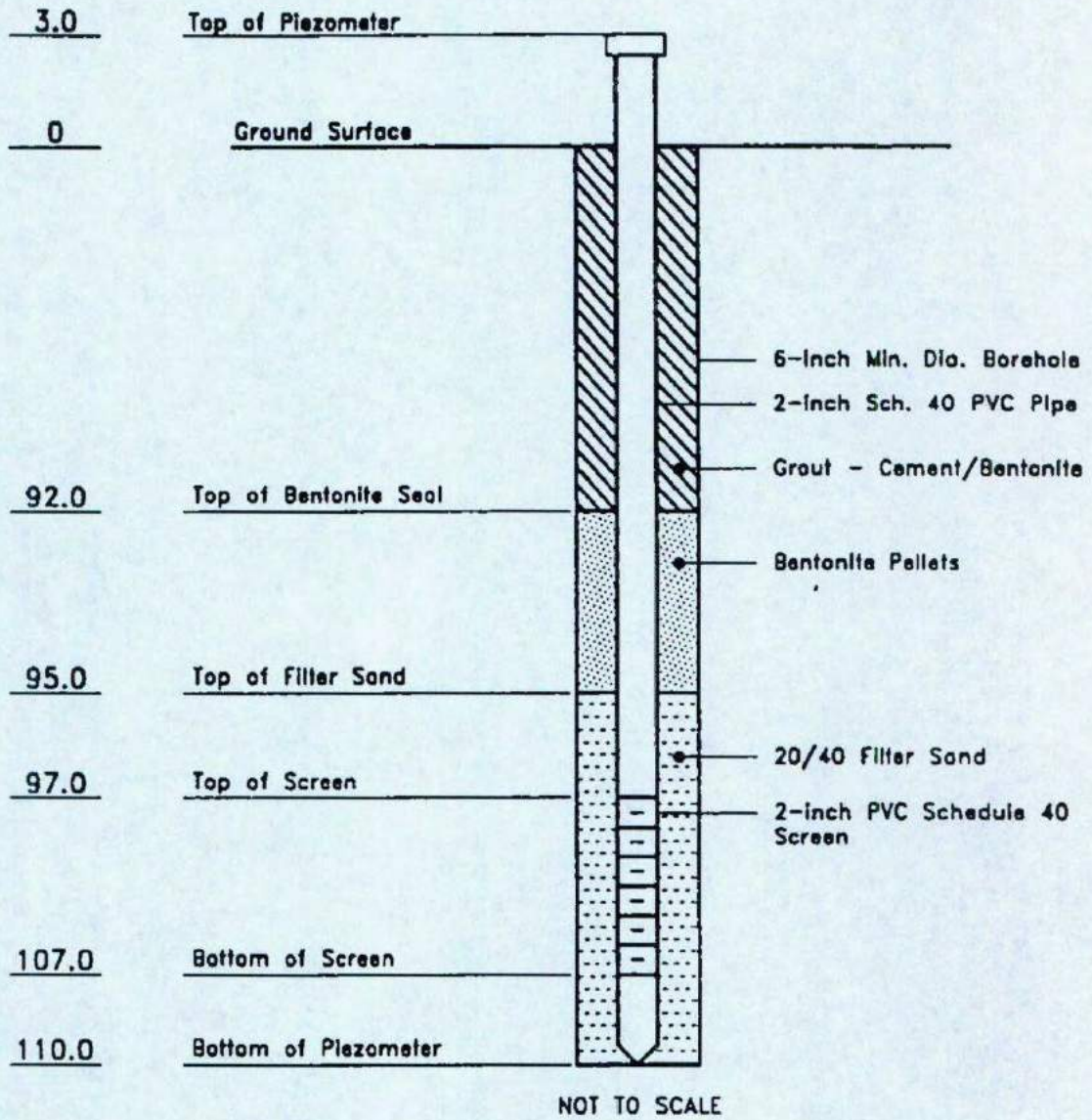
STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



PIEZOMETER P-20-Z2 (P-5)

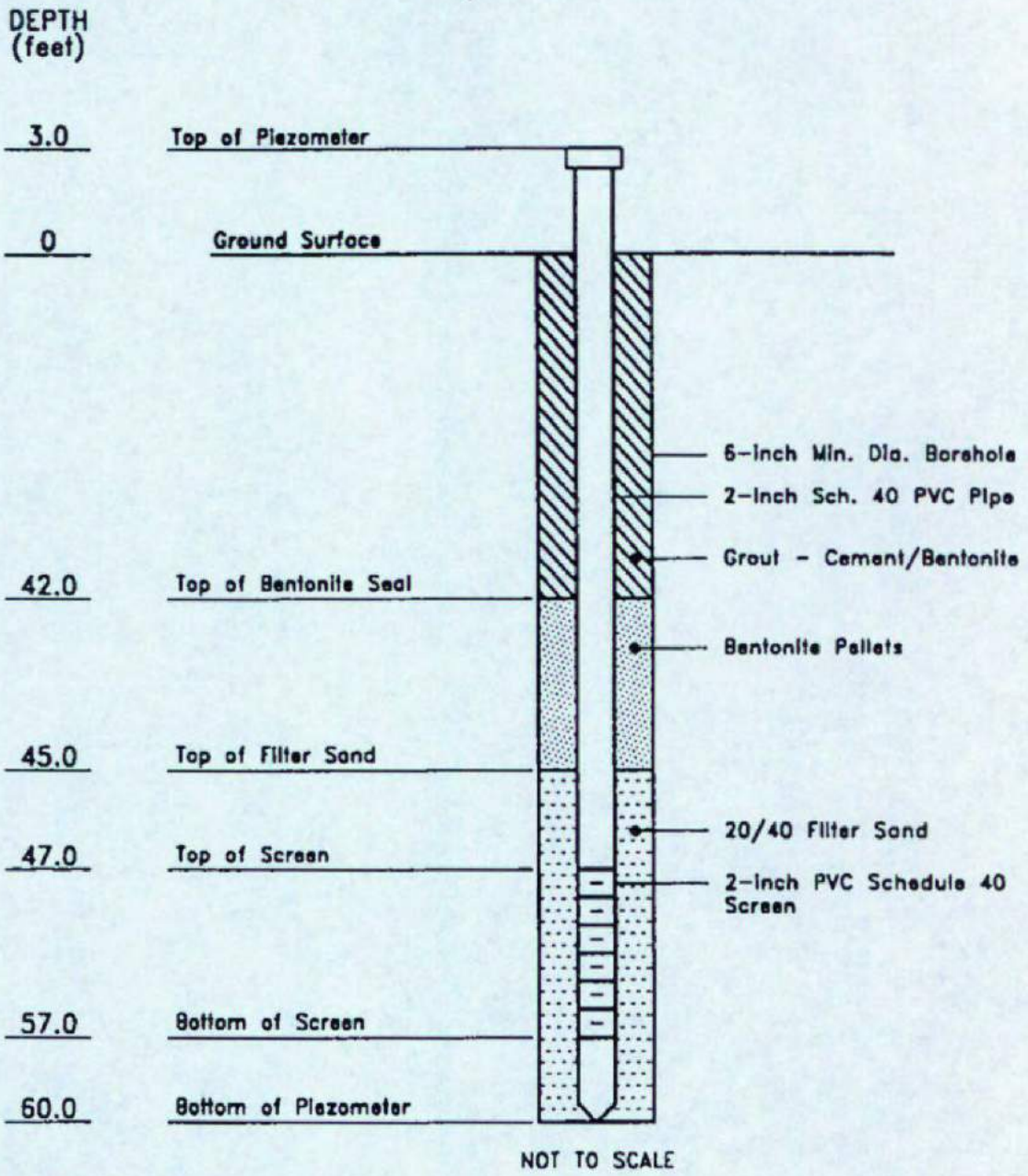
Date Installed : 8-01-96

11-96.PLT

C:\96-1030\P7

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



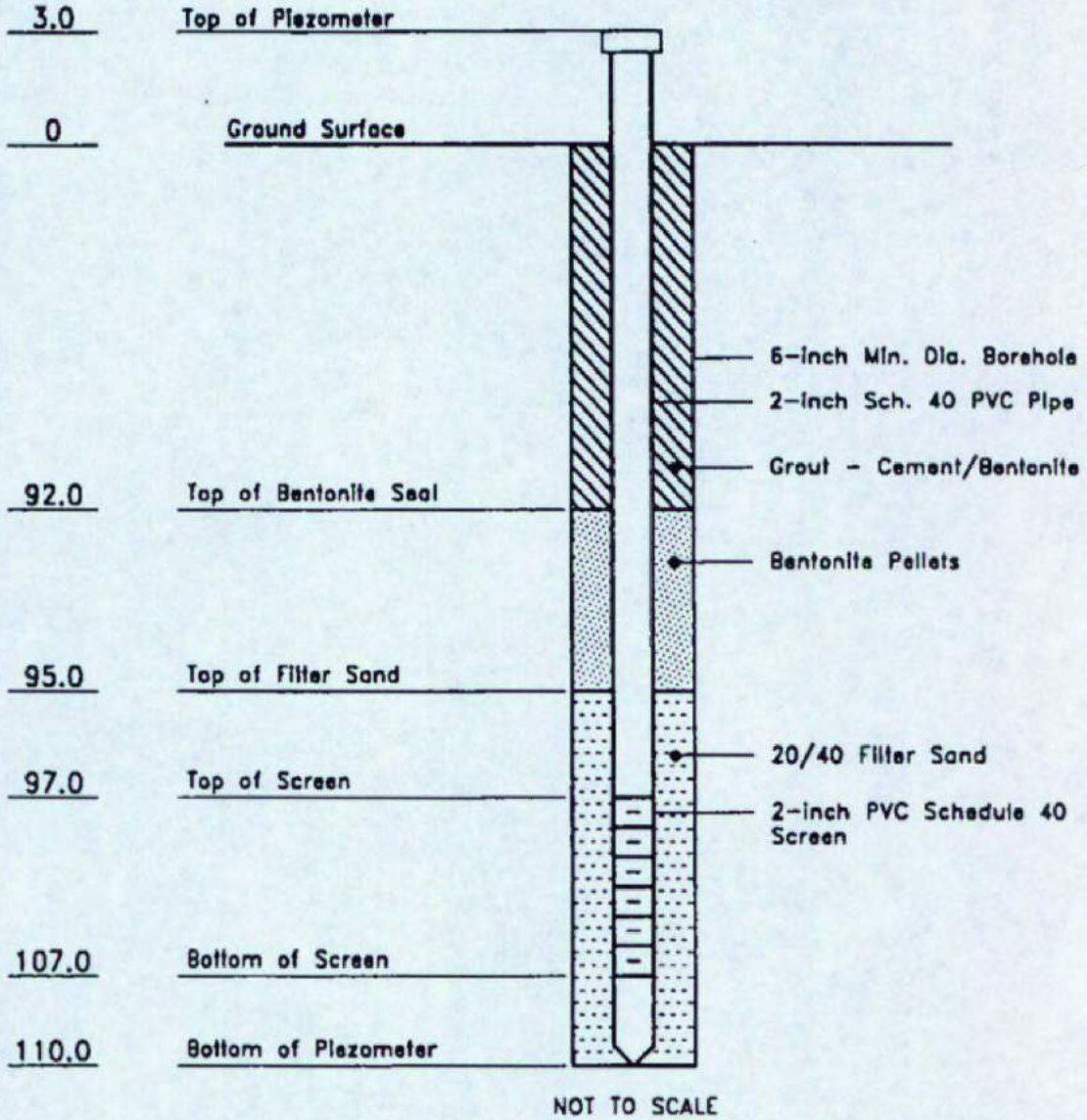
PIEZOMETER P-15-Z1 (P-6)

Date Installed : 8-15-96

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030

C:\96-1030\P-11-96.PLT

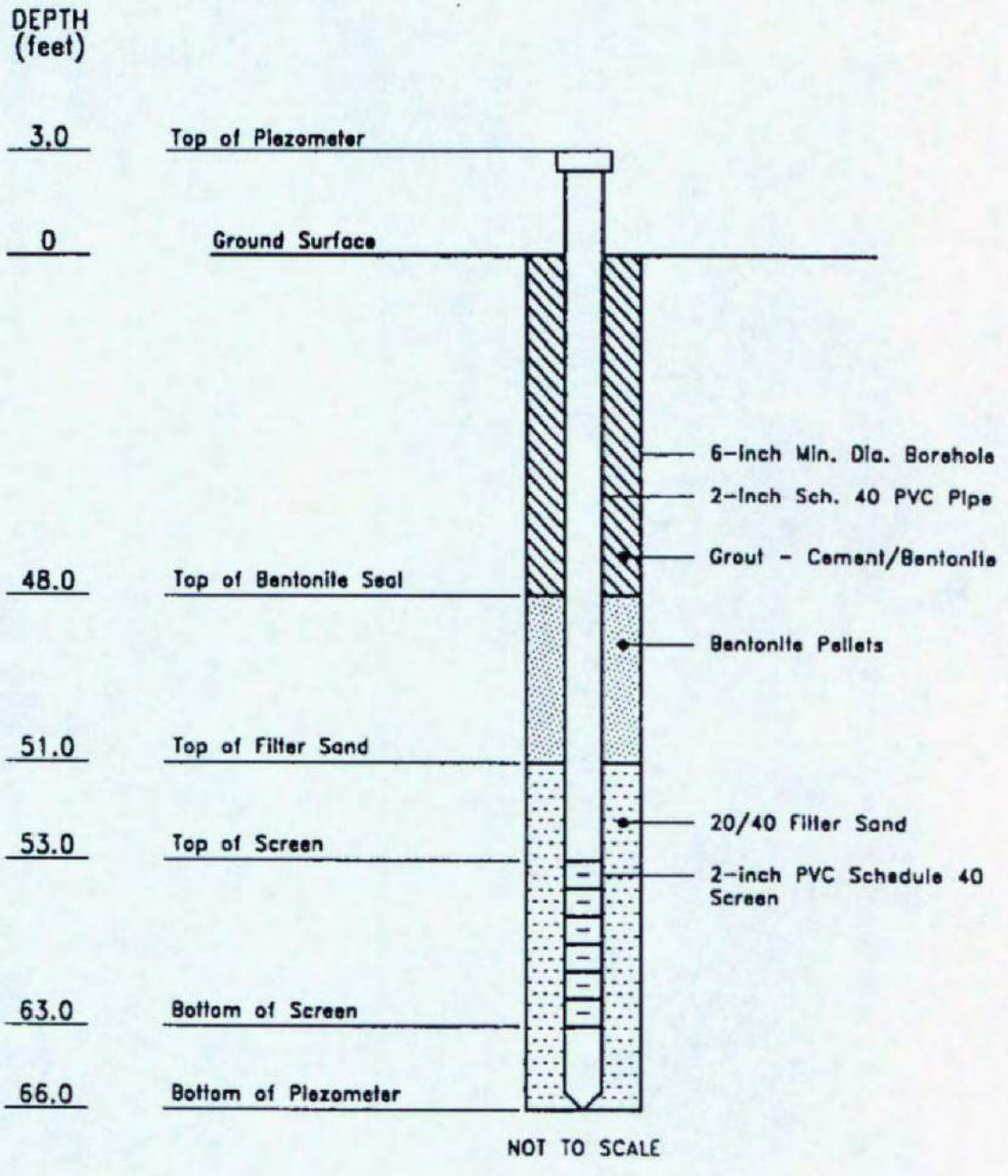


PIEZOMETER P-9-Z3 (P-7)

Date Installed : 8-12-96

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



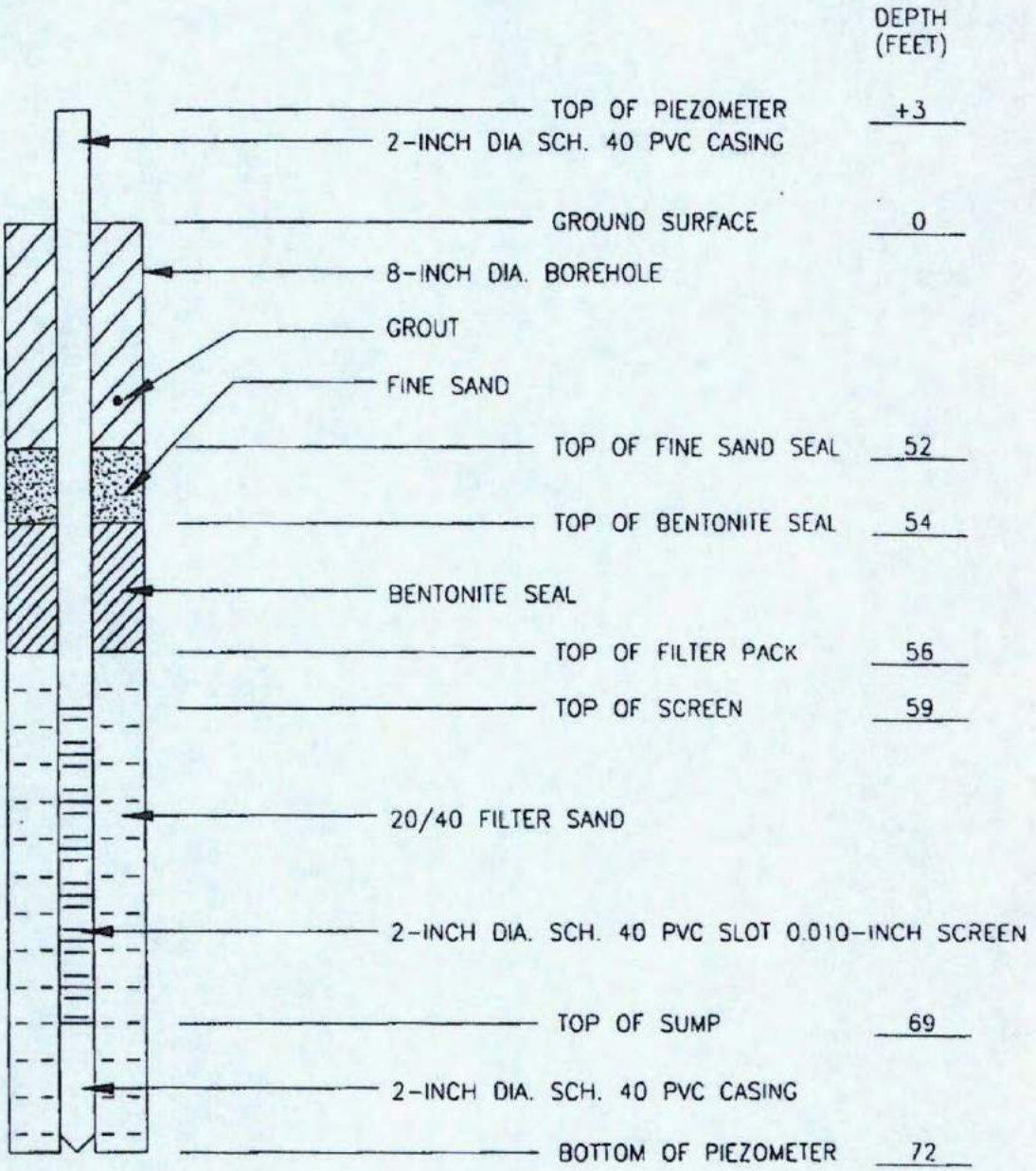
PIEZOMETER P-9-Z2 (P-8)

Date Installed : 8-14-96

C:\96-1030\P...\12-11-96.PLT

STE
Soil Testing Engineers, Inc.

CLIENT: CLECO
LOCATION: DOLET HILLS POWER PLANT
JOB NO.: 96-1030



(Converted to MW-1B)

DRAWING NOT TO SCALE

DATE INSTALLED: 6/10/97

TOP OF CASING ELEVATION: 382.06

GROUND SURFACE ELEVATION: 380.00

CLECO

DOLET HILLS POWER STATION

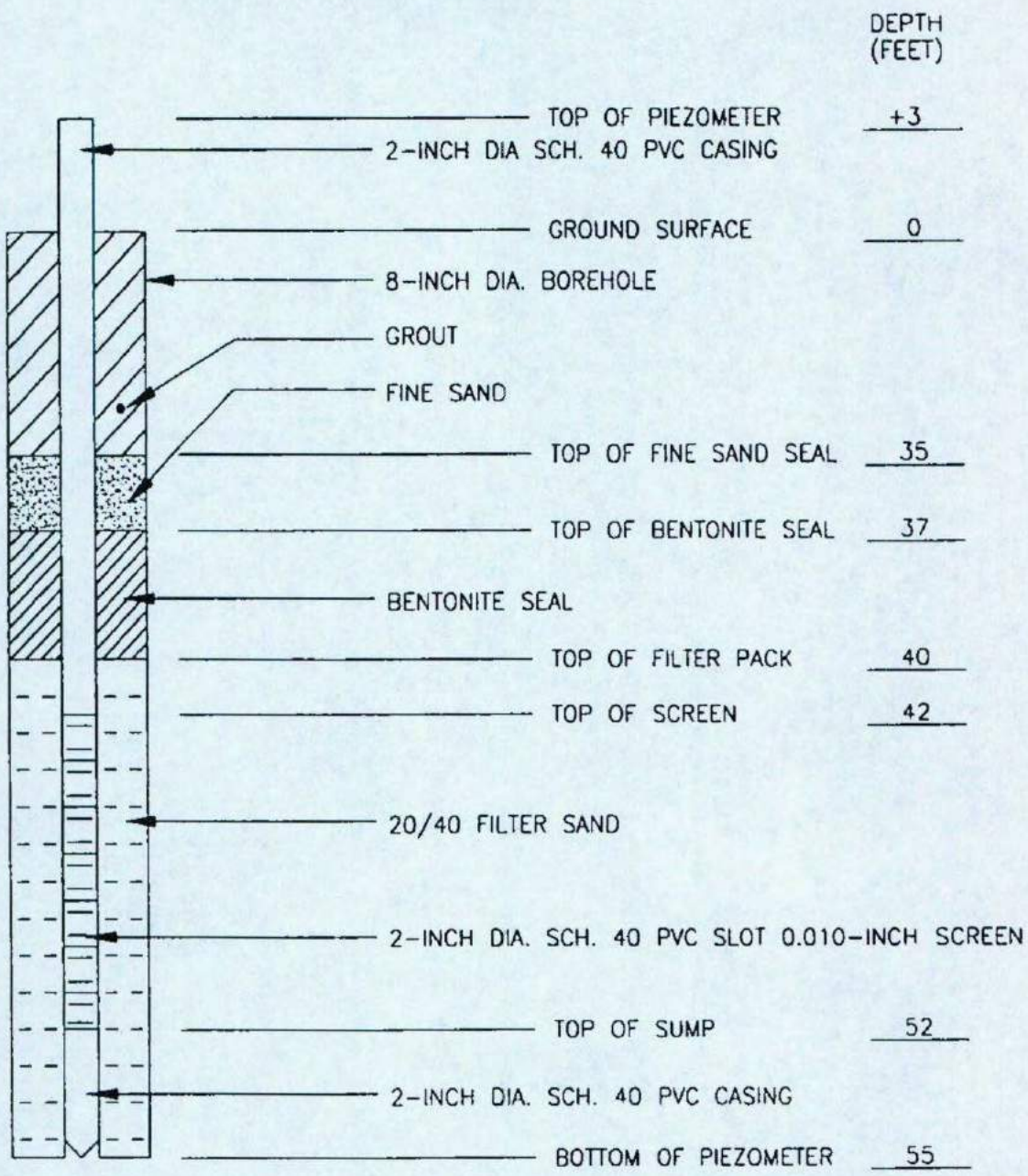
FLY ASH/SCRUBBER SLUDGE LANDFILL

CONSTRUCTION DETAIL

WELL # P-9

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.	Drawn: TML/ACAD
	Checked: RS
	Approved: RDS
	Date: 2/5/98
	Dwg. No.: A01-0001-43
7423 PICARDY AVE. SUITE A	FIGURE



DRAWING NOT TO SCALE

DATE INSTALLED: 6/11/97

TOP OF CASING ELEVATION: 373.58

GROUND SURFACE ELEVATION: 370.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

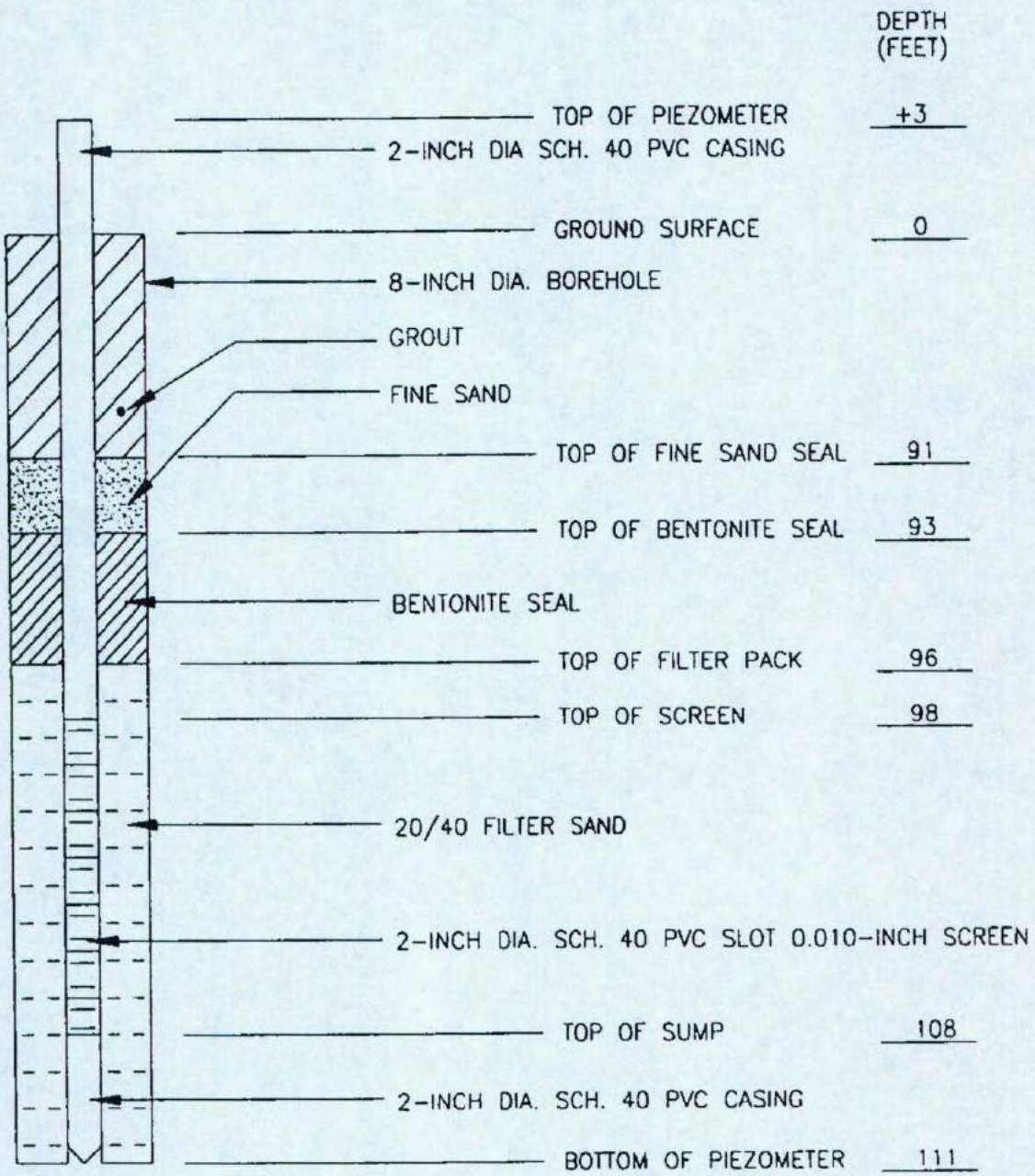
CONSTRUCTION DETAIL

WELL # P-10

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-44



DRAWING NOT TO SCALE

DATE INSTALLED: 6/27/97

? OF CASING ELEVATION: 378.46

.OUND SURFACE ELEVATION: 375.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

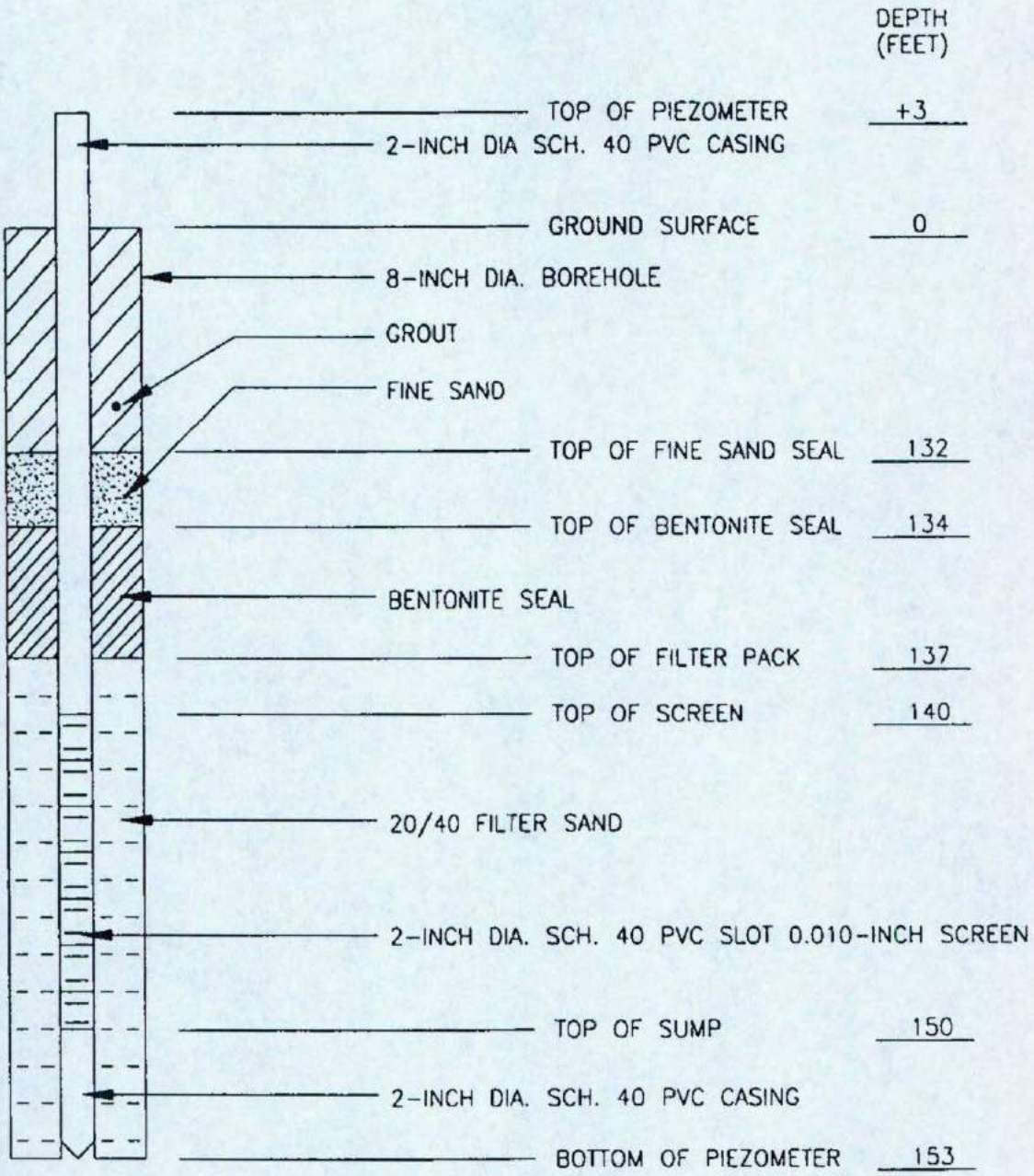
CONSTRUCTION DETAIL

WELL # P-11

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-45



DRAWING NOT TO SCALE

DATE INSTALLED: 7/1/97

' OF CASING ELEVATION: 379.17

.OUND SURFACE ELEVATION: 376.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

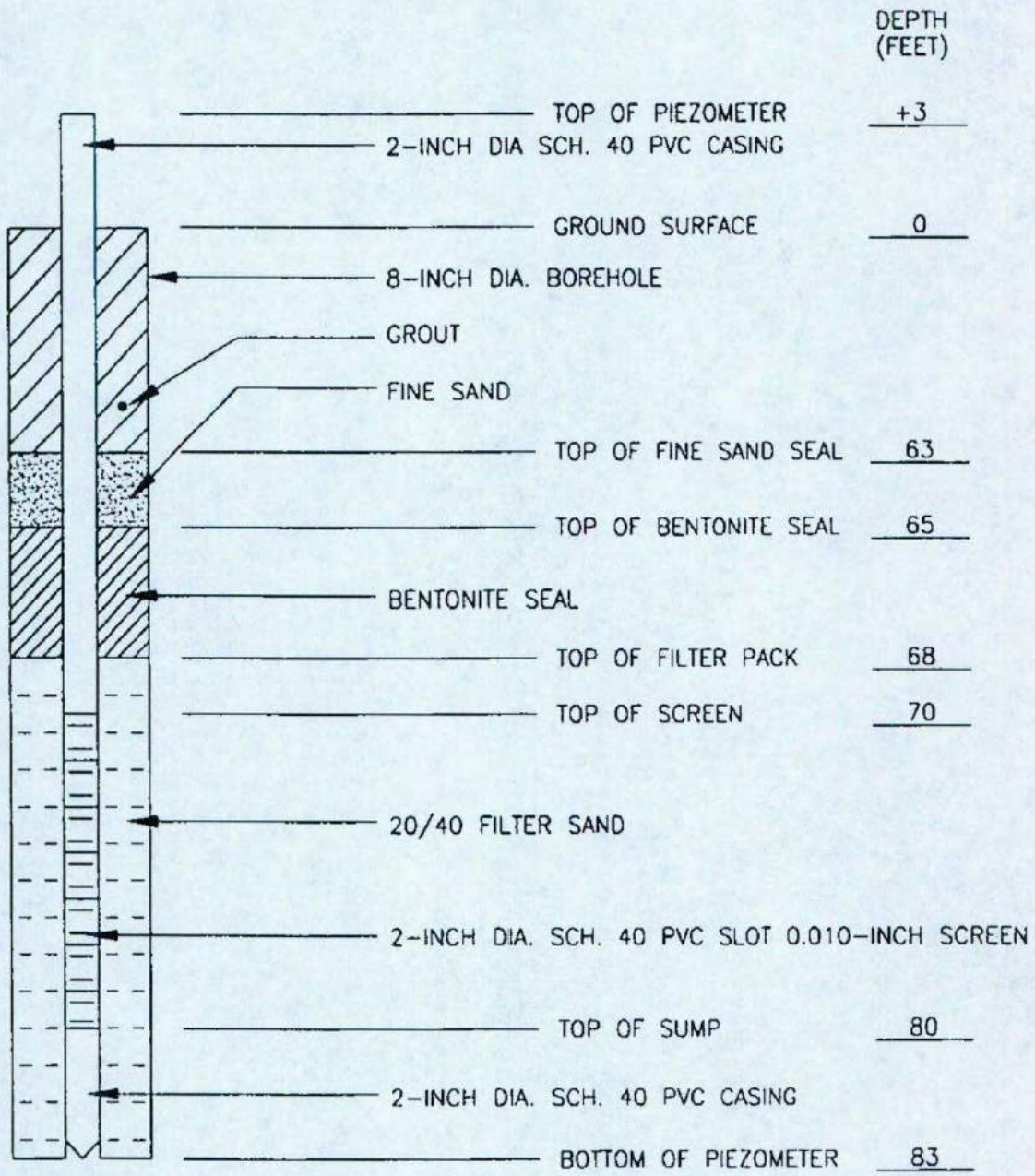
CONSTRUCTION DETAIL

WELL # P-12

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-46



DRAWING NOT TO SCALE

DATE INSTALLED: 6/12/97

TOP OF CASING ELEVATION: 367.14

GROUND SURFACE ELEVATION: 364.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

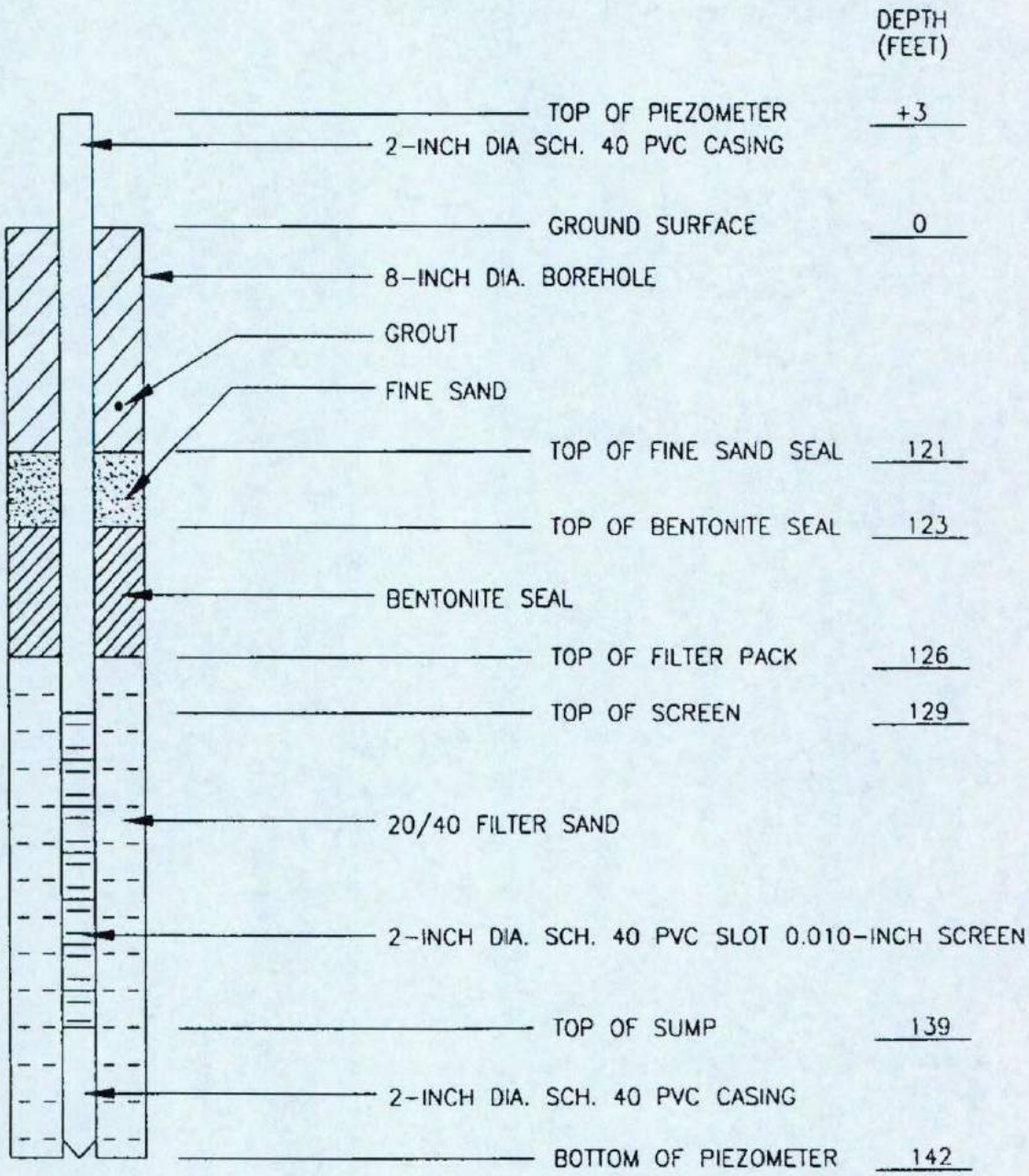
CONSTRUCTION DETAIL

WELL # P-13

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-47



DRAWING NOT TO SCALE

DATE INSTALLED: 7/1/97

? OF CASING ELEVATION: 367.16

:OUND SURFACE ELEVATION: 364.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

CONSTRUCTION DETAIL

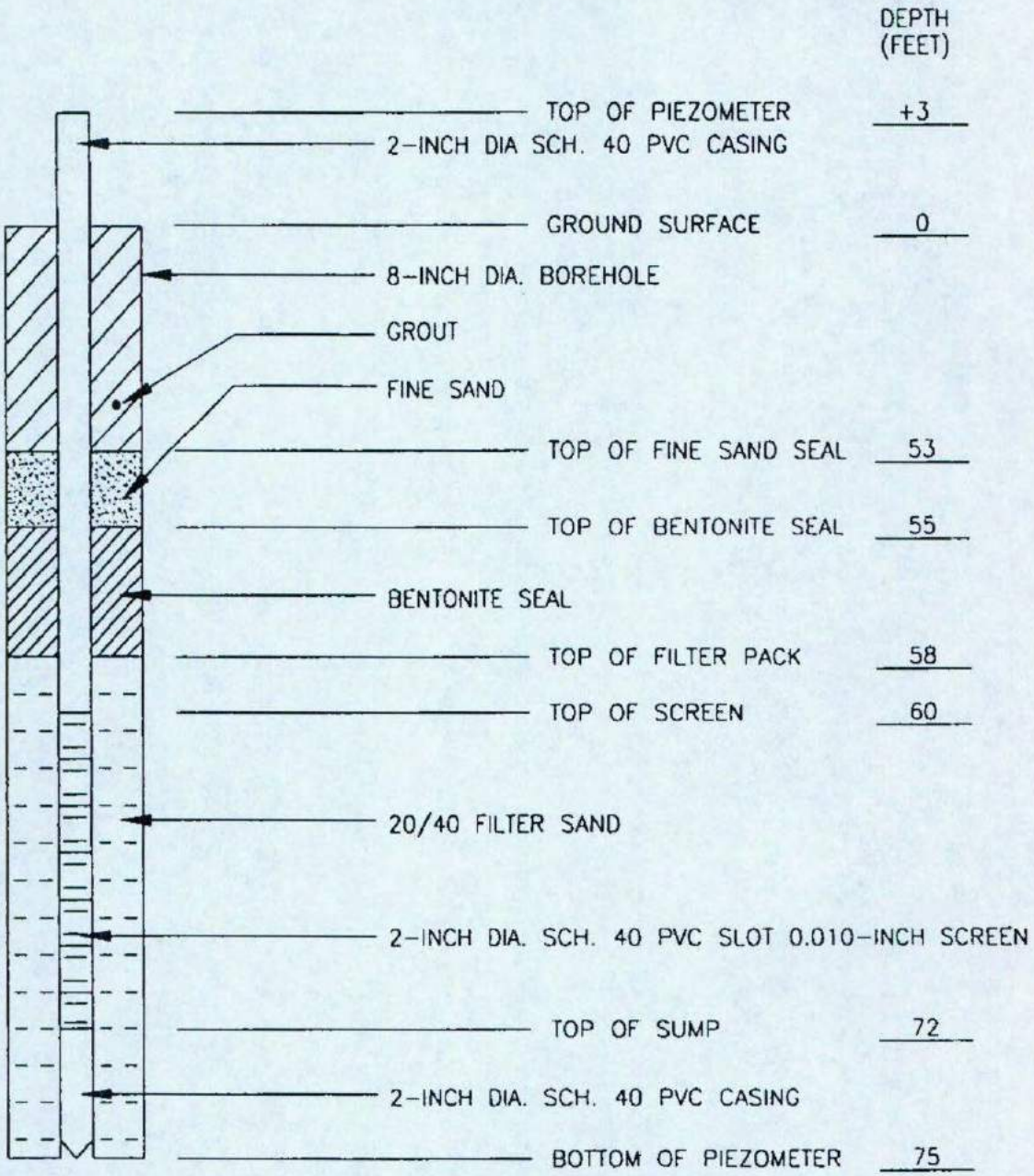
WELL # P-14

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-48

7423 PICARDY AVE., SUITE A



DRAWING NOT TO SCALE

DATE INSTALLED: 6/18/97

OF CASING ELEVATION: 371.86

OUND SURFACE ELEVATION: 369.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

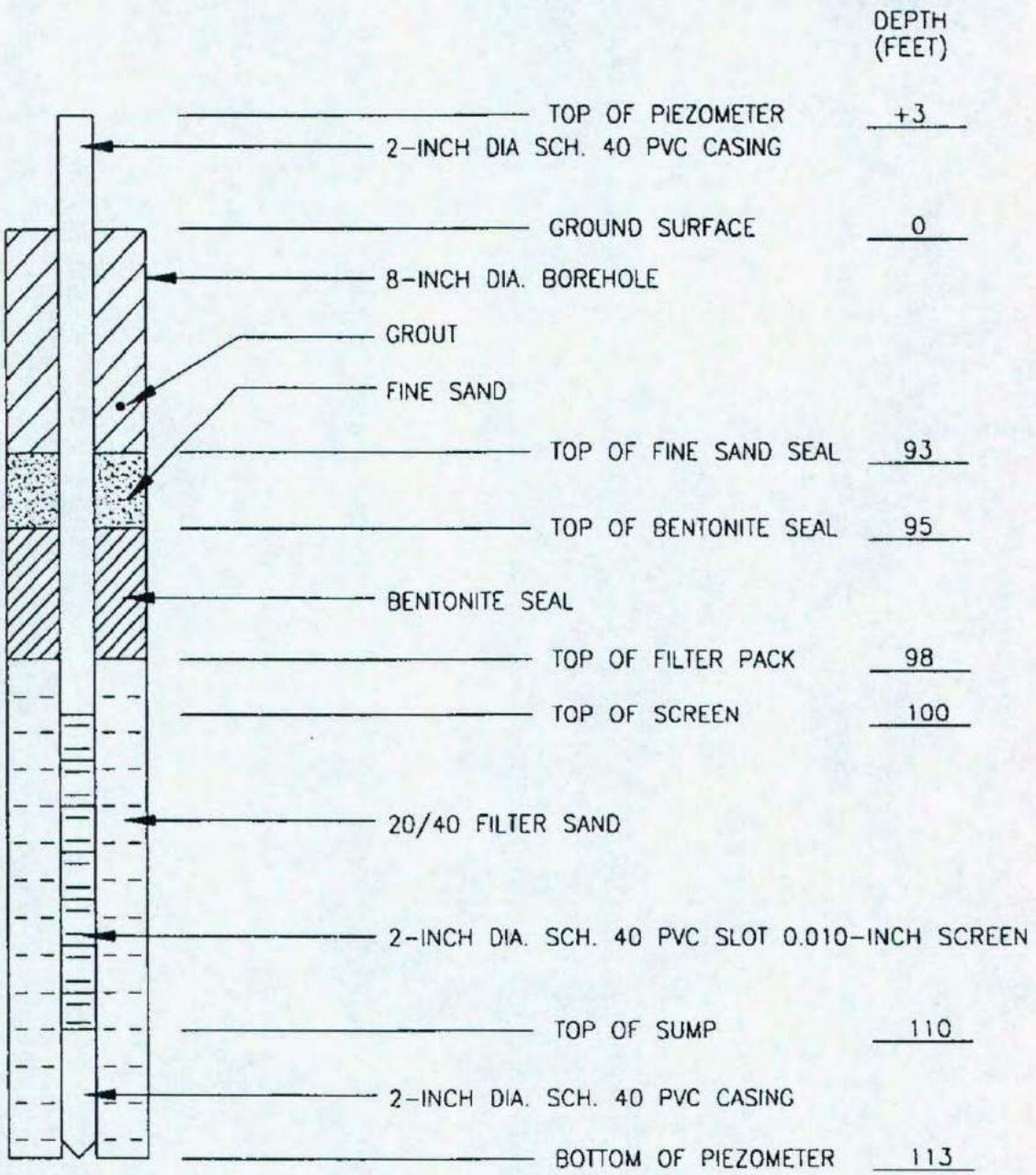
CONSTRUCTION DETAIL

WELL # P-15

DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KDS
Date:	2/5/98
Dwg. No.:	A01-0001-49



DRAWING NOT TO SCALE

DATE INSTALLED: 6/19/97

OF CASING ELEVATION: 371.07

..OUND SURFACE ELEVATION: 369.00

CLECO

DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

CONSTRUCTION DETAIL

WELL # P-16

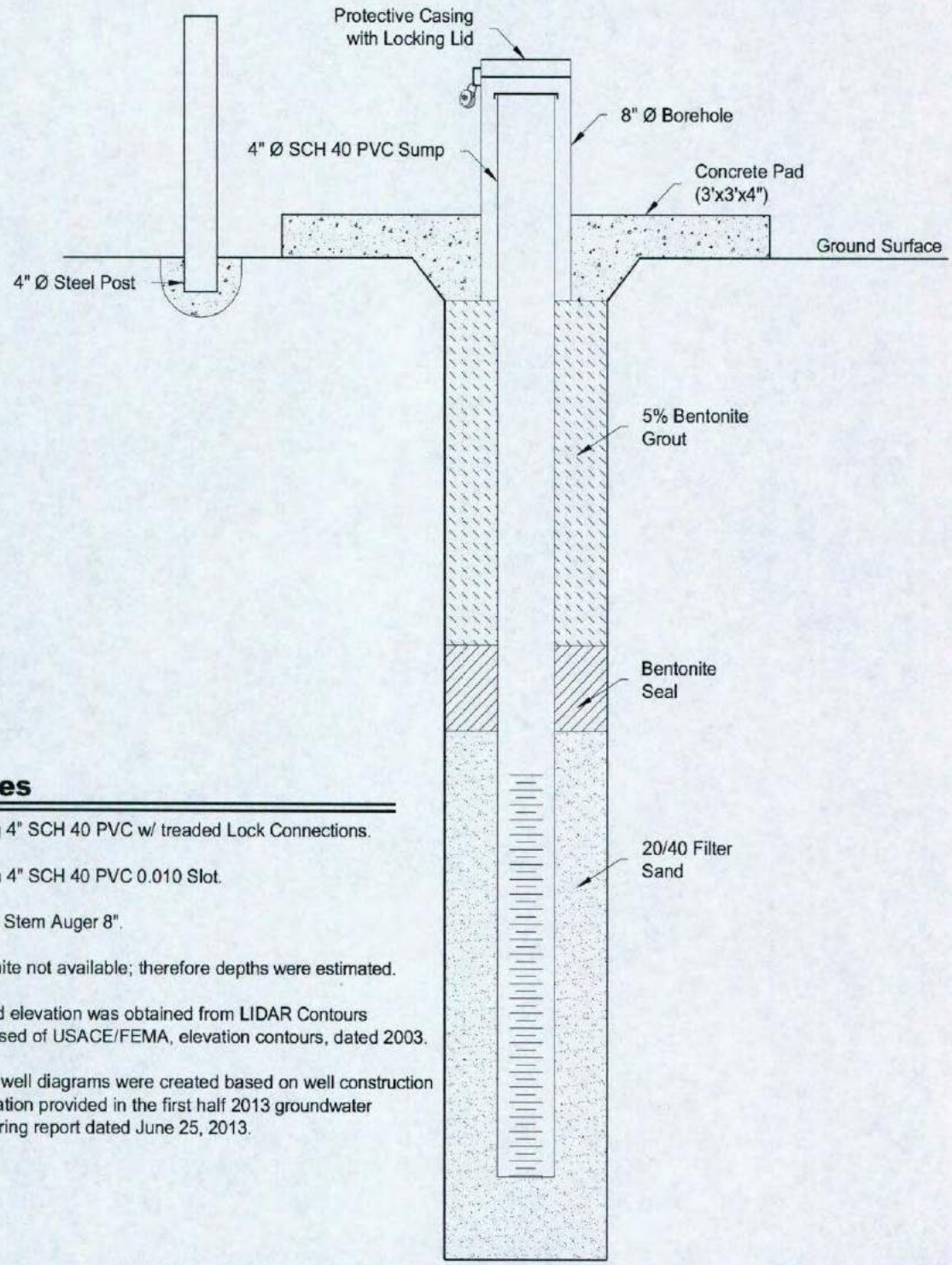
DESOTO PARISH

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/ACAD
Checked:	RS
Approved:	KAS
Date:	2/5/98
Dwg. No.:	A01-0001-50

PROVIDENCE

Diagram of Monitor Well: MW-3



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

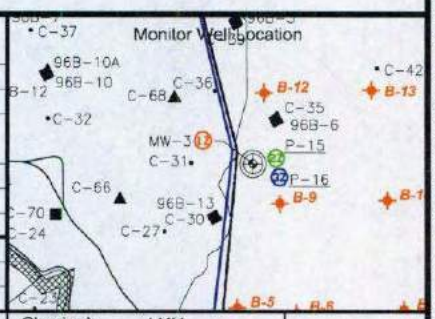
Hollow Stem Auger 8".

Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

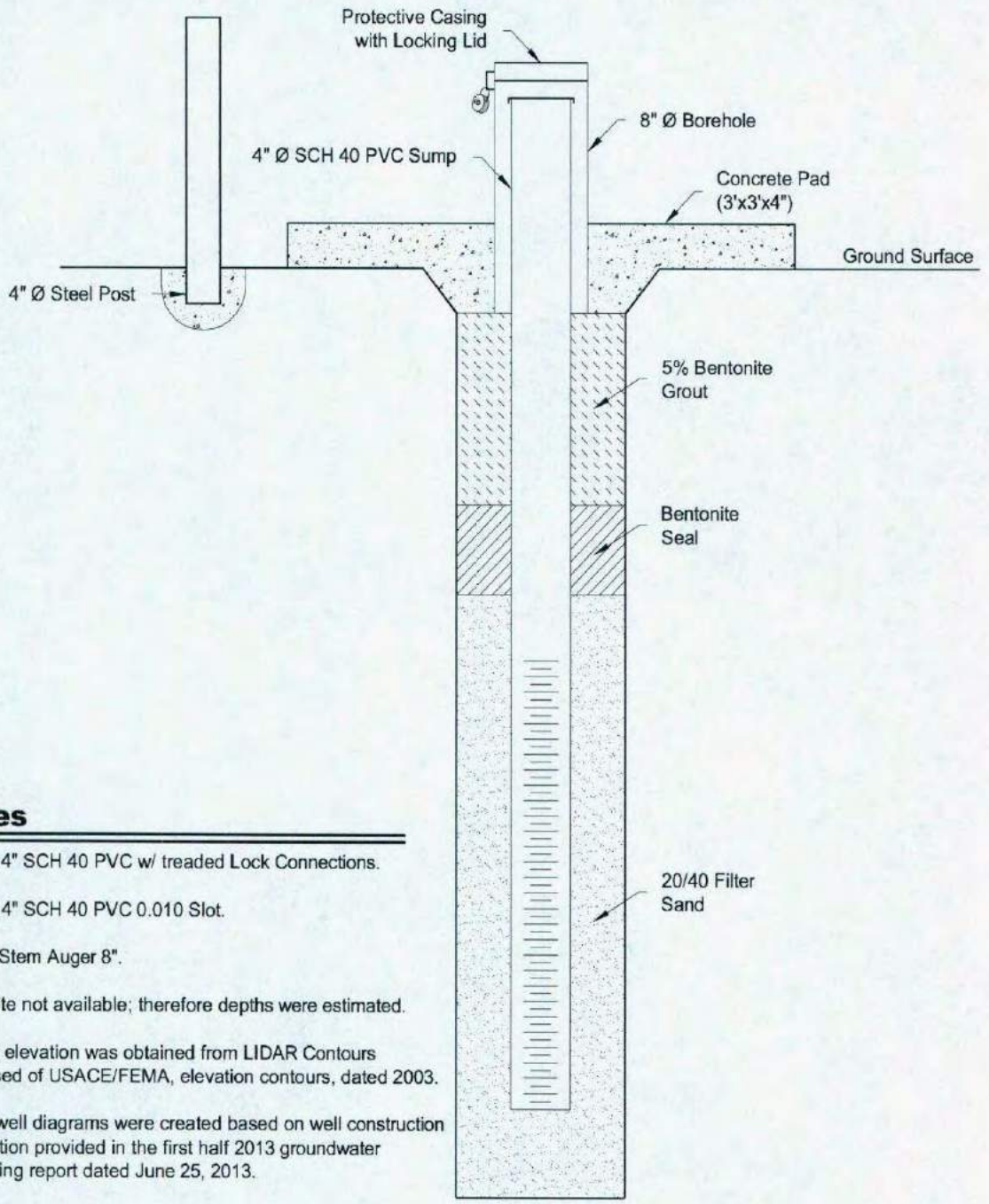
These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 00' 56.0" N		
		Longitude:	93° 34' 02.0" W		
Drilling Methods:	Rotary	Elevations			
Driller:	NA	TOC:	372.10'		
		Ground:	369.00'		
Date Drilled:	12/03/85	Initial Water Level:	NA		
Depth of Well:	45'	Depth of Hole:	45'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	48'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A148	Drawn:	CMM
				Checked:	LMM
				Approved:	KH
				Date:	03/07/14



PROVIDENCE

Diagram of Monitor Well: MW-4



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

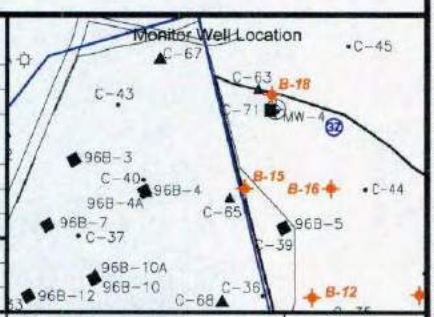
Hollow Stem Auger 8".

Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

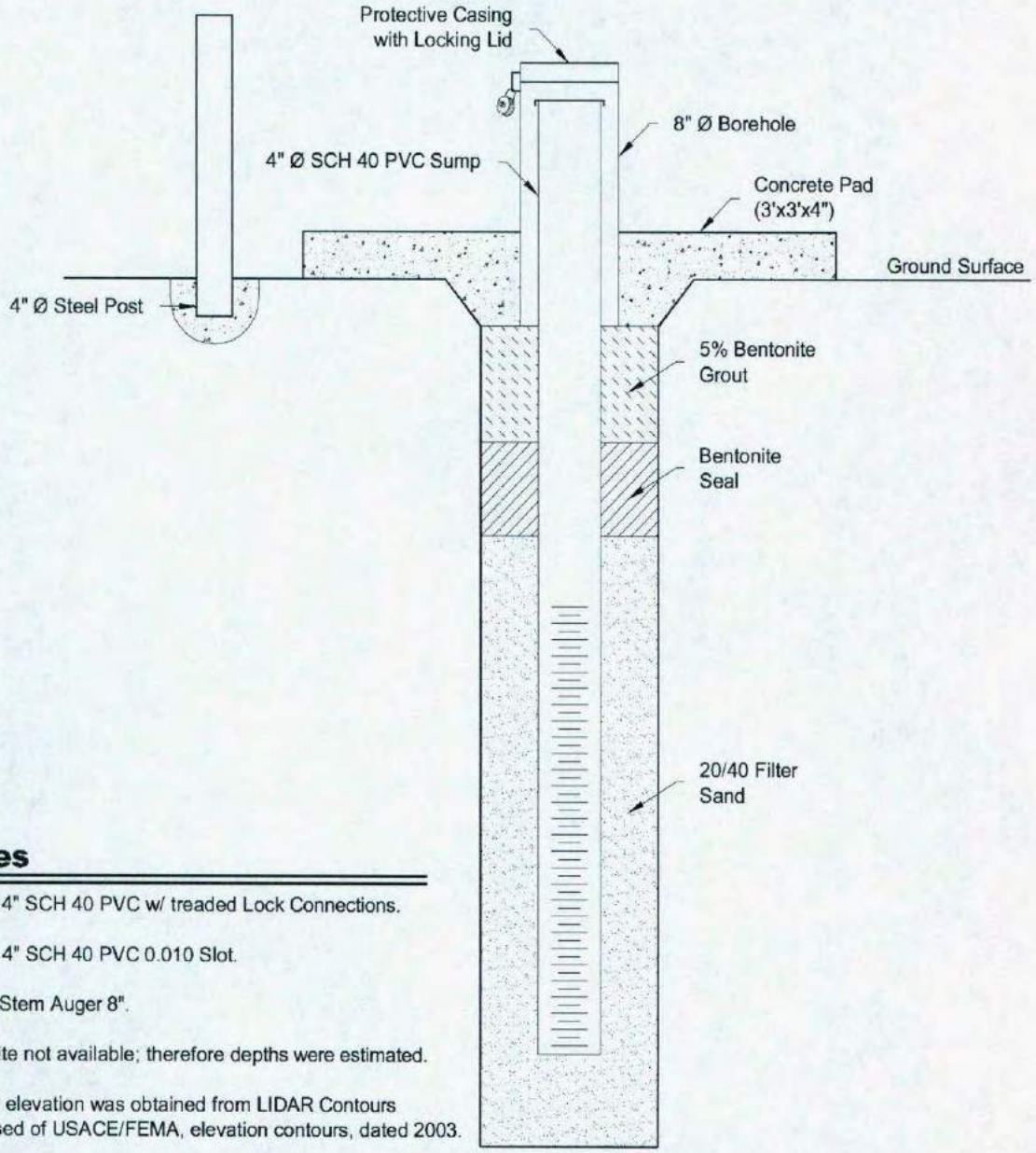
Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 01' 06.4" N		
		Longitude:	93° 34' 02.9" W		
Drilling Methods:	Rotary	Elevations			
Driller:	NA	TOC:	305.90'		
		Ground:	303.00'		
Date Drilled:	12/03/85	Initial Water Level:	NA		
Depth of Well:	30'	Depth of Hole:	45'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	33'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A149	Drawn:	CMM
				Checked:	LMM
				Approved:	KH
				Date:	03/07/14



Providence Engineering and Environmental Group LLC

PROVIDENCE

Diagram of Monitor Well: MW-5



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

Hollow Stem Auger 8".

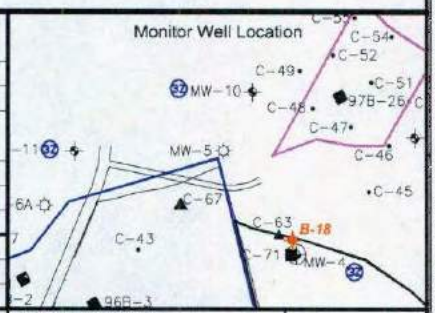
Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 01' 11.0" N		
		Longitude:	93° 34' 08.4" W		
Drilling Methods:	Rotary	Elevations			
Driller:	NA	TOC:	257.70'		
		Ground:	255.00'		
Date Drilled:	12/05/85	Initial Water Level:	NA		
Depth of Well:	22'	Depth of Hole:	22'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	25'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A150	Drawn:	CMM

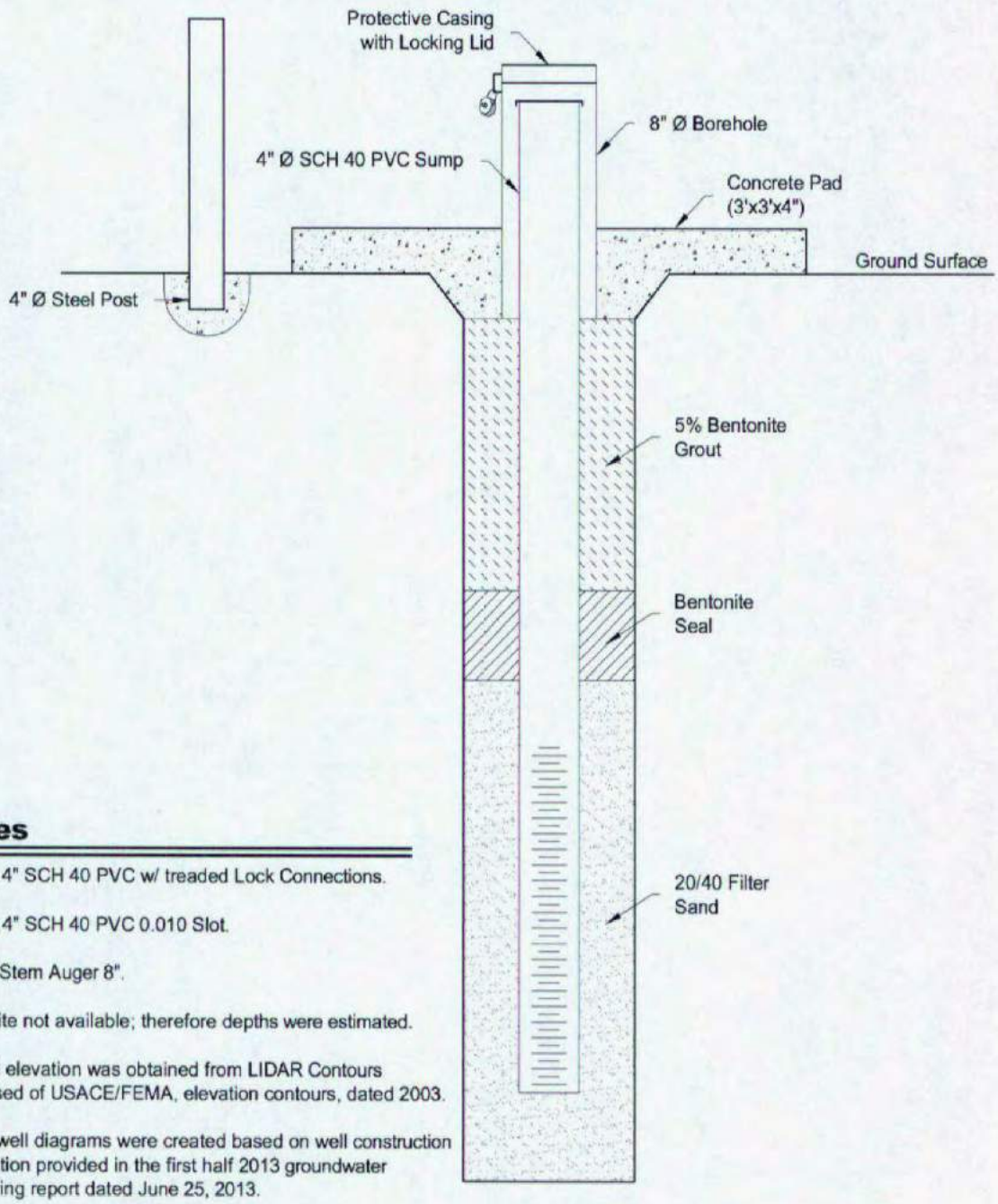
Monitor Well Location



Checked:	LMM
Approved:	KH
Date:	03/07/14

PROVIDENCE

Diagram of Monitor Well: MW-7



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

Hollow Stem Auger 8".

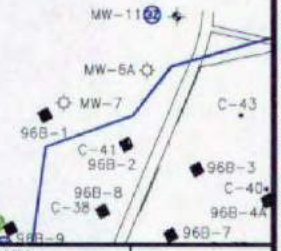
Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 01' 07.2" N		
		Longitude:	93° 34' 19.3" W		
Drilling Methods:	NA	Elevations			
Driller:	NA	TOC:	352.20'		
		Ground:	350.00'		
Date Drilled:	12/05/85	Initial Water Level:	NA		
Depth of Well:	27'	Depth of Hole:	27'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	30'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A151	Drawn:	CMM

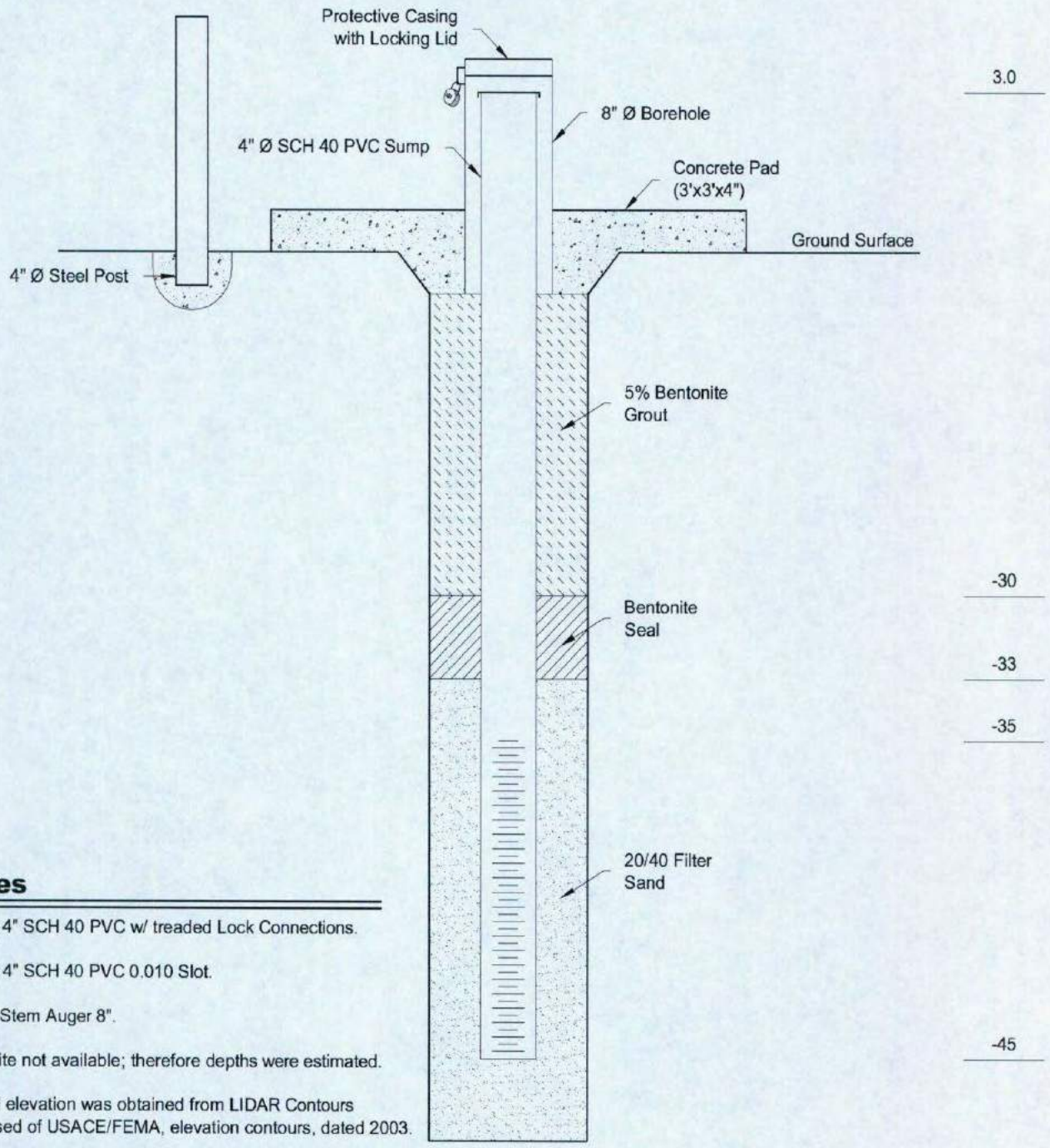
Monitor Well Location



Checked:	LMM	Date: 03/07/14
Approved:	KH	

PROVIDENCE

Diagram of Monitor Well: MW-2A



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

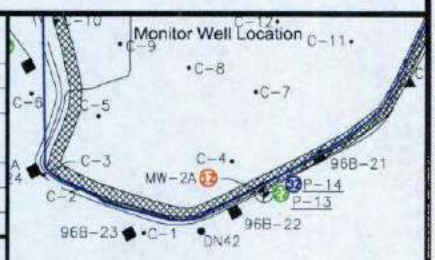
Hollow Stem Auger 8".

Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

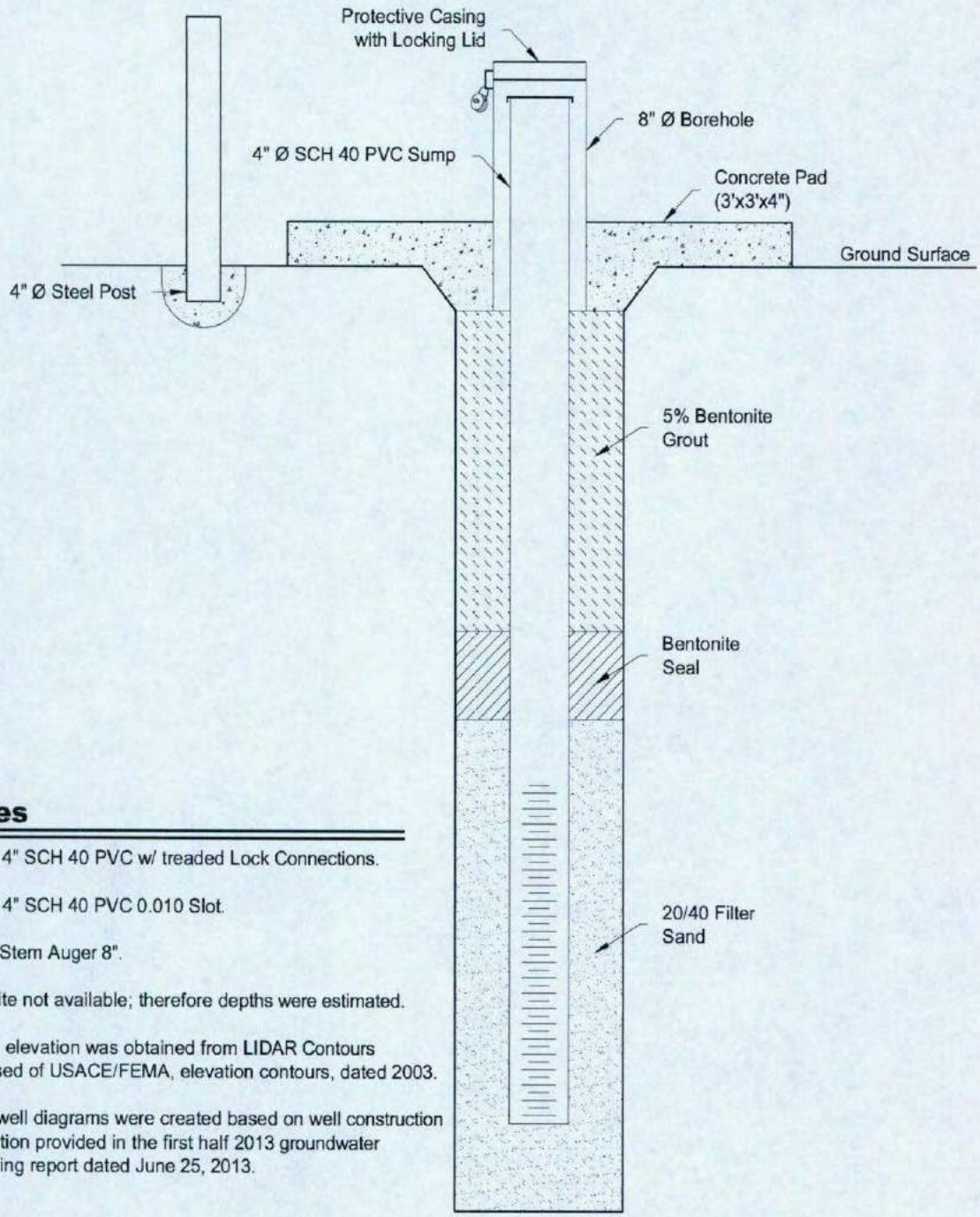
These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 00' 37.2" N		
		Longitude:	93° 34' 14.7" W		
Drilling Methods:	NA	Elevations			
Driller:	NA	TOC:	367.20'		
		Ground:	364.00'		
Date Drilled:	February 1988	Initial Water Level:	NA		
Depth of Well:	45'	Depth of Hole:	45'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	33'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A152	Drawn:	CMM
				Checked:	LMM
				Approved:	KH
				Date:	03/07/14



PROVIDENCE

Diagram of Monitor Well: MW-6A



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

Hollow Stem Auger 8".

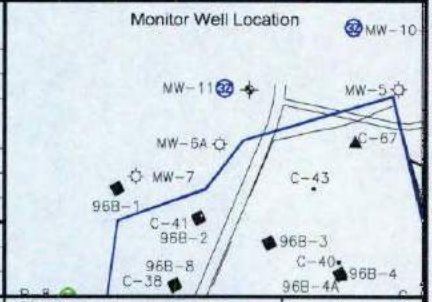
Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

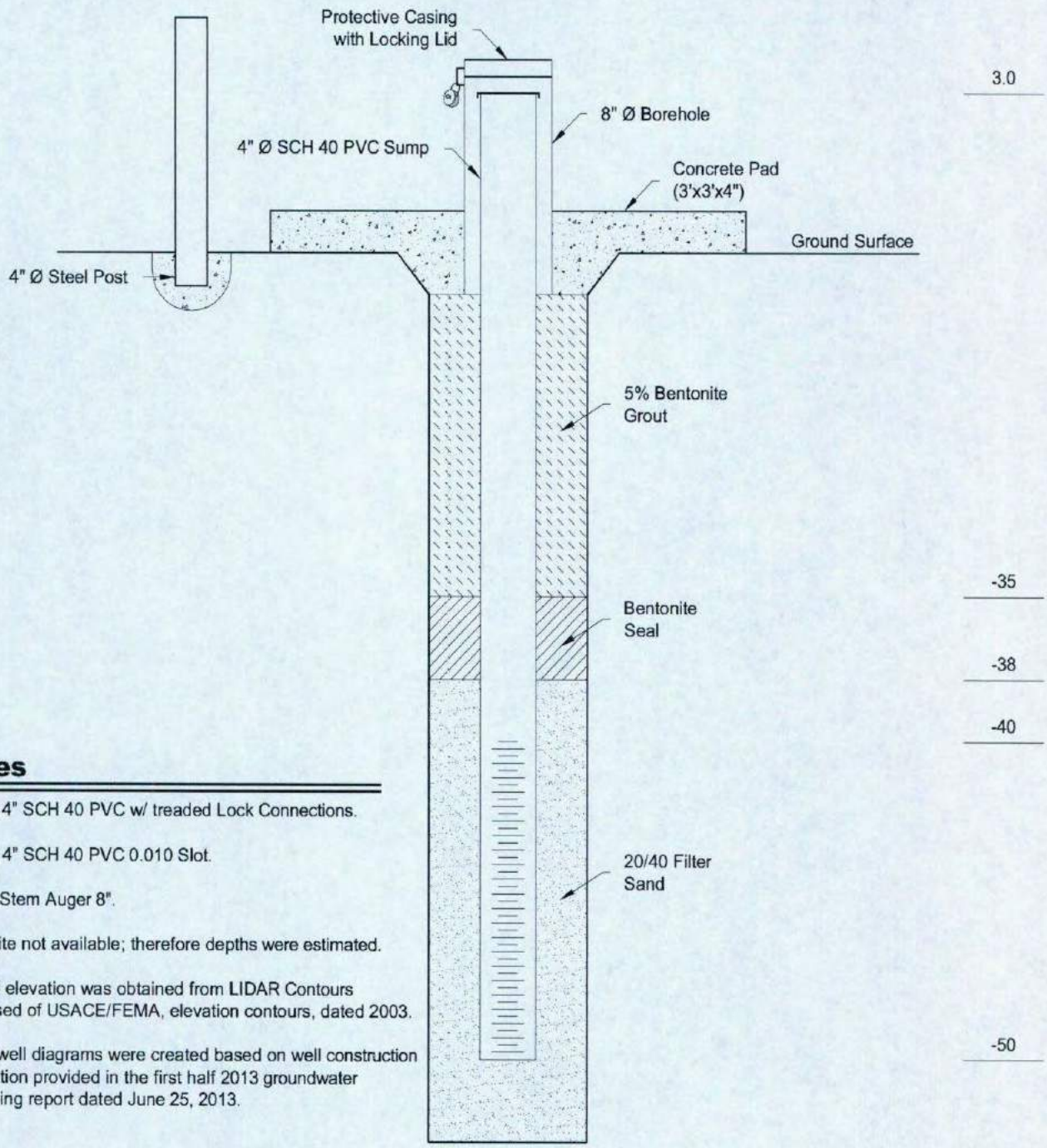
Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 01' 08.6" N		
		Longitude:	93° 34' 15.3" W		
Drilling Methods:	NA	Elevations			
Driller:	NA	TOC:	316.92'		
		Ground:	314.00'		
Date Drilled:	February 1988	Initial Water Level:	NA		
Depth of Well:	35'	Depth of Hole:	35'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	38'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A153	Drawn:	CMM
				Checked:	LMM
				Approved:	KH
				Date:	03/07/14

Monitor Well Location



PROVIDENCE

Diagram of Monitor Well: MW-8A



Notes

Casing 4" SCH 40 PVC w/ treaded Lock Connections.

Screen 4" SCH 40 PVC 0.010 Slot.

Hollow Stem Auger 8".

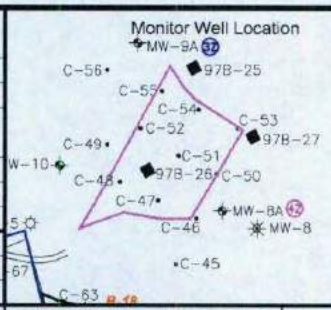
Bentonite not available; therefore depths were estimated.

Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates			
Engineer/Geologist:	NA	Latitude:	32° 01' 08.6" N		
		Longitude:	93° 34' 15.3" W		
Drilling Methods:	NA	Elevations			
Driller:	NA	TOC:	316.92'		
		Ground:	314.00'		
Date Drilled:	01/16/86	Initial Water Level:	NA		
Depth of Well:	50'	Depth of Hole:	50'	Hole Dia.:	8"
Screen Length:	10'	Screen Dia.:	4"	Slot Size:	0.01
Casing Length:	53'	Casing Dia.:	4"	TYPE:	NA
Doc Code	002-125	Dwg. No.:	002-125-A154	Drawn:	CMM
				Checked:	LMM
				Approved:	KH
				Date:	03/07/14

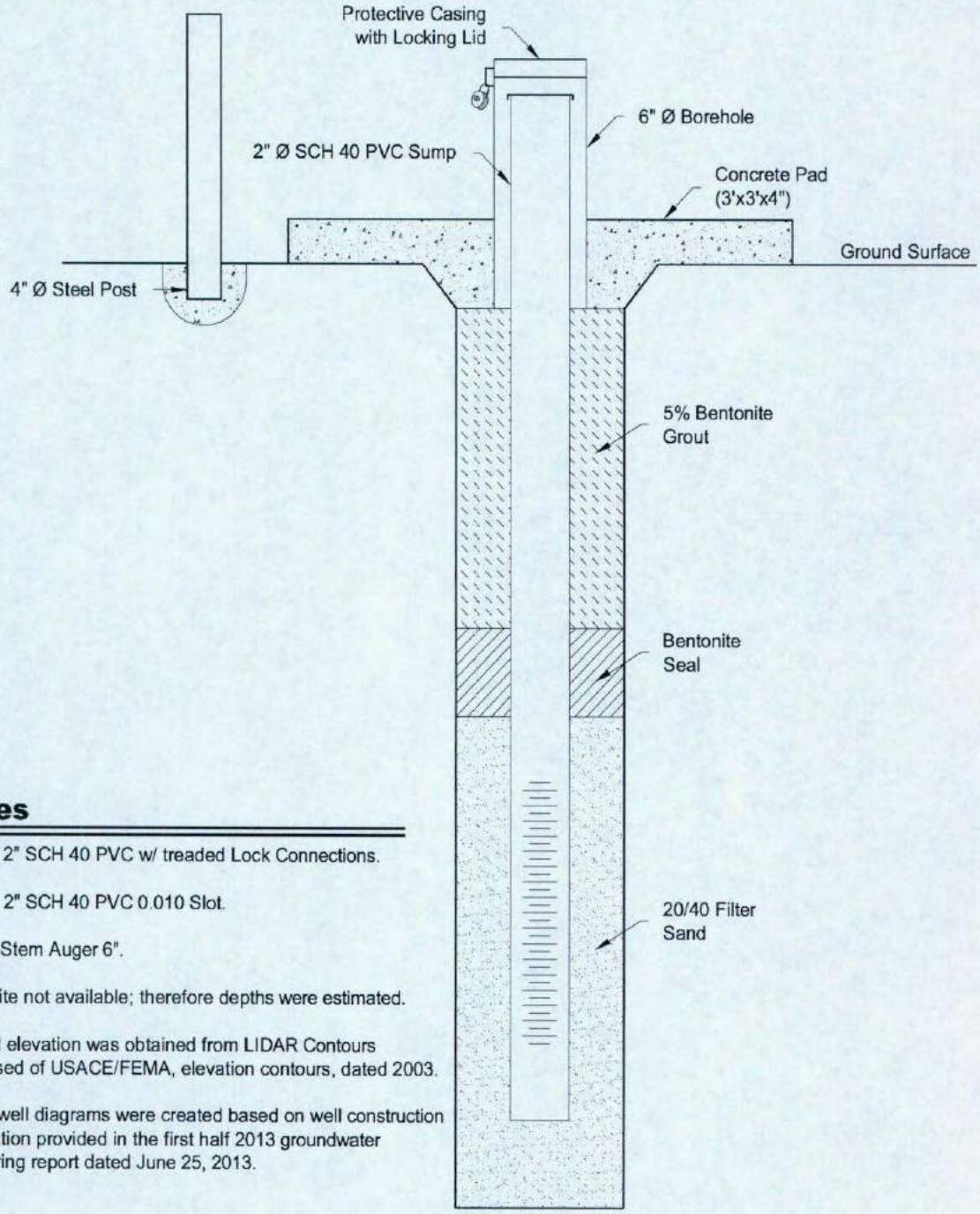
Monitor Well Location



Providence Engineering and Environmental Group LLC

PROVIDENCE

Diagram of Monitor Well: P-4A



Notes

Casing 2" SCH 40 PVC w/ treaded Lock Connections.

Screen 2" SCH 40 PVC 0.010 Slot.

Hollow Stem Auger 6".

Bentonite not available; therefore depths were estimated.

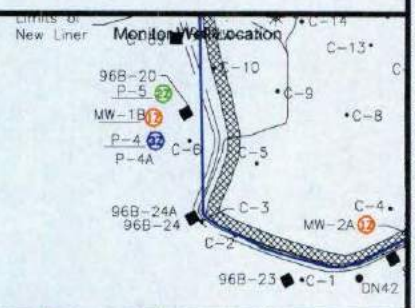
Ground elevation was obtained from LIDAR Contours comprised of USACE/FEMA, elevation contours, dated 2003.

These well diagrams were created based on well construction information provided in the first half 2013 groundwater monitoring report dated June 25, 2013.

Location:	Mansfield, LA	Well Coordinates	
Engineer/Geologist:	NA	Latitude:	32° 00' 41.1" N
		Longitude:	93° 34' 25.6" W
Drilling Methods:	Rotary	Elevations	
Driller:	NA	TOC:	382.00'
		Ground:	379.62'
Date Drilled:	November 2012	Initial Water Level:	NA

Depth of Well:	163'	Depth of Hole:	163'	Hole Dia.:	6"
Screen Length:	10'	Screen Dia.:	2"	Slot Size:	0.01
Casing Length:	166'	Casing Dia.:	2"	TYPE:	NA

Doc Code	002-125	Dwg. No.:	002-125-A155	Drawn:	CMM	Checked: LMM / Approved: KH	Date: 03/07/14



Providence Engineering and Environmental Group LLC

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-12**
TOTAL DEPTH:	**50 FEET**
TOP OF CASING ELEV.:	**313.12 Ft NGVD**
GROUND SURFACE ELEV.:	**310.40 Ft NGVD**

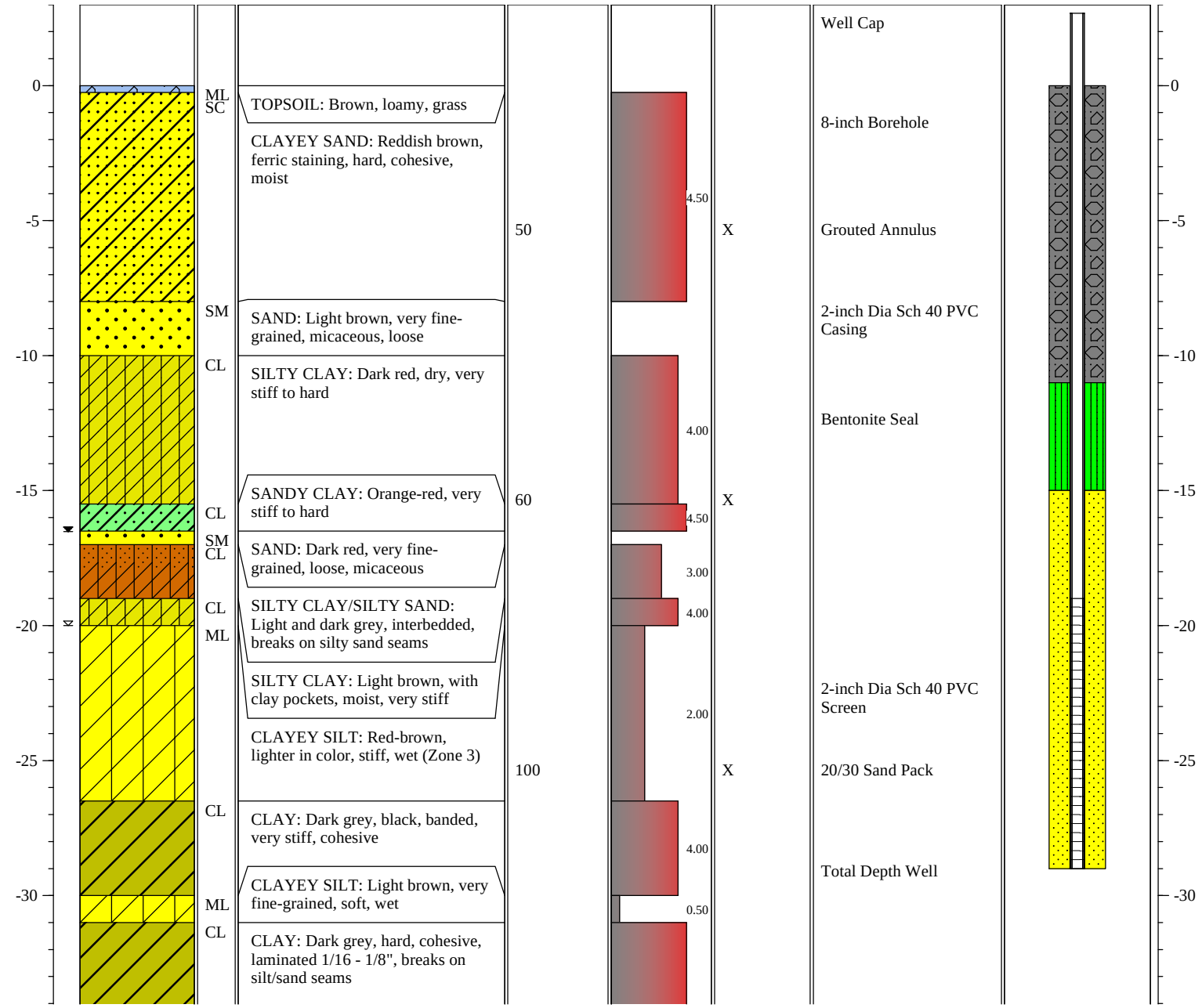
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/21 to 6/11/2019**

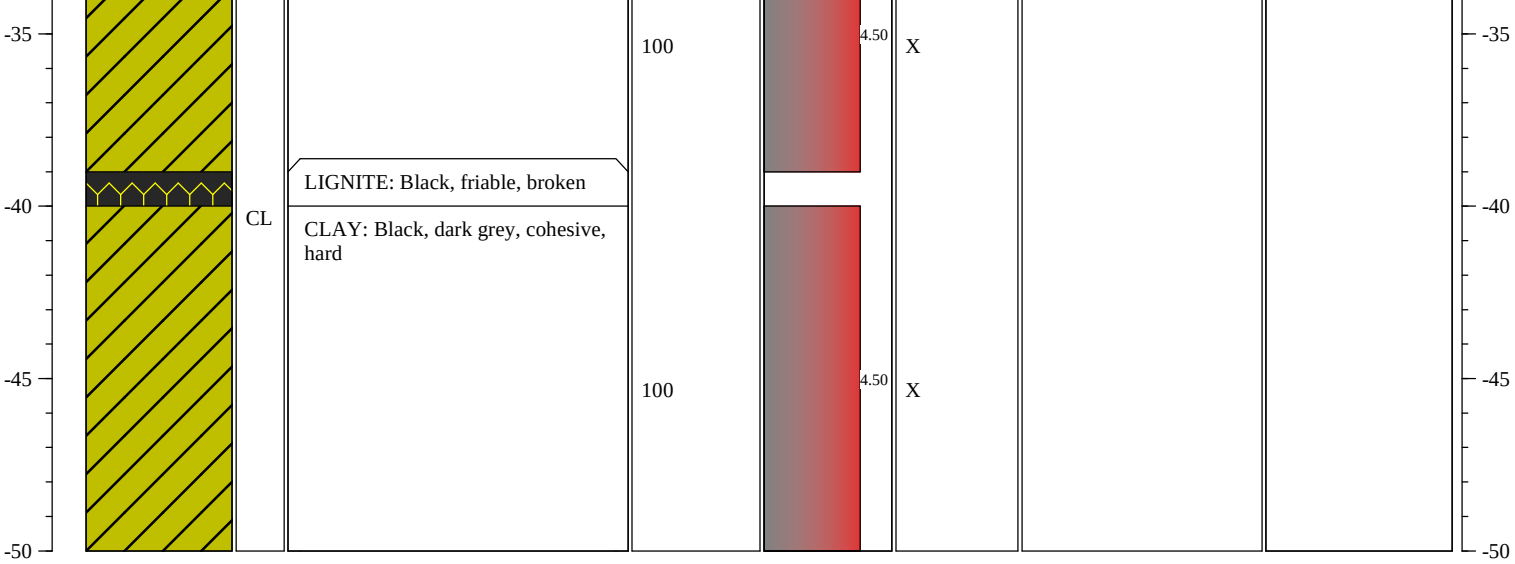
Notes:

Water level during drilling: 20 FT BGS

Water level in completed well: 16.52 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION




-35
-40
-45
-50
CL
LIGNITE: Black, friable, broken
CLAY: Black, dark grey, cohesive, hard
100
100
4.50
4.50
X
X

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-13**
TOTAL DEPTH:	**90 FEET**
TOP OF CASING ELEV.:	**380.61 Ft NGVD**
GROUND SURFACE ELEV.:	**378.11 Ft NGVD**

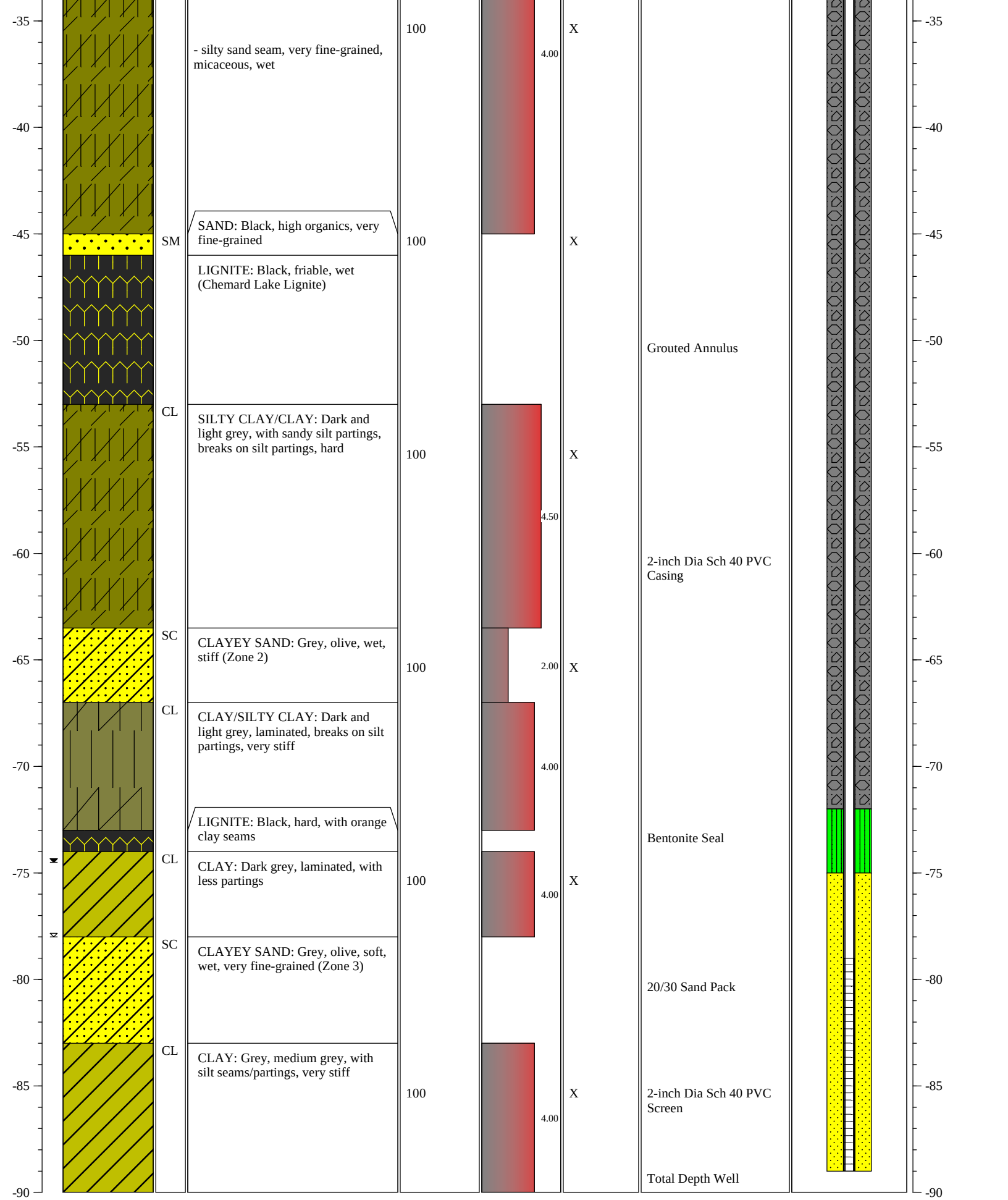
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/22 to 6/11/2019**

Notes:

Water level during drilling: 78 FT BGS

Water level in completed well: 74.5 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML SM	TOPSOIL: Brown, loamy				Well Cap	
			SILTY SAND: Orange, yellow, very fine-grained, micaceous, loose, ferric staining				8-inch Borehole	
-5		CL	SANDY CLAY: Orange, yellow, very fine-grained, micaceous, soft, ferric staining	50	0.50	X	Grouted Annulus	
		SM	SILTY SAND: Pale yellow, very fine-grained, micaceous, loose, ferric staining (Dolet Hills Sand)					
-10								
-15		SC	CLAYEY SAND: Orange, banded, very fine-grained, ferric staining, moist	80		X	2-inch Dia Sch 40 PVC Casing	
		SM	SANDY SILT: Light brown, very loose, moist					
-20								
		CL	SANDY CLAY: Dark red, orange, grey, high ferric staining		4.00			
-25		CL	SANDY CLAY: Grey, white, banded, very silty, high ferric staining	100	4.00	X		
-30		CL	SILTY CLAY/CLAY: Dark and light grey, laminated, 1/2 to 1" partings, very stiff					


-35
-40
-45
-50
-55
-60
-65
-70
-75
-80
-85
-90
- silty sand seam, very fine-grained, micaceous, wet
SAND: Black, high organics, very fine-grained
SM
LIGNITE: Black, friable, wet (Chemard Lake Lignite)
SILTY CLAY/CLAY: Dark and light grey, with sandy silt partings, breaks on silt partings, hard
CL
CLAYEY SAND: Grey, olive, wet, stiff (Zone 2)
SC
CLAY/SILTY CLAY: Dark and light grey, laminated, breaks on silt partings, very stiff
CL
LIGNITE: Black, hard, with orange clay seams
CLAY: Dark grey, laminated, with less partings
CL
CLAYEY SAND: Grey, olive, soft, wet, very fine-grained (Zone 3)
SC
CLAY: Grey, medium grey, with silt seams/partings, very stiff
CL
100
4.00
4.50
2.00
X
Grouted Annulus
2-inch Dia Sch 40 PVC Casing
Bentonite Seal
20/30 Sand Pack
2-inch Dia Sch 40 PVC Screen
Total Depth Well

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-14**
TOTAL DEPTH:	**36 FEET**
TOP OF CASING ELEV.:	**311.63 Ft NGVD**
GROUND SURFACE ELEV.:	**308.98 Ft NGVD**

CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**6/11/2019**

Notes:

Water level during drilling: 25 FT BGS

Water level in completed well: 16.60 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			SILTY CLAY: Grey, mottled, ferric staining, dry	100	4.00	X	8-inch Borehole	
-5							Grouted Annulus	
-10		CL	CLAY: Grey, cohesive, high plasticity, moist-dry		4.00			
		ML	SILT: Light grey, loose, micaceous, dry	100		X	2-inch Dia Sch 40 PVC Casing	
-15		CL	CLAYEY SILT: Light grey, light brown, breaks on silt/sand partings and seams, micaceous		4.00			
-20				100		X	Bentonite Seal	
		SM	SILT/SILTY CLAY: Dark and light grey, very sandy, breaks on 1 to 2" seams, micaceous, laminations 1/16 - 1/8"					
-25		CL	CLAY: Dark grey, cohesive, with silt seams		4.00		20/30 Sand Pack	
-30		SM	SANDY SILT: Light grey, loose, micaceous (Zone 3)	100		X	2-inch Dia Sch 40 PVC Screen	
		CL	CLAY: Dark grey, cohesive, breaks on 12" layers, hard		4.50			
-35		CL	SILT/SILTY CLAY: Dark and ligh grey, laminated, very sandy, moist, with increasing sandy silt partings and seams		4.00		Total Depth Well	

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-15**
TOTAL DEPTH:	**30 FEET**
TOP OF CASING ELEV.:	**308.80 Ft NGVD**
GROUND SURFACE ELEV.:	**306.12 Ft NGVD**

CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/23 to 6/11/2019**

Notes:

Water level during drilling: 24 FT BGS

Water level in completed well: 22.72 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			CLAY: Red, very stiff, dry				8-inch Borehole	
-5				100	4.00	X	Grouted Annulus	
-10		CL	SILTY CLAY: Red, with silt seams, hard		4.50		2-inch Dia Sch 40 PVC Casing	
-15		CL	CLAY: Red, grey, moist, hard	70	4.50	X	Bentonite Seal	
-20			LIGNITE: Black, friable					
		CL	CLAY: Grey, light and dark laminations, very stiff		4.50	X	20/30 Sand Pack	
-25		SM	SILTY SAND: Dark grey, olive, very fine-grained, silty, wet	100				
		CL SM	SILT/SILTY CLAY: Dark grey, olive, silt laminations, very stiff, wet		4.00			
-30			SANDY SILT: Grey, olive, very fine-grained, with 1/8" silty clay partings, wet (Zone 3)	100		X	2-inch Dia Sch 40 PVC Screen Total Depth Well	

SOIL BORING LOG

BORING/WELL NO.:	**MW-16**
TOTAL DEPTH:	**70 FEET**
TOP OF CASING ELEV.:	**331.71 Ft NGVD**
GROUND SURFACE ELEV.:	**328.82 Ft NGVD**

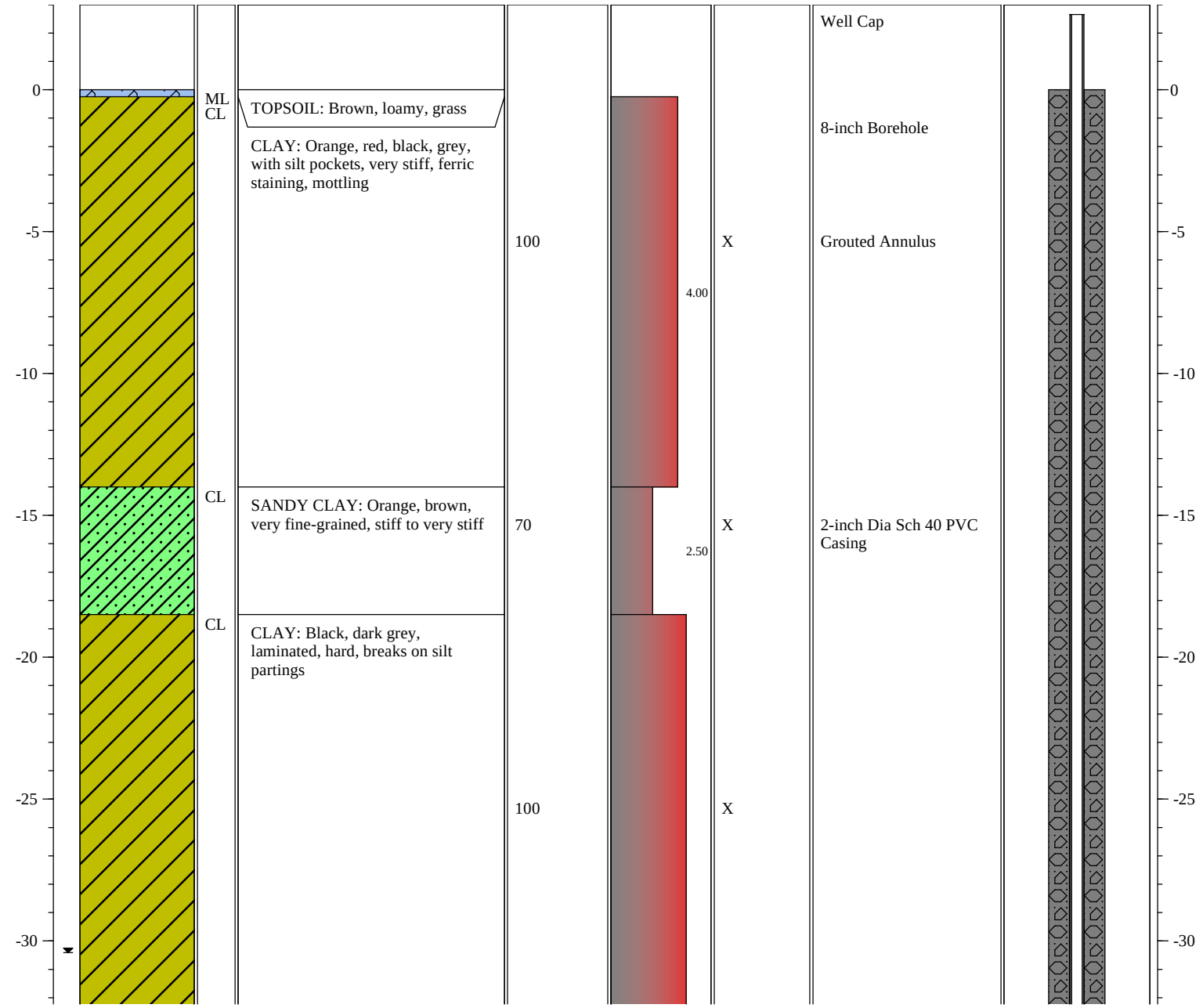
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/23 to 6/11/2019**

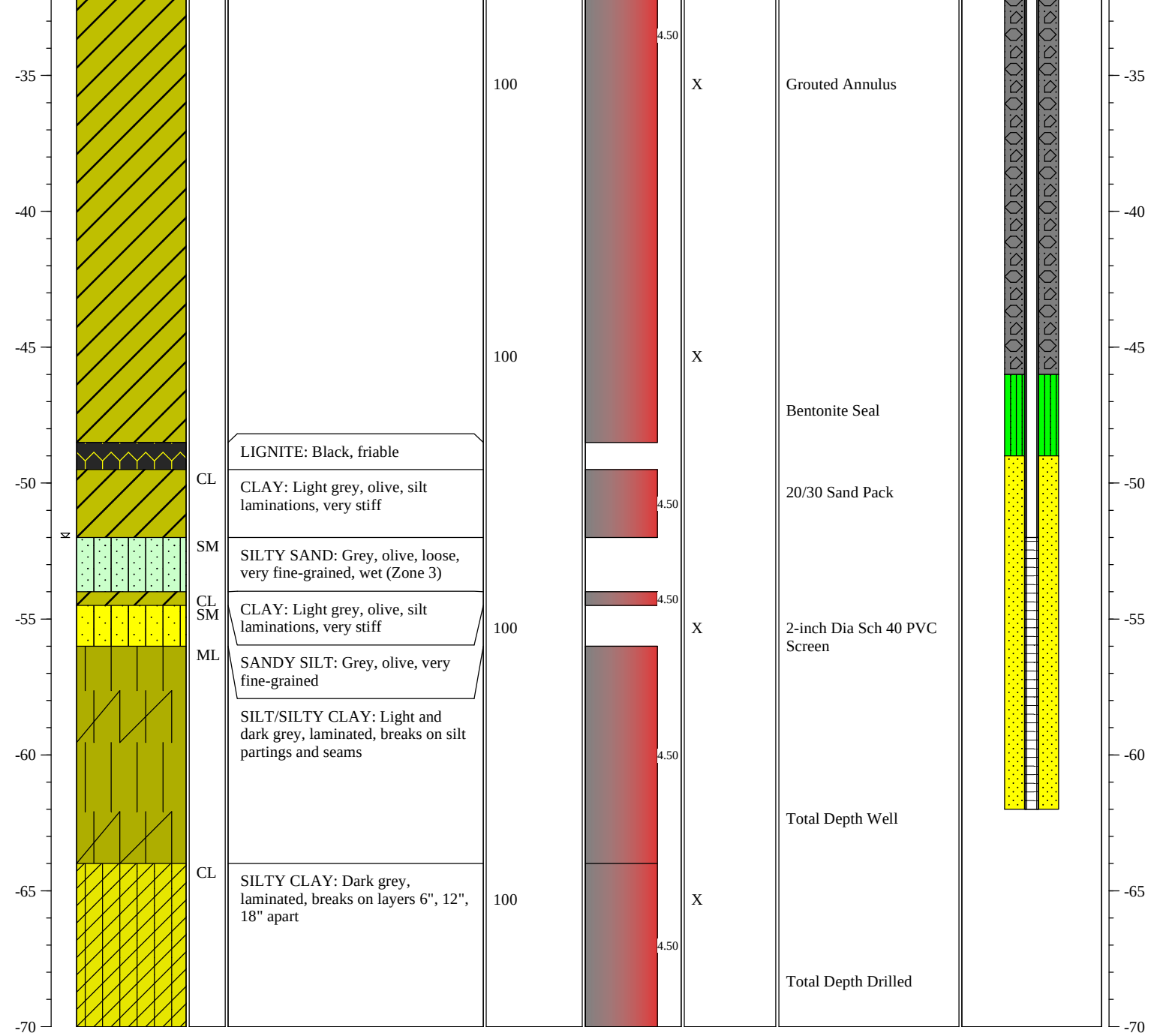
Notes:

▽ Water level during drilling: 52 FT BGS

▼ Water level in completed well: 30.41 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			CLAY: Orange, red, black, grey, with silt pockets, very stiff, ferric staining, mottling				8-inch Borehole	
-5				100	4.00	X	Grouted Annulus	
-10								
-15		CL	SANDY CLAY: Orange, brown, very fine-grained, stiff to very stiff	70	2.50	X	2-inch Dia Sch 40 PVC Casing	
-20		CL	CLAY: Black, dark grey, laminated, hard, breaks on silt partings					
-25				100		X		
-30								




-35
-40
-45
-50
-55
-60
-65
-70
LIGNITE: Black, friable
CL
CLAY: Light grey, olive, silt laminations, very stiff
SM
SILTY SAND: Grey, olive, loose, very fine-grained, wet (Zone 3)
CL
SM
CLAY: Light grey, olive, silt laminations, very stiff
ML
SANDY SILT: Grey, olive, very fine-grained
SILT/SILTY CLAY: Light and dark grey, laminated, breaks on silt partings and seams
CL
SILTY CLAY: Dark grey, laminated, breaks on layers 6", 12", 18" apart
100
100
100
100
4.50
4.50
4.50
4.50
X
X
X
X
Grouted Annulus
Bentonite Seal
20/30 Sand Pack
2-inch Dia Sch 40 PVC Screen
Total Depth Well
Total Depth Drilled

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
2		4.5					2
4		4.5		**Sandy Clay (SMCL)** brown, hard, moderate plasticity, moist			4
6				**Clayey Sand (CLSM)** gray, loose, fine grainded, moist			6
8		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			8
10		4.5		**Silty Clay (MLCL)** tan, gray, hard, mottled, moderate plasticity, moist			10
12		4.5					12
14		3.0		**Silty Clay (MLCL)** tan, gray, extremely stiff, moderate plasticity, moist			14
16		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			16
18				**Organic Clay (OH)** gray, soft, moderate to high plasticity, moist			18
20							20

Legend

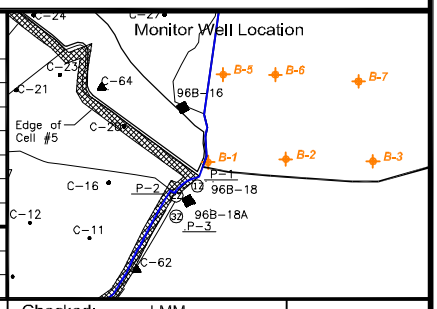
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A123	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	09/03/14

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** gray, tan, hard, moderate plasticity, moist			
22							22
		4.5					
24				**Clayey Sand (CLSM)** tan, light gray, medium dense, fine grained, moist			24
26				**Sand (SM)** tan, light gray, very loose, fine grained, well graded, wet			26
28							28
30							30
32							32
34				**Silty Clay (MLCL)** tan, gray, stiff, mottled, moderate plasticity, moist			34
36				**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			36
		4.5					
38							38
		4.5					
40							40

Legend

Split Spoon

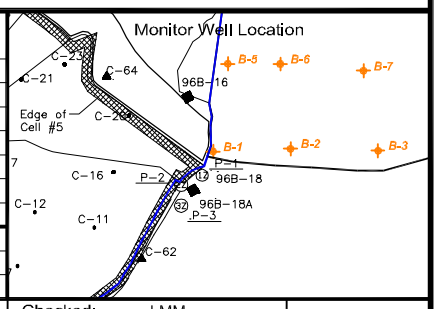
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/9/13-12/13/13

Well Coordinates	
Latitude:	32.012789
Longitude:	-93.567454
Elevations	
TOC:	NA
Ground:	362.53' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A124	Drawn:	CMM	Checked: / Approved:	LMM / VRG
						Date:	09/03/14

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
42							42
		4.5		**Silty Clay (MLCL)** gray, hard, layered, low plasticity, moist			
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50				**Silty Clay (MLCL)** gray, hard, low plasticity, moist			50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5					
60							60

Legend

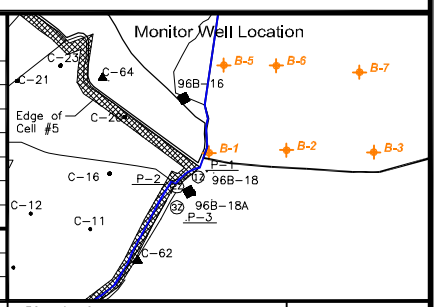
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A125	Drawn:	CMM



Checked:	LMM	Date: 09/03/14
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
62		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			62
64		4.5		**Silty Clay (MLCL)** gray, hard, layered, low plasticity, moist			64
66		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, moist			66
68		4.5		**Silty Clay (MLCL)** dark gray, hard, layered, crumbly, low plasticity, dry			68
70		4.5		**Silty Clay (MLCL)** black, hard, layered, crumbly, low plasticity, dry			70
72				**No Recovery**			72
74				**Clayey Sand (CLSM)** light gray, dense, fine grained, poorly sorted, moist			74
76		4.5		**Sandy Clay (SMCL)** light gray, hard, moderate plasticity, moist			76
78		4.5					78
80							80

Legend

Split Spoon

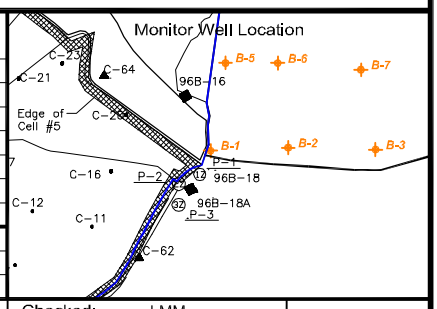
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/9/13-12/13/13

Well Coordinates	
Latitude:	32.012789
Longitude:	-93.567454
Elevations	
TOC:	NA
Ground:	362.53' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A126	Drawn:	CMM	Checked:	LMM
						Approved:	VRG

Date: 09/03/14

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Clayey Sand (CLSM)** light gray, dense, poorly graded, moist			80
82							82
84				**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			84
86		5.0					86
88		5.0					88
90		5.0					90
92		5.0					92
94		5.0					94
96		5.0					96
98		5.0					98
100		5.0					100

Legend

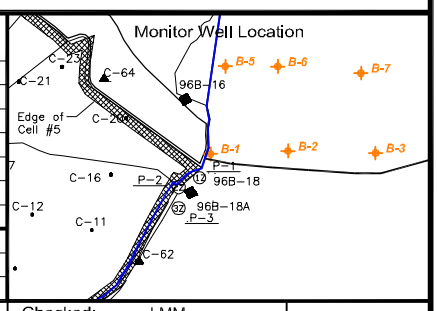
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A127	Drawn:	CMM



Checked:	LMM	Date: 09/03/14
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		5.0		**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
102		5.0					102
104		5.0					104
106		5.0					106
108		5.0					108
110		5.0		**Clay (CL)** black, hard, high plasticity, very moist			110
112		5.0					112
114		5.0					114
116		5.0					116
118		5.0					118
120							120

Legend

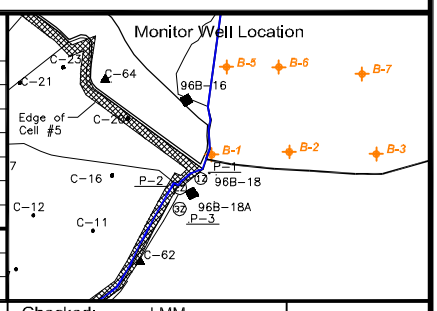
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A128	Drawn:	CMM



Checked:	LMM	Date:	09/03/14
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
120							120
		5.0		**Clay (CL)** black, hard, high plasticity, very moist			
122							122
		5.0					
124							124
		5.0					
126							126
		5.0					
128							128
		5.0					
130							130
		5.0					
132							132
		5.0					
134							134
		5.0					
136							136
		5.0					
138							138
		5.0					
140							140

Legend

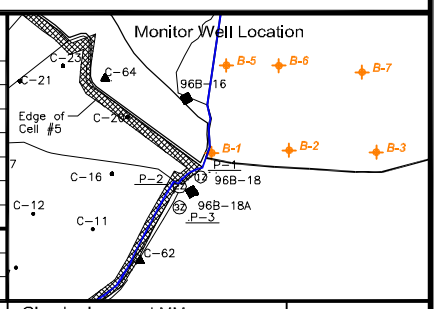
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A129	Drawn:	CMM



Checked:	LMM	Date: 09/03/14
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
140							140
		5.0		**Clay (CL)** black, hard, high plasticity, very moist			
142							142

Legend

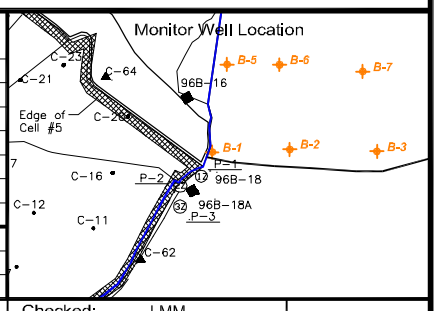
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012789		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567454		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13-12/13/13	Ground:	362.53' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	142' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A130	Drawn:	CMM



Checked:	LMM	Date:	09/03/14
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0				**Clayey Sand (CLSM)** tan/orange, very loose, fine grainded, moist			0
2				**Clayey Sand (CLSM)** tan/orange, loose, fine grainded, moist			2
4				**Sand (SM)** tan, loose, fine grained, moist			4
6							6
8							8
10							10
12							12
14							14
16				**Sand (SM)** tan, loose, fine grained, wet			▽ 16
18				**Clay (CL)** tan, black at 19.5'-20', stiff, low to moderate plasticity, moist			18
20		1.5					20

Legend

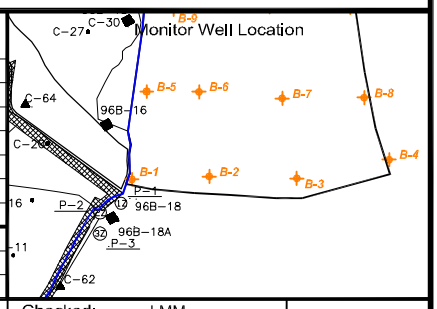
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012840		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566152		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/09/13 - 12/11/13	Ground:	334.52' (NAVD88)		
		Initial Water Level:	16.5'		
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A131	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	03/27/17

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20		2.5		**Clay (CL)** black, very stiff, high plasticity, moist			20
22		4.5		**Clay (CL)** black, hard, high plasticity, moist			22
24		4.5					24
26		4.5					26
28		4.5		**Clay (CL)** black, hard, crumbly, low plasticity, dry			28
30		4.5					30
32		4.5					32
34		4.5					34
36		4.5					36
38		4.5					38
40							40

Legend

Split Spoon

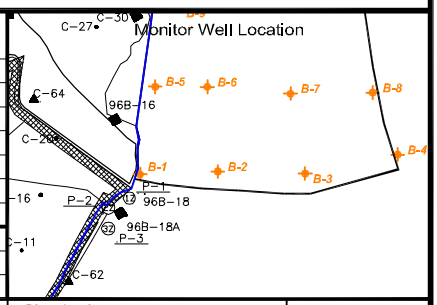
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.012840
Engineer/Geologist:	Mark Smith	Longitude:	-93.566152
Drilling Methods:	Mud Rotary	Elevations	
Driller:	GTL	TOC:	NA
Date Drilled:	12/09/13 - 12/11/13	Ground:	334.52' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A132	Drawn:	CMM	Checked:	LMM
						Approved:	VRG

Date: 03/27/17

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52				**Silty Clay (MLCL)** black, hard, layered, low plasticity, dry			52
		4.5					
54							54
		4.5					
56				**Silty Clay (MLCL)** gray, hard, layered, low plasticity, dry			56
		4.5					
58				**Clayey Silt (CLML)** gray, loose, moist			58
60							60

Legend

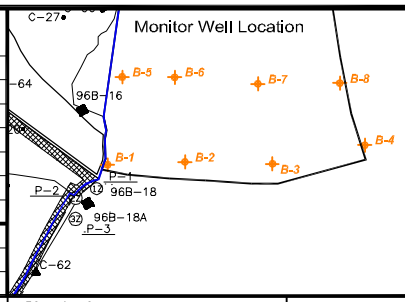
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012840		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566152		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/09/13 - 12/11/13	Ground:	334.52' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A133	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60				**Clayey Silt (CLML)** gray, loose, moist			
62							
64							
66							
68				**No Sample - Rock drilled through with roller bit**			
70				**Clayey Silt (CLML)** gray, dense, moist			
72							
74							
76							
78							
80							

Legend

Split Spoon

Shelby Tube

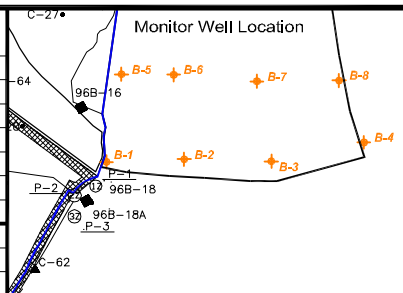
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	GTL
Date Drilled:	12/09/13 - 12/11/13

Well Coordinates	
Latitude:	32.012840
Longitude:	-93.566152
Elevations	
TOC:	NA
Ground:	334.52' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A134	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Clayey Silt (CLML)** gray, stiff, dense, blocky, with 6" black stringer, moist			80
82		4.0		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			82
84		4.0					84
86		4.0					86
88		4.0					88
90		4.0					90
92		4.0					92
94		4.0					94
96		4.0					96
98		4.0					98
100		4.0					100

Legend

Split Spoon

Shelby Tube

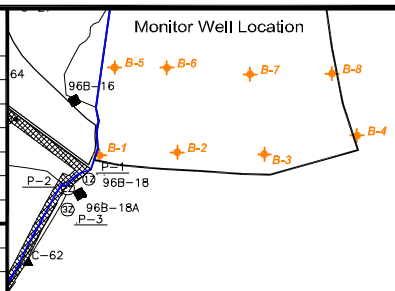
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	GTL
Date Drilled:	12/09/13 - 12/11/13

Well Coordinates	
Latitude:	32.012840
Longitude:	-93.566152
Elevations	
TOC:	NA
Ground:	334.52' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A135	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-2

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100				**Silty Clay (MLCL)** gray, hard, low plasticity, dry			100
102							102
104							104

Legend

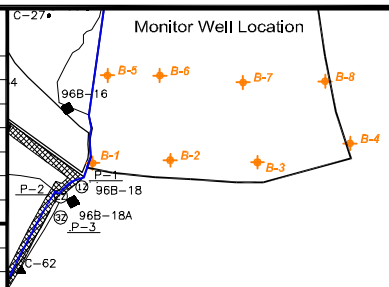
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012840		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566152		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/09/13 - 12/11/13	Ground:	334.52' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A136	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-3

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
2				**Clay (CL)** tan/gray, soft, moderate plasticity, moist			2
4		1.0		**Clay (CL)** tan/gray, stiff, moderate plasticity, moist			4
6		1.0					6
8		2.0					8
10		2.5					10
12		4.5		**Silty Clay (MLCL)** gray, black, light blue, hard, low plasticity, dry			12
14		4.0		**Silty Clay (MLCL)** tan, hard, low plasticity, dry			14
16		4.2					16
18		4.0					18
20		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			20

Legend

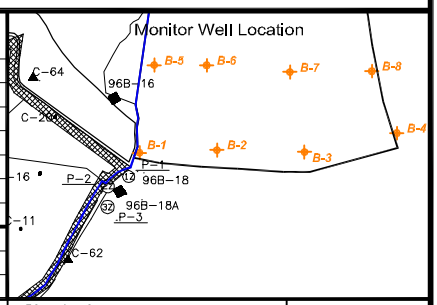
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012824		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564686		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	291.42' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	72' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A137	Drawn:	CMM



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-3

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			
22							22
		4.25					
24							24
		4.5					
26							26
		4.5					
28							28
		4.5					
30							30
		4.5					
32							32
		4.25					
34							34
		4.25					
36							36
		4.0					
38				**Silty Clay (MLCL)** gray, hard, low plasticity, trace coal, dry			38
		4.0					
40							40

Legend

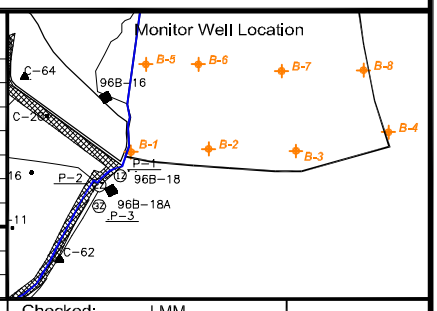
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012824		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564686		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	291.42' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	72' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A138	Drawn:	CMM



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-3

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.25		**Silty Clay (MLCL)** gray, hard, low plasticity			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.25					
50							50
		4.0					
52							52
		4.0					
54							54
		4.0					
56							56
		4.0					
58							58
		4.25					
60							60

Legend

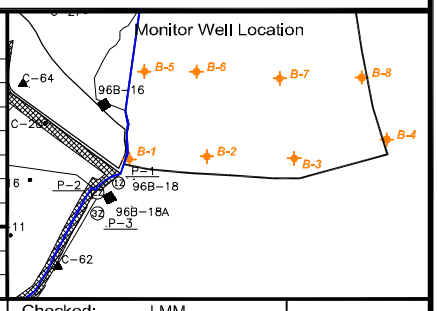
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012824		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564686		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	291.42' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	72' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A139	Drawn:	CMM



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-3

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		4.0		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			
62							62
		4.5					
64							64
		4.5					
66							66
		4.5					
68							68
		4.5					
70							70
		4.5					
72							72

Legend

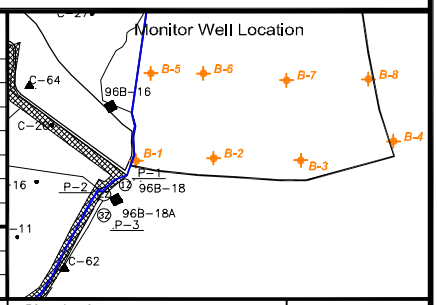
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.012824		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564686		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	291.42' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	72' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A140	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-4

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.0	10	**Clay (CL)** red, very stiff, high plasticity, very moist			
2							2
		2.5	10	**Clay (CL)** red, very stiff, very moist			
4							4
*		3.0	10	**Clay (CL)** red, extremely stiff, very moist			
6							6
		3.5	10	**Clay (CL)** red, extremely stiff, very moist			
8							8
		5.0	10	**Clay (CL)** red, hard, moderate plasticity, very moist			
10							10
*		4.5	10	**Sandy Clay (SMCL)** red, hard, moderate plasticity			
12							12
		4.5	8	**Sandy Clay (SMCL)** red, hard, with silt lenses, very moist			
14							14
		4.5	8				
16							16
*		5.0	10	**Clay (CL)** red/gray, hard, very moist			
18							18
*		5.0	10	**Clay (CL)** gray, hard, moderate plasticity, very moist			
20							20

Legend

Split Spoon

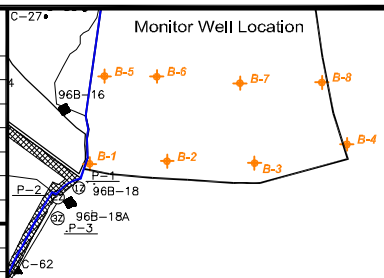
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/29/13 - 12/30/13

Well Coordinates	
Latitude:	32.013106
Longitude:	-93.563136
Elevations	
TOC:	NA
Ground:	299.08' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A141	Drawn:	CMM
Checked:	LMM	Approved:	VRG	Date:	03/27/17

PROVIDENCE

Log of Borehole: B-4

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
*		5.0	10	**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, very moist			
22							22
		5.0	10	**Sandy Clay (SMCL)** gray, hard, very moist			
24							24
		5.0	10				
26							26
		5.0	10				
28							28
		5.0	10				
30							30
		5.0	10				
32							32
*		5.0	10	**Clay (CL)** gray, hard, very moist			
34							34
		5.0	10				
36							36
		5.0	10				
38							38
		5.0	10				
40							40

Legend

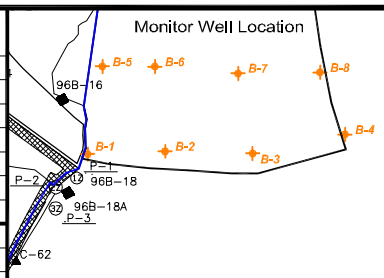
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013106		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563136		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/29/13 - 12/30/13	Ground:	299.08' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A142	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-4

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		5.0	10	**Clay (CL)** gray, hard, moderate plasticity, very moist			
42							42
		5.0	8	**Clay (CL)** gray, hard, very moist			
44							44
		5.0	8	**Clay (CL)** black, hard, very moist			
46							46
		5.0	8	**Clay (CL)** black, hard, very moist			
48							48
			3	**Coal (C)**			
50							50
		4.5	8	**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
52							52
		5.0	8	**Sandy Clay (SMCL)** black, hard, very moist			
54							54
		5.0	8	**Sandy Clay (SMCL)** black, hard, very moist			
56							56
*		5.0	8	**Clay (CL)** black, hard, very moist			
58							58
		5.0	8	**Clay (CL)** black, hard, very moist			
60							60

Legend

Split Spoon

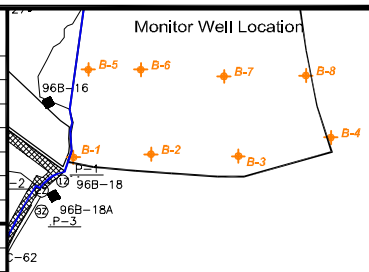
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/29/13 - 12/30/13

Well Coordinates	
Latitude:	32.013106
Longitude:	-93.563136
Elevations	
TOC:	NA
Ground:	299.08' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A143	Drawn:	CMM	Checked: / Approved:	LMM / VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-4

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		5.0	8	**Clay (CL)** black, hard, moderate plasticity, very moist			
62							62
		5.0	8	**Clay (CL)** black, hard, very moist			
64		5.0	8				64
66		5.0	8				66
68		5.0	8				68
70		5.0	8				70
72		5.0	8				72
74		5.0	8				74
76		5.0	8				76
78		5.0	8				78
80		5.0	8				80

Legend

Split Spoon

Shelby Tube

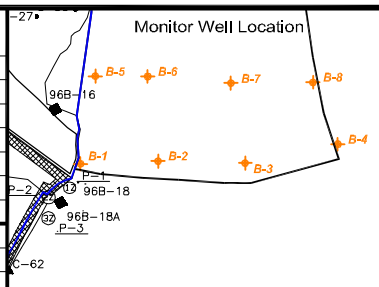
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/29/13 - 12/30/13

Well Coordinates	
Latitude:	32.013106
Longitude:	-93.563136
Elevations	
TOC:	NA
Ground:	299.08' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A144	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-4

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Drill through 6" of rock**			80
*		5.0	8	**Clay (CL)** black, hard, moderate plasticity, very moist			
82							82

Legend

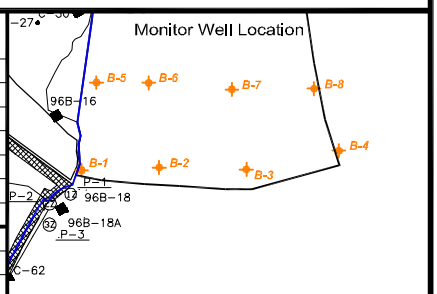
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013106		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563136		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/29/13 - 12/30/13	Ground:	299.08' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A145	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17



PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.0		**Organic Clay (OH)** red, stiff, high plasticity, moist			
2							2
		5.0		**Clay (CL)** red, hard, moderate plasticity, moist			
4							4
*		5.0					
6							6
		5.0		**Sand (SM)** gray, very dense, fine grained, well graded, poorly sorted			
8							8
		5.0					
10							10
		2.0					
12							12
14				**Sand (SM)** gray, medium dense, well graded, poorly sorted, fine grained, moist			14
16				**Sand (SM)** gray, very dense, well graded, poorly sorted, fine grained, moist			16
18				**Sand (SM)** gray, medium dense, well graded, poorly sorted, fine grained, moist			18
20							20

Legend

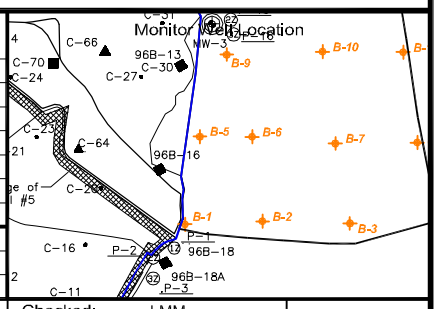
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A146	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20				**Sand (SM)** gray, medium dense, fine grained, well graded, poorly sorted, moist			20
22				**Sand (SM)** gray/yellow, medium dense, fine grained, well graded, poorly sorted, moist			22
24		1.5					24
26		1.5		**Clayey Sand (CLSM)** gray/yellow, loose, poorly graded, well sorted, moist			26
28				**Sand (SM)** yellow, loose, fine grained, well graded, poorly sorted, very moist			28
30				**Sand (SM)** yellow, dense, fine grained, well graded, poorly sorted, very moist			30
32		5.0		**Silty Clay (MLCL)** gray, hard, moderate plasticity			32
34		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			34
36		5.0					36
38		4.5					38
40							40

Legend

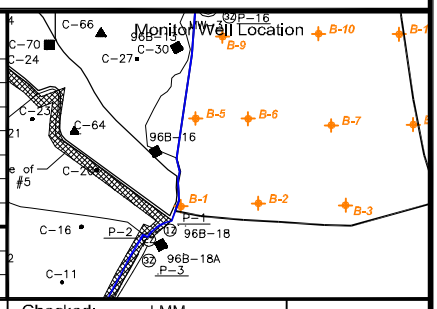
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A147	Drawn:	CMM



Checked: LMM

Approved: VRG

Date: 03/27/17

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			
42							42
		5.0					
44							44
		5.0					
46							46
		5.0					
48							48
		5.0					
50							50
		5.0					
52				**Clayey Sand (CLSM)** black, loose, poorly graded, well sorted			52
		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			
54							54
		5.0					
56							56
		5.0					
58							58
		5.0					
60							60

Legend

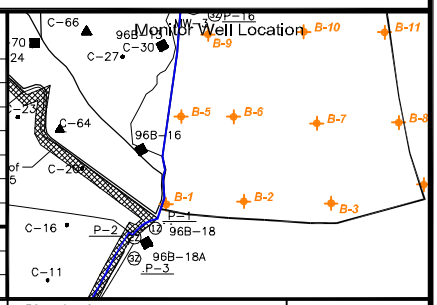
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A148	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
62		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			62
64		5.0					64
66		4.5					66
68		4.5		**Clayey Sand (CLSM)** black, very dense, poorly sorted, well graded, very miost			68
70				**Sand (SM)** black, very dense, fine grained, well sorted, poorly graded, very miost			▽ 70
72							72
74							74
76							76
78							78
80							80

Legend

Split Spoon

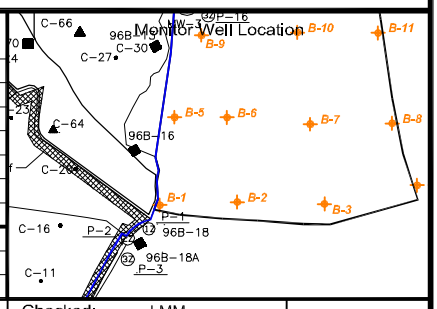
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.014045
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A149	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Sand (SM)** black, very dense, fine grained, well sorted, poorly graded, wet			80
82							82
84				**Clayey Sand (CLSM)** black, very dense, poorly sorted, well graded, wet			84
86							86
88							88
90		5.0		**Clay (CL)** black, hard, high plasticity, very moist			90
92		5.0					92
94				**Coal (C)**			94
96		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			96
98		5.0					98
100							100

Legend

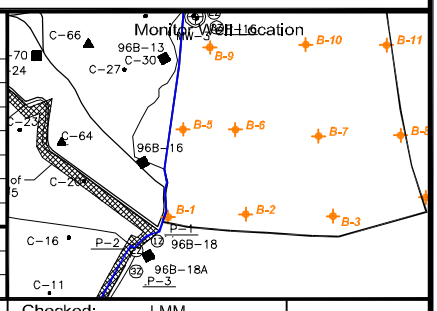
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A150	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			
102							102
		5.0					
104							104
		5.0					
106							106
		5.0					
108							108
		5.0					
110							110
		5.0					
112							112
		5.0					
114							114
		5.0					
116							116
		5.0					
118							118
		5.0					
120							120

Legend

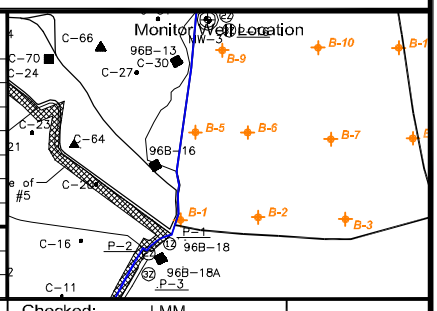
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A151	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
120							120
		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			
122							122
		5.0					
124							124
		5.0					
126							126
		5.0					
128							128
		5.0					
130							130
		5.0					
132							132
		5.0					
134							134
		5.0					
136							136
		5.0					
138							138
		5.0		**Organic Clay (OH)** black, hard, high plasticity, very moist			
140							140

Legend

Split Spoon

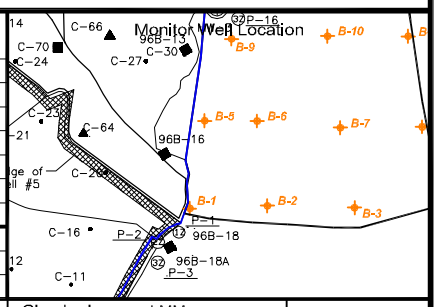
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.014045
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A152	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-5

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
140				**Coal (C)**			140
142		5.0		**Clay (CL)** black, hard, moderate plasticity, very moist			142
144		5.0					144
146		4.5		**Sandy Clay (SMCL)** gray, hard, moderate plasticity, very moist			146
148		3.0		**Sandy Clay (SMCL)** gray, stiff, moderate plasticity, very moist			148
150		4.0		**Sandy Clay (SMCL)** gray, hard, moderate plasticity, very moist			150
152							152

Legend

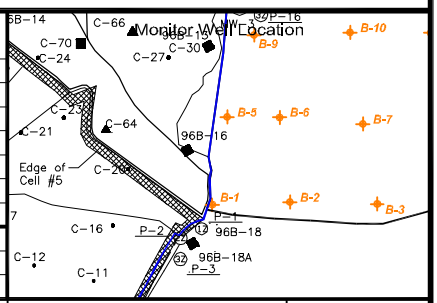
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014045		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567218		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/9/13 - 12/12/13	Ground:	372.02' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A153	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		1.0	10	**Clay (CL)** red, stiff, high plasticity, very moist			
2							2
*		1.5	10	**Clay (CL)** red/gray, stiff, very moist			
4							4
		2.0	10	**Clay (CL)** red/gray, stiff, very moist			
6							6
*		5.0	10	**Clay (CL)** gray, hard, moderate plasticity, very moist			
8							8
		5.0	10	**Clay (CL)** gray, hard, very moist			
10							10
		5.0	10				
12							12
		5.0	10				
14							14
		5.0	10				
16							16
*		5.0	10	**Sandy Clay (SMCL)** gray, hard, with sand lenses, very moist			
18							18
		5.0	10	**Sandy Clay (SMCL)** gray, hard, very moist			
20							20

Legend

Split Spoon

Shelby Tube

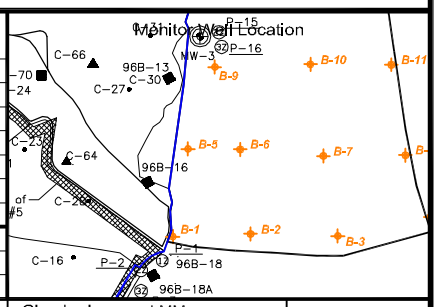
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.014048
Longitude:	-93.566339
Elevations	
TOC:	NA
Ground:	333.97' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A154	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		5.0	8	**Sandy Clay (SMCL)** gray, hard, moderate plasticity, very moist			
22							22
		5.0	8	**Sandy Clay (SMCL)** gray, hard, very moist			
24							24
		5.0	8	**Clay (CL)** gray, hard, with sand lenses, very moist			
26							26
		5.0	8	**Clay (CL)** gray, hard, very moist			
28							28
*		5.0	8	**Clay (CL)** black, hard, very moist			
30							30
		5.0	8				
32							32
		5.0	8				
34							34
*			8	**Sand (SM)** gray, very dense, fine grained, very moist			
36							36
			4	**Sand (SM)** gray, very dense, poorly sorted, well graded very moist			
38							38
			8	**Sand (SM)** gray, very dense, very moist			
40							40

Legend

Split Spoon

Shelby Tube

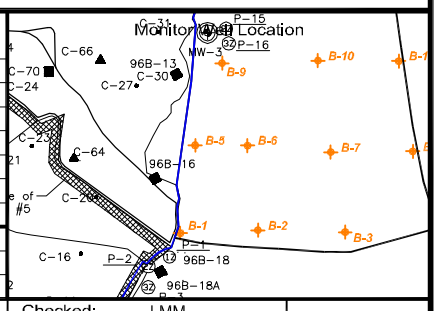
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.014048
Longitude:	-93.566339
Elevations	
TOC:	NA
Ground:	333.97' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A155	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
*		4.5	8	**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
42							42
		5.0	8	**Sandy Clay (SMCL)** black, hard, very moist			
44							44
		5.0	8				
46							46
		5.0	8				
48							48
		5.0	8				
50							50
		5.0	8				
52							52
		5.0	8				
54							54
		5.0	8				
56							56
		5.0	8				
58							58
		5.0	8				
60							60

Legend

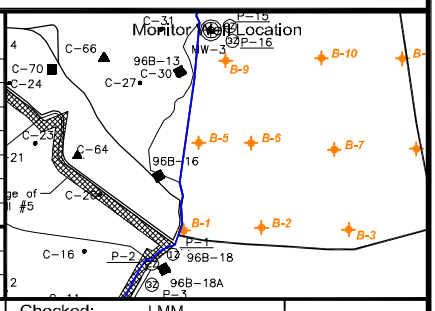
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014048		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566339		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/28/13 - 12/29/13	Ground:	333.97' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A156	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		5.0	8	**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
62							62
*		5.0	8	**Clay (CL)** black, hard, very moist			
64		5.0	8				64
66		5.0	8				66
68		5.0	8				68
70		5.0	8				70
72		5.0	8				72
74		5.0	8				74
76		5.0	8				76
78		5.0	8				78
80							80

Legend

Split Spoon

Shelby Tube

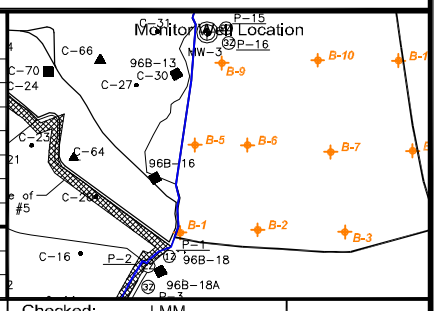
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.014048
Longitude:	-93.566339
Elevations	
TOC:	NA
Ground:	333.97' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A157	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		5.0	8	**Clay (CL)** black, hard, moderate plasticity, very moist			
82							82
		5.0	8	**Clay (CL)** black, hard, very moist			
84							84
		5.0	8				
86							86
		5.0	8				
88							88
		5.0	8				
90							90
		5.0	8				
92							92
		5.0	8				
94							94
		5.0	8				
96				**No Recovery**			96
98							98
*		5.0	6	**Coal (C)**			
100							100

Legend

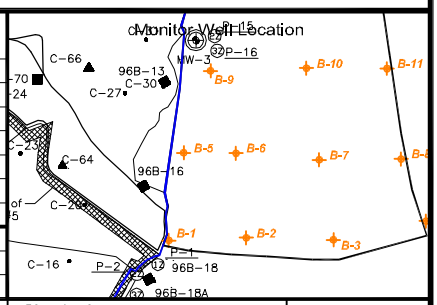
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014048		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566339		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/28/13 - 12/29/13	Ground:	333.97' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A158	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-6

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
*				**Coal (C)** No Recovery			
102							102
*		5.0	8	**Clay (CL)** black, hard, moderate plasticity, very moist			
104							104
		5.0	8	**Clay (CL)** black, hard, very moist			
106							106
*			4	**Clayey Sand (CLSM)** black, very dense, very moist			
108							108
			4				
110							110
			4				
112							112
			4				
114				Drill thru rock to 115' bgs			114
116							116
*		5.0	8	**Clay (CL)** black, hard, very moist			
118							118

Legend

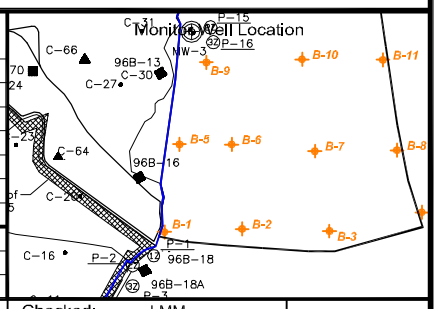
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.014048		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566339		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/28/13 - 12/29/13	Ground:	333.97' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	118' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A159	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.0	10	**Clay (CL)** red, stiff, high plasticity, very moist			
2							2
*		2.0	10	**Clayey Sand (CLSM)** red, medium dense, very moist			
4							4
		2.0	10	**Clayey Sand (CLSM)** red, medium dense, very moist			
6							6
*			8	**Sand (SM)** red, medium dense, fine grainded, poorly graded, well sorted, very moist			
8							8
*			8	**Sand (SM)** red, medium dense, very moist			
10							10
			8				
12							12
*			18				
14							14
*			18	**Sand (SM)** red top, bottom gray, very dense, very moist			
16							16
*		4.5	18	**Clay (CL)** gray, hard, very moist			
18							18
		5.0	10	**Clay (CL)** gray, hard, moderate plasticity, very moist			
20							20

Legend

Split Spoon

Shelby Tube

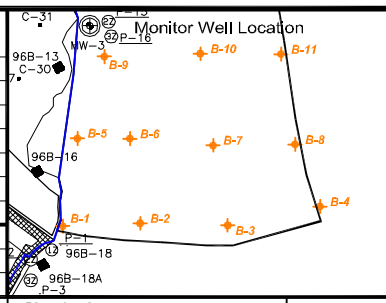
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/20/13 & 12/27/13

Well Coordinates	
Latitude:	32.013964
Longitude:	-93.564941
Elevations	
TOC:	NA
Ground:	323.86' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A160	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		5.0	6	**Clay (CL)** gray, hard, moderate plasticity, very moist			
22							22
		5.0	6	**Clay (CL)** gray, hard, very moist			
24							24
		5.0	8				
26							26
		5.0	8				
28							28
		5.0	8	**Clay (CL)** black, hard, very moist			
30							30
		5.0	8				
32							32
*		5.0	8	**Clayey Silt (CLML)** gray, hard, very moist			
34							34
		5.0	8				
36							36
		5.0	8				
38							38
		5.0	8				
40							40

Legend

Split Spoon

Shelby Tube

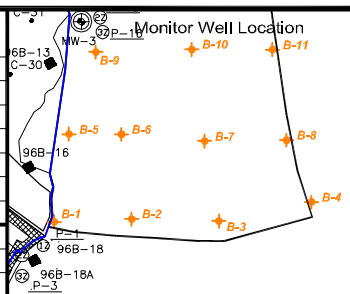
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/20/13 & 12/27/13

Well Coordinates	
Latitude:	32.013964
Longitude:	-93.564941
Elevations	
TOC:	NA
Ground:	323.86' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A161	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		5.0	8	**Clayey Silt (CLML)** gray, hard, moderate plasticity, very moist			
42							42
		5.0	8	**Clayey Silt (CLML)** gray, hard, very moist			
44							44
		5.0	8				
46							46
*		5.0	8	**Clay (CL)** black, hard, very moist			
48							48
		5.0	8				
50							50
		5.0	8				
52							52
		5.0	6	**Sandy Clay (SMCL)** black, hard, very moist			
54							54
		5.0	4				
56							56
		5.0	4				
58							58
		5.0	4				
60							60

Legend

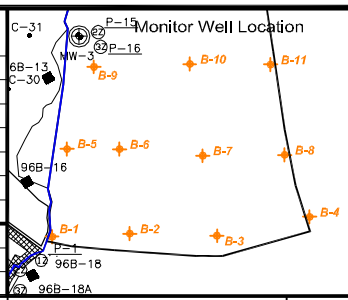
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013964		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564941		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/20/13 & 12/27/13	Ground:	323.86' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A162	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	03/27/17

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		5.0	6	**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
62							62
		5.0	6	**Sandy Clay (SMCL)** black, hard, very moist			
64							64
		5.0	6				
66							66
		5.0	6				
68				**Hard Rock No Recovery**			68
70							70
		5.0	4	**Sandy Clay (SMCL)** black, hard, very moist			
72							72
		5.0	4				
74							74
		5.0	4				
76							76
		5.0	4				
78				**Coal (C)** No Recovery			78
80							80

Legend

Split Spoon

Shelby Tube

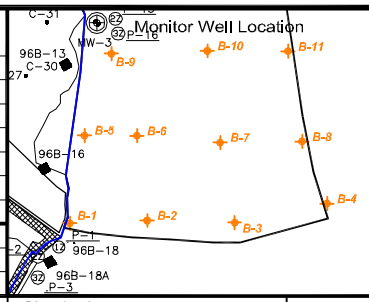
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/20/13 & 12/27/13

Well Coordinates	
Latitude:	32.013964
Longitude:	-93.564941
Elevations	
TOC:	NA
Ground:	323.86' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A163	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
			16	**Coal (C)** No Recovery			
82							82
		5.0	12	**Clay (CL)** black, hard, moderate plasticity, very moist			
84							84
		5.0	12	**Clay (CL)** black, hard, very moist			
86							86
		5.0	10				
88							88
		5.0	8				
90							90
		5.0	8				
92							92
		5.0	8				
94							94
		5.0	8				
96							96
		5.0	8				
98							98
		5.0	8				
100							100

Legend

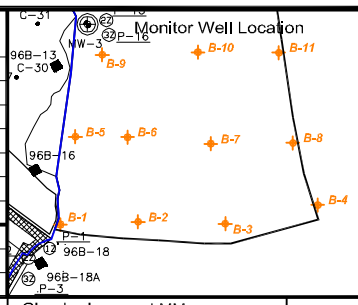
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013964		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564941		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/20/13 & 12/27/13	Ground:	323.86' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A164	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-7

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		5.0	8	**Clay (CL)** black, hard, very moist			
102							102
		5.0	8				
104							104

Legend

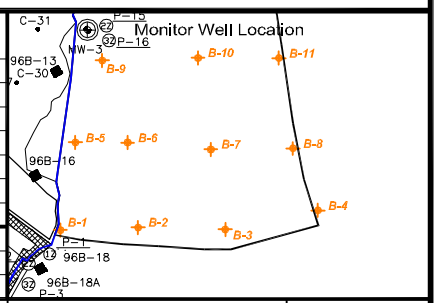
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013964		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564941		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/20/13 & 12/27/13	Ground:	323.86' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	104' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A165	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17



PROVIDENCE

Log of Borehole: B-8

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		1.5	8	**Clay (CL)** red, stiff, high plasticity, very moist			
2							2
		3.5	8	**Clay (CL)** red/gray, moderate plasticity, very moist			
4							4
*		3.5	8	**Clay (CL)** gray, extremely stiff, with silt lenses, very moist			
6							6
		3.5	8	**Clay (CL)** gray, extremely stiff, very moist			
8							8
		4.0	8	**Clay (CL)** gray, hard, very moist			
10							10
		5.0	8				
12							12
		5.0	8				
14							14
		5.0	8				
16							16
*		4.0	8	**Clayey Sand (CLSM)** gray, hard, fine grained, very moist			
18							18
		4.0	8	**Clayey Sand (CLSM)** gray, hard, very moist			
20							20

Legend

Split Spoon

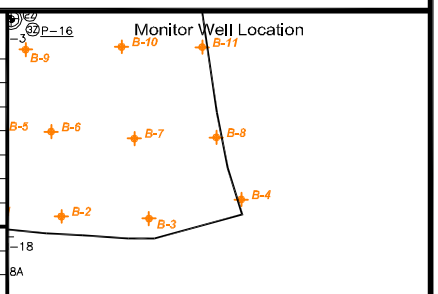
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/27/13 - 12/28/13

Well Coordinates	
Latitude:	32.013989
Longitude:	-93.563565
Elevations	
TOC:	NA
Ground:	288.14' (NAVD88)
Initial Water Level:	
Static Water Level:	



Monitor Well Location

Depth of Well:	NA	Depth of Hole:	68' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A166	Drawn:	CMM	Checked: / Approved:	LMM / VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-8

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		5.0	8	**Clayey Sand (CLSM)** gray, loose, fine grained, very moist			
22							22
		5.0	8	**Clayey Sand (CLSM)** gray, loose, very moist			
24							24
*		5.0	8	**Sandy Clay (SMCL)** gray, hard, moderate plasticity, very moist			
26							26
		5.0	8	**Sandy Clay (SMCL)** gray, hard, very moist			
28							28
		5.0	8				
30							30
		5.0	8				
32							32
		5.0	8				
34							34
		5.0	8				
36							36
		5.0	8				
38							38
		5.0	8				
40							40

Legend

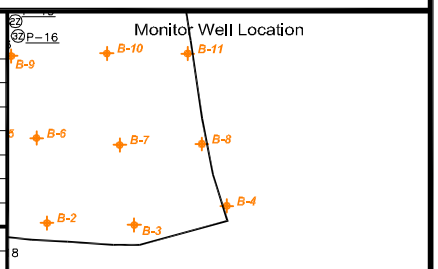
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013989		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563565		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	288.14' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	68' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A167	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-8

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		5.0	8	**Sandy Clay (SMCL)** gray, hard, moderate plasticity, very moist			
42							42
*		5.0	8	**Clay (CL)** black, hard, very moist			
44							44
		5.0	8				
46							46
		5.0	6	**Coal (C)**			
48							48
*		5.0	8	**Clay (CL)** black, hard, very moist			
50							50
		5.0	8				
52							52
		5.0	8				
54							54
		5.0	8				
56							56
		5.0	8				
58							58
		5.0	8				
60							60

Legend

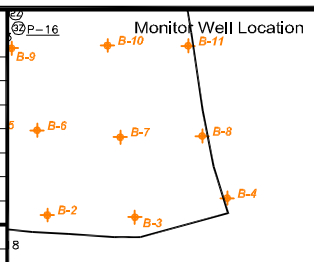
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013989		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563565		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	288.14' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	68' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A168	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-8

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		5.0	8	**Clay (CL)** black, hard, moderate plasticity, very moist			
62							62
		5.0	8	**Clay (CL)** black, hard, very moist			
64							64
		5.0	8				
66							66
		5.0	8				
68							68

Legend

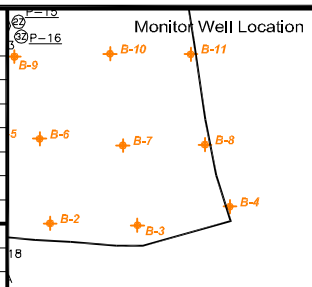
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.013989		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563565		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	288.14' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	68' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A169	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		3.0	10	**Organic Clay (OH)** red, high plasticity, very moist			
2							2
		3.0	10	**Clay (CL)** red, very stiff, very moist			
4							4
*		3.5	10	**Clayey Sand (CLSM)** gray, dense, fine grained, very moist			
6							6
*			18	**Sand (SM)** tan, medium density, fine grained, moist			
8							8
			18	**Sand (SM)** tan, medium density, moist			
10							10
			18	**Sand (SM)** gray, medium density, moist			
12							12
			2				
14							14
			18				
16							16
			18	**Sand (SM)** very light gray, medium density, fine grained, moist			
18							18
			18	**Sand (SM)** gray, medium density, moist			
20							20

Legend

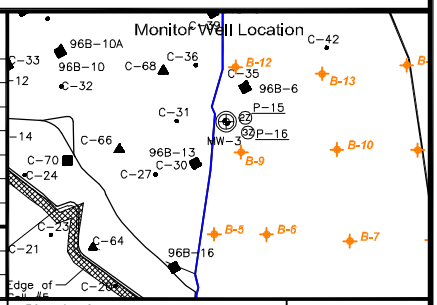
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015219		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566781		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/16/13 - 12/17/13	Ground:	375.27' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A170	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
*			18	**Clayey Sand (CLSM)** gray, dense, very moist			
22							22
			18	**Sand (SM)** grayish orange, dense, fine grained, very moist			
24							24
*			18	**Sand (SM)** gray, dense, wet			
26							26
*			18	**Sand (SM)** gray, dense, very moist			
28				**Clay (CL)** red, dense, very moist			28
		5.0	10	**Clay (CL)** gray, hard, moderate plasticity, very moist			
30							30
*		5.0	6	**Clay (CL)** gray, hard, very moist			
32				**Sand (SM)** gray, dense, very moist			32
*		5.0	6	**Clay (CL)** brown, hard, very moist			
34							34
		2.7	8	**Clay (CL)** brown, very stiff, good to fair cohesion, very moist			
36							36
		3.7	8	**Sand (SM)** light gray, interbedded clay laminates, very fine grained, very moist			
38							38
*		5.0	8	**Sandy Clay (SMCL)** gray, hard, very moist			
40							40

Legend

Split Spoon

Shelby Tube

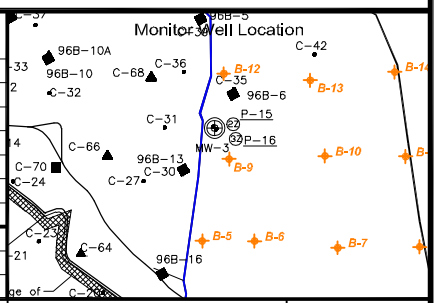
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/16/13 - 12/17/13

Well Coordinates	
Latitude:	32.015219
Longitude:	-93.566781
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A171	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.0	10	**Clay (CL)** gray, very stiff to hard, fair to good cohesion, moderate plasticity, abundant sand laminations, very moist			
42							42
*		5.0	10	**Clay (CL)** gray, hard, very moist			
44				**Clayey Sand (CLSM)** gray, hard, very moist			44
		>4.0	10	**Clay (CL)** medium gray, parts easily, poor cohesion, with occasional sand laminations, very moist			
46							46
*		5.0	10	**Clay (CL)** gray, hard, very moist			
48							48
		>4.0	10	**Clay (CL)** medium gray, hard, parts easily, abundant of sand laminations, poor cohesion, very moist			
50							50
		>4.0	8	**Clay (CL)** medium gray, hard, parts easily, poor cohesion, parts easily, abundant sand laminations, very moist			
52							52
		>4.0	8	**Sandy Clay (SMCL)** medium gray, hard, with thin sand laminations throughout, poor cohesion, parts easily, very moist			
54							54
		>4.0	8	**Clay (CL)** medium gray to medium dark gray, hard, poor cohesion, poor plasticity, trace sand laminations, very moist			
56							56
		>4.0	8	**Clay (CL)** dark yellow brown with occasional dark yellow orange, hard, poor cohesion, poor plasticity, very moist			
58							58
		5.0	8	**Clay (CL)** black, hard, very moist			
60							60

Legend

Split Spoon

Shelby Tube

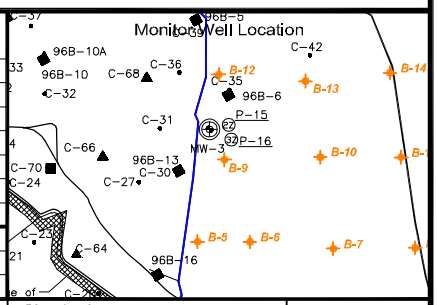
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/16/13 - 12/17/13

Well Coordinates	
Latitude:	32.015219
Longitude:	-93.566781
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A172	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
*		5.0	6	**Sandy Clay (SMCL)** black, hard, moderate plasticity, very moist			
62							62
*			12	**Sand (SM)** yellow, very dense, very moist			
64							64
*		5.0	18				
66				**Clay (CL)** gray, hard, very moist			66
*		5.0	6	**Sandy Clay (SMCL)** black, hard, low to moderate plasticity, very moist			
68							68
		>4.0	10	**Sandy Clay (SMCL)** medium gray to light gray, stiff to hard, poor cohesion, very moist			
70							70
		5.0	6	**Sandy Clay (SMCL)** black, hard, very moist			
72							72
		5.0	6				
74				**Rock** hard			74
*		5.0	4	**Clayey Sand (CLSM)** black, very dense, very moist			
76							76
*		5.0	6	**Clay (CL)** black, hard, low to moderate plasticity, very moist			
78							78
		5.0	6	**Clay (CL)** black, hard, very moist			
80							80

Legend

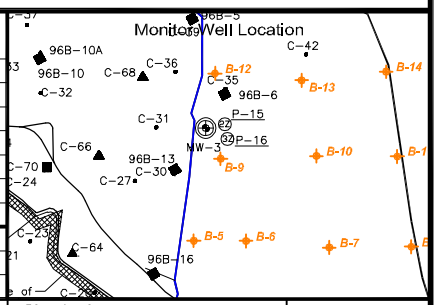
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015219		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566781		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/16/13 - 12/17/13	Ground:	375.27' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A173	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		5.0	8	**Clay (CL)** black, hard, low to moderate plasticity, very moist			
82							82
		5.0	6	**Clay (CL)** black, hard, very moist			
84							84
		3.25	8	**Silty Clay (MLCL)** medium gray, very stiff, parts easily, with occasional silt and sand laminations, fair cohesion, very moist			
86							86
		5.0	5	**Clay (CL)** black, hard, very moist			
				Coal			
88							88
		>4.0	6	**Clay (CL)** dark gray, hard, fair cohesion, moderate plasticity, with silt and sand occasional, very moist			
90							90
		5.0	6	**Clay (CL)** black, hard, very moist			
92							92
		>4.0	6	**Silty Clay (MLCL)** medium gray to light gray, hard, poor cohsesion, parts easily, friable, laminations of silt and clay, very moist			
94							94
		>4.0	6	**Silty Clay (MLCL)** medium gray , hard, poor cohsesion, poor plasticity, parts easily, very moist			
96							96
		5.0	6				
98							98
		5.0	6	**Silty Clay (MLCL)** black, hard, very moist			
100							100

Legend

Split Spoon

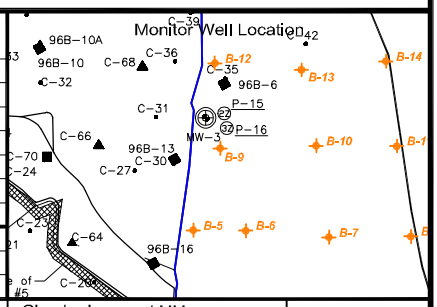
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.015219
Engineer/Geologist:	Mark Smith	Longitude:	-93.566781
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/16/13 - 12/17/13	Ground:	375.27' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A174	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		5.0	6	**Clay (CL)** black, hard, moderate plasticity, very moist			
102							102
		5.0	6	**Clay (CL)** black, hard, very moist			
104							104
		5.0	10				
106							106
		5.0	10				
108							108
		5.0	10				
110							110
		5.0	10				
112							112
		5.0	10				
114							114
		5.0	10				
116							116
		5.0	10				
118							118
		5.0	10				
120							120

Legend

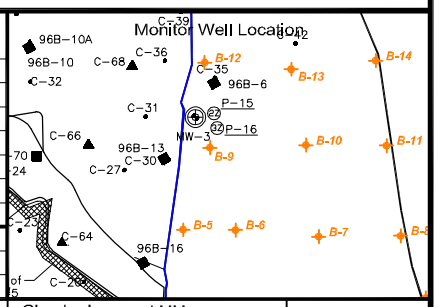
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015219		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566781		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/16/13 - 12/17/13	Ground:	375.27' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A175	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
120							120
		5.0	10	**Clay (CL)** black, hard, very moist			
122							122
		5.0	10				
124							124
		5.0	10				
126							126
		5.0	10				
128							128
		5.0	10				
130							130
		5.0	10				
132							132
		5.0	10				
134				**Coal No Recovery**			134
136				**Clay (CL)** black, hard, very moist			136
		5.0	10				
138							138
		5.0	10				
140							140

Legend

Split Spoon

Shelby Tube

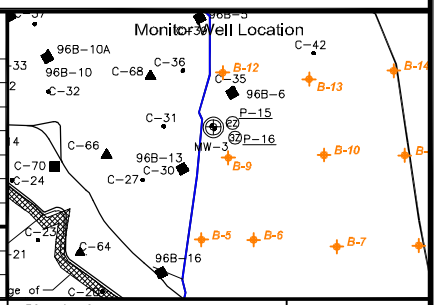
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/16/13 - 12/17/13

Well Coordinates	
Latitude:	32.015219
Longitude:	-93.566781
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A176	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-9

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
140							140
		5.0	10	**Clay (CL)** black, hard, very moist			
142							142
*			8	**Sand (SM)** black, very dense, very moist			
144							144
			6				
146							146
*			8	**Sand (SM)** gray, very dense, very moist			
148				**Sandstone No Recovery**			148
150				**Sand (SM)** gray, very dense, very moist			150
152							152

Legend

Split Spoon

Shelby Tube

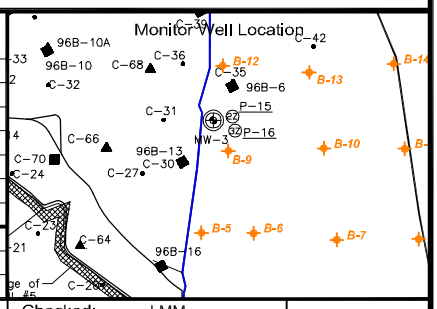
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/16/13 - 12/17/13

Well Coordinates	
Latitude:	32.015219
Longitude:	-93.566781
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	152' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A177	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0		4.5		**Silty Clay (MLCL)** orange/gray, hard, low plasticity, dry			0
2		4.0		**Silty Clay (MLCL)** tan, gray, hard, low plasticity, dry			2
4		4.5		**Silty Clay (MLCL)** tan/gray, hard, trace sand, low plasticity, dry			4
6		3.0		**Silty Clay (MLCL)** orange/tan, very stiff, low plasticity, dry			6
8		3.25		**Silty Clay (MLCL)** orange/tan, very stiff, moderate plasticity, with silt lenses, moist			8
10		4.0		**Silty Clay (MLCL)** orange/red/gray, hard, mottled, moderate plasticity, moist			10
12		4.5					12
14		4.5					14
16		4.0		**Silty Clay (MLCL)** tan, hard, moderate plasticity, moist			16
18		4.0		**Silty Clay (MLCL)** tan, hard, moderate plasticity, trace sand, moist			18
20							20

Legend

Split Spoon

Shelby Tube

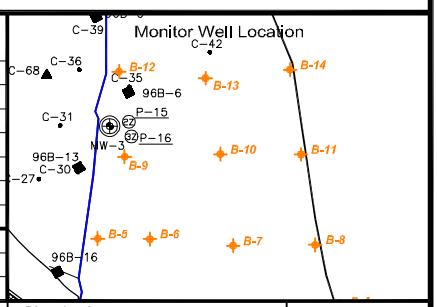
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	GTL
Date Drilled:	12/19/13 - 12/20/13

Well Coordinates	
Latitude:	32.015272
Longitude:	-93.565171
Elevations	
TOC:	NA
Ground:	328.73' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A178	Drawn:	CMM
Checked:	LMM	Approved:	VRG	Date:	04/17/17

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** tan, hard, trace sand, moderate plastcity, moist			
22							22
		0.5		**Clayey Silt (CLML)** gray, tan, very soft, moist			
24							24
		2.0		**Silty Clay (MLCL)** gray, very stiff, with silt seams1/4", slicken sided, low plasticity, moist			
26							26
		2.75					
28							28
		3.0					
30							30
		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			
32							32
		4.25					
34							34
		4.5					
36							36
		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
38							38
		4.5					
40							40

Legend

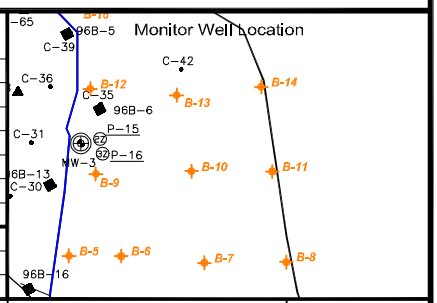
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015272		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565171		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/19/13 - 12/20/13	Ground:	328.73' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A179	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
42							42
		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.25					
54							54
		4.0					
56							56
		4.0					
58							58
		4.5					
60							60

Legend

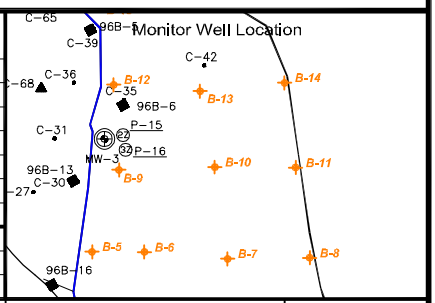
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015272		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565171		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/19/13 - 12/20/13	Ground:	328.73' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A180	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60				**Silty Clay (MLCL)** gray, hard, low plasticity, dry			60
62							62
64							64
66							66
68							68
70							70
72							72
74				**Silty Clay (MLCL)** black, hard, low plasticity, dry			74
76							76
78							78
80							80

Legend

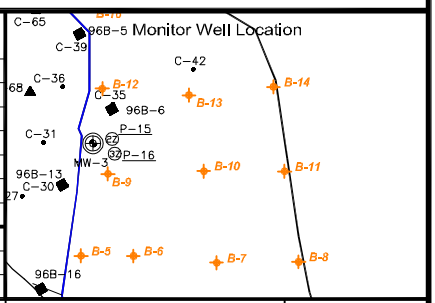
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015272		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565171		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/19/13 - 12/20/13	Ground:	328.73' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A181	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Silty Clay (MLCL)** black, hard, low plasticity, dry			80
82							82
84							84
86							86
88							88
90				**Silty Clay (MLCL)** gray, hard, low plasticity, dry			90
92							92
94							94
96				**Sand (SM)** gray, loose, fine grained, poorly graded, moist			96
98							98
100							100

Legend

Split Spoon

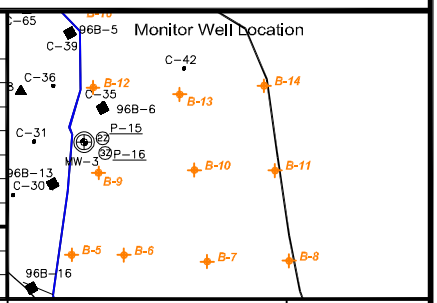
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.015272
Engineer/Geologist:	Mark Smith	Longitude:	-93.565171
Drilling Methods:	Mud Rotary	Elevations	
Driller:	GTL	TOC:	NA
Date Drilled:	12/19/13 - 12/20/13	Ground:	328.73' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A182	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-10

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100				**Clayey Silt (CLML)** gray, loose, moist			100
102							102
104				**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			104
106		4.0					106
108		4.0					108

Legend

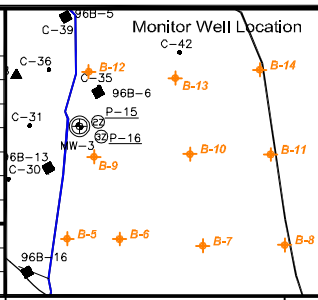
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015272		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565171		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/19/13 - 12/20/13	Ground:	328.73' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	108' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A183	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-11

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
2				**Sandy Clay (SMCL)** dirt moved in to build up location			2
4		3.0		**Sandy Clay (SMCL)** tan/orange/gray, very soft layers, moderate plasticity, moist			4
6		3.5					6
8		3.5					8
10		3.0					10
12		4.5		**Silty Clay (MLCL)** orange/tan/gray, hard, low to moderate plasticity, moist			12
14		4.5					14
16		4.5		**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			16
18		4.5					18
20							20

Legend

Split Spoon

Shelby Tube

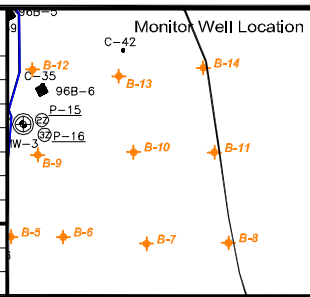
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.015278
Longitude:	-93.563816
Elevations	
TOC:	NA
Ground:	316.09' (NAVD88)
Initial Water Level:	
Static Water Level:	

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	96' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A184	Drawn:	CMM	Checked: / Approved:	LMM / VRG
						Date:	03/27/17

PROVIDENCE

Log of Borehole: B-11

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
20		4.5		**Sandy Clay (SMCL)** gray, hard, moist			
22		4.5					22
24		4.5					24
26		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, with silt lenses, moist			26
28		4.5		**Silty Sand (MLSM)** gray, moist			28
30		4.5		**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			30
32		4.5					32
34		4.5					34
36		4.5					36
38		4.5					38
40		4.5					40

Legend

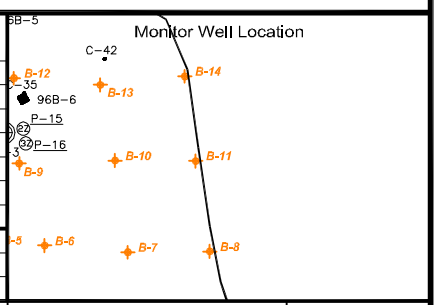
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015278		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563816		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/28/13 - 12/29/13	Ground:	316.09' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	96' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A185	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	03/27/17

PROVIDENCE

Log of Borehole: B-11

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5		**Silty Sand (MLSM)** gray, dense, fine grained, moist			
60							60

Legend

Split Spoon

Shelby Tube

Static Water Level

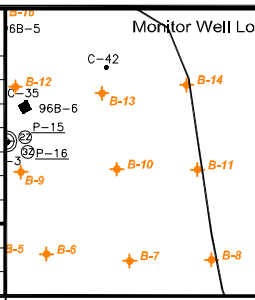
Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.015278
Longitude:	-93.563816
Elevations	
TOC:	NA
Ground:	316.09' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	96' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A186	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-11

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
62							62
		4.5					
64							64
		4.5					
66							66
		4.5					
68							68
		4.5					
70							70
		4.5					
72							72
		4.5					
74							74
		4.5					
76							76
		4.5					
78							78
		4.5					
80							80

Legend

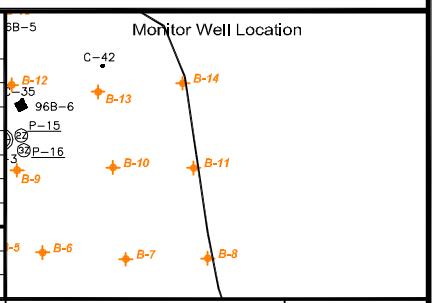
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.015278		
Engineer/Geologist:	Mark Smith	Longitude:	-93.563816		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/28/13 - 12/29/13	Ground:	316.09' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	96' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A187	Drawn:	CMM



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-11

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, moist			
82		4.5					82
84		4.5					84
86		4.5					86
88		4.5		**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			88
90		4.5					90
92		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, moist			92
94		4.5					94
96							96

Legend

Split Spoon

Shelby Tube

Static Water Level

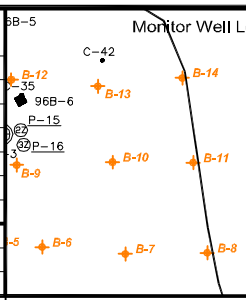
Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/28/13 - 12/29/13

Well Coordinates	
Latitude:	32.015278
Longitude:	-93.563816
Elevations	
TOC:	NA
Ground:	316.09' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	96' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A188	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/27/17

PROVIDENCE

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.5		**Silty Clay (MLCL)** gray/orange, very soft, moderate plasticity, mottled, moist			
2							2
		2.5		**Silty Clay (MLCL)** gray/tan, very soft, moderate plasticity, mottled, moist			
4							4
		2.0					
6							6
		2.0		**Silty Clay (MLCL)** tan/gray, very soft, trace sand, moderate plasticity, mottled, moist			
8							8
		2.0					
10							10
		2.0		**Silty Clay (MLCL)** tan/orange, very soft, trace sand, moderate plasticity, mottled, moist			
12							12
		4.5		**Silty Clay (MLCL)** tan/orange, hard, moderate plasticity, mottled, moist			
14							14
		4.5					
16							16
		4.5		**Silty Clay (MLCL)** tan/gray/orange, hard, moderate plasticity, mottled, moist			
18							18
		3.0		**Silty Clay (MLCL)** gray/tan, very soft, moderate plasticity, mottled, moist			
20							20

Legend

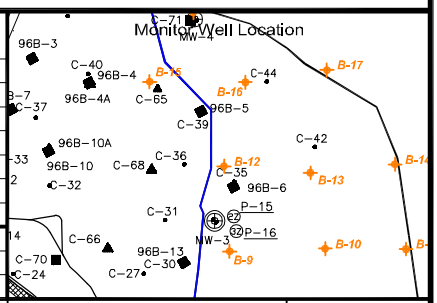
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016435		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566886		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	345.72' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A189	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

Providence Engineering and Environmental Group LLC

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
22							22
		4.5					
24							24
		4.5					
26							26
		4.5					
28							28
		4.5		**Silty Clay (MLCL)** gray/tan/orange, hard, mottled, moderate plasticity, moist			
30							30
		3.0		**Silty Clay (MLCL)** gray/tan/orange, very soft, mottled, moderate plasticity, moist			
32							32
		1.5		**Clayey Silt (CLML)** gray/tan/orange, very loose, moist			
34							34
		4.5		**Silty Clay (MLCL)** orange/tan, hard, moderate plasticity, moist			
36							36
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
38							38
		4.5					
40							40

Legend

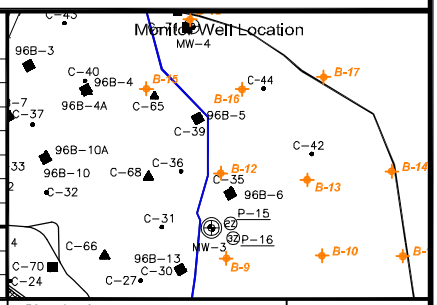
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016435		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566886		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	345.72' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A190	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, with 6" sand stone lense, moist			
60							60

Legend

Split Spoon

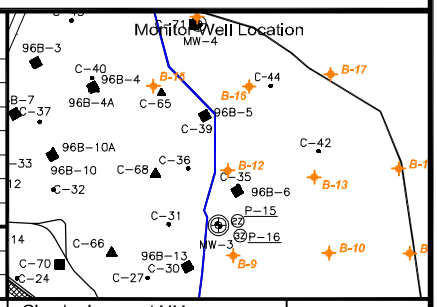
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.016435
Engineer/Geologist:	Mark Smith	Longitude:	-93.566886
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/17/13 - 12/18/13	Ground:	345.72' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A191	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
62							62
		4.5					
64							64
		4.5					
66							66
		4.5					
68							68
		4.5					
70							70
		4.5					
72							72
		4.5					
74							74
		4.5					
76							76
		4.5					
78							78
		4.5					
80							80

Legend

Split Spoon

Shelby Tube

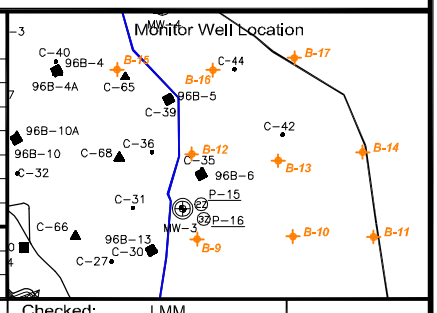
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/17/13 - 12/18/13

Well Coordinates	
Latitude:	32.016435
Longitude:	-93.566886
Elevations	
TOC:	NA
Ground:	345.72' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A192	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5		**Silty Clay (MLCL)** gray, hard, moderate plasticity, moist			
82							82
		4.5					
84							84
		4.5					
86							86
		4.5					
88							88
		4.5					
90							90
		4.5					
92							92
		4.5					
94				**Silty Clay (MLCL)** black/gray, hard, moderate stiffness, moist			94
		4.5					
96							96
		4.5					
98							98
		4.5					
100							100

Legend

Split Spoon

Shelby Tube

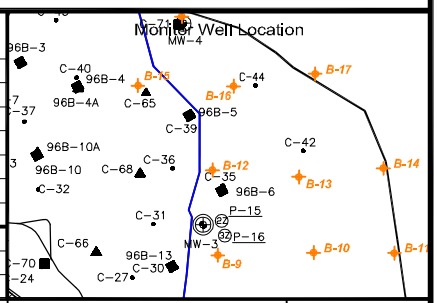
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/17/13 - 12/18/13

Well Coordinates	
Latitude:	32.016435
Longitude:	-93.566886
Elevations	
TOC:	NA
Ground:	345.72' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A193	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-12

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		4.5		**Silty Clay (MLCL)** black/gray, hard, moderate plasticity, moist			
102							102
		4.5					
104							104
		4.5					
106							106
		4.5					
108				**No Recovery**			108
110							110
		4.5		**Silty Clay (MLCL)** black, hard, layers, low to moderate plasticity, moist			
112							112
		4.5					
114							114
		4.5		**Sandy Clay (SMCL)** gray, hard, moderate plasticity, moist			
116							116
		4.5					
118				**Lost Sampler**			118
120							120

Legend

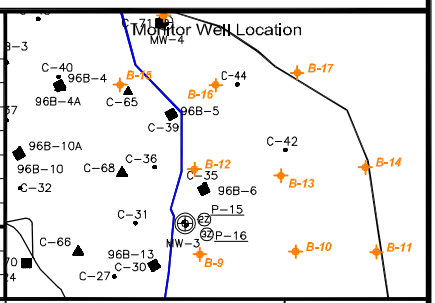
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016435		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566886		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/17/13 - 12/18/13	Ground:	345.72' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	120' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A194	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		1.0		**Silty Clay (MLCL)** orange/tan, stiff to very stiff, mottled, moderate plasticity, moist			
2							2
		3.5					
4				**Sandy Clay (SMCL)** gray, hard, moderate plasticity, moist			4
		4.0					
6							6
		4.5					
8							8
		4.5					
10				**Clayey Sand (CLSM)** orange/tan, well graded, fine grainded, moist			10
12							12
14							14
16							16
18							18
20							20

Legend

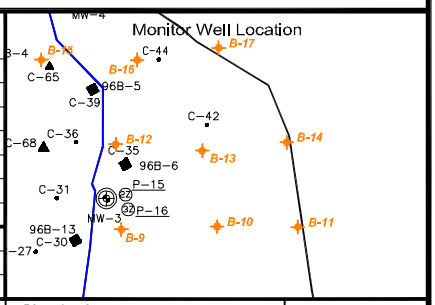
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016353		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A195	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		1.5		**Sandy Clay (SMCL)** gray/tan, stiff, low to moderate plasticity, slightly moist			
22							22
		1.5					
24							24
		1.5					
26							26
		1.0		**Clayey Sand (CLSM)** gray/tan, soft, fine grained, well graded			
28							28
		1.0					
30							30
		1.0					
32							32
		1.0					
34							34
36							36
38							38
40							40

Legend

Split Spoon

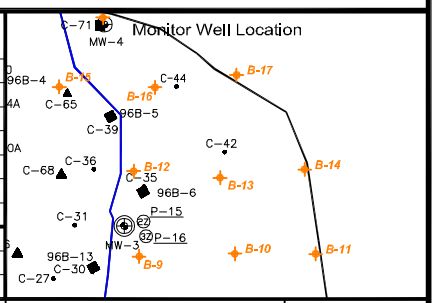
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.016353
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-196	Dwg. No.:	002-125-A113	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
42		4.5		**Silty Clay (MLCL)** gray/black, hard, low to moderate plasticity, moist			42
44		4.5					44
46		4.5					46
48		4.5					48
50		4.5		**Silty Clay (MLCL)** gray/black, hard, low to moderate plasticity, with sand lenses, moist			50
52		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			52
54		4.5					54
56		4.5					56
58		4.5					58
60		4.5					60

Legend

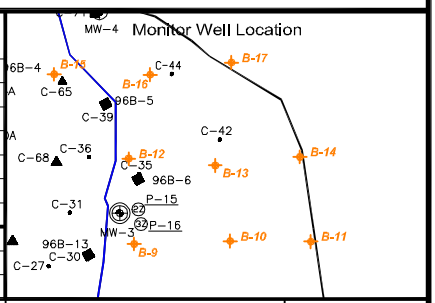
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	358.20	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016353		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A197	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		4.5		**Silty Clay (MLCL)** gray, hard, moist			
62							62
		4.5					
64							64
		4.5					
66							66
		4.5					
68							68
		4.5					
70							70
		4.5					
72							72
		4.5					
74							74
		4.5					
76				**Silty Clay (MLCL)** gray, hard, with silt lenses, moist			76
		4.5					
78							78
		4.5					
80							80

Legend

Split Spoon

Shelby Tube

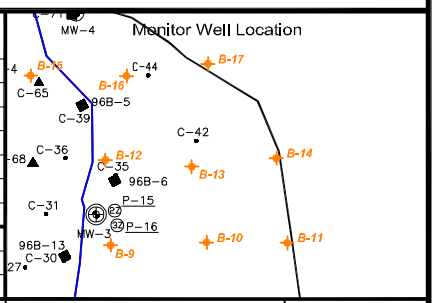
Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.016353
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A198	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80				**Clayey Silt (CLML)** gray, very dense, fine grained, moist			80
82							82
84							84
86							86
88							88
90		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			90
92		4.5					92
94		4.5					94
96		4.5					96
98		4.5					98
100							100

Legend

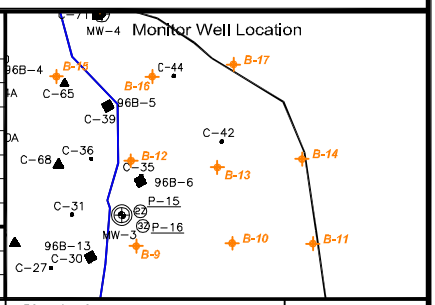
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016353		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A199	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
102							102
		4.5					
104							104
		4.5					
106							106
		4.5					
108							108
		4.5					
110							110
		4.5					
112							112
		4.5					
114				**Clayey Sand (CLSM)** gray, very dense, fine grained, poorly graded, moist			114
116							116
118							118
120							120

Legend

Split Spoon

Shelby Tube

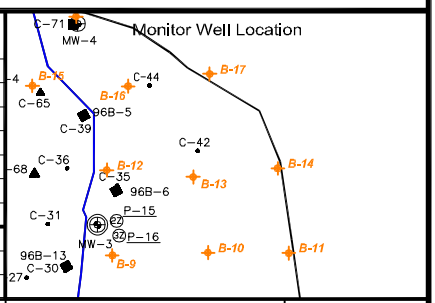
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/18/13 - 12/20/13

Well Coordinates	
Latitude:	32.016353
Longitude:	-93.565432
Elevations	
TOC:	NA
Ground:	358.20' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A200	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-13

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
120							120
122				**Sand Stone** - Drilled through could not push samplers			122
124							124
126				**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			126
128							128
130		4.5					130
132		4.5					132
134		4.5					134
136		4.5					136
138							138

Legend

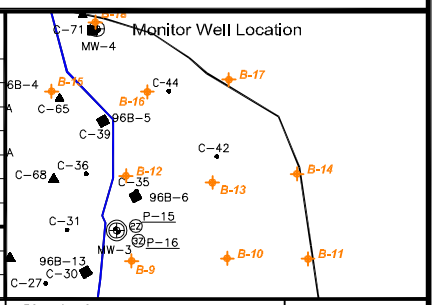
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016353		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565432		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/20/13	Ground:	358.20' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	138' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A201	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.0	10	**Clay (CL)** red, stiff, high plasticity, moist			
2							2
		2.0	10	**Clay (CL)** red, stiff, moist			
4							4
			10	**Sand (SM)** yellow, fine grained, well graded, poorly sorted, moist			
6							6
*			18	**Sand (SM)** yellow, very loose, moist			
8							8
*			10	**Sand (SM)** red, dense, moist			
10							10
*			10	**Sand (SM)** tan, dense, moist			
12							12
			6				
14							14
			8				
16							16
*		5.0	8	**Sandy Clay (SMCL)** gray, dense, moderate plasticity, moist			
18							18
		5.0	6	**Sandy Clay (SMCL)** gray, moist			
20							20

Legend

Split Spoon

Shelby Tube

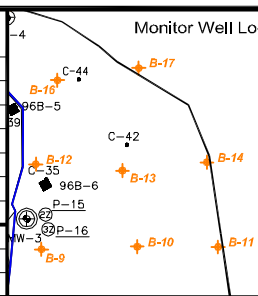
Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.016486
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A202	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		5.0	8	**Sandy Clay (SMCL)** gray, hard, moist			
22							22
*			6	**Sand (SM)** gray/red, dense, fine grained, well graded, moist			
24							24
			6	**Sand (SM)** gray/red, dense, poorly sorted, moist			
26							26
*		5.0	8	**Sand (SM)** gray, dense, moist			
				Clay (CL) gray, hard, moist			
28				**Clayey Sand (CLSM)** gray, dense, moist			28
*			6	**Sand (SM)** gray, dense, moist			
30							30
			8	**Sand (SM)** gray, dense, fine grained, well graded, moist			
32							32
*		4.0	8	**Clayey Sand (CLSM)** gray, dense, poorly sorted, moist			
34							34
		4.0	8	**Clayey Sand (CLSM)** gray, dense, moist			
36							36
*		2.5	10	**Sand (SM)** gray, medium dense, very moist			
38							38
		3.5	4	**Sand (SM)** gray, dense, very moist			
40							40

Legend

Split Spoon

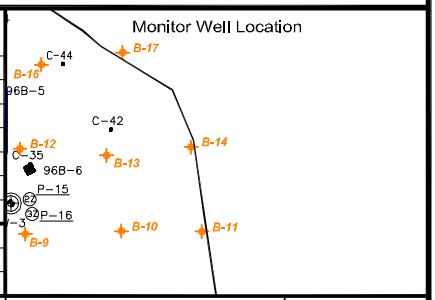
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016486		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A203	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		3.5	6	**Sand (SM)** gray, dense, very moist			
42							42
*		5.0	4	**Clay (CL)** gray, hard, moist			
44				**Coal (C)** No Recovery			44
46							46
			3				
48							48
50				**Sandy Clay (SMCL)**			50
		3.5	10	**Clay (CL)** gray, hard, very moist			
52							52
		4.0	10	**Clay (CL)** gray, hard, low to moderate plasticity, very moist			
54							54
		4.5	10	**Clay (CL)** gray, hard, very moist			
56							56
		5.0	10				
58							58
		5.0	10				
60							60

Legend

Split Spoon

Shelby Tube

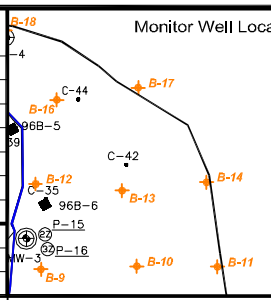
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/18/13 - 12/19/13

Well Coordinates	
Latitude:	32.016486
Longitude:	-93.564014
Elevations	
TOC:	NA
Ground:	372.62' (NAVD88)
Initial Water Level:	
Static Water Level:	

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A204	Drawn:	CMM	Checked: / Approved:	LMM / VRG
						Date:	03/27/17

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		5.0	10	**Clay (CL)** black, hard, low to moderate plasticity, very moist			
62							62
		5.0	10	**Clay (CL)** black, hard, very moist			
64							64
		5.0	10				
66							66
		5.0	10				
68							68
		5.0	10				
70							70
		5.0	10				
72							72
		5.0	10				
74							74
		5.0	10				
76							76
		5.0	10				
78							78
*		5.0	10	**Sandy Clay (SMCL)** black, hard, very moist			
80							80

Legend

Split Spoon

Shelby Tube

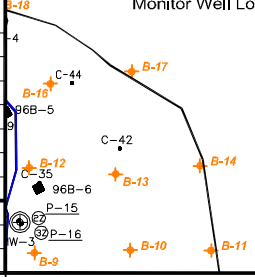
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/18/13 - 12/19/13

Well Coordinates	
Latitude:	32.016486
Longitude:	-93.564014
Elevations	
TOC:	NA
Ground:	372.62' (NAVD88)
Initial Water Level:	
Static Water Level:	

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA		
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA		
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA		
Doc Code	002-177	Dwg. No.:	002-177-A205	Drawn:	CMM	Checked:	LMM
						Approved:	VRG
						Date:	03/27/17

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5	6	**Sandy Clay (SMCL)** black, hard, low to moderate, very moist			
82							82
		5.0	4	**Sandy Clay (SMCL)** black, hard, very moist			
84							84
		5.0	6				
86							86
		5.0	6				
88							88
		5.0	6				
90							90
		5.0	6				
92							92
		5.0	6				
94							94
		5.0	6				
96							96
		5.0	8				
98							98
		5.0	6				
100							100

Legend

Split Spoon

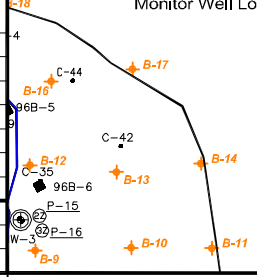
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016486		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A206	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

PROVIDENCE

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
100							100
*		5.0	6	**Clay (CL)** black, hard, low to moderate, very moist			
102		5.0	6	**Clay (CL)** black, hard, very moist			102
104		5.0	6				104
106		5.0	6				106
108		5.0	8				108
110		5.0	6				110
112		5.0	8				112
114		5.0	8				114
116		5.0	8				116
118		5.0	8				118
120							120

Legend

Split Spoon

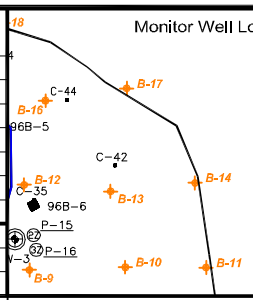
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016486		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A207	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
120							120
		5.0	8	**Clay (CL)** black, hard, low to moderate, very moist			
122							122
		5.0	8	**Clay (CL)** black, hard, very moist			
124							124
		5.0	8				
126							126
		5.0	8				
128							128
		5.0	8				
130							130
		5.0	8				
132							132
		5.0	8				
134							134
		5.0	8				
136							136
		5.0	8				
138							138
		5.0	8				
140							140

Legend

Split Spoon

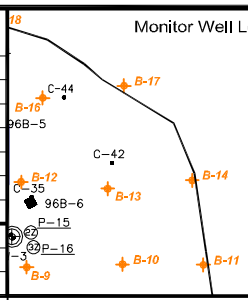
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016486		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A208	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/27/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-14

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
140							140
		5.0	8	**Clay (CL)** black, hard, low to moderate, very moist			
142							142
		5.0	8	**Clay (CL)** black, hard, very moist			
144							144
		5.0	8				
146							146
		5.0	8				
148							148
		5.0	4	**Coal No Recovery**			
150							150
151							151

Legend

Split Spoon

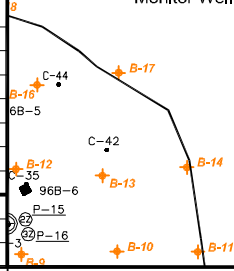
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.016486		
Engineer/Geologist:	Mark Smith	Longitude:	-93.564014		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	372.62' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	151' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A209	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date: 03/27/17
Approved:	VRG	

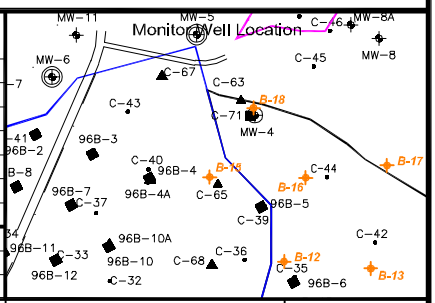
Log of Borehole: B-15

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		1.5		**Clay (CL)** orange/tan, stiff, moderate plasticity, moist			
2							2
		1.0					
4				**Silty Clay (MLCL)** tan/gray, hard, layers, low plasticity, moist			4
		4.5					
6							6
		4.5					
8							8
		4.5					
10							10
		4.5					
12							12
		0.5					
14							14
		4.5					
16							16
		4.5					
18							18
		4.5					
20							20

Legend

- Split Spoon
- Shelby Tube
- Static Water Level
- Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017631		
Engineer/Geologist:	Mark Smith	Longitude:	-93.568151		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/11/13 - 12/12/13	Ground:	292.61' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	86' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A210	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17



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Log of Borehole: B-15

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.0		**Sandy Clay (SMCL)** gray, hard, low to moderate plasticity, moist			
22							22
		4.5					
24							24
		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
26							26
		4.5					
28							28
		4.5					
30							30
		4.5					
32							32
		4.5					
34							34
		4.5					
36				**Clayey Silt (CLML)** black, medium dense, moist			36
38							38
40							40

Legend

Split Spoon

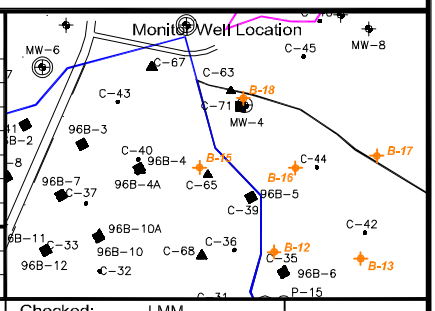
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.017631
Engineer/Geologist:	Mark Smith	Longitude:	-93.568151
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/11/13 - 12/12/13	Ground:	292.61' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	86' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A211	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-15

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5					
60							60

Legend

Split Spoon

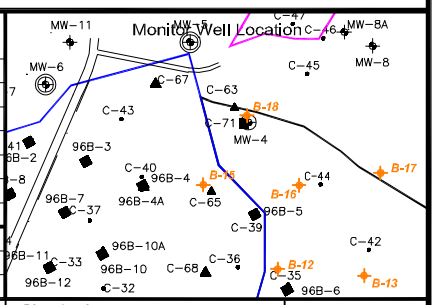
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.017631
Engineer/Geologist:	Mark Smith	Longitude:	-93.568151
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/11/13 - 12/12/13	Ground:	292.61' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	86' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-A212	Dwg. No.:	002-125-A129	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-15

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60				**Clayey Sand (CLSM)** gray, soft, moist			
62							
64							
66				**Silty Clay (MLCL)** gray, hard, moist			
68		4.5					
70		4.5		**Drilled Rock**			
72							
74				**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
76		4.5					
78		4.5					
80		4.5					

Legend

Split Spoon

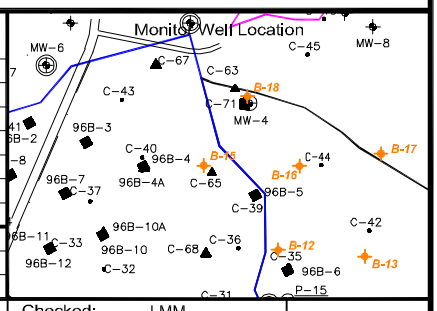
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.017631
Engineer/Geologist:	Mark Smith	Longitude:	-93.568151
Drilling Methods:	Mud Rotary	Elevations	
Driller:	Triangle	TOC:	NA
Date Drilled:	12/11/13 - 12/12/13	Ground:	292.61' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	86' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A213	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-15

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5		**Silty Clay (MLCL)** gray, hard, low to moderate plasticity, moist			
82							82
		4.5					
84							84
		4.5					
86							86

Legend

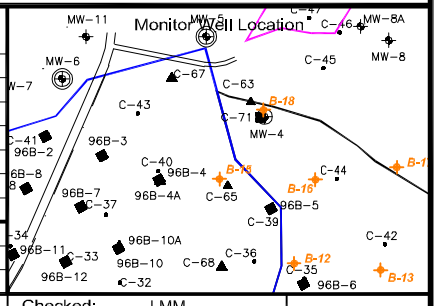
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017631		
Engineer/Geologist:	Mark Smith	Longitude:	-93.568151		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/11/13 - 12/12/13	Ground:	292.61' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	86' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A214	Drawn:	CMM



Checked:	LMM	Date: 04/17/17
Approved:	VRG	

Log of Borehole: B-16

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.0		**Clay (CH)** red/gray/tan, stiff, mottled, high plasticity, moist			
2							2
		4.5		**Clay (CH)** red/gray/tan, hard, mottled, high plasticity, moist			
4							4
		4.5		**Clay (CH)** red/tan, hard, high plasticity, moist			
6							6
		4.5		**Silty Clay (MLCL)** tan/gray, hard, low plasticity, dry			
8							8
		4.25					
10							10
		4.25					
12							12
		4.5					
14							14
		4.5					
16				**Silty Clay (MLCL)** black, hard, low plasticity, dry			16
		4.5					
18							18
		4.5					
20							20

Legend

Split Spoon

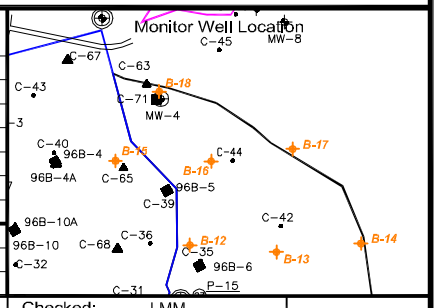
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	GTL
Date Drilled:	12/18/13 - 12/19/13

Well Coordinates	
Latitude:	32.017638
Longitude:	-93.566541
Elevations	
TOC:	NA
Ground:	299.16' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	80' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A215	Drawn:	CMM
Checked:	LMM	Approved:	VRG	Date:	04/17/17

PROVIDENCE

Log of Borehole: B-16

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
22							22
		4.5					
24							24
		4.25					
26							26
		4.5					
28							28
		4.5					
30							30
		4.5					
32							32
		4.5					
34							34
		4.25					
36							36
		4.25					
38							38
		4.25					
40							40

Legend

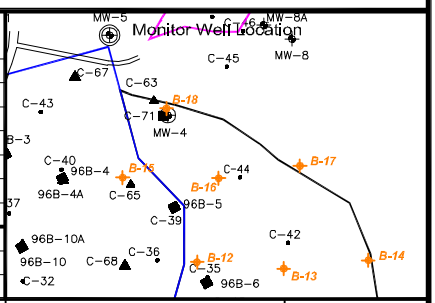
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017638		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566541		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	299.16' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	80' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A216	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17



Providence Engineering and Environmental Group LLC

PROVIDENCE

Log of Borehole: B-16

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.25		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
42							42
		4.5					
44							44
		4.25					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5					
60							60

Legend

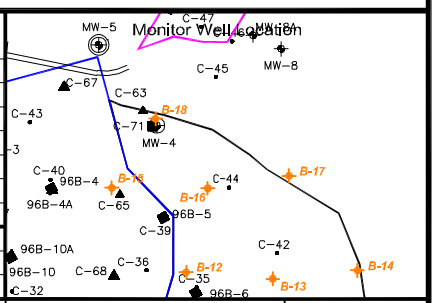
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017638		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566541		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	299.16' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	80' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A217	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-16

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60				**Clayey Silt (CLML)** medium dark gray, loose, moist			60
62							62
64				**Clayey Silt (CLML) to Silty Clay (MLCL)** medium dark gray, moist			64
66				**Clayey Silt (CLML)** medium dark gray, parts easily, moist			66
68							68
70							70
72							72
74							74
76				**Silty Clay (MLCL)** gray, hard, low plasticity, dry			76
78							78
80							80

Legend

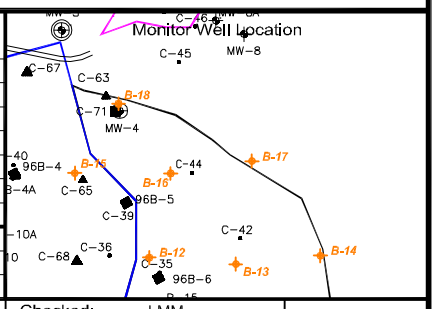
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017638		
Engineer/Geologist:	Mark Smith	Longitude:	-93.566541		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/18/13 - 12/19/13	Ground:	299.16' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	80' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A218	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-17

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		2.5		**Silty Clay (MLCL)** orange/tan/gray, stiff to hard, mottled, moderate plasticity, moist			
2							2
		2.0					
4							4
		3.0					
6							6
		3.0					
8							8
		3.5					
10							10
		4.5					
12				**Silty Clay (MLCL)** gray/tan, hard, low plasticity, moist			12
		4.5					
14							14
		4.5					
16							16
		4.5					
18							18
		4.5					
20							20

Legend

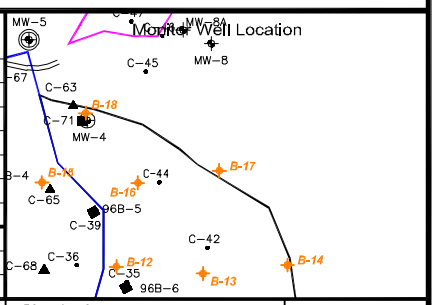
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017825		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565177		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	317.09' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	100'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A219	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-17

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.5		**Silty Clay (MLCL)** brown/gray, hard, low plasticity, moist			
22							22
		4.5					
24							24
		4.5					
26							26
		4.5					
28							28
		4.5					
30				**Clayey Silt (CLML)** brown/gray, soft, loose, moist			30
32							32
		4.5		**Silty Clay (MLCL)** brown/gray, hard, low plasticity, moist			
34							34
		4.5		**Sandy Clay (SMCL)** gray, hard, low plasticity, moist			
36							36
		4.5					
38							38
		4.5					
40							40

Legend

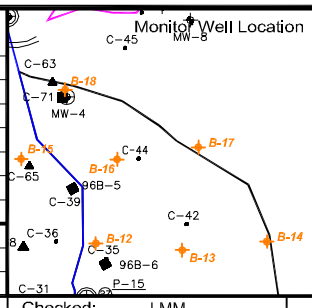
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017825		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565177		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	317.09' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	100'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A220	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-17

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Sandy Clay (SMCL)** gray, hard, low plasticity, moist			
42							42
		4.5					
44							44
		4.5					
46							46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5					
60							60

Legend

Split Spoon

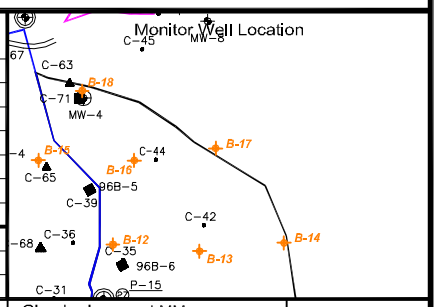
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/27/13 - 12/28/13

Well Coordinates	
Latitude:	32.017825
Longitude:	-93.565177
Elevations	
TOC:	NA
Ground:	317.09' (NAVD88)
Initial Water Level:	
Static Water Level:	



Depth of Well:	NA	Depth of Hole:	100'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A221	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-17

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
		4.5		**Sandy Clay (SMCL)** gray, hard, low plasticity, moist			
62		4.5					62
64		4.5					64
66		4.5					66
68		4.5					68
70		4.5		**Silty Clay (MLCL)** gray/black, hard, mottled, low plasticity, moist			70
72		4.5					72
74		4.5					74
76		4.5					76
78		4.5					78
80							80

Legend

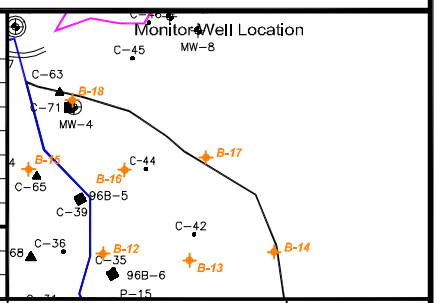
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.017825		
Engineer/Geologist:	Mark Smith	Longitude:	-93.565177		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	Triangle	TOC:	NA		
Date Drilled:	12/27/13 - 12/28/13	Ground:	317.09' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	100'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A222	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	04/17/17

PROVIDENCE

Log of Borehole: B-17

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5		**Silty Clay (MLCL)** gray/black, hard, mottled, low plasticity, moist			
82		4.5					82
84		4.5					84
86		4.5					86
88		4.5					88
90		4.5					90
92		4.5					92
94		4.5					94
96		4.5					96
98		4.5					98
100		4.5					100

Legend

Split Spoon

Shelby Tube

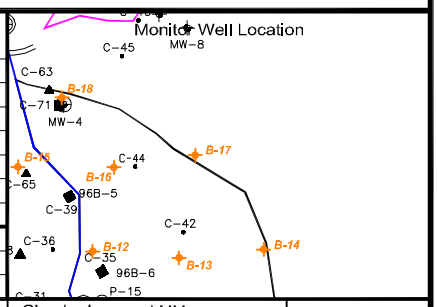
Static Water Level

Initial Water Level

Client:	CLECO
Location:	Dolet Hills Power Plant
Engineer/Geologist:	Mark Smith
Drilling Methods:	Mud Rotary
Driller:	Triangle
Date Drilled:	12/27/13 - 12/28/13

Well Coordinates	
Latitude:	32.017825
Longitude:	-93.565177
Elevations	
TOC:	NA
Ground:	317.09' (NAVD88)
Initial Water Level:	
Static Water Level:	

Depth of Well:	NA	Depth of Hole:	100'	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A223	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-18

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
0							0
		3.75		**Silty Clay (MLCL)** red/gray, extremely stiff, moderate plasticity, moist			
2							2
		4.5		**Silty Clay (MLCL)** tan/yellow, hard, low plasticity, dry			
4							4
		4.5		**Silty Clay (MLCL)** tan/gray, hard, low plasticity, dry			
6							6
		4.0		**Silty Clay (MLCL)** gray, hard, low plasticity, crumbly, dry			
8							8
		4.0					
10							10
		4.0		**Silty Clay (MLCL)** gray, hard, low plasticity, organic matter, dry			
12							12
		4.0		**Silty Clay (MLCL)** yellow, hard, low plasticity, dry			
14							14
		4.0		**Silty Clay (MLCL)** gray with orange, hard, low plasticity, with 1/8" silt seams, dry			
16							16
		4.0					
18							18
		4.0		**Silty Clay (MLCL)** black, hard, with calcareous nodules, dry			
20							20

Legend

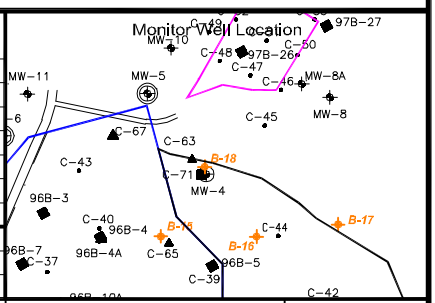
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.018627		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567426		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/12/13 - 12/16/13	Ground:	302.25' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A224	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

Log of Borehole: B-18

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
20							20
		4.0		**Silty Clay (MLCL)** black, hard, trace organic matter, some calcareous nodules, low plasticity, dry			
22							22
		4.5					
24				**Clay (CL)** black, hard, moderate plasticity, dry			24
		4.25					
26							26
		4.0					
28				**Silty Clay (MLCL)** black, hard, low plasticity, dry			28
		4.0					
30							30
		4.25					
32							32
		4.5					
34							34
		4.5					
36							36
		4.25					
38							38
		4.5					
40							40

Legend

Split Spoon

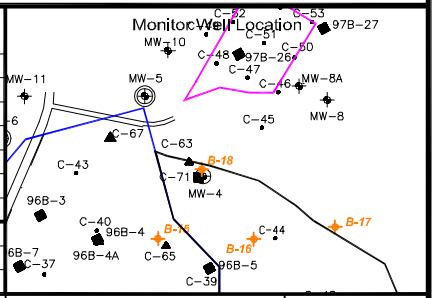
Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates	
Location:	Dolet Hills Power Plant	Latitude:	32.018627
Engineer/Geologist:	Mark Smith	Longitude:	-93.567426
Drilling Methods:	Mud Rotary	Elevations	
Driller:	GTL	TOC:	NA
Date Drilled:	12/12/13 - 12/16/13	Ground:	302.25' (NAVD88)
		Initial Water Level:	
		Static Water Level:	

Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A225	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17

PROVIDENCE

Log of Borehole: B-18

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
40							40
		4.5		**Silty Clay (MLCL)** black, hard, low plasticity, dry			
42							42
		4.5					
44				**Silty Clay (MLCL)** black, hard, low plasticity, trace coal, dry			44
		4.5					
46				**Silty Clay (MLCL)** black, hard, low plasticity, dry			46
		4.5					
48							48
		4.5					
50							50
		4.5					
52							52
		4.5					
54							54
		4.5					
56							56
		4.5					
58							58
		4.5					
60							60

Legend

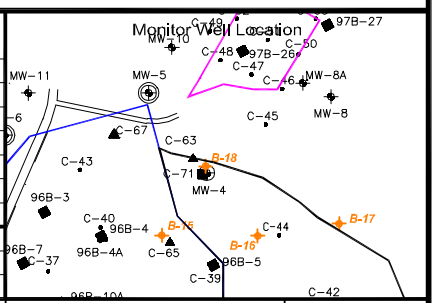
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.018627		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567426		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/12/13 - 12/16/13	Ground:	302.25' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A226	Drawn:	CMM



Checked:	LMM	Date:	04/17/17
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-18

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
60							60
62		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			62
64		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, fine grained, dry			64
66				**Sand (SM)** gray, loose, poorly graded, moist			66
68							68
70							70
72							72
74							74
76							76
78		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			78
80							80

Legend

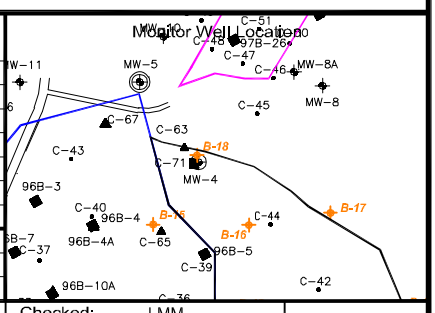
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.018627		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567426		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/12/13 - 12/16/13	Ground:	302.25' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A227	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17



Providence Engineering and Environmental Group LLC

Log of Borehole: B-18

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	OVM	USCS	Remarks
80							80
		4.5		**Silty Clay (MLCL)** gray, hard, low plasticity, dry			
82							82

Legend

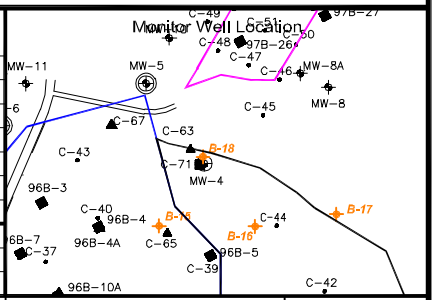
Split Spoon

Shelby Tube

Static Water Level

Initial Water Level

Client:	CLECO	Well Coordinates			
Location:	Dolet Hills Power Plant	Latitude:	32.018627		
Engineer/Geologist:	Mark Smith	Longitude:	-93.567426		
Drilling Methods:	Mud Rotary	Elevations			
Driller:	GTL	TOC:	NA		
Date Drilled:	12/12/13 - 12/16/13	Ground:	302.25' (NAVD88)		
		Initial Water Level:			
		Static Water Level:			
Depth of Well:	NA	Depth of Hole:	82' bgs	Hole Dia.:	NA
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A228	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	04/17/17



Providence Engineering and Environmental Group LLC

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
0				Ground Surface		0
0 – 2		<.5	24	**Sandy Clay (CL)** generally dark yellowish orange, soft to medium stiff consistency, good cohesion, poor plasticity, moist		2
2 – 4		>4.5	24	**Sandy Silty Clay (CL)** generally light brownish gray (uniform), hard consistency, very dense, good cohesion, moist		4
4 – 6		>4.5	24			6
6 – 8		>4.5	24			8
8 – 10		>4.5	24			10
10 – 12		1.4	24	**Silty Clay (CL)** light gray to medium light gray, stiff consistency, very good cohesion, moist		12
12 – 14		NM	24			14
14 – 16		>4.5	24	**Silty Clay (CL)** generally medium dark gray, hard consistency, very dense, good cohesion, moist		16
16 – 18		>4.5	24			18
18 – 20		>2.8	24	**Sandy Clay (CL)** light gray with dark yellowish orange staining, very stiff consistency, poor cohesion, moist		20

Legend

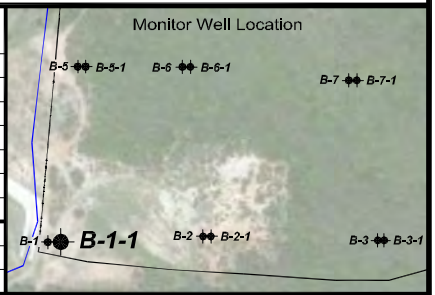
▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	1/26/16

Well Coordinates	
Latitude:	32.012789° (Approx.)
Longitude:	-93.567454° (Approx.)
Elevations	
TOC:	NA
Ground:	362.53' (NAVD88) (Approx.)
Initial Water Level:	27'
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A008	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	0/25/16

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		>2.4	24	**Silty Clay (CL)** generally light olive gray, very stiff to stiff consistency, good cohesion, good plasticity, moist		
22						22
		1.9	24			
24						24
		1.4	12	**Silty Silty Clay (CL)** light olive gray, becoming heavily interbedded with clayey sand, from 25'-26' bgs, moist		
26						26
		NM	12			
				Sand (SM) pale yellow brown, grading to dark yellow orange, fine grained, loosely consolidate, wet at 27' bgs		
28						28
		NM	24			
30						30
		NM	24			
32						32
		NM	24			
34						34
		>4.5	24	**Slightly Silty Clay (CL)** medium gray to medium dark gray (uniform), very dense, very hard consistency, good cohesion, moist		
36						36
		>4.5	24			
38						38
		>4.5	24			
40						40

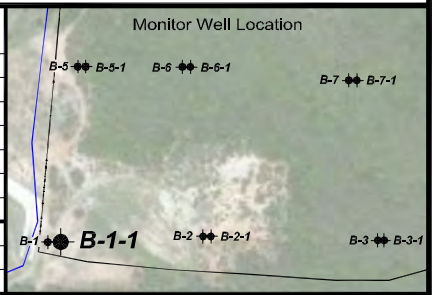
Legend

▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012789° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567454° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	362.53' (NAVD88) (Approx.)		
		Initial Water Level:	27'		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A009	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Slightly Silty Clay (CL)** medium dark gray (uniform), very dense, vary hard consistency, good plasticity, moist		
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24			48
50		>4.5	24			50
52		>4.5	24			52
54		>4.5	24			54
56		>4.5	24			56
58		>4.5	24			58
60		>4.5	24			60

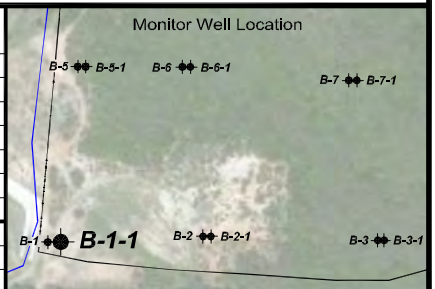
Legend

▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012789° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567454° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	362.53' (NAVD88) (Approx.)		
		Initial Water Level:	27'		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A010	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		>4.5	24	**Organic Clay (OH)** medium to dark gray to dark grayish yellow, scattered interbedded peat layers from 60'-65' bgs, dense hard consistency, moist		
62		>4.5	24			62
64		>4.5	24			64
				Slightly Silty Clay (CL) dark gray to medium dark gray, good to fair cohesion, very dense, very hard consistency, moist		
66		>4.5	24			66
68		>4.5	24			68
70		1.4	24	**Silty Sand (SM)** medium light gray (uniform) with occasional clay interbedding, fine grained to very fine grained, poor consistancy, 4" wet zone at 74' bgs, 4" wet zone at 76' bgs, moist other areas		70
72		NM	24			72
74		NM	24			74
76		>4.5	24	**Silty Clay (CL)** medium light gray, very hard consistency, good cohesion, dense, coarsens down to very sandy clay, moist		76
78		>4.5	24			78
80						80

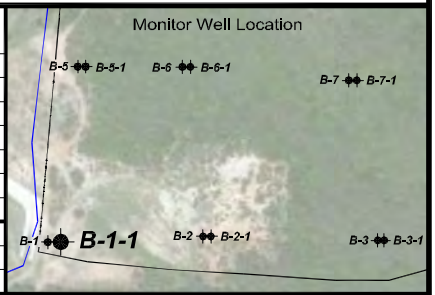
Legend

Initial Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012789° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567454° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	362.53' (NAVD88) (Approx.)		
		Initial Water Level:	27'		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A011	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		>4.5	24	**Very Silty Clay (CL)** generally medium dark gray with scattered medium light gray laminations, parts easily along lamination, fair to good cohesion, very stiff consistency, laminated throughout intervals, occasionally very silty lenses, density increases at 88' bgs, moist		
82		>4.5	24			82
84		>4.5	24			84
86		>4.5	24			86
88		>4.5	24			88
90		1.4	24	**Slightly Silty Clay (CL)** generally olive gray, occasional laminations, fair to good cohesion, very dense, hard consistency, ~4" silt present at 94' bgs, moist		90
92		NM	24			92
94		NM	24	**Silty Clay (CL)** generally dark gray, more uniform, less laminations, very dense, hard consistency, good to fair cohesion, moist		94
96		>4.5	24			96
98		>4.5	24			98
100						100

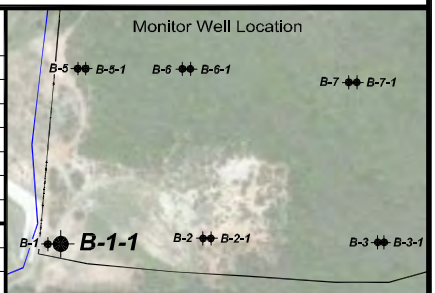
Legend

▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012789° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567454° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	362.53' (NAVD88) (Approx.)		
		Initial Water Level:	27'		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A012	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
100						100
		>4.5	24	**Silty Clay to Very Silty Clay (CL)** medium gray with slight medium dark gray laminations, hard consistency, fair to poor cohesion, parts along lamination, moist		
102		>4.5	24			102
104		>4.5	24			104
106		>4.5	24			106
108		>4.5	24			108
110		>4.5	24	**Silty Clay (CL)** dark gray (uniform), fair to good cohesion, very dense, very hard consistency, very little to no lamination present, does not part easily, moist		110
112		>4.5	24			112
114		>4.5	24			114
116		>4.5	24			116
118		>4.5	24			118
120						120

Legend

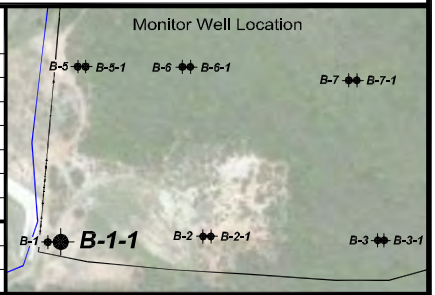
▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	1/26/16

Well Coordinates	
Latitude:	32.012789° (Approx.)
Longitude:	-93.567454° (Approx.)
Elevations	
TOC:	NA
Ground:	362.53' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	27'
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA



Doc Code	002-177	Dwg. No.:	002-177-A013	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	0/25/16

Log of Borehole: B-1-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
120						120
		>4.5	24	**Sandy Silty Clay (CL)** generally olive gray, fair to good cohesion, dense, hard consistency, interbedded with silt lenses from 121' to 124' bgs (~1"), moist		
122		>4.5	24			122
124		>4.5	24			124
126		>4.5	24	**Sandy Silty Clay (CL)** poor to fair cohesion, dense, hard, very little interbedding, moist		126
128		>4.5	24			128
130		>4.5	24	**Silty Clay to Very Silty Clay (CL)** olive gray to medium dark gray, dense, hard consistency, poor cohesion, fins downward to 137' bgs, moist		130
132		>4.5	24			132
134		>4.5	24			134
136		>4.5	24			136
138		>4.5	24			138
140						140

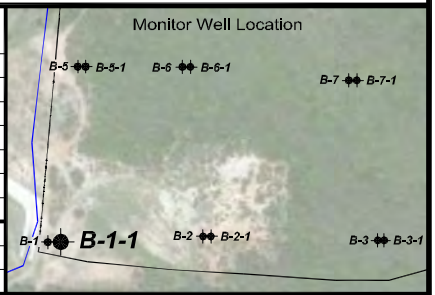
Legend

▽ Initial Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012789° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567454° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	362.53' (NAVD88) (Approx.)		
		Initial Water Level:	27'		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	140'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NM
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A014	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	RG		

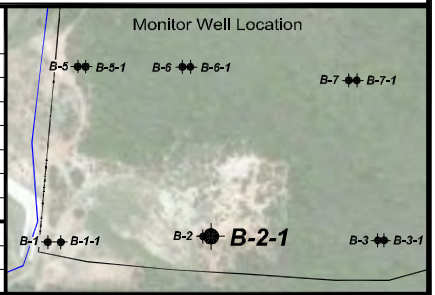
Log of Borehole: B-2-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		NM	24	**Sand (SM)** generally, light brown in color, occasionally very light gray, loosely consolidated, moist		0
2		NM	24			2
4		NM	24	**Sand (SM)** very light gray to light brown, fine to medium grained, moist		4
6		NM	24			6
8		NM	24	**Sand (SM)** red brick color, loosely consolidated, fine to medium grained, moist		8
10		NM	24	**Sand (SM)** generally dark yellowish orange, fine to medium grained, loosely consolidated, very moist		10
12		NM	24			12
14		NM	24			14
16		NM	24			16
18		NM	24	**Sand (SM)** very light gray from 18-19' bgs before grading back to dark yellow orange, fine to medium grained, loosely consolidated, wet at 18'		18
20						20

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012840° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566152° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	334.52' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	85'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A015	Drawn:	CMM



Checked:	LMM	Date:	0/25/16
Approved:	VRG		

PROVIDENCE

Log of Borehole: B-2-1

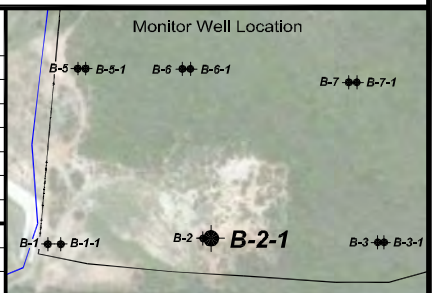
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		NM	24	**Sand (SM)** dark yellow orange, fine to medium grained, loosely consolidated, moist		
22		NM	24			22
		>4.5		**Slightly Silty Clay (CL)** dark gray (uniform colors), very dense, very hard consistency, good cohesion, moist		
24		>4.5	12			24
26		>4.5	12			26
28		>4.5	24			28
30		3.2	24	**Slightly Silty Clay (CL)** dark gray (uniform colors), occasional silt laminations observed from 32-36' bgs, good cohesion, fair plasticity, stiff to very stiff consistency, moist		30
32		3.6	24			32
34		3.9	24			34
36		3.9	24			36
38		>4.5	24			38
40						40

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012840° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566152° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	334.52' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	85'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A016	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	VRG		

PROVIDENCE

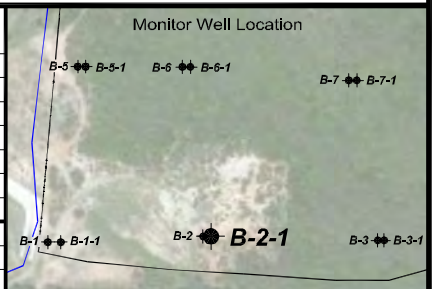
Log of Borehole: B-2-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Slightly Silty Clay (MLCL)** dark gray, very dense, very hard consistency, moist		
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24			48
50		>4.5	24			50
52		>4.5	24			52
54		>4.5	24			54
56		>4.5	24			56
58		>4.5	24			58
60						60

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012840° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566152° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	334.52' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	85'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A017	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	0/25/16



Log of Borehole: B-2-1

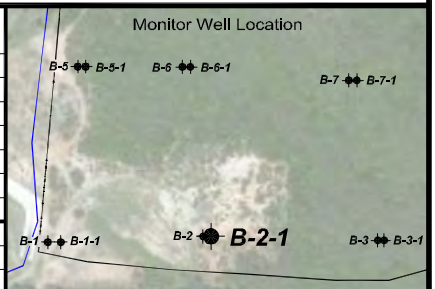
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		>4.5	24	**Slightly Silty Clay (CL)** dark gray with olive gray, interbedded lenses, clay friable when broken, hard consistency, very dense, slickensides and fractures observed throughout, moist		
62		>4.5	24			62
64		>4.5	24			64
				Sand (SM) medium light gray, loosely consolidated, moist		
66		>4.5	24	**Sandy Clayey Silt (ML)** medium light gray (uniform), with abundent clay and sand laminations, crumbly, occasional clay and sand lenses throughout, approximately 1" of sand lens at 70' bgs and 74' bgs, very moist		66
68		>4.5	24			68
70		1.4	24			70
72		NM	24			72
74		NM	24			74
76		>4.5	24			76
78		>4.5	24	**Very Silty Clay (CL)** medium gray clay with medium light gray laminations, moist		78
80						80

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012840° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566152° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	334.52' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	85'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A018	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	VRG		

Log of Borehole: B-2-1

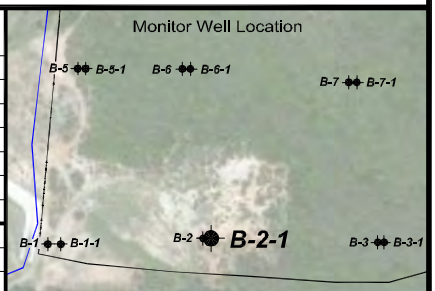
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		NM	NM	**Very Silty Clay (CL)** medium gray to medium light gray, clay and silt interbedding, fines downward, very dense, very hard, moist		
82		NM	NM			82
84		NM	NM			84
86						86
88						88
90						90
92						92
94						94
96						96
98						98
100						100

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012840° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566152° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	334.52' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	85'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A019	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	0/25/16
Approved:	VRG		

Log of Borehole: B-3-1

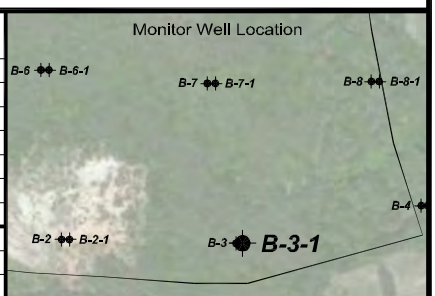
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		1.5	12	**Silty Clay (CL)** generally light brown, stiff, good cohesion, moist		0
2		1.9	12			2
4		3.0	24			4
6		3.2	24	**Clay (CL)** generally light gray with light brown laminations, very stiff consistency, very good cohesion, good plasticity, moist		6
8		2.4	24	**Slightly Silty Clay (CL)** generally light olive brown with occasional light gray layers interbedded, very stiff consistency, good to fair cohesion, interbedded, moist		8
10		NM	24	**Silty Sand (SM)** light gray to yellowish gray, loosely consolidated, fine to very fine grained, wet at 13' bgs		10
12		NM	24			12
14		3.0	24	**Sandy Clay (CL)** light gray with heavily interbedded dark yellowish staining, fine to very fine grained, very slight cohesion, moist to very moist		14
16		3.0	24	**Sandy Clay (CL)** generally light olive gray with dark yellowish orange to light brown laminations, very stiff, parts along laminations, very moist		16
18		3.5				18
20		3.5	24	**Silty Clay (MLCL)** generally medium dark gray with medium light grey laminations, very stiff, heavy silt laminations, moist		20

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.012824° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564686° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	291.42' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A020	Drawn:	CMM
				Checked:	CMM
				Approved:	VRG
				Date:	03/07/16

Monitor Well Location



PROVIDENCE

Log of Borehole: B-3-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		>4.5	24	**Silty Sandy Clay (CL)** generally medium dark gray with light gray laminations, heavily laminated throughout, hard, poor to fair cohesion, parts easily along laminations, moist		
22		>4.5	24			22
24		>4.5	24			24
26		>4.5	24	**Silty Clay (CL)** generally dark gray with medium light gray laminations, increasing clay laminations, dense, moist		26
28		>4.5	24			28
30		>4.5	24			30
32		>4.5	24	**Slightly Silty Clay (CL)** olive gray, very dense, very hard consistency, little to no laminations, fair cohesion, moist		32
34		>4.5	24			34
36			24			36
38		>4.5	24	**Organic Clay (CL)** olive black, very dense, hard consistency, slickensides, OH present, 4" coal seam at 38' bgs (very moist), moist		38
40						40

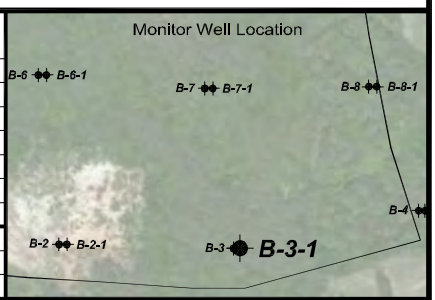
Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	1/26/16

Well Coordinates	
Latitude:	32.012824° (Approx.)
Longitude:	-93.564686° (Approx.)
Elevations	
TOC:	NA
Ground:	291.42' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A021	Drawn:	CMM
				Checked:	CMM
				Approved:	VRG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-3-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Clayey Silt (ML)** greenish gray, laminated bedding, parts easily, poor cohesion, moist		
42						42
		>4.5	24	**Silty Clay (CL)** medium gray, laminated bedding with occasional silt present, dense to hard consistency, moist		
44						44
		>4.5	24			
46						46
		>4.5	24	**Silty Clay (CL)** light olive gray, hard consistency, becoming very dense with depth, fair to good cohesion, moist		
48						48
		>4.5	24			
50						50

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.012824° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564686° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	291.42' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A022	Drawn:	CMM	Checked: CMM Approved: VRG	Date: 03/07/16

PROVIDENCE

Log of Borehole: B-5-1

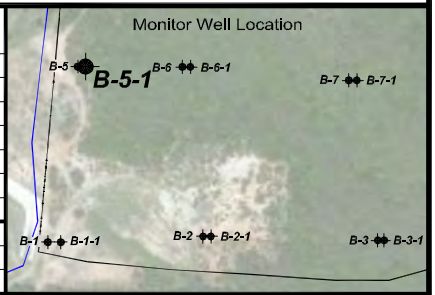
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		2.8	24	**Silty Clay (CL)** light brown occasional gray, good cohesion		0
2		3.0	24			2
4		1.4	24	**Sandy Clay (CL)** light gray, stiff, parts easily, fair cohesion, moist		4
6		NM	24	**Clayey Sand (SM)** light gray to grayish orange, very fine grained, with occasional sandy clay, fair cohesion, moist		6
8		NM	24			8
10		NM	24			10
12		NM	12			12
14		NM	12			14
16		NM	12			16
18		NM	24			18
20						20

Legend

- Initial Water Level
- Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014045° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567218° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/25-26/16	Ground:	372.02' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A023	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/07/16
Approved:	RG		

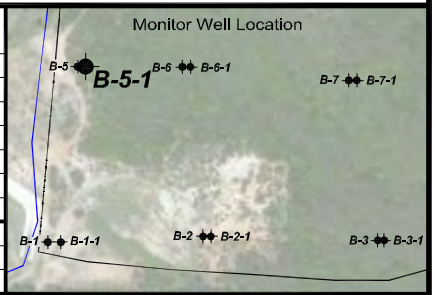
Log of Borehole: B-5-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		NM	24			
22						22
		NM	24			
24						24
		NM	12			
26						26
		NM	12			
28						28
		NM	24			
30						30
		NM	24			
32						32
		NM	24			
34				**Slightly Silty Clay (CL)** medium dark gray uniform, hard consistency, very dense, fair cohesion, slickensides present, moist		34
		>4.5	24			
36						36
		>4.5	24			
38						38
		>4.5	24			
40						40

Legend

- Initial Water Level
- Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014045° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567218° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/25-26/16	Ground:	372.02' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A024	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

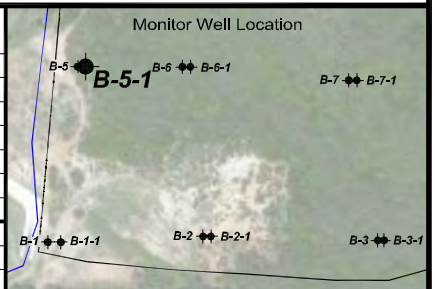
Log of Borehole: B-5-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40		>4.5	24	**Very Silty Clay (CL)** medium dark gray uniform, very hard consistency, very dense, fair cohesion, extremely dense at 48' bgs, moist		40
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24			48
50		>4.5	24			50
52		2.6	24	**Silty Clay (CL)** medium gray, very stiff consistency, poor cohesion, abundant silt lenses (approximately 1"), moist		52
54			24	**Silty Clay (CL)** medium gray, hard consistency, very dense, sand lenses at 55' bgs, sandy clay lenses at 57'bgs, moist		54
56			24			56
58			24			58
60						60

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014045° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567218° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/25-26/16	Ground:	372.02' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A025	Drawn:	CMM



Checked:	LMM	Date:	0/25/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-5-1

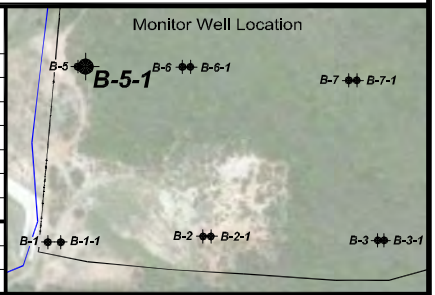
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		1.9	24	**Organic Clay (OH)** dark gray, good cohesion with friable very hard clay fragments within (shale like), coal seam present at 63' bgs (approximately 1"), moist		
62						62
		>4.5	24	**Silty Clay (CL)** generally dark gray with light gray silt laminations at 65' bgs, very hard consistency, dense, moist		
64						64
		>4.5	24			
				Slightly Clayey Silt (ML) generally medium light gray, laminated bedding, parts easily, poor cohesion, coarsens down, moist		
66						66
		NM	24	**Silty Sand (SM)** generally greenish gray, very fine grained, loosely consolidated, very moist at 67' bgs		
68						68
		NM	24			
70						70
		3.1	24	**Very Sandy Clay (CL)** generally medium light gray with abundant medium gray laminations, heavily laminated (alternating between clay and sand)crumbly, poor cohesion when dry, good cohesion when water added, fines downward, moist		
72						72
		3.4	24			
74						74
		3.4	24			
76						76
		>4.5	24	**Silty Clay (CL)** generally medium gray with occasional laminations, becoming more dense with less laminations, hard, moist		
78						78
		>4.5	24			
80						80

Legend

- Initial Water Level
- Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014045° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567218° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	372.02' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A026	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/07/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-5-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		3.9	24	**Silty Clay (CL)** generally light olive gray, abundant sand and silt interbedded from 80-81' bgs, very stiff, parts easily, poor cohesion, moist		
82		>4.5	24	**Slightly Silty Clay (CL)** generally medium dark gray to olive gray, lightly scattered interbeddings, very dense, hard conistency, moist		82
84		>4.5	24			84
86		>4.5	24			86
88		>4.5	24			88
90		>4.5	24			90
92		>4.5	24	**Organic Clay (OH)** dark gray to black, hard, dense, 4" and 2" coal seams present at 92' and 93' bgs, moist		92
94		>4.5	24	**Silty Clay (CL)** medium gray grading to medium light gray, sand lenses present at 95' bgs (4") and at 96' bgs (1"), sand lenses are very moist, hard, very dense, clay in moist		94
96		>4.5	24			96
98		>4.5	24	**Silty Clay (CL)** medium dark gray, very hard, very dense, fair cohesion, moist		98
100						100

Legend

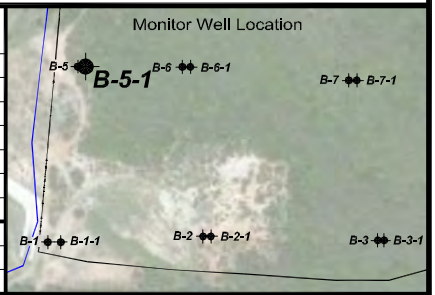
- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	1/26/16

Well Coordinates	
Latitude:	32.014045° (Approx.)
Longitude:	-93.567218° (Approx.)
Elevations	
TOC:	NA
Ground:	372.02' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A027	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-5-1

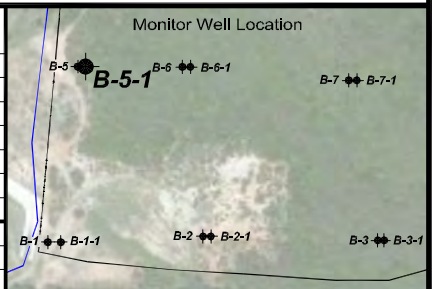
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
100						100
		>4.5	24	**Slightly Silty Clay (CL)** medium dark gray (uniform), very hard consistency, very dense, good cohesion, silt lenses present at 109' bgs (1"), silt lens is very moist, clay is moist		
102						102
		>4.5	24			
104						104
		>4.5	24			
106						106
		>4.5	24			
108						108
		>4.5	24			
110						110
		>4.5	24	**Slightly Silty Clay (CL)** medium light gray from 110' to 112' bgs grading to medium gray, laminated bedding from 110' to 112' bgs, very hard, very dense, good cohesion, moist		
112						112
		>4.5	24			
114						114
		>4.5	24			
116						116
		>4.5	24			
118						118
		>4.5	24			
120						120

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014045° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567218° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	1/26/16	Ground:	372.02' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	120'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A028	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/07/16
Approved:	RG		

Log of Borehole: B-6-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		1.8	12	**Silty Clay (CL)** light brown with scattered light gray laminations, stiff consistency, good cohesion, moist		0
2		1.9	12			2
4		NM	24			4
6		>4.5	24	**Silty Clay (CL)** light gray with light brown interbedding, good cohesion, moi **Silty Clay (CL)** pale yellow brown with dark yellow-orange interbedding, dense, hard consistency, moist		6
8		>4.5	24			8
10		3.4	24	**Silty Clay (CL)** pale yellow brown with alternating layers of light gray to dark yellow orange, good cohesion, very stiff consistency, does not part easily moist		10
12		3.4	24			12
14		3.2	24			14
16		3.1	24	**Very Clayey Silt (ML)** light brown with slight light gray laminations, parts easily along laminations, very stiff, moist		16
18		>4.5	24	**Slightly Silty Clay (CL)** generally pale yellow brown with dark yellow orange interbedding, dense, hard consistency, fair to good cohesion, moist		18
20						20

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.014048° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566339° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	01/28/16	Ground:	333.97' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	80'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-255-001	Dwg. No.:	002-255-001-A029	Drawn:	LMH
				Checked:	LMH
				Approved:	EKS
				Date:	05/01/20

PROVIDENCE

Log of Borehole: B-6-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		2.9	24	**Slightly Silty Clay (CL)** generally pale yellow brown with dark yellow orange interbedding, dense, hard consistency, fair to good cohesion, moist		
22		3.4	24			22
24		3.4	12			24
26		>4.5	12	**Slightly Silty Clay (CL)** medium dark gray to dark gray, dense, hard consistency, fair to good cohesion, trace silt interbedding (2"), organic clay lenses at 30' bgs, moist		26
28		>4.5	24			28
30		1.9	24	**Slightly Silty Clay (CL)** medium light gray to dark yellow gray interbedding, clay lenses, moist		30
32		NM	24	**Very Clayey Sand (SM)** yellowish gray, loosely consolidated, very fined grained, fair cohesion, very moist		32
34		NM	24			34
36		NM	24			36
38		>4.5	24	**Very Silty Clay (CL)** generally medium dark gray, laminated bedding, poor cohesion, hard consistency, moist		38
40						40

Legend

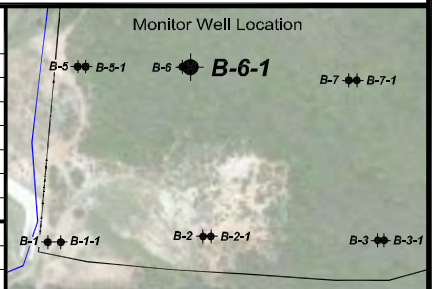
- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	01/28/16

Well Coordinates	
Latitude:	32.014048° (Approx.)
Longitude:	-93.566339° (Approx.)
Elevations	
TOC:	NA
Ground:	333.97' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Depth of Well:	NA	Depth of Hole:	80'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-255-001	Dwg. No.:	002-255-001-A030	Drawn:	LMH
				Checked:	LMH
				Approved:	EKS
				Date:	05/01/20

Log of Borehole: B-6-1

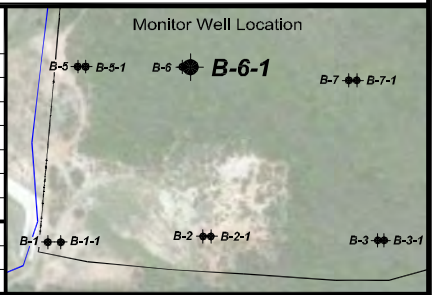
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Very Silty Clay (CL)** medium dark gray with scattered medium light gray interbedding, laminated bedding, parts easily along laminations, very dense, very hard, fair to poor cohesion, moist		
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24			48
50		>4.5	24	**Silty Clay (CL)** medium dark gray to olive gray with scattered medium light gray interbedding, very dense, hard consistency, fair cohesion, fines downward with less interbedding with depth, moist		50
52		>4.5	24			52
54		>4.5	24			54
56		>4.5	24			56
58		4.5	24	**Organic Clay (CL)** Olive black, very dense, very hard, poor cohesion, slickensides present, moist		58
60						60

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.014048° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566339° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	01/28/16	Ground:	333.97' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	80'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-255-001	Dwg. No.:	002-255-001-A031	Drawn:	LMH

Monitor Well Location



Checked:	LMH	Date:	05/01/20
Approved:	EKS		

PROVIDENCE

Log of Borehole: B-6-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		>4.5	24	**Clayey Silt (ML)** greenish gray, hard consistency, poor cohesion, heavily laminated bedding, moist		
62						62
		>4.5	24	**Silty Clay (CL)** medium dark gray to olive gray with scattered medium light gray interbedding, very dense, hard consistency, fair to poor cohesion, moist		
64						64
		>4.5	24			
66						66
		>4.5	24			
68						68
		>4.5	24			
70						70
		2.5	24	**Very Clayey Sand (SM)** Medium light gray, some consolidation, moist		
				Very Sandy Clay (CL) Medium gray with scattered medium light gray interbedding, laminated bedding, very dense, very hard, moist		
72						72
		>4.5	24			
74						74
		>4.5	24			
76						76
		>4.5	24			
78						78
		>4.5	24			
80						80

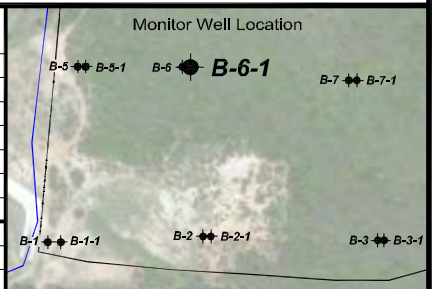
Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker-Hill (WWC)
Date Drilled:	01/28/16

Well Coordinates	
Latitude:	32.014048° (Approx.)
Longitude:	-93.566339° (Approx.)
Elevations	
TOC:	NA
Ground:	333.97' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	80'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-255-001	Dwg. No.:	002-255-001-A032	Drawn:	LMH
				Checked:	LMH
				Approved:	EKS
				Date:	05/01/20

PROVIDENCE

Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0				**Clay (CL)** light brown with occasional light gray mottles, stiff Consistency, good cohesion, fair plasticity, moist		0
		1.9	24			
2						2
		1.9	24			
4				**Silty Clay (CL)** light gray with occasional light brown, very stiff, parts easily, fair cohesion, moist		4
		3.2	12			
6				**Note:** No recovery from 6-10' bgs		6
		NM	NR			
8						8
		NM	NR			
10				**Very Clayey Silt (ML)** very pale orange, soft consistency, parts easily, fair cohesion, moist		10
		<.5	24			
12				**Clayey Sand (SM)** very pale orange, very fine grained, loosely consolidated, no cohesion, moist		12
		NM	12			
14				**Silty Sand (SM)** generally light gray to very light gray, scattered clay concretions, very fine grained, loosely consolidated, powdery, moist		14
		NM	12			
16						16
		NM	12			
18						18
		NM	24			
20						20

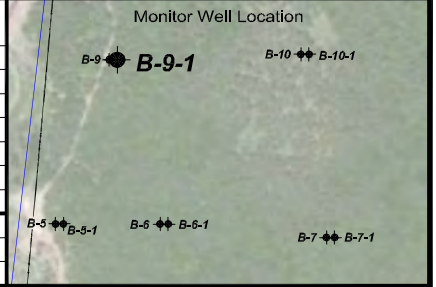
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	WHE - Rodney LaBrosse
Date Drilled:	1/20/16

Well Coordinates	
Latitude:	32.015219° (Approx.)
Longitude:	-93.566781° (Approx.)
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A033	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

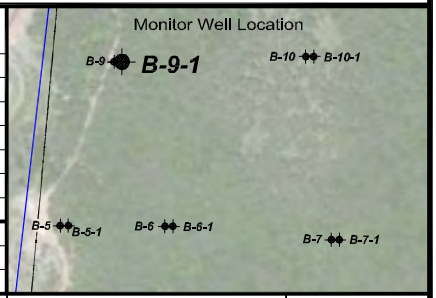
Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20		NM	24	**Sandy Silt (ML)** generally very pale orange, grades to light gray at 25' bgs, very loosely consolidated, no structure, very fine grained, moist		20
22		NM	24			22
24		NM	12	**Very Clayey Silt (ML)** generally light gray, very loosely consolidated, very fine grained, powder like moist		24
26		NM	12			26
28		NM	24			28
30		3.8	24	**Silty Clay (CL)** pale yellow brown, very stiff, dense, good cohesion, moist		30
		NM		**Clayey Sand (SM)** light gray with occasional dark yellow, very fine grained, poor cohesion, moist to very moist		
32		2.8	24	**Slightly Silty Clay (CL)** generally grayish brown with pale yellow brown laminations, stiff, coarsens downward moist		32
34		3.0	24			34
36		2.0	24	**Very Silty Clay (CL)** pale yellow brown, stiff to very stiff consistency, very good cohesion, good plasticity, coarsens downward, very moist at 36' bgs		36
38		2.0	24			38
40						40

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015219° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566781° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	WHE - Rodney LaBrosse	TOC:	NA		
Date Drilled:	1/20/16	Ground:	375.27' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A034	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16



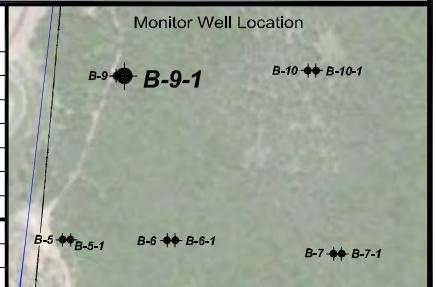
Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40		>4.5	12	**Very Sandy Silt (ML)** with scattered clay interbedded, medium light gray with occasional dark yellow, very stiff, parts easily, very stiff, consistency, fines downward, wet at 41' bgs		40
		3.0	12			
42		2.9	24			42
44		3.4	24	**Silty Clay (CL)** with silt interbedded, generally olive gray with dark yellowish orange laminations, parts along laminations, moist		44
46		3.2	24	**Silty Clay (CL)** generally medium gray with occasional light gray laminations, very stiff, good cohesion, moist		46
48		4.0	24	**Silty Clay (CL)** generally medium gray, fair to poor cohesion, silt lenses present, 4" silt lenses at 49' bgs, moist		48
50		>4.5	24	**Silty Clay (CL)** medium gray, hard, very good cohesion, good plasticity, trace silt laminations, moist		50
52		>4.5	24			52
54		>4.5	24			54
56		>4.5	24	**Slightly Silty Clay (CL)** occasional silt laminations, medium dark gray, very hard consistency, very dense, crumbly, poor cohesion, slickensides present, with organic/peat layer from 58-59' bgs, moist		56
58		>4.5	24			58
60						60

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015219° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566781° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	WHE - Rodney LaBrosse	TOC:	NA		
Date Drilled:	1/20/16	Ground:	375.27' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A035	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16



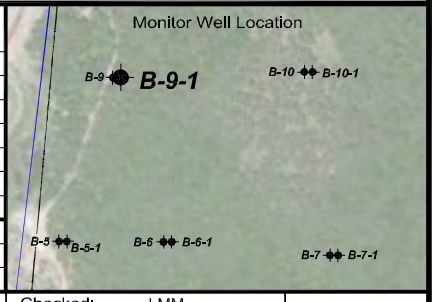
Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60		1.9	12	**Sandy Clay (CL)** generally light brown with occasional light gray laminations, stiff consistency, good cohesion, poor plasticity, coarsens down, moist		60
		NM	12	**Silty Sand (SM)** yellow gray (uniform), loosely consolidated, very fine grained, very moist		
62		NM	24			62
64		>4.5	24			64
66		4.1	24	**Silty Clay (CL)** dark yellowish orange to light brown, very hard consistency, poor cohesion, Fe staining, moist		66
68		<4.5	24	**Silty Clay (CL)** generally light olive gray grading to medium light gray at 69' bgs, hard consistency, good cohesion, laminated bedding, moist **Very Silty Clay (CL)** medium light gray laminated bedding, parts easily along bedding, fair cohesion, 2" sand lens present at 69' bgs (very moist), moist		68
70		<4.5	24			70
72			24			72
74			12			74
			24	**Slightly Silty Clay (CL)** medium dark gray, very hard, very dense, good cohesion, poor plasticity, abundant silt lenses, moist		
76		>4.5	24			76
78			24			78
80						80

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015219° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566781° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	WHE - Rodney LaBrosse	TOC:	NA		
Date Drilled:	1/20/16	Ground:	375.27' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A036	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16



PROVIDENCE

Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		3.9	24	**Slightly Silty Clay (CL)** medium dark gray, very hard, very dense, poor cohesion, moist		
82		>4.5	24			82
84		>4.5	24			84
86		>4.5	24			86
88		>4.5	24			88
90		>4.5	24	**Organic Clay (CL)** olive gray, hard, dense, 3" peat layer present at 90' bgs, moist		90
92		>4.5	24	**Very Clayey Silt (ML)** generally medium light gray, blueish green at 95' bgs, laminated bedding, very hard consistency, fair cohesion, fines downward, moist		92
94		>4.5	24			94
96		>4.5	24	**Slightly Silty Clay (CL)** medium dark gray, very hard, very dense, good to fair cohesion, poor plasticity, moist		96
98		>4.5	24			98
100						100

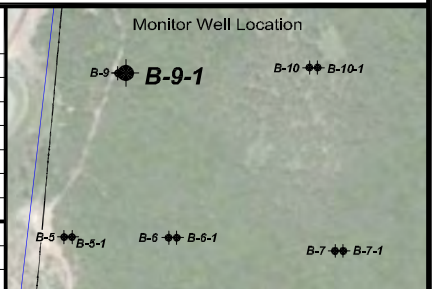
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	WHE - Rodney LaBrosse
Date Drilled:	1/20/16

Well Coordinates	
Latitude:	32.015219° (Approx.)
Longitude:	-93.566781° (Approx.)
Elevations	
TOC:	NA
Ground:	375.27' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A037	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

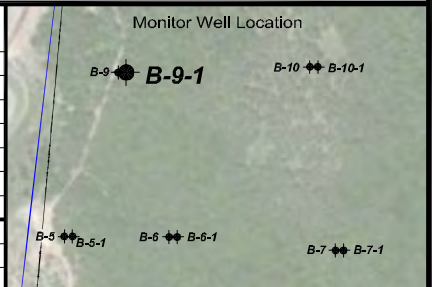
Log of Borehole: B-9-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
100						100
		>4.5	24			
102						102
		>4.5	24			
104						104
		>4.5	24			
106				**Silty Clay (CL)** generally light olive gray, very hard consistency, very dense, poor cohesion, faint laminated bedding, moist		106
		>4.5	24			
108						108
		>4.5	24			
110						110
		>4.5	24			
112						112
		>4.5	24			
114						114
		>4.5	12			
115						115

Legend

▽	Initial Water Level		Sonic
▼	Static Water Level		
*	Sample Location		
NM	Not Measured		
NR	No Recovery		

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015219° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566781° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	WHE - Rodney LaBrosse	TOC:	NA		
Date Drilled:	1/25/16	Ground:	375.27' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	115'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A038	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

PROVIDENCE

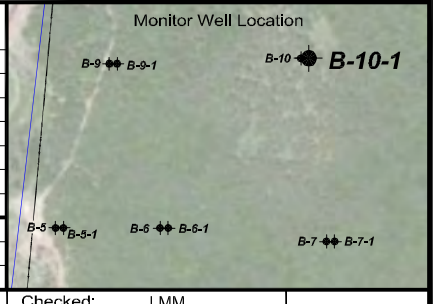
Log of Borehole: B-10-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		1.25	24	**Sandy Silt (ML)** orange with gray, stiff consistency, surface material, moist		0
2		>4.5	24			2
				Clayey Silt (ML) orange in color, hard consistency, poor cohesion, moist		
4		NM	24	**Sandy Silt (ML)** tannish orange, loose, crumbles, mostly dry		4
6		NM	24	**Sandy Silt (ML)** orange, loose, crumbles, mostly dry		6
8		NM	24	**Sandy Silt (ML)** red, loose, crumbles, mostly dry		8
10		2.5	24	**Silty Clay (CL)** red/orange with gray mottles, very stiff, good cohesion, good plasticity, moist		10
12		>4.5	24			12
14		>4.5	24	**Silty Clay (CL)** red/orange with gray and tan mottle, hard, moist		14
16		>4.5	24	**Silty Clay (CL)** gray/red with orange mottle, hard, poor cohesion, moist		16
18		>4.5	24	**Silty Clay (CL)** light gray with slight orange mottle, hard, crumbles, moist		18
20						20

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015272° (Approx.)		
Engineer/Geologist:	John Sherrill	Longitude:	-93.565171° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	02/01/16	Ground:	328.73' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	70'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A039	Drawn:	CMM



Checked:	LMM	Date:	03/08/16
Approved:	RG		

Log of Borehole: B-10-1

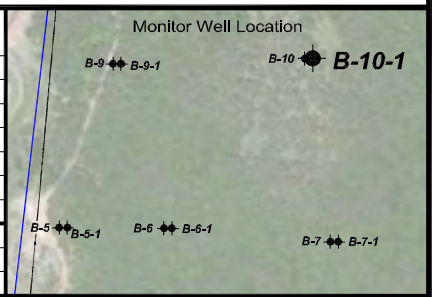
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		<0.25	24	**Sand (SM)** tan, very soft, wet to very moist		
22						22
		4.0	24	**Silty Clay (CL)** blueish gray with orange mottles, extremely stiff, good cohesion, interbedding present, moist		
24						24
		4.0	24			
26						26
		3.5	24	**Silty Clay (CL)** gray and orange mottled, extremely stiff, moist		
28						28
		3.5	24			
30						30
		>4.5	24	**Clay (CL)** dark gray with orange and dark brown mottles, moist		
32						32
		4.0	24	**Silty Clay (CL)** gray with orange mottles, extremely stiff, crumbles, laminated bedding, moist		
34						34
		>4.5	24			
36				**Clay (CL)** dark gray, hard consistency, crumbles, moist		36
		>4.5	24			
38						38
			24			
40						40

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015272° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565171° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	02/01/16	Ground:	328.73' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	70'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A040	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/08/16

Monitor Well Location



PROVIDENCE

Log of Borehole: B-10-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Silty Clay (CL)** medium gray, hard, crumbles, moist		
42				**Lignite** 1.5" thick		42
		>4.5	24	**Silty Clay (CL)** dark gray, hard consistency, crumbles, moist		
44						44
		>4.5	24			
46				**Clayey Silt (ML)** medium light gray, mottled, hard consistency, crumbles, moist		46
		>4.5	24			
48						48
		>4.5	24			
50						50
		>4.5	24	**Silty Clay (CL)** dark to medium gray, laminated bedding, hard, crumbles, moist		
52						52
		>4.5	24			
54						54
		>4.5	24			
56						56
		>4.5	24			
58						58
		>4.5	24	**Silty Clay (CL)** dark to light gray, sandy towards base, crumbles, moist		
60						60

Legend

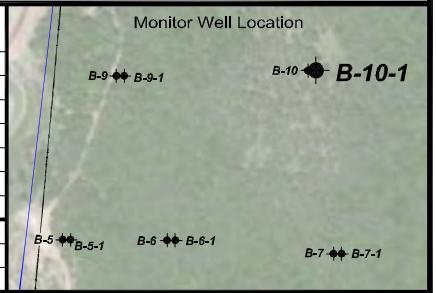
- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	02/01/16

Well Coordinates	
Latitude:	32.015272° (Approx.)
Longitude:	-93.565171° (Approx.)
Elevations	
TOC:	NA
Ground:	328.73' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Depth of Well:	NA	Depth of Hole:	70'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A041	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/08/16

Log of Borehole: B-10-1

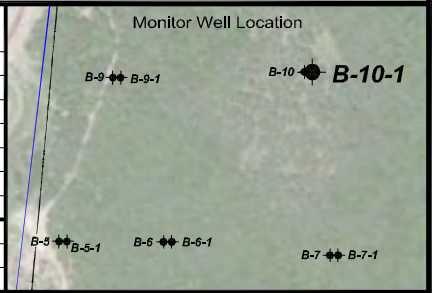
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		>4.5		**Sandy Clay (CL)** gray, hard consistency, crumbles, laminated bedding, moist		
62						62
		>4.5				
64						64
		>4.5				
66						66
		>4.5				
68						68
		<4.5				
70						70

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Page 4 of 4

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015272° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565171° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	02/01/16	Ground:	328.73' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	70'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A042	Drawn:	CMM



Checked: LMM
Approved: RG
Date: 03/08/16

PROVIDENCE

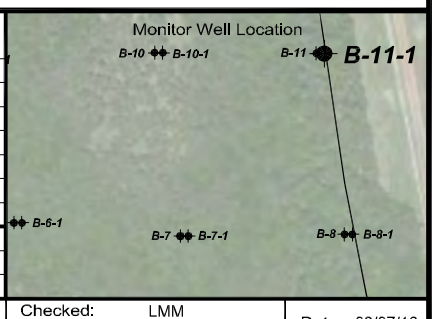
Log of Borehole: B-11-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		NM	24	**Sand (SM)** light brownish gray, loose consolidation, contains surface debris/roots		0
2		3.5	24	**Clay (CL)** orange with gray mottles, very stiff consistency, good cohesion, moist		2
4		3.0	24	**Silty Clay (CL)** gray with orange mottles, very stiff consistency, moist		4
6		3.5	24	**Silty Clay (CL)** gray with slight orange mottles, very stiff consistency, moist		6
8		2.5	24			8
10		1.5	24	**Sandy Clay(CL)** orange with slight gray mottles, stiff consistency, good cohesion, good plasticity, moist		10
12		2.0	24			12
14		4.0	24	**Clay (CL)** orange with gray mottles, very stiff consistency, good cohesion, moist		14
16		>4.5	24	**Clay (CL)** medium gray grading to dark gray with slight orange mottles, hard consistency, moist		16
18		>4.5	24			18
20						20

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015278° (Approx.)		
Engineer/Geologist:	John Sherrill	Longitude:	-93.563816° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	02/01/16	Ground:	316.09' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A043	Drawn:	CMM



Checked:	LMM
Approved:	VRG
Date:	03/07/16

Log of Borehole: B-11-1

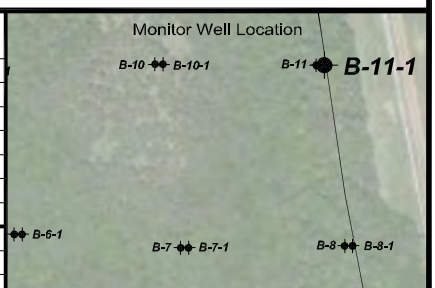
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		>4.5	24	**Clay (CL)** dark gray, hard consistency, moist		
22						22
		>4.5	24	**Clay (CL)** black to very dark gray, hard consistency, thin lignite seam at 22.5' bgs, moist		
24						24
		>4.5	24	**Clay (CL)** dark to medium gray, hard consistency, coarsens down, moist		
26						26
		>4.5	24	**Silty Clay (CL)** medium gray, hard consistency, coarsens downward, moist		
		1.0				
28				**Sandy Clay (CL)** gray with some orange, good cohesion, good plasticity, wet at seam in clay		28
		1.5	24	**Clayey Sand (SM)** gray, stiff, crumbles, moist to dry		
30						30
		4.0	24	**Sandy Clay (CL)** medium light gray, laminated bedding, crumbles, dry to moist		
32						32
		4.0	24			
34						34
		>4.5	24			
36						36
		>4.5	24			
38						38
		>4.5	24			
40						40

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.015278° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.563816° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	02/01/16	Ground:	316.09' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A044	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/07/16

Monitor Well Location



Log of Borehole: B-11-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40		>4.5	24	**Sandy Clay (CL)** gray, hard consistency, crumbles, moist		40
42		2.5	24	**Clayey Sand (SM)** gray, very stiff consistency, moist		42
44		>4.5	24	**Sandy Clay (CL)** medium dark gray, laminated bedding, crumbles, moist		44
46		>4.5	24			46
48		>4.5	24			48
50		>4.5	24	**Sandy Clay (CL)** dark to medium gray, hard consistency, crumbles, 1' lignite seam present from 54-55' bgs, moist to dry		50
52		>4.5	24			52
54		>4.5	24	**Coal**		54
56		>4.5	24	**Sandy Clay (CL)** dark to medium gray, hard consistency, crumbles, laminated bedding, moist		56
58		4.5	24			58
60						60

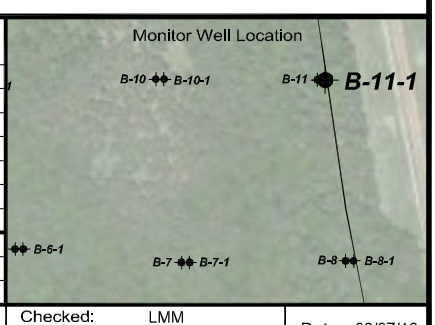
Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.015278° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.563816° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	002/01/16	Ground:	316.09' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A045	Drawn:	CMM
				Checked:	LMM
				Approved:	VRG
				Date:	03/07/16



Log of Borehole: B-12-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
0				Ground Surface		0
		NM	NR			
2		2.5	12	**Silty Clay (CL)** medium light gray to pale yellowish brown, good cohesion, good to fair plasticity, Fe staining, coarsens down to a fine sand at 9.5' bgs, moist		2
4		1.5	12			4
6		1.9	24			6
8		1.9	24			8
10		1.8	24	**Sand (SM)** pale yellow brown, fine grained, loosely consolidated, wet		10
12		4.0	24	**Silty Clay (CL)** pale yellow brown with occasional dark yellowish orange laminations, fair cohesion, poor plasticity, moist		12
14		>4.5	24			14
16		>4.5	24	**Silty Clay (CL)** medium gray with occasional dark yellowish orange laminations, dense, hard consistency, good cohesion, laminated bedding, moist		16
18		1.4		**Silt (ML)** medium gray to dark yellowish orange, mottled, crumbly, poor cohesion, very moist		18
20		>4.5	24	**Clay (CL)** light olive gray, very hard consistency, very dense, Fe staining, moist		20

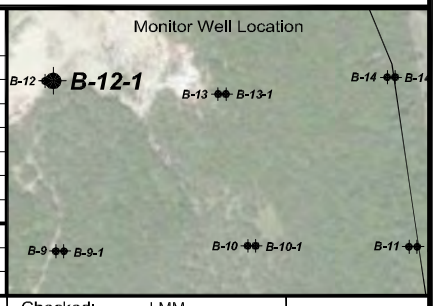
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	1/19/16

Well Coordinates	
Latitude:	32.016435° (Approx.)
Longitude:	-93.566886° (Approx.)
Elevations	
TOC:	NA
Ground:	345.72' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A046	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

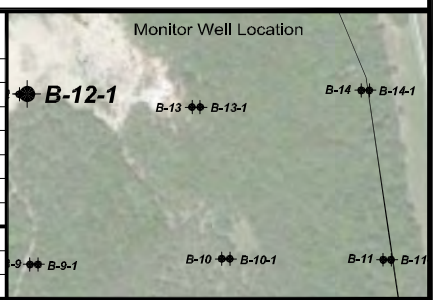
Log of Borehole: B-12-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20		NM	24	**Clay (CL)** light olive gray, very hard consistency, very dense, Fe staining, moist		20
22		NM	24	**Clayey Sand (SM)** grayish orange with occasional dark yellowish orange to light brown laminations, scattered clay laminations, very soft, mushy in areas, fines downward wet		22
24		1.5	24			24
26		3.0	24	**Silty Clay (CL)** light brown to pale yellow brown, good cohesion, slight Fe staining, laminated bedding with alternating colors, coarsens down, moist		26
28		3.1	24	**Clayey Silt (ML)** grayish orange, parts easily, moist		28
30		2.5	24	**Silty Clay (CL)** grayish orange grading to medium gray laminated bedding, parts easily, very stiff consistency, crumbly, moist		30
32		3.1	24	**Very Clayey Silt (ML)** medium gray laminated bedding, parts along laminations, occasional silt lenses, fines downward, moist		32
34		>4.5	24			34
36		>4.5	24			36
38		>4.5	24	**Silty Clay (CL)** medium gray with medium light gray silt stringers, parts along laminations, fair cohesion, poor plasticity, moist		38
40						40

Legend

▽	Initial Water Level		Sonic
▼	Static Water Level		
*	Sample Location		
NM	Not Measured		
NR	No Recovery		

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016435° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566886° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/19/16	Ground:	345.72' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A047	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-12-1

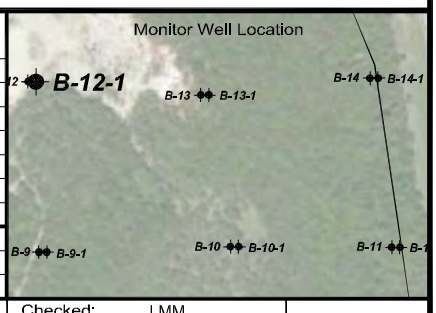
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Clay (CL)** medium gray uniform, very hard consistency, very dense, trace silt laminations, good cohesion, moist		
42						42
		>4.5	24			
44						44
		>4.5	24	**Silty Clay to Occasionaly Clayey Silt (CL)** medium gray to medium dark gray, silt stringers present, parts easily along laminations, silt stringers, poor cohesion, moist		
46						46
		3.1	24			
				Clay (CL) medium dark gray, hard consistency, dense, fair cohesion, 2" very soft (mushy) clay at 48' bgs (very moist), moist		
48						48
		>4.5	24			
50						50
		>4.5	24	**Silt (ML)** greenish gray, parts easily, laminated bedding, poor cohesion, moist		
52						52
		3.2	24			
54						54
		>4.5	24			
				Clay (CL) medium dark gray, hard consistency, very dense, occasional silt laminations at 58' bgs, moist		
56						56
		>4.5	24			
58						58
		>4.5	24	**Silty Clay (CL)** medium dark gray, hard consistency, very dense, occasional silt laminations throughout, moist		
60						60

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016435° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566886° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/19/16	Ground:	345.72' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A048	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date:	03/07/16
Approved:	RG		

PROVIDENCE

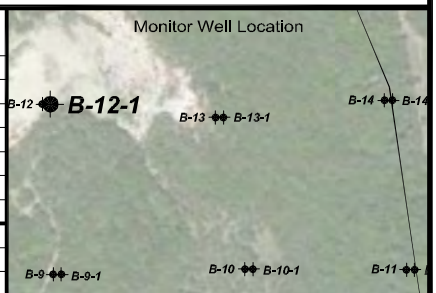
Log of Borehole: B-12-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		NM	24	**Clay (CL)** medium dark gray, very crumbly, very friable similar to shale, moist		
62						62
		2.0	24			
64				**Silt (ML)** medium gray, stiff to very stiff consistency, parts easily, poor cohesion, moist		64
		NM	24			
			12	**Clay (CL)** medium dark gray, very crumbly, very friable similar to shale, moist		
66						66
		3.2	24			
68						68
		3.2	24	**Clay (CL)** medium dark gray, very stiff consistency, dense, good cohesion, moist		
70						70
		3.5	24	**Very Silty Clay (CL)** medium gray (uniform), very stiff to hard consistency, dense, poor to fair cohesion, poor plasticity, interbedded with silt, moist		
72						72
		3.8	24			
74						74
		3.6	24			
76						76
		>4.5	24			
78						78
		>4.5	24			
80						80

Legend

▽	Initial Water Level		Sonic
▼	Static Water Level		
*	Sample Location		
NM	Not Measured		
NR	No Recovery		

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016435° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566886° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/19/16	Ground:	345.72' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A049	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

Log of Borehole: B-12-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		3.9	24			
82						82
		>4.5	24			
84						84
		>4.5	24			
				Clay (CL) medium gray, hard consistency, dense, very friable, moist		
86						86
		>4.5	24	**Very Silty Clay (CL)** medium light gray, laminated bedding, parts easily along laminations, poor cohesion, moist		
88						88
		>4.5	24			
90						90

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.016435° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566886° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/19/16	Ground:	345.72' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A050	Drawn:	CMM	Checked:	LMM
						Approved:	RG
						Date:	03/07/16

PROVIDENCE

Log of Borehole: B-13-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		3.8	24	**Slightly Silty Clay (CL)** light brown with occasional light gray stringers, grading to light gray with occasional light brown stringers, good cohesion, good plasticity, coarsens downward, moist		0
2		2.8	24			2
4		2.8	24	**Clayey Silt (ML)** light brown, very stiff consistency, fair to poor cohesion, moist		4
6		NM	NR	**Slightly Clayey Sand (SM)** generally grayish orange, loosely consolidated, fine grained, moist		6
8		NM	NR	**No Recovery**		8
10		NM	24	**Silty Sand (SM)** grayish orange to dark yellowish orange, poorly consolidated, moist		10
12		NM	24			12
14		1.6	24	**Sandy Silt (ML)** grayish orange to light gray, parts easily, poor cohesion, moist		14
		NM		**Silty Sand (SM)** yellowish gray, loosely consolidated, very fine grained, moist		
16		NM	24			16
18		NM	24			18
20						20

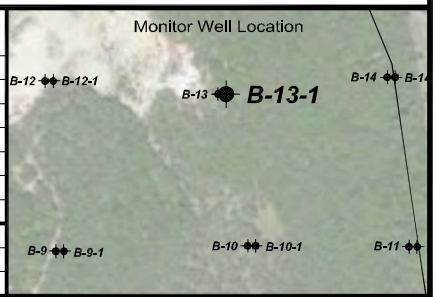
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	1/20/16

Well Coordinates	
Latitude:	32.016353° (Approx.)
Longitude:	-93.565432° (Approx.)
Elevations	
TOC:	NA
Ground:	358.20' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A051	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-13-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		NM	24	**Silty Sand (SM)** yellowish gray with occasional dark yellowish orange to 28' bgs, loosely consolidated, very fine grained, moist		
22		NM	24			22
24		NM	24			24
26		NM	24			26
28		NM	24			28
30		NM	24			30
32		NM	24			32
34		NM	24			34
36		NM	24			36
38		NM	24			38
40						40

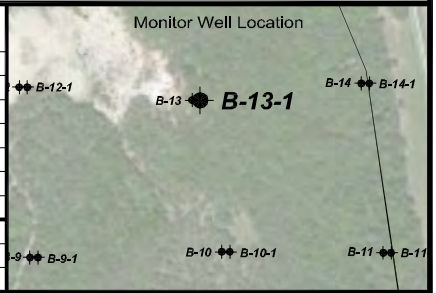
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	1/19/16

Well Coordinates	
Latitude:	32.016353° (Approx.)
Longitude:	-93.565432° (Approx.)
Elevations	
TOC:	NA
Ground:	358.20' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A052	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-13-1

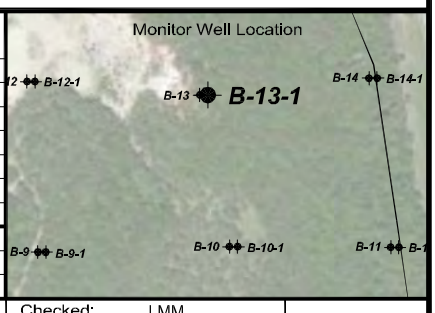
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Clayey Sand (SM)** yellowish gray, very fine grained, fair cohesion, moist		
42						42
		>4.5	24	**Organic Clay (OH)** black, soft to very soft consistency, good cohesion, peat with lignite, wet		
44						44
		>4.5	24			
46						46
		3.1	24	**Silty Clay (CL)** light gray, dense, good cohesion, fair plasticity, moist		
48						48
		>4.5	24			
50						50
		>4.5	24			
52						52
		3.2	24	**Silty Clay (CL)** medium dark gray with occasional light gray stringers, hard consistency, dense, fair cohesion, moist		
54				**Silty Clay (CL)** medium gray, hard, dense, parts along laminations, fair to good cohesion, very moist		54
		>4.5	24			
56						56
		>4.5	24	**Sandy Clay (CL)** medium light gray, soft to medium stiff, good cohesion, poor plasticity, very moist, wet at 58' bgs		
58						58
		>4.5	24	**Clayey Sand (SM)** medium light gray, fine grained, poor cohesion, wet		
60						60

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016353° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565432° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/20/16	Ground:	358.20' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A053	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

Monitor Well Location



PROVIDENCE

Log of Borehole: B-13-1

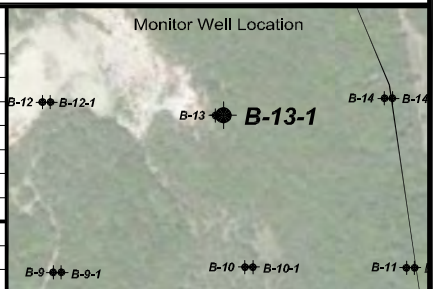
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		2.9	24	**Silty Clay (CL)** generally medium gray, parts along laminations, very stiff consistency, fair cohesion, moist		
62		3.6	24			62
64		3.2				64
66		>4.5	24			66
68		>4.5	24	**Silty Clay (CL)** medium gray to medium dark gray, hard consistency, dense, fair to poor cohesion, moist		68
70		>4.5	24			70
72		NM	12			72
74		.45	12	**Silty Clay (CL)** medium gray to medium dark gray, soft, parts easily, fair cohesion, coarsens down, moist		74
76		.40	24			76
78		1.5	24	**Sandy Silt (ML)** medium gray, very moist at 79' bgs		78
80						80

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016353° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565432° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/20/16	Ground:	358.20' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A054	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

Monitor Well Location



PROVIDENCE

Log of Borehole: B-13-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		3.9	24	**Clayey Silt (ML)** medium gray to medium blueish gray, silt and clay laminations, parts easily, poor cohesion, poor plasticity, moist		
82		>4.5	24			82
84		>4.5	24	**Silty Clay (CL)** medium gray to medium blueish gray, parts along laminations, fair to poor cohesion, silt lenses, moist		84
86		>4.5	24			86
88		>4.5	24			88
90						90

Legend

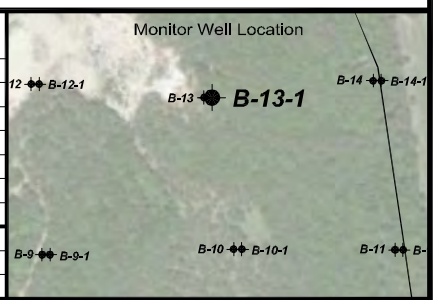
- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	1/20/16

Well Coordinates	
Latitude:	32.016353° (Approx.)
Longitude:	-93.565432° (Approx.)
Elevations	
TOC:	NA
Ground:	358.20' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Monitor Well Location



Doc Code	002-177	Dwg. No.:	002-177-A055	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-14-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		NM	24	**Sand (SM)** light brown, fine to very fine grained, loosely consolidated, moist		0
2		NM	24			2
4		NM	24	**Sand (SM)** dark yellowish, fine to very fine grained, loosely consolidated, poor cohesion, moist		4
6		NM	24			6
8		NM	24			8
10		NM	24			10
12		2.4	24	**Silty Sandy Clay (CL)** light gray with light brown interbedding, very stiff consistency, parts easily, good cohesion, moist		12
14		2.9	24	**Very Silty Clay (CL)** light gray, very stiff consistency, moist		14
16		NM	24	**Silty Sand (SM)** generally yellowish gray to light gray, very fine grained, loosely consolidated, moist		16
18		NM	24			18
20						20

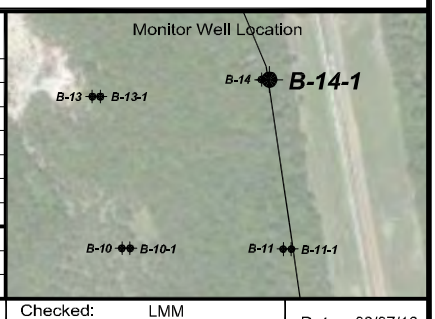
Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	1/28/16

Well Coordinates	
Latitude:	32.016486° (Approx.)
Longitude:	-93.564014° (Approx.)
Elevations	
TOC:	NA
Ground:	372.62' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A056	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

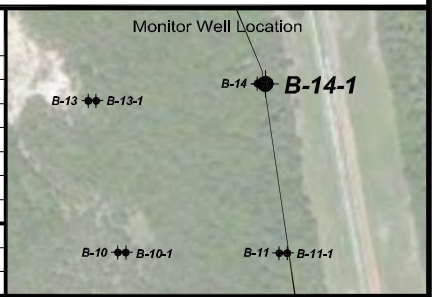
Log of Borehole: B-14-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20		NM	24			20
22			24	**Very Clayey Silt (ML)** red brick color, loosely consolidated, falls apart, moist		22
24		NM	24	**Sand (SM)** very light gray to light gray with scattered thin clay interbedded throughout, loosely consolidated, crumbly, moist		24
26		NM	24			26
28		NM	24			28
30			24			30
32		3.9	24	**Silty Clay (CL)** light olive gray with light gray silt and dark yellowish orange laminations, heavily laminated, parts along laminations, good cohesion, moist		32
34			24	**Very Sandy Clay (CL)** very light gray with dark yellow, interbedd with sand and clay layers, dense, very fine grained		34
36		2.9	24	**Clayey Sand (SM)** fine to very fine grained, loosely consolidated, moist		36
38		>4.5	24	**Silty Clay (MLCL)** olive brown with light interbedded gray sand and silt lenses, hard, clay is very hard, moist		38
40						40

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- NM Not Measured
- NR No Recovery
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016486° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564014° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/28/16	Ground:	372.62' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A057	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16



PROVIDENCE

Log of Borehole: B-14-1

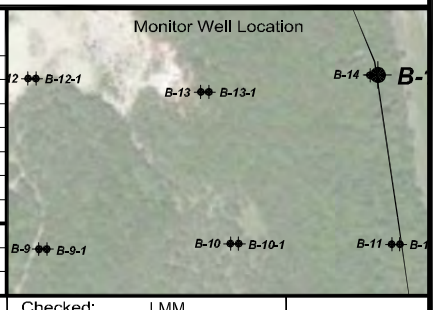
Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
42		NM	24			42
44		NM	24			44
46		.9	24	**Peat (Coal Base)** olive black to black, lignite seam at base, moist		46
48		.9	24			48
50		>4.5	24	**Silty Clay (CL)** medium light gray to medium gray heavily laminated, parts easily, poor cohesion, clayey silt lenses interbedded, parts along laminations, 3" clayey silt lens at 51' bgs (very moist), 4" Clayey silt lens at 53' bgs (very moist) moist		50
52		>4.5	24			52
54		>4.5	24			54
56		>4.5	24			56
58		4.0	24	**Very Clayey Sand (SM)** light gray uniform, stiff consistency, loose to fairly consolidated, fine to very fine grained, increasing clay lenses from 58-60' bgs, very moist at 57.5' bgs		58
60		>4.5	24			60

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016486° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564014° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/28/16	Ground:	372.62' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A058	Drawn:	CMM

Monitor Well Location



Checked:	LMM	Date: 03/07/16
Approved:	RG	

PROVIDENCE

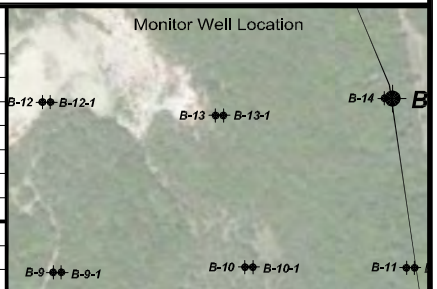
Log of Borehole: B-14-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
			24	**Very Clayey Sand (SM)** medium light gray (uniform), crumbly, parts easily, very fine grained, poor cohesion, wet from 63-64.5' bgs, clay layers from 65' bgs, moist		
62		1.9	24			62
64		>4.5	24			64
66		>4.5	24	**Silty Clay (CL)** generally medium dark gray with medium gray laminations, very dense, very hard consistency, laminated bedding, moist		66
68		>4.5	24			68
70		>4.5	24	**Silty Clay (CL)** generally dark gray with scattered medium dark gray interbedding, hard consistency, dense, crumbly, moist		70
72		>4.5	24			72
74		>4.5	24	**Organic Clay (OH)** olive black, hard, dense, occasional peat lenses, moist		74
76		>4.5	24	**Silty Clay (CL)** dark gray with scattered medium gray interbedding, laminated bedding, hard consistency, dense, moist		76
78		1.5	24			78
80						80

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.016486° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564014° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/28/16	Ground:	372.62' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A059	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

PROVIDENCE

Log of Borehole: B-14-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
80						80
		3.9	24	**Clayey Silty Sand (SM)** medium light gray, with scattered medium gray laminations, poor cohesion, parts easily, fine to very fine grained, increasing clay laminations with depth, very moist at 83' bgs		
82						82
		>4.5	24			
84						84
		>4.5	24			
86						86
		>4.5	24	**Very Sandy Clay (CL)** medium gray with light gray laminations, heavily interbedded, parts easily, moist		
88						88
		>4.5	24			
90						90

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.016486° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.564014° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	1/28/16	Ground:	372.62' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	90'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A060	Drawn:	CMM	Checked:	LMM
						Approved:	RG
						Date:	03/07/16

Log of Borehole: B-16-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0						0
		2.0	24	**Silty Clay (CL)** red orange with slight gray mottles, stiff consistency, contains roots, good cohesion, good plasticity, moist		
2						2
		>4.5	24	**Silty Clay (CL)** light gray with orange mottles, hard consistency, fair cohesion, moist		
4						4
		>4.5	24			
6						6
		>4.5	24			
				Sandy Silt (ML) gray with some red oxidation, very fine grained, well sorted, crumbles, dry		
8						8
		NM	24			
10						10
		>4.5	24	**Clayey Silt (ML)** gray with orange mottle, hard, poor cohesion, poor plasticity, moist		
12						12
		>4.5	24			
14						14
		>4.5	24	**Clayey Silt (ML)** medium gray with some orange mottling, hard, poor cohesion, moist		
				Silty Clay (MLCL) dark gray with gray interbedded layers, hard consistency, parts easily along laminations, moist		
16						16
		>4.5	24			
18						18
		>4.5	24			
20						20

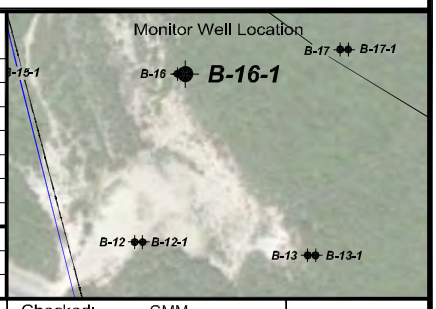
Note

No definitive groundwater bearing zones encountered

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- NM Not Measured
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.017638° (Approx.)		
Engineer/Geologist:	John Sherrill	Longitude:	-93.566541° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	02/02/16	Ground:	299.16' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A061	Drawn:	CMM



Checked:	CMM	Date:	03/07/16
Approved:	VRG		

Log of Borehole: B-16-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		NM	24	**Clayey Sand (SM)** medium gray, crumbles, fine grained, well sorted, poor cohesion, poor plasticity, moist		
22		NM	24			22
24		NM	24			24
26		>4.5	24	**Sandy Clay (CL)** gray, hard, crumbles, fair to poor cohesion, contains sand lenses interbedded, moist		26
28		NM	24			28
30		>4.5	24	**Sandy Clay (CL)** with sand interbedded, gray, hard, crumbles, fair cohesion, fines downward, moist		30
32		>4.5	24			32
34		>4.5	24			34
36		>4.5	24			36
38		>4.5	24			38
40						40

Note

No definitive groundwater bearing zones encountered

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- NM Not Measured
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.017638° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566541° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	02/02/16	Ground:	299.16' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A062	Drawn:	CMM
				Checked:	CMM
				Approved:	VRG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-16-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40		>4.5	24	**Silty Clay (CL)** medium gray darkening downwards, interbedded, hard, fair cohesion, parts along bedding, moist		40
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24	**Lignite Seam**		48
50		>4.5	24	**Clayey Silt (ML)** dark gray, hard consistency, crumbles, moist		50
52		>4.5	24	**Clayey Silt (ML)** dark gray with light gray interbedded, hard consistency, interbedded, moist		52
54		>4.5	24	**Lignite Seam** **Clayey Silt (ML)** dark gray with medium gray interbedded, hard consistency, some lignite present, parts along laminations, dry		54
56		>4.5	24			56
58		>4.5	24			58
60						60

Note

No definitive groundwater bearing zones encountered

Legend

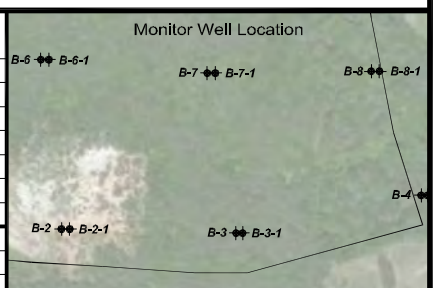
Initial Water Level

Static Water Level

Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.017638° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.566541° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker-Hill (WWC)	TOC:	NA		
Date Drilled:	02/02/16	Ground:	299.16' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	60'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A063	Drawn:	CMM
				Checked:	CMM
				Approved:	VRG
				Date:	03/07/16

Monitor Well Location



PROVIDENCE

Log of Borehole: B-17-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
0				Ground Surface		0
		3.0	18	**Sandy Silt (ML)** red orange, very stiff, surface material		
2		3.0	18	**Silty Clay (CL)** red orange with slight gray mottle, very stiff consistency, fair to good cohesion, moist		2
4		4.0	18	**Silty Clay (CL)** light gray with red orange mottles, hard, good cohesion, moist		4
6		>4.5	18			6
8		>4.5	18	**Clayey Silt (ML)** gray, hard, crumbles near base, moist to dry		8
10		1.5	24	**Sandy Silt (ML)** red orange with tan and gray mottles, stiff consistency, poor cohesion, moist		10
12		1.5	24			12
14		2.5		**Silty Clay (CL)** tan/gray mottle with thin (1-2 mm) black intrerbedded seams, very stiff consistency, good cohesion, moist		14
		3.0	24			
16		>4.5	24	**Silty Clay (CL)** tan with slight brown mottles, thin (1-2 mm) black interbedded seams, hard, moist		16
18		>4.5	24	**Clay (CL)** dark gray with slight orangeish brown mottles, hard, good cohesion, good plasticity, moist		18
20						20

Note

No definitive groundwater bearing zones encountered

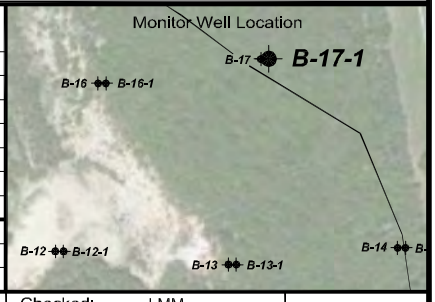
Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	02/02/16

Well Coordinates	
Latitude:	32.017825° (Approx.)
Longitude:	-93.565177° (Approx.)
Elevations	
TOC:	NA
Ground:	317.09' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA

Monitor Well Location



Depth of Well:	NA	Depth of Hole:	75'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A051	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

PROVIDENCE

Log of Borehole: B-17-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		>4.5	24	**Silty Clay (CL)** medium gray with brown and purple mottles, hard consistency, good cohesion, moist		
22		>4.5	24			22
24		3.5	24	**Clayey Sand (SM)** tan with medium gray mottles, very stiff consistency, very fine grained, well sorted, moist		24
26		1.0	24	**Clayey Sand (SM)** tan with some orange mottles, loose, very fine grained, well sorted sand, moist		26
28		1.5	24			28
30		>4.5	24	**Clayey Silt (ML)** medium dark gray, reddish orange interbedded, breaks along interbeds, hard consistency, moist		30
32		2.0	24	**Sandy Clay (CL)** medium gray with light gray interbeds, very stiff, breaks along sand interbeds, very stiff, very fine well sorted, sand, moist		32
34		>4.5	24			34
36		3.0	24			36
38		>4.5	24			38
40						40

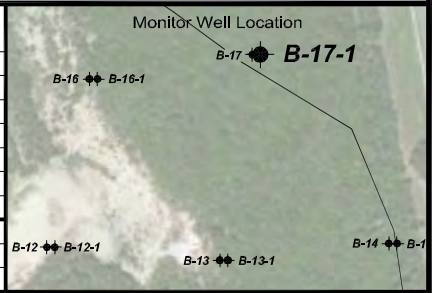
Note

No definitive groundwater bearing zones encountered

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- * Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.017825° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565177° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	02/02/16	Ground:	317.09' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	75'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A065	Drawn:	CMM



Checked:	LMM	Date:	03/07/16
Approved:	RG		

Log of Borehole: B-17-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		3.0	24	**Sandy Clay (CL)** medium gray with lighter gray interbedds, very stiff consistency, breaks along interbedds, good cohesion, moist		
42						42
		4.0	24			
44						44
		4.0	24			
46						46
		4.0	24			
48						48
		4.0	24			
50						50
		>4.5	24	**Clayey Silt (ML)** dark gray, hard consistency, interbedded, parts along laminations, dry		
52						52
		>4.5	24			
54						54
		NM	24	**Lignite Seam**		
56						56
		>4.5	24	**Silty Clay (CL)** dark gray, hard, crumbles, moist		
				Clayey Sand (SM) medium light gray, loose fine grained well sorted sand, visible layering, crumbles, moist		
58						58
		2.5	24			
60						60

Note

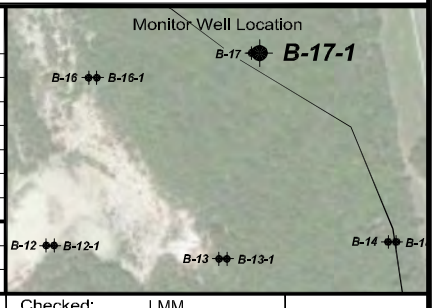
No definitive groundwater bearing zones encountered

Legend

- ▽ Initial Water Level
- ▼ Static Water Level
- NM Not Measured
- Sonic

Client:	Cleco Power, LLC
Location:	Mansfield, LA
Engineer/Geologist:	Randy Grice
Drilling Methods:	Sonic Rig
Driller:	Walker Hill
Date Drilled:	02/02/16

Well Coordinates	
Latitude:	32.017825° (Approx.)
Longitude:	-93.565177° (Approx.)
Elevations	
TOC:	NA
Ground:	317.09' (NAVD88) (Approx.)
Initial Water Level:	NA
Static Water Level:	NA



Depth of Well:	NA	Depth of Hole:	75'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A066	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

Log of Borehole: B-17-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
60						60
		>4.5	24	**Sandy Clay (CL)** medium dark gray interbedded, hard consistency, parts along interbedded layers, moist		
62		>4.5	24			62
64		>4.5	24			64
66		>4.5	24			66
				Silty Clay (CL) dark gray, interbedded, parts along interbedded layers, moist		
68		>4.5	24			68
70		2.0	24	**Clayey Sand (SM)** medium dark gray, stiff consistency, crumbles, laminated bedding, moist		70
72		1.5	24			72
74		4.0	12			74
75						75

Note

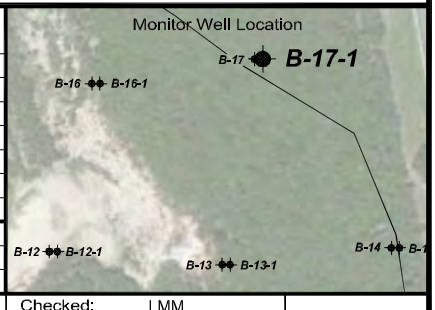
No definitive groundwater bearing zones encountered

Legend

- Initial Water Level
- Static Water Level
- Sample Location
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.017825° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.565177° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	02/02/16	Ground:	317.09' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	75'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A067	Drawn:	CMM
				Checked:	LMM
				Approved:	RG
				Date:	03/07/16

Monitor Well Location

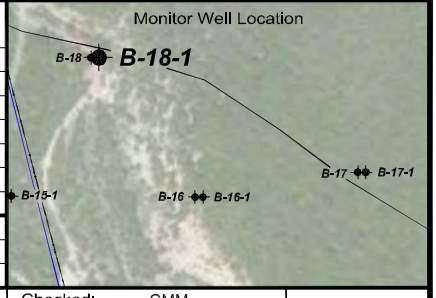


Log of Borehole: B-18-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Feet)	Soil Description	USCS	Remarks
				Ground Surface		
0		2.5	24	**Clay (CL)** light brown to medium yellowish green, dense, good cohesion, good plasticity, moist		0
2		3.0	24			2
4		>4.5	24	**Silty Clay (CL)** with abundant silt laminations, pale yellow brown with light gray laminations, parts easily, occasional Fe staining, moist		4
6			NR			6
8			NR			8
10			24	**Clayey Silt (ML)** grayish orange to pale yellow brown, crumbles easily, parts easily, occasional Fe staining, moist		10
12		>4.5	24			12
14			24	**Clayey Silt (ML)** medium gray wit occasional dark yellow orange laminations, 6" silt lense fragment 15.5' to 16' bgs		14
16			12	**Clay (CL)** dark yellow brown, very dense, clear crystallization present, mottled appearance, Fe staining, slightly moist		16
18			12			18
20						20

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.018627° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567426° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	01/19/16	Ground:	302.25' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"		
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA		
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA		
Doc Code	002-177	Dwg. No.:	002-177-A068	Drawn:	LMM	Checked: CMM / Approved: VRG	Date: 03/11/16

Log of Borehole: B-18-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
20						20
		>4.5	24	**Silty Clay (CL)** dark gray, dense, crumbly, good consistency, occasional dark yellowish orange laminations to 21.5', moist		
22						22
		>4.5	24	**Clay (CL)** gray (uniform color), very dense, crystalline laminations at 24', poor plasticity, increasing Fe staining, moist		
24						24
		>4.5	24			
26						26
		>4.5	24	**Clayey Silt (CL)** dark gray to dark yellowish orange, mottled appearance, very dense, contains clay and silt laminations, occasional crystalline laminations, moist		
28						28
		>4.5	24	**Silt (ML)** medium light gray, crumbly, trace Fe staining, parts easily, moist		
30						30
		2.0	24	**Clayey Silt (ML)** medium light gray to pale yellow brown with occasional dark yellowish orange mottling, stiff to very stiff consistency, parts easily, mottled, very soft mushy, wet at 31' bgs		
32						32
		>4.5	24	**Silty Clay (CL)** gray, hard, parts easily, abundant silt laminations, wet at 34' bgs		
34						34
		>4.5	24	**Silty Clay (CL)** medium gray (uniform), very soft, good lamination, good cohesion, moist		
36						36
		>4.5	24	**Silty Clay (CL)** medium gray, very dense, hard, light gray, silt laminations, moist		
38						38
		>4.5	24			
40						40

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates		Monitor Well Location	
Location:	Mansfield, LA	Latitude:	32.018627° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567426° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	01/19/16	Ground:	302.25' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		

Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA

Doc Code	002-177	Dwg. No.:	002-177-A069	Drawn:	LMM
				Checked:	CMM
				Approved:	VRG
				Date:	03/11/16

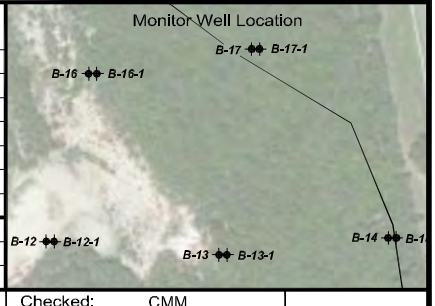
Log of Borehole: B-18-1

Depth (Feet)	Sample Type	P. Pen (TSF)	Recovery (Inches)	Soil Description	USCS	Remarks
40						40
		>4.5	24	**Clay (CL)** medium gray, dense, increasing silt lenses at 43' bgs, 2" lignite seam present at 46' bgs, clay becomes very crumbly at 47' bgs, moist		
42		>4.5	24			42
44		>4.5	24			44
46		>4.5	24			46
48		>4.5	24			48
50						50
52						52
54						54
56						56
58						58
60						60

Legend

- Initial Water Level
- Static Water Level
- Sonic

Client:	Cleco Power, LLC	Well Coordinates			
Location:	Mansfield, LA	Latitude:	32.018627° (Approx.)		
Engineer/Geologist:	Randy Grice	Longitude:	-93.567426° (Approx.)		
Drilling Methods:	Sonic Rig	Elevations			
Driller:	Walker Hill	TOC:	NA		
Date Drilled:	01/19/16	Ground:	302.25' (NAVD88) (Approx.)		
		Initial Water Level:	NA		
		Static Water Level:	NA		
Depth of Well:	NA	Depth of Hole:	50'	Hole Dia.:	4"
Screen Length:	NA	Screen Dia.:	NA	Slot Size:	NA
Casing Length:	NA	Casing Dia.:	NA	TYPE:	NA
Doc Code	002-177	Dwg. No.:	002-177-A070	Drawn:	LMM



Checked:	CMM
Approved:	VRG
Date:	03/11/16

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-14

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1KK)

...ld, LA

Location: N 491,090, E 1,667,710
Surface Elevation: 366.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Dense tan CLAYEY SAND (SC) w/gravel
			No (P)	4.76	20	100	44	24			Hard tan SANDY CLAY (CL)
	5		No (P)								– w/iron ore at 4 to 8 ft.
			No (P)						k		
			No (P)								Firm brown SILTY SAND (SM) *
	10		No (P)		23				GS1		
			No (P)								
	15		No (P)								
			No (P)								
			No (P)								
	20										
			No (P)								
	25										
			No (P)		23				GS2		
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Sand
k: Permeability (cm/sec)
k = 1.8x10(-7)
GS: Particle Size Analysis
GS1: Sand = 78%
GS2: Sand = 91%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-14

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1KK)

...ieville, LA

Location: N 491,090, E 1,667,710
Surface Elevation: 366.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)								Firm brown SILTY SAND (SM)
	50		No (P)		23				GS3		**
											Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		** SWL indicates Sand at 43 to 45 ft. GS: Particle Size Analysis GS3: Sand = 94%
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-16

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1P)

O
le, LA

Sheet 1 of 2

Location: N 491,110, E 1,668,680
Surface Elevation: 341.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		17						Hard to stiff tan & brown SANDY CLAY & SILTY CLAY (CL)
			No (P)	4.6	16	117	36	18			
	5		23 b/f 8-10-13		16						
			No (P)	2.8	11	123	21	4			Tan, brown, and gray CLAYEY SILT (CL-ML)
			No (P)	3.64	24	105					Very stiff tan & gray CLAY (CH) w/silt lenses
	10										
			No (P)	2.43	25	103					
	15										
			No (P)	2.83	26	105	47	27	k		
	20										
			No (P)	0.65	22	101					Stiff to hard gray CLAY (CH) w/silt lenses
	25										
			No (P)		21						
	30										
			50 b/10" 27-23		22		53	32			
	35										
			50 b/10" 33-17		22						
	40										

Continued Next Page

Ground Water Level Data

☒ No free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 2x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-16

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1P)

...eville, LA

Location: N 491,110, E 1,668,680
Surface Elevation: 341.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/10" 24-26		26						Gray SILTY CLAY (CL) *
	50		50 b/10" 18-39		37				GS		Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

...ee water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates clayey silty sandy lenses at 43.5 to 45 ft. and Silty Sand at 48.5 to 50 ft.
GS: Particle Size Analysis
GS: Sand = 8%, Silt = 64%, Clay = 28%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-17

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 07/02/84
Company: Southwestern Laboratories (B-1M)

Pineville, LA

Location: N 491,127, E 1,668,030
Surface Elevation: 335.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		4						Dense tan SILTY SAND (SM)
			44 b/f 12-17-27		13		29	12			Hard to very stiff tan & red SILTY CLAY (CL) w/sand
	5		33 b/f 20-15-18		11						
			23 b/f 7-10-13		15						
			17 b/f 8-10-7		16		21	5	GS		Firm tan CLAYEY SILT (CL-ML) w/sand
	10										
			2 b/f 1-1-1		18						Very loose to loose gray & tan CLAYEY SAND (SC)
	15										
			4 b/f 2-1-3		17		19.3				
	20										
			4 b/f 2-1-3		23						
	25										
			No (P)		27						Stiff to hard gray CLAY (CH) w/silt lenses
	30										
			No (P)		26		45	25			
	35										
			50 b/9" 17-26-24		22						
	40										

Continued Next Page

Ground Water Level Data

▽ free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS: Sand = 49%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-17

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 07/02/84
Company: Southwestern Laboratories (B-1M)

[illegible], LA

Location: N 491,127, E 1,668,030
Surface Elevation: 335.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/11" 23-27		22		42	22			Hard gray CLAY (CH) w/silt lenses
	50		50 b/10" 30-20		22						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

☒ No free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-24

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/21/84
Company: Southwestern Laboratories (B-1DD)

Location: N 491,980, E 1,668,290
Surface Elevation: 321.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		4						Firm tan SILTY SAND (SM)
			No (P)		10						Firm tan CLAYEY SAND (SC)
	5		No (P)		9		26	7			
			No (P)		13						
			No (P)		19						
	10		No (P)	2.40	9	101					Very stiff to stiff tan & gray SANDY CLAY (CL)
			No (P)	2.03	22	99					
	15		No (P)		21						
			No (P)	0.70	29	94					Medium gray SILTY CLAY (CL)
			No (P)	1.34	27	96	60	36			Stiff gray CLAY (CH)
	20										
▽			No (P)		25						
	25										Stiff gray SANDY CLAY (CL)
			No (P)		21						
	30										
			No (P)		20		26	9			
	35										
			No (P)		19						
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

• SWL indicates dense gray Clayey Sand at 28 to 30 ft. & 38 to 40 ft.

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-24

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/21/84
Company: Southwestern Laboratories (B-1DD)

( )
...eville, LA

Location: N 491,980, E 1,668,290
Surface Elevation: 321.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		21						Dense brown CLAYEY SAND (SC)
	50		No (P)		24						Dense brown SILTY SAND (SM)
											Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-28

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 3

File: 94-1157
Date: 02/08/83
Company: McCelland Engineers (8-18)

O
, ineville, LA

Location: N 492,211.4, E 1,668,027.8
Surface Elevation: 350.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Stiff red & tan SILTY CLAY (CL) w/brown silt & organic matter
			2.2 (P)								– w/sand pockets below 2 ft.
	5		2.6 (P)	1.6	17	111	34	14			– w/gray color below 3 ft.
			2.6 (P)								– w/sand pockets below 4 ft.
											– w/sandstone nodules below 6 ft.
	10										
			Ref/6"								Very dense gray & brown SILTY Fine SAND (SM)
	15										
			50 b/4"						GS		– w/red color below 18.5 ft.
	20										
			Ref/5"								
	25										
			39 b/f								
✳	30										Stiff gray SANDY CLAY w/numerous seams
			No (P)								
	35										
			2.6 (P)	1.6	20	101	36	16			
	40										

Continued Next Page

Ground Water Level Data

✳ Boring caved in at 31.5 ft.

.e water first encountered

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

GS: Particle Size Analysis
GS: Sand = 80%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-28

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 02/08/83
Company: McCelland Engineers (B-1B)

)
:ville, LA

Sheet 2 of 3

Location: N 492,211.4, E 1,668,027.8
Surface Elevation: 350.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SANDY CLAY (CL) w/numerous seams
	45		2.6 (P)								Very stiff laminated gray CLAY (CH) & SILT (ML)
	50		No (P)	2.6t	22	106					
	55		2.6(P)		22	111	50	26	k		Very stiff gray CLAY (CH) w/shale, silt seams, silt pockets & siltstone seam
	60		2.6 (P)								
	65		2.6 (P)								-- w/silty fine sand seams & pockets at 64.5 to 65 ft.
	70		2.6 (P)								Alternating layers of gray SILTY Fine SAND (SM) and gray CLAY (CH)
	75		Ref/0"								Light gray SILTSTONE
			No (P)								Very stiff gray SILTY CLAY (CL) w/silt pockets
	80										Very stiff brown CLAY (CH) w/silt seams & lignite nodules

Continued Next Page

Ground Water Level Data

✳ Boring caved in at 31.5 ft.

· water first encountered

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Confining pressure unknown
k: Permeability (cm/sec)
k = 7.7x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-28

CLECO

Central Louisiana Electric Company, Inc.

Sheet 3 of 3

File: 94-1157
Date: 02/08/83
Company: McCelland Engineers (B-1B)

...eville, LA

Location: N 492,211.4, E 1,668,027.8
Surface Elevation: 350.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Very stiff brown CLAY (CH) w/silt seams & lignite nodules
	85		2.6 (P)								
	90		2.6 (P)								Black Lignite
			2.6 (P)								Very stiff brown SILTY CLAY (CL) w/silt pockets
	95										
	100		2.6 (P)								
			2.6 (P)								Very stiff brown CLAY (CH) w/shale & silt pockets
	105										Boring completed at 105 ft.
	110										
	115										
	120										

Ground Water Level Data	Boring Advancement Method	Notes
✳ Boring caved in at 31.5 ft.		
▽ water first encountered		
	Boring Abandonment Method: Borehole grouted upon completion	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-29

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-1AA)

CO
rineville, LA

Location: N 492,340, E 1,667,810
Surface Elevation: 349.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		9						Firm brown SILTY SAND (SM)
			No (P)		6		18	NP	GS1		
	5		No (P)		25						
			No (P)		22						
			No (P)		26						
	10		No (P)		23		18	NP	GS2		
			No (P)		28						
	15		No (P)		25						
			No (P)		25						
			No (P)		27						
	20										
			No (P)		22				GS3		
	25										
▽			No (P)		23						
	30										
			No (P)		27						
	35										
			No (P)		23				GS4		
	40										

Continued Next Page

Ground Water Level Data

ee water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
GS: Particle Size Analysis
GS1: Sand = 78%
GS2: Sand = 89%
GS3: Sand = 100%
GS4: Sand = 100%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-29

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-1AA)

-O
rineville, LA

Location: N 492,340, E 1,667,810
Surface Elevation: 349.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Lignite
	45		No (P)								
	50		No (P)								Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
e water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-30

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 3

File: 94-1157
Date: 04/04/83
Company: McCelland Engineers (B-1C)

)
gville, LA

Location: N 492,035, E 1,669,200.1
Surface Elevation: 356.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
✳			No (P)								Brown SILTY Fine SAND (SM) w/organic matter
			2.1 (P)								Very stiff red, tan, & gray SANDY CLAY (CL) w/organic matter to 5 ft.
			1.8 (P)								
	5		2.6 (P)	2.6	17	108	46	29			– w/sand pockets below 4 ft.
			1.2 (P)								– w/sand seams below 6 ft.
	10								GS		Tan & brown SILTY Fine SAND (SM)
											-- w/lignite seams at 12 ft.
			1.8 (P)		25	103			k1		Very stiff gray & brown SILTY CLAY (CL)
	15										
			2.6 (P)	2.25t1	25	94	34	14			
	20										-- w/silt seams below 20 ft.
			3.2+ (P)	2.6t2	27	92	43	23			Very stiff gray CLAY (CH) w/shale & silt seams
	25										
			2.6 (P)		20	104			k2		
	30										
			2.6 (P)								
	35										
			2.6 (P)								
	40										

Continued Next Page

Ground Water Level Data

✳ No water indicated

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

GS: Particle Size Analysis
Sand = 72%
k: Permeability (cm/sec)
k1 = 2.5x10(-9)
k2 = 1.3x10(-7)
t: Unconsolidated, Undrained Triaxial Compression Test
t1: Confining pressure unknown
t2: Confining pressure unknown

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-30

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 3

File: 94-1157
Date: 04/04/83
Company: McCelland Engineers (B-1C)

,O
rineville, LA

Location: N 492,035, E 1,669,200.1
Surface Elevation: 356.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Gray SILTY Fine SAND (SM)
			2.6 (P)								
	45										
											Very stiff gray CLAY (CH) w/shale & silt seams
			2.6 (P)								
	50										
			2.6 (P)								
	55										
			2.6 (P)								
	60										
			2.6 (P)								
	65										
			2.6 (P)								-- w/lignite seams at 68 to 69 ft.
	70										
			2.6 (P)								-- w/shale & clay at 73.5 to 83 ft.
	75										
			2.6 (P)								
	80										

Continued Next Page

Ground Water Level Data

✱ No water indicated

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-30

CLECO

Central Louisiana Electric Company, Inc.

Sheet 3 of 3

File: 94-1157
Date: 04/04/83
Company: McCelland Engineers
(B-1C)

rineville, LA

Location: N 492,035, E 1,669,200.1
Surface Elevation: 356.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Very stiff gray CLAY (CH) w/shale & silt seams
			2.6 (P)								
	85										
			2.6 (P)								
	90										
			2.6 (P)								
	95		2.6 (P)								
			2.6 (P)								
	100										
	105										
	110										
			2.6 (P)								
	115										Boring completed at 112 ft.
	120										

Ground Water Level Data	Boring Advancement Method	Notes
✳ No water indicated		

Boring Abandonment Method
Borehole grouted upon completion

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-41

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 06/28/84
Company: Southwestern Laboratories (8-1E)

Pineville, LA

Location: N 493,210, E 1,668,103
Surface Elevation: 323.1

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)	0.86	8	110					Loose to very loose tan & gray CLAYEY SAND (SC)
			6 b/f 3-3-3		14		19	3	GS1		
	5		2 b/f 1-1-1		21						
			12 b/f 3-5-7		26						Stiff gray SILTY CLAY (CL)
				1.28	28	98	45	25			
	10										
				1.84	26	101					
	15										
				2.59	29	95					
	20										
				3.20	26	102	40	21	k		
	25										
				1.54	28	95	33	15	GS2		Very dense tan & gray CLAYEY SAND (SC)
	30										
			50 b/10" 10-25-25		26						
▽	35										
			50 b/9" 12-30-20		29		23	6	GS3		
	40										

Continued Next Page

Ground Water Level Data

Water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS1: Sand = 76%
GS2: Sand = 58%, Silt = 25%, Clay = 17%
GS3: Sand = 76%
k = Permeability (cm/sec)
k = 1.05x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-41

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/28/84
Company: Southwestern Laboratories (B-1E)

.O
Pineville, LA

Location: N 493,210, E 1,668,103
Surface Elevation: 323.1

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard gray SILTY CLAY (CL)
	45		50 b/ft 15-35		23						
			50 b/11" 30-30		23						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
ater first encountered		
	Boring Abandonment Method	

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-43

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 1

File: 94-1157
Date: 02/08/83
Company: McCelland Engineers (B-1A)

:O
. neville, LA

Location: N 493,319.7, E 1,868,573.4
Surface Elevation: 284.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
*			No (P)								Stiff gray & tan SANDY CLAY (CL) w/sand & clayey sand
			1.5 (P)				73	51			Stiff brown & gray CLAY (CH)
	5		2.4 (P)								– w/sand & silt seams & pockets below 4 ft.
			2.6 (P)	2.75		86					
			2.1 (P)			98	74	47	k1		
	10										
			No (P)		22						Alternating layers of tan, gray & brown SILT (ML) and VERY SILTY CLAY (CL)
	15										
			2.6 (P)	2.25	23	95	56	25			Very stiff to hard brown & tan SILTY CLAY (CL) w/silt pockets
	20										
											– w/gray shale below 22 ft.
			2.6 (P)			102	67	41	k2		
	25										
			2.6 (P)								
	30										– w/silt seams below 31 ft.
			2.6 (P)								
	35										
			2.6 (P)								
	40										

Ground Water Level Data

* N er indicated

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

Boring completed at 40 ft.
k: Permeability (cm/sec)
k1 = 8.4x10(-9)
k2 = 4.3x10(-8)

Data computerized by

CLECO Dolet Hills
Power Plant
...sfield, LA

LOG OF SOIL BORING C-47

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-8)

CLECO
Pineville, LA

Sheet 1 of 2

Location: N 493,815, E 1,669,465
Surface Elevation: 262.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		28						Medium brown & gray SILTY CLAY (CL)
			No (P)	2.07	20	95	64	42			Very stiff brown & gray CLAY (CH)
▽	5		No (P)		19		32	11			Stiff brown & gray SILTY CLAY (CL) w/sand traces
			No (P)		20				k1		
			No (P)	1.27	31	80	55	33			Very stiff brown & gray CLAY (CH)
	10		No (P)		25						
			No (P)		25	100			k2		
	15		No (P)		26		62	37			
			No (P)		28				k3		
			No (P)		24		71	47			-- w/silt lenses below 18 ft.
	20										
			No (P)								Lignite
	25										
			No (P)		28	73					Very stiff gray CLAY (CH) w/silt lenses
	30										
			No (P)		26						
	35										
			50 b/9"		26						Very dense gray SILTY SAND (SM)
	40										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 2.1x10(-8)
k2 = 3.5x10(-7)
k3 = 1.2x10(-8)

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-47

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-8)

CLECO
Pineville, LA

Location: N 493,815, E 1,669,465
Surface Elevation: 262.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Sample	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/9"		28						Very dense gray SILTY SAND (SM)
			50 b/7.5"		26						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
Free water first encountered		
	Boring Abandonment Method	

Data computerized by

LECO Dolet Hills
ower Plant
lansfield, LA

LOG OF SOIL BORING C-51

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/10/85
Company: Southwestern Laboratories (DB-11)

Sheet 1 of 2

ll, LA

Location: N 493,995, E 1,669,550
Surface Elevation: 268.7

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		17		28	5			Stiff brown, tan, and gray CLAYEY SAND (SC) w/silt traces
			No (P)	1.52	14	113					Stiff brown, tan, and gray SILTY CLAY (CL) w/sand traces
	5		No (P)		18		42	24			
			No (P)		18				k1		
			No (P)		28						
	10		No (P)		56						– w/lignite at 10 to 14 ft.
			No (P)		49						
			No (P)		23				k2		
Z			No (P)	2.77	27	84	56	34			Very stiff tan & gray CLAY (CH) w/silt lenses
			No (P)		27						
	20										
			No (P)	1.27	25	75	36	15			Stiff brown, tan, and gray SILTY CLAY (CL)
	25										
			50 b/9"		29						Very dense brown CLAYEY SAND (SC) w/silt traces
	30										
			50 b/8"		28		32	13			Hard gray SILTY CLAY (CL) w/sand traces
	35										
			50 b/8"		27						
	40										

Continued Next Page

Ground Water Level Data

ater first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 5.3x10(-9)
k2 = 6.1x10(-7)

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-51

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 05/10/85
Company: Southwestern Laboratories (DB-11)

...O
...rineville, LA

Location: N 493,995, E 1,669,550
Surface Elevation: 268.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard gray SILTY CLAY (CL) w/sand traces
	45		50 b/7"		28						
	50		50 b/6"		26						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

... water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by ...

:LECO Dolet Hills
'ower Plant
Mansfield, LA

LOG OF SOIL BORING C-54

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-14)

Sheet 1 of 2

'nieville, LA

Location: N 494,180, E 1,669,635
Surface Elevation: 268.6

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		16						Medium brown & tan SILTY CLAY (CL)
			No (P)		14		17	NP			Firm brown & tan SILTY SAND (SM)
	5		No (P)	0.94	23	85	47	26			Medium to stiff brown & gray SILTY CLAY (CL) w/sand traces
			No (P)		21				k1		
Z			No (P)	3.94	20	89					– very stiff at 8 to 10 ft.
	10		No (P)	1.68	29	81			k2		
			No (P)		28						
	15		No (P)		27						Stiff gray CLAY (CH) w/lignite
			No (P)		23				k3		Stiff brown SILTY CLAY (CL) w/sand traces
	20		No (P)	1.44	26	86					
			No (P)	1.35	23	84	48	25			
	25										
	30		No (P)		23						
			No (P)		23		39	20			
	35										
	40		No (P)		24						

Continued Next Page

Ground Water Level Data

· water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
k: Permeability (cm/sec)
k1 = 3.6x10(-8)
k2 = 1.8x10(-8)
k3 = 9.9x10(-8)

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-54

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-14)

Sheet 2 of 2

Pineville, LA

Location: N 494,180, E 1,669,635
Surface Elevation: 268.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Medium brown SILTY CLAY (CL) w/sand traces
	45		No (P)		22	81					
			No (P)		22						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

s water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-66

STE
Soil Testing Engineers, Inc.

Sheet 1 of 3

File: 94-1157
Date: 03/23/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

Pineville, LA

Location: N 492,111, E 1,668,782
Surface Elevation: 335.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Very loose tan SAND (SM) fill
			3 b/f 2-1-2								
▽	5		14 b/f 2-6-8		18				GS1		
▽			17 b/f 2-7-10								– w/ 1/2-inch layer of lignite at 6.5 to 8 ft.
			2.25 (P)		27		43	21			Medium gray, red, and tan SILTY CLAY (CL) w/silty sand lenses
	10		0.75 (P)	0.55	27	95					
			3.0 (P)								
			2.25 (P)								Stiff tan & gray CLAY (CH) w/sand layers
	15		4.5 + (P)								
			16 b/f 5-7-9								– w/lignite traces at 16.5 to 18 ft.
			4.5 + (P)	1.32	25	98	46	21			
	20		3.5 (P)								
			4.5 + (P)								
	25		50 b/10" 17-25-25/4"		23		81	42			Hard dark gray laminated CLAY (CH) w/2-inches of lignite
			50 b/10" 18-27-23/4"								
			50 b/9" 15-30-20/3"								
	30				29				GS2		Hard gray SANDY CLAY (CL) w/sand pockets
	35										
			50 b/9"								
	40		17-33-17/3"								

Continued Next Page

Ground Water Level Data

ce water first encountered
▽ Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 96 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Location coordinates reflect field offsets.

GS: Particle Size Analysis
GS1: Sand = 90%
GS2: Sand = 28%, Silt = 48% Clay = 24%

Strata Boundaries May Not Be Exact

LECO Dolet Hills
ower Plant
lansfield, LA

LOG OF SOIL BORING C-66

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/23/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

ineville, LA

Location: N 492,111, E 1,668,782
Surface Elevation: 335.3

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45				28				GS3		Hard gray SILTY & SANDY CLAY (CL) w/sand traces
			50 b/7"								
	50		22-35-15/1"								Hard dark gray laminated CLAY (CH) w/silty sand seams
	55				24		63	39			
			50 b/6"								
	60		(27-50)								
					30				GS4		
	65										
			50 b/8"								
	70		42-37-13/2"								
					25		69	38			
	75										
			50 b/9"								
	80		34-34-16/3"								

Continued Next Page

Ground Water Level Data

. water first encountered
water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 96 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS3: Sand = 24% Silt = 55%, Clay = 21%
GS4: Sand = 8%, Silt = 75%, Clay = 17%

Strata Boundaries May Not Be Exact

LECO Dolet Hills
ower Plant
lan- -d, LA

LOG OF SOIL BORING C-66

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/23/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

_CO
'ineville, LA

Sheet 3 of 3

Location: N 492,111, E 1,668,782
Surface Elevation: 335.3

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	85				24				GS5		Hard dark gray laminated CLAY (CH) w/fine sand traces & silt seams
			50 b/11"								
	90		30-27-23/5"		26		73	46			
	95										Boring completed at 96 ft.
	100										
	105										
	110										
	115										
	120										

round Water Level Data

-ree water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 96 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS5: Sand = 10%, Silt = 61%, Clay = 29%

:LECO Dolet Hills
'ower Plant
Mansfield, LA

:O
'ineville, LA

LOG OF SOIL BORING C-67

STE
Soil Testing Engineers, Inc.

Sheet 1 of 1

File: 94-1157
Date: 03/24/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

Location: N 493,501, E 1,668,750
Surface Elevation: 275.8

Water Level	Depth (feet)	Sample	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Tan & gray SAND (SP) & CLAYEY SAND (SC)
			1.75 (P)								
	5		4.5 + (P)		14				GS1		
			3.75 (P)								Stiff gray & tan SANDY CLAY (CL)
			4.5 + (P)								
			4.5 + (P)	1.27	29	91	47	14			
▽	10		4.5 + (P)		30		59	26			Hard gray & tan CLAY (CH) w/silty sand layers
▽			No (P)								
			4.5 + (P)								
	15		50 b/f								
			19-22-28								
			50 b/9"								Hard dark gray SILTY & SANDY CLAY (CL) w/sandy silt seams
			19-24-26/3"								
			50 b/8"								
	20		19-30-20/2"		27				GS2		
			50 b/10"								
			12-24-26/4"								
			48 b/f								
			14-18-30								
	25		48 b/f								
			20-21-27								
			43 b/f								Hard gray CLAY (CH)
			15-21-22								
			50 b/f								
	30		24-25-25								
					25				GS3		
	35										Boring completed at 36 ft.
	40										

Ground Water Level Data

e water first encountered
▽ water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 12 ft.
4" dia. Rotary Wash:
12 to 36 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Location coordinates reflect field offsets.

GS: Particle Size Analysis
GS1: Sand = 58%, Silt = 18%, Clay = 24%
GS2: Sand = 41%, Silt = 41%, Clay = 18%
GS3: Sand = 2%, Silt = 66%, Clay = 32%

CLECO Dolet Hills
Power Plant
nsfield, LA

LOG OF SOIL BORING C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/27/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
				FIELD DATA		LABORATORY DATA					
			4.5+ (P)								Hard orange & light gray SANDY CLAY (CL) w/grass roots
			No (P)		19	107	66	46			Hard light gray CLAY (CH), mottled w/red color
	5		37 b/f 12-19-18								Dense light gray SAND (SP), mottled w/orange color
			No (P)								Hard gray CLAY (CH) w/sand traces
			59 b/f 21-14-45								Very dense light gray & orange SAND (SP)
	10		63 b/9" 37-38-25/3"		10				GS1		Hard light gray CLAY (CH) Very dense light gray & tan SILTY SAND (SM)
			44 b/f 21-21-23								Hard light gray CLAY (CH)
	15		58 b/f 17-18-40								-- w/ 1/10-inch alternating layers of clay & orange sand
			66 b/f 13-26-40								Very dense light gray SAND (SP) -- w/tan sand at 16 to 18 ft.
			75 b/11" 25-42-33/5"								
	20		69 b/f 20-29-40		7				GS2		-- w/ 1/10-inch light gray clay seams & tan sand at 21 to 22 ft.
			63 b/f 18-29-34								-- w/ 1/2-inch light gray clay seam at 24 to 26 ft.
	25		86 b/f 14-40-46								
			50 b/4" 29-50/4"								-- w/ 1/10-inch tan sand seams at 28 to 30 ft.
			50 b/6" 30-50/6"								
	30		50 b/5" 41-50/5"								Very dense tan SAND (SP) -- w/clay pockets & light gray color at 30 to 32 ft.
			50 b/4" 40-50/4"								
	35		50 b/4" 30-50/4"		5				GS3		
			50 b/4" 32-50/4"								-- w/light gray color at 38 to 40 ft.
			84 b/9" 16-40-44/3"								
	40										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

6-inch dia. borehole at 0 to 76 ft.
4-inch dia. borehole at 76 to 136 ft.
GS: Particle Size Analysis
GS1: Sand = 84%, Silt & Clay = 16%
GS2: Sand = 93%, Silt & Clay = 7%
GS3: Sand = 95%, Silt & Clay = 5%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/27/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			50 b/5"								Very dense tan & light gray SAND (SP)
			38-50/5"								
			50 b/5"								-- w/alternating tan, red, and light gray sand seams 1/5-inch thick at 42 to 44 ft.
			40-50/5"								
	45		53 b/f 21-21-32								
▽			50 b/f 16-26-24								
			76 b/f 24-36-40								
	50		77 b/f 16-39-38		21				GS4		
			64 b/f 16-24-40								-- w/lignite trace at 54 to 56 ft.
			50 b/5"								
	55		50/5"								
			No (P)								
			No (P)								Hard dark gray CLAY (CH)
	60		4.0 (P)	6.30	18	129	66	41			-- w/light gray silt streaks at 58 to 62 ft.
			No (P)		20		63	41	GS5		
	65		4.0 (P)								
			4.0 (P)								
			No (P)								
	70		4.5 + (P)								-- w/silt pockets at 72 to 74 ft.
			No (P)		21		67	39			-- w/silt seams & sand streaks at 74 to 76 ft.
	75		No (P)								
			No (P)								-- w/sand streaks & lignite pockets at 78 to 80 ft.
			4.5 + (P)								
	80										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

6-inch dia. borehole at 0 to 76 ft.
4-inch dia. borehole at 76 to 136 ft.
GS: Particle Size Analysis
GS4: Sand = 96%, Silt & Clay = 4%
GS5: Sand = 1%, Silt = 36%, Clay = 63%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/27/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Hard dark gray CLAY (CH) w/gray sandy silt
			4.5 + (P)								– w/sandy silt laminations & pockets at 81 to 84 ft.
			4.5 + (P)								
	85		4.5 + (P)								
			4.5 + (P)								– w/sandy silt laminations at 87 to 88.5 ft.
			4.5 + (P)								– w/sandy silt pockets at 88.5 to 90 ft.
			4.5 + (P)								– w/lignite at 90 to 90.5 ft.
	90		77 b/9" 23-40-37/3"								
			No (P)		27		41	14			Dark gray CLAYEY SILT (ML) w/sand traces
											Dark gray CLAY (CH) w/light gray sandy silt seams
	95		No (P)								Very dense dark gray SILTY SAND (SM) w/clay pockets
			No (P)								
			No (P)								
	100		74 b/8" 26-40-34/2"								
			No (P)		24				GS6		Dark gray SAND (SP) w/clay pockets & seams
											– w/alternating 1/5-inch to 1/12-inch clay seams at 104 to 106 ft.
	105		No (P)								
			No (P)								
			No (P)								Hard dark gray CLAY (CH) w/gray sand seams & pockets
	110		40 b/f 12-18-22								
			4.5 + (P)								
	115		No (P)								– w/lignite trace at 116 to 118 ft.
			4.5 + (P)								– w/4-inch lignite layer at 118 to 120 ft.
			50 b/4" 50/4"								
	120										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

300 lb. hammer used to perform SPT below 90 ft.
GS: Particle Size Analysis
GS6: Sand = 71%, Silt = 17%, Clay = 12%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-69

STE
Soil Testing Engineers, Inc.

Sheet 4 of 4

File: 94-1157
Date: 09/27/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			38 b/f 13-18-20								Hard dark gray CLAY (CH)
			No (P)								
	125		4.5 + (P)								-- w/sandy silt pockets below 124 ft.
			No (P)								
			No (P)								
	130		47 b/f 20-25-22								
			4.5 + (P)								
	135		No (P)								
											Boring completed at 136 ft.
	140										
	145										
	150										
	155										
	160										

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

6-inch dia. borehole at 0 to 76 ft.
4-inch dia. borehole at 76 to 136 ft.
300 lb. hammer used to perform SPT below 90 ft.

CLECO Dolet Hills
Power Plant
[illegible]sfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/18/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
				Orange SANDY CLAY
				Light gray & red SANDY CLAY
	5			Light gray & orange SAND w/clay traces
	10			Tan SAND
				-- w/clay traces at 14 to 16 ft.
	15			-- light gray below 16 ft.
	20			-- w/clay traces at 20 to 22 ft.
	25			-- w/clay traces at 24 to 26 ft.
	30			-- w/clay traces at 30 to 32 ft.
	35			
	40			

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Geophysical logging performed in same borehole from which soil samples were obtained.

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/18/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

:CO
rineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
	45			Tan & light gray SAND -- red color at 42 to 44 ft.
▽	50			
	55			
	60			Dark gray CLAY
	65			
	70			
	75			
	80			

Continued Next Page

Ground Water Level Data

› water first encountered
.ter level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Geophysical logging performed in same borehole from which soil samples were obtained.

Strata boundaries may not be exact.

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/18/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

:CO
rineville, LA

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
	85			Dark gray CLAY w/silt traces
	90			
	95			
	100			Dark gray SAND w/clay traces
	105			Dark gray CLAY w/sand traces
	110			
	115			
	120			Black LIGNITE

Continued Next Page

Ground Water Level Data

:e water first encountered
ater level after 15 mins.

▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash:
48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Geophysical logging performed in same borehole from which soil samples were obtained.

Strata boundaries may not be exact.

CLECO Dolet Hills
Power Plant
M- -ield, LA

-ECO
Pineville, LA

GEOPHYSICAL SOIL BORING CUTTINGS LOG C-69

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/18/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

Location: N 491,023, E 1,667,183
Surface Elevation: 375.1

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
	to 135.5		(hatched)	Dark gray CLAY
	136			Boring completed at 136 ft.

Depth scale: 125, 130, 135, 140, 145, 150, 155, 160

Ground Water Level Data

ree water first encountered
Water level after 15 mins.
▼ Long-term water level after 1 hr.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 38 ft.
Dry Air Wash: 38 to 48 ft.
4" dia. Rotary Wash: 48 to 136 ft.

Boring Abandonment Method

Borehole grouted with cement/bentonite upon completion

Notes

Geophysical logging performed in same borehole from which soil samples were obtained.

S... ...device may not be exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-70

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 10/02/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 492,051, E 1,668,523
Surface Elevation: 294.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
				FIELD DATA		LABORATORY DATA					
			No (P)								Brown SANDY SILT (ML) w/sandstone -- w/grass roots in upper 2-ft.
			4.5 + (P)								
	5		4.5 + (P)		20		59	37			Hard tan & gray CLAY (CH) w/red sandstone & sand traces -- w/tree roots at 4 to 6 ft.
			3.5 (P)								
			4.5 + (P)								
	10		4.0 (P)								Stiff to very stiff tan & gray SILTY and SANDY CLAY (CL) w/sand traces
			12 b/f 4-5-7		29				GS1		
	15		11 b/f 4-6-5								-- w/alternating 2-inch clayey sand layers at 14 to 18 ft.
			13 b/f 5-6-7								-- w/red sandstone & 1/2-inch sand seams
▼			14 b/f 4-7-7								
	20		9 b/f 3-4-5		26		39	13	GS2		Loose to firm dark gray CLAYEY SAND (SC)
▽			19 b/f 6-7-12								Hard to very stiff dark gray SILTY CLAY (CL) w/sand traces
	25		No (P)								
			33 b/f 19-18-15								
			17 b/f 7-6-11								
	30		20 b/f 6-9-11								-- w/sandstone fragments at 32 to 36 ft.
			No (P)		31		42	21	GS3		
	35		No (P)								-- w/1-inch lignite layer at 36 to 38 ft.
			No (P)								-- w/lignite pockets at 38 to 40 ft.
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins.
▼ Long-term water level after 36 hrs.

Boring Advancement Method

Dry Air Wash:
0 to 24 ft.
4" dia. Rotary Wash:
24 to 56 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

300 lb. hammer used to perform SPT
GS: Particle Size Analysis
GS1: Sand = 27%, Silt = 47%, Clay = 26%
GS2: Sand = 53%, Silt = 27%, Clay = 20%
GS3: Sand = 19%, Silt = 46%, Clay = 35%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-70

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 10/02/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 492,051, E 1,868,523
Surface Elevation: 294.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			24 b/f 9-11-13		25		45	15			Firm gray CLAYEY SILT (ML)
			No (P)								Gray CLAY (CH) and SILTY CLAY (CL) w/sand silt traces & pockets
	45		No (P)								
			No (P)								Hard dark gray CLAY (CH) w/gray silt pockets
			No (P)								
	50		30 b/f 9-15-15		25						
			No (P)								
	55		No (P)								Boring completed at 56 ft.
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

Free water first encountered
Water level after 15 mins.
Long-term water level after 36 hrs.

Boring Advancement Method

Dry Air Wash:
0 to 24 ft.
4" dia. Rotary Wash:
24 to 56 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

300 lb. hammer used to perform SPT

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-70

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/28/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 492,051, E 1,668,518
Surface Elevation: 294.3

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
✳	0			Tan SAND
	5			Tan & gray CLAY
	10			
	15			
	20			
	25			Gray CLAY w/silt traces
	30			
	35			Gray SILTY CLAY
	40			

Continued Next Page

Ground Water Level Data
Borehole rotary washed from ground surface. Refer to Log of Soil Boring C-70 for groundwater location.

Boring Advancement Method
4" dia. Rotary Wash:
0 to 70 ft.

Boring Abandonment Method
Borehole grouted with cement/ bentonite upon completion

Notes
This boring was offset 5 ft. west of conventionally sampled soil boring C-70.

Strata boundaries may not be exact.

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-70

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/28/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 492,051, E 1,668,518
Surface Elevation: 294.3

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
				Gray SILTY CLAY
	45			
	50			Gray CLAY w/sand traces
	55			
	60			
	65			
	70			Boring completed at 70 ft.
	75			
	80			

Ground Water Level Data

Borehole rotary washed from ground surface. Refer to Log of Soil Boring C-70 for groundwater location.

Boring Advancement Method

4" dia. Rotary Wash:
0 to 70 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Strata boundaries may not be exact.

CLECO Dolet Hills
Power Plant
[illegible]nsfield, LA

LOG OF SOIL BORING C-71

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 10/03/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 493,298, E 1,669,212
Surface Elevation: 306.2

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Loose tan & gray CLAYEY SILT (CL-ML)
			0.75 (P)								Very stiff to hard gray & red CLAY (CH)
			3.5 (P)								
			4.0 (P)								
	5		4.0 (P)		25	97					-- w/red to tan color change & silt traces at 4 to 6 ft.
			3.0 (P)								
			2.75 (P)		25		61	41			-- w/sand pockets at 8 to 12 ft.
	10		4.5 + (P)								
			4.5 + (P)								Hard gray CLAY (CH)
			4.5 + (P)								-- w/lignite traces at 12 to 14 ft.
	15		4.5 + (P)								-- w/sand pockets at 14 to 18 ft.
			4.5 + (P)								
			30 b/f 9-16-14								-- w/silt traces at 18 to 20 ft.
	20		21 b/f 5-9-12								-- w/sandy clay pockets & laminated at 20 to 22 ft.
			29 b/f 9-13-16								
			31 b/f 9-14-17								Hard gray SILTY CLAY (CL) w/sand pockets
	25		25 b/f 7-11-14		26		42	11	GS1		Firm dark gray CLAYEY SILT (ML) w/clay pockets, mica, and sand
			20 b/f 5-9-11								
	30		4.5 + (P)								Hard dark gray SILTY CLAY (CL) w/clay & sandy clay pockets
			4.5 + (P)								
	35		No (P)								
			4.5 + (P)								
			4.5 + (P)								
	40										

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ No rise in water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 6 ft.
Dry Air Wash: 6 to 42 ft.
4" Nom. Dia. Short Flight Auger: 42 to 67 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

300 lb. hammer used to perform SPT
GS: Particle Size Analysis
GS1: Sand = 20%, Silt = 72%, Clay = 8%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mar[illegible]field, LA

LOG OF SOIL BORING C-71

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 10/03/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

Sheet 2 of 2

CLECO
Pineville, LA

Location: N 493,298, E 1,669,212
Surface Elevation: 306.2

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
▽			4.5 + (P)								Hard dark gray CLAY (CH)
			4.5 + (P)								
	45		4.5 + (P)		28		89	60			
			4.5 + (P)								
			4.5 + (P)								-- w/ 1/10-inch lignite seams at 48 to 50 ft.
	50		4.5 + (P)								-- w/lignite pockets & 1/10-inch seams at 50 to 52 ft.
			2.5 (P)								Hard LIGNITE
			4.5 + (P)								
	55		4.5 + (P)								Hard dark gray CLAY (CH) w/silt pockets & streaks
			4.5 + (P)								
			No (P)								
			4.5 + (P)								
	60		4.5 + (P)								
			4.5 + (P)								-- w/sand streaks, pockets, and 1/10-inch seams at 64 to 67 ft.
	65		4.5 + (P)								
			No (P)								Boring completed at 67 ft.
	70										
	75										
	80										

Ground Water Level Data

[illegible]e water first encountered
[illegible]o rise in water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 6 ft.
Dry Air Wash: 6 to 42 ft.
4" Nom. Dia. Short Flight Auger: 42 to 67 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

300 lb. hammer used to perform SPT

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-71

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/28/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 493,295, E 1,669,214
Surface Elevation: 306.2

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
*	0			Red CLAY
	5			Tan CLAY
	10			
	15			Gray CLAY w/orange sandy silt
	20			Gray CLAY
	25			
	30			
	35			
	40			

Continued Next Page

Ground Water Level Data

* Borehole rotary washed from ground surface. Refer to Log of Soil Boring C-71 for groundwater location.

Boring Advancement Method

4" dia. Rotary Wash:
0 to 70 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

This boring was offset 3 ft. south and 2 ft. east of boring C-71.

Strata boundaries may not be exact.

CLECO Dolet Hills
Power Plant
Mansfield, LA

GEOPHYSICAL SOIL BORING
CUTTINGS LOG C-71

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 09/28/95
Engr.: R. Perrin
Driller: D. Thibodeaux
Rig: Failing 1500

CLECO
Pineville, LA

Location: N 493,295, E 1,669,214
Surface Elevation: 306.2

FIELD DATA: Ground Water Level	Depth (feet)	Samples	Soil Type	DESCRIPTION
				Gray CLAY
	45			Dark gray CLAY
	50			Dark gray CLAY w/lignite
	55			LIGNITE w/dark gray clay
	60			Dark gray CLAY
	65			
	70			Boring completed at 70 ft.
	75			
	80			

Ground Water Level Data

✱ Borehole rotary washed from ground surface. Refer to Log of Soil Boring C-71 for groundwater location.

Boring Advancement Method

4" dia. Rotary Wash:
0 to 70 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Strata boundaries may not be exact.

LOG OF BORING

861044

PROJECT: Monitoring Well Installation - Dolet Hills
CLIENT: SWEPCO
Date: 7-22-87
Type: Auger

BORING NO.: MW-1A
LOCATION: Mansfield, La.
N 491038.0368 E 1667284.170
Ground Elevation: 375.29 Top of Slab

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
		A	Red & brown sandy clay
5		A	Tan, brown & grey sandy clay
10		A	Tan, brown & grey clayey silty sand
15		A	Tan & grey clayey silty sand
20		A	Tan & grey clayey silty sand
25		A	Tan & grey clayey silty sand
30		A	Brown, tan & grey clayey silty sand
35		A	Brown & tan clayey silty sand laminations
40		A	Brown & tan clayey silty sand laminations
45		A	Brown & tan clayey silty sand laminations
50			

SOUTHWESTERN LABORATORIES

861044

LOG OF BORING

PROJECT: Monitoring Well Installation - Dolet Hills
CLIENT: SWEPCO
BORING NO.: MW-1A
LOCATION: Mansfield, La.
N 491038.0368 E 1667284.170
Ground Elevation: 375.29 Top of Slab
Date: 7-22-87
Type: Auger

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
55		A	Brown & tan clayey silty sand laminations
60		A	Grey clayey silty sand laminations
65		A	Grey clayey silty sand laminations
70			Top of screen at 52 feet.
75			Bottom of screen at 62 feet.
80			Bottom of boring at 65 feet.
85			Water encountered at 50 feet.
90			
95			
100			

SOUTHWESTERN LABORATORIES

LOG OF BORING

853744

PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 1
LOCATION: N 491108.393
E 1667600.6042

Date: 11/15/85 Type: Rotary Ground Elevation: 378.13

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
5			Red, brown and gray sandy clay
10			Tan, brown and gray clayey silty sand
15			
20			
25			Tan and gray clayey sand
30			
35			
40			Brown and gray sandy clay w/silt and sand lenses
45			
50			

SOUTHWESTERN LABORATORIES

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 1
LOCATION: N 491108.393
E 1667600.6042

Date: 11/15/85 Type: Rotary Ground Elevation: 378.13

Legend: ■ Sample × Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
55			Gray sandy clay w/silt and sand lenses
60			
70			Bottom of Boring at 70 feet.
75			
80			
85			
90			
95			
100			

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 3
LOCATION: N 492256.136
E 1669339.1432
Ground Elevation: 372.17

Date: 12/3/85 Type: Rotary

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			Tan and gray sandy clay
5			
10			Red and brown clayey sand
15			
20			Brown and gray clayey sand
25			
30			
35			Gray sandy clay w/sand lenses
40			
45			
50			Bottom of Boring at 50 feet.

335

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 4
LOCATION: N 493300
E 1669230
Ground Elevation: 305.92

Date: 12/3/85 Type: Rotary

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
			Brown clayey sand
5			Brown, gray and tan sandy clay
10			
15			Brown and gray clayey sand
20			
25			
30			Gray sandy clay w/silt and sand lenses
35			Bottom of Boring at 35 feet.
40			
45			
50			

SOUTHWESTERN LABORATORIES

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 7
LOCATION: N 493370
E 1667830
Ground Elevation: 352.19

Date: 12/5/85 Type: Rotary

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			
5			Tan and gray sandy clay
10			
15			
20			Gray sandy clay w/silt and sand seams
25			
30			Bottom of Boring at 30 feet.
35			
40			
45			
50			

SOUTHWESTERN LABORATORIES

E·A·G·L·E
ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG

BORING/WELL NO.:	**MW-11**
TOTAL DEPTH:	**40 feet**
TOP OF CASING ELEV.:	**301.73 Ft NGVD**
GROUND SURFACE ELEV.:	**298.1 Ft NGVD**

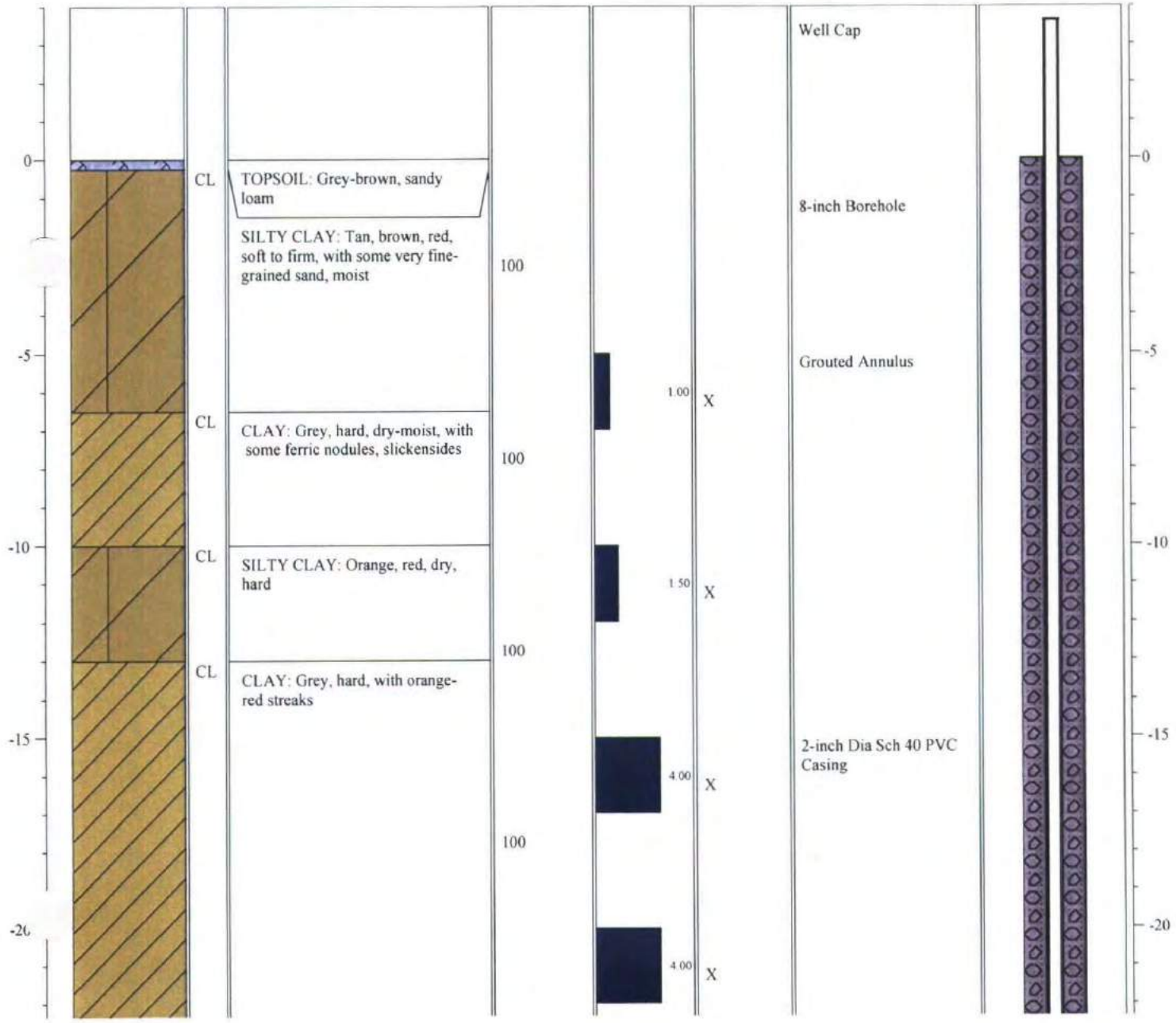
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**SW Permitting**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-10-0072**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/13/2010**

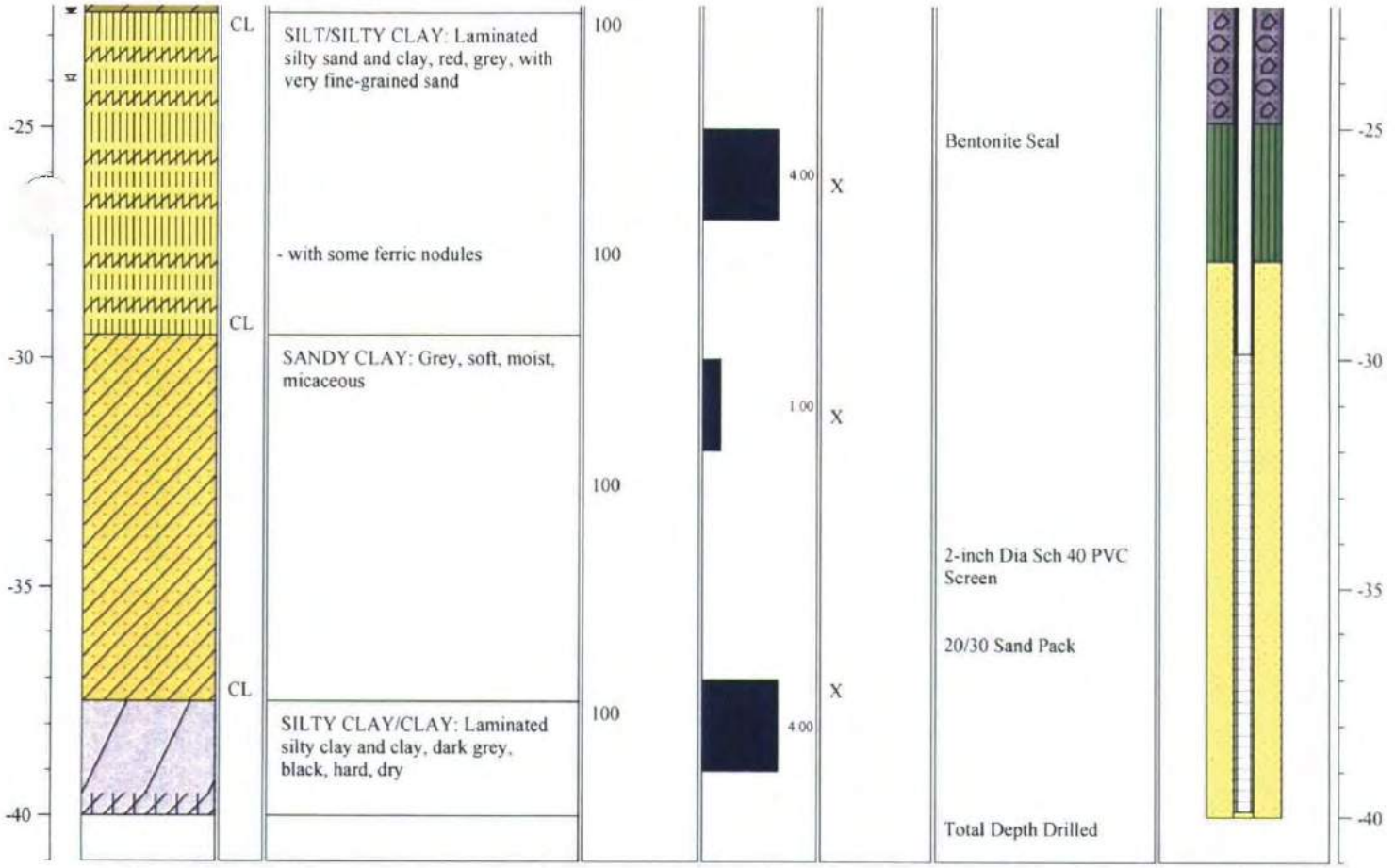
Notes:

▽ Water level during drilling: 24 ft bgs

▼ Water level in completed well: 22.53 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		CL	TOPSOIL: Grey-brown, sandy loam				Well Cap	
-5			SILTY CLAY: Tan, brown, red, soft to firm, with some very fine-grained sand, moist	100	1.00	X	8-inch Borehole	
-10		CL	CLAY: Grey, hard, dry-moist, with some ferric nodules, slickensides	100	1.50	X	Grouted Annulus	
-15		CL	SILTY CLAY: Orange, red, dry, hard	100	4.00	X	2-inch Dia Sch 40 PVC Casing	
-20		CL	CLAY: Grey, hard, with orange-red streaks	100	4.00	X		




-25
-30
-35
-40
CL
CL
CL
SILT/SILTY CLAY: Laminated silty sand and clay, red, grey, with very fine-grained sand
- with some ferric nodules
SANDY CLAY: Grey, soft, moist, micaceous
SILTY CLAY/CLAY: Laminated silty clay and clay, dark grey, black, hard, dry
100
100
100
100
4.00
1.00
4.00
X
X
X
Bentonite Seal
2-inch Dia Sch 40 PVC Screen
20/30 Sand Pack
Total Depth Drilled
-25
-30
-35
-40

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-12**
TOTAL DEPTH:	**50 FEET**
TOP OF CASING ELEV.:	**313.12 Ft NGVD**
GROUND SURFACE ELEV.:	**310.40 Ft NGVD**

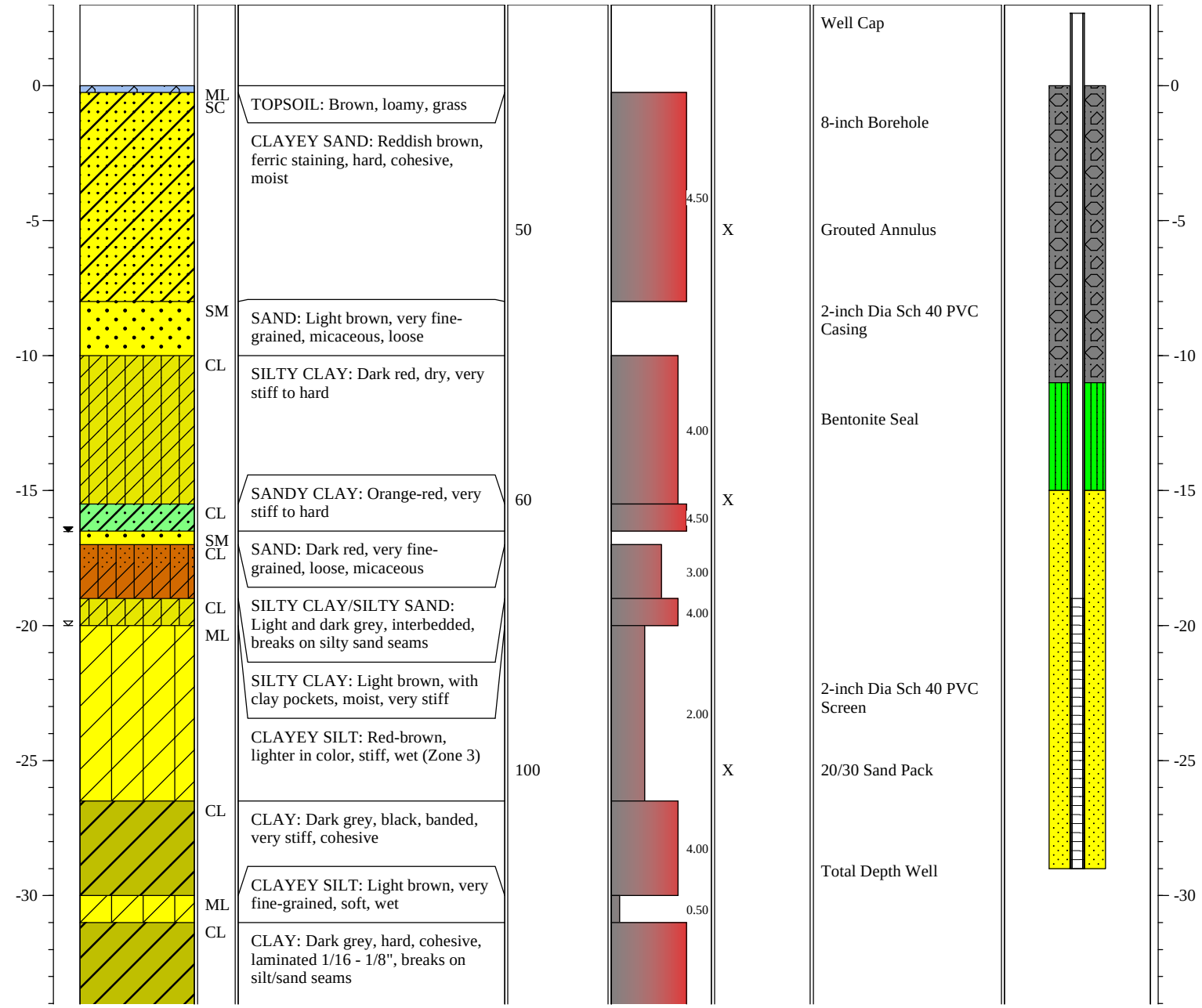
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/21 to 6/11/2019**

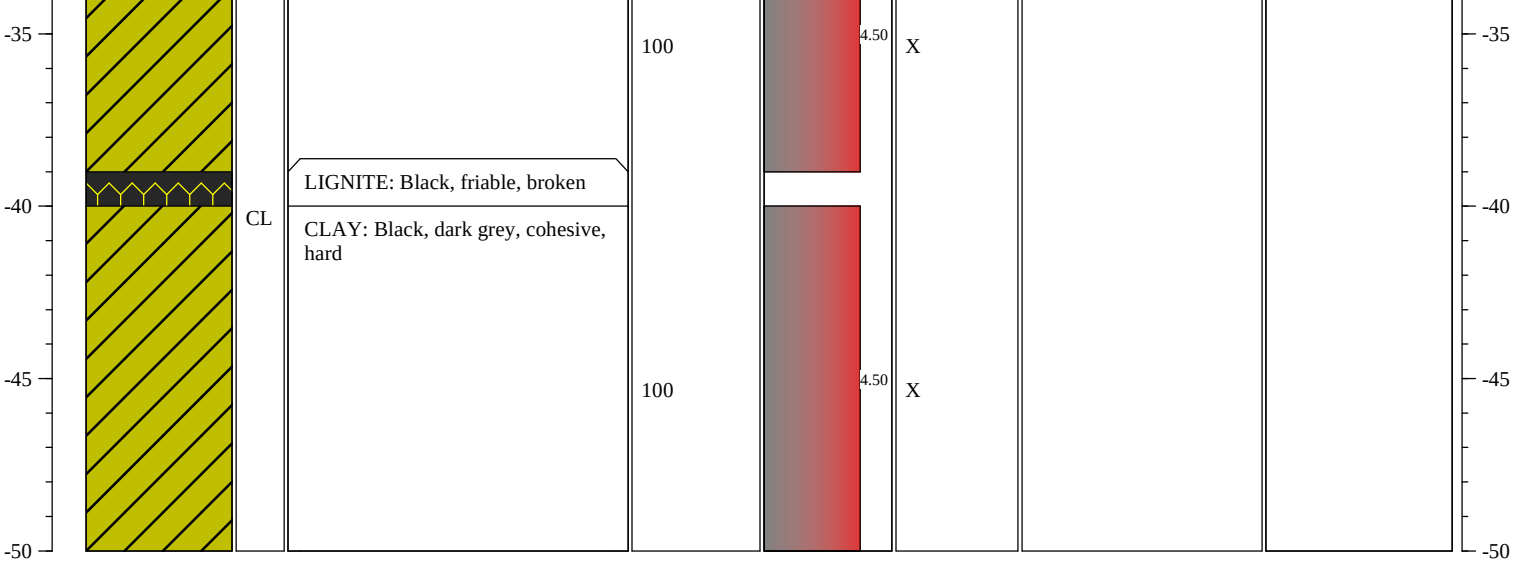
Notes:

Water level during drilling: 20 FT BGS

Water level in completed well: 16.52 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION




-35
-40
-45
-50
CL
LIGNITE: Black, friable, broken
CLAY: Black, dark grey, cohesive, hard
100
100
4.50
4.50
X
X

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-13**
TOTAL DEPTH:	**90 FEET**
TOP OF CASING ELEV.:	**380.61 Ft NGVD**
GROUND SURFACE ELEV.:	**378.11 Ft NGVD**

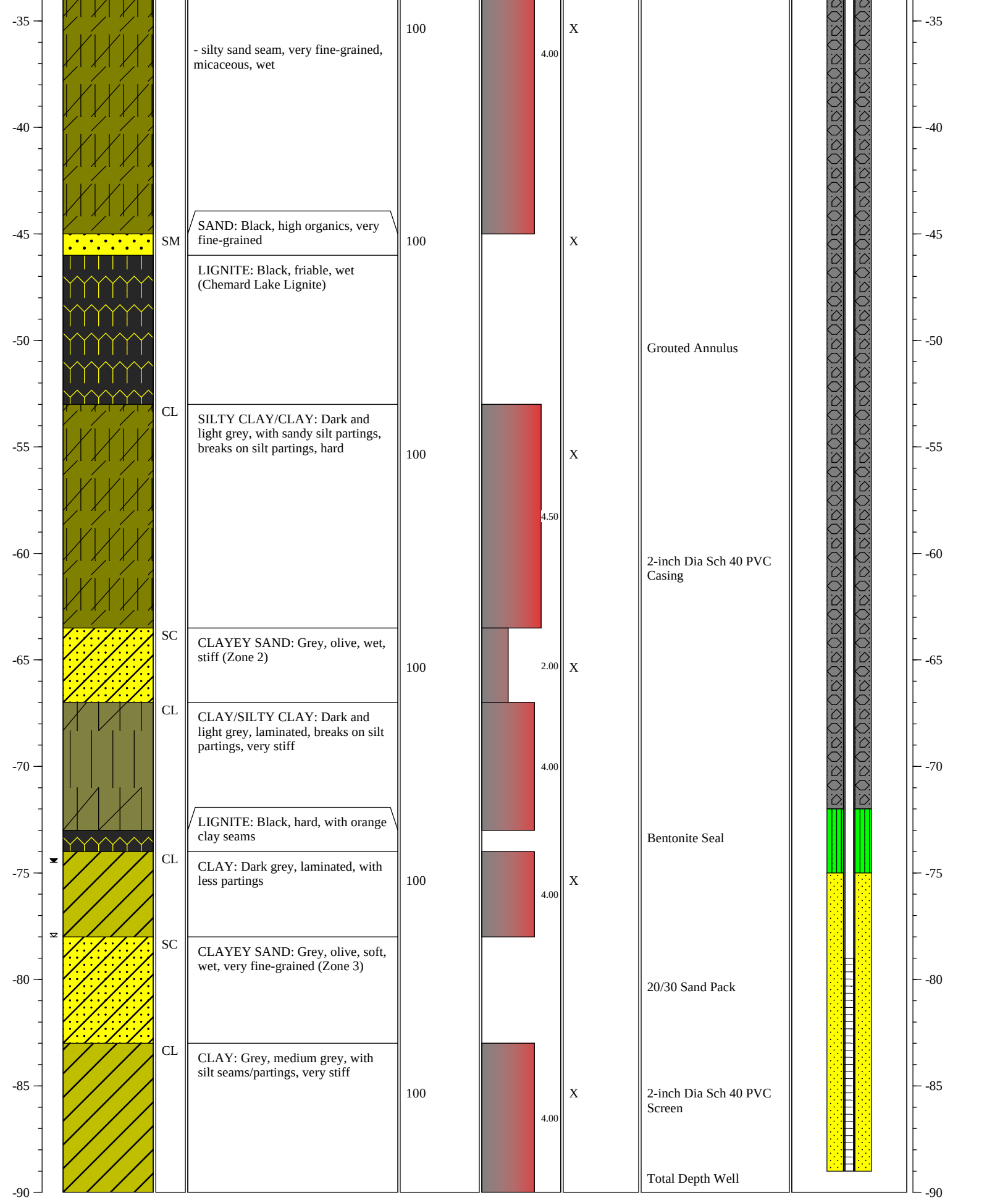
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/22 to 6/11/2019**

Notes:

Water level during drilling: 78 FT BGS

Water level in completed well: 74.5 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML SM	TOPSOIL: Brown, loamy				Well Cap	
			SILTY SAND: Orange, yellow, very fine-grained, micaceous, loose, ferric staining				8-inch Borehole	
-5		CL	SANDY CLAY: Orange, yellow, very fine-grained, micaceous, soft, ferric staining	50	0.50	X	Grouted Annulus	
		SM	SILTY SAND: Pale yellow, very fine-grained, micaceous, loose, ferric staining (Dolet Hills Sand)					
-10								
-15		SC	CLAYEY SAND: Orange, banded, very fine-grained, ferric staining, moist	80		X	2-inch Dia Sch 40 PVC Casing	
		SM	SANDY SILT: Light brown, very loose, moist					
-20								
		CL	SANDY CLAY: Dark red, orange, grey, high ferric staining		4.00			
-25		CL	SANDY CLAY: Grey, white, banded, very silty, high ferric staining	100	4.00	X		
-30		CL	SILTY CLAY/CLAY: Dark and light grey, laminated, 1/2 to 1" partings, very stiff					


-35
-40
-45
-50
-55
-60
-65
-70
-75
-80
-85
-90
- silty sand seam, very fine-grained, micaceous, wet
SAND: Black, high organics, very fine-grained
SM
LIGNITE: Black, friable, wet (Chemard Lake Lignite)
SILTY CLAY/CLAY: Dark and light grey, with sandy silt partings, breaks on silt partings, hard
CL
CLAYEY SAND: Grey, olive, wet, stiff (Zone 2)
SC
CLAY/SILTY CLAY: Dark and light grey, laminated, breaks on silt partings, very stiff
CL
LIGNITE: Black, hard, with orange clay seams
CLAY: Dark grey, laminated, with less partings
CL
CLAYEY SAND: Grey, olive, soft, wet, very fine-grained (Zone 3)
SC
CLAY: Grey, medium grey, with silt seams/partings, very stiff
CL
100
4.00
4.50
2.00
X
Grouted Annulus
2-inch Dia Sch 40 PVC Casing
Bentonite Seal
20/30 Sand Pack
2-inch Dia Sch 40 PVC Screen
Total Depth Well

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-14**
TOTAL DEPTH:	**36 FEET**
TOP OF CASING ELEV.:	**311.63 Ft NGVD**
GROUND SURFACE ELEV.:	**308.98 Ft NGVD**

CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**6/11/2019**

Notes:

Water level during drilling: 25 FT BGS

Water level in completed well: 16.60 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			SILTY CLAY: Grey, mottled, ferric staining, dry	100	4.00	X	8-inch Borehole	
-5							Grouted Annulus	
-10		CL	CLAY: Grey, cohesive, high plasticity, moist-dry		4.00			
		ML	SILT: Light grey, loose, micaceous, dry	100		X	2-inch Dia Sch 40 PVC Casing	
-15		CL	CLAYEY SILT: Light grey, light brown, breaks on silt/sand partings and seams, micaceous		4.00			
-20				100		X	Bentonite Seal	
		SM	SILT/SILTY CLAY: Dark and light grey, very sandy, breaks on 1 to 2" seams, micaceous, laminations 1/16 - 1/8"					
-25		CL	CLAY: Dark grey, cohesive, with silt seams		4.00		20/30 Sand Pack	
-30		SM	SANDY SILT: Light grey, loose, micaceous (Zone 3)	100		X	2-inch Dia Sch 40 PVC Screen	
		CL	CLAY: Dark grey, cohesive, breaks on 12" layers, hard		4.50			
-35		CL	SILT/SILTY CLAY: Dark and ligh grey, laminated, very sandy, moist, with increasing sandy silt partings and seams		4.00		Total Depth Well	

SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-15**
TOTAL DEPTH:	**30 FEET**
TOP OF CASING ELEV.:	**308.80 Ft NGVD**
GROUND SURFACE ELEV.:	**306.12 Ft NGVD**

CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/23 to 6/11/2019**

Notes:

Water level during drilling: 24 FT BGS

Water level in completed well: 22.72 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			CLAY: Red, very stiff, dry				8-inch Borehole	
-5				100	4.00	X	Grouted Annulus	
-10		CL	SILTY CLAY: Red, with silt seams, hard		4.50		2-inch Dia Sch 40 PVC Casing	
-15		CL	CLAY: Red, grey, moist, hard	70	4.50	X	Bentonite Seal	
-20			LIGNITE: Black, friable					
		CL	CLAY: Grey, light and dark laminations, very stiff		4.50	X	20/30 Sand Pack	
-25		SM	SILTY SAND: Dark grey, olive, very fine-grained, silty, wet	100				
		CL SM	SILT/SILTY CLAY: Dark grey, olive, silt laminations, very stiff, wet		4.00			
-30			SANDY SILT: Grey, olive, very fine-grained, with 1/8" silty clay partings, wet (Zone 3)	100		X	2-inch Dia Sch 40 PVC Screen Total Depth Well	

SOIL BORING LOG

BORING/WELL NO.:	**MW-16**
TOTAL DEPTH:	**70 FEET**
TOP OF CASING ELEV.:	**331.71 Ft NGVD**
GROUND SURFACE ELEV.:	**328.82 Ft NGVD**

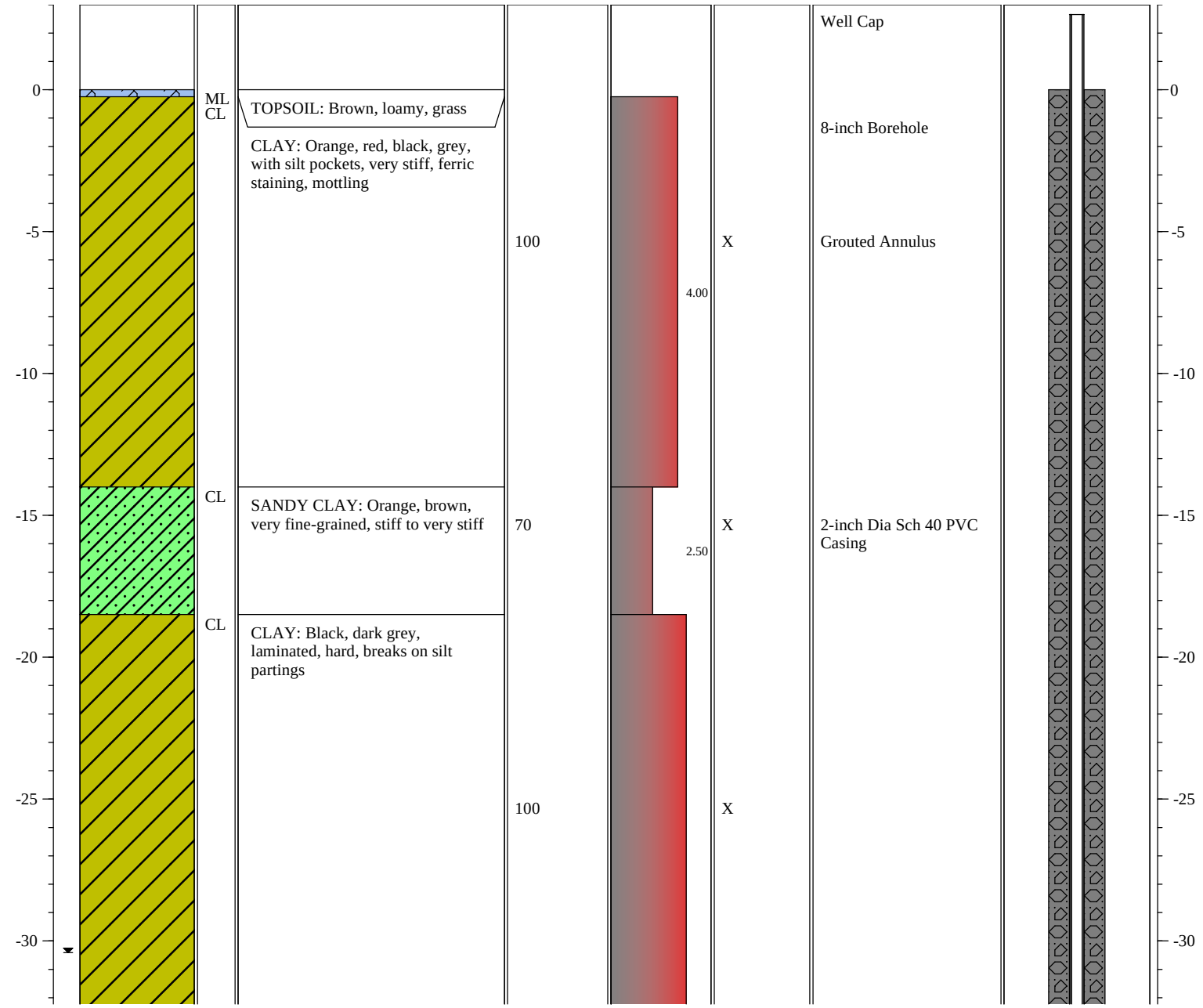
CLIENT:	**CLECO DHPS**	DRILLING CO.:	**WALKER-HILL ENV**
PROJECT:	**NEW LANDFILL**	DRILLER:	**T SMITH**
SITE LOCATION:	**MANSFIELD, LA**	METHOD OF DRILLING:	**ROTOSONIC**
PROJECT NO.:	**01-18-0180**	SAMPLING METHODS:	**ROTOSONIC**
LOGGED BY:	**R STURDIVANT**	DATES DRILLED:	**5/23 to 6/11/2019**

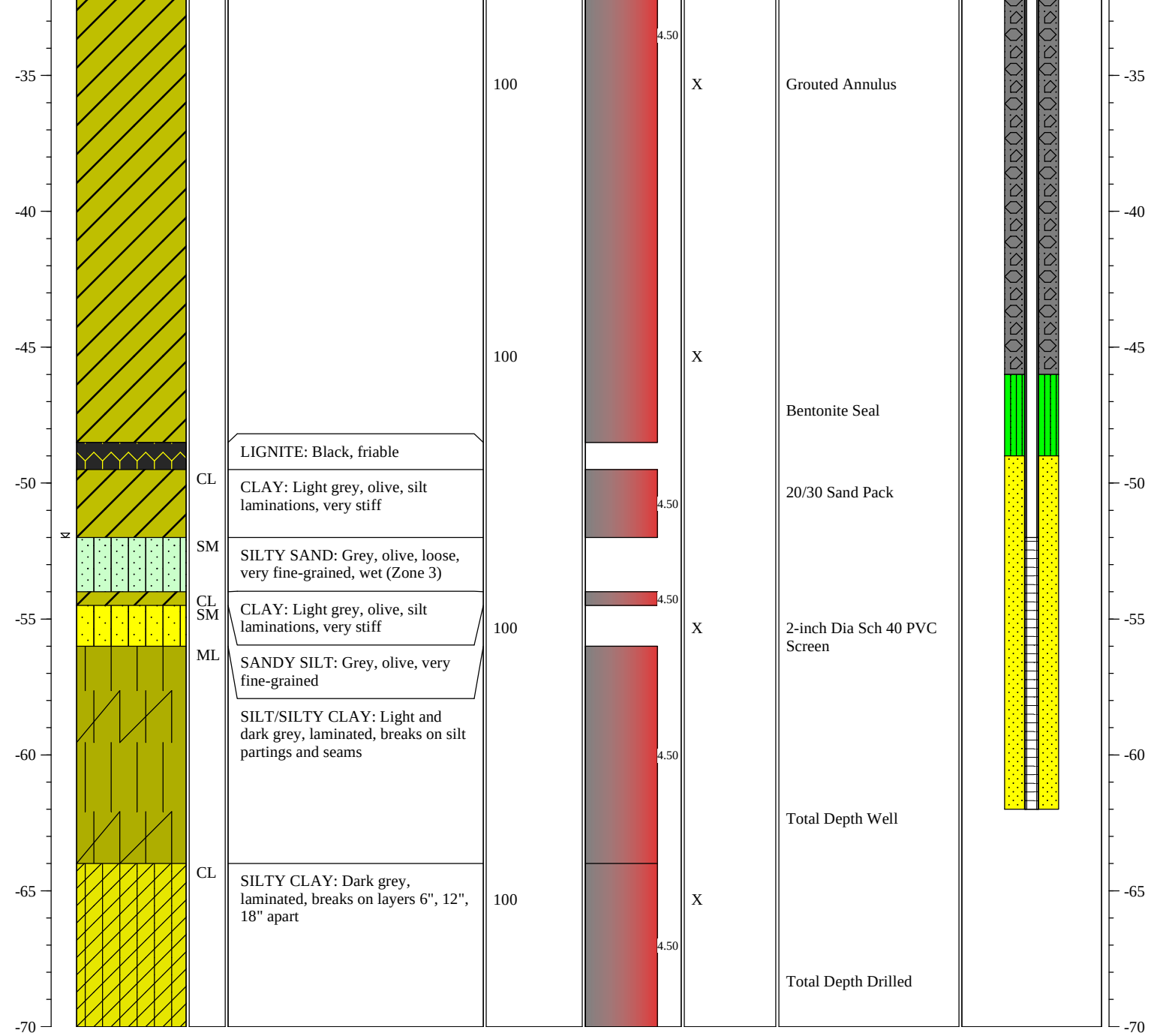
Notes:

▽ Water level during drilling: 52 FT BGS

▼ Water level in completed well: 30.41 FT BGS

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0		ML CL	TOPSOIL: Brown, loamy, grass				Well Cap	
			CLAY: Orange, red, black, grey, with silt pockets, very stiff, ferric staining, mottling				8-inch Borehole	
-5				100	4.00	X	Grouted Annulus	
-10								
-15		CL	SANDY CLAY: Orange, brown, very fine-grained, stiff to very stiff	70	2.50	X	2-inch Dia Sch 40 PVC Casing	
-20		CL	CLAY: Black, dark grey, laminated, hard, breaks on silt partings					
-25				100		X		
-30								




-35
-40
-45
-50
-55
-60
-65
-70
LIGNITE: Black, friable
CL
CLAY: Light grey, olive, silt laminations, very stiff
SM
SILTY SAND: Grey, olive, loose, very fine-grained, wet (Zone 3)
CL
SM
CLAY: Light grey, olive, silt laminations, very stiff
ML
SANDY SILT: Grey, olive, very fine-grained
SILT/SILTY CLAY: Light and dark grey, laminated, breaks on silt partings and seams
CL
SILTY CLAY: Dark grey, laminated, breaks on layers 6", 12", 18" apart
100
100
100
100
4.50
4.50
4.50
4.50
X
X
X
X
Grouted Annulus
Bentonite Seal
20/30 Sand Pack
2-inch Dia Sch 40 PVC Screen
Total Depth Well
Total Depth Drilled

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING 96B-4A

STE
Soil Testing Engineers, Inc.

Sheet 1 of 3

File: 96-1030
Start Date: 04/02/96
End Date: 04/03/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,965, E 1,669,689

Surface Elevation (ft.,MSL): 272.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			0.5 (P)	50									Loose brown SILTY fine SAND (SM) w/clay traces
			2.0 (P)	42									– w/tan color at 2 to 4 ft.
	5		3.0 (P)	54		14	113	37	15	22			Stiff light gray SANDY CLAY (CL) – w/silty fine sand seams & layers
			1.5 (P)	67									
▽			1.75 (P)	75	1.25	17	109						
▽	10		2.0 (P)	63									
			4.5 + (P)	83									
	15		4.5 + (P)	63		32							Hard brown CLAY (CH) w/fine sand & silt laminations
			4.5 + (P)	75		22							– w/lignite at 16 to 18 ft.
			4.5 + (P)	46		24	87						Hard black lignite
	20		4.5 + (P)	50		22							-- w/clay traces at 20 to 22 ft.
			4.5 + (P)	63		26		77	28	49	GS1		Hard dark gray CLAY (CH) w/silt laminations
	25		4.5 + (P)	46									
			4.5 + (P)	75		22	101	73	29	44			
			4.5 + (P)	42									
	30		No (P)	38									Very stiff light gray SANDY CLAY (CL) w/silty fine sand seams & layers
			No (P)	50									
	35		No (P)	54									
			No (P)	58	2.09	22	84				GS2		
			No (P)	63									
	40												

Continued Next Page

Ground Water Level Data

ıe water first encountered
Vater level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 22 ft.
4" dia. Rotary Wash:
22 to 100 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS1: Silt = 44%, Clay = 56%
GS2: Sand = 49%, Silt = 36%, Clay = 15%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
M[illegible]field, LA

LOG OF SOIL BORING 96B-4A

STE
Soil Testing Engineers, Inc.

File: 96-1030
Start Date: 04/02/96
End Date: 04/03/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,965, E 1,668,689

Surface Elevation (ft.,MSL): 272.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	71									Hard light gray SANDY CLAY (CL) w/silty fine sand seams & layers
			4.5 + (P)	63		24					GS3		
	45		4.5 + (P)	50									
			4.5 + (P)	50									
			4.5 + (P)	63									
	50		4.5 + (P)	67									Hard dark gray CLAY (CH) w/silt & fine sand laminations
			4.5 + (P)	71									
	55		4.5 + (P)	75									
			4.5 + (P)	83		25	94	54	25	29			
			4.5 + (P)	75		24	97						
	60		4.5 + (P)	67									
			4.5 + (P)	71									
	65		4.5 + (P)	63									
			4.5 + (P)	54		22	81	68	26	42			
			4.5 + (P)	63									
	70		4.5 + (P)	71									
			4.5 + (P)	67									
	75		4.5 + (P)	79		20	107						
			4.5 + (P)	100									
	80		4.5 + (P)	75									

Continued Next Page

Ground Water Level Data

[illegible]ree water first encountered
[illegible]. Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 22 ft.
4" dia. Rotary Wash:
22 to 100 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS3: Sand = 49%, Silt = 32%, Clay = 19%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
P[illegible]er Plant
[illegible]field, LA

LOG OF SOIL BORING 96B-4A

STE
Soil Testing Engineers, Inc.

Sheet 3 of 3

File: 96-1030
Start Date: 04/02/96
End Date: 04/03/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,965, E 1,668,689

Surface Elevation (ft.,MSL): 272.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5+ (P)	75									Hard dark gray CLAY (CH) w/silt & fine sand laminations & silt layers
			4.5+ (P)	71									
	85		4.0 (P)	79		22		75	29	46			
			4.5+ (P)	71									
			4.5+ (P)	58									
	90		4.5+ (P)	75									
			4.5+ (P)	75									
	95		4.5+ (P)	79		20	105						
			4.5+ (P)	79									
			4.5+ (P)	75									
	100												Boring completed at 100 ft.
	105												
	110												
	115												
	120												

Ground Water Level Data

Free water first encountered
Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 22 ft.
4" dia. Rotary Wash:
22 to 100 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-1

CLECO

Central Louisiana Electric Company, Inc.

Pineville, LA

Sheet 1 of 2

File: 94-1157
Date: 06/22/84
Company: Southwestern Laboratories (B-1S)

Location: N 490,050, E 1,667,710
Surface Elevation: 359.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			10 b/f 3-4-6		1						Firm to dense tan & red SILTY SAND (SM) and CLAYEY SAND (SC)
			16 b/f 4-7-9		6		18	NP	GS		
	5		17 b/f 3-8-9		8						
			38 b/f 10-18-20		7						– w/clay pockets at 6.5 to 8 ft.
	10		29 b/f 11-12-17		11						
	15		49 b/f 22-19-30		7						– w/white color change at 14.5 to 15 ft.
	20		25 b/f 5-8-17		8						
	25		47 b/f 16-28-19		7						
▽	30		33 b/f 7-15-18		18						
	35		37 b/f 6-15-22		26		41	21			Very stiff SILTY CLAY (CL)
	40		No (P)	3.31	22	107					

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
Sand = 70%, Silt = 8%, Clay = 22%
NP: Non-plastic

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-1

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/22/84
Company: Southwestern Laboratories (B-1S)

rineville, LA

Location: N 490,050, E 1,667,710
Surface Elevation: 359.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)	3.46	26	96	48	28			Very stiff SILTY CLAY (CL)
	50		No (P)								Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
vater first encountered		
	Boring Abandonment Method	

Date computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-2

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1VV)

Location: N 490,230, E 1,667,430
Surface Elevation: 353.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		4						Firm to loose brown SILTY SAND (SM) *
			No (P)		63				GS1		
	5		No (P)								
			No (P)								
			No (P)								
	10		No (P)						GS2		
			No (P)								
	15		No (P)								
			No (P)								
			No (P)								
	20										
			No (P)								
	25										
▽			No (P)								
	30										
			No (P)								
	35										
			No (P)		33				GS3		
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Sand below 4 ft.
GS: Particle Size Analysis
GS1: Sand = 55%
GS2: Sand = 92%
GS3: Sand = 87%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-2

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1VV)

Pineville, LA

Location: N 490,230, E 1,667,430
Surface Elevation: 353.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Loose brown SILTY SAND (SM) *
	45		No (P)								
	50		No (P)								Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

** SWL indicates Sand

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-3

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1UU)

Pineville, LA

Location: N 490,285, E 1,667,290
Surface Elevation: 355.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		8						Dense to very dense tan CLAYEY SAND (SC)
			No (P)	3.74	11	115					
	5		No (P)		7				k		
			No (P)		28						Dense brown SILTY SAND (SM)
			No (P)		33						
	10		No (P)		23						
			No (P)		27						
▽	15		No (P)		22				GS1		
			No (P)		20						
			No (P)		14						
	20										
			No (P)		22						Dense gray SILTY SAND (SM)
	25										
			No (P)		23						
	30										
			No (P)		29						
	35										
			No (P)		23				GS2		
	40										

Continued Next Page

Ground Water Level Data

Water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 1.0x10(-7)
GS: Particle Size Analysis
GS1: Sand = 96%
GS2: Sand = 95%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-3

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1UU)

...O
Pineville, LA

Location: N 490,285, E 1,667,290
Surface Elevation: 355.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL)
	45		No (P)		27						
			No (P)		28						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-4

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1TT)

...ieville, LA

Location: N 490,340, E 1,668,080
Surface Elevation: 368.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm tan SILTY SAND (SM)
			No (P)								
	5		No (P)		24				GS1		
			No (P)								Firm tan CLAYEY SAND (SC)
			No (P)								
	10		No (P)								Firm brown SILTY SAND (SM)
			No (P)								
	15		No (P)		20				GS2		
			No (P)								
			No (P)								
	20										
			No (P)								
	25										
			No (P)		13				GS3		
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS1: Sand = 82%
GS2: Sand = 91%
GS3: Sand = 92%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-4

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1TT)

Location: N 490,340, E 1,668,080
Surface Elevation: 368.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Firm brown SILTY SAND (SM)
	45		No (P)		16				GS4		
			No (P)								
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		GS: Particle Size Analysis GS4: Sand = 95%
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-5

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1SS)

)
rineville, LA

Location: N 490,520, E 1,667,520
Surface Elevation: 350.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		10						Firm brown & tan SILTY SAND (SM)
			No (P)								Firm tan CLAYEY SAND (SC)
	5		No (P)		11						Medium to stiff brown SANDY & SILTY CLAY (CL)
			No (P)		13		28	11			
			No (P)		9						
	10		No (P)		22				k		
			No (P)	1.23	20	103					
	15		No (P)		25						
			No (P)	0.75	22	100					
			No (P)		18						Firm brown SILTY SAND (SM)
▽	20										
			No (P)		20						
	25										
			No (P)		15						
	30										
			No (P)		19						
	35										
			No (P)		23						
	40										

Continued Next Page

Ground Water Level Data

vater first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 5.5x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-5

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1SS)

Pineville, LA

Location: N 490,520, E 1,667,520
Surface Elevation: 350.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Firm brown SILTY SAND (SM)
	45		No (P)		32						
			No (P)								
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-6

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1RR)

)
.neville, LA

Location: N 490,610, E 1,667,240
Surface Elevation: 385.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Firm tan CLAYEY SAND (SC)
			No (P)		5						
	5		No (P)		9		24	8			-- w/iron ore at 4 to 8 ft.
			No (P)		11						
			No (P)		13						Medium to stiff tan, gray, and brown SANDY & SILTY CLAY (CL)
	10		No (P)		14						
			No (P)	1.88	17	110	29	12			
	15		No (P)		18				k1		
			No (P)		25						
			No (P)		20				k2		
	20										
			No (P)		21						
	25										
			No (P)		23						
	30										
			No (P)		28						-- very stiff below 33 ft.
	35										
			No (P)	2.46	17	106	40	21			
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 3.0x10(-7)
k2 = 3.0x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-6

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1RR)

...ville, LA

Location: N 490,610, E 1,667,240
Surface Elevation: 385.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Sample	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)								Very stiff gray SILTY CLAY (CL)
	50		No (P)		19						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-7

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 06/28/84
Company: Southwestern Laboratories (B-1R)

Sheet 1 of 2

)
.ville, LA

Location: N 490,620, E 1,668,180
Surface Elevation: 337.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Loose tan SILTY SAND (SM)
			7 b/f 3-3-4		4		17	NP			
	5		8 b/f 5-4-4		10						-- w/clay pockets at 4.5 to 6 ft.
			9 b/f 4-6-3		11						Loose to firm red CLAYEY SAND (SC)
	10		12 b/f 3-3-9		15		21	4	GS		
											Dense red CLAYEY SAND (SC)
	15		36 b/f 12-16-20		15						
											Dense to very dense red, brown, and tan SILTY SAND (SM)
	20		45 b/f 15-20-25		16		18	NP			
	25		50 b/10" 18-28-22		27						
	30		50 b/11" 25-27		29						
											Hard gray SILTY CLAY (CL) *
	35		45 b/f 12-18-26		23		37	18			
			47 b/f 15-30-27		23						
	40										

Continued Next Page

Ground Water Level Data

ater first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates dense at 33.5 to 35 ft. and 38.5 to40 ft.
NP: Non-plastic
GS: Particle Size Analysis
Sand = 73%, Silt = 10%, Clay = 17%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-7

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/28/84
Company: Southwestern Laboratories (B-1R)

...O
Pineville, LA

Location: N 490,620, E 1,688,180
Surface Elevation: 337.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/10" 22-28		20						Hard gray SILTY CLAY (CL) **
	50		50 b/9" 30-20		22		39	20			Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

** SWL indicates very dense at 43.5 to 45 ft. and 48.5 to 50 ft.

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-8

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-100)

Sheet 1 of 2

Pineville, LA

Location: N 490,715, E 1,667,900
Surface Elevation: 332.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm brown CLAYEY SAND (SC)
			No (P)								Firm brown & tan SILTY SAND (SM)
	5		No (P)						GS1		
			No (P)								
			No (P)								
	10		No (P)								
			No (P)								
	15		No (P)		23				GS2		
			No (P)								
▽			No (P)								
	20										
			No (P)								
	25										
			No (P)								
	30										
			No (P)						k		Very stiff gray SILTY CLAY (CL) *
	35										
			No (P)	2.89	16	110	40	21			
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates medium
GS: Particle Size Analysis
GS1: Sand = 90%
GS2: Sand = 96%
k: Permeability (cm/sec)
k = 3.5x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-8

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1QQ)

rineville, LA

Location: N 490,715, E 1,667,900
Surface Elevation: 332.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Gray SILTY CLAY (CL)
			No (P)								
	45										Boring completed at 45 ft.
	50										
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-9

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 06/26/84
Company: Southwestern Laboratories (B-1Q)

Pineville, LA

Location: N 490,810, E 1,667,610
Surface Elevation: 381.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
⊠			14 b/f 5-6-8		9						Firm red CLAYEY SAND (SC)
			No (P)	4.49	18	97					Hard to very stiff red, tan, and gray SANDY & SILTY CLAY (CL)
	5		No (P)	3.40	37	96					
			No (P)	3.39	21	110	44	24			
			No (P)	2.34	21	112					
	10										
			No (P)	3.44	18	115	37	18			
	15										
			No (P)		17	94					
	20										
			50 b/9" 30-20		12						Very dense white CLAYEY SAND (SC)
	25										
			50 b/9" 36-14		12						
	30										
			50 b/7" 44-6		11		23	6	GS1		
	35										
			50 b/6"		11						Very dense white SILTY SAND (SM)
	40										

Continued Next Page

Ground Water Level Data
free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes
GS: Particle Size Analysis
GS1: Sand = 87%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-9

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/26/84
Company: Southwestern Laboratories (B-10)

Pineville, LA

Location: N 490,810, E 1,667,610
Surface Elevation: 381.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/7" 40-10		6						Very dense white CLAYEY SILT (ML) w/clay pockets *
	50		50 b/6"		7				GS2		Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Silty Sand w/silt pockets
GS: Particle Size Analysis
GS2: Sand = 9%, Silt = 69%, Clay = 22%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-10

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1PP)

Pineville, LA

Location: N 490,900, E 1,667,340
Surface Elevation: 387.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Firm tan SILTY SAND (SM)
			No (P)		6						
	5		No (P)		18						Medium tan and gray SILTY CLAY (CL) w/sand
			No (P)		18		34	16			
			No (P)		19						
	10		No (P)		20						
			No (P)		21		32	14			
	15		No (P)		23						
			No (P)		23						Firm gray CLAYEY SAND (SC)
			No (P)		19						
	20										
			No (P)		19				k		Medium gray SILTY CLAY (CL) w/sand
	25										
			No (P)		21						Firm gray CLAYEY SAND (SC)
	30										
	35										
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 5.3x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-10

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1PP)

rineville, LA

Location: N 490,900, E 1,667,340
Surface Elevation: 387.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		22		18	NP	GS1		Firm gray SILTY SAND (SM)
	50		No (P)		14				GS2		Firm gray SAND (SP)
											Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS1: Sand = 60%
GS2: Sand = 100%

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-11

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1NN)

ECO
le, LA

Sheet 1 of 1

Location: N 490,820, E 1,668,580
Surface Elevation: 340.5

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm brown SILTY SAND (SM)
			No (P)		18				GS1		
	5		No (P)								Firm brown CLAYEY SAND (SC)
			No (P)								Firm brown SILTY SAND (SM)
▽			No (P)								Firm brown CLAYEY SAND (SC)
	10		No (P)						GS2		
			No (P)								
	15		No (P)								
			No (P)								
			No (P)								
	20										
			No (P)				47	27			Stiff gray SILTY CLAY (CL)
	25										
			No (P)								Gray SAND (SP)
	30										Boring completed at 30 ft.
	35										
	40										

Ground Water Level Data

ree water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS1: Sand = 81%
GS2: Sand = 75%

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-12

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1MM)

C
. neville, LA

Location: N 490,900, E 1,668,270
Surface Elevation: 340.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)	3.79	12	108					Very stiff to hard gray, tan, and brown SAND & SILTY CLAY (CL)
			No (P)		15		38	19	GS1		
	5		No (P)	4.99	17	114					
			No (P)		19						
			No (P)		19				k1		
	10		No (P)	0.74	19	106					Medium to stiff gray & brown SANDY CLAY (CL)
			No (P)		19				k2		
▽	15		No (P)		16						
			No (P)	1.02	19	102					
			No (P)		23						
	20										
			No (P)		23						Firm to dense brown SILTY SAND (SM)
	25										
			No (P)		21				GS2		
	30										
			No (P)		23						
	35										
			No (P)		20						Stiff gray SILTY CLAY (CL)
	40										

Continued Next Page

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS1: Sand = 7%, Silt = 53%, Clay = 40%
GS2: Sand = 92%
k: Permeability (cm/sec)
k1 = 2.22x10(-8)
k2 = 2.22x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-12

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1MM)

Pineville, LA

Location: N 490,900, E 1,668,270
Surface Elevation: 340.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45										Stiff gray SILTY CLAY (CL)
			No (P)		34		44	24	GS3		
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS3: Sand = 7%, Silt = 33%, Clay = 60%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-13

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1LL)

--CO
Pineville, LA

Sheet 1 of 2

Location: N 490,995, E 1,668,000
Surface Elevation: 338.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Medium to stiff tan SANDY CLAY (CL) w/iron ore at 0 to 2 ft.
			No (P)								
	5		No (P)								Dense tan CLAYEY SAND (SC) w/gravel
			No (P)								
			No (P)								
	10		No (P)								Firm brown SILTY SAND (SM)
			No (P)								
▽			No (P)		21				GS		
	15		No (P)								
			No (P)								
			No (P)								
	20										
			No (P)								
	25										
			No (P)						k1		Firm brown & gray CLAYEY SAND (SC)
	30										
			No (P)		26		23	6			
	35										
			No (P)								Firm gray SILTY SAND (SM)
	40										

Continued Next Page

Ground Water Level Data

se water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

GS: Particle Size Analysis
GS: Sand = 90%
k: Permeability (cm/sec)
k1 = 1.7x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-13

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1LL)

...ansfield, LA

Location: N 490,995, E 1,668,000
Surface Elevation: 338.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)						k2		Medium to stiff gray CLAY (CH) w/silt seams
	50		No (P)	1.69	23	106					Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k2 = 1.0x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-15

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1JJ)

J
rineville, LA

Location: N 491,180, E 1,667,430
Surface Elevation: 367.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		6						Firm gray & brown SILTY SAND (SM)
			No (P)		4						
	5		No (P)		7						
			No (P)		21		20	NP			
			No (P)		24						
	10		No (P)		16		19	NP	GS		
			No (P)		31						
	15		No (P)		26						
			No (P)		27						
			No (P)		24						
	20										
▽			No (P)		22						
	25										
			No (P)		24						
	30										
			No (P)		21						
	35										
			No (P)		24						
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
GS: Particle Size Analysis
GS: Sand = 81%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-15

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1JJ)

, ineville, LA

Location: N 491,180, E 1,667,430
Surface Elevation: 367.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Firm gray & brown SILTY SAND (SM)
	45		No (P)		22						
			No (P)		23						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-18

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 06/27/84
Company: Southwestern Laboratories (B-1N)

)
[illegible]ville, LA

Sheet 1 of 2

Location: N 491,400, E 1,667,530
Surface Elevation: 358.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		12		25	8			Firm tan & gray SILTY CLAY (CL) w/sand *
			No (P)		17						
	5		No (P)		7		26	9	k		
			35 b/f 11-15-20		11						Hard tan SILTY CLAY (CL) w/silt lenses & sand **
	10		No (P)		17		27	10			
			39 b/f 10-17-22		18						Dense white CLAYEY SAND (SC) w/silt
	15										
			29 b/f 5-12-17		21						
	20										
			24 b/f 7-12-17								
	25										
			35 b/f 15-10-19		27		38	19			Hard tan SANDY CLAY (CL)
	30										
			38 b/f 14-17-21		9						Dense tan SILTY SAND (SM)
	35										
▽			50 b/9" 30-20		63						Lignite
	40										

Continued Next Page

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Clayey Silty Sand at 0 to 6 ft.
** SWL indicates clayey sandy silt lenses
k: Permeability (cm/sec)
k = 7.4x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-18

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/27/84
Company: Southwestern Laboratories (B-1N)

rineville, LA

Location: N 491,400, E 1,667,530
Surface Elevation: 358.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/10" 17-27-23		30						Hard black lignitic CLAY (CH)
	50		50 b/9" 20-29-21		30						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-19

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1HH)

,O
Pineville, LA

Location: N 491,485, E 1,667,290
Surface Elevation: 363.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		15						Medium to stiff tan & gray SANDY CLAY (CL)
			No (P)		15						
	5		No (P)		16		42	22			
			No (P)		18						
			No (P)		15						
	10		No (P)		15						
			No (P)		15						
	15		No (P)		15		23	6			Firm to dense gray CLAYEY SILT (CL-ML) w/sand
			No (P)		15						
			No (P)		15						
▽	20										
			No (P)		17						
	25										
			No (P)		17		25	8			
	30										
			No (P)		17						
	35										
			No (P)		16						
	40										

Continued Next Page

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-19

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1HH)

...sville, LA

Location: N 491,485, E 1,667,290
Surface Elevation: 363.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Dense gray CLAYEY SILT (CL-ML) w/sand
			No (P)		17		23	7			
	45										
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-20

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1GG)

:O
.ieville, LA

Location: N 491,400, E 1,668,770
Surface Elevation: 324.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm tan SILTY SAND (SM) w/organic matter at 0 to 2 ft.
			No (P)								
	5		No (P)	3.69	20	98	47	26			Very stiff to stiff gray SILTY CLAY (CL)
			No (P)								
			No (P)						k1		
	10		No (P)	2.0	21	93					
			No (P)	0.88	26	97					Medium to stiff gray SILTY CLAY (CL)
	15		No (P)								
			No (P)						k2		-- w/iron ore at 16 to 18 ft.
			No (P)	1.15	24	98	53	31			Stiff gray CLAY (CH) w/iron ore
	20										
			No (P)						k3		
	25										Dense gray CLAYEY SAND (SC)
	30										
	35										
	40										

Continued Next Page

Ground Water Level Data

e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.6x10(-8)
k2 = 7.5x10(-9)
k3 = 1.6x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-20

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1GG)

O
rineville, LA

Location: N 491,400, E 1,668,770
Surface Elevation: 324.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Dense gray CLAYEY SAND (SC)
			No (P)								
	45										Boring completed at 45 ft.
	50										
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
a water first encountered		
	Boring Abandonment Method	

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-21

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1FF)

[illegible]O
[illegible]lle, LA

Sheet 1 of 2

Location: N 491,590, E 1,668,200
Surface Elevation: 329.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Firm brown SILTY SAND (SM)
			No (P)		3		18	NP			
	5		No (P)	1.31	16	109					Stiff to very stiff brown & gray SANDY CLAY (CL)
			No (P)		15						
			No (P)		13				k1		
	10		No (P)	3.66	9	116	29	11			
			No (P)		23		24	7			Dense to very dense brown CLAYEY SAND (SC)
	15		No (P)	3.68	10	120					
			No (P)		26						
			No (P)	1.32	20	102	44	24			Stiff gray & brown SILTY CLAY (CL)
	20										
			No (P)		26						
	25										
			No (P)		29				k2		Stiff gray CLAY (CH) w/lignite
	30										Lignite
			No (P)								
	35										
			No (P)		24						Firm gray SILTY SAND (SM)
	40										

Continued Next Page

Ground Water Level Data

[illegible]e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
k: Permeability (cm/sec)
k1 = 1.9x10(-7)
k2 = 1.5x10(-7)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-21

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1FF)

.ville, LA

Location: N 491,590, E 1,668,200
Surface Elevation: 329.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Firm to loose gray SILTY SAND (SM)
	45		No (P)		20						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-22

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1EE)

rineville, LA

Location: N 491,690, E 1,667,620
Surface Elevation: 327.5

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		6						Firm brown & tan SILTY SAND (SM)
			No (P)		21		17	NP			
	5		No (P)	0.25	15	103					Brown CLAYEY SAND (SC)
			No (P)		16						
			No (P)		20				k1		Firm gray & tan SILTY & SANDY CLAY (CL)
	10		No (P)	0.75	20	105	32	14			
			No (P)								Lignite
	15		No (P)								
			No (P)								
			No (P)		23						Medium gray SILTY CLAY (CL)
	20										
			No (P)		26				k2		
▽	25										
			No (P)		38						
	30										
			No (P)								
	35										
			No (P)		17						
	40										

Continued Next Page

Ground Water Level Data

. water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
k: Permeability (cm/sec)
k1 = 5.4x10(-8)
k2 = 2.1x10(-6)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-22

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1EE)

)
le, LA

Location: N 491,690, E 1,667,620
Surface Elevation: 327.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Medium gray SILTY CLAY (CL)
	45		No (P)		20						
			No (P)		25						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-23

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 04/03/83
Company: McCelland Engineers
(B-1D)

ECO
lle, LA

Location: N 491,667, E 1,668,435.5
Surface Elevation: 291.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Brown SILTY Fine SAND (SM) w/organic matter
▽			No (P)		17				GS		– w/coarse to fine sand below 2 ft.
			1.2 (P)								
	5										
			1.25 (P)								Firm gray & tan SANDY CLAY (CL) w/sand pockets
			No (P)	0.75	30	91	49	27			– w/sand seams below 6 ft.
			2.6 (P)		25	95					
	10										
			No (P)	6.5t	22	100					Hard gray CLAY (CH) w/shale & silt seams
	15										
			2.6 (P)		22	99	86	59			
	20										
✳			2.6 (P)								
	25										
	30										
			2.6 (P)								
	35										
			2.6 (P)								
			2.6 (P)								
	40										

Continued Next Page

Ground Water Level Data

✳ Borehole caved at 24.0 ft.

ree water first encountered

Boring Advancement Method

Boring Abandonment Method

Borehole grouted upon completion

Notes

GS: Particle Size Analysis
Sand = 87%
k: Permeability (cm/sec)
k = 4.1x10(-6)
t: Unconsolidated, Undrained Triaxial Compression Test
Confining pressure unknown

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-23

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 04/03/83
Company: McCelland Engineers (B-1D)

:O
..neville, LA

Sheet 2 of 2

Location: N 491,667, E 1,668,435.5
Surface Elevation: 291.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45										Hard gray CLAY (CH)
			2.6 (P)								
											Boring completed at 47 ft.
	50										
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
✱ Borehole caved at 24.0 ft.		
e water first encountered		
	Boring Abandonment Method	
	Borehole grouted upon completion	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-25

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-1CC)

O
ville, LA

Location: N 491,970, E 1,668,005
Surface Elevation: 354.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		4		22	6			Firm brown, tan, and gray CLAYEY SAND (SC)
			No (P)		5						
	5		No (P)		11		24	7			
			No (P)		12						
			No (P)		15						
	10		No (P)		10						
			No (P)		14						
	15		No (P)		14				k		
			No (P)		26						Firm brown SILTY SAND (SM)
			No (P)		30						
	20										
			No (P)		27						
▽	25										
			No (P)		29		20	NP			
	30										
			No (P)								Lignite
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 4.3x10(-6)
NP: Non-plastic

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-25

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-1CC)

, ville, LA

Location: N 491,970, E 1,668,005
Surface Elevation: 354.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL) w/lenses
	45		No (P)		20		41	22			
			No (P)		19						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-26

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 06/27/84
Company: Southwestern Laboratories (B-1L)

)
rineville, LA

Location: N 492,100, E 1,667,560
Surface Elevation: 367.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		3						Firm brown SANDY SILT (ML)
			No (P)		9						Firm red CLAYEY SILT (CL-ML)
	5		No (P)		14						Firm red SILTY CLAY (CL) w/sand *
			No (P)		15		25	8	k		
			50 b/11"								Very dense red CLAYEY SAND (SC)
	10		17-30-20		18						
			21 b/f		15		23	6	GS1		Firm tan & white CLAYEY SAND (SC)
	15		6-10-11								
			18 b/f		17						
	20		6-7-11								
			21 b/f		18						
	25		8-9-12								
			50 b/9"		16						Very dense tan CLAYEY SAND (SC)
	30		14-30-20								
			50 b/10"		18		20	NP	GS2		-- w/clay pockets **
	35		15-25-25								
			50 b/6"		7						Very dense red SILTY SAND (SM)
	40										

Continued Next Page

Ground Water Level Data

ree water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Clayey Silty Sand
** SWL indicates Silty Sand w/clay pockets
k: Permeability (cm/sec)
k = 2.5x10(-5)
GS: Particle Size Analysis
GS1: Sand = 80%
GS2: Sand = 69%, Silt = 9%, Clay = 22%
NP: Non-plastic

Strata Boundaries May Not Be Exact

Data computerized by
Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-26

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/27/84
Company: Southwestern Laboratories (B-1L)

ille, LA

Location: N 492,100, E 1,667,560
Surface Elevation: 367.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Sample	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/6"		9						Very dense red SILTY SAND (SM)
	50		50 b/5"		7						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
☒ No free water encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-27

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-1BB)

-CO
-neville, LA

Location: N 491,980, E 1,668,980
Surface Elevation: 330.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		7						Firm brown SILTY SAND (SM) w/gravel
			No (P)		3						
	5		No (P)		12		24	7			Firm brown CLAYEY SAND (SC) w/gravel
			No (P)		15						Medium brown, tan, and gray SANDY CLAY (CL)
			No (P)		17						Stiff to very stiff tan, gray, and brown SILTY & SANDY CLAY (CL)
	10		No (P)	1.64	26	99					
▽			No (P)		25				k1		
	15		No (P)	1.75	24	104					
			No (P)	2.43	23	107					-- w/iron ore at 16 to 18 ft.
			No (P)	1.99	25	105					
	20										
			No (P)		26				k2		
	25										
			No (P)		24						
	30										
			No (P)		25		44	24			
	35										
			No (P)		26						
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 6.6x10(-9)
k2 = 9.5x10(-9)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-27

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (B-188)

, neville, LA

Location: N 491,980, E 1,668,980
Surface Elevation: 330.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL)
			No (P)		39						
	45										
			No (P)		38		25	8			– very silty w/sand *
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		* SWL indicates dense gray Clayey Sandy Silt
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-31

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1K)

'O
.ville, LA

Sheet 1 of 2

Location: N 492,260, E 1,669,080
Surface Elevation: 347.2

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)								Firm tan SILTY SAND (SM)
			No (P)		3						
	5		30 b/f 9-13-17		15		27	11	GS		Hard to very stiff tan & gray SILTY CLAY (CL) *
			25 b/f 7-11-14		15						
	10		21 b/f		29						
			No (P)	1.24	29	96	34	16	k1		Stiff to medium tan & gray SILTY & SANDY CLAY (CL)
	15										
			No (P)	0.99	25	105					
	20										
			No (P)		23						
	25										
			No (P)	1.75	24	100	41	21	k2		
	30										
			50 b/10" 25-25-50		24						Hard tan & gray SILTY CLAY (CL)
	35										
			50 b/9" 27-23		24						
	40										

Continued Next Page

Ground Water Level Data

☒ No free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL indicates Clayey Silty Sand at 4.5 to 6 ft. and 6.5 to 8 ft.
GS: Particle Size Analysis
GS: Sand = 32%, Silt = 49%, Clay = 19%
k: Permeability (cm/sec)
k1 = 7.0x10(-5)
k2 = 0.9x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-31

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1K)

...ille, LA

Location: N 492,260, E 1,669,080
Surface Elevation: 347.2

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard tan & gray SILTY CLAY (CL)
	45		50 b/10" 15-25		23		30	12			
			50 b/9" 17-33		35						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
No free water encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-32

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 1

File: 94-1157
Date: 06/28/84
Company: Southwestern Laboratories (B-1J)

O
...ville, LA

Location: N 492,440, E 1,668,480
Surface Elevation: 278.2

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		4						Tan SANDY SILT (ML)
			9 b/f 5-5-4		4		19	NP	GS1		Loose tan & red SILTY SAND (SM)
	5		No (P)	0.74	8	122	18	NP			-- w/clay pockets at 4 to 6 ft.
			No (P)	1.58	37	83					Stiff gray SILTY CLAY (CL)
			No (P)	4.03	24	99	51	30	k		Hard gray CLAY (CH)
	10										
			50 b/8" 16-30-20		26						Hard gray SANDY & SILTY CLAY (CL)
	15										
			50 b/9" 19-29-23		26		32	14	GS2		
	20										
			50 b/8" 20-30		20						
	25										
			50 b/8" 35-15		21		46	26			
	30										
			50 b/7" 40-10		22						
	35										Boring completed at 35 ft.
	40										

Ground Water Level Data

☒ No free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
GS: Particle Size Analysis
GS1: Sand = 72%
GS2: Sand = 25%, Silt = 65%, Clay = 10%
k: Permeability (cm/sec)
k = 1.2x10(-5)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-33

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1Z)

cCO
Pineville, LA

Location: N 492,535, E 1,668,190
Surface Elevation: 304.3

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		26						Firm gray CLAYEY SAND (SC)
			No (P)		28						
	5		No (P)		25						
			No (P)		26						Medium to stiff brown & gray SANDY & SILTY CLAY (CL)
			No (P)		16		29	12			
	10		No (P)	0.55	33	84					-- soft at 10 to 12 ft.
			No (P)	0.36	30	86					
	15		No (P)	0.66	30	88	27	10			
			No (P)		18						
			No (P)	0.76	29	93					
	20										
			No (P)	1.02	28	94					
	25										
			No (P)		18		31	14			
	30										
			No (P)		14				k		
	35										
	40										

Continued Next Page

Ground Water Level Data

.e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 4.87x10(-6)

Data computerized by
Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-33

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1Z)

)
ville, LA

Sheet 2 of 2

Location: N 492,535, E 1,668,190
Surface Elevation: 304.3

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff to medium gray SILTY CLAY (CL)
	45		No (P)		17		35	17			
			No (P)		33						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-34

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 06/28/94
Company: Southwestern Laboratories (B-1H)

CLECO
Pineville, LA

Sheet 1 of 2

Location: N 492,630, E 1,667,910
Surface Elevation: 359.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		4						Very dense to dense tan & red SILTY SAND (SM) & CLAYEY SAND (SC)
			No (P)	3.87	18	106					
	5		No (P)	3.68	11	110	20	3	k		
			No (P)	1.82	9	105					
			50 b/10"		12						
	10		25-25								
			37 b/f		14						– w/gray color change at 13.5 ft.
	15		15-20-17								
			42 b/f		16						
	20		20-19-23								
			26 b/f		14				GS		Firm to dense gray CLAYEY SAND (SC) & SILTY SAND (SM)
	25		13-13-13								
			31 b/f		14						
	30		17-15-16								
			18 b/f		18						– w/white color change at 33.5 ft.
	35		8-10-8								
			21 b/f		19						
	40										

Continued Next Page

Ground Water Level Data

▽ No free water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 1.2x10(-6)
GS: Particle Size Analysis
GS: Sand = 62%, Silt = 13%, Clay = 25%

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-34

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/28/94
Company: Southwestern Laboratories (B-1H)

O
:ville, LA

Location: N 492,630, E 1,667,910
Surface Elevation: 359.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			10-12-9								Firm gray CLAYEY SAND (SC)
	45		25 b/f 8-10-15		21		25	8			
			17 b/f 12-8-9		19						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
☒ No free water encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-35

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1Y)

,O
, neville, LA

Location: N 492,460, E 1,669,440
Surface Elevation: 363.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm brown SILTY SAND (SM)
			No (P)								
	5		No (P)		11		31	12	k1		Medium tan & brown SILTY & SANDY CLAY (CL)
			No (P)								
			No (P)								Dense tan & gray CLAYEY SAND (SC)
	10		No (P)		14		24	7			
			No (P)		18		18	NP			Firm brown & gray SILTY SAND (SM)
▽	15		No (P)						k2		Firm to loose gray CLAYEY SAND (SC)
			No (P)	0.50	21	101					
			No (P)						k3		Medium to stiff gray & brown SILTY CLAY (CL)
	20										
			No (P)								
	25										
			No (P)								
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 2.14x10(-7)
k2 = 2.85x10(-7)
k3 = 1.34x10(-6)
NP: Non-plastic

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-35

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1Y)

...ieville, LA

Location: N 492,460, E 1,869,440
Surface Elevation: 363.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL)
	45										
			No (P)		20		40	20			
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-36

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1X)

,O
...ieville, LA

Location: N 492,550, E 1,669,180
Surface Elevation: 356.1

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm white SILTY SAND (SM) w/organic matter
			No (P)								Firm to dense red, tan, and gray CLAYEY SAND (SC)
	5		No (P)								
			No (P)								
			No (P)						k1		
	10		No (P)								
			No (P)								
	15		No (P)								
▽			No (P)								Stiff to medium brown & gray SILTY CLAY (CL)
			No (P)								
	20										
			No (P)								
	25										
			No (P)						k2		-- w/sand at 28 to 30 ft.
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

...e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 8.04x10(-8)
k2 = 2.23x10(-8)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-36

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1X)

)
;ville, LA

Sheet 2 of 2

Location: N 492,550, E 1,669,180
Surface Elevation: 356.1

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL)
	45		No (P)						k3		
			No (P)								
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		k: Permeability (cm/sec) k3 = 2.62x10(-8)
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-37

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1W)

CO
Pineville, LA

Location: N 492,830, E 1,668,295
Surface Elevation: 312.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Loose to firm brown SILTY SAND (SM)
			No (P)								
	5		No (P)								Firm brown CLAYEY SAND (SC)
			No (P)								
			No (P)						k		
	10		No (P)								
			No (P)								Medium brown & gray SILTY CLAY (CL)
	15		No (P)								
			No (P)								
			No (P)								
	20										
			No (P)								Medium brown & gray CLAY (CH) w/silt lenses
	25										
▽			No (P)								Medium gray SILTY CLAY (CL)
	30										
			No (P)								
	35										
	40										

Continued Next Page

Ground Water Level Data

.e water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes
k: Permeability (cm/sec)
k = 2.38x10(-7)

Data computerized by

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-37

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1W)

:O
rineville, LA

Location: N 492,830, E 1,668,295
Surface Elevation: 312.5

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Medium gray SANDY CLAY (CL)
	45		No (P)								
	50		No (P)								Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-38

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1V)

.O
rineville, LA

Location: N 492,920, E 1,668,005
Surface Elevation: 343.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Very dense brown & gray CLAYEY SAND (SC)
			No (P)						k1		
	5		No (P)								
			No (P)								
			No (P)								
	10		No (P)								
			No (P)								
			No (P)								
Z	15		No (P)								
			No (P)						k2		
			No (P)								
	20										
			No (P)								Stiff to medium brown & gray SILTY CLAY
	25										
			No (P)								
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data

ater first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.04x10(-6)
k2 = 9.0x10(-7)

ata computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-38

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1V)

CO
Pineville, LA

Location: N 492,920, E 1,668,005
Surface Elevation: 343.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45										Medium gray SILTY CLAY (CL)
			No (P)								
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-39

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1F)

.0
Pineville, LA

Location: N 492,830, E 1,669,280
Surface Elevation: 327.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)	3.08	22	94					Very stiff to hard brown, tan, and gray SILTY & SANDY CLAY (CL) w/organic matter at 0 to 2 ft.
			No (P)	5.12	19	107	43	23			
	5		No (P)	5.22	17	109					
			38 b/f 8-14-24		13						
			36 b/f 8-14-22		18						
	10										
			34 b/f 9-13-21		21						
	15										
			30 b/f 9-11-19		20		34	16			
	20										
			No (P)	1.81	24	100					– stiff at 23 to 25 ft.
	25										
			No (P)		24				k		
	30										
			50 b/f 10-20-30		24						
	35										
			50 b/10.5" 13-24-26		25		31	12			
	40										

Continued Next Page

Ground Water Level Data

water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 1.7x10(-8)

Data computerized by

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-39

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1F)

:O
rineville, LA

Location: N 492,830, E 1,669,280
Surface Elevation: 327.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard gray SILTY CLAY (CL)
	45		50 b/10" 15-20-30		26						
	50		50 b/10" 17-33		24						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
▽ water encountered		
	Boring Abandonment Method	

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-40

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (B-1U)

:O
Pineville, LA

Location: N 493,020, E 1,868,680
Surface Elevation: 268.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Firm tan SILTY SAND (SM)
			No (P)								Firm gray CLAYEY SAND (SC)
	5		No (P)								
			No (P)								
			No (P)								
	10		No (P)						k		
			No (P)								
	15		No (P)								Stiff gray CLAY (CH) w/lignite
			No (P)								Stiff tan & gray SILTY & SANDY CLAY (CL)
Z	20										
			No (P)								
	25										
			No (P)								
	30										
			No (P)								
	35										
			No (P)								
	40										

Continued Next Page

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		k: Permeability (cm/sec) k = 2.87x10(-8)
	Boring Abandonment Method	

ata computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-40

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories (8-1U)

CO
Pineville, LA

Location: N 493,020, E 1,688,680
Surface Elevation: 268.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Stiff gray SILTY CLAY (CL)
	45		No (P)								
	50		No (P)								Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-42

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1G)

CO
Pineville, LA

Location: N 492,640, E 1,669,860
Surface Elevation: 348.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			No (P)		10						Dense tan & gray CLAYEY SAND (SC) & SILTY SAND (SM)
			38 b/f 13-13-25		11		23	6			
	5		37 b/f 11-14-23		11						
			45 b/f 8-19-26		8						
			39 b/f 9-16-23		9						
	10										
			45 b/f 12-21-24		7		18	NP	GS1		– w/white color starting at 13.5 ft.
	15										
			36 b/f 10-17-19		7						
	20										
			25 b/f 6-9-16		24						
	25										
			25 b/f 9-9-15		22						– w/clay pockets at 28 to 30 ft.
	30										
			40 b/f 5-12-28		28		28	11	GS2		Hard SILTY CLAY (CL)
	35										
			38 b/f 9-13-25		26						
	40										

Continued Next Page

Ground Water Level Data

▽ water encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
GS: Particle Size Analysis
GS1: Sand = 81%
GS2: Sand = 43%, Silt = 42%, Clay = 15%

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-42

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 06/29/84
Company: Southwestern Laboratories (B-1G)

.CO
rineville, LA

Location: N 492,640, E 1,669,860
Surface Elevation: 348.9

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard SILTY CLAY (CL)
	45		50 b/f 16-34		25		43	23			
	50		50 b/11" 14-25-25		24						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
▽ ...se water encountered		
	Boring Abandonment Method	

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-44

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories
(B-1T)

20
rineville, LA

Location: N 492,980, E 1,669,610
Surface Elevation: 309.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		10						Firm brown SILTY SAND (SM)
			No (P)		12		19	NP			
	5		No (P)		7						
			No (P)		17						Dense tan & gray CLAYEY SAND (SC)
			No (P)		13				k1		
	10		No (P)		10		24	6			
			No (P)		16						
	15		No (P)	4.91	15	116					Hard gray SANDY CLAY (CL)
			No (P)	1.00	20	102					Medium gray SILTY CLAY (CL)
			No (P)		18		40	21	k2		
	20										
			No (P)	3.69	17	103					Very stiff gray SILTY CLAY (CL)
	25										
			No (P)		15						Medium gray SILTY CLAY (CL)
	30										
			No (P)	0.95	21	98					
	35										
			No (P)		27						
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

NP: Non-plastic
k: Permeability (cm/sec)
k1 = 1.34x10(-8)
k2 = 9.7x10(-9)

Data computerized by

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-44

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/22/84
Company: Southwestern Laboratories
(B-1T)

CO
Pineville, LA

Location: N 492,980, E 1,669,610
Surface Elevation: 309.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Medium gray SILTY CLAY (CL)
	45		No (P)		22		44	24			
			No (P)								
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-45

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 05/15/85
Company: Southwestern Laboratories (DB-6)

CLECO
Pineville, LA

Location: N 493,555, E 1,669,540
Surface Elevation: 272.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		29						Medium to stiff brown & gray SILTY CLAY (CL)
			No (P)		28						
	5		No (P)		27		47	24			
			No (P)	0.6	25	85					
			No (P)		26						
	10										
▽			No (P)		27	86					
			No (P)		26		47	25			
	15		No (P)		25				k		Very stiff gray SILTY CLAY (CL) w/sand traces
			No (P)	3.01	26	82					
			No (P)		24		56	33			Very stiff gray CLAY (CH)
	20										
			No (P)	2.98	30	78					
	25										
			No (P)		27						Very stiff to hard gray SANDY CLAY (CL) w/silt traces
	30										
			No (P)		25						
	35										
			No (P)		26						
	40										

Continued Next Page

Ground Water Level Data

Free water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k = 1.3x10(-6)

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-45

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/15/85
Company: Southwestern Laboratories (DB-6)

CLECO
Pineville, LA

Sheet 2 of 2

Location: N 493,555, E 1,669,540
Surface Elevation: 272.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)								Hard gray SANDY CLAY (CL) w/silt traces
	50		50 b/8"		25						*
											Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

ree water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

* SWL does not show symbol for standard penetration test

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-46

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-7)

CLECO
Pineville, LA

Sheet 1 of 2

Location: N 493,740, E 1,669,625
Surface Elevation: 273.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		27						Medium brown, red, and gray SANDY CLAY (CL)
			No (P)		31		40	22			Stiff to very stiff brown & gray SILTY and SANDY CLAY (CL)
	5		No (P)	1.37	30	87					
			No (P)	2.3	28	84	40	22			
			No (P)		27		49	27			
	10		No (P)		24						
▽			No (P)		24						
	15		No (P)		26						
			No (P)		24						
	20		No (P)		26						Very stiff gray CLAY (CH) w/silt lenses
	25		No (P)		26		57	33			
	30		No (P)		33						-- w/lignite lenses at 28 to 30 ft.
	35		No (P)		41						-- w/lignite lenses at 33 to 35 ft.
	40		No (P)		24		36	17			Hard gray SILTY CLAY (CL) w/sand traces

Continued Next Page

Ground Water Level Data

.ee water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-46

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-7)

CLECO
Pineville, LA

Sheet 2 of 2

Location: N 493,740, E 1,669,625
Surface Elevation: 273.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		29						Dense gray CLAYEY SAND (SC) w/silt traces
	50		No (P)		27						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
Free water first encountered		
	Boring Abandonment Method	

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-48

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-9)

CLECO
Pineville, LA

Location: N 493,890, E 1,669,305
Surface Elevation: 261.2

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		27						Medium brown & gray SILTY CLAY (CL) w/sand traces
			No (P)		24		38	19	k1		
	5		No (P)	0.83	28	84					
			No (P)		29						Very stiff brown & gray SILTY CLAY (CL)
▽			No (P)		27		45	24	k2		
	10		No (P)		23	84					
			No (P)		29						
	15		No (P)		33		66	41			Very stiff brown & gray CLAY (CH)
			No (P)	1.7	34	80			k3		
			No (P)		29						-- w/lignite at 18 to 20 ft.
	20										
			No (P)		24	83					Stiff to very stiff gray SILTY CLAY (CL) w/sand traces
	25										
			No (P)		24						
	30										
			No (P)		30						
	35										
			No (P)		26						
	40										

Continued Next Page

Ground Water Level Data

Free water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.2x10(-8)
k2 = 1.2x10(-7)
k3 = 7.9x10(-9)

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-48

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-9)

CLECO
Pineville, LA

Location: N 493,890, E 1,669,305
Surface Elevation: 261.2

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		25						Very stiff to hard gray SILTY CLAY (CL) w/sand traces
	50		50 b/7"		26						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
Free water first encountered		
	Boring Abandonment Method	

:LECO Dolet Hills
'ower Plant
Mansfield, LA

LOG OF SOIL BORING C-49

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-5)

:O
'ineville, LA

Sheet 1 of 2

Location: N 494,040, E 1,1669,250
Surface Elevation: 253.0

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		7						Dense brown SILTY SAND (SM)
			No (P)	2.16	14	111					Very dense brown CLAYEY SAND (SC)
	5		No (P)		11		28	11			Stiff to very stiff brown, tan, and gray SANDY & SILTY CLAY (CL)
			No (P)		12						
			No (P)		13				k1		
Z	10		No (P)	3.61	14	117					
			No (P)		19		33	15			
	15		No (P)		22						
			No (P)		25				k2		
			No (P)	2.02	23	102					
	20										
			No (P)		27		31	13			
	25										
			No (P)		24						
	30										
			No (P)		25				k3		
	35										
			No (P)	4.18	24	100					Hard gray SILTY CLAY (CL)
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.3x10(-7)
k2 = 2.0x10(-5)
k3 = 1.5x10(-6)

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-49

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-5)

CO
Pineville, LA

Sheet 2 of 2

Location: N 494,040, E 1,1669,250
Surface Elevation: 253.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Hard gray SILTY CLAY (CL)
	45		No (P)		25		48	28			
			No (P)		25				k4		
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

s water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k4 = 5.5x10(-7)

Stratum Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-50

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 05/16/85
Company: Southwestern Laboratories (DB-10)

rinoville, LA

Location: N 493,920, E 1,669,710
Surface Elevation: 280.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		21						Medium brown & gray SILTY CLAY (CL) w/sand traces
			No (P)	0.96	15	99	22	3	k1		Firm brown & gray CLAYEY SAND (SC)
	5		No (P)		15						
			No (P)		12						
			No (P)		11		31	10			Hard brown & gray SILTY CLAY (CL) w/sand traces
	10		No (P)		10						
▽			No (P)		29						Hard to very stiff brown & gray CLAY (CH) w/lignite
	15		No (P)		29		67	45	k2		-- medium at 16 to 20 ft.
			No (P)		40				k3		
			No (P)		28						
	20										
			No (P)		26	83					Medium to stiff gray SILTY CLAY (CL) w/sand traces
	25										
			No (P)		25	87					
	30										
			No (P)		29						Dense to very dense gray SILTY SAND (SM)
	35										
			50 b/8"		25						
	40										

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.9x10(-7)
k2 = 4.8x10(-7)
k3 = 4.2x10(-8)

Strata Boundaries May Not Be Exact

:LECO Dolet Hills
'ower Plant
Mansfield, LA

LOG OF SOIL BORING C-50

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157.
Date: 05/16/85
Company: Southwestern Laboratories (DB-10)

O
...eville, LA

FIELD DATA				LABORATORY DATA							
Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/7.5"		25						Very dense gray SILTY SAND (SM)
	50		50 b/7"		26						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Location: N 493,920, E 1,669,710
Surface Elevation: 280.8

Ground Water Level Data

water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

Data summarized by

Strata Boundaries May Not Be Exact

:LECO Dolet Hills
'ower Plant
Mans'ield, LA

LOG OF SOIL BORING C-52

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-12)

.:O
Pineville, LA

Sheet 1 of 2

Location: N 494,070, E 1,669,390
Surface Elevation: 254.9

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
*			No (P)	0.94	19	94					Medium to soft brown & tan SILTY CLAY (CL)
			No (P)		22				k1		
	5		No (P)	0.48	17	99	24	4			Firm tan & brown CLAYEY SAND (SC) w/silt traces
			No (P)		17	94					
			No (P)		19				k2		Medium brown, tan, and gray SILTY CLAY (CL) w/silt pockets
	10		No (P)	0.70	28	79					
			No (P)		26		31	13			
	15		No (P)		26				k3		
			No (P)	0.95	25	84	28	9			
	20										
			No (P)		26	83	39	17			Very stiff gray SILTY CLAY (CL) w/sand traces
	25										
			No (P)		24						
	30										
			No (P)		30						
	35										
			No (P)		30						
	40										

Continued Next Page

'ound Water Level Data
.ree water encountered;
'ing caved in at 2 ft.

Boring Advancement Method

Boring Abandonment Method

Notes
k: Permeability (cm/sec)
k1 = 3.2x10(-8)
k2 = 1.2x10(-7)
k3 = 2.5x10(-6)

Strata Boundaries May Not Be Exact

LECO Dolet Hills
ower Plant
lansfield, LA

LOG OF SOIL BORING C-52

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-12)

O
ineville, LA

Sheet 2 of 2

Location: N 494,070, E 1,669,390
Surface Elevation: 254.9

FIELD DATA				LABORATORY DATA							
Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Very stiff gray SILTY CLAY (CL) w/sand traces
	45		No (P)		24						
			No (P)		24						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

* ...e water encountered;
...g caved in at 2 ft.

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data summarized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-53

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 05/10/85
Company: Southwestern Laboratories (DB-13)

...ville, LA

Location: N 494,105, E 1,669,800
Surface Elevation: 266.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
*			No (P)		13		23	5			Firm brown CLAYEY SAND (SC)
			No (P)	0.77	16	93					Medium brown SILTY CLAY (CL) w/sand traces
	5		No (P)		13						Firm brown CLAYEY SAND (SC) w/silt traces
			No (P)	0.74	17	86	23	6			
			No (P)	0.6	16	92					
	10		No (P)		14						
			No (P)	0.48	18	91			k1		
	15		No (P)		25						Stiff brown & gray SILTY CLAY (CL) w/sand traces
			No (P)		29		35	14			
			No (P)		25				k2		
	20										
			No (P)	1.29	27	71	42	21			
	25										Hard gray SILTY and SANDY CLAY (CL)
	30		50 b/8"		27						
	35		50 b/7.5"		26		42	20			
	40		50 b/7"		27						

Continued Next Page

Ground Water Level Data

* No free water encountered;
...ng caved in at 1 ft.

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.9x10(-7)
k2 = 3.6x10(-7)

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-53

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/10/85
Company: Southwestern Laboratories (DB-13)

CO
ineville, LA

Sheet 2 of 2

Location: N 494,105, E 1,669,800
Surface Elevation: 268.6

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		50 b/6"		27						Hard gray SANDY CLAY (CL) w/silt traces
	50		50 b/6"		25						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

▼ ree water encountered;
ng caved in at 1 ft.

Boring Advancement Method

Boring Abandonment Method

Notes

Strata Boundaries May Not Be Exact

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-55

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-15)

neville, LA

Location: N 494,255, E 1,669,480
Surface Elevation: 263.8

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		16						Stiff to very stiff brown & gray SILTY CLAY (CL) w/sand traces
			No (P)	1.42	16	101	31	11			
	5		No (P)		22				k1		
			No (P)	3.2	21	90					
			No (P)		28		64	38			Very stiff gray CLAY (CH)
	10		No (P)		28						
			No (P)		26				k2		Dense brown CLAYEY SAND (SC) w/silt traces
Z			No (P)	1.73	30	80					Stiff brown & gray CLAY (CH)
	15		No (P)		29						
			No (P)		28		53	30			
	20										
			No (P)		22	92					Stiff gray SILTY CLAY (CL) w/sand traces
	25										
			No (P)		29		31	11			
	30										
			No (P)		24						
	35										
			No (P)		23						Hard gray SILTY CLAY (CL) w/sand traces
	40										

Continued Next Page

Ground Water Level Data

ater first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 2.4x10(-8)
k2 = 1.3x10(-6)

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-55

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 05/13/85
Company: Southwestern Laboratories (DB-15)

...neville, LA

Location: N 494,255, E 1,669,480
Surface Elevation: 263.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		23						Hard gray SILTY CLAY (CL) w/sand traces
	50		No (P)		23						Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered		
	Boring Abandonment Method	

Data computerized by Soil Testing Engineers, Inc.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-56

CLECO

Central Louisiana Electric Company, Inc.

Sheet 1 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-4)

:O
rineville, LA

Location: N 494,340, E 1,669,250
Surface Elevation: 248.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		2						Brown SILTY SAND (SM) w/organic matter
			No (P)		0						
	5		No (P)		7		17	NP			
			No (P)	2.03	10	106					Very stiff brown & gray SANDY & SILTY CLAY (CL)
			No (P)		19				k1		
▽	10		No (P)	3.43	16	104					
			No (P)		15						
	15		No (P)	2.10	25	99					
			No (P)		13						
			No (P)		15						
	20										
			No (P)		17		48	28			
	25										
			No (P)	3.11	23	99					
	30										
			No (P)		15						
	35										
			No (P)	1.22	14	110					Stiff gray CLAY (CH) w/silt lenses
	40										

Continued Next Page

Ground Water Level Data
water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes
NP: Non-plastic
k: Permeability (cm/sec)
k1 = 7.2x10(-7)

Data computerized by

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-56

CLECO

Central Louisiana Electric Company, Inc.

Sheet 2 of 2

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-4)

CO
...ieville, LA

Location: N 494,340, E 1,669,250
Surface Elevation: 248.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		17				k2		Stiff gray CLAY (CH) w/silt lenses
	50		No (P)		15		47	26			Stiff gray SILTY CLAY (CL)
											Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

› water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k2 = 3.2x10(-6)

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-57

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-3)

CO
Pineville, LA

Sheet 1 of 2

Location: N 494,640, E 1,669,250
Surface Elevation: 242.7

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Firm tan SILTY SAND (SM)
			No (P)		2						Dense brown & tan CLAYEY SAND (SC)
	5		No (P)		27						Very stiff brown, tan, and gray SANDY & SILTY CLAY (CL)
			No (P)		29						
▽			No (P)	2.7	26	94					
	10		No (P)		32						
			No (P)								Lignite
			No (P)								Very stiff brown & gray SILTY CLAY (CL)
	15		No (P)		28						
			No (P)								Lignite
			No (P)	2.49	16	101					Very stiff SILTY CLAY (CL) w/lignite
	20										
			No (P)		26						Very stiff gray CLAY (CH)
	25										
			No (P)		23		36	18			Very stiff gray SILTY CLAY (CL)
	30										
			No (P)		21				k1		
	35										Very dense CLAYEY SAND (SC)
			No (P)	3.49	14	110					
	40										

Continued Next Page

Ground Water Level Data

ıe water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes
k: Permeability (cm/sec)
k1 = 3.0x10(-7)

Strata Boundaries May Not Be Exact

Data computerized by

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-57

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories
(DB-3)

Sheet 2 of 2

CLECO
Pineville, LA

Location: N 494,640, E 1,669,250
Surface Elevation: 242.7

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)		28		25	8			Dense gray CLAYEY SAND (SC)
	50		No (P)		27				k2		Dense gray SAND (SP) Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

ee water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes
k: Permeability (cm/sec)
k2 = 5.1x10(-5)

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-58

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-2)

Sheet 1 of 2

Pineville, LA

Location: N 494,875, E 1,669,120
Surface Elevation: 256.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		5						Firm tan & white CLAYEY SAND (SC)
			No (P)		7.		22	6			
	5		No (P)		9						
			No (P)		3						Dense to very dense white, tan, and brown CLAYEY SAND (SC)
			No (P)	4.28	7	119					
	10		No (P)		8						
			No (P)		11		21	4			
	15		No (P)	1.88	7	121					
			No (P)		17						Very stiff tan & brown SANDY CLAY (CL)
			No (P)	3.41	16	103					
	20										
			No (P)		15						Very stiff gray CLAY (CH)
	25										
			No (P)		78						Lignite
	30										
			No (P)		19						Very stiff gray CLAY (CH)
	35										
			No (P)		15		62	38			
	40										

Continued Next Page

Ground Water Level Data	Boring Advancement Method	Notes
▽ water first encountered		
	Boring Abandonment Method	

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mar 'd, LA

LOG OF SOIL BORING C-58

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-2)

:CO
Pineville, LA

Sheet 2 of 2

Location: N 494,875, E 1,669,120
Surface Elevation: 256.4

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45		No (P)	3.41	14	111					Very stiff gray CLAY (CH) w/sand lenses
	50		No (P)		17						Dense gray SILTY SAND (SM) Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

ound Water Level Data

a water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-59

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-1)

Sheet 1 of 2

rineville, LA

Location: N 494,875, E 1,669,370
Surface Elevation: 241.8

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)		3						Firm brown SILTY SAND (SM)
			No (P)	3.28	4	121					Very stiff brown SANDY CLAY (CL)
	5		No (P)		3						Very stiff brown & gray CLAY (CH)
			No (P)		19				k1		
			No (P)	2.17	17	105					
	10		No (P)		15						Firm to dense gray & brown SILTY SAND (SM)
▽			No (P)		15						
	15		No (P)		24						
			No (P)	1.85	15	108					Dense gray CLAYEY SAND (SC)
			No (P)		19		26	9			
	20										
			No (P)		16						Stiff to very stiff gray SANDY CLAY (CL)
	25										
			No (P)		23		34	16			
	30										
			No (P)	2.21	14	107					
	35										
			No (P)	2.85	14	109			k2		
	40										

Continued Next Page

Ground Water Level Data

▽ water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes

k: Permeability (cm/sec)
k1 = 1.9x10(-8)
k2 = 3.7x10(-7)

Strata Boundaries May Not Be Exact

Data computerized by Soil Testing Engineers, Inc.

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-59

CLECO

Central Louisiana Electric Company, Inc.

File: 94-1157
Date: 09/19/84
Company: Southwestern Laboratories (DB-1)

CO
Pineville, LA

Sheet 2 of 2

Location: N 494,875, E 1,669,370
Surface Elevation: 241.8

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Medium gray SILTY CLAY (CL) *
	45		No (P)		14		46	28			
			No (P)		15						
	50										Boring completed at 50 ft.
	55										
	60										
	65										
	70										
	75										
	80										

Ground Water Level Data

se water first encountered

Boring Advancement Method

Boring Abandonment Method

Notes
* SWL indicates firm Silty Sand

Strata Boundaries May Not Be Exact

LECO Dolet Hills
ower Plant
a , LA

LOG OF SOIL BORING C-62

STE
Soil Testing Engineers, Inc.

Sheet 1 of 3

File: 94-1157
Date: 03/06/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

LECO
ineville, LA

Location: N 490,656, E 1,668,824
Surface Elevation: 357.4

Water Level	Depth (feet)	Sampler	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Tan & gray SANDY CLAY (CL)
☒			No (P)								Tan SAND (SM)
			29 b/f 12-14-15								Firm to loose tan, gray, and reddish tan CLAYEY SAND (SC) & SAND (SP) w/sandstone gravel
	5		10 b/f 6-5-5		11				GS1		
			8 b/f 4-3-3								
			9 b/f 3-4-5		7				GS2		
	10		14 b/f 3-5-9								
			28 b/f 7-12-16								
	5		32 b/f 9-15-17		12				GS3		Dense to very dense red & tan CLAYEY SAND (SC)
			50 b/9"								
			19-33-17/5"								
			50 b/7"								
			24-36-14/1"								
	20		50 b/6"								
			29-50/6"		16				GS4		
			50 b/5"								
			43-50/5"								
	25		21 b/f 5-10-11								Very stiff dark gray CLAY (CH) w/sand streaks & silt lenses
			4.5 + (P)	2.62	26	96					
			4.5 + (P)		24	97	55	32			
	30		No (P)								
			50 b/8"								
			22-30-20/2"								
			50 b/8"								
	35		33-36-14/2"								
			50 b/7"								
			25-40-10/1"		23		59	29			
			50 b/6"								
	40		35-50/6"								

Continued Next Page

...ound Water Level Data

...o free water encountered to 18 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 18 ft.
4" dia. Rotary Wash:
18 to 118 ft.

Boring Abandonment Method

...backfilled with cement/

Notes

Location coordinates reflect field offsets.

GS: Particle Size Analysis
GS1: Gravel = 4%, Sand = 66%, Silt = 10%, Clay = 17%
GS2: Gravel = 2%, Sand = 92%
GS3: Sand = 77%, Silt = 4%, Clay = 19%
GS4: Sand = 85%, Silt = 5%, Clay = 10%

LECO Dolet Hills
ower Plant
l? i, LA

LOG OF SOIL BORING C-62

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/06/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

LECO
Pineville, LA

Location: N 490,656, E 1,668,824
Surface Elevation: 357.4

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			50 b/6"								Hard dark gray CLAY (CH) w/silty sand layers
			28-50/6"								
			35 b/3"								Very dense to dense gray SANDY CLAY (CL)
			35/3"								
	45		50 b/7"		3				GS5		
			22-44-6								
			50 b/8"								Hard dark gray CLAY (CH) w/laminated sandy silt streaks
			24-36-24/2"								
			50 b/8"								
			29-32-18/2"								
	50		50 b/8"								
			29-40-10/2"								
			50 b/7"								
			23-42-8/1"								
			50 b/8.5"								
	55		25-46-4/0.5"		22		71	43			
			50 b/5"								
			37-50/5"								
			50 b/4"								Very dense gray SILTY FINE SAND (SM)
			39-50/4"								
	60		50 b/5"								Hard dark gray CLAY (CH) w/laminated sandy silt streaks & a 3-inch lignite layer at the top of 60.5 to 62 ft.
			24-50/5"								
			50 b/5"								
			34-50/5"								
											Very dense Lignite
	65		50 b/2"								
			50/2"								Very dense gray SILTY FINE SAND (SM) w/dark gray clay & lignite layers
			50 b/5.5"								
			50/5.5"								
			50 b/5"								
			34-50/5"								
	70		50 b/9"								
			23-26-24/3"								
			50 b/8"								Hard dark gray & gray CLAY (CH) w/silty sand pockets & streaks
			23-33-17/2"								
	75										
			50 b/5"								– w/3-inch lignite layer at 78.5 to 80 ft.
			41-50/5"		30		73	45			
	80										

Continued Next Page

round Water Level Data

a free water encountered to 18 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 18 ft.
4" dia. Rotary Wash:
18 to 118 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS5: Sand = 27%, Silt = 48%, Clay = 25%

:LECO Dolet Hills
'ower Plant
Mar' 'd, LA

LOG OF SOIL BORING C-62

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/06/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

Sheet 3 of 3

_ECO
Pineville, LA

Location: N 490,656, E 1,668,824
Surface Elevation: 357.4

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	85										Hard gray CLAY (CH) w/sandy silt laminations
	90		50 b/8" 34-35-15/2"								Hard gray SILTY CLAY (CL) w/silt pockets & sandy silt laminations
	95										
	100		50 b/9" 34-38-12/3"		27		48	23			
	105										
	110		50 b/7" 23-40-10/1"								
	115										
	120		50 b/7" 37-42-8/1"								Boring completed at 118 ft.

Ground Water Level Data

free water encountered to 18 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 18 ft.
4" dia. Rotary Wash:
18 to 118 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

LECO Dolet Hills
ower Plant
lan[illegible]d, LA

LOG OF SOIL BORING C-63

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/17/95
Engr.: R. Perrin
Driller: R. Warren
Rig: Ardco K-1000

LECO
Pineville, LA

Location: N 493,377, E 1,889,162
Surface Elevation: 298.4

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			3.0 (P)								Very stiff red CLAY (CH) w/grass roots
☒			0.75 (P)								Medium brown & tan SILTY CLAY (CL) w/grass roots
			4.5 (P)		24	98	45	22			Very stiff tan & gray SILTY CLAY (CL) w/sand pockets & lenses
	5		4.5+ (P)								
			4.5+ (P)	2.60	22	100					– w/sandy silt laminations & layers below 8 ft.
			4.5+ (P)		21				GS1		
	10		4.5+ (P)								
			4.5+ (P)								Hard gray & tan CLAY (CH) w/fine sand traces
			4.5+ (P)								– w/2-inch lignite layer at 14 to 16 ft.
	15		4.5+ (P)		27		75	51			– w/gypsum pockets at 16 to 18 ft.
			4.5+ (P)								– w/silty sand layers at 18 to 20 ft.
			4.5+ (P)								– w/mica traces & fine sandy silt layer at 20 to 22 ft.
	20		4.5+ (P)								– w/silt pockets at 22 to 24 ft.
			4.5+ (P)		24				GS2		
	25		4.5+ (P)	3.94	24	98					Hard dark gray CLAY (CH) w/silt lenses & pockets
			4.5+ (P)								– w/silt layers at 28 to 30 ft.
			4.5+ (P)		24		67	39			
	30		4.5+ (P)								
			4.5+ (P)								
	35		4.5+ (P)		25	95					
			4.5+ (P)								
			4.5+ (P)								
	40										

Continued Next Page

Ground Water Level Data

o free water encountered to 28 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 28 ft.
4" dia. Rotary Wash:
28 to 60 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

Location coordinates reflect field offsets.

GS: Particle Size Analysis
GS1: Sand = 11%, Silt = 69%, Clay = 20%
GS2: Sand = 3%, Silt = 74%, Clay = 23%

ECO Dolet Hills
wer Plant
ansfield, LA

LOG OF SOIL BORING C-63

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/17/95
Engr.: R. Perrin
Driller: R. Warren
Rig: Ardco K-1000

ECO
neville, LA

Sheet 2 of 2

Location: N 493,377, E 1,669,162
Surface Elevation: 298.4

Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			4.5+ (P)								Hard dark gray CLAY (CH) w/silt layers & laminations
			4.5+ (P)								
	45		4.5+ (P)		25				GS3		
			4.5+ (P)								
			4.5+ (P)								
	50		4.5+ (P)								
			4.5+ (P)								
	55		4.5+ (P)		26	96	92	58			
			4.5+ (P)								
			4.5+ (P)								
	60										Boring completed at 60 ft.
	65										
	70										
	75										
	80										

Ground Water Level Data

free water encountered to 28 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 28 ft.
4" dia. Rotary Wash:
28 to 60 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS3: Sand = 1%, Silt = 67%, Clay = 32%

CLECO Dolet Hills
Power Plant
Ma[illegible]ld, LA

LOG OF SOIL BORING C-64

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/20/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

Sheet 1 of 3

CLECO
Pineville, LA

Location: N 491,603, E 1,668,654
Surface Elevation: 330.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			2.75 (P)								Stiff gray CLAY (CH) w/orange clay pockets & white sand pockets
			4.5+ (P)								
			4.5+ (P)	1.46	28	94					
											– w/orange clayey sand pockets below 4 ft.
	5		3.25 (P)		25	94	59	32			
			3.25 (P)								
▽			No (P)								
	10		35 b/f 12-17-18								– hard at 10.5 to 12 ft.
			37 b/f 9-17-19								Hard dark gray laminated CLAY (CH)
	15		43 b/f 17-19-24								
			39 b/f 9-17-22								
			36 b/f 11-16-20								
	20		47 b/f 13-20-27		25		64	41			
			21 b/8" 12-17-4/2"								– w/sandy silt streaks & gray shale at bottom of the 22.5 to 24 ft. sample
			50 b/9" 13-36-14/3"								– w/sandy silt layer at 24.5 to 26 ft.
	25										– w/clayey silt layer at 26.5 to 28 ft.
			45 b/f 13-19-26								
			50 b/11" 12-21-29/5"								– w/lignite layers at 30 to 32 ft.
	30										
											– w/fine sand silt lenses & clayey silt layer
	35				25		53	28			– w/sandstone at 36 to 38 ft.
			50 b/7" 16-40-10/1"								
	40										

Continued Next Page

Ground Water Level Data

Free water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 10 ft.
4" dia. Rotary Wash:
10 to 92 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

Location coordinates reflect field offsets.

LECO Dolet Hills
ower Plant
lan[illegible]ld, LA

LOG OF SOIL BORING C-64

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/20/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

..ECO
'ineville, LA

Sheet 2 of 3

Location: N 491,603, E 1,668,654
Surface Elevation: 330.6

FIELD DATA			LABORATORY DATA							
Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
					26				GS1		Hard gray SILTY CLAY (CL) w/sand traces
	45				18				GS2		Very dense SILTY SAND (SM) w/clay layers & pockets – w/sandstone at 46 to 48 ft. – w/sandstone at 50 to 51 ft.
			50 b/6" 21-50/6"								
	50										
	55										Hard dark gray laminated CLAY (CH) w/sand pockets, layers, and lenses
			50 b/9" 26-35-15/3"		20				GS3		
	60										
	65										
			50 b/8" 31-36-12/2"								
	70										
	75										
			50 b/6.5" 30-46-4/0.5"								
	80										

Continued Next Page

Ground Water Level Data

rree water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 10 ft.
4" dia. Rotary Wash:
10 to 92 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS1: Sand = 14%, Silt = 61%, Clay = 25%
GS2: Gravel = 40%, Sand = 41%
GS3: Sand = 2%, Silt = 55%, Clay = 43%

:LECO Dolet Hills
'ower Plant
Mar 'd, LA

.CO
'ineville, LA

LOG OF SOIL BORING C-64

STE
Soil Testing Engineers, Inc.

Sheet 3 of 3

File: 94-1157
Date: 03/20/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

Location: N 491,603, E 1,668,654
Surface Elevation: 330.8

FIELD DATA			LABORATORY DATA							
Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type
	85				24				GS4	
	90		50 b/10" 31-30-20/4"							
	95									
	100									
	105									
	110									
	115									
	120									

DESCRIPTION

Hard dark gray laminated CLAY (CH) w/sandy silt pockets

Boring completed at 92 ft.

Ground Water Level Data

.e water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 10 ft.
4" dia. Rotary Wash:
10 to 92 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS4: Sand = 19%, Silt = 58%, Clay = 23%

CLECO Dolet Hills
Power Plant
Mar[illegible]ld, LA

LOG OF SOIL BORING C-65

STE
Soil Testing Engineers, Inc.

File: 94-1157 -
Date: 03/22/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

CLECO
Pineville, LA

Sheet 1 of 2

Location: N 492,941, E 1,669,042
Surface Elevation: 309.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
☒			4.5 + (P)								Stiff tan SILTY & SANDY CLAY (CL) w/sandy silt streaks
			4.5 + (P)								
	5		4.5 + (P)	1.27	21	98					
			4.5 + (P)		22	39	17				– w/gypsum at 8 to 10 ft.
			4.5 + (P)								
	10		4.5 + (P)								Hard dark gray & brown CLAY (CH) w/sandy silt lenses
			38 b/f 10-16-22								
			1.75 (P)								– w/a 1/2-inch lignite layer at 14 to 16 ft.
	15		4.5 + (P)								– w/sandy silt pockets below 16 ft.
			38 b/f 10-17-21		27		52	23			
	20		46 b/f 15-19-27								
			46 b/f 14-20-26								
			50 b/11" 16-25-25/5"		23				GS1		
	25		50 b/11" 16-23-27/5"								
			50 b/10" 17-28-22/4"								
	30										Hard dark gray SILTY CLAY (CL) w/sand pockets
	35				26				GS2		
			46 b/f 21-24-22								
	40										

Continued Next Page

Ground Water Level Data

No free water encountered to 18 ft.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 18 ft.
4" dia. Rotary Wash:
18 to 70 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

Location coordinates reflect field offsets.

GS: Particle Size Analysis
GS1: Sand = 1%, Silt = 66%, Clay = 33%
GS2: Sand = 3%, Silt = 75%, Clay = 22%

CLECO Dolet Hills
Power Plant
M· Id, LA

LOG OF SOIL BORING C-65

STE
Soil Testing Engineers, Inc.

Sheet 2 of 2

File: 94-1157
Date: 03/22/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

--ECO
Pineville, LA

Location: N 492,941, E 1,669,042
Surface Elevation: 309.0

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
					25		74	48			Hard gray laminated CLAY (CH) w/silt pockets
	45										-- w/sand seams at 44 to 46 ft.
			50 b/9"								
	50		20-29-21/3"								
											-- w/sand seams at 52 to 54 ft.
	55										
			50 b/8"								
	60		28-33-17/2"								-- w/lignite pockets at 60 to 62 ft.
					29		80	52			
	65										
			46 b/9"								
	70		16-23-13/3"								Boring completed at 70 ft.
	75										
	80										

und Water Level Data	Boring Advancement Method	Notes
ree water encountered to 18	4" dia. Short Flight Auger: 0 to 18 ft. 4" dia. Rotary Wash: 18 to 70 ft.	
	Boring Abandonment Method	

CLECO Dolet Hills
Power Plant
Ma[illegible]ld, LA

LOG OF SOIL BORING C-68

STE
Soil Testing Engineers, Inc.

Sheet 1 of 3

File: 94-1157
Date: 03/25/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

.ECO
Pineville, LA

Location: N 492,520, E 1,669,010
Surface Elevation: 332.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			No (P)								Tan & gray SAND (SP)
			No (P)								
	5		2.0 (P)	0.86t	27	93					Medium gray & tan SANDY CLAY (CL) w/silt traces
▽			1.25 (P)		25		36	14			
			3.0 (P)								
	10		2.5 (P)								Stiff gray & tan CLAY (CH) w/silty sand layers
			3.0 (P)								
	15		2.5 (P)								-- w/wood fragments & sandstone at 14 to 16 ft.
			4.5 + (P)		25		48	22			
			50 b/9"								Hard dark gray SILTY CLAY (CL) w/silt streaks & seams
	20		21-26-24/3"								
			50 b/7"		23						
			21-35-15/1"								-- w/shale at 22.5 to 24 ft.
			50 b/f								
			19-21-29								
	25		50 b/10"								
			21-28-22/4"								
			31 b/9"								
			14-21-10/3"								
			50 b/10"								
			21-24-26/4"								
	30				29				GS1		Tan CLAYEY SAND (SC)
											Hard gray & tan SANDY CLAY (CL)
	35				27						
			50 b/8"								
			17-35-15/2"								
	40										

Continued Next Page

Ground Water Level Data

- Free water first encountered
- ▽ Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 94 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

Location coordinates reflect field offsets.

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure = 0.54 ksf
GS: Particle Size Analysis
GS1: Sand = 75%

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING C-68

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/25/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

CLECO
Pineville, LA

Sheet 2 of 3

Location: N 492,520, E 1,669,010
Surface Elevation: 332.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	45				25				GS2		Hard gray SILTY CLAY (CL) w/sand traces
	50		50 b/9" 25-30-20/3"		26		51	27			Hard dark gray CLAY (CH) w/silty sand streaks
	55										
	60		50 b/8" 19-37-13/2"		21				GS3		Hard gray laminated SILTY CLAY (CL) w/sand traces
	65										
	70		50 b/9" 22-38-12/3"		26		71	47			Hard dark gray laminated CLAY (CH) w/red sandstone
	75										Hard gray laminated SILTY CLAY (CL) w/sand traces
	80		49 b/f 21-25-24								

Continued Next Page

Ground Water Level Data

Free water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 94 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS2: Sand = 16%, Silt = 60%, Clay = 24%
GS3: Sand = 2%, Silt = 63%, Clay = 35%

CLECO Dolet Hills
Power Plant
M[illegible]field, LA

LOG OF SOIL BORING C-68

STE
Soil Testing Engineers, Inc.

File: 94-1157
Date: 03/25/95
Engr.: R. Perrin
Driller: F. Patino
Rig: Failing 1500

CLECO
Pineville, LA

Sheet 3 of 3

Location: N 492,520, E 1,669,010
Surface Elevation: 332.6

Ground Water Level	Depth (feet)	Samples	Field Test Results	C (ksf)	w (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
	85				28				GS4		Hard dark gray laminated SILTY CLAY (CL) w/sand traces
			50 b/8"								
	90		28-40-10/2"		21						Hard dark gray laminated CLAY (CH)
											Boring completed at 94 ft.
	95										
	100										
	105										
	110										
	115										
	120										

Ground Water Level Data

Free water first encountered
Water level after 15 mins.

Boring Advancement Method

4" dia. Short Flight Auger:
0 to 8 ft.
4" dia. Rotary Wash:
8 to 94 ft.

Boring Abandonment Method

Borehole grouted with cement/

Notes

GS: Particle Size Analysis
GS4: Sand = 13%, Silt = 61%, Clay = 26%

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 2
LOCATION: N 490293.18
E 1668229.0201
Ground Elevation: 367.20

Date: 12/ 2/85 Type: Rotary

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
5			
10			Brown, tan and gray sandy clay
15			
20			
25			Brown and gray clayey sand
30			
35			
40			Gray sandy clay
45			
50			

325

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 2
LOCATION: N 490293.18
E 1668229.020I
Ground Elevation: 367.20

Date: 12/ 2/85 Type: Rotary

Legend: ■ Sample × Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
			Gray clay w/silt and sand lenses
55			Bottom of Boring at 55 feet.
60			
65			
70			
75			
80			
85			
90			
95			
100			

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 5
LOCATION: N 493720
E 1668930

Date: 12/5/85 Type: Rotary Ground Elevation: 257.74

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			Brown and gray clayey sand
5			
10			Brown and gray sandy clay w/silt and sand seams
15			
20			Bottom of Boring at 20 feet.
25			
30			
35			
40			
45			
50			

251

SOUTHWESTERN LABORATORIES

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 6
LOCATION: N 493500
E 1668180

Date: 12/6/85 Type: Rotary Ground Elevation: 316.92

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			Tan and gray clayey sand
5			
10			Tan, brown and gray sandy clay
15			
20			
25			Gray sandy clay w/silt and sand seams
30			Bottom of Boring at 30 feet.
35			
40			
45			
50			

Z90

LOG OF BORING

853744
PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 8
LOCATION: N 493700
E 1669880
Ground Elevation: 304.73

Date: 12/4/85 Type: Rotary

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
6			Tan and grown sandy clay
10			
15			Gray sandy clay w/silt and sand seams
20			Bottom of Boring at 20 feet.
25			
30			
35			
40			
45			
50			

LOG OF BORING

853744
PROJECT: Monitor Well Installation
CLIENT: Southwestern Electric Power Company

BORING NO.: MW-8A
LOCATION: E 1669733.2168
N 493771.0637

Date: 1/16/86 Type: Rotary Ground Elevation: 285.57

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			Brown clayey silty sand
5			
10			Brown silty sand w/iron ore
15			
20			Gray brown silty sandy clay w/iron ore
25			
30			Gray clay w/iron ore & silt lenses
35			
40			Dark gray clay w/silt lenses
45			
50			Dark bray clay w/silt and lignite lenses

LOG OF BORING

853744
PROJECT: Monitor Well Installation
CLIENT: Southwestern Electric Power Company

BORING NO.: MW-8A
LOCATION: E 1669733.2168
N 493771.0637

Date: 1/16/86 Type: Rotary Ground Elevation: 285.57

Legend: ■ Sample × Penetration ▼ Water

Depth, feet	Symbol	Sample	Description of Stratum
55			Dense gray clay
			Dense gray clayey silty sand
60			Bottom of Boring at 58 feet.
5			
70			
75			
80			
85			
90			
95			
100			

LOG OF BORING

853744

PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 9
LOCATION: N 494483.3669
E 1669404.0848

Date: 12/4/85 Type: Rotary Ground Elevation: 255.87

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
5			Tan and gray sandy clay w/silt and sand seams
10			
15			Tan and gray sandy clay w/silt and sand seams
20			Bottom of Boring at 20 feet.
25			
30			
35			
40			
45			
50			

SOUTHWESTERN LABORATORIES

LOG OF BORING

853744

PROJECT: Monitor Well Sludge Disposal Area
CLIENT: Southwestern Electric Power Company

BORING NO.: MW 9
LOCATION: N 494483.3669
E 1669404.0848

Date: 12/4/85 Type: Rotary Ground Elevation: 255.87

Legend: ■ Sample X Penetration ▼ Water

Depth, Feet	Symbol	Sample	Description of Stratum
0			Tan and gray sandy clay w/silt and sand seams
16			Tan and gray sandy clay w/silt and sand seams
20			Bottom of Boring at 20 feet.

5 10 15 20 25 30 35 40 45 50

E·A·G·L·E
ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG

BORING/WELL NO.:	**MW-9A**
TOTAL DEPTH:	**25 feet**
TOP OF CASING ELEV.:	**254.98 Ft NGVD**
GROUND SURFACE ELEV.:	**251.8 Ft NGVD**

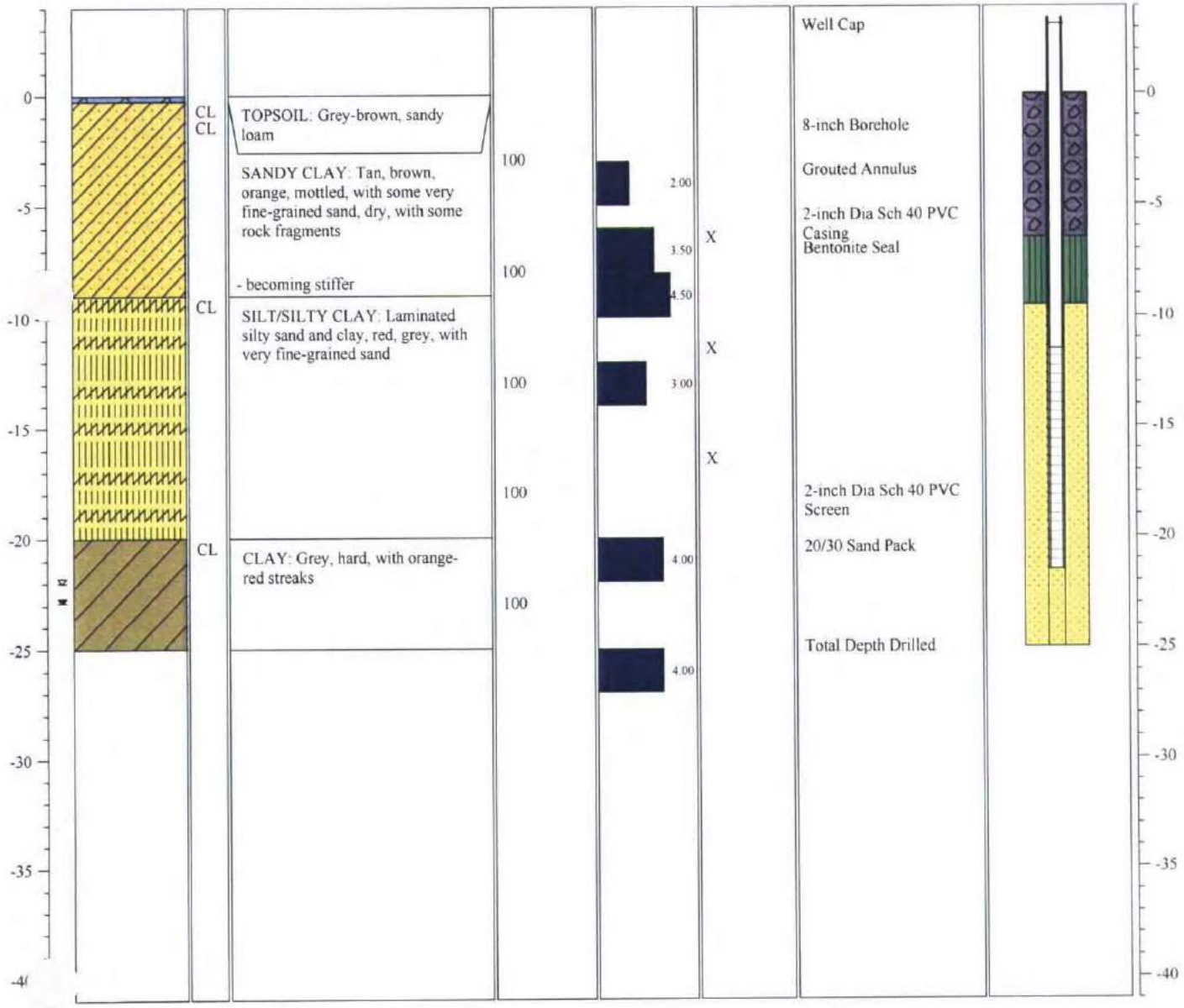
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**SW Permitting**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-10-0072**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/13/2010**

Notes:

Water level during drilling: 22 ft bgs

Water level in completed well: 22.88 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0 to -5		CL	TOPSOIL: Grey-brown, sandy loam	100	2.00		Well Cap	
		CL	SANDY CLAY: Tan, brown, orange, mottled, with some very fine-grained sand, dry, with some rock fragments		3.50	X	8-inch Borehole	
-5 to -10			- becoming stiffer	100	4.50		Grouted Annulus	
		CL	SILT/SILTY CLAY: Laminated silty sand and clay, red, grey, with very fine-grained sand		3.00	X	2-inch Dia Sch 40 PVC Casing Bentonite Seal	
-15 to -20				100		X		
		CL	CLAY: Grey, hard, with orange-red streaks		4.00		2-inch Dia Sch 40 PVC Screen 20/30 Sand Pack	
-20 to -25				100	4.00		Total Depth Drilled	
-25 to -40								



E·A·G·L·E
ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG

BORING/WELL NO.:	**MW-9B**
TOTAL DEPTH:	**30 feet**
TOP OF CASING ELEV.:	**254.95 Ft NGVD**
GROUND SURFACE ELEV.:	**251.5 Ft NGVD**

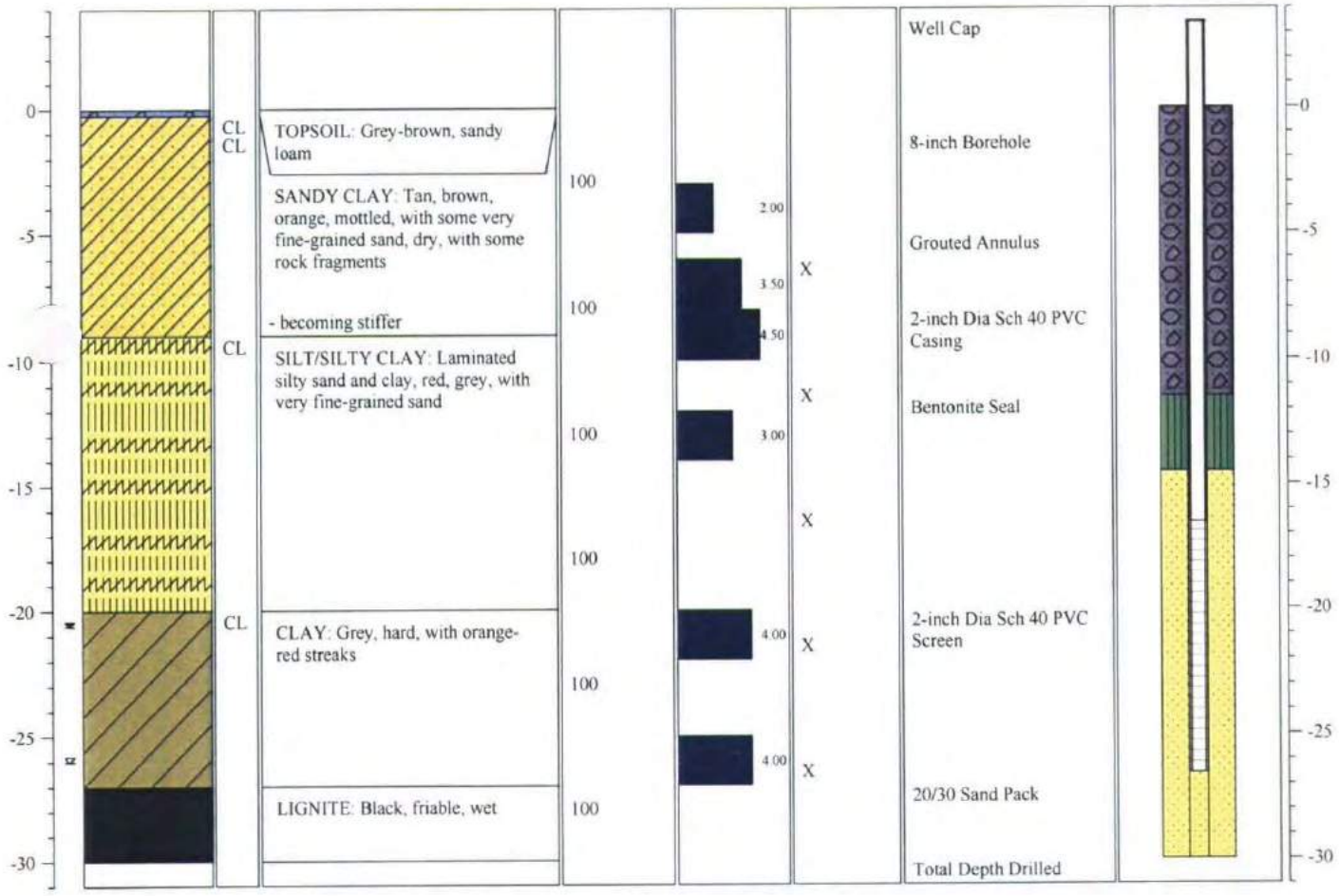
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**SW Permitting**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-10-0072**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/13/2010**

Notes:

Water level during drilling: 26 ft bgs

Water level in completed well: 20.63 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION
0 to -30		CL CL	TOPSOIL: Grey-brown, sandy loam	100	2.00	X	Well Cap	
			SANDY CLAY: Tan, brown, orange, mottled, with some very fine-grained sand, dry, with some rock fragments		3.50	X	8-inch Borehole	
			- becoming stiffer	100	4.50		Grouted Annulus	
		CL	SILT/SILTY CLAY: Laminated silty sand and clay, red, grey, with very fine-grained sand		3.00	X	2-inch Dia Sch 40 PVC Casing	
				100		X	Bentonite Seal	
						X		
				100				
		CL	CLAY: Grey, hard, with orange-red streaks		4.00	X	2-inch Dia Sch 40 PVC Screen	
				100				
					4.00	X		
			LIGNITE: Black, friable, wet	100			20/30 Sand Pack	
							Total Depth Drilled	



SOIL BORING LOG

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

BORING/WELL NO.:	**MW-9R**
TOTAL DEPTH:	**12.5 feet**
TOP OF CASING ELEV.:	**241.50 Ft NGVD**
GROUND SURFACE ELEV.:	**239.0 Ft NGVD**

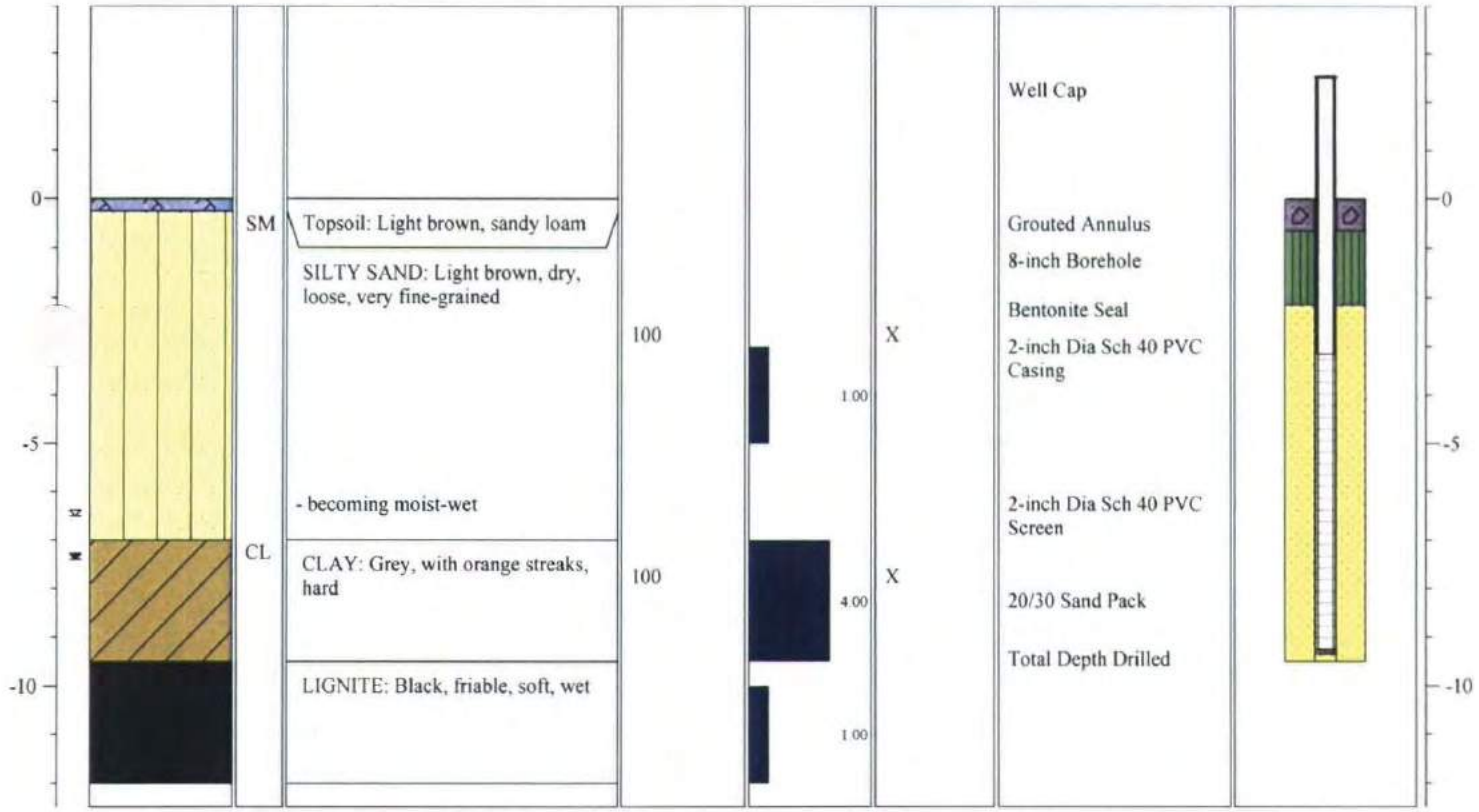
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**SW Permitting**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-10-0072**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**5/13/2010**

Notes:

Water level during drilling: 6.5 ft bgs

Water level in completed well: 7.40 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



E·A·G·L·E
ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG

BORING/WELL NO.:	**MW-10**
TOTAL DEPTH:	**20 feet**
TOP OF CASING ELEV.:	**252.80 Ft NGVD**
GROUND SURFACE ELEV.:	**249.7 Ft NGVD**

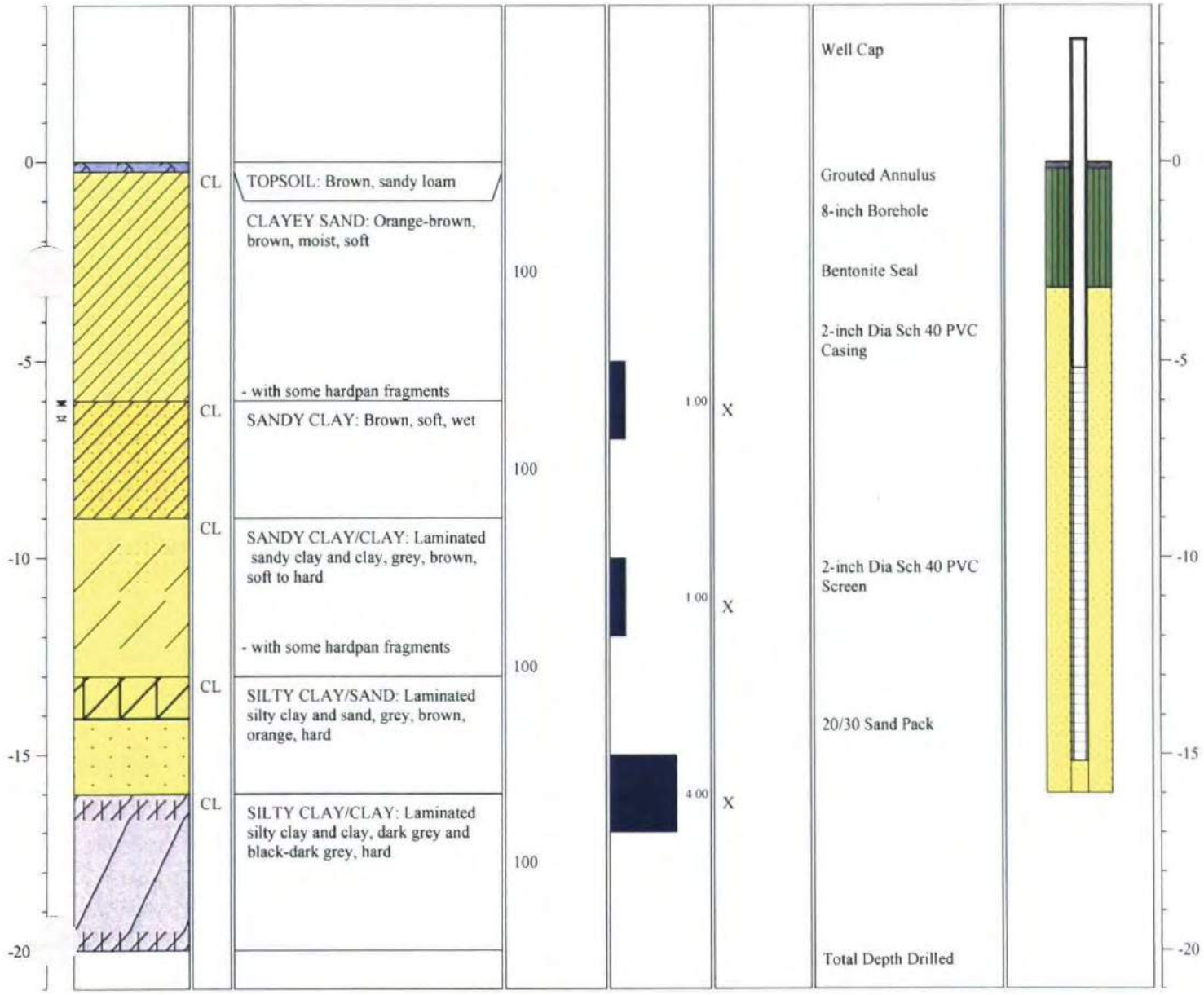
CLIENT:	**Cleco Dolet Hills**	DRILLING CO.:	**Devonian Group**
PROJECT:	**SW Permitting**	DRILLER:	**C Hebert**
SITE LOCATION:	**Mansfield, Louisiana**	METHOD OF DRILLING:	**Hollow Stem Auger**
PROJECT NO.:	**01-10-0072**	SAMPLING METHODS:	**Split-Spoon**
LOGGED BY:	**R Sturdivant**	DATES DRILLED:	**4/07/2010**

Notes:

▽ Water level during drilling: 6.5 ft bgs

▼ Water level in completed well: 6.10 ft bgs

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	CORE RECOVERY (Percent)	STIFFNESS (Kg/cm^2)	SAMPLE TAKEN	BORING DESCRIPTION	WELL CONSTRUCTION



CLECO Dolet Hills
Power Plant
M- -ield, LA

LOG OF SOIL BORING 96B-10A

STE
Soil Testing Engineers, Inc.

Sheet 1 of 4

File: 96-1030
Start Date: 04/03/96
End Date: 04/09/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,627, E 1,668,477

Surface Elevation (ft.,MSL): 291.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			No (P)	42									Loose yellow & orange SILTY fine SAND (SM)
			1.5 (P)	54		17		45	21	24			Stiff orange & light gray SANDY CLAY (CL) – w/silty fine sand seams & layers
	5		2.0 (P)	67									
			4.5+ (P)	67									Hard gray & brown CLAY (CH) w/silt & sand laminations
			4.5+ (P)	63									
	10		4.5+ (P)	71	4.46	29	93	57	36	21			
▼			4.5+ (P)	46		32					GS1		
	15		4.5+ (P)	71									
			4.5 (P)	67		26					GS2		Very stiff to stiff dark gray SILTY & SANDY CLAY (CL) – w/silty fine sand seams & layers
▽	20		No (P)	71									
			2.0 (P)	71									
▽			2.0 (P)	50									
	25		4.5+ (P)	46		24	98	50	33	17			Hard dark gray CLAY (CH) w/silt & sand laminations – penetrated hard material at 26 to 28 ft.
			4.5+ (P)	54									
	30		4.5+ (P)	67									
			4.5+ (P)	63									
	35		4.5+ (P)	67		25		64	31	33			
			4.5+ (P)	67									
			4.5+ (P)	58									
	40												

Continued Next Page

Ground Water Level Data

...e water first encountered
...ater level after 15 mins.

▼ Long-term water level

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 26 ft.
4" dia. Rotary Wash:
26 to 160 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS1: Sand = 20%, Silt = 53%, Clay = 27%
GS2: Sand = 26%, Silt = 62%, Clay = 12%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING 96B-10A

STE
Soil Testing Engineers, Inc.

Sheet 2 of 4

File: 96-1030
Start Date: 04/03/96
End Date: 04/09/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,627, E 1,668,477

Surface Elevation (ft.,MSL): 291.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	46									Hard dark gray CLAY (CH) w/silt & sand laminations
			4.5 + (P)	54									
	45		4.5 + (P)	67		26							– w/organic matter at 46 to 48 ft.
			4.5 + (P)	63		30		79	40	39			
			4.5 + (P)	46		40							Hard black CLAY (CH) w/lignite layers
	50		4.5 + (P)	38		47							Hard black lignite
			~~4.5 + (P)~~	~~42~~		~~46~~							Hard dark gray CLAY (CH) w/silt & sand laminations
	55		4.5 + (P)	63		23		71	35	36			
			4.5 + (P)	58									
			4.5 + (P)	54		22					GS3		Hard dark gray & light gray SANDY CLAY (CL) w/silty fine sand seams & layers
	60		3.0 (P)	71									
			3.0 (P)	63									
	65		2.5 (P)	71									
			1.5 (P)	63									
			No (P)	13									
	70		2.5 (P)	58									
			3.0 (P)	71									
	75		3.5 (P)	63		25		43	25	18			
			4.5 + (P)	83									
			4.5 + (P)	67									
	80												

Continued Next Page

Ground Water Level Data

▽ water first encountered
▽ ater level after 15 mins.
—▽— Long-term water level

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 26 ft.
4" dia. Rotary Wash: 26 to 160 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS3: Sand = 43%, Silt = 37%, Clay = 20%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
M[illegible]eld, LA

LOG OF SOIL BORING 96B-10A

STE
Soil Testing Engineers, Inc.

File: 96-1030
Start Date: 04/03/96
End Date: 04/09/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,627, E 1,668,477

Surface Elevation (ft.,MSL): 291.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	54									Hard dark gray CLAY (CH) w/silt & sand laminations
			4.5 + (P)	58									
	85		2.5 (P)	50									
			4.5 + (P)	54									
			4.5 + (P)	71									
	90												
			4.5 + (P)	75									
			4.5 + (P)	71									
	95		4.5 + (P)	75		23		64	22	42			
			4.5 + (P)	71									
			4.5 + (P)	71									
	100												
			4.5 + (P)	71									
			4.5 + (P)	75									
	105		4.5 + (P)	71									
			4.5 + (P)	71									
			No (P)	71									
	110												
			4.5 + (P)	75									
			4.5 + (P)	71									
	115		4.5 + (P)	71									
			4.5 + (P)	71									
			4.5 + (P)	71									
	120												

Continued Next Page

Ground Water Level Data

e water first encountered
Vater level after 15 mins.

Long-term water level

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 26 ft.
4" dia. Rotary Wash:
26 to 160 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING 96B-10A

STE
Soil Testing Engineers, Inc.

Sheet 4 of 4

File: 96-1030
Start Date: 04/03/96
End Date: 04/09/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 492,627, E 1,668,477

Surface Elevation (ft.,MSL): 291.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	75									Hard dark gray CLAY (CH) w/silt seams, layers, and laminations
			No (P)	75									
	125		No (P)	75									
			4.5 + (P)	100									
			4.5 + (P)	100									
	130		4.5 + (P)	100									
			4.5 + (P)	100									
			4.5 + (P)	100									
	135		4.5 + (P)	83									
			4.5 + (P)	83									
			4.5 + (P)	83									
	140		4.5 + (P)	58									
			4.5 + (P)	50									-- encountered hard material at 144 to 146 ft.
	145												-- w/sandstone fragments below 146 ft.
			50b /4"	22									
			50 b/4"	22									
	150		Cuttings										Dark gray CLAY w/sandstone fragments
			Cuttings										
	155		Cuttings										
			Cuttings										
			Cuttings										
	160												

Ground Water Level Data

ɜe water first encountered
Vater level after 15 mins.

Long-term water level

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 26 ft.
4" dia. Rotary Wash:
26 to 160 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

Boring completed at 160 ft.

Note: No samples obtained below 149.5 ft. Soil cuttings were logged from 149.5 ft. to 160 ft.

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING 96B-18A

STE
Soil Testing Engineers, Inc.

Sheet 1 of 4

File: 96-1030
Start Date: 04/09/96
End Date: 04/10/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 491,012, E 1,669,107

Surface Elevation (ft.,MSL): 359.0

Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
		No (P)	50									Brown SANDY SILT (ML) w/organic matter & tan sand
		4.5 + (P)	58									Very stiff red & tan CLAY (CH) w/sand & silt pockets
5		4.5 + (P)	58	2.34	16	107	50	24	26			
		4.5 + (P)	42									
		No (P)			7					GS1		Very dense red, tan, and gray SAND (SP) w/sandstone fragments
10		50/2"	11									
		50/5"	28									
15		50/5.5"	31									
		50 b/6"	50									-- w/clay seams at 16 to 22 ft.
		46-50/6"										
		50 b/6"	58		7					GS2		
		17-50/6"										
20		50 b/6"	56									
		50 b/6"	61									
		35-50/6"										
		50 b/6"	67									
25		25-50/6"										
		12 b/f 4-5-7	67									
		No (P)	67									Black lignite
30		15-50/6"	67									Very dense tan SAND (SP) – w/1-inch gravel layers
		50/5"	39									
35		22-50/8"	33		19					GS3		
		16 b/f 11-9-7	56									Very stiff dark gray CLAY (CH) w/silt seams & lenses
		2.5 (P)	42		25	95	66	26	40			
40												

Continued Next Page

Ground Water Level Data

water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 32 ft.
4" dia. Rotary Wash:
0 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS1: Sand = 96%
GS2: Sand = 96%
GS3: Gravel = 11%, Sand = 86%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
field, LA

LOG OF SOIL BORING 96B-18A

STE
Soil Testing Engineers, Inc.

Sheet 2 of 4

File: 96-1030
Start Date: 04/09/96
End Date: 04/10/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 491,012, E 1,669,107

Surface Elevation (ft.,MSL): 359.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	100									Hard dark gray CLAY (CH) w/silt seams & sand seams & lenses
			4.5 + (P)	83									
	45		4.5 + (P)	75		23		60	28	32	GS4		
			4.5 + (P)	75									– w/wood fragments at 48 to 50 ft.
			4.5 + (P)	75									
	50		4.5 + (P)	100									
			4.5 + (P)	75									
	55		4.5 + (P)	75	4.02	24	100						
			4.5 + (P)	83									– w/organic matter at 58 to 60 ft.
			4.5 + (P)	100									– w/silt laminations at 60 to 64 ft.
	60		4.5 + (P)	83									– w/2-inch sandstone layer between 62 to 64 ft.
			4.5 + (P)	83									
	65		4.5 + (P)	83									
			4.5 + (P)	83									– w/1-inch layer of lignite at 68 ft.
			4.5 + (P)	83									
	70		No (P)	75		24					GS5		Dark gray SILTY SAND (SM) w/clayey lenses
			No (P)	67									
			4.5 + (P)	67									Dark gray SANDY CLAY (CL) w/silty fine sand laminations
	75		4.5 + (P)	67									
			4.5 + (P)	83									
	80												

Continued Next Page

Ground Water Level Data

free water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 32 ft.
4" dia. Rotary Wash:
0 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS4: Sand = 3%, Silt = 47%, Clay = 49%
GS5: Sand = 65%, Silt = 24%, Clay = 11%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
[illegible]ield, LA

LOG OF SOIL BORING 96B-18A

STE
Soil Testing Engineers, Inc.

File: 96-1030
Start Date: 04/09/96
End Date: 04/10/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Sheet 3 of 4

Location: N 491,012, E 1,669,107

Surface Elevation (ft..MSL): 359.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	67		24					GS6		Hard dark gray SANDY CLAY (CL) w/silty fine sand laminations
			4.5 + (P)	58									
	85		4.5 + (P)	58		24	103	45	25	20	GS7		– w/wood fragments at 84 to 86 ft.
			4.5 + (P)	50		24					GS8		
			4.5 + (P)	63									
	90		4.5 + (P)	63									Hard dark gray CLAY (CH) w/silty fine sand laminations
			4.5 + (P)	75									– w/wood fragments at 92 to 94 ft.
	95		4.5 + (P)	83									
			4.5 + (P)	100									– w/2-inch lignite layer at 98 to 100 ft.
			4.5 + (P)	67									
	100		4.5 + (P)	83									
			4.5 + (P)	83									
	105		4.5 + (P)	83		22	106	50	30	20			
			4.5 + (P)	67									
			4.5 + (P)	67									
	110		4.5 + (P)	75									
			4.5 + (P)	75									
	115		4.5 + (P)	83									
			No (P)										
	120		4.5 + (P)	100									

Continued Next Page

Ground Water Level Data

[illegible]ee water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 32 ft.
4" dia. Rotary Wash:
0 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS6: Sand = 29%, Silt = 54%, Clay = 17%
GS7: Sand = 35%, Silt = 47%, Clay = 18%
GS8: Sand = 38%, Silt = 40%, Clay = 22%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
'ield, LA

LOG OF SOIL BORING 96B-18A

STE
Soil Testing Engineers, Inc.

Sheet 4 of 4

File: 96-1030
Start Date: 04/09/96
End Date: 04/10/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 491,012, E 1,669,107

Surface Elevation (ft..MSL): 359.0

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type
			No (P)	67		28						
			4.5 + (P)	67								

Description

Hard dark gray CLAY (CH) w/silt laminations

Boring completed at 124 ft.

125
130
135
140
145
150
155
160

Ground Water Level Data	Boring Advancement Method	Notes
e water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 32 ft. 4" dia. Rotary Wash: 0 to 124 ft.	
	Boring Abandonment Method: Borehole grouted with cement/ bentonite upon completion	

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Pineville, LA

LOG OF SOIL BORING 96B-24A

STE
Soil Testing Engineers, Inc.

Sheet 1 of 4

File: 96-1030
Start Date: 04/12/96
End Date: 04/13/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 490,303, E 1,667,260

Surface Elevation (ft.,MSL): 362.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	50									Hard red & brown SANDY CLAY (CL) -- w/silt & sand pockets & seams
			4.5 + (P)	38		20		34	19	15			
	5		0.75 (P)	29									Very dense red & brown CLAYEY SAND (SC)
			1.0 (P)	38		22					GS1		-- yellow & orange color change below 6 ft.
			47 b/f 14-22-25	78									
	10		24 b/f 11-10-14	78									Medium brown & tan fine SAND (SP)
			26 b/f 8-7-19	72									
	15		82 b/f 18-37-45	72		3					GS2		Very dense light gray & tan fine SAND (SP)
			50 b/f 11-20-30	78									
			56 b/f 11-21-35	67									
	20		100 b/10" 20-50-50/4"	67									
			99 b/f 20-49-50	72									
	25		50 b/5" 14-50/5"	50		9					GS3		-- w/silt at 24 to 26 ft.
			68 b/f 8-35-33	89		18					GS4		Hard light gray SANDY CLAY (CL) -- w/silty fine sand seams & layers
			No (P)	67									-- w/thin lignite seam between 30 to 32 ft.
	30		1.5 (P)	13		27		42	17	25			
			No (P)	50		18					GS5		Very dense tan & light gray CLAYEY SAND (SC)
▽	35		50 b/5" 43-50/5"	39									
			50 b/5"	28		22					GS6		Very dense tan & light gray fine SAND (SP)
			13 b/f 6-5-8	100		26							
	40												

Continued Next Page

Ground Water Level Data

Free water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 36 ft.
4" dia. Rotary Wash:
36 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS1: Sand = 69%, Silt = 7%, Clay = 24%
GS2: Sand = 98%
GS3: Sand = 90%
GS4: Sand = 34%, Silt = 29%, Clay = 37%
GS5: Sand = 72%, Silt = 6%, Clay = 22%
GS6: Sand = 95%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
Mansfield, LA

LOG OF SOIL BORING 96B-24A

STE
Soil Testing Engineers, Inc.

File: 96-1030
Start Date: 04/12/96
End Date: 04/13/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 490,303, E 1,667,260

Surface Elevation (ft.,MSL): 362.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			95 b/f 16-45-50	100									Very dense light gray & tan fine SAND (SP)
			1.0 (P)	92		20					GS7		Hard gray & tan SANDY CLAY (CL) w/sand & silt pockets & lenses
	45		50 b/5"	28									
			50 b/5"										
	50		35-50/5"										
			52 b/f 25-33-19										
			4.5 + (P)	71		26	98	35	23	12			
	55		4.5 + (P)	63		20					GS8		Hard dark gray CLAY (CH) w/silt laminations
			4.5 + (P)	92									
			4.5 + (P)	96									
	60		4.5 + (P)	96									
			4.5 + (P)	96									
	65		4.5 + (P)	92									
			4.5 + (P)	92									
			4.5 + (P)	75									
	70		4.5 + (P)	92		23	98	62	30	32			
			4.5 + (P)	71									
	75		4.5 + (P)	92									-- w/sand traces below 76 ft.
			4.5 + (P)	79									
	80		4.5 + (P)	83		21	102	67	28	39	GS9		

Continued Next Page

Ground Water Level Data

se water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 36 ft.
4" dia. Rotary Wash:
36 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS7: Sand = 41%, Silt = 30%, Clay = 29%
GS8: Sand = 3%, Silt = 52%, Clay = 45%
GS9: Sand = 29%, Silt = 53%, Clay = 18%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
M- ld, LA

LOG OF SOIL BORING 96B-24A

STE
Soil Testing Engineers, Inc.

Sheet 3 of 4

File: 96-1030
Start Date: 04/12/96
End Date: 04/13/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 490,303, E 1,667,260

Surface Elevation (ft.,MSL): 362.0

Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	92									Hard dark gray CLAY (CH) w/silt seams & laminations
			4.5 + (P)	54									
	85		4.5 + (P)	58									
			4.5 + (P)	83									-- w/4-inch lignite seam between 89 to 90 ft.
			4.5 + (P)	63		26					GS10		-- w/4-inch lignite seam between 90 to 92 ft.
	90		4.5 + (P)	54									
			4.5 + (P)	93									
	95		4.5 + (P)	63		31	87						
			4.5 + (P)	54									-- w/lignite seams at 98 to 100 ft.
			1.0 (P)	33									
	100		4.5 + (P)	63		23		36	24	12	GS1		Hard dark gray SANDY CLAY (CL) w/silt & sand laminations
			4.5 + (P)	71									
	105		4.5 + (P)	67									Hard dark gray CLAY (CH) w/silt & sand laminations
			4.5 + (P)	92									
			4.5 + (P)	83									
	110		4.5 + (P)	67									-- w/4-inch lignite layer at 112 ft.
			4.5 + (P)	75									
	115		4.5 + (P)	67									
			4.5 + (P)	71		22	102						
			4.5 + (P)	83									
	120												

Continued Next Page

Ground Water Level Data

ree water first encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 36 ft.
4" dia. Rotary Wash:
36 to 124 ft.

Boring Abandonment Method

Borehole grouted with cement/ bentonite upon completion

Notes

GS: Particle Size Analysis
GS10: Sand = 6%, Silt = 69%, Clay = 25%
GS11: Sand = 29%, Silt = 50%, Clay = 22%

Strata Boundaries May Not Be Exact

CLECO Dolet Hills
Power Plant
M[illegible]-field, LA

LOG OF SOIL BORING 96B-24A

STE
Soil Testing Engineers, Inc.

Sheet 4 of 4

File: 96-1030
Start Date: 04/12/96
End Date: 04/13/96
Geol.: J. Harrer
Driller: MASA
Rig: Buggy

CLECO
Pineville, LA

Location: N 490,303, E 1,667,260

Surface Elevation (ft.,MSL): 362.0

FIELD DATA					LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Recovery (%)	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4.5 + (P)	79									Hard dark gray CLAY (CH) w/silt seams
			4.5 + (P)	83									
													Boring completed at 124 ft.
	125												
	130												
	135												
	140												
	145												
	150												
	155												
	160												

Ground Water Level Data	Boring Advancement Method	Notes
water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 36 ft. 4" dia. Rotary Wash: 36 to 124 ft.	
	Boring Abandonment Method: Borehole grouted with cement/ bentonite upon completion	

Strata Boundaries May Not Be Exact

ICON ENVIRONMENTAL SERVICES

5637 Superior Drive Suite B-1
Baton Rouge, Louisiana 70816

DATE: 9-28-95

COMPANY: SOIL TESTING ENGINEERS, INC.
HOLE NO.: MW-2A
AREA: Cleco Dolet Hills
PARISH: Desoto
STATE: Louisiana
SECTION: 23 | TOWNSHIP: 12N | RANGE: 12W | LOG MEASURED FROM: 370.15

WELL DATA

T.D. Logged: 55 FT.
Speed: FT./MIN.
Type Fluid in Hole: Groundwater
Fluid Level: FT.
Resistivity: OHM-M
Density:
Viscosity: Temp. °C

T.D. Drilled: FT.
Bit Size: From: To:
Casing Size: 4.00" From: 0 To: 55'
Bottom Hole Temp.: °C

LOG TIME
Start: Stop: Total:
Witnessed By: Randy Perrin

OTHER SERVICES:

REMARKS:

INITIAL RUN

T.D. LOGGED: 55 FT.
PROBE TYPE/SER. NO.: D,G,SP,R/1
LOGGING SPEED: 12 FT./MIN.
GAMMA-SCALE: 10 CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE): OHMS
S. P.: MV/IN
G/G DENSITY-SCALE: CPS/IN
TIME CONSTANT: SEC.
NEUTRON-SCALE: CPS/IN
TIME CONSTANT: SEC.

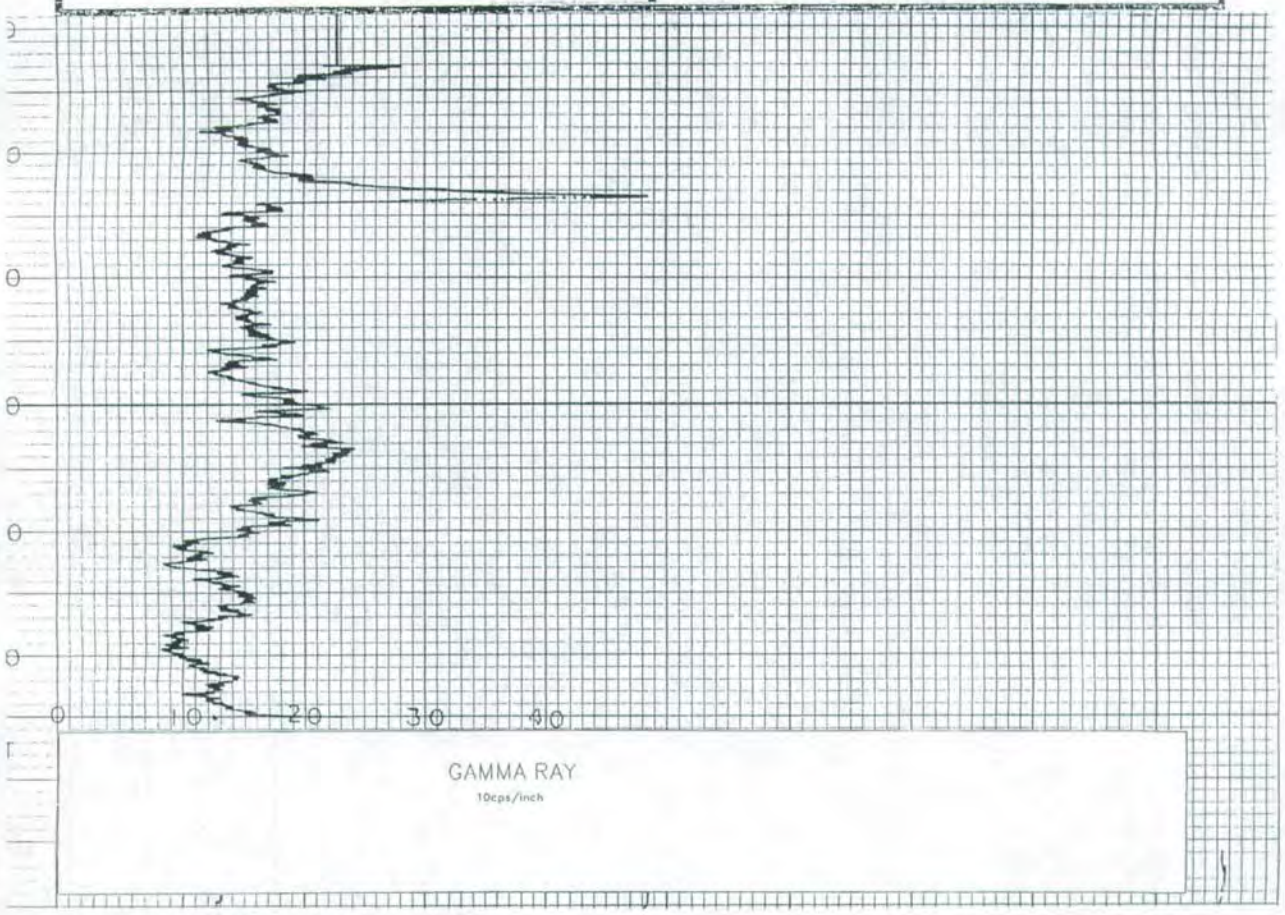
K FACTOR:
W. FACTOR: DEAD TIME: M SEC.

REMARKS:

RERUNS

T.D. LOGGED: FT.
PROBE TYPE/SER. NO.:
LOGGING SPEED: FT./MIN.
GAMMA-SCALE: CPS/IN
TIME CONSTANT: SEC.
RESISTIVITY (FULL SCALE): OHMS
S. P.: MV/IN
G/G DENSITY-SCALE: CPS/IN
TIME CONSTANT: SEC.
NEUTRON-SCALE: CPS/IN
TIME CONSTANT: SEC.

K FACTOR:
W. FACTOR: DEAD TIME: M SEC.



031 - 6261 Z

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER CLECO PHONE (318) 484-5000

3. WELL OWNER'S ADDRESS P. O. Box 5000 Pineville La. 71361

4 OWNER'S WELL NUMBER OR NAME (if any) P-18-Z1 P-1

5. DATE COMPLETED 8/1/96 DEPTH OF HOLE 38 FT. DEPTH OF WELL 38 FT.

6 STATIC WATER LEVEL 27 FT. BELOW GROUND SURFACE MEASURED ON 8/14/96

7. CASING 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 25 FT.

8 SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.

9 CEMENTED FROM 20 FT BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH De Soto WELL IS NEAR, Mansfield, LA (Town or city)

APPROXIMATELY 2 MILES FROM south side of Power Plant Road (Crossroads, railroad, any landmark, etc)

(Please draw sketch on back of Original)

11 REMARKS: 3 foot sump located below the screen

12 DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Red Sandy Silt			
8	35	Red & Tan Sand			
35	38	Dark Gray Clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL E. Hull

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF - WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO — 6261 Z

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

Use of well W

SECTION TOWNSHIP RANGE

ELEV. QUAD NO

INPUT BY: MB DATE. 9-11-96

INSPECTED BY DATE

REMARKS:

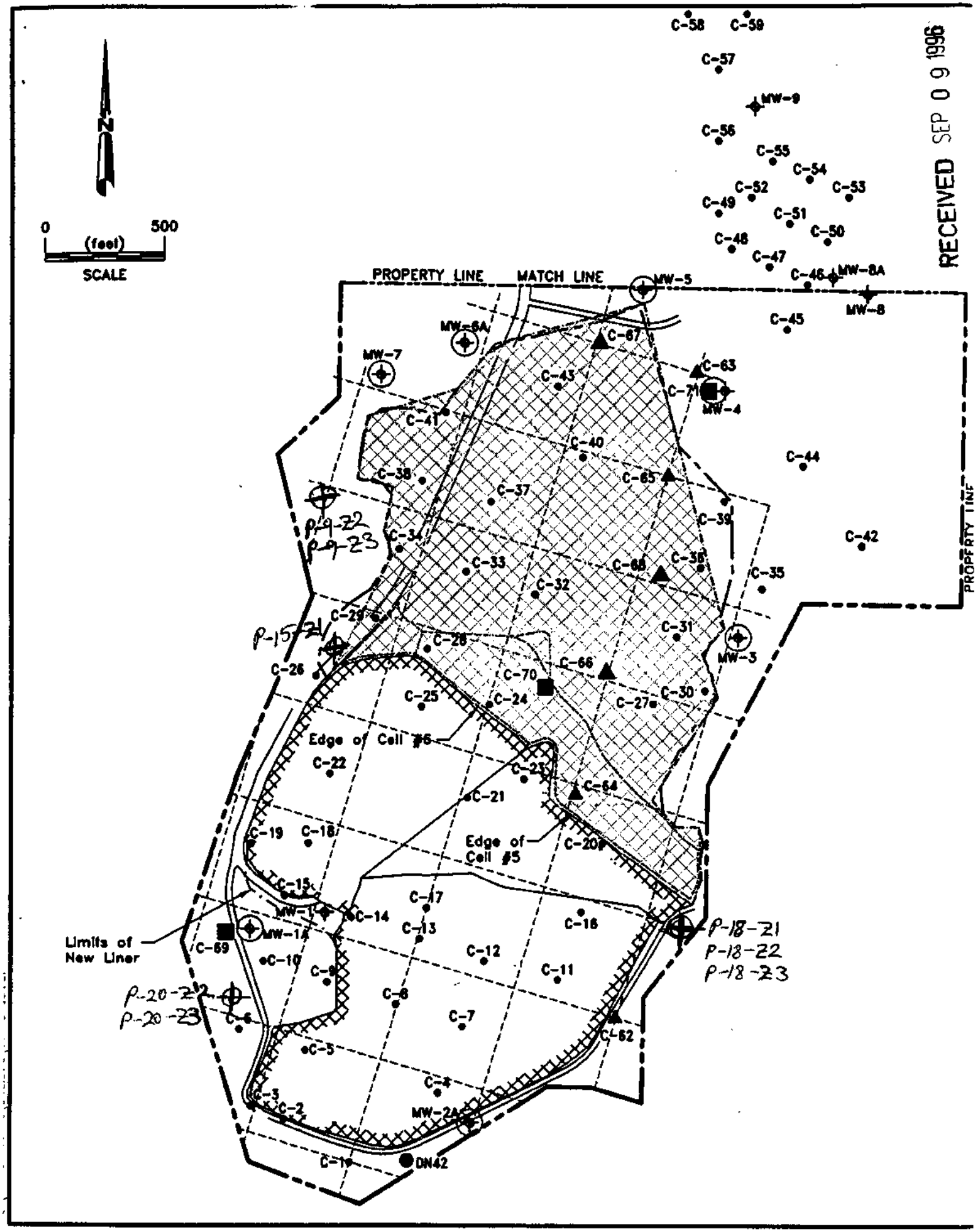
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 320043 LONGITUDE 9334051 01

SECTION 023 TOWNSHIP 12N RANGE 12 ☒ W

ELEV. 0350 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: 963 Power Plant Rd. Mansfield, La


N
0
500
(feet)
SCALE
RECEIVED SEP 0 9 1996
PROPERTY LINE
MATCH LINE
PROPERTY LINE
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-48
C-50
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
C-67
MW-7
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-9-22
P-9-23
C-34
C-42
C-33
C-68
C-36
C-35
C-32
C-29
C-31
P-15-21
C-28
MW-3
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
MW-1
C-14
C-16
Limits of New Liner
MW-1A
C-13
P-18-21
P-18-22
P-18-23
C-69
C-12
C-10
C-11
C-9
P-20-22
P-20-23
C-8
C-6
C-7
C-62
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-62627

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2 WELL OWNER **CLECO** PHONE (318) **484-5000**

3. WELL OWNER'S ADDRESS **P. O. Box 5000 Pineville La. 71361**

4 OWNER'S WELL NUMBER OR NAME (if any) **P-18-Z2** P-2

5 DATE COMPLETED **8/1/96** DEPTH OF HOLE **80** FT. DEPTH OF WELL **80** FT.

6 STATIC WATER LEVEL **55** FT BELOW GROUND SURFACE MEASURED ON **8/14/96**

7 CASING **2** IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH **67** FT.

8 SCREEN **2** IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE **.010** LENGTH **10** FT

9. CEMENTED FROM **62** FT BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL. PARISH **De Soto** WELL IS NEAR, **Mansfield, LA** (Town or city)

APPROXIMATELY **2** MILES FROM **south side of Power Plant Road** (Crossroads, railroad, any landmark, etc)

(Please deaw skeich on back of Original

11 REMARKS **3 foot sump located below the screen**

12 DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Red Sandy Silt			
8	35	Red & Tan Sand			
35	71	Dark Gray Clay			
71	80	Light Gray Silty Sand			

13. FOR HEAT PUMP ONLY AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL **E. Hull**

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER **WWC - 212**

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN : CHIEF - WATER RESOURCES SECTION
P O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO —62627

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

Use of well W

INPUT BY: MB DATE: 9-11-96

INSPECTED BY: DATE:

REMARKS:

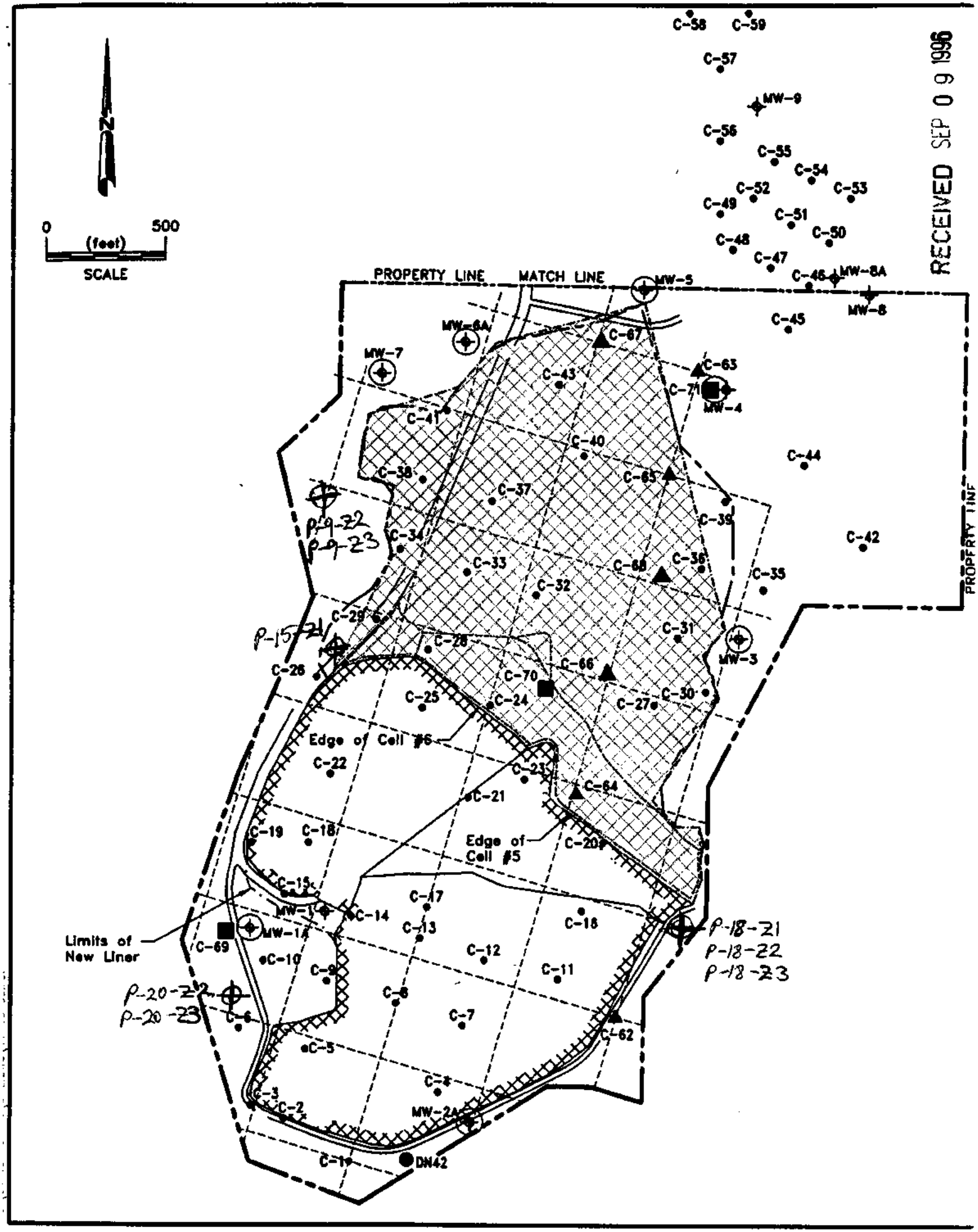
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 00 43 LONGITUDE 93 34 05 02

SECTION 03 TOWNSHIP 12 N RANGE 12 E W

ELEV. 0350 QUAD NO 057D Bayou Pierre Lake La.

SITE ADDRESS: **963 Power Plant Rd. Mansfield, La**


RECEIVED SEP 09 1996
0
500
(feet)
SCALE
PROPERTY LINE
MATCH LINE
PROPERTY LINE
MW-5
MW-6A
MW-8A
MW-8
MW-7
MW-9
MW-4
MW-3
MW-2A
MW-1
MW-1A
DN42
C-58
C-59
C-57
C-56
C-55
C-54
C-53
C-52
C-49
C-51
C-50
C-48
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C-35
C-32
C-29
C-31
C-28
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
C-14
C-13
C-16
Limits of New Liner
C-69
C-12
C-10
C-9
C-11
C-8
C-7
C-6
C-62
C-5
C-4
C-3
C-2
C-1
P-9-22
P-9-23
P-15-21
P-18-21
P-18-22
P-18-23
P-20-22
P-20-23

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-62637

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER CLECO PHONE (318) 484-5000

3. WELL OWNER'S ADDRESS P. O. Box 5000 Pineville La. 71361

4. OWNER'S WELL NUMBER OR NAME (if any) P-18-Z-3 P-3

5. DATE COMPLETED 8/1/96 DEPTH OF HOLE 124 FT. DEPTH OF WELL 124 FT.

6. STATIC WATER LEVEL 76 FT. BELOW GROUND SURFACE MEASURED ON 8/14/96

7. CASING 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 111 FT.

8. SCREEN 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.

9. CEMENTED FROM 106 FT BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH De Soto WELL IS NEAR, Mansfield, LA (Town or city)

APPROXIMATELY 2 MILES FROM south side of Power Plant Road (Crossroads, railroad, any landmark, etc)

(Please draw sketch on back of Original)

11. REMARKS: 3 foot sump located below the screen

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Red Sandy Silt	110	124	Dark Gray Clay
8	35	Red & Tan Sand			
35	71	Dark Gray Clay			
71	75	Light Gray Silty Sand			
75	108	Dark Gray Clay			
108	110	Dark Gray Silty Clay			

13. FOR HEAT PUMP ONLY. AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: E. Hull

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN : CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO. -62637

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

SECTION TOWNSHIP RANGE

ELEV QUAD NO.

Use of well W

INPUT BY: MB DATE: 9-11-96

INSPECTED BY _____ DATE _____

REMARKS _____

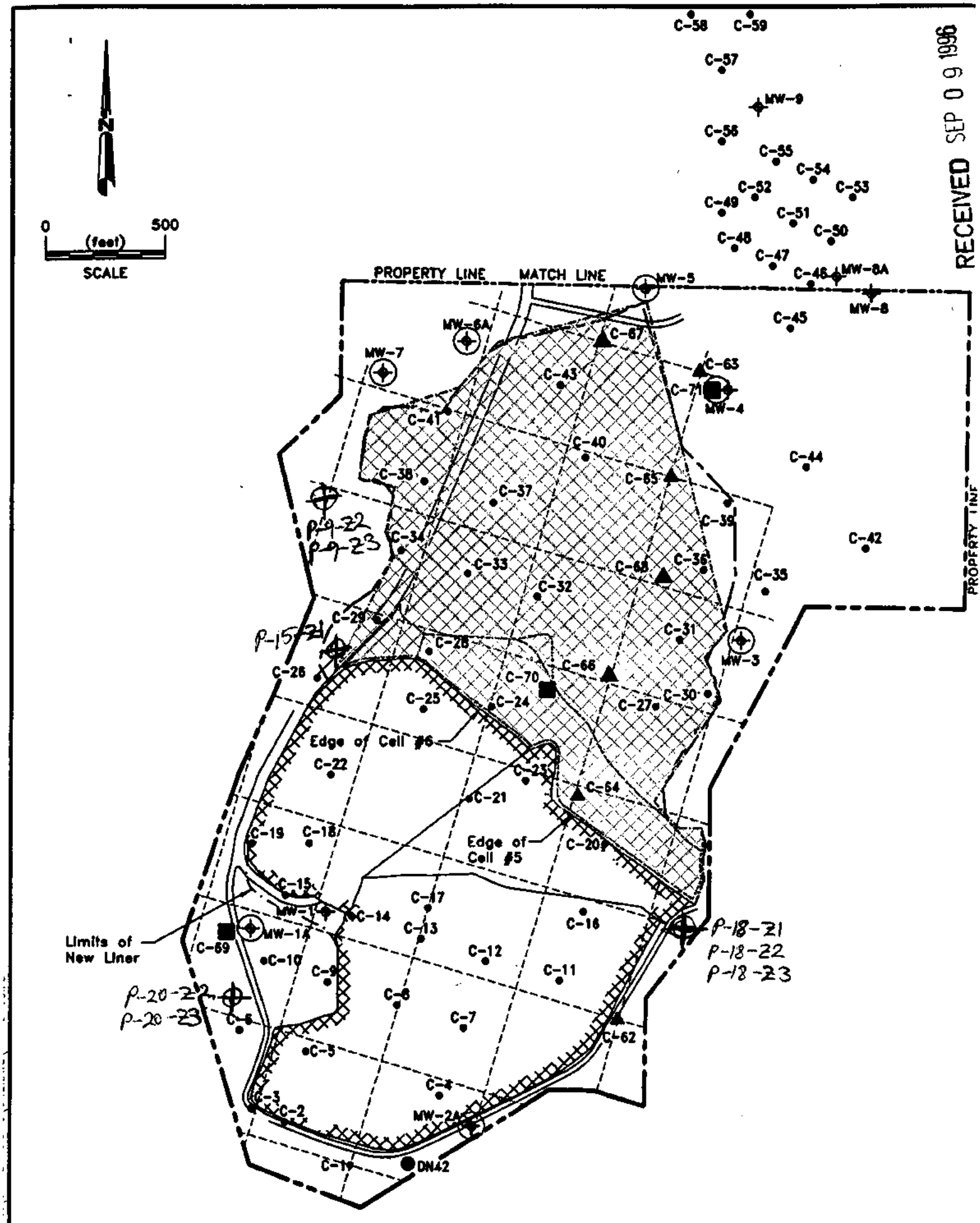
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 320043 LONGITUDE 9334053

SECTION 023 TOWNSHIP 12N RANGE 12E

ELEV. 0350 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: 963 Power Plant Rd. Mansfield, La


0
500
(feet)
SCALE
PROPERTY LINE
MATCH LINE
RECEIVED SEP 09 1996
PROPERTY LINE
Edge of Cell #6
Edge of Cell #5
Limits of New Liner
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-50
C-48
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
C-67
MW-7
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-22-21
P-22-22
P-22-23
C-34
C-42
C-33
C-68
C-36
C-32
C-35
C-29
C-31
P-15-21
C-28
MW-3
C-70
C-66
C-26
C-25
C-24
C-27
C-30
C-22
C-23
C-64
C-21
C-19
C-18
C-20
C-15
C-17
MW-1
C-14
C-16
C-13
MW-1A
C-69
C-12
C-10
C-11
C-9
C-8
P-18-21
P-18-22
P-18-23
P-20-22
P-20-23
C-7
C-62
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-62657

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2 WELL OWNER **CLECO** PHONE (**318**) **484-5000**

3. WELL OWNER'S ADDRESS **P. O. Box 5000 Pineville La. 71361**

4. OWNER'S WELL NUMBER OR NAME (if any) **P-20-Z3** P-4

5 DATE COMPLETED **8/1/96** DEPTH OF HOLE **160** FT. DEPTH OF WELL **160** FT.

6 STATIC WATER LEVEL **99** FT. BELOW GROUND SURFACE MEASURED ON **8/14/96**

7 CASING **2** IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH **147** FT.

8 SCREEN **2** IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE **.010** LENGTH **10** FT.

9 CEMENTED FROM **142** FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH **De Soto** WELL IS NEAR, **Mansfield, LA** (Town or city)

APPROXIMATELY **2** MILES FROM **south side of Power Plant Road** (Crossroads, railroad, any landmark, etc)

(Please deaw sketch on back of Original

11 REMARKS: **3 foot sump located below the screen**

12 DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	10	Red & Brown Silty Clay	120	125	Gray Clay
10	53	Tan & Gray Clay	125	143	Gray Clay w/ Lignite
53	57	Tan & Light Gray Silty Clay	143	160	Gray Silty Clay
57	74	Tan Sand			
74	102	Dark Gray Clay			
102	120	Dark Gray Silty Clay			

13 FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION. DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL **E. Hull**

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER **WWC - 212**

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN : CHIEF - WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO. -62657

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit SECTION TOWNSHIP RANGE ELEV. QUAD NO

Use of well W

INPUT BY: MS DATE 9-11-96

INSPECTED BY: DATE:

REMARKS:

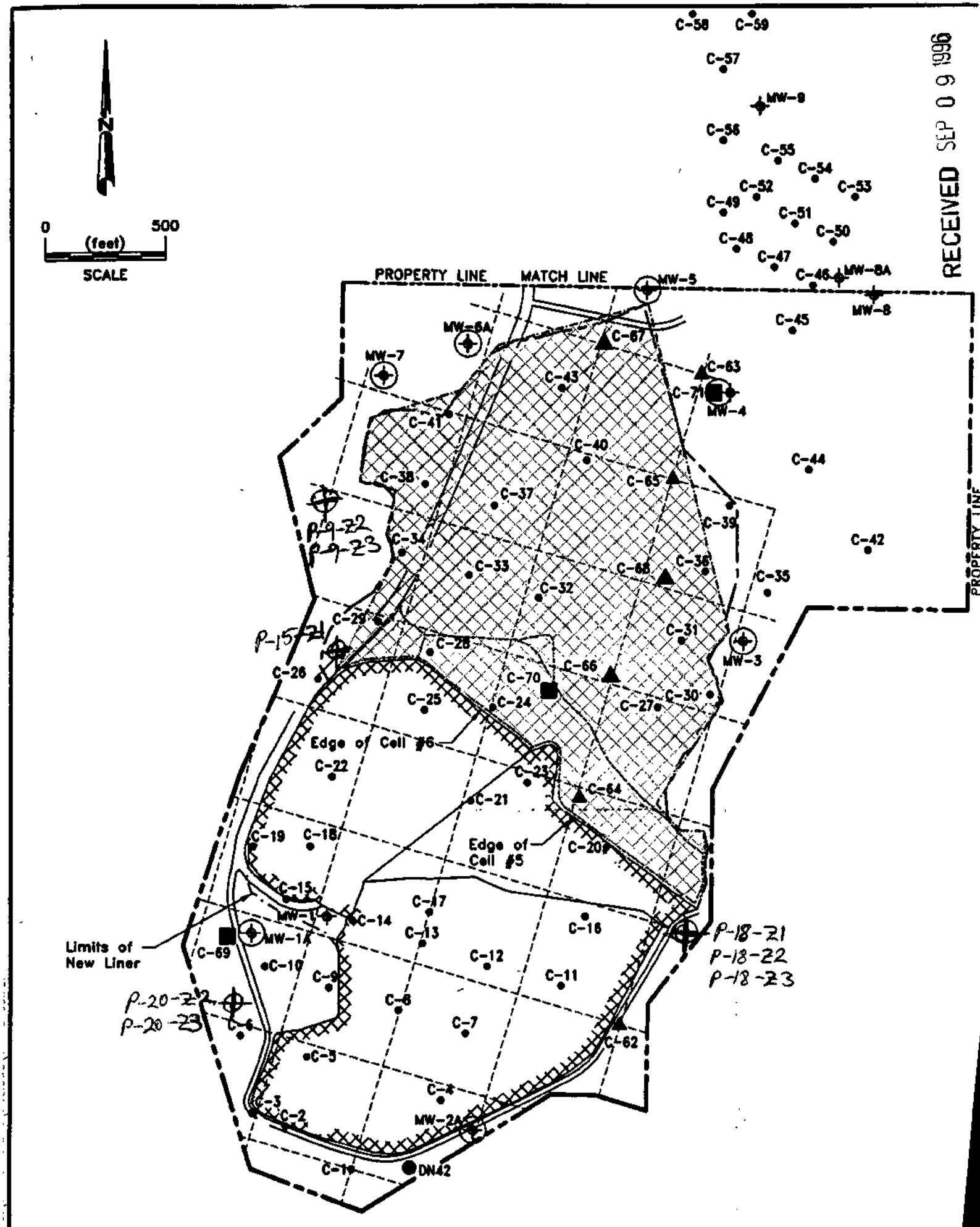
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 00 41 LONGITUDE 93 34 24 01

SECTION 03 TOWNSHIP 12 N RANGE 12 E

ELEV. 0340 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: **963 Power Plant Rd. Mansfield, La**


N
0
500
(feet)
SCALE
PROPERTY LINE
MATCH LINE
RECEIVED SEP 0 9 1996
PROPERTY LINE
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-50
C-48
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
C-67
MW-7
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-22-21
P-23-21
C-34
C-42
C-33
C-68
C-36
C-35
C-32
C-29
C-31
P-15-21
C-28
MW-3
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
MW-1
C-14
C-16
C-13
Limits of New Liner
C-69
MW-1A
C-12
P-18-21
P-18-22
P-18-23
C-10
C-9
C-11
P-20-22
P-20-23
C-8
C-7
C-62
C-6
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-02647

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER CLECO PHONE (318) 484-5000

3. WELL OWNER'S ADDRESS P. O. Box 5000 Pineville La. 71361

4. OWNER'S WELL NUMBER OR NAME (if any) P-20-Z2 P-5

5 DATE COMPLETED 8/1/96 DEPTH OF HOLE 110 FT. DEPTH OF WELL 110 FT.

6 STATIC WATER LEVEL 69 FT. BELOW GROUND SURFACE MEASURED ON 8/14/96

7 CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 97 FT.

8 SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.

9 CEMENTED FROM 92 FT BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL. PARISH De Soto WELL IS NEAR, Mansfield, LA (Town or city)

APPROXIMATELY 2 MILES FROM south side of Power Plant Road (Crossroads, railroad, any landmark, etc)

(Please draw sketch on back of Original)

11. REMARKS: 3 foot sump located below the screen

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	10	Red & Brown Silty Clay			
10	53	Tan & Gray Clay			
53	57	Tan & Light Gray Silty Clay			
57	74	Tan Sand			
74	110	Dark Gray Clay			

13. FOR HEAT PUMP ONLY. AVG DEPTH _____ FT. NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: E. Hull

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.. CHIEF - WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO -6264Z

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

Use of well W

SECTION TOWNSHIP RANGE

ELEV QUAD NO.

INPUT BY MB DATE 9-11-96

INSPECTED BY: DATE

REMARKS:

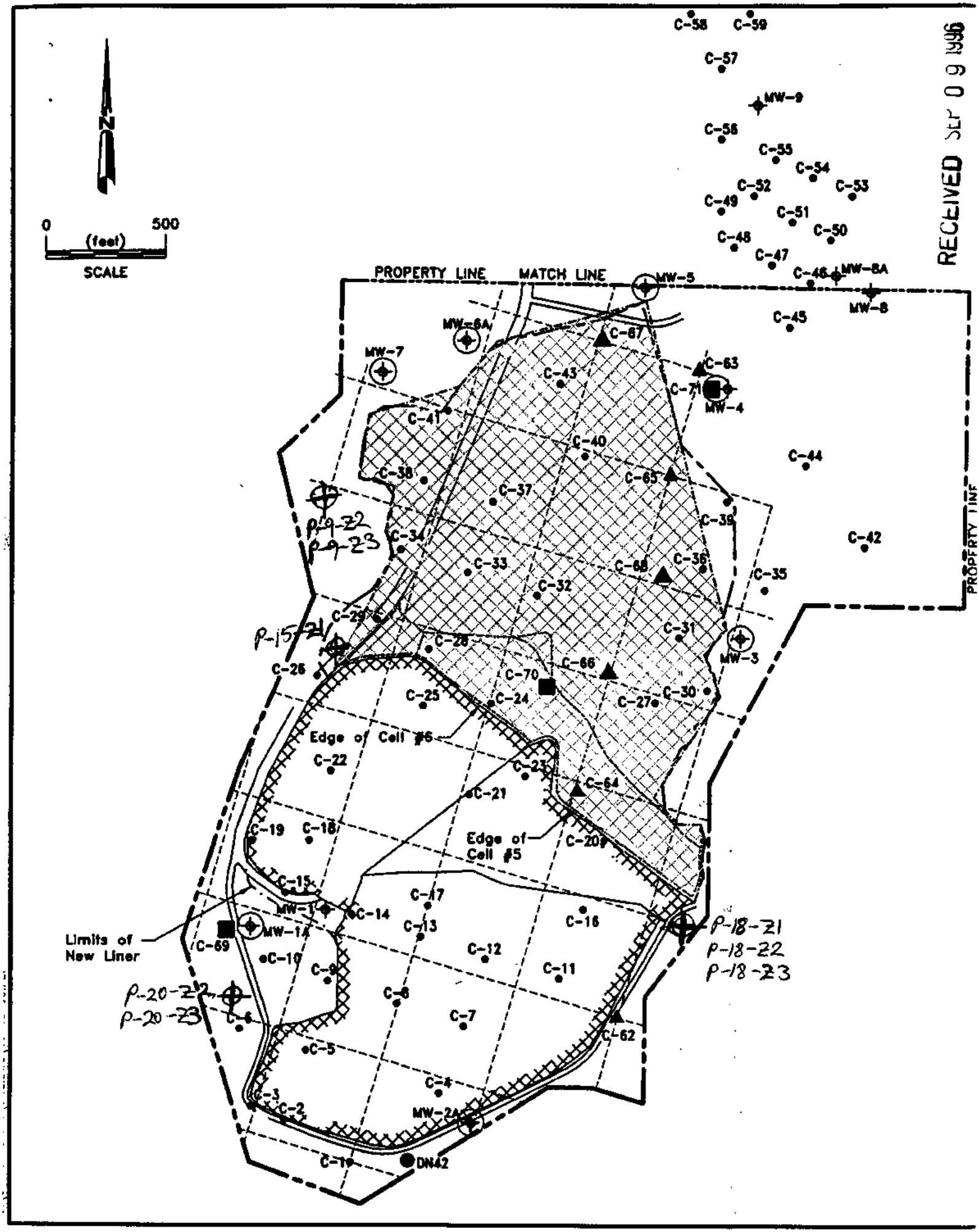
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 00 41 LONGITUDE 93 34 23 01

SECTION 023 TOWNSHIP 12N RANGE 12E W

ELEV. 0340 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: 963 Power Plant Rd. Mansfield, La


N
0
500
(feet)
SCALE
RECEIVED
PROPERTY LINE
MATCH LINE
PROPERTY LINE
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-50
C-48
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
MW-7
C-67
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-22-21
P-23-21
C-34
C-42
C-33
C-68
C-36
C-35
C-32
C-29
C-31
P-15-21
C-28
MW-3
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
MW-1
C-14
C-16
C-13
Limits of New Liner
C-69
MW-1A
C-12
P-18-21
P-18-22
P-18-23
C-10
C-9
C-11
P-20-22
P-20-23
C-8
C-6
C-7
C-62
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-62607

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2 WELL OWNER **CLECO** PHONE (**318**) **484-5000**

3 WELL OWNER'S ADDRESS **P. O. Box 5000 Pineville La. 71361**

4. OWNER'S WELL NUMBER OR NAME (If any) **P-15-Z1** P-6

5. DATE COMPLETED **8/15/96** DEPTH OF HOLE **60** FT. DEPTH OF WELL **60** FT

6 STATIC WATER LEVEL **38** FT BELOW GROUND SURFACE MEASURED ON **8/16/96**

7. CASING **2** IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH **47** FT

8 SCREEN **2** IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE **.010** LENGTH **10** FT.

9 CEMENTED FROM **42** FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL: PARISH **De Soto** WELL IS NEAR, **Mansfield, LA** (Town or city)

APPROXIMATELY **2** MILES FROM **south side of Power Plant Road** (Crossroads, railroad, any landmark, etc)

(Please deaw sketch on back of Original)

11 REMARKS: **3 foot sump located below the screen**

12 DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	16	Reddish Brown Sandy Clay			
16	46	Reddish Brown Clayey Sand			
46	48	Gray Clay			
48	52	Red & Brown Clayey Sand			
52	54	Dark Gray Sandy Clay			
54	60	Gray Clay & Lignite			

13 FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL: **E. Hull**

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER **WWC - 212**

Authorized Signature _____ Date 9-6-96

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN. CHIEF - WATER RESOURCES SECTION
P O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO. -62607

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

SECTION TOWNSHIP RANGE

ELEV QUAD NO

Use of well W

INPUT BY M B DATE 9-11-96

INSPECTED BY: DATE:

REMARKS:

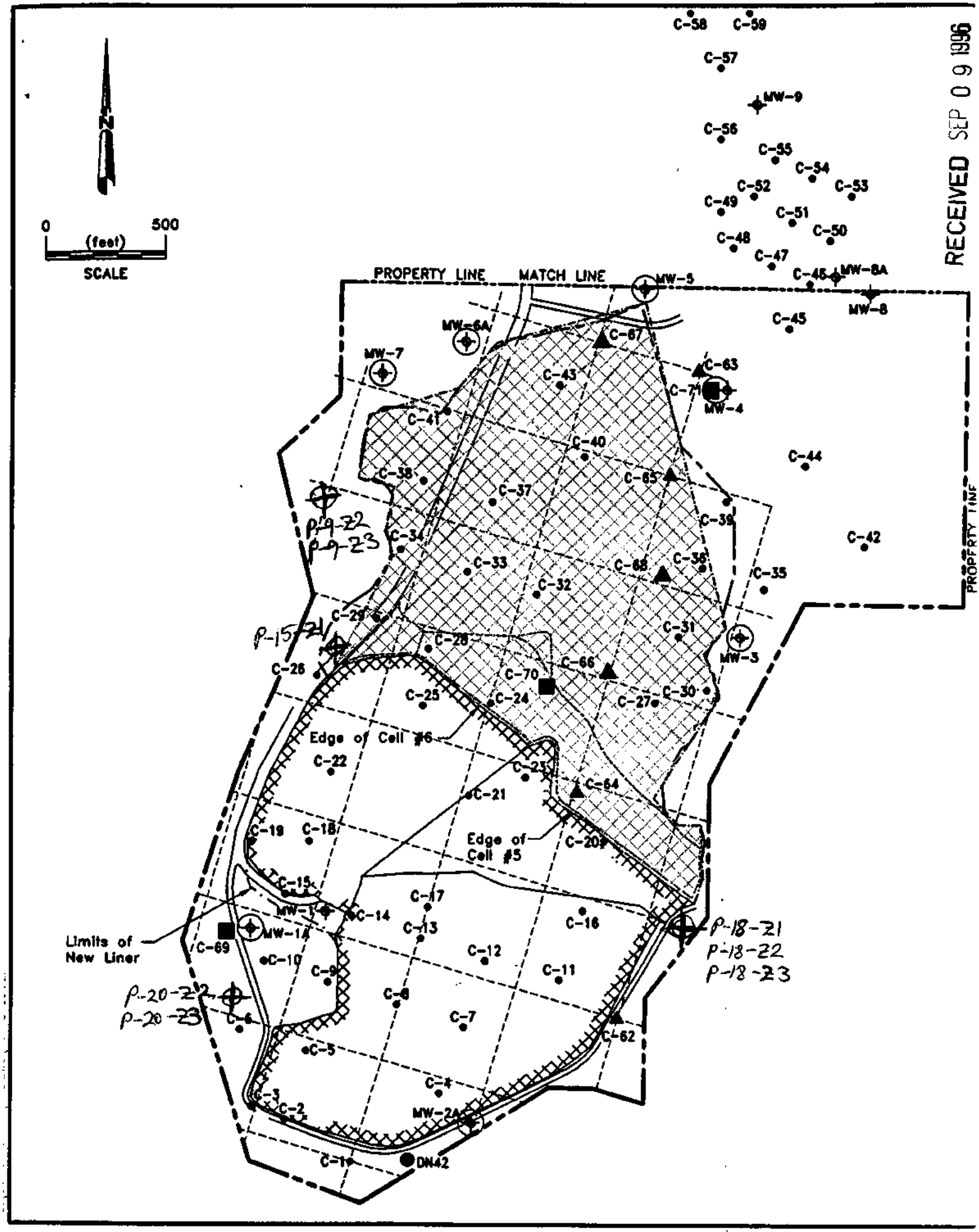
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 01 00 LONGITUDE 93 34 20 01

SECTION 023 TOWNSHIP 12N RANGE 12E

ELEV 0345 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: **963 Power Plant Rd. Mansfield, La**


RECEIVED SEP 09 1996
N
0
500
(feet)
SCALE
PROPERTY LINE
MATCH LINE
PROPERTY LINE
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-48
C-50
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
C-67
MW-7
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-19-22
P-19-23
C-34
C-42
C-33
C-68
C-36
C-32
C-35
C-29
P-15-21
C-31
C-28
MW-3
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
MW-1
C-14
C-16
C-13
Limits of New Liner
MW-1A
C-69
C-12
P-18-21
P-18-22
P-18-23
C-10
C-11
C-9
P-20-22
P-20-23
C-8
C-7
C-6
C-62
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-6259Z

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER CLECO PHONE (318) 484-5000

3 WELL OWNER'S ADDRESS P. O. Box 5000 Pineville La. 71361

4. OWNER'S WELL NUMBER OR NAME (if any) P-9-Z3 P-7

5 DATE COMPLETED 8/12/96 DEPTH OF HOLE 110 FT DEPTH OF WELL 110 FT.

6 STATIC WATER LEVEL 78 FT. BELOW GROUND SURFACE MEASURED ON 8/14/96

7. CASING 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 97 FT.

8. SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.

9 CEMENTED FROM 92 FT BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL: PARISH De Soto WELL IS NEAR, Mansfield, LA (Town or city)

APPROXIMATELY 2 MILES FROM south side of Power Plant Road (Crossroads, railroad, any landmark, etc)

(Please deaw sketch on back of Original)

11. REMARKS: 3 foot sump located below the screen

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	11	Red Silty Sand	82	100	Gray Clay
11	21	Light Gray Clay	100	108	Dark Gray Silty Clay
21	31	Light Gray Clayey Sand	108	110	Dark Gray Clay
31	52	Light Gray Silty Clay			
52	62	Gray Silty Sand			
62	82	Gray Silty Clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL: E. Hull

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO. -6259Z

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

SECTION TOWNSHIP RANGE

ELEV QUAD NO.

Use of well W

INPUT BY: MD DATE. 9-11-96

INSPECTED BY: DATE

REMARKS.

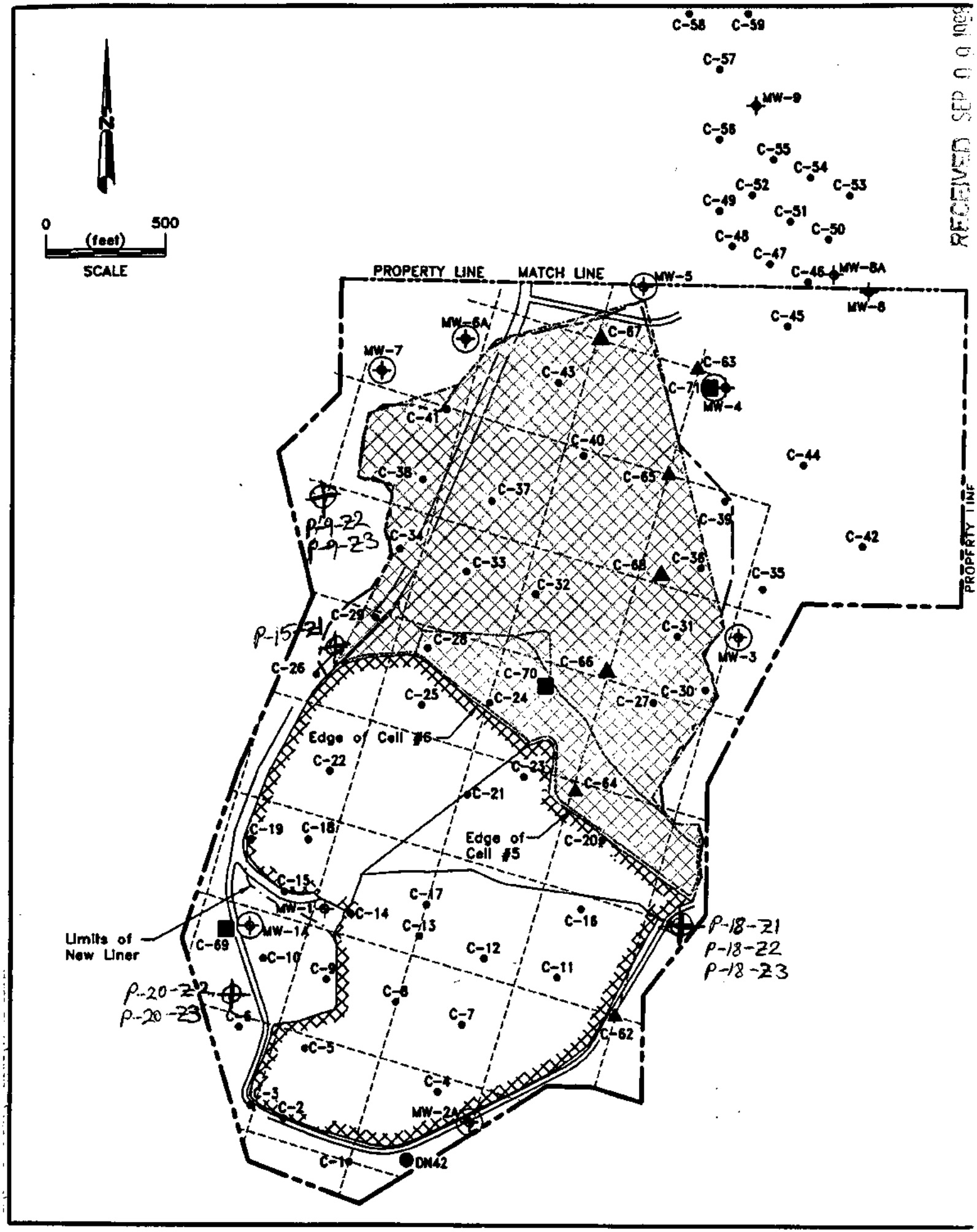
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 01 02 LONGITUDE 93 34 20 02

SECTION 023 TOWNSHIP 12N RANGE 12E

ELEV. 0340 QUAD NO. 057D Bayou Pierre Lake La.

SITE ADDRESS: 963 Power Plant Rd. Mansfield, La


N
0
500
(feet)
SCALE
PROPERTY LINE
MATCH LINE
PROPERTY LINE
C-58
C-59
C-57
MW-9
C-56
C-55
C-54
C-52
C-53
C-49
C-51
C-48
C-50
C-47
C-46
MW-8A
MW-8
C-45
MW-5
MW-6A
C-67
MW-7
C-43
C-63
C-71
MW-4
C-41
C-40
C-44
C-38
C-65
C-37
C-39
P-9-22
P-9-23
C-34
C-42
C-33
C-68
C-36
C-32
C-35
C-29
C-31
P-15-21
C-28
MW-3
C-26
C-70
C-66
C-25
C-24
C-27
C-30
Edge of Cell #6
C-22
C-23
C-64
C-21
C-19
C-18
Edge of Cell #5
C-20
C-15
C-17
MW-1
C-14
C-16
C-13
Limits of New Liner
C-69
MW-14
C-12
P-18-21
P-18-22
P-18-23
C-10
C-11
C-9
P-20-22
P-20-23
C-8
C-7
C-62
C-6
C-5
C-4
C-3
C-2
MW-2A
C-1
DN42

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPEMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

031-6258Z

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER CLECO PHONE (318) 484-5000

3. WELL OWNER'S ADDRESS P. O. Box 5000 Pineville La. 71361

4. OWNER'S WELL NUMBER OR NAME (if any) P-9-Z2 P-8

5. DATE COMPLETED 8/14/96 DEPTH OF HOLE 66 FT. DEPTH OF WELL 66 FT.

6. STATIC WATER LEVEL 66 FT. BELOW GROUND SURFACE MEASURED ON 8/14/96

7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 53 FT.

8. SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT

9. CEMENTED FROM 48 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH De Soto WELL IS NEAR, Mansfield, LA (Town or city)

APPROXIMATELY 2 MILES FROM south side of Power Plant Road (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS 3 foot sump located below the screen

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	10	Red Silty Sand			
10	22	Light Gray Clay			
22	31	Light Gray Clayey Sand			
≈31	50	Dark Gray Silty Clay			
50	52	Dark Gray Clay			
52	66	Light Gray Silty Sand			

13. FOR HEAT PUMP ONLY. AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION. DOES THE WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: E. Hull

DOTD'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 9-6-96 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO. -6258Z

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

Use of well W - -

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: MB DATE: 9-11-96

INSPECTED BY. _____ DATE _____

REMARKS: _____

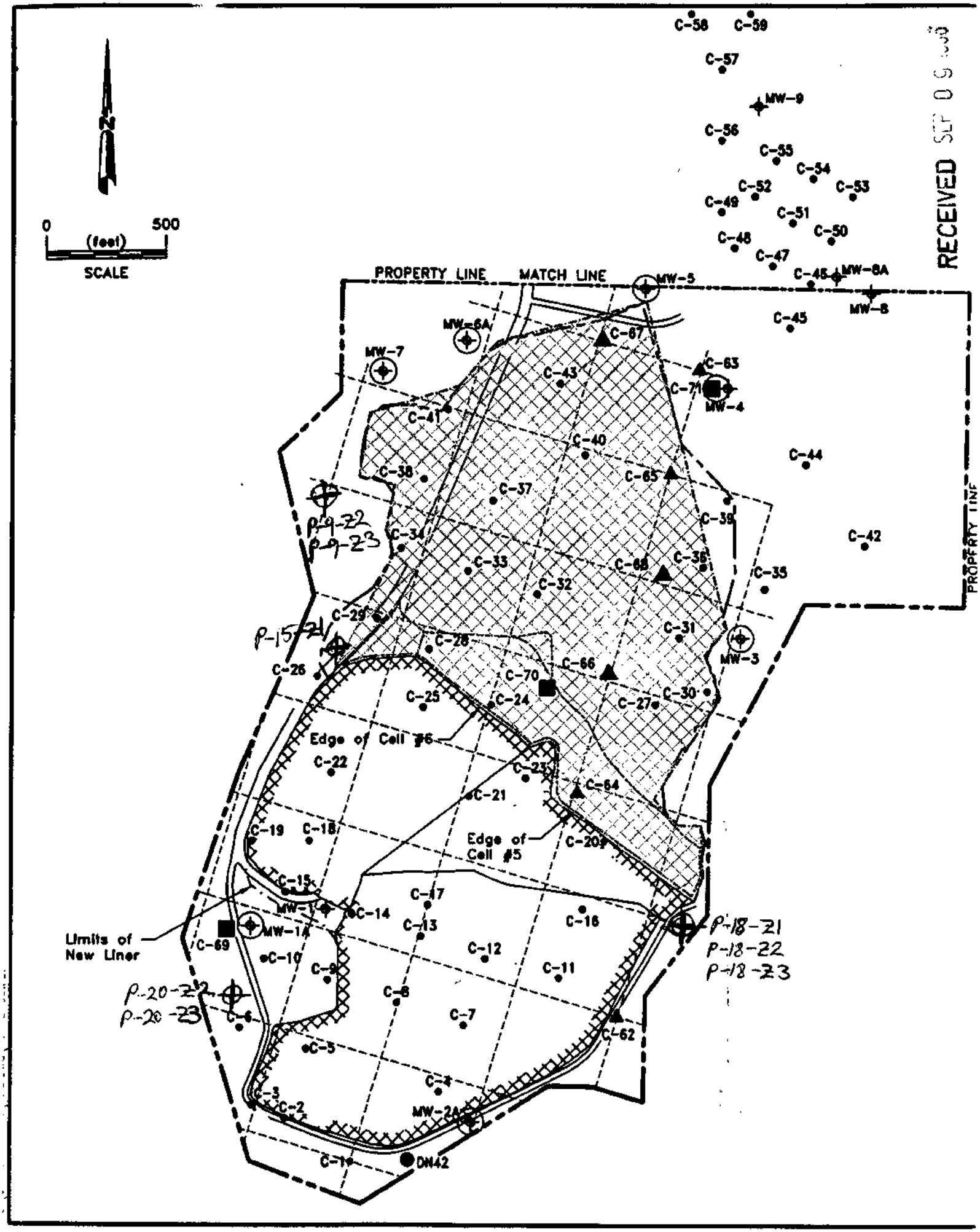
FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 32 01 02 LONGITUDE 93 34 20 01

SECTION 023 TOWNSHIP 12N RANGE 12 E W

ELEV 034 QUAD NO 057D Bayou Pierre Lake La.

SITE ADDRESS: 963 Power Plant Rd. Mansfield, La.



97-124

C31-65472

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

Re-filing - Original Never Returned

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER CLECO PHONE (318) 872-5460
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (if any) P-10
5. DATE COMPLETED 6-11-97 DEPTH OF HOLE 55* FT DEPTH OF WELL 55 FT.
6. STATIC WATER LEVEL 44.91 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 42 FT
8. SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.
9. CEMENTED FROM 37 FT. TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH DeSoto WELL IS NEAR, Naborton, La (Town or City)
    APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 + Hwy 522. P-10, P-11, + P-12 are next to Boring B-13 (Crossroads, Railroad, Any Landmark, etc.) (Please draw sketch on back of Original)
11. REMARKS: * 3 ft Sump at end of well Screen
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	30	Tan Clayey Sand			
30	50	Tan Sand			
50	55	Gray Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL. John Charles

(REV. 7/93)

DOTD'S COPY

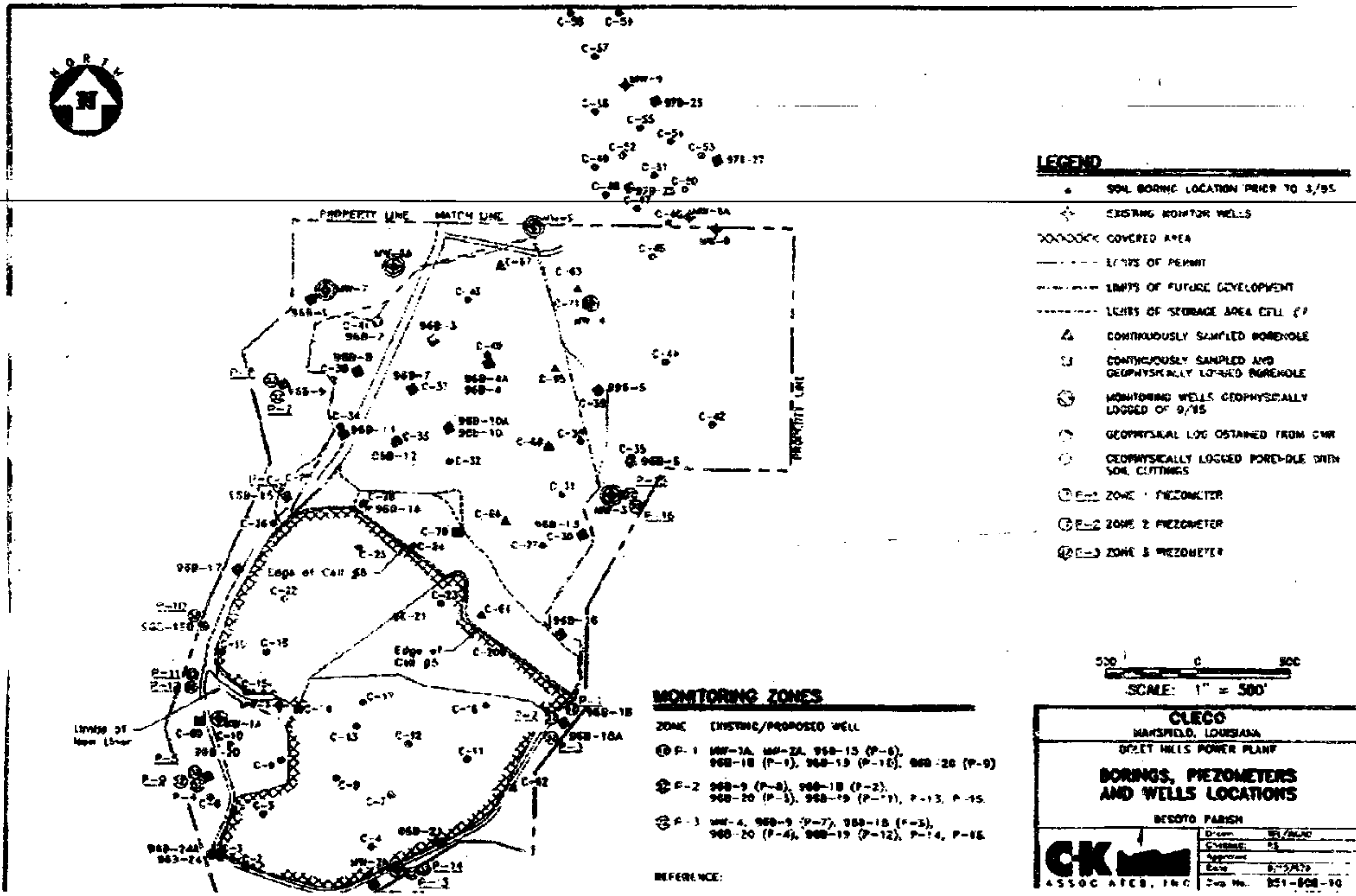
Name of Water Well Contractor: Charles Drilling Serv
LICENSE NUMBER WWC-477
Authorized Signature: John C Charles Date: 7-10-97

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN.. CHIEF - WATER RESOURCES SECTION
P.O BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

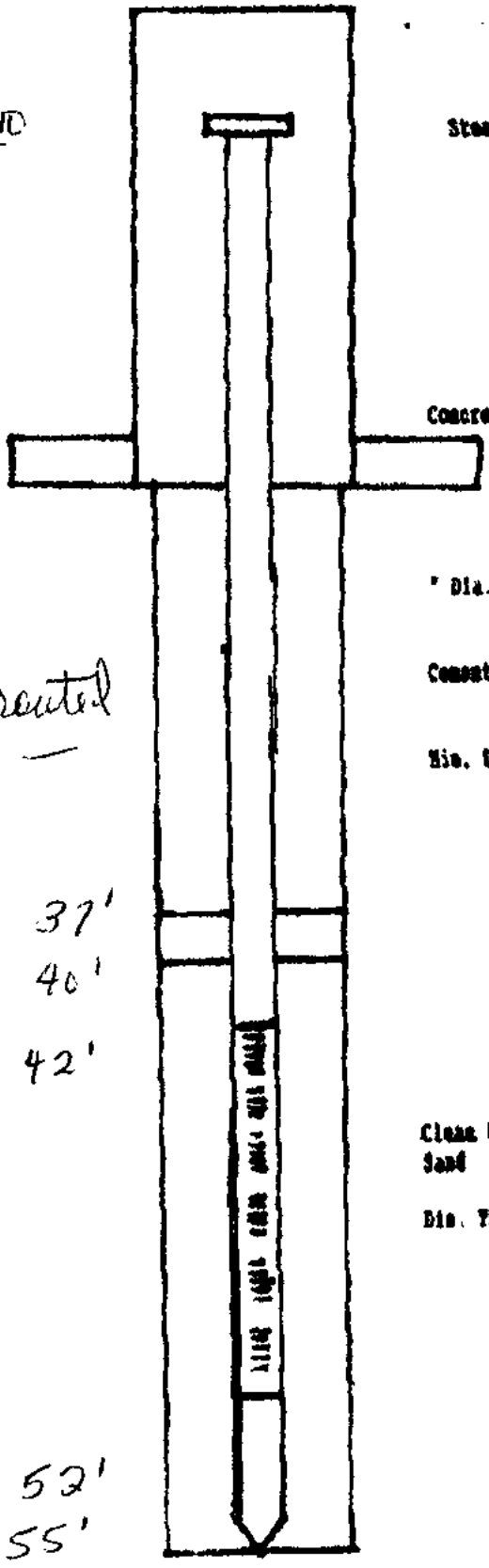
FOR OFFICE USE ONLY
PARISH 031 WELL NO. 65472
IDENTIFICATION NUMBER
REVISED COORDINATES
Geologic Unit
SECTION TOWNSHIP RANGE
ELEV. QUAD NO
Use of Well W
INPUT BY BJB DATE 12/17/98
INSPECTED BY. _____ DATE _____
REMARKS. _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY
LATITUDE 32 00 47 LONGITUDE 93 39 24 01
SECTION 23 TOWNSHIP 12N RANGE 12W
ELEV 313 QUAD NO 57D
SITE ADDRESS Rt 2, Box 215
Mansfield, La 71052

031-65472


NORTH
N
PROPERTY LINE
MATCH LINE
PROPERTY LINE
Edge of Cell #8
Edge of Cell #5
SCALE: 1" = 500'
LEGEND
SOIL BORING LOCATION PRIOR TO 3/95
EXISTING MONITOR WELLS
COVERED AREA
LIMITS OF PERMIT
LIMITS OF FUTURE DEVELOPMENT
LIMITS OF STORAGE AREA CELL [illegible]
CONTINUOUSLY SAMPLED BOREHOLE
CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
GEOPHYSICAL LOG OBTAINED FROM CMR
GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
P-1 ZONE 1 PIEZOMETER
P-2 ZONE 2 PIEZOMETER
P-3 ZONE 3 PIEZOMETER
MONITORING ZONES
ZONE EXISTING/PROPOSED WELL
P-1 MW-3A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
P-2 96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15.
P-3 MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16
REFERENCE:
CLECO
MANSFIELD, LOUISIANA
DOLET HILLS POWER PLANT
BORINGS, PIEZOMETERS AND WELLS LOCATIONS
DESOTO PARISH
C-K ASSOCIATES, INC
Drawn:
Checked:
Approved:
Date:
Dwg No.

Monitor Well No.- P-10



Date Installed: 6-11-97

Logger: Ray Stardavant

Driller: John Charles

24459-130

97-124

C31-65487

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

Re-filing – Original Never Returned

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER CLECO PHONE (318) 372-5400
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (If any) P-11
5. DATE COMPLETED 6-27-97 DEPTH OF HOLE 110 + FT. DEPTH OF WELL 110 FT
6. STATIC WATER LEVEL 70.50 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 98 FT.
8. SCREEN 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT
9. CEMENTED FROM 93 FT. TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL. PARISH DeSoto WELL IS NEAR, Naborton, La. (Town or City)
    APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 & Hwy 522. P-10, P-11, & P-12 Are next to Bering B-13 (Crossroads, Railroad, Any Landmark, etc.)
    (Please draw sketch on back of Original)
11. REMARKS: * 2 ft Sump at end of well Screen
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	30	Tan Clayey Sand			
30	50	Tan Sand			
50	60	Gray Sand			
60	95	Gray Clay / Gray Silty Clay			
95	110	Gray Silty Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL. John O. Charles

(REV. 7/93)

DOTD'S COPY

Charles Drilling Serv
Name of Water Well Contractor

LICENSE NUMBER WWC-477

John O Charles 7-10-97
Authorized Signature Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPMENT
ATTN.. CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH 031 WELL NO 65487

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit

SECTION TOWNSHIP RANGE

ELEV QUAD. NO

Use of Well: W

INPUT BY: BJB DATE: 12/17/98

INSPECTED BY: _____ DATE: _____

REMARKS. _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

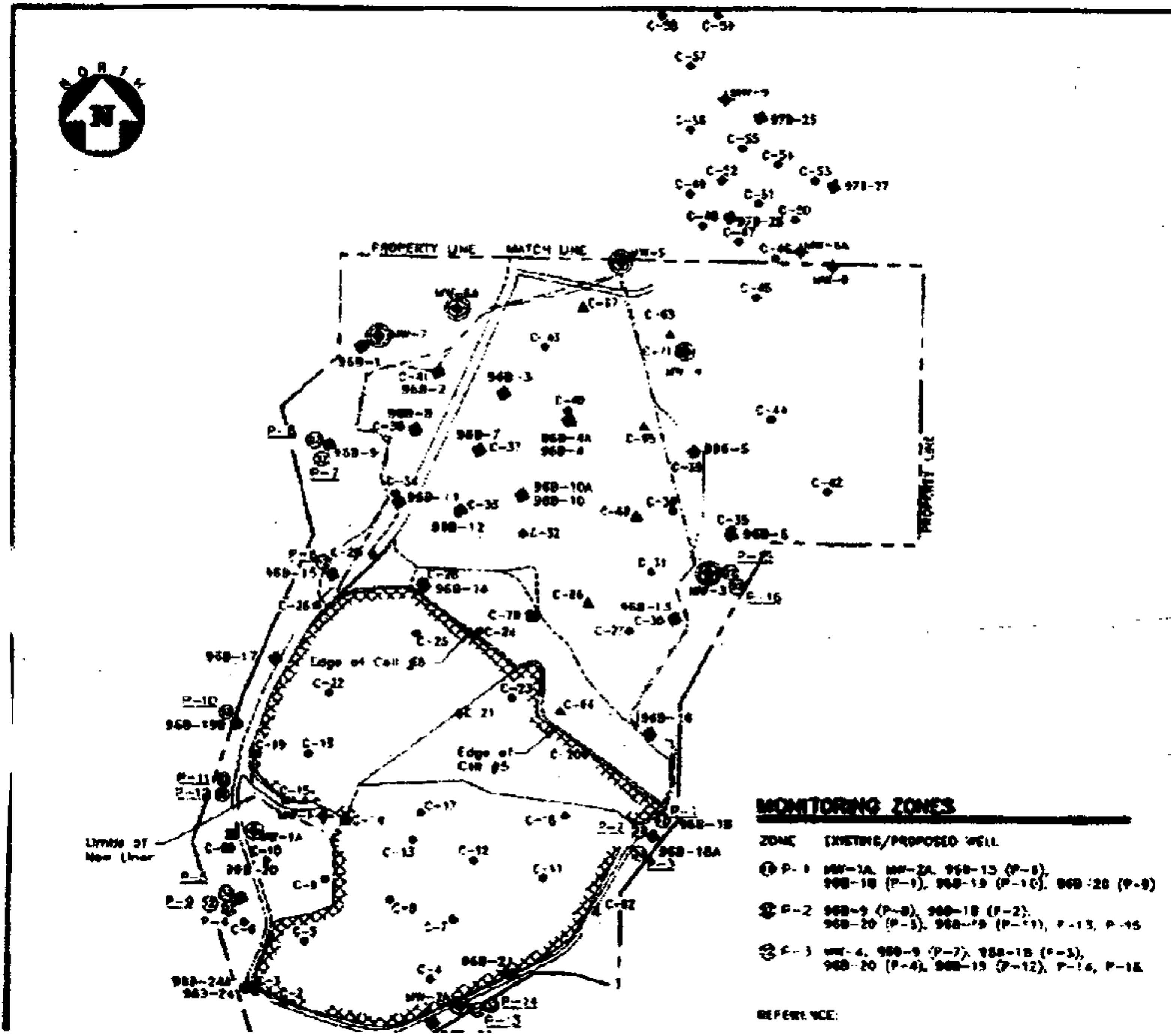
LATITUDE 32 00 47 LONGITUDE 93 34 35 01

SECTION 23 TOWNSHIP 12N RANGE 12W

ELEV 378 QUAD NO 57D

SITE ADDRESS Rt 2, Box 215
Mansfield, La 71052

131-6548Z



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- COVERED AREA
- LIMITS OF PERMIT
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM CNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- P-1 ZONE 1 PIEZOMETER
- P-2 ZONE 2 PIEZOMETER
- P-3 ZONE 3 PIEZOMETER

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
P-1	MW-1A, MW-2A, 96B-15 (P-6), 96B-16 (P-1), 96B-19 (P-10), 96B-20 (P-9)
P-2	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
P-3	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:

500 0 500

SCALE: 1" = 500'

CLECO
MANSFIELD, LOUISIANA
DOLET HILLS POWER PLANT

BORINGS, PIEZOMETERS AND WELLS LOCATIONS

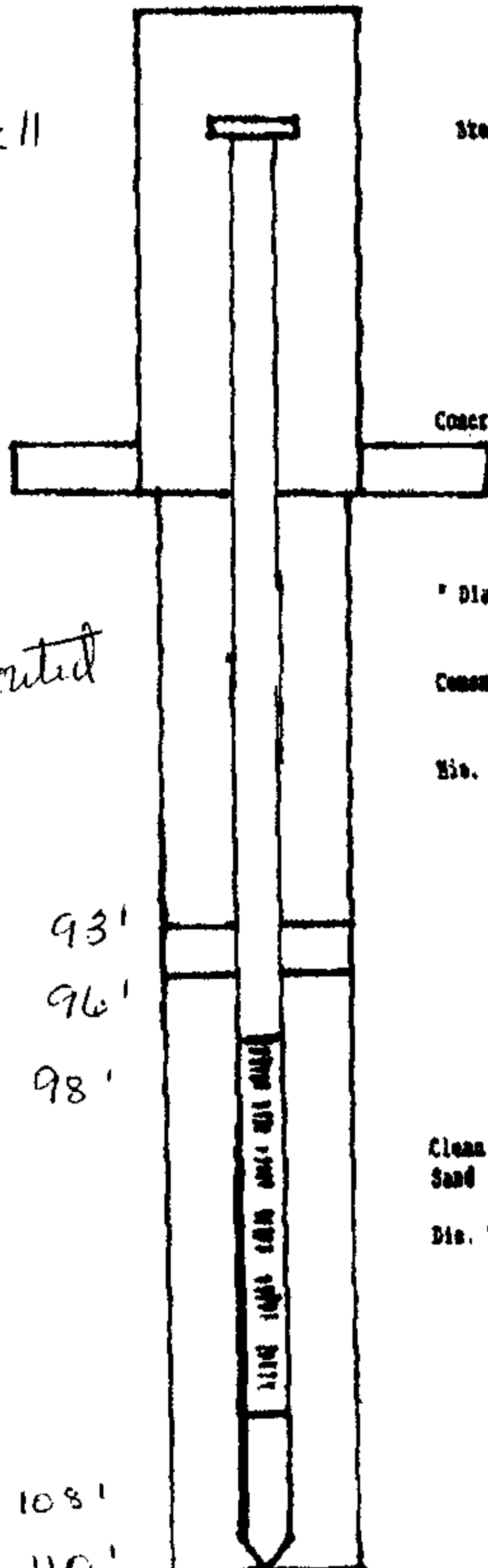
DESOTO PARISH

C-K ASSOCIATES, INC.

Drawn	[illegible]
Checked	[illegible]
Approved	
Date	[illegible]
Dwg. No.	851-808-10

Monitor Well ____ P-11

Top Of Well



Steel Protective Casing

Concrete Pad

Ground Surface

" Dia. Threaded Casing

grouted

Cement/Bentonite Grout

Min. Dia. Borehole

Top of Pellet Seal 93'

Top of Sand 96'

Top of Screen 98'

Clean Uniformly Graded Sand

Dia. Threaded Casing

Top of Sump 108'

Bottom of Well 110'

Date Installed: 6-27-97

Logger: Ray Sturdavant

Driller: John Charles

0345482

C31-65497

97-124

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM — Re-filing — Original Never Returned

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☑ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER CLECO PHONE (318) 872-5402
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La. 71361
4. OWNER'S WELL NUMBER OR NAME (if any) P-12
5. DATE COMPLETED 6-24-97 DEPTH OF HOLE 160 FT. DEPTH OF WELL 153 FT
6. STATIC WATER LEVEL 80.51 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☑ PLASTIC ☐ OTHER LENGTH 140 FT
8. SCREEN 2 IN ☐ METAL ☑ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.
9. CEMENTED FROM 135 FT. TO GROUND SURFACE, USING ☑ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH DeSoto WELL IS NEAR, Naborton La (Town or City)
    APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 + Hwy 522 (Crossroads, Railroad, Any Landmark, etc.)
    Back-filled boring w/Sand from 153 ft to 160 ft.
    (Please draw sketch on back of Original)
11. REMARKS: 3' Sump at end of well Screen. P-10, P-11 & P-12 are next to Boring B-13
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	30	Tan Clayey Sand	140	153	Gray Silty Sand
30	50	Tan Sand			
50	60	Gray Sand			
60	95	Gray Clay/Silty Clay			
95	100	Gray Silty Sand			
100	140	Gray Silty Clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☑
15. NAME OF PERSON WHO DRILLED THE WELL. John Charles

(REV 7/93) DOTD'S COPY

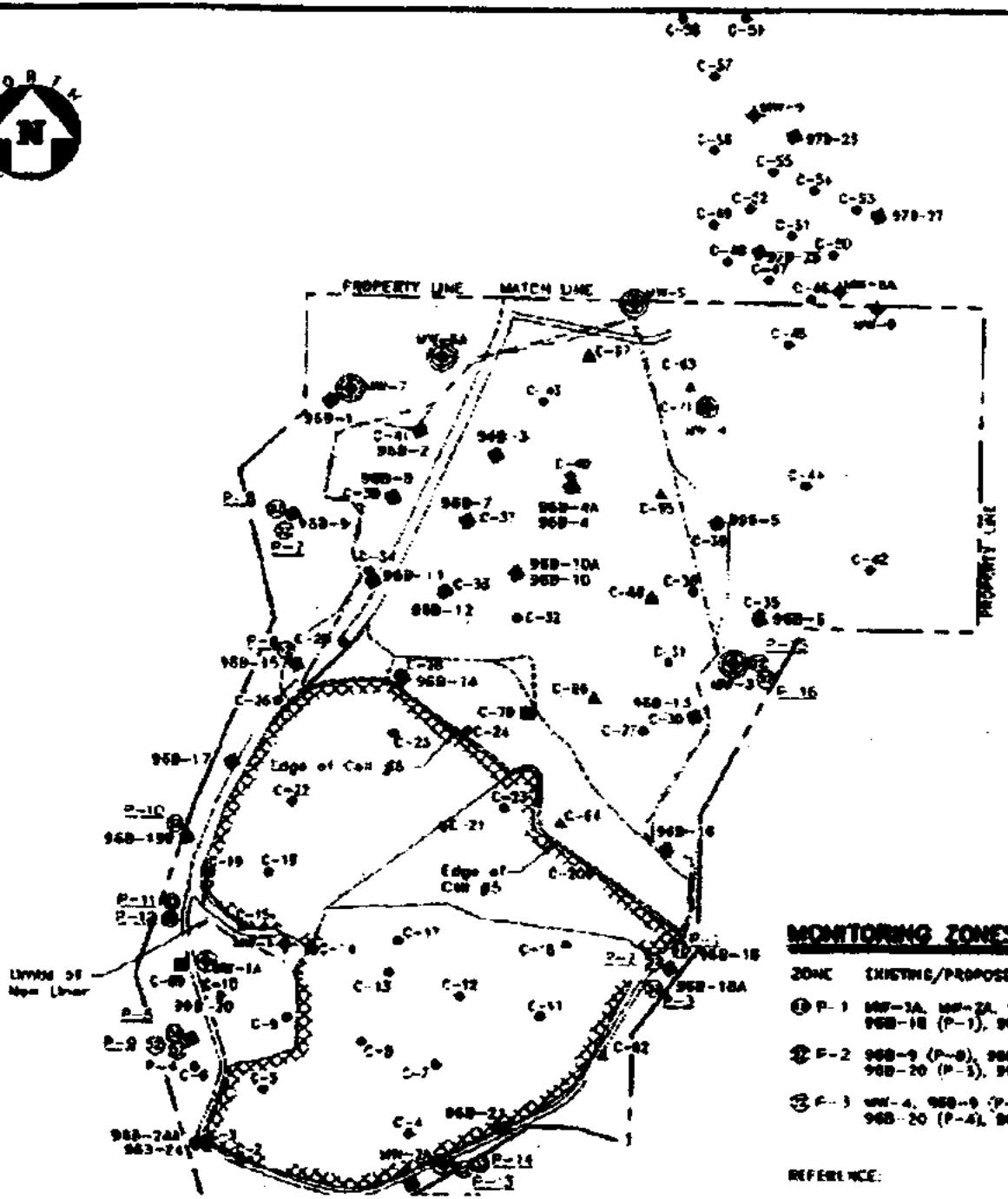
Charles Drilling Serv.
Name of Water Well Contractor
LICENSE NUMBER WWC-477
John O Charles 7-10-97
Authorized Signature Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY
PARISH 031 WELL NO 65497
IDENTIFICATION NUMBER
REVISED COORDINATES
Geologic Unit
SECTION TOWNSHIP RANGE
ELEV QUAD. NO.
Use of Well W
INPUT BY: Bill DATE: 12/17/98
INSPECTED BY: _____ DATE: _____
REMARKS: _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY
LATITUDE 32 00 47 LONGITUDE 93 34 25 02
SECTION 23 TOWNSHIP 12N RANGE 12W
ELEV. 379 QUAD NO 510
SITE ADDRESS Rt 2, Box 215
Mansfield La 71052

031-6549E



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- COVERED AREA
- LIMITS OF PERMIT
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM CMR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (1) P-1 ZONE 1 PIEZOMETER
- (2) P-2 ZONE 2 PIEZOMETER
- (3) P-3 ZONE 3 PIEZOMETER

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(1) P-1	MW-3A, MW-2A, 96B-13 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(2) P-2	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(3) P-3	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:

550 0 500

SCALE: 1" = 500'

CLECO
MANSFIELD, LOUISIANA
DOLET HILLS POWER PLANT

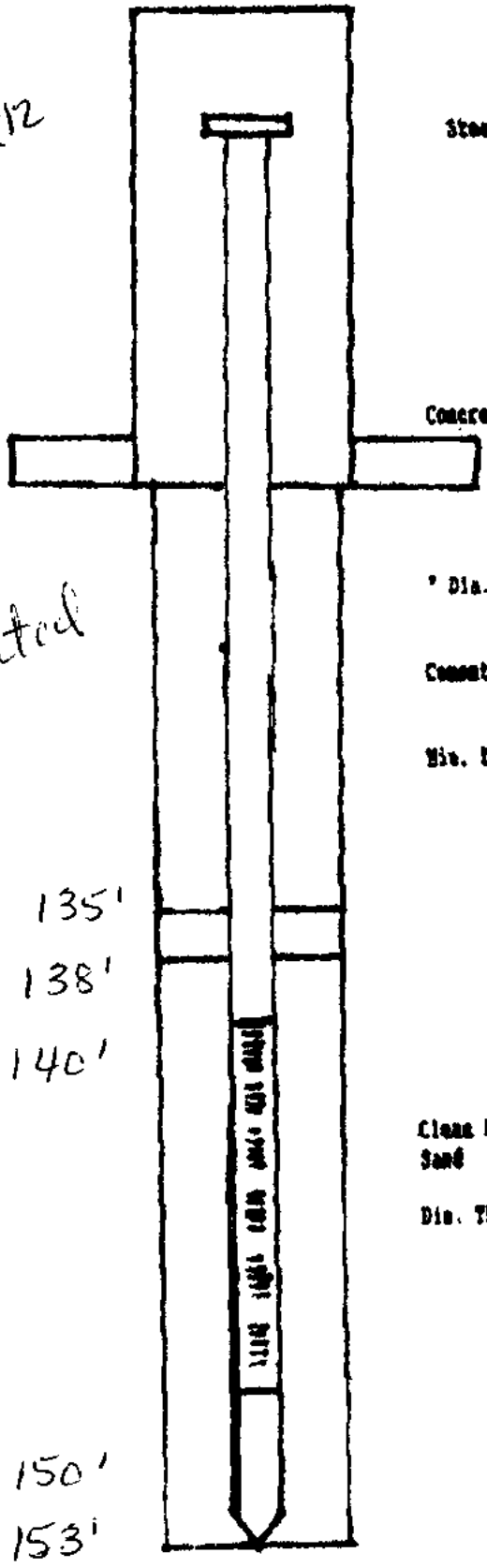
BORINGS, PIEZOMETERS AND WELLS LOCATIONS

DESOTO PARISH

C-K ASSOCIATES, INC

Drawn:	WS/MLAD
Checked:	RS
Approved:	
Date:	8/15/95
Dwg No.:	851-600-10

Monitor Well No.- P-12



Date Installed: 6-24-97

Logger: Ray Sturdivant

Driller: John Charles

031-05492

C31-65507

97-124

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

Re-filing — Original Never Returned

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (Check Appropriate Box)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)

2. WELL OWNER CLECO PHONE (318) 872-5400
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (if any) P-13 #
5. DATE COMPLETED 6-12-97 DEPTH OF HOLE 83 FT. DEPTH OF WELL 83 FT.
6. STATIC WATER LEVEL 59.92 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 70 FT.
8. SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.
9. CEMENTED FROM 65 FT. TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH DeSoto WELL IS NEAR, Naberton, La (Town or City)
APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 & Hwy 522 (Crossroads, Railroad, Any Landmark, etc.)
P-13 & P-14 located near Boring # B-20
(Please draw sketch on back of Original)
11. REMARKS: # 3 ft Sump at end of well Screen
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	50	Tan Sand			
50	75	Gray Clay / Silty Clay			
75	83	Gray Silty Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: John Charles

(REV 7/93)

DOTD'S COPY

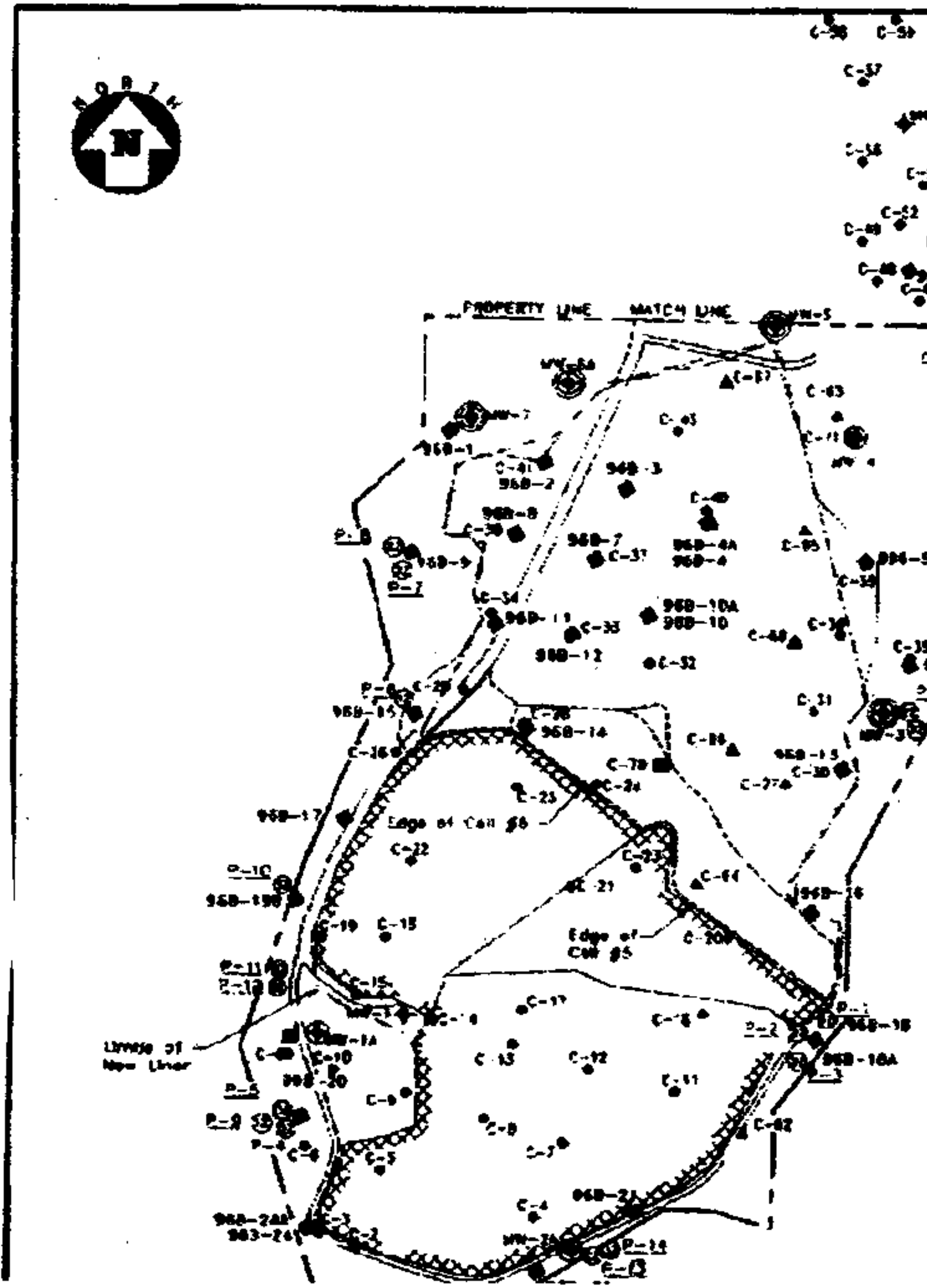
Name of Water Well Contractor: Charles Drilling Service
LICENSE NUMBER: WWC-477
Authorized Signature: John C Charles Date: 7-10-97

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY
PARISH: 031 WELL NO: 65507
IDENTIFICATION NUMBER: 0
REVISED COORDINATES:
Geologic Unit:
SECTION: TOWNSHIP: RANGE:
ELEV: QUAD NO:
Use of Well: W
INPUT BY: Brad DATE: 12/17/98
INSPECTED BY: _____ DATE: _____
REMARKS: _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY
LATITUDE: 32 00 35 LONGITUDE: 93 14 01
SECTION: 23 TOWNSHIP: 12N RANGE: 12W
ELEV: 367 QUAD NO: 570
SITE ADDRESS: PO Box 215, Route 2
Mansfield, La 71052

031-6550Z



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- COVERED AREA
- LIMITS OF PERMIT
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM CNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- P-1 ZONE 1 PIEZOMETER
- P-2 ZONE 2 PIEZOMETER
- P-3 ZONE 3 PIEZOMETER

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
P-1	MW-3A, MW-2A, 95B-15 (P-6), 95B-18 (P-1), 95B-19 (P-10), 95B-20 (P-9)
P-2	95B-9 (P-8), 95B-18 (P-2), 95B-20 (P-5), 95B-19 (P-11), P-13, P-15
P-3	MW-4, 95B-9 (P-7), 95B-18 (P-3), 95B-20 (P-4), 95B-19 (P-12), P-14, P-16

REFERENCE:

500 0 500

SCALE: 1" = 500'

CLECO

MANSFIELD, LOUISIANA

DOLET HILLS POWER PLANT

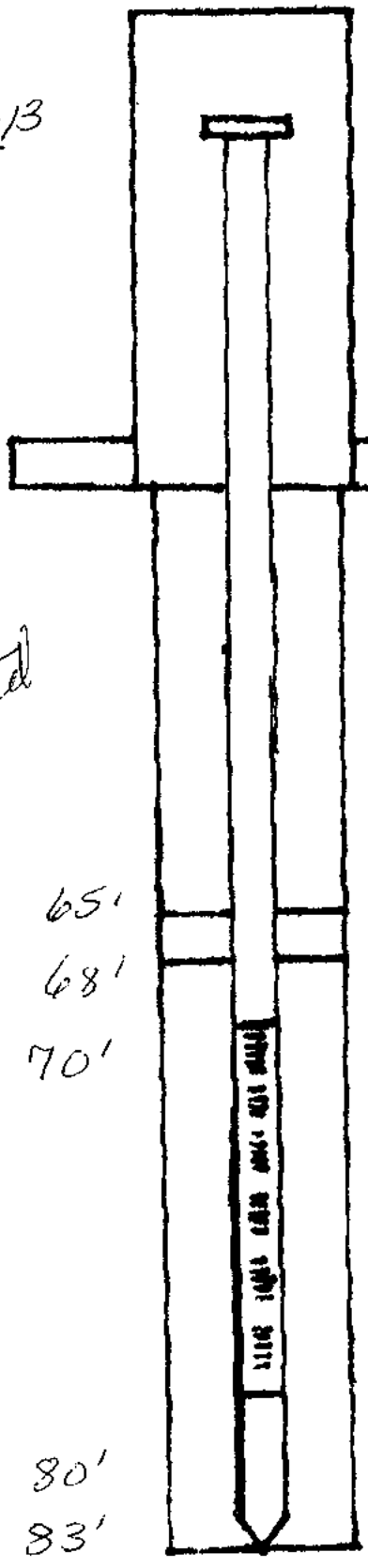
BORINGS, PIEZOMETERS AND WELLS LOCATIONS

DESOTO PARISH

C-K ASSOCIATES, INC

Drawn	[illegible]
Checked	[illegible]
Approved	
Date	[illegible]
Dwg. No.	[illegible]

Monitor Well P-13



Top Of Well

Steel Protective Casing

Concrete Pad

Ground Surface

4" Dia. Threaded Casing

Cement/Bentonite Grout

Min. Dia. Borehole

grouted

Top of Pellet Seal 65'

Top of Sand 68'

Top of Screen 70'

Clean Uniformly Graded Sand

Dia. Threaded Casing

Top of Sump 80'

Bottom of Well 83'

Date Installed: 6-12-97

Logger: Ray Sturdivant

Driller: John Charles

031-0559-107

97-124

C31-65512

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

Re-filing — Original Never Returned

Name of Water Well Contractor: Charles Drilling Serv

LICENSE NUMBER: WWC-477

Authorized Signature: John C Charles Date: 7-10-97

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER: CLECO PHONE (318) 872-5400
3. WELL OWNER'S ADDRESS: PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (if any): P-14
5. DATE COMPLETED: 7-1-97 DEPTH OF HOLE: 130 FT DEPTH OF WELL: 130 FT.
6. STATIC WATER LEVEL: 72.34 FT. BELOW GROUND SURFACE MEASURED ON: 7-3-97 (Date)
7. CASING: 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH: 117 FT
8. SCREEN: 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE: .010 LENGTH: 10 FT.
9. CEMENTED FROM: 112' FT TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH: DeSoto WELL IS NEAR, (Town or City): Naborton, La
    APPROXIMATELY: 2.2 MILES FROM (Crossroads, Railroad, Any Landmark etc.): Intersection of Hwy 84 + Hwy 522
    P-13 + P-14- Located New Boring ± 6-20
    (Please draw sketch on back of Original)
11. REMARKS: ± 3ft Sump at end of Well Screen
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	50	Tan Sand			
50	75	Gray Clay/S.Ity Clay			
75	100	Gray Silty Sand			
100	125	Gray Silty Clay			
125	130	Gray Silty Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: John Charles

(REV. 7/93)

DOTD'S COPY

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH: 031 WELL NO: 65512

IDENTIFICATION NUMBER: 0

REVISED COORDINATES

Geologic Unit

Use of Well: W

SECTION TOWNSHIP RANGE

ELEV QUAD. NO.

INPUT BY: BMB DATE: 12/17/98

INSPECTED BY: _____ DATE: _____

REMARKS: _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

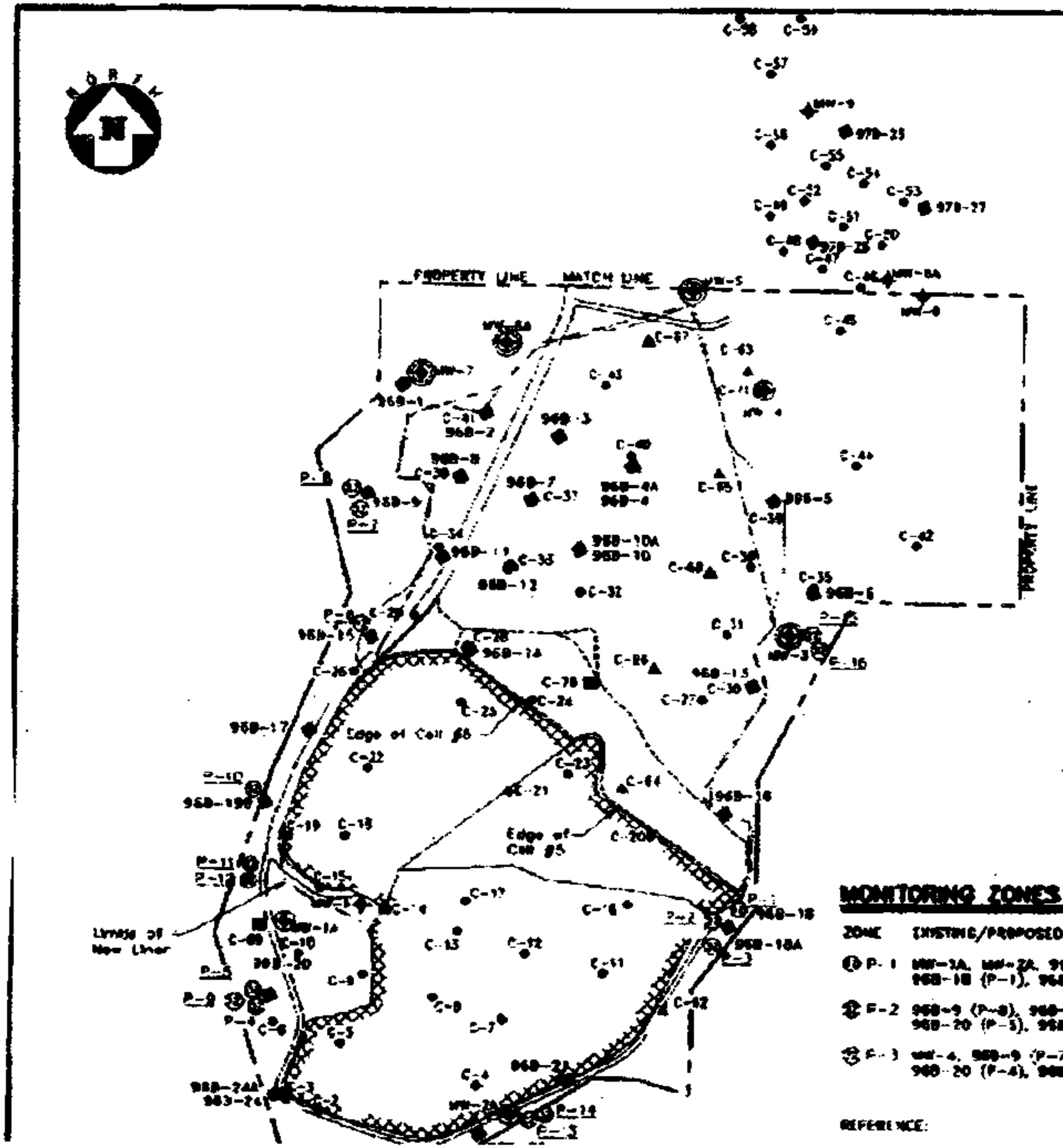
LATITUDE: 32 06 55 LONGITUDE: 93 34 14 02

SECTION: 23 TOWNSHIP: 12N RANGE: 12W

ELEV: 307 QUAD. NO.: 57D

SITE ADDRESS: Rt 2, Box 215
Mansfield, La 71052

031-65512



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- COVERED AREA
- LIMITS OF PERMIT
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM CNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- P-1 ZONE 1 PIEZOMETER
- P-2 ZONE 2 PIEZOMETER
- P-3 ZONE 3 PIEZOMETER

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
P-1	MW-3A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
P-2	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
P-3	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:

500 0 500

SCALE: 1" = 500'

CLECO

MANSFIELD, LOUISIANA

DOLET HILLS POWER PLANT

BORINGS, PIEZOMETERS AND WELLS LOCATIONS

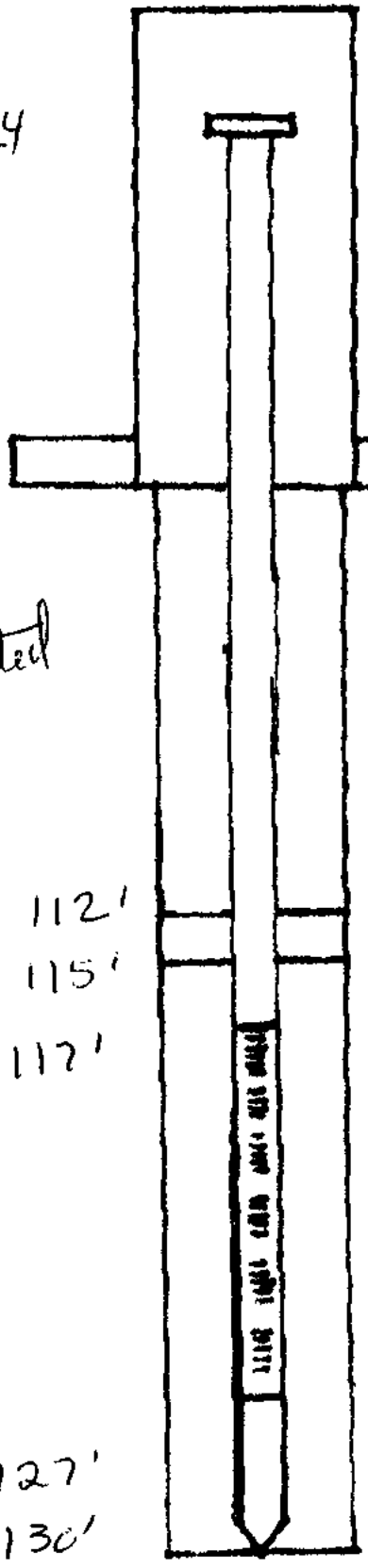
DESOTO PARISH

C-K ASSOCIATES, INC

Drawn	
Checked	
Approved	
Date	
Dwg. No.	851-008-10

Monitor Well [redacted]- P-14

Top Of Well



grouted

Top of Pellet Seal 112'

Top of Sand 115'

Top of Screen 117'

Top of Sump 127'

Bottom of Well 130'

Date Installed: 7-1-97

Logger: Ray Stardivant

Driller: John Charles

031-65517

97-124

C31-65527

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

Re-filing — Original Never Returned

1. USE OF WELL (Check Appropriate Box)

☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)

2. WELL OWNER CLECO PHONE (318) 872-5400
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (if any) P-15
5. DATE COMPLETED 6-18-97 DEPTH OF HOLE 75* FT. DEPTH OF WELL 75 FT.
6. STATIC WATER LEVEL 62.03 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 60 FT
8. SCREEN 2 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.
9. CEMENTED FROM 55 FT. TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH DeSoto WELL IS NEAR, Naberton, La (Town or City)
APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 & Hwy 522 (Crossroads, Railroad, Any Landmark, etc.)
P-15 + P-16 Located next to Same Boring*
(Please draw sketch on back of Original)
11. REMARKS: * 5ft slump at end of well Screen
12 DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	40	Tan Sand			
40	50	Tan Silty Clay			
50	55	Gray Silty Clay			
55	75	Gray Silty Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION. DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: John Charles

(REV. 7/93) DOTD'S COPY

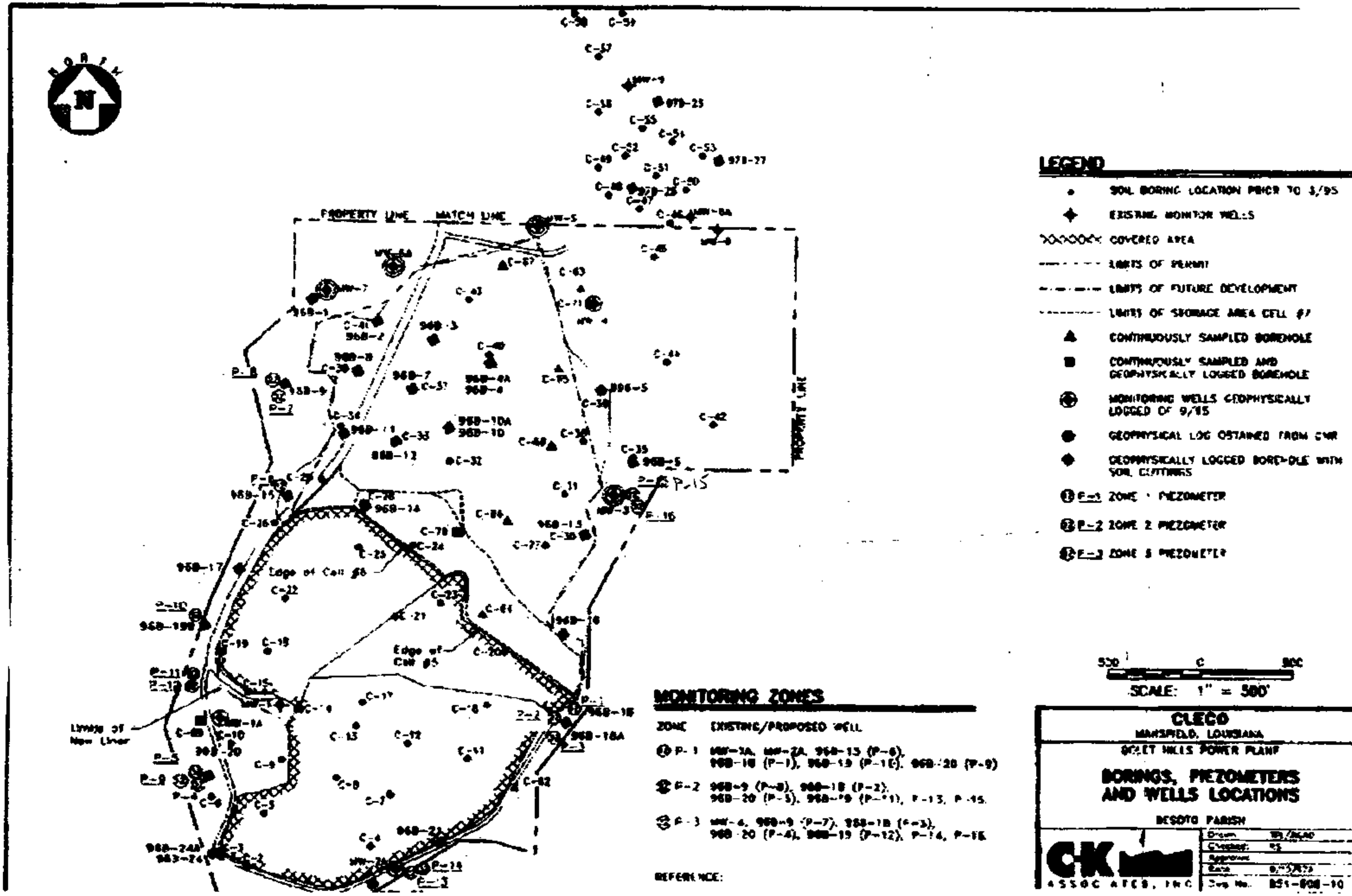
Charles Drilling Serv
Name of Water Well Contractor
LICENSE NUMBER WWC-477
John C Charles 7-10-97
Authorized Signature Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN : CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

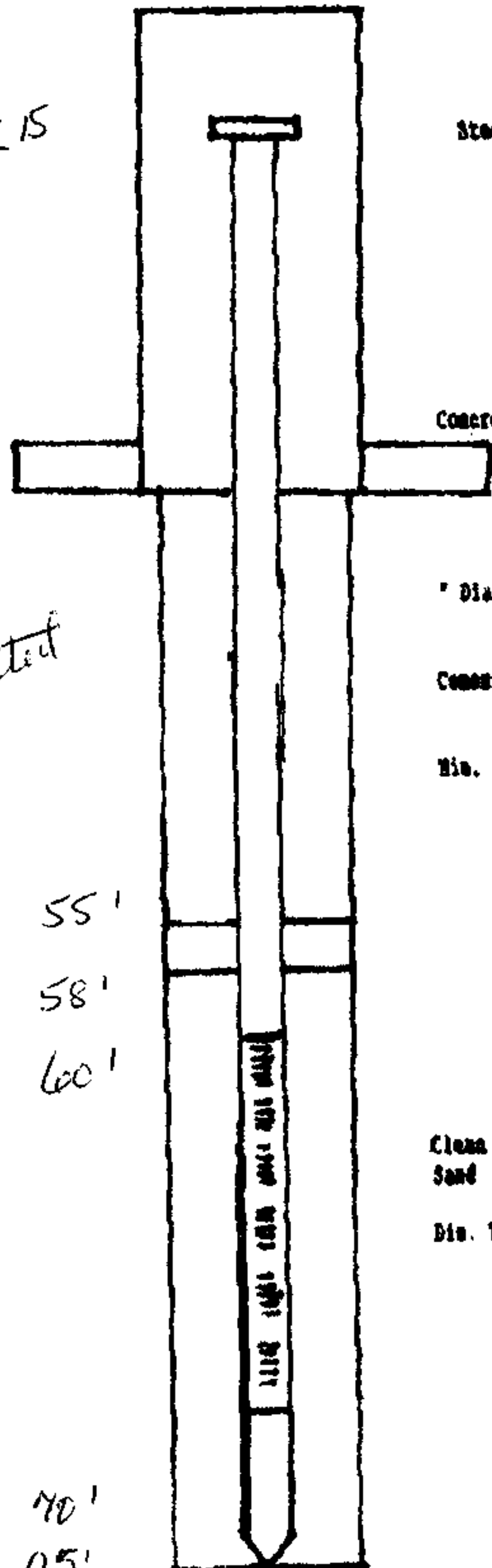
FOR OFFICE USE ONLY
PARISH 031 WELL NO 6552Z
IDENTIFICATION NUMBER
REVISED COORDINATES
Geologic Unit
Use of Well W
SECTION TOWNSHIP RANGE
ELEV QUAD. NO.
INPUT BY: Pam DATE: 12/17/98
INSPECTED BY. _____ DATE: _____
REMARKS: _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY
LATITUDE 32 00 56 LONGITUDE 93 34 01 01
SECTION 23 TOWNSHIP 12N RANGE 12W
ELEV 372 QUAD. NO. 570
SITE ADDRESS Rt 2, Box 215
Mansfield, La 71052

031-65522


NORTH
N
PROPERTY LINE
MATCH LINE
PROPERTY LINE
Edge of Cell #6
Edge of Cell #5
Limits of New Liner
LEGEND
SOIL BORING LOCATION PRIOR TO 3/95
EXISTING MONITOR WELLS
COVERED AREA
LIMITS OF PERMIT
LIMITS OF FUTURE DEVELOPMENT
LIMITS OF STORAGE AREA CELL #7
CONTINUOUSLY SAMPLED BOREHOLE
CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
GEOPHYSICAL LOG OBTAINED FROM CNR
GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
P-1 ZONE 1 PIEZOMETER
P-2 ZONE 2 PIEZOMETER
P-3 ZONE 3 PIEZOMETER
MONITORING ZONES
ZONE EXISTING/PROPOSED WELL
P-1 MW-3A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
P-2 96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
P-3 MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16
REFERENCE:
SCALE: 1" = 500'
CLECO
MANSFIELD, LOUISIANA
DOLET HILLS POWER PLANT
BORINGS, PIEZOMETERS AND WELLS LOCATIONS
DESOTO PARISH
C-K ASSOCIATES, INC
Drawn
Checked
Approved
Date
Dwg No.

Monitor Well ~~Name~~- P-15



Steel Protective Casing

Top Of Well

Concrete Pad

Ground Surface

" Dia. Threaded Casing

Cement/Bentonite Grout

Min. Dia. Borehole

grouted

Top of Pellet Seal 55'

Top of Sand 58'

Top of Screen 60'

Clean Uniformly Graded Sand

Dia. Threaded Casing

Top of Sump 70'

Bottom of Well 75'

Date Installed: 6-18-97

Logger: Ray Sturdavant

Driller: John Charles

031-65522

C31-6553Z

97-124

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

Re-filing — Original Never Returned

Name of Water Well Contractor: Charles Drilling Serv

LICENSE NUMBER: WWC-477

Authorized Signature: John O Charles Date: 7-10-97

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☐ MONITORING ☒ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER CLECO PHONE (318) 872-5400
3. WELL OWNER'S ADDRESS PO Box 5000, Pineville, La 71361
4. OWNER'S WELL NUMBER OR NAME (if any) P-16
5. DATE COMPLETED 6-11-97 DEPTH OF HOLE 113* FT DEPTH OF WELL 113* FT.
6. STATIC WATER LEVEL 80.38 FT. BELOW GROUND SURFACE MEASURED ON 7-3-97 (Date)
7. CASING 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 102 FT.
8. SCREEN 2 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 10 FT.
9. CEMENTED FROM 95 FT. TO GROUND SURFACE, USING ☒ PUMP DOWN METHOD OR ☐ GRAVITY METHOD
10. LOCATION OF WELL: PARISH DeSoto WELL IS NEAR, Naborton, La (Town or City)
    APPROXIMATELY 2.2 MILES FROM Intersection of Hwy 84 & Hwy 522 (Crossroads, Railroad, Any Landmark, etc.)
    P-15 & P-16 located next to pond bearing* (Please draw sketch on back of Original)
11. REMARKS. *3 ft Sump at end of well Screen.
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	40	Tan Sand			
40	50	Tan Silty Clay			
50	55	Gray Silty Clay			
55	75	Gray Silty Sand			
75	100	Gray Silty Clay			
100	113	Gray Silty Sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: John Charles

(REV. 7/93)

DOTD'S COPY

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN.. CHIEF - WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(504) 379-1434

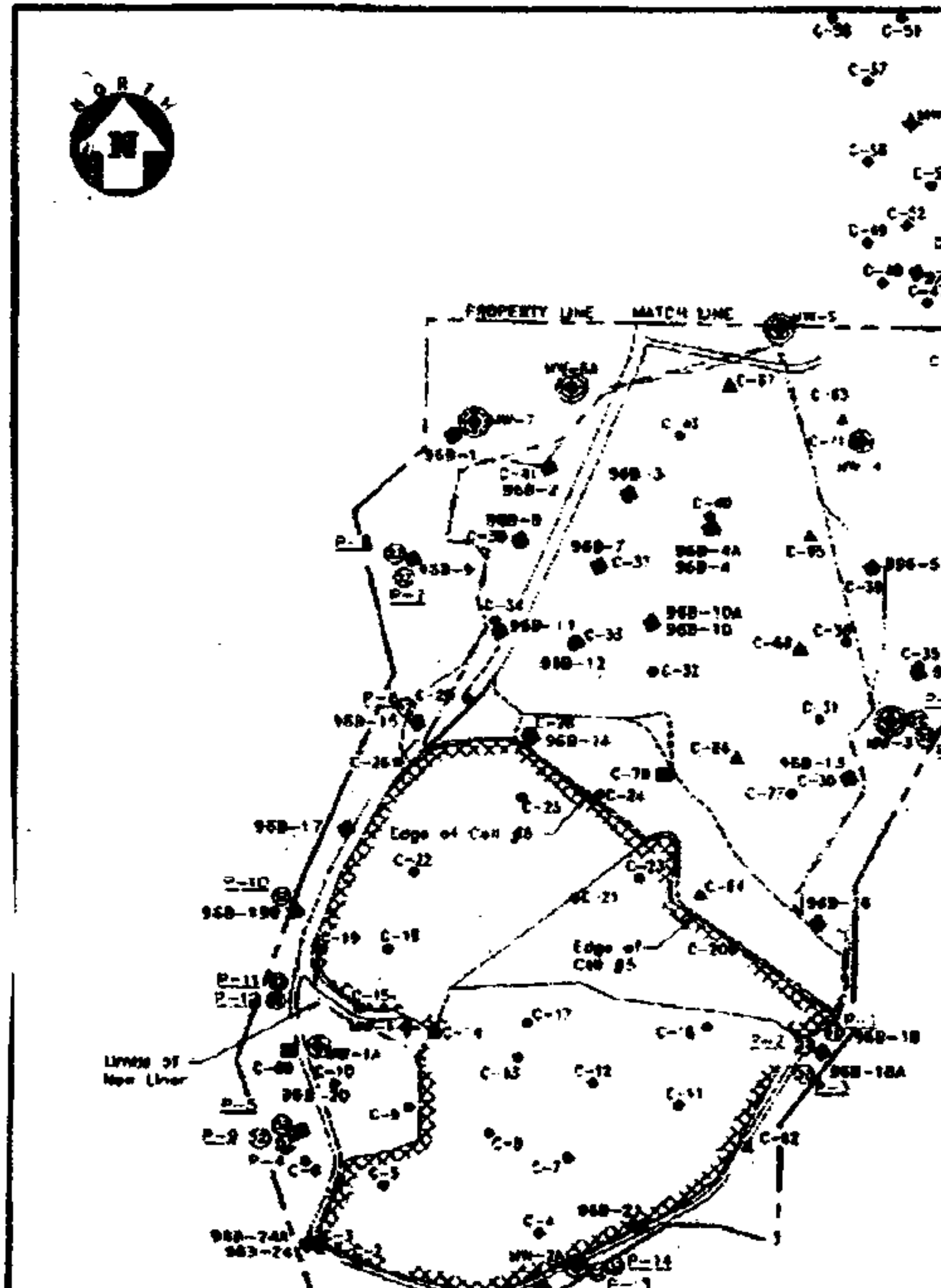
FOR OFFICE USE ONLY

PARISH: 031 WELL NO: 6553Z
IDENTIFICATION NUMBER: 0
REVISED COORDINATES:
Geologic Unit:
SECTION: 23 TOWNSHIP: 12N RANGE: 12W
ELEV: 371 QUAD. NO.: 570
Use of Well: W
INPUT BY: [illegible] DATE: 12/17/98
INSPECTED BY: _____ DATE: _____
REMARKS: _____

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE: 32 00 56 LONGITUDE: 93 34 21 02
SECTION: 23 TOWNSHIP: 12N RANGE: 12W
ELEV: 371 QUAD. NO.: 570
SITE ADDRESS Rt 2, Box 215
Mansfield, La 71052

131-65532



LEGEND

- • SOIL BORING LOCATION PRIOR TO 3/95
- ◆ EXISTING MONITOR WELLS
- XXXXXX COVERED AREA
- — - - - LIMITS OF PERMIT
- —·—·— LIMITS OF FUTURE DEVELOPMENT
- ---------- LIMITS OF STORAGE AREA CELL #7
- ▲ CONTINUOUSLY SAMPLED BOREHOLE
- ■ CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- ⊕ MONITORING WELLS GEOPHYSICALLY LOGGED OF 9/95
- ● GEOPHYSICAL LOG OBTAINED FROM CNR
- ◆ GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- ① P-1 ZONE 1 PIEZOMETER
- ② P-2 ZONE 2 PIEZOMETER
- ③ P-3 ZONE 3 PIEZOMETER

500 0 500

SCALE: 1" = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
① P-1	MW-2A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-28 (P-9)
② P-2	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
③ P-3	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:

CLECO
MANSFIELD, LOUISIANA

DOLET HILLS POWER PLANT

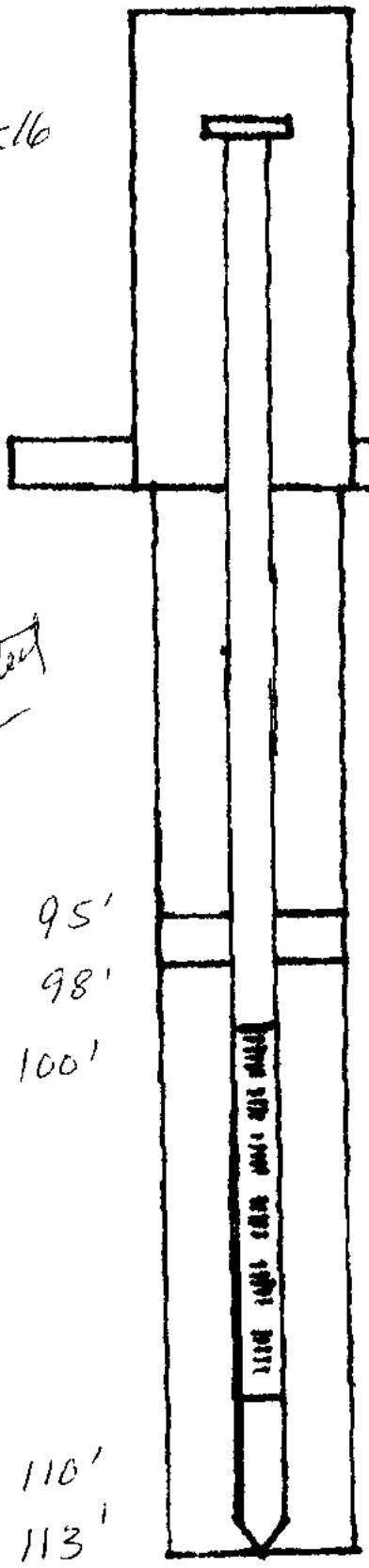
BORINGS, PIEZOMETERS AND WELLS LOCATIONS

DESOTO PARISH

C-K ASSOCIATES, INC

Drawn	[illegible]
Checked	RS
Approved	
Date	[illegible]
Dwg. No.	851-808-10

Monitor Well [redacted]- R-16



Date Installed: 6-19-97

Logger: Ray Sturdavant

Driller: John Charles

22550-126

BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-9-95

COMPANY: CLECO / STEI

HOLE NO.: B-1

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO | STATE: LOUISIANA

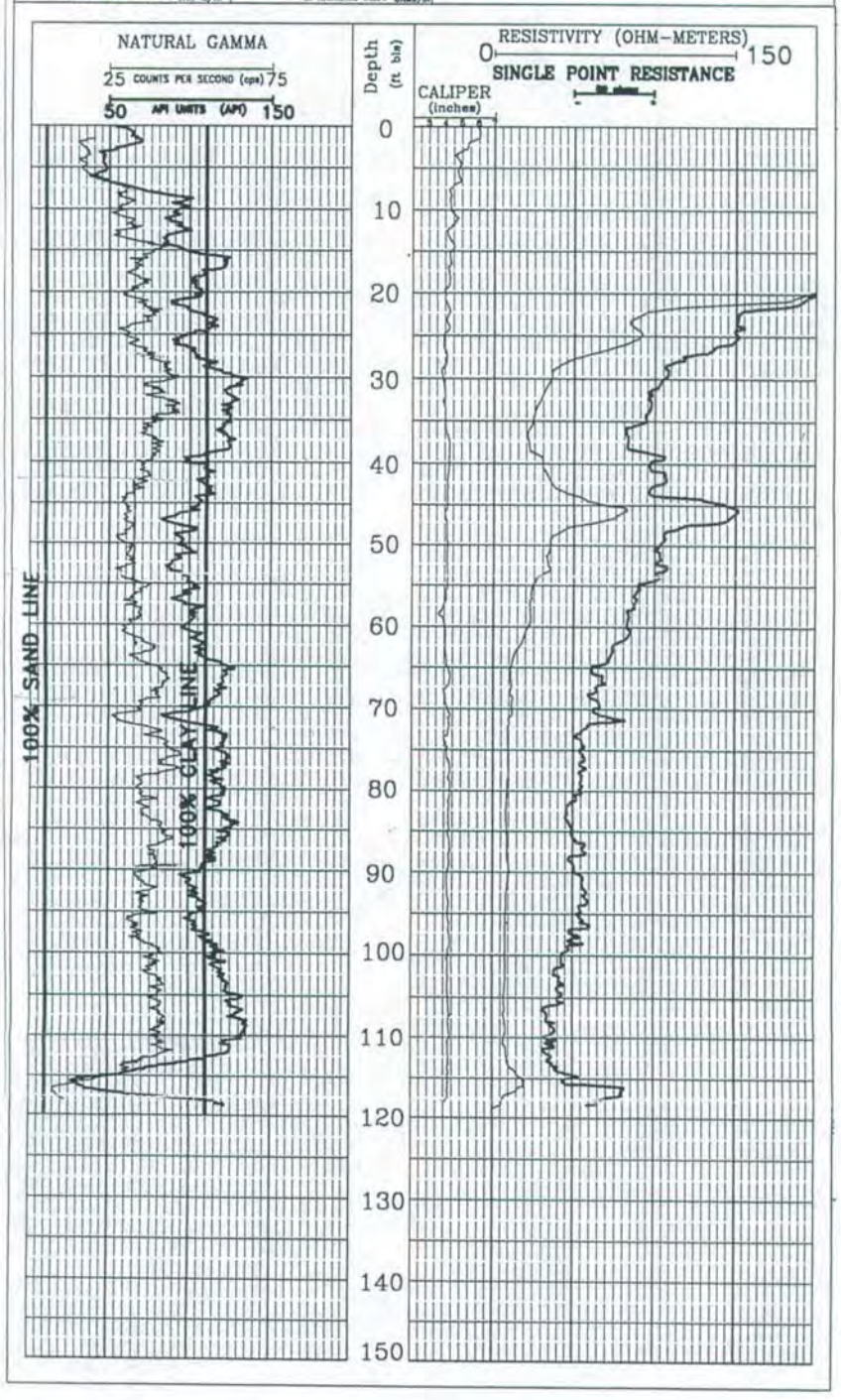
SECTION: 23 | TOWNSHIP: T12N | RANGE: R12W | LOG MEASURED FROM: 352.97 MSL

INITIAL RUN	RERUNS
T.D. LOGGED: 119 FT.	T.D. LOGGED: 118 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below API/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS/IN

WELL DATA

T.D. Logged	119 FT.	T.D. Drilled	120 FT.
Driller	Mesa Drilling	Hl Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	70 OHM-M	LOG TIME	
Density		Start / Stop / Total Hr. TD	
Viscosity	Temp. 59 °F	Witnessed By:	Joe Harrer

OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-6-96

COMPANY: CLECO / STEI

HOLE NO.: B-2

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 322.6 MSL

WELL DATA

T.D. Logged: 87 FT. T.D. Drilled: 88 FT.
Driller: Mesa Drilling Bit Size: 4.25"
Type Fluid in Hole: Groundwater Casing Size: Open Hole
Fluid Level: Grade FT. Bottom Hole Temp.: 60 °F
Resistivity: 40 OHM-M

LOG TIME

Density — Start — Stop — Minutes Total 21.75
Viscosity — Temp. 66 °F — Witnessed By: Joe Harrer

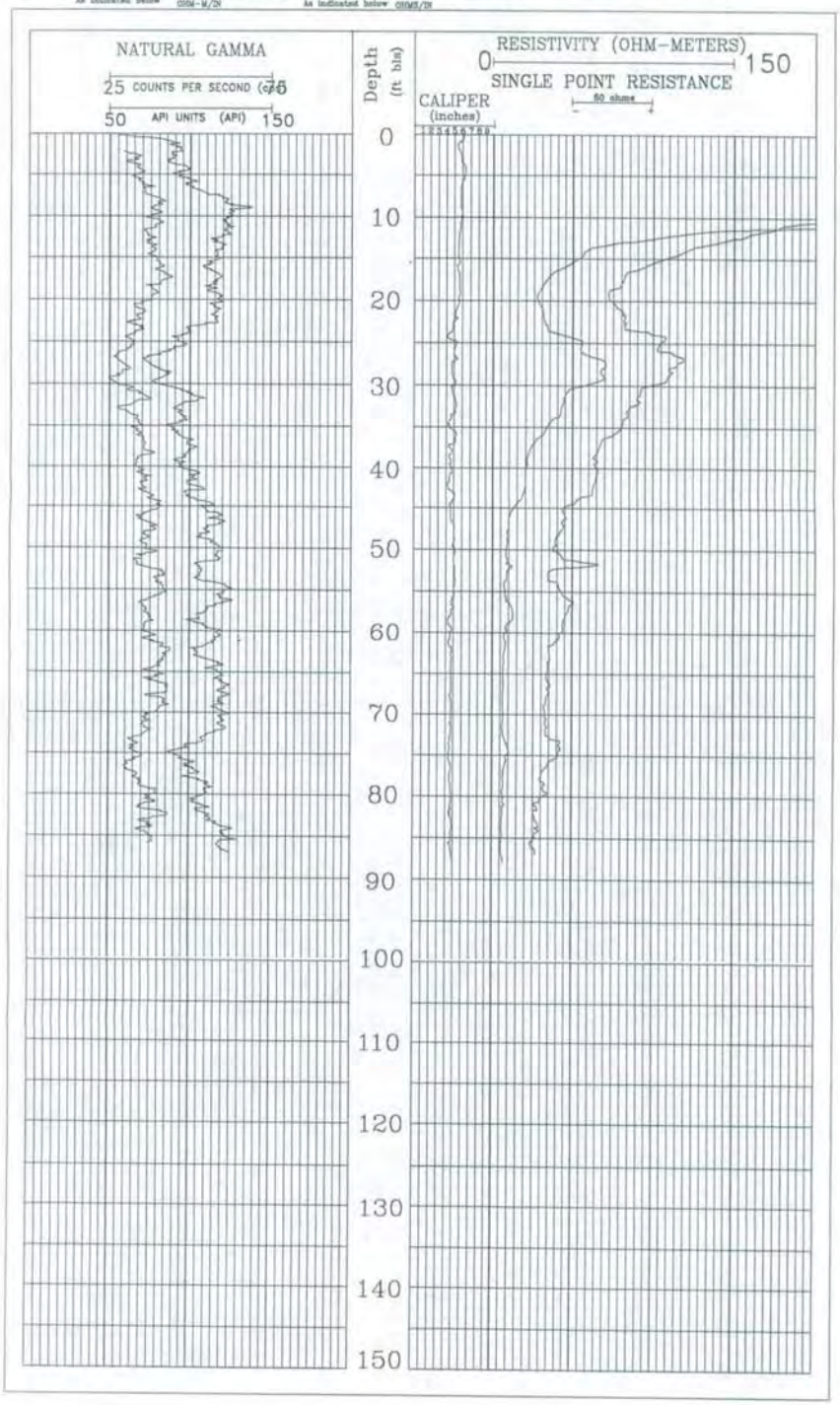
OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.

INITIAL RUN

T.D. LOGGED: 87 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below API/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 87 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS/IN



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-11-96

COMPANY: CLECO / STEI

HOLE NO.: B-3

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 297.4 MSL

WELL DATA

T.D. Logged 59 FT. T.D. Drilled 60 FT.

Driller Mesa Drilling Bit Size 4.25"

Type Fluid in Hole Groundwater Casing Size Open Hole

Fluid Level Grade FT. Bottom Hole Temp. 60 °F

Resistivity 39 OHM-M

Density

Viscosity Temp. 69 °F

INITIAL RUN

T.D. LOGGED: 59 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below API/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 59 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS/IN

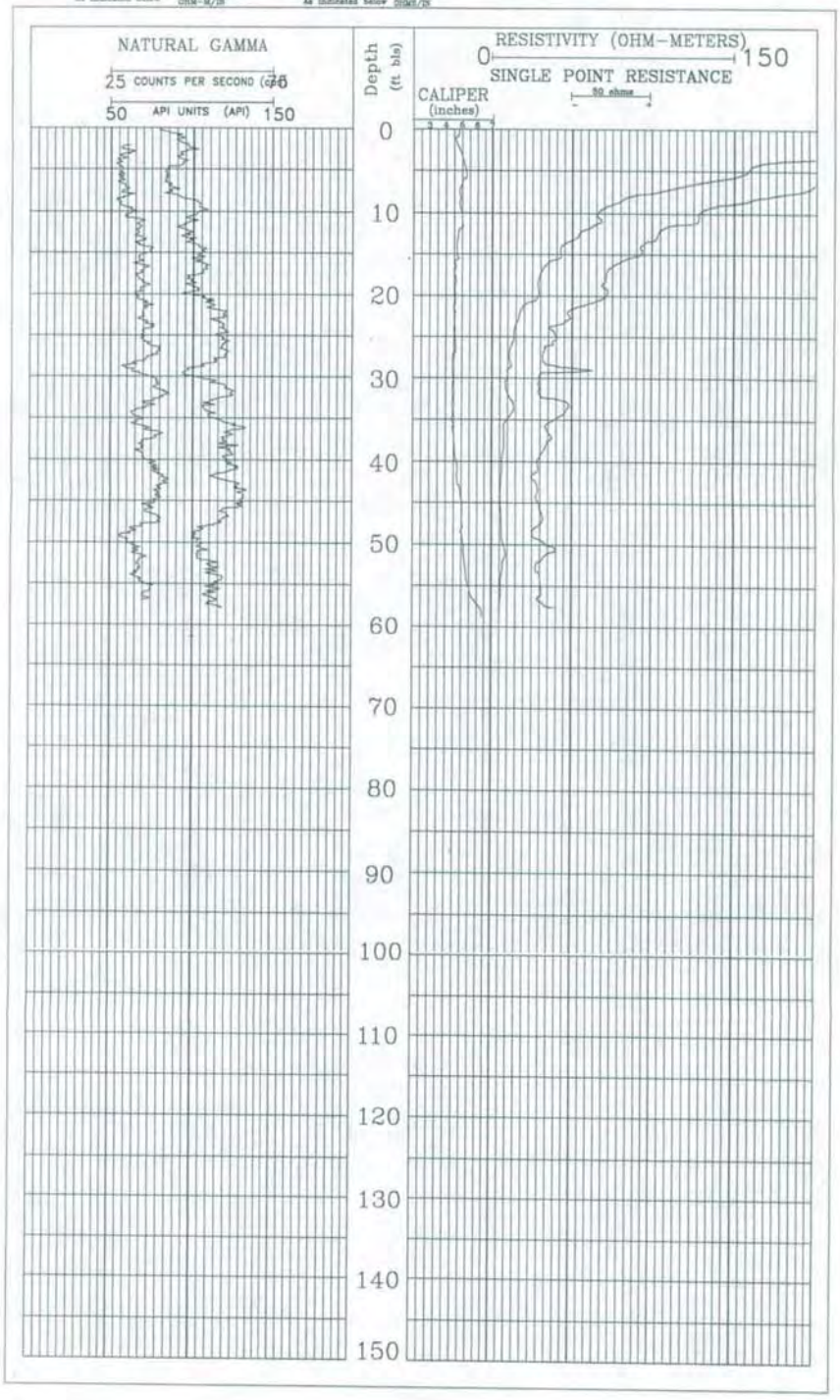
LOG TIME

Start	Stop	Minutes Total 14.75

Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS:

Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-13-96

COMPANY: CLECO / STEI

WELL DATA

HOLE NO.: B-4

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 271.7 MSL

T.D. Logged: 100 FT. T.D. Drilled: 101 FT.

Driller: Mesa Drilling Bit Size: 4.25"

Type Fluid in Hole: Groundwater Casing Size: Open Hole

Fluid Level: Grade FT. Bottom Hole Temp.: 60 °F

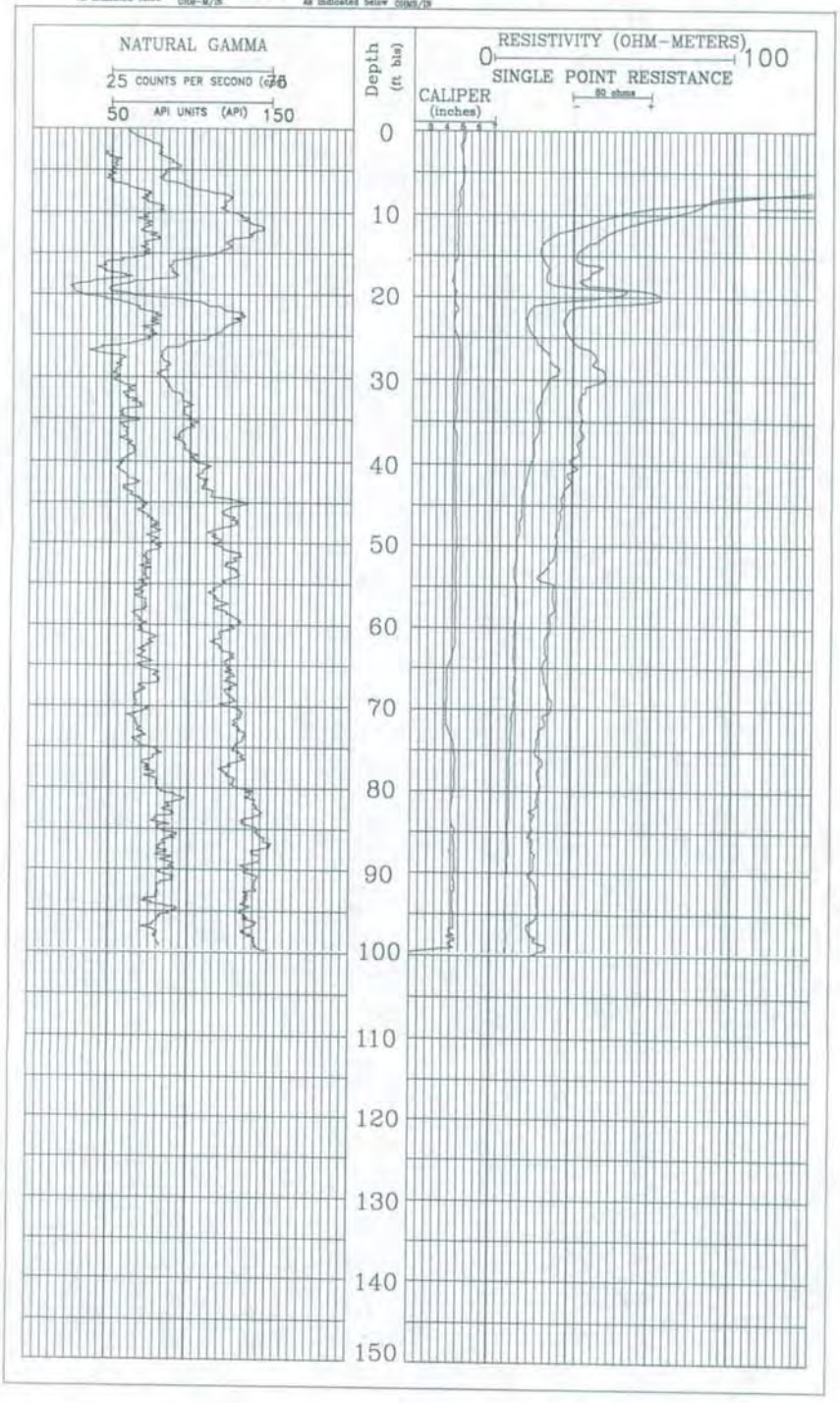
Resistivity: 43 OHM-M LOG TIME

Density: Start: Stop: Minutes Total 25

Viscosity: Temp.: 71 °F Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

INITIAL RUN	RERUNS
T.D. LOGGED: 100 FT.	T.D. LOGGED: 100 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below API/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS/IN



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-10-96

COMPANY: CLECO / STEI

HOLE NO.: B-5

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 310.6

WELL DATA

T.D. Logged 100 FT. T.D. Drilled 100 FT.

Driller Mesa Drilling Bit Size 4.25"

Type Fluid in Hole Groundwater Casing Size Open Hole

Fluid Level Grade FT. Bottom Hole Temp. 60 °F

Resistivity 42 OHM-M

Density

Viscosity Temp. 71 °C

INITIAL RUN

T.D. LOGGED: 100 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 100 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

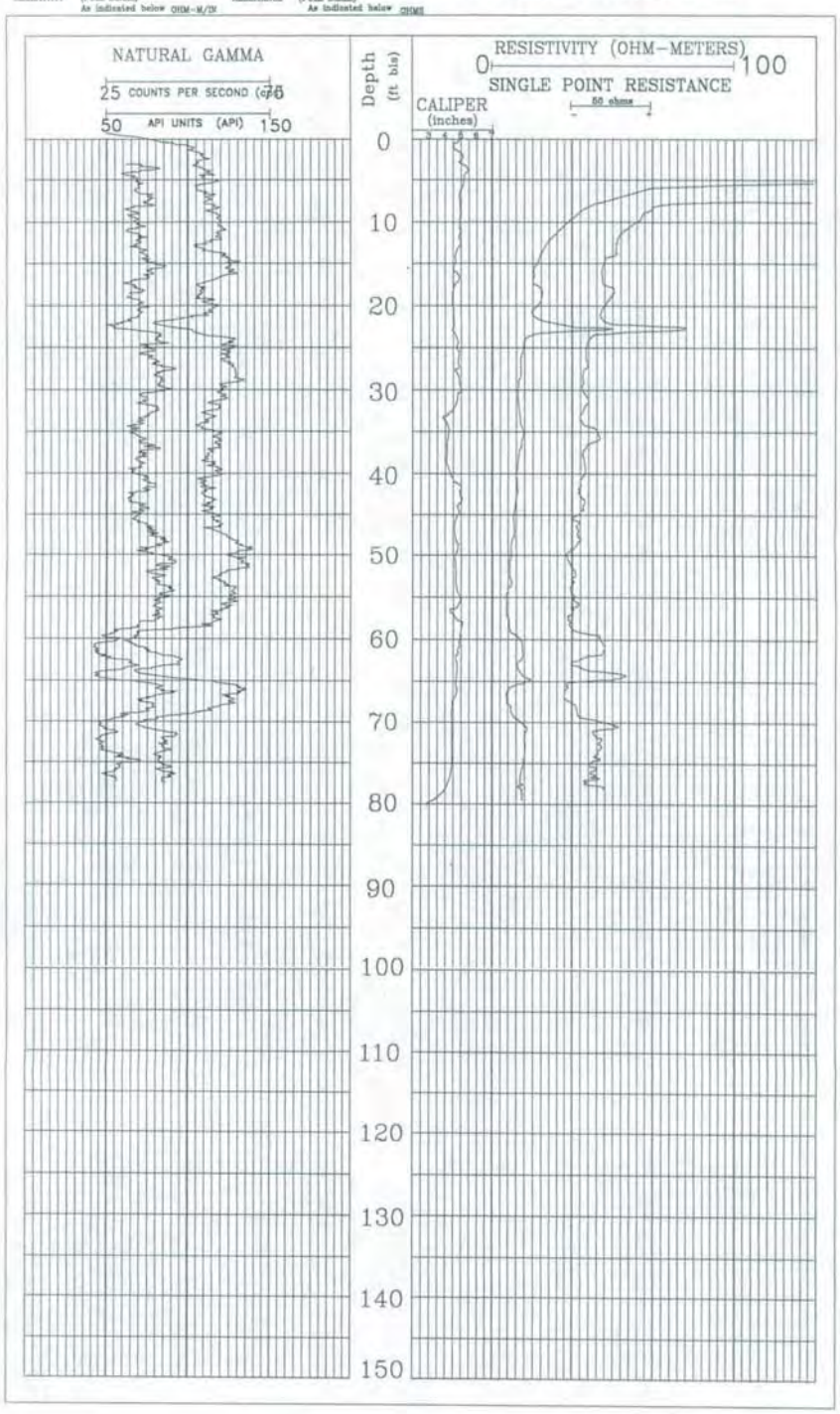
RESISTANCE (FULL SCALE) As indicated below OHMS

LOG TIME

	Start	Stop	Total
Minutes			

Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-21-96

COMPANY: CLECO / STEI

HOLE NO.: B-6

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 365.0 MSL

WELL DATA

T.D. Logged: 128 FT. T.D. Drilled: 129 FT.

Driller: Mesa Drilling Bit Size: 4.25"

Type Fluid in Hole: Groundwater Casing Size: Open Hole

Fluid Level: Grade FT. Bottom Hole Temp.: 60 °F

Resistivity: 55 OHM-M

Density

Viscosity Temp.: 59 °F

INITIAL RUN

T.D. LOGGED: 128 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below API/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 128 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS/IN

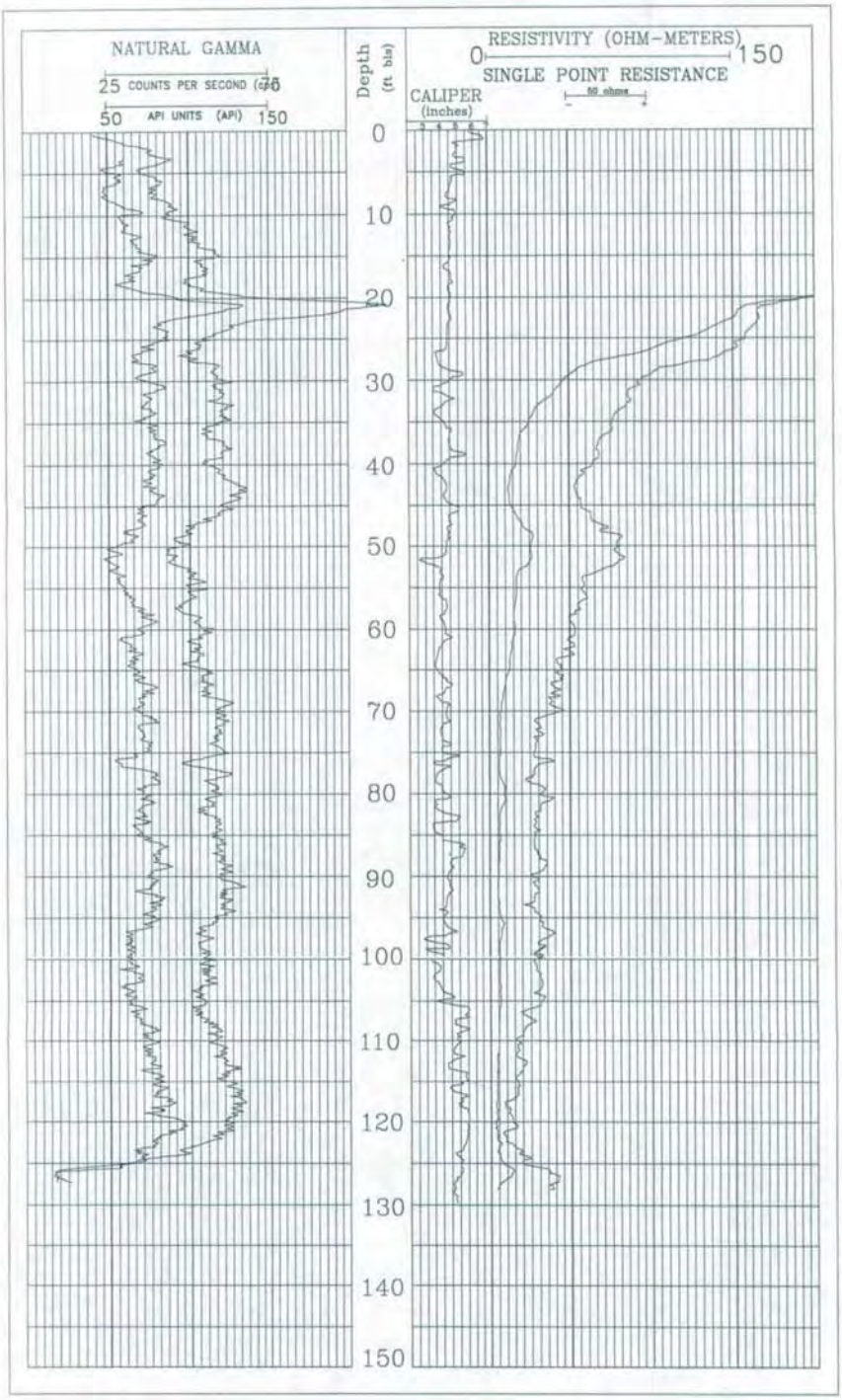
LOG TIME

Start Stop Minutes Total: 32

Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS:

Three arm caliper run on a separate third run.
Had to spud the first tool down from 98 to 100 feet



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-11-96

COMPANY: CLECO / STEI

HOLE NO.: B-7

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 313.4 MSL

WELL DATA

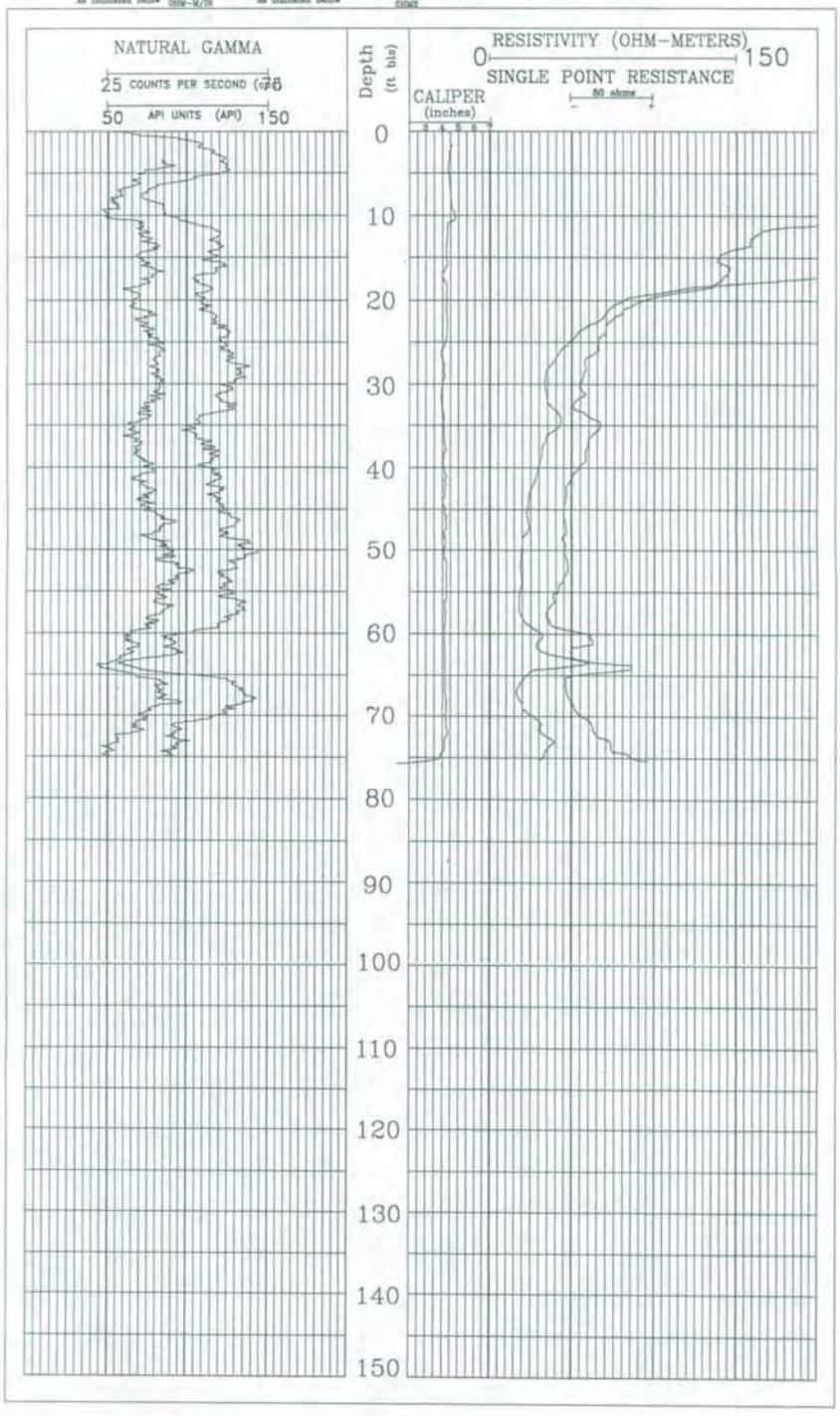
T.D. Logged	75.5 FT.	T.D. Drilled	75.5 FT.
Driller	Mesa Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	44 OHM-M		
Density			
Viscosity	Temp. 69 °F	Witnessed By:	Joe Harrer

LOG TIME

Start Stop Minutes Total 18.88

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

INITIAL RUN	RERUNS
T.D. LOGGED: 75.5 FT.	T.D. LOGGED: 75.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-18-96

COMPANY: CLECO / STEI

HOLE NO.: B-6

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 343.0 MSL

WELL DATA

T.D. Logged	105 FT.	T.D. Drilled	106 FT.
Driller	Mesa Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	39 OHM-M	LOG TIME	
Density		Start	Stop Total 98.85 Minutes
Viscosity	Temp. 62 °F	Witnessed By:	Joe Harrer

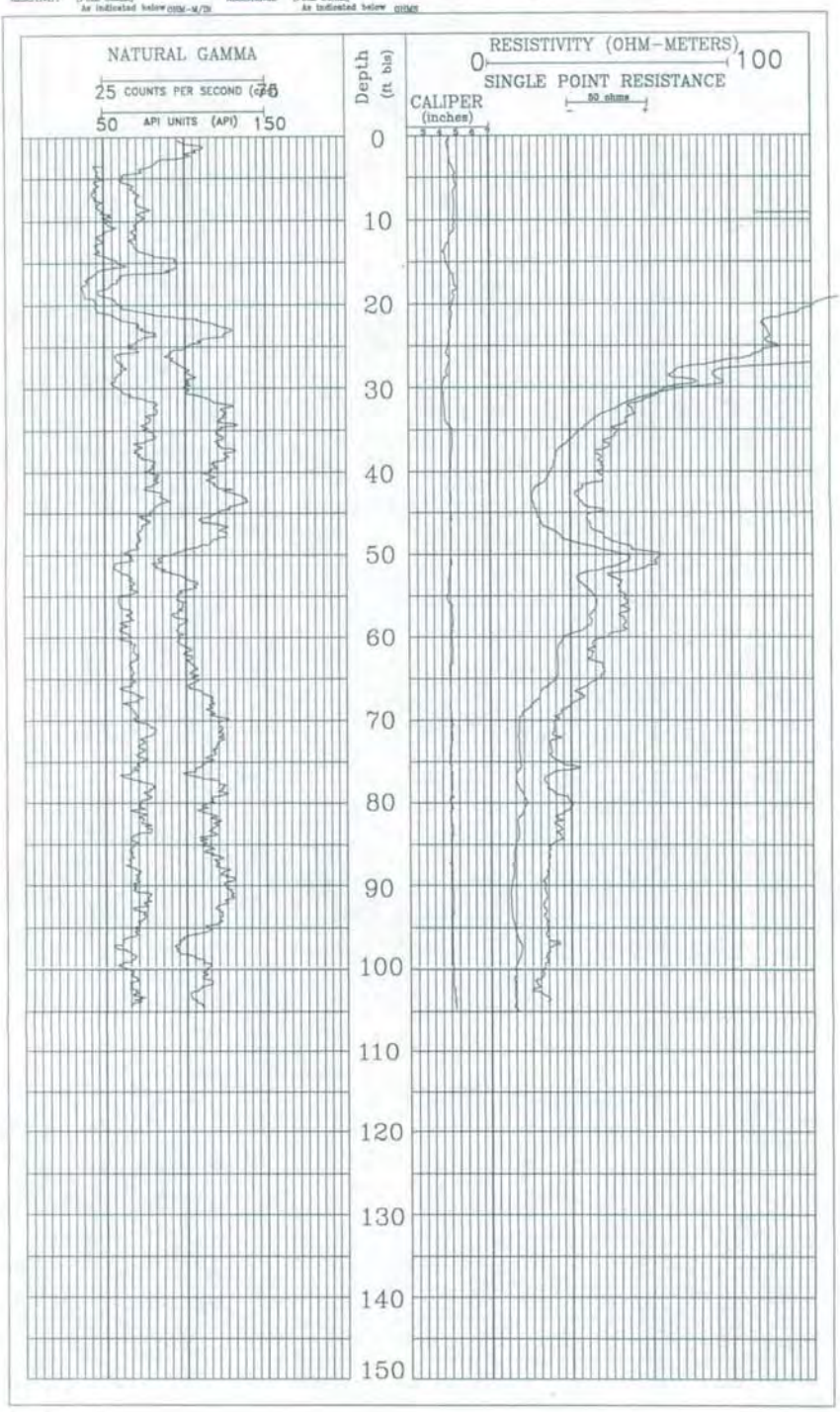
OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

INITIAL RUN

T.D. LOGGED: 105 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 105 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-10-96

COMPANY: CLECO / STEI

HOLE NO.: B-9

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 374.3 MSL

WELL DATA

T.D. Logged 135 FT. T.D. Drilled 135 FT.

Driller Mesa Drilling Bit Size 4.25"

Type Fluid in Hole Groundwater Casing Size Open Hole

Fluid Level Grade FT. Bottom Hole Temp. 60 °F

Resistivity 44 OHM-M

Density

Viscosity Temp. 67 °F

INITIAL RUN

T.D. LOGGED: 135 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 135 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

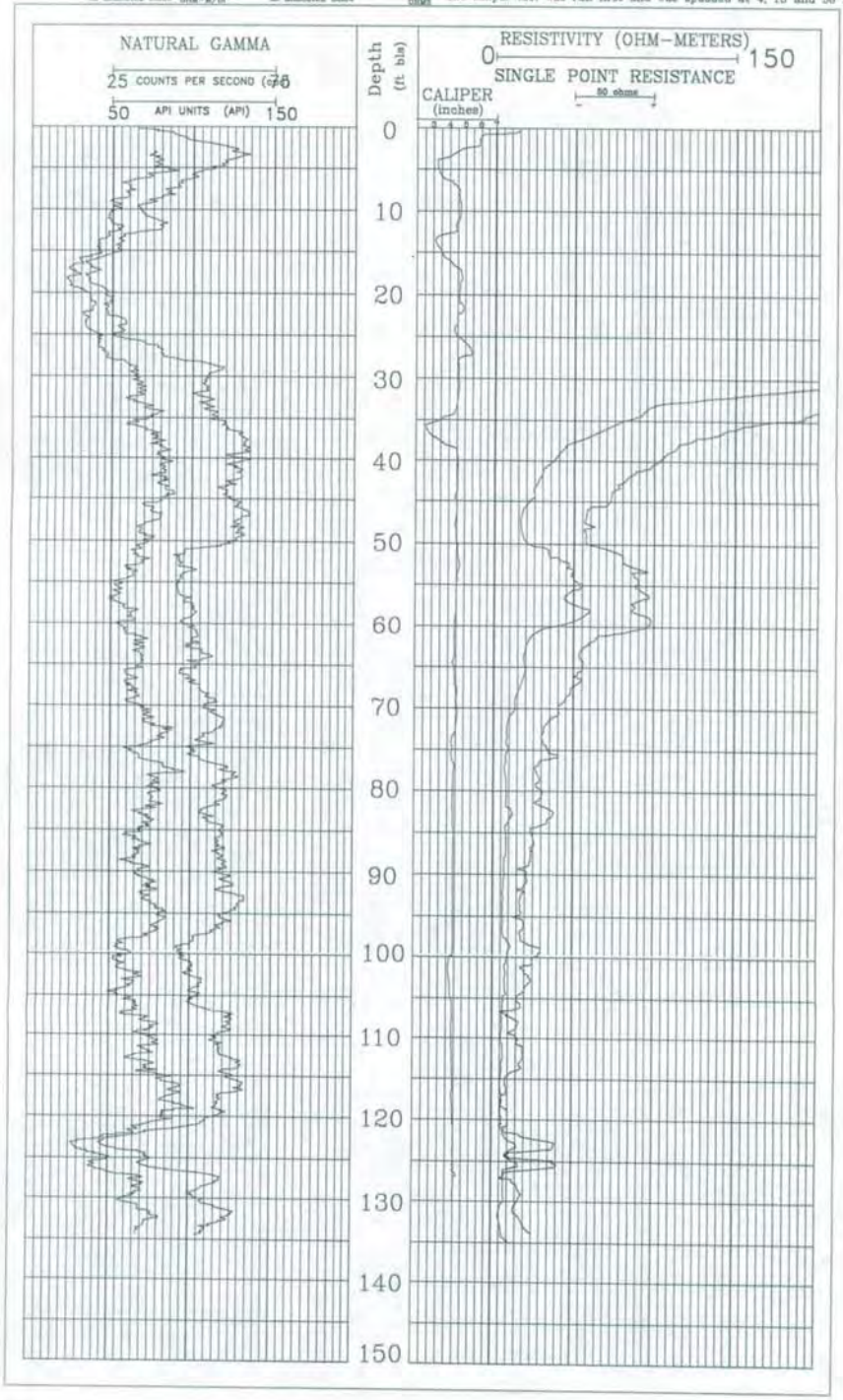
LOG TIME

Start Stop Minutes Total 53.75

Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS:

Three arm caliper run on a separate third run.
The caliper tool was run first and was spudded at 4, 13 and 36 feet



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-12-96

COMPANY: CLECO / STEI

HOLE NO.: B-10

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

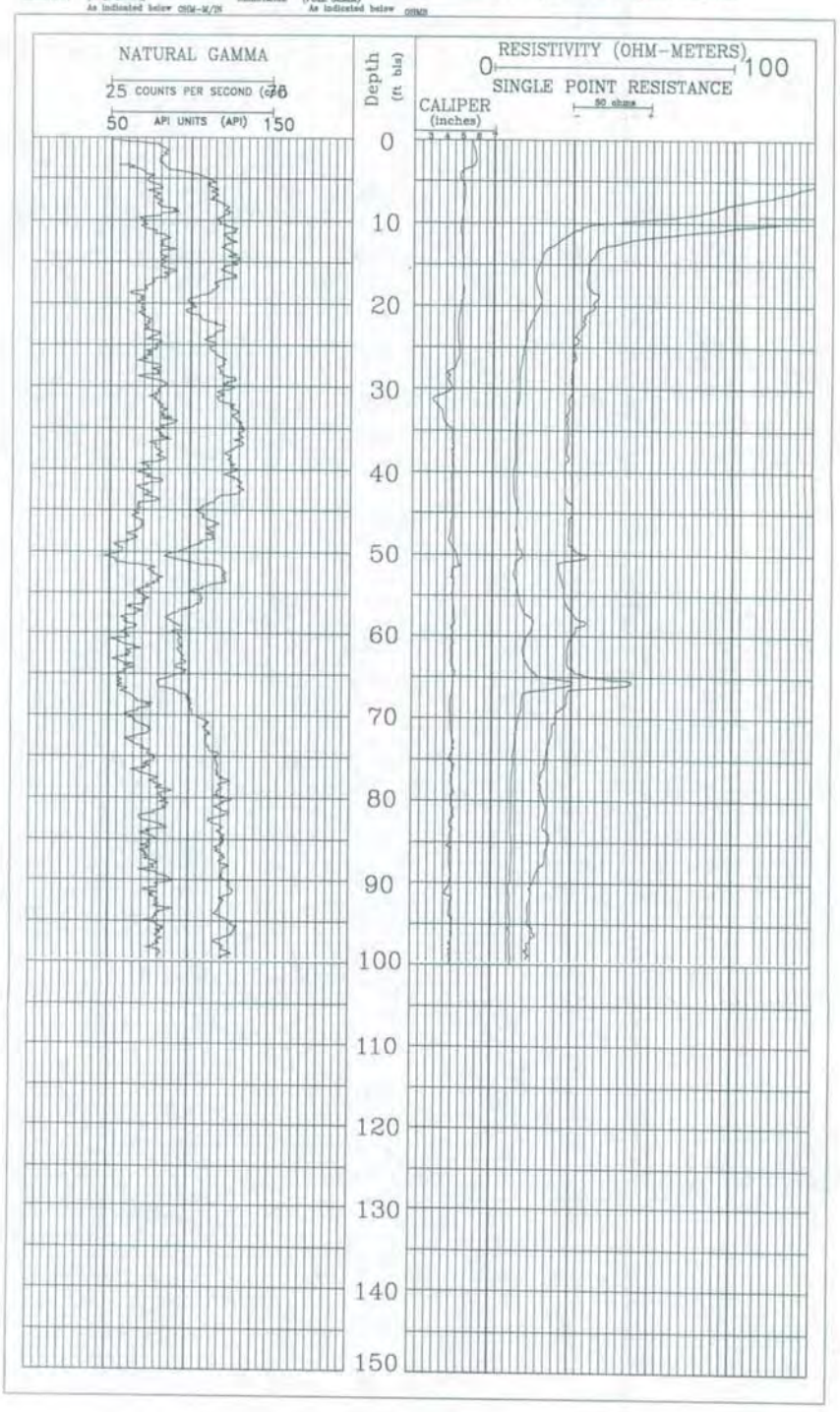
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURES FROM: 292.1

WELL DATA

T.D. Logged	100 FT.	T.D. Drilled	100 FT.
Driller	Mesa Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	34 OHM-M		
Density		LOG TIME	Minutes
Viscosity	Temp. 79 °F	Start	Stop Total ED
		Witnessed By:	Joe Harrer

INITIAL RUN	RERUNS
T.D. LOGGED: 100 FT.	T.D. LOGGED: 100 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-6-96

COMPANY: CLECO / STEI
HOLE NO.: B-11
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO STATE: LOUISIANA
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 348.5 MSL

WELL DATA

T.D. Logged 102 FT. T.D. Drilled 103 FT.
Driller Mesa Drilling Bit Size 4.25"
Type Fluid in Hole Groundwater Casing Size Open Hole
Fluid Level Grade FT. Bottom Hole Temp. 60 °F
Resistivity 66 OHM-M LOG TIME
Density Start Stop Minutes Total 85.5
Viscosity Temp. 65 °F Witnessed By: Joe Harrer

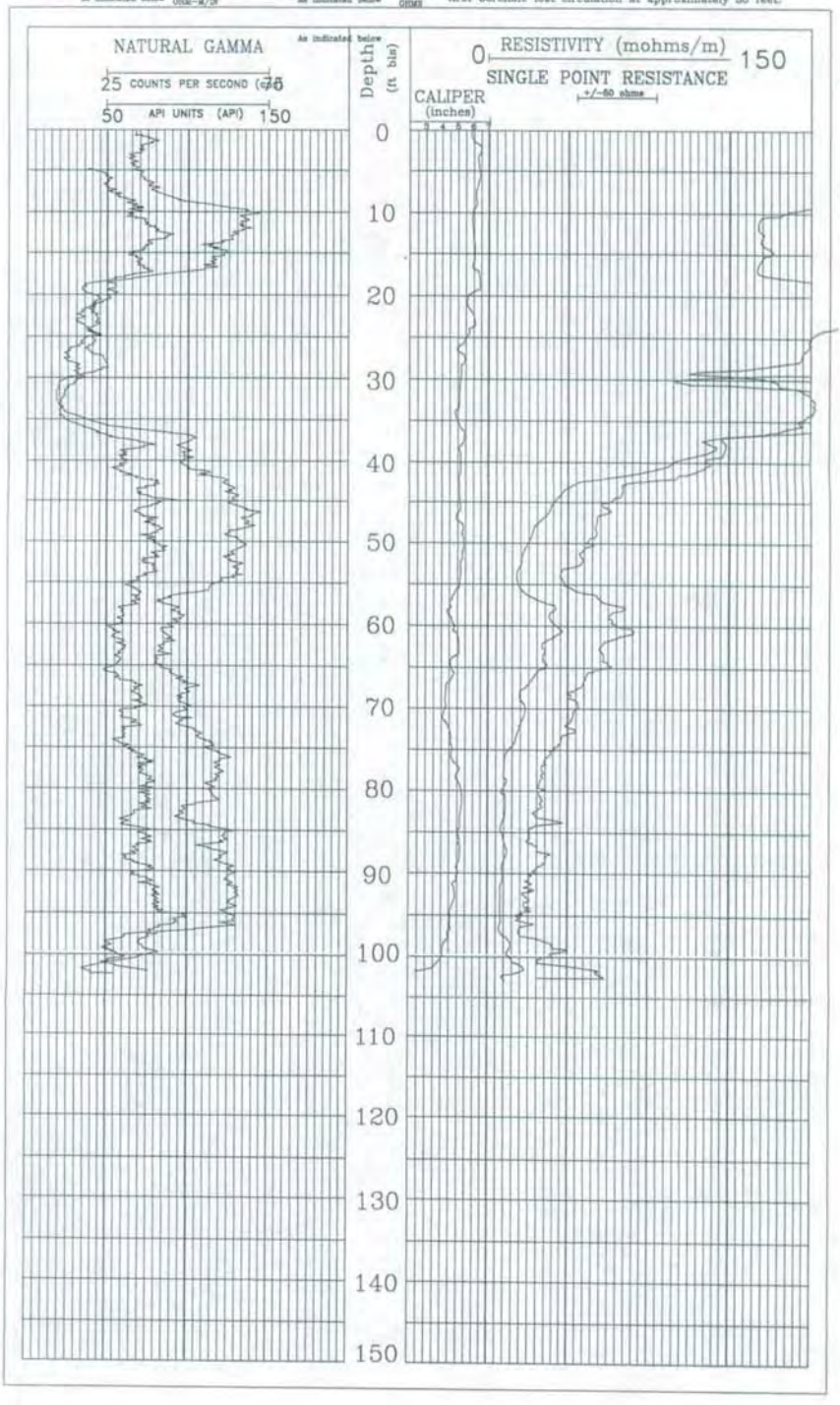
OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.
Another borehole was drilled utilizing heavy drilling mud after the first borehole lost circulation at approximately 36 feet.

INITIAL RUN

T.D. LOGGED: 102 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 102 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-11-96

COMPANY: CLECO / STEI

HOLE NO.: B-12

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 303.9 MSL

WELL DATA

T.D. Logged: 66.5 FT. T.D. Drilled: 69 FT.
Driller: Mesa Drilling Bit Size: 4.25"
Type Fluid in Hole: Groundwater Casing Size: Open Hole
Fluid Level: Grade FT. Bottom Hole Temp. 60 °F
Resistivity: 47 OHM-M
Density
Viscosity Temp. 59 °F Witnessed By: Joe Harrer

INITIAL RUN

T.D. LOGGED: 66.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

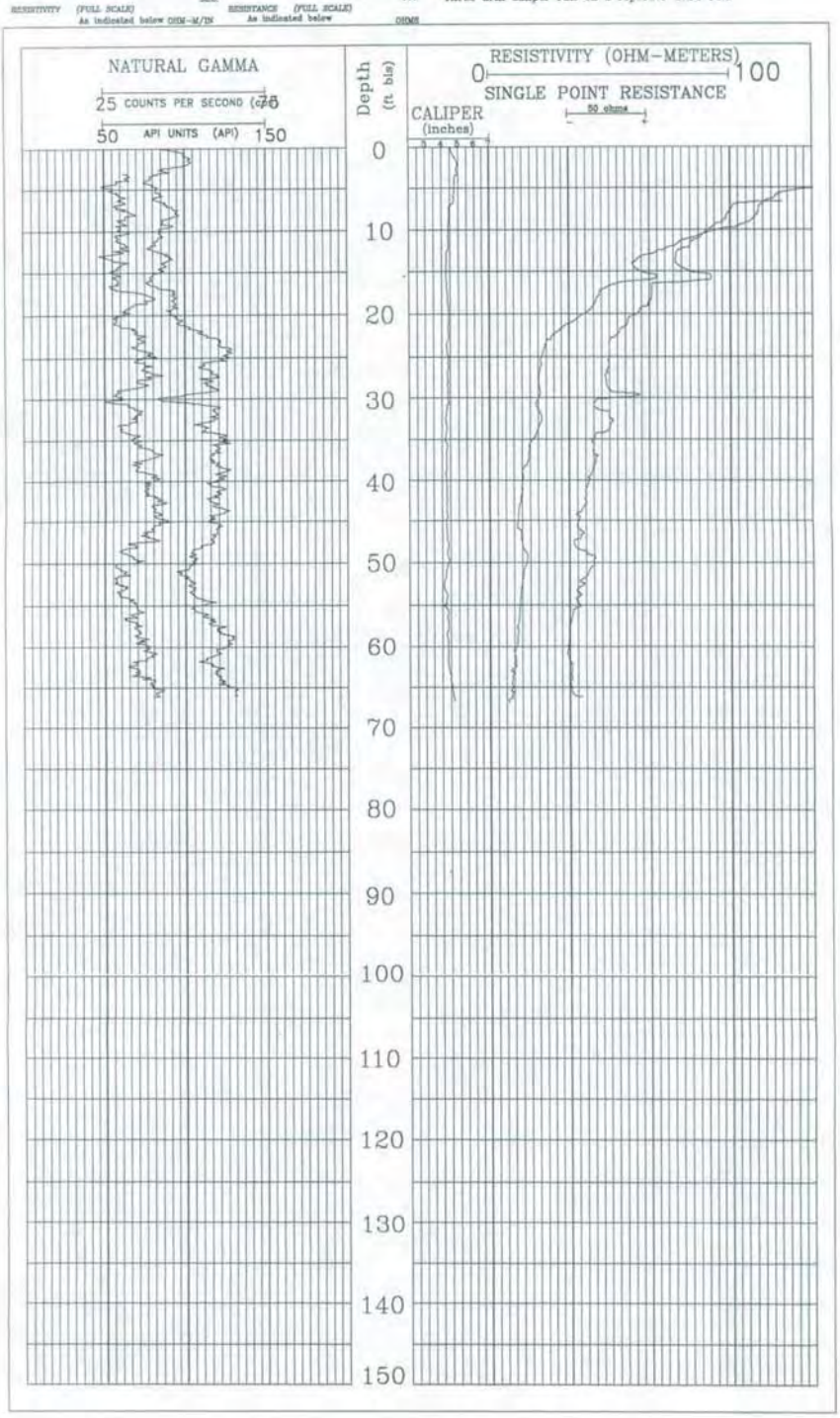
RERUNS

T.D. LOGGED: 66.5 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS

LOG TIME

Start Stop Total 16.75 Minutes

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-21-96

COMPANY: CLECO / STEI
HOLE NO.: B-13
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO STATE: LOUISIANA
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 355.1 MSL

WELL DATA

T.D. Logged: 118 FT. T.D. Drilled: 119 FT.
Driller: Mesa Drilling Bit Size: 4.25"
Type Fluid in Hole: Groundwater Casing Size: Open Hole
Fluid Level: Grade FT. Bottom Hole Temp.: 60 °F
Resistivity: 35 OHM-M
Density
Viscosity Temp.: 70 °F

LOG TIME

Start Stop Minutes Total 28.5
Witnessed By: Joe Harrer

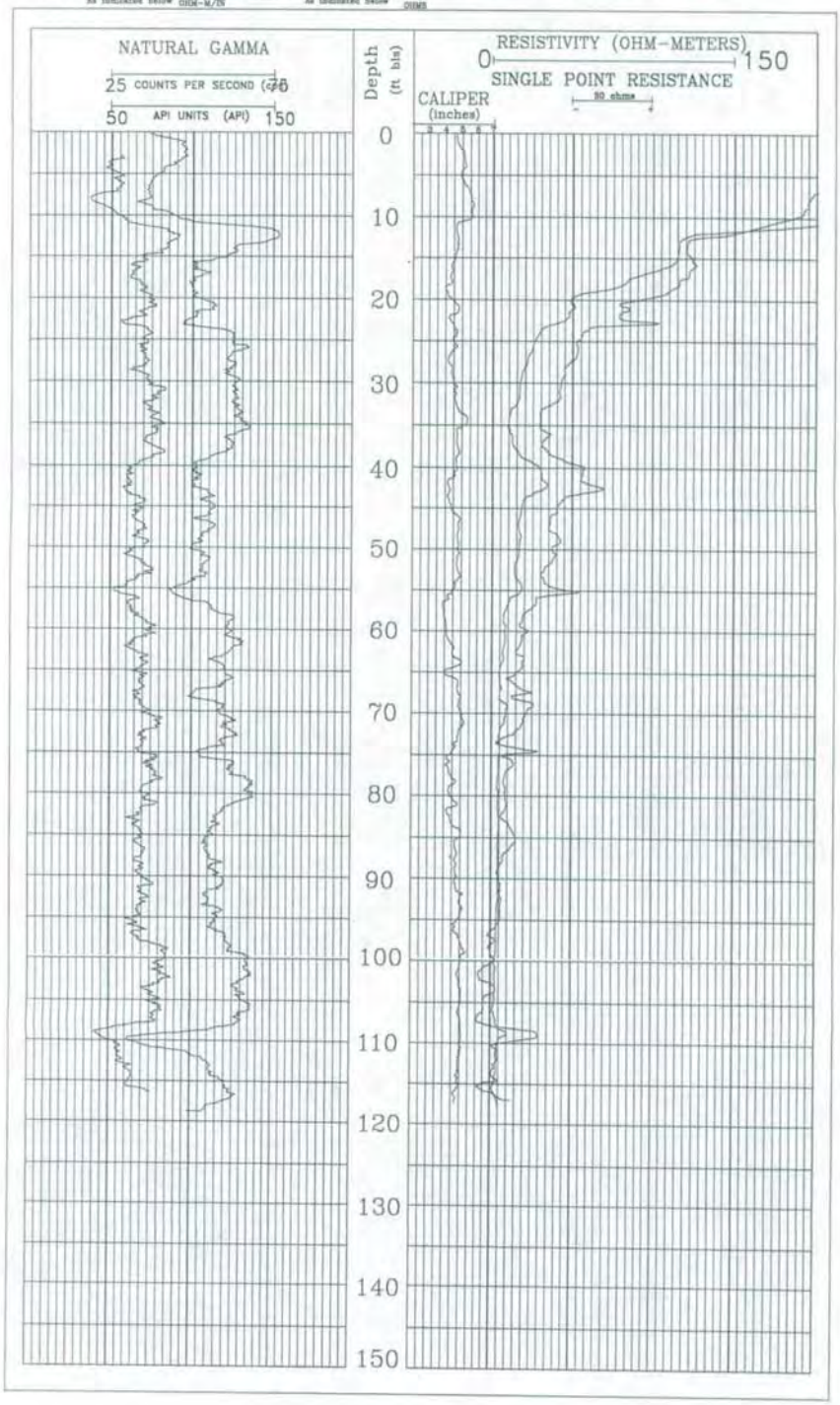
OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

INITIAL RUN

T.D. LOGGED: 118 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 118 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5537 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-25-96

COMPANY: CLECO / STEI
HOLE NO.: B-14
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO STATE: LOUISIANA
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 350.9 MSL

WELL DATA

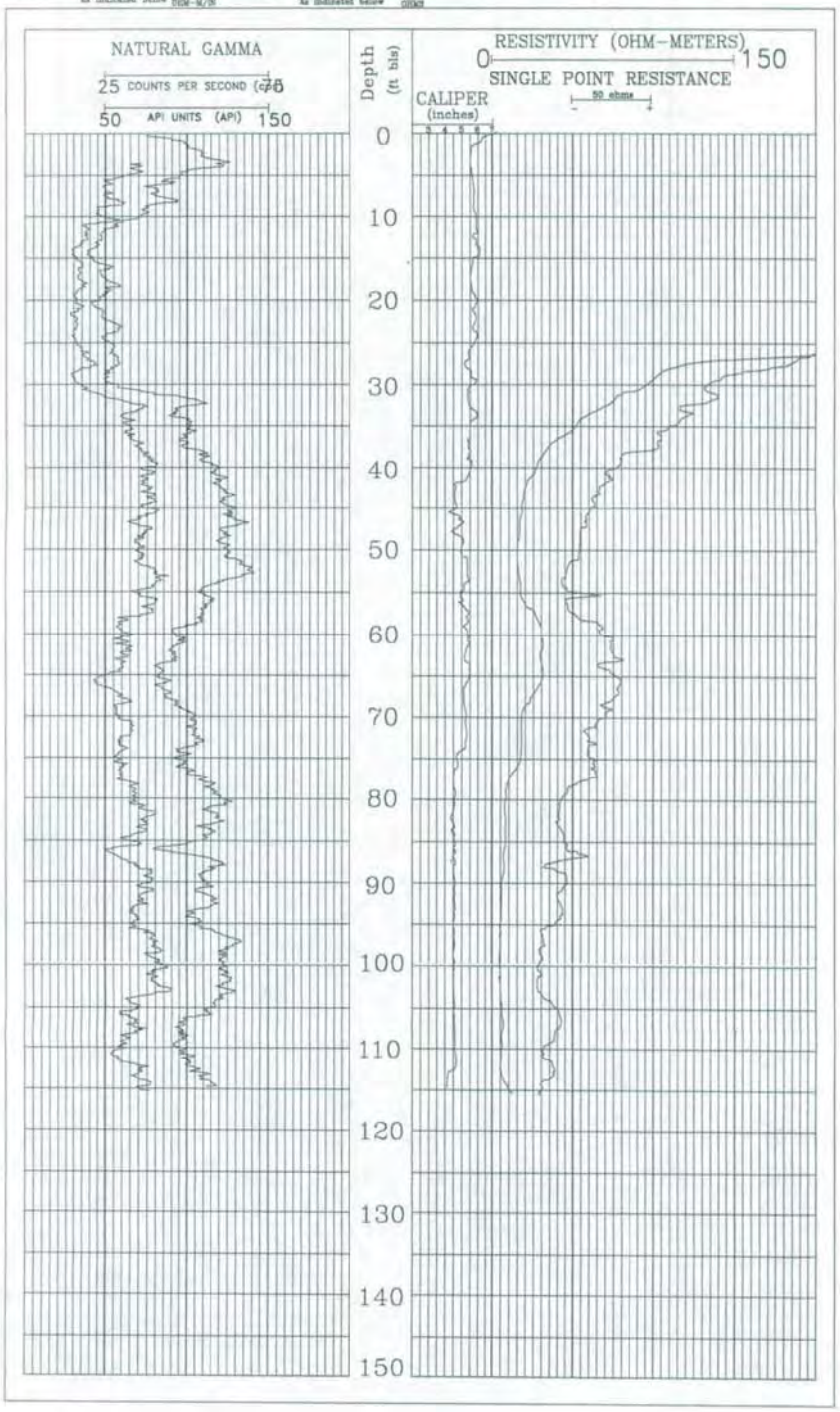
T.D. Logged 115.5 FT. T.D. Drilled 117 FT.
Driller Mesa Drilling Bit Size 4.25"
Type Fluid in Hole Groundwater Casing Size Open Hole
Fluid Level Grade FT. Bottom Hole Temp. 60 °F
Resistivity 100 OHM-M
Density
Viscosity Temp. 60 ° F

LOG TIME

Start Stop Minutes Total 26.88
Witnessed By: Joe Harrer

INITIAL RUN	RERUNS
T.D. LOGGED: 115.5 FT.	T.D. LOGGED: 115.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-5-96

COMPANY: CLECO / STEI
HOLE NO.: B-15
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO STATE: LOUISIANA
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 357.3 MSL

WELL DATA

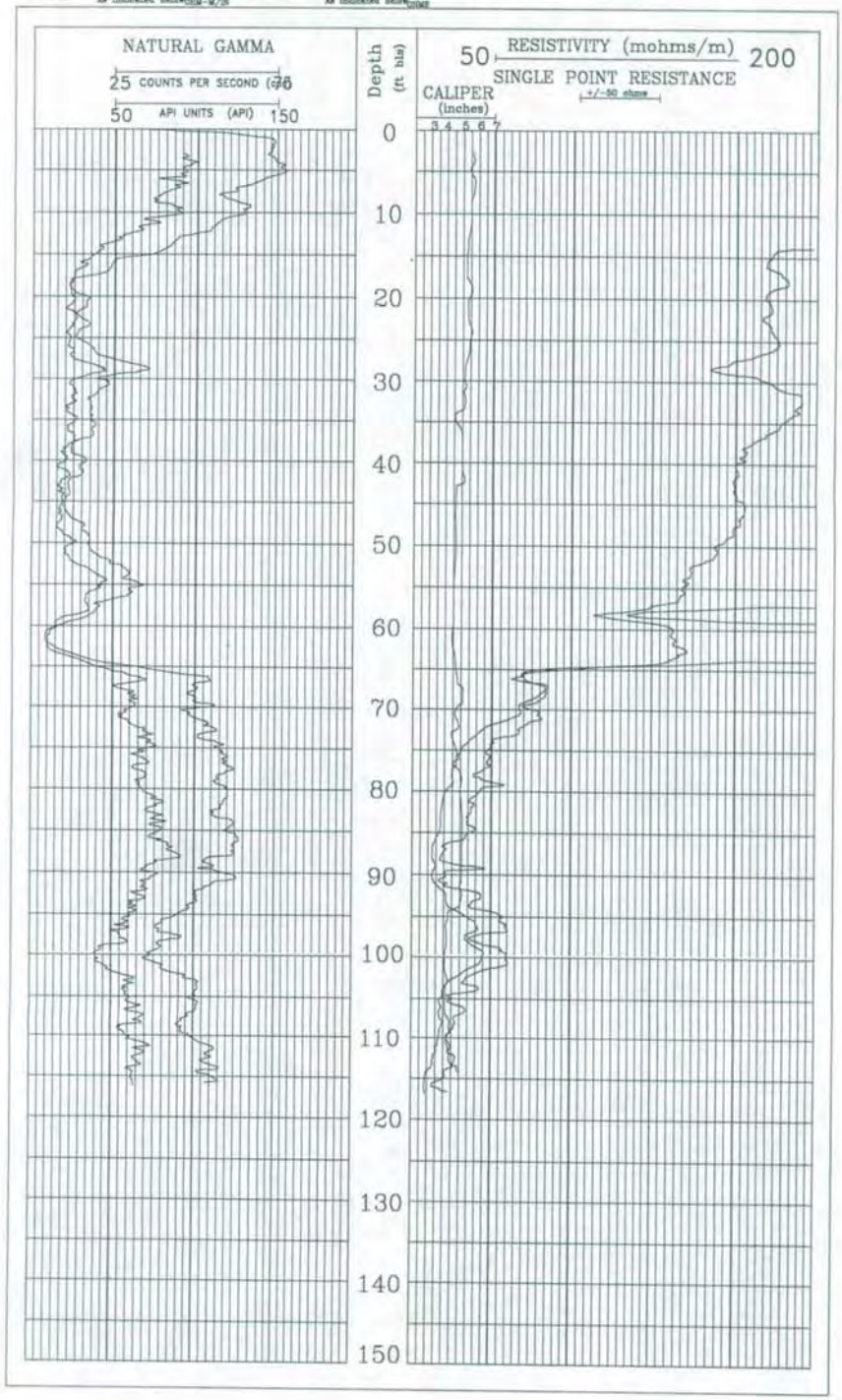
T.D. Logged 117 FT. T.D. Drilled 118 FT.
Driller Mesa Drilling Bit Size 4.25"
Type Fluid in Hole Groundwater Casing Size Open Hole
Fluid Level Grade FT. Bottom Hole Temp. 60 °F
Resistivity 90 OHM-M
Density
Viscosity Temp. 85 °F

LOG TIME

Start Stop Total Minutes 26.25
Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.

INITIAL RUN	RERUNS
T.D. LOGGED: 117 FT.	T.D. LOGGED: 117 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-21-96

COMPANY: CLECO / STEI

HOLE NO.: B-16

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 365.6 MSL

WELL DATA

T.D. Logged 135 FT. T.D. Drilled 136 FT.

Driller Mesa Drilling Bit Size 4.25"

Type Fluid in Hole Groundwater Casing Size Open Hole

Fluid Level Grade FT. Bottom Hole Temp. 60 °F

Resistivity 80 OHM-M

Density

Viscosity Temp. 58 °F

LOG TIME

Minutes

Start Stop Total 53.75

Witnessed By: Joe Harrer

INITIAL RUN

T.D. LOGGED: 135 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 135 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

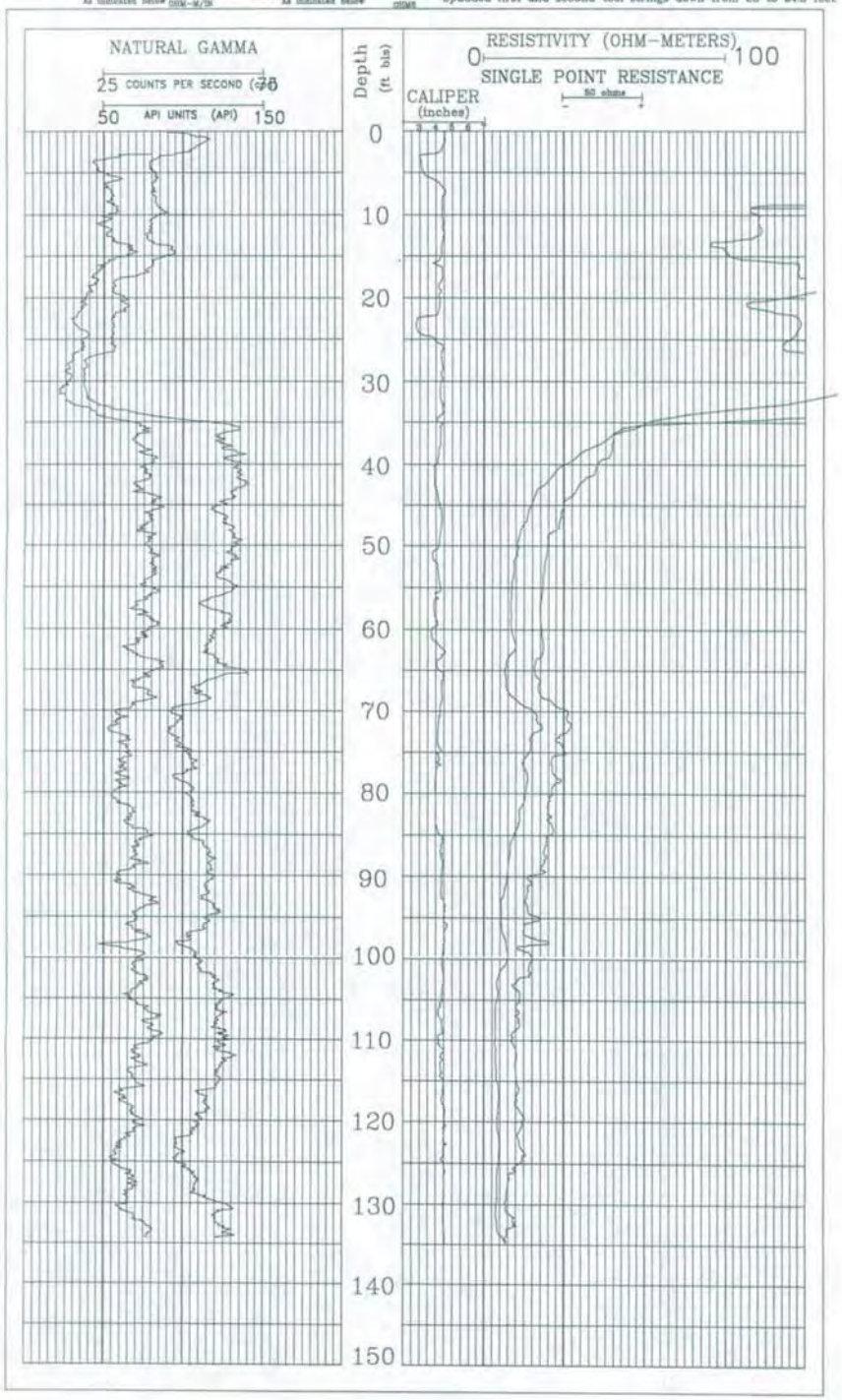
TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

OTHER SERVICES / REMARKS:

Three arm caliper run on a separate third run.

Spudded first and second tool strings down from 23 to 24.5 feet



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-17-96

COMPANY: CLECO / STEI

HOLE NO.: B-17

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 369.7 MSL

WELL DATA

T.D. Logged 136 FT. T.D. Drilled 137 FT.

Driller Mesa Drilling Bit Size 4.25"

Type Fluid in Hole Groundwater Casing Size Open Hole

Fluid Level Grade FT. Bottom Hole Temp. 60 °F

Resistivity 59 OHM-M

Density

Viscosity Temp. 52 °F

INITIAL RUN

T.D. LOGGED: 136 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 136 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

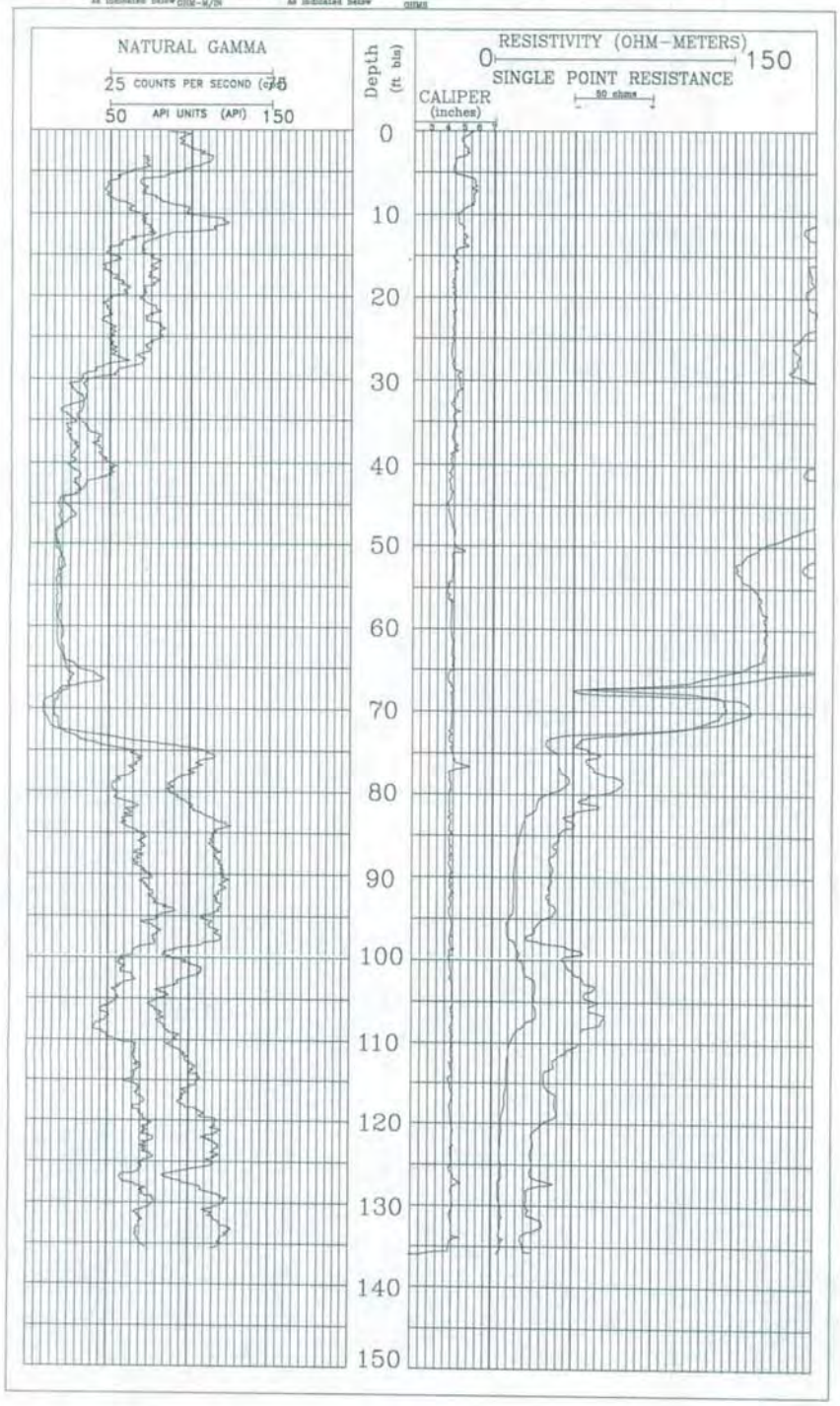
TIME CONSTANT: 2 SEC.

RESISTANCE (FULL SCALE) As indicated below OHMS

LOG TIME

	Start	Stop	Minutes Total Hr
Witnessed By: Joe Harrer			

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-20-96

COMPANY: CLECO / STEI
HOLE NO.: B-18
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO STATE: LOUISIANA
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 359.5 MSL

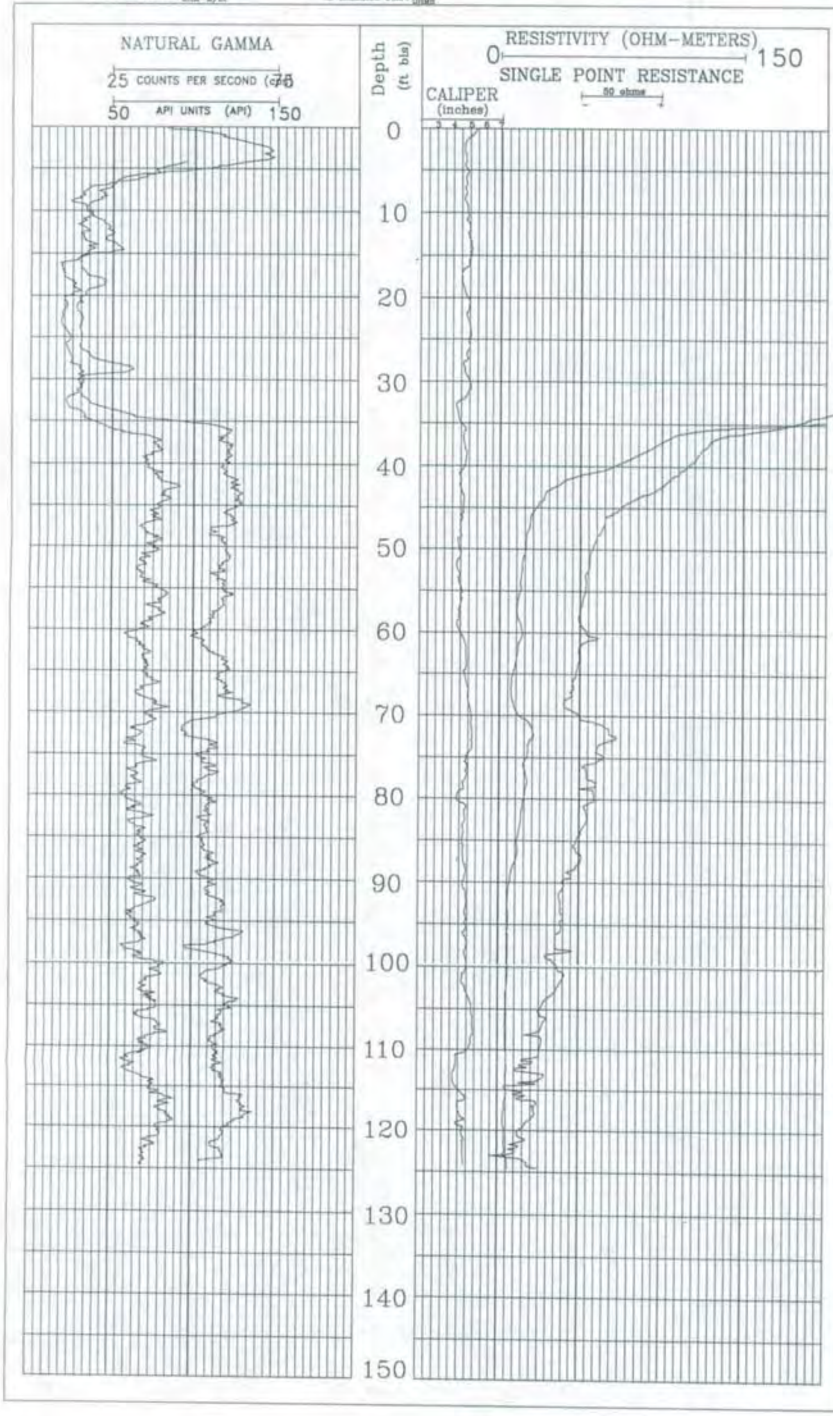
WELL DATA

T.D. Logged: 124 FT. T.D. Drilled: 124 FT.
Driller: Mesa Drilling Bit Size: 4.25"
Type Fluid in Hole: Groundwater Casing Size: Open Hole
Fluid Level: Grade FT. Bottom Hole Temp. 60 °F
Resistivity: 75 OHM-M
Density
Viscosity Temp. 58 °F

LOG TIME
Start Stop Minutes Total 31
Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

INITIAL RUN	RERUNS
T.D. LOGGED: 124 FT.	T.D. LOGGED: 124 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-15-96

COMPANY: CLECO / STEI
HOLE NO.: B-19
AREA: CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO
STATE: LOUISIANA
SECTION: 23
TOWNSHIP: T12N
RANGE: R12W
LOG MEASURED FROM: 370.0 MSL

INITIAL RUN

T.D. LOGGED: 132.5 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 132.5 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE) As indicated below OHMS

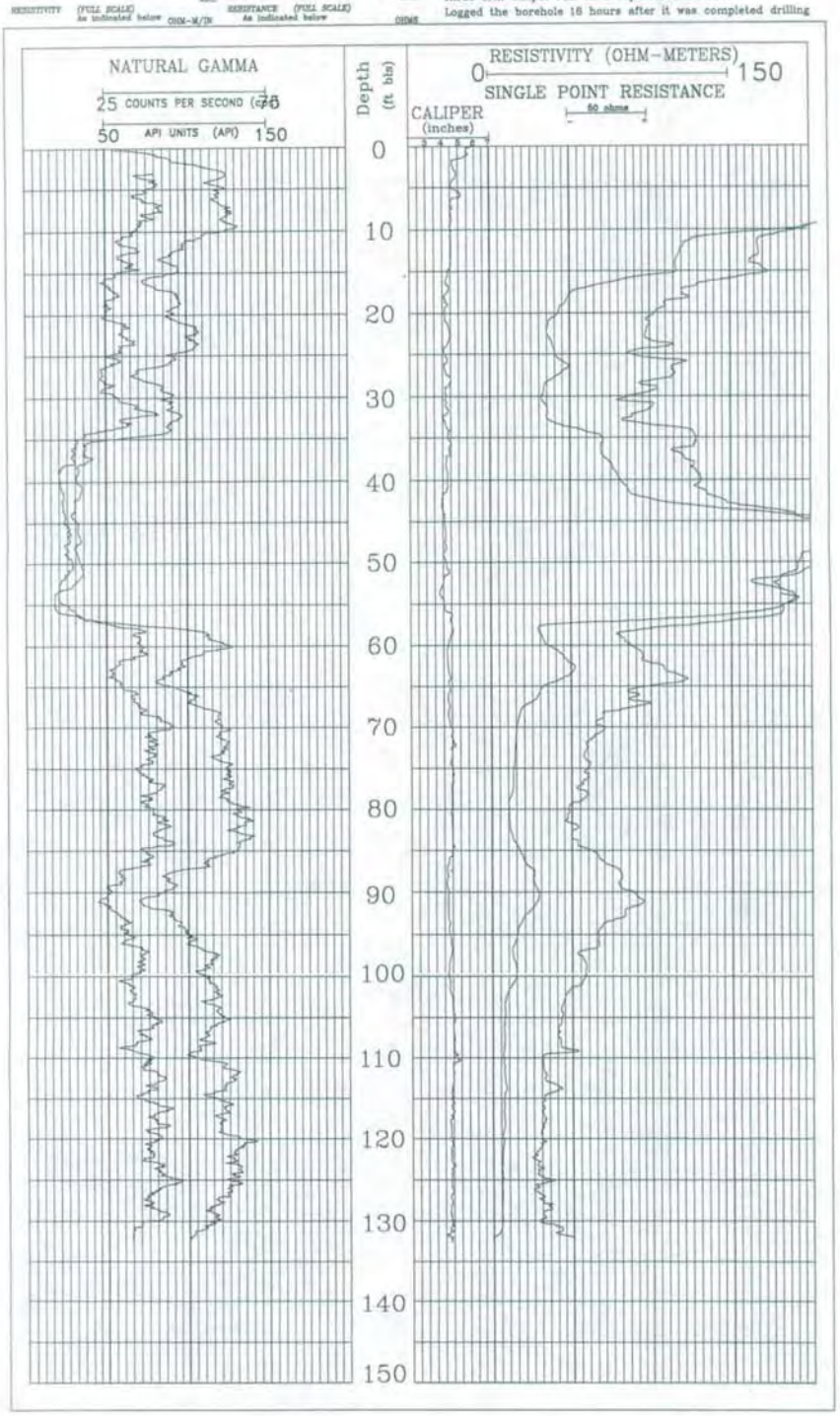
WELL DATA

T.D. Logged: 132.5 FT. T.D. Drilled: 132.5 FT.
Driller: Mesa Drilling Bit Size: 4.25"
Type Fluid in Hole: Groundwater Casing Size: Open Hole
Fluid Level: Grade FT. Bottom Hole Temp: 60 °F
Resistivity: 34 OHM-M
Density
Viscosity Temp. 80 °F Witnessed By: Joe Harrer

LOG TIME

Start Stop Minutes Total 33.13

OTHER SERVICES / REMARKS:
Three arm caliper run on a separate third run.
Logged the borehole 16 hours after it was completed drilling



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-20-96

COMPANY: CLECO / STEI

HOLE NO.: B-22

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

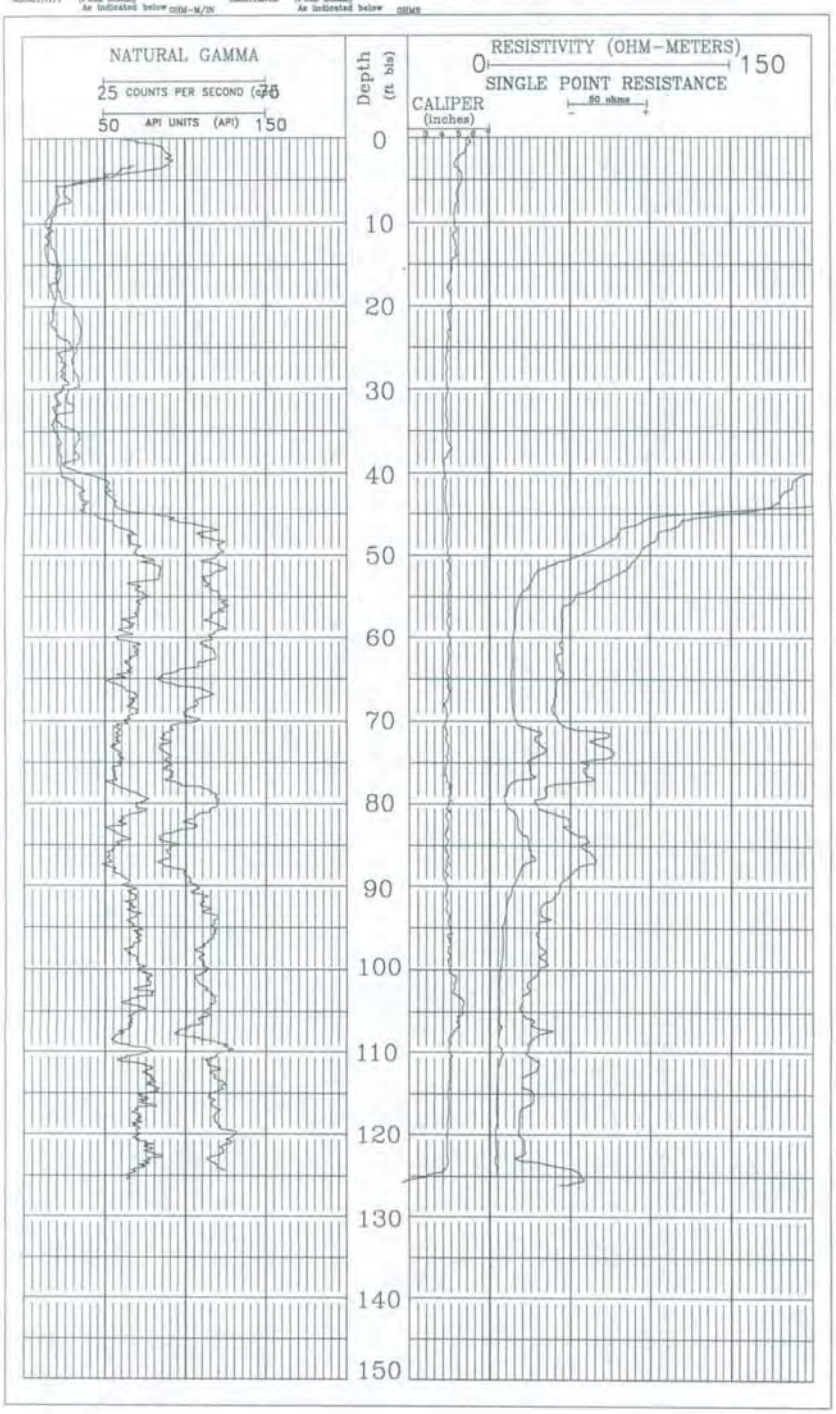
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 364.2 MSL

WELL DATA

T.D. Logged	125 FT.	T.D. Drilled	126 FT.
Driller	Mesa Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	80 OHM-M	LOG TIME	
Density		Start	Stop Total Minutes
Viscosity	Temp. 58 °F	Witnessed By:	Joe Harrer

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.

	INITIAL RUN	RERUNS
T.D. LOGGED:	125 FT.	125 FT.
PROBE TYPE/SER. NO.:	Gamma (API), resistivity (6 inch)	Gamma (cps), sp resistance, caliper
LOGGING SPEED:	12 FT/MIN.	12 FT/MIN.
GAMMA-SCALE:	As indicated below CPS/IN	As indicated below CPS/IN
TIME CONSTANT:	2 SEC.	2 SEC.
RESISTIVITY (FULL SCALE)	As indicated below OHM-M/IN	
RESISTANCE (FULL SCALE)		As indicated below OHMS



BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 3-19-96

COMPANY: CLECO / STEI

HOLE NO.: B-24

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 362.4 MSL

WELL DATA

T.D. Logged: 126 FT. T.D. Drilled: 127 FT.

Driller: Mesa Drilling Bit Size: 4.25"

Type Fluid in Hole: Groundwater Casing Size: Open Hole

Fluid Level: Grade FT. Bottom Hole Temp.: 60 °F

Resistivity: 33 OHM-M

Density

Viscosity Temp. 64 °F

INITIAL RUN

T.D. LOGGED: 126 FT.

PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 126 FT.

PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper

LOGGING SPEED: 12 FT/MIN.

GAMMA-SCALE: As indicated below CPS/IN

TIME CONSTANT: 2 SEC.

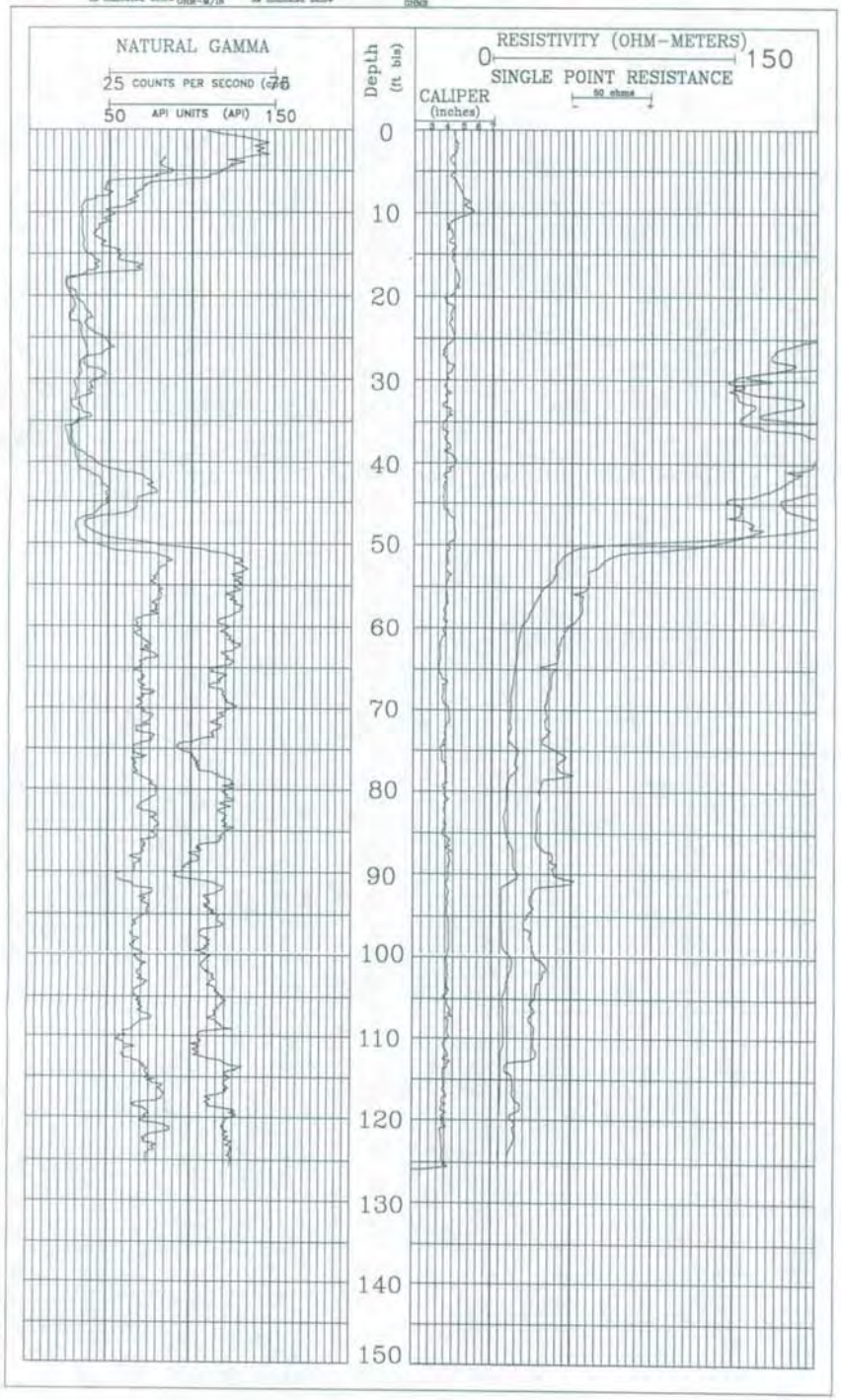
RESISTANCE (FULL SCALE) As indicated below OHMS

LOG TIME

	Start	Stop	Minutes Total 31.5

Witnessed By: Joe Harrer

OTHER SERVICES / REMARKS: Three arm caliper run on a separate third run.



ICON ENVIRONMENTAL SERVICES

BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 6-23-97

COMPANY: CLECO / STEI

HOLE NO: B-25

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO | STATE: LOUISIANA

SECTION: 23 | TOWNSHIP: T12N | RANGE: R12W | LOG MEASURED FROM: 26132 MSL

WELL DATA

T.D. Logged	110 FT.	T.D. Drilled	110 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	70 OHM-M	LOG TIME	
Density		Start / Stop / Minutes Total 03:75	
Viscosity	Temp. 59 °F	Witnessed By:	Lamar C-K

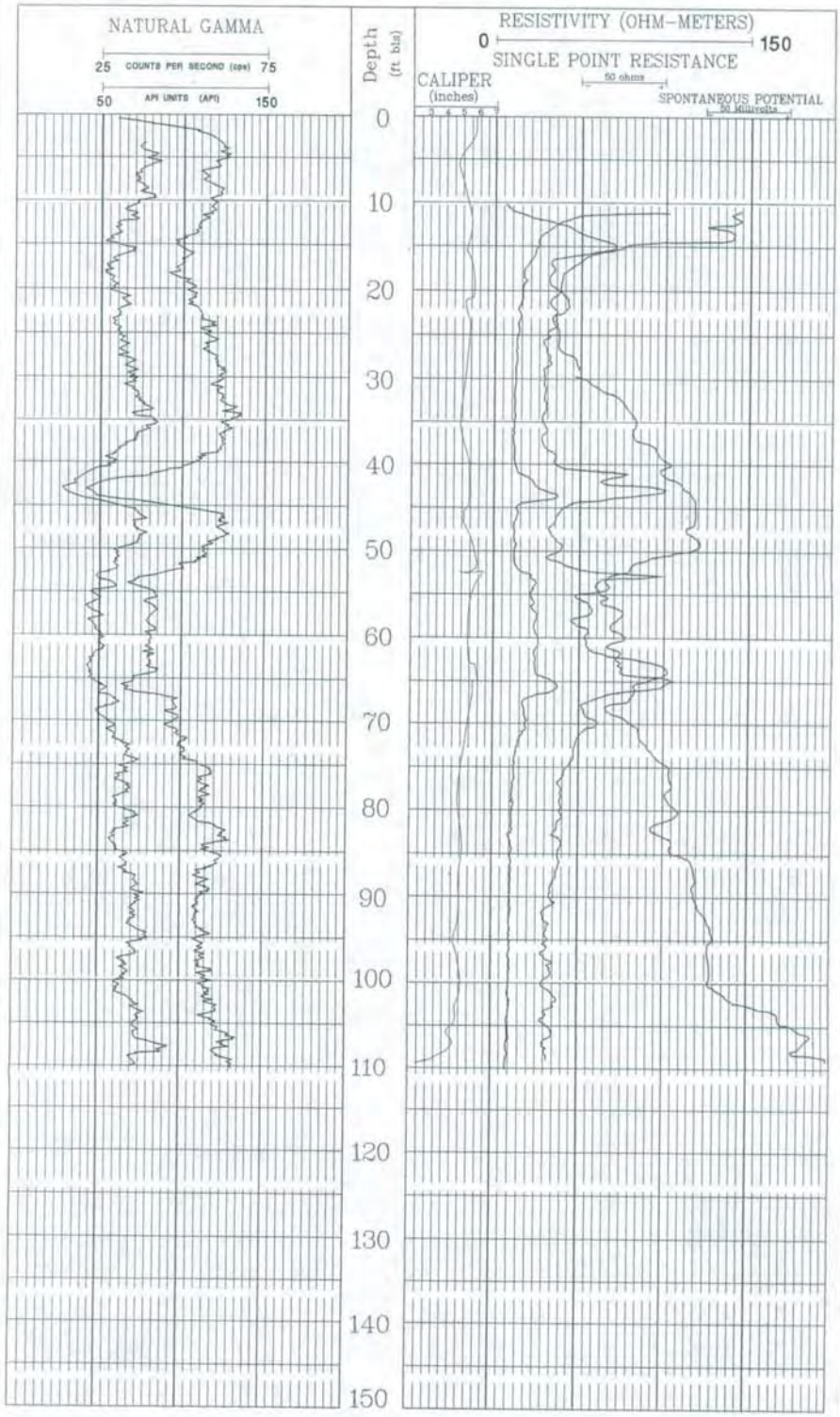
OTHER SERVICES / REMARKS:

INITIAL RUN

T.D. LOGGED: 110 FT.
PROBE TYPE/SER. NO.: Gamma (API) resistivity (6 inch)
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below API/IN
TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE): As indicated below OHM-M/IN

RERUNS

T.D. LOGGED: 110 FT.
PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.
RESISTANCE (FULL SCALE): As indicated below OHMS/IN



ICON ENVIRONMENTAL SERVICES

BOREHOLE GEOPHYSICAL LOG

ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 6-26-97

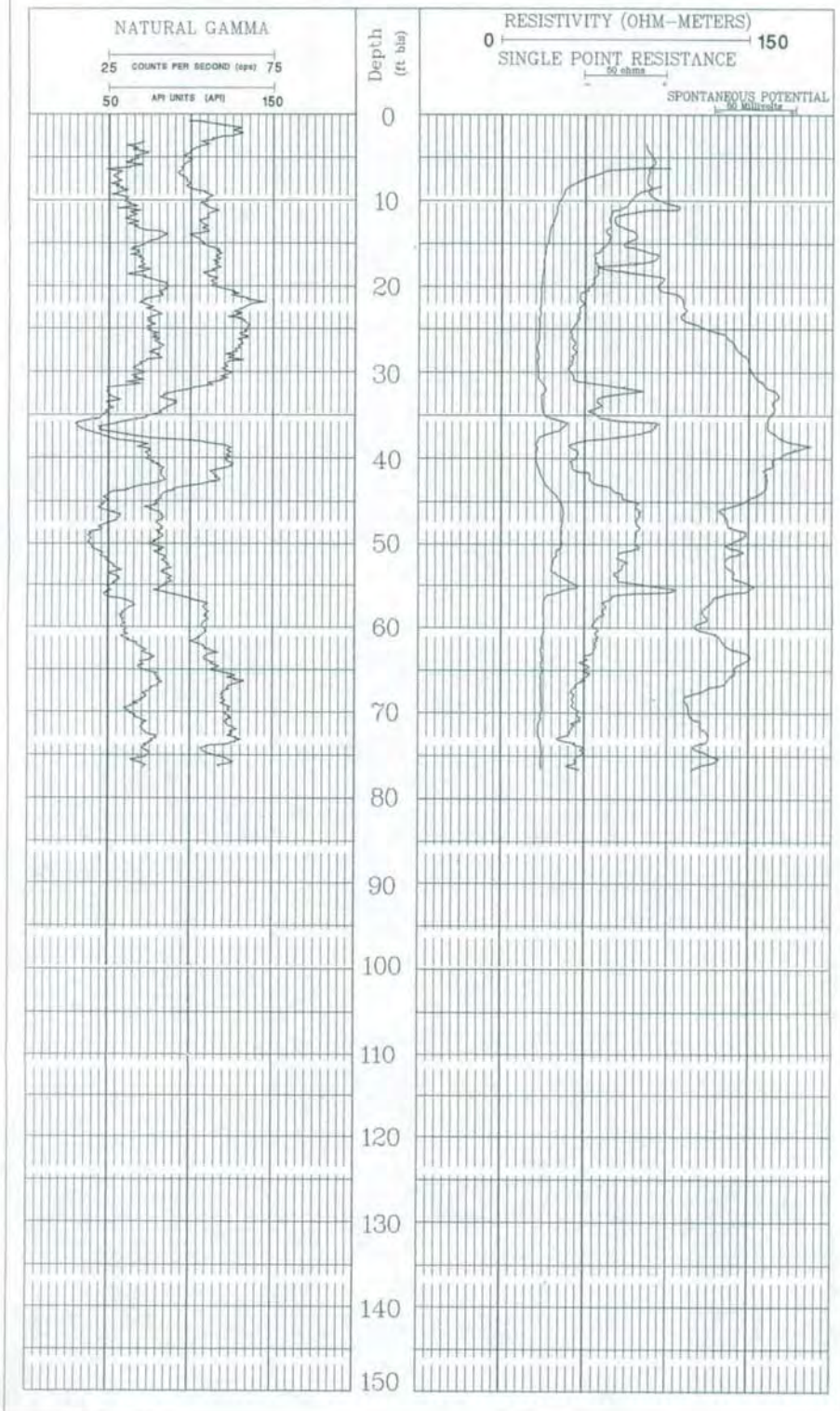
COMPANY:	CLECO / STEI
HOLE NO:	B-26
AREA:	CLECO DOLET HILLS POWER STATION
PARISH: DE SOTO	STATE: LOUISIANA
SECTION: 23	TOWNSHIP: T12N RANGE: R12W
LOG MEASURES FROM:	271.50 MSL

WELL DATA

T.D. Logged	76 FT.	T.D. Drilled	76 FT.
Driller	Charles Drilling	Bit Size	4.25"
Type Fluid in Hole	Groundwater	Casing Size	Open Hole
Fluid Level	Grade FT.	Bottom Hole Temp.	60 °F
Resistivity	70 OHM-M	LOG TIME	
Density		Start / Stop / Minutes Total 29.75	
Viscosity	Temp. 59 °F	Witnessed By:	Ray C-K

OTHER SERVICES / REMARKS

INITIAL RUN	RERUNS
T.D. LOGGED: 76 FT.	T.D. LOGGED: 76 FT.
PROBE TYPE/SER. NO.: Gamma (API), resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN	LOGGING SPEED: 12 FT/MIN.
GAMMA-SCALE: As indicated below API/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC.	TIME CONSTANT: 2 SEC.
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS/IN



BOREHOLE GEOPHYSICAL LOG

ICON ENVIRONMENTAL SERVICES
ICON Environmental Services, Inc.
5637 Superior Drive, Baton Rouge, Louisiana 70816
(504) 291-9499

DATE: 6-26-97

COMPANY: CLECO / STEI

HOLE NO.: B-27

AREA: CLECO DOLET HILLS POWER STATION

PARISH: DE SOTO STATE: LOUISIANA

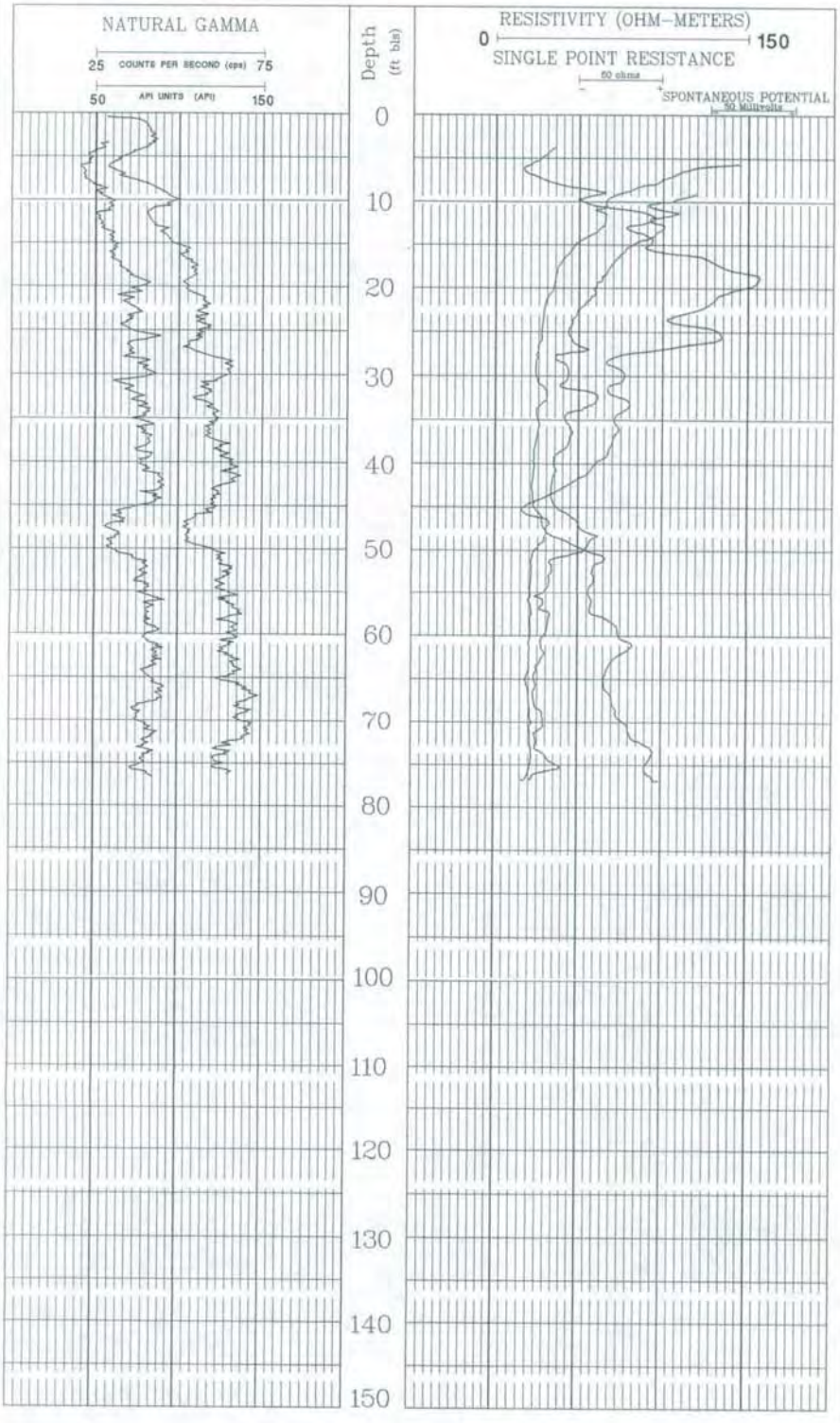
SECTION: 23 TOWNSHIP: T12N RANGE: R12W LOG MEASURED FROM: 267.95 MSL

INITIAL RUN	RERUNS
T.D. LOGGED: 76 FT.	T.D. LOGGED: 76 FT.
PROBE TYPE/SER. NO.: Gamma (API) resistivity (6 inch)	PROBE TYPE/SER. NO.: Gamma (cps), sp resistance, caliper
LOGGING SPEED: 12 FT/MIN	LOGGING SPEED: 12 FT/MIN
GAMMA-SCALE: As indicated below API/IN	GAMMA-SCALE: As indicated below CPS/IN
TIME CONSTANT: 2 SEC	TIME CONSTANT: 2 SEC
RESISTIVITY (FULL SCALE) As indicated below OHM-M/IN	RESISTANCE (FULL SCALE) As indicated below OHMS/IN

WELL DATA

T.D. Logged: 76 FT.	T.D. Drilled: 76 FT.
Driller: Charles Drilling	Bit Size: 4.25"
Type Fluid in Hole: Groundwater	Casing Size: Open Hole
Fluid Level: Grade FT.	Bottom Hole Temp: 60 °F
Resistivity: 70 OHM-M	LOG TIME
Density:	Start / Stop / Minutes Total
Viscosity: Temp: 59 °F	Witnessed By: Ray C-K

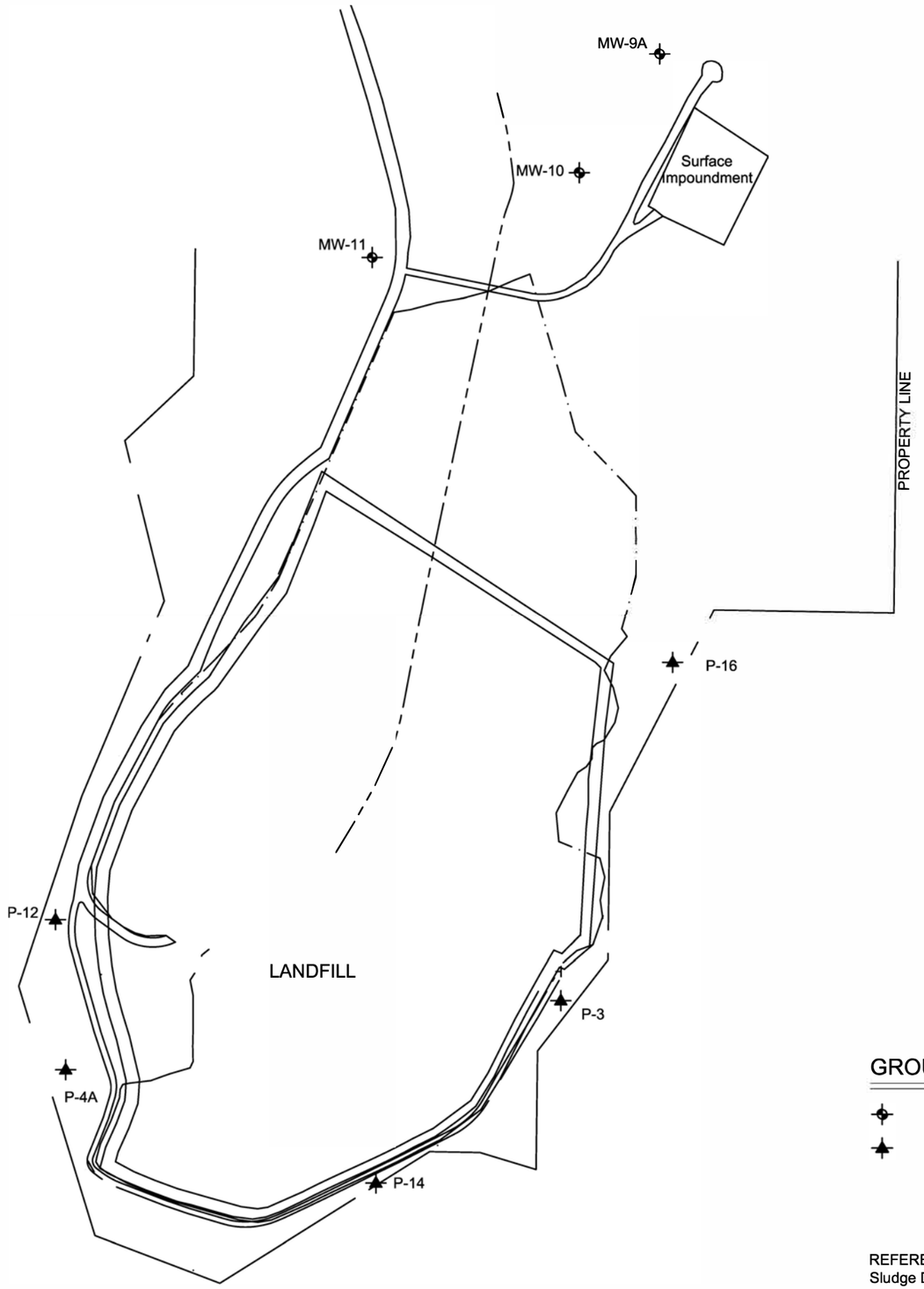
OTHER SERVICES / REMARKS:



APPENDIX K

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

POTENTIOMETRIC SURFACE MAPS



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⊕	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

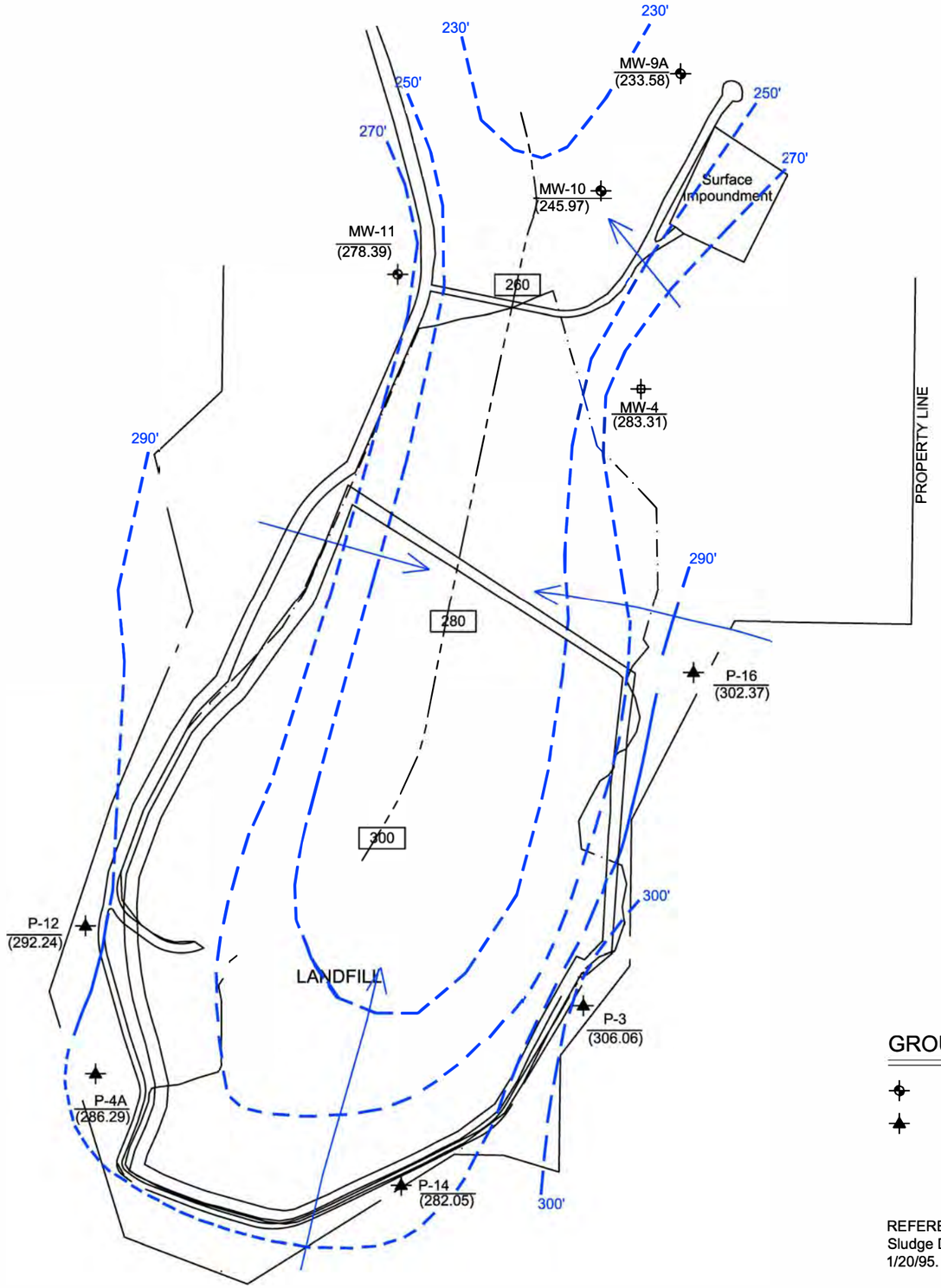
Monitoring Well Location Map

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A005

Figure K-1



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (245.97) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
⌖	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

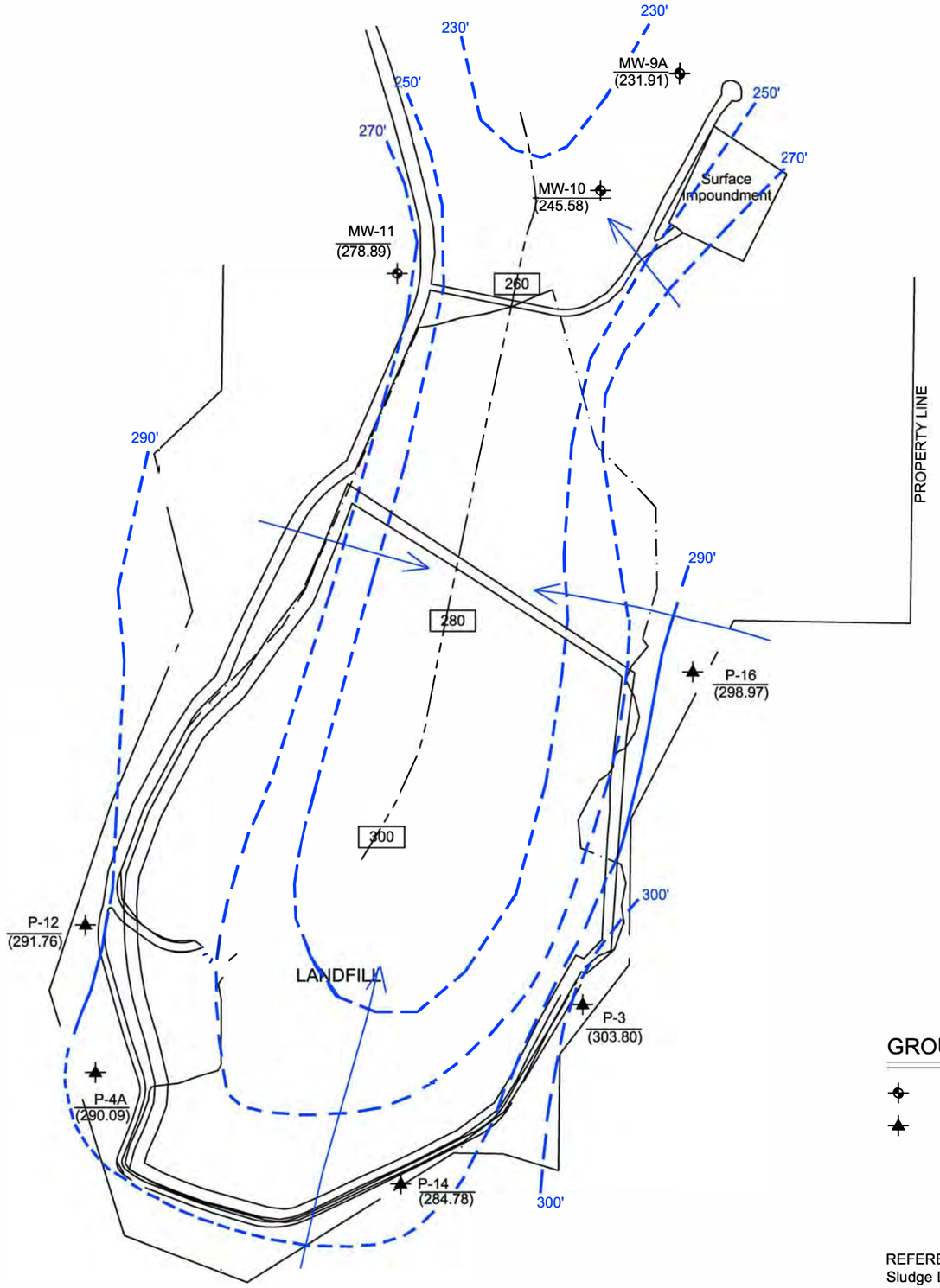
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2016

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/16/17
Dwg. No.:	01-17-0168-A001

Figure K-2



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (303.80) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

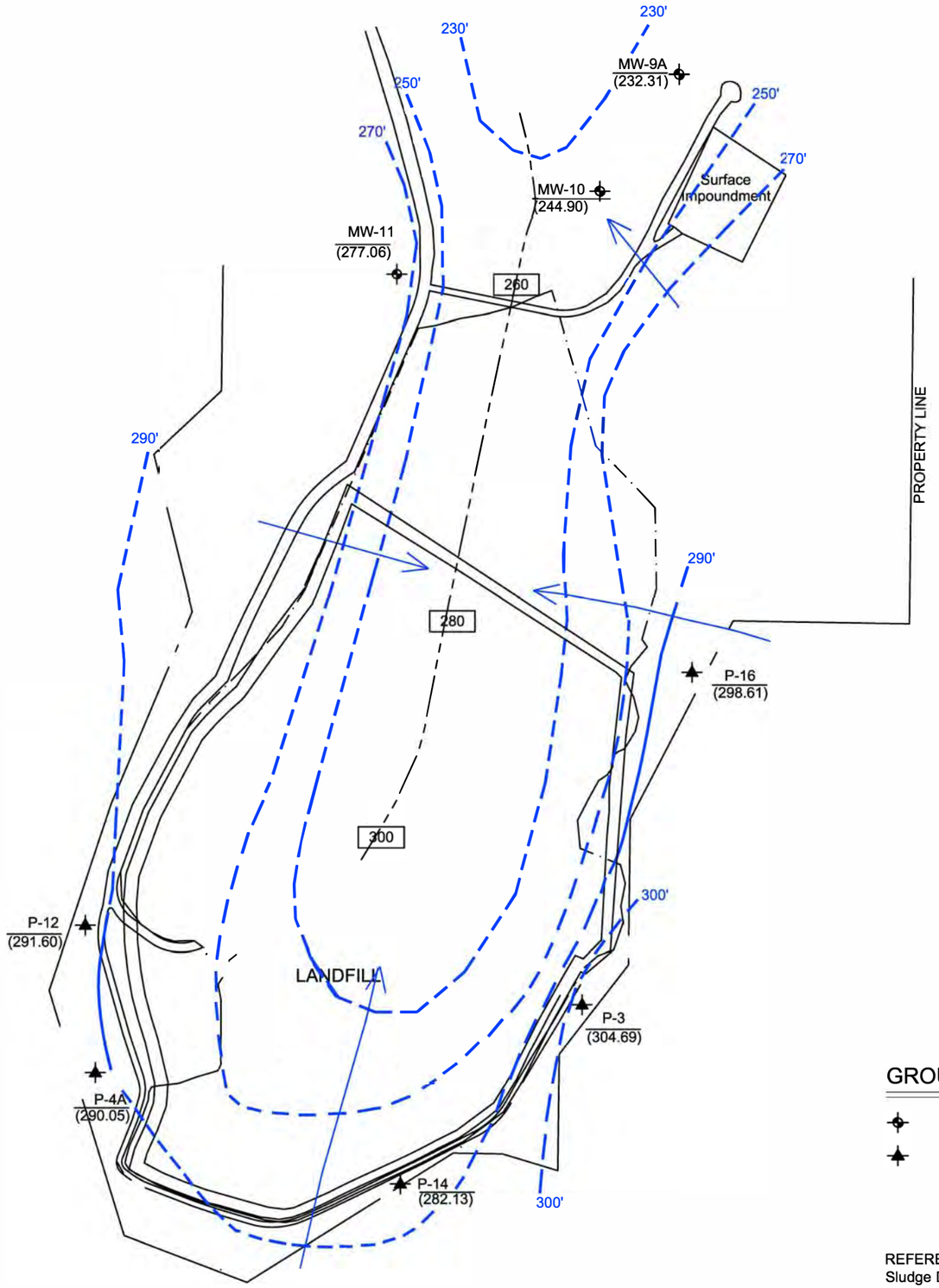
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map June 2016

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A002

Figure K-3



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (291.60) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

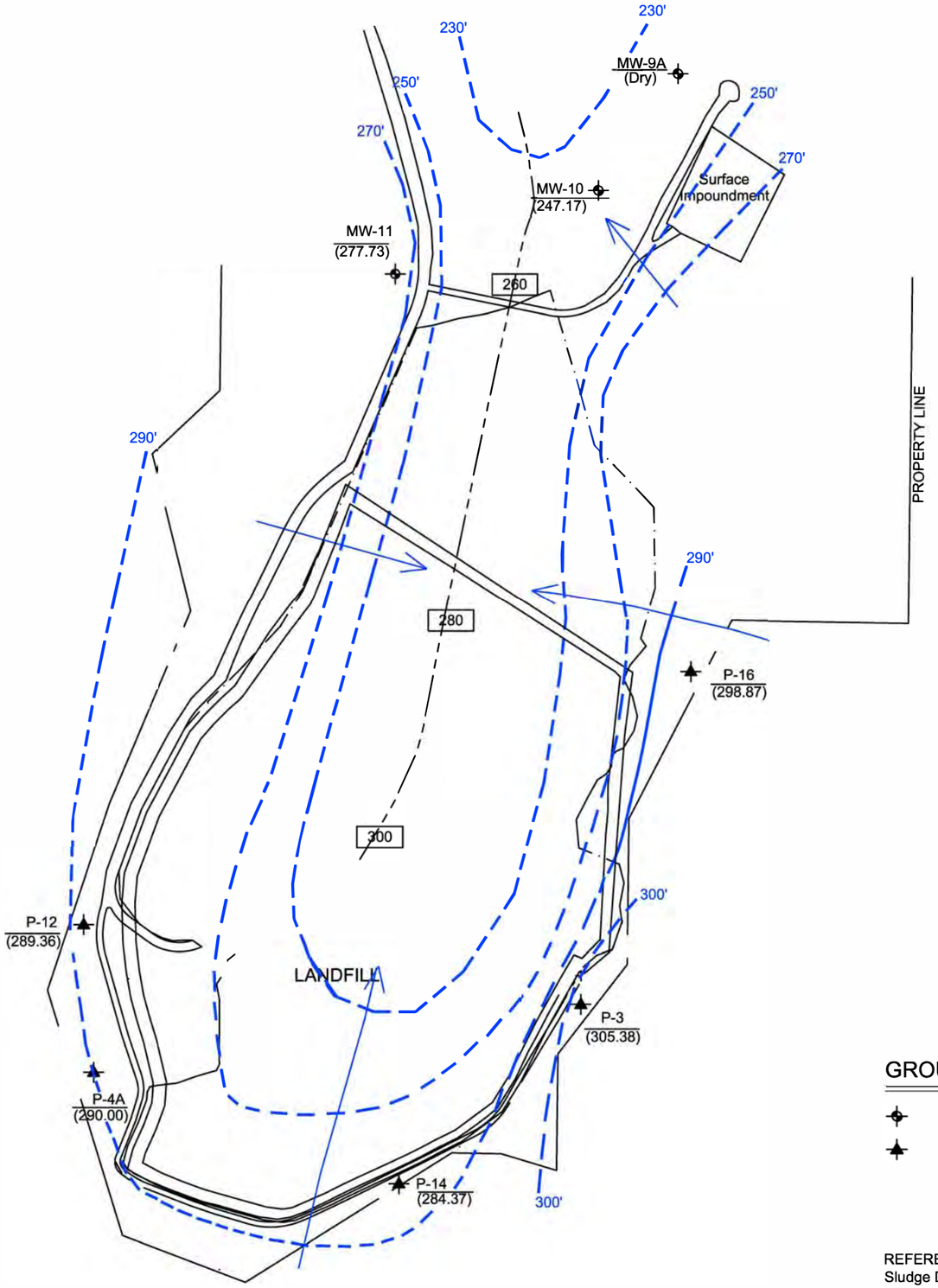
Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
September 2016

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A003

Figure K-4



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (247.17) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

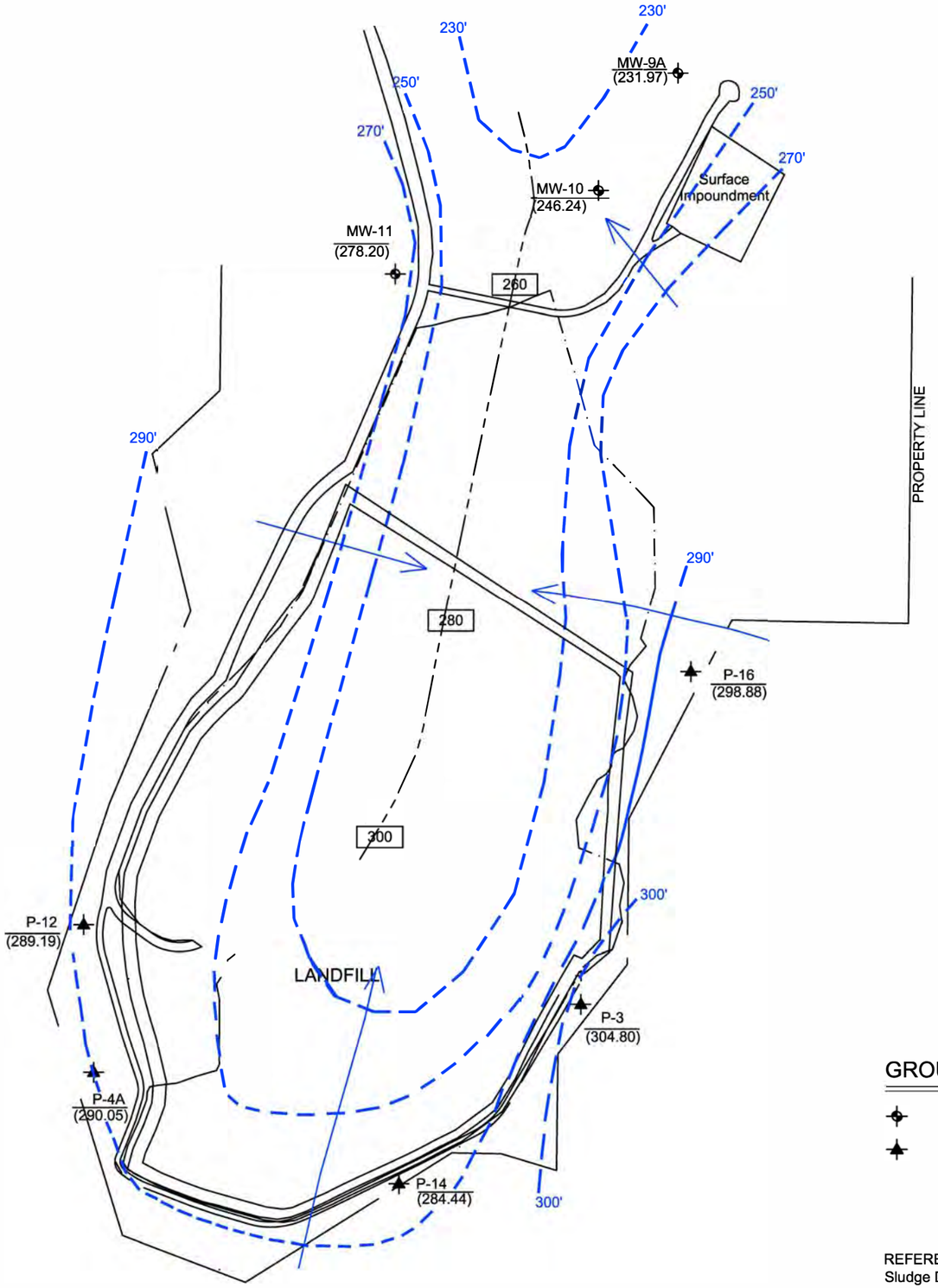
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map December 2016

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A004

Figure K-5



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (246.24) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

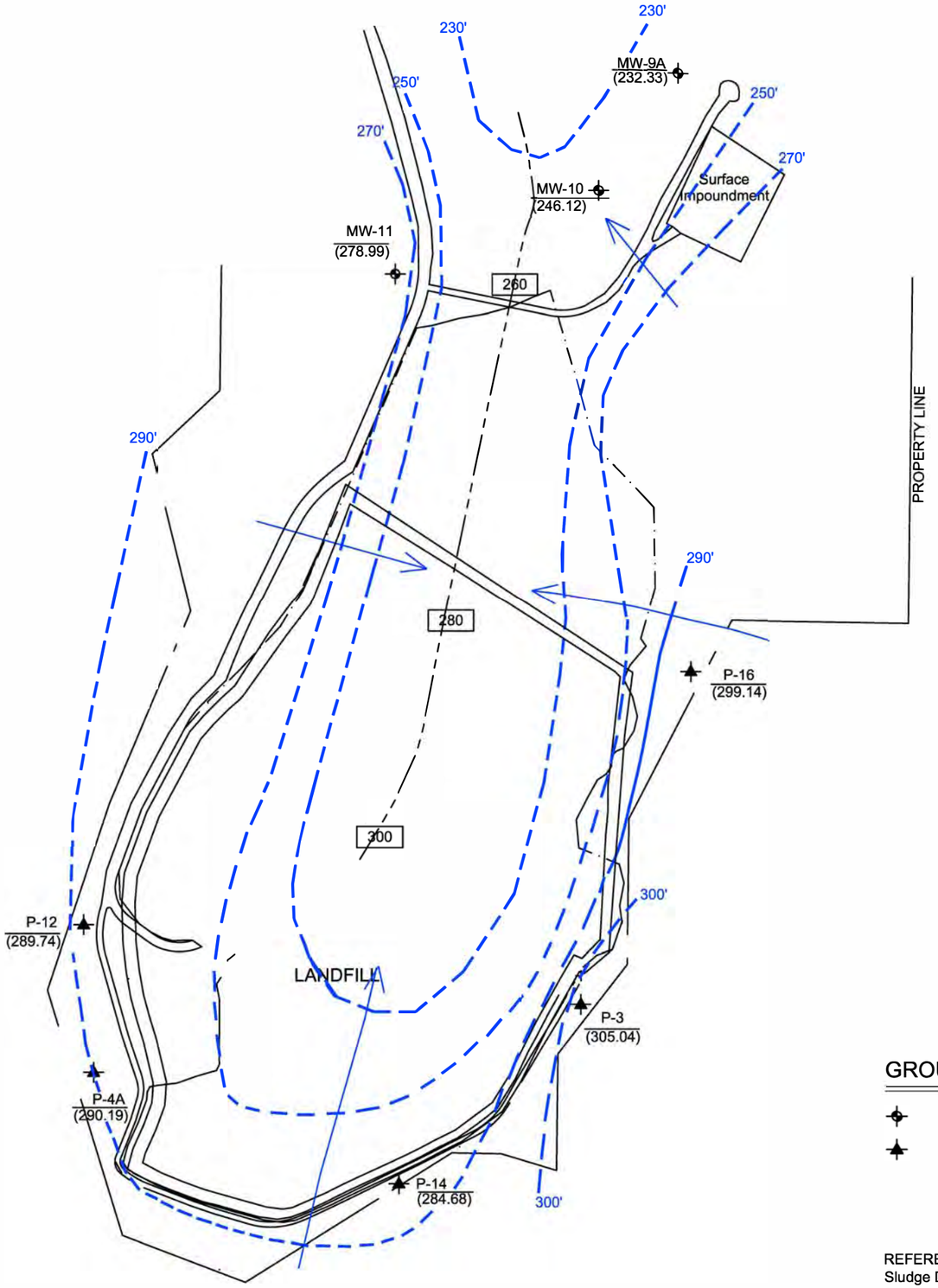
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map January 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A007

Figure K-6



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (246.12) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

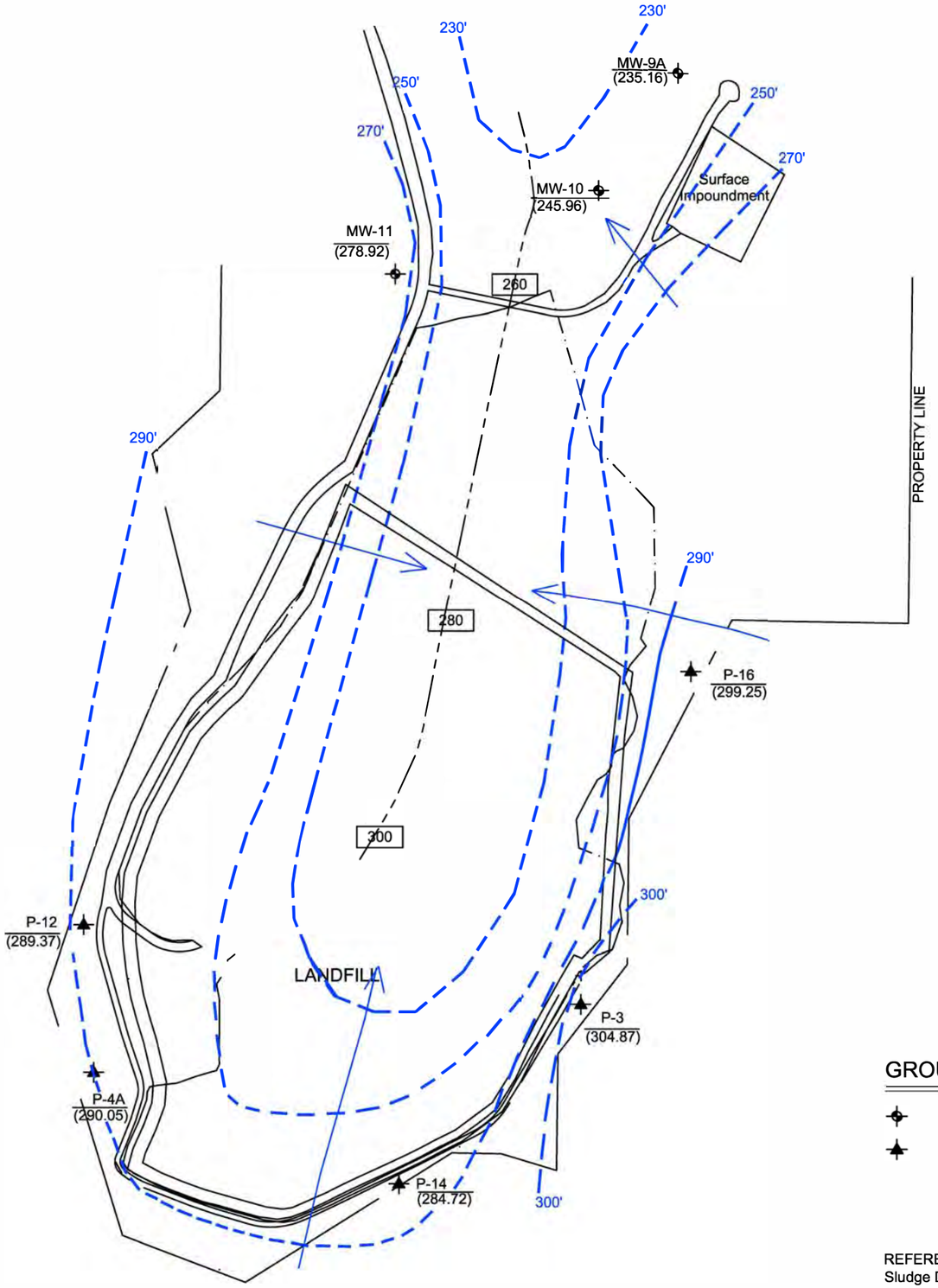
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map February 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	3/6/17
Dwg. No.:	01-17-0168-A008

Figure K-7



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (304.87) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

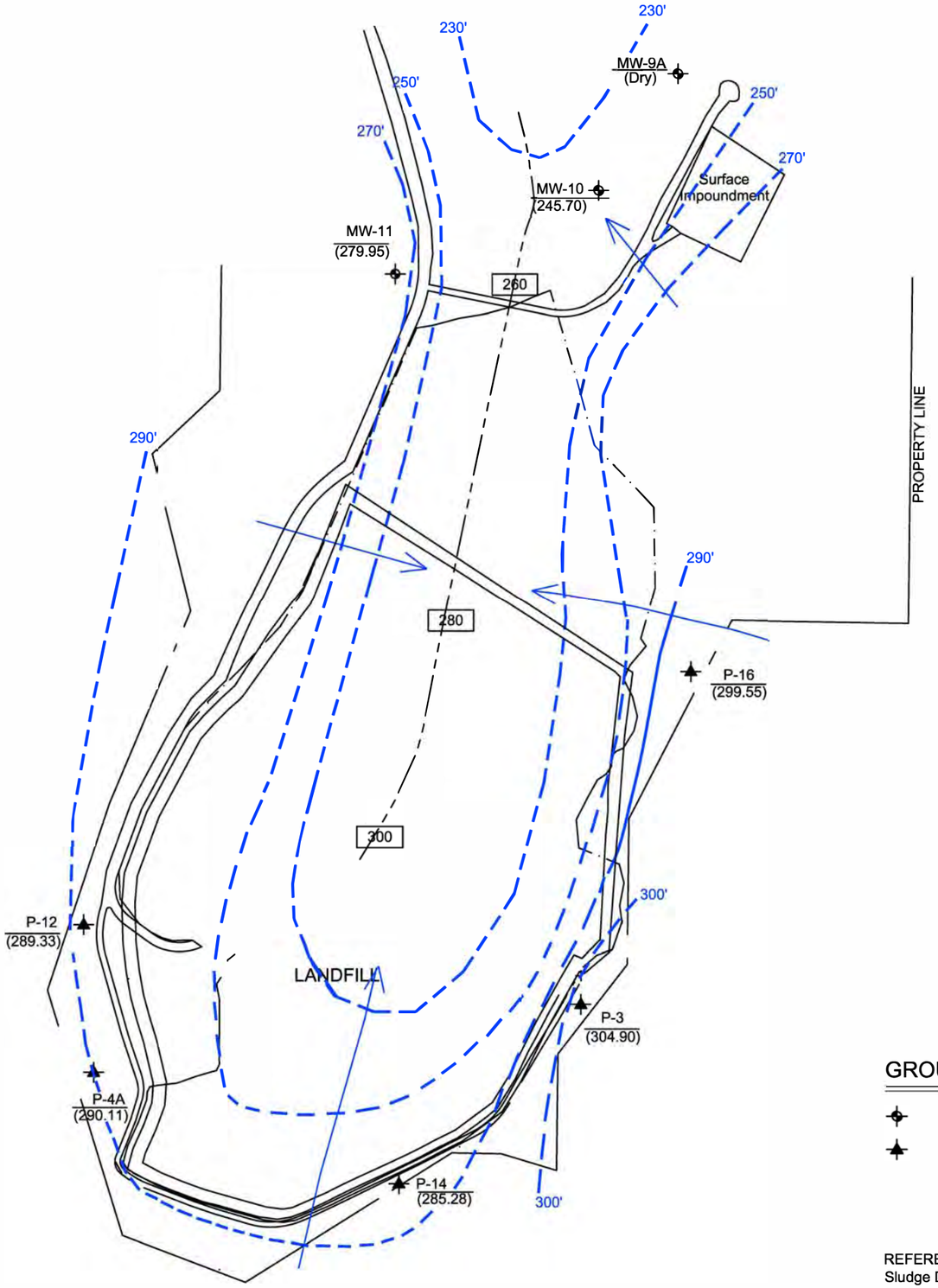
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	4/17/17
Dwg. No.:	01-17-0168-A009

Figure K-8



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (304.90) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

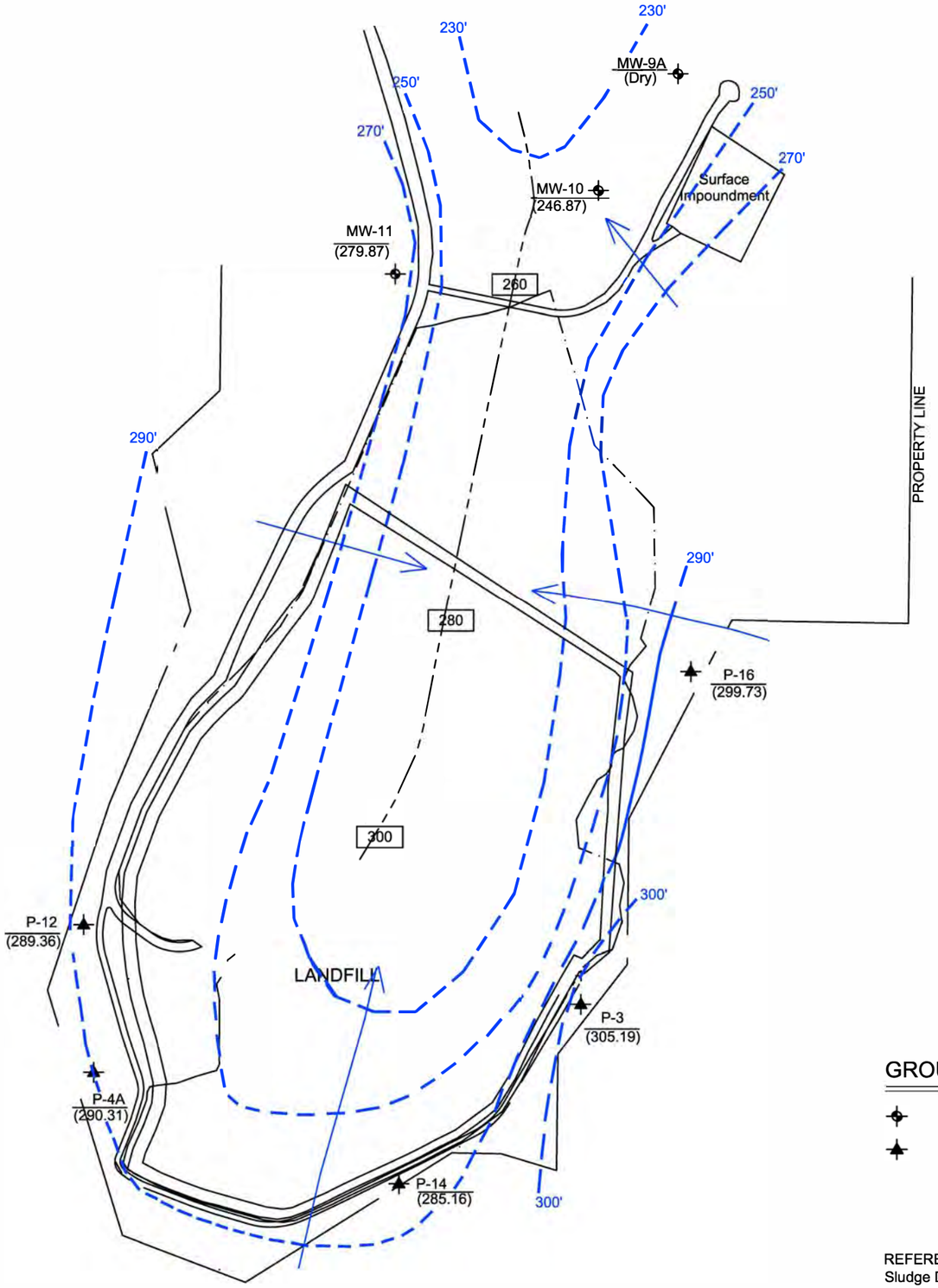
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map June 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	8/1/17
Dwg. No.:	01-17-0168-A010

Figure K-9



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (305.19) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

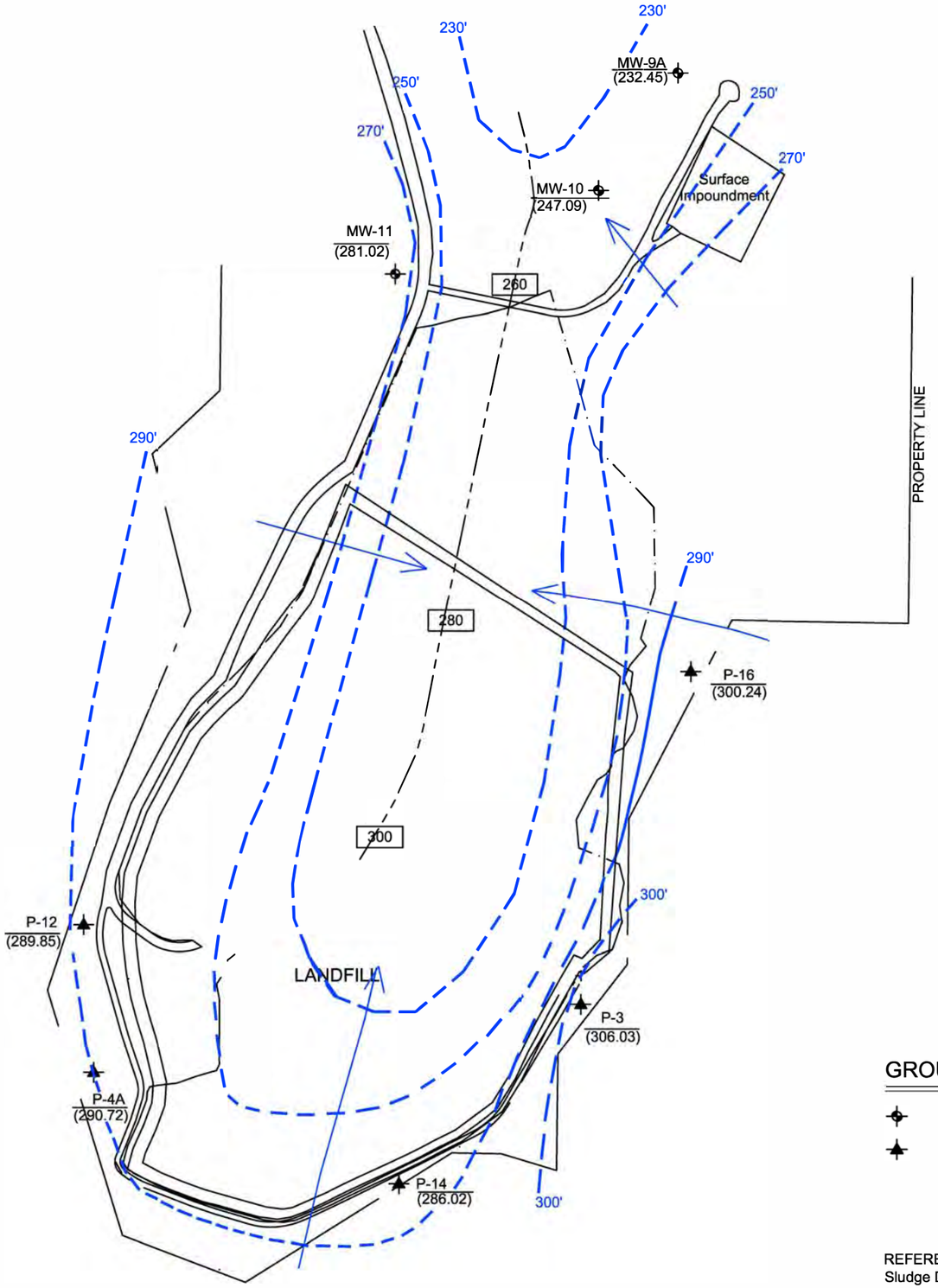
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map August 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	9/12/17
Dwg. No.:	01-17-0168-D007

Figure K-10



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (306.03) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

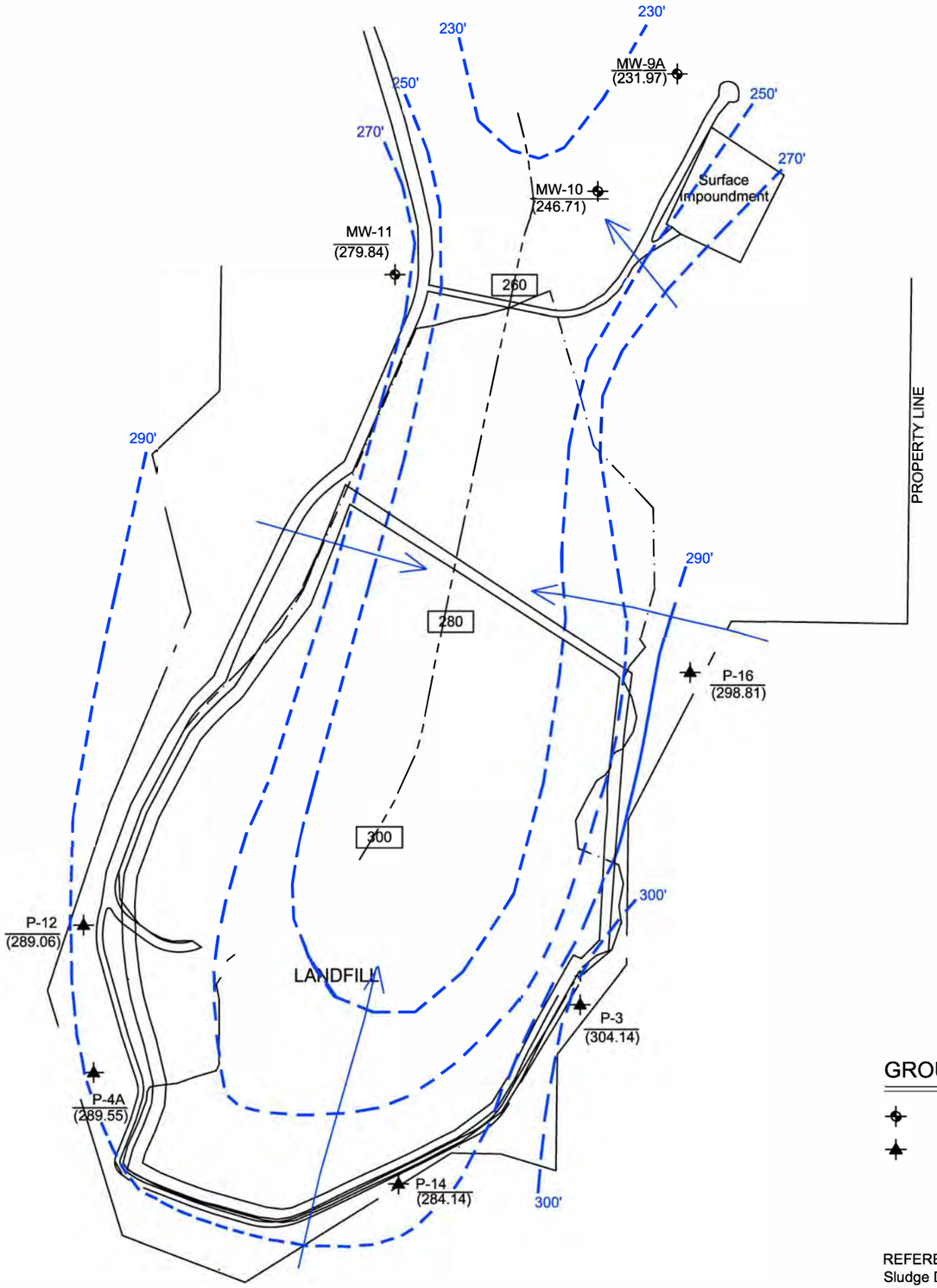
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	3/19/18
Dwg. No.:	01-18-0168-A002

Figure K-11



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (279.84) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

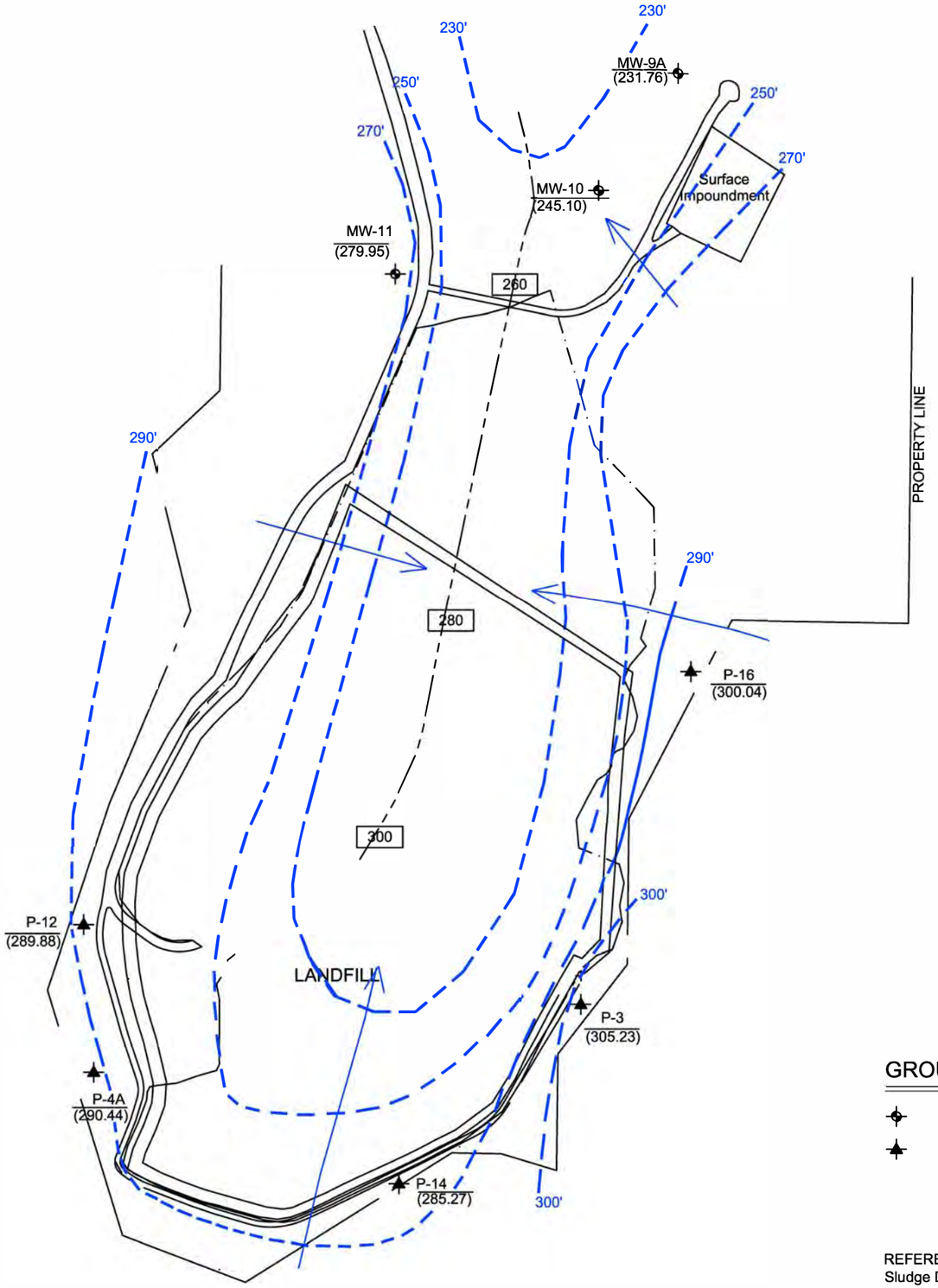
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map May 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	6/11/18
Dwg. No.:	01-18-0168-A004

Figure K-12



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (279.95) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

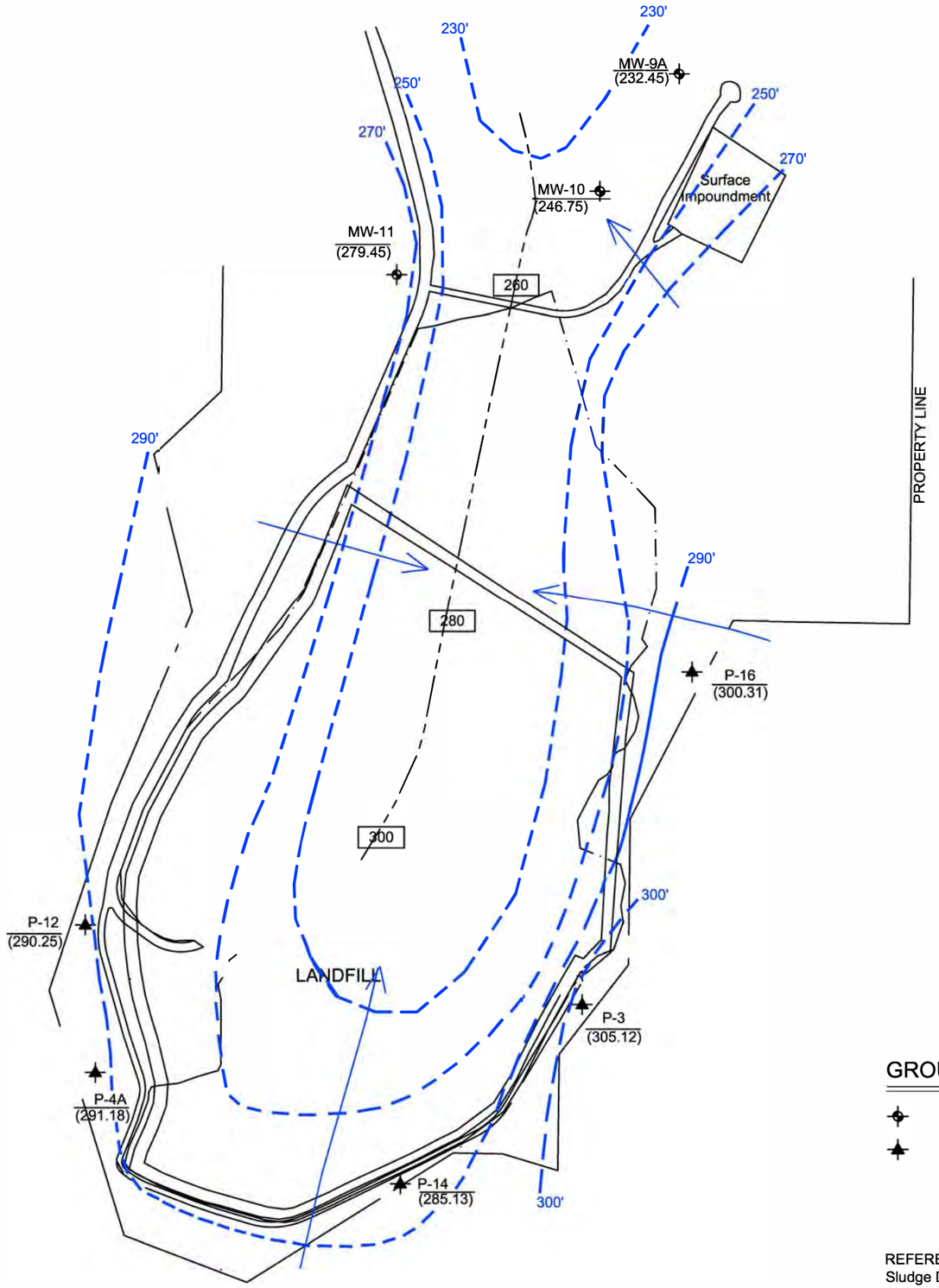
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map July 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	8/13/18
Dwg. No.:	01-18-0168-A006

Figure K-13



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (279.45) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

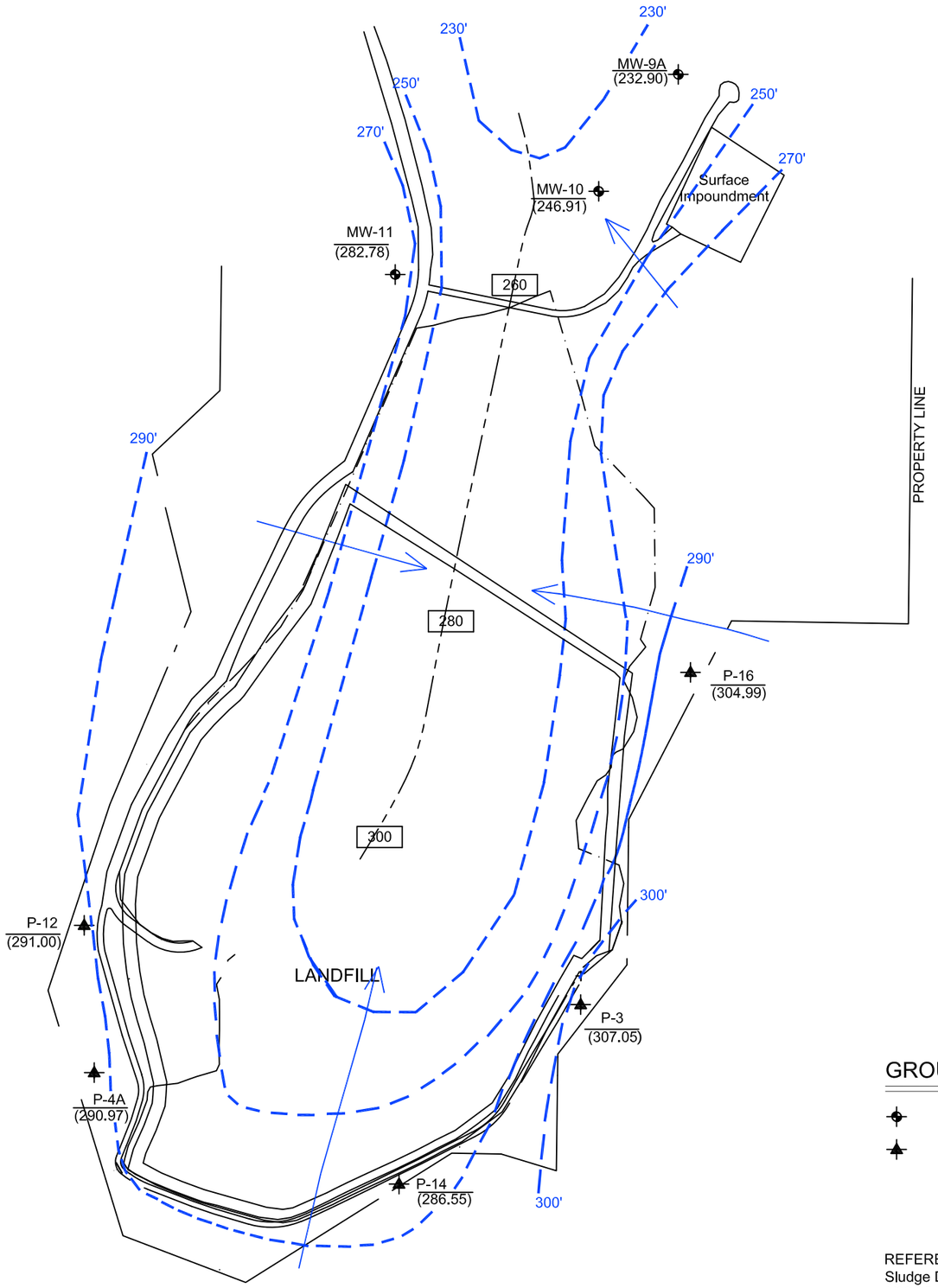
Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
September 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	11/12/18
Dwg. No.:	01-18-0168-A008

Figure K-14



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (246.91) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

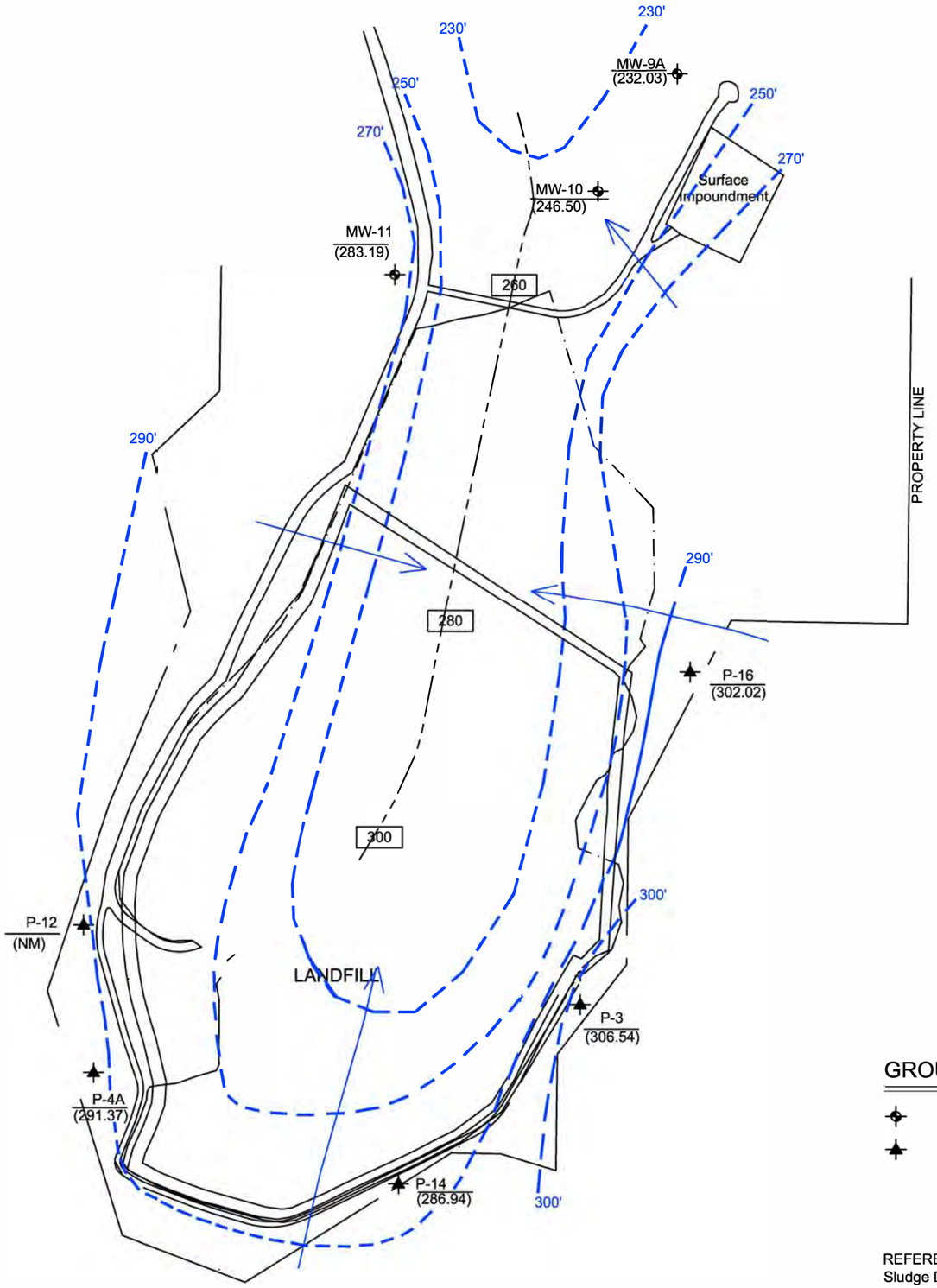
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	4/23/19
Dwg. No.:	01-19-0168-A002

Figure K-15



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (306.54) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)
- NM NOT MEASURED

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

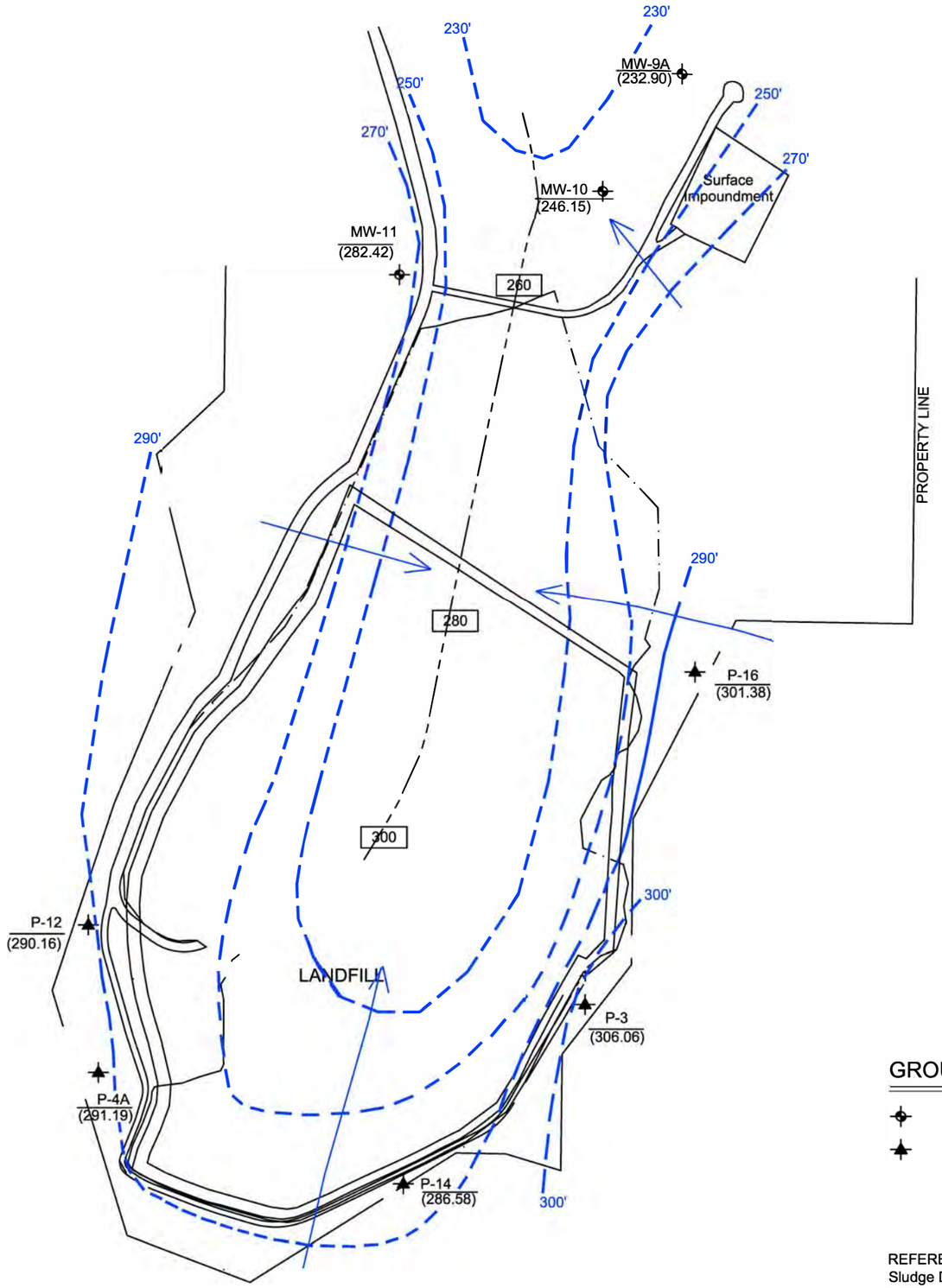
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map June 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	7/8/19
Dwg. No.:	01-19-0168-B002

Figure K-16



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (306.06) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)
- NM NOT MEASURED

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

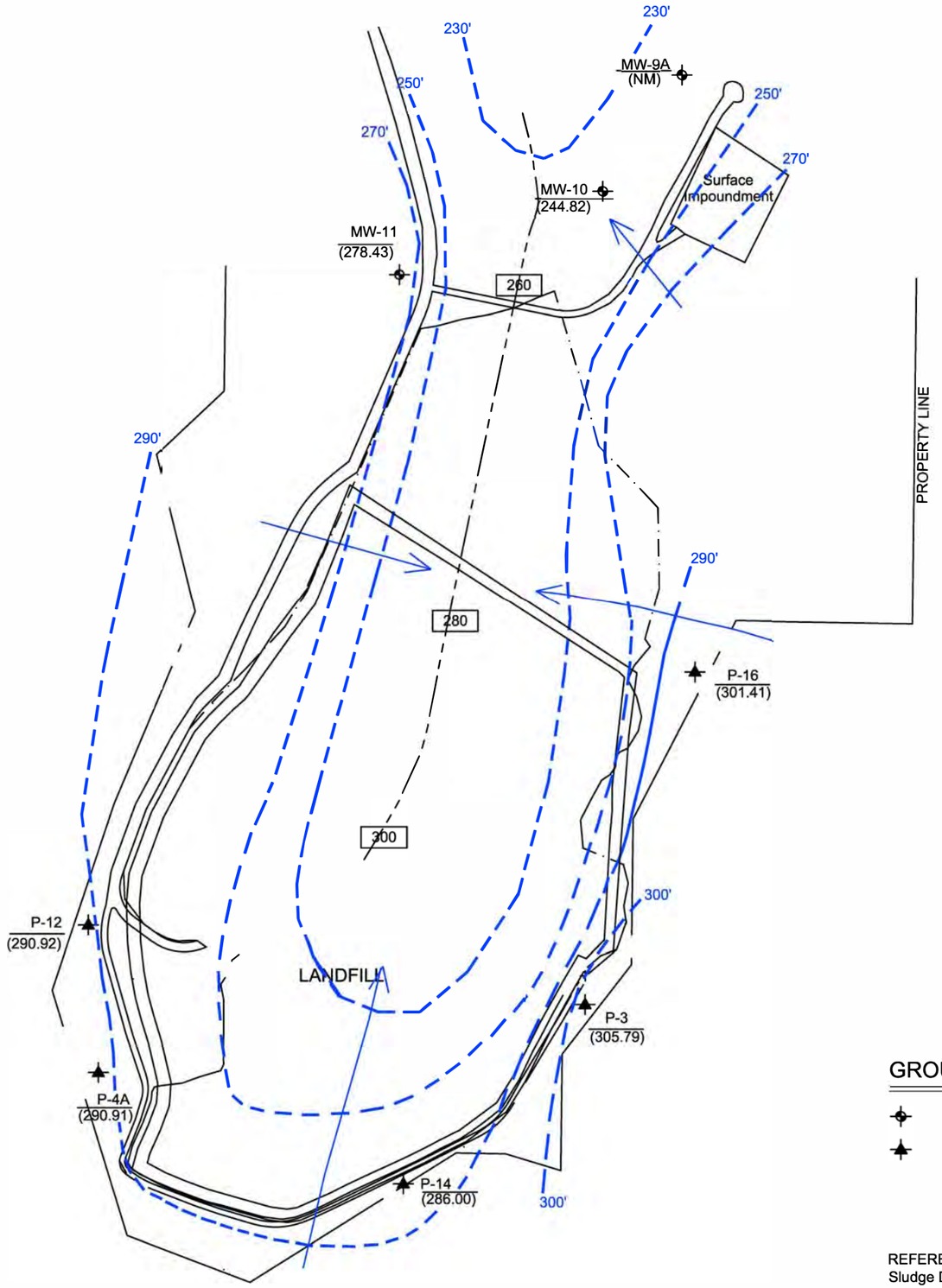
Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
August 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	9/23/19
Dwg. No.:	01-19-0168-C002

Figure K-17



N

Legend

- EXISTING MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (305.79) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)
- NM NOT MEASURED

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
October 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	JM
Date:	11/19/19
Dwg. No.:	01-19-0168-D002

Figure K-18

APPENDIX L

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

GROUNDWATER QUALITY DATA

Table 2
March 2016 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 3/28/16	P-4A (BG) 3/29/16	P-12 (BG) 3/29/16	P-14 (BG) 3/28/16	P-16 (BG) 3/29/16	MW-10 3/29/16	MW-11 3/30/16
Detection Monitoring Parameters								
Boron (mg/l)	NA	0.34	1	1	0.94	0.64	6.6	0.46
Calcium (mg/l)	NA	62.5	6.3	45.4	110	110	325	104
Chloride (mg/l)	NA	11.6	14.7	23.6	16.3	49.7	96	991
Fluoride (mg/l)	4	<0.5	0.63	0.72	0.55	0.19	<0.1	1
pH (S.U.)	NA	9.55	8.33	7.39	10.33	7.99	7.68	7.17
Sulfate (mg/l)	NA	5.3	9.9	1.9	15.7	180	1,870	610
TDS (mg/l)	NA	175	600	395	365	695	2,760	2,700
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	0.0018	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0017	0.0026	<0.001	0.0023	0.0016	<0.001	<0.001
Barium (mg/l)	2	0.19	0.11	0.16	0.61	0.11	0.024	0.058
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0019	0.003	0.0021	0.032	0.077	<0.001	0.0017
Cobalt (mg/l)	NA	<0.001	0.0026	<0.001	0.005	0.0013	0.0062	0.0017
Lead (mg/l)	0.015	0.002	0.005	<0.001	0.0053	0.0019	<0.001	<0.001
Lithium (mg/l)	NA	0.011	0.086	0.031	0.046	0.041	0.034	0.44
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0044	0.0035	0.005	0.039	0.2	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.01
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	1.75	0.456	0.0653	0.992	0.0721	0.25	0.761
Radium-228 (pCi/l)	5	0.554	-0.0798	0.235	0.915	1.58	1.39	1.24

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 3
June 2016 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 6/27/16	P-4A (BG) 6/28/16	P-12 (BG) 6/28/16	P-14 (BG) 6/28/16	P-16 (BG) 6/27/16	MW-10 6/27/16	MW-11 6/28/16
Detection Monitoring Parameters								
Boron (mg/l)	NA	0.97	1	1.1	1.1	1.1	7.1	0.42
Calcium (mg/l)	NA	22.1	8.3	37.6	23.3	43.1	273	108
Chloride (mg/l)	NA	37	14.2	24.2	16.1	71.9	94.1	977
Fluoride (mg/l)	4	0.42	0.58	0.82	0.56	0.31	0.14	1.4
pH (S.U.)	NA	9.61	8.95	7.57	10.68	8.25	7.07	7.22
Sulfate (mg/l)	NA	3.8	7.3	1.6	12.6	143	1,600	629
TDS (mg/l)	NA	420	495	440	575	735	2,990	3,130
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0037	0.0022	<0.001	0.0041	0.0015	0.0013	<0.001
Barium (mg/l)	2	0.11	0.14	0.14	0.22	0.18	0.027	0.062
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0028	0.0016	0.0027	0.013	0.023	<0.001	0.002
Cobalt (mg/l)	NA	0.0012	0.0014	<0.001	0.0045	0.0011	0.027	0.001
Lead (mg/l)	0.015	0.0022	0.0016	<0.001	0.0077	0.0022	<0.001	<0.001
Lithium (mg/l)	NA	0.034	0.29	0.032	0.047	0.06	0.027	0.42
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0043	0.0035	0.0055	0.019	0.17	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.01
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.62	0.878	0.284	1.51	0.217	-0.056	0
Radium-228 (pCi/l)	5	0.746	0.688	0.278	0.302	0.997	1.05	1.15

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 4
September 2016 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 9/26/16	P-4A (BG) 9/27/16	P-12 (BG) 9/27/16	P-14 (BG) 9/27/16	P-16 (BG) 9/26/16	MW-10 9/26/16	MW-11 9/27/16
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.2	1.1	1.2	0.94	1.1	5.5	0.42
Calcium (mg/l)	NA	56.9	6.5	35.2	64.4	28.1	187	89.5
Chloride (mg/l)	NA	43.7	15.8	23.8	15.9	65.2	78.4	974
Fluoride (mg/l)	4	4.4	0.74	0.68	0.58	<0.5	<0.5	0.97
pH (S.U.)	NA	9.11	9.12	7.22	11.69	7.83	7.17	7.09
Sulfate (mg/l)	NA	1.7	5.1	1.3	15.8	183	1,200	687
TDS (mg/l)	NA	405	595	420	430	780	1,850	2,760
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0017	0.0016	<0.001	0.0017	0.0022	<0.001	<0.001
Barium (mg/l)	2	0.22	0.16	0.14	0.48	0.1	0.027	0.044
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0012	0.0026	0.0026	0.023	0.011	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	0.0022	<0.001	0.0041	<0.001	0.018	<0.001
Lead (mg/l)	0.015	0.0011	0.0026	<0.001	0.0042	0.0011	<0.001	<0.001
Lithium (mg/l)	NA	0.035	0.12	0.03	0.044	0.063	0.076	0.36
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.004	<0.003	0.0057	0.036	0.18	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0089
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	1.54	0.0758	0.598	2.24	-0.084	0.476	0.519
Radium-228 (pCi/l)	5	-0.394	0.716	0.983	0.32	0.548	0.502	1.14

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

CLECO

Table 5
December 2016 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 12/7/16	P-4A (BG) 12/7/16	P-12 (BG) 12/7/16	P-14 (BG) 12/7/16	P-16 (BG) 12/7/16	MW-10 12/7/16	MW-11 12/7/16
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.1	0.97	1.2	1	1.1	7.8	0.38
Calcium (mg/l)	NA	36.1	5.3	21.8	25.8	32.1	214	87.1
Chloride (mg/l)	NA	43.9	13.8	25.2	15.9	68.3	82.5	811
Fluoride (mg/l)	4	0.41	0.6	0.67	0.65	0.24	0.18	0.92
pH (S.U.)	NA	7.48	8.71	8.42	9.78	7.63	7.66	7.69
Sulfate (mg/l)	NA	2	4.3	1.7	9.7	175	1,290	600
TDS (mg/l)	NA	505	515	445	650	780	2,400	2,890
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0014	0.0012	<0.001	0.0053	0.0022	<0.001	<0.001
Barium (mg/l)	2	0.18	0.13	0.096	0.29	0.11	0.024	0.045
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0022	0.002	0.0015	0.022	0.0031	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	0.0019	<0.001	0.0096	<0.001	0.0029	<0.001
Lead (mg/l)	0.015	0.0015	0.0022	<0.001	0.014	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.037	0.13	0.027	0.05	0.059	0.026	0.35
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0032	<0.003	0.0035	0.015	0.18	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0081
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.898	0.489	0.257	1.55	0.308	0.0667	0.258
Radium-228 (pCi/l)	5	0.0324	0.408	-0.295	-0.0122	1.17	0.597	1.33

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 6
January 2017 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 1/5/17	P-4A (BG) 1/5/17	P-12 (BG) 1/5/17	P-14 (BG) 1/5/17	P-16 (BG) 1/5/17	MW-10 1/5/17	MW-11 1/5/17
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.3	1.2	1.3	1.1	1.1	7.4	0.43
Calcium (mg/l)	NA	27.8	29.6	30.8	21.5	27.6	258	92.3
Chloride (mg/l)	NA	44.2	12.3	25	17.7	73.5	79	848
Fluoride (mg/l)	4	0.37	0.6	0.62	0.56	0.22	<0.1	1.1
pH (S.U.)	NA	7.99	8.02	7.55	9.09	7.75	6.07	7
Sulfate (mg/l)	NA	2	3.7	1.4	6.5	170	1,370	632
TDS (mg/l)	NA	435	475	425	450	785	2,320	2,740
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0016	0.012	<0.001	0.0033	0.0028	<0.001	<0.001
Barium (mg/l)	2	0.15	0.86	0.13	0.19	0.12	0.022	0.043
Beryllium (mg/l)	0.004	<0.001	0.0029	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0025	0.034	0.0035	0.011	0.02	<0.001	0.0013
Cobalt (mg/l)	NA	0.0011	0.029	0.0011	0.0034	0.0011	<0.001	<0.001
Lead (mg/l)	0.015	0.0018	0.044	0.0011	0.0065	0.0019	<0.001	<0.001
Lithium (mg/l)	NA	0.037	0.11	0.029	0.039	0.061	0.019	0.36
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0033	<0.003	0.0049	0.019	0.17	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	0.0066
Thallium (mg/l)	0.002	<0.0005	0.00078	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.423	0.257	0.347	0.619	0.289	-0.065	-0.068
Radium-228 (pCi/l)	5	1.66	0.845	0.711	2.42	1.11	0.64	0.795

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 7
February 2017 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 2/8/17	P-4A (BG) 2/8/17	P-12 (BG) 2/8/17	P-14 (BG) 2/8/17	P-16 (BG) 2/8/17	MW-10 2/8/17	MW-11 2/8/17
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.1	1.1	1.1	1.1	1.1	5.8	0.43
Calcium (mg/l)	NA	28	4.7	32.5	21.3	30	202	92.8
Chloride (mg/l)	NA	43.7	12.3	25.2	17.2	75.5	84.7	900
Fluoride (mg/l)	4	0.45	0.61	0.77	0.6	0.23	<0.10	1.2
pH (S.U.)	NA	7.59	7.46	8.04	9.02	7.4	5.93	6.33
Sulfate (mg/l)	NA	2	4.2	1.1	7.9	173	1,350	646
TDS (mg/l)	NA	535	495	505	590	875	1,920	2,900
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0016	0.002	<0.001	0.0029	0.0043	<0.001	<0.001
Barium (mg/l)	2	0.13	0.083	0.13	0.19	0.17	0.023	0.041
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0015	0.0034	0.0026	0.013	0.056	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	<0.001	<0.001	0.0034	0.0044	0.005	<0.001
Lead (mg/l)	0.015	0.0011	<0.001	<0.001	0.0055	0.0074	<0.001	<0.001
Lithium (mg/l)	NA	0.035	0.067	0.028	0.039	0.069	0.048	0.37
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	0.0034	<0.003	0.006	0.022	0.15	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0063
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.565	0.478	0.241	1.62	-0.232	0.559	0.348
Radium-228 (pCi/l)	5	1.38	1.11	0.531	0.96	0.873	1.42	0.528

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 8
March 2017 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 3/21/17	P-4A (BG) 3/22/17	P-12 (BG) 3/22/17	P-14 (BG) 3/21/17	P-16 (BG) 3/21/17	MW-10 3/22/17	MW-11 3/22/17
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.4	0.99	1.3	1.1	1.2	8.1	0.46
Calcium (mg/l)	NA	13	13.1	31	23.8	24.4	259	93
Chloride (mg/l)	NA	44.6	11.9	25	16.6	97.8	94.6	835
Fluoride (mg/l)	4	0.41	0.52	0.64	0.61	0.26	<0.1	1.2
pH (S.U.)	NA	10.01	8.03	6.7	9.51	7.33	5.34	6.29
Sulfate (mg/l)	NA	1.7	3	1.7	2.8	136	1,360	611
TDS (mg/l)	NA	490	470	390	500	810	2,370	2,800
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0018	0.0018	<0.001	0.0016	0.0018	<0.001	<0.001
Barium (mg/l)	2	0.094	0.37	0.13	0.17	0.12	0.023	0.049
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0016	0.0044	0.0035	0.0088	0.0038	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	0.0062	0.0012	<0.001	<0.001	0.0025	<0.001
Lead (mg/l)	0.015	0.0012	0.0032	0.0014	0.0019	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.037	0.4	0.031	0.035	0.068	0.022	0.36
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	0.0052	0.024	0.14	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0055
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.593	0.502	1.55	1.16	0.17	0.188	0.63
Radium-228 (pCi/l)	5	0.267	0.953	0.428	0.546	0.469	0.867	0.382

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 9
June 2017 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 6/20/17	P-4A (BG) 6/20/17	P-12 (BG) 6/20/17	P-14 (BG) 6/20/17	P-16 (BG) 6/20/17	MW-10 6/20/17	MW-11 6/20/17
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.2	1.1	1.2	1.1	1.2	8.1	0.38
Calcium (mg/l)	NA	14.5	3.6	19.5	27.6	20.6	221	91.7
Chloride (mg/l)	NA	46.2	13.6	26.7	15.8	81.8	112	873
Fluoride (mg/l)	4	0.42	0.74	0.77	0.58	0.25	<0.1	1.4
pH (S.U.)	NA	9.45	8.27	7.08	9.69	7.47	6.83	7.31
Sulfate (mg/l)	NA	2.6	5	1.2	5.2	128	1,220	602
TDS (mg/l)	NA	495	535	430	430	755	2,320	2,670
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0018	0.0031	<0.001	0.0011	0.0015	<0.001	<0.001
Barium (mg/l)	2	0.1	0.096	0.079	0.17	0.083	0.022	0.042
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0028	0.0042	0.0022	0.0099	0.0018	<0.001	0.0012
Cobalt (mg/l)	NA	0.0016	0.0027	<0.001	<0.001	<0.001	0.0075	0.0041
Lead (mg/l)	0.015	0.0017	0.0036	<0.001	0.0011	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.036	0.051	0.027	0.035	0.059	0.031	0.34
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	0.0037	0.026	0.15	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0035
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.481	0.757	0.691	1.39	0.802	0.673	1.06
Radium-228 (pCi/l)	5	1.15	0.421	0.508	0.51	0.932	0.578	1.05

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 10
August 2017 Analytical Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/ Date	MCL	P-3 (BG) 8/22/17	P-4A (BG) 8/22/17	P-12 (BG) 8/22/17	P-14 (BG) 8/22/17	P-16 (BG) 8/22/17	MW-10 8/22/17	MW-11 8/22/17
Detection Monitoring Parameters								
Boron (mg/l)	NA	1.2	1.1	1.2	1	1.2	8.4	0.39
Calcium (mg/l)	NA	13	7	36.7	33.1	22.7	230	77.6
Chloride (mg/l)	NA	46.1	12.8	25.9	16.2	89.2	105	800
Fluoride (mg/l)	4	0.46	0.75	0.8	0.64	0.35	0.24	1.2
pH (S.U.)	NA	9.81	8.43	6.84	9.68	7.69	7	7.61
Sulfate (mg/l)	NA	2.1	3.6	1.9	6.3	130	1,350	642
TDS (mg/l)	NA	510	490	435	500	805	2,520	2,620
Assessment Monitoring Parameters								
Antimony (mg/l)	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	0.01	0.0016	0.0032	<0.001	0.0012	0.0013	<0.001	<0.001
Barium (mg/l)	2	0.089	0.16	0.15	0.24	0.1	0.027	0.039
Beryllium (mg/l)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)	0.1	0.0016	0.0045	0.0039	0.0088	0.0043	<0.001	<0.001
Cobalt (mg/l)	NA	<0.001	0.0041	0.0013	<0.001	<0.001	0.012	<0.001
Lead (mg/l)	0.015	<0.001	0.0049	0.0013	0.001	<0.001	<0.001	<0.001
Lithium (mg/l)	NA	0.038	0.071	0.031	0.037	0.063	0.042	0.32
Mercury (mg/l)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/l)	NA	<0.003	<0.003	0.0069	0.026	0.14	<0.003	<0.003
Selenium (mg/l)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0028
Thallium (mg/l)	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Radium-226 (pCi/l)	5	0.934	0.713	0.693	2.21	1.53	0.418	0.597
Radium-228 (pCi/l)	5	0.341	0.636	0.116	0.393	0.777	1.05	1.52

Notes:
mg/l = milligrams per liter
S.U. = standard units
pCi/l = picocuries per liter

Table 2
2018 Analytical Data Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/Date		Boron (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	pH (S.U.)	Sulfate (mg/l)	TDS (mg/l)
P-3 (BG)	3/7/18	0.36	726	12.8	0.13	7.77	3.3	270
	5/16/18	0.3	74.5	12.8	0.13	7.64	4.8	325
	7/23/18	0.55	17.7	18.1	0.24	9.48	2.5	215
	9/26/18	0.92	35.8	30.3	0.33	7.98	1.6	310
P-4A (BG)	3/8/18	0.87	12.1	14.3	0.6	7.82	1.4	425
	5/17/18	1.1	16.3	12.3	0.62	7.93	1.6	470
	7/23/18	0.73	42.1	9.5	0.33	8.1	6.8	355
	9/26/18	1.1	7.4	13	0.58	7.94	<5	610
P-12 (BG)	3/8/18	0.94	55.5	24.4	0.58	8.06	2.2	510
	5/16/18	1	54.3	26.1	0.63	7.88	1.9	455
	7/24/18	1.2	47.4	23.1	0.61	7.64	2.9	500
	9/26/18	1.2	53.7	25.5	0.7	7.88	1.14	525
P-14 (BG)	3/7/18	0.94	42.2	16.5	0.49	9.21	8.6	445
	5/17/18	0.92	30.3	16.9	0.54	9.32	7.2	470
	7/24/18	1.3	31.1	16.7	0.54	9.49	7.7	435
	9/26/18	1.2	17.3	15.7	0.57	9.36	5.04	465
P-16 (BG)	3/7/18	1.2	17.1	107	0.25	7.55	110	850
	5/16/18	1.5	27	107	0.26	7.81	111	880
	7/23/18	1.5	22.4	96.2	0.24	7.86	109	765
	9/26/18	1.3	18.3	109	0.27	7.76	95.9	650
MW-10	3/8/18	9.9	388	119	<0.1	6.98	1,590	2,790
	5/17/18	6.8	256	107	0.12	7.03	1,470	1,980
	7/24/18	7.4	250	101	<0.1	7.42	1,210	2,260
	9/26/18	7.8	216	98.4	0.69 / <0.1*	7.27	1,050	2,020
MW-11	3/8/18	0.37	84.6	906	0.84	7.75	715	2,450
	5/16/18	0.41	79	807	0.92	7.77	632	2,540
	7/24/18	0.46	68.7	662	1.3	8.24	578	2,350
	9/26/18	0.39	71.6	694	1.1	8.12	560	2,330

* 11/16/18 resampling result.

Notes:
mg/l = milligrams per liter
S.U. = standard units

Table 2
2019 Analytical Data Summary

Cleco Dolet Hills Power Station
Fly Ash/Scrubber Sludge Landfill

Parameter/Well/Date		Boron (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Fluoride (mg/l)	pH (S.U.)	Sulfate (mg/l)	TDS (mg/l)
P-3 (BG)	3/20/19	0.48	55.5	19.3	0.23	8.46	2.5	210
	6/4/19	0.19	46.5	2.7	0.1	7.99	3.3	105
	8/7/19	0.17	48.2	2.6	0.16	9.81	3	135
	10/9/19	0.48	21.9	14.4	0.24	8.86	3.4	145
P-4A (BG)	3/20/19	1.1	6.9	14.3	0.59	8.34	<1	430
	6/5/19	2.2	8.2	12.2	0.64	8.03	<1	435
	8/7/19	1.3	8.3	12.5	0.61	7.88	<1	485
	10/9/19	1	5.6	13	0.58	8.21	<1	390
P-12 (BG)	3/20/19	1.2	59	28.3	0.69	8.21	1.5	410
	6/5/19	0.23	59.9	26.6	0.68	7.76	2.1	455
	8/7/19	1.4	52.9	24.6	0.63	7.12	2.5	460
	10/9/19	1	47.1	22.3	0.72	7.05	2.2	410
P-14 (BG)	3/20/19	0.92	68.6	17	0.55	9.27	4.1	380
	6/5/19	0.53	66.8	14.8	0.48	9.41	5.4	510
	8/7/19	1.2	59.3	14.5	0.52	9.75	4	390
	10/9/19	0.97	14.7	16.9	0.54	9.35	5.7	285
P-16 (BG)	3/20/19	0.25	129	5.9	0.1	7.67	104	470
	6/4/19	0.27	122	6	0.19	7.38	97.4	415
	8/7/19	0.36	199	6	0.2	7.28	95.3	670
	10/9/19	0.5	97.8	21.2	0.21	7.5	119	660
MW-10	3/20/19	7.8	279	115	0.1	7.21	1,230	1,840
	6/4/19	6.6	172	90.5	0.19	7.18	974	1,600
	8/7/19	5.7	171	93.1	0.19	6.78	893	1,520
	10/9/19	5.2	143	99.9	0.2	6.91	982	1,480
MW-11	3/20/19	0.4	65.3	726	1.1	7.89	584	2,000
	6/4/19	0.44	61.8	739	1.2	7.81	571	2,080
	8/7/19	0.45	62.2	639	1.1	6.67	563	2,210
	10/9/19	0.33	62.6	643	1.1	6.69	569	2,060

Notes:
mg/l = milligrams per liter
S.U. = standard units

APPENDIX M

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

SITE HYDROGEOLOGY AND GEOLOGIC CROSS SECTIONS

SITE HYDROGEOLOGY AND GEOLOGIC CROSS SECTIONS

HYDROGEOLOGIC SETTING

The Fly Ash/Scrubber Sludge Landfill and surface impoundment were constructed within a valley located immediately south of the power station. The landfill was primarily constructed over the Naborton Formation and the underlying Porters Creek clay, a massive marine clay with thickness approaching 600 feet. The Porters Creek clay is not a potable source of water for DeSoto Parish, as freshwater is not available at depth, neither within nor below the Porters Creek clay. The water-bearing zone currently monitored for groundwater quality is a laterally discontinuous unit within the Naborton Formation, and it does not extend continuously to the north.

SITE GEOLOGY

DHPS is located across geologic formations of Eocene and Paleocene age that include, in ascending order of deposition:

- The Porters Creek clay of the Midway Group, overlain by
- The Naborton Formation of the Wilcox Group, and
- The Dolet Hills sand of the Wilcox Group.

The Sabine Uplift structurally dominates northwestern Louisiana as an asymmetrical dome that extends westward into East Texas. The DHPS site is located south of the Sabine Uplift. Structural influence of the Sabine Uplift extends southward beyond DHPS as dipping and folded geologic units.

The Paleocene Porters Creek clay is a marine clay that is composed primarily of light to dark grey to black lignitic and limy shale and clay with minor glauconitic, micaceous sand lenses. The Porters Creek clay is a massive regional formation extending from Tennessee to East Texas. Regionally, the Porters Creek clay and other Paleocene formations associated with the marine clay comprise the Midway confining unit. The Porters Creek clay generally yields no potable freshwater (USGS, 1964), and it is not considered a potable source of fresh groundwater for DeSoto Parish. The thickness of the Porters Creek clay approaches 600 feet at DHPS. The Landfill is primarily constructed above the Porters Creek clay.

The Eocene Naborton Formation is composed primarily of lignitic fine-grained sand, clay, and silt. The Naborton Formation is part of the Carrizo-Wilcox aquifer system. In DeSoto Parish, the Carrizo aquifers have been eroded away and only the less productive Wilcox portions of the Carrizo-Wilcox aquifer system remain. The aquifer is confined (artesian) to semi-confined, except in areas where the Naborton Formation is exposed in outcrops, creating an unconfined (water table) aquifer.

Geologic cross-sections included in **Appendix M** illustrate the heterogeneous stratigraphy and variable depths of permeable zones underlying the site. Soil boring logs used in constructing the cross sections represent numerous soil borings completed in the vicinity of the Landfill, and are included in **Appendix J**. **Figure J-1** in **Appendix J** shows the soil boring logs, including both conventional soil boring logs and geophysical logs.

DHPS is partly underlain by four distinct permeable zones that are referred to as Zones 1, 2, 3, and 4. Zone 1 correlates with the main sand bed of the Dolet Hills sand, and Zones 2, 3, and 4 correlate with

the minor sand beds of the Naborton Formation.

The Dolet Hills sand transmits freshwater and is regionally mostly a massive-bedded sand. Based on site-specific data collected at the facility, the Dolet Hills sand (Zone 1) is absent in the northern portion of the Landfill where it has been eroded away by natural processes.

Compared to the Dolet Hills sand, Zones 2, 3, and 4 of the Naborton Formation represent three relatively thin sand beds, separated vertically by clay or lignite beds that contribute to low hydraulic conductivities in conjunction with the fine-grained, silty texture of the sand beds. Zone 3 sand of the Naborton Formation is considered the uppermost water bearing zone beneath the Landfill. The Zone 3 sand is laterally discontinuous, and it terminates north of the Landfill. As with the Zone 1 Dolet Hills sand, erosion has removed the Zone 2 sand of the Naborton Formation from the northern portion of the Landfill.

GROUNDWATER FLOW EVALUATION

For the landfill site characterization, four distinct permeable zones that are referred to as Zones 1, 2, 3, and 4 underlie the facilities. Zone 1 correlates with the sand of the Dolet Hills, and Zones 2, 3, and 4 correlates with the sand beds of the Naborton Formation. These zones were evaluated for determination of groundwater flow direction and groundwater flow velocity.

Monitoring wells MW-1B, MW-2A, MW-3, MW-4, MW-5, MW-6A, MW-7, MW-8A, MW-9, MW-9A, MW-10 and MW-11 and piezometers P-1 to P-16 comprise the monitoring and observation well network of DHPS. Each monitoring well and piezometer was constructed with its screened interval intercepting one of the four sand zones identified beneath DHPS in the Dolet Hills sand and Naborton Formation. Diagrams and construction details of piezometers and monitoring wells completed at the site are included in **Appendix J**.

Potentiometric surface data has been collected from selected wells since 1998. Potentiometric surface data from all wells and piezometers were collected to evaluate seasonal fluctuations in groundwater flow in Zones 1, 2, and 3. Based on Snider (1982), relatively low rainfall and high evapotranspiration in the area occurs from June through November, while relatively high rainfall and low evapotranspiration occurs from December through May. The following sections describe the groundwater flow directions and groundwater flow velocities in Zones 1, 2, and 3.

Zone 3 is the most suitable water-bearing zone to monitor groundwater quality at the Landfill. The potentiometric surface maps prepared for Zone 3 (**Appendix K**) indicate that groundwater flow in Zone 3 mimics the topography of the site, flowing inward to the lower elevations of the valley. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow.

GROUNDWATER SEEPS

As presented in Snider (1982), natural discharge by seepage from the aquifers to streams is common in the valleys of the Dolet Hills area. At the Dolet Hills Power Station, field observations have identified the presence of groundwater seeps in northern areas of the landfill. The field activities described in this report occurred in 1998 and 1999. The groundwater seeps occur in outcrop areas of the water-bearing sand zones that underlie the site. The occurrence of these groundwater seeps is

consistent with the interpretated groundwater flow direction in Zones 1, 2, and 3, northward and converging into the valley, mimicking the local topography. Site geologic characterization further documents erosional incisions into Zones 1, 2, and 3 in the valley, visible in outcrops.

Field mapping of groundwater seeps in the valley north of the Landfill identified seeps from all four sand zones (Zones 1, 2, 3, and 4). In addition to direct observation of groundwater seepage, small willow and wax myrtle trees were among the vegetation typical of intermittently wet seepage areas. Seepage mapping employed a Trimble® Differential Global Positioning System (GPS) Model PROXR. The Differential GPS used in the field placed seep locations onto USGS 15-minute quadrangle map "Bayou Pierre Lake, LA" (1992) with meter to sub-meter accuracy. Significant groundwater seeps observed in the valley area were photographed for further documentation.

The distribution of groundwater seeps from the four sand zones across the valley area supports the interpreted direction of groundwater flow in these zones, with groundwater flow converging into the valley and discharging to the stream in local areas in the valley.

ZONE 1 GROUNDWATER FLOW EVALUATION

Potentiometric surface data measured from wells and piezometers screened in Zone 1 indicate the groundwater flow direction within the sand zone. Zone 1 is not laterally continuous across the area of DHPS because of erosion in the north part of the Landfill and surface impoundment. The field investigation described above identified groundwater seeps to land surface in outcrop areas of Zone 1 and into surface drainage toward the stream in the base of the valley where the Landfill is located. Groundwater seeps indicate a discharge point of groundwater from Zone 1 to the stream. Elevations of the stream bed have been incorporated into the potentiometric surface maps for Zone 1. These elevations were obtained from a detailed site topographic survey of the Fly Ash/Scrubber Sludge Landfill, dated April 3, 1995.

Potentiometric surface maps selected for evaluating seasonal fluctuations in the Zone 1 sand indicate that groundwater flow in Zone 1 converges into the valley toward the stream. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow. These potentiometric surface maps are included in this **Appendix** and **Appendix K**.

The groundwater flow velocity is an average linear flow velocity that is calculated using the groundwater flow equation, $v = [k(dh/dl)] / n_e$. For this equation, v is groundwater flow velocity in feet per day (ft/day), k is hydraulic conductivity in ft/day, dh/dl is hydraulic gradient in feet per foot (ft/ft), and n_e is effective porosity (nondimensional).

For Zone 1, a hydraulic conductivity (k) value of 20 ft/day was assumed based on the fine to medium-grained sand observed in soil cuttings from soil borings completed at the site. A hydraulic gradient (dh/dl) value ranging from 0.01 to 0.06 ft/ft was used based on potentiometric surface maps completed for Zone 1. An effective porosity (n_e) of 0.3 was assumed based on the soil types of Zone 1 (Fetter, 1980). Using these values, the groundwater flow rate (v) for Zone 1 is estimated to range from 0.7 to 4 feet/day. It is important to note that this is an advective rate and does not account for potential geological heterogeneities which may cause significant variability in geochemical and hydrologic parameters including adsorption, biodegradation, dispersion, fraction of organic carbon, and other retarding factors affecting groundwater fate and transport in this zone. Additionally, lateral geological

heterogeneities may cause variations in advective flow.

ZONE 2 GROUNDWATER FLOW EVALUATION

Potentiometric surface data measured from wells and piezometers screened in Zone 2 indicate the groundwater flow direction within the sand zone. Zone 2 is not laterally continuous across the area of DHPS because of erosion north of the Landfill and surface impoundment. The field investigation described above identified groundwater seeps to land surface in outcrop areas of Zone 2 and into surface drainage toward the stream in the base of the valley where the Landfill is located. Groundwater seeps indicate a discharge point of groundwater from Zone 2 to the stream. Elevations of the stream bed have been incorporated into the potentiometric surface maps for Zone 2. These elevations were obtained from a detailed site topographic survey of the Fly Ash/Scrubber Sludge Landfill, dated April 3, 1995.

Potentiometric surface maps selected for evaluating seasonal fluctuations in the Zone 2 sand indicate that groundwater flow in Zone 2 converges into the valley toward the stream. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow. These potentiometric surface maps are also included in this **Appendix** and **Appendix K**.

The groundwater flow velocity is an average linear flow velocity that is calculated using the groundwater flow equation, $v = [k(dh/dl)] / n_e$. For this equation, v is groundwater flow velocity in ft/day, k is hydraulic conductivity in ft/day, dh/dl is hydraulic gradient in ft/ft, and n_e is effective porosity (nondimensional).

For Zone 2, a hydraulic conductivity (k) value ranging from 0.1 to 10 ft/day was assumed based on the very fine- to fine-grained silty sand observed in soil cuttings from soil borings completed at the site (Heath, 1989). A hydraulic gradient (dh/dl) value ranging from 0.005 to 0.03 ft/ft was used based on potentiometric surface maps completed for Zone 2. An effective porosity (n_e) of 0.2 was assumed based on the soil types of Zone 2 (Fetter, 1980). Using these values, the groundwater flow rate (v) for Zone 2 is estimated to range from 0.003 to 1.5 feet/day. It is important to note that this is an advective rate and does not account for potential geological heterogeneities which may cause significant variability in geochemical and hydrologic parameters including adsorption, biodegradation, dispersion, fraction of organic carbon, and other retarding factors affecting groundwater fate and transport in this zone. Additionally, lateral geological heterogeneities may cause variations in advective flow.

ZONE 3 GROUNDWATER FLOW EVALUATION

Potentiometric surface data measured from wells and piezometers screened in Zone 3 indicate the groundwater flow direction within the sand zone. Of the four sand zones, only Zone 3 extends continuously under the entire Landfill area, but based on soil borings completed for solid waste permitting activities for Cleco's surge ponds and other impoundments to the north, Zone 3 is not laterally continuous in areas north of the landfill and surface impoundment. The field investigation described above identified groundwater seeps to land surface in outcrop areas of Zone 3 and into surface drainage toward the stream in the base of the valley where the Landfill is located. Groundwater seeps indicate discharge points for groundwater from Zone 3 to the stream. Elevations of the stream bed have been incorporated into the potentiometric surface maps for Zone 3. These

elevations were obtained from a detailed site topographic survey of the Fly Ash/Scrubber Sludge Landfill, dated April 3, 1995. Potentiometric surface maps selected for evaluating seasonal fluctuations in the Zone 3 sand indicate that groundwater flow in Zone 3 flows to the north, converging toward the stream and mimicking the topography of the site. This pattern of groundwater flow is consistent in the potentiometric surface maps, indicating little significant fluctuation in groundwater flow. These potentiometric surface maps are included in this **Appendix** and **Appendix K**.

The groundwater flow velocity is an average linear flow velocity that is calculated using the groundwater flow equation, $v = [k(dh/dl)] / n_e$. For this equation, v is groundwater flow velocity in ft/day, k is hydraulic conductivity in ft/day, dh/dl is hydraulic gradient in ft/ft, and n_e is effective porosity (nondimensional).

For Zone 3, a hydraulic conductivity (k) value ranging from 0.1 to 10 ft/day was assumed based on the silty, very fine- to fine-grained sand observed in soil cuttings from soil borings completed at the site (Heath, 1989). A hydraulic gradient (dh/dl) value ranging from 0.05 to 0.1 ft/ft was used based on potentiometric surface maps completed for Zone 3. An effective porosity (n_e) of 0.2 was assumed based on the soil types of Zone 3 (Fetter, 1980). Using these values, the groundwater flow rate (v) for Zone 3 is estimated to range from 0.03 to 5 feet/day. It is important to note that this is an advective rate and does not account for potential geological heterogeneities which may cause significant variability in geochemical and hydrologic parameters including adsorption, biodegradation, dispersion, fraction of organic carbon, and other retarding factors affecting groundwater fate and transport in this zone. Additionally, lateral geological heterogeneities may cause variations in advective flow.

EVALUATION OF HYDRAULIC COMMUNICATION BETWEEN SAND ZONES

Comparison of potentiometric surface elevations between selected nested monitoring wells and piezometers screened in different zones indicates the degree of hydraulic separation between the sand zones. The hydraulic gradient between the sand zones is used in conjunction with leakance of the intervening aquitard units to assess vertical groundwater migration. According to Snider (1982), vertical groundwater flow is primarily downward in this area.

Four nested well groups are located at the site that consist of wells screened in Zones 1, 2, and 3, respectively (MW-2A/P-13/P-14, MW-3/P-15/P-16, P-1/P-2/P-3, and P-9/P-5/P-4). In addition, there are two nested well pairs that consist of wells screened in Zones 2 and 3, respectively (P-7/P-8 and P-11/P-12). The vertical hydraulic gradient and the potentiometric surface head ranges between zones are discussed below.

Vertical groundwater flow was evaluated in nested wells screened in Zones 1 and 2 for vertical hydraulic gradient and potentiometric surface head range between wells in nested well pairs MW-2A/P-13, MW-3/P-15, P-1/P-2, and P-9/P-5. The vertical hydraulic gradient is predominantly downward at the site between Zones 1 and 2. The following ranges of vertical hydraulic gradients were calculated for each nested well pair:

- From (-)0.43 to (-)0.49 ft/ft in nested well pair MW-2A/P-13,
- From (-)1.12 to (-)1.19 ft/ft in nested well pair MW-3/P-15,
- From (-)0.50 to (-)0.56 ft/ft in nested well pair P-1/P-2, and

- From (-)0.48 to (-)0.50 ft/ft in nested well pair P-9/P-5.

The potentiometric surfaces between Zones 1 and 2 have ranged as follows during the period investigated:

- From 15.01 to 17.29 feet in nested well pair MW-2A/P-13,
- From 28.32 to 30.07 feet in nested well pair MW-3/P-15,
- From 21.07 to 23.60 feet in nested well pair P-1/P-2, and
- From 16.23 to 16.81 feet in nested well pair P-9/P-5.

Vertical groundwater flow was also evaluated in nested wells screened in Zones 2 and 3 for vertical hydraulic gradient and potentiometric surface head range between nested well pairs P-13/P-14, P-15/P-16, P-2/P-3, and P-5/P-4. The vertical hydraulic gradient is predominantly downward at the site between Zones 2 and 3. The following ranges of vertical hydraulic gradients were calculated for each nested well pair:

- From (-)0.04 to (-)0.26 ft/ft in nested well pair P-13/P-14,
- From (-)0.47 to (-)0.55 ft/ft in nested well pair P-15/P-16,
- From (-)0.20 to (-)0.24 ft/ft in nested well pair P-2/P-3,
- From (-)0.22 to (+)0.03 ft/ft in nested well pair P-11/P-12, and
- From (-)0.50 ft/ft in nested well pair P-5/P-4.

The potentiometric surfaces between Zones 2 and 3 have ranged as follows during the period investigated:

- From 1.82 to 12.42 feet in nested well pair P-13/P-14,
- From 19.14 to 22.26 feet in nested well pair P-15/P-16,
- From 8.72 to 10.68 feet in nested well pair P-2/P-3,
- From 0.68 to 9.21 feet in nested well pair P-11/P-12, and
- From 25.02 to 25.15 feet in nested well pair P-5/P-4.

The vertical component of groundwater flow between Zones 1 and 2, and between Zones 2 and 3, at the site is primarily downward. This pattern of vertical groundwater flow is consistent with the conclusion of Snider (1982) for this region.

Changes in groundwater flow direction in Zones 1, 2, or 3 are not anticipated to result from operation of the solid waste permitted facilities.

UPPERMOST WATER BEARING ZONE CHARACTERIZATION

A summary of results of the uppermost water-bearing characterization include the following:

- The Landfill was primarily constructed over the lower portions of the Naborton Formation and the Porters Creek clay. The Porters reek clay is a massive marine clay with thickness approaching 600 feet and is not a potable source of water for DeSoto Parish. Neither the Porters Creek clay nor the underlying water-bearing units transmit fresh groundwater.
- Zone 3 is the optimum zone to monitor for a release from the Landfill to groundwater and was

selected as the uppermost water-bearing zone. The uppermost water-bearing zone that is currently monitored is laterally continuous under the Landfill but is not laterally continuous to the north as it has been eroded away and is absent north of the Landfill.

- The water quantity yield of Zone 3 is minimal, rendering the zone unusable for development. Water use in the vicinity of the Landfill is restricted to surface water. Groundwater is neither an available nor reliable resource for industrial, power generation, domestic, or public supply in the vicinity of DHPS. DHPS receives surface water from Toledo Bend for power generation use, as groundwater is not available for this purpose. Review of groundwater use indicates that groundwater is not usable at DHPS.
- Numerous oil & gas exploration locations for the Haynesville Shale and other plays are located in the vicinity of DHPS and these locations convey surface water to the drilling location by pipeline rather than using groundwater. Groundwater is not usable for this purpose in the Landfill area.
- Groundwater quality is generally poor with naturally high total dissolved solids, chlorides, and sulfates due to the marine depositional environment of the Porters Creek clay and the lignitic nature of the lower Naborton Formation.

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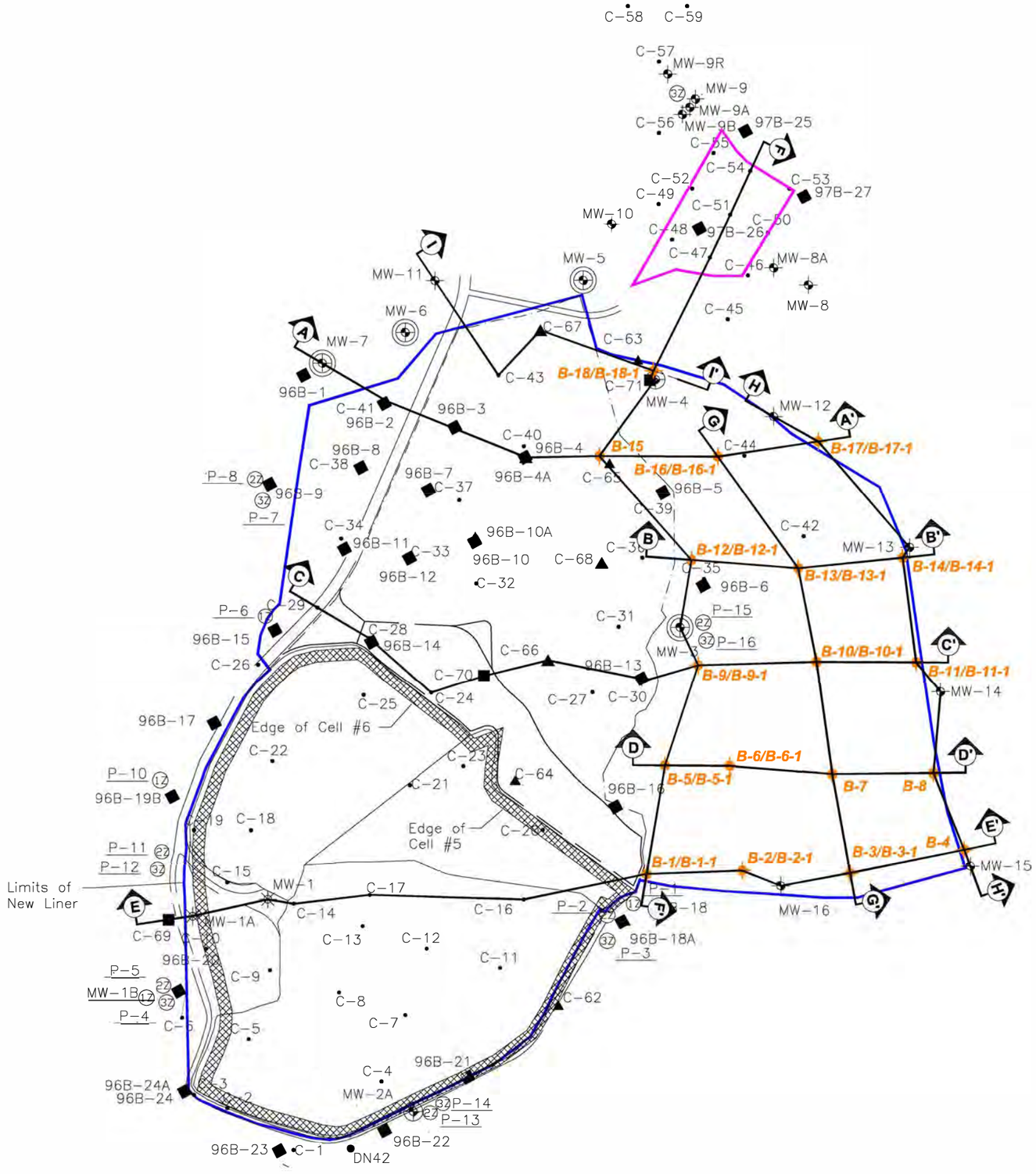
United States Geological Survey (USGS) Quadrangle, 15-minute series, 1992. Bayou Pierre Lake, LA., USGS, Reston, Virginia.



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer/Monitor Well
- (27) Zone 2 Piezometer/Monitor Well
- (32) Zone 3 Piezometer/Monitor Well

N

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9, MW-12, MW-13, MW-14, MW-15, MW-16

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill, Soil Borings, Monitor Wells, and Piezometer Locations, drawing no: 01-10-0079-A003, figure no: 13, dated: 07/20/10.

500 0 500

Scale: 1" = 500'

Geologic Cross Section Location Map

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

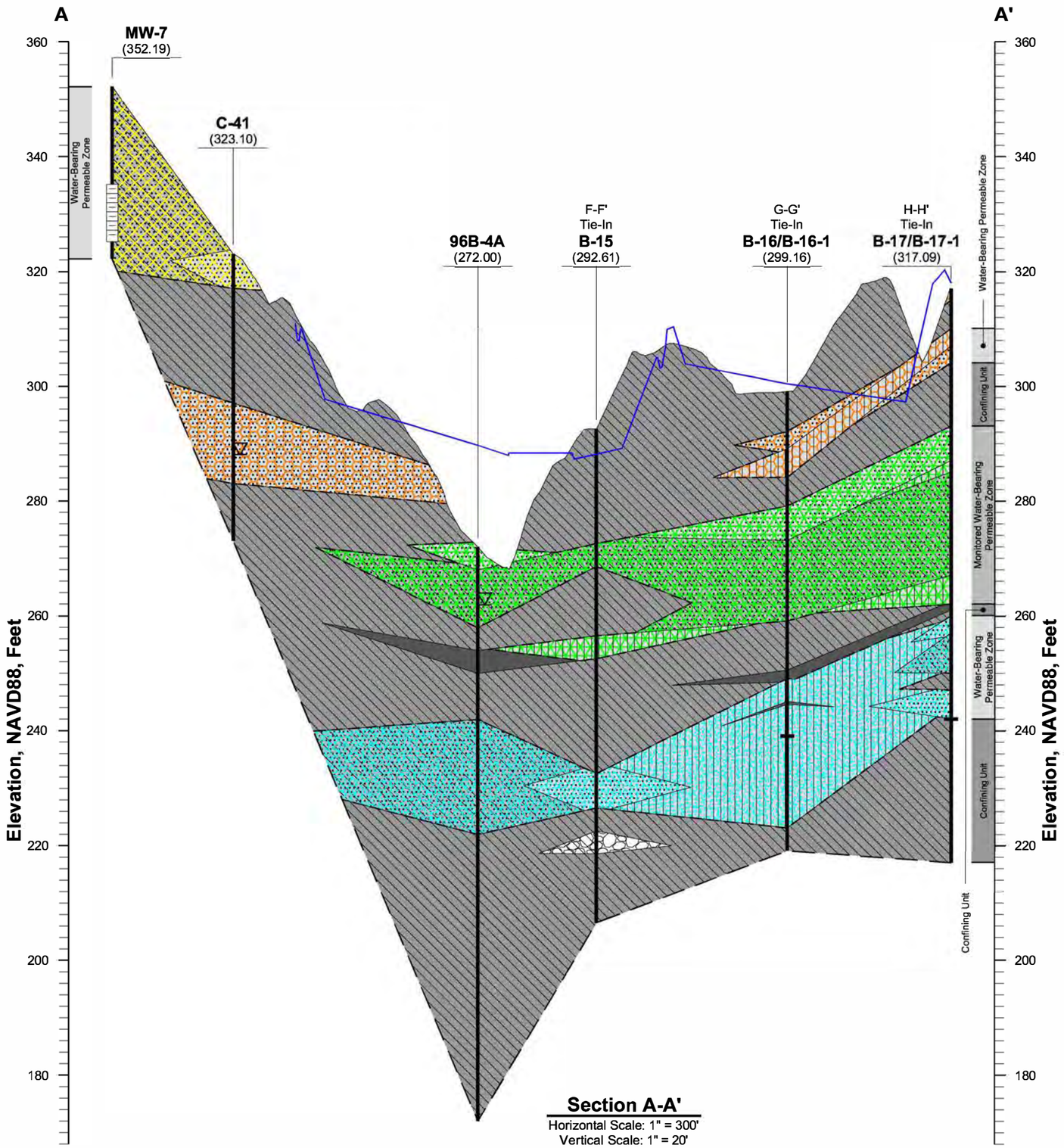
Drawn By	LMH	08/07/20
Checked By	MV	08/07/20
Approved By	EKSw	08/07/20

Project Number 002-255-002

Drawing Number 002-255-002-B002

F-1 Attachment

Providence Engineering and Environmental Group LLC



Section A-A'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section A-A'

Solid Waste Permit Renwal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

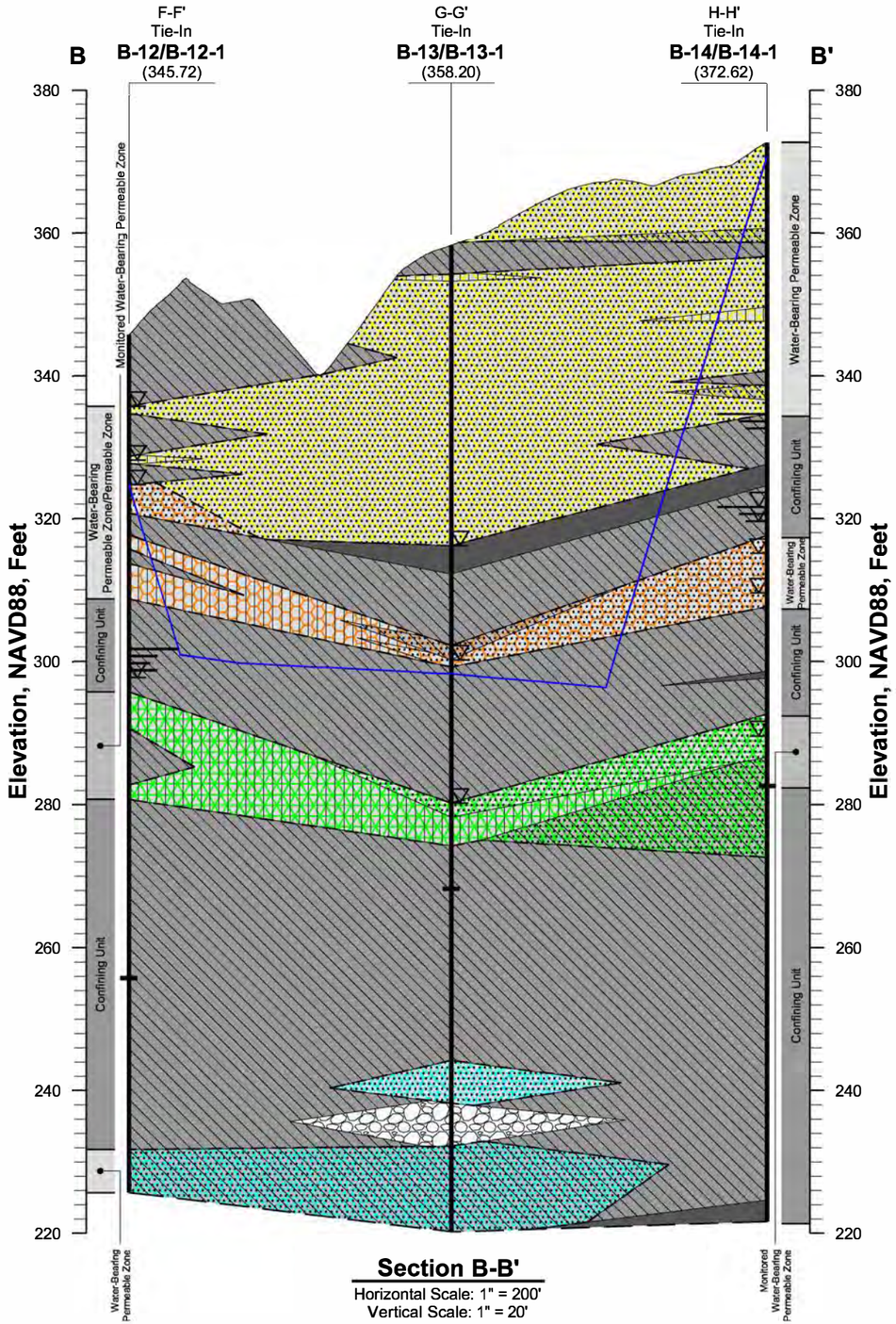
PROVIDENCE

Drawn By	DSG	08/28/20
Checked By	MV	08/28/20
Approved By	EKS	08/28/20

Project Number
002-255-002

Drawing Number
002-255-002-B003

F-2
Attachment



Section B-B'
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section B-B'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

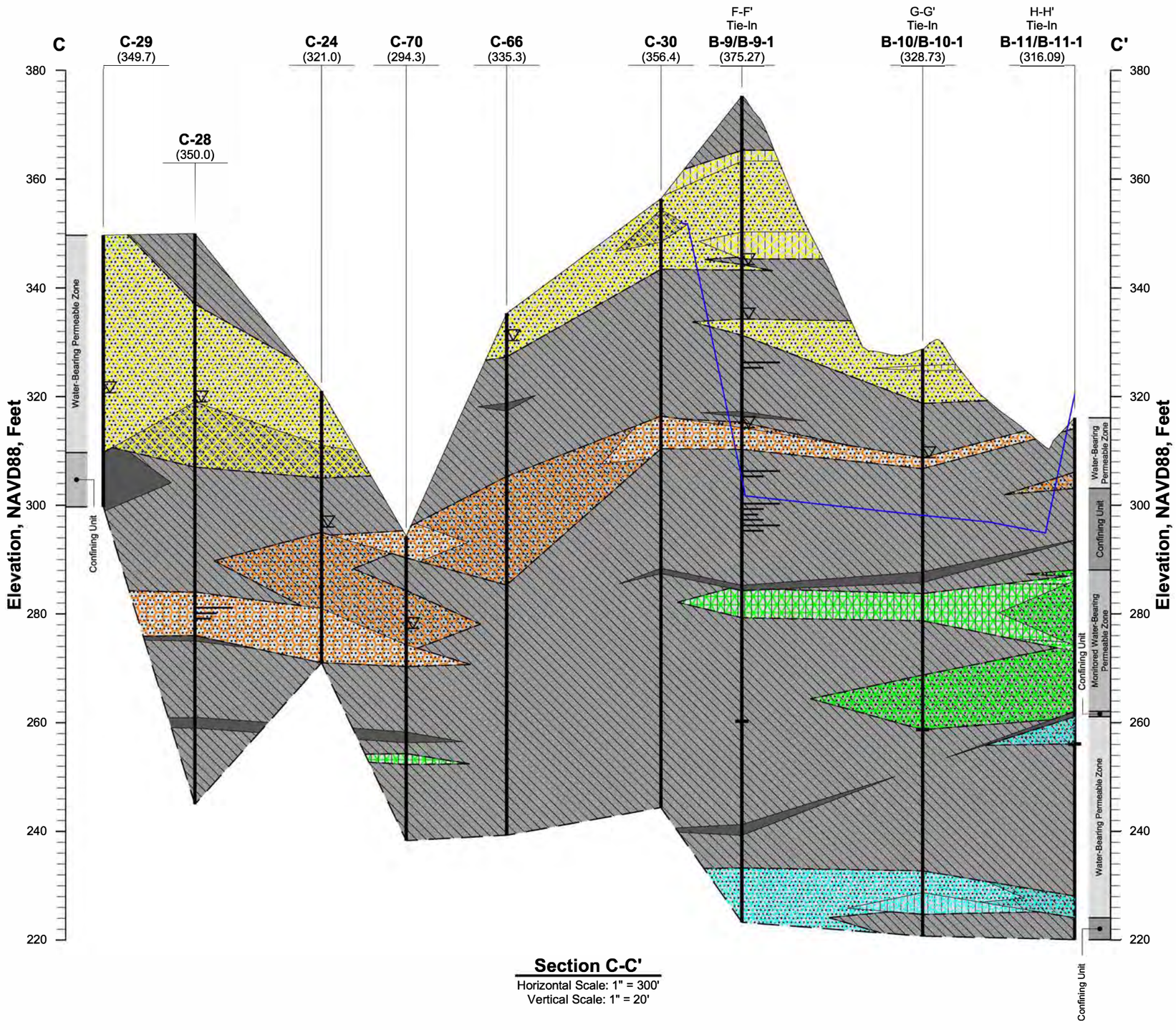
PROVIDENCE

Drawn By	DSG	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number
002-255-002

Drawing Number
002-255-002-B004

F-3
Attachment



Section C-C'
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section C-C'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

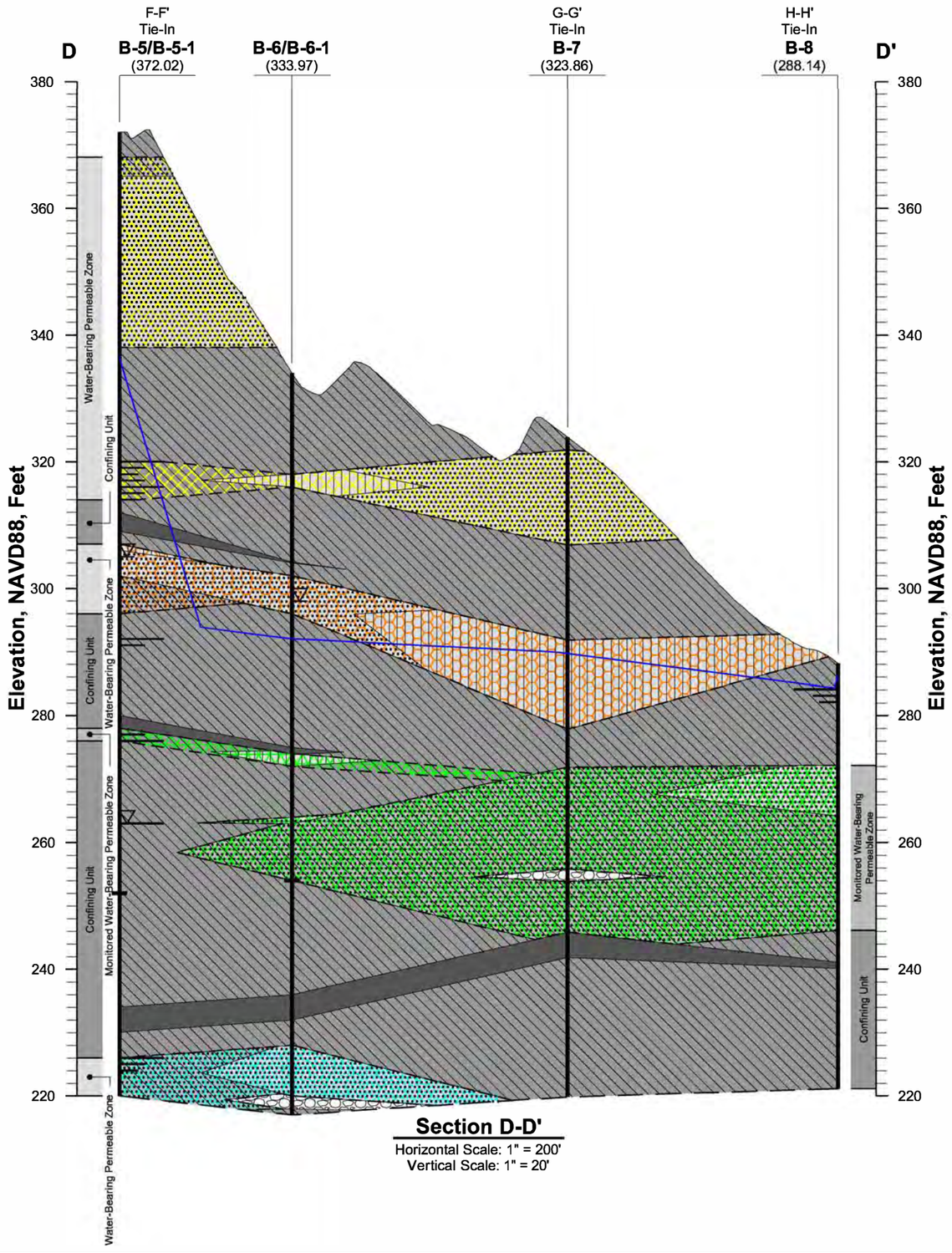
PROVIDENCE

Drawn By	DSG	08/28/20
Checked By	MV	08/28/20
Approved By	EKS	08/28/20

Project Number
002-255-002

Drawing Number
002-255-002-B005

F-4
Attachment



Section D-D'
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section D-D'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

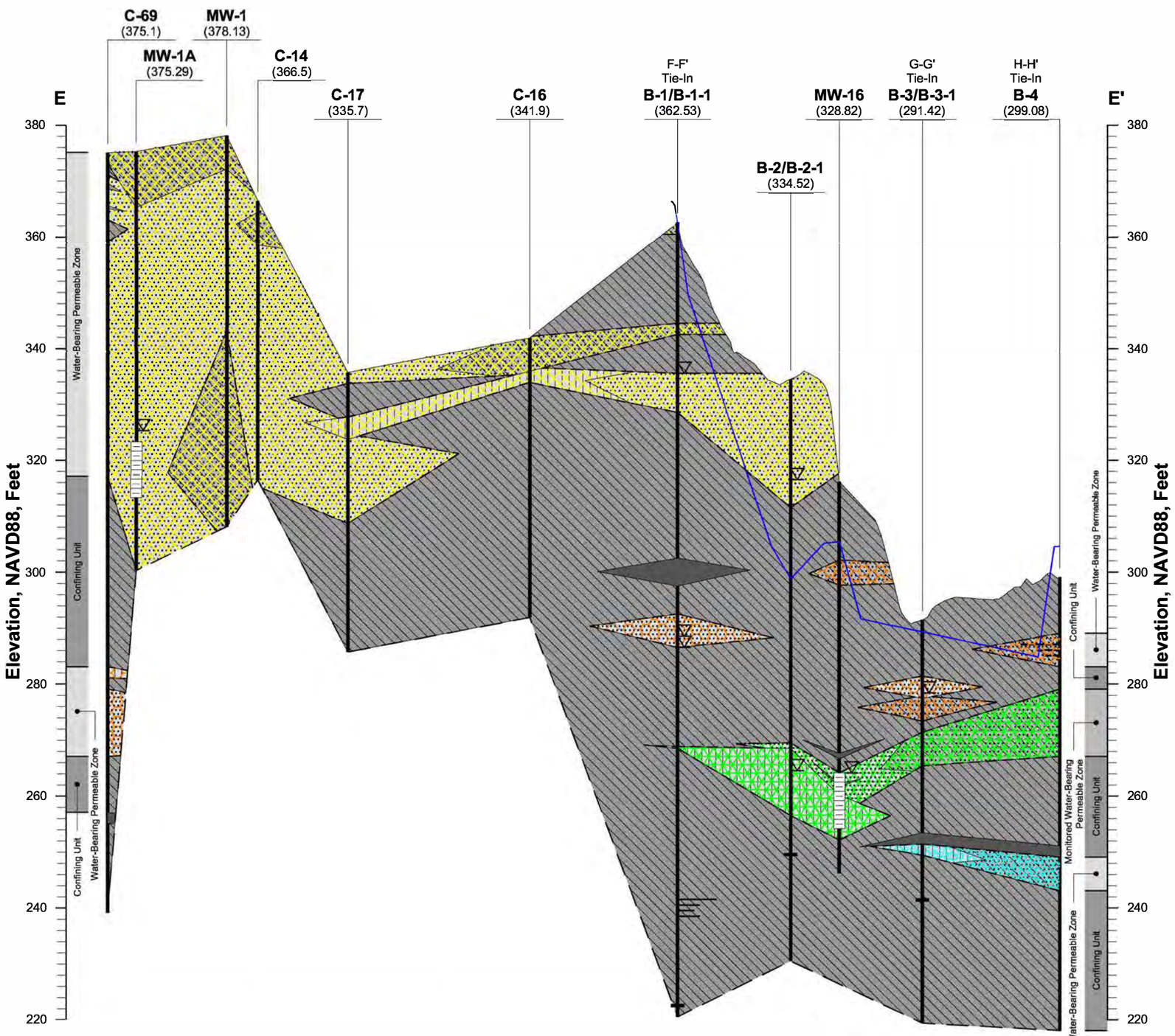
PROVIDENCE

Drawn By	DSG	08/28/20
Checked By	MV	08/28/20
Approved By	EKS	08/28/20

Project Number
002-255-002

Drawing Number
002-255-002-B006

F-5
Attachment



Section E-E'
Horizontal Scale: 1" = 400'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Screen
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section E-E'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

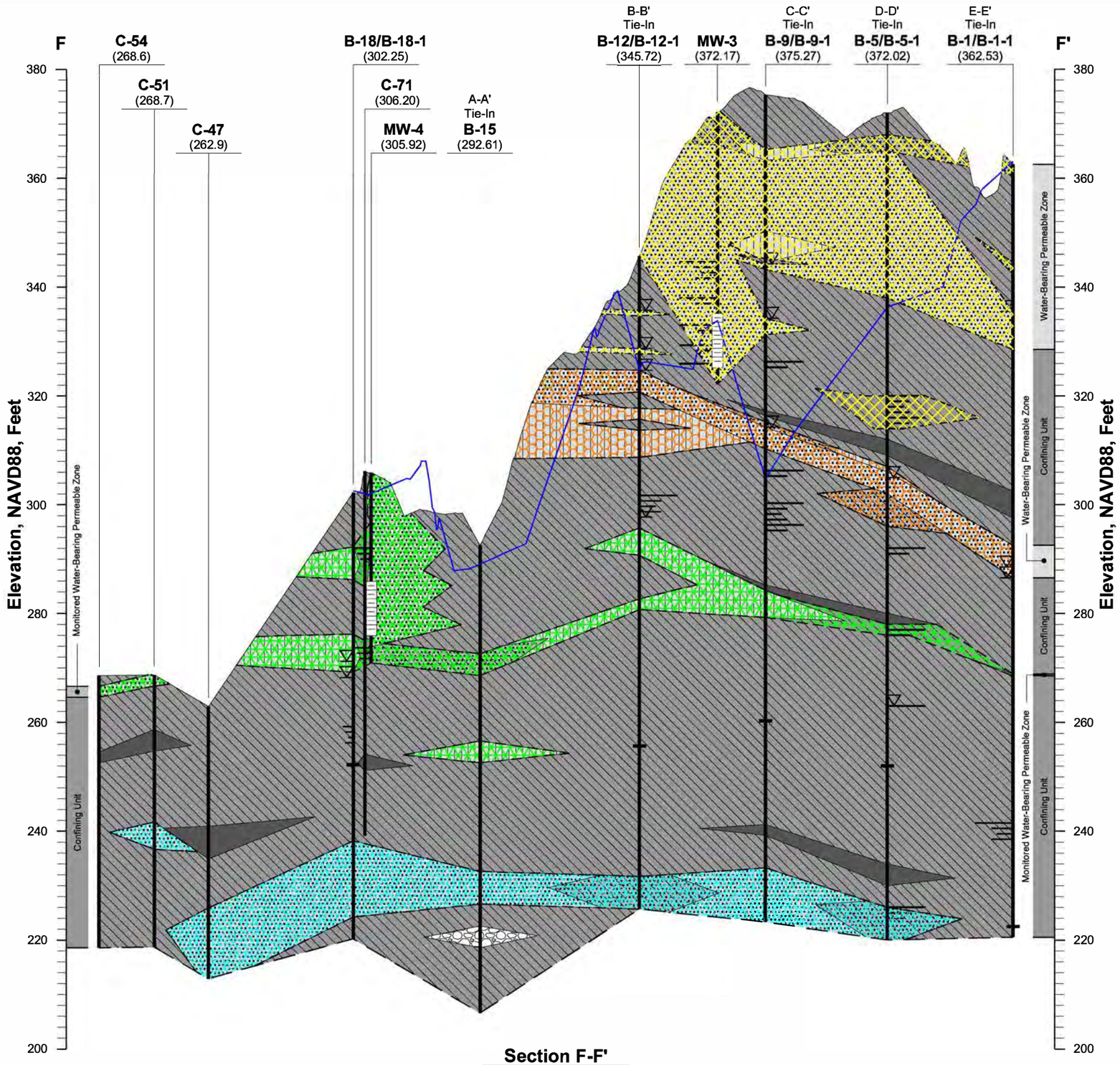
PROVIDENCE

Drawn By	DSG	08/28/20
Checked By	MV	08/28/20
Approved By	EKS	08/28/20

Project Number
002-255-002

Drawing Number
002-255-002-B007

F-6
Attachment



Section F-F'
Horizontal Scale: 1" = 400'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Screen
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section F-F'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

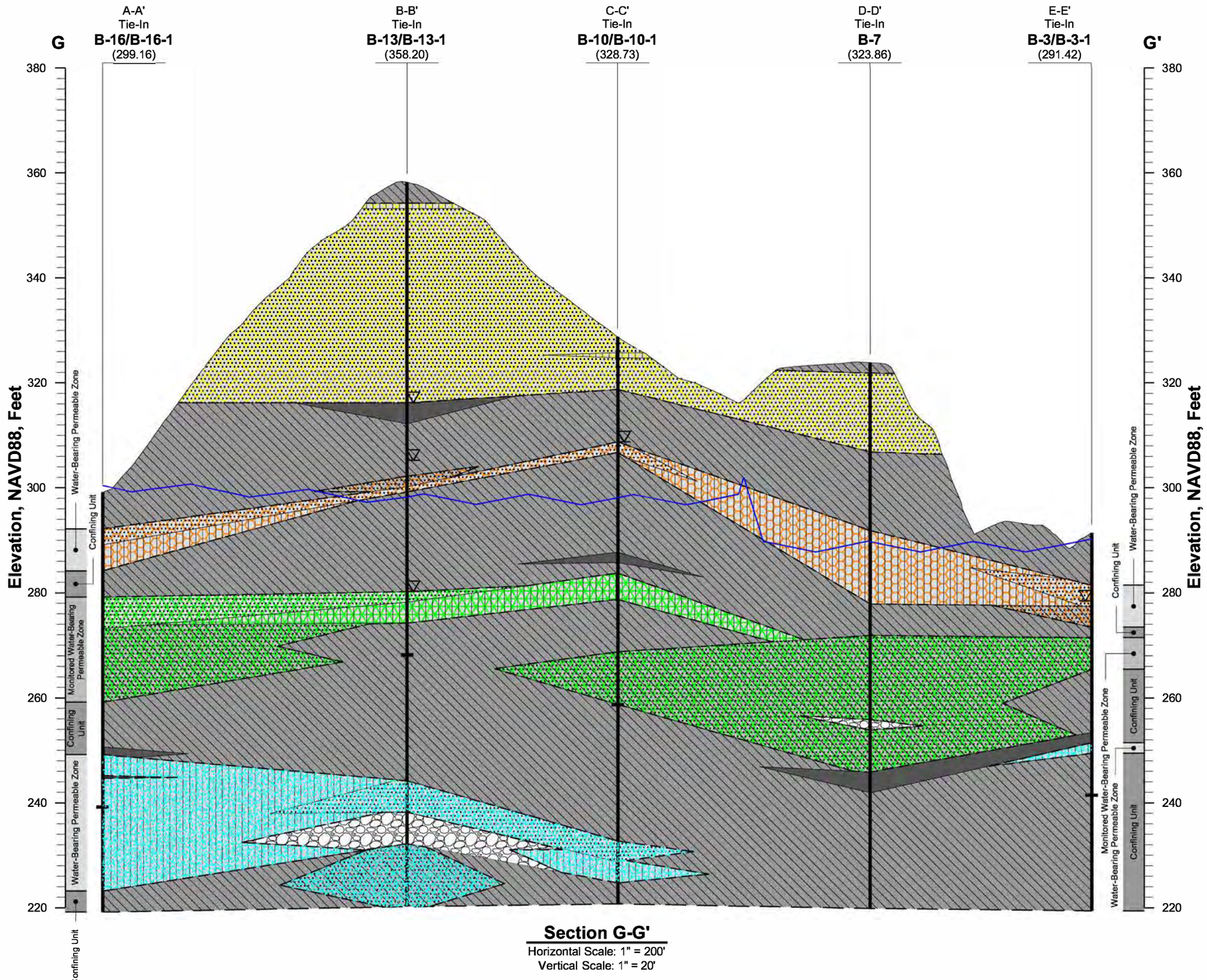
PROVIDENCE

Drawn By	DSG	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number
002-255-002

Drawing Number
002-255-002-B008

F-7
Attachment



Section G-G'
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section G-G'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

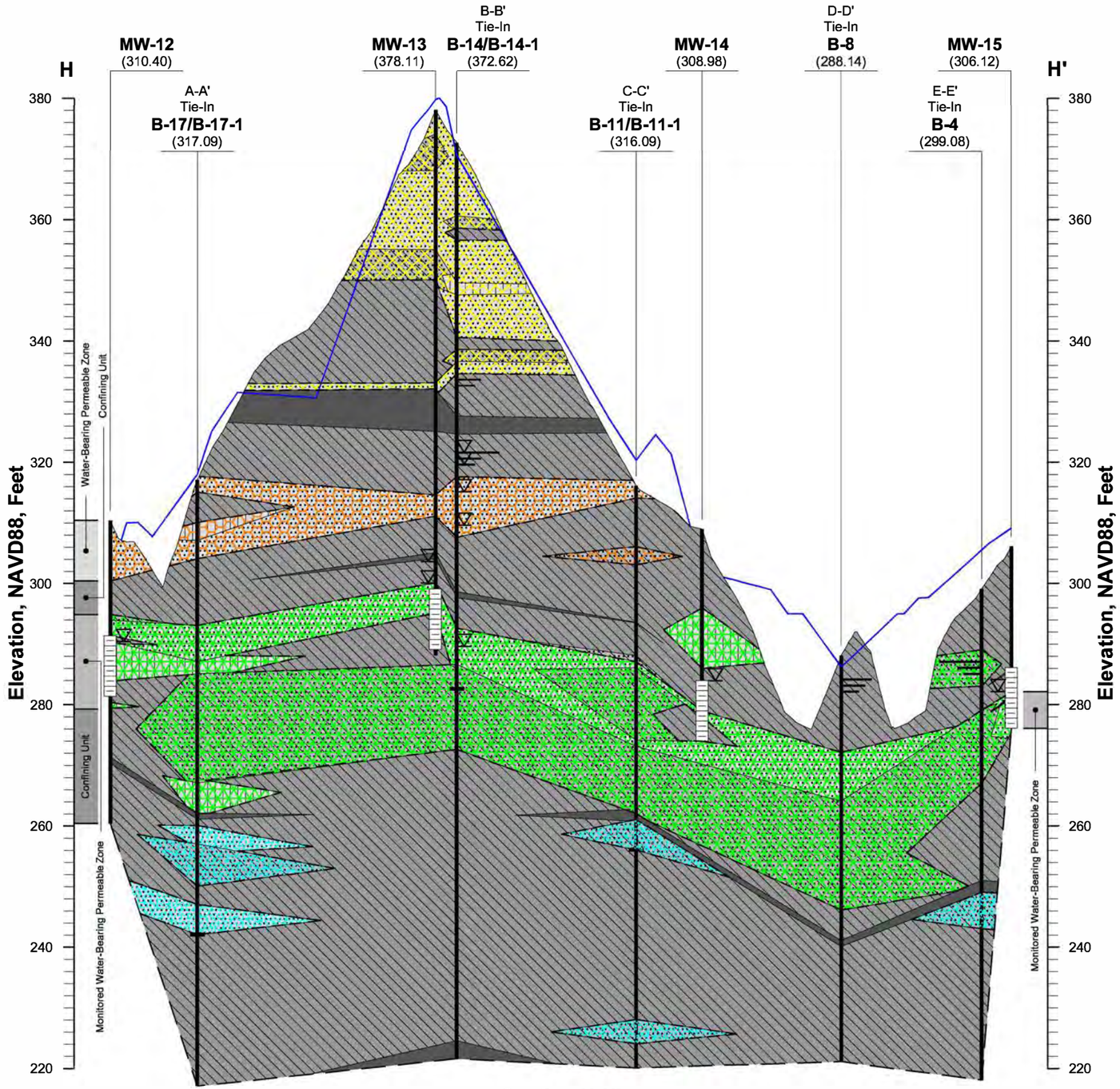
Drawn By	LMH	08/07/20
Checked By	MV	08/07/20
Approved By	EKS	08/07/20

Project Number
002-255-002

Drawing Number
002-255-002-B009

F-8
Attachment

PROVIDENCE



Section H-H'

Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Screen
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Landfill Subgrade / Excavation
- Groundwater Elevation, FT
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section H-H'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

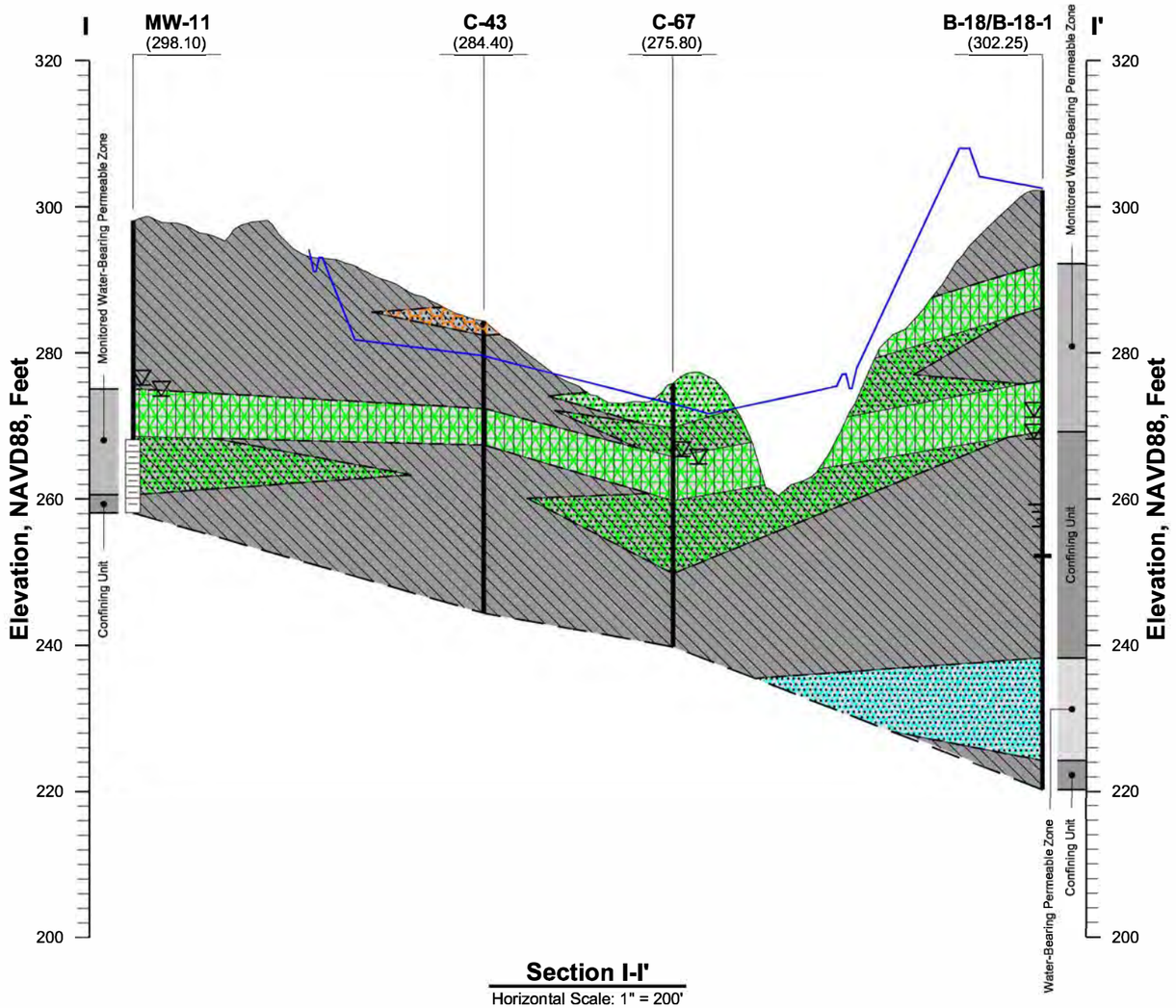
PROVIDENCE

Drawn By	DSG	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number
002-255-002

Drawing Number
002-255-002-B010

F-9
Attachment



Section I-I'
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Legend

- Sandy Clay
- Clay, Silty Clay
- Silt, Clayey Silt
- Sand, Clayey Sand, Silty Sand, Sandy Silt
- Rock
- Coal/Peat/Lignite
- Silt/Sand Lenses
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Groundwater Elevation, FT
- Landfill Subgrade / Excavation
- Delineation Mark Between Original Boring and "-1" Boring

Note

Locations where two logs were used at the same location in the creation of the cross section are designated with a "/" between the boring ID's (ex B-12/B-12-1). The "-1" series of borings is considered the dominant logs since they contain more geologic detail. The original borings (which were installed deeper) were used to extend the cross section depth to meet regulatory requirements. A "tick" mark is included along the boring line on the cross section to differentiate where the "-1" series boring ends and the original series of borings begin.

Geologic Cross Section I-I'

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

PROVIDENCE

Drawn By	DSG	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number
002-255-002

Drawing Number
002-255-002-B011

F-10
Attachment

DHPS Landfill Geologic Maps

AREAL GEOLOGY OF MIDWAY AND WILCOX SEDIMENTS OF THE SABINE UPLIFT LOUISIANA AND TEXAS AND RELATED STRUCTURAL AXES

AFTER GROVER E. MURRAY AND E. PAUL THOMAS
A. A. P. G., 1945

SCALE — MILES

0 6 12 18 24 30

SITE

LEGEND

NORTHERN PART OF SABINE UPLIFT

TERTIARY

EOCENE SERIES — WILCOX GROUP

- Carrizo (Sand) formation
- Undifferentiated Wilcox [Includes Sabinetown and Pendleton formations]
- Marthaville (?) shale

PALEOCENE SERIES — MIDWAY GROUP

- Hall Summit (?) sand
- Lime Hill member
- Cow Bayou member, Dolet Hills member } Logansport formation
- Naborton formation

Porters Creek and Kincaid (Clayton) formations not exposed in normal outcrops

SOUTHERN PART OF SABINE UPLIFT

TERTIARY

EOCENE SERIES — WILCOX GROUP

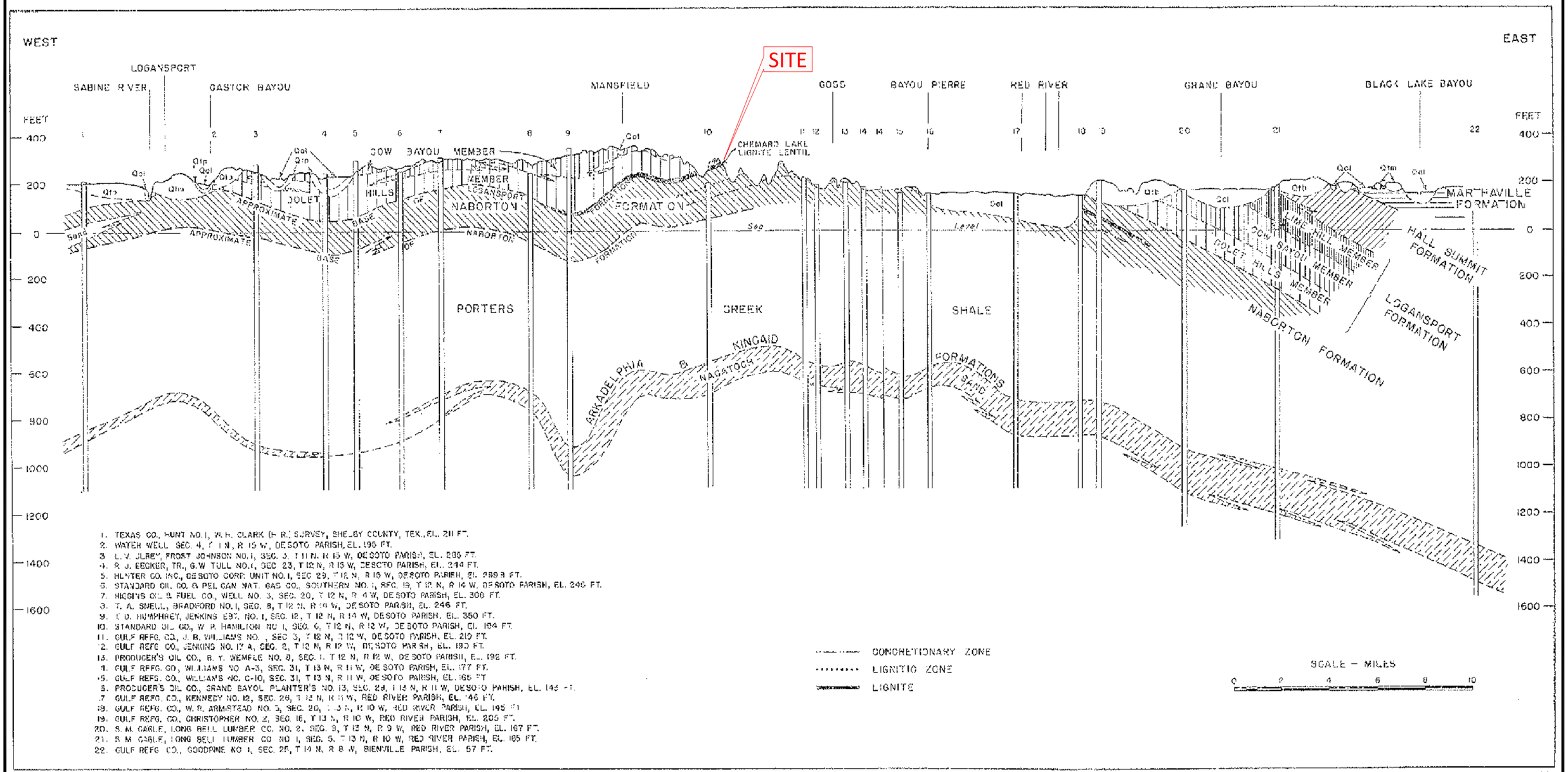
- Carrizo formation
- Sabinetown formation
- Pendleton formation
- Marthaville formation

PALEOCENE SERIES — MIDWAY GROUP

- Hall Summit formation [Bistineau member, Grand Bayou member, Loggy Bayou member]
- Lime Hill member
- Cow Bayou member, Dolet Hills member } Logansport formation
- Naborton formation

Porters Creek and Kincaid (Clayton) formations not exposed in normal outcrops

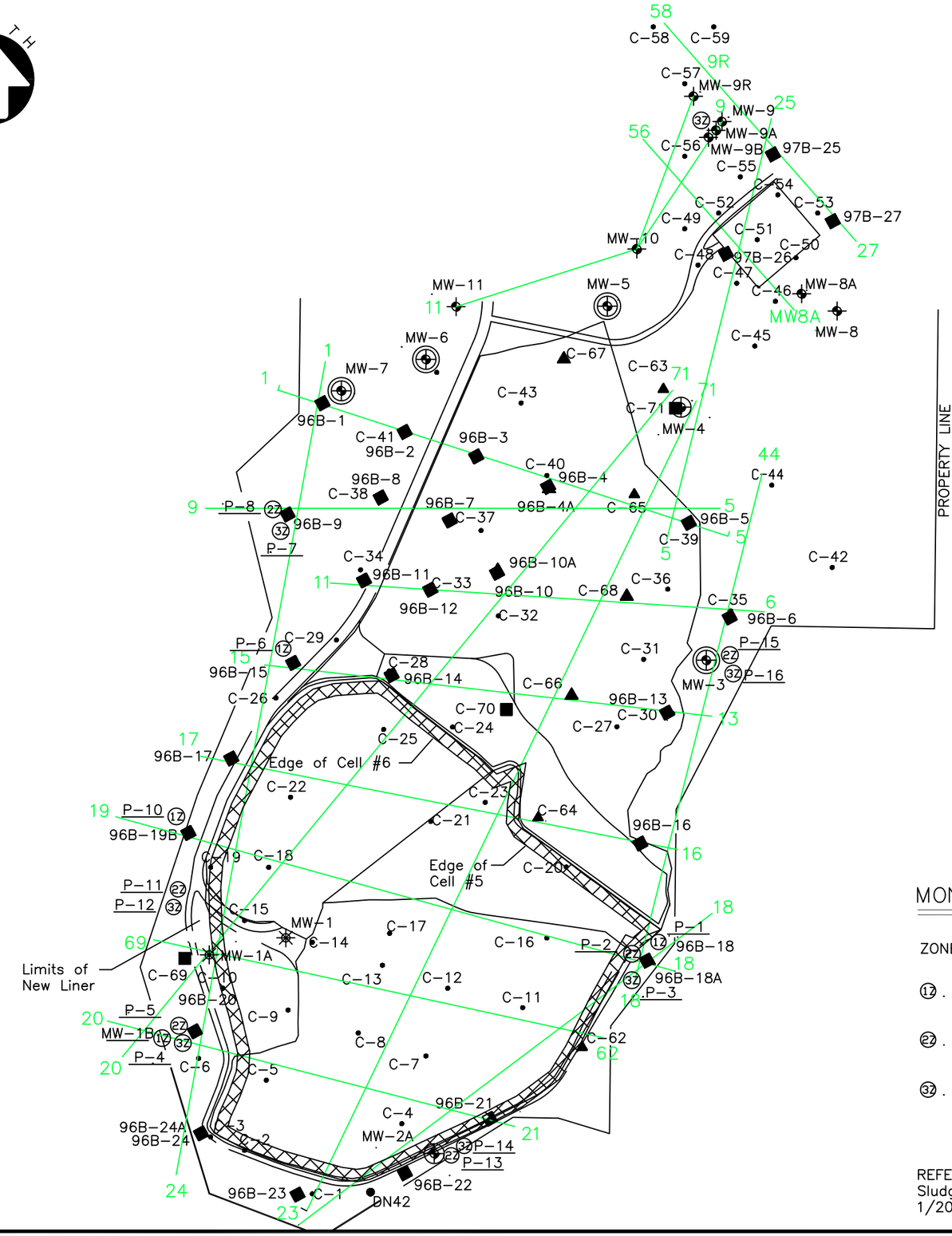
- Definite Syncline
- Probable Syncline
- Definite Anticline, Dome, or Structural Nosing
- Probable Anticline, Dome, or Structural Nosing



1. TEXAS CO., HUNT NO.1, W.H. CLARK (H.R.) SURVEY, SHELBY COUNTY, TEX., EL. 211 FT.
2. WATER WELL SEC. 4, T 11 N., R 15 W., DE SOTO PARISH, EL. 195 FT.
3. L.V. JUREY, FROST JOHNSON NO.1, SEC. 3, T 11 N., R 15 W., DE SOTO PARISH, EL. 230 FT.
4. R. J. BECKER, TR., G.W TULL NO.1, SEC. 23, T 12 N., R 15 W., DE SOTO PARISH, EL. 244 FT.
5. HUNTER CO. INC., DE SOTO CORP. UNIT NO.1, SEC 29, T 12 N., R 15 W., DE SOTO PARISH, EL. 289.8 FT.
6. STANDARD OIL CO. & PEL CAN NAT. GAS CO., SOUTHERN NO. 1, SEC. 19, T 12 N., R 14 W. DE SOTO PARISH, EL. 246 FT.
7. HIGGINS OIL & FUEL CO., WELL NO. 3, SEC. 20, T 12 N., R 14 W, DE SOTO PARISH, EL. 308 FT.
8. T. A. SNELL, BRADFORD NO.1, SEC. 8, T 12 N., R 14 W, DE SOTO PARISH, EL. 246 FT.
9. E. D. HUMPHREY, JENKINS EST. NO. 1, SEC. 12, T 12 N., R 14 W, DE SOTO PARISH, EL. 350 FT.
10. STANDARD OIL CO., W. P. HAMILTON NO. 1, SEC. 6, T 12 N., R 13 W., DE SOTO PARISH, EL. 194 FT.
11. GULF REFG. CO., J. B. WILLIAMS NO. , SEC 3, T 12 N., R 12 W., DE SOTO PARISH, EL. 210 FT.
12. GULF REFG. CO., JENKINS NO. 17 A, SEC. 2, T 12 N., R 12 W., DE SOTO PARISH, EL. 190 FT.
13. PRODUCER'S OIL CO., B. Y. WEMPLE NO. 3, SEC. 1, T 12 N., R 12 W., DE SOTO PARISH, EL. 196 FT.
14. GULF REFG. CO., WILLIAMS NO A-3, SEC. 31, T 13 N., R 11 W, DE SOTO PARISH, EL. 177 FT.
15. GULF REFG. CO., WILLIAMS NO. C-10, SEC. 31, T 13 N., R 11 W., DE SOTO PARISH, EL. 165 FT.
16. PRODUCER'S OIL CO., GRAND BAYOU PLANTER'S NO. 13, SEC. 29, T 13 N., R 11 W, DE SOTO PARISH, EL. 145 FT.
17. GULF REFG. CO., KENNEDY NO. 12, SEC. 26, T 12 N., R 11 W., RED RIVER PARISH, EL. 146 FT.
18. GULF REFG. CO., W. D. ARMISTEAD NO. 3, SEC. 20, T 13 N., R 10 W., RED RIVER PARISH, EL. 195 FT.
19. GULF REFG. CO., CHRISTOPHER NO. 2, SEC. 16, T 13 N., R 10 W., RED RIVER PARISH, EL. 205 FT.
20. S. M. CAGLE, LONG BELL LUMBER CO. NO. 2, SEC. 8, T 13 N., R 9 W., RED RIVER PARISH, EL. 167 FT.
21. S. M. CAGLE, LONG BELL LUMBER CO. NO 1, SEC. 5, T 13 N., R 10 W., RED RIVER PARISH, EL. 185 FT.
22. GULF REFG. CO., GOODPINE NO 1, SEC. 25, T 14 N., R 8 W., SIENVILLE PARISH, EL. 57 FT.

Plate 8, La. Dept. Conn. Geol. Bull. No. 25

Plate 8



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- 1——5 TRANSECT LOCATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
Transect Locations

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

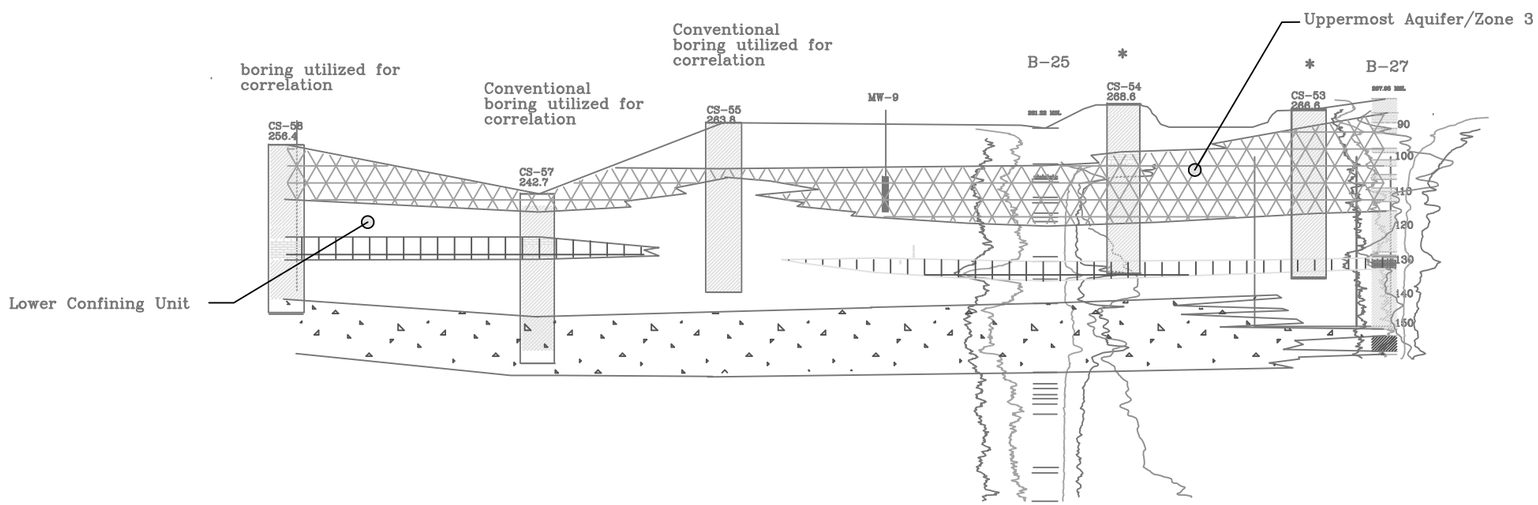
Drawn:	JLP/jbh
Checked:	RS
Approved:	RS
Date:	07/20/10
Dwg. No.:	01-10-0079-A032

FIGURE F-1

NORTH NORTHWEST

SOUTH SOUTHEAST

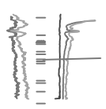
CROSS SECTION 58 – 27



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval



Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. xs58-27

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
58 - 27

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

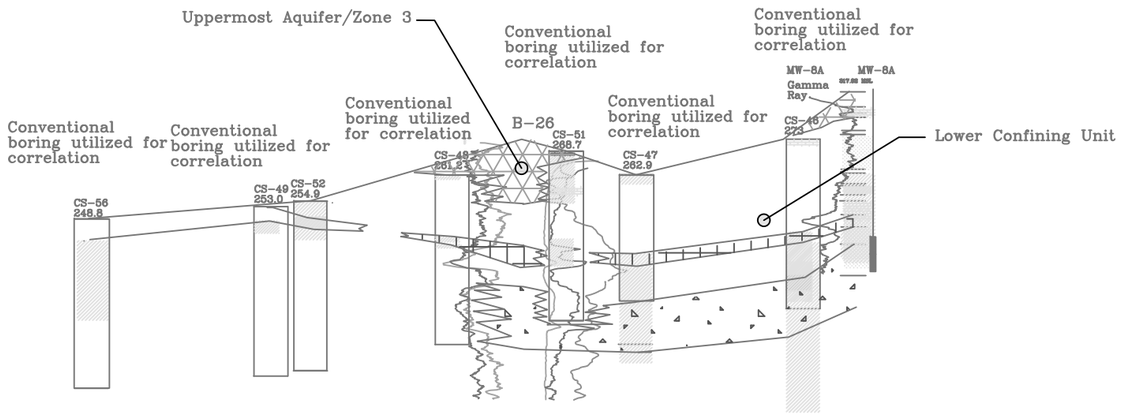
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	04/27/09
Dwg. No.:	01-10-0079-A016

FIGURE F-2

CROSS SECTION 56 – MW8A

NORTHWEST

SOUTHEAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 56–mw8aa

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
56 - MW8A

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

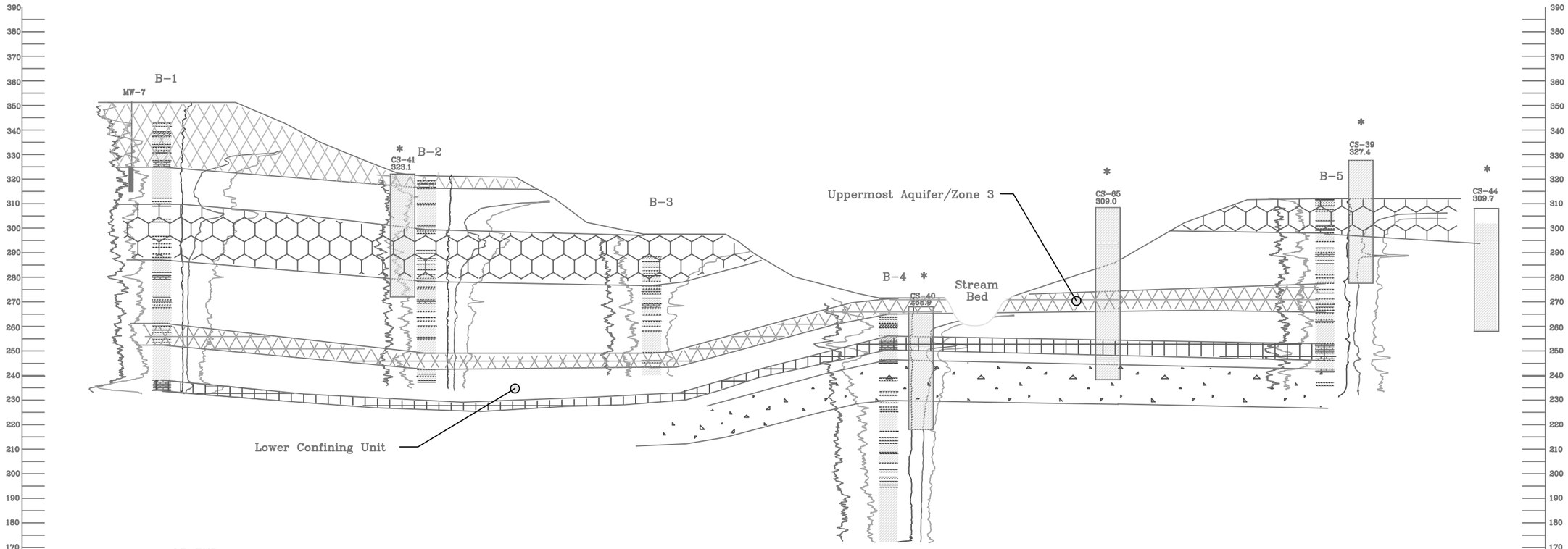
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	04/27/09
Dwg. No.:	01-10-0079-A017

FIGURE F-3

CROSS SECTION 1 – 5

WEST NORTHWEST

EAST SOUTHEAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

HORIZONTAL SCALE

0 250 500

FEET

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. xs1-5

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
1 - 5

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

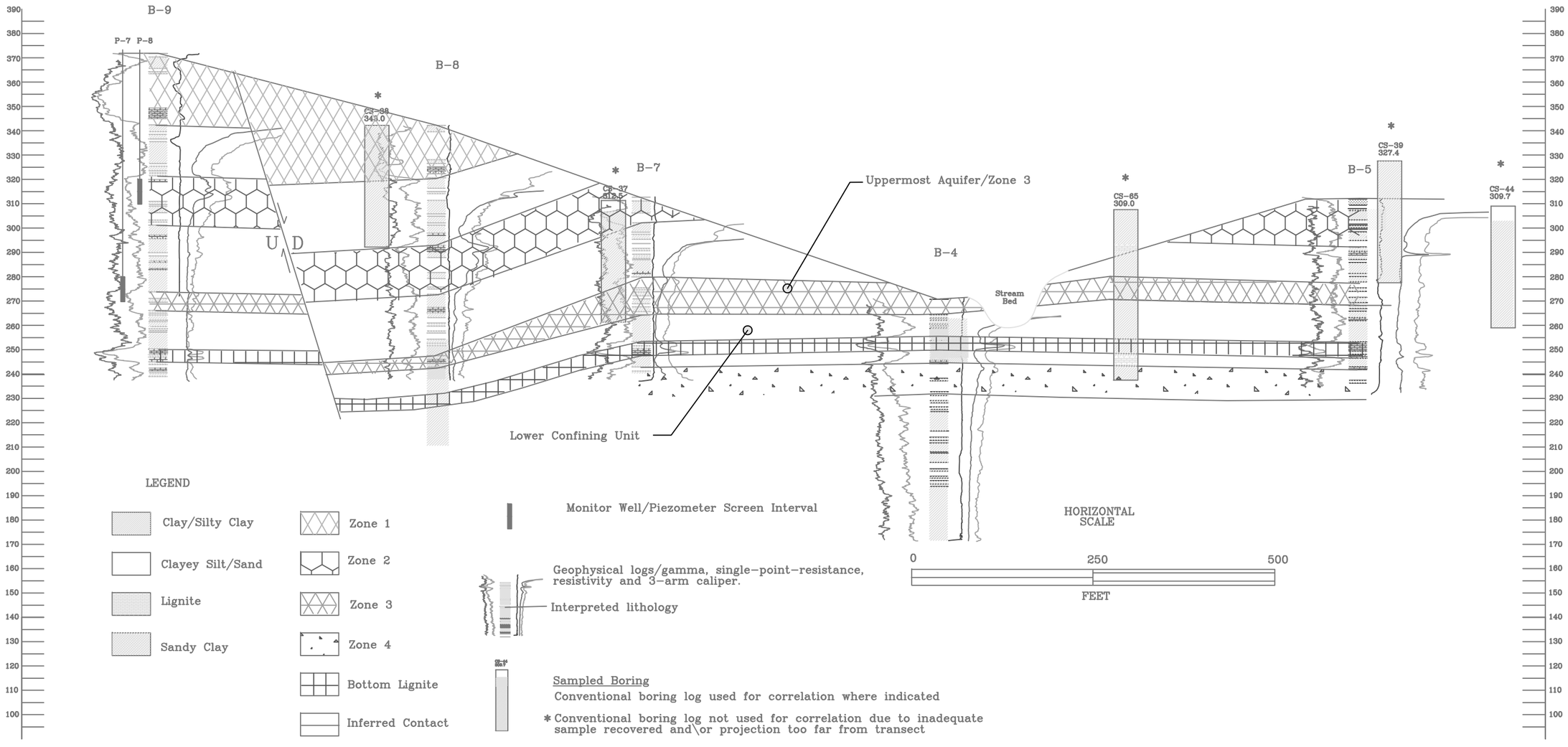
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A018

FIGURE F-4

CROSS SECTION 9 – 5

WEST

EAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. xs9-5

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
9 - 5

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

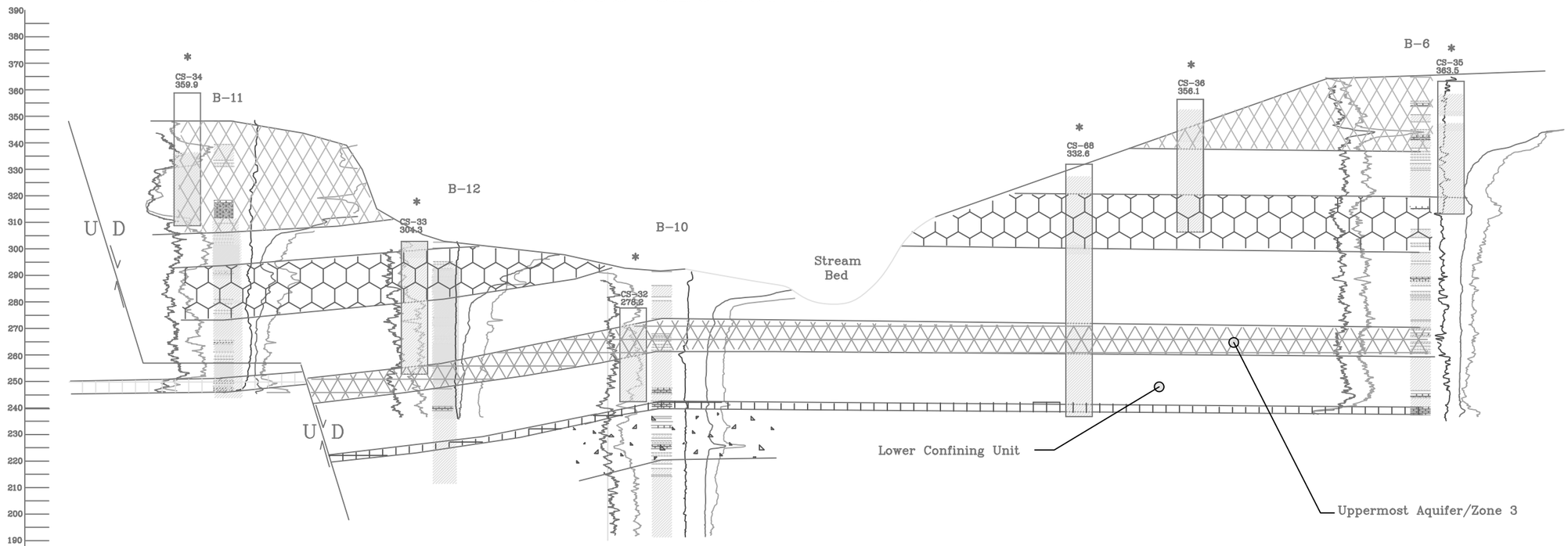
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A019

FIGURE F-5

CROSS SECTION 11 – 6

WEST

EAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 11–6xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
11 - 6

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

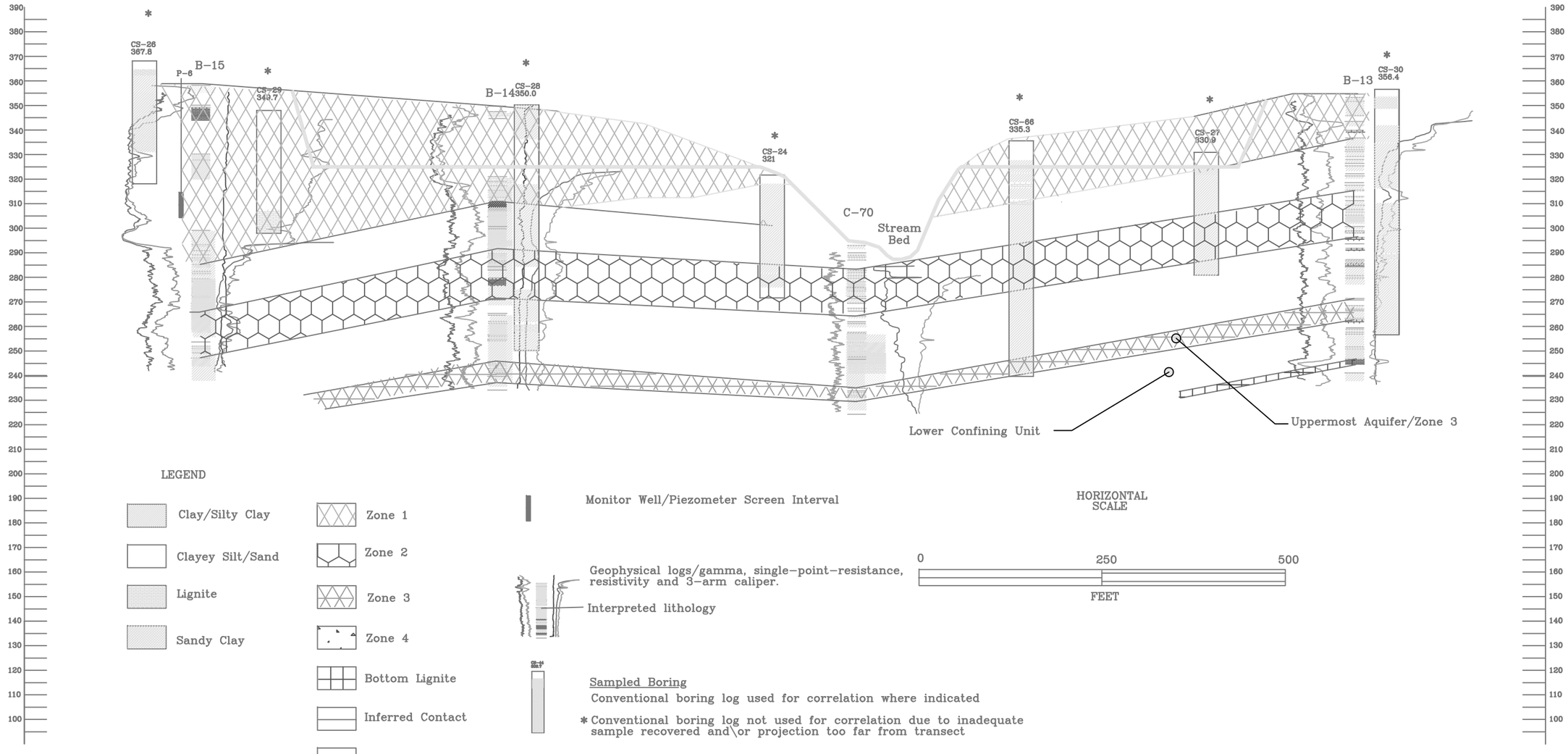
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A020

FIGURE F-6

CROSS SECTION 15 – 13

WEST

EAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 15-13xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
15 - 13

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

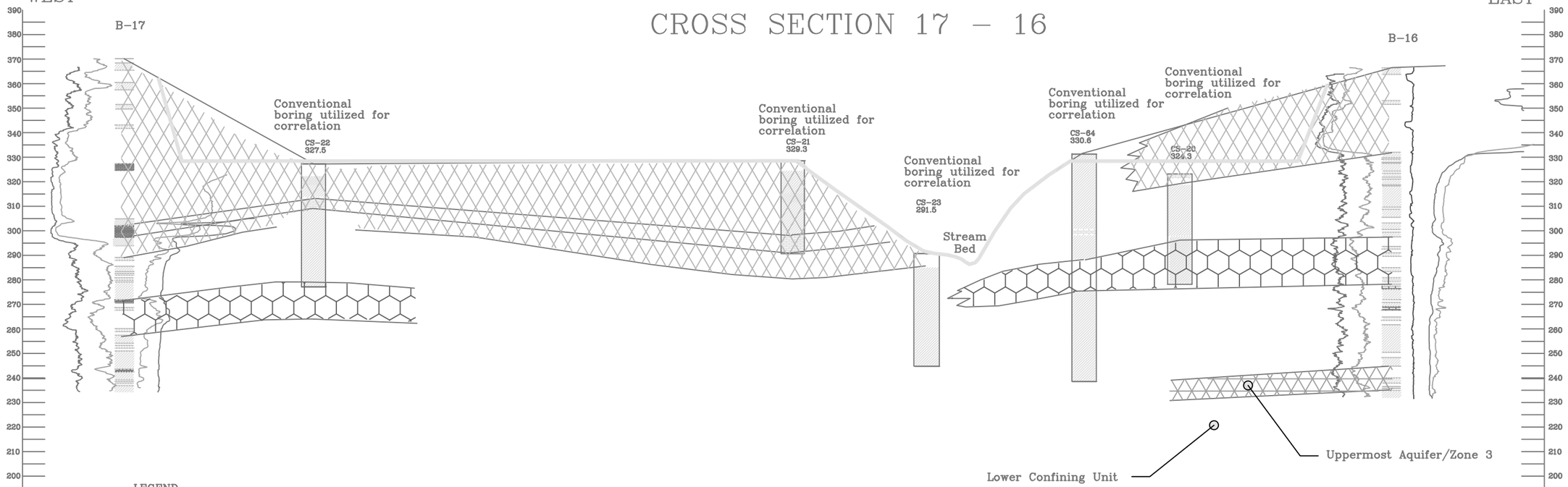
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A021

FIGURE F-7

CROSS SECTION 17 – 16

WEST

EAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 17–16xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
17 - 16

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

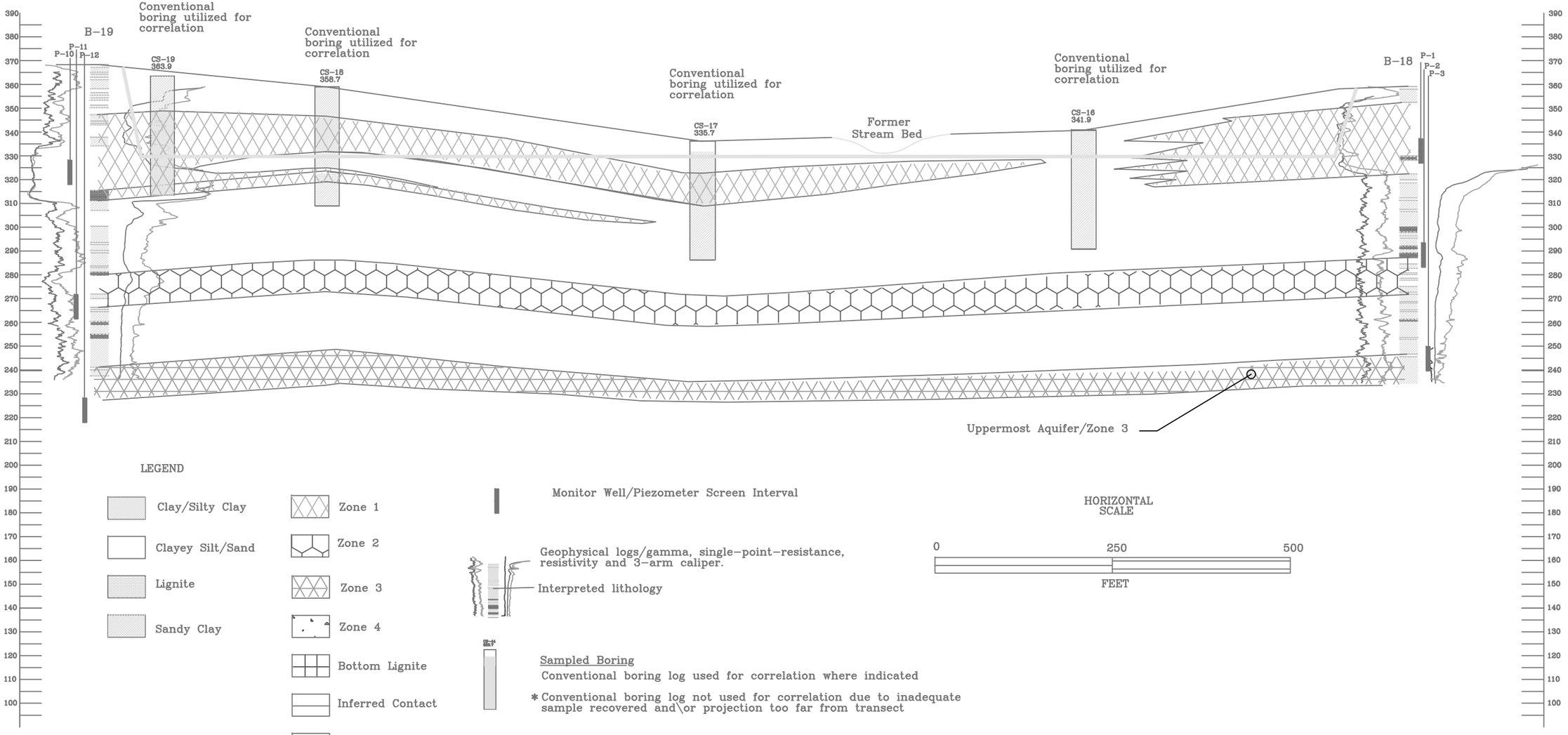
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A022

FIGURE F-8

WEST NORTHWEST

EAST SOUTHEAST

CROSS SECTION 19 – 18



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base
- Monitor Well/Piezometer Screen Interval
- Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.
- Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 19–18xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
19 - 18

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

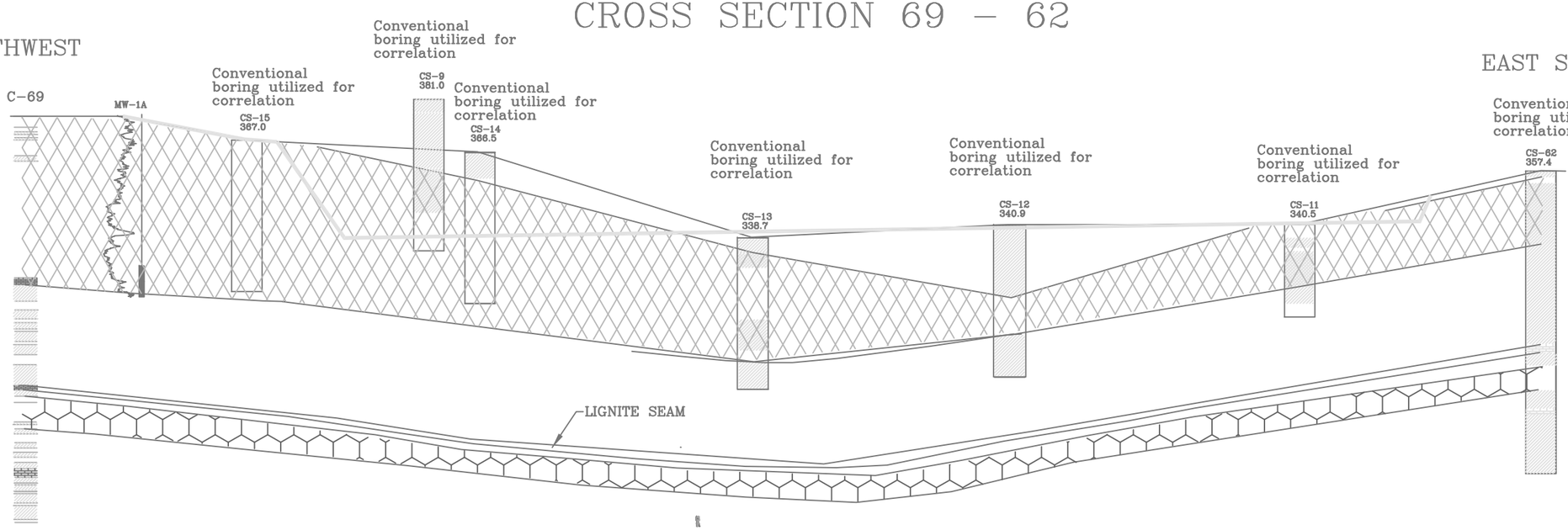
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/23/10
Dwg. No.:	01-10-0079-A023

FIGURE F-9

CROSS SECTION 69 – 62

WEST NORTHWEST

EAST SOUTHEAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

HORIZONTAL SCALE

0 250 500

FEET

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection to far from transect

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 19–18xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
69 - 62

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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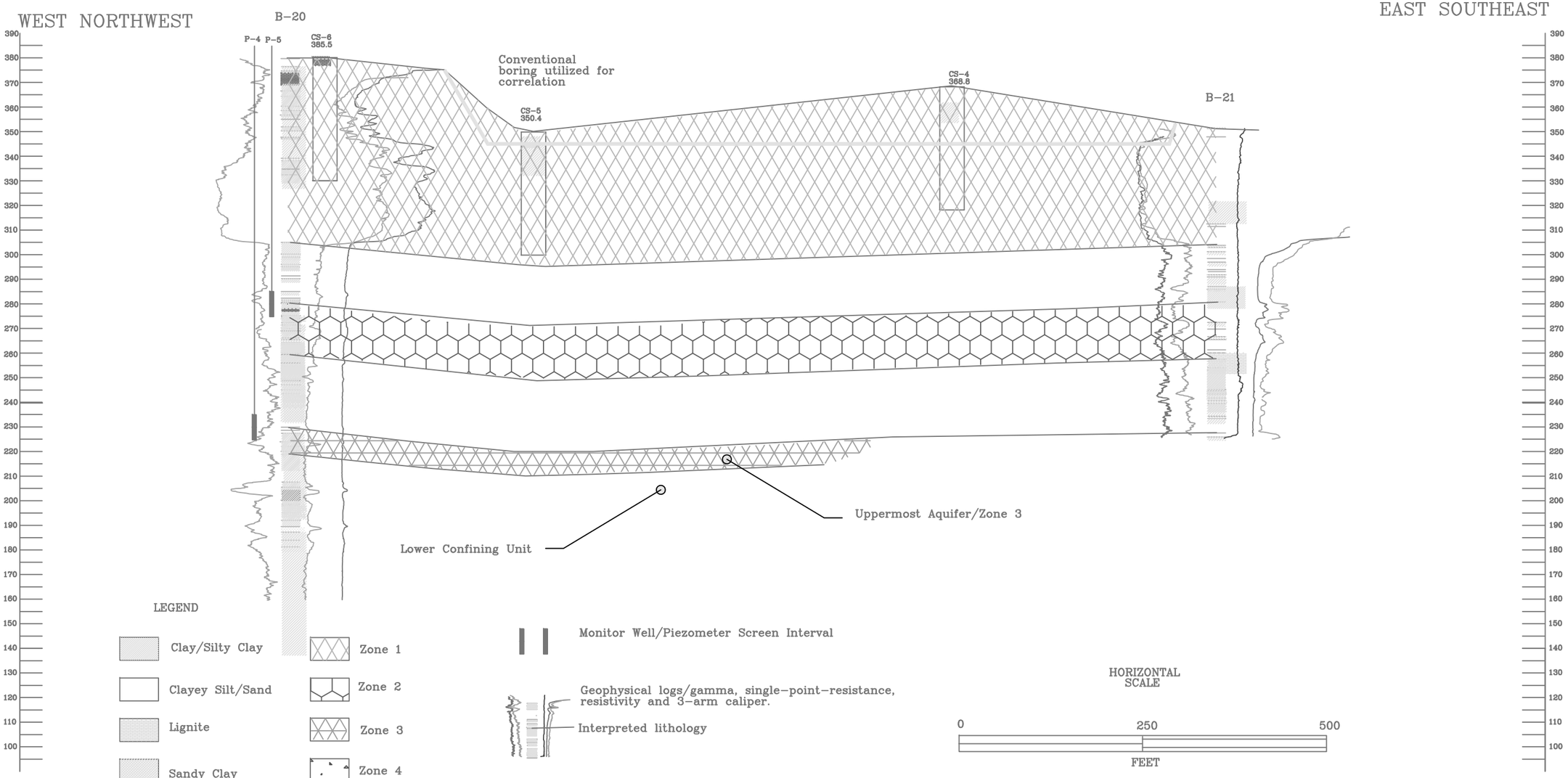
Date:	05/25/10
Dwg. No.:	01-10-0079-A024

FIGURE F-10

CROSS SECTION 20 – 21

WEST NORTHWEST

EAST SOUTHEAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

HORIZONTAL SCALE

0 250 500

FEET

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 20–21xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
20 - 21

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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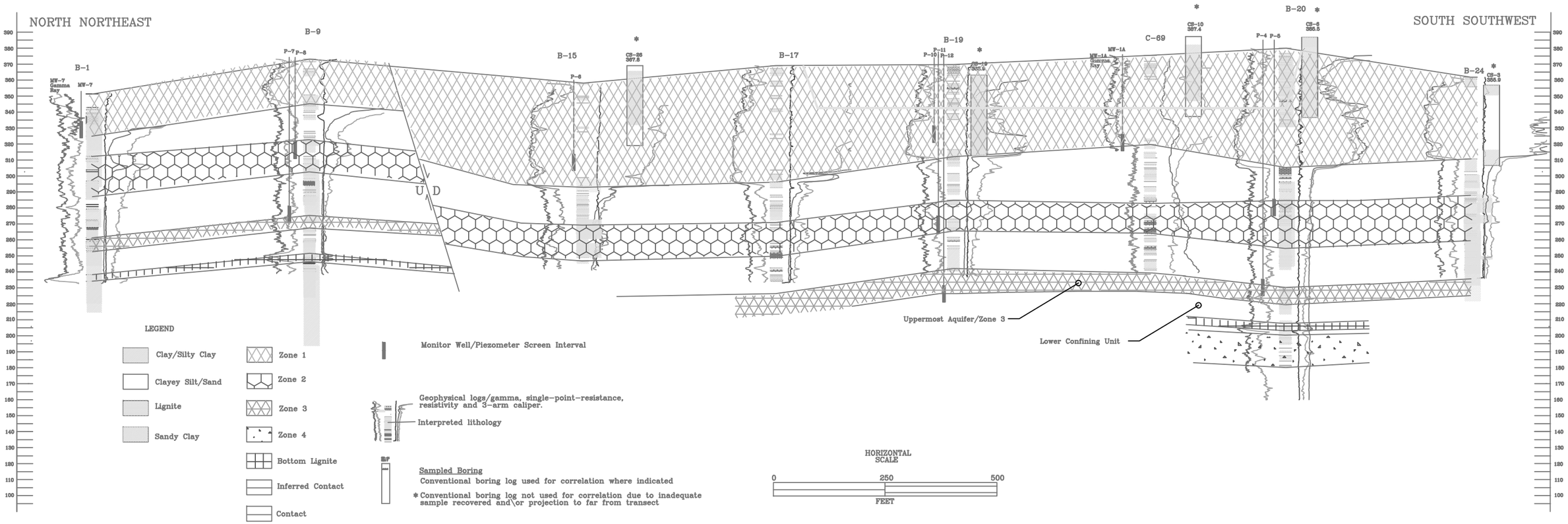
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A025

FIGURE F-11

CROSS SECTION 1 – 24



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection to far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 1-24x

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
1 - 24

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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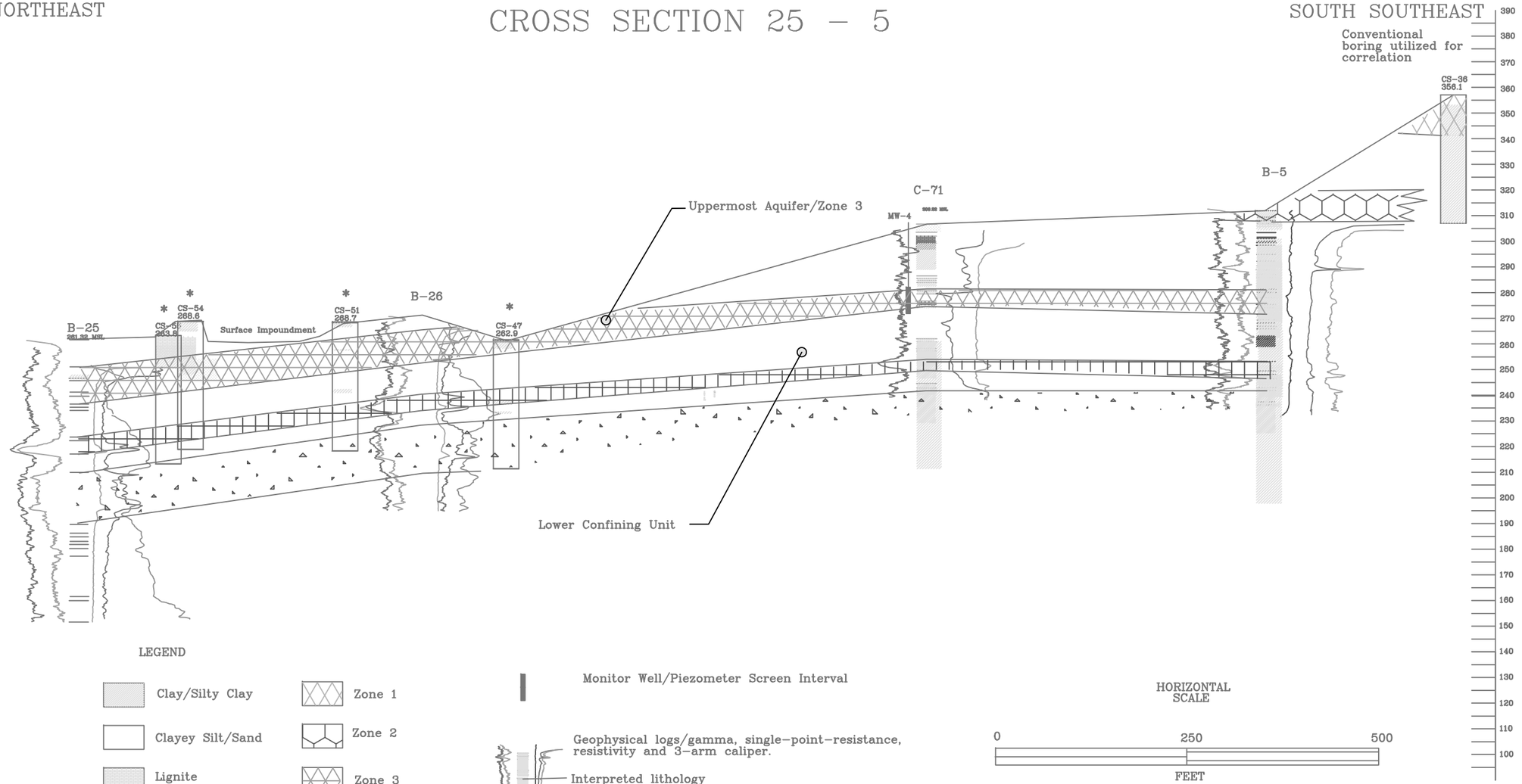
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A026

FIGURE F-12

CROSS SECTION 25 – 5

NORTH NORTHEAST

SOUTH SOUTHEAST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. xs25–5

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
25 - 5

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

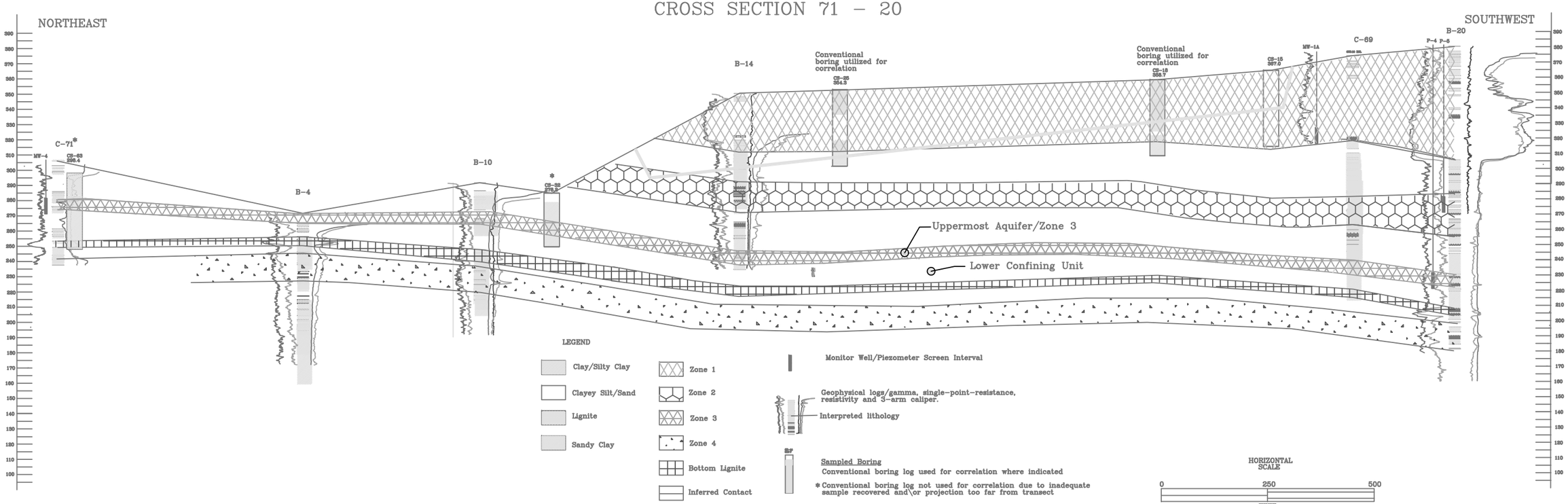
Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A027

FIGURE F-13

CROSS SECTION 71 – 20

NORTHEAST

SOUTHWEST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base
- Monitor Well/Piezometer Screen Interval
- Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.
- Interpreted lithology
- Sampled Boring
  Conventional boring log used for correlation where indicated
- * Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 71–20xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
71 - 20

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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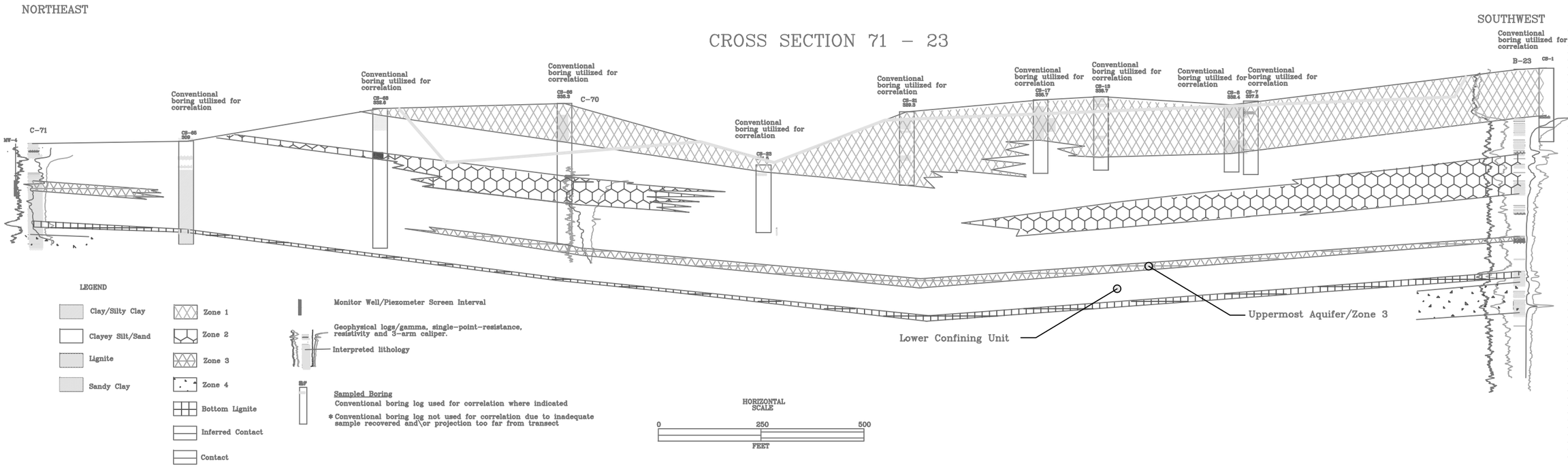
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A028

FIGURE F-14

CROSS SECTION 71 – 23

NORTHEAST

SOUTHWEST



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact
- Approximate Landfill Base

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

B–7

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 71–23xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
71 - 23

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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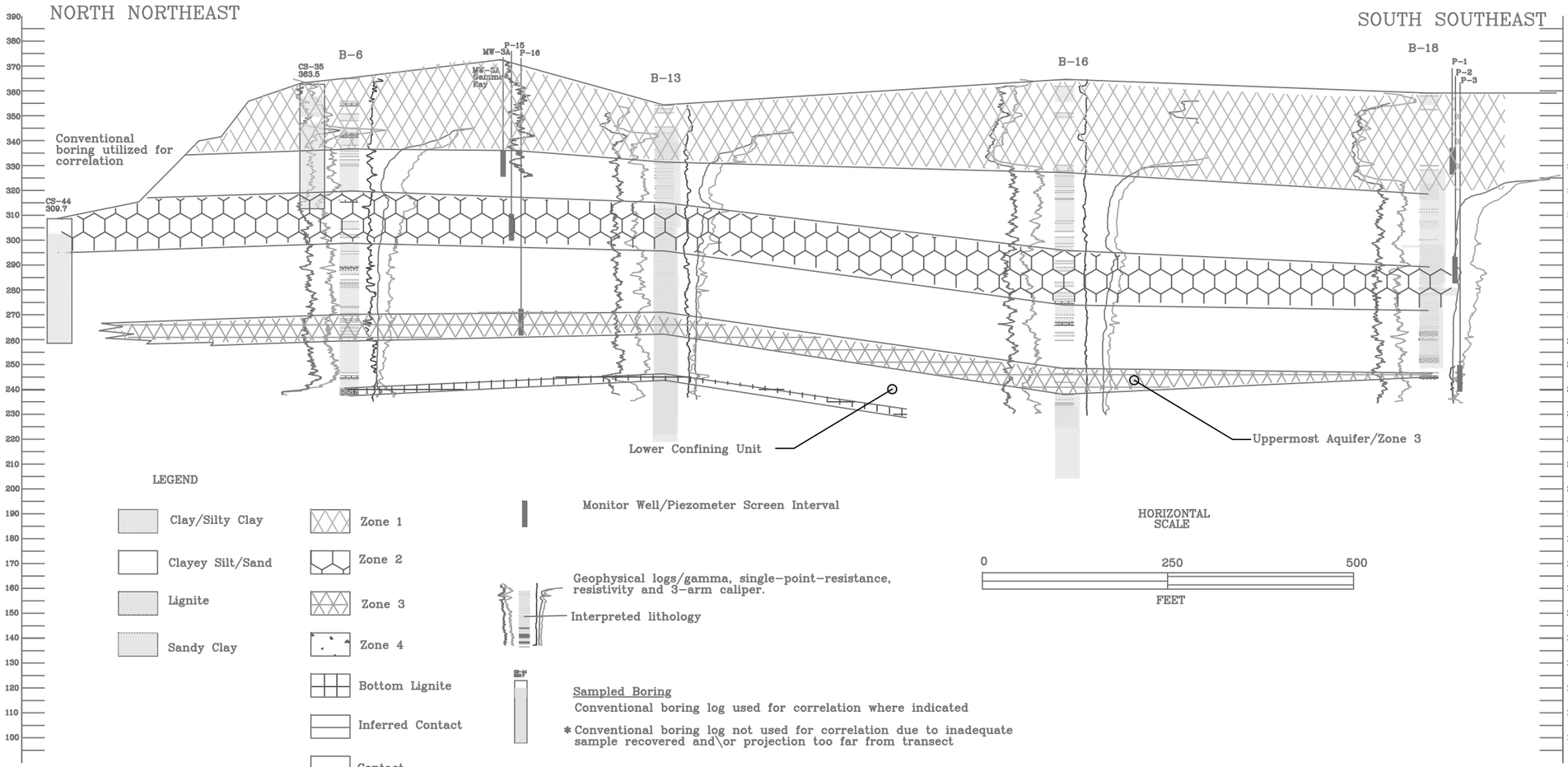
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A029

FIGURE F-15

CROSS SECTION 44 – 18



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single–point–resistance, resistivity and 3–arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 44–18xs

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
44 - 18

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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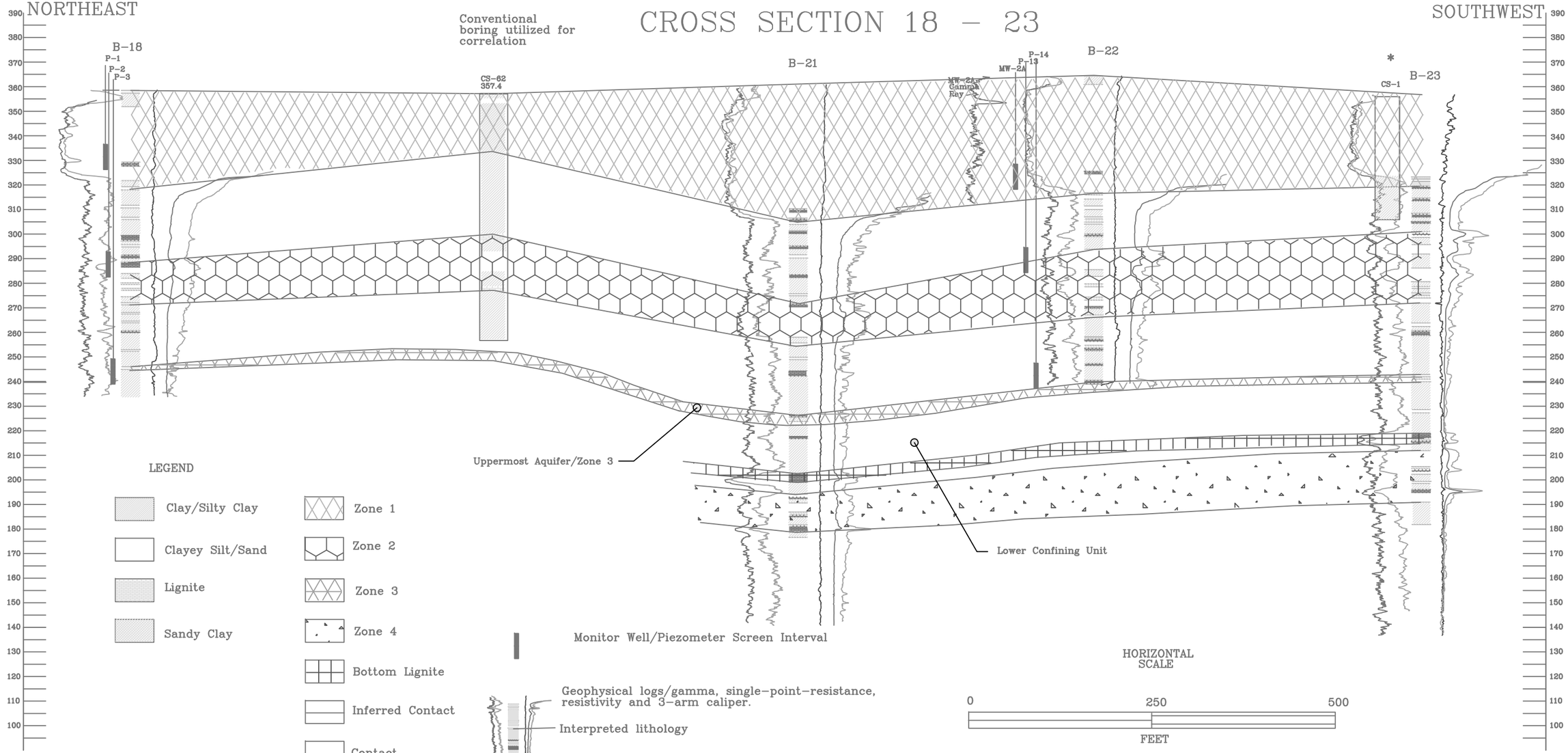
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A030

FIGURE F-16

CROSS SECTION 18 – 23

NORTHEAST

SOUTHWEST



Conventional boring utilized for correlation

LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Inferred Contact
- Contact

Monitor Well/Piezometer Screen Interval

Geophysical logs/gamma, single-point-resistance, resistivity and 3-arm caliper.

Interpreted lithology

Sampled Boring

Conventional boring log used for correlation where indicated

* Conventional boring log not used for correlation due to inadequate sample recovered and\or projection too far from transect

HORIZONTAL SCALE

0 250 500

FEET

RESOURCE: DRAWING PROVIDED BY ICON ENVIRONMENTAL SERVICES, BATON ROUGE, LOUISIANA, DRAWING NO. 18-23x

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
18 - 23

DeSoto Parish, Louisiana

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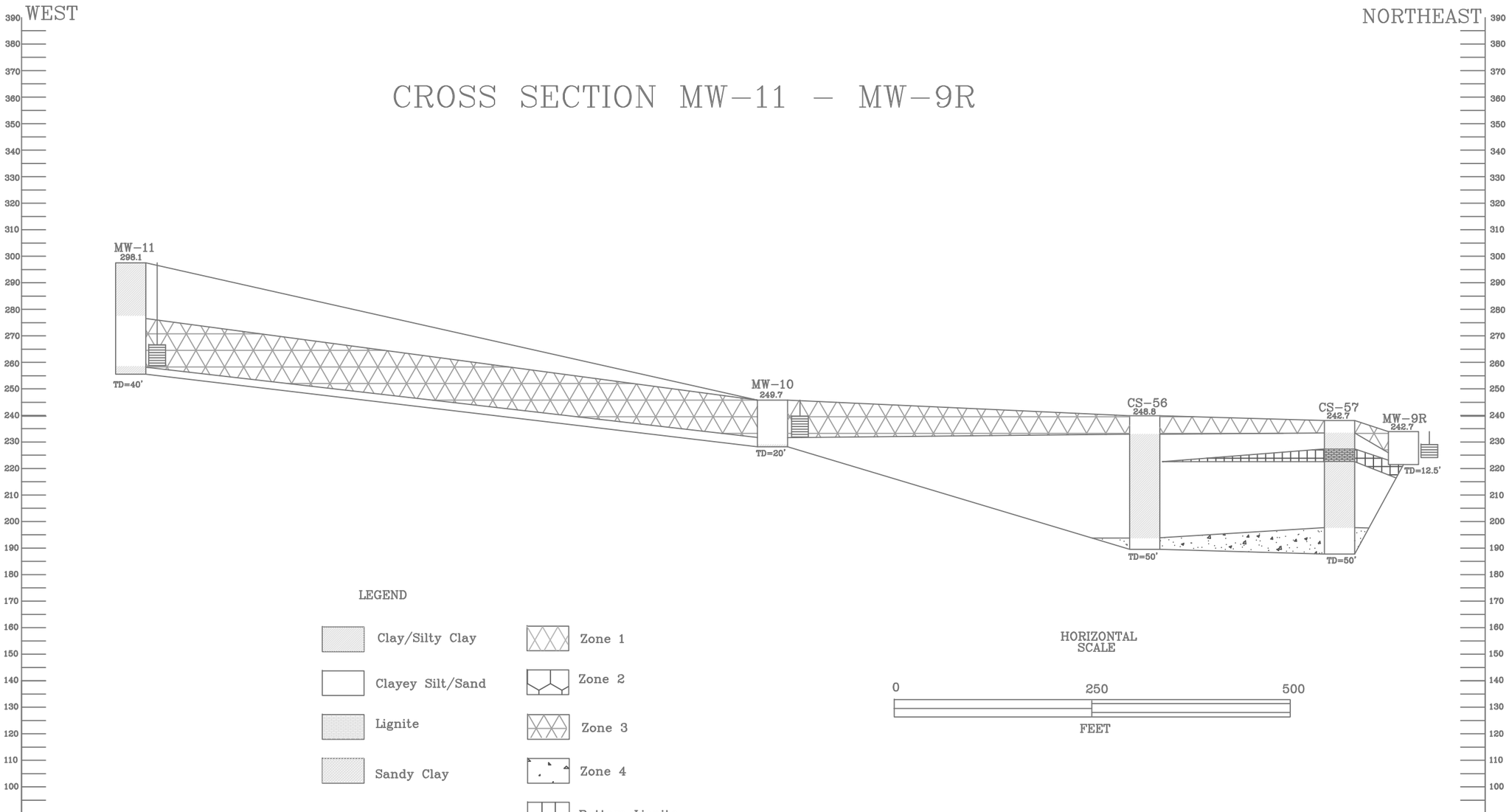
Date:	05/25/10
Dwg. No.:	01-10-0079-A031

FIGURE F-17

CROSS SECTION MW-11 – MW-9R



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Screen Interval

HORIZONTAL SCALE

0 250 500

FEET

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
MW-11 - MW-9R

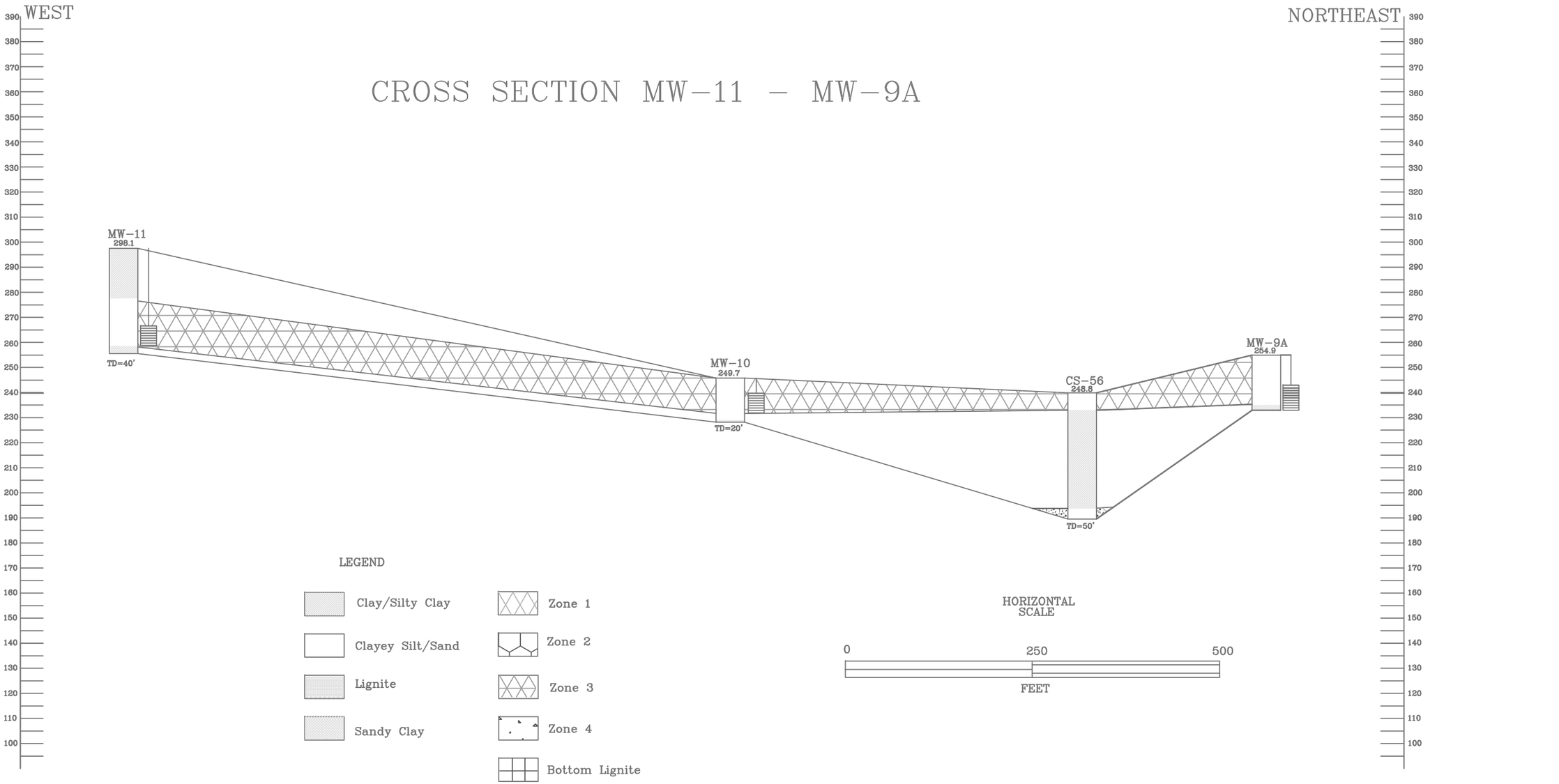
DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	08/12/10
Dwg. No.:	01-10-0079-A031A

FIGURE F-18

CROSS SECTION MW-11 - MW-9A



LEGEND

- Clay/Silty Clay
- Clayey Silt/Sand
- Lignite
- Sandy Clay
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Bottom Lignite
- Screen Interval

HORIZONTAL SCALE

0 250 500

FEET

CLECO Power LLC

Dolet Hills Power Station

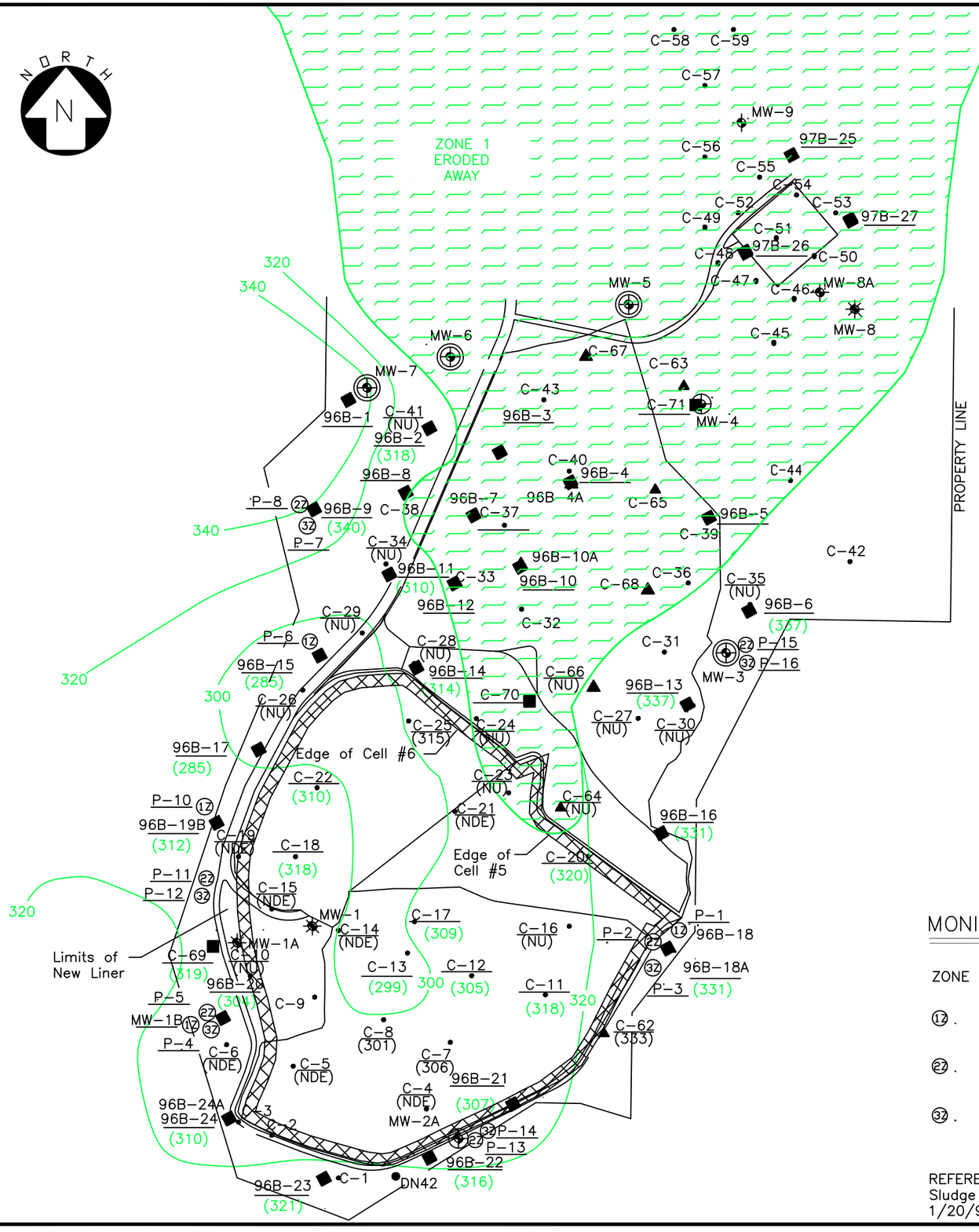
Fly Ash / Scrubber Sludge Landfill
Geologic Cross Section
MW-11 - MW-9A

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	08/12/10
Dwg. No.:	01-10-0079-A031B

FIGURE F-19



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (27). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (337) BASE OF ZONE 1 ELEVATION (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

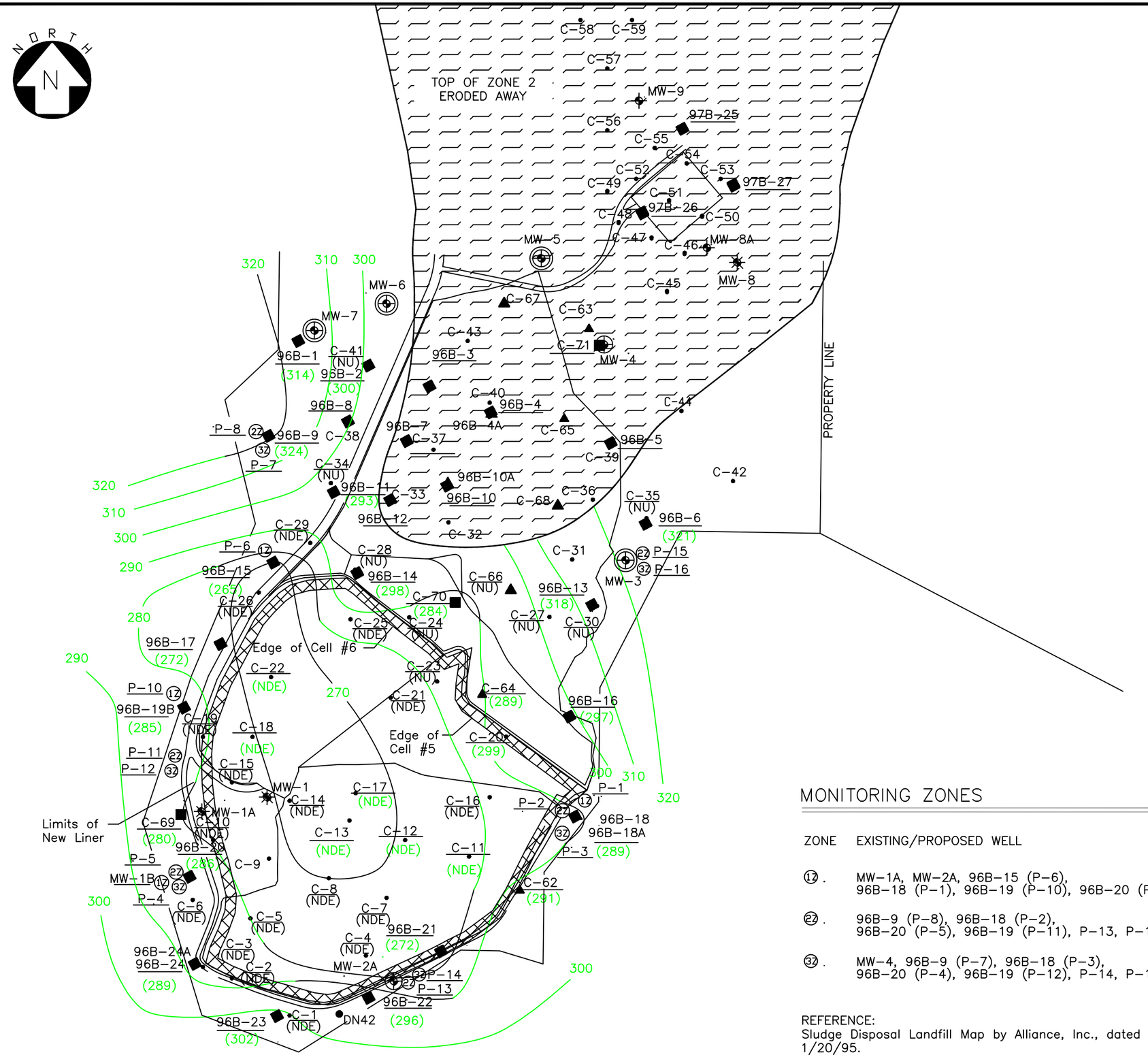
Fly Ash / Scrubber Sludge Landfill
Structural Map
Base of Zone 1

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A035

FIGURE M-1



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (297) TOP OF ZONE 2 ELEVATION (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

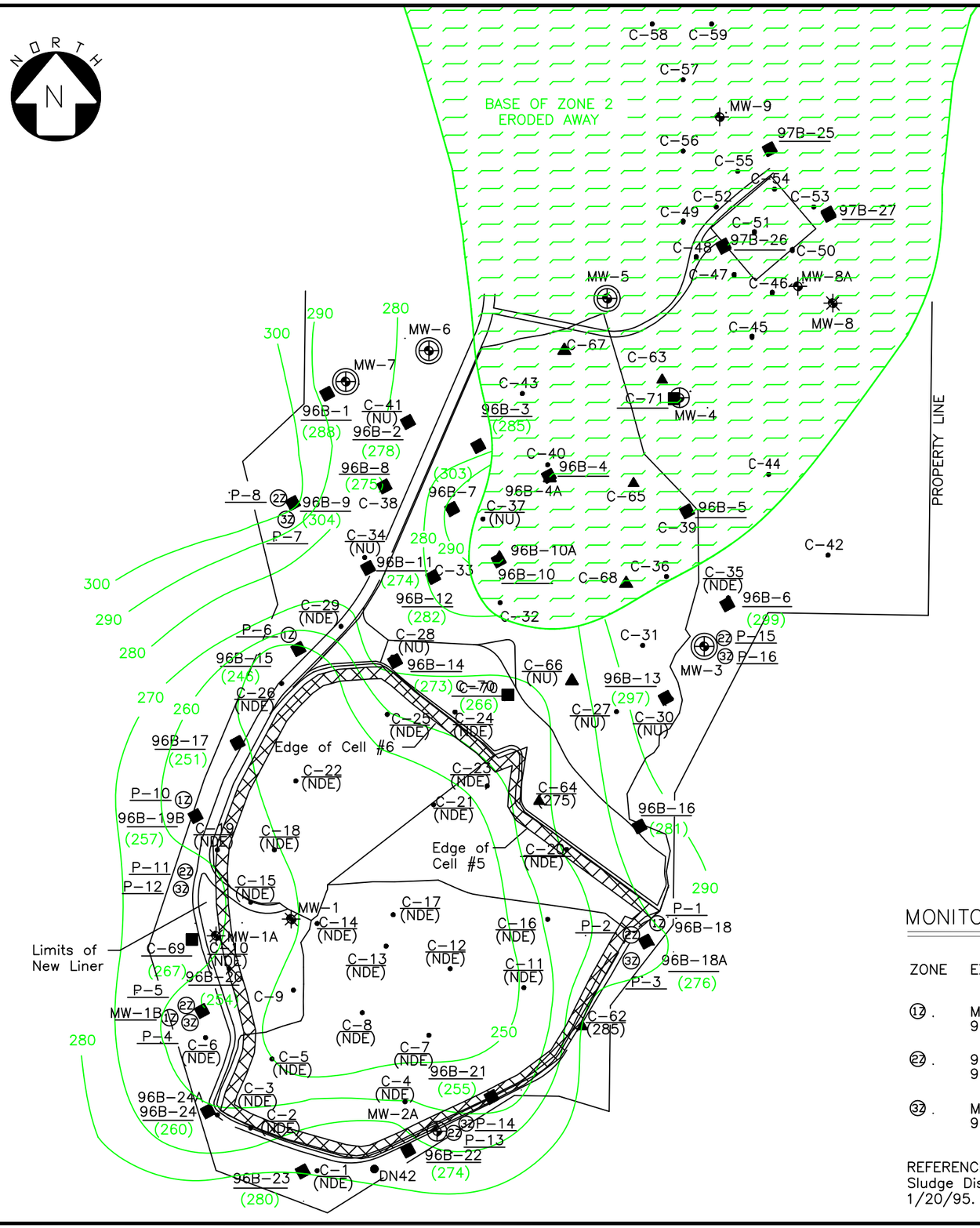
Fly Ash / Scrubber Sludge Landfill
Structural Map
Top of Zone 2

DeSoto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A036

FIGURE M-2



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (297) BASE OF ZONE 2 ELEVATION (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

500 0 500

SCALE: 1'' = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

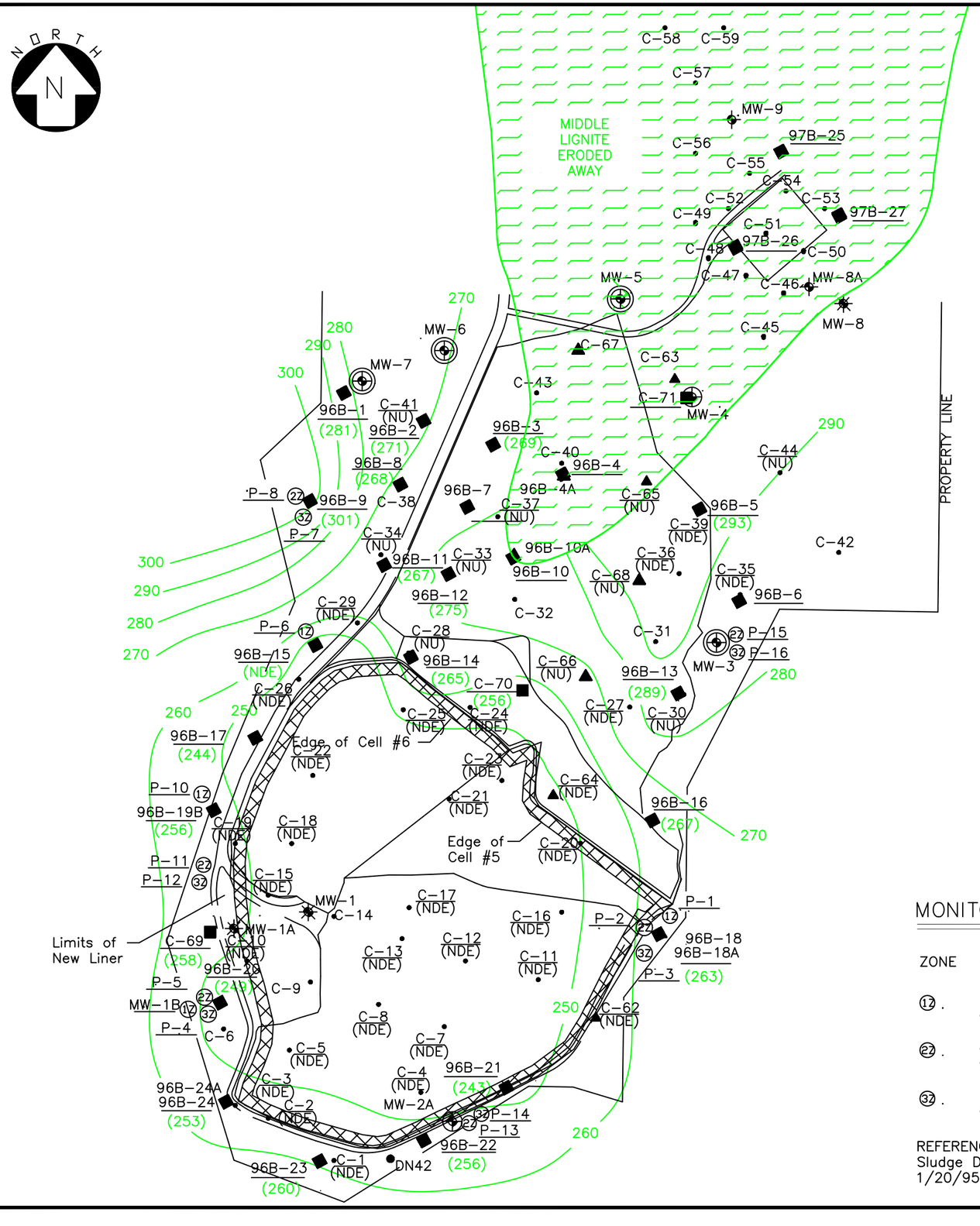
Fly Ash / Scrubber Sludge Landfill Structural Map Base of Zone 2

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A037

FIGURE M-3



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (27). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (289) MIDDLE LIGNITE ELEVATION (FEET)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

500 0 500

SCALE: 1'' = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Structural Map Middle Lignite

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
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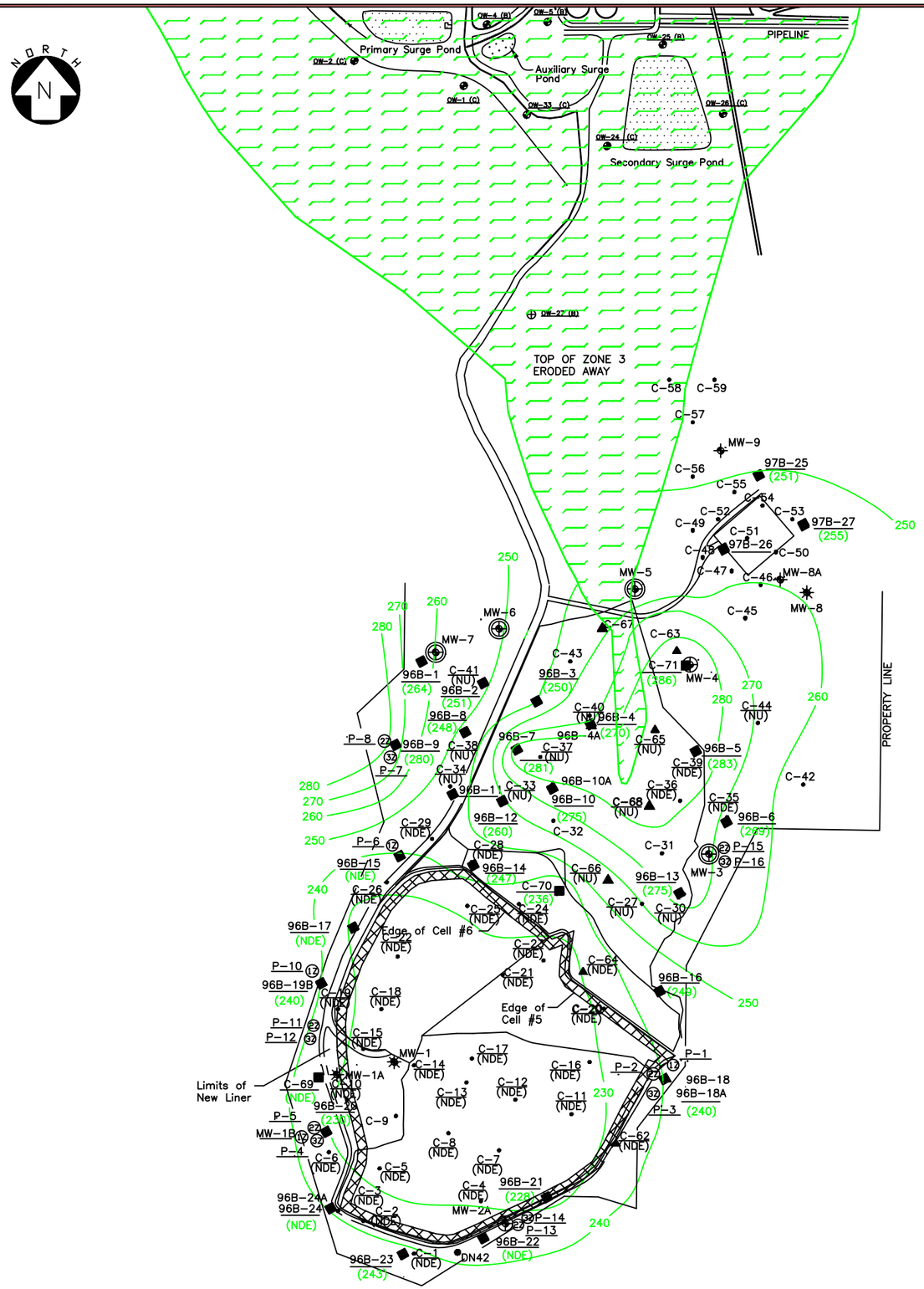
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A038

FIGURE M-4



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (17). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (269) TOP OF ZONE 3 ELEVATION (FEET)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

700 0 700

SCALE: 1'' = 700'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(17).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Structural Map Top of Zone 3

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
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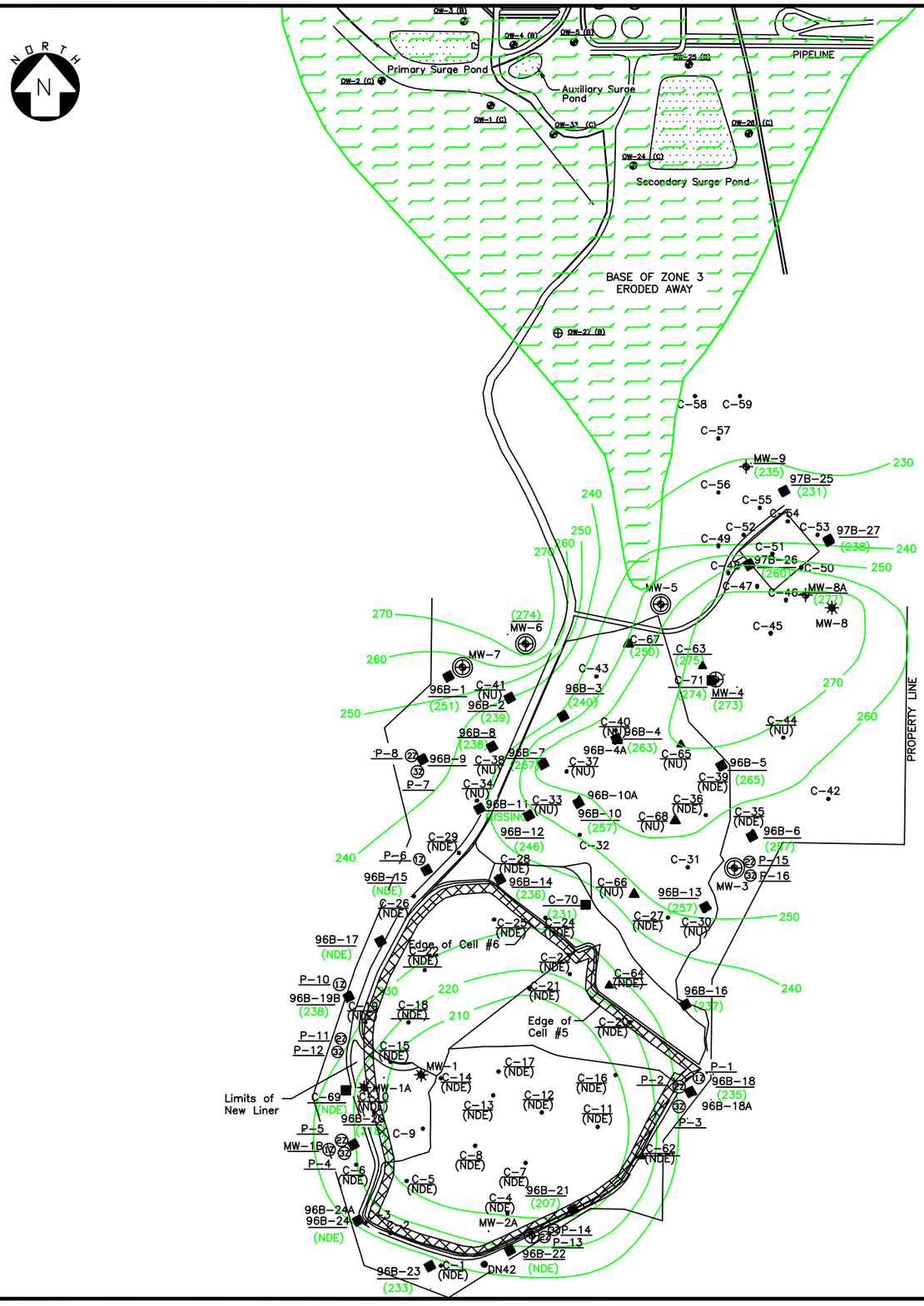
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A039

FIGURE M-5



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (257) BASE OF ZONE 3 ELEVATION (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

700 0 700

SCALE: 1'' = 700'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

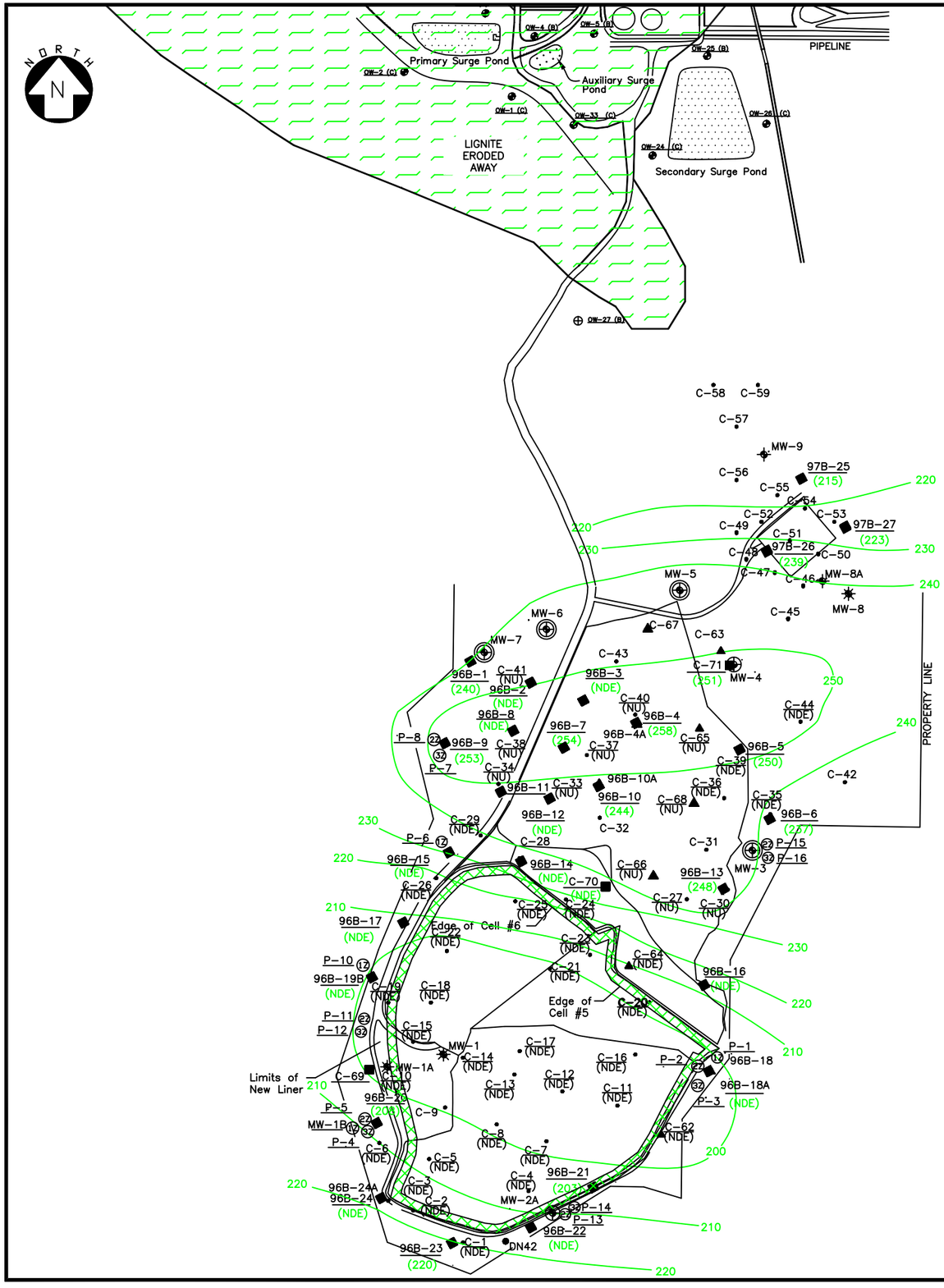
Fly Ash / Scrubber Sludge Landfill Structural Map Base of Zone 3

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JLP
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A040

FIGURE M-6



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- ⑫ . ZONE 1 PIEZOMETER
- ㉗ . ZONE 2 PIEZOMETER
- ㉜ . ZONE 3 PIEZOMETER
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (237) MAIN LIGNITE ELEVATION (FEET)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

700 0 700

SCALE: 1'' = 700'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
⑫ .	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
㉗ .	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
㉜ .	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Stuctural Map
Main Lignite

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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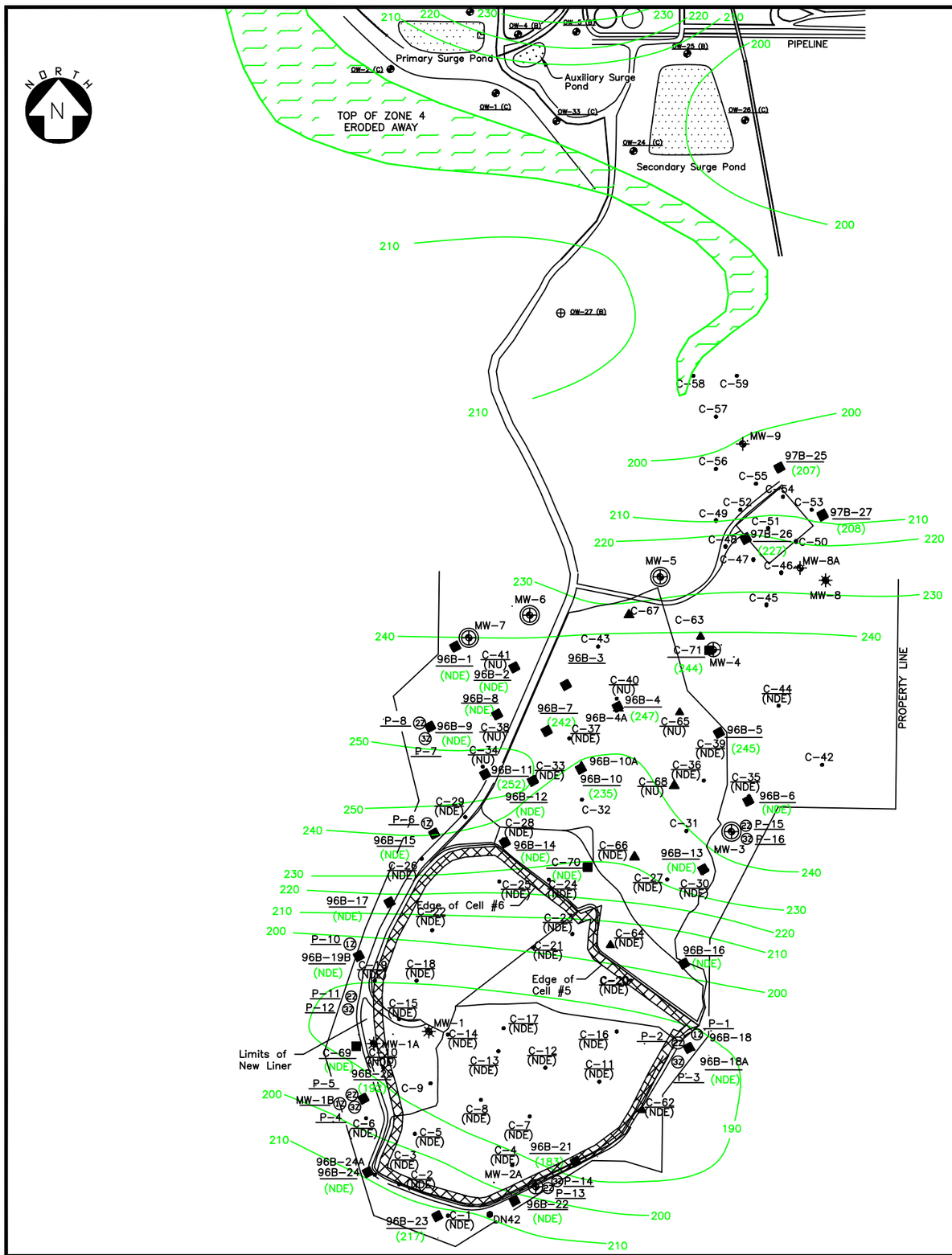
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A041

FIGURE M-7



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (245) TOP OF ZONE 4 ELEVATION (FEET)
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

700 0 700

SCALE: 1'' = 700'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Stuctural Map
Top of Zone 4

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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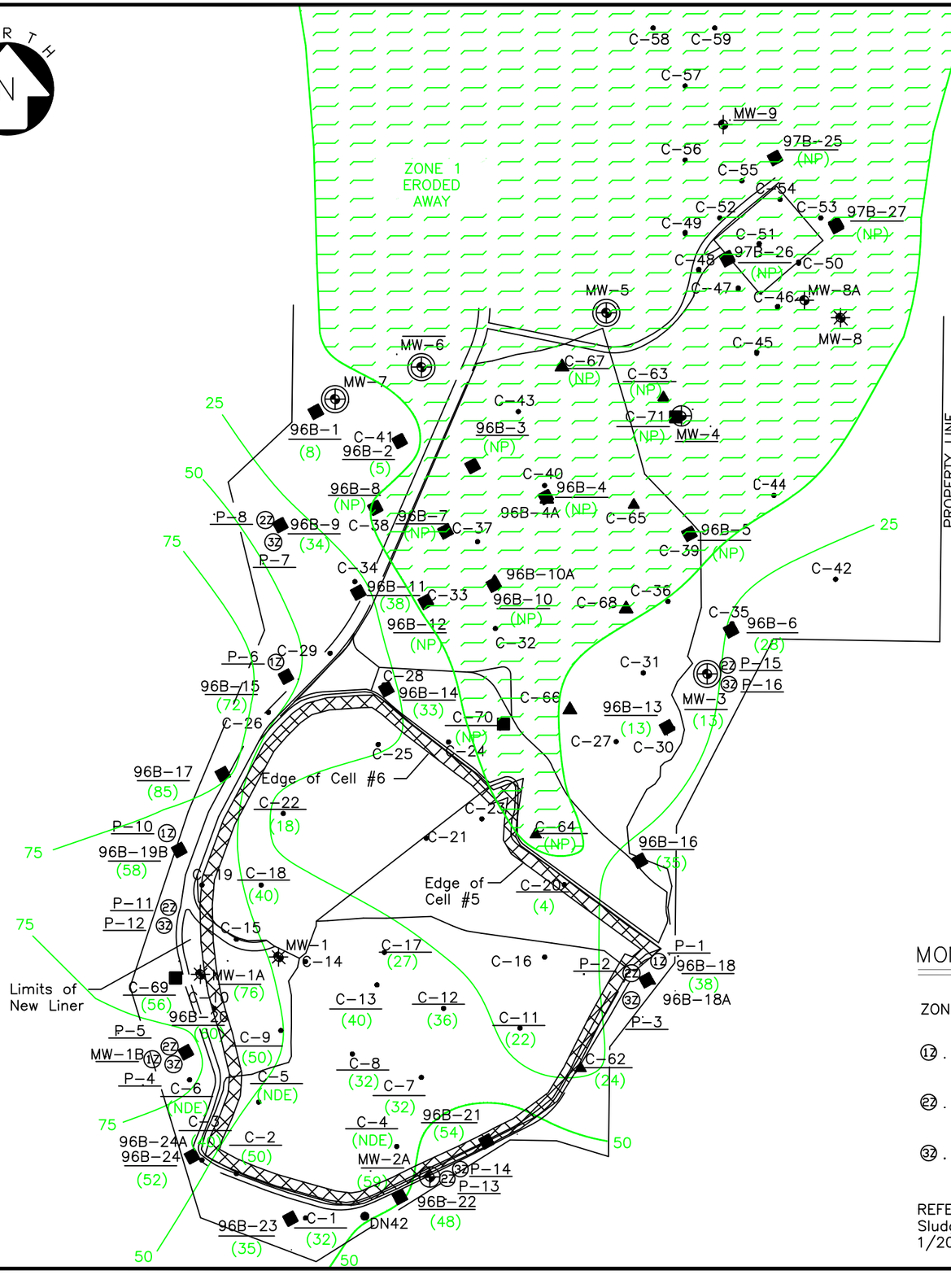
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A042

FIGURE M-8



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (8) ZONE THICKNESS (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NP) NOT PRESENT
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

500 0 500

SCALE: 1'' = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Isopach Map
Zone 1

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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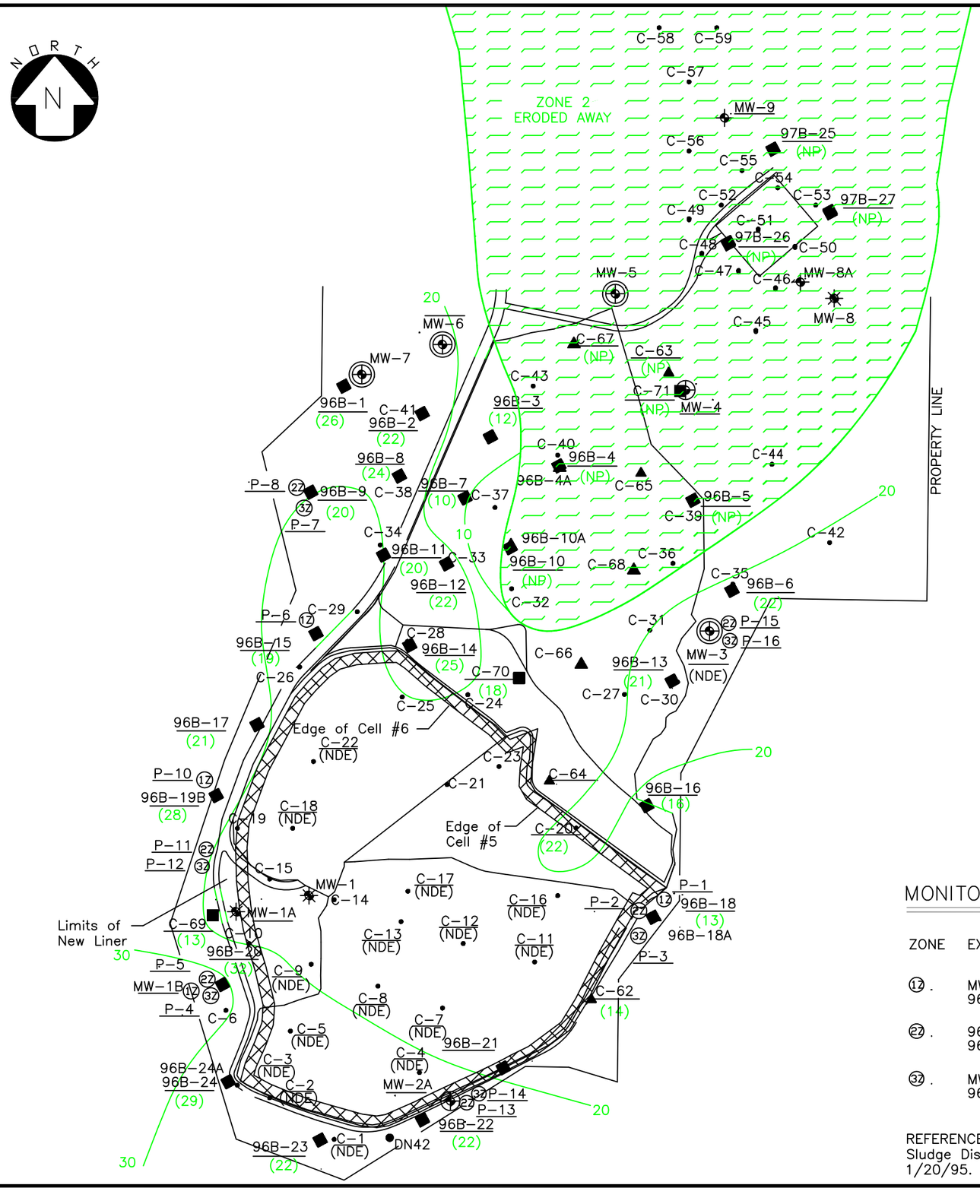
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A043

FIGURE M-9



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (10) ZONE THICKNESS (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NP) NOT PRESENT
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

500 0 500

SCALE: 1'' = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Isopach Map Zone 2

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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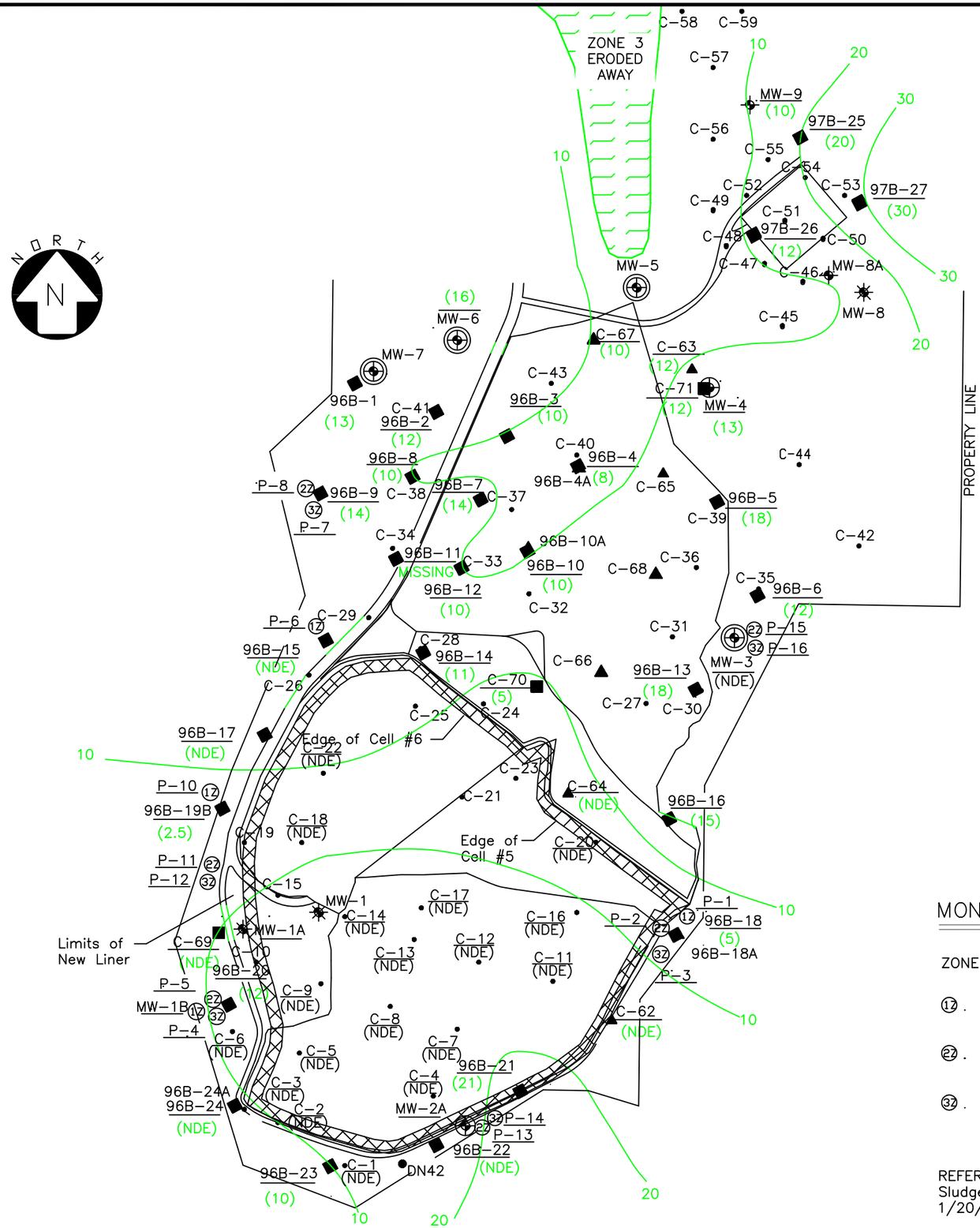
Checked:	RS
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A044

FIGURE M-10



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- COVERED AREA
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- CONTINUOUSLY SAMPLED BOREHOLE
- CONTINUOUSLY SAMPLED AND GEOPHYSICALLY LOGGED BOREHOLE
- MONITOR WELLS GEOPHYSICALLY LOGGED OF 9/95
- GEOPHYSICAL LOG OBTAINED FROM DNR
- GEOPHYSICALLY LOGGED BOREHOLE WITH SOIL CUTTINGS
- (17). ZONE 1 PIEZOMETER
- (27). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (10) ZONE THICKNESS (FEET)
- (NDE) NOT DEEP ENOUGH (BORING DEPTH)
- (NP) NOT PRESENT
- (NU) NOT UTILIZED (INADEQUATE SAMPLE RECOVERY)

500 0 500

SCALE: 1'' = 500'

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(17).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Isopach Map
Zone 3

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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Approved:	RS
Date:	05/25/10
Dwg. No.:	01-10-0079-A045

FIGURE M-11

ZONE 1 POTENTIOMETRIC SURFACE MAPS

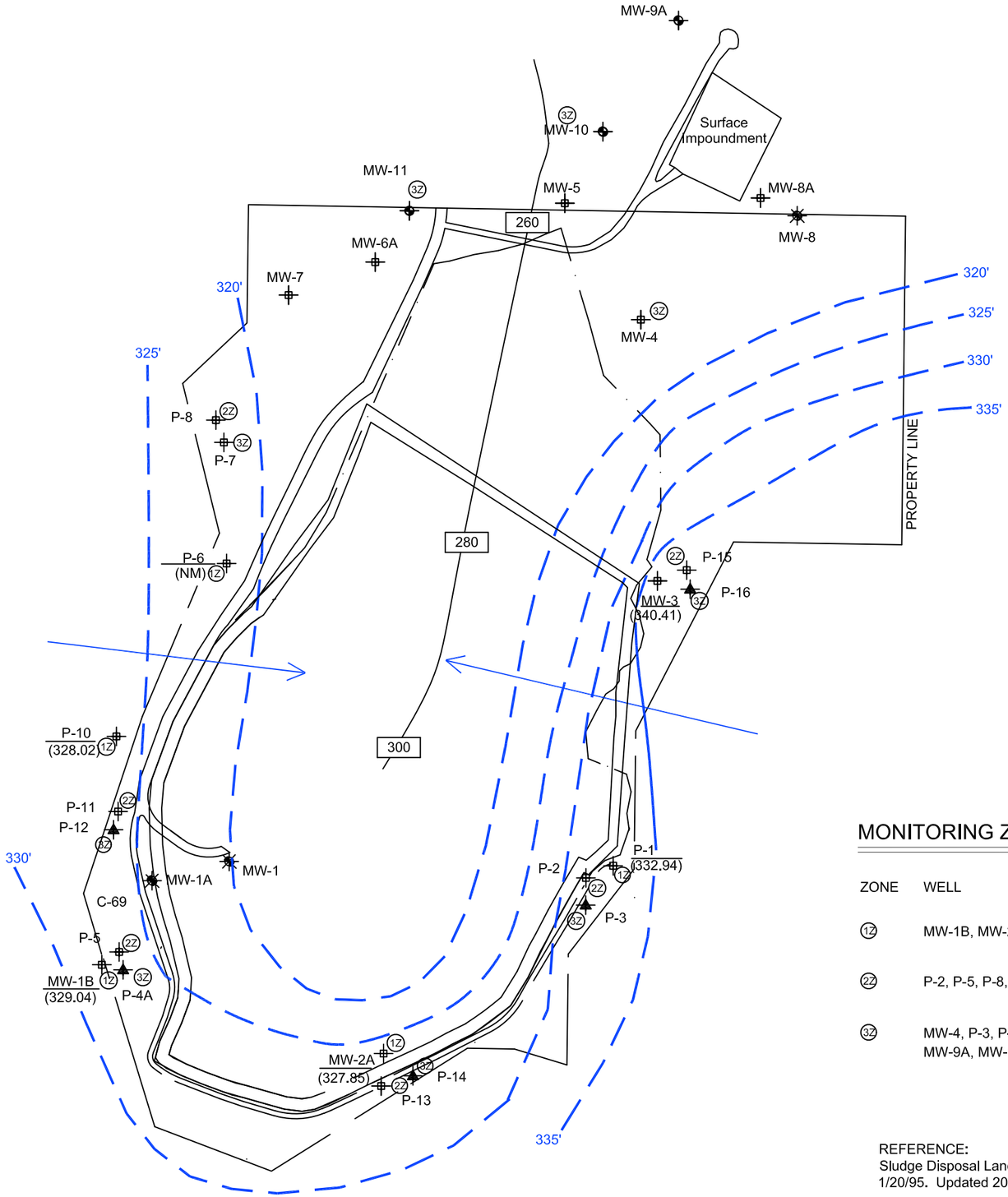
AUGUST 2017

MARCH 2018

JULY 2018

MARCH 2019

AUGUST 2019



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (340.41) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16 MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

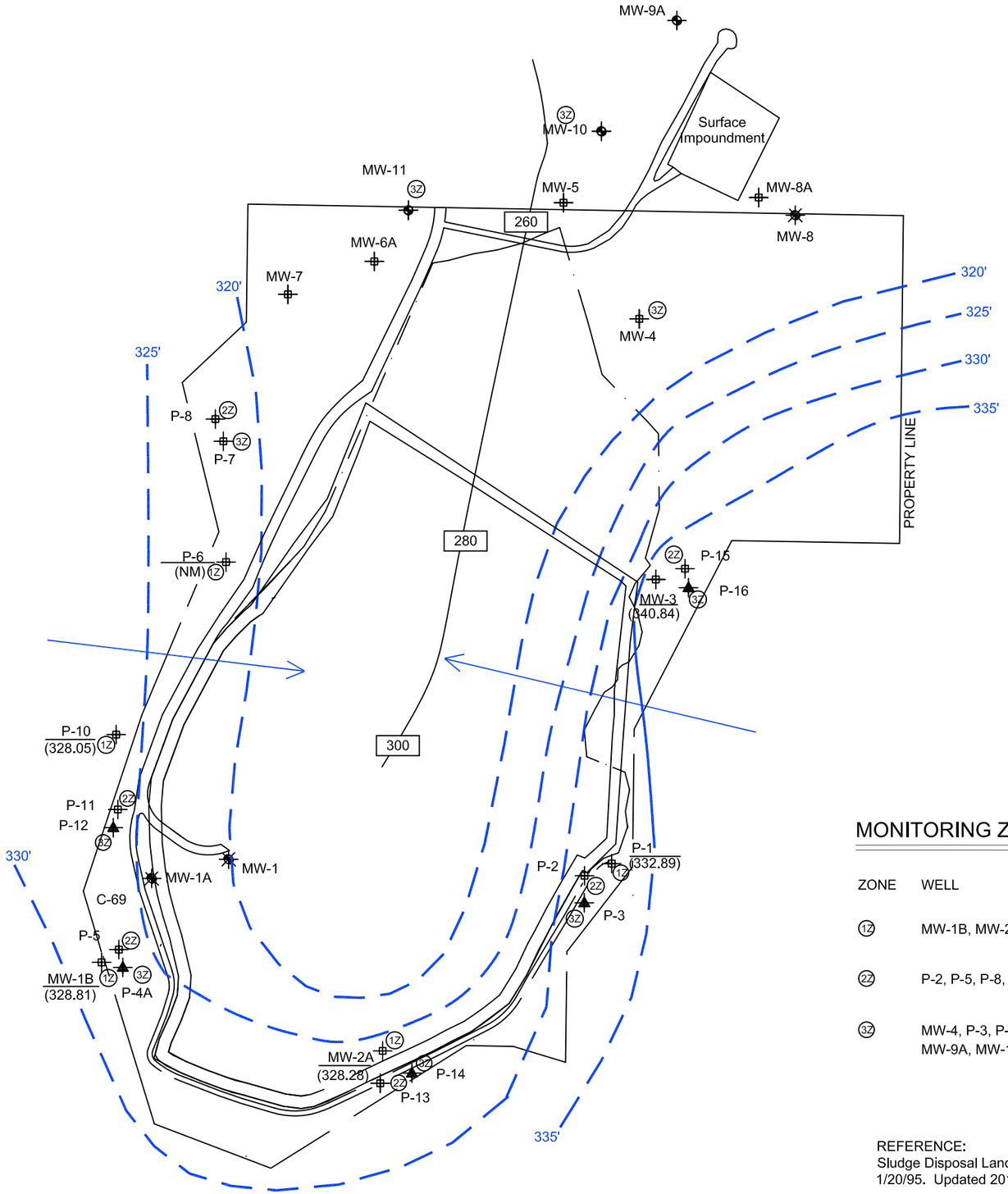
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
August 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	9/12/17
Dwg. No.:	01-20-0212-A51-1a

Figure 50-1a



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (340.84) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16 MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

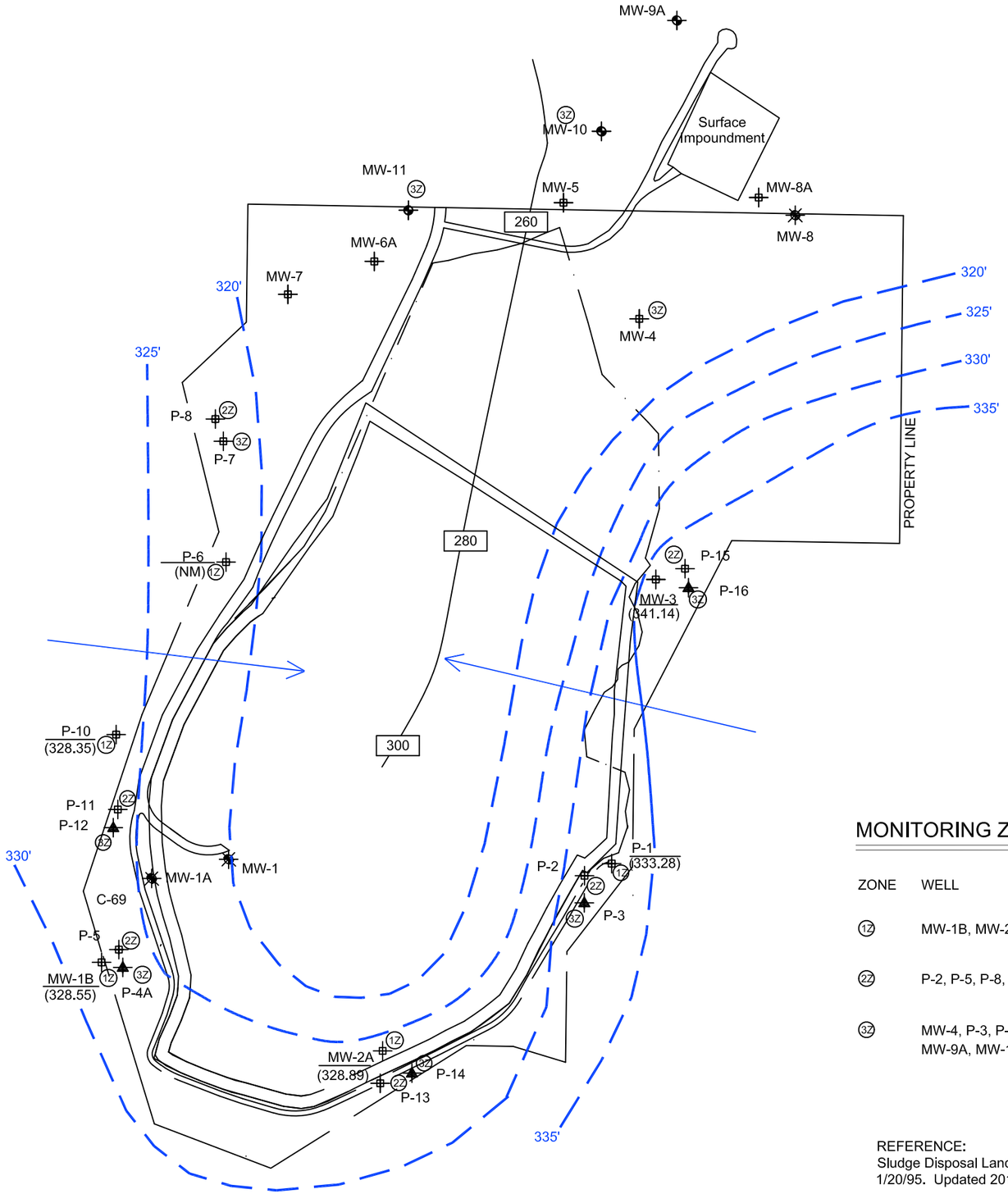
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
March 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	3/19/18
Dwg. No.:	01-20-0212-A50-1b

Figure 50-1b



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (341.14) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16 MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

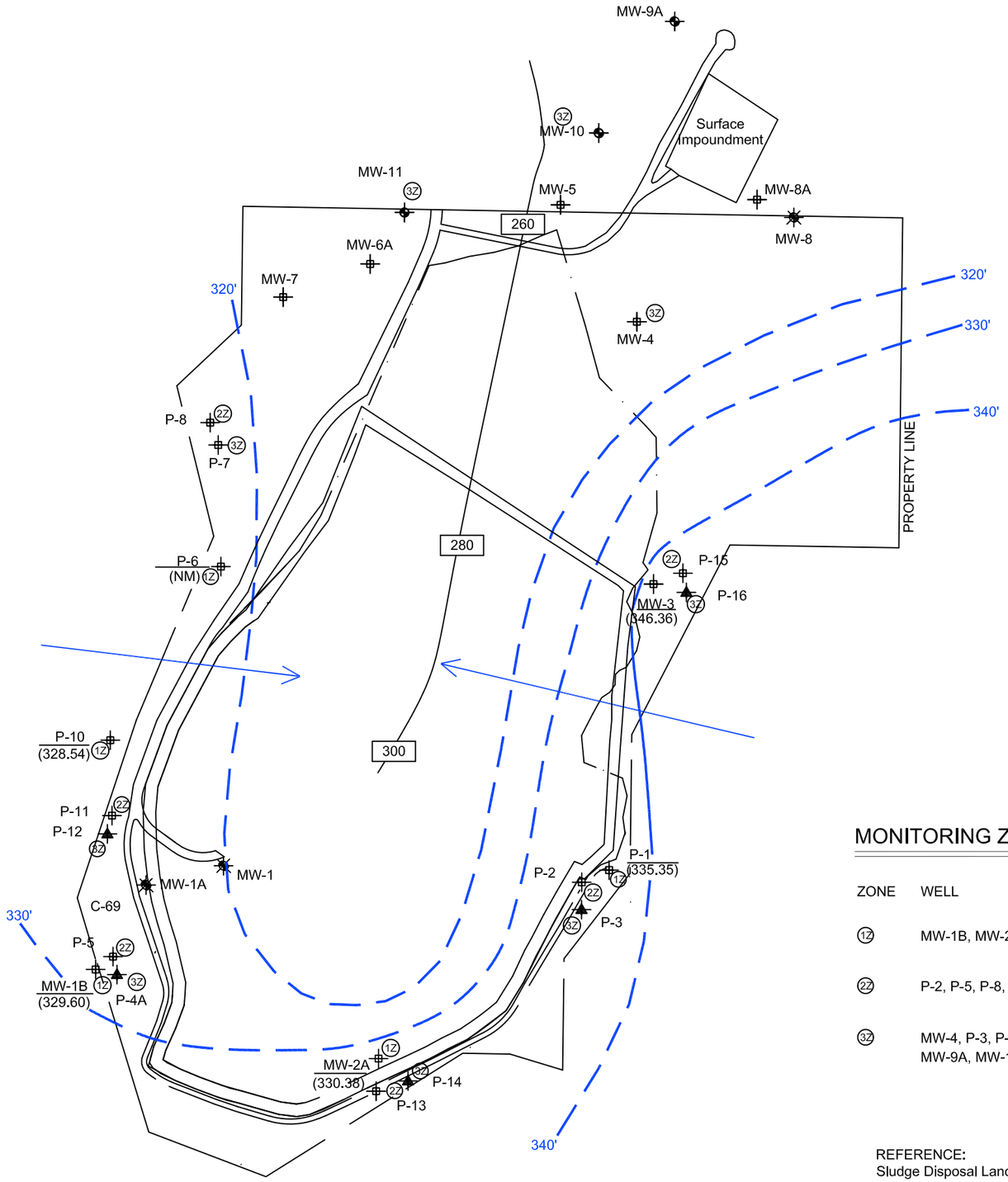
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
July 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	8/13/18
Dwg. No.:	01-20-0212-A50-1c

Figure 50-1c



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (346.36) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16 MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

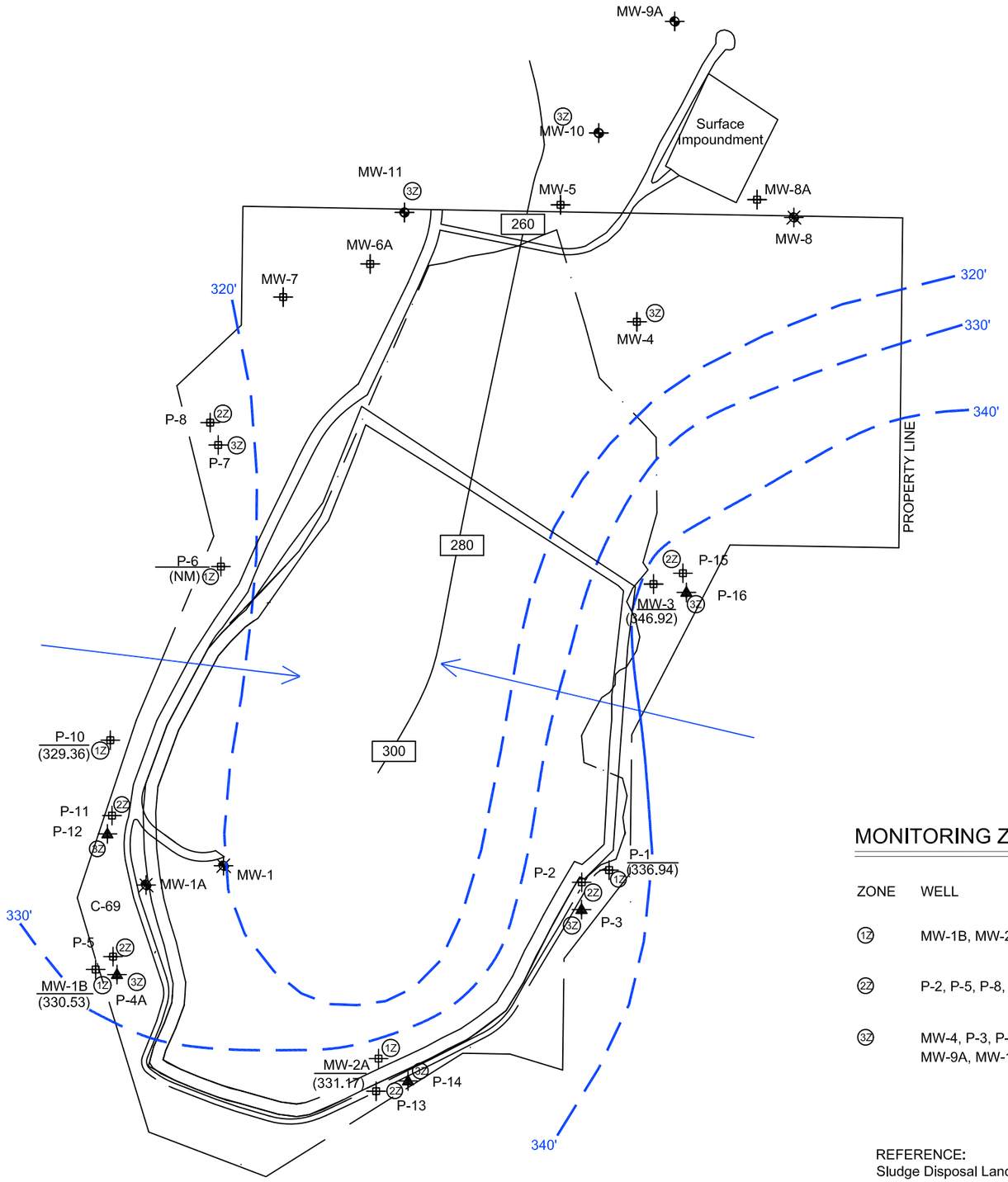
Fly Ash / Scrubber Sludge Landfill Zone 1 Potentiometric Surface Map March 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	JM
Approved:	RS
Date:	4/23/19
Dwg. No.:	01-20-0212-A50-1d

Figure 50-1d



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (346.92) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16 MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 1 Potentiometric Surface Map August 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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Approved:	RS
Date:	9/21/19
Dwg. No.:	01-20-0212-A50-1e

Figure 50-1e

ZONE 2 POTENTIOMETRIC SURFACE MAPS

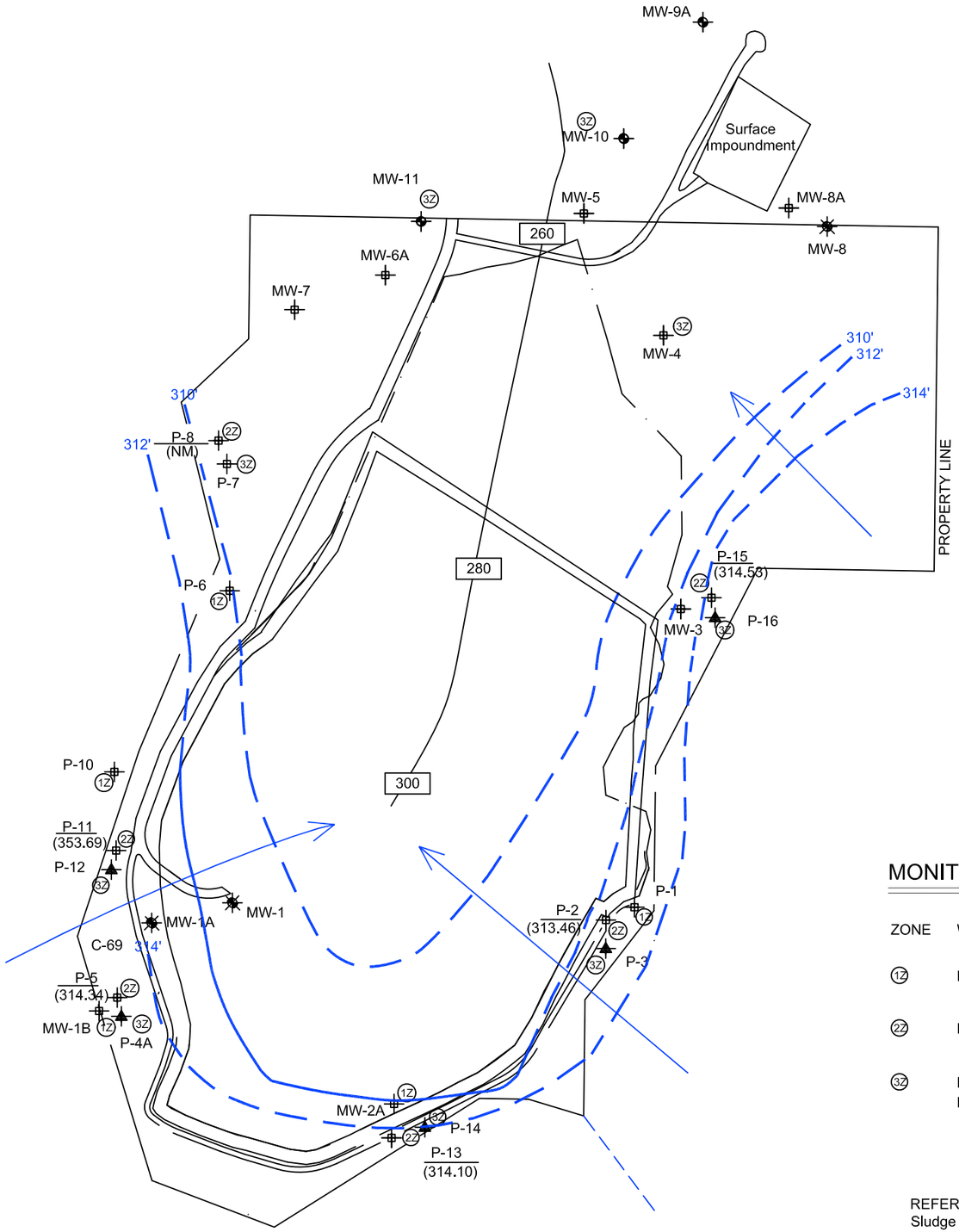
AUGUST 2017

MARCH 2018

JULY 2018

MARCH 2019

AUGUST 2019



Legend

N

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (353.69) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 310' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map August 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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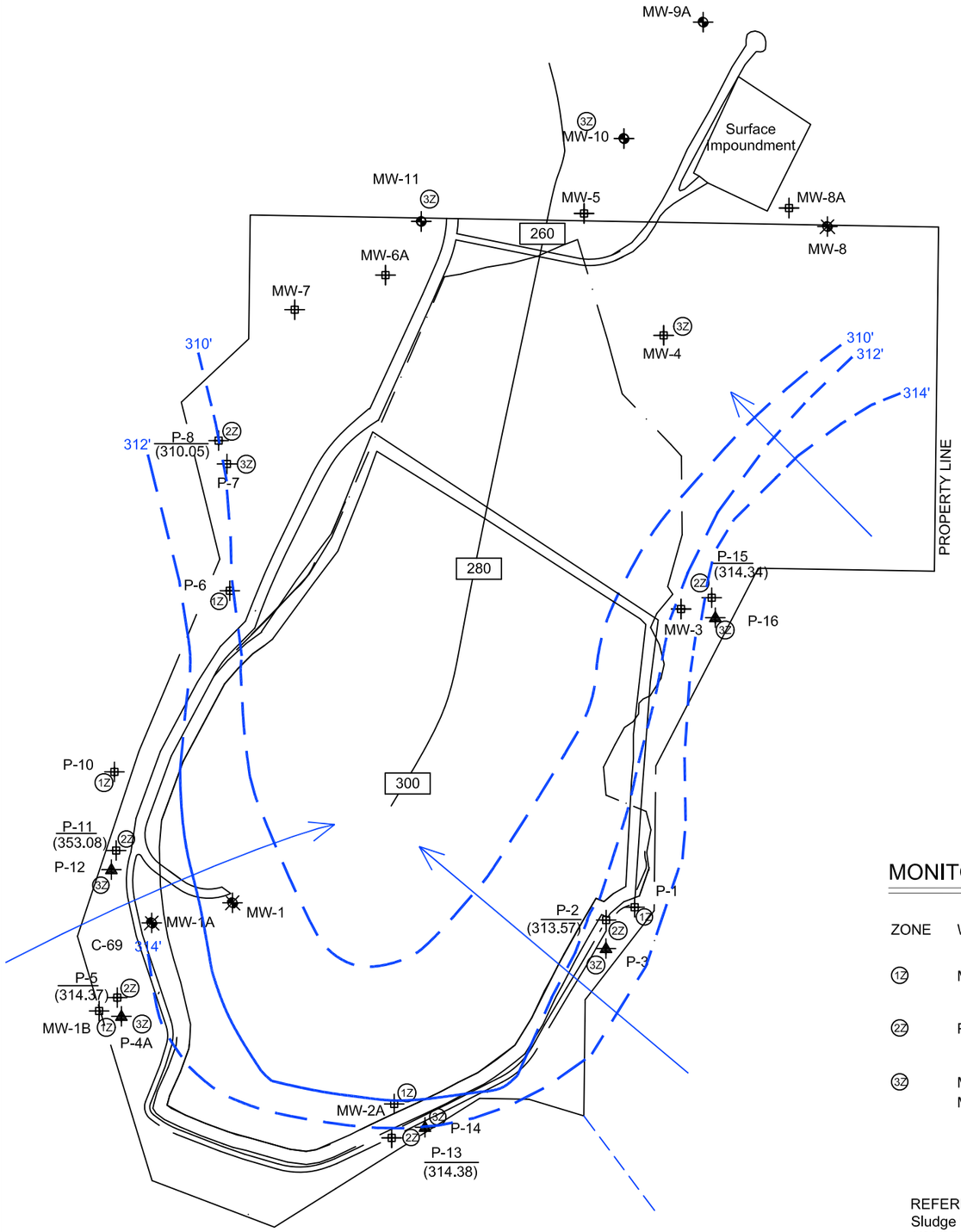
Checked:	ON
Approved:	JM
Date:	9/12/17
Dwg. No.:	01-20-0212-A50-2a

Figure 50-2a



Legend

N

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (314.34) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 310' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map March 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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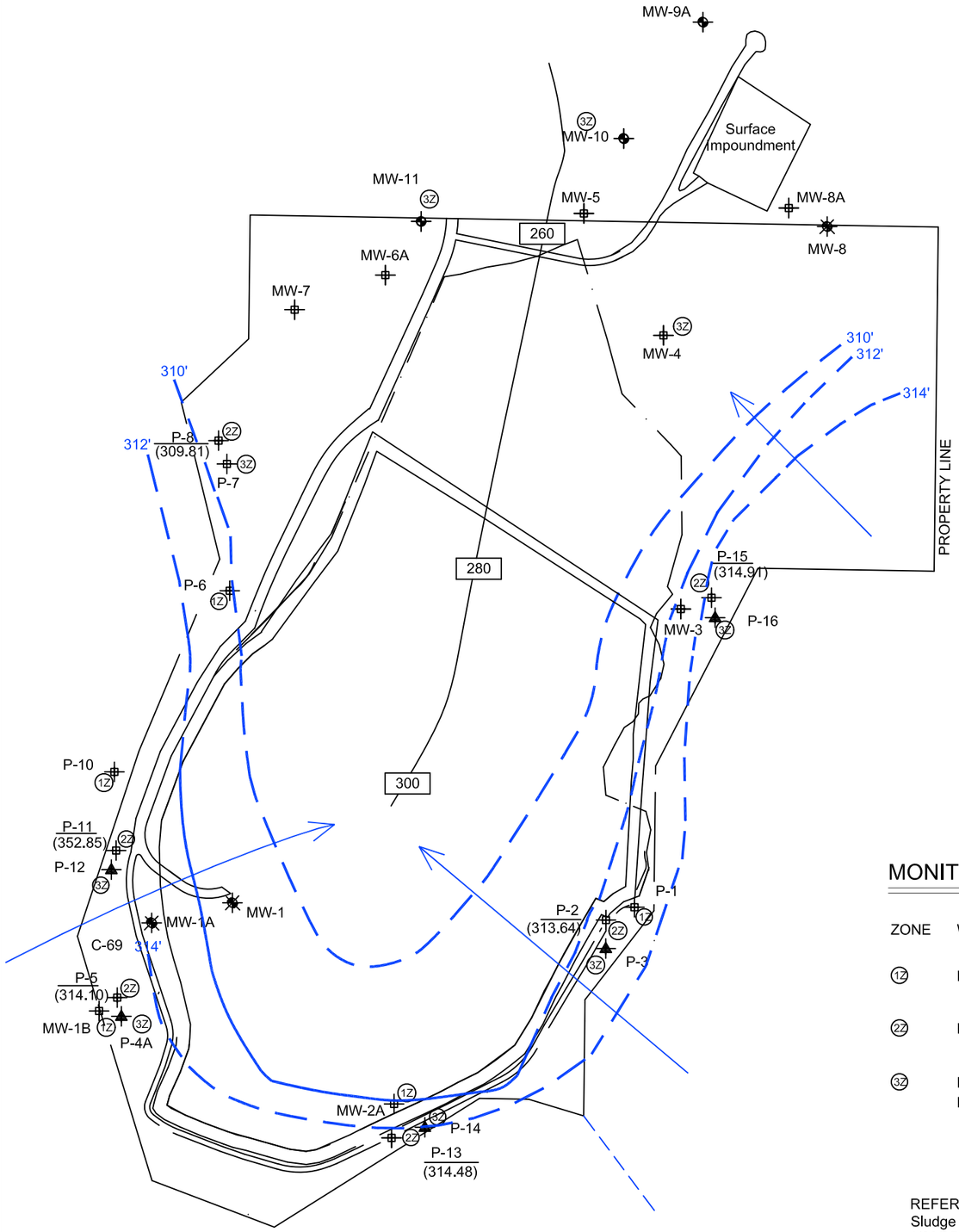
Checked:	ON
Approved:	JM
Date:	3/19/18
Dwg. No.:	01-20-0212-A50-2b

Figure 50-2b



Legend

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (313.64) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 310' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

N

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map July 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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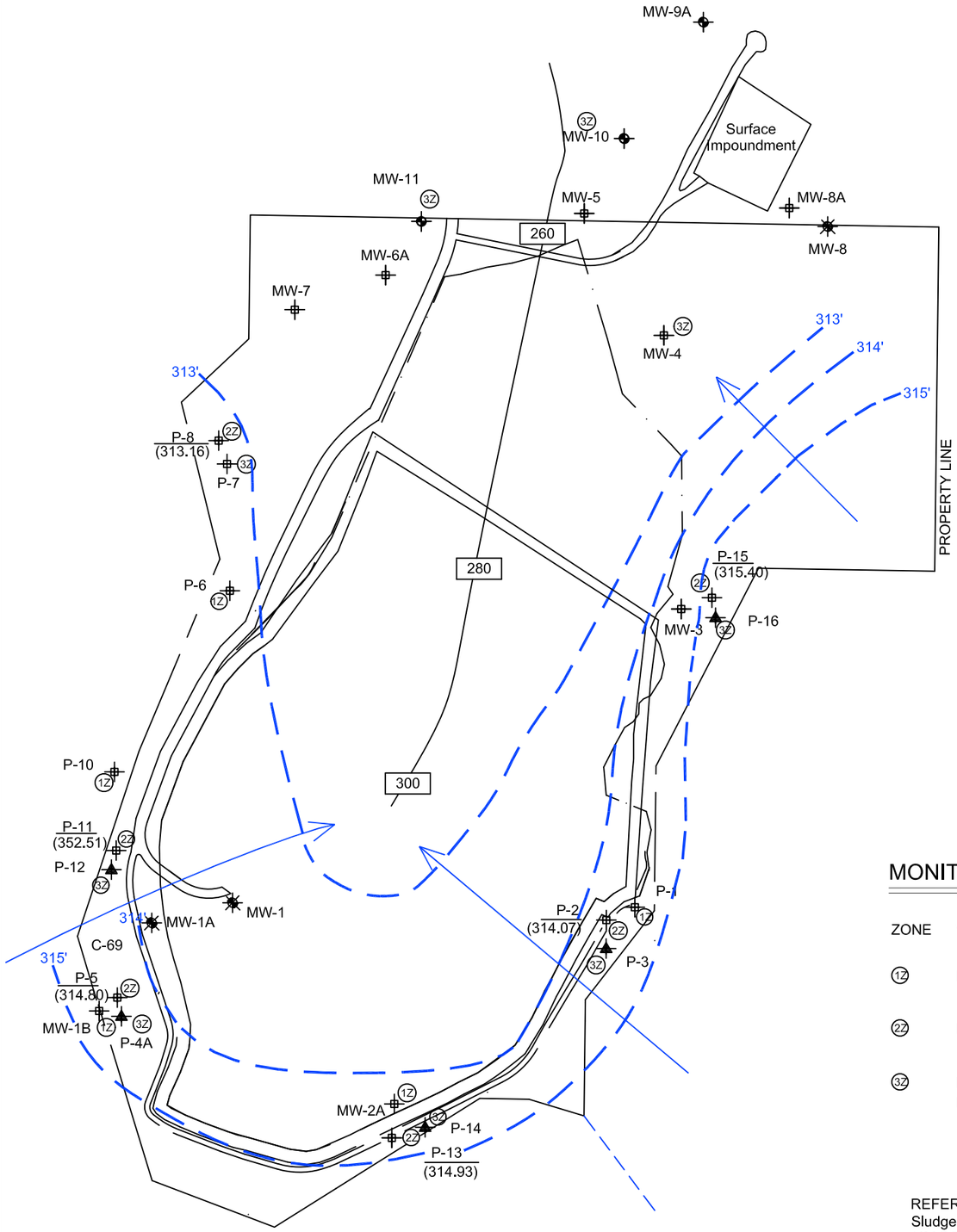
Checked:	ON
Approved:	JM
Date:	8/13/18
Dwg. No.:	01-20-0212-A50-2c

Figure 50-2c



Legend

N

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (314.07) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 315' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map March 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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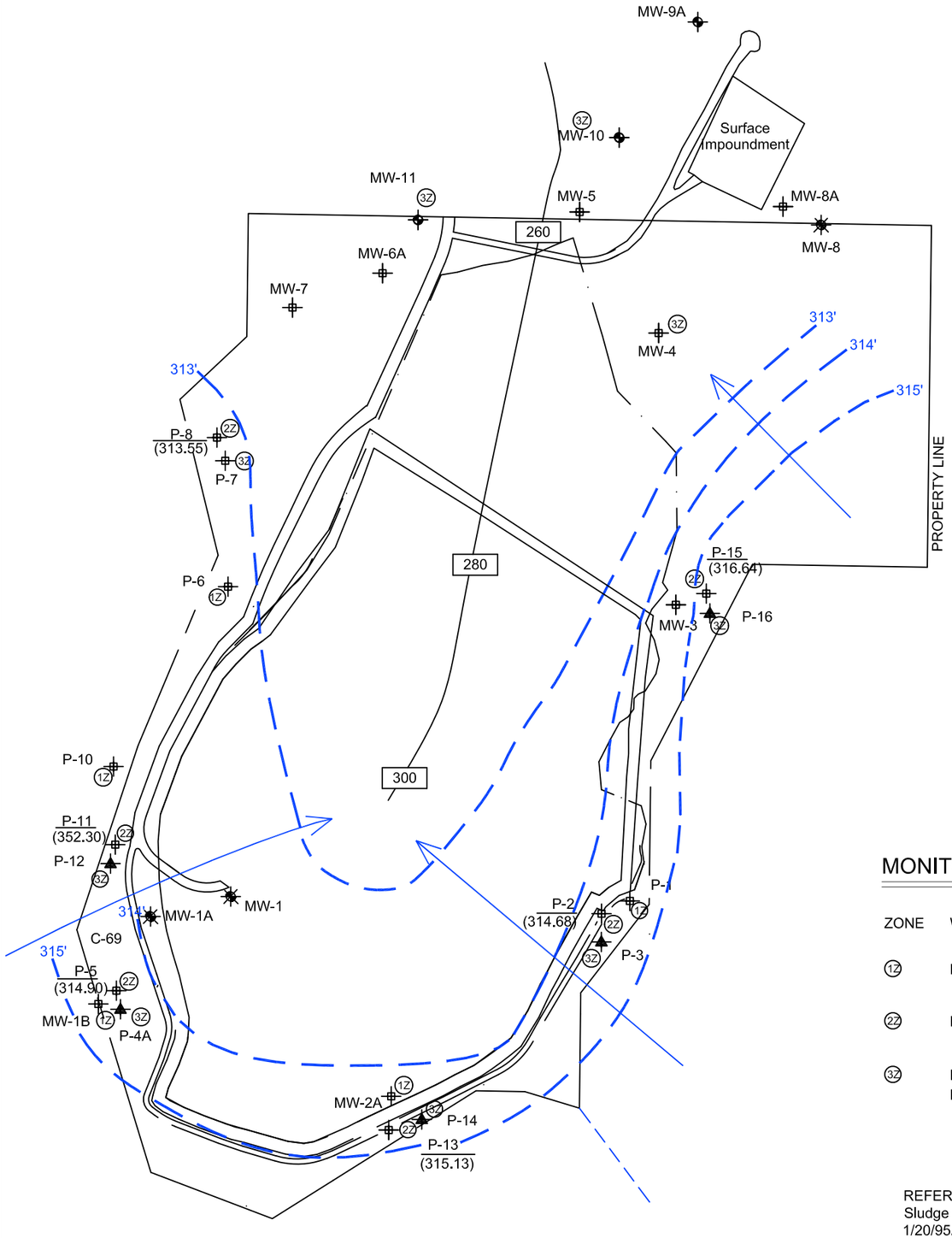
Checked:	ON
Approved:	JM
Date:	4/23/19
Dwg. No.:	01-20-0212-A50-2d

Figure 50-2d



Legend

N

- DOWNGRADIENT MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- BACKGROUND MONITORING WELLS
- PIEZOMETER
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (314.90) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 315' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map August 2019

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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Approved:	JM
Date:	9/23/19
Dwg. No.:	01-20-0212-A50-2e

Figure 50-2e

ZONE 3 POTENTIOMETRIC SURFACE MAPS

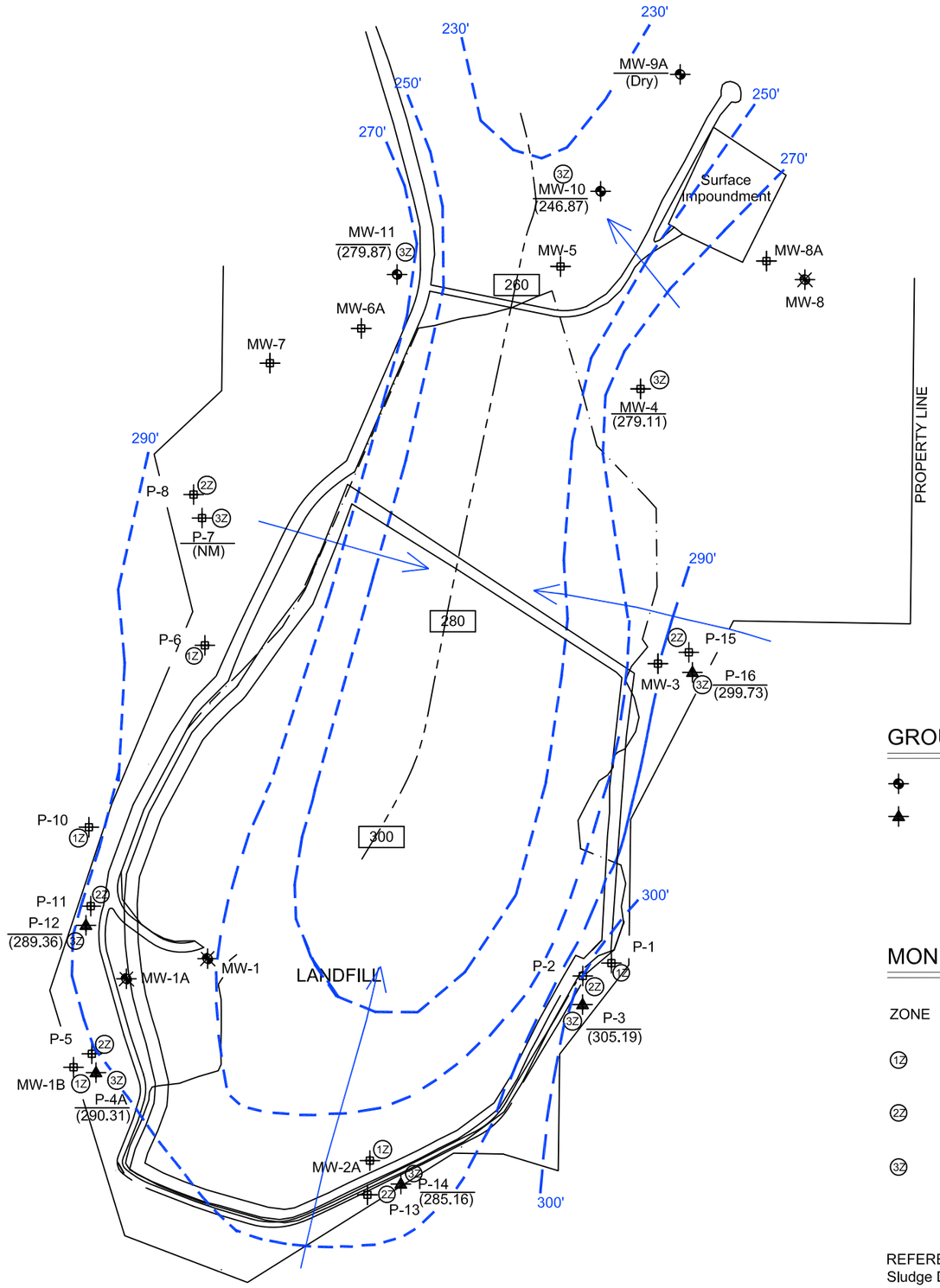
AUGUST 2017

MARCH 2018

JULY 2018

MARCH 2019

AUGUST 2019



N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (305.19) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

⊕	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
August 2017

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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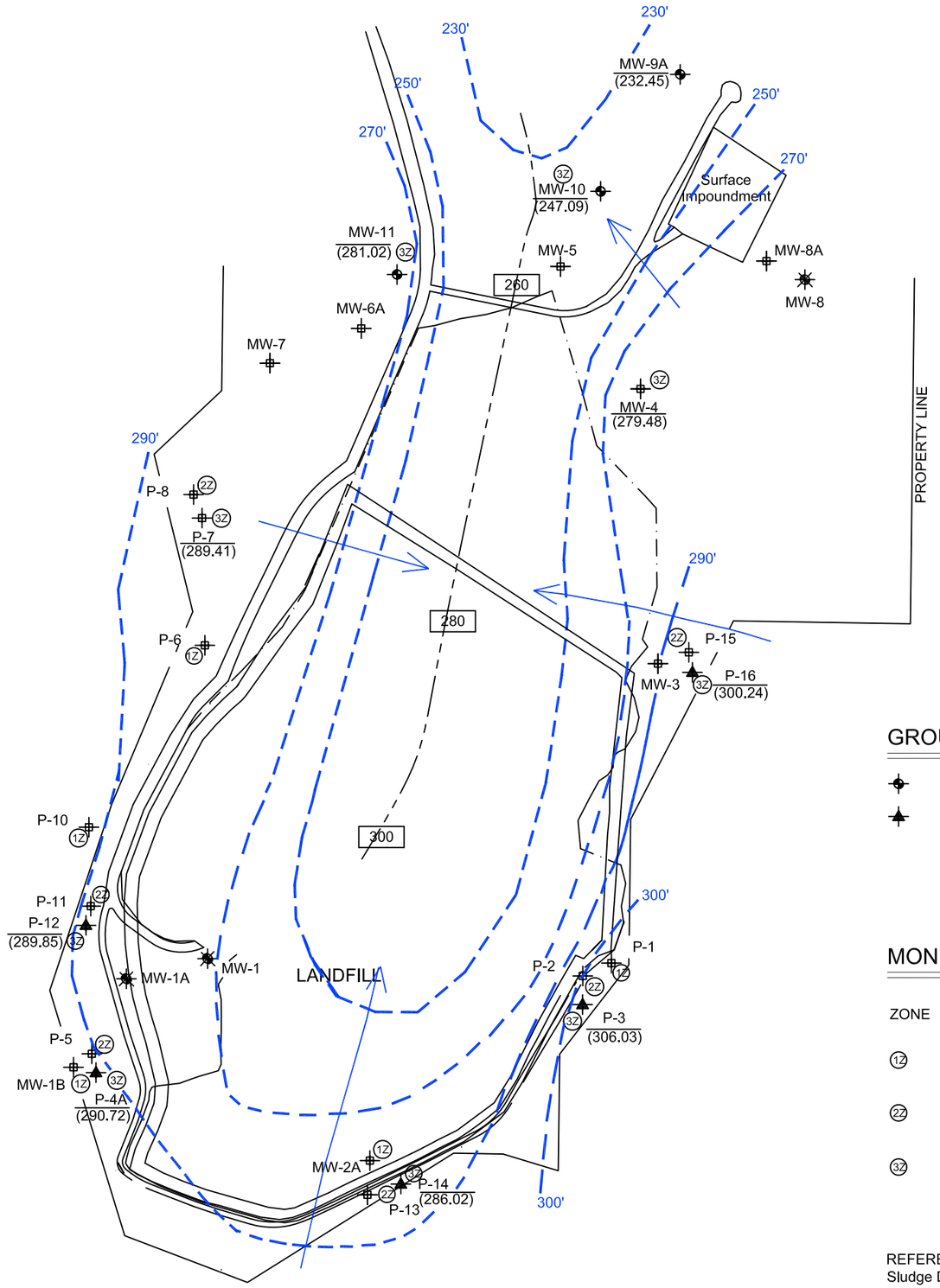
Checked:	ON
Approved:	JM
Date:	9/12/17
Dwg. No.:	01-20-0212-A50-3a

Figure 50-3a



GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
1Z	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
2Z	P-2, P-5, P-8, P-11, P-13, P-15
3Z	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- 1Z ZONE 1 PIEZOMETER
- 2Z ZONE 2 PIEZOMETER
- 3Z ZONE 3 PIEZOMETER
- (279.48) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

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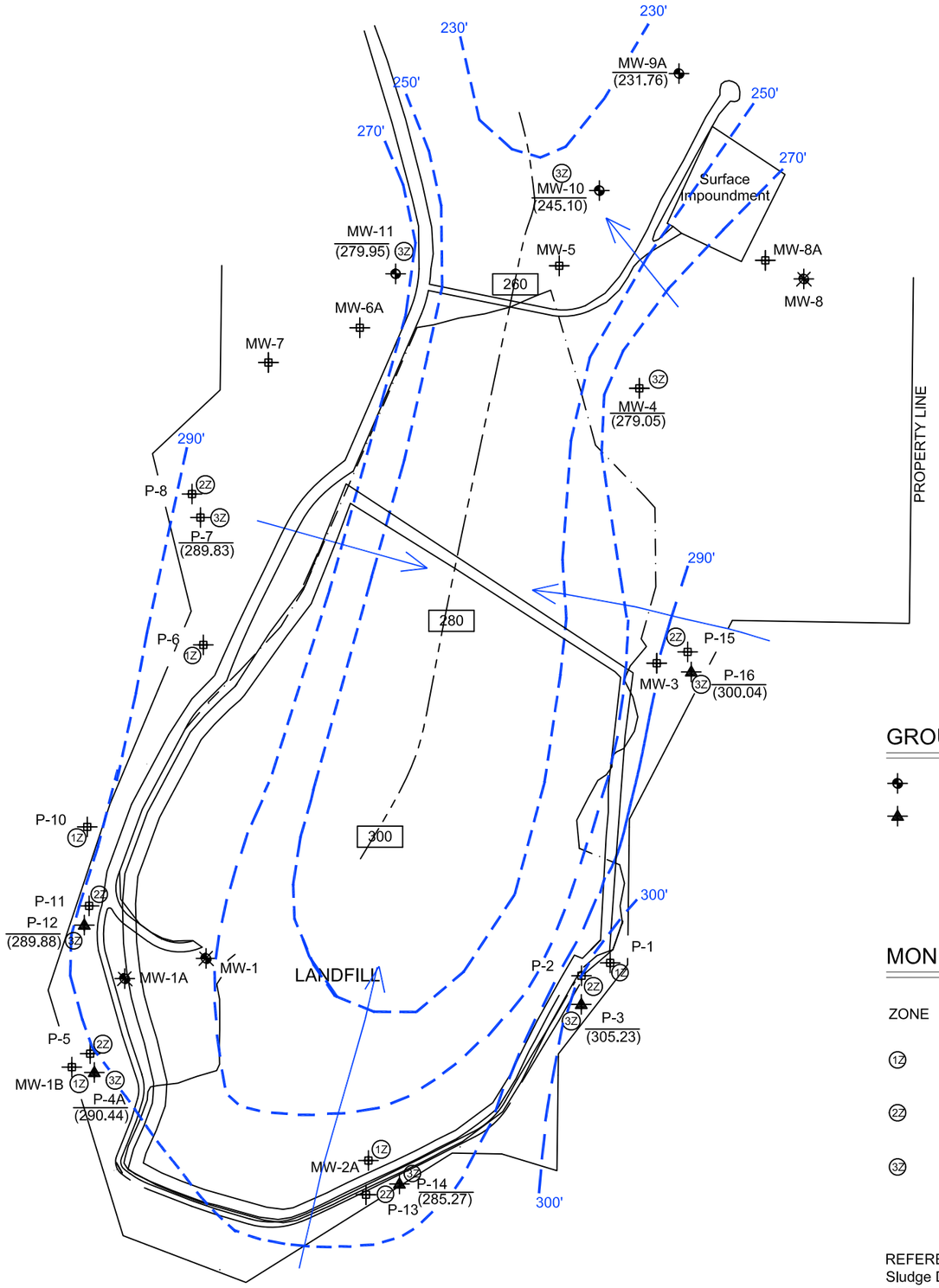
Checked:	ON
Approved:	JM
Date:	3/19/18
Dwg. No.:	01-20-0212-A50-3b

Figure 50-3b



N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (279.95) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

GROUNDWATER MONITORING SYSTEM - ZONE 3

✦	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(1Z)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(2Z)	P-2, P-5, P-8, P-11, P-13, P-15
(3Z)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

CLECO Power LLC

Dolet Hills Power Station

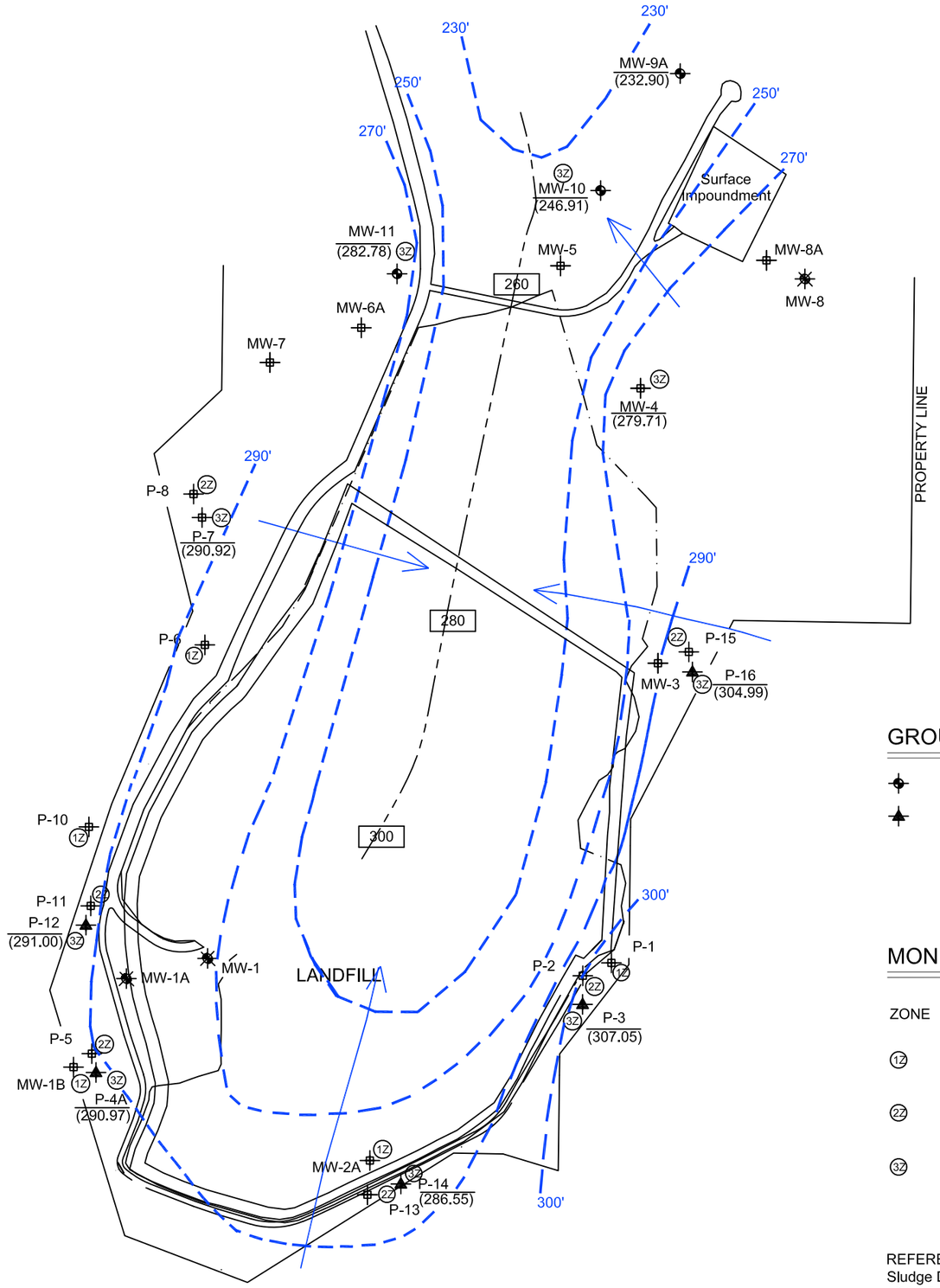
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map July 2018

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	8/13/18
Dwg. No.:	01-20-0212-A50-3c

Figure 50-3c



GROUNDWATER MONITORING SYSTEM - ZONE 3

✦	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
(12)	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
(22)	P-2, P-5, P-8, P-11, P-13, P-15
(32)	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- (1Z) ZONE 1 PIEZOMETER
- (2Z) ZONE 2 PIEZOMETER
- (3Z) ZONE 3 PIEZOMETER
- (279.71) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

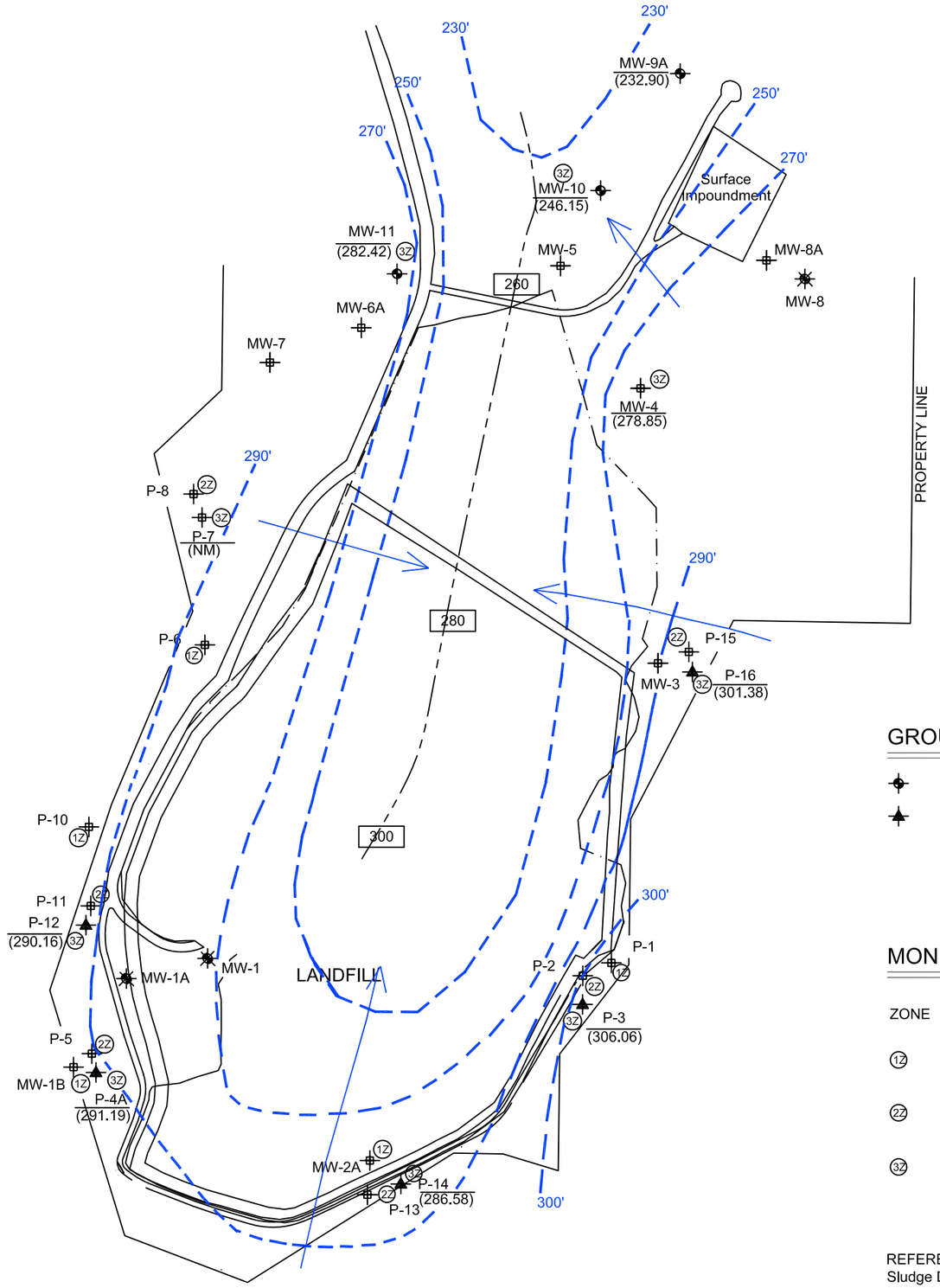
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map March 2019

De Soto Parish, Louisiana

EAGLE ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	4/23/19
Dwg. No.:	01-20-0212-A50-3d

Figure 50-3d



GROUNDWATER MONITORING SYSTEM - ZONE 3

⌖	DOWNGRADIENT / DETECTION	MW-9A, MW-10, MW-11
▲	UPGRADIENT / BACKROUND	P-3, P-4A, P-12, P-14, P-16

MONITORING ZONES / WELLS AND PIEZOMETERS

ZONE	WELL
1Z	MW-1B, MW-2A, MW-3, P-1, P-6, P-10
2Z	P-2, P-5, P-8, P-11, P-13, P-15
3Z	MW-4, P-3, P-4A, P-7, P-12, P-14, P-16, MW-9A, MW-10, MW-11

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95. Updated 2013.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- 1Z ZONE 1 PIEZOMETER
- 2Z ZONE 2 PIEZOMETER
- 3Z ZONE 3 PIEZOMETER
- (278.85) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- NM NOT MEASURED
- 270' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map August 2019

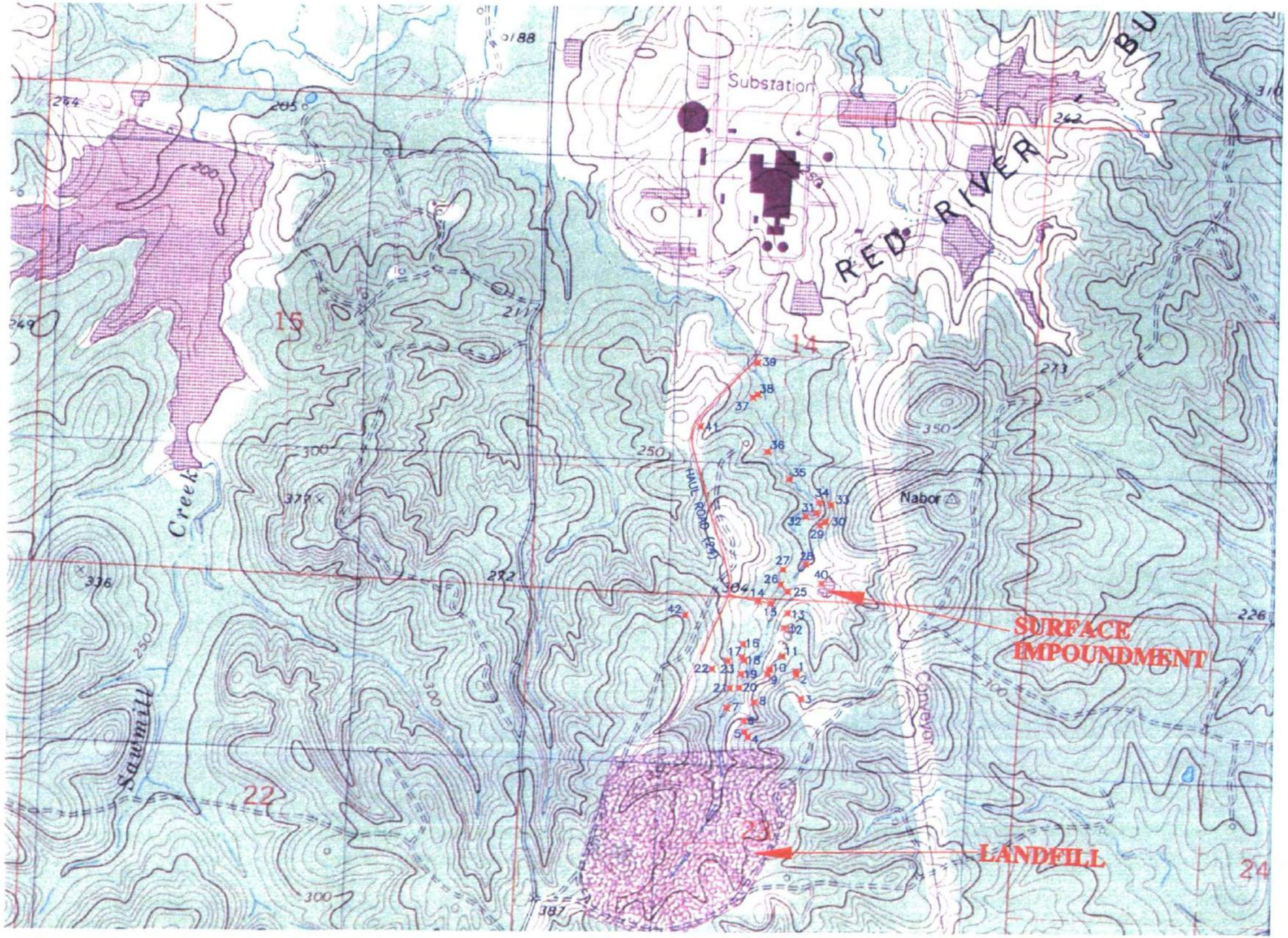
De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	JP
Checked:	ON
Approved:	JM
Date:	9/23/19
Dwg. No.:	01-20-0212-A50-3e

Figure 50-3e

GROUNDWATER SEEPS MAPPING DATA AND PHOTOGRAPHS



STATION	DESCRIPTION / ELEVATION(FT NGVD)
1	SEEP / 320
2	SEEP / 321
3	SEEP / 345
4	SEEP / 330
5	SEEP / 320
6	SEEP / 300
7	BASE OF STREAM / 200
8	BASE OF STREAM / 305
9	SEEP / 295
10	SEEP / 295
11	SEEP / 300
12	SEEP / 285
13	CULVERT LOCATION / --
14	CULVERT LOCATION / --
15	CULVERT LOCATION / --
16	SEEP / 280
17	SEEP / 282
18	SEEP / 283
19	SEEP / 278
20	BASE OF STREAM / 275
21	BORING LOCATION OF 98B-10 / --
22	BORING LOCATION OF 98B-11 / --
23	SEEP / 295
24	HAUL ROAD / --
25	WELL LOCATION, MW-5 / --
26	BASE OF STREAM / 260
27	SEEP / 260
28	DRAINAGE VALVE/SURFACE IMPOUNDMENT / --
29	WELL LOCATION, MW-9 / --
30	SEEP / 260
31	SEEP / 235
32	SEEP / 240
33	SEEP / 270
34	SEEP / 240
35	SEEP / 230
36	BASE OF STREAM / 240
37	BASE OF STREAM / 225
38	CONVERGENCE OF STREAM / 225
39	STREAM UNDER HAUL ROAD / 220
40	SURFACE IMPOUNDMENT / --
41	WELL LOCATION, W-27 / --
42	SEEP / 340

NOTE: MODIFIED FROM USGS 7.5 MINUTE QUADRANGLE, "BAYOU PIERRE LAKE, LA" 1992.

1200 0 1200

SCALE: 1" = 1200'

CLECO CORPORATION
DOLET HILLS POWER STATION

FLY ASH/SCRUBBER SLUDGE LANDFILL

GROUNDWATER SEEP MAPPING

DESOTO PARISH

E·A·G·L·E

Drawn:	JLP
Checked:	RS
Approved:	KDS
Date:	2/11/99
Dwg. No.:	801-0001-91
FIGURE:	

Photo 1 – Outcrop of Zone 2

Groundwater seep in outcrop area of Zone 2. Soils consist of tan, silty, very fine grained sand. Saturated soils evident in outcrop from groundwater seepage. Field scientist with Trimble differential GPS for scale.

E·A·G·L·E
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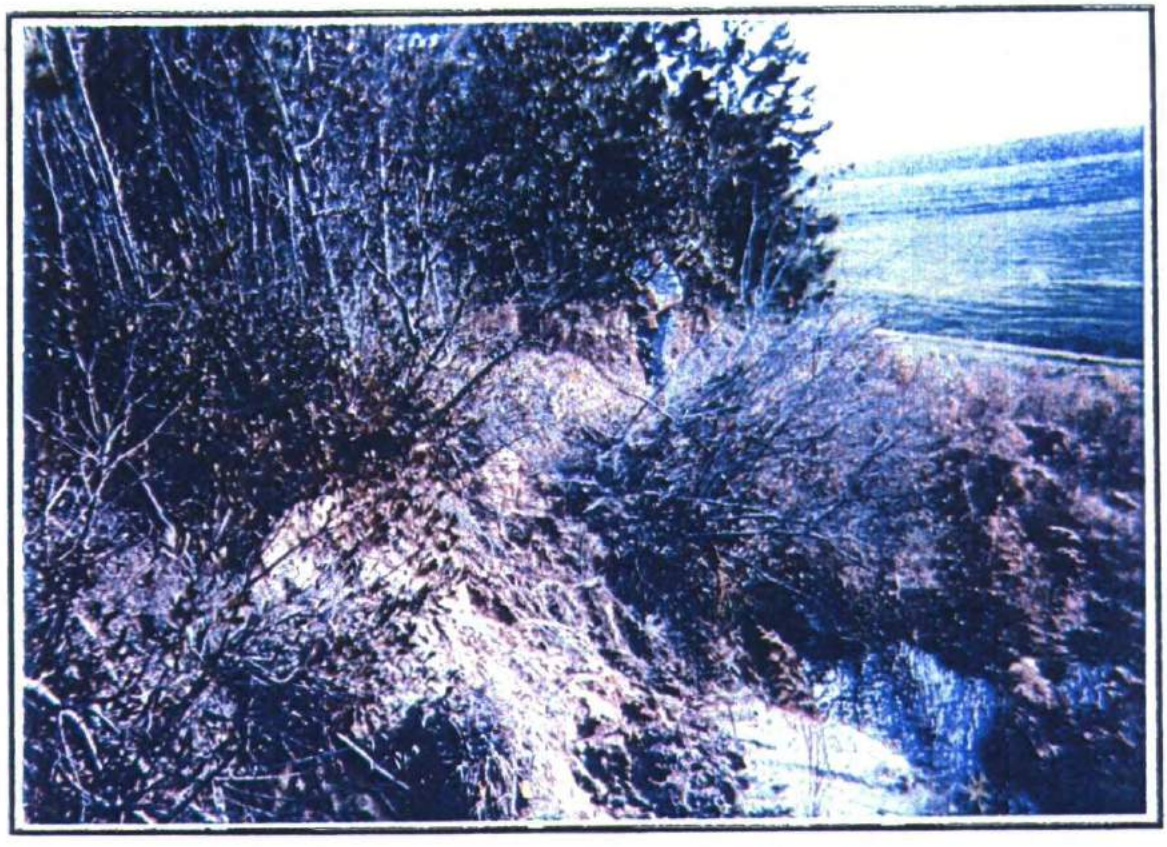
Photo 2 – Outcrop of Zone 2

Groundwater seep in outcrop area of Zone 2. Soils consist of tan, silty, very fine grained sand. Soils were saturated from groundwater seepage.

E·A·G·L·E
ENVIRONMENTAL SERVICES INC

Photo 3 – Outcrop of Zone 2



Groundwater seep in outcrop area of Zone 2 Groundwater pooled up in this area. Small wax myrtle growing in vicinity.

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Photo 4 – Outcrop of Zone 3

Groundwater seep in outcrop area of Zone 3 Groundwater pooled up in this area. Small wax myrtle and some willow growing in vicinity.

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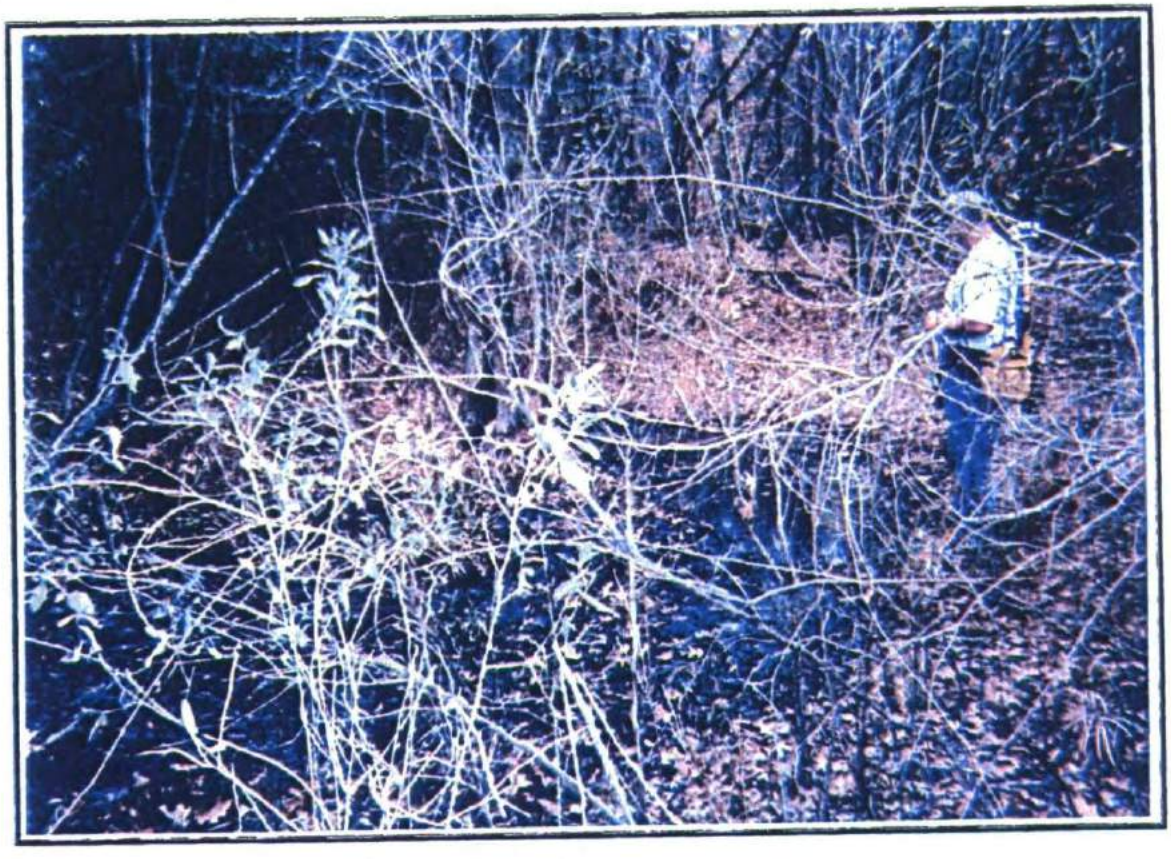
ENVIRONMENTAL SERVICES INC

Photo 5 – Outcrop of Zone 3



Groundwater seep in outcrop area of Zone 3 Groundwater pooled up in this area. Small wax myrtle growing in vicinity.

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Photo 6 – Outcrop of Zone 4 and Porters Creek Clay

Groundwater seep in outcrop area of Zone 4 and Porters Creek clay. Soils of Zone 4 consist of tan, silty, very fine-grained clayey sand and sandy clay overlying gray to dark gray clay. Saturated soils evident in outcrop from groundwater seepage.

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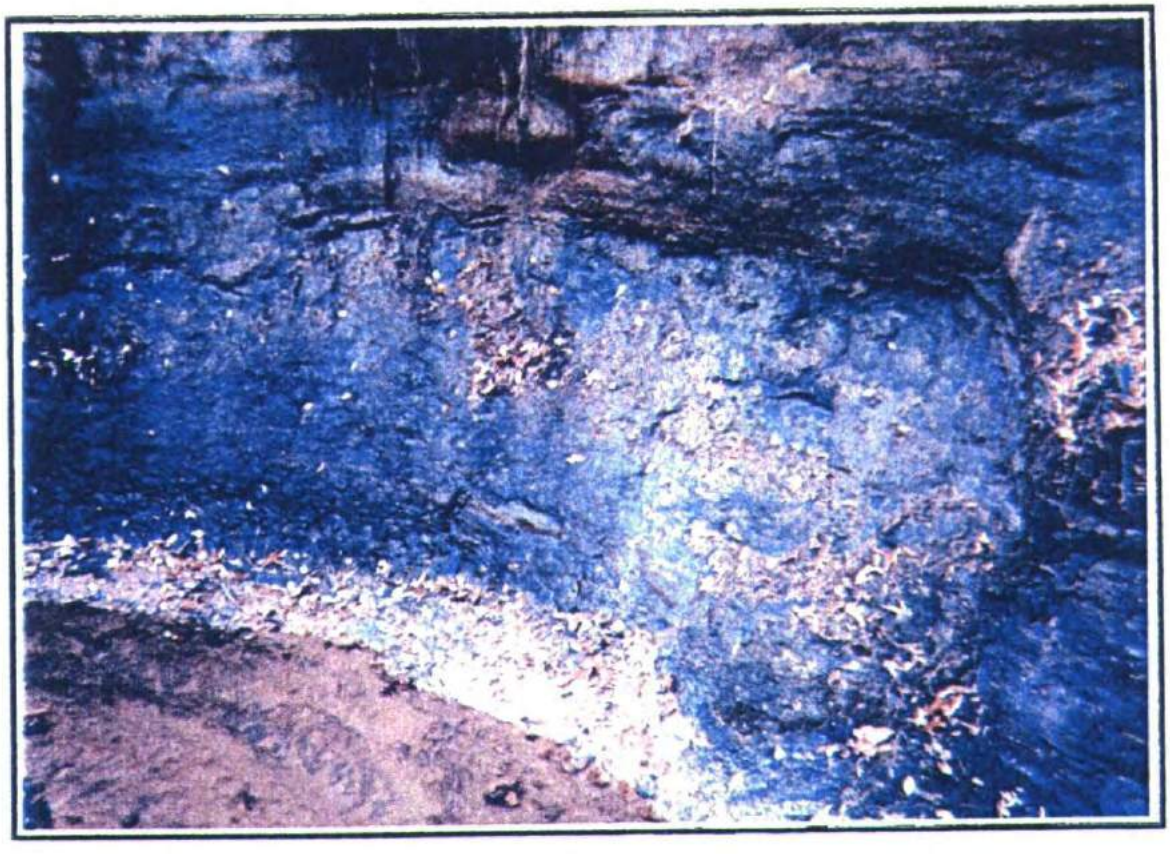
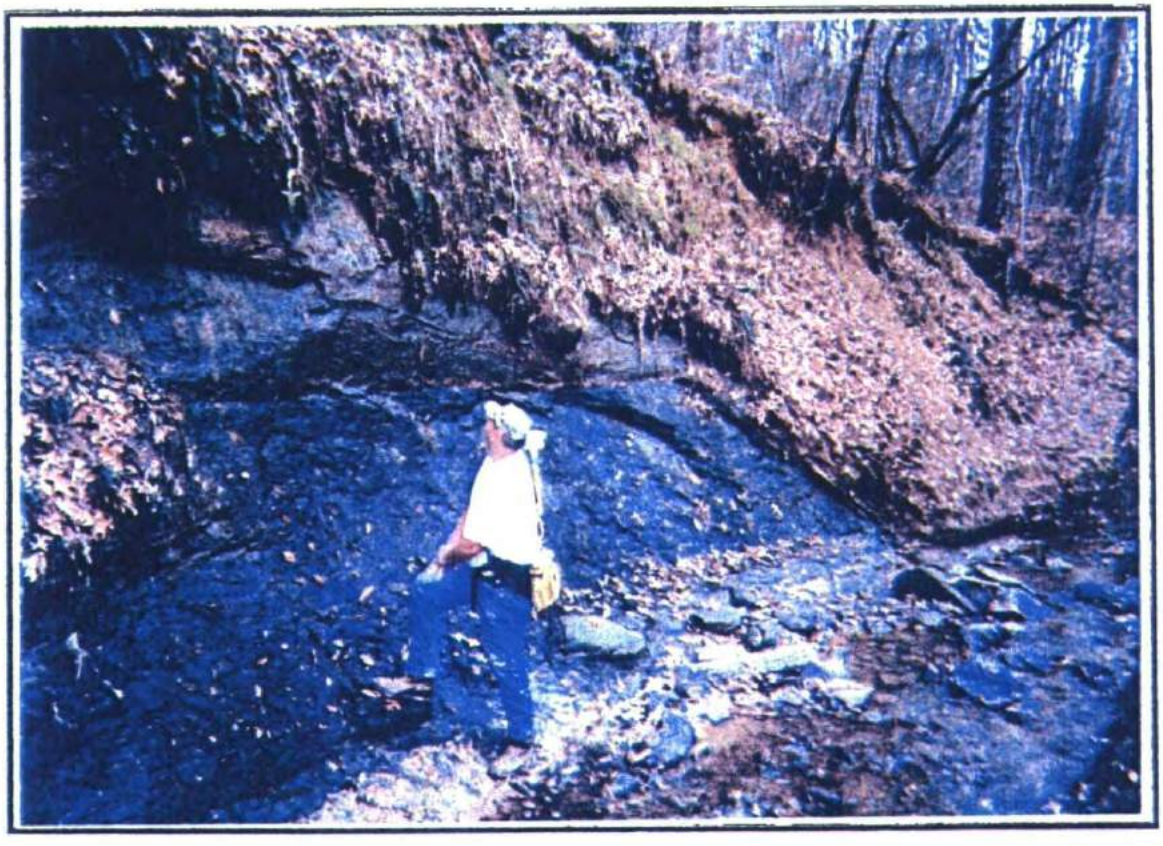
Photo 7 – Outcrop of Zone 4 and Porters Creek Clay



Groundwater seep in outcrop area of Zone 4 and clay of the Porters Creek formation. Soils of Zone 4 consist of tan, silty, very fine-grained clayey sand and sandy clay overlying gray to dark gray clay. Saturated soils evident in outcrop from groundwater seepage. Large siderite cemented sandstone concretion evident in outcrop in transition zone between Naborton formation and Porters Creek formation.

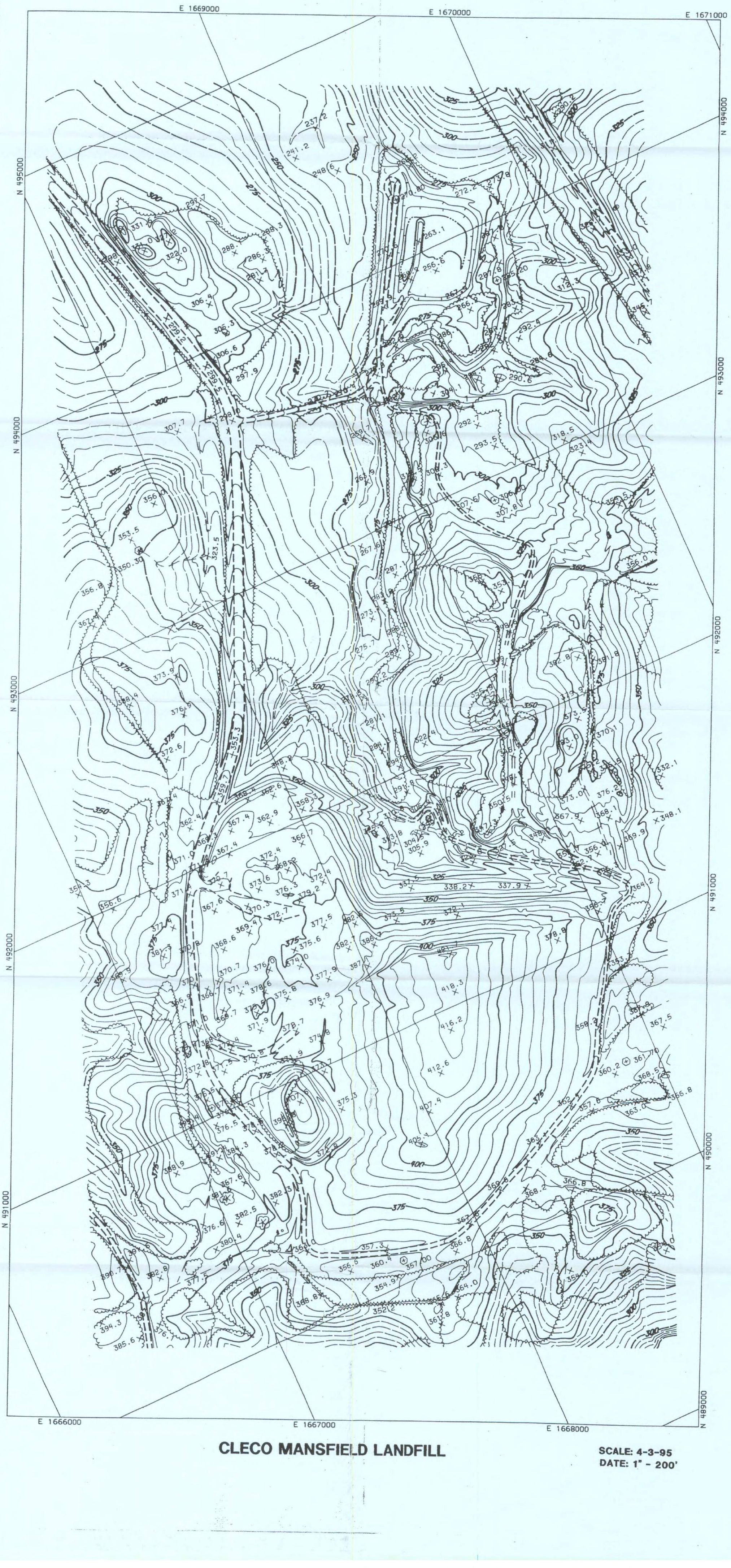
E·A·G·L·E
ENVIRONMENTAL SERVICES, INC

Photo 8 – Outcrop of Zone 4 and Porters Creek Clay



Groundwater seep in outcrop area of Zone 4 and clay of the Porters Creek formation. Soils of Zone 4 consist of tan, silty, very fine-grained clayey sand and sandy clay overlying gray to dark gray clay. Saturated soils evident in outcrop from groundwater seepage. Field scientist with Trimble differential GPS for scale.

E·A·G·L·E
ENVIRONMENTAL SERVICES INC



CLECO MANSFIELD LANDFILL

SCALE: 4-3-95
DATE: 1" - 200'

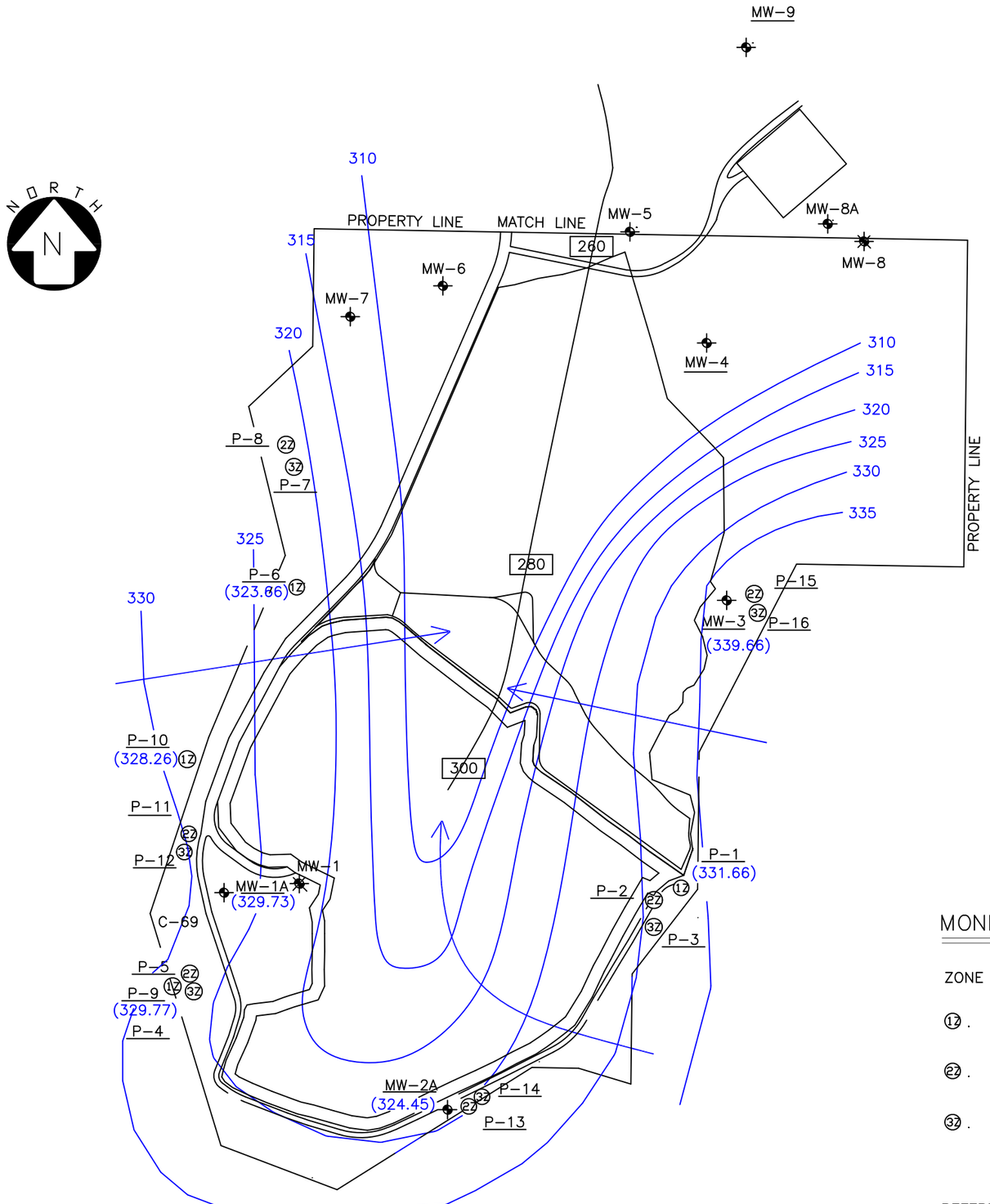
ZONE 1 POTENTIOMETRIC SURFACE MAPS

JULY 1997

OCTOBER 1997

JANUARY 1998

APRIL 2009



LEGEND

- ∘ SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (339.66) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 330 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

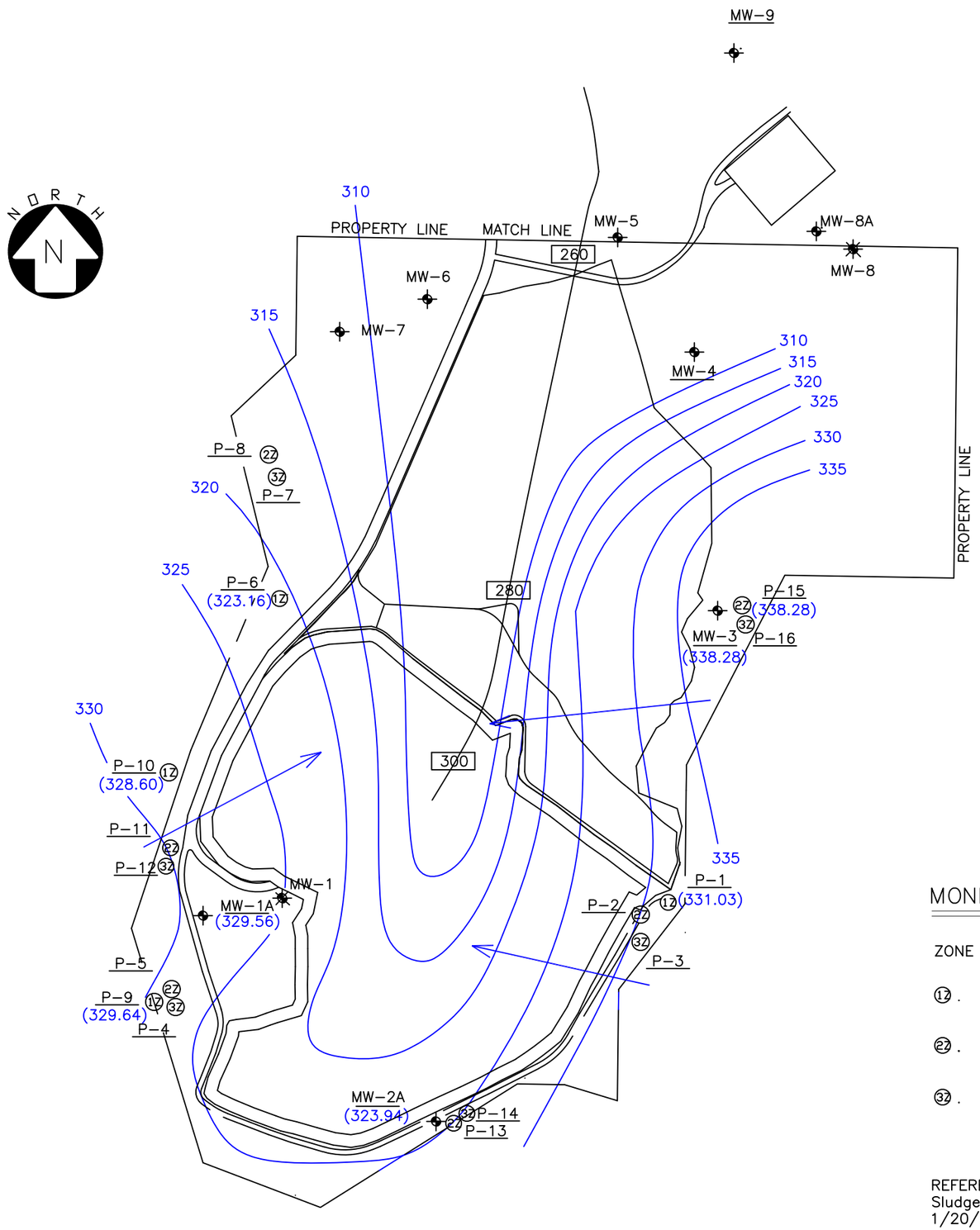
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
July 18, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-4a

Figure 50-4a



LEGEND

- • SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (17) . ZONE 1 PIEZOMETER
- (27) . ZONE 2 PIEZOMETER
- (32) . ZONE 3 PIEZOMETER
- (338.28) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 330 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(17) .	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27) .	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32) .	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500
SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

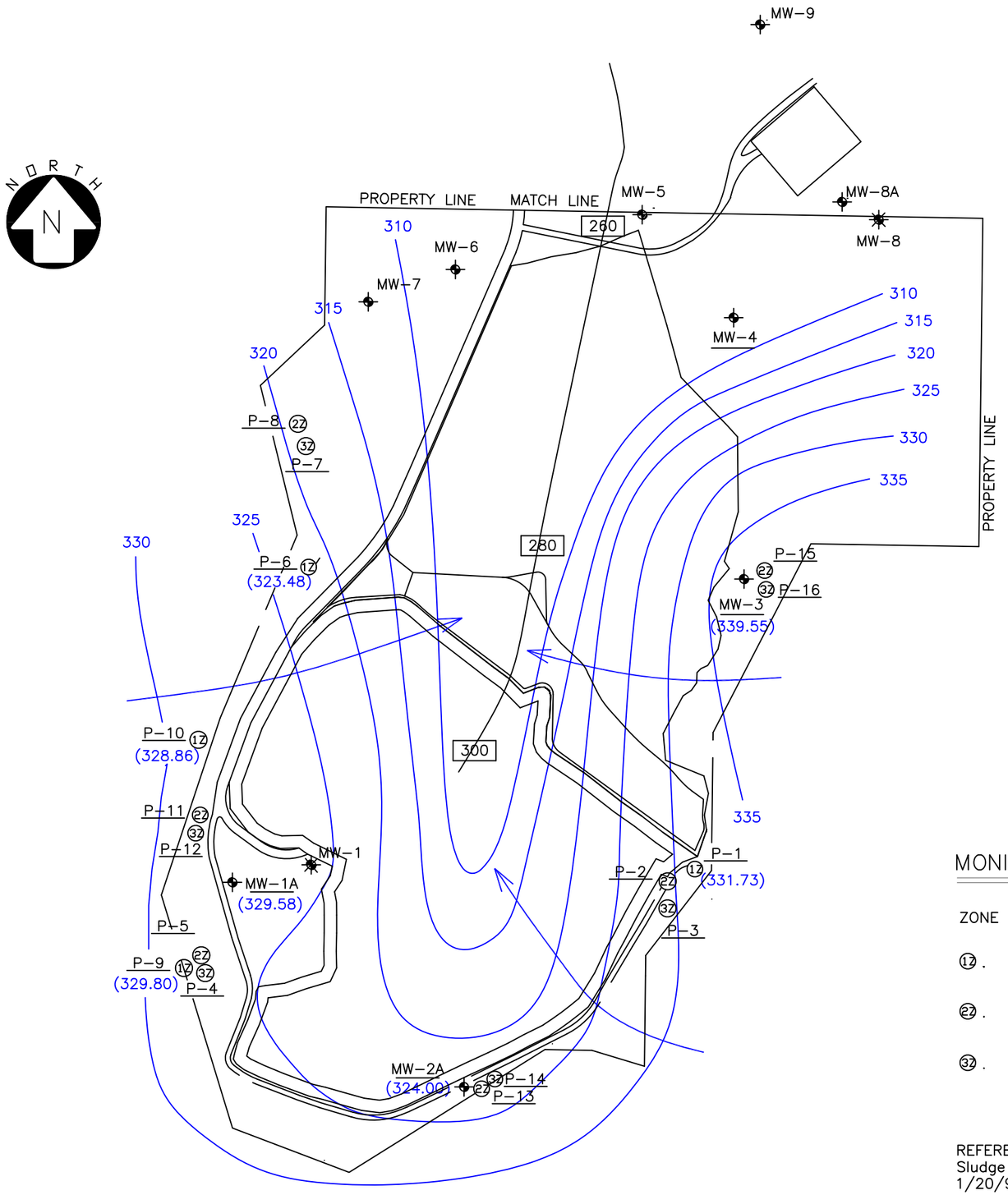
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
October 28, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-4b

Figure 50-4b



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (27). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (331.7) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 330 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500
SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

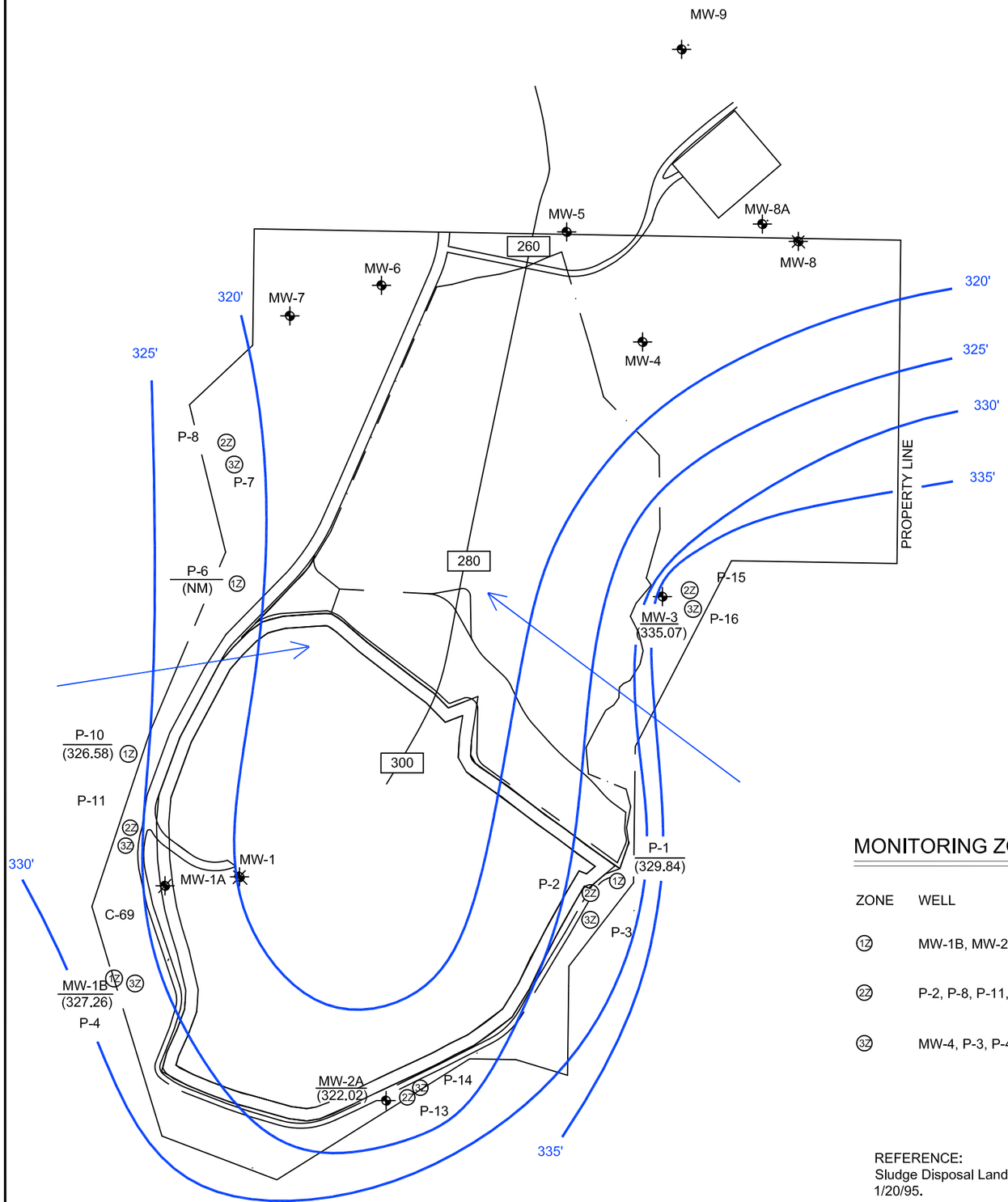
Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
January 20, 1998

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-4c

Figure 50-4c



MONITORING ZONES

ZONE	WELL
1Z	MW-1B, MW-2A, P-1, P-6, P-10
2Z	P-2, P-8, P-11, P-13, P-15
3Z	MW-4, P-3, P-4, P-7, P-12, P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- 1Z ZONE 1 PIEZOMETER
- 2Z ZONE 2 PIEZOMETER
- 3Z ZONE 3 PIEZOMETER
- (335.07) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 330' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Zone 1 Potentiometric Surface Map
April 30, 2009

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	jbh/jlp
Checked:	JM
Approved:	RS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-4d

Figure 50-4d

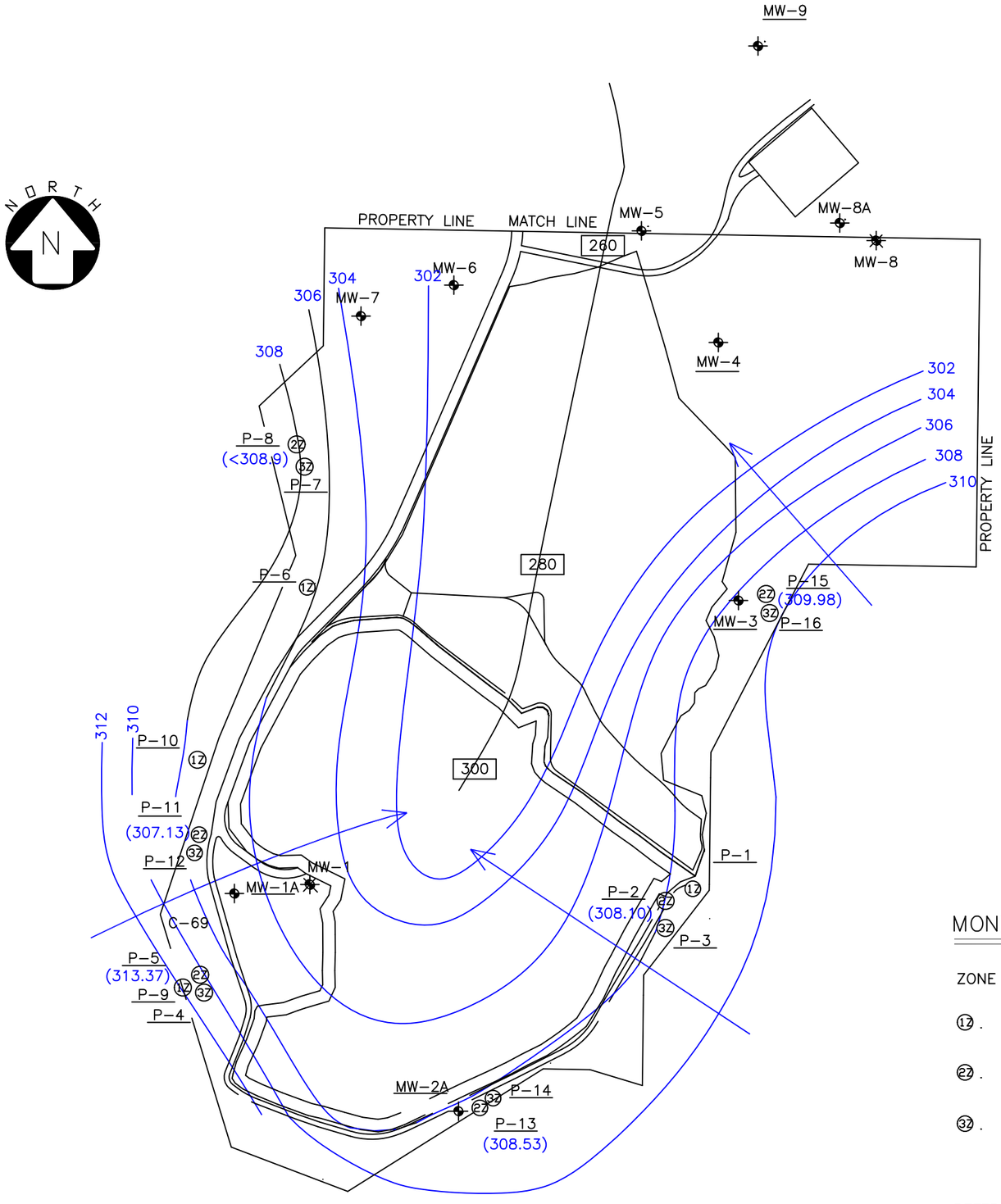
ZONE 2 POTENTIOMETRIC SURFACE MAPS

JULY 1997

OCTOBER 1997

JANUARY 1998

APRIL 2009



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (309.98) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 310 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

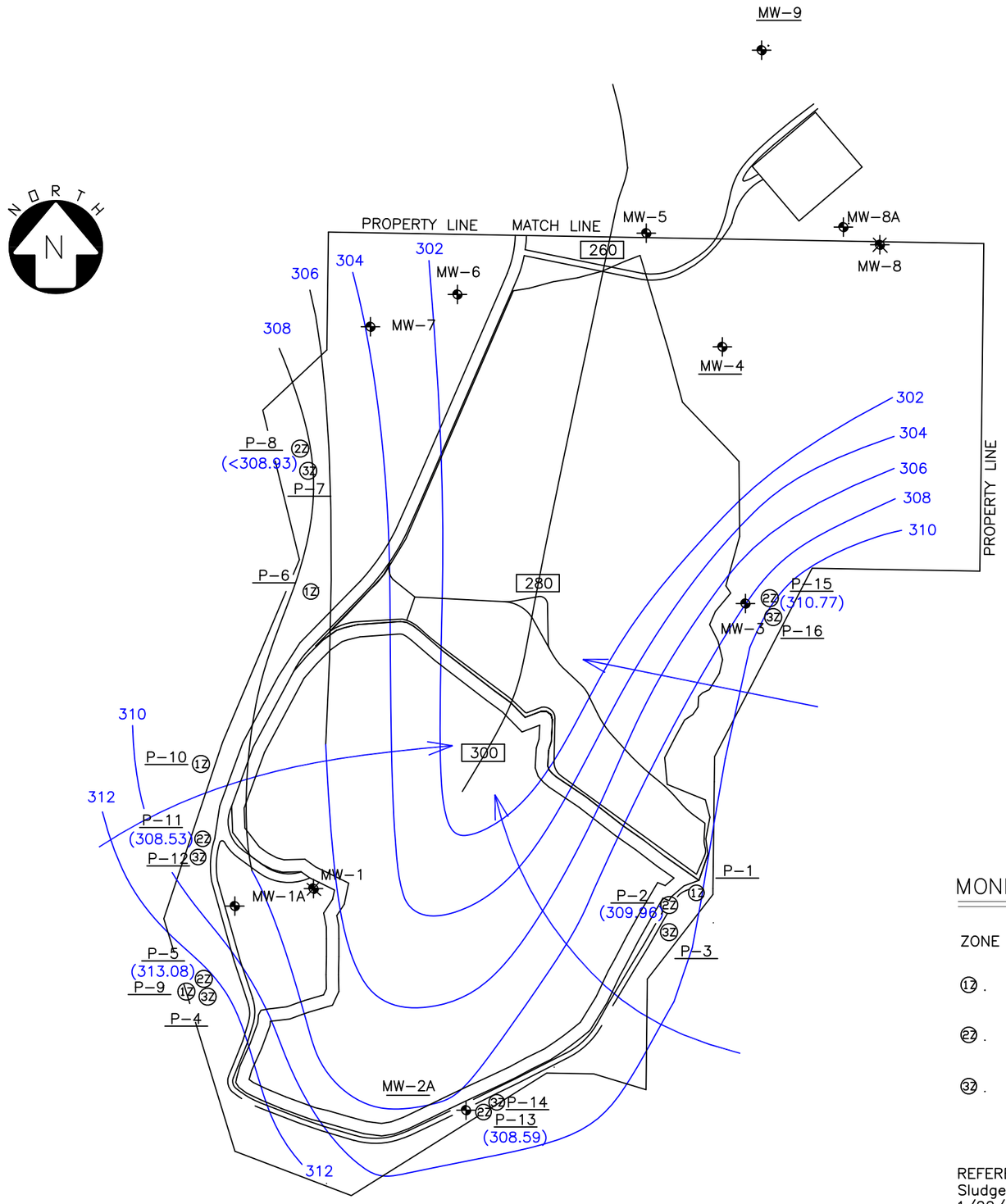
Fly Ash / Scrubber Sludge Landfill
Zone 2 Potentiometric Surface Map
July 18, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-5a

Figure 50-5a



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (310.77) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 310 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

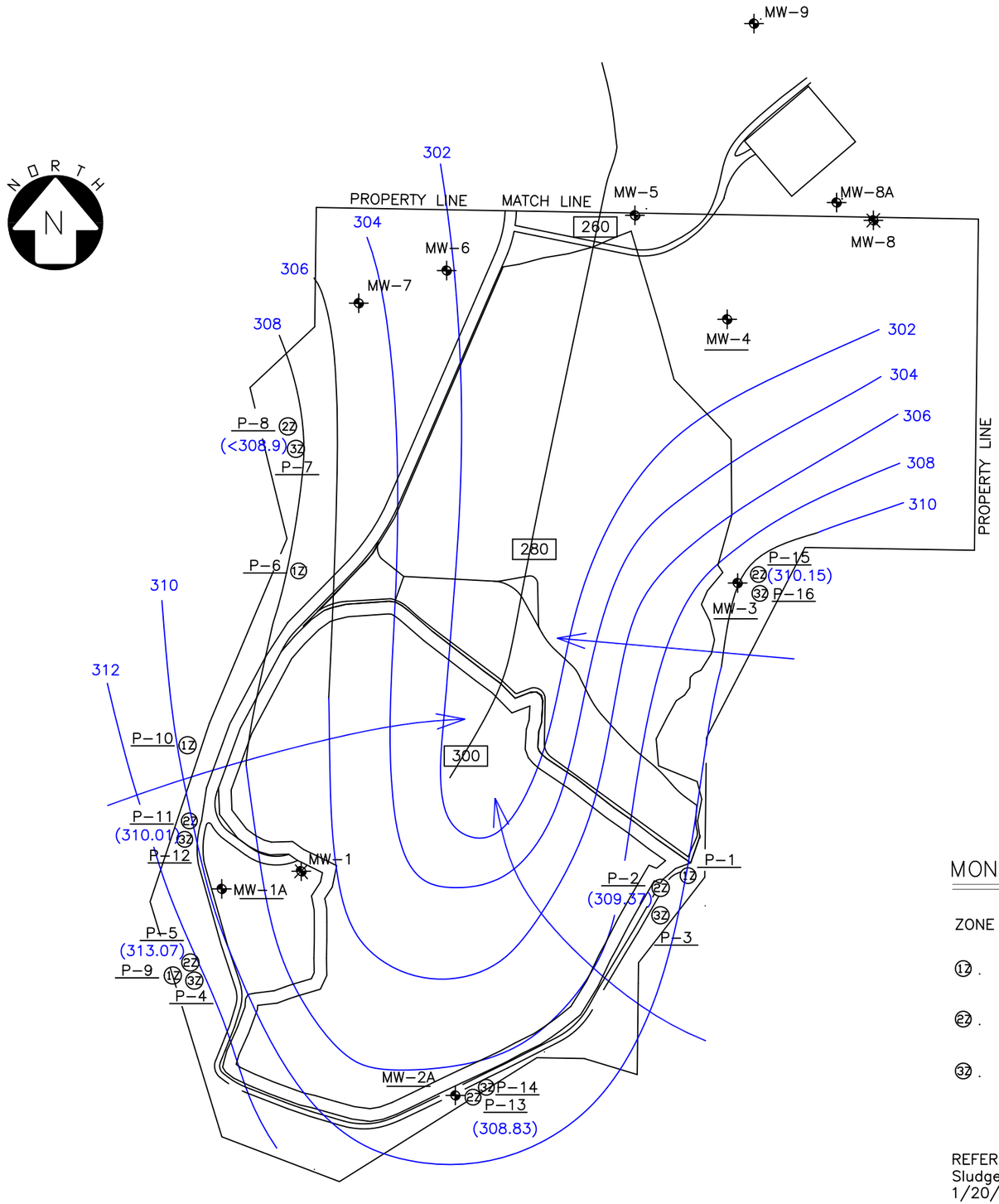
Fly Ash / Scrubber Sludge Landfill
Zone 2 Potentiometric Surface Map
October 28, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-5b

Figure 50-5b



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12) ZONE 1 PIEZOMETER
- (22) ZONE 2 PIEZOMETER
- (32) ZONE 3 PIEZOMETER
- (309.37) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 310 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- [260] [280] [300] INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12)	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

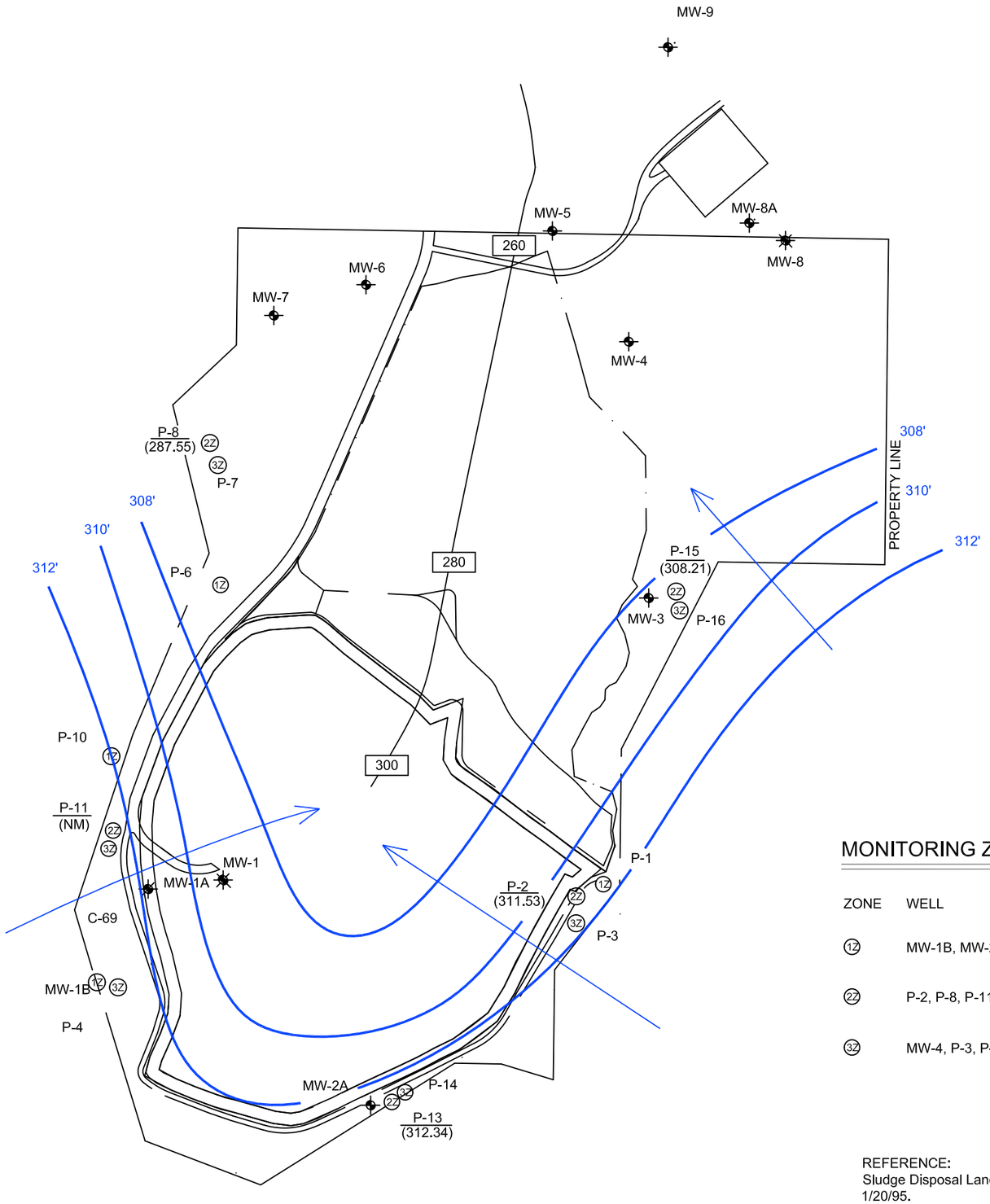
Fly Ash / Scrubber Sludge Landfill
Zone 2 Potentiometric Surface Map
January 20, 1998

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-5c

Figure 50-5c



MONITORING ZONES

ZONE	WELL
1Z	MW-1B, MW-2A, P-1, P-6, P-10
2Z	P-2, P-8, P-11, P-13, P-15
3Z	MW-4, P-3, P-4, P-7, P-12, P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- 1Z ZONE 1 PIEZOMETER
- 2Z ZONE 2 PIEZOMETER
- 3Z ZONE 3 PIEZOMETER
- (308.21) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 310' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill Zone 2 Potentiometric Surface Map April 30, 2009

De Soto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	jbh/jlp
Checked:	JM
Approved:	RS
Date:	05/24/10
Dwg. No.:	01-20-0212-A50-5d

Figure 50-5d

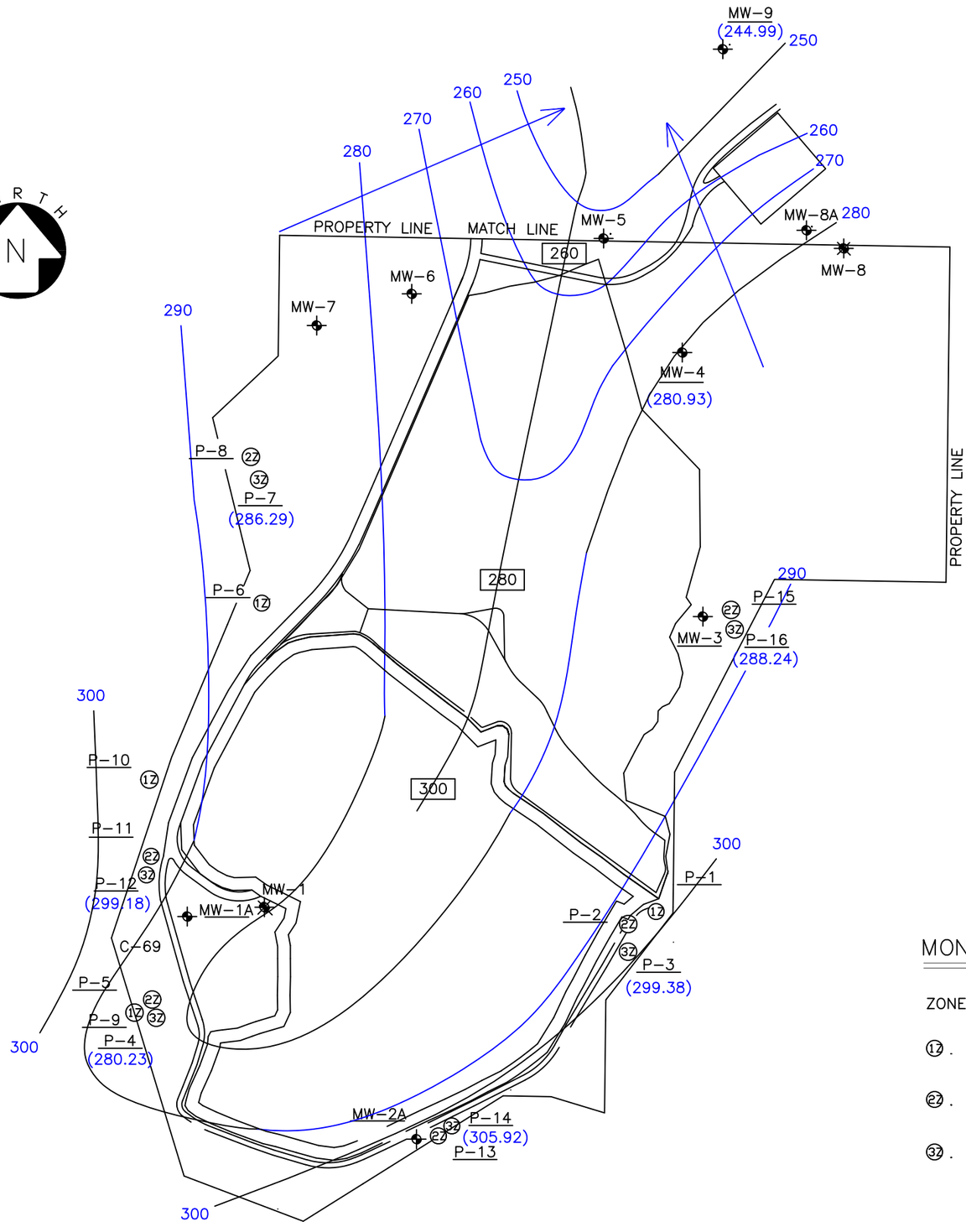
ZONE 3 POTENTIOMETRIC SURFACE MAPS

JULY 1997

OCTOBER 1997

JANUARY 1998

APRIL 2009



LEGEND

- ∘ SOIL BORING LOCATION PRIOR TO 3/95
- ⌖ EXISTING MONITOR WELLS
- ✸ PLUGGED AND ABANDONED MONITOR WELLS
- ——— LIMITS OF FUTURE DEVELOPMENT
- ——— LIMITS OF STORAGE AREA CELL #7
- ⑫ . ZONE 1 PIEZOMETER
- ㉗ . ZONE 2 PIEZOMETER
- ㉜ . ZONE 3 PIEZOMETER
- (288.24) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 300 ——— POTENTIOMETRIC SURFACE CONTOUR
- ←——— INFERRED GROUNDWATER FLOW DIRECTION
- ——— INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
⑫ .	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
㉗ .	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
㉜ .	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

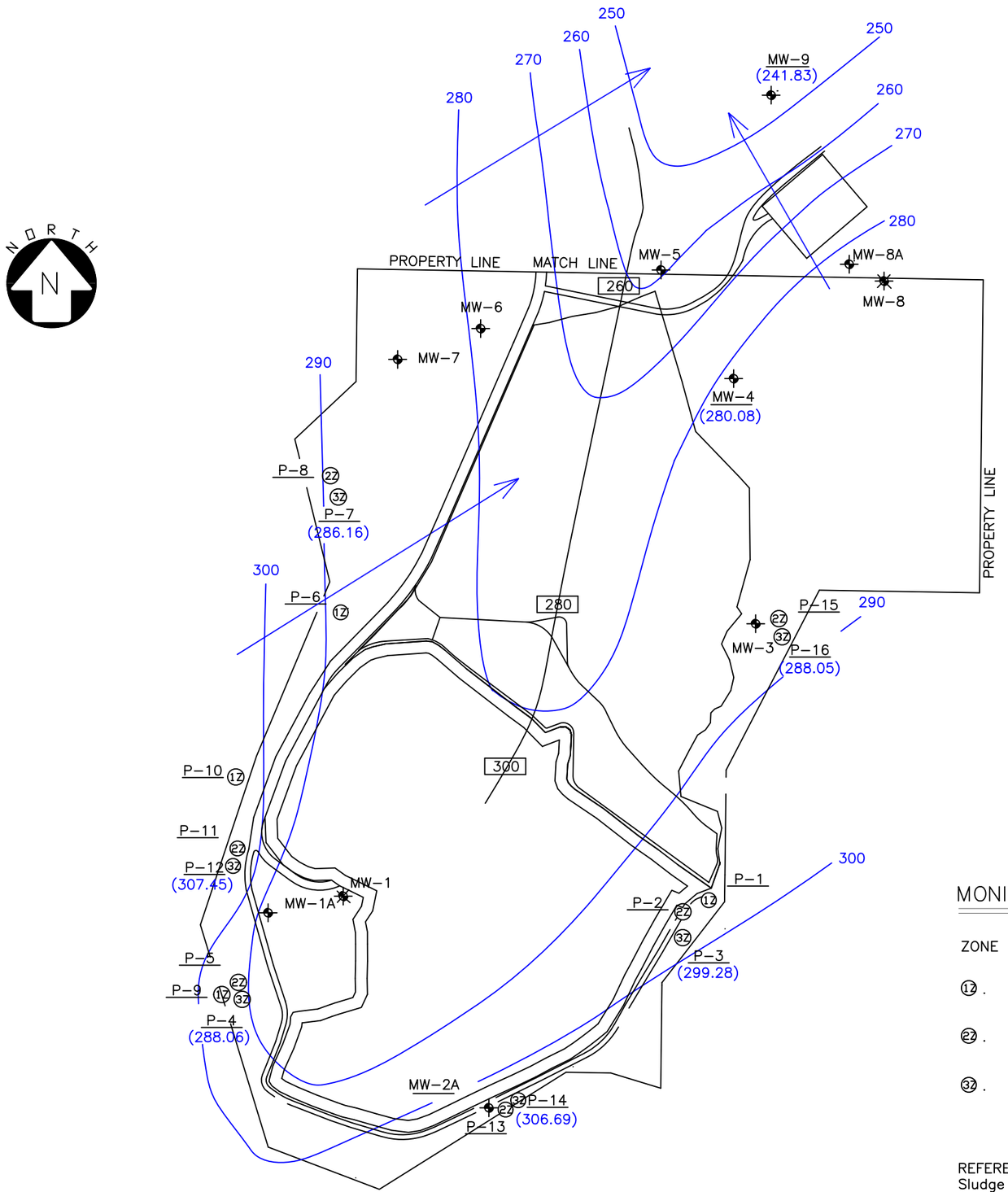
Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
July 18, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/25/10
Dwg. No.:	01-20-0212-A50-6a

Figure 50-6a



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (22). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (288.05) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 290 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- [260] [280] [300] INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(22).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500

SCALE: 1" = 500'

CLECO Power LLC

Dolet Hills Power Station

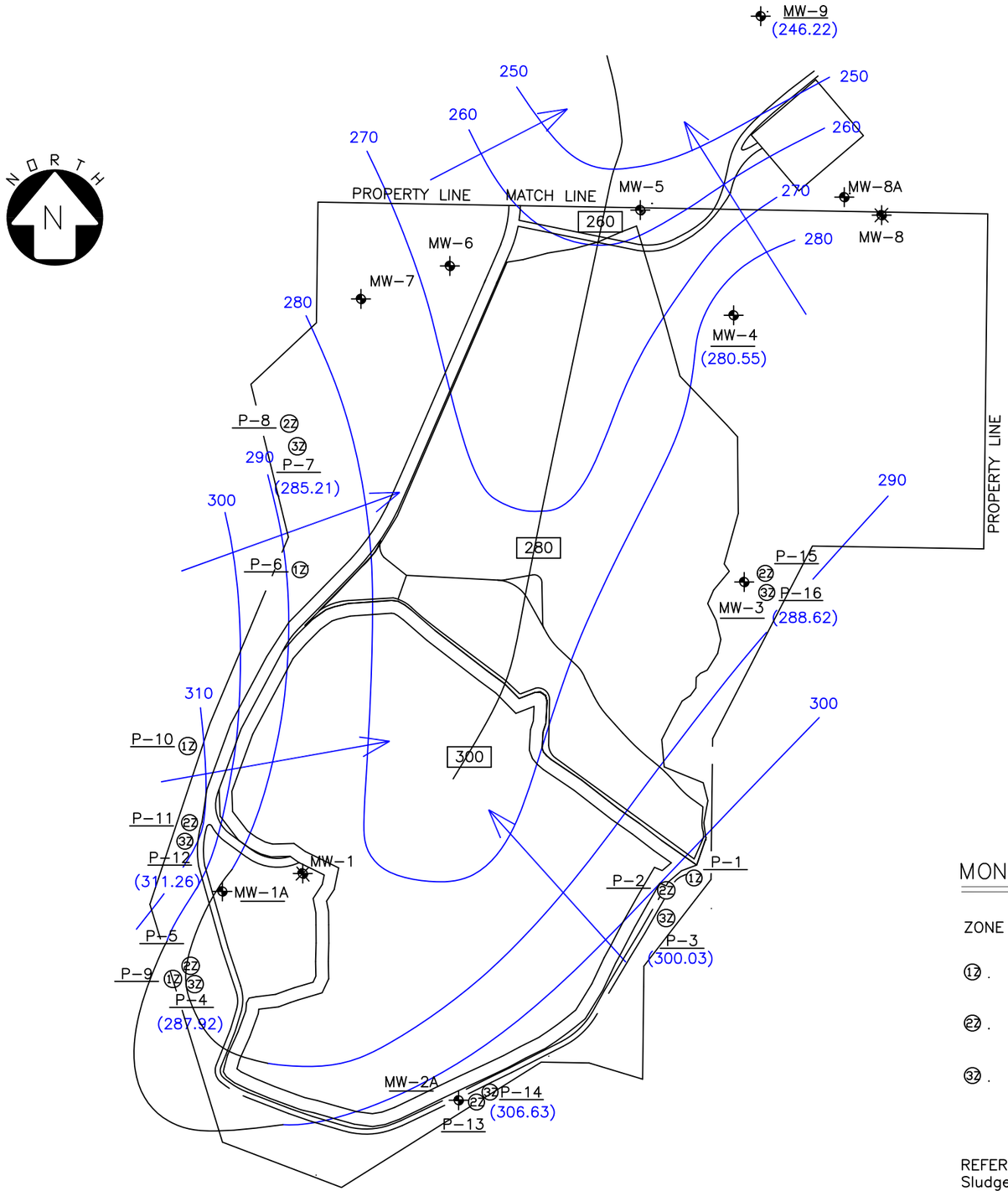
Fly Ash / Scrubber Sludge Landfill Zone 3 Potentiometric Surface Map October 28, 1997

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/25/10
Dwg. No.:	01-20-0212-A50-6b

Figure 50-6b



LEGEND

- SOIL BORING LOCATION PRIOR TO 3/95
- EXISTING MONITOR WELLS
- PLUGGED AND ABANDONED MONITOR WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- (12). ZONE 1 PIEZOMETER
- (27). ZONE 2 PIEZOMETER
- (32). ZONE 3 PIEZOMETER
- (300.03) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 300 POTENTIOMETRIC SURFACE CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS

MONITORING ZONES

ZONE	EXISTING/PROPOSED WELL
(12).	MW-1A, MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9)
(27).	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32).	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4), 96B-19 (P-12), P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

500 0 500
SCALE: 1'' = 500'

CLECO Power LLC

Dolet Hills Power Station

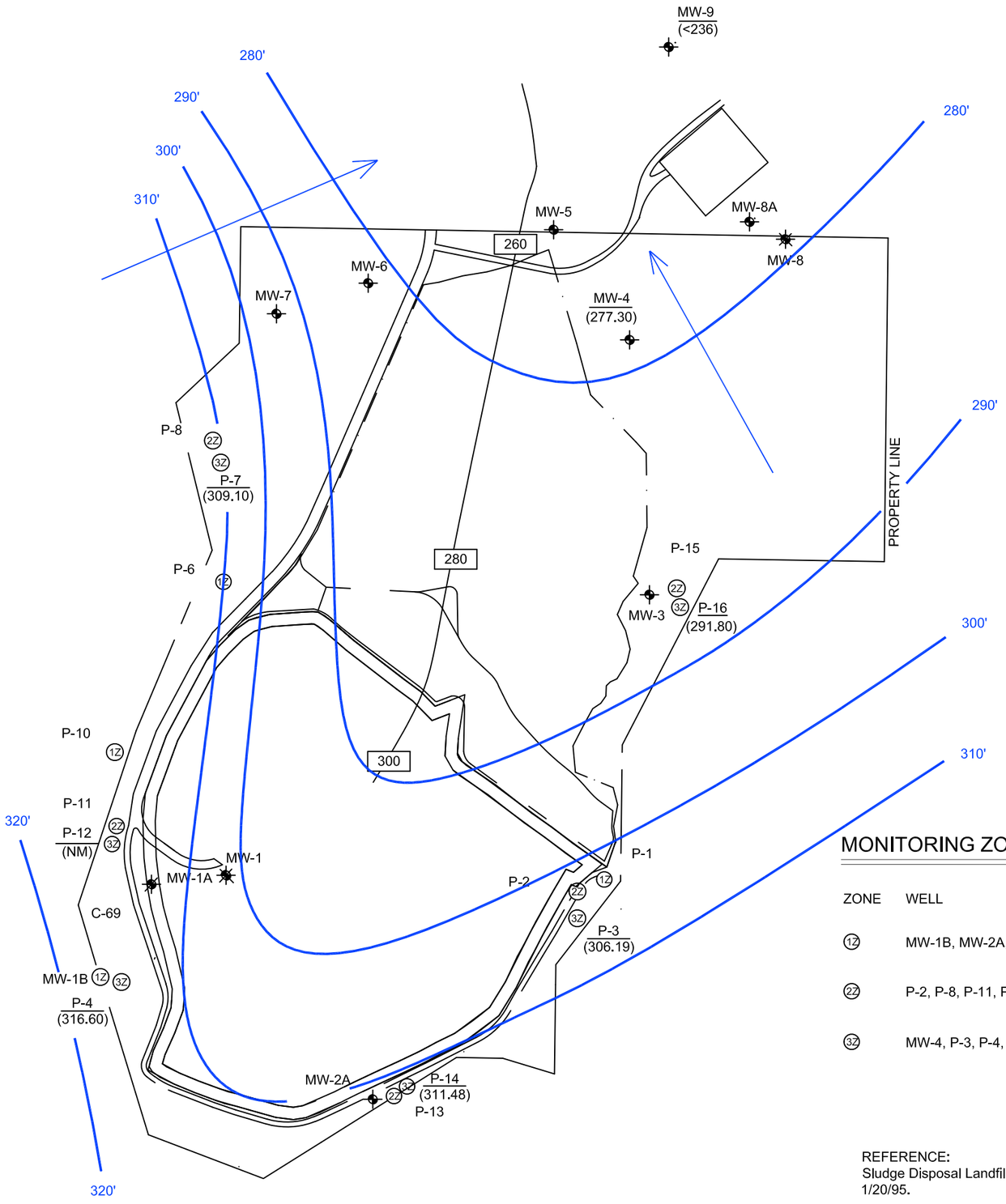
Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
January 20, 1998

DeSoto Parish, Louisiana

E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	TML/jbh
Checked:	RS
Approved:	KDS
Date:	05/25/10
Dwg. No.:	01-20-0212-A50-6c

Figure 50-6c



MONITORING ZONES

ZONE	WELL
1Z	MW-1B, MW-2A, P-1, P-6, P-10
2Z	P-2, P-8, P-11, P-13, P-15
3Z	MW-4, P-3, P-4, P-7, P-12, P-14, P-16, MW-9

REFERENCE:
Sludge Disposal Landfill Map by Alliance, Inc., dated 1/20/95.

N

Legend

- EXISTING MONITORING WELLS
- PLUGGED AND ABANDONED MONITORING WELLS
- LIMITS OF FUTURE DEVELOPMENT
- LIMITS OF STORAGE AREA CELL #7
- 1Z ZONE 1 PIEZOMETER
- 2Z ZONE 2 PIEZOMETER
- 3Z ZONE 3 PIEZOMETER
- (291.80) POTENTIOMETRIC SURFACE ELEVATION (FEET)
- 310' POTENTIOMETRIC SURFACE CONTOUR (FEET)
- INFERRED GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- 260 280 300 INTERMITTENT STREAM ELEVATIONS (Values taken from historical data)

500 0 500

Scale: 1" = 500'

CLECO Corporation

Dolet Hills Power Station

Fly Ash / Scrubber Sludge Landfill
Zone 3 Potentiometric Surface Map
April 30, 2009

De Soto Parish, Louisiana

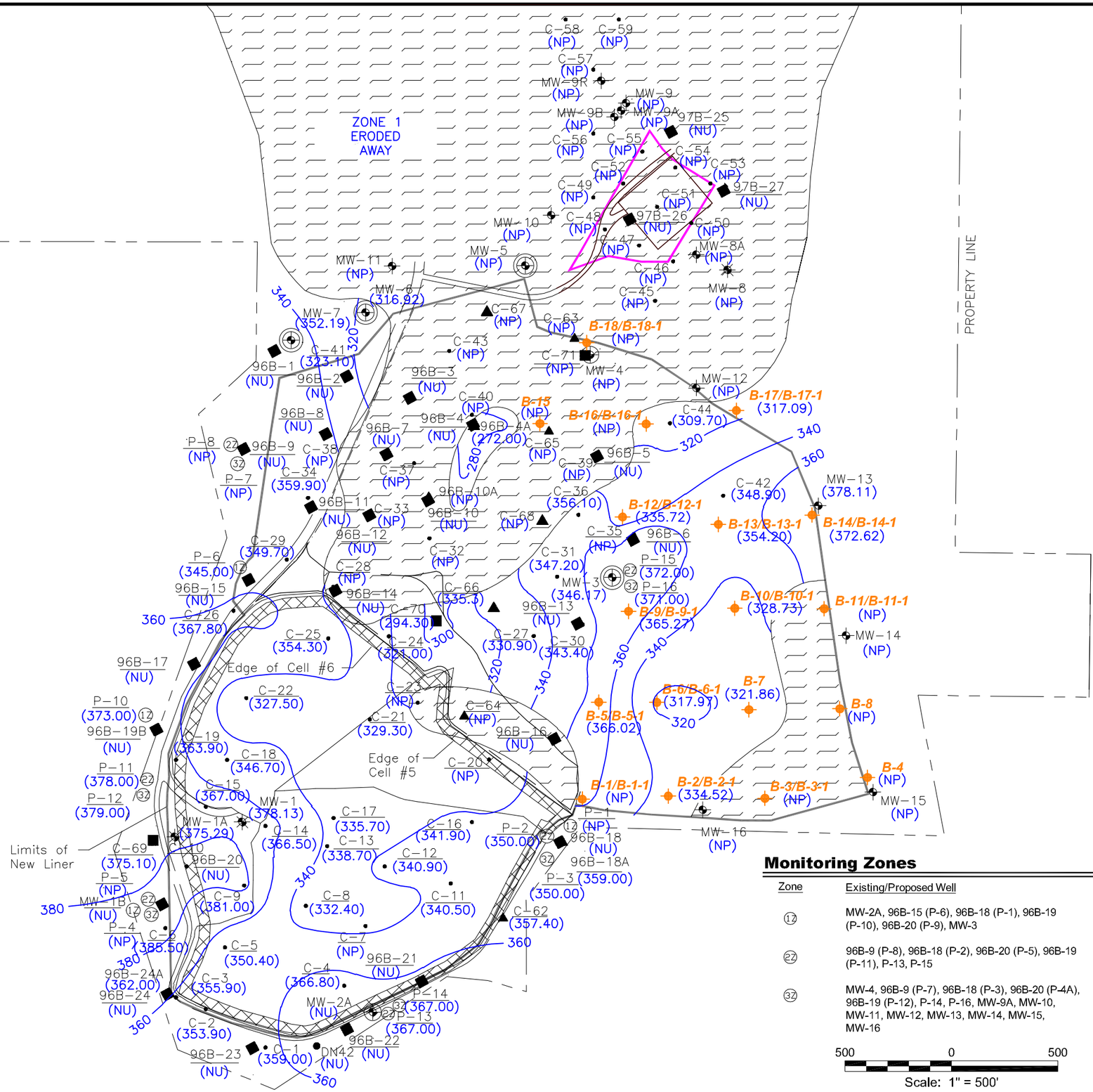
E·A·G·L·E ENVIRONMENTAL SERVICES, INC.

Drawn:	jbh/jlp
Checked:	JM
Approved:	RS
Date:	05/25/10
Dwg. No.:	01-20-0212-A50-6d

Figure 50-6d

FLY ASH/SCRUBBER SLUDGE LANDFILL AND SURFACE IMPOUNDMENT

ISOPACH AND STRUCTURAL MAPS



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (337) Top of Zone 1 Elevation (Feet)
- (NDE) Not Deep Enough (Boring Depth)
- (NP) Not Present
- (NP) Not Utilized
- —320— Top of Zone 1 Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Base of Zone 1, drawing no: 01-10-0079-A035, figure no: M-1, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Zone 1

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

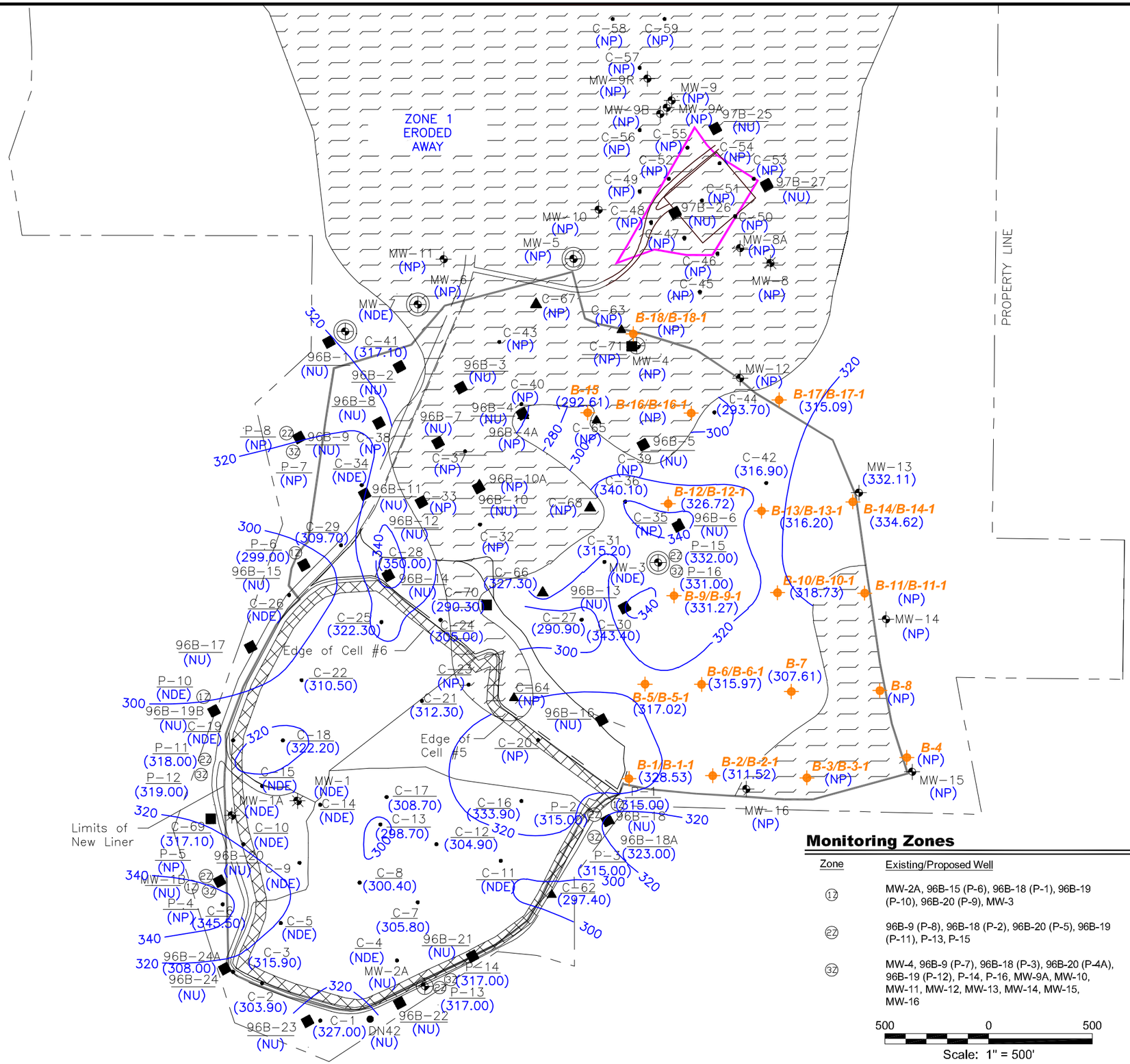
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20
Project Number	002-255-002	
Drawing Number	002-255-002-B012	

49a Attachment

Providence Engineering and Environmental Group LLC



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (337) Base of Zone 1 Elevation (Feet)
- (NDE) Not Deep Enough (Boring Depth)
- (NP) Not Present
- (NU) Not Utilized
- —320— Base of Zone 1 Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Base of Zone 1, drawing no: 01-10-0079-A035, figure no: M-1, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Confining Layer Under Zone 1

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

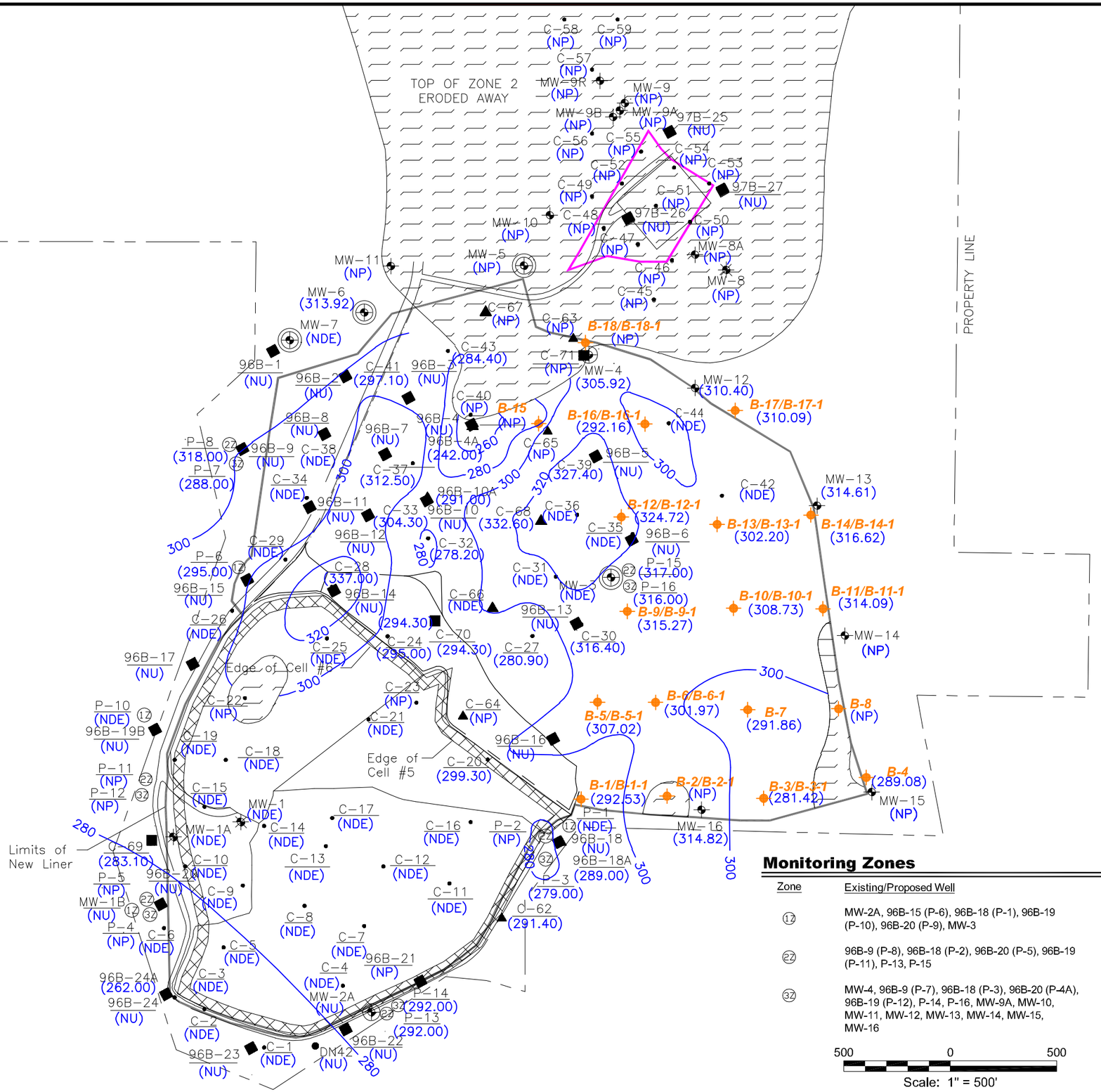
Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B013

49b Attachment

Providence Engineering and Environmental Group LLC



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (297) Top of Zone 2 Elevation (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized
- —290— Top of Zone 2 Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Top of Zone 2, drawing no: 01-10-0079-A036, figure no: M-2, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Zone 2

Solid Waste Permit Renewal

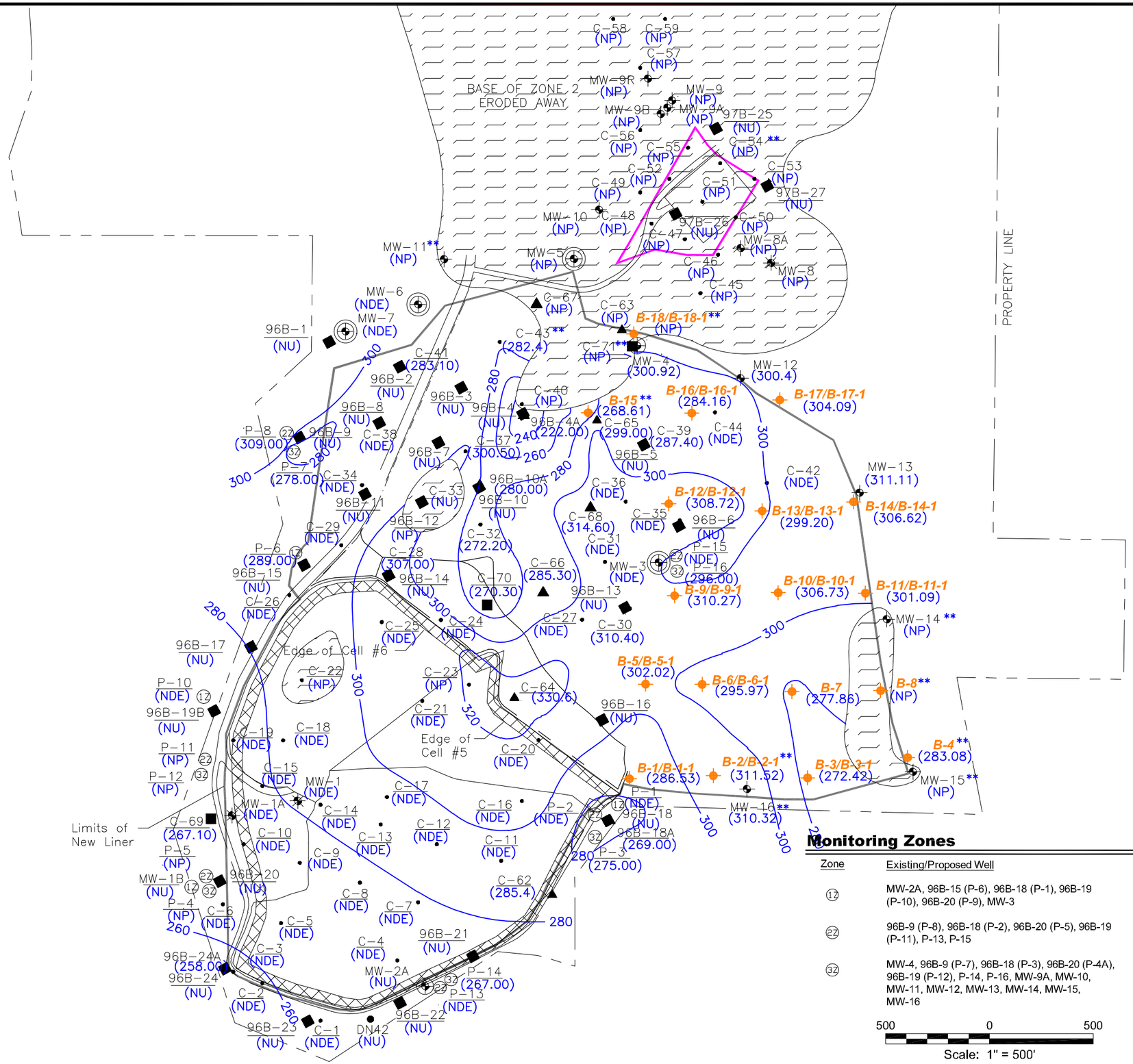
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20
Project Number	002-255-002	
Drawing Number	002-255-002-B014	49c Attachment



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (285) Base of Zone 2 Elevation (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized
- —280— Base of Zone 2 Contour (Feet)
- ** Zone 2 is Not Present at This Location, However Confining Clay Present
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Base of Zone 2, drawing no: 01-10-0079-A037, figure no: M-3, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Confining Layer Under Zone 2

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

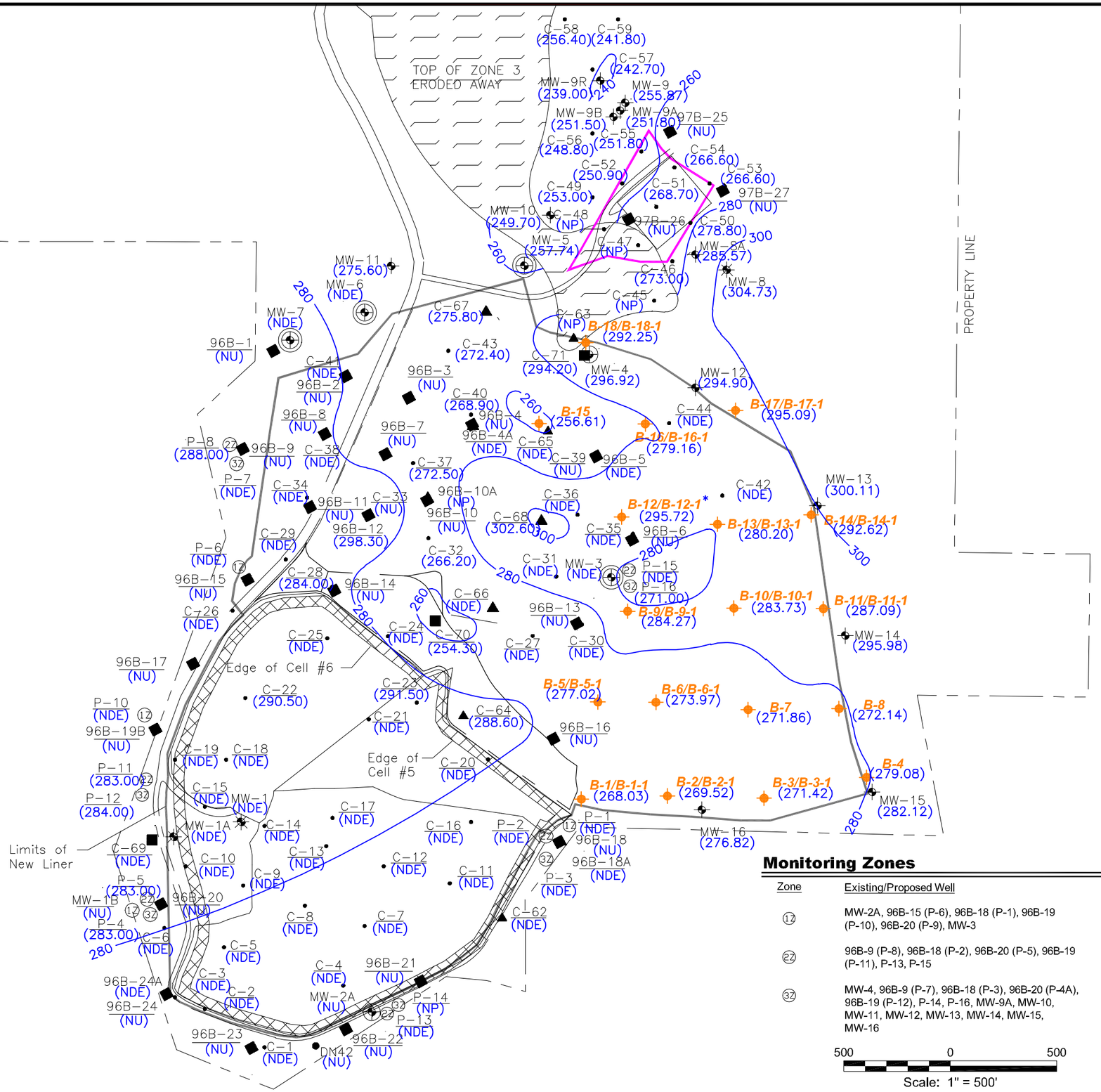
Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	04/27/20
Checked By	MV	04/27/20
Approved By	EKS	04/27/20
Project Number	002-255-002	
Drawing Number	002-255-002-B015	

49d Attachment

Providence Engineering and Environmental Group LLC



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (243) Top of Zone 3 Elevation (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized
- —280— Top of Zone 3 Contour (Feet)
- * Zone 2 & 3 Combined in this Area
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Top of Zone 3, drawing no: 01-10-0079-A039, figure no: M-5, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Zone 3

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

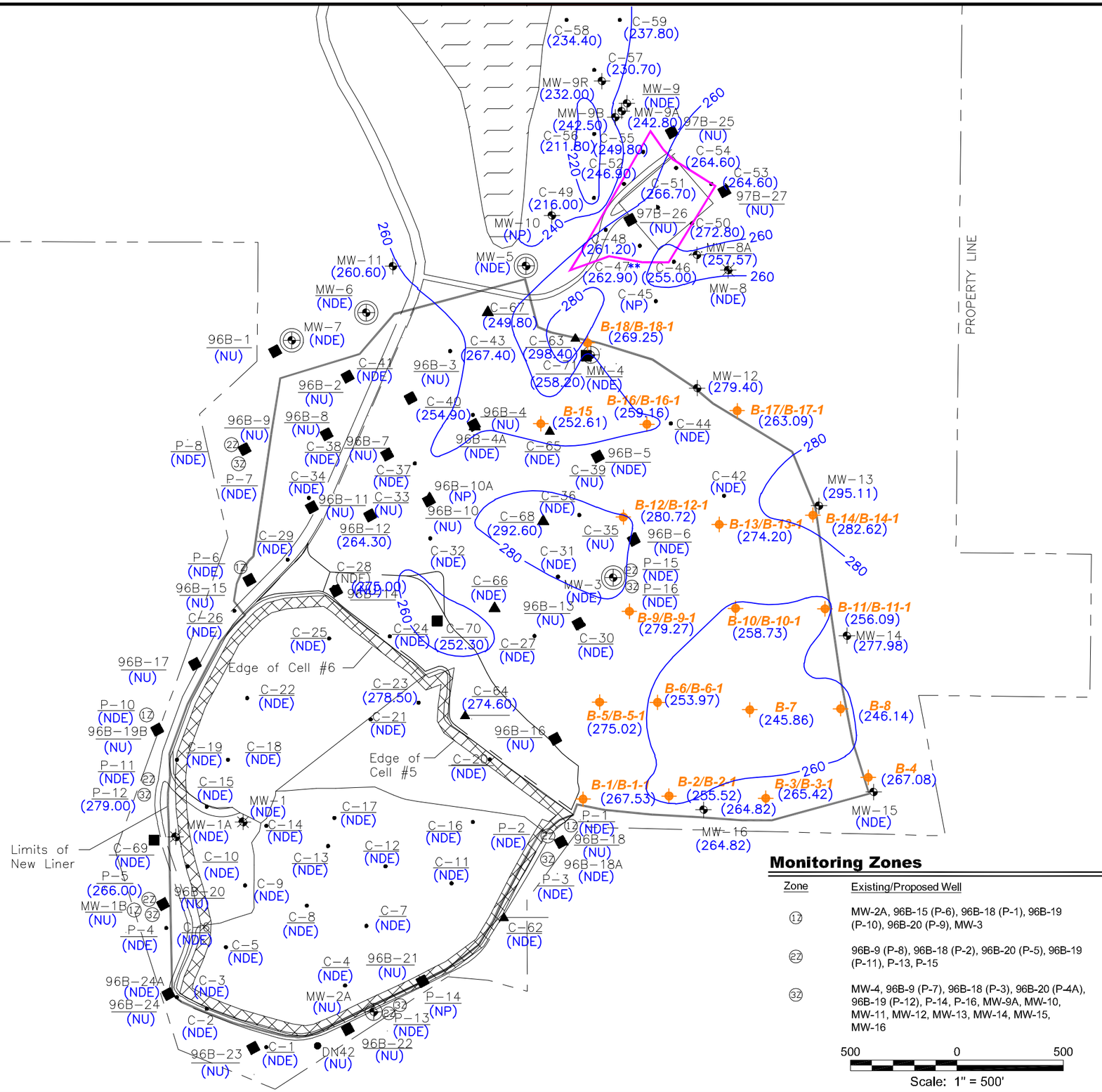
Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20
Project Number	002-255-002	
Drawing Number	002-255-002-B016	

49e Figure



Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (257) Base of Zone 3 Elevation (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized
- —250— Base of Zone 3 Contour (Feet)
- * Zone 2 & 3 Combined in this Area
- ** Zone 3 is not Present at this location, However Confining Clay Present
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Base of Zone 3, drawing no: 01-10-0079-A040, figure no: M-6, dated: 05/25/10.

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Confining Layer Under Zone 3

Solid Waste Permit Renewal

Mansfield, De Soto Parish, Louisiana

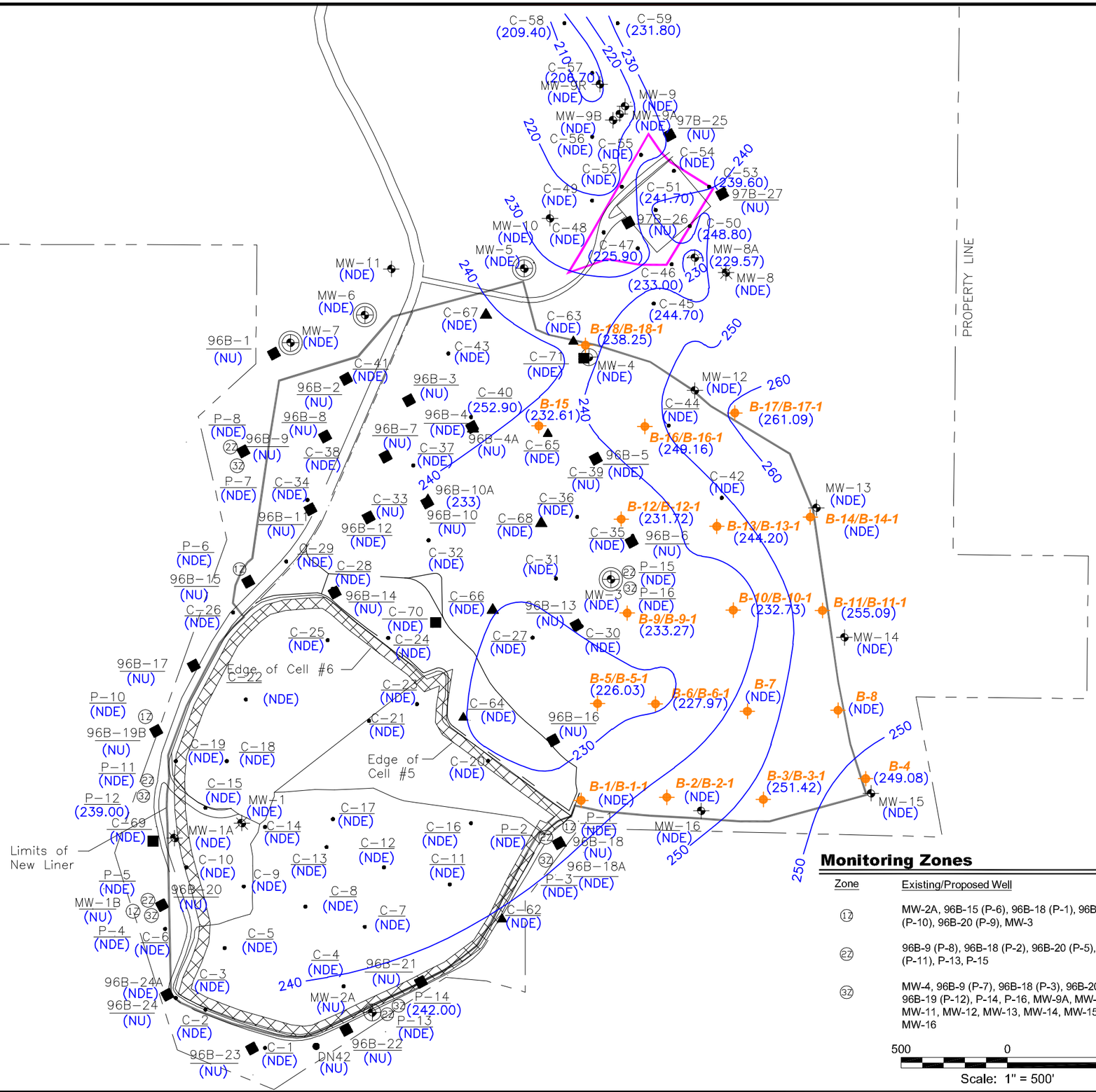
Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20
Project Number	002-255-002	
Drawing Number	002-255-002-B017	

49f Figure



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (27) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (227) Top of Zone 4 Elevation (Feet)
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized
- —220— Top of Zone 4 Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Structural Map Top of Zone 4, drawing no: 01-10-0079-A042, figure no: M-8, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(27)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Structural Map - Top of Zone 4

Solid Waste Permit Renewal

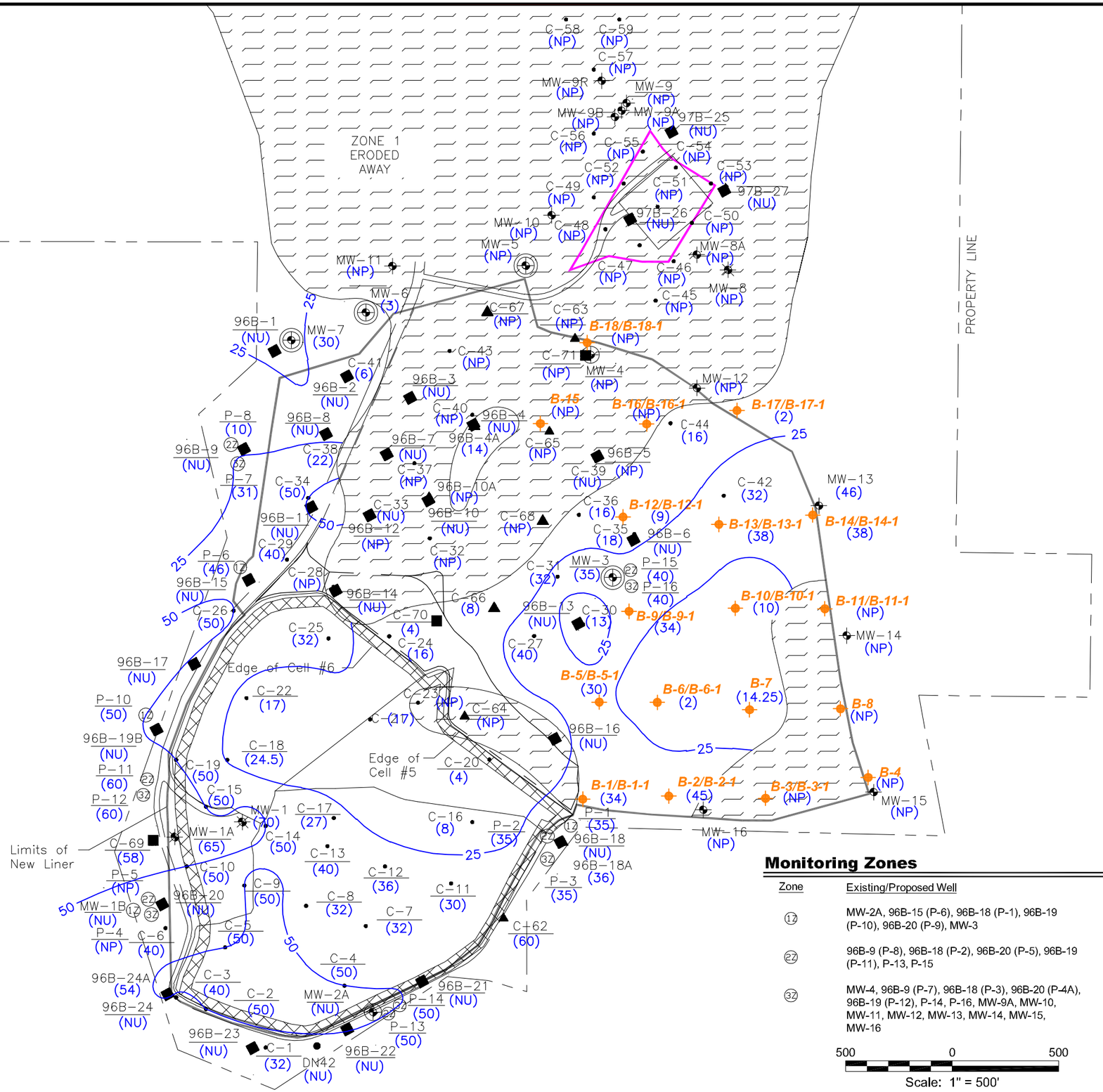
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20
Project Number	002-255-002	
Drawing Number	002-255-002-B018	49g Figure



Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (35) Zone 1 Thickness (Feet)
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized (Inadequate Sample Recovery)
- — 50 — Zone 1 Thickness Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 1, drawing no: 01-10-0079-A043, figure no: M-9, dated: 05/25/10.

Fly Ash/Scrubber Sludge Landfill Isopach Map - Zone 1

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

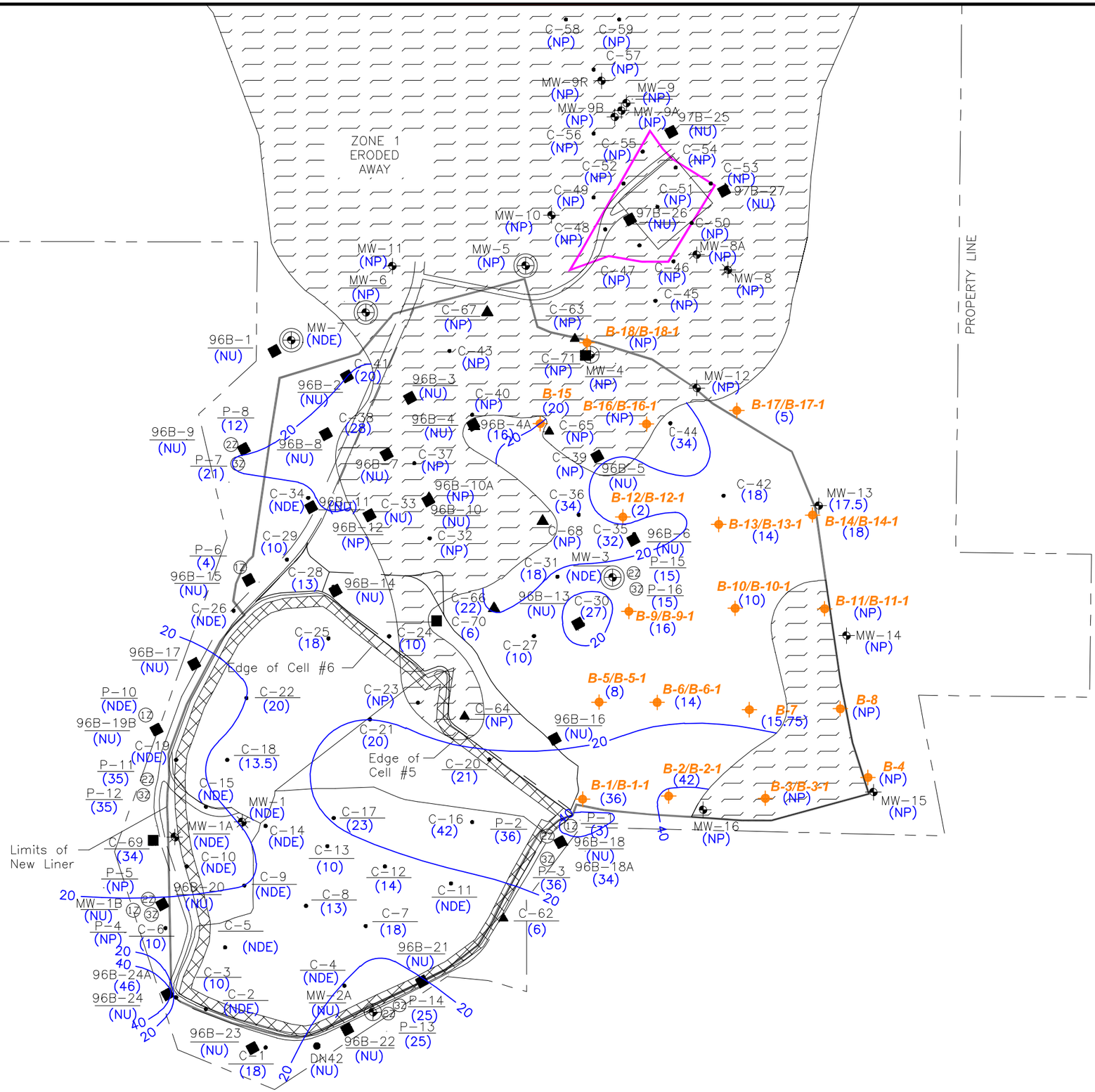
PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B019

49h Attachment



Legend

- Permitted Landfill Limits
- Limits of Storage Area Cell #7
- Covered Area
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (13) Zone Thickness (Feet)
- (NP) Not Present
- (NU) Not Utilized
- — 10 — Zone Thickness Contour (Feet)
- Zone Not Present in this Area

N

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 1, drawing no: 01-10-0079-A043, figure no: M-9, dated: 05/25/10.

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Isopach Map - Confining Layer Beneath Zone 1

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

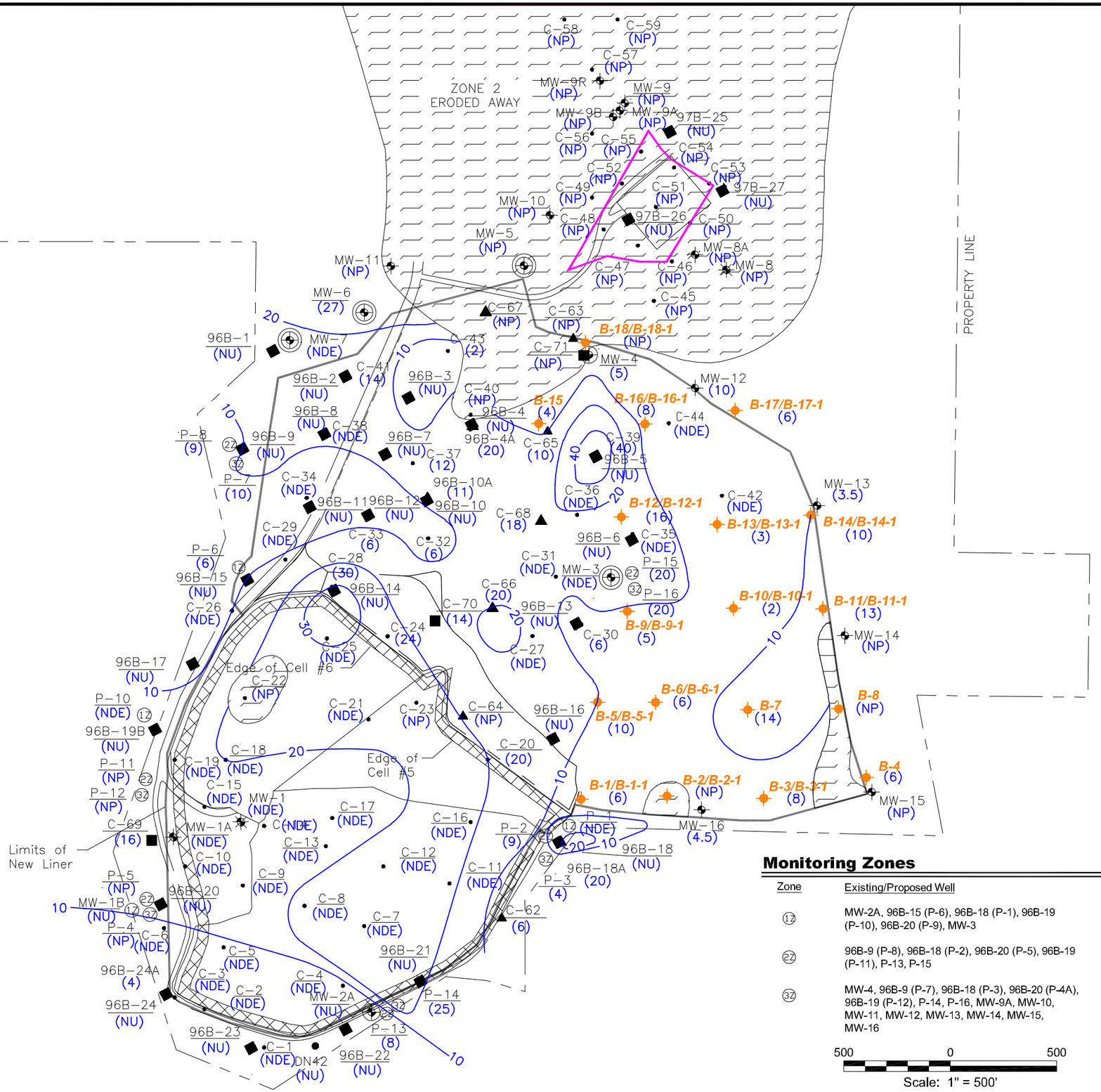
Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B020

49i Attachment

Providence Engineering and Environmental Group LLC



Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (10) Zone Thickness (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized (Inadequate Sample Recovery)
- — 20 — Zone Thickness Contour (Feet)
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 2, drawing no: 01-10-0079-A044, figure no: M-10, dated: 05/25/10.

Fly Ash/Scrubber Sludge Landfill Isopach Map - Zone 2

Solid Waste Permit Renewal
Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC
Dolet Hills Power Station

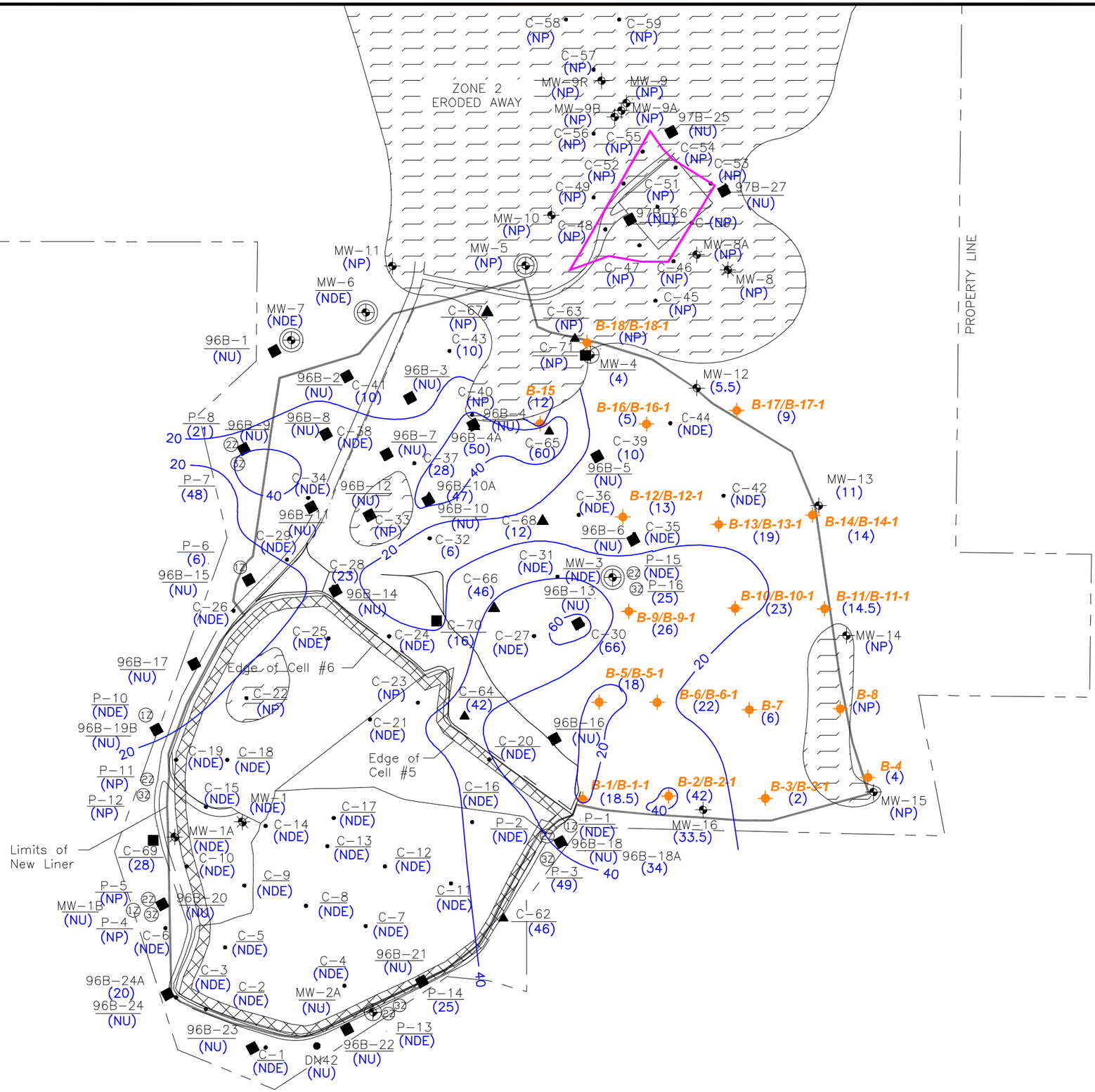
PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B021

49j Attachment



Legend

- Permitted Landfill Limits
- Limits of Storage Area Cell #7
- Covered Area
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (13) Zone Thickness (Feet)
- (NP) Not Present
- (NU) Not Utilized
- * Zone 2 Not Present at This Location
- ** Confining Layer Beneath Zone 1 and Zone 2 Combined in This Area
- — 10 — Zone Thickness Contour (Feet)
- Zone Not Present in this Area

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 1, drawing no: 01-10-0079-A043, figure no: M-9, dated: 05/25/10.

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Isopach Map - Confining Layer Beneath Zone 2

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

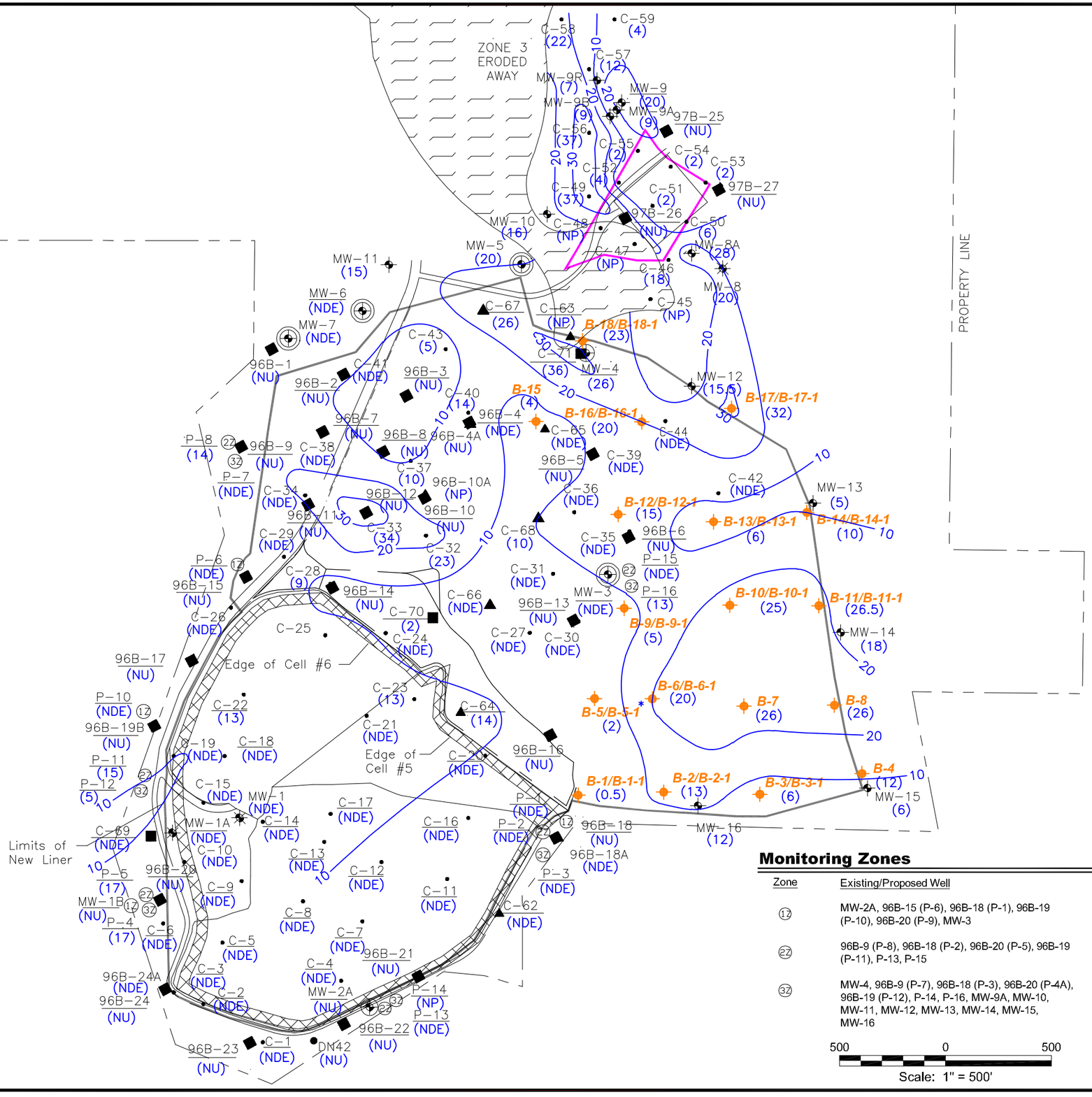
PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B022

49k Attachment



Legend

- Permitted Landfill Limits
- Fly Ash/FGD Landfill Runoff Pond
- Covered Area
- Limits of Future Development
- Limits of Storage Area Cell #7
- Soil Boring Location (Prior to 3/95)
- Existing Monitor Well Location
- Plugged and Abandoned Monitor Well Location
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (10) Zone Thickness (Feet)
- (NP) Not Present
- (NDE) Not Deep Enough (Boring Depth)
- (NU) Not Utilized (Inadequate Sample Recovery)
- — 20 — Zone Thickness Contour (Feet)
- * Zones 2 & 3 Combined in this Area
- Zone Not Present in this Area

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 3, drawing no: 01-10-0079-A045, figure no: M-11, dated: 05/25/10.

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Isopach Map - Zone 3

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

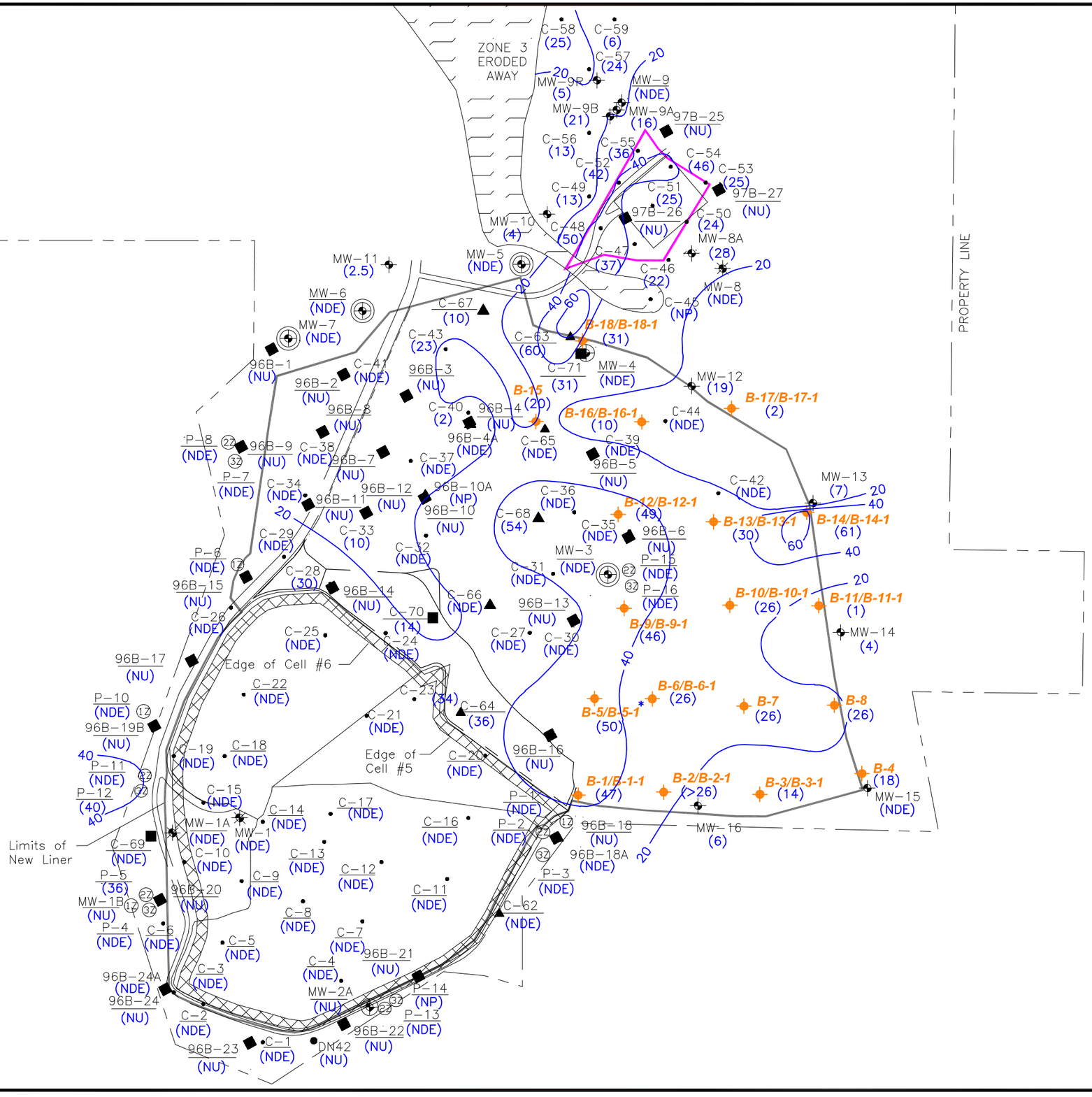
PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B023

491 Attachment



Legend

- Permitted Landfill Limits
- Limits of Storage Area Cell #7
- Covered Area
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (26) Zone Thickness (Feet)
- (NP) Not Present
- (NU) Not Utilized
- — 30 — Zone Thickness Contour (Feet)

N

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 1, drawing no: 01-10-0079-A043, figure no: M-9, dated: 05/25/10.

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Isopach Map - Confining Layer Beneath Zone 3

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

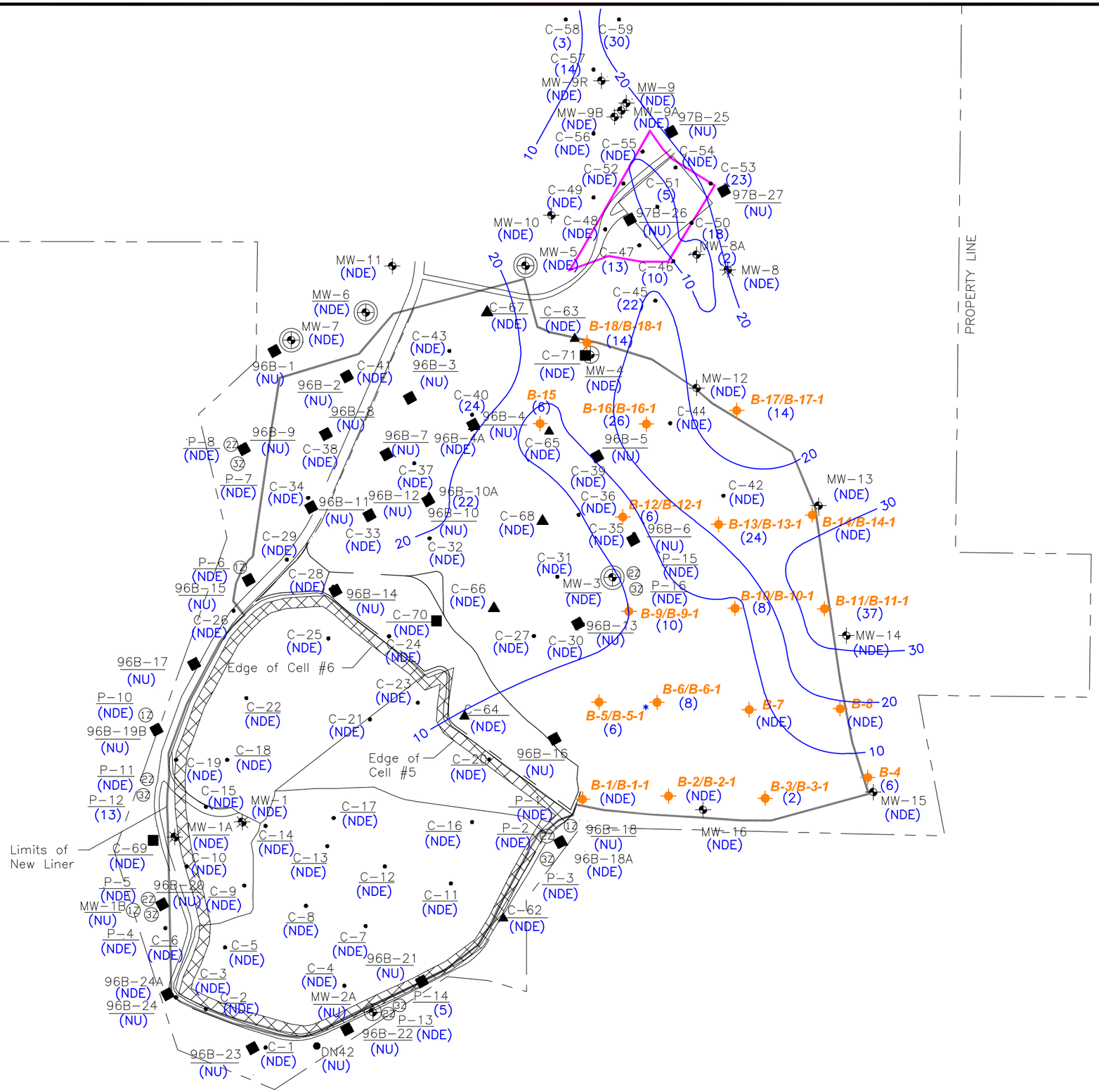
Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B024

49m Attachment

Providence Engineering and Environmental Group LLC



Legend

- Permitted Landfill Limits
- Limits of Storage Area Cell #7
- Covered Area
- Continuously Sampled Borehole
- Continuously Sampled and Geophysically Logged Borehole
- Monitor Well Geophysically Logged (9/95)
- Geophysical Log Obtained From DNR
- Geophysically Logged Borehole With Soil Cuttings
- Boring Location
- (12) Zone 1 Piezometer
- (22) Zone 2 Piezometer
- (32) Zone 3 Piezometer
- (6) Zone Thickness (Feet)
- (NP) Not Present
- (NU) Not Utilized
- (BE) Zone 4 Is Not Encountered at 30' Below The Lowest Point of Excavation
- 10 Zone Thickness Contour (Feet)
- Zone Not Present in this Area

Monitoring Zones

Zone	Existing/Proposed Well
(12)	MW-2A, 96B-15 (P-6), 96B-18 (P-1), 96B-19 (P-10), 96B-20 (P-9), MW-3
(22)	96B-9 (P-8), 96B-18 (P-2), 96B-20 (P-5), 96B-19 (P-11), P-13, P-15
(32)	MW-4, 96B-9 (P-7), 96B-18 (P-3), 96B-20 (P-4A), 96B-19 (P-12), P-14, P-16, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16

Reference

Base map comprised of client provided figure, titled: Fly Ash/Scrubber Sludge Landfill Isopach Map Zone 1, drawing no: 01-10-0079-A043, figure no: M-9, dated: 05/25/10.

500 0 500

Scale: 1" = 500'

Fly Ash/Scrubber Sludge Landfill Isopach Map - Zone 4

Solid Waste Permit Renewal

Mansfield, DeSoto Parish, Louisiana

Cleco Power LLC

Dolet Hills Power Station

PROVIDENCE

Drawn By	LMH	09/14/20
Checked By	MV	09/14/20
Approved By	EKS	09/14/20

Project Number 002-255-002

Drawing Number 002-255-002-B025

49n Attachment

CHAPTER 5.0

Appendices

A Ash Basin 1 Closure Plan
B Ash Basin 2 Closure Plan
C Closure Plan Addendums

November 30, 2020

APPENDIX A

Closure Plan
Dolet Hills Ash Basin 1

CLECO Corporation

Dolet Hills Power Station
Project No. 90965

Revision 0
10/14/2016

Closure Plan
Dolet Hills Ash Basin 1

prepared for

CLECO Corporation
Dolet Hills Power Station
DeSoto Parish, Louisiana

Project No. 90965

Revision 0
10/14/2016

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

INDEX AND CERTIFICATION

CLECO Corporation
Closure Plan
Dolet Hills Ash Basin 1
Project No. 90965

Report Index

Certification

I hereby certify, as a Professional Engineer in the state of Louisiana, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the CLECO Corporation or others without specific verification or adaptation by the Engineer.

Randell L Sedlacek

Randell L Sedlacek, P.E.
Louisiana License #38408

Date: 10/14/16

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LIST OF TABLES

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
BMcD	Burns & McDonnell
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
CLECO	CLECO Corporation
cm/sec	Centimeters/Second
CY	Cubic Yards
Dolet Hills	Dolet Hills Power Station
EPA	Environmental Protection Agency
LDEQ	Louisiana Department of Environmental Quality
RCRA	Resource Conservation and Recovery Act
U.S.C.	United States Code

1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual Rule (CCR Rule) to regulate the disposal of coal combustion residual (CCR) materials generated at coal-fired units. The rule will be administered as part of the Resource Conservation and Recovery Act ([RCRA, 42 United States Code [(U.S.C.]) §6901 et seq.)], using the Subtitle D approach.

The existing CCR impoundments at CLECO Corporation's (CLECO's) Dolet Hills Power Station (Dolet Hills) are subject to the CCR Rule and as such CLECO is required to develop a Closure Plan per 40 Code of Federal Regulations (CFR) §257.102. This report serves as the Closure Plan for Ash Basin 1 at Dolet Hills.

This closure plan is in addition to, not in place of, any other applicable site permits, environmental standards, or work safety practices.

2.0 PLAN OBJECTIVES

Per 40 CFR §257.102, the Closure Plan must contain the following:

- A description of how the CCR unit will be closed.
  - For closure through leaving CCR in place:
    - A description of the final cover system and methods used to install the final cover, including methods for achieving performance standards specified in 40 CFR §257.102(d).
- An estimate of the maximum inventory of CCR material ever stored in the CCR unit over its active life.
- An estimate of the largest area of the CCR unit ever requiring a final cover.
- A schedule for completing closure activities, including the anticipated year of closure and major milestones for permitting and construction activities.

Additionally, CLECO is required to develop a Post-Closure Plan per 40 CFR §257.104, which will be covered in a separate document.

Per 40 CFR §257.102(b)(4), CLECO must obtain certification from a qualified professional engineer that the closure plan, and subsequent updates to the plan, meet the requirements of 40 CFR §257.102. This sealed document serves as that certification.

3.0 EXISTING CONDITIONS

Dolet Hills is located east of Mansfield in DeSoto Parish, Louisiana. Dolet Hills contains two CCR surface impoundments, Ash Basin 1 and Ash Basin 2, which overflow to the Secondary Pond. A site plan is included in Appendix A. The existing ponds were constructed by following the natural topography of the area and building a single shared berm to form a cross-valley configuration. An intermediary berm separates Ash Basin 1 from the Secondary Pond, and the Secondary Pond from Ash Basin 2.

3.1 CCR Inventory

Ash Basin 1 is permitted as a 25.5-acre pond with approximately 650,000 cubic yards (CY) of ash capacity. This volume is also an estimate of the maximum inventory of material that could potentially be store in the impoundment over its active life. This estimated area is the largest area of the impoundment that should ever require a final cover. A site plan is included in Appendix A. CLECO dewaters and removes CCR material from Ash Basin 1 periodically for disposal in the CCR landfill on-site.

4.0 CLOSURE METHOD

Ash Basin 1 will be closed through leaving CCR material in place as noted in the most recent version of the permit documentation. Procedures planned for closing the surface impoundment are described in detail herein.

4.1 Final Cover System Requirements

Per the CCR Rule, the final cover system must be designed and constructed to meet the following criteria pursuant to 40 CFR §257.102(d):

- Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ centimeters per second (cm/sec), whichever is less.
- The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.
- The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.
- The owner or operator may select an alternative final cover system design, provided the alternative final cover system meets the above requirements.

4.1.1 Drainage / Stabilization of CCR Material

Prior to installing the final cover system, Cleco must perform the following activities outlined in 40 CFR §257.102(d) of the CCR Rule:

- Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues
- Stabilize remaining wastes sufficiently in order to support the final cover system.

Free liquids will be removed initially, with excess water discharged via Outfall 002. Free liquid removal will be performed throughout construction, as necessary, to manage surface water and storm water runoff.

Additional dewatering may be required to remove entrained water. This can be accomplished through mechanical means such as double-handling and/or discing, or potentially through methods such as the use of a well point system, wick drains, or other means determined by the Contractor, Engineer, or Owner.

4.1.2 Geometry and Stormwater Management

Once stabilized, the impoundment will be backfilled, compacted, and graded to drain to the Secondary Pond. The geometry and stormwater management controls of the closed impoundment will allow the CCR unit to meet the following requirements as outlined in 40 CFR §257.102(d) of the CCR Rule:

- Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.
- Prevent future impoundment of water.
- Provide for slope stability to protect against sloughing or movement of the final cover system.

The closure system will be designed to provide adequate drainage during storm events. Material will be graded in order to promote stability of the cover system, to prevent the collection of standing water, to limit the velocity of storm water runoff, and to reduce the potential for soil erosion.

4.1.3 Permeability and Infiltration

Once the grade of the backfilled CCR impoundment is established, the final cover system will be placed over the maximum extents of the impoundment to minimize infiltration into the consolidated waste material and erosion of the cap. Per 40 CFR §257.102(d), the final cover system will consist of, at minimum, an 18-inch infiltration layer and 6-inch erosion layer. The permeability of the final cover system will be will be equal to that of the bottom liner system and natural subsoils present, or no greater than $1x10^{-5}$ cm/sec, whichever is less. Per the current permit, CLECO may select an alternative final cover system design, provided the alternative cover system is designed and constructed to meet the criteria of the CCR Rule and is approved by LDEQ.

During installation of the cover soils, proper quality control methods will be used to ensure the following:

- The selected cover material is suitable;
- The material meets the minimum federal and state thickness and permeability requirements;
- The material is properly placed and compacted; and
- The material is properly protected before, during, and after construction.

The erosion layer will consist of topsoil and will be seeded with native vegetation. The period of time for greatest soil erosion concern will be immediately after placement of the topsoil material, before vegetation is established. Manufactured erosion control products, as well as a seed mix containing quick-growth seed varieties, will aid in erosion prevention during this critical timeframe.

4.1.4 Integrity of the Final Cover

Settling and subsidence of the final cover system is expected to be minimal. The underlying natural subsoils at the site are overconsolidated clays and silts that are not prone to long-term settlement. Settlement would potentially be caused by consolidation of the CCR material or general fill material under new loads from construction activities; however, this settlement will occur for the duration of site grading activities and is expected to be minimal after the cover soil is installed. General fill, if necessary, will be installed in a controlled manner to minimize post-fill installation settlement.

5.0 CLOSURE SCHEDULE

Burns & McDonnell developed a preliminary schedule (see Table 5-1) outlining the critical scope and timeline necessary for the CCR surface impoundment closure at Dolet Hills. Per 40 CFR §257.102(f) of the CCR Rule, closure must be completed within five years of initiating closure activities. At this time, the anticipated closure trigger for Ash Basin 1 is the final receipt of waste, including either CCR or non-CCR streams. Per the 2010 Permit Renewal, the anticipated date of closure for Ash Basin 1 is no sooner than 2025, with the actual closure date dependent on plant operations.

Table 5-1: Preliminary Closure Schedule

Closure Activity	Timeframe (Working Days)	Accumulated Duration (Working Days)
Preparation for Closure		
Permitting / design	120	120
Submit Notification of Intent to Close to LDEQ	20	140
Design documents issued for bid	0	140
Bid period	15	155
Bid evaluation	10	165
Contract Award	20	185
Final placement of CCR material	0	185
Commence construction / mobilization	30	215
Closure Construction		
Dewatering / stabilization	90	305
Grading / backfill of impoundment	60	365
Install infiltration layer	90	455
Install erosion layer (topsoil)	20	475
LDEQ inspection	20	495
Seeding	20	515
Site clean-up / demobilization	10	525
Closure Completion		
Submit Notification of Completion of Closure	20	545

Closure of the existing CCR surface impoundment will commence no later than 30 days after the known final receipt of waste. No later than the date CLECO initiates closure of the existing CCR surface impoundment, a Notification of Intent to Close the CCR surface impoundment certified by a qualified professional engineer will be placed in the facility's CCR Operating Record. The notification will then be placed on CLECO's CCR public website within 30 days.

For the purposes of this Closure Plan, closure of Ash Basin 1 is considered complete after the erosion layer has been seeded and stabilized. From there, the Post-Closure Care Period for Ash Basin 1 will commence.

Within 30 days of completion of closure of the CCR surface impoundment, a Notification of Closure of the CCR surface impoundment will be prepared and placed in the facility's CCR Operating Record and on CLECO's CCR public website. This notification will include certification by a qualified professional engineer in the State of Louisiana verifying closure has been completed in accordance with this Closure Plan and the requirements of 40 CFR §257.102.

6.0 REVISIONS AND AMENDMENTS

The initial Closure Plan will be placed in the CCR Operating Record by October 17, 2016. The plan will be amended whenever there is a change in operation of the CCR unit that affects the current or planned closure operations. The Closure Plan will be amended 60 days prior to a planned change in operation, or within 60 days following an unplanned change in operation. If a written Closure Plan is revised after closure activities have commenced, the written Closure Plan will be amended no later than 30 days following the triggering event. The initial Closure Plan and any amendment will be certified by a qualified professional engineer in the State of Louisiana for meeting the requirements of 40 CFR §257.102 of the CCR Rule. All amendments and revisions will be placed on the CCR public website within 30 days following placement in the facility's CCR Operating Record. A record of revisions made to this document is included in Section 7.0 of this document.

7.0 RECORD OF AMENDMENTS

Revision Number	Date	Revisions Made	By Whom
0	10/14/2016	Initial Closure Plan	Burns & McDonnell

APPENDIX A – SITE LAYOUT

BURNS McDONNELL

date 8/10/2016

designed A. MYERS

CLECO CORPORATION

CCR COMPLIANCE DOCUMENTATION

SITE LAYOUT

project 90965

contract -

drawing no. **SK - CIVIL - 001**

rev. **0**

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APPENDIX B

Closure Plan
Dolet Hills Ash Basin 2

CLECO Corporation

Dolet Hills Power Station
Project No. 90965

Revision 0
10/14/2016

Closure Plan
Dolet Hills Ash Basin 2

prepared for

CLECO Corporation
Dolet Hills Power Station
DeSoto Parish, Louisiana

Project No. 90965

Revision 0
10/14/2016

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

INDEX AND CERTIFICATION

CLECO Corporation
Closure Plan
Dolet Hills Ash Basin 2
Project No. 90965

Report Index

Certification

I hereby certify, as a Professional Engineer in the state of Louisiana, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the CLECO Corporation or others without specific verification or adaptation by the Engineer.

Randell L Sedlacek, P.E.
Louisiana License #38408

Date: 10/14/16

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
BMcD	Burns & McDonnell
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
CLECO	CLECO Corporation
cm/sec	Centimeters/Second
CY	Cubic Yards
Dolet Hills	Dolet Hills Power Station
EPA	Environmental Protection Agency
LDEQ	Louisiana Department of Environmental Quality
RCRA	Resource Conservation and Recovery Act
U.S.C.	United States Code

1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual Rule (CCR Rule) to regulate the disposal of coal combustion residual (CCR) materials generated at coal-fired units. The rule will be administered as part of the Resource Conservation and Recovery Act ([RCRA, 42 United States Code [(U.S.C.]) §6901 et seq.)], using the Subtitle D approach.

The existing CCR impoundments at CLECO Corporation's (CLECO's) Dolet Hills Power Station (Dolet Hills) are subject to the CCR Rule and as such CLECO is required to develop a Closure Plan per 40 Code of Federal Regulations (CFR) §257.102. This report serves as the Closure Plan for Ash Basin 2 at Dolet Hills.

This closure plan is in addition to, not in place of, any other applicable site permits, environmental standards, or work safety practices.

2.0 PLAN OBJECTIVES

Per 40 CFR §257.102, the Closure Plan must contain the following:

- A description of how the CCR unit will be closed.
  - For closure through leaving CCR in place:
    - A description of the final cover system and methods used to install the final cover, including methods for achieving performance standards specified in 40 CFR §257.102(d).
- An estimate of the maximum inventory of CCR material ever stored in the CCR unit over its active life.
- An estimate of the largest area of the CCR unit ever requiring a final cover.
- A schedule for completing closure activities, including the anticipated year of closure and major milestones for permitting and construction activities.

Additionally, CLECO is required to develop a Post-Closure Plan per 40 CFR §257.104, which will be covered in a separate document.

Per 40 CFR §257.102(b)(4), CLECO must obtain certification from a qualified professional engineer that the closure plan, and subsequent updates to the plan, meet the requirements of 40 CFR §257.102. This sealed document serves as that certification.

3.0 EXISTING CONDITIONS

Dolet Hills is located east of Mansfield in DeSoto Parish, Louisiana. Dolet Hills contains two CCR surface impoundments, Ash Basin 1 and Ash Basin 2, which overflow to the Secondary Pond. A site plan is included in Appendix A. The existing ponds were constructed by following the natural topography of the area and building a single shared berm to form a cross-valley configuration. An intermediary berm separates Ash Basin 1 from the Secondary Pond, and the Secondary Pond from Ash Basin 2.

3.1 CCR Inventory

Ash Basin 2 is permitted as a 26-acre pond with approximately 680,000 cubic yards (CY) of ash capacity. This volume is also an estimate of the maximum inventory of material that could potentially be stored in the impoundment over its active life. This estimated area is the largest area of the impoundment that should ever require a final cover. A site plan is included in Appendix A. CLECO dewaters and removes CCR material from Ash Basin 2 periodically for disposal in the CCR landfill on-site.

4.0 CLOSURE METHOD

Ash Basin 2 will be closed through leaving CCR material in place as noted in the most recent version of the permit documentation. Procedures planned for closing the surface impoundment are described in detail herein.

4.1 Final Cover System Requirements

Per the CCR Rule, the final cover system must be designed and constructed to meet the following criteria pursuant to 40 CFR §257.102(d):

- Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ centimeters per second (cm/sec), whichever is less.
- The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.
- The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.
- The owner or operator may select an alternative final cover system design, provided the alternative final cover system [meets the above requirements].

4.1.1 Drainage / Stabilization of CCR Material

Prior to installing the final cover system, Cleco must perform the following activities outlined in 40 CFR §257.102(d) of the CCR Rule:

- Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues
- Stabilize remaining wastes sufficiently in order to support the final cover system.

Free liquids will be removed initially, with excess water discharged via Outfall 002. Free liquid removal will be performed throughout construction, as necessary, to manage surface water and storm water runoff.

Additional dewatering may be required to remove entrained water. This can be accomplished through mechanical means such as double-handling and/or discing, or potentially through methods such as the use of a well point system, wick drains, or other means determined by the Contractor, Engineer, or Owner.

4.1.2 Geometry and Stormwater Management

Once stabilized, the impoundment will be backfilled, compacted, and graded to drain to the Secondary Pond. The geometry and stormwater management controls of the closed impoundment will allow the CCR unit to meet the following requirements as outlined in 40 CFR §257.102(d) of the CCR Rule:

- Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.
- Prevent future impoundment of water.
- Provide for slope stability to protect against sloughing or movement of the final cover system.

The closure system will be designed to provide adequate drainage during storm events. Material will be graded in order to promote stability of the cover system, to prevent the collection of standing water, to limit the velocity of storm water runoff, and to reduce the potential for soil erosion.

4.1.3 Permeability and Infiltration

Once the grade of the backfilled CCR impoundment is established, the final cover system will be placed over the maximum extents of the impoundment to minimize infiltration into the consolidated waste material and erosion of the cap. Per 40 CFR §257.102(d), the final cover system will consist of, at minimum, an 18-inch infiltration layer and 6-inch erosion layer. The permeability of the final cover system will be will be equal to that of the bottom liner system and natural subsoils present, or no greater than $1x10^{-5}$ cm/sec, whichever is less. Per the current permit, CLECO may select an alternative final cover system design, provided the alternative cover system is designed and constructed to meet the criteria of the CCR Rule and is approved by LDEQ.

During installation of the cover soils, proper quality control methods will be used to ensure the following:

- The selected cover material is suitable;
- The material meets the minimum federal and state thickness and permeability requirements;
- The material is properly placed and compacted; and
- The material is properly protected before, during, and after construction.

The erosion layer will consist of topsoil and will be seeded with native vegetation. The period of time for greatest soil erosion concern will be immediately after placement of the topsoil material, before vegetation is established. Manufactured erosion control products, as well as a seed mix containing quick-growth seed varieties, will aid in erosion prevention during this critical timeframe.

4.1.4 Integrity of the Final Cover

Settling and subsidence of the final cover system is expected to be minimal. The underlying natural subsoils at the site are overconsolidated clays and silts that are not prone to long-term settlement. Settlement would potentially be caused by consolidation of the CCR material or general fill material under new loads from construction activities; however, this settlement will occur for the duration of site grading activities and is expected to be minimal after the cover soil is installed. General fill, if necessary, will be installed in a controlled manner to minimize post-fill installation settlement.

5.0 CLOSURE SCHEDULE

Burns & McDonnell developed a preliminary schedule (see Table 5-1) outlining the critical scope and timeline necessary for the CCR surface impoundment closure at Dolet Hills. Per 40 CFR §257.102(f) of the CCR Rule, closure must be completed within five years of initiating closure activities. At this time, the anticipated closure trigger for Ash Basin 2 is the final receipt of waste, including either CCR or non-CCR streams. Per the 2010 Permit Renewal, the anticipated date of closure for Ash Basin 2 is no sooner than 2025, with the actual closure date dependent on plant operations.

Table 5-1: Preliminary Closure Schedule

Closure Activity	Timeframe (Working Days)	Accumulated Duration (Working Days)
Preparation for Closure		
Permitting / design	120	120
Submit Notification of Intent to Close to LDEQ	20	140
Design documents issued for bid	0	140
Bid period	15	155
Bid evaluation	10	165
Contract Award	20	185
Final placement of CCR material	0	185
Commence construction / mobilization	30	215
Closure Construction		
Dewatering / stabilization	90	305
Grading / backfill of impoundment	60	365
Install infiltration layer	90	455
Install erosion layer (topsoil)	20	475
LDEQ inspection	20	495
Seeding	20	515
Site clean-up / demobilization	10	525
Closure Completion		
Submit Notification of Completion of Closure	20	545

Closure of the existing CCR surface impoundment will commence no later than 30 days after the known final receipt of waste. No later than the date CLECO initiates closure of the existing CCR surface impoundment, a Notification of Intent to Close the CCR surface impoundment certified by a qualified professional engineer will be placed in the facility's CCR Operating Record. The notification will then be placed on CLECO's CCR public website within 30 days.

For the purposes of this Closure Plan, closure of Ash Basin 2 is considered complete after the erosion layer has been seeded and stabilized. From there, the Post-Closure Care Period for Ash Basin 2 will commence.

Within 30 days of completion of closure of the CCR surface impoundment, a Notification of Closure of the CCR surface impoundment will be prepared and placed in the facility's CCR Operating Record and on CLECO's CCR public website. This notification will include certification by a qualified professional engineer in the State of Louisiana verifying closure has been completed in accordance with this Closure Plan and the requirements of 40 CFR §257.102.

6.0 REVISIONS AND AMENDMENTS

The initial Closure Plan will be placed in the CCR Operating Record by October 17, 2016. The plan will be amended whenever there is a change in operation of the CCR unit that affects the current or planned closure operations. The Closure Plan will be amended 60 days prior to a planned change in operation, or within 60 days following an unplanned change in operation. If a written Closure Plan is revised after closure activities have commenced, the written Closure Plan will be amended no later than 30 days following the triggering event. The initial Closure Plan and any amendment will be certified by a qualified professional engineer in the State of Louisiana for meeting the requirements of 40 CFR §257.102 of the CCR Rule. All amendments and revisions will be placed on the CCR public website within 30 days following placement in the facility's CCR Operating Record. A record of revisions made to this document is included in Section 7.0 of this document.

7.0 RECORD OF AMENDMENTS

Revision Number	Date	Revisions Made	By Whom
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APPENDIX C

Addendum to Closure Plan for Ash Basin 1 at Dolet Hills Power Station (DHPS)

This Addendum to the October 14, 2016 DHPS Ash Basin 1 Closure Plan (Closure Plan) is being made for purposes of qualifying for the coal combustion residuals (CCR) rule's alternative closure requirements delineated at 40 C.F.R. § 257.103(f)(2)—"Permanent Cessation of a Coal-Fired Boiler(s) by a Date Certain." For a CCR surface impoundment to qualify for these alternative closure requirements, an owner or operator must submit a closure plan required by 40 C.F.R. § 257.102(b) showing that the surface impoundment will cease receipt of waste into a CCR surface impoundment in enough time to meet the alternative closure deadline. 40 C.F.R. § 257.103(f)(2)(v)(D).

As detailed in the Alternative Closure Demonstration for DHPS Ash Basins 1 and 2, Ash Basin 1 will cease receipt of wastestreams by no later than approximately December 2021. In addition, Ash Basin 1 is estimated to complete closure by January or February 2023 and will complete closure by no later than October 17, 2023.

All other aspects of the Closure Plan are unchanged.

This Addendum will become effective upon EPA's approval of the DHPS Alternative Closure Demonstration.

Addendum to Closure Plan for Ash Basin 2 at Dolet Hills Power Station (DHPS)

This Addendum to the October 14, 2016 DHPS Ash Basin 2 Closure Plan (Closure Plan) is being made for purposes of qualifying for the coal combustion residuals (CCR) rule's alternative closure requirements delineated at 40 C.F.R. § 257.103(f)(2)—"Permanent Cessation of a Coal-Fired Boiler(s) by a Date Certain." For a CCR surface impoundment to qualify for these alternative closure requirements, an owner or operator must submit a closure plan required by 40 C.F.R. § 257.102(b) showing that the surface impoundment will cease receipt of waste into a CCR surface impoundment in enough time to meet the alternative closure deadline. 40 C.F.R. § 257.103(f)(2)(v)(D).

As detailed in the Alternative Closure Demonstration for DHPS Ash Basins 1 and 2, Ash Basin 2 will cease receipt of wastestreams by no later than approximately December 2021. In addition, Ash Basin 2 is estimated to complete closure by January or February 2023 and will complete closure by no later than October 17, 2023.

All other aspects of the Closure Plan are unchanged.

This Addendum will become effective upon EPA's approval of the DHPS Alternative Closure Demonstration.