

CLECO POWER LLC DOLET HILLS POWER STATION

**ASH BASIN NO. 1
MANSFIELD, LA**

**Placement Above Uppermost Aquifer
Location Restriction Demonstration
for the Coal Combustion Residuals Rule**

October 2018



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1.0 INTRODUCTION

Cleco Power LLC (Cleco) hereby presents the evaluation of the Placement above the Uppermost Aquifer Location Restriction for Ash Basin No. 1 at the Dolet Hills Power Station (DHPS) located in Mansfield, Louisiana (**Figure 1**). This report summarizes hydrogeological evaluation of the uppermost aquifer and its relationship with Ash Basin No. 1 in accordance with § 257.60 of the U.S. Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) Rule.

2.0 FACILITY INFORMATION

Cleco owns and operates DHPS located at 963 Power Plant Road, Mansfield, Louisiana 71052. Ash Basin No. 1 was constructed by placement of engineered earthen berms along the eastern edge of a natural erosional valley surfaces. The ash basin was not further excavated to have regular flat horizontal surfaces like many conventional impoundments as it was constructed to utilize the natural depression in place. The ash basin is 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 uppermost water-bearing zone that is currently monitored for groundwater quality 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 are absent of groundwater.

3.0 HYDROGEOLOGIC SETTING

DHPS is located across geologic formations of Eocene and Paleocene age that include in ascending order, the Porters Creek clay of the Midway Group, and then the Naborton formation and the Dolet Hills sand of the Wilcox Group.

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 and is not considered a source of fresh groundwater in DeSoto Parish. The Porters Creek clay is a regional massive formation extending from Tennessee to east Texas. The Porter Creek clay makes up the Midway confining unit. The Porters Creek clay yields no potable freshwater (USGS, 1964). The thickness of the Porters Creek clay approaches 600 feet at DHPS. The ash basins were primarily constructed over this massive marine clay (Porters Creek clay) of which is not a potable source of water for DeSoto parish.

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. Groundwater occurs in artesian-like conditions in the Naborton formation except for outcrop areas where it also occurs in unconfined/water table conditions. Only remnants of the lower part of the Naborton formation is present around the ash basins as it is eroded away prior to site development and is absent in many areas of the ash basin units.

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 (USGS, 2014). Industrial use is the largest consumer of both water supply sources. Toledo Bend Reservoir is the primary source of water supply in DeSoto parish and supplies the water for power generation to Cleco DHPS. There are no domestic, industrial, power generation, or public supply water wells within a 1-mile radius of the ash basin at DHPS.

4.0 PLACEMENT ABOVE THE UPPERMOST AQUIFER LOCATION RESTRICTION DETERMINATION

The hydrogeological data presented in this evaluation indicate that Ash Basin No. 1 meets the criteria of the Location Restriction, Placement above the Uppermost Aquifer. The uppermost aquifer is absent at the ash basin. The lines of evidence that lead to this conclusion include the following:

- The ash basins were primarily constructed over a massive marine clay (Porters Creek clay) with thickness approaching 600 feet of which is not a potable source of water for DeSoto parish. Freshwater is not available at depth within or below the Porters Creek clay.
- 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 are absent of groundwater.
- The absence of an uppermost aquifer required Cleco DHPS to monitor this uppermost water-bearing zone although it is primarily in the Porters Creek clay with comprises the Midway confining unit in DeSoto parish.
- The water quantity yield of the thin, laterally discontinuous uppermost water-bearing unit is minimal, yielding the zone unusable.
- Water use in the near vicinity of Ash Basin No. 1 is via surface water, not groundwater. Groundwater is not an available or reliable resource for domestic, industrial, power generation, or public supply in the near vicinity of the ash basin. DHPS receives surface water from Toledo Bend for power generation use, as groundwater is not an available resource for this need. 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 near vicinity of the ash basin and these locations utilized surface water by piping it in to the drilling location rather than using groundwater. Groundwater is not usable for this purpose in the area.
- Groundwater quality is generally poor with high TDS, 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 Basin No. 1 are not a usable aquifer due to their limited groundwater resource

development as groundwater is of limited availability due to its laterally discontinuous nature, low well yield potential, and less desirable water quality.

5.0 CONCLUSIONS

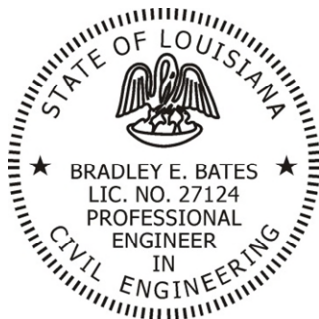
Cleco DHPS has completed its evaluation of §257.60, the Placement above the Uppermost Aquifer Location Restriction. As required by the CCR Rule part §257.60, DHPS hereby demonstrates that Ash Basin No. 1 unit meets the following criteria:

§257.60 Placement Above the Uppermost Aquifer Location Restriction

§257.60 (a) The evaluation indicates that existing CCR unit Ash Basin No. 1 meets and exceeds the minimum requirements in this standard. An uppermost aquifer is not present underlying the ash basin. The uppermost water-bearing zone is a laterally discontinuous low yielding zone consisting of the remnant lower Naborton formation and the upper Porters Creek clay. The Porters Creek clay is a massive confining unit estimated to approach 600 feet in thickness of which there are no potable water resources available. This investigation concludes that the uppermost water bearing zone is not an uppermost aquifer as it does not yield usable water.

6.0 CERTIFICATION

I hereby certify this location restriction evaluation report for Cleco Power LLC. I am a duly licensed Professional Engineer under the laws of the State of Louisiana.



Bradley E. Bates

Signature

Bradley E. Bates

Name

Eagle Environmental Services, Inc.

Company

27124

PE Registration Number

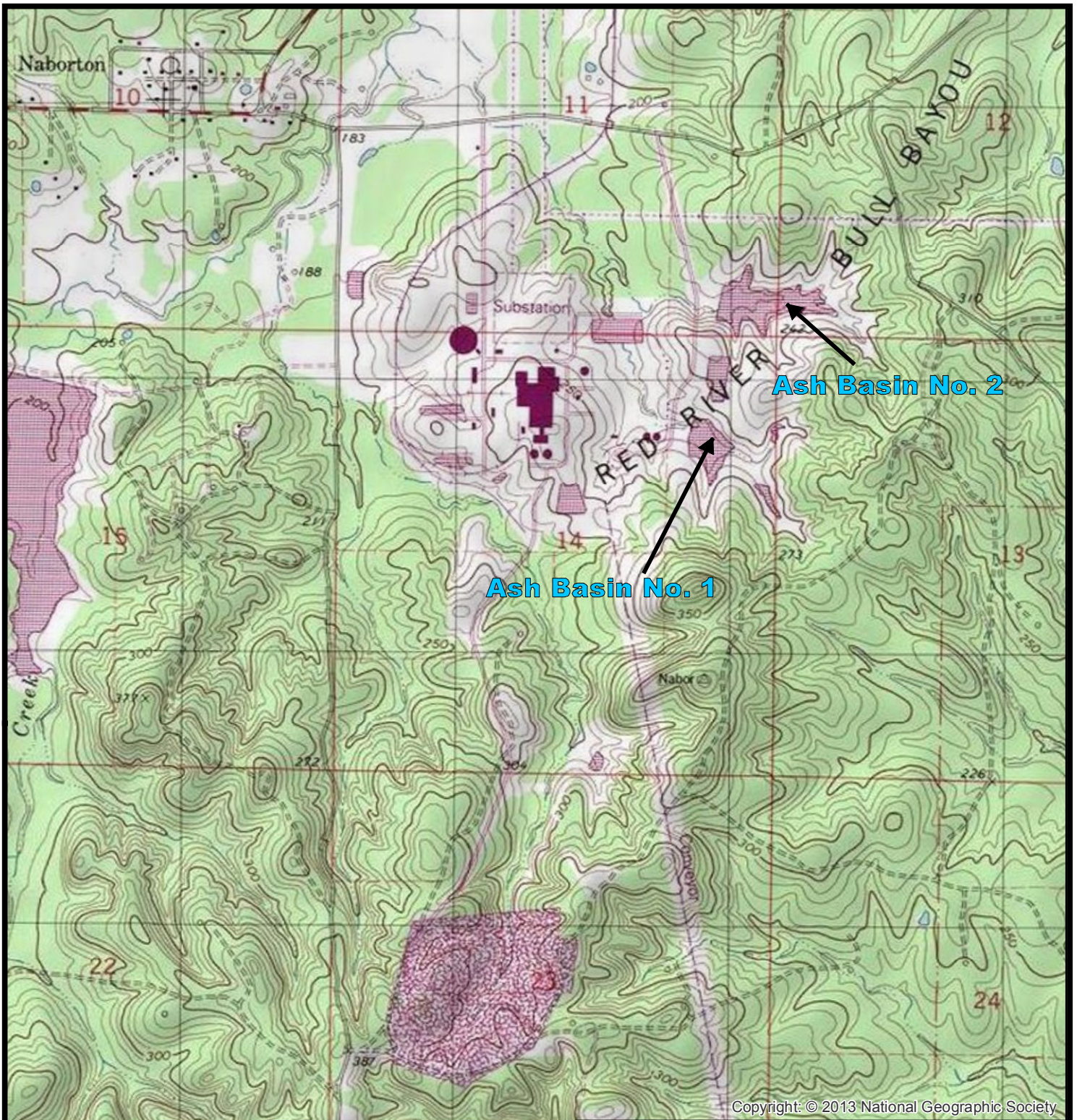
Professional Engineer

Title

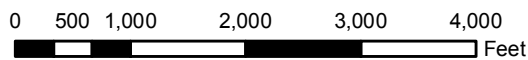
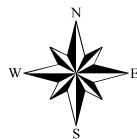
10-08-2018

Date

FIGURES



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CLECO Corporation

Dolet Hills Power Station

Site Topographic Map

De Soto Parish



Drawn:	JP
Checked:	RS
Approved:	RS
Date:	10/23/18
Dwg. No.:	01-18-0184-D001

Note:

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

Figure 1