

TECHNICAL MEMORANDUM

DATE October 10, 2018

Project No. 18107517

TO Jeff Jones
Luminant Generation Company LLC

FROM Patrick J. Behling, P.E.

**LUMINANT GENERATION COMPANY LLC
CCR RULE LOCATION RESTRICTION DEMONSTRATION
OAK GROVE STEAM ELECTRIC STATION – ROBERTSON COUNTY, TEXAS
ASH LANDFILL 1**

Luminant Generation Company LLC (Luminant) operates the Oak Grove Steam Electric Station (OGSES) located approximately 12 miles north of Franklin, Robertson County, Texas. The OGSES consists of two coal/lignite-fired units with a combined operating capacity of approximately 800 megawatts. Coal Combustion Residuals (CCR) including fly ash, bottom ash, boiler slag, and flue gas desulfurization sludge (gypsum) are generated as part of OGSES unit operation.

The U.S. Environmental Protection Agency's (EPA's) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities* (CCR Rule) has established technical requirements for CCR landfills and surface impoundments (See 80 Fed. Reg. 21,302 (Apr. 17, 2015); 83 Fed. Reg. 36,435 (July 30, 2018)). The following landfill at the OGSES has been identified as an Existing CCR Landfill regulated under the CCR Rule:

- Ash Landfill 1.

Ash Landfill 1 is located approximately 2,000 feet southwest of the OGSES power plant (Figure 1). Golder Associates Inc. (Golder) was retained by Luminant to evaluate Ash Landfill 1 against the applicable location restriction criterion for existing CCR landfills described in Section 257.64 of the CCR Rule. This memorandum sets forth Luminant's location restriction demonstration and corresponding certification required by the CCR Rule.

LOCATION RESTRICTION DEMONSTRATION – SUMMARY OF FINDINGS/CONCLUSIONS

This location restriction demonstration concludes that Ash Landfill 1 satisfies the CCR Rule location restriction criterion for existing CCR landfills (unstable areas). Ash Landfill 1 was determined to not be located in an Unstable Area in accordance with §257.64.

A professional engineering certification for the subject location restriction evaluations is included as part of this memorandum.

MEMORANDUM ORGANIZATION

The memorandum is organized as follows:

SECTION 1.0 - Location Restriction Criterion & CCR Unit Description

SECTION 2.0 - Unstable Areas

SECTION 3.0 - Limitations

SECTION 4.0 - Professional Certification

FIGURE 1 – Site Plan – Ash Landfill 1

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SECTION 1.0 Location Restriction Criterion & CCR Unit Description

LOCATION RESTRICTION CRITERION

Existing CCR Landfills must comply with the Unstable Areas location restriction described in Section 257.64 of the CCR Rule. The CCR Rule requires that the CCR Landfill owner or operator certify that the CCR Unit meets the specified location restriction requirements by October 17, 2018 for continued operation of the CCR Unit.

CCR UNIT DESCRIPTION

Ash Landfill 1 receives bottom ash, fly ash and a limited amount of other non-hazardous wastes from the OGSES and is considered an existing CCR Landfill under the CCR Rule. The landfill was first registered with the TCEQ as a Class 2 non-hazardous industrial waste landfill in September 1987 under the name of Twin Oak Steam Electric Station; however, construction of the Twin Oak Steam Electric Station and the landfill was postponed. An updated registration package was submitted to the TCEQ for Ash Landfill 1 (at the renamed Oak Grove Steam Electric Station) in July 2008 and landfill construction was initiated in 2009. Additional amendments to the registration package were submitted in 2011, 2012 and 2016.

Ash Landfill 1 is constructed partially above and partially below grade and is surrounded by engineered earthen dikes that extend up to approximately 40 feet above surrounding grade. The landfill is lined with a 3-foot thick compacted clay liner.

Section 2.0 Unstable Areas

Section 257.64(a) of the CCR Rule states:

- a) *An existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit must not be located in an unstable area unless the owner or operator demonstrates by the dates specified in paragraph (d) of this section that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.*

Section 257.53 of the CCR Rule defines unstable area as follows:

- Unstable area: a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing releases from such unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.
- Poor Foundation Conditions: those areas where features exist which indicate that a natural or human-induced event may result in inadequate foundation support for the structural components of an existing or new CCR unit.
- Areas Susceptible to Mass Movement: those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where, because of natural or human-induced events, the movement of earthen material at, beneath, or adjacent to the CCR unit results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.
- Karst terrain: an area where karst topography, with its characteristic erosional surface and subterranean features, is developed as a result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrain include, but are not limited to, dolines, collapse shafts (sinkholes), sinking streams, caves, seeps, large springs, and blind valleys.

Under § 257.64(b), the following factors must be considered when determining whether an area is unstable:

- on-site or local soil conditions that may result in significant differential settling;
- on-site or local geologic or geomorphic features; and
- on-site or local human-made features or events (both surface and subsurface).

Golder reviewed a soil investigation report presenting the results of soil geotechnical investigation activities performed at Ash Landfill 1 in 1987. The investigation concluded that soils beneath the landfill area generally consisted of low permeability clay strata to a depth of approximately 10 feet, underlain by interbedded layers of laminated clays, silty clays, clayey silts and silty sands and were stable and suitable for construction of the landfill. As a result, Ash Landfill 1 is not located in an unstable area as defined in the CCR Rule.

Section 3.0 Limitations

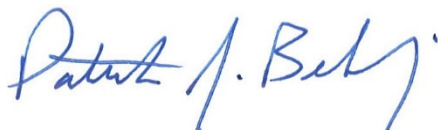
In preparing this evaluation, Golder has reviewed historic, design and investigative information and other data furnished by Luminant. Golder has relied on this information in completing the location restriction evaluation for Ash Landfill 1.

The conclusions presented in this memorandum assume that subsurface site conditions in the vicinity of Ash Landfill 1 reasonably match those conditions associated with site borings, laboratory testing results, etc. The reported conclusions are also based on our understanding of current site operations, maintenance and CCR management practices at the OGSES at the current time as provided by Luminant.

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Section 4.0 Professional Certification

I, Patrick J. Behling, being a Registered Professional Engineer in good standing in the State of Texas, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this CCR Rule Location Restriction Demonstration has been prepared in accordance with the accepted practice of engineering. I certify that the CCR Unit described in this report and as explained further in the CCR Rule Location Restriction Evaluation – Oak Grove Steam Electric Station Ash Landfill 1, Golder Associates Inc. October 10, 2018, meets the requirements of 40 CFR Section 257.64.



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Texas Engineering Firm No. 2578



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Figures



Ash Landfill 1

0 350 700
1" = 700' FEET

CLIENT
LUMINANT GENERATION COMPANY LLC

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ASH LANDFILL 1
CCR RULE LOCATION RESTRICTION DEMONSTRATION
TITLE
SITE PLAN

CONSULTANT



GOLDER

YYYY-MM-DD 2018-10-05

DESIGNED BZH

PREPARED BZH

REVIEWED PJB

APPROVED PJB

REFERENCE(S)
IMAGERY FROM GOOGLE EARTH DATED 10/30/2014.

PROJECT NO.
18107517-2

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FIGURE
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