

**CCR POST-CLOSURE PLAN
MARTIN LAKE STEAM ELECTRIC STATION
PERMANENT DISPOSAL POND - 5
RUSK COUNTY, TEXAS**

October 2016

Prepared for:

LUMINANT GENERATION COMPANY, LLC
1601 Bryan Street (EP-27)
Dallas, Texas 75201

Prepared by:


PASTOR, BEHLING & WHEELER, LLC
5416 Plaza Drive
Texarkana, Texas 75503
Texas Engineering Firm No. 4760

PBW Project No. 5196B

PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by Pastor, Behling & Wheeler, LLC under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that this Post-Closure Plan has been prepared in accordance with the requirements of 40 CFR 257.104 of the CCR Rule.



 10/5/16

Brian Thomas, P.E.
Principal Engineer
PASTOR, BEHLING & WHEELER, LLC

LUMINANT

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1.0 INTRODUCTION

Luminant Generation Company, LLC (Luminant) owns and operates the Martin Lake Steam Electric Station (MLSES) located approximately five miles southwest of Tatum in Rusk County, Texas. The power plant and related support areas occupy approximately 700 acres on a peninsula on the southwest side of Martin Lake (Figure 1). The MLSES consists of three coal/lignite-fired units with a combined operating capacity of approximately 2,250 megawatts. Coal Combustion Residuals (CCR) including fly ash, bottom ash, and gypsum are generated as part of MLSES unit operation. The CCRs are transported off-site for beneficial use by third-parties, are managed by Luminant on-site at Permanent Disposal Pond No. 5 (PDP-5) or are disposed at Luminant's A-1 Area Landfill.

The CCR Rule (40 CFR 257 Subpart D - *Standards for the Receipt of Coal Combustion Residuals in Landfills and Surface Impoundments*) has been promulgated by EPA to regulate the management and disposal of CCRs as solid waste under Resource Conservation and Recovery Act (RCRA) Subtitle D. The final CCR Rule was published in the Federal Register on April 17, 2015. The effective date of the CCR Rule was October 19, 2015.

The CCR Rule establishes national operating criteria for existing CCR surface impoundments and landfills, including development of post-closure plans (PCP) for all CCR impoundments and landfills. Pastor, Behling & Wheeler, LLC (PBW) was retained by Luminant to develop this PCP for PDP-5 at the MLSES.

1.1 CCR Impoundment Post-Closure Care Requirements

40 CFR 257.104 of the CCR Rule specifies the post-closure care requirements for existing CCR impoundments that have been closed in accordance with 40 CFR 257.102 of the Rule. Following closure of the impoundment, the owner/operator must conduct post-closure care for the unit, consisting of at least the following:

- Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover; and
- Maintaining the groundwater monitoring system for the unit and monitoring the groundwater in accordance with the requirements of 40 CFR 257.90 through 257.98 of the CCR Rule.

Post-closure care must be conducted for 30 years after the CCR impoundment has been closed. If at the end of the 30-year post-closure care period, groundwater assessment monitoring is being performed at the

unit in accordance with 40 CFR 257.95 of the CCR Rule, post-closure care of the unit must continue until the unit has returned to groundwater detection monitoring under 40 CFR 257.95.

Once the post-closure care period has been completed, the owner/operator of the CCR impoundment must prepare a notification verifying that post-closure care has been completed. The notification must include certification by a qualified professional engineer verifying that post-closure care has been completed in accordance with the written closure plan for the unit. The notification must be placed in the facility operating record within 60 days of the completion of post-closure care.

40 CFR 257.104(d) of the CCR Rule specifies that a written PCP must be prepared for each existing CCR unit that describes the post-closure care activities for the unit. The PCP must include, at a minimum, the following information:

- A description of the required post-closure monitoring and maintenance activities and the frequency at which these activities will be performed;
- The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period; and
- A description of the planned uses of the closed unit property during the post-closure period. Post-closure use of the property must not disturb the integrity of the final cover, liner, or any other component of the unit containment system, or the function of the monitoring systems.

If the owner/operator of the unit desires to disturb any of the components of the closure during the post-closure care period, a qualified professional engineer must certify that the disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The certification must be placed in the facility operating record and the Texas Commission on Environmental Quality (TCEQ) must be notified.

The PCP must be certified by a qualified professional engineer and must document how the PCP has been designed and constructed to comply with the requirements of 40 CFR 257.104.

In accordance with 40 CFR 257.104(d)(2) of the CCR Rule, the initial PCP for an existing CCR unit must be completed and placed in the facility operating record no later than October 17, 2016. The PCP must be amended whenever:

- There is a change in the operation of the unit that would substantially affect the written PCP in effect; or

- After post-closure activities have commenced, unanticipated events necessitate a revision of the written PCP.

The PCP must be amended at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing PCP. If the PCP is revised after post-closure activities have commenced for a CCR unit, the PCP must be amended no later than 30 days following the triggering event. The owner or operator of the CCR impoundment must obtain a written certification from a qualified professional engineer that the initial and any amendment of the PCP plan meets the requirements of 40 CFR 257.104 of the CCR Rule.

1.2 MLSES Units Subject to PCP Requirements

The CCR Rule defines coal combustion residuals such as fly ash, bottom ash, boiler slag, flue gas desulfurization (FGD) materials (gypsum), and related solids generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers. The PCP requirements of the CCR Rule apply to existing and new CCR impoundments that dispose or otherwise engage in solid waste management of CCR.

This PCP addresses PDP-5 at the MLSES.

1.3 Description of PDP-5

PDP-5 is located approximately 3,000 feet west-northwest of the MLSES power plant (Figure 2). A site plan for PDP-5 is shown on Figure 3. PDP-5 is an approximately 40-acre surface impoundment that is constructed above grade and is surrounded by engineered earthen embankments that extend approximately 10 to 15 feet above surrounding grade. The exterior slopes of the embankments are vegetated with grass and similar vegetation.

PDP-5 is primarily used to manage excess liquids, including storm water from large precipitation events and excess process wastewater from both the FGD and bottom ash loops. Recovered CCR wastewaters are received in PDP-5 during cleaning cycles for the BAPs and SP. Process wastewater can be transferred between the BAPs, SP, or used as makeup water for specific CCR related systems. Process wastewater can be transferred from PDP-5 to the BAPs and the SP. PDP-5 is located above grade and all material that enters the pond is pumped into the impoundment. There are no gravity discharges to PDP-5.

PDP-5 was constructed in 2010 over three closed PDPs (PDPs 1-3). The impoundment was constructed with a compacted clay liner that consisted of a six-inch thick soil layer over the closed PDPs (in-place permeability of 1×10^{-5} cm/sec), a two-foot thick compacted clay liner (in-place permeability of 1×10^{-7} cm/sec), and a three-foot thick compacted clay interior/exterior embankment liner (minimum in-place permeability of 1×10^{-7} cm/sec). The crest elevation of the PDP-5 embankments is 405.5 feet MSL. Based on available construction data PDP-5, the total design operating capacity of the impoundment is approximately 62,000,000 gallons or 190.3 acre-feet. PDP-5 is classified as a low hazard potential impoundment in accordance with the requirements of 40 CFR 257.73(a)(2) of the CCR Rule (PBW, 2016A).

As described in the CCR Closure Plan prepared for PDP-5, Luminant plans to close PDP-5 in accordance with 40 CFR 257.102(d) by leaving CCR in-place and constructing a final cover system over the CCR located within the footprint of the surface impoundment (PBW, 2016A). The proposed final grading plan for the final cover system is illustrated in Figure 4. Additional details regarding the final cover system are described in the CCR Closure Plan (PBW, 2016B)

2.0 POST-CLOSURE INSPECTION AND MAINTENANCE PLAN

Monitoring and maintenance activities will be performed to maintain the integrity and effectiveness of the final cover system as specified in 40 CFR 257.104(b)(1). During the post-closure monitoring and maintenance period at PDP-5, the final cover of the closed CCR unit will be inspected at the frequency indicated in Table 1 below:

Table 1 – Post-Closure Care Maintenance

| Post-Closure Care Maintenance Item | Frequency of Inspections | Types of Deficiency Conditions to be looked for during inspections |
|---|---------------------------------|---|
| Final Cover Condition | Annually | Inspection for vegetation, erosion, settlement, ponding water, and functionality and the surface water drainage system |
| Vegetation | Annually | Erosion rills and depressions, vegetative stress |
| Drainage structures | Annually | Sediment and debris build up, component damage, blockages, erosion, ponding of water in non-designated areas, excessive vegetative growth |

Each monitoring and maintenance activity will be documented and include the date, components and items monitored, name of the individual performing the monitoring/maintenance, a description of the deficiencies observed (if any), maintenance/repairs performed (if any), and related information.

At a minimum, maintenance will be performed as needed prior to the next scheduled inspection.

3.0 GROUNDWATER MONITORING

As specified in 40 CFR 257.104(b)(3), groundwater monitoring activities will continue throughout the post-closure care period in accordance with 40 CFR 257.90 through 257.98. All groundwater monitoring wells that are part of the groundwater monitoring network will be monitored and maintained during the post-closure care period in accordance with the Groundwater Sampling and Analysis Plan, which will be finalized and placed in the Operating Record by October 17, 2017.

If at the end of the 30-year post-closure care period, groundwater assessment monitoring is being performed at the unit in accordance with 40 CFR 257.95, post-closure care of the unit must continue until the unit has returned to groundwater detection monitoring under 40 CFR 257.95.

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4.0 FACILITY CONTACT INFORMATION**Table 2: Contact Information**

| | |
|-------------------------|-------------------------------------|
| Name | Luminant - Environmental Services |
| Address | 1601 Bryan St., Dallas, Texas 75201 |
| Telephone Number | 214-875-8654 |
| Email | CCRPostClosurePlan@Luminant.com |

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5.0 POST-CLOSURE LAND USE

Post-closure use of the property will not disturb the integrity of the final cover, liner system, or any other component of the containment system, or function of the monitoring system in accordance with §257.104(d)(1)(iii) unless necessary to comply with the maintenance requirements of this subpart or as otherwise provided as allowed under this subpart.

Post-closure land use is anticipated to be undeveloped/unchanged and the area will be deed recorded and deed restricted to prevent disturbance of the closed waste management unit.

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6.0 NOTIFICATION OF COMPLETION OF POST-CLOSURE CARE PERIOD

No later than 60 days following completion of the post-closure care period, a certification will be prepared by a qualified professional engineer verifying that the post-closure care has been completed in accordance with this Post-Closure Plan.

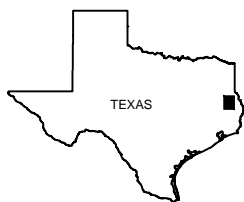
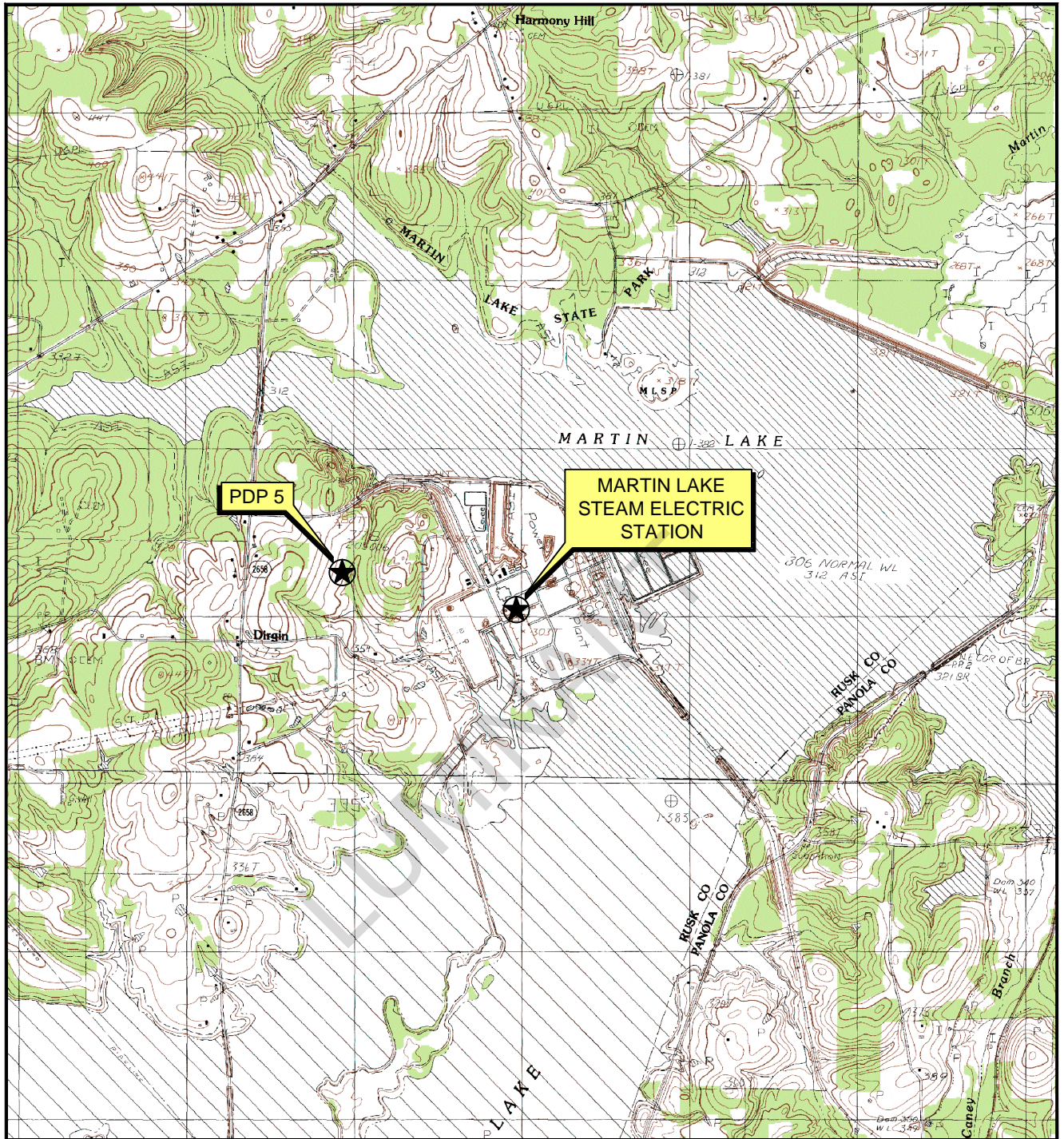
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7.0 REFERENCES

- Burns & McDonnell Engineering Company, Inc., 2016. *History of Construction – Martin Lake Steam Electric Station CCR Surface Impoundments*. August 16.
- Pastor, Behling & Wheeler, LLC. , 2014. *Affected Property Assessment Report Martin Lake Steam Electric Station Permanent Disposal Pond Area*. May 13.
- Pastor, Behling & Wheeler, LLC. , 2016. *Annual CCR Unit Inspection Report, Luminant – Martin Lake Steam Electric Station Ash Pond Area, Permanent Disposal Pond No.5 & A-1 Area Landfill, Rusk and Panola County, Texas*. January 16.
- Pastor, Behling & Wheeler, LLC (PBW), 2016A. *Hazard Classification Assessment – Martin Lake Steam Electric Station Ash Pond Area and Permanent Disposal Pond No. 5, Rusk County, Texas*. October.
- Pastor, Behling & Wheeler, LLC (PBW), 2016B. *CCR Closure Plan – Martin Lake Steam Electric Station Permanent Disposal Pond No. 5, Rusk County, Texas*. October.
- United States Geological Survey (U.S.G.S.), 1983, *7.5-Minute Series Topographic Map, Tatum, TX Quadrangle*.
- United States Geological Survey (U.S.G.S.), 1983, *7.5-Minute Series Topographic Map, Fair Play, TX Quadrangle*.

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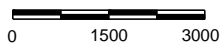
FIGURES



QUADRANGLE LOCATION



Scale in Feet



LUMINANT GENERATION COMPANY, LLC
MARTIN LAKE STEAM ELECTRIC STATION

Figure 1

SITE LOCATION MAP

PROJECT: 5196B

BY: AJD

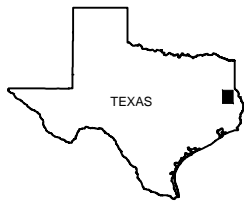
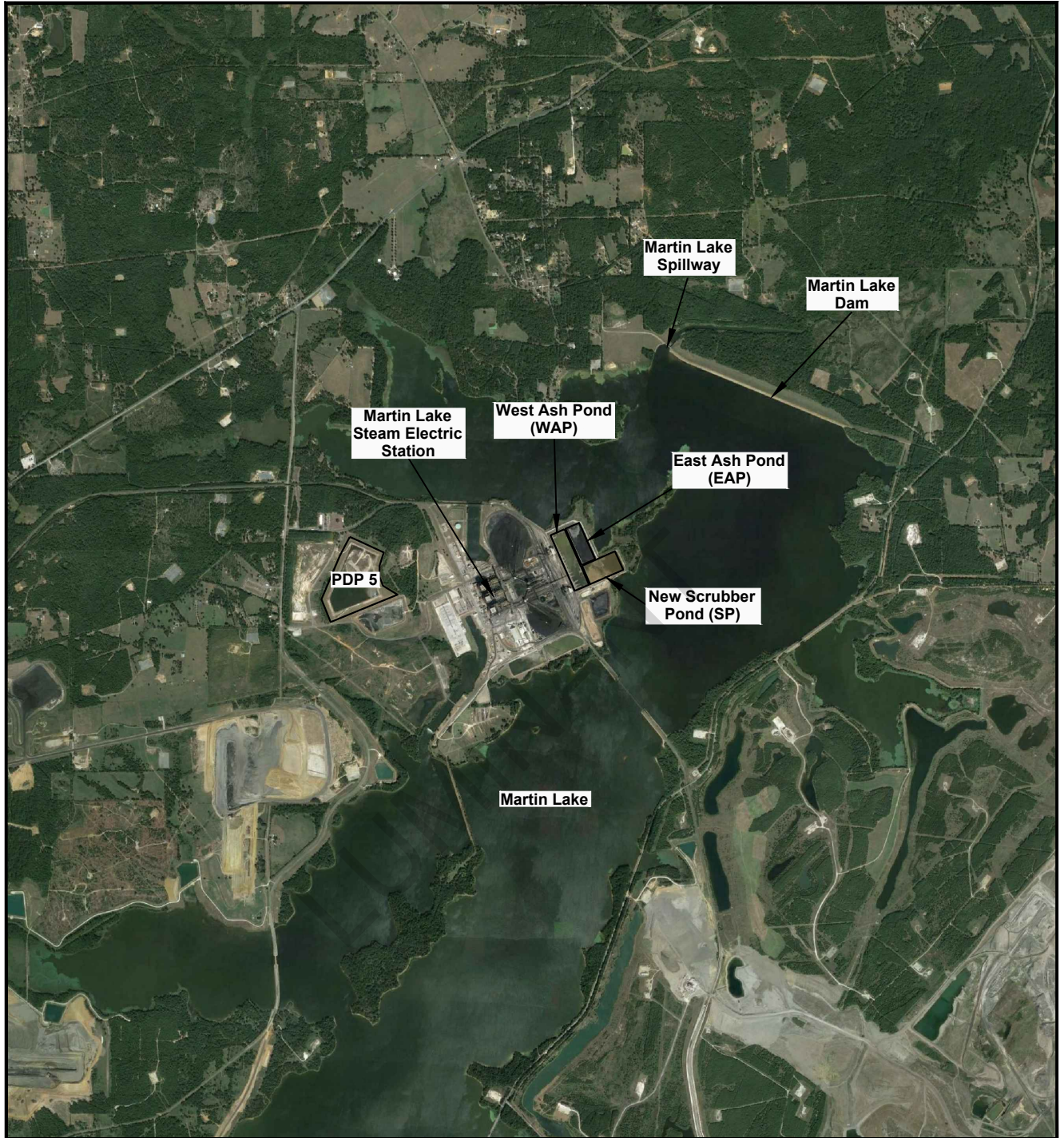
REVISIONS

DATE: SEPT., 2016

CHECKED: BDT

PASTOR, BEHLING & WHEELER, LLC
 CONSULTING ENGINEERS AND SCIENTISTS

SOURCE:
 Base map from www.tnris.gov, Tatum, TX 7.5 min. USGS quadrangle dated 1983.



PHOTOGRAPH LOCATION



Scale in Feet



LUMINANT GENERATION COMPANY, LLC
MARTIN LAKE STEAM ELECTRIC STATION

Figure 2

SITE VICINITY MAP

PROJECT: 5196B

BY: AJD

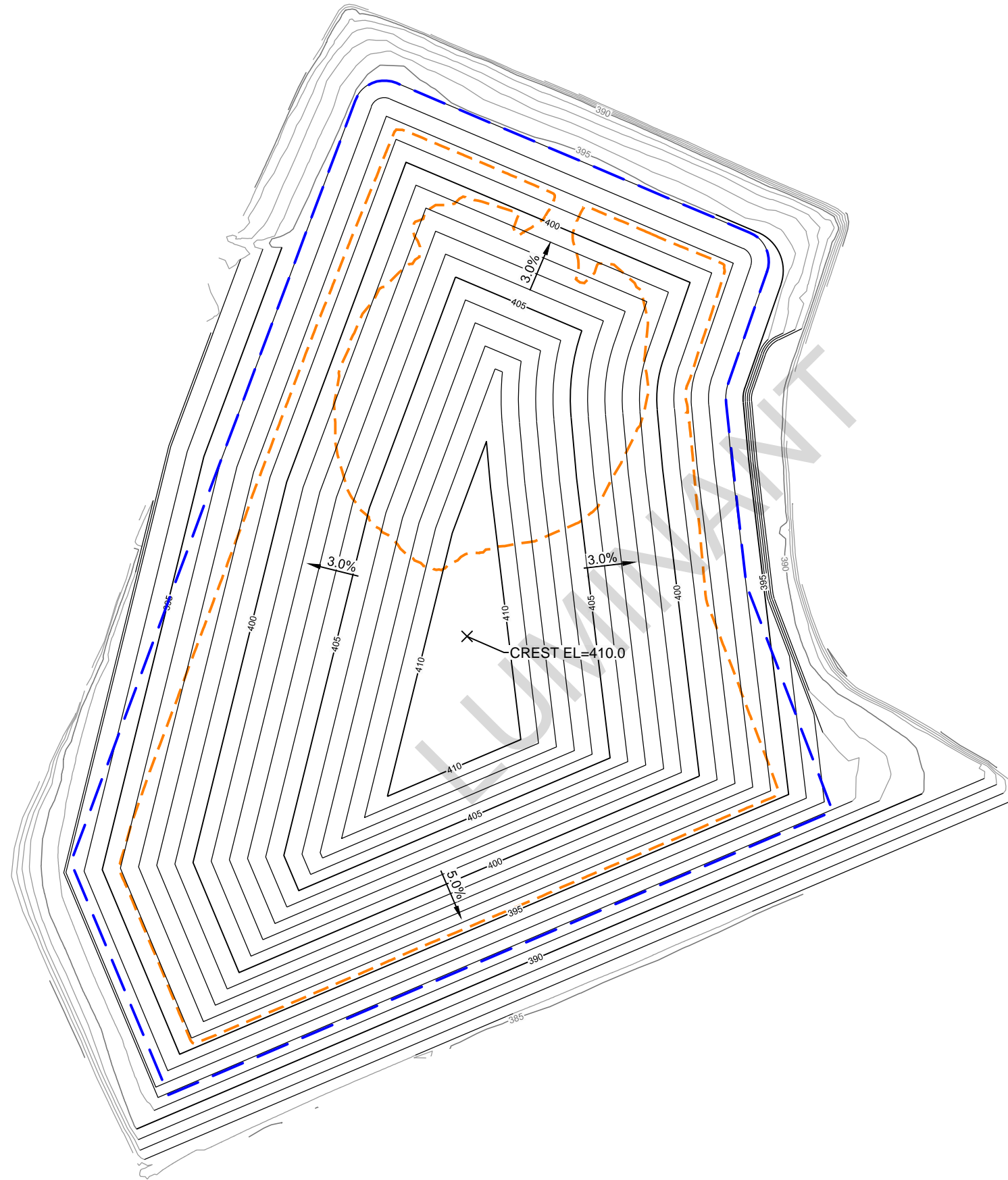
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DATE: SEPT., 2016

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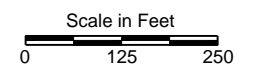
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SOURCE:
 Imagery from Google Earth, photography dated October 1, 2015.



EXPLANATION

- Proposed Finished Grade Contour
1 ft Interval
- Proposed Finished Grade Contour
5 ft Interval
- - - Proposed Limits of CAP
- - - Estimated Limits of CCR
(Elev. 400.5)



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Figure 3
**PROPOSED
FINAL COVER GRADING PLAN**

| | | |
|-------------------|--------------|-----------|
| PROJECT: 5196B | BY: AJD | REVISIONS |
| DATE: SEPT., 2016 | CHECKED: BDT | |

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