

ANNUAL CCR UNIT INSPECTION REPORT

**LUMINANT – MARTIN LAKE STEAM ELECTRIC STATION
ASH POND AREA, PERMANENT DISPOSAL POND NO. 5 & A1 AREA LANDFILL
RUSK & PANOLA COUNTY, TEXAS**

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1.0 INTRODUCTION

Luminant Power (Luminant) 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 (see 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, 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 A1 Area Landfill. The A1 Landfill is located approximately 2.5 miles southeast of the MLSES in Panola County.

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 operating criteria for existing CCR surface impoundments and landfills, including annual inspection requirements for all CCR units to ensure that the design, construction, operation, and maintenance of the CCR impoundment are consistent with recognized and generally accepted good engineering standards. Pastor, Behling & Wheeler, LLC (PBW) was retained by Luminant to perform the 2015 annual inspections of the CCR units at the MLSES. This report presents the findings of the 2015 annual inspections.

1.1 Annual CCR Surface Impoundment Inspection Requirements

Section 257.83(b) of the CCR Rule specifies that annual inspections by a qualified professional engineer be performed for each CCR surface impoundment that: (1) has a dike height of five feet or more and a storage volume of 20 acre-feet or more; or (2) has a dike height of 20 feet or more. The annual CCR surface impoundment inspection must include the following:

- A review of available information regarding the status and condition of the CCR unit, including files available in the operating record, such as CCR unit design and construction information required by Sections 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under Sections 257.73(d) and 257.74(d), the results of inspections by the

qualified person as required under Section 257.83(a), and the results of previous annual CCR inspections (where applicable).

- A visual inspection of the CCR unit to identify signs of distress or malfunction of the impoundment and appurtenant structures, and
- A visual inspection of any hydraulic structures underlying the base of the impoundment or passing through the dike of the impoundment for structural integrity and continued safe and reliable operation.

The qualified professional engineer must prepare a report following each inspection that addresses the following:

- Any changes in geometry of the impounding structure since previous annual inspection;
- The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;
- The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;
- The storage capacity of the impounding structure at the time of the inspection;
- The approximate volume of the impounded water and CCR at the time of the inspection;
- Any appearances of actual or potential structural weakness of the impoundment, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the impoundment and appurtenant structures; and
- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous inspection.

1.2 Annual CCR Landfill Inspection Requirements

Section 257.84(b) of the CCR Rule specifies that annual inspections be performed for CCR landfills by a qualified professional engineer. The annual CCR landfill inspection must include a review of available information regarding the status and condition of the CCR landfill including files available in the operating record, such as the results of inspections by the qualified person as required under Section 257.84(a), and the results of previous annual CCR inspections (where applicable) and visual inspection of the CCR landfill to identify signs of distress or malfunction of the landfill. The qualified professional engineer must prepare a report following each inspection that addresses the following:

- Any changes in geometry of the structure since the previous annual inspection;

- The approximate volume of CCR in the landfill at the time of the inspection;
- Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and
- Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

1.3 MLSES Units Subject to Annual CCR Inspection 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 annual inspection requirements of the CCR Rule apply to surface impoundments and landfills that dispose or otherwise engage in solid waste management of CCRs.

The following surface impoundments and landfills at the MLSES have been identified as CCR Units subject to the annual CCR inspection requirements. Each of the listed surface impoundments is surrounded by earthen embankments (dikes) with heights of five feet or more and has a storage volume greater than 20 acre-feet.

- West Ash Pond (WAP),
- East Ash Pond (EAP),
- New Scrubber Pond (SP),
- PDP-5, and
- A1 Area Landfill.

These CCR Units are described in greater detail below:

- **Bottom Ash Ponds.** The WAP and EAP (collectively “Bottom Ash Ponds” or “BAPs”) are located approximately 2,000 feet east of the MLSES power plant (Figure 2). The WAP and EAP receive recovered sluice water from bottom ash dewatering bins and other MLSES process wastewater sources that typically include bottom ash fines. The ponds also act as surge basins for various water streams in the ash-water system. Process wastewater can be transferred from the BAPs to the SP and PDP-5 or used as makeup water to the bottom ash system. When sufficient ash has accumulated in either the WAP or EAP, the recovered sluice water is diverted to the other pond. Ash in the inactive pond is then removed and transported via rail car to the A1 Area Landfill. The BAPs were originally constructed in the 1977 and upgraded in 1988 (WAP) and 2010 (EAP).

The WAP and EAP are constructed partially above and partially below grade and are surrounded by engineered earthen embankments that extend above grade. The WAP and EAP share an

interior embankment and cover areas of approximately 14.6 acres and 9.6 acres, respectively. The crest elevation of the BAP embankments is 330 feet above mean sea level (MSL) and the EAP borders Martin Lake (normal pool elevation 306 feet MSL).

The BAPs were originally constructed in the 1977 with an in-situ compacted clay liner. The WAP was removed from service in March 1988 and re-lined with a double 60-mil high density polyethylene (HDPE) liner system overlain with a concrete revetment mat. The EAP was dredged and removed from service in 1989, and a new south embankment was constructed to allow for an increase in the size of the SP. The EAP remained inactive until the installation of a new double 60-mil HDPE liner system with concrete revetment mat was completed in February 2010.

With the exception of 24-inch subsurface dewatering lines used for decanting process wastewater from the WAP, no subsurface penetrations of the CCR units are present at MLSES. These subsurface lines are connected to a collection sump at the low pressure ash water pump station located south of the SP.

- Scrubber Pond. The SP is located immediately south of the EAP and east of the WAP (Figure 2). The SP is an approximately 12.5 acre surface impoundment that is used to manage FGD wastes as well as discharge from the sludge thickener sumps, the plant yard sumps, and storm water management areas. Solids present in the FGD wastewater settle within the pond and are periodically removed and managed similar to the ash solids from the WAP and EAP. Process wastewater can be transferred from the SP to the BAPs and PDP-5, or used as makeup water to the scrubber systems. The SP was originally constructed in the 1977 and was expanded to its current size in 1989.

The SP is constructed partially above and partially below grade and is surrounded by engineered earthen embankments that extend above grade. The west embankment of the SP is an internal/shared embankment with the WAP and a portion of the northern embankment is an internal/shared embankment with the EAP. The crest elevation of the SP embankments is 330 feet MSL. Martin Lake (normal pool elevation 306 feet MSL) adjoins portions of the north and south embankments of the SP.

The SP was originally constructed in 1977 with an in-situ compacted clay liner and was expanded to its current size in 1989. The SP was relined in 1989 with a double 60-mil HDPE liner system, overlain with a concrete revetment mat.

With the exception of 24-inch subsurface dewatering lines used for decanting process wastewater from the SP, no subsurface penetrations are present at the SP. These subsurface lines are connected to a collection sump at the low pressure ash water pump station located south of the SP.

- PDP-5. PDP-5 is located approximately 3,000 feet west-northwest of the MLSES power plant (Figure 2). PDP-5 is an approximately 53-acre surface impoundment that was constructed in 2010 over three closed PDPs (PDPs 1-3). 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 constructed above grade and is surrounded by engineered earthen embankments. The crest elevation of the PDP-5 embankments is 405.5 feet MSL, and the embankments are approximately 10 to 15 feet above surrounding grade. The liner system for the PDP-5 consists of the following:

- a six-inch thick soil layer over the closed PDPs (in-place permeability of 1×10^{-5} cm/sec);
 - two-foot thick compacted clay liner (in-place permeability of 1×10^{-7} cm/sec); and
 - three-foot thick compacted clay interior/exterior embankment liner (minimum in-place permeability of 1×10^{-7} cm/sec).
- A1 Area Landfill. The A1 Area Landfill is located approximately 2.5 miles southeast of the MLSES power plant (Figure 2). The A1 Area Landfill is the primary disposal facility for CCRs generated at the MLSES. The landfill covers an area of approximately 986 acres and is located within a reclaimed section of the Luminant Beckville Mine. The A1 Area Landfill is surrounded by and underlain by spoil material that was previously excavated during lignite mining operations. The A1 Area Landfill is registered under the Texas Commission on Environmental Quality and began receiving CCR in 1980.

The A1 Area Landfill is surrounded by earthen embankments constructed of mine spoil. Prior to placement of CCRs, a 1-foot thick compacted clay bottom liner is constructed over prepared subgrade (mine spoil 70-100 feet in thickness). Hence, the bottom liner consists of clay scarified and re-compacted to achieve the design specification of 95 percent of maximum density and an in-place permeability of 1×10^{-7} cm/sec or less. Specifications for the construction of the perimeter embankments include placement of a 3-foot thick compacted clay liner on the interior slope of the embankment, which was specified not to exceed a 3:1 (horizontal:vertical) sideslope. Approximately 450-acres of the A1 Area landfill has been closed by placement of a 3-foot thick compacted clay cap with a minimum 2-foot thick vegetative cover layer. Progressive capping/closure of the A1 Area Landfill is performed as placement of CCR reaches the target cap subgrade elevations.

A number of former drainage control valves and active pond discharge control pipes that penetrate the perimeter embankment of the A1 Area Landfill remain in-place.

2.0 RECORDS REVIEW

In accordance with the requirements of 40 CFR Parts 257.83(b)(i) and 257.84(b)(i), Luminant provided PBW with the following information from the facility operating records for the CCR units at the MLSES:

- Fugitive Dust Control Plan (FDCP) for the CCR units,
- weekly qualified person inspection records for the CCR units,
- historical CCR unit design and construction documentation, and
- assessments of the structural stability of the CCR surface impoundments.

The 2015 annual inspection is the first annual inspection performed under the CCR Rule. As a result, no previous CCR annual inspections were available for review.

2.1 CCR Fugitive Dust Control Plan

The CCR FDCP for the MLSES dated October 2015 was reviewed by PBW as part of the annual CCR inspection process. The FDCP was certified by a Registered Professional Engineer on October 5, 2015, and placed into the operating record on October 16, 2015. CCR within the BAPs, SP and PDP-5 is managed using wet handling systems, which virtually eliminates the generation of fugitive dust. However, the MLSES CCR FDCP does include the following dust control measures:

- Water spray or fogging systems;
- Compaction;
- Vegetative cover; and
- Reduced vehicle speeds.

These dust controls shall be implemented during periodic removal of CCR solids from the BAPs and SP. In addition, during loading of fly ash at MLSES the material is conditioned during the loading process to mitigate fugitive dust. Controls are also in-place at the Beckville Mine to comply with the FDCP during placement of CCR within the A1 Area Landfill. The FDCP includes provisions to amend the plan as necessary, and the plan includes a log for citizen complaints. No citizen complaints were recorded with the FDCP at the time of the annual inspection.

2.2 Weekly Qualified Person Inspection Records

PBW reviewed weekly qualified person inspection forms for the WAP, EAP, SP, PDP-5 and A1 Area Landfill. Luminant initiated weekly CCR qualified person inspections at the MLSES during the week of October 12, 2015. Four weekly qualified person inspections were performed by Luminant prior to the annual inspection of the WAP, EAP, SP and PDP-5 and eight weekly inspections were performed prior to the A1 Area Landfill annual inspection.

Items identified for monitoring or action at each CCR Unit during the 2015 weekly qualified person inspections can be summarized as follows:

- WAP and EAP:
 - Monitor irregular slope conditions on northern downstream embankment of WAP and EAP;
 - Repair small animal burrows;
 - Monitor ash removal from WAP and potential heavy equipment damage to embankment crest; and
 - Repair ash water leak and related erosion on WAP western downstream embankment.
- SP:
 - Repair small animal burrows (inspection logs included documentation of completed repairs);
 - Monitor minor erosion present on downstream embankment; and
 - Monitor damage to embankment crest related to heavy equipment traffic.
- PDP-5:
 - Monitor erosion of the upstream (interior) embankment (near corners) related to wave action;
 - Monitor and repair minor rutting on embankment crest; and
 - Monitor growth of temporary vegetative cover (October 23, 2015 annual rye grass planting noted).
- A1 Area Landfill:
 - Monitor bulges observed on downstream embankment slope near Station 5+00;
 - Seepage noted at downstream embankment toe between Stations 14+00 and 35+00;
 - Monitor and repair feral hog damage as slope conditions allow;
 - Monitor and repair minor slope erosion as conditions allow;
 - Monitor seepage on north slope (near Station 220+00);
 - Continue minor repairs, reseeding and mowing as conditions allow; and
 - Document on-going brush removal along northern boundary.

No conditions with the potential to result in structural weakness of the impoundment embankments or that could potentially disrupt the operation and safety of the impoundments were reported during the weekly qualified person inspections of the WAP, EAP, SP and PDP-5. Recommended action items were limited to routine maintenance of access roads, erosion and animal burrows that do not currently have potential to result in structural weakness or disrupt the operation and safety of the impoundments.

Wet areas/seepage was frequently noted along the toe of the A1 Area Landfill embankments in several areas during the weekly qualified person inspections. The wet/seepage areas were identified for on-going monitoring to assess the potential to result in a structural weakness in the embankments surrounding the landfill. Other observations/recommended action items were limited to routine maintenance of access roads, erosion and animal burrows that do not currently have potential to result in a structural weakness or disrupt the operation and safety of landfill.

2.3 CCR Unit Design and Construction Documentation

Luminant provided PBW with the following historical documents that included information concerning the design and construction of the WAP, EAP, SP, and PDP-5 surface impoundments at the MLSES:

- CCR Study for MLSES (Burns & McDonnell, July 31, 2015); and
- Critical Impoundment Inspection Report for MLSES (Pinnacle Technical Resources, Inc., May 14, 2014)

The CCR Study prepared by Burns and McDonnell included a review of historical slope stability evaluations performed for the WAP, EAP, SP and PDP-5 surface impoundments. A table summarizing the construction history and CCR management activities for the surface impoundments based on the historical documents is provided in Appendix A. A description of the design and construction characteristics for the WAP, EAP, SP and PDP-5 is presented in Section 1.3 of this annual report.

Luminant provided PBW with the following historical documents that included information concerning the siting study, construction specifications (i.e. clay liner and cap placement), and typical design section of the perimeter embankments and soil cap for the A1 Area Landfill:

- Hydrogeologic/Geotechnical Evaluation A1 Expansion Area (MFG, November 1991); and
- A-1 Disposal Area Expansion, Class II Landfill Expansion Registration Notification and Technical Report (TU Electric Company, June 1993)

A description of available design and construction characteristics for the A1Area Landfill is presented in Section 1.3 of this annual report.

2.4 CCR Surface Impoundment Structural Stability Assessment

Sections 4.2.3, 5.2.3, and 7.2.3 of the CCR Study (Burns & McDonnell, 2015) include an assessment of historical structural stability analyses performed at the BAPs, SP and PDP-5. As described in the report, a geotechnical and slope stability evaluation was performed in 2012 on the BAPs and SP by Golder Associates. The Golder slope stability evaluation concluded that the critical embankment slopes in the BAPs were stable under short-term and long-term conditions. Similarly, a geotechnical and slope stability evaluation was performed by ETTL in 2009 that includes calculated slope stability safety factors for PDP-5. The ETTL evaluation also concluded that the critical embankment slopes of PDP-5 were stable under short-term and long-term conditions.

3.0 CCR SURFACE IMPOUNDMENT FIELD INSPECTIONS

The 2015 annual inspection of the MLSES CCR surface impoundments was performed on November 10, 2015. Brian Thomas, a registered professional engineer in the State of Texas, was accompanied by Luminant qualified persons during the November 10th inspection (Anthony Davis, Shea Harboth and Bennett Jones). The inspection consisted of a walking visual survey of the downstream embankments, the embankment crest, and upstream embankments of the surface impoundments to identify potential areas of concern (if present) that could affect structural integrity or disrupt operation of the impoundment. Since this was the initial annual CCR inspection for each unit, conditions at the surface impoundments observed were compared to the MLSES critical impoundment inspections performed on behalf of Luminant in March 2014 (Pinnacle Technical Resources, 2014).

Current observations were recorded in the field using a hand-held global positioning system survey instrument in order to locate areas that require further monitoring and/or action to address potential areas of concern noted during the inspection. Figures 3 and 5 summarize the field observations from the inspections of the BAPs/SP and PDP-5, respectively. Photographs of the surface impoundments taken during the annual inspection are included as Appendices B and C. Figures 4 and 6 illustrate the location where photographs were taken during the inspection of the BAPs/SP and PDP-5, respectively. The following sections summarize the results of the initial annual inspection, including specific observations related to the structural elements of the MLSES CCR surface impoundments.

3.1 Field Inspection - Bottom Ash Ponds & Scrubber Ponds

The earthen embankments of the WAP, EAP and SP were inspected collectively since each surface impoundment shares interior embankments with the others.

3.1.1 Surface Impoundments – Downstream Embankment

The downstream embankments of the BAPs and SP were generally in good condition and no visual evidence or slope movement or miss-alignment was noted during the inspection. With the exception of isolated areas along the north and west sides of both the EAP and WAP, the embankments were well vegetated with grasses that have been mowed to a height of less than 6 inches. An isolated area of limited vegetative cover is associated with irregular slope conditions resulting from the presence of surficial bottom ash. However, the relatively short slope lengths have limited erosion in these areas.

Localized areas of erosion were noted on the downstream embankment, but in all cases the erosional features were generally surficial and should be monitored to ensure further erosion does not occur that warrants repair. Surface conditions at the Site were generally damp due to heavy Fall rains, including 3.16 inches recorded in November prior to the inspection; hence, numerous wet areas near the toe of the embankment slopes were noted. However, no active seepage was observed in these areas during the inspection. Recommended monitoring of wet areas will allow for identification of potential seepage during weekly inspections performed during seasonally dry periods. As indicated on Figure 3, the following areas were noted for future monitoring or repair:

- Repair erosion associated with a low pressure ash water transfer line leak on the west side of the WAP.
- Remove trees at the toe of the slope along the northern embankment of the SP and at the southeast corner of the SP to allow for improved inspection and maintenance.
- Monitor localized erosional features near the northwest corner of the WAP, under the influent pipe rack on the north end of the EAP, and at the southeast corner of the EAP where the embankment joins the SP embankment.
- Monitor the following areas of slope irregularities where vegetative maintenance is difficult and localized steepened slopes may result in development of erosion:
 - South Embankment of the WAP;
 - Central and northern portion of the west embankment of the WAP;
 - North embankment of the WAP and EAP;
 - Steepening slope near the crest of the north and east embankments of the SP as well as immediately above the contact with the roller compacted cement portion of the embankment near the southeast corner of the SP; and
 - South central embankment of the SP.
- Monitor the following areas where area of excessive wetness was observed at the toe of the slope:
 - South slope of the WAP and western portion of south slope of the SP where a piping corridor limits drainage relief at the toe. Reestablishing cribbing beneath the piping may provide for improved drainage;
 - East slope of the SP near the southeast corner;
 - East slope of the EAP along the face of the roller compacted cement portion of the slope.
 - North slope near the common embankment for the EAP and WAP
 - Near influent pipe rack of the EAP
- Repair animal burrows with compacted clay fill.
- Monitor slope irregularities, including a localized bulge (apparent former shallow surface slide) on the south embankment of the WAP and a slight depression near the south central portion of the SP embankment.

3.1.2 Surface Impoundments – Embankment Crest

The majority of the embankment crest is improved with a crushed aggregate access road or elevated concrete pipe crossings. Access roads are generally in good conditions with limited areas of shallow ponding along the roadways. Recent heavy equipment traffic associated with the cleanout of the WAP has resulted in rutting, which was noted for maintenance by Luminant during recent weekly qualified person inspections. No visual evidence of slope failures or miss-alignments were noted on the crest of the embankments.

3.1.3 Surface Impoundments – Upstream Embankment

The upstream embankments of the BAPs and SP are armored with concrete revetment matting, which is generally in good condition and prevents erosion of the interior slopes via either wave action or erosion from run-off. Routine removal of solids and the associated heavy equipment traffic has resulted in localized damage of the interior slope protection in the areas noted on Figure 3. The HDPE liner is visible in most of these areas, and the liner should be inspected and repaired (if needed) prior to repairing the damaged area with cement grout. With the exception of minor displacement of the revetment mat in localized areas, no visual evidence of slope failures or miss-alignments was noted on the upstream embankment of the BAPs and SP.

3.2 **Field Inspection – PDP-5**

3.2.1 Surface Impoundment – Downstream Embankment

PDP-5 was constructed in 2010 and generally remains in very good condition, with the exception of the lack of uniform permanent vegetative cover in some areas. The downstream embankments of PDP-5 were observed to be in good condition and no visual evidence of slope movement or miss-alignment noted during the inspection. The entire downstream embankment was recently top-dressed and re-seeded with annual rye grass on October 23, 2015 to repair widespread shallow rill erosion resulting from the limited permanent grass coverage. The annual rye grass will provide temporary cover through the winter months; however, the slope should be over seeded with an appropriate perennial grass mixture in the spring of 2016. Localized areas of rill erosion were noted and are generally associated with areas where the annual ryegrass has not achieved uniform coverage. Agronomic testing of the shallow surface soil is recommended prior to over seeding the embankment to allow for the addition of soil amendments/

conditioners that may improve uniform perennial grass coverage on the embankment. As indicated on Figure 5, the following areas were noted for future monitoring or repair:

- Monitor two recent surficial repair areas on the south embankment; and
- Monitor localized shallow rill erosion occurring in areas with limited annual rye grass coverage, which is primarily located along the east embankment with other more localized areas noted on Figure 5.

3.2.2 Surface Impoundment – Embankment Crest

A small portion of the north and south embankment crest is improved for vehicular traffic with crushed aggregate, while the remaining areas are graded to drain and vegetated. The embankment crest is generally in good condition with limited areas of shallow ponding along the roadways. A localized area of ponding and shallow rutting is present near the northeast corner of the embankment crest. These areas of the crest should continue to be inspected and routine maintenance/re-grading should be performed as needed to minimize ponding on the crest. No visual evidence of slope failures or miss-alignments was noted on the crest of the embankment.

3.2.3 Surface Impoundment – Upstream Embankment

More uniform perennial grass coverage is generally present on the upstream embankment of PDP-5. However, minor erosion is occurring near the waterline on the upstream embankment as a result of wave action. This erosion is intensified near the corners of the impoundment, and the northwestern corner of the impoundment should be monitored and repaired (e.g. armored) if conditions worsen. No visual evidence of slope failures or misalignment was noted on the upstream embankment of PDP-5.

4.0 CCR LANDFILL FIELD INSPECTION

The 2015 annual inspection of the MLSES A1 Area Landfill was performed on December 9-10, 2015. Brian Thomas, a registered professional engineer in the State of Texas, was accompanied by a Luminant qualified person during the December 9-10, 2015 inspection (Bennett Jones). The inspection consisted of a walking visual survey of the embankments, cap, and storm water control structures of the A1 Area Landfill. Current observations were recorded in the field using a hand-held global positioning system survey instrument in order to locate areas that require further monitoring and/or action to address potential areas of concern noted during the inspection. Figures 7 and 8 summarize the field observations from the inspections of the A1 Area Landfill. Photographs of the landfill taken during the annual inspection are included as Appendix D. Figure 9 illustrates the location where photographs were taken during the inspection of the A1 Area Landfill. The following sections present the results of the annual inspection, including specific observations related to the structural elements of the A1 Area Landfill.

The inspection requirements for CCR landfills include a review of the design, construction, operation and maintenance of the landfill in order to determine if the CCR unit meets generally accepted good engineering practice. The primary objective of the visual inspection of the A1 Area Landfill was to identify any evidence of actual or potential structural weakness of the CCR unit, including conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit. This is the initial annual inspection; hence, the recently completed weekly inspections and this annual inspection will serve as the baseline inspection for the A1 Area Landfill.

Approximately 450 acres of the A1 Area Landfill has been completed with the final cap and cover system described in Section 1.3, and with exception of an approximately 100-acre portion of the permitted limits of the A1 Area Landfill Area, subgrade preparation and placement of the bottom compacted clay liner has been completed. CCR placement is primarily focused near the central portion of the landfill to continue fill placement until the design cap subgrade elevations are reached. As the design subgrade elevations are achieved, the landfill is progressively closed with the final cap and vegetative cover system. The field inspection of the landfill included a walking survey of the perimeter embankment or limits of incised areas within the permitted landfill limits. Observations were recorded in the field using a hand-held global positioning system and referenced to existing stationing marked at 500 foot intervals along the permitted limits of the A1 Area Landfill. Inspection of the cap and vegetative cover system, active disposal areas, and the surface water control structures was performed in conjunction with

the embankment inspection as well as during a driving survey of the landfill. Additional details concerning the landfill inspection are included in the following sections.

4.1 Perimeter Embankment

Topography along the 5-mile perimeter of the A1 Area Landfill (permitted limits) varies greatly. Given the size and siting of the landfill within the reclaimed portion of the Luminant Beckville Mine, the perimeter earthen embankment varies from absent at incised portions of the landfill to heights greater than 20 feet within the closed/capped portions of the landfill. With the exception of areas near the toe that were recently repaired or cleared and grubbed of vegetation, the embankments were well vegetated with grasses that have been mowed to allow for visual inspection. The most extensive area of recent repairs has occurred between Stations 13+00 to 32+00. Widespread areas of wet soil conditions were noted near the toe of the embankment within this area on the north side of the landfill where both active placement of ash and collection/transfer of contact storm water are occurring. The ditch that provides drainage relief for the toe of the embankment in this area contained baseflow at the time of the inspection; however, discrete seepage was not observed. Luminant recently completed repair of an area near Station 27+00 where discrete seepage was discovered during removal of vegetation prior to the annual inspection. Seepage from the repaired area was not observed at the time of the inspection; however, Luminant has initiated an investigation of subsurface conditions centered at this location. On-going evaluation of this area of concern will provide data necessary to determine whether observed seepage requires corrective action or if existing embankment conditions are stable.

It should be noted, that surface conditions at the Site were generally damp following heavy fall rains including 2.41-inches of rain in the two weeks prior to the inspection. As a result, numerous areas of wet surface conditions near the toe of the embankment were noted; however, no active seepage was observed at the time of the inspection. Recommended monitoring of wet areas will allow for identification of potential seepage during weekly inspections performed during seasonally dry periods. As indicated on Figure 7, the following areas were noted for future monitoring or repair:

- Repair erosion near the crest of the embankment on the east side of the railroad embankment near Station 132+00.
- Repair localized area of subsidence on north side of the access road near the toe of the embankment (Station 67+00).
- Monitor the following recent embankment repairs to ensure the repaired area remains stable and uniform vegetative cover is achieved:

- Drainage improvement near toe of the embankment (Station 13+00);
 - Drainage improvement near embankment toe between Station 16+00 and 25+00;
 - Major slope repair in the vicinity of a recent seep (Station 27+00);
 - Wet area recently repaired just beyond the toe of the embankment (Station 32+00);
 - Slope repair near the embankment crest (Station 108+00);
 - Slope repair near the embankment crest (Station 121+00);
 - Storm water let-down inlet area at the embankment crest (Station 127+00);
 - Wet area recently repaired on slope between Station 139+00 to 142+00; and
 - Slope/road repair near embankment crest (Station 227+00).
- Monitor the following areas where area of excessive wetness were observed at the toe of the slope:
 - Station 8+00 to 10+00;
 - Improved drainage ditch with baseflow present (Station 13+00 to 32+00);
 - Station 51+00;
 - Heavily vegetated drainage ditch with baseflow (Station 68+00 to 103+00);
 - Station 139+00 to 142+00;
 - Station 215+00; and
 - Station 219+00 to 221+00;
 - Monitor the wet area immediately downslope of the contact water collection sump near the crest of the embankment (Station 89+00).
 - Monitor two wet areas on the upper portion of the slope (near same elevation) of the northwest embankment near Stations 214+00 and 218+00. Wetness was observed on the embankment immediately downslope of South Holding Pond.
 - Monitor the following areas where minor embankment slope erosion is present:
 - Station 29+00 near embankment crest;
 - Station 31+00 near embankment crest;
 - Station 44+00 near embankment crest;
 - Station 134+00 near embankment crest;
 - Station 154+00 near embankment crest; and
 - Numerous areas of localized rill erosion and some moderate erosional features are present on the northwest slope of the landfill in an area where widespread brush removal and revegetation has recently occurred (Station 214+00 to 227+00). This area is the downslope embankment for the South Holding Pond and the long slope length makes this area susceptible to erosion prior to establishment of uniform grass coverage.
 - Monitor an area of poor vegetative coverage on the embankment near Station 43+00.
 - Monitor discharge structure and pipe penetrations at the North Treatment Pond.
 - Monitor erosion at the storm water let-down structure discharge near Station 100+00.
 - Monitor and repair vehicle ruts on embankment slope near Station 117+00.

- Monitor erosion/head cut occurring beyond the toe of the embankment just past the permitted limits of the landfill to ensure the erosion does not encroach towards the embankment.
- Monitor depression at the crest of the embankment slope immediately west of the south contact water containment sump (Station 131+00).
- Widespread feral hog damage is present on the embankment as illustrated on Figure 8. Areas of heavy damage noted should be monitored to ensure erosion is not occurring due to the irregular slope and loss of vegetation. These areas should be repaired when conditions allow and a more aggressive deterrent program should be implemented.

4.2 Landfill Cap

The capped portion of A1 Area Landfill is generally in a stable condition with a well maintained 3-foot thick compacted clay cap with additional vegetative soil cover. Although slope lengths are long in some areas, the vegetative cover is generally in very good condition and the slopes typically do not exceed 3 percent, which results in relatively low potential for erosion. Storm water diversion berms are present on the south and east sides of the landfill cap to prevent surface water from reaching contact water collection sumps present along the crest of the embankment in these areas (Figure 7). Additional details concerning the sumps, contact, and non-contact storm water is provided in Section 4.4. Inspection of the capped portion of A1 Area Landfill indicates that conditions that could disrupt or have the potential to disrupt the operation and safety of the CCR unit are not present.

4.3 Active CCR Placement Areas

The majority of CCR placement is occurring near the central portion of the landfill in an effort to fill this area to target subgrade elevations. However, CCR is also placed within other areas of the landfill to allow for final subgrade preparation and progressive capping of the landfill. Areas immediately west of the North Holding Pond and southward to the existing capped area are currently planned for capping within the next two years. Luminant personnel maintain and update a conceptual material placement and progressive capping plan with current operating projections through the year 2025. To date Luminant estimated that approximately 40,000,000 cubic yards of CCR has been placed in the A1 Landfill.

In addition to the FDCP Luminant has also implemented a surface water control plan to divert contact storm water to holding ponds where the water can be transferred to treatment ponds within the A1 area, if needed, prior to discharge through permitted outfalls monitored by Luminant. Additional details concerning surface water drainage controls are provided in Section 4.4.

4.4 Surface Water Controls

Storm water is diverted off the capped portion of the A1 Area Landfill to adjacent surface water ditches that provide drainage to areas within the Luminant Beckville Mine and ultimately to final discharge ponds that are permitted under the Texas Pollutant Discharge Elimination System (TPDES) and monitored by Luminant for compliance with effluent limitations. Contact storm water is collected in a number of areas within the A1 Area Landfill (Figure 7). The North and South Holding Ponds are the primary collection areas for contact storm water. Accumulated storm water in these areas is pumped to either of two treatment ponds prior to discharge into surrounding drainage ditches that ultimately report to a final TPDES monitoring location within the Beckville Mine.

Berms are located on the landfill cap immediately upslope and downslope of contact water collection sumps, which are located along the south and southeast portions of the landfill. Contact water collected within these sumps is pumped to either of two treatment ponds prior to discharge. Non-contact storm water upstream of the sumps is diverted to storm water let-down structures; however, the very limited slope along these berms and long flow length likely results in additional infiltration in the vicinity of the contact water collection sumps. Collection and management of storm water will be a continuing requirement while the A1 Area Landfill remains active; however, to the extent possible long-term impoundment of water within the landfill should be minimized to the extent possible.

5.0 SUMMARY OF FINDINGS

The findings of the 2015 annual inspection of the MLSES CCR surface impoundments are summarized herein. Luminant qualified persons responsible for the weekly inspections accompanied PBW during the annual inspection to ensure that observed conditions did not represent a change in geometry since previous inspection or have the potential to disrupt operation and safety of the CCR unit.

5.1 Visual Observation of Embankment Alignments

- Bottom Ash Ponds, Scrubber Pond and PDP-5. Consistent with previous structural integrity evaluations, critical impoundment inspections performed on behalf of Luminant, and recently completed weekly inspections, no evidence of slope movements or miss-alignments that have potential to affect the structural integrity of the surface impoundment embankments were noted.
- A1 Area Landfill. With the exception of an area the embankment that was repaired in response to the presence of a seep near Station 27+00, no evidence of slope movements or miss-alignments that have potential to affect the structural integrity of the landfill embankments were noted. Although PBW understands that only surficial repairs were made to the embankment slope and toe in the vicinity of the former seep, the recent placement and compaction of fill has altered the slope profile in this area and a visual determination regarding potential miss-alignments or other indications of an unstable condition that could have the potential to affect the structural integrity of the embankment could not be made during the inspection.

As part of the on-going evaluation of seepage observed at the A1 Area Landfill, Luminant is currently implementing a geotechnical study that will include an evaluation of slope stability in the area of the observed seepage.

5.2 Visual Observation of Surface Impoundment Capacity

MLSES staff monitor fluid levels in each of the CCR surface impoundments on a daily basis from surveyed control points for each impoundment (Figures 3 and 5). The following water level elevations were observed within the MLSES surface impoundments during the annual inspection:

- WAP: 321 feet above mean sea level (MSL)
- EAP: 327.67 feet-MSL;
- SP: 327.67 feet-MSL; and
- PDP-5: 404.1 feet-MSL.

The maximum impounded elevation of water in each of the surface impoundments within the past year and the associated minimum freeboard are listed below:

- WAP: 322.83 feet-MSL (7.17 feet freeboard);
- EAP: 328.17 feet-MSL (1.83 feet freeboard);
- SP: 329 feet-MSL (1.0 foot freeboard); and
- PDP-5: 404.1 (1.4 feet freeboard).

The minimum impounded elevation of water in each of the surface impoundments within the past year are listed below:

- WAP: 318.00 feet-MSL (12 feet freeboard);
- EAP: 327.17 feet-MSL (2.83 feet freeboard);
- SP: 326.83 feet-MSL (3.17 feet freeboard); and
- PDP-5: 397.5 feet-MSL (8.0 feet freeboard).

Based on available construction data, each of the surface impoundments were constructed to provide the following estimated storage capacities:

- WAP: 232.6 acre-feet;
- EAP: 125.8 acre-feet;
- SP: 198.9 acre-feet; and
- PDP-5: 190.3 acre-feet.

A visual estimate of the quantity of impounded solids present in the surface impoundments at the time of the annual inspection suggests the impoundments contain the following estimated percentages of available capacity:

- WAP: 50 percent;
- EAP: 70 percent;
- SP: 80 percent; and
- PDP-5: 60 percent.

It should be noted that no soundings or other quantitative measurements were used to estimate the current volume of CCR stored within the BAPs or the volume of water currently impounded.

5.3 Surface Impoundments – Visual Observations of Structural Integrity

No conditions were observed during the annual inspection that indicates an actual or potential structural weakness of any of the four CCR units at MLSES (EAP, WAP, SP and PDP-5) is present. No changes in geometry of the structure were noted with respect to conditions documented in the May 2014 critical impoundment inspection report (Pinnacle, 2014). In addition, no conditions were observed during the annual inspection that would indicate a disruption or the potential for disruption of the operation and

safety of the CCR unit. A review of weekly inspections completed to date by Luminant and the completion of the annual inspection suggest that no changes that may affect the stability or operation of impounding structure have been observed.

5.4 Landfill – Visual Observations of Structural Integrity

With the exception of the recent repair and on-going evaluation of slope stability near Station 27+00, no conditions were observed during the annual inspection that indicates an actual or potential structural weakness of the A1 Area Landfill is present. In addition, no conditions were observed during the annual inspection that would indicate a disruption or the potential for disruption of the operation and safety of the CCR unit. A review of weekly inspections completed to date by Luminant and the completion of the annual inspection suggest that changes that may affect the stability or operation of impounding structure have not been observed. As part of the on-going evaluation of seepage observed at the A1 Area Landfill, Luminant is currently planning to conduct a geotechnical study that will include an evaluation of slope stability in the area of the observed seepage near Station 27+00.

6.0 RECOMMENDATIONS

The following recommendations are based on the results of the 2015 annual CCR inspection of the MLSES surface impoundments conducted November 10, 2015, and the 2015 annual inspection of the A1 Area Landfill performed December 9-10, 2015:

- Luminant should continue to monitor the areas of concern documented during the annual inspection of each of the surface impoundments and listed in Sections 3.0 and 4.0 of this report. However, based on a review of the slope stability assessment for the surface impoundments and the annual inspection activities presented herein, the recommended drainage improvements and minor erosion repairs do not currently pose a significant risk to the structural stability of the embankments. Hence, these recommended actions should only be completed when surface conditions allow for equipment access without causing further damage to the areas of concern.
- Contingent upon the results of the geotechnical evaluation of the area of concern near Station 27+00 of the A-1 Landfill, the recommended drainage improvements and minor erosion repairs do not currently pose a significant risk to the structural stability of the embankments. Hence, these recommended actions should only be completed when surface conditions allow for equipment access without causing further damage to the areas of concern.
- This annual inspection report should be completed by filing the report in the operating record of the respective CCR units no later than January 19, 2016.
- The 2016 annual inspection of the MLSES surface impoundments and A1 Area Landfill should be performed in November/December 2016, unless otherwise required by the CCR rule.

7.0 REFERENCES

Burns & McDonnell, 2015. *CCR Study for Martin Lake Steam Electric Station, July 31.*

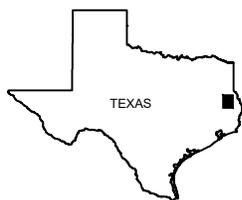
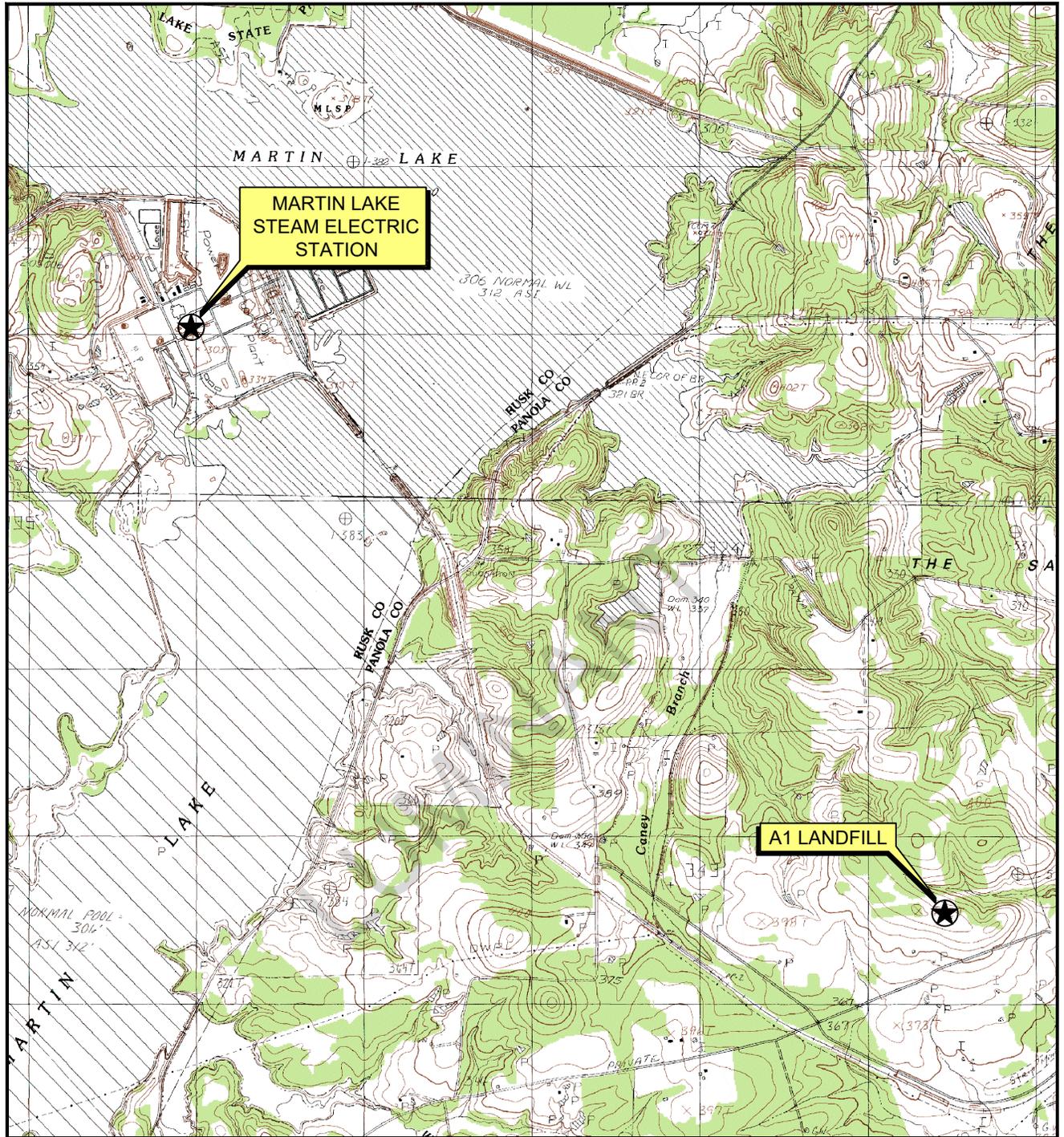
McCulley, Frick & Gillman, Inc (MFG), 1991. *Hydrogeologic/Geotechnical Evaluation A1 Expansion Area. November.*

Pinnacle Technical Resources, Inc., 2014. *Critical Impoundment Inspection Report for Martin Lake Steam Electric Station. May 14.*

LUMINANT

FIGURES

LUMINANT



□ UADRANGLE LOCATION



Scale in Feet



**MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS**

Figure 1

SITE LOCATION MAP

PROJECT: 5178B

BY: AJD

REVISIONS

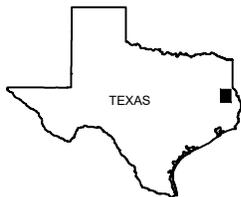
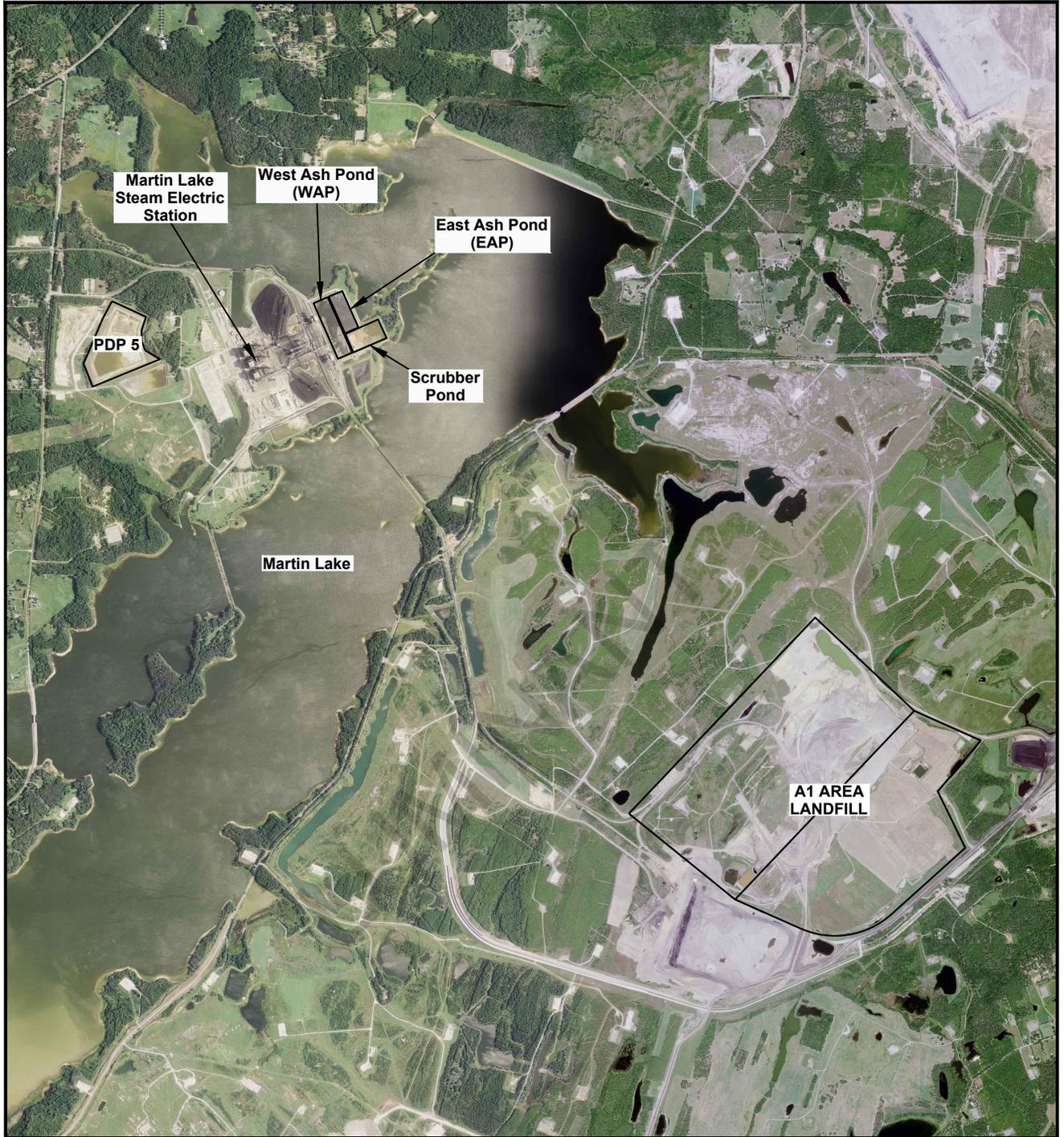
DATE: DEC., 2015

CHECKED: BDT

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

SOURCE:

Base map from www.tnris.gov, Tatum, TX 7.5 min. USGS □uadrangle dated 1□83.



PHOTOGRAPH LOCATION



Scale in Feet



MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

Figure 2

SITE VICINITY MAP

PROJECT: 5178B

BY: AJD

REVISIONS

DATE: DEC., 2015

CHECKED: BDT

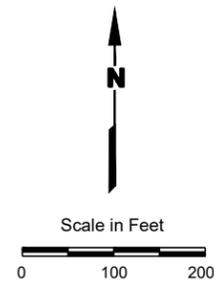
PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

SOURCE:
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.



EXPLANATION

- ▲ Monitor Erosion
- ✕ Monitor Revetment Mat Damage
□Liner Visibility□
- Monitor Wet Area at Toe or Improve Drainage
- ~ Monitor Irregular Slope



SOURCE:
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

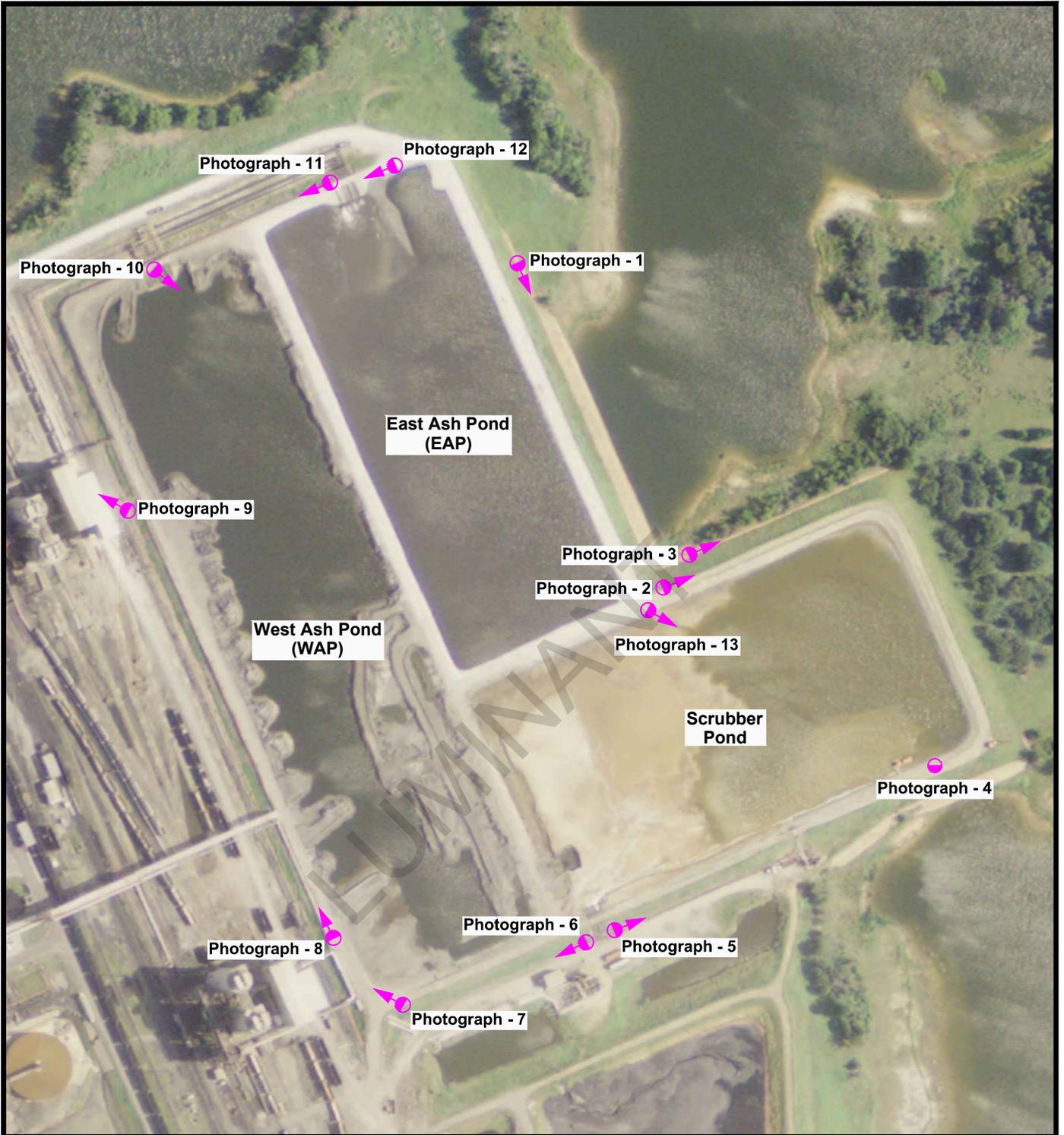
**MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS**

Figure 3

**ANNUAL INSPECTION
FINDINGS SUMMARY MAP
BOTTOM ASH PONDS & SCRUBBER POND**

PROJECT: 5178B	BY: AJD	REVISIONS
DATE: DEC., 2015	CHECKED: BDT	

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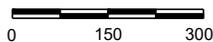
EXPLANATION

 Photograph Location and Direction

Note:
See Appendix B for Inspection Photographs.



Scale in Feet



SOURCE:
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

**MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS**

Figure 4

**ANNUAL INSPECTION
PHOTOGRAPH LOG
BOTTOM ASH PONDS & SCRUBBER POND**

PROJECT: 5178B

BY: AJD

REVISIONS

DATE: DEC., 2015

CHECKED: BDT

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MONITOR INTERIOR EMBANKMENT EROSION

MAINT. ROAD TO PREVENT PONDING

MONITOR RILL EROSION

MONITOR RILL EROSION

PDP 5

MONITOR POOR VEGETATIVE COVER

MONITOR MODERATE RILL EROSION

MONITOR RILL EROSION

MONITOR RECENT SURFICIAL SLOPE REPAIR

MONITOR POOR VEGETATIVE COVER

MONITOR RECENT SURFICIAL SLOPE REPAIR



Scale in Feet
0 125 250

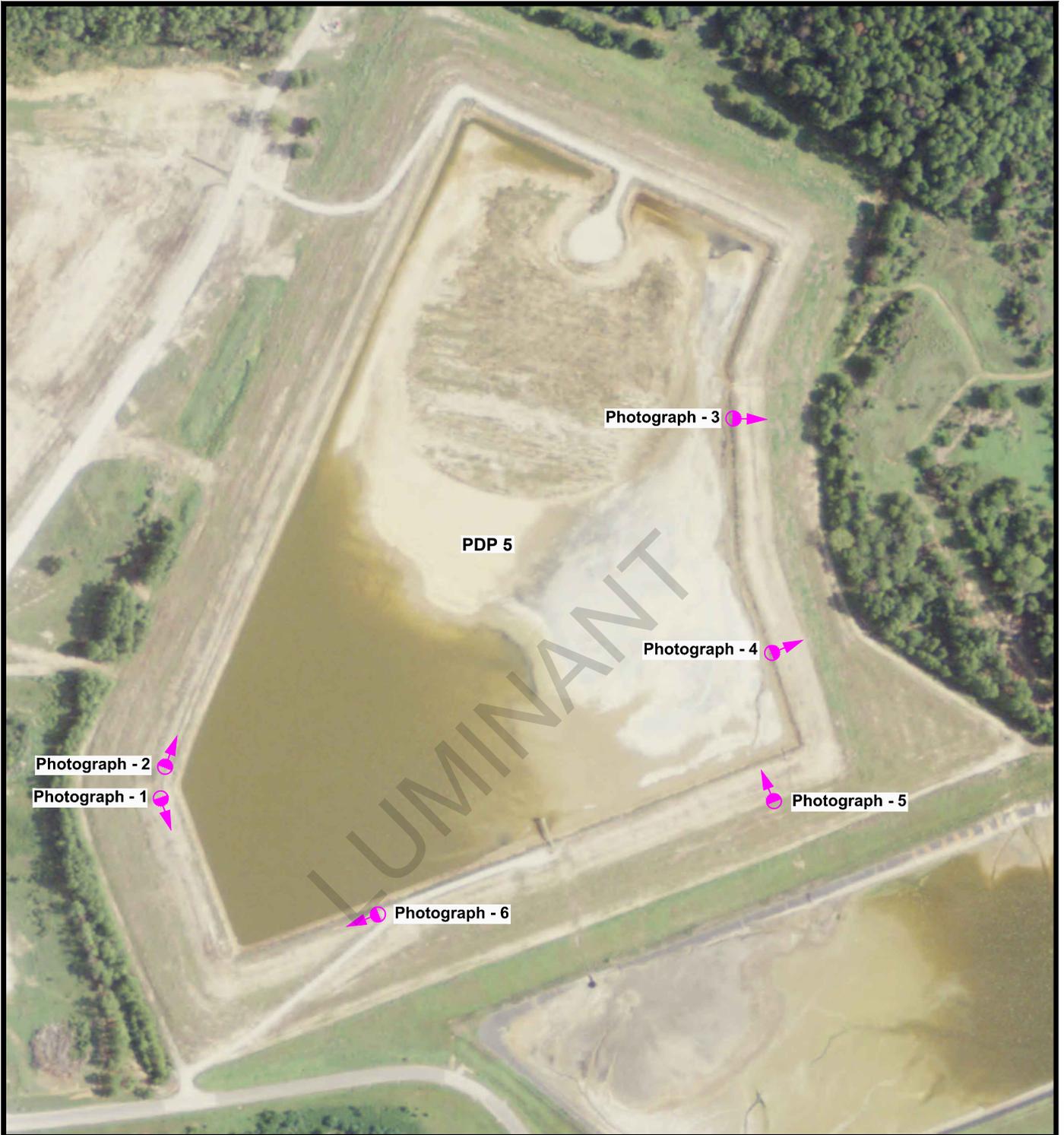
SOURCE:
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

Figure 5
ANNUAL INSPECTION FINDINGS SUMMARY MAP PDP 5

PROJECT: 5178B	BY: AJD	REVISIONS
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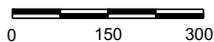
EXPLANATION

 Photograph Location and Direction

Note:
See Appendix C for Inspection Photographs.



Scale in Feet



SOURCE:
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

Figure 6

**ANNUAL INSPECTION
PHOTOGRAPH LOG
PDP 5**

PROJECT: 5178B

BY: AJD

REVISIONS

DATE: DEC., 2015

CHECKED: BDT

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EXPLANATION

▲▲▲ Monitor Wet Area at Toe



Scale in Feet
0 500 1000

MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

Figure 7

ANNUAL INSPECTION FINDINGS SUMMARY MAP
A1 AREA LANDFILL

PROJECT: 5178B	BY: AJD	REVISIONS
DATE: DEC., 2015	CHECKED: BDT	

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EXPLANATION

- Feral Hog Damage
- ▨ Heavy Hog Damage



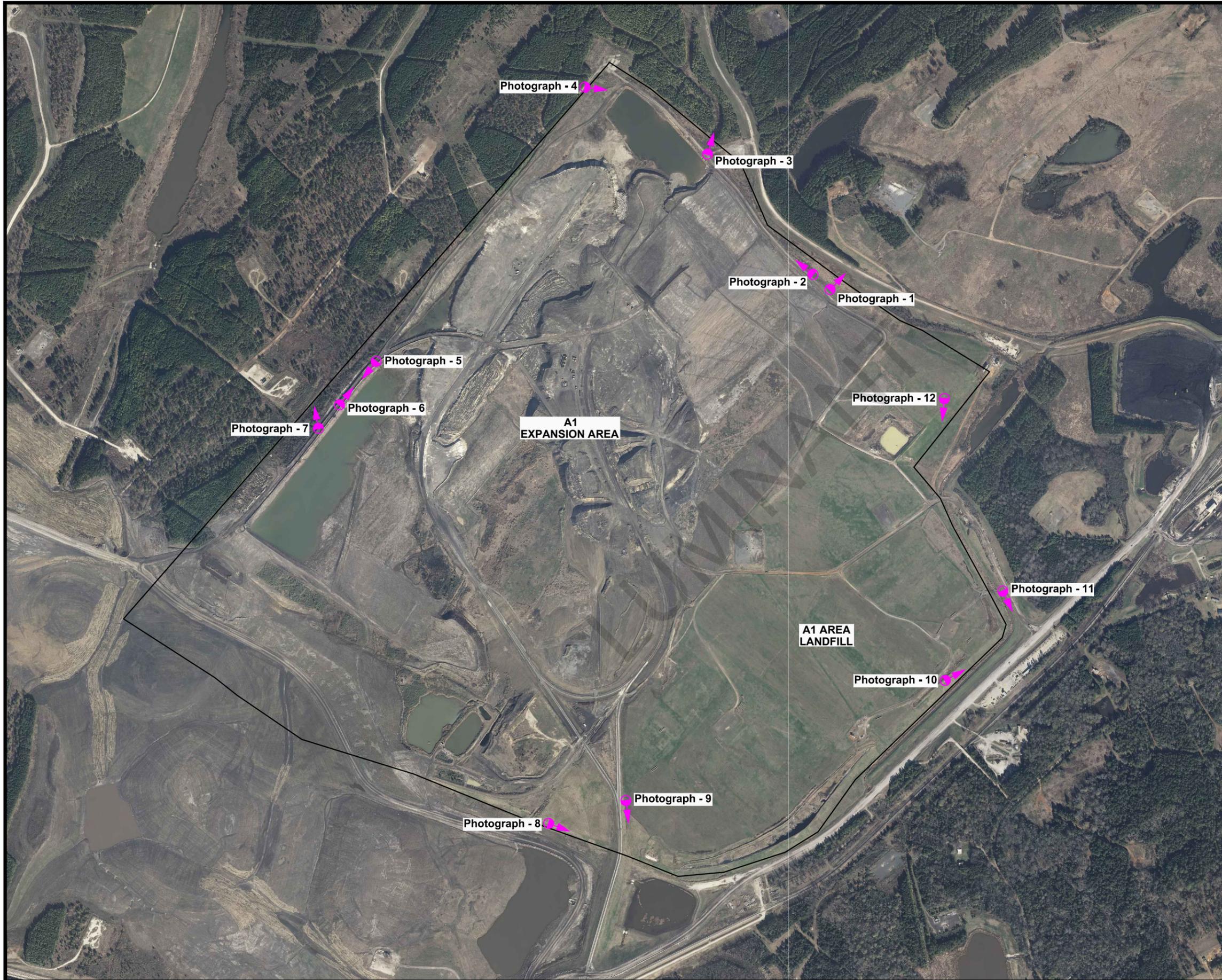
Scale in Feet
 0 500 1000

**MARTIN LAKE STEAM ELECTRIC STATION
 TATUM, TEXAS**

Figure 8
**ANNUAL INSPECTION
 FINDINGS SUMMARY MAP
 A1 AREA LANDFILL-FERAL HOG DAMAGE**

PROJECT: 5178B	BY: AJD	REVISIONS
DATE: DEC., 2015	CHECKED: BDT	

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EXPLANATION

 Photograph Location and Direction

Note:
See Appendix D for Inspection Photographs.



Scale in Feet
0 500 1000

MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

Figure 9

**ANNUAL INSPECTION
PHOTOGRAPH LOG
A1 AREA LANDFILL**

PROJECT: 5178B	BY: AJD	REVISIONS
DATE: DEC., 2015	CHECKED: BDT	

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APPENDIX A
CCR SURFACE IMPOUNDMENT SUMMARY

LUMINANT

APPENDIX A

CCR SURFACE IMPOUNDMENT SUMMARY
MARTIN LAKE STEAM ELECTRIC STATION

Surface Impoundment Identification	Date of Construction	Liner Specifications	Impoundment/Liner Modifications	Approximate Surface Area (Acres)	Influent Process Source(s)	Effluent Management
West Ash Pond (WAP)	1977	Double polyethylene liner system with leachate collection system overlain by fabric-formed grout armor (In service March 1988)	Original in-situ compacted clay liner replaced with current liner system	15	Process wastewater (Bottom ash fines and scrubber sludge at typical 95%-5% ratio, respectively)	Solids dredged, dewatered and loaded in railcars for off-site disposal. Process wastewater transferred between EAP, WAP and ESP, used as process make-up water in EAP and WAP or transferred to Permanent Disposal Pond-4 via double-walled pipe.
East Ash Pond (EAP)	1977	Double polyethylene liner system with leachate collection system overlain by fabric-formed grout armor (In service February 2010)	Pond dredged and inactive between 1989 and 2010. New south dike was constructed in 1989 to increase the size of the ESP to current configuration. Original in-situ compacted clay liner replaced with current liner system in 2010.	10	Process wastewater (Bottom ash fines and scrubber sludge at typical 95%-5% ratio, respectively)	Solids dredged, dewatered and loaded in railcars for off-site disposal. Process wastewater transferred between EAP, WAP and ESP, used as process make-up water in EAP and WAP or transferred to Permanent Disposal Pond-4 via double-walled pipe.
Scrubber Pond (SP)	1977	Double polyethylene liner system with leachate collection system overlain by fabric-formed grout armor (In service 1989)	Original in-situ compacted clay liner replaced with current liner system and pond expanded to current size in 1989.	12	Flue gas desulfurization waste (scrubber sludge), sludge thickener sumps north and south yards, and stormwater (high volume via yard sumps)	Solids dredged, dewatered and loaded in railcars for off-site disposal. Process wastewater transferred between EAP and WAP for use as process make-up water or transferred to Permanent Disposal Pond-4 via double-walled pipe.
PDP5	2010	6-inch thick clay buffer (1×10^{-5} cm/sec) on top of closed PDPs 1, 2, & 3 overlain by a 2 ft thick compacted clay (1×10^{-7} cm/sec) with leachate collection system	None	53	Fly ash, bottom ash, scrubber sludge, treated sewage sludge and process plant water	Water re-circulated back through plant processes

APPENDIX B

PHOTOGRAPHS – BOTTOM ASH PONDS AND SCRUBBER POND

LUMINANT



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 1 – (View SE) Monitor wetness on roller compacted cement near toe of EAP embankment	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 2 – (View NE) Typical slope steepening near crest of SP embankment.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 3 – (View NE) Trees encroaching at toe of SP embankment. Remove trees to allow inspection of toe.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 4 – Damage to concrete revetment mat with polyethylene liner of SP visible. Repair liner and replace revetment material.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 5 – (View NE) Downstream embankment of SP with ash water transfer lines at right (piping limits toe drainage). Monitor wetness at toe of slope.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 6 – (View SW) Downstream embankment of WAP with former slope failure (local shallow slide) flagged at upper right. Monitor wetness at toe near ash water transfer piping.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 7 – (View NW) CCR removal from WAP with concrete revetment mat visible in foreground. CCR visible on lined areas.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 8 – (View NNW) View of embankment crest of WAP.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 9 – (View NW) Monitor erosion surrounding concrete pipe support on west embankment of WAP.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 10 – (View SE) View of influent to WAP and interior embankment between EAP and WAP.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 11 – (View SW) Monitor irregular slope along north downstream embankment of EAP and WAP. Note cribbing of process wastewater piping at right to promote drainage away from toe of slope.	
PROJECT NO. 5178-B	SITE NAME	Monticello Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/3/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 12 – (View SW) Influent piping to EAP with above-ground concrete pipe crossing. Concrete revetment mat and liner system vent visible on upstream (interior) embankment.	
PROJECT NO. 5178-B	SITE NAME	Monticello Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/3/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 13 – (View SE) Posted CCR signage for SP. Signage typical of each MLSES CCR unit.	
PROJECT NO. 5178-B	SITE NAME	Monticello Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/3/2015

LUMINANT

APPENDIX C
PHOTOGRAPHS – PDP-5



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 1 – (View SE) Downstream embankment of PDP-5 with annual rye grass in good condition.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 2 – (View NE) Downstream embankment of PDP-5 with areas of limited annual rye grass coverage.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 3 – (View E) Moderate rill erosion focused in minor rutting on downstream embankment. Area of limited annual rye grass coverage.	
	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 4 – (View NE) Moderate rill erosion on downstream embankment focused in area of limited annual rye grass coverage.	
	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 5 – (View NW) Recent downstream embankment repair with limited vegetative coverage. Fines at toe from rill erosion.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 6 – (View SW) Upstream embankment with collection sump in background.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake Steam Electric Station– Annual Surface Impoundment Inspection	DATE 11/10/2015

LUMINANT

APPENDIX D

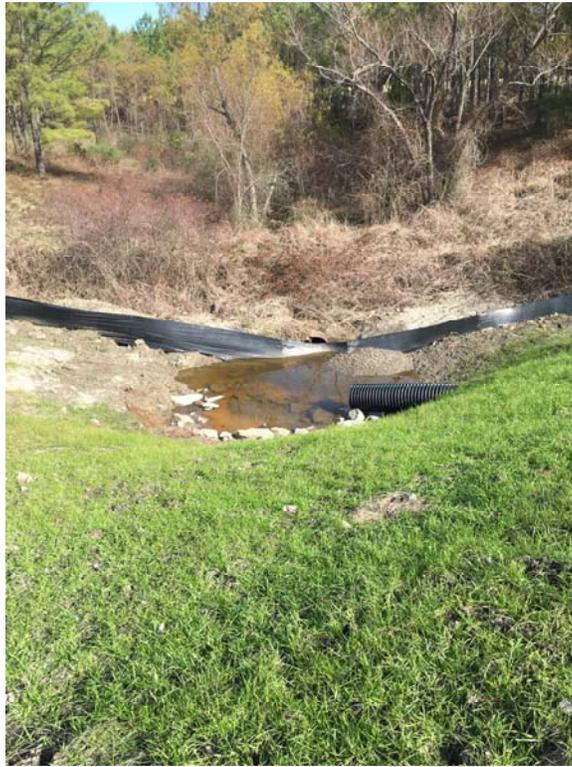
PHOTOGRAPHS – A1 AREA LANDFILL



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 1 – (View NE; Sta. 33+00) Monitor recent repair of wet area at toe of embankment	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 2 – (View NW; Sta. 28+00) Monitor recent repair of former seep location near Sta. 27+00.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 3 – (View N; Sta. 13+00) Monitor recent slope repair and discharge point of drainage improvement.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 4 – (View E; Sta. 263+00) North Holding Pond.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 5 – (View SW; Sta. 227+00) Monitor recent road repair and cut on slope side.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 6 – (View NE; Sta. 220+00) Embankment of South Holding Pond with large area of recent brush/tree removal. Monitor slope for erosion during reestablishment of vegetative cover.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 7 – (View N; Sta. 217+00) Monitor wet areas beyond toe of slope to the northwest of South Holding Pond.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler	DESCRIPTION	Photograph 8 – (View SE; Sta. 140+00) Monitor recent repair and wetness on embankment.	
PROJECT NO. 5178-B	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/9/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 9 – (View S; Sta. 132+00) Repair gully erosion/head cut between cap and railroad embankments.	
	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/10/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 10 – (View NE; 94+00) Monitor wetness at toe of slope in vegetated area. Remove vegetation when conditions allow. (Note: baseflow present from permitted discharge)	
	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/10/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 11 – (View SE; Sta 77+00) View of typical feral hog damage near crest of embankment (See Figure 8 for locations of similar damage).	
	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/10/2015



Pastor, Behling & Wheeler PROJECT NO. 5178-B	DESCRIPTION	Photograph 12 – (View S; Sta. 57+00) View of southeast portion of capped landfill. Discharge controls for North Treatment Pond visible at center-right.	
	SITE NAME	Martin Lake A1 Landfill – Annual Inspection	DATE 12/10/2015