REPORT

Inflow Design Flood Control System Plan 5 Year Update

San Miguel Electric Cooperative Power Plant
CCR Ponds
Atascosa County, Texas

Submitted to:

San Miguel Electric Cooperative, Inc.
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Christine, TX 78012

Submitted by:

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October 2021

PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by Golder Associates Inc. 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 the Inflow Design Flood Control System Plan has been prepared in accordance with the requirements of Section 257.82 of the CCR Rule.

Patrick J. Behling, P.E.
Principal Engineer
Golder Associates Inc.
Firm Registration No. F-2578

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1.0 INTRODUCTION

San Miguel Electric Cooperative, Inc. (SMECI) owns and operates the San Miguel Power Plant (SMPP) located approximately 6 miles south of Christine, Texas in Atascosa County, Texas (Figure 1). The SMPP is a 440-megawatt, lignite-fired electric power plant that was placed into service in 1982. Coal Combustion Residuals (CCR) including fly ash, bottom ash and flue gas desulfurization (FGD) wastewater/solids are generated as part of SMPP operation.

From 1982 through 2020, bottom ash and FGD wastewater/solids were managed in Ash Pond A and Ash Pond B (which were collocated and referred to collectively as the Ash Ponds) and an Equalization Pond (EQ Pond). The Ash Ponds and EQ Pond are located southeast of the SMPP generating unit (Figure 2). In 2020, SMECI retrofitted the Ash Ponds by subdividing Ash Pond B to create a smaller Retrofitted Ash Pond B and a Retrofitted EQ Pond (See Figure 2). The previous EQ Pond (referred to herein as the Former EQ Pond) was removed from service in 2021 and is undergoing closure.

The U.S. Environmental Protection Agency promulgated 40 C.F.R. Part 257, Subpart D (the CCR Rule) to establish technical requirements for new and existing CCR landfills and surface impoundments. Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond have been identified as Existing CCR Surface Impoundments regulated under the CCR Rule.

Section 257.82 of the CCR Rule specifies that an Inflow Design Flood Control System Plan (IDFCSP) be designed, constructed, operated, and maintained for each existing CCR surface impoundment. In accordance with Section 257.82(c)(3) of the CCR Rule, the initial IDFCSP for the Ash Ponds and Former EQ Pond was completed and placed in the facility operating record in October 2016 (ERM, 2016a). As specified in Section 257.82(c)(4), the IDFCSP must be updated every five years from the completion date of the initial plan. Golder Associates Inc., member of WSP (Golder) was retained by SMECI to prepare this updated IDFCSP for Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond.

1.1 CCR Surface Impoundment Inflow Design Flood Control System Plan Requirements

Section 257.82(a) of the CCR Rule specifies that an IDFCSP be designed, constructed, operated, and maintained for each existing CCR surface impoundment. The flood control system must adequately:

- Manage flow into the CCR impoundment during and following the peak discharge of the specified inflow design flood.
- Manage flow from the CCR impoundment to collect and control the peak discharge resulting from the specified inflow design flood.

The inflow design flood (IDF) for each CCR impoundment varies based on the hazard potential classification of the impoundment:

- High hazard potential impoundment: Probable Maximum Flood
- Significant hazard potential impoundment: 1,000-year flood
- Low hazard potential impoundment: 100-year flood

The IDFCSP must document how the inflow design flood control system has been designed and constructed to comply with the requirements of Section 257.82 of the CCR Rule and must be certified by a qualified professional engineer.

1.2 SMPP Surface Impoundments Subject to Inflow Design Flood Control System Plan Requirements

The CCR Rule defines CCR's 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 IDFCSP requirements of the CCR Rule apply to surface impoundments that dispose or otherwise engage in solid waste management of CCRs.

The following surface impoundments at the SMPPP have been identified as CCR Units subject to the IDFCSP requirements (Figure 2):

- Ash Pond A,
- Retrofitted Ash Pond B, and
- Retrofitted EQ Pond.

The Former EQ Pond is out of service and undergoing closure and is no longer considered to be subject to CCR IDFCSP requirements.

1.3 Description of Ash Pond A and Retrofitted Ash Pond B

From 1982 through 2020, bottom ash was managed in Ash Pond A and Ash Pond B, which were constructed as part of the original SMPP construction. Ash Ponds A and B were constructed above grade and are surrounded by engineered earthen dikes that extend approximately 20 feet above grade. Both ash ponds were constructed with a clay soil liner consisting of 3 feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec (ERM, 2016b; Zephyr, 2017).

In 2020, SMECI retrofitted Ash Pond A and Ash Pond B as follows:

- A 60-mil HDPE liner was installed in Ash Pond A over the existing clay soil liner. The HDPE liner extends across the floor of the pond and up the interior faces of the perimeter dikes and is secured in anchor trenches at the top of the dikes.
- Ash Pond B was subdivided to create a smaller Retrofitted Ash Pond B and a Retrofitted EQ Pond by constructing a divider dike across the width of Ash Pond B. A 60-mil HDPE liner was installed in Retrofitted Ash Pond B over the existing clay soil liner. The HDPE liner extends across the floor of the pond and up the interior faces of the perimeter dikes and is secured in anchor trenches at the top of the dikes.

Engineering Drawings for the Ash Pond Retrofit project are reproduced in Appendix A (Newfields, 2019). Based on the engineering drawings, key design characteristics for Ash Pond A and Retrofitted Ash Pond B can be summarized as follows:

- Ash Pond A:
  - Pond Length at Top of Dike (ft): 2,455
  - Pond Width at Top of Dike (ft): 245

- Elevation of Top of Dike: 315
- Elevation of Pond Bottom: 295
- Pond Depth from Top of Dike (ft): 20
- Dike Side Slopes: 2.5:1
- Pond Bottom Length (ft): 2,355
- Pond Bottom Width (ft): 145
- Pond Length at 2 Ft Freeboard (ft): 2,445
- Pond Width at 2 ft Freeboard (ft): 235
- Pond Depth at 2 ft Freeboard (ft): 18

- Retrofitted Ash Pond B:
  - Pond Length at Top of Dike (ft): 1,217.5
  - Pond Width at Top of Dike (ft): 245
  - Elevation of Top of Dike: 315
  - Elevation of Pond Bottom: 295
  - Pond Depth from Top of Dike (ft): 20
  - Dike Side Slopes: 2.5:1
  - Pond Bottom Length (ft): 1,117.5
  - Pond Bottom Width (ft): 145
  - Pond Length at 2 Ft Freeboard (ft): 1,207.5
  - Pond Width at 2 ft Freeboard (ft): 235
  - Pond Depth at 2 ft Freeboard (ft): 18

Using these dimensions, the surface areas and storage volumes for Ash Pond A and Retrofitted Ash Pond B were calculated to be as follows (see Appendix B):

- Ash Pond A:
  - Surface Area at Top of Dike (sf): 601,475
  - Surface Area at Top of Dike(acres): 13.8
  - Storage Volume at Top of Dike (ac-ft): 213.7
  - Storage Volume at Top of Dike (cf): 9,307,655
  - Storage Volume at 2 Ft Freeboard (cf): 8,153,988
  - Storage Available in Freeboard (cf): 1,153,667

- Retrofitted Ash Pond B:
  - Surface Area at Top of Dike (sf): 298,288
  - Surface Area at Top of Dike (acres): 6.8
  - Storage Volume at Top of Dike (ac-ft): 104.1
  - Storage Volume at Top of Dike (cf): 4,534,496
  - Storage Volume at 2 Ft Freeboard (cf): 3,961,379
  - Storage Available in Freeboard (cf): 573,117

1.4 Description of Retrofitted EQ Pond

From 1982 through 2020, FGD wastewater/solids were managed in the Former EQ Pond, which was constructed as part of the original SMPP construction. In 2020, SMECI removed the Former EQ Pond from service and retrofitted the Ash Ponds by subdividing Ash Pond B to create a smaller Retrofitted Ash Pond B and a Retrofitted EQ Pond (See Figure 2). The Former EQ Pond is undergoing closure.

A 60-mil HDPE liner was installed in the Retrofitted EQ Pond over the existing clay soil liner. The HDPE liner extends across the floor of the pond and up the interior faces of the perimeter dikes and is secured in anchor trenches at the top of the dikes.

Engineering Drawings for the Ash Pond Retrofit project are reproduced in Appendix A (Newfields, 2019). Based on the engineering drawings, key design characteristics for the Retrofitted EQ Pond can be summarized as follows:

- Retrofitted EQ Pond:

  - Pond Length at Top of Dike (ft): 1,217.5
  - Pond Width at Top of Dike (ft): 245
  - Elevation of Top of Dike: 315
  - Elevation of Pond Bottom: 295
  - Pond Depth from Top of Dike (ft): 20
  - Dike Side Slopes: 2.5:1
  - Pond Bottom Length (ft): 1,117.5
  - Pond Bottom Width (ft): 145
  - Pond Length at 2 Ft Freeboard (ft): 1,207.5
  - Pond Width at 2 ft Freeboard (ft): 235
  - Pond Depth at 2 ft Freeboard (ft): 18

Using these dimensions, the surface area and storage volumes for the Retrofitted EQ Pond were calculated to be as follows (see Appendix B):

- Retrofitted EQ Pond:

  - Surface Area at Top of Dike (sf): 298,288
  - Surface Area at Top of Dike (acres): 6.8
  - Storage Volume at Top of Dike (ac-ft): 104.1
  - Storage Volume at Top of Dike (cf): 4,534,496
  - Storage Volume at 2 Ft Freeboard (cf): 3,961,379
  - Storage Available in Freeboard (cf): 573,117

1.5 USACE Size Classification for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

The US Army Corps of Engineers (USACE) classifies the relative size of dams based on the height of the dam and the storage capacity of the impounded area behind the dam as follows (USACE, 1979):

USACE Dam Size Classification		
Size Category	**Impoundment Capacity (acre-ft)**	**Impoundment Height (ft)**
Small	50 and < 1,000	25 and < 40
Intermediate	1,000 and < 50,000	40 and < 100
Large	> 50,000	> 100

Based on the dike heights and operating capacities of Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond, these ponds are categorized as small impoundments based on the USACE dam size classification criteria.

1.6 Hazard Potential Classification of Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond are classified as low hazard potential impoundments in accordance with the requirements of Section 257.73(a)(2) of the CCR Rule (Golder, 2021).

1.7 Previous Hydraulic Capacity Evaluations of Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

From 1982 through 2020, bottom ash and FGD wastewater/solids were managed in Ash Pond A, Former Ash Pond B, and the Former EQ Pond. As required under Section 257.82 of the CCR Rule, the initial IDFCSP for these impoundments was completed and placed in the facility operating record in October 2016 (ERM, 2016a). However, in 2020, SMECI retrofitted the Ash Ponds by subdividing Ash Pond B to create a smaller Retrofitted Ash Pond B and a Retrofitted EQ Pond. No previous hydraulic capacity evaluations have been performed for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond.

2.0 UPDATED HYDRAULIC CAPACITY EVALUATION OF ASH POND A, RETROFITTED ASH POND B AND RETROFITTED EQ POND

The CCR Rule defines the inflow design flood (IDF) as "the flood hydrograph that is used in the design or modification of the CCR surface impoundment and its appurtenant works." From an engineering design standpoint, the IDF is the rate of water coming into a surface impoundment over time that the impoundment must be able to safely pass or contain using a combination of outlet works and surcharge storage (freeboard).

The updated IDFCSP for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond must demonstrate that the impoundments are designed to manage flow into and out of the units during and following the peak discharge of the specified inflow design flood. This demonstration will be accomplished through calculation of a water balance for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond. The basic equation for the water balance is as follows:

Inflows = Outflows + Change in Pond Storage

For the water balance to demonstrate compliance with CCR requirements, the rate of inflows into Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond (the inflow design flood) must not be greater than the rate of outflows from Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond plus the maximum allowable storage in the ponds.

2.1 Inflows to Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

Ash Pond A and Retrofitted Ash Pond B can receive process inflows from the following sources:

- Bottom ash and economizer ash transport water;
- Lignite Yard Retention Pond (also known as the Coal Pile Runoff Pond);
- Water Well Storage Pond (also known as the Raw Water Pond);
- Cooling tower blowdown water;
- Boiler feed treatment wastewater;
- Stormwater runoff/drainage from the Plant Floor;
- Direct precipitation on the ponds; and
- Stormwater runoff from dikes/access roads alongside the ponds.

Most of the sources of inflow to Ash Pond A and Retrofitted Ash Pond B are process units that generate water at controlled rates which are not significantly affected by variations in precipitation intensity and associated flood conditions. In addition, approximately the same flow rate and volume of water is pumped from Ash Pond A and Retrofitted Ash Pond B to the plant ash transport water system as the plant ash transport water system returns to Ash Pond A and Retrofitted Ash Pond B. As a result, for the purposes of this IDFCSP, it is assumed that the only net contributions from process inflows to Ash Pond A and Retrofitted Ash Pond B during the design flood event are:

- Stormwater runoff/drainage from the Plant Floor;
- Direct precipitation on the ponds, and

- Stormwater runoff from dikes/access roads alongside the ponds.

The Retrofitted EQ Pond can receive process inflows from the following sources:

- Flue Gas Desulfurization Scrubber Waste Treatment System wastewater;
- Sanitary treated wastewater;
- Water transferred from the Ash Ponds;
- Direct precipitation on the pond; and
- Stormwater runoff from dikes/access roads alongside the pond.

Most of the sources of inflow to the Retrofitted EQ Pond are process units that generate water at controlled rates which are not significantly affected by variations in precipitation intensity and associated flood conditions. As a result, for the purposes of this IDFCSP, it is assumed the only net contributions from the process inflows to the Retrofitted EQ Pond during the design flood event are:

- Direct precipitation on the pond, and
- Stormwater runoff from dikes/access roads alongside the pond.

2.2 Outflows From Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

Wastewater discharges from the SMPP are authorized under Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0002601000; however, wastewater discharges from Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond are not permitted under the TPDES permit.

A spillway connects Ash Pond A to Retrofitted Ash Pond B; however, there are no external emergency spillways constructed in the Ash Ponds to release water from the ponds during extreme precipitation events. The Retrofitted EQ Pond is also not constructed with an external emergency spillway.

Water is pumped from Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond for use in the SMPP ash transport water system and approximately the same flow rate and volume of water is pumped from and returned to the ponds. The rate of water pumped from and returned to Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond is controlled to maintain a minimum 2-foot freeboard in the impoundments under normal operating conditions.

Water is removed from Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond through evaporation associated with generating unit operation and through natural evaporation from the ponds; however, evaporation is not considered as part of the IDFCSP.

For the purposes of this IDFCSP, it is assumed that no outflows occur from the ponds during the design flood event.

2.3 Inflow Design Flood for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

As described in Section 1.6, Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond are classified as low hazard potential CCR Impoundments. In accordance with Section 257.82(a)(3) of the CCR Rule, the inflow design flood for a low hazard potential CCR impoundment is the 100-year flood event.

The 100-year, 24-hour storm for Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond is estimated to be 11.0 inches based on the Point Precipitation Frequency Estimate Table from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 for Jourdanton, TX (NOAA, 2021, see Appendix C).

2.4 Hydraulic Capacity Evaluation for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond

A hydraulic capacity evaluation was performed for Ash Pond A, Retrofitted Ash Pond B and Retrofitted EQ Pond for the inflow design flood as part of the development of the IDFCSP. The evaluation was based on the water balance equation described above and the following assumptions:

- The design operating level in the ponds is managed to maintain a minimum 2-foot freeboard in the ponds under normal operating conditions.
- Ash Pond A and Retrofitted Ash Pond B are connected by an internal spillway that allows the water levels in these two ponds to equilibrate.
- Inflows to the ponds considered as part of the evaluation are as described in Section 2.1 of this report.
- There are no outflows from the ponds considered as part of the evaluation as described in Section 2.2 of this report. Evaporation from the ponds is assumed to be negligible during the inflow design flood event.

Based on these assumptions, the water balance equation for Ash Pond A and Retrofitted Ash Pond B becomes the following:

Process Inflows = Change in Pond Storage

Where:

Process Inflows = Stormwater runoff/drainage from the Plant Floor, direct precipitation on the ponds, and stormwater runoff from dikes/access roads alongside the ponds.

Change in Pond Storage = Water accumulated in the freeboard of the ponds (assumed minimum of 2 feet of freeboard prior to storm event).

Similarly, the water balance equation for the Retrofitted EQ Pond becomes the following:

Process Inflows = Change in Pond Storage

Where:

Process Inflows = Direct precipitation on the pond and stormwater runoff from dikes/access roads alongside the pond.

Change in Pond Storage = Water accumulated in the freeboard of the pond (assumed minimum of 2 feet of freeboard prior to storm event).

Stormwater runoff volumes were calculated using the Rational Method:

$V = CiA$, where:

V = Estimated Runoff Volume (cf)

C = Rational Method Runoff Coefficient. Assumed Runoff Coefficients:

- Direct Precipitation on Pond Water and Lined Pond Surface: 1.00
- Runoff From Dikes/Access Roads: 0.95
- Runoff From Plant Floor Drainage: 0.95

i = Rainfall (ft). Assumed to be 11.0 inches (0.92 feet) for the 100-year, 24-hr design flood.

A = Stormwater Drainage Area (sf)

2.4.1 Hydraulic Capacity Evaluation for Ash Pond A and Retrofitted Ash Pond B

Hydraulic capacity evaluation calculations for Ash Pond A and Retrofitted Ash Pond B are presented in Appendix D. Inflows into the ponds during the design flood were estimated to be as follows:

- Direct Precipitation On Ponds. The lined surface area of Ash Pond A and Retrofitted Ash Pond B at the top of the dikes is estimated to be approximately 601,475 sf plus 298,288 sf or approximately 899,763 sf. The ponds contain water and exposed sections of the interior dike side slopes are covered with an HDPE liner, so a Runoff Coefficient of 1.0 was assumed for this area.

  Based on these assumptions, the volume of direct precipitation onto the ponds is estimated to be approximately 551,352 cf (Ash Pond A) plus 273,430 cf (Retrofitted Ash Pond B) or a total of approximately 824,782 cf.

- Runoff from Dikes/Access Roads. For the purposes of this IDFCSP, it is assumed that all stormwater runoff from the access roads and tops of the dikes that surround the ponds drains into the ponds during the design flood. The total surface area of these areas is estimated to be approximately 137,900 sf. The surface of these area consists of crushed stone overlying compacted clay, so a Runoff Coefficient of 0.95 was assumed for this area.

  Based on these assumptions, the volume of runoff from the Dikes/Access Roads is estimated to be 120,088 cf.

- Runoff from Plant Floor Drainage. For the purposes of this IDFCSP, it is assumed that all stormwater runoff/drainage from the plant floor is pumped to the Ash Ponds during the design flood. The surface area of the plant floor is estimated to be approximately 7 acres (304,920 sf) based on the dimensions shown on the original design drawing for this area (T&G, 1980, reproduced in Appendix E). The surface of the plant floor is primarily concrete, so a Runoff Coefficient of 0.95 was assumed for this area.

  Based on these assumptions, the volume of runoff from the Plant Floor is estimated to be 265,535 cf.

The total inflow into Ash Pond A and Retrofitted Ash Pond B during the design flood is estimated to be 1,210,405 cf.

As described in Section 1.4, the available storage capacity provided by the 2-foot freeboard in the ponds is estimated to be 1,153,667 cf (Ash Pond A) plus 573,117 cf (Retrofitted Ash Pond B) or 1,726,784 cf. The available freeboard storage compares to the total inflow into the ponds during the design flood as follows:

- Available Freeboard Storage: 1,726,784 cf
- Total Inflow into Ponds: 1,210,405 cf

  Remaining Freeboard Storage: 516,379 cf

Based on the surface areas of the ponds, this equates to slightly less than 7 inches of freeboard remaining in Ash Pond A and Retrofitted Ash Pond B following the inflow design flood. As a result, Ash Pond A and Retrofitted Ash

Pond B are adequately designed to manage the inflow design flood in accordance with Section 257.82 of the CCR Rule.

2.4.2 Hydraulic Capacity Evaluation for Retrofitted EQ Pond

Hydraulic capacity evaluation calculations for the Retrofitted EQ Pond are presented in Appendix F. Inflows into the pond during the design flood were estimated to be as follows:

- Direct Precipitation On Pond. The lined surface area of the Retrofitted EQ Pond at the top of the dikes is estimated to be approximately 298,288 sf. The pond contains water and exposed sections of the interior dike side slopes are covered with an HDPE liner, so a Runoff Coefficient of 1.0 was assumed for this area.

  Based on these assumptions, the volume of direct precipitation onto the pond is estimated to be approximately 273,430 cf.

- Runoff from Dikes/Access Roads. For the purposes of this IDFCSP, it is assumed that all stormwater runoff from the access roads and tops of the dikes that surround the ponds drains into the ponds during the design flood. The total surface area of these areas is estimated to be approximately 59,000 sf. The surface of these area consists of crushed stone overlying compacted clay, so a Runoff Coefficient of 0.95 was assumed for this area.

  Based on these assumptions, the volume of runoff from the Dikes/Access Roads is estimated to be 51,379 cf.

The total inflow into the Retrofitted EQ Pond during the design flood is estimated to be 324,809 cf.

As described in Section 1.4, the available storage capacity provided by the 2-foot freeboard in the pond is estimated to be 573,117 cf. The available freeboard storage compares to the total inflow into the pond during the design flood as follows:

- Available Freeboard Storage: 573,117 cf
- Total Inflow into Ponds: 324,809 cf

  Remaining Freeboard Storage: 248,307 cf

Based on the surface areas of the ponds, this equates to approximately 10 inches of freeboard remaining in the Retrofitted EQ Pond following the inflow design flood. As a result, the Retrofitted EQ Pond is adequately designed to manage the inflow design flood in accordance with Section 257.82 of the CCR Rule.

3.0 UPDATED INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN FOR ASH POND A, RETROFITTED ASH POND B AND RETROFITTED EQ POND

Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond are adequately designed to manage the 100-year, 24-hour inflow design flood in accordance with Section 257.82 of the CCR Rule. Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond should be operated in accordance with the following Inflow Design Flood Control System Plan to maintain adequate freeboard in the ponds to manage the design flood conditions:

- The operating level in Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond should be maintained at an approximate elevation of 313 feet MSL to provide approximately 2 feet of freeboard in the ponds under normal operating conditions.

- The rate of water decanted from the Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond (process outflow) should be equivalent to the inflows of process water pumped to the ponds during the design flood event so that the design operating level of 313 feet MSL is maintained in the ponds.

- The rate of water pumped from and returned to Ash Pond A, Retrofitted Ash Pond B and the Retrofitted EQ Pond should be balanced to maintain a minimum 2-foot freeboard in the impoundments under normal operating conditions.

In accordance with Section 257.82(c)(4) of the CCR Rule, this updated IDFCSP must be placed in the operating record for the MLSES no later than October 17, 2021. Subsequent periodic IDFCSPs must be completed every five years. In addition, the IDFCSP must be amended whenever there is a change in conditions that would substantially affect the plan.

4.0 REFERENCES

Environmental Resources Management (ERM), 2016a. San Miguel Electric Cooperative, Inc., Inflow Design Flood Control System Plan, Christine, Texas, October 18.

ERM, 2016b. Existing CCR Surface Impoundment Liner Design Criteria – Ash Pond A, San Miguel Electric Cooperative, Inc., Atascosa County, Texas, October 17.

Golder Associates, Inc. (Golder), 2021. Updated Hazard Classification Assessment – CCR Ponds, San Miguel Electric Cooperative Power Plant, Atascosa County, Texas. October X.

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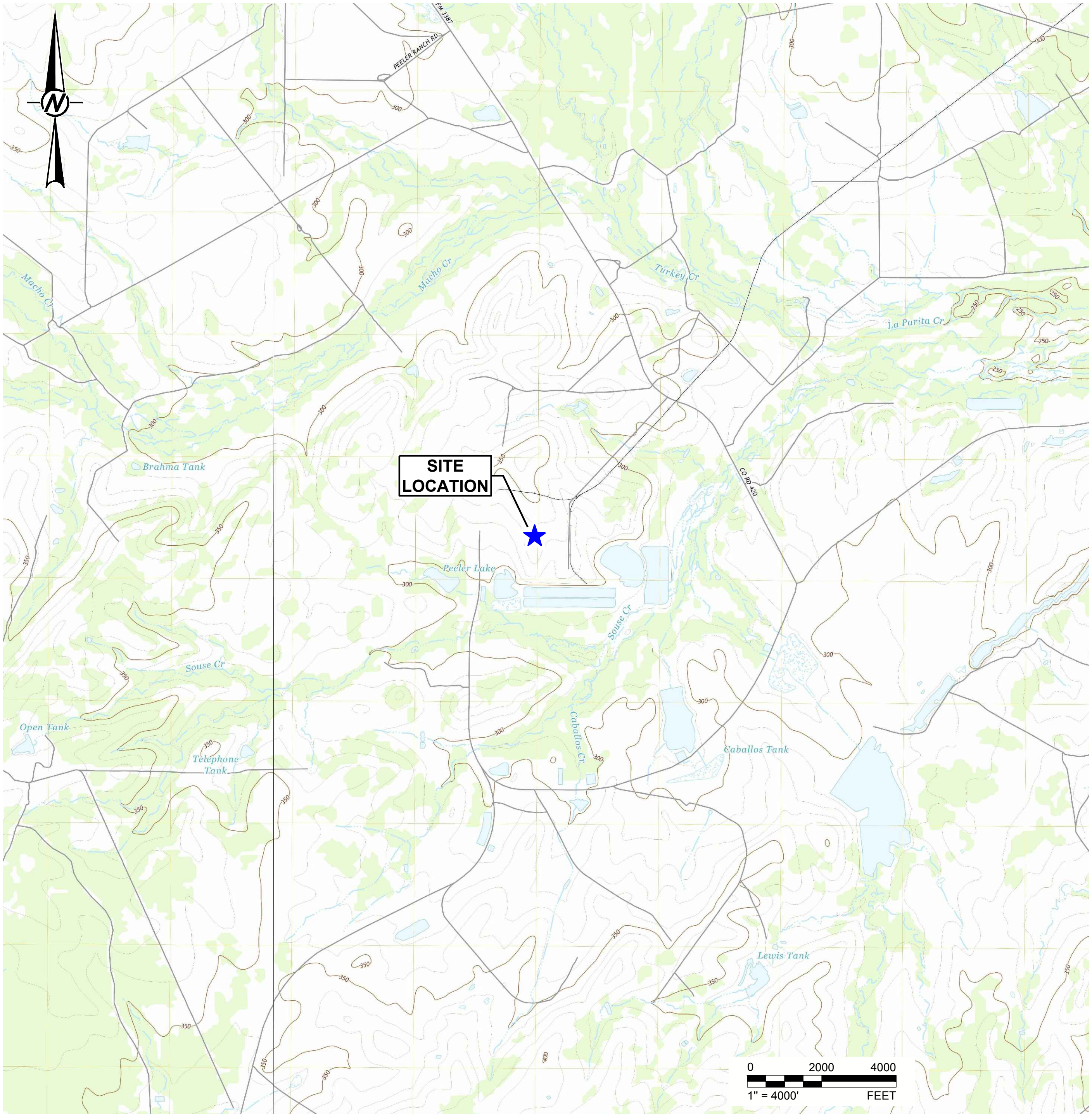
Newfields, 2019. Engineering Drawings for Ash Disposal Pond Retrofit, San Miguel Electric Plant, Atascosa County, Texas, August.

Tippet & Gee, Inc (T&G), 1980b. Site Plan Section No. 6, San Miguel Plant Unit No. 1, Drawing No. 1-C-35, Rev 16, April 1, 1977, revised August 6, 1980.

United States Army Corps of Engineers (USACE), 1979. Recommended Guidelines for Safety Inspections of Dams, ER 1110-2-106, September 26.

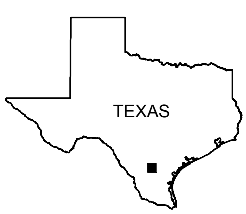
Zephyr Environmental Corporation (Zephyr), 2017. Liner System Certification Report – Ash Water Transport Pond 1-B, San Miguel Electric Cooperative, Inc., San Miguel Plant, Christine, Atascosa County, Texas, November 28.

FIGURES



REFERENCE(S)

BASE MAP TAKEN FROM USGS.GOV, CROSS NE AND CABALLOS CREEK, TX 7.5 MIN. USGS QUADRANGLE DATED 2019.



QUADRANGLE LOCATIONS

CLIENT
SAN MIGUEL ELECTRIC COOPERATIVE, INC.

PROJECT
CCR PONDS
INFLOW DESIGN CONTROL SYSTEM PLAN UPDATE

TITLE
SITE LOCATION MAP

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-07
DESIGNED	AJD
PREPARED	AJD
REVIEWED	PJB
APPROVED	PJB

PROJECT NO.	CONTROL	REV.	FIGURE
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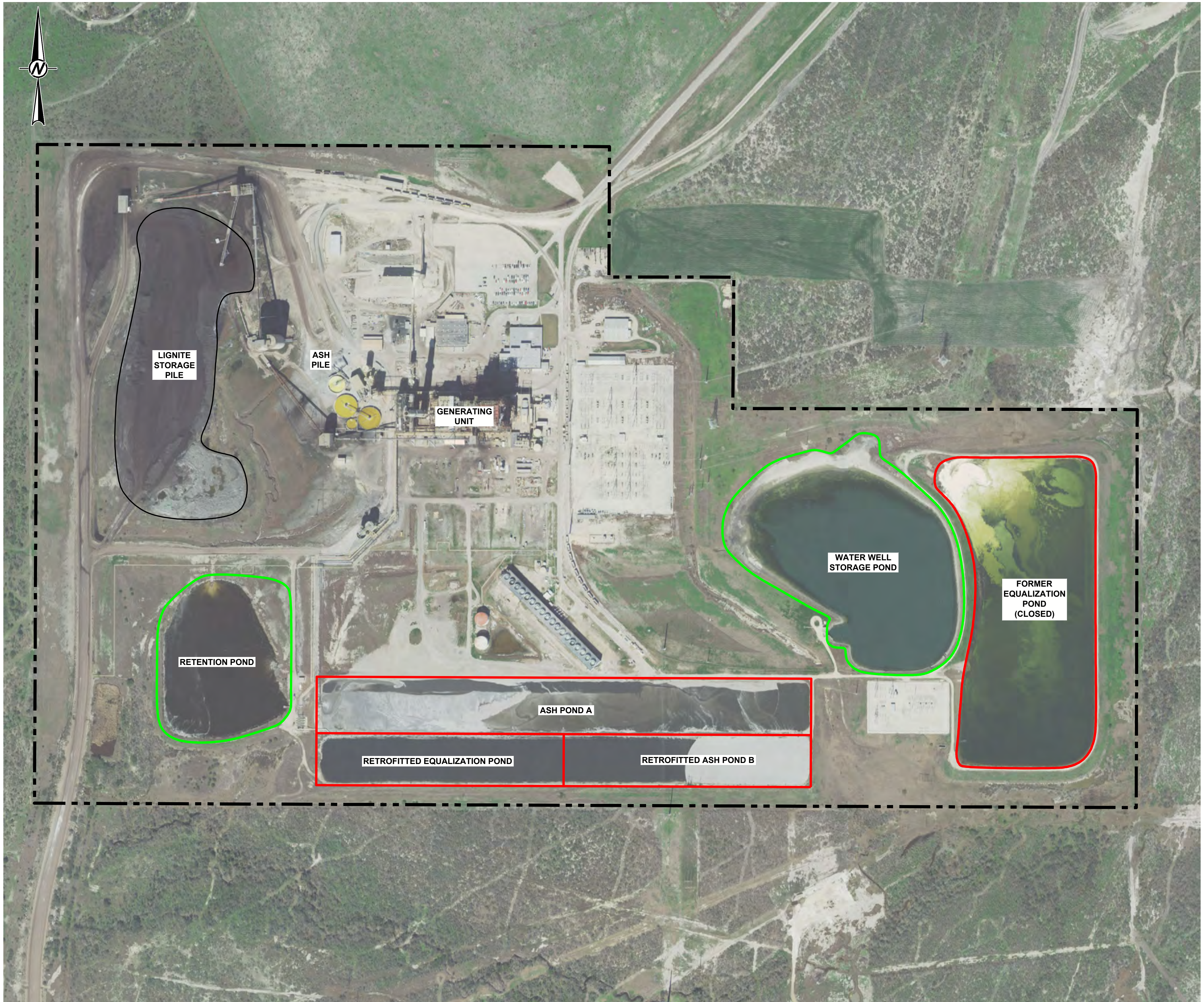
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0 1 in



LEGEND

- APPROX. PLANT BOUNDARY
- CCR IMPOUNDMENT/UNIT
- NON-CCR IMPOUNDMENT

0 250 500
1" = 500' FEET

REFERENCE(S)
BASE MAP TAKEN FROM TNRIS.ORG, ATASCOSA CO., 2015 PHOTOGRAPHY.
MONITORING WELL LOCATIONS FROM FIGURE 1 - CCR UNIT GROUNDWATER MONITORING SYSTEM, ERM, 10/16/2017.

CLIENT
SAN MIGUEL ELECTRIC COOPERATIVE, INC.

PROJECT
CCR PONDS
INFLOW DESIGN CONTROL SYSTEM PLAN UPDATE

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-07
DESIGNED	AJD
PREPARED	AJD
REVIEWED	PJB
APPROVED	PJB

PROJECT NO.	CONTROL	REV.	FIGURE
21455682		0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

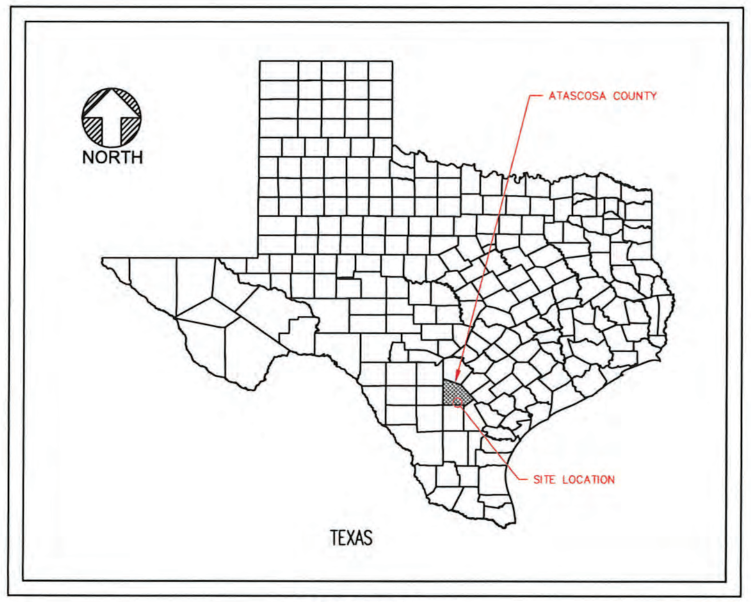
APPENDIX A

Engineering Drawings – 2020 Ash Pond Retrofit Project

SAN MIGUEL ELECTRIC PLANT

ATASCOSA COUNTY, TEXAS

ASH DISPOSAL POND RETROFIT



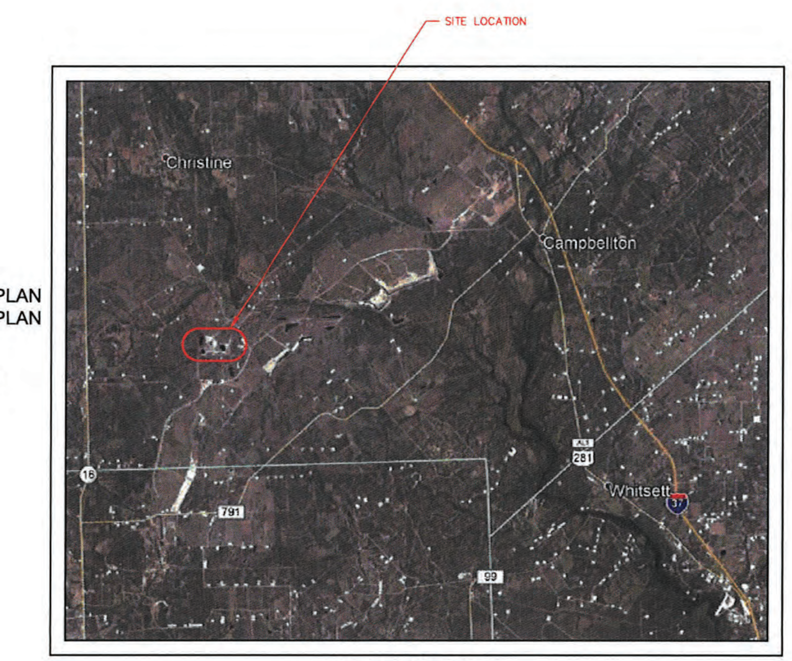
LOCATION MAP

DRAWING INDEX

SHEET	DRAWING	TITLE
1		COVER SHEET
2	C-101	SURVEY MAP
3	C-102	EXISTING CONDITIONS SITE PLAN
4	C-103	LAY DOWN YARD, EROSION AND SEDIMENT CONTROL PLAN
5	C-104	POND "A" TILLING, GRADING AND COMPACTION PLAN
6	C-105	POND "B" TILLING, GRADING AND COMPACTION PLAN
7	C-106	POND "B" DIVIDER BERM PLAN AND DETAILS
8	C-107	POND "A" LINER INSTALLATION PLAN
9	C-108	NEW POND "B" AND EQUALIZATION POND LINER INSTALLATION PLAN

ABBREVIATIONS

ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
BOTT	BOTTOM
DP.	DEEP
E	EAST
EL	ELEVATION
ESC	EROSION AND SEDIMENT CONTROL
F.G.D.	FLUE GAS DESULFURIZATION
FT.	FEET
GAL	GALLON
H	HORIZONTAL
HDPE	HIGH DENSITY POLYETHYLENE
KV	KILOVOLT
MCC	MOTOR CONTROL CENTER
MIN.	MINIMUM
N	NORTH
SEC	SECOND
V	VERTICAL
YD^3	CUBIC YARDS



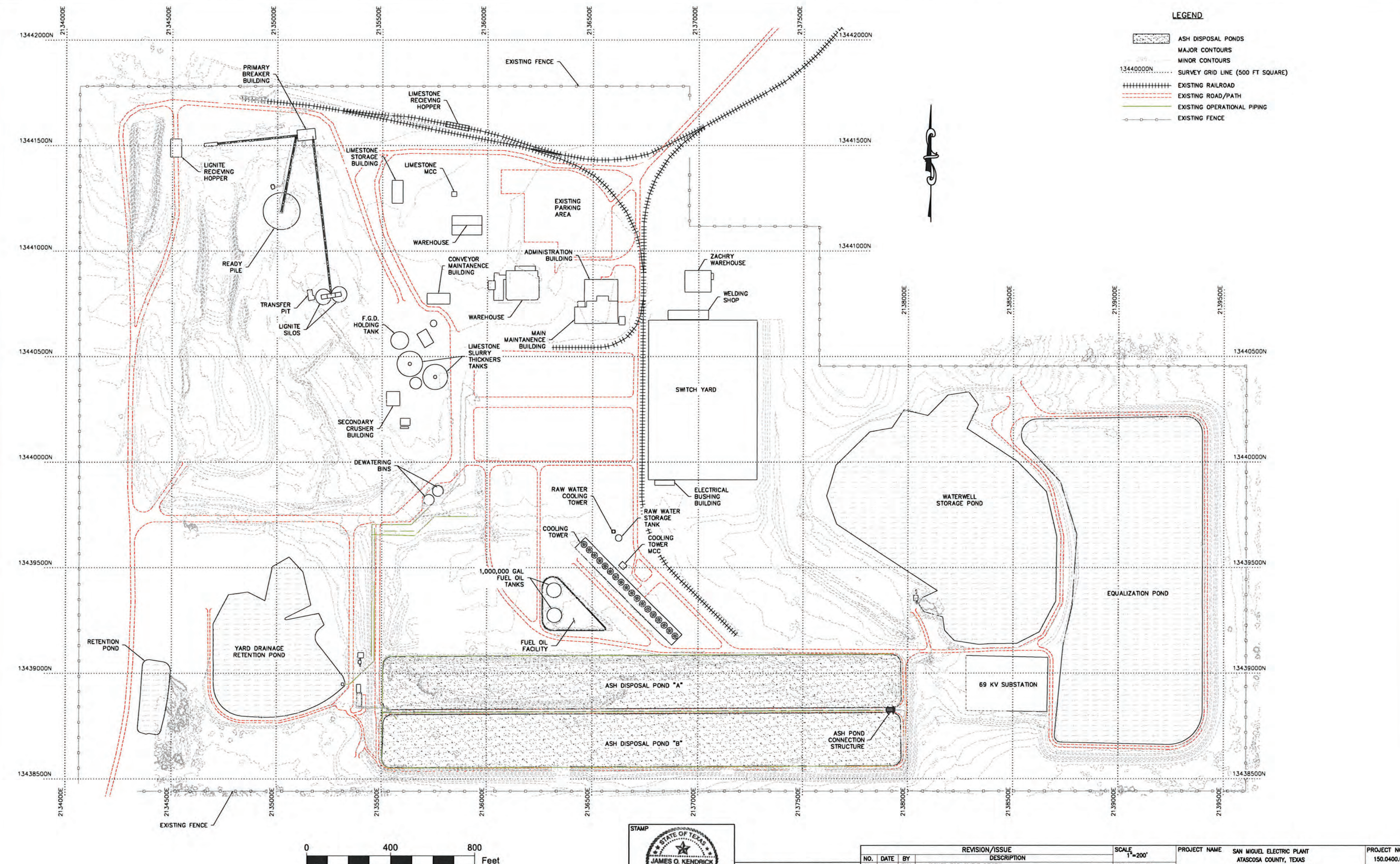
SITE VICINITY MAP

SAN MIGUEL ELECTRIC PLANT
ATASCOSA COUNTY, TEXAS
ASH DISPOSAL POND RETROFIT

PREPARED BY

NewFields

AUGUST, 2019



STAMP

STATE OF TEXAS
JAMES O. KENDRICK
84079
LICENSED
PROFESSIONAL ENGINEER

8/28/19

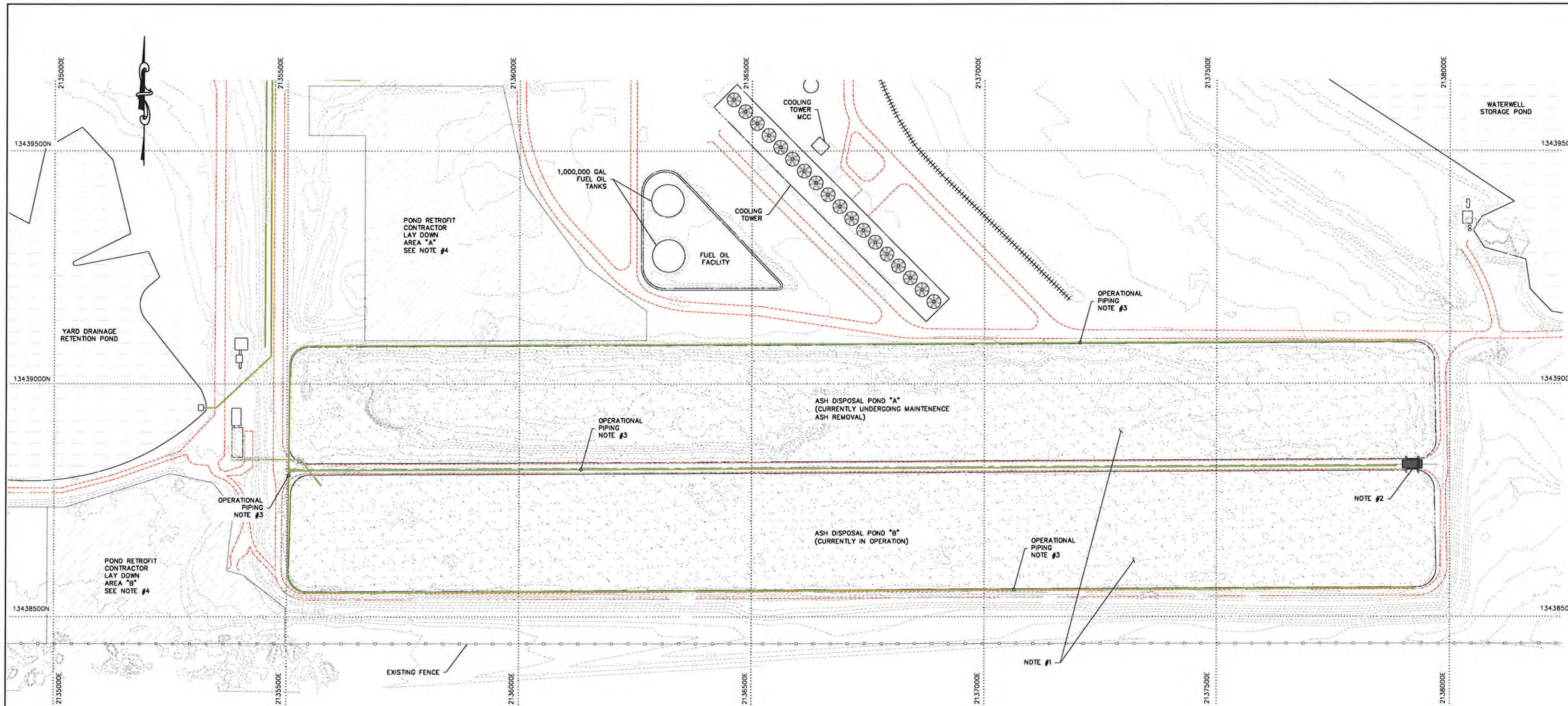
NewFields
1349 WEST PEACHTREE STREET
SUITE 2000
ATLANTA, GEORGIA 30309
PHONE: 404-347-9050
FIRM # F-5735

REVISION/ISSUE			
NO.	DATE	BY	DESCRIPTION
01	8/19	FAH	ISSUED FOR CLIENT REVIEW

SCALE 1"=200'
DESIGNED BY RWG
DRAWN BY FAH
CHECKED BY RWG
DRAWING DATE 8/28/19

PROJECT NAME: SAN MIGUEL ELECTRIC PLANT, ATASCOSA COUNTY, TEXAS, ASH DISPOSAL POND RETROFIT
DRAWING NAME: SURVEY MAP

PROJECT NO. 150.0400.000
PROJECT DATE AUGUST 2019
DRAWING NO. C-101
SHEET NO. 2 OF 9



EXISTING CONDITIONS SITE PLAN

0 200 400 Feet

LEGEND

- ASH DISPOSAL PONDS
- CONTRACTOR'S LAY DOWN AREA
- MAJOR CONTOURS
- MINOR CONTOURS
- 13440000N SURVEY GRID LINE (500 FT SQUARE)
- EXISTING RAILROAD
- EXISTING ROAD/PATH
- EXISTING FENCE
- EXISTING OPERATIONAL PIPING

NOTES:

1. APPROXIMATELY 3–4 FEET OF ASH WILL REMAIN IN POND A TO BE REMOVED AND STAGED BY THE CONTRACTOR UNDER THIS CONTRACT. POND B IS CURRENTLY IN OPERATION. ONCE POND A HAS BEEN RETROFITTED, THE WATER IN POND B WILL BE TRANSFERRED BY THE CONTRACTOR TO POND A AND POND A WILL BE PUT BACK INTO SERVICE. THE CONTRACTOR SHALL THEN REMOVE AND STAGE ALL ASH FROM POND B.
2. THE CONNECTION STRUCTURE BETWEEN POND A AND POND B IS A CONCRETE SPILLWAY CONTROLLED BY DIVIDER GATES THAT ARE INSTALLED AND REMOVED BY CRANE.
3. OPERATIONAL PIPING OF VARYING SIZES LIE ON THE SURFACE OF THE EXISTING BERMS. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR MOVING THESE PIPES TO SUIT THE CONTRACTOR'S STRATEGY FOR ENTRY TO AND EXIT FROM THE PONDS DURING RETROFIT WORK.
4. THE CONTRACTOR SHALL DEVELOP THEIR LAYDOWN AND SUPPORT AREAS IN THE LOCATIONS SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF ACERAGE FOR THEIR USE TO THE FURTHEST EXTENT POSSIBLE AND SHALL UTILIZE THESE AREAS TO ALLOW FOR THE MOST EFFICIENT ACCESS TO AND FROM THE PONDS AND FACILITY AS POSSIBLE.

STAMP

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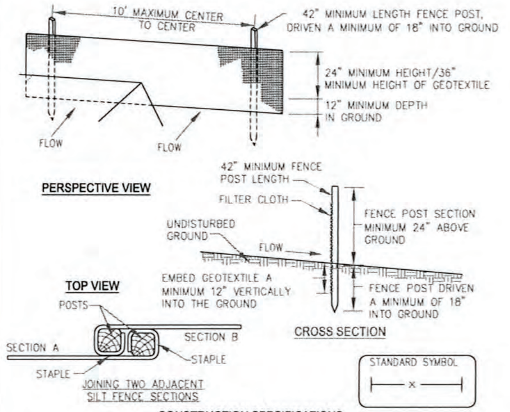
REVISION/ISSUE			
NO.	DATE	BY	DESCRIPTION
01	8/19	FAH	ISSUED FOR CLIENT REVIEW

SCALE	1"=100'
DESIGNED BY	RWG
DRAWN BY	FAH
CHECKED BY	RWG
DRAWING DATE	8/28/19
PROJECT NAME	SAN MIGUEL ELECTRIC PLANT, ATASCOSA COUNTY, TEXAS, ASH DISPOSAL POND RETROFIT
DRAWING NAME	EXISTING CONDITIONS SITE PLAN / ASH REMOVAL
PROJECT NO.	150.0400.000
PROJECT DATE	AUGUST 2019
DRAWING NO.	C-102
SHEET NO.	3 OF 9



CONSTRUCTION SPECIFICATIONS

1. FENCE POSTS SHALL BE A MINIMUM OF 42" LONG, DRIVEN 18" MINIMUM INTO THE GROUND.
   WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION OF 1¼" AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION, WEIGHING NOT LESS THAN 1.33 POUND PER LINEAR FOOT.
2. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES (¾" LONG MINIMUM) AT TOP, MID-SECTION, AND BOTTOM AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR CDOT SILT FENCE GEOTEXTILES::

GRAB STRENGTH	90 LBS (MIN.)	TEST: ASTM D4632
PERMITTIVITY	0.05/SEC	TEST: ASTM D4491
ULTRAVIOLET STABILITY	70% (MIN.) STRENGTH RETAINED	TEST: ASTM D4355

3. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
4. SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% IF THE FABRIC HEIGHT.

001 **SILT FENCE DETAILS**
NOT TO SCALE

SOIL EROSION AND SEDIMENT CONTROL NOTES

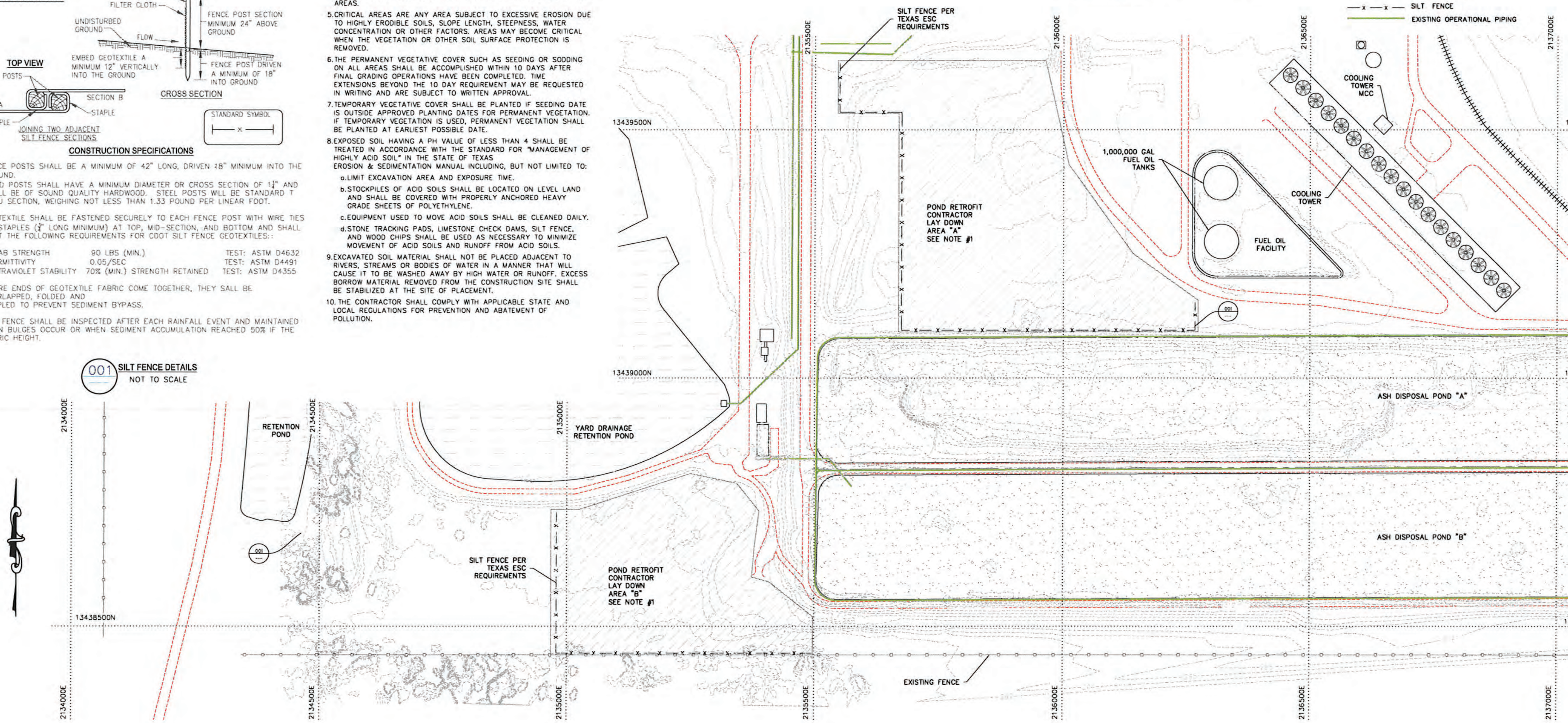
1. THE CONTRACTOR SHALL CONFORM TO STATE OF TEXAS EROSION & SEDIMENTATION MANUAL LATEST EDITION AND ALL APPLICABLE LOCAL REGULATIONS CONCERNING SOIL EROSION AND SEDIMENT CONTROL.
2. THE CONTRACTOR SHALL PERFORM ALL WORK, FURNISH ALL MATERIALS AND INSTALL ALL MEASURES REQUIRED TO REASONABLY CONTROL SOIL EROSION RESULTING FROM CONSTRUCTION OPERATIONS AND MINIMIZE LOSS OF SEDIMENT FROM THE CONSTRUCTION SITE.
3. THE CONTRACTOR SHALL ADHERE TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN SHOWING THE METHODS TO BE USED FOR CONTROLLING EROSION DURING CONSTRUCTION WHICH INCLUDES SEQUENCE FROM THE CONSTRUCTION OPERATIONS.
4. THE CONTRACTOR SHALL INSTALL EROSION CONTROLS ON ALL DISTURBED CRITICAL AREAS OR DISTURBANCES ADJACENT TO CRITICAL AREAS.
5. CRITICAL AREAS ARE ANY AREA SUBJECT TO EXCESSIVE EROSION DUE TO HIGHLY ERODIBLE SOILS, SLOPE LENGTH, STEEPNESS, WATER CONCENTRATION OR OTHER FACTORS. AREAS MAY BECOME CRITICAL WHEN THE VEGETATION OR OTHER SOIL SURFACE PROTECTION IS REMOVED.
6. THE PERMANENT VEGETATIVE COVER SUCH AS SEEDING OR SODDING ON ALL AREAS SHALL BE ACCOMPLISHED WITHIN 10 DAYS AFTER FINAL GRADING OPERATIONS HAVE BEEN COMPLETED. TIME EXTENSIONS BEYOND THE 10 DAY REQUIREMENT MAY BE REQUESTED IN WRITING AND ARE SUBJECT TO WRITTEN APPROVAL.
7. TEMPORARY VEGETATIVE COVER SHALL BE PLANTED IF SEEDING DATE IS OUTSIDE APPROVED PLANTING DATES FOR PERMANENT VEGETATION. IF TEMPORARY VEGETATION IS USED, PERMANENT VEGETATION SHALL BE PLANTED AT EARLIEST POSSIBLE DATE.
8. EXPOSED SOIL HAVING A PH VALUE OF LESS THAN 4 SHALL BE TREATED IN ACCORDANCE WITH THE STANDARD FOR "MANAGEMENT OF HIGHLY ACID SOIL" IN THE STATE OF TEXAS EROSION & SEDIMENTATION MANUAL INCLUDING, BUT NOT LIMITED TO:
   a. LIMIT EXCAVATION AREA AND EXPOSURE TIME.
   b. STOCKPILES OF ACID SOILS SHALL BE LOCATED ON LEVEL LAND AND SHALL BE COVERED WITH PROPERLY ANCHORED HEAVY GRADE SHEETS OF POLYETHYLENE.
   c. EQUIPMENT USED TO MOVE ACID SOILS SHALL BE CLEANED DAILY.
   d. STONE TRACKING PADS, LIMESTONE CHECK DAMS, SILT FENCE, AND WOOD CHIPS SHALL BE USED AS NECESSARY TO MINIMIZE MOVEMENT OF ACID SOILS AND RUNOFF FROM ACID SOILS.
9. EXCAVATED SOIL MATERIAL SHALL NOT BE PLACED ADJACENT TO RIVERS, STREAMS OR BODIES OF WATER IN A MANNER THAT WILL CAUSE IT TO BE WASHED AWAY BY HIGH WATER OR RUNOFF. EXCESS BORROW MATERIAL REMOVED FROM THE CONSTRUCTION SITE SHALL BE STABILIZED AT THE SITE OF PLACEMENT.
10. THE CONTRACTOR SHALL COMPLY WITH APPLICABLE STATE AND LOCAL REGULATIONS FOR PREVENTION AND ABATEMENT OF POLLUTION.

NOTES:

1. THE CONTRACTOR SHALL DEVELOP THEIR LAYDOWN AND SUPPORT AREAS IN THE LOCATIONS SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF ACERAGE FOR THEIR USE TO THE FURTHEST EXTENT POSSIBLE AND SHALL UTILIZE THESE AREAS TO ALLOW FOR THE MOST EFFICIENT ACCESS TO AND FROM THE PONDS AND FACILITY AS POSSIBLE.
2. ALL ESC MATERIALS SHALL BE REMOVED BY THE CONTRACTOR AFTER COMPLETION OF USE OF THE LAYDOWN AREAS. ALL AREAS USED FOR CONTRACTOR LAYDOWN SHALL BE RESTORED TO ITS ORIGINAL CONDITION.

LEGEND

- ASH DISPOSAL PONDS
- CONTRACTOR'S LAY DOWN AREA
- MAJOR CONTOURS
- MINOR CONTOURS
- 13440000N ...... SURVEY GRID LINE (500 FT SQUARE)
- EXISTING RAILROAD
- EXISTING ROAD/PATH
- EXISTING FENCE
- —x—x— SILT FENCE
- EXISTING OPERATIONAL PIPING



LAY DOWN YARD, EROSION AND SEDIMENT CONTROL PLAN

0 200 400
Feet

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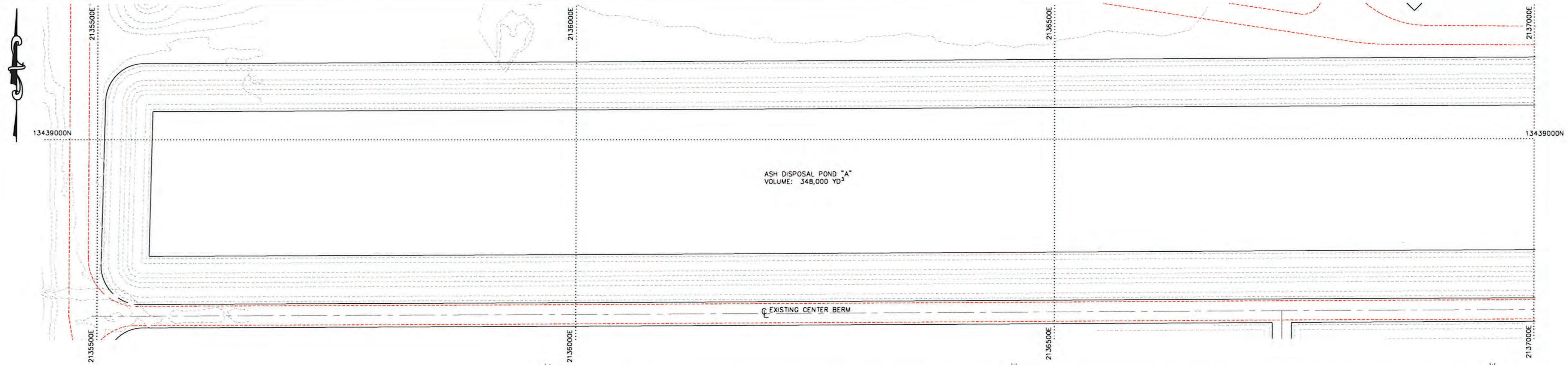
PHONE: 404-347-9050
FIRM # F-5735

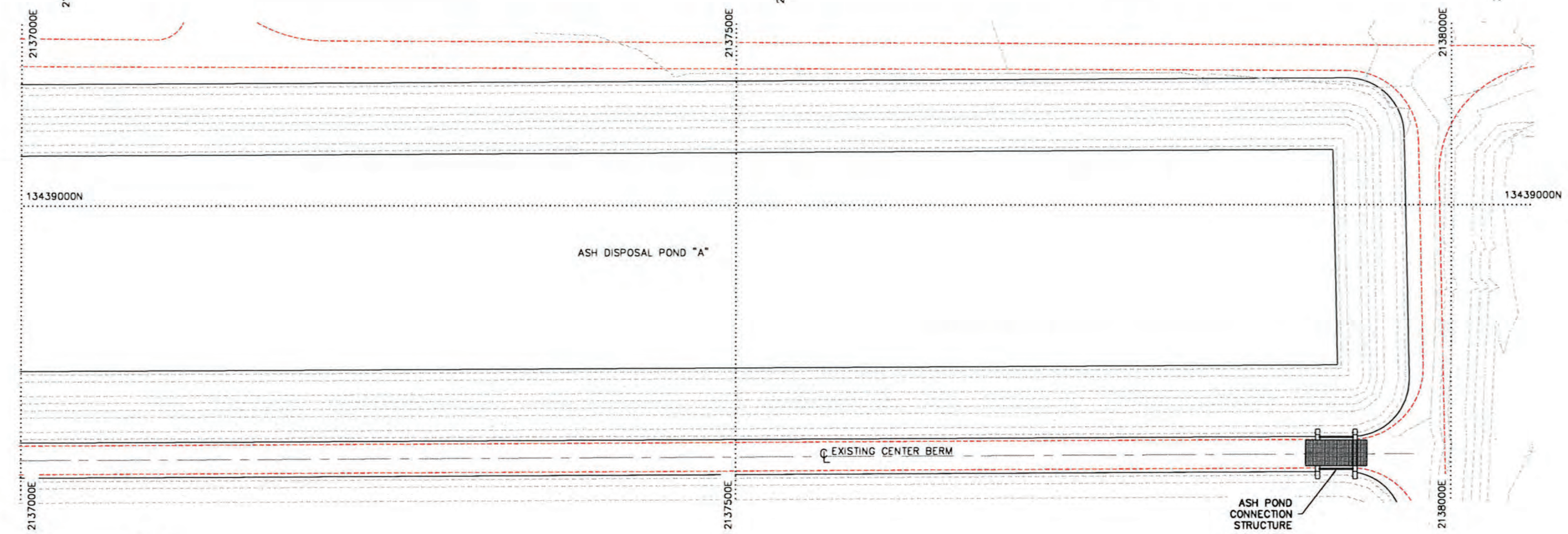
NO.	DATE	BY	REVISION/ISSUE DESCRIPTION
01	8/19	FAH	ISSUED FOR CLIENT REVIEW

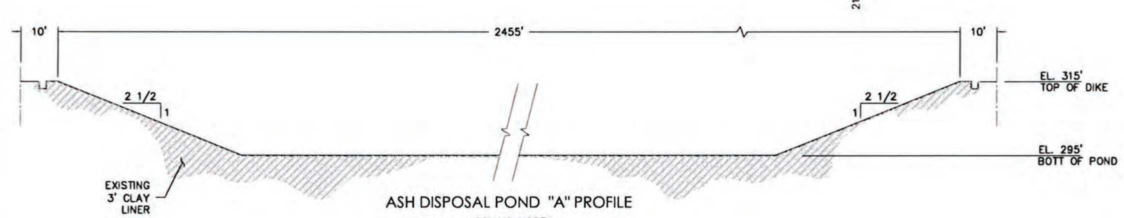
SCALE	1"=100'
DESIGNED BY	RWG
DRAWN BY	FAH
CHECKED BY	RWG
DRAWING DATE	8/28/19
PROJECT NAME	SAN MIGUEL ELECTRIC PLANT ATASCOSA COUNTY, TEXAS ASH DISPOSAL POND RETROFIT
DRAWING NAME	LAY DOWN YARD, EROSION AND SEDIMENT CONTROL PLAN
PROJECT NO.	150.0400.000
PROJECT DATE	AUGUST 2019
DRAWING NO.	C-103
SHEET NO.	4 OF 9



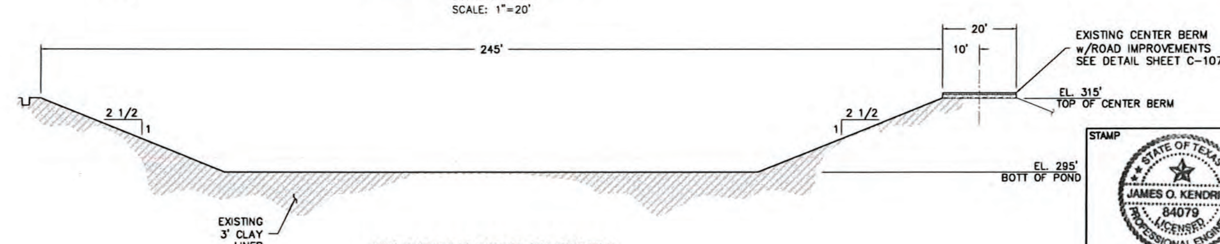
NOTES:

1. CONTRACTOR SHALL TILL, GRADE AND COMPACT POND "A" TO THE LINES AND ELEVATIONS ON THIS DRAWING IN ACCORDANCE WITH THE RETROFIT PLAN.
2. ALL TILLING, GRADING AND COMPACTION WORK WILL BE PERFORMED BY THE CONTRACTOR ON THE INSIDE OF THE PONDS. NO EARTHWORK WILL BE PERFORMED ON THE OUTSIDE BERMS.
3. THE ROAD BETWEEN THE 2 EXISTING PONDS WILL BE GRADED AND COMPACTED IN ACCORDANCE WITH THE RETROFIT PLAN IN PREPARATION FOR LINER PLACEMENT.
4. CONTOURS SHOWN ARE FINAL CONTOURS AFTER TILLING, GRADING AND COMPACTION ARE COMPLETED.
5. NO GARBAGE, ROCKS OR OBJECTIONABLE MATERIALS SHALL REMAIN ON THE SURFACE THAT COULD PUNCTURE THE LINER (SECTION 6.0 OF THE RETROFIT PLAN)
6. THE ROUGH GRADED POND SURFACE SHALL BE ROLLED AT LEAST TWO PASSES.
7. THE CONTRACTOR SHALL GRADE SLOPES TO NO STEEPER THAN 1 V AND 2.5 H.





ASH DISPOSAL POND "A" PROFILE
LOOKING NORTH
SCALE: 1"=20'



ASH DISPOSAL POND "A" PROFILE
LOOKING EAST
SCALE: 1"=20'

ASH DISPOSAL POND "A" TILLING, GRADING AND COMPACTION PLAN

0 100 200 Feet

LEGEND

MAJOR CONTOURS
MINOR CONTOURS
13440000N SURVEY GRID LINE (500 FT SQUARE)
EXISTING ROAD/PATH

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8/28/19

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PHONE: 404-347-9050
FIRM # F-5735

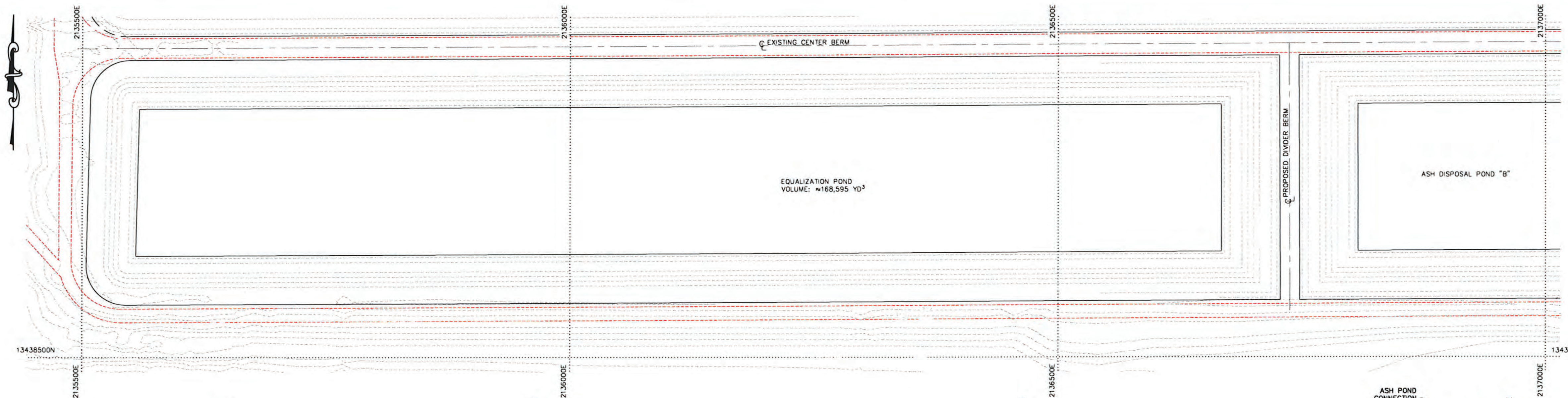
NO.	DATE	BY	REVISION/ISSUE DESCRIPTION
01	8/19	FAH	ISSUED FOR CLIENT REVIEW

SCALE: AS NOTED
DESIGNED BY: RWG
DRAWN BY: FAH
CHECKED BY: RWG
DRAWING DATE: 8/28/19

PROJECT NAME: SAN MIGUEL ELECTRIC PLANT
ATASCOSA COUNTY, TEXAS
ASH DISPOSAL POND RETROFIT

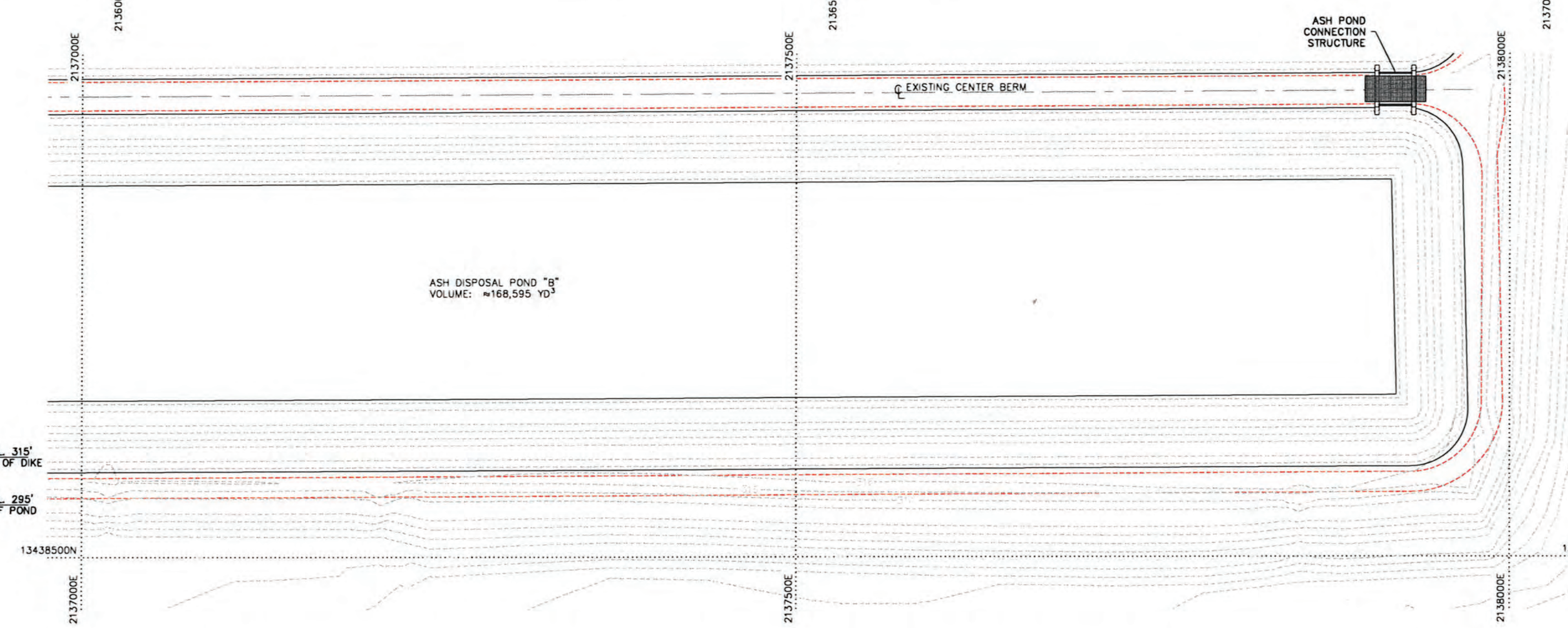
DRAWING NAME: POND "A" TILLING, GRADING AND COMPACTION PLAN

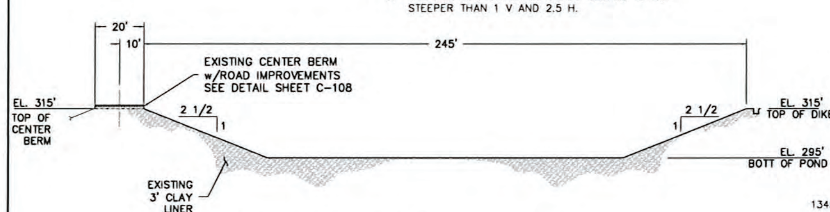
PROJECT NO.: 150.0400.000
PROJECT DATE: AUGUST 2019
DRAWING NO.: C-104
SHEET NO.: 5 OF 9



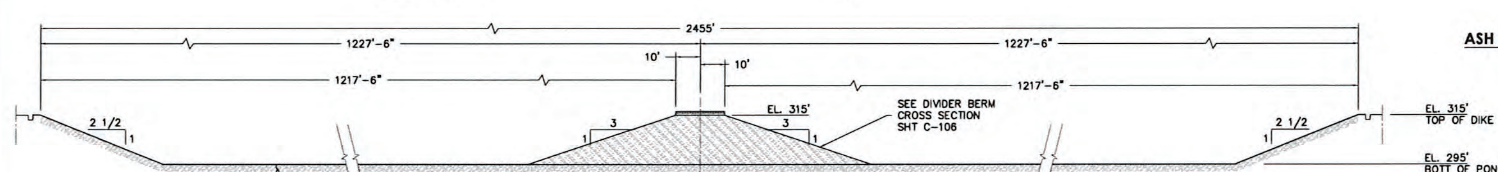
NOTES:

1. CONTRACTOR SHALL TILL, GRADE AND COMPACT POND "B" TO THE LINES AND ELEVATIONS ON THIS DRAWING IN ACCORDANCE WITH THE RETROFIT PLAN.
2. ALL TILLING, GRADING AND COMPACTION WORK WILL BE PERFORMED BY THE CONTRACTOR ON THE INSIDE OF THE PONDS. NO EARTHWORK WILL BE PERFORMED ON THE OUTSIDE BERMS.
3. THE ROAD BETWEEN THE 2 EXISTING PONDS WILL BE GRADED AND COMPACTED IN ACCORDANCE WITH THE RETROFIT PLAN IN PREPARATION FOR LINER PLACEMENT.
4. CONTOURS SHOWN ARE FINAL CONTOURS AFTER TILLING, GRADING AND COMPACTION ARE COMPLETED.
5. NO GARBAGE, ROCKS OR OBJECTIONABLE MATERIALS SHALL REMAIN ON THE SURFACE THAT COULD PUNCTURE THE LINER (SECTION 6.0 OF THE RETROFIT PLAN)
6. THE ROUGH GRADED POND SURFACE SHALL BE ROLLED AT LEAST TWO PASSES.
7. THE CONTRACTOR SHALL GRADE SLOPES TO NO STEEPER THAN 1 V AND 2.5 H.





ASH DISPOSAL POND "B"/ EQUALIZATION POND PROFILE
LOOKING EAST
SCALE: 1"=30'



ASH DISPOSAL POND "B" / EQUALIZATION POND PROFILE
LOOKING NORTH
SCALE: 1"=30'

ASH DISPOSAL POND "B" TILLING, GRADING AND COMPACTION PLAN

0 100 200 Feet

LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- 13440000N .... SURVEY GRID LINE (500 FT SQUARE)
- EXISTING ROAD/PATH

STAMP
STATE OF TEXAS
JAMES O. KENDRICK
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FIRM # F-5735

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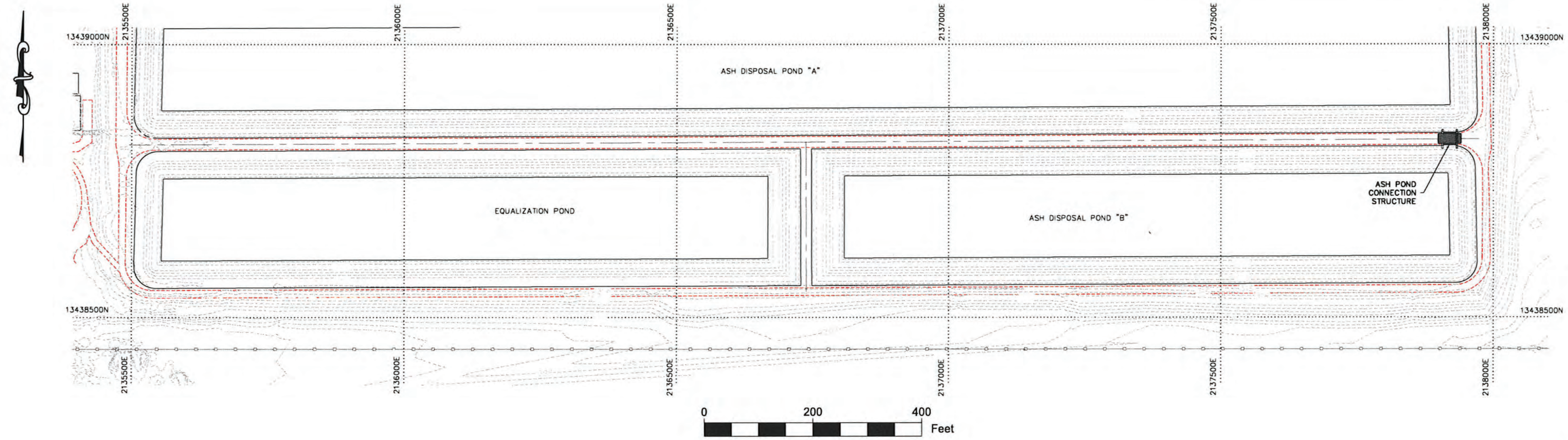
SCALE	AS NOTED
DESIGNED BY	RWG
DRAWN BY	FAH
CHECKED BY	RWG
DRAWING DATE	8/28/19

PROJECT NAME: SAN MIGUEL ELECTRIC PLANT, ATASCOSA COUNTY, TEXAS, ASH DISPOSAL POND RETROFIT

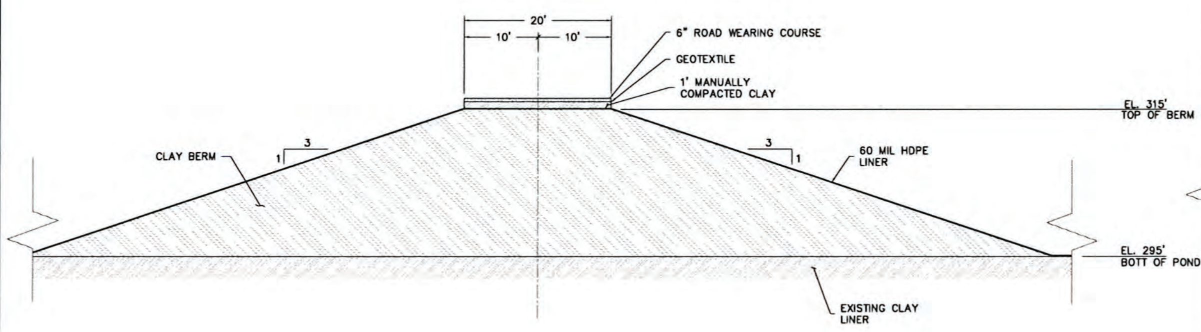
DRAWING NAME: POND "B" TILLING, GRADING AND COMPACTION PLAN

PROJECT NO.	150.0400.000
PROJECT DATE	AUGUST 2019
DRAWING NO.	C-105
SHEET NO.	6 OF 9



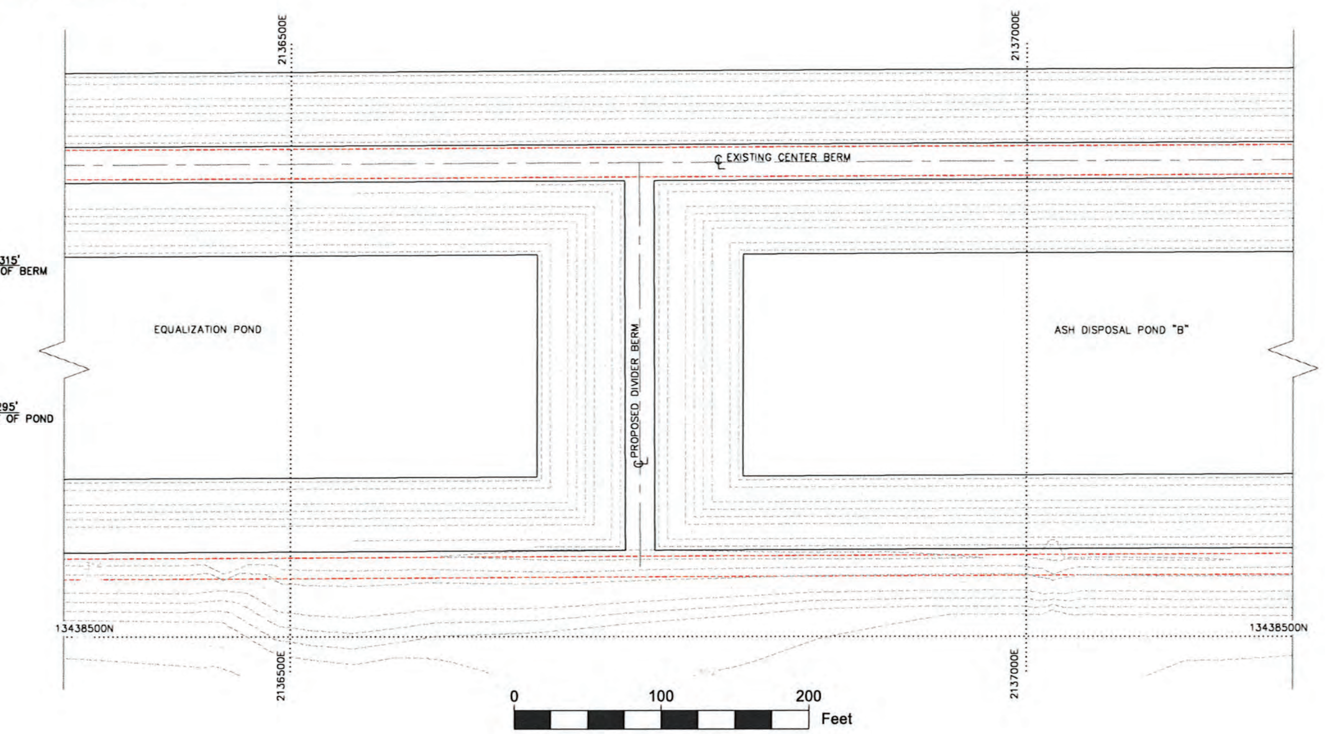
LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- 13440000N SURVEY GRID LINE (500 FT SQUARE)
- EXISTING ROAD/PATH
- EXISTING FENCE



PROPOSED DIVIDER BERM CROSS SECTION

SCALE: 1"=10'



NOTES:

1. CONTRACTOR SHALL PERFORM NUCLEAR DENSITY TESTING ON THE NEW BERM CONSTRUCTION IN ACCORDANCE WITH THE RETROFIT PLAN

STAMP

STATE OF TEXAS
JAMES O. KENDRICK
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8/28/19

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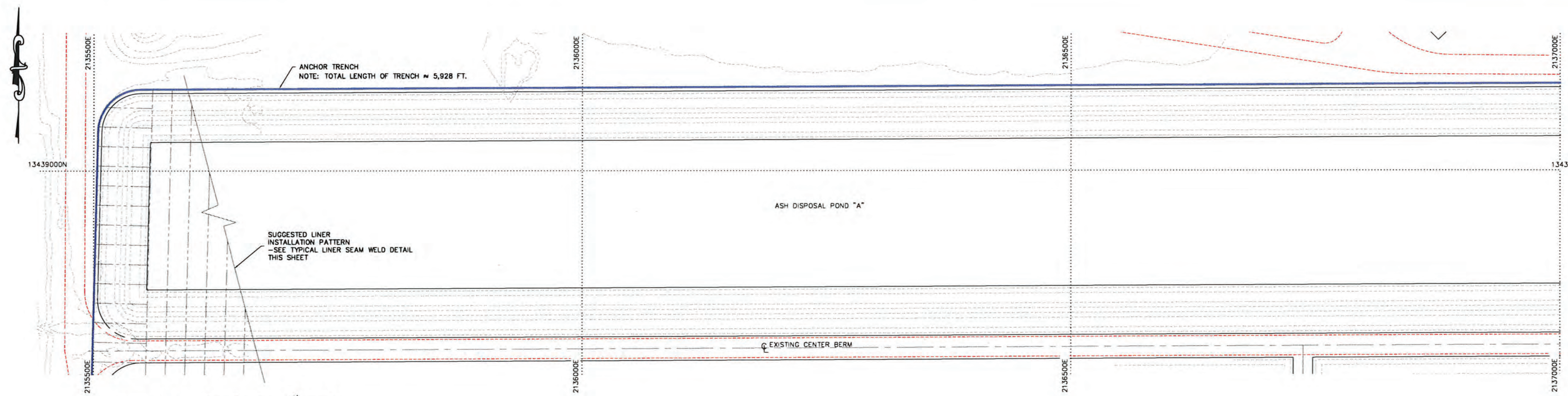
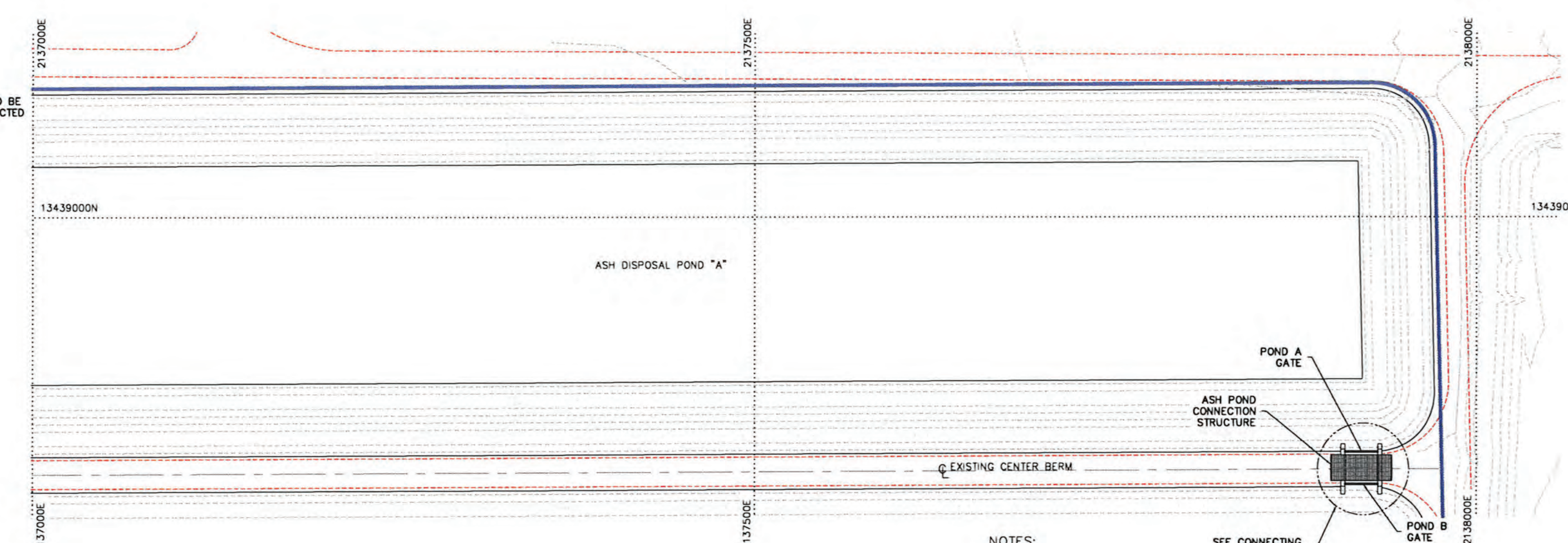
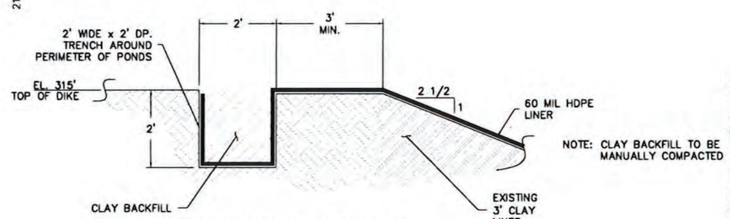
SCALE	AS NOTED
DESIGNED BY	RWG
DRAWN BY	FAH
CHECKED BY	RWG
DRAWING DATE	8/28/19
PROJECT NAME	SAN MIGUEL ELECTRIC PLANT ATASCOSA COUNTY, TEXAS ASH DISPOSAL POND RETROFIT
DRAWING NAME	POND "B" DIVIDER BERM PLAN AND DETAILS
PROJECT NO.	150.0400.000
PROJECT DATE	AUGUST 2019
DRAWING NO.	C-106
SHEET NO.	7 OF 9





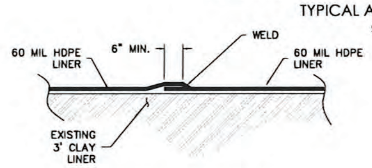
POND "A" LINER INSTALLATION PLAN

0 100 200 Feet



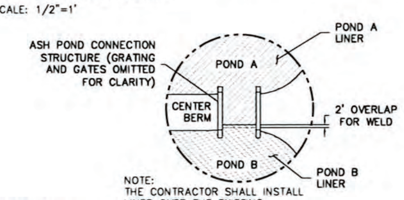
TYPICAL ANCHOR TRENCH DETAIL

SCALE: 1/2"=1'



TYPICAL LINER SEAM WELD DETAIL

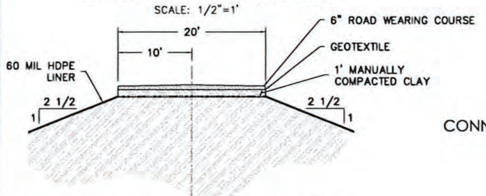
SCALE: 1/2"=1'



NOTE:
THE CONTRACTOR SHALL INSTALL LINER OVER THE EXISTING STRUCTURE CONNECTING POND A AND POND B. DURING INSTALLATION OF POND A LINER, LINER WILL COVER THE STRUCTURE AND EXTEND TO THE POND B GATE. DURING INSTALLATION OF POND B LINER, THE LINER WILL BE SEAMED WITH THE POND A LINER.

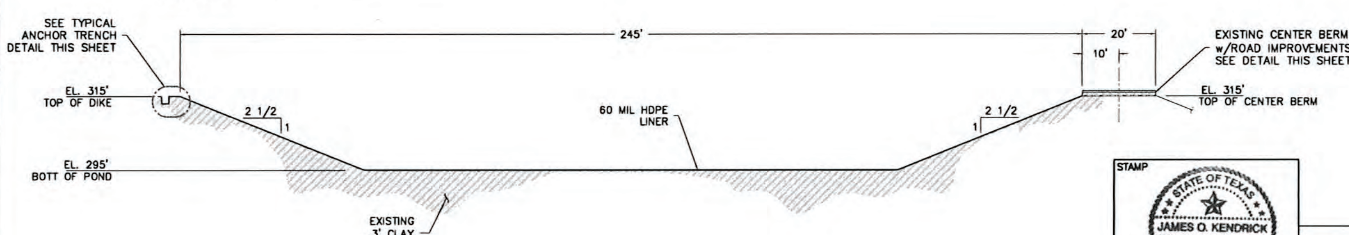
CONNECTING STRUCTURE LINER INSTALLATION DETAIL

SCALE: 1"=50'



CENTER BERM ROAD IMPROVEMENTS DETAIL

SCALE: 1"=10'



ASH DISPOSAL POND "A" PROFILE

LOOKING EAST

SCALE: 1"=20'

NOTES:

1. LINER PANELS SHALL BE INSTALLED BY THE CONTRACTOR IN A NORTH-SOUTH ORIENTATION EXCEPT IN AREAS ON THE EXTREME EAST AND WEST SLOPES OF THE POND.
2. LINER PANELS SHALL BE ANCHORED IN ANCHOR TRENCHES ALONG THE PERIMETER OF THE 2-POND SYSTEM. LINER PANELS WILL BE OVERLAPPED AND WELDED ON THE DIVIDER BERM BETWEEN THE 2 PONDS.
3. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR RELOCATION OF ABOVE GROUND PIPING FOR INSTALLATION OF ANCHOR TRENCHES.

LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- 13440000N SURVEY GRID LINE (500 FT SQUARE)
- EXISTING ROAD/PATH
- ANCHOR TRENCH

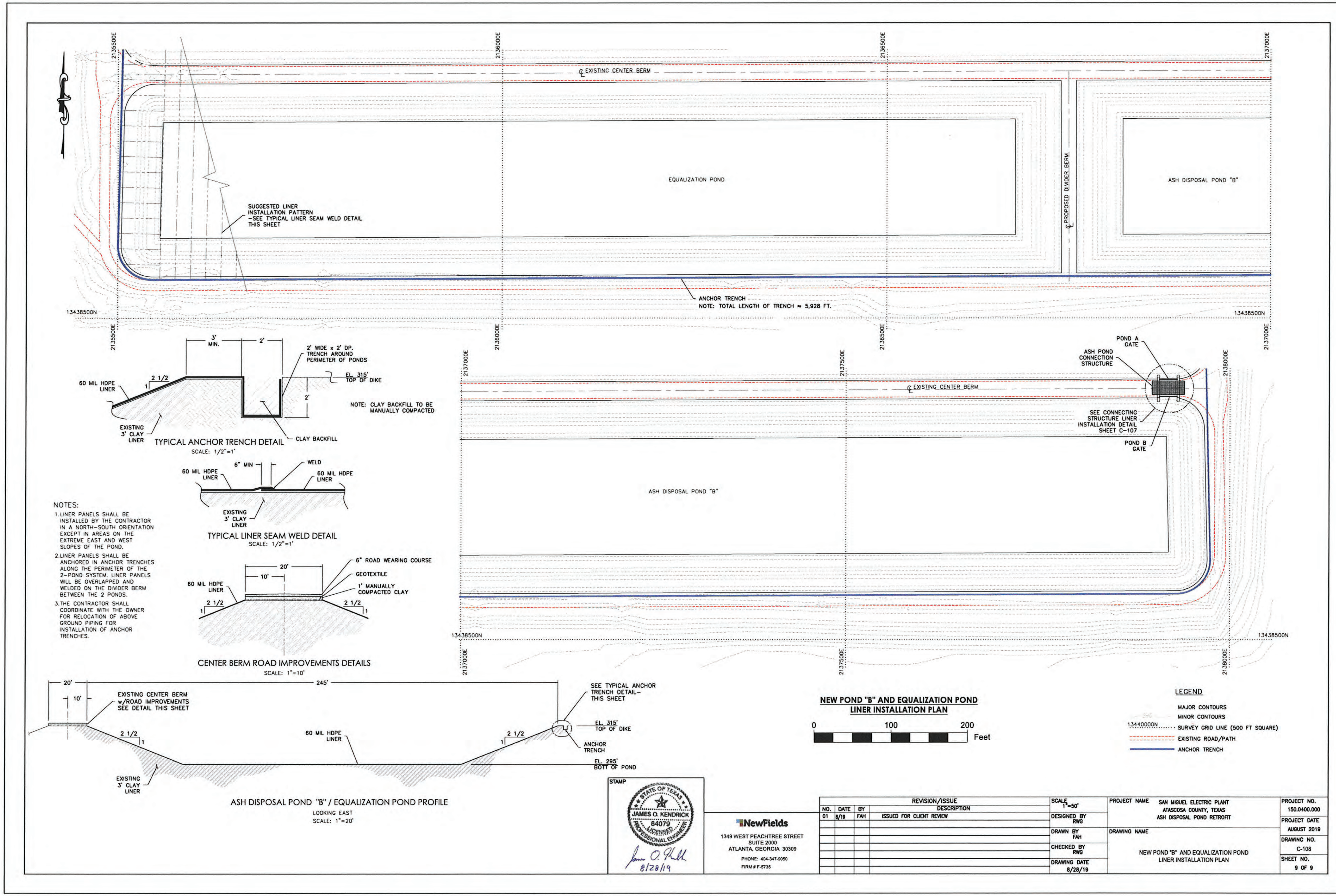
STAMP

STATE OF TEXAS
JAMES O. KENDRICK
84079
LICENSED
PROFESSIONAL ENGINEER
8/28/19

NewFields
1349 WEST PEACHTREE STREET
SUITE 2000
ATLANTA, GEORGIA 30309
PHONE: 404-347-9050
FIRM # F-5735

NO.	DATE	BY	REVISION/ISSUE DESCRIPTION
01	8/19	FAH	ISSUED FOR CLIENT REVIEW

SCALE	AS NOTED
DESIGNED BY	RWG
DRAWN BY	FAH
CHECKED BY	RWG
DRAWING DATE	8/28/19
PROJECT NAME	SAN MIGUEL ELECTRIC PLANT ATASCOSA COUNTY, TEXAS ASH DISPOSAL POND RETROFIT
DRAWING NAME	POND "A" LINER INSTALLATION PLAN
PROJECT NO.	150.0400.000
PROJECT DATE	AUGUST 2019
DRAWING NO.	C-107
SHEET NO.	8 OF 9



EXISTING CENTER BERM
EQUALIZATION POND
PROPOSED DIVIDER BERM
ASH DISPOSAL POND "B"
SUGGESTED LINER INSTALLATION PATTERN -SEE TYPICAL LINER SEAM WELD DETAIL THIS SHEET
ANCHOR TRENCH NOTE: TOTAL LENGTH OF TRENCH ≈ 5,928 FT.
2135500E
2136000E
2136500E
2137000E
2137500E
2138000E
13438500N
POND A GATE
ASH POND CONNECTION STRUCTURE
SEE CONNECTING STRUCTURE LINER INSTALLATION DETAIL SHEET C-107
POND B GATE
3' MIN.
2'
2' WIDE x 2' DP. TRENCH AROUND PERIMETER OF PONDS
EL. 315' TOP OF DIKE
60 MIL HDPE LINER
2 1/2
1
EXISTING 3' CLAY LINER
CLAY BACKFILL
NOTE: CLAY BACKFILL TO BE MANUALLY COMPACTED
TYPICAL ANCHOR TRENCH DETAIL
SCALE: 1/2"=1'
6" MIN
WELD
60 MIL HDPE LINER
TYPICAL LINER SEAM WELD DETAIL
SCALE: 1/2"=1'
NOTES:
1. LINER PANELS SHALL BE INSTALLED BY THE CONTRACTOR IN A NORTH-SOUTH ORIENTATION EXCEPT IN AREAS ON THE EXTREME EAST AND WEST SLOPES OF THE POND.
2. LINER PANELS SHALL BE ANCHORED IN ANCHOR TRENCHES ALONG THE PERIMETER OF THE 2-POND SYSTEM. LINER PANELS WILL BE OVERLAPPED AND WELDED ON THE DIVIDER BERM BETWEEN THE 2 PONDS.
3. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR RELOCATION OF ABOVE GROUND PIPING FOR INSTALLATION OF ANCHOR TRENCHES.
20'
10'
6" ROAD WEARING COURSE
GEOTEXTILE
1' MANUALLY COMPACTED CLAY
CENTER BERM ROAD IMPROVEMENTS DETAILS
SCALE: 1"=10'
245'
EXISTING CENTER BERM w/ROAD IMPROVEMENTS SEE DETAIL THIS SHEET
SEE TYPICAL ANCHOR TRENCH DETAIL- THIS SHEET
ANCHOR TRENCH
EL. 295' BOTT OF POND
ASH DISPOSAL POND "B" / EQUALIZATION POND PROFILE
LOOKING EAST
SCALE: 1"=20'
NEW POND "B" AND EQUALIZATION POND LINER INSTALLATION PLAN
0
100
200
Feet
LEGEND
MAJOR CONTOURS
MINOR CONTOURS
13440000N
SURVEY GRID LINE (500 FT SQUARE)
EXISTING ROAD/PATH
ANCHOR TRENCH
STAMP
STATE OF TEXAS
JAMES O. KENDRICK
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LICENSED
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1349 WEST PEACHTREE STREET
SUITE 2000
ATLANTA, GEORGIA 30309
PHONE: 404-347-9050
FIRM # F-5735
REVISION/ISSUE
NO. DATE BY DESCRIPTION
01 8/19 FAH ISSUED FOR CLIENT REVIEW
SCALE 1"=50'
DESIGNED BY RWG
DRAWN BY FAH
CHECKED BY RWG
DRAWING DATE 8/28/19
PROJECT NAME SAN MIGUEL ELECTRIC PLANT ATASCOSA COUNTY, TEXAS ASH DISPOSAL POND RETROFIT
DRAWING NAME NEW POND "B" AND EQUALIZATION POND LINER INSTALLATION PLAN
PROJECT NO. 150.0400.000
PROJECT DATE AUGUST 2019
DRAWING NO. C-108
SHEET NO. 9 OF 9

APPENDIX B

Pond Surface Area and Storage Volume Calculations

Appendix B-1

San Miguel Power Plant
Inflow Design Flood Control System Plan
Pond Volume Calculations
Ash Pond A

Pond Dimensions	
Length at Top of Dike (ft):	2,455
Width at Top of Dike (ft):	245
Depth at Top of Dike (ft)	20
Dike Side Slopes (H:1):	2.5
Length at 2 Ft Freeboard (ft):	2,445
Width at 2 ft Freeboard (ft):	235
Depth at 2 ft Freeboard (ft):	18
Length at Base of Dike (ft):	2,355
Width at Base of Dike (ft):	145

Pond Surface Area at Top of Dikes	
Area (sf):	601,475
Area (acres):	13.8

Pond Volumes	
Volume at Top of Dike (cf):	9,307,655
Volume at Top of Dike (CY):	344,728
Volume at 2 Ft Freeboard (cf):	8,153,988
Volume at 2 Ft Freeboard (CY):	302,000
Storage Available in Freeboard (cf):	**1,153,667**

Note: Pond Dimensions from "Ash Disposal Pond Retrofit", NewFields, August 2019.

Appendix B-2

San Miguel Power Plant
Inflow Design Flood Control System Plan
Pond Volume Calculations
Retrofitted Ash Pond B

Pond Dimensions	
Length at Top of Dike (ft):	1,217.5
Width at Top of Dike (ft):	245
Depth at Top of Dike (ft)	20
Dike Side Slopes (H:1):	2.5
Length at 2 Ft Freeboard (ft):	1,207.5
Width at 2 ft Freeboard (ft):	235
Depth at 2 ft Freeboard (ft):	18
Length at Base of Dike (ft):	1,117.5
Width at Base of Dike (ft):	145

Pond Surface Area at Top of Dikes	
Area (sf):	298,288
Area (acres):	6.8

Pond Volumes	
Volume at Top of Dike (cf):	4,534,496
Volume at Top of Dike (CY):	167,944
Volume at 2 Ft Freeboard (cf):	3,961,379
Volume at 2 Ft Freeboard (CY):	146,718
Storage Available in Freeboard (cf):	**573,117**

Note: Pond Dimensions from "Ash Disposal Pond Retrofit", NewFields, August 2019.

Appendix B-3

San Miguel Power Plant
Inflow Design Flood Control System Plan
Pond Volume Calculations
Retrofitted EQ Pond

<u>Pond Dimensions</u>	
Length at Top of Dike (ft):	1,217.5
Width at Top of Dike (ft):	245
Depth at Top of Dike (ft)	20
Dike Side Slopes (H:1):	2.5
Length at 2 Ft Freeboard (ft):	1,207.5
Width at 2 ft Freeboard (ft):	235
Depth at 2 ft Freeboard (ft):	18
Length at Base of Dike (ft):	1,117.5
Width at Base of Dike (ft):	145
<u>Pond Surface Area at Top of Dikes</u>	
Area (sf):	298,288
Area (acres):	6.8
<u>Pond Volumes</u>	
Volume at Top of Dike (cf):	4,534,496
Volume at Top of Dike (CY):	167,944
Volume at 2 Ft Freeboard (cf):	3,961,379
Volume at 2 Ft Freeboard (CY):	146,718
Storage Available in Freeboard (cf):	**573,117**

Note: Pond Dimensions from "Ash Disposal Pond Retrofit", NewFields, August 2019.

APPENDIX C

NOAA Atlas 14 Precipitation Data – Jourdanton, Texas

NOAA Atlas 14, Volume 11, Version 2
Location name: Jourdanton, Texas, USA*
Latitude: 28.7042°, Longitude: -98.4766°
Elevation: 329.57 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.449** (0.340-0.593)	**0.526** (0.404-0.691)	**0.655** (0.499-0.861)	**0.759** (0.570-1.01)	**0.900** (0.655-1.24)	**1.01** (0.713-1.42)	**1.11** (0.765-1.60)	**1.21** (0.813-1.79)	**1.34** (0.868-2.05)	**1.43** (0.903-2.24)
10-min	**0.714** (0.540-0.943)	**0.838** (0.642-1.10)	**1.04** (0.796-1.37)	**1.21** (0.910-1.62)	**1.44** (1.05-1.98)	**1.61** (1.14-2.27)	**1.78** (1.23-2.57)	**1.93** (1.30-2.87)	**2.13** (1.38-3.26)	**2.27** (1.43-3.56)
15-min	**0.908** (0.688-1.20)	**1.06** (0.810-1.39)	**1.31** (0.996-1.72)	**1.51** (1.13-2.01)	**1.79** (1.30-2.46)	**2.00** (1.42-2.82)	**2.21** (1.53-3.20)	**2.41** (1.62-3.57)	**2.67** (1.73-4.09)	**2.85** (1.81-4.48)
30-min	**1.29** (0.974-1.70)	**1.49** (1.15-1.96)	**1.84** (1.40-2.42)	**2.12** (1.59-2.83)	**2.50** (1.82-3.43)	**2.79** (1.97-3.93)	**3.07** (2.12-4.43)	**3.35** (2.25-4.97)	**3.72** (2.41-5.69)	**3.99** (2.52-6.26)
60-min	**1.66** (1.26-2.19)	**1.94** (1.49-2.55)	**2.42** (1.85-3.18)	**2.80** (2.11-3.74)	**3.33** (2.41-4.55)	**3.71** (2.63-5.22)	**4.10** (2.83-5.92)	**4.50** (3.03-6.67)	**5.04** (3.28-7.73)	**5.45** (3.45-8.57)
2-hr	**1.97** (1.50-2.58)	**2.37** (1.82-3.07)	**3.02** (2.32-3.94)	**3.57** (2.70-4.72)	**4.32** (3.16-5.87)	**4.90** (3.48-6.83)	**5.50** (3.81-7.87)	**6.15** (4.15-9.02)	**7.06** (4.60-10.7)	**7.78** (4.94-12.1)
3-hr	**2.13** (1.63-2.78)	**2.61** (2.01-3.36)	**3.39** (2.61-4.39)	**4.05** (3.07-5.33)	**4.97** (3.64-6.72)	**5.69** (4.06-7.89)	**6.45** (4.49-9.18)	**7.30** (4.94-10.6)	**8.50** (5.56-12.8)	**9.49** (6.04-14.6)
6-hr	**2.40** (1.85-3.12)	**3.02** (2.33-3.83)	**3.98** (3.08-5.12)	**4.82** (3.68-6.30)	**6.03** (4.45-8.09)	**7.01** (5.03-9.63)	**8.06** (5.63-11.3)	**9.25** (6.29-13.3)	**11.0** (7.21-16.3)	**12.4** (7.93-18.9)
12-hr	**2.69** (2.08-3.46)	**3.41** (2.62-4.25)	**4.50** (3.50-5.74)	**5.49** (4.22-7.12)	**6.95** (5.17-9.26)	**8.16** (5.90-11.1)	**9.51** (6.68-13.2)	**11.0** (7.53-15.7)	**13.3** (8.75-19.5)	**15.2** (9.73-22.8)
24-hr	**2.99** (2.33-3.82)	**3.82** (2.94-4.69)	**5.04** (3.94-6.37)	**6.18** (4.78-7.95)	**7.89** (5.91-10.4)	**9.34** (6.80-12.7)	**11.0** (7.75-15.1)	**12.8** (8.79-18.0)	**15.6** (10.3-22.6)	**17.8** (11.5-26.4)
2-day	**3.32** (2.61-4.21)	**4.29** (3.31-5.21)	**5.69** (4.47-7.13)	**7.01** (5.46-8.96)	**9.02** (6.82-11.9)	**10.8** (7.89-14.5)	**12.7** (9.01-17.3)	**14.8** (10.2-20.6)	**17.8** (11.8-25.5)	**20.3** (13.1-29.6)
3-day	**3.56** (2.81-4.50)	**4.61** (3.57-5.58)	**6.12** (4.83-7.64)	**7.54** (5.89-9.58)	**9.68** (7.35-12.7)	**11.5** (8.49-15.4)	**13.6** (9.66-18.4)	**15.8** (10.9-21.8)	**18.9** (12.6-26.8)	**21.5** (13.9-31.1)
4-day	**3.77** (2.99-4.75)	**4.85** (3.78-5.88)	**6.42** (5.09-8.00)	**7.89** (6.18-9.99)	**10.1** (7.66-13.1)	**12.0** (8.81-15.9)	**14.0** (10.00-18.9)	**16.3** (11.2-22.3)	**19.5** (13.0-27.5)	**22.0** (14.3-31.7)
7-day	**4.28** (3.40-5.36)	**5.39** (4.26-6.55)	**7.06** (5.63-8.75)	**8.57** (6.75-10.8)	**10.8** (8.23-13.9)	**12.7** (9.36-16.7)	**14.7** (10.5-19.7)	**17.0** (11.8-23.1)	**20.3** (13.6-28.3)	**23.0** (14.9-32.7)
10-day	**4.70** (3.75-5.86)	**5.84** (4.64-7.10)	**7.58** (6.07-9.38)	**9.14** (7.22-11.5)	**11.4** (8.70-14.6)	**13.3** (9.82-17.3)	**15.3** (11.0-20.4)	**17.6** (12.3-23.8)	**20.9** (14.0-29.1)	**23.7** (15.4-33.4)
20-day	**5.91** (4.75-7.31)	**7.17** (5.80-8.76)	**9.19** (7.43-11.3)	**10.9** (8.67-13.6)	**13.3** (10.2-16.9)	**15.2** (11.3-19.6)	**17.2** (12.4-22.6)	**19.5** (13.6-26.1)	**22.8** (15.3-31.2)	**25.4** (16.6-35.5)
30-day	**6.90** (5.57-8.50)	**8.28** (6.76-10.1)	**10.5** (8.56-12.9)	**12.4** (9.90-15.4)	**15.0** (11.5-18.8)	**16.9** (12.6-21.7)	**18.9** (13.7-24.8)	**21.2** (14.9-28.2)	**24.4** (16.5-33.2)	**27.0** (17.7-37.4)
45-day	**8.27** (6.71-10.2)	**9.86** (8.10-12.1)	**12.5** (10.2-15.3)	**14.6** (11.7-18.0)	**17.6** (13.5-22.0)	**19.7** (14.7-25.2)	**22.0** (15.9-28.5)	**24.4** (17.2-32.2)	**27.6** (18.7-37.3)	**30.2** (19.9-41.4)
60-day	**9.49** (7.72-11.6)	**11.3** (9.30-13.8)	**14.2** (11.7-17.4)	**16.7** (13.4-20.5)	**20.0** (15.4-24.9)	**22.4** (16.8-28.5)	**24.9** (18.1-32.2)	**27.4** (19.4-36.0)	**30.8** (20.9-41.4)	**33.5** (22.0-45.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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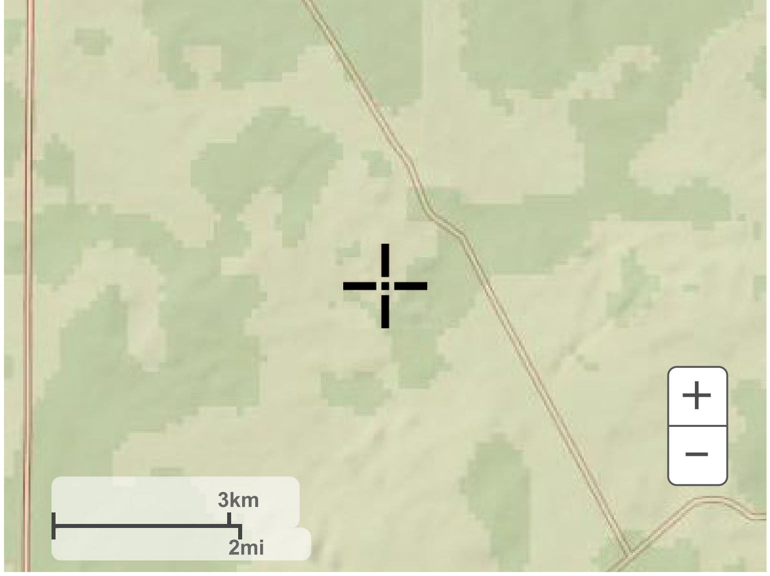
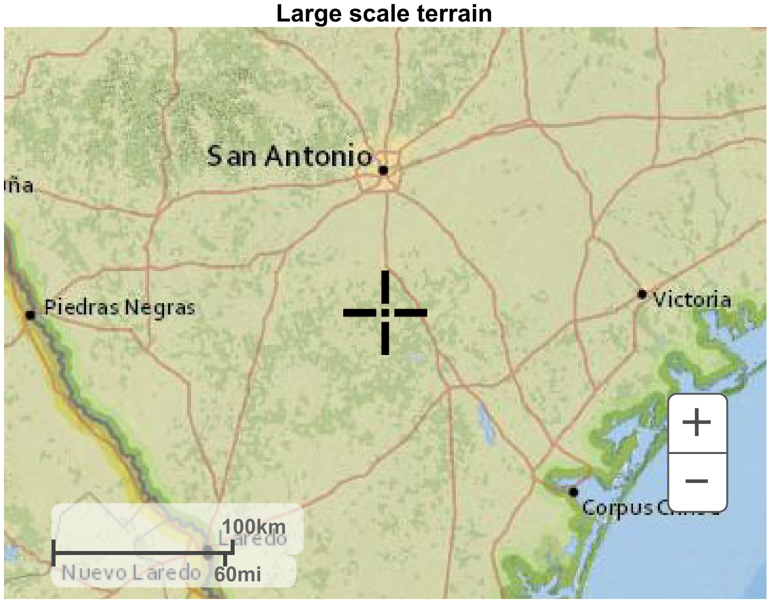
PF graphical



Large scale terrain



Large scale map

Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

APPENDIX D

Hydraulic Capacity Evaluation Calculations - Ash Pond A and Retrofitted Ash Pond B

Appendix D
San Miguel Power Plant
Inflow Design Flood Control System Plan
Inflow Volume Estimates and Pond Freeboard Storage Evaluation
Ash Pond A and Retrofitted Ash Pond B

Assumptions

1) Design Rainfall (in): 11.0 100-Year, 24-Hr Storm

2) Inflows to Ash Ponds Consist of the Following:

- Direct Precipitation on the Lined Pond Surface Area of Ash Pond A at Top of Dikes
- Direct Precipitation on the Lined Pond Surface Area of Retrofitted Ash Pond B at Top of Dikes
- 100% of Runoff from Access Roads On Perimeter Dikes Around Ash Pond A and Retrofitted Ash Pond B
- 100% of Runoff from Access Road on Dike Between Ash Pond A and Retrofitted Ash Pond B
- 100% of the Runoff from the Access Road on Dike Between Retrofitted Ash Pond B and Retrofitted EQ Pond
- Plant Floor Drainage

3) Runoff Volumes Calculated Using the Rational Method:

V = CiA, where:

V = Estimated Runoff Volume (cf)
C = Rational Method Runoff Coefficient
i = Rainfall (ft)
A = Stormwater Drainage Area (sf)

4) Assumed Runoff Coefficients:

- Direct Precipitation on Lined Pond Surface:	1.00
- Runoff From Access Roads:	0.95
- Plant Floor Drainage:	0.95

5) Drainage Areas:

- Lined Surface Area of Ash Pond A:		601,475
- Lined Surface Area of Retrofitted Ash Pond B:		298,288
- Access Roads On Perimeter Dikes:		
a) North Side of Pond A:		
i) Length (ft):	2,455	
ii) Width (ft):	20	
iii) Area (sf):	49,100	
b) West Side of Ponds A and B:		
i) Length (ft):	510	
ii) Width (ft):	20	
iii) Area (sf):	10,200	
c) South Side of Retrofitted Pond B:		
i) Length (ft):	1,230	
ii) Width (ft):	20	
iii) Area (sf):	24,600	
d) Total Access Roads on Perimeter Dikes:		83,900

Appendix D
San Miguel Power Plant
Inflow Design Flood Control System Plan
Inflow Volume Estimates and Pond Freeboard Storage Evaluation
Ash Pond A and Retrofitted Ash Pond B

- Access Road On Dike Between Pond A and Retrofitted Pond B:		
i) Length (ft):	2,455	
ii) Width (ft):	20	
iii) Area (sf):		49,100
- Access Road On Dike Between Retrofited Pond B and EQ Pond:		
i) Length (ft):	245	
ii) Width (ft):	20	
iii) Area (sf):		4,900
- Plant Floor Drainage:		
i) Area (Acres):	7.0	
ii) Area (sf):		304,920

6) Assume Total Inflow Volume Generated During 100-Yr, 24-Hr Storm must be Contained in Freeboard of Ash Pond A and Retrofitted Ash Pond B

Inflow Volume Estimates

1) Precip on Lined Surface Area of Ash Pond A (cf):	551,352
2) Precip on Lined Surface Area of Retrofitted Ash Pond B (cf):	273,430
3) Runoff from Access Roads On Perimeter Dikes (cf):	73,063
4) Runoff from Access Road On Dike Between Pond A and Retrofitted Pond B (cf):	42,758
5) Runoff from Access Road On Dike Between Retrofited Pond B and EQ Pond (cf):	4,267
6) Plant Floor Drainage (cf):	265,535
Total Inflow Volume to Ponds A and B (cf):	**1,210,405**

Available Freeboard Storage in Ponds A and B

1) Assume 2 feet of Freeboard maintained in Ponds A and B

2) Ponds A and B are connected by a Gravity Spillway - assume water levels are similar in both ponds

Storage Available in Ash Pond A Freeboard (cf):	1,153,667
Storage Available in Retrofitted Ash Pond B Freeboard (cf):	573,117
Total Storage Available in Ponds A and B Freeboard (cf):	**1,726,784**

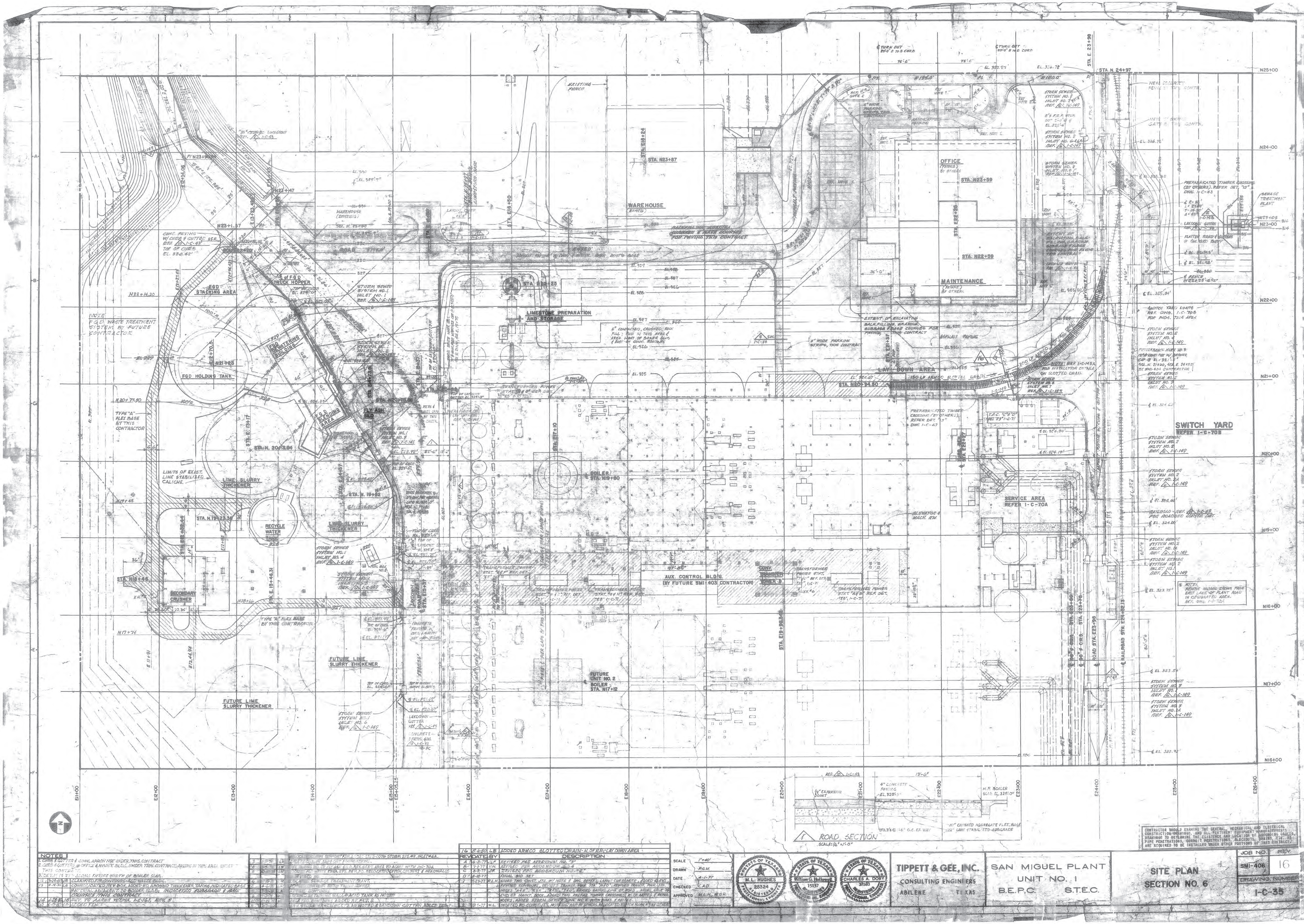
Comparison of Freeboard Storage to Inflow Volume

Total Storage Available in Ponds A and B Freeboard (cf):	1,726,784
Total Inflow Volume to Ponds A and B (cf):	1,210,405
Excess Storage in Ponds A and B Freeboard (cf):	**516,379**
Estimated Remaining Freeboard (ft):	**0.57**
Estimated Remaining Freeboard (in):	**6.9**

Notes:
1) Pond, Dike and Acces Road Dimensions from "Ash Disposal Pond Retrofit", NewFields, August 2019.
2) 100 Yr, 24-Hr Storm from NOAA Atlas 14 for Jourdanton, TX.

APPENDIX E

Tippet & Gee, Inc - Site Plan Section No. 6, San Miguel Plant Unit No. 1, Drawing No. 1-C-35, Rev 16, April 1, 1977, revised August 6, 1980


WAREHOUSE
OFFICE
MAINTENANCE
LIMESTONE PREPARATION AND STORAGE
FGD STACKING AREA
FGD HOLDING TANK
LIME SLURRY THICKENER
RECYCLE WATER TANK
SECONDARY CRUSHER
FUTURE LIME SLURRY THICKENER
BOILER STA. N19+60
FUTURE UNIT NO. 2 BOILER STA. N17+12
AUX. CONTROL BLDG. (BY FUTURE SMI-403 CONTRACTOR)
LAY DOWN AREA
SWITCH YARD REFER 1-C-70B
SERVICE AREA REFER 1-C-70A
ROAD SECTION
SCALE: 1/2" = 1'-0"
N25+00
N24+00
N23+00
N22+00
N21+00
N20+00
N19+00
N18+00
N17+00
N16+00
E11+00
E12+00
E13+00
E14+00
E15+00
E16+00
E17+00
E18+00
E19+00
E20+00
E21+00
E22+00
E23+00
E24+00
E25+00
E26+00
CONTRACTOR SHOULD EXAMINE THE GENERAL, MECHANICAL AND ELECTRICAL CONSTRUCTION DRAWINGS, AND ALL PERTINENT EQUIPMENT MANUFACTURERS DRAWINGS TO DETERMINE THE EXISTENCE AND LOCATION OF GROUNDING CABLES, PIPE PENETRATIONS, CONDUIT PENETRATIONS, BLOCKOUTS, DRAINS, ETC. AS ARE REQUIRED TO BE INSTALLED UNDER OTHER PORTIONS OF THIS CONTRACT.
NOTES
16 8-6-80 LB ADDED ARMCO SLOTTED DRAIN - N. OF R.R. - LAY DOWN AREA
REV. DATE BY DESCRIPTION
SCALE 1"=40'
DRAWN P.G.M.
DATE 4-1-77
CHECKED C.A.D.
APPROVED M.L.H.
M.L. HUGHES 25324
William G. Hollowell 15137
CHARLES A. DOBY 37593
TIPPETT & GEE, INC.
CONSULTING ENGINEERS
ABILENE TEXAS
SAN MIGUEL PLANT
UNIT NO. 1
B.E.P.C. S.T.E.C.
SITE PLAN
SECTION NO. 6
JOB NO. SMI-406
REV. 16
DRAWING NUMBER I-C-35

APPENDIX F

Hydraulic Capacity Evaluation Calculations - Retrofitted EQ Pond

Appendix F
San Miguel Power Plant
Inflow Design Flood Control System Plan
Inflow Volume Estimates and Pond Freeboard Storage Evaluation
Retrofitted EQ Pond

Assumptions

1) Design Rainfall (in):	11.0	100-Year, 24-Hr Storm

2) Inflows to Retrofiitted EQ Pond Consist of the Following:

- Direct Precipitation on the Lined Pond Surface Area of the Retrofitted EQ Pond at Top of Dikes
- 100% of Runoff from Access Roads On Perimeter Dikes Around Retrofitted EQ Pond
- 100% of Runoff from Access Road on Dike Between Ash Pond A and Retrofitted EQ Pond
- 100% of the Runoff from the Access Road on Dike Between Retrofitted Ash Pond B and Retrofitted EQ Pond

3) Runoff Volumes Calculated Using the Rational Method:

$V = CiA$, where:

V = Estimated Runoff Volume (cf)
C = Rational Method Runoff Coefficient
i = Rainfall (ft)
A = Stormwater Drainage Area (sf)

4) Assumed Runoff Coefficients:

- Direct Precipitation on Lined Pond Surface:	1.00
- Runoff From Access Roads:	0.95

5) Drainage Areas:

- Lined Surface Area of Retrofitted EQ Pond:		298,288
- Access Roads On Perimeter Dikes:		
a) South Side of Retrofitted EQ Pond:		
i) Length (ft):	1,230	
ii) Width (ft):	20	
iii) Area (sf):	24,600	
b) East Side of Retrofitted EQ Pond:		
i) Length (ft):	245	
ii) Width (ft):	20	
iii) Area (sf):	4,900	
c) Total Access Roads on Perimeter Dikes:		29,500

Appendix F
San Miguel Power Plant
Inflow Design Flood Control System Plan
Inflow Volume Estimates and Pond Freeboard Storage Evaluation
Retrofitted EQ Pond

- Access Road On Dike Between Retrofitted EQ Pond and Pond A:		
i) Length (ft):	1,230	
ii) Width (ft):	20	
iii) Area (sf):		24,600
- Access Road On Dike Between Retrofited Pond B and Retrofitted EQ Pond:		
i) Length (ft):	245	
ii) Width (ft):	20	
iii) Area (sf):		4,900

6) Assume Total Inflow Volume Generated During 100-Yr, 24-Hr Storm must be Contained in Freeboard of Retrofitted EQ Pond

Inflow Volume Estimates

1) Precip on Lined Surface Area of Retrofitted EQ Pond (cf):	273,430
3) Runoff from Access Roads On Perimeter Dikes (cf):	25,690
4) Runoff from Access Road On Dike Between Retrofitted EQ Pond and Pond A (cf):	21,423
5) Runoff from Access Road On Dike Between Retrofited Pond B and EQ Pond (cf):	4,267
Total Inflow Volume to Retrofitted EQ Pond (cf):	**324,809**

Available Freeboard Storage in Retrofitted EQ Pond

1) Assume 2 feet of Freeboard maintained in Retrofitted EQ Pond

Storage Available in Retrofitted EQ Pond Freeboard (cf):	573,117
Total Storage Available in Retrofitted EQ Pond Freeboard (cf):	**573,117**

Comparison of Freeboard Storage to Inflow Volume

Total Storage Available in Retrofitted EQ Pond Freeboard (cf):	573,117
Total Inflow Volume to Retrofitted EQ Pond (cf):	324,809
Excess Storage in Retrofitted EQ Pond Freeboard (cf):	**248,307**
Estimated Remaining Freeboard (ft):	**0.83**
Estimated Remaining Freeboard (in):	**10.0**

Notes:
1) Pond, Dike and Acces Road Dimensions from "Ash Disposal Pond Retrofit", NewFields, August 2019.
2) 100 Yr, 24-Hr Storm from NOAA Atlas 14 for Jourdanton, TX.