October 2016 Project No. 1648164

Luminant
1601 Bryan Street
Dallas, Texas 75201

RE: HISTORY OF CONSTRUCTION
CCR SURFACE IMPOUNDMENTS, OAK GROVE SES
ROBERTSON COUNTY, TX

1.0 INTRODUCTION

The "Disposal of Coal Combustion Residuals (CCR) from Electric Utilities rule" (40 Code of Federal Regulations (40 CFR) Part 257), effective October 19, 2015, requires that existing CCR units meeting the requirements of §257.73(b) compile a history of construction, containing all the items, to the extent feasible, listed in §257.73(c)(1)(i) – (xii). This letter provides a history of construction pursuant to §257.73(c) for the Oak Grove Steam Electric Station's (OGSES) CCR Impoundments, identified as flue gas desulphurization (FGD) Ponds FGD-A, FGD-B, and FGD-C.

2.0 OWNER AND OPERATOR - §257.73(c)(1)(i)

OGSES is currently owned and operated by Oak Grove Management Company LLC. The three FGD Ponds referenced in this letter have been assigned the following TCEQ WMU numbers.

- FGD-A 011
- FGD-B 012
- FGD-C 013

3.0 HISTORY OF CONSTRUCTION

OGSES is a lignite-fueled (i.e. coal-fired) power plant that commenced final construction activities in 2007. Golder Associates Inc. (Golder) has provided engineering services supporting construction of the Oak Grove CCR units since 2008.

3.1 Location - §257.73(c)(1)(ii)

OGSES is located in Robertson County, Texas, approximately 10 miles north of the City of Franklin. Figure 1 provides the location of the Power Plant with the FGD Ponds identified on the most recent U.S. Geological Survey (USGS) topographic map. Figure 2 provides an aerial map view of the power plant and its ancillary facilities.

Golder Associates Inc.
500 Century Plaza Drive, Suite 190
Houston, TX 77073 USA
Tel: (281) 821-6868 Fax: (281) 821-6870 www.golder.com

3.2 Purpose - §257.73(c)(1)(iii)

The OGSES power plant produces coal combustion residuals (CCR's) in the form of fly ash, bottom ash and flue gas desulphurization (FGD) byproduct (gypsum). The CCR Surface Impoundments at OG that are covered by the CCR Rule (FGD- A, FGD- B and FGD-C) handle primarily the FGD gypsum. Fly ash and bottom ash are processed and transported by dry methods to Ash Landfill 1.

3.3 Watershed - §257.73(c)(1)(iv)

The embankments of all three ponds are raised above the surrounding ground surface; therefore, the surface impoundments are not affected by any adjacent watershed. However, in the event of a failure of the northern embankment in FGD-A, the contents of FGD-A could flow into FGD-B.

3.4 Foundation Materials - §257.73(c)(1)(v)

Preparation of FGD-A and FGD-B Pond's foundation occurred during the initial phase of construction in the 1980s. Golder conducted a subsurface investigation for FGD-A in 2008 and evaluated the existing liner in FGD-B in 2011. Based on a review of the available information and the subsurface investigations, the foundation soils at FGD-A and FGD-B Ponds consist of very stiff to hard clays and compact to very dense sands.

Continuous construction of FGD-C began on July, 12, 2015. Based on a subsurface investigation conducted by Golder in 2014, the foundation soils consist of a combination of fill and native clays and sands. Accurate identification of existing fill materials during drilling activities was not always possible, due to similarity with natural soils, not only in type but in relative consistency. In general, both the fill and native material consists of stiff to hard clays and compact to very dense sands.

3.5 Construction - §257.73(c)(1)(vi)

3.5.1 Construction Materials and Site Preparation

The following sections provide details on the materials and site preparation methods employed during construction of each of the surface impoundments. Construction dates are provided in section 3.5.2 and specific construction documentation references are provided in section 3.10 of this letter.

3.5.1.1 FGD-A Pond

The FGD-A Pond embankment was constructed of compacted site soils. No construction testing of the original embankment fill is available.

A compacted clay liner was installed within FGD-A in 2008. The clay was obtained from an on-site borrow source and compacted in 6-inch lifts to ≥ 95% of the maximum standard Proctor dry density and within +2% to +6% of the standard Proctor optimum water content. Based on testing of Shelby tube samples collected during clay liner construction, the 3-foot thick compacted clay liner has a hydraulic conductivity less than 1×10^{-7} cm/s.

3.5.1.2 FGD-B Pond

The original FGD-B Pond embankment was constructed of compacted site soils. No construction testing of the original embankment fill is available.

In 2011, the base and embankment crest elevation of FGD-B Pond were raised and the pond was lined with a composite geomembrane/clay liner system. The subgrade was raised using structural fill to increase the separation depth from the groundwater. Approximately 150,000 cy of structural fill was placed in 6-inch lifts and compacted to ≥ 95% of the maximum standard Proctor dry density and within -3% to +3% of the standard Proctor optimum water content. Following subgrade preparation, a 2-ft thick clay liner was placed and compacted in 6-inch thick lifts to 95% of the maximum standard Proctor dry density and within +2% to

+6% of the standard Proctor optimum water content. Based on testing of Shelby tube samples collected during clay liner construction, the compacted clay liner has a hydraulic conductivity less than 1 x 10^{-7} cm/s. A 60-mil HDPE geomembrane was placed over the clay liner and subsequently covered with a 1-ft thick soil cover.

In 2015, repairs were made to the protective cover along the inside crest of the embankment.

3.5.1.3 FGD-C Pond

Following removal of loose/soft and/or organic material, the FGD-C embankment was constructed of compacted site soils placed in 6-inch lifts compacted to ≥ 95% of the standard Proctor maximum dry density and within -3% to +3% of the standard Proctor optimum water content.

FGD-C Pond is lined with a composite liner consisting of a 2-ft thick clay liner, a 60-mil HDPE geomembrane and a 2-ft thick soil/ash protective cover. The clay liner was placed and compacted in 6-inch thick lifts to ≥ 95% of the maximum standard Proctor dry density and within +2% to +6% of the standard Proctor optimum water content. Based on testing of Shelby tube samples collected during clay liner construction, the compacted clay liner has a hydraulic conductivity less than 1 x 10^{-7} cm/s.

3.5.2 Construction Dates

The following is a list of the Oak Grove FGD-A, FGD-B, and FGD-C Ponds' construction dates.

- Circa 1980: Site grading, structural fill placement, and soil liner placement at FGD-A and FGD-B Ponds.
- August 28, 2008 - October 18, 2008: Construction of the FGD-A Pond clay liner system.
- July 7, 2011 – July 25, 2011: Site grading and structural fill placement for FGD-B Pond.
- October 7, 2011 - November 9, 2011: Construction of the FGD-B Pond composite liner system.
- July 12, 2015 – August 20, 2015: Site grading and structural fill placement for FGD-C Pond.
- August 21, 2015 – February 10, 2016: Construction of the FGD-C Pond composite liner system.
- April 1, 2016 – June 24, 2016: Placement of the ash protective cover layer.

3.6 Drawings - §257.73(c)(1)(vii)

Attachment 1 provides the design drawings from the FGD-A, FGD-B, and FGD-C Pond Registration Packages as well as the as-built drawings submitted within each impoundment's Liner Evaluation Report.

In each pond the normal operating pool surface and maximum depth of CCR elevation is 2 feet below the crest elevation and the maximum pool surface is equal to the embankment crest elevation. The depths of CCR are 25.5 feet in FGD-A; 13.5 feet in FGD-B; and 19.0 feet in FGD-C.

3.7 Instrumentation - §257.73(c)(1)(viii)

With the exception of pool elevation gauges, there is no instrumentation on any of the surface impoundments.

3.8 Area-Capacity Curves - §257.73(c)(1)(ix)

Using as-built survey information, area capacity curves have been developed or each FGD pond. The capacity curves calculation is included as Attachment 2.

3.9 Spillways and Diversion Features - §257.73(c)(1)(x)

There are no spillways on any of the surface impoundments.

3.10 Construction Specifications and Surveillance - §257.73(c)(1)(xi)

The following tables list documents that contain the design, figures, specifications, construction and quality assurance reports for the FGD Ponds.

Table 1 - FGD-A Construction Documentation

Document Category	Reference
TCEQ Registration Package	Pastor, Behling & Wheeler, LLC Consulting Engineers and Scientists (PBW), August 2008; TCEQ Registration Package Oak Grove Steam Electric Station FGD-A Pond.
Engineering Drawings and Technical Specifications	Fluor, August 2008; Oak Grove Power Plant, "Issued for Construction" Drawings. Fluor, 2008; Contract Documents, FGD Impoundment Construction Specifications
Construction Quality Assurance	Fluor, 2008; Contractors Quality Assurance/Quality Control Plan, Oak Grove Project, Waste Containment Units, FGD Impoundment.
Quality Assurance Report	Golder, November 2008; FGD Pond Soil Liner Evaluation Report.

Table 2 - FGD-B Construction Documentation

Document Category	Document Reference
Technical Specifications	Burns and McDonnell, March 2011; Refurbished FGD-B Pond, Oak Grove Electric Station FGD-B Pond.
Update to Registration Package	Golder, October 2011; FGD-B Effluent Pond Notice of Registration Revision.
Construction Drawings	Golder, September 2011; Oak Grove Steam Electric Station FGD-B Pond Robertson County, Texas.
Construction Quality Assurance	Golder, March 2011; Soil Liner Quality Control Plan (Oak Grove Steam Electric Station). Golder, October 2011; Geomembrane Liner Quality Control Plan (Oak Grove Steam Electric Station).
Quality Assurance Report	Golder, January 2012; Liner Evaluation Report, Oak Grove SES, FGD-B Pond.

Table 3 - FGD-C Construction Documentation

Document Category	Document Reference
TCEQ Registration Package	Golder, June 2015; TCEQ Registration Package Oak Grove Steam Electric Station FGD-C Pond.
Construction Drawings	Golder, April 2015; Oak Grove Steam Electric Station, FGD-C Pond, Robertson County, Texas.
Specifications and Contract Documents	Golder, April 2015; Specifications and Contract Documents For Construction of FGD-C Pond, Oak Grove Steam Electric Station.
Quality Assurance Report	Golder, October 2016; FGD-C Pond Liner Evaluation Report.

Each surface impoundment is inspected weekly by Luminant personnel and annually by a licensed professional engineer in accordance with §257.83. Items requiring maintenance and repair are identified during the inspections and subsequently repaired.

3.11 Structural Instability - §257.73(c)(1)(xii)

There is no knowledge of structural instability within any of the surface impoundments.

4.0 CLOSING

Golder Associates was retained by Luminant to prepare a history of construction for the CCR units at the Oak Grove SES. Based on our review of the available information, to the extent feasible, this letter provides information required by 40 CFR §257.73(c)(i) through (xii), related to construction of FGD-A, FGD-B, and FGD-C Ponds.

Sincerely,

GOLDER ASSOCIATES INC.

Varenya Kumar
Staff Geotechnical Engineer

Jeffrey B. Fassett, PE
Senior Consultant and Associate

Golder Associates Inc.
Firm Registration Number F-2578

VK/JBF/kc

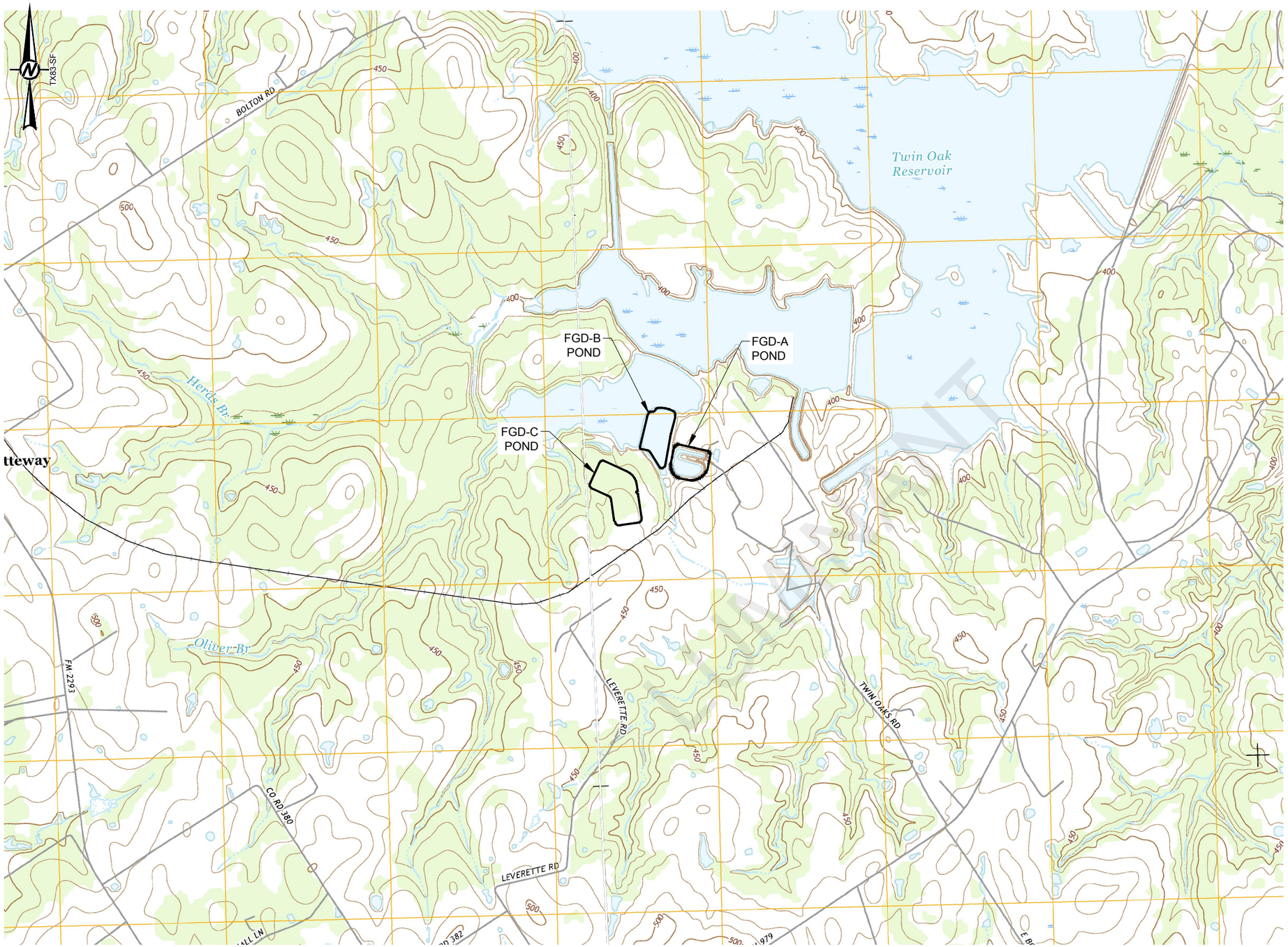
Attachments or Enclosures:

Figure 1 –Topographic Map
Figure 2 – General Site Map

Attachment 1 – Design Drawings
Attachment 2 – Area Capacity Curves

5.0 REFERENCES:

- Fluor Enterprises, Inc. (May 2008). Soil Liners and Cover Systems (Rev. 0). Robertson County, TX.
- Pastor, Behling & Wheeler, LLC Consulting Engineers and Scientists (August 2008). TCEQ Registration Package Oak Grove Steam Electric Station FGD-A Pond.
- Golder Associates Inc. (October 2008). Oak Grove SES FGD Pond Subsurface Investigation.
- Golder Associates Inc. (November 2008). FGD Pond Soil Liner Evaluation Report.
- Golder Associates Inc. (May 2010). FGD Pond Existing Liner Evaluation.
- Burns and McDonnell, (March 2011) Refurbished FGD-B Pond, Oak Grove Electric Station FGD-B Pond.
- Golder Associates Inc. (March 2011). Soil Liner Quality Control Plan (Oak Grove Steam Electric Station).
- Golder Associates Inc. (March 2011). FGD-A Slope Stability Evaluation Report.
- Golder Associates Inc. (October 2011). Geomembrane Liner Quality Control Plan (Oak Grove Steam Electric Station).
- Golder Associates Inc. (January 2012). Liner Evaluation Report, Oak Grove SES, FGD-B Pond.
- Golder Associates Inc. (March 2014). Addendum to Slope Stability Investigation Reports.
- O'Brien & Gere Engineers, Inc. (June 2014). Dam Safety Assessment of CCW Impoundments, Luminant/Oak Grove Steam Electric Station, Prepared for: US Environmental Protection Agency. Washington, DC.
- Golder Associates Inc. (August 2016). FGD-C Pond Liner Evaluation Report.
- Golder Associates Inc. (September 2016). Oak Grove SES FGD-A, FGD-B, and FGD-C Ponds Structural Stability Assessment.
- Golder Associates Inc. (September 2016). Oak Grove SES FGD-A, FGD-B, and FGD-C Ponds Safety Factor Assessment.



LEGEND

ROAD CLASSIFICATION

- INTERSTATE ROUTE
- US ROUTE
- RAMP
- STATE ROUTE
- LOCAL ROAD
- 4WD
- Interstate Route
- US Route
- State Route
- MAJOR CONTOURS 550
- MINOR CONTOURS
- BODY OF WATER
- PERENNIAL STREAM
- WOODLAND
- INTERMITTENT STREAM

REFERENCE

BASE MAP PUBLISHED BY U.S. GEOLOGICAL SURVEY. PETTEWAY AND BALD PRAIRIE QUADRANGLES, TX. SCALE 1:24,000. 7.5 MINUTE SERIES. DATED MARCH 2016.

10/10/16

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED PROFESSIONAL ENGINEER

Professional Engineering Firm
Registration Number F-2578

0 1000 2000
1" = 2000' FEET

CLIENT
LUMINANT POWER
OAK GROVE

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-09-29
DESIGNED	VK
PREPARED	TNB
REVIEWED	MX
APPROVED	JBF

PROJECT
2016 COAL COMBUSTION RESIDUALS
ENGINEERING SERVICES

TITLE
TOPOGRAPHIC MAP

PROJECT NO. 1648164 | REV. A | FIGURE 1

Path: \\houston\drafting_2016_1648164 - Luminant\D_OakGrove\PRODUCTION\B-HISTORY OF CONSTRUCTION\ | File Name: 1648164B002.dwg | Last Edited By: tbookout Date: 2016-10-10 Time:10:31:38 AM | Printed By: TBookout Date: 2016-10-10 Time:10:31:50 AM

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

REFERENCE(S)
AERIAL PHOTO SOURCED FROM GOOGLE EARTH PRO DATED 2016

10/10/16

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED PROFESSIONAL ENGINEER

Professional Engineering Firm
Registration Number F-2578

0 400 800
1" = 800' FEET

CLIENT
LUMINANT POWER
OAK GROVE

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-09-29
DESIGNED	VK
PREPARED	TNB
REVIEWED	MX
APPROVED	JBF

PROJECT
2016 COAL COMBUSTION RESIDUALS
ENGINEERING SERVICES

TITLE
GENERAL SITE MAP

PROJECT NO. 1648164 | REV. A | FIGURE 2

Path: \\houston\drafting_2016_1648164 - Luminant\D_Oak\Grove\PRODUCTION\B-HISTORY OF CONSTRUCTION\ | File Name: 1648164B001.dwg

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

ATTACHMENT 1
DESIGN DRAWINGS

FDG A
DESIGN DRAWINGS

E 2600 E 2800 E 3000 E 3200 E 3400 E 3600

N 5100 N 4900 N 4700 N 4500 N 4300

BORING 11 BORING 12 BORING 13 BORING 10 BORING 9 BORING 4 BORING 5 BORING 3 BORING 1 BORING 7 BORING 6 BORING 14

BOTTOM EL 422.0

EXISTING WATER SURFACE ELEVATION 428.5± FEB 2006

OPERATING NORMAL POOL ELEVATION 431.0

FGD-A POND

BORING 2

BOTTOM EL 422.0

JJ°8'6" TRUE NORTH

PLANT NORTH

LEGEND:

⊕ BORING 1 EXISTING BORING

50 25 0 50 100 150

GRAPHIC SCALE

TXU

REVISION DESCRIPTION	DRWN CHK.	LAYO MECH	CSA ELEC	ENGM REF.	DWG.NO.	REFERENCE DRAWINGS
OUSLY ISSUED AS A2YF00-0-CV-0-SW-SK-04 - ISSUED FOR CONSTRUCTION	DRF JS	JPC				

RESERVED FOR PROFESSIONAL ENGINEER'S SEAL, IF APPLICABLE

STATE OF TEXAS JOSEPH M. MELE 98178 LICENSED PROFESSIONAL ENGINEER

FLUOR ENTERPRISES, Inc

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DRAWN BY DJFOX	DETAILS/DATE DRF	8/5/08
CHECKED BY J.GERVAIS	DETAILS/DATE JKF	8/5/08
INSPECTED BY LAYOUT	DETAILS/DATE	8-5-08
INSPECTED BY SYSTEMS	DETAILS/DATE	
INSPECTED BY QA J.MELE	DETAILS/DATE	8-5-08
INSPECTED BY MECHANICAL	DETAILS/DATE	8/5/08
ENGINEERING MANAGER	DETAILS/DATE	8/5/08

OAK GROVE MANAGEMENT COMPANY, LLC
OAK GROVE ELECTRIC STATION
ROBERTSON COUNTY, TX

FIGURE 1-1
FGD SCRUBBER POND
EXISTING BORING LOCATION PLAN

SCALE AS NOTED

PROJECT NUMBER A2YF00 | UNIT No 0 | DOC TYPE CV | FUNC 0 | SUBJECT CODE CF-01 | SEQ No 02 | REV. 1

DIST.CODE 0 | WRK. PKG. 5' | CADD FILE NO. 10' | DRGS/SPECS 20' | CONTRACT PKG. 30'

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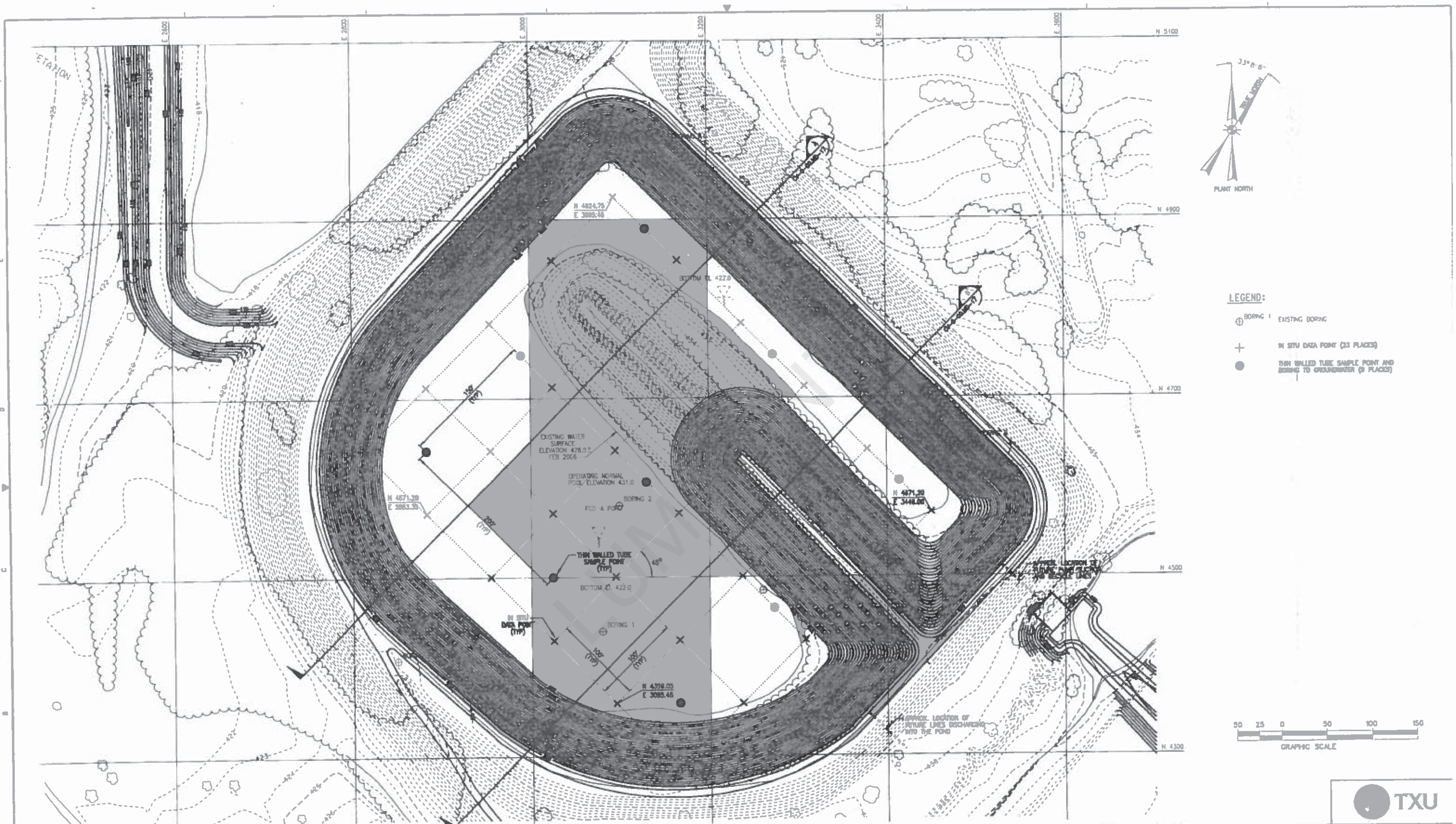

REV.	DATE	REVISION DESCRIPTION
1	05/30/08	PREVIOUSLY ISSUED AS A2YF00-0-CV-0-SB-SK-05 - ISSUED FOR CONSTRUCTION

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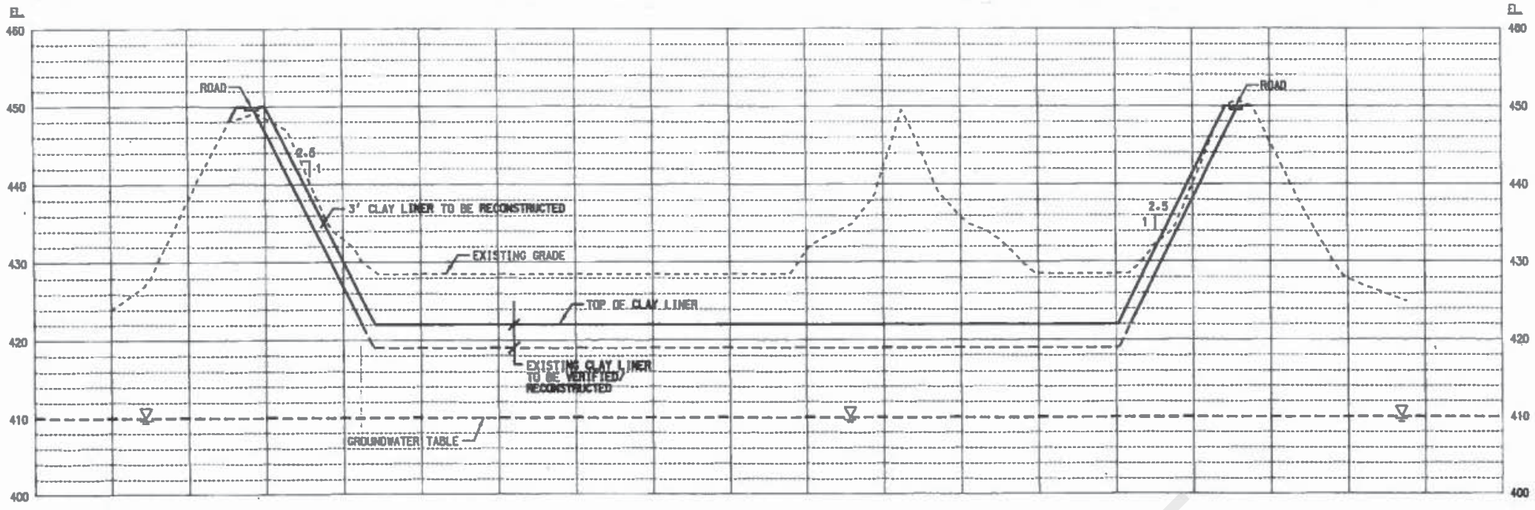
OAK GROVE MANAGEMENT COMPANY, LLC
OAK GROVE ELECTRIC STATION
ROBERTSON COUNTY, TX

FIGURE 2-1
FGD SCRUBBER POND
LINER VERIFICATION SAMPLING PLAN

AS NOTED A2YF00 - 0 - CV - 0 - CF-01 - 03 - 1

MANUAL CHANGES MADE - YES ☐ NO ☐ DWG. FILE UPDATED - YES ☐ NO ☐ MODEL UPDATED - YES ☐ NO ☐



SECTION A
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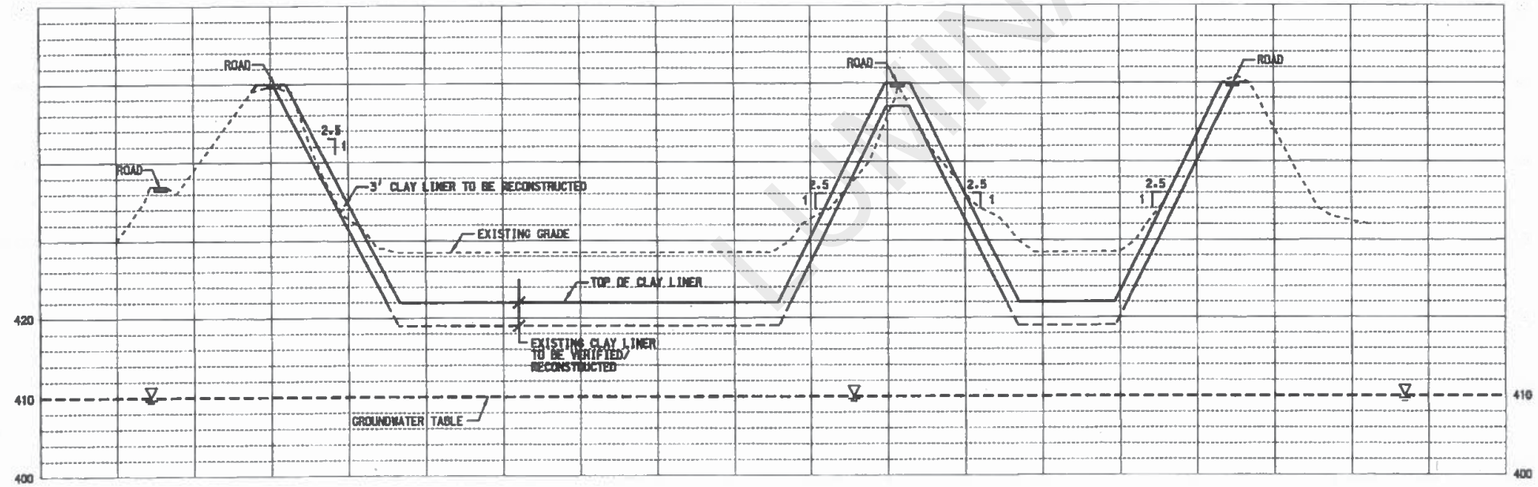
CV-0-CF-01-03



SECTION B
SCALE: 1"=50' HORIZONTAL
1"=10' VERTICAL
CV-0-CF-01-03

	DRWN	LAYO	CSA	ENGM
	CHK.	MECH	ELEC	REF.
ED FOR CONSTRUCTION	DRF			
	JD			

DWG.NO.

REFERENCE DRAWINGS

RESERVED FOR PROFESSIONAL ENGINEER'S SEAL, IF APPLICABLE

STATE OF TEXAS
JOSEPH H. WELLS
88178
PROFESSIONAL ENGINEER

FLUOR ENTERPRISES, Inc

DESIGN BY	D.FOX	DATE/INITIALS 8/15/08
CHECKED BY	J.GERVAIS	DATE/INITIALS 8/15/08
APPROVED BY GROUP		DATE/INITIALS 8/15/08
APPROVED BY OWNER		DATE/INITIALS
APPROVED BY CSA	J.WELS	DATE/INITIALS 8-5-08
APPROVED BY ENGINEER		DATE/INITIALS 8/5/08
ENGINEERING MANAGER		DATE/INITIALS 8/15/08

TXU

OAK GROVE MANAGEMENT COMPANY, LLC
OAK GROVE ELECTRIC STATION
ROBERTSON COUNTY, TX

FGD SCRUBBER POND
CROSS SECTIONS

SCALE	PROJECT NUMBER	UNIT No	DOC TYPE	FUNC	SUBJECT CODE	REV No	REV.
AS NOTED	A2YF00	0	CV	0	00.MD	17	1

DIST.CODE | WRK. PKG. | CADD FILE NO. | $$$DGNSPEC | CONTRACT PKG.

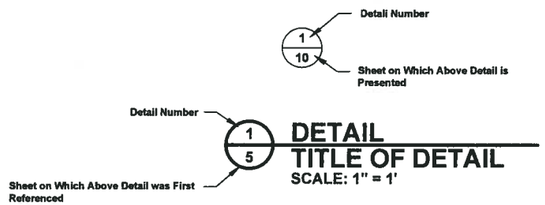
MANUAL CHANGES MADE – YES ☐ NO ☐ DWG. FILE UPDATED – YES ☐ NO ☐ MODEL UPDATED – YES ☐ NO ☐

FDG B
DESIGN DRAWINGS

Luminant

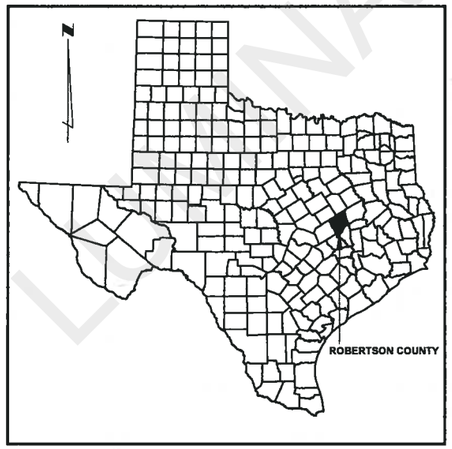
OAK GROVE STEAM ELECTRIC STATION
FGD - B POND CONSTRUCTION
ROBERTSON COUNTY, TEXAS

DETAIL IDENTIFICATION LEGEND



Example: Detail Number 1 Presented on Sheet No. 10 was Referenced for the First Time on Sheet No. 5.

NOTES: ABOVE REFERENCING SYSTEM ALSO APPLIES TO SECTION IDENTIFICATIONS.



SITE LOCATION MAP

INDEX OF DRAWINGS

Prepared By:

Golder Associates
500 Century Plaza Drive, Suite 190
Houston, Texas USA 77073
Tel: (281) 821-6868
Texas Registration Number: F-2578

SEPTEMBER 2011
113-94788

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	REVISION DESCRIPTION	CED	CADD	CHK	RVW
1	09/2011		South Berm Realignment				

STATE OF TEXAS — CHARLES FRED ROCKERT — 62392 — LICENSED PROFESSIONAL ENGINEER — 9-21-11

GOLDER ASSOCIATES INC. F-2578

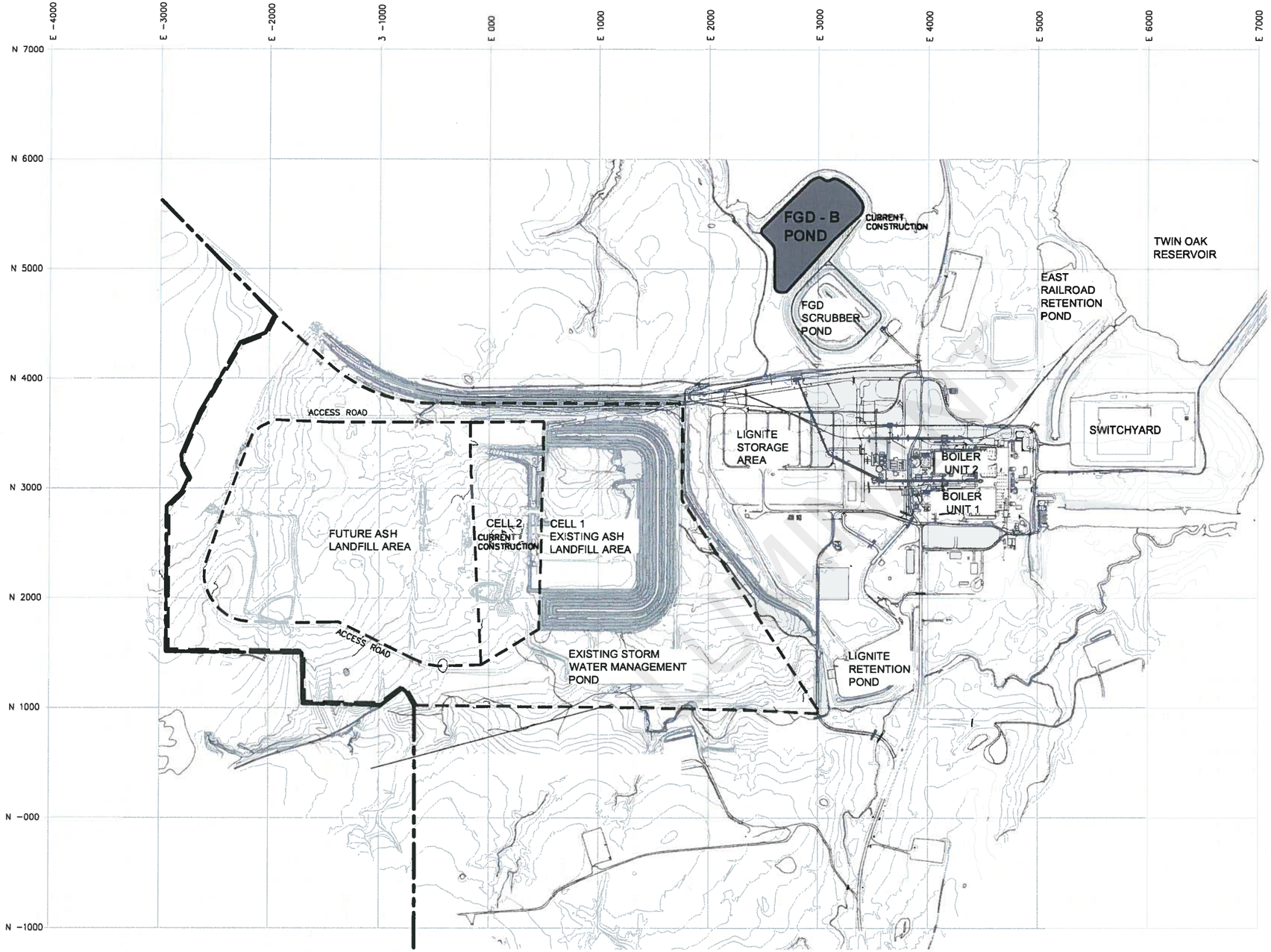
PROJECT: LUMINANT FGD - B POND CONSTRUCTION ROBERTSON COUNTY, TEXAS

TITLE: COVER SHEET

PROJECT No.		113-94788
FILE No.		11394788C 002
SCALE		NOT APPLICABLE
DESIGN	CEI	08/2011
CADD	VJE	08/2011
CHECK	JGFR	09/2011
REVIEW	CED	09/2011

1

Drawing File: J:_2011\113-94788 - Oak Grove_C - FGD Pond Option 3 \ 11394788C002.dwg | Layout: ANSI Full Bleed B (11.00 X 17.00 Inches) | Modified: 9/16/2011 3:37:36 PM VEstrada | Plotted: Wednesday, September 21, 2011 3:30:55 PM VEstrada



PLANT GRID NORTH
33°08'05" GEODETIC NORTH

LEGEND

- LIMIT OF 1987 REGISTERED LANDFILL AREA
- PROPERTY BOUNDARY
- EXISTING GROUND TOPOGRAPHY
- CURRENT POND CONSTRUCTION AREA

NOTES

1. SITE LOCATION: ROBERTSON COUNTY, TEXAS.

REFERENCES

1. EXISTING GROUND TOPOGRAPHY IN THE VICINITY OF THE ASH LANDFILL IS FROM AN AERIAL SURVEY PERFORMED BY GEODETIX, INC., ON MAY 27, 2010. EXISTING GROUND TOPOGRAPHY ELSEWHERE IS FROM FLUOR ENTERPRISES, INC., DRAWING A2YF00-0-CV-0-SW.PL.-01, AS PROVIDED BY LUMINANT.
2. COORDINATES ARE BASED ON OAK GROVE STEAM ELECTRIC STATION PLANT GRID SYSTEM.
3. ELEVATIONS ARE BASED ON MEAN SEA LEVEL DATUM.
4. CLAY MATERIAL AND STRUCTURAL FILL STOCKPILE AREAS NEED TO BE CLEARED AND GRUBBED PRIOR TO STOCKPILING ACTIVITIES.

1000 0 1000
SCALE FEET

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	REVISION DESCRIPTION	CED	CADD	CHK
1	04/2011		South Berm Realignment			RVW

STATE OF TEXAS CHARLES FRED RICKERT 82392 LICENSED PROFESSIONAL ENGINEER 9-21-11
GOLDER ASSOCIATES INC. F-2578

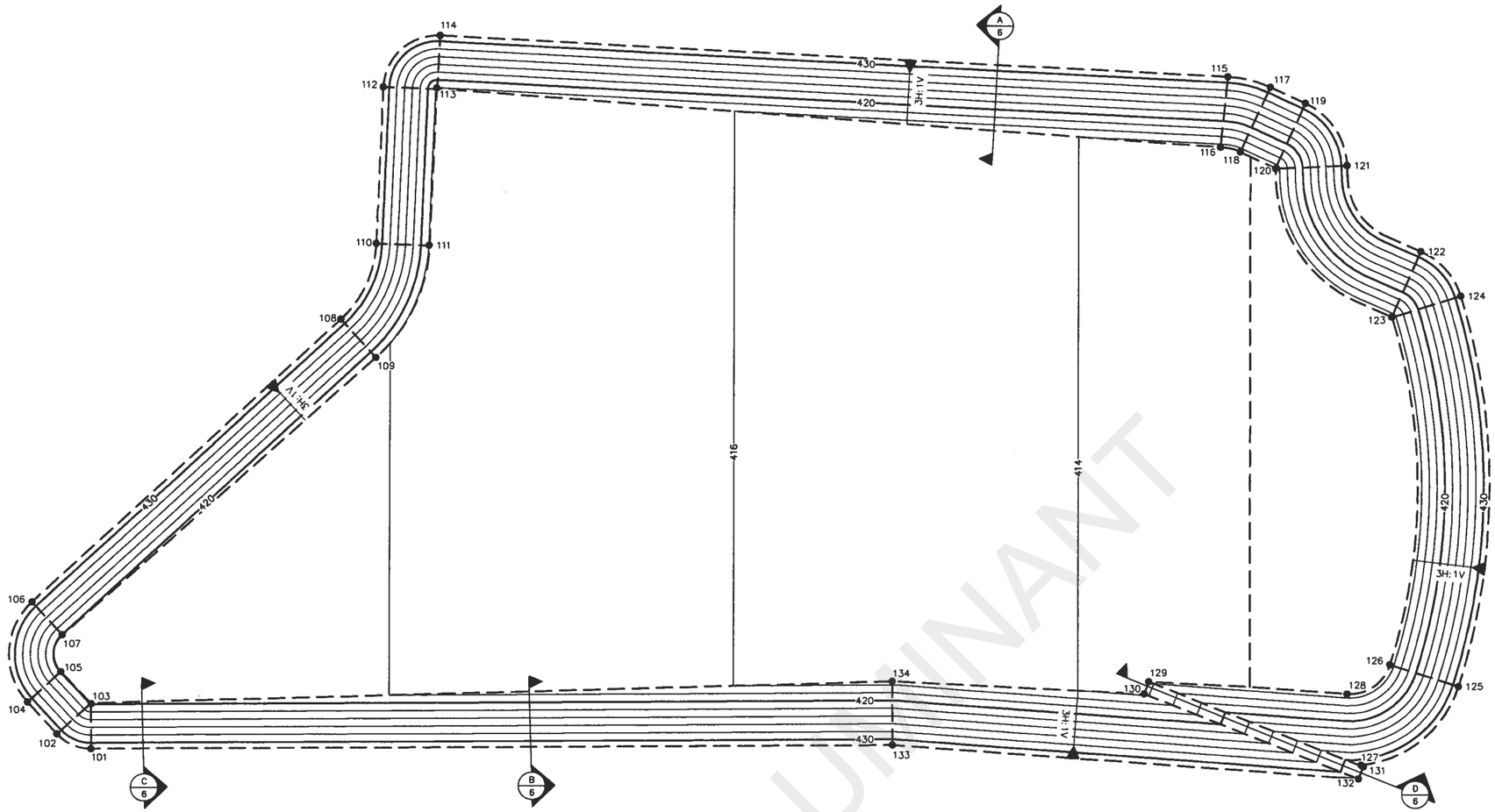
PROJECT
LUMINANT
FGD - B POND CONSTRUCTION
ROBERTSON COUNTY, TEXAS

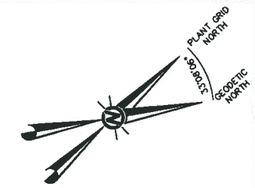
TITLE
SITE LAYOUT PLAN

PROJECT No.		113-94788
FILE No.		11394788C 003
SCALE		AS SHOWN
DESIGN	CEI	08/2011
CADD	VJE	08/2011
CHECK	CFR	09/2011
REVIEW	CEI	09/2011

2

Drawing File: J:_2011\113-94788 - Oak Grove_C - FGD Pond Option 3 \ 11394788C003.dwg | Layout: ANSI Full Bleed B (17.00 X 11.00 Inches) | Modified: 9/16/2011 3:41:42 PM VEstrada | Plotted: Wednesday, September 21, 2011 3:28:24 PM VEstrada





LEGEND

- 430 SUBGRADE CONTOUR
- SUBGRADE GRADE BREAK
- 101 SUBGRADE CONTROL POINT

NOTES

1. CONTOURS SHOWN ARE FOR SUBGRADE OF CELL.
2. EXCAVATED SOILS TO BE SEGREGATED AND STOCKPILED AT A LOCATION DESIGNATED BY OWNER.

100 0 100
SCALE FEET

SUBGRADE CONTROL POINTS			
Point No.	Northing	Easting	Elevation
101	4801.63	2715.01	431.50
102	4790.01	2688.69	431.50
103	4825.31	2689.48	419.89
104	4790.01	2655.00	431.50
105	4824.84	2655.09	419.90
106	4845.00	2600.01	431.50
107	4844.98	2634.84	419.89
108	5168.67	2600.01	431.50
109	5168.67	2640.27	418.08
110	5228.49	2575.24	431.50
111	5257.49	2603.98	417.89
112	5314.44	2489.29	431.50
113	5344.20	2518.00	417.90
114	5373.65	2489.65	431.50
115	5801.42	2927.83	431.50
116	5760.14	2964.25	413.17
117	5820.03	2956.03	431.50
118	5768.92	2977.21	413.06
119	5831.51	2983.74	431.50
120	5780.19	3005.33	413.00

SUBGRADE CONTROL POINTS			
Point No.	Northing	Easting	Elevation
121	5822.52	3041.22	431.50
122	5819.36	3128.97	431.50
123	5768.48	3151.14	413.00
124	5818.55	3175.36	431.50
125	5612.21	3396.96	431.50
126	5584.76	3348.73	413.00
127	5515.65	3390.73	431.50
128	5545.05	3342.82	413.00
129	5438.48	3231.50	413.59
130	5429.57	3236.06	413.61
131	5515.98	3392.98	431.50
132	5506.96	3397.31	431.50
133	5259.49	3132.82	431.50
134	5292.70	3096.44	415.08

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	REVISION DESCRIPTION	CED	CHK	RVW
1	04/2011		South Berm Realignment		CADD	

STATE OF TEXAS
CHARLES FRED RICKERT
82392
LICENSED PROFESSIONAL ENGINEER
9-21-11
GOLDER ASSOCIATES INC.
F-2578

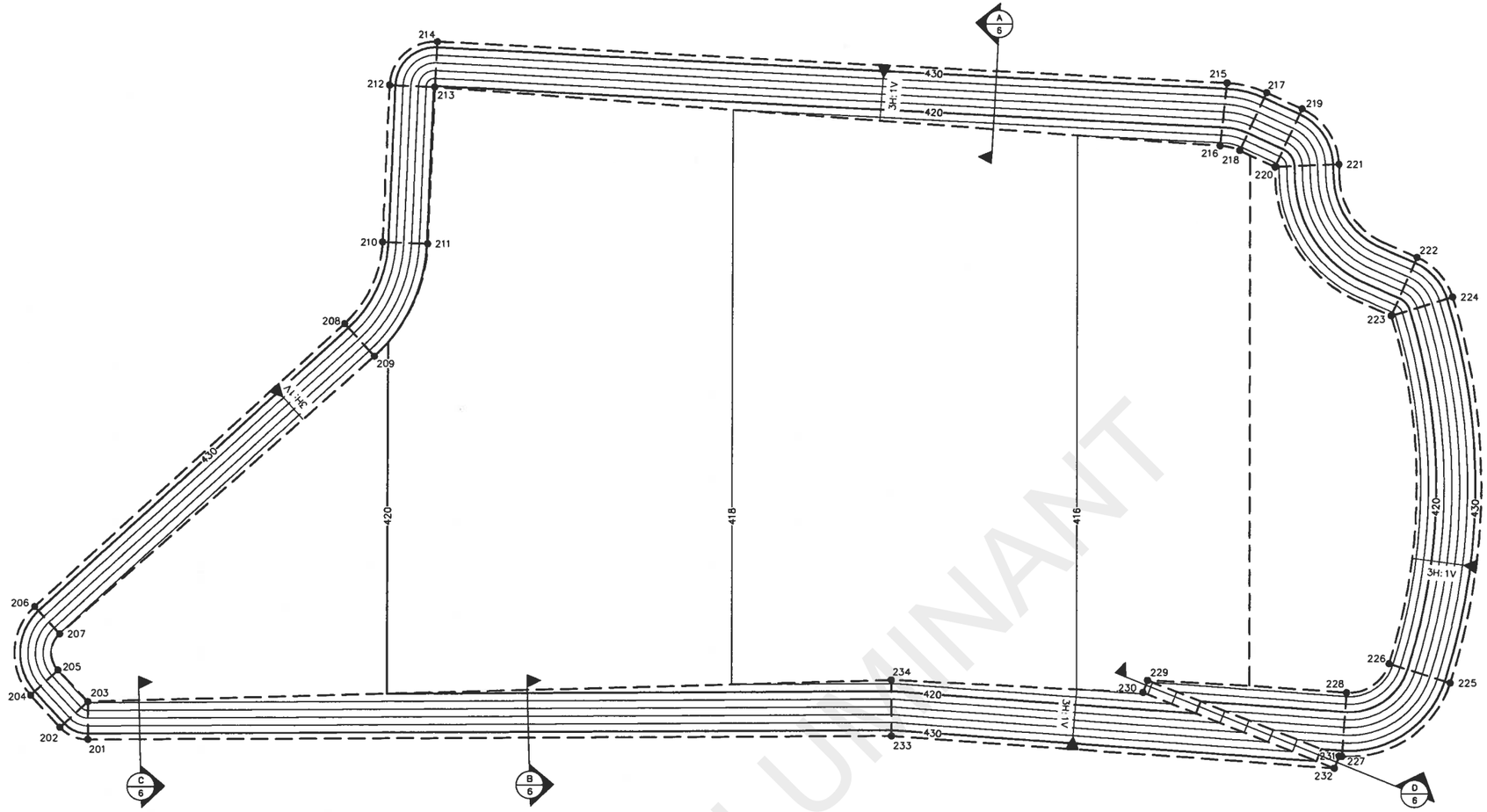
PROJECT
LUMINANT
FGD - B POND CONSTRUCTION
ROBERTSON COUNTY, TEXAS

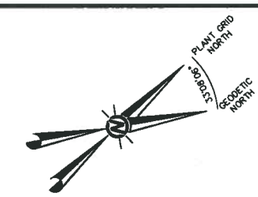
TITLE
SUBGRADE GRADING PLAN

PROJECT No.		113-94788
FILE No.		11394788C 004
SCALE		AS SHOWN
DESIGN	CEI	08/2011
CADD	VJE	08/2011
CHECK	CFR	09/2011
REVIEW	CEI	09/2011

3

Drawing File: J:_2011\113-94788 - Oak Grove_C - FGD Pond Option 3 \ 11394788C004.dwg | Layout: ANSI Full Bleed B (11.00 X 17.00 Inches) | Modified: 9/16/2011 3:43:05 PM VEstrada | Plotted: Wednesday, September 21, 2011 3:27:04 PM VEstrada





LEGEND

- 430 — CLAY CONTOUR
- CLAY GRADE BREAK
- ● 201 CLAY CONTROL POINT

NOTES

1. CONTOURS SHOWN ARE FOR TOP OF CLAY OF FGD – B POND.

100 0 100
SCALE FEET

CLAY CONTROL POINTS			
Point No.	Northing	Easting	Elevation
201	4805.89	2710.34	431.50
202	4796.34	2688.69	431.50
203	4825.66	2688.69	421.73
204	4796.34	2655.00	431.50
205	4825.13	2655.00	421.90
206	4845.00	2606.34	431.50
207	4845.00	2635.16	421.89
208	5168.67	2606.34	431.50
209	5168.67	2640.60	420.08
210	5232.96	2579.71	431.50
211	5257.84	2604.59	419.77
212	5318.91	2493.76	431.50
213	5343.87	2518.72	419.73
214	5369.13	2494.07	431.50
215	5796.90	2932.24	431.50
216	5759.88	2964.44	415.17
217	5814.19	2958.46	431.50
218	5768.63	2977.34	415.06
219	5825.67	2986.16	431.50
220	5779.94	3005.12	415.00

CLAY CONTROL POINTS			
Point No.	Northing	Easting	Elevation
221	5817.69	3037.13	431.50
222	5813.56	3131.49	431.50
223	5768.19	3151.27	415.00
224	5812.84	3172.63	431.50
225	5609.08	3391.47	431.50
226	5584.59	3348.45	415.00
227	5509.01	3376.28	431.50
228	5545.16	3342.46	415.00
229	5438.71	3231.28	415.59
230	5429.81	3235.84	415.61
231	5507.56	3374.73	431.50
232	5498.54	3379.05	431.50
233	5263.94	3128.32	431.50
234	5293.11	3096.36	417.08

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	REVISION DESCRIPTION	CED	CHK	RVW
A	04/2011		South Berm Realignment		CADD	

STATE OF TEXAS
CHARLES FRED RICKERT
82392
LICENSED PROFESSIONAL ENGINEER
9-21-11
GOLDER ASSOCIATES INC.
F - 2578

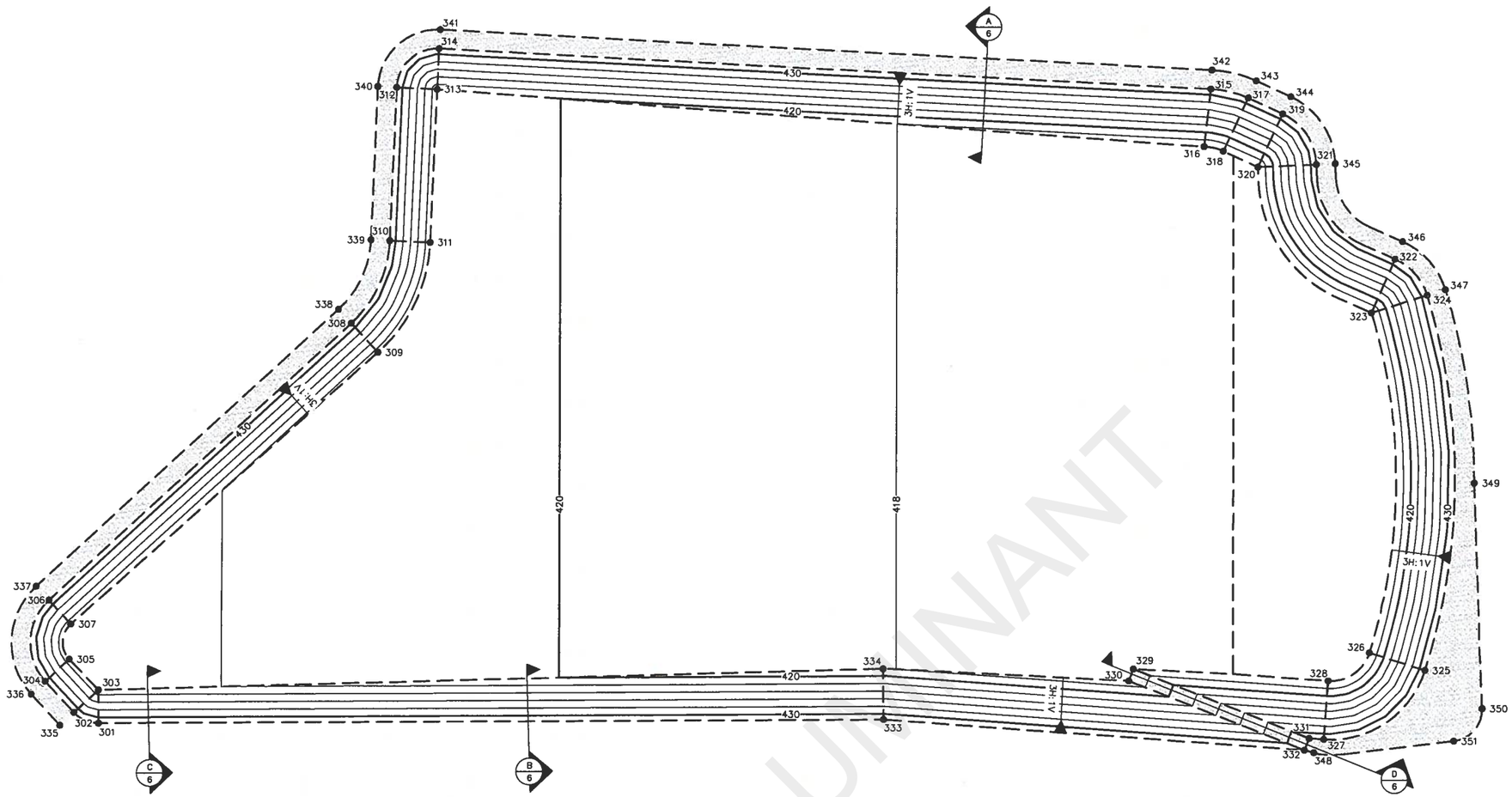
PROJECT
LUMINANT
FGD - B POND CONSTRUCTION
ROBERTSON COUNTY, TEXAS

TITLE
CLAY GRADING PLAN

PROJECT No.		113-94788
FILE No.		11394788C 005
SCALE		AS SHOWN
DESIGN	CEI	08/2011
CADD	VJE	08/2011
CHECK	CFR	09/2011
REVIEW	CEI	09/2011

4

Drawing File: J:_2011\113-94788 - Oak Grove_C - FGD Pond Option 3 \ 11394788C005.dwg | Layout: ANSI Full Bleed B (11.00 X 17.00 Inches) | Modified: 9/16/2011 3:44:46 PM VEstrada | Plotted: Wednesday, September 21, 2011 3:24:18 PM VEstrada



PLANT GRID NORTH
37.08°
GEODETIC NORTH

LEGEND

- 430 — PROTECTIVE COVER CONTOUR
- PROTECTIVE COVER GRADE BREAK
- ● 301 PROTECTIVE COVER CONTROL POINT

NOTES

1. CONTOURS SHOWN ARE FOR TOP OF PROTECTIVE COVER OF FGD – B POND.

100 0 100
SCALE FEET

PROTECTIVE COVER CONTROL POINTS

Point No.	Northing	Easting	Elevation
301	4808.03	2708.01	431.50
302	4799.50	2688.69	431.50
303	4825.82	2688.61	422.73
304	4799.50	2655.00	431.50
305	4825.30	2655.00	422.90
306	4845.00	2609.50	431.50
307	4845.00	2635.32	422.89
308	5168.67	2609.50	431.50
309	5168.67	2640.76	421.08
310	5235.20	2581.95	431.50
311	5257.96	2604.71	420.77
312	5321.15	2496.00	431.50
313	5343.87	2518.96	420.73
314	5366.87	2496.28	431.50
315	5794.63	2934.45	431.50
316	5759.76	2964.55	416.17
317	5811.27	2959.67	431.50
318	5768.48	2977.40	416.06
319	5822.75	2987.38	431.50
320	5779.75	3005.09	416.00

PROTECTIVE COVER CONTROL POINTS

Point No.	Northing	Easting	Elevation
321	5815.28	3035.09	431.50
322	5810.66	3132.76	431.50
323	5768.01	3151.27	416.00
324	5809.99	3171.27	431.50
325	5607.51	3388.72	431.50
326	5584.52	3348.30	416.00
327	5511.31	3374.11	0.00
328	5545.27	3342.35	416.00
329	5438.82	3231.16	416.59
330	5429.92	3235.72	416.61
331	5503.35	3365.60	431.50
332	5494.33	3369.93	431.50
333	5266.17	3126.07	431.50
334	5293.11	3096.36	418.13
335	4784.50	2688.69	431.50
336	4784.50	2655.00	431.50
337	4845.00	2594.50	431.50
338	5168.67	2594.50	431.50
339	5224.59	2571.34	431.50
340	5310.54	2485.39	431.50

PROTECTIVE COVER CONTROL POINTS

Point No.	Northing	Easting	Elevation
341	5377.60	2485.80	431.50
342	5805.37	2923.98	431.50
343	5825.12	2953.92	431.50
344	5836.61	2981.63	431.50
345	5826.72	3044.79	431.50
346	5824.41	3126.76	431.50
347	5823.52	3177.74	431.50
348	5498.35	3376.49	431.50

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	REVISION DESCRIPTION	CED	CADD	CHK	RVW
1	04/2011		South Berm Realignment				

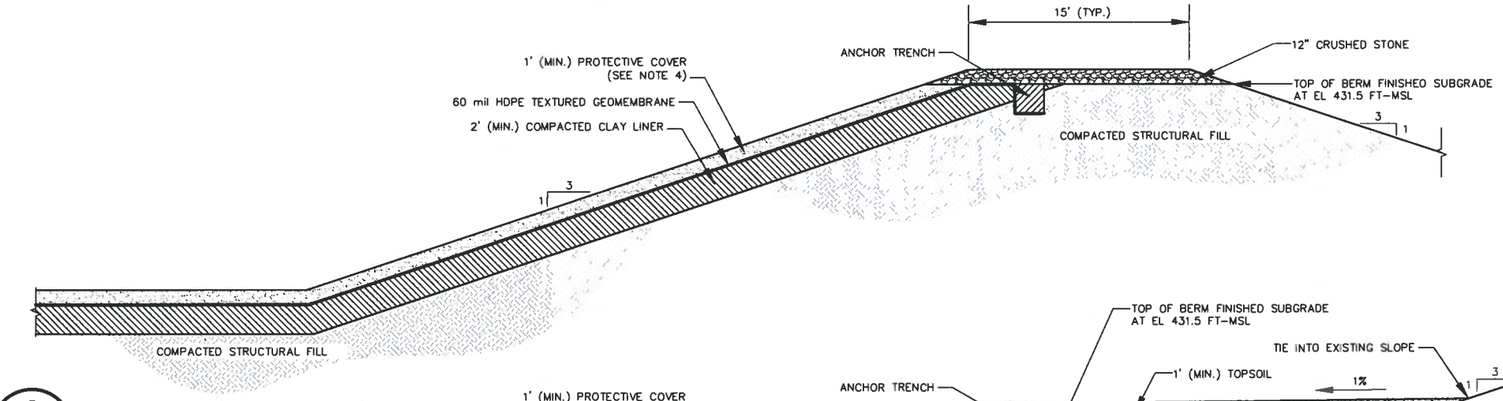
STATE OF TEXAS
CHARLES FRED RICKERT
82392
LICENSED PROFESSIONAL ENGINEER
9-21-11
GOLDER ASSOCIATES INC.
F-2578

PROJECT
LUMINANT
FGD - B POND CONSTRUCTION
ROBERTSON COUNTY, TEXAS

TITLE
PROTECTIVE COVER GRADING PLAN

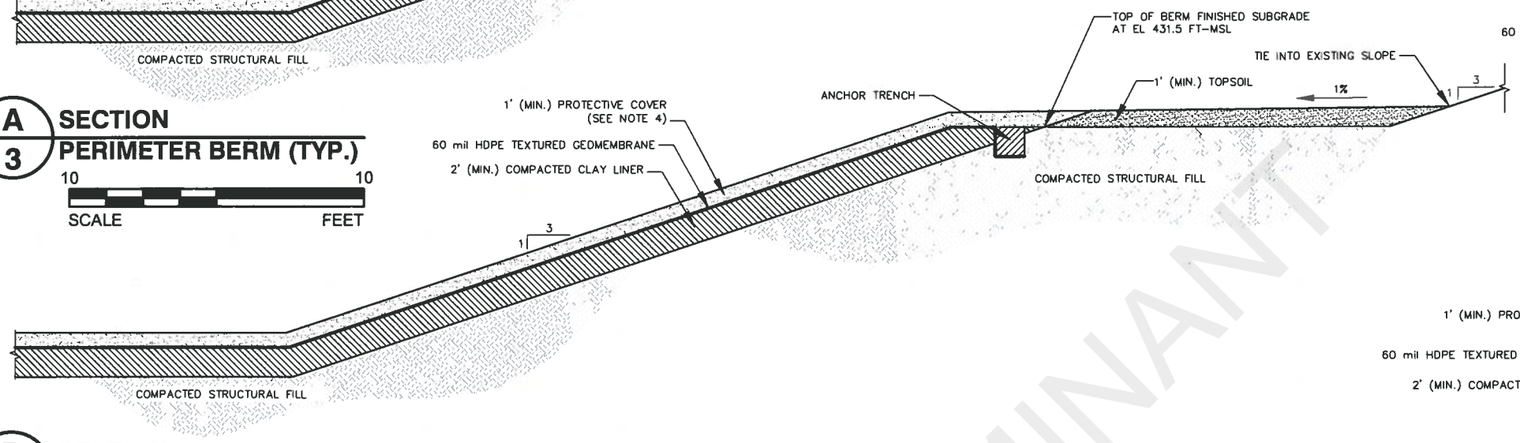
PROJECT No.		113-94788
FILE No.		113947880 006
SCALE		AS SHOWN
DESIGN	CEI	08/2011
CADD	VJE	08/2011
CHECK	CFR	09/2011
REVIEW	CEI	09/2011

5



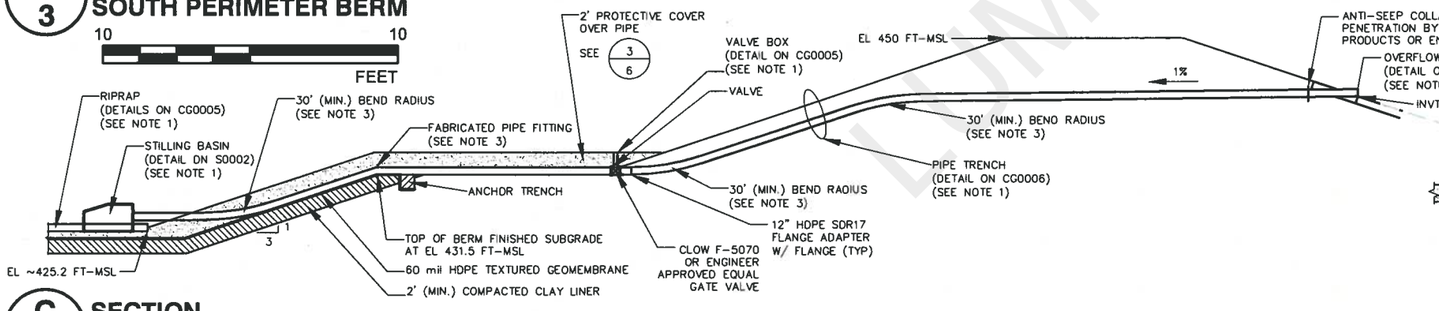
A/3 SECTION — PERIMETER BERM (TYP.)

10 10
SCALE FEET



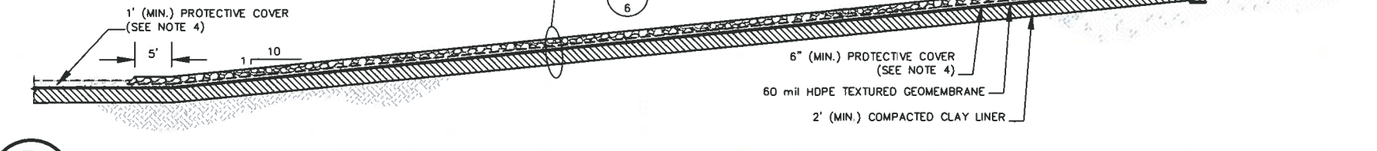
B/3 SECTION — SOUTH PERIMETER BERM

10 10
FEET



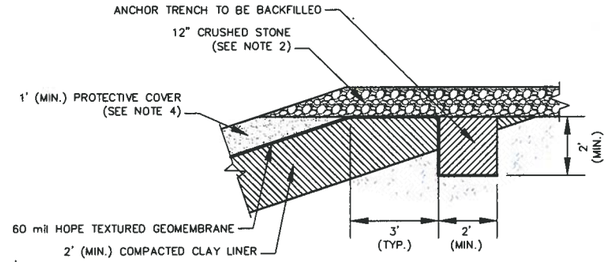
C/3 SECTION — OVERFLOW PIPING

20 20
SCALE FEET



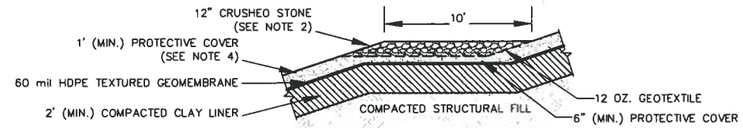
D/3 SECTION — ACCESS ROAD

20 20
SCALE FEET



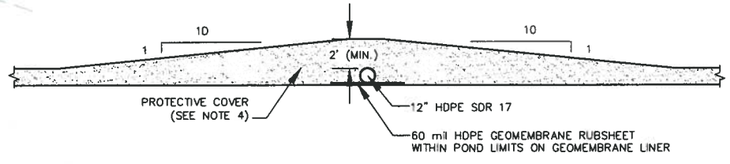
1/6 DETAIL — ANCHOR TRENCH

5 5
SCALE FEET



2/6 DETAIL — ACCESS ROAD

10 10
SCALE FEET



3/6 SECTION — OVERFLOW PIPE COVER

10 10
SCALE FEET

NOTES

1. REFER TO BURNS & McDONNELL LUMINANT PROJECT 4159K004 "REFURBISH FGD-B POND" CONTRACT DRAWINGS.
2. COMPACTED CRUSHED STONE ROAD BASE
3. USE FABRICATED PIPE FITTINGS WHERE 30' (MIN.) BEND RADIUS IS EXCEEDED.
4. PROTECTIVE COVER WILL CONSIST OF ONSITE SOILS (COMPACT TO 95% MDD BENEATH ACCESS ROAD AND STILLING BASIN.)

ISSUED FOR CONSTRUCTION

Golder Associates

REV	DATE	DES	South Berm Realignment	CED	CADD	CHK	RVW
1	04/2011						

STATE OF TEXAS — CHARLES FRED ROGERT — 62392 — LICENSED PROFESSIONAL ENGINEER — 9-21-11
GOLDER ASSOCIATES INC. F-2578

PROJECT: LUMINANT FGD - B POND CONSTRUCTION ROBERTSON COUNTY, TEXAS

TITLE: DETAILS AND CROSS SECTIONS I

PROJECT No.		113-94788
FILE No.		11394788C 007
SCALE		AS SHOWN
DESIGN	CEI	08/2011
CADD	VJE	09/2011
CHECK	CFR	09/2011
REVIEW	CEI	09/2011

6

Drawing File: J:_2011\113-94788 - Oak Grove_C - FGD Pond Option 3 \ 11394788C007.dwg | Layout: ANSI Full Bleed B (11.00 X 17.00 Inches) | Modified: 9/21/2011 3:19:35 PM VEstrada | Plotted: Wednesday, September 21, 2011 3:51:34 PM VEstrada

FDG C
DESIGN DRAWINGS

OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

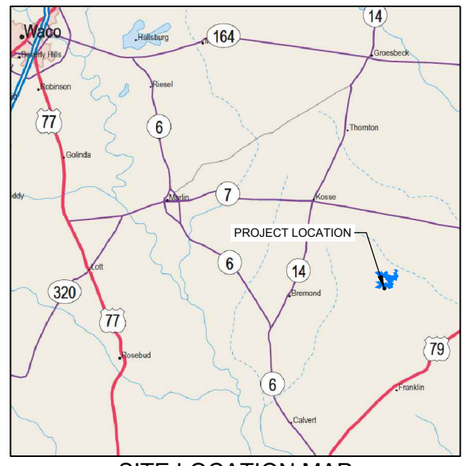
PREPARED FOR:

Luminant

PREPARED BY:

GOLDER ASSOCIATES INC.
500 CENTURY PLAZA DRIVE, SUITE 190
HOUSTON, TEXAS USA 77073

GENERAL LOCATION MAP



SITE LOCATION MAP

Sheet List Table

Luminant Drawing No.	Sheet Number	
A2YF00-0-CV-0-SW.PL-01	1	TITLE SHEET
A2YF00-0-CV-0-SW.PL-02	2	SITE OVERVIEW
A2YF00-0-CV-0-SW.PL-03	3	SUBGRADE GRADING PLAN AND CONTAINMENT DIKE
A2YF00-0-CV-0-SW.PL-04	4	CLAY LINER GRADING PLAN
A2YF00-0-CV-0-SW.PL-05	5	PROTECTIVE COVER GRADING PLAN
A2YF00-0-CV-0-SW.PL-06	6	PROFILES
A2YF00-0-CV-0-SW.PL-07	7	DETAILS

ISSUED FOR CONSTRUCTION

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-20	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED
PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
Luminant

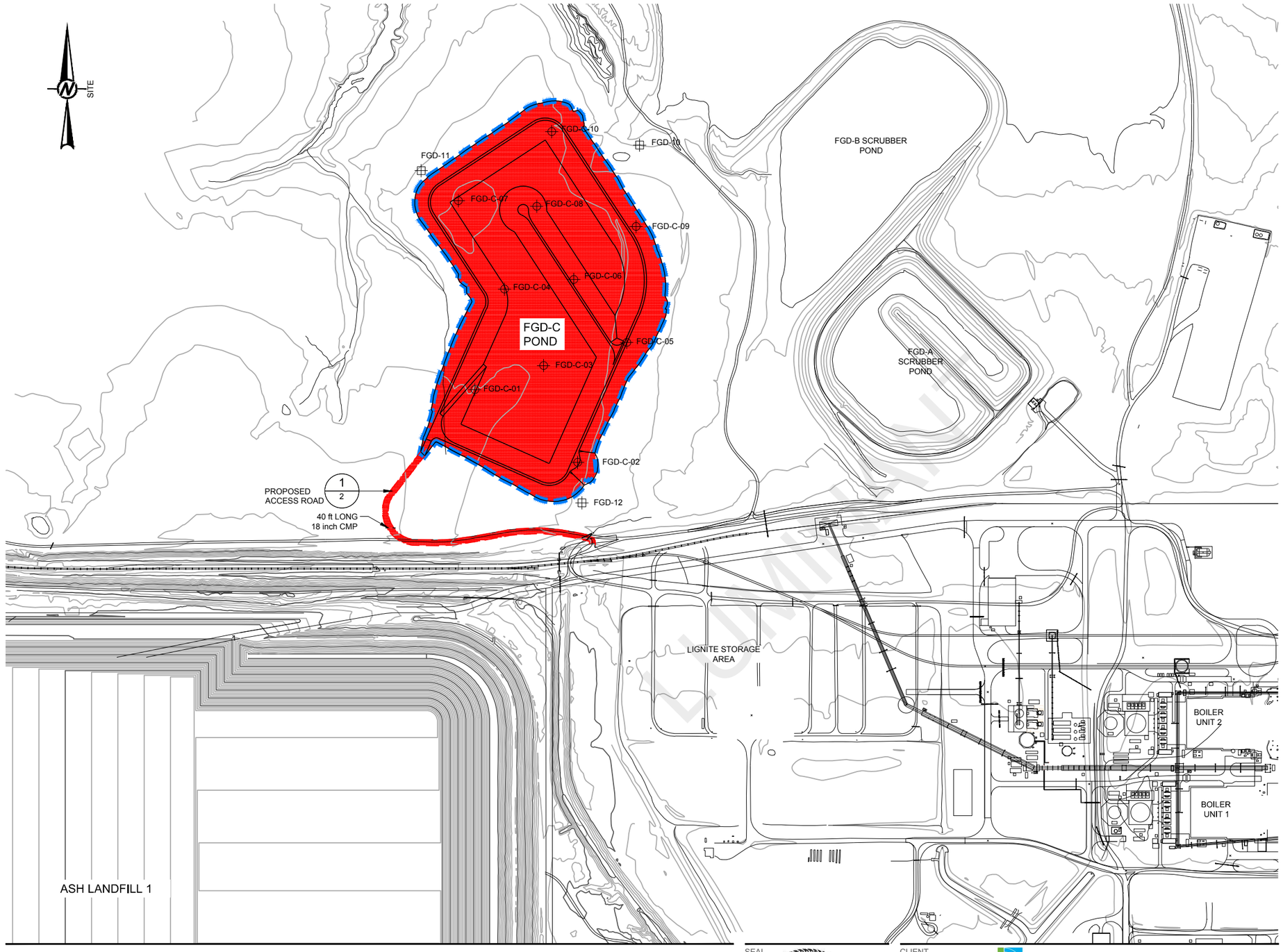
CONSULTANT
Golder Associates

HOUSTON OFFICE
500 CENTURY PLAZA DR
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
TITLE SHEET

PROJECT No.	LUMINANT DRAWING NO	Rev.		FIGURE
1406296	A2YF00-0-CV-0-SW.PL-01	0	1 of 7	1

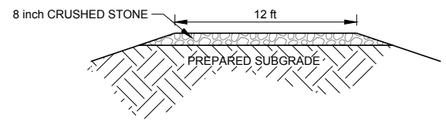


LEGEND

- 25 ft EXISTING CONTOUR
- 5 ft EXISTING CONTOUR
- CURRENT POND CONSTRUCTION AREA
- FGD-C-01 BOREHOLE
- FGD-01 MONITORING WELL

NOTES

1. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY GEODETIX, INC. ON MAY 27, 2010 AND GROUND SURVEY PERFORMED BY SAM INC. ON OCTOBER 23, 2014. EXISTING GROUND TOPOGRAPHY ELSEWHERE IS FROM FLOUR ENTERPRISE, INC. DRAWING A2YF00-0-CV-0-SW.PL.-01, AS PROVIDED BY LUMINANT.
2. COORDINATES ARE BASED ON OAK GROVE STEAM ELECTRIC STATION PLANT GRID SYSTEM.
3. ELEVATIONS ARE BASED ON MEAN SEA LEVEL DATUM.
4. CLAY MATERIAL AND STRUCTURAL FILL STOCKPILE AREAS NEED TO BE CLEARED AND GRUBBED PRIOR TO STOCKPILING ACTIVITIES.



SCALE 1" = 10' 1/2 ACCESS ROAD

ISSUED FOR CONSTRUCTION

SCALE 0 0.5 10 FEET

SCALE 0 200 400 FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED
PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT

Luminant

CONSULTANT

Golder Associates

HOUSTON OFFICE
500 CENTURY PLAZA DR
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
SITE OVERVIEW

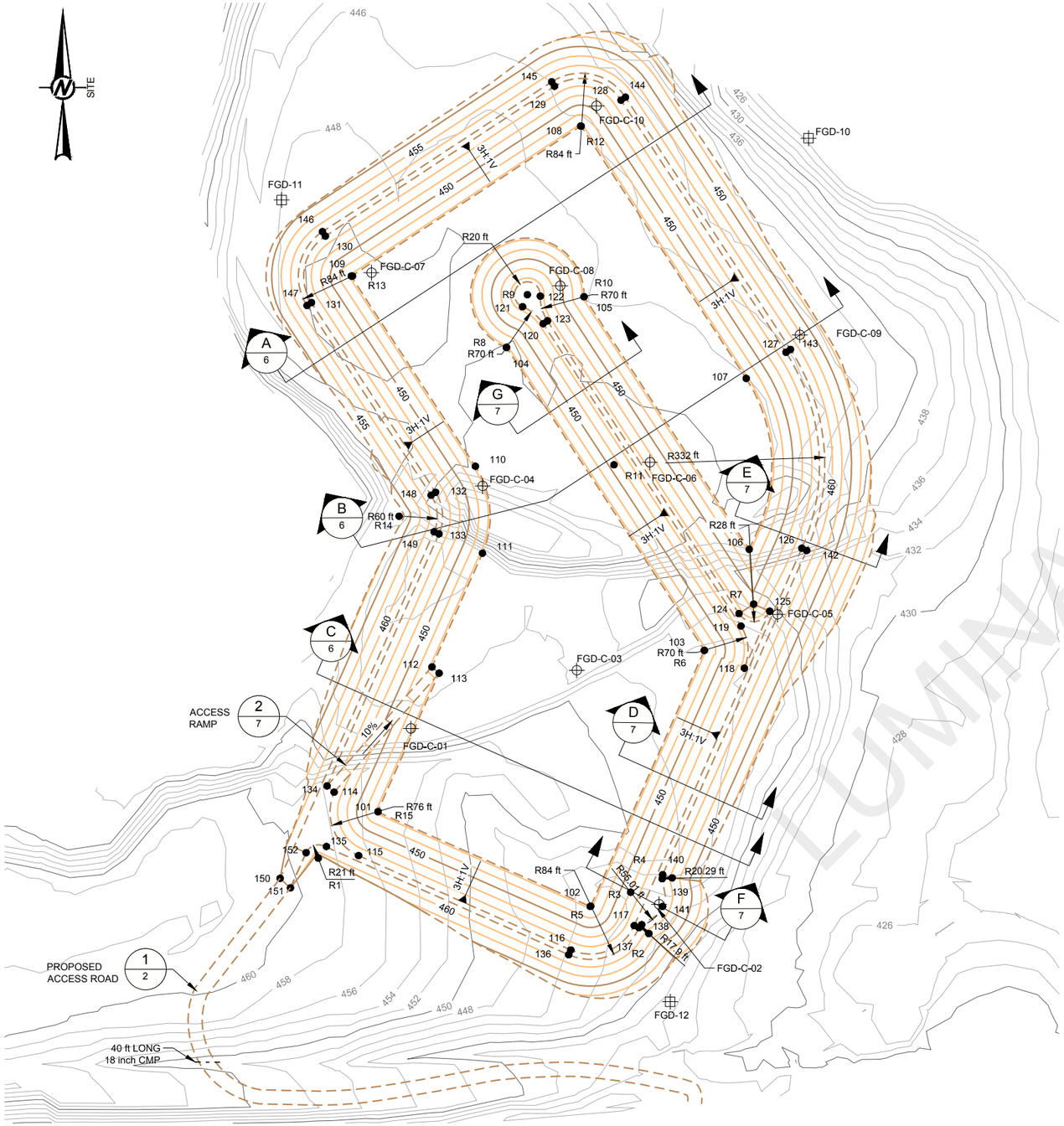
PROJECT No.	LUMINANT DRAWING NO	Rev.		FIGURE
1406296	A2YF00-0-CV-0-SW.PL-02	0	2 of 7	2

Path: \\houston\drafting_2014\1406296_Luminant FGD-C\PRODUCTION\B - POND\ | File Name: 1406296B002.dwg

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

1 in

0



CONTROL POINT TABLES

POINT	NORTHING	EASTING	ELEV.
101	4377.31	1408.84	439.00
102	4228.15	1743.04	439.00
103	4631.40	1922.87	439.00
104	5108.52	1611.15	439.00
105	5188.44	1733.34	439.00
106	4790.57	1993.58	439.00
107	5059.86	1988.71	439.00
108	5457.08	1728.90	439.00
109	5221.15	1367.01	439.00
110	4921.44	1562.27	439.00
111	4784.47	1573.33	439.00
112	4605.44	1493.81	439.00
113	4595.52	1505.06	439.00
114	4408.02	1339.70	464.00
115	4308.17	1378.13	464.00
116	4159.60	1712.59	464.00
117	4198.03	1812.44	464.00
118	4603.38	1985.93	464.00
119	4669.78	1980.57	462.00
120	5146.12	1669.01	462.00
121	5172.70	1636.51	462.00
122	5189.50	1664.50	461.95
123	5150.50	1675.70	462.00
124	4689.24	1977.40	462.00
125	4693.15	2025.81	464.00
126	4792.28	2076.40	464.00

POINT	NORTHING	EASTING	ELEV.
127	5100.91	2051.47	464.00
128	5498.13	1791.66	464.00
129	5520.03	1686.95	464.00
130	5283.92	1325.96	464.00
131	5179.20	1304.05	464.00
132	4880.38	1499.50	464.00
133	4814.91	1504.79	464.00
134	4417.94	1328.45	464.00
135	4322.50	1327.50	464.00
136	4151.97	1709.20	464.00
137	4194.64	1820.07	464.00
138	4199.36	1824.24	464.00
139	4271.81	1856.42	464.00
140	4278.07	1857.13	464.00
141	4228.19	1856.99	464.00
142	4788.89	2084.04	464.00
143	5105.48	2058.46	464.00
144	5502.70	1798.65	464.00
145	5527.02	1682.37	464.00
146	5290.91	1321.38	464.00
147	5174.63	1297.07	464.00
148	4875.81	1492.51	464.00
149	4818.30	1497.16	464.00
150	4272.38	1254.66	460.79
151	4257.32	1270.95	460.36
152	4312.76	1295.57	464.00

POINT	NORTHING	EASTING
R1	4304.21	1314.75
R2	4185.34	1835.37
R3	4250.52	1806.71
R4	4273.17	1872.07
R5	4228.48	1743.90
R6	4631.40	1922.87
R7	4704.38	2000.54
R8	5108.52	1611.15
R9	5191.60	1644.04
R10	5188.41	1733.36
R11	4923.70	1780.54
R12	5457.34	1728.16
R13	5220.99	1368.56
R14	4842.79	1442.03
R15	4377.31	1408.84

LEGEND

- SUBGRADE GRADE BREAK LINE
- 5 ft SUBGRADE CONTOUR
- 25 ft SUBGRADE CONTOUR
- 5 ft EXISTING CONTOUR
- 25 ft EXISTING CONTOUR
- 101 ● SURVEY CONTROL POINT
- FGD-C-01 BOREHOLE
- FGD-01 MONITORING WELL

NOTES

1. EXISTING GROUND TOPOGRAPHY IN THE VICINITY OF THE POND IS TAKEN FROM A GROUND SURVEY PERFORMED BY SAM, INC. ON OCTOBER 23, 2014 AND FEBRUARY 4, 2015.
2. PROPOSED CONTOURS SHOWN ARE TOP OF SUBGRADE AND CONTAINMENT DIKE.
3. EXCAVATED SOILS TO BE SEGREGATED AND STOCKPILED AT A LOCATION DESIGNATED BY OWNER.
4. COMPACTED FILL SHALL BE PLACED ON STABLE SUBGRADE FREE OF LOOSE OR ORGANIC MATERIAL. COMPACTED FILL SHALL BE PLACED AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. UNSTABLE SOILS SHALL BE OVEREXCAVATED AND REPLACED WITH COMPACTED FILL AS DEEMED APPROPRIATE BY THE OWNER OR ENGINEER.
5. CONTROL POINTS SHOWN ARE ON THE LOCAL COORDINATE PLANT GRID SYSTEM.

ISSUED FOR CONSTRUCTION

SCALE 0 100 200 FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED
PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
Luminant

CONSULTANT
Golder Associates

HOUSTON OFFICE
500 CENTURY PLAZA DR
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
SUBGRADE GRADING PLAN AND CONTAINMENT DIKE

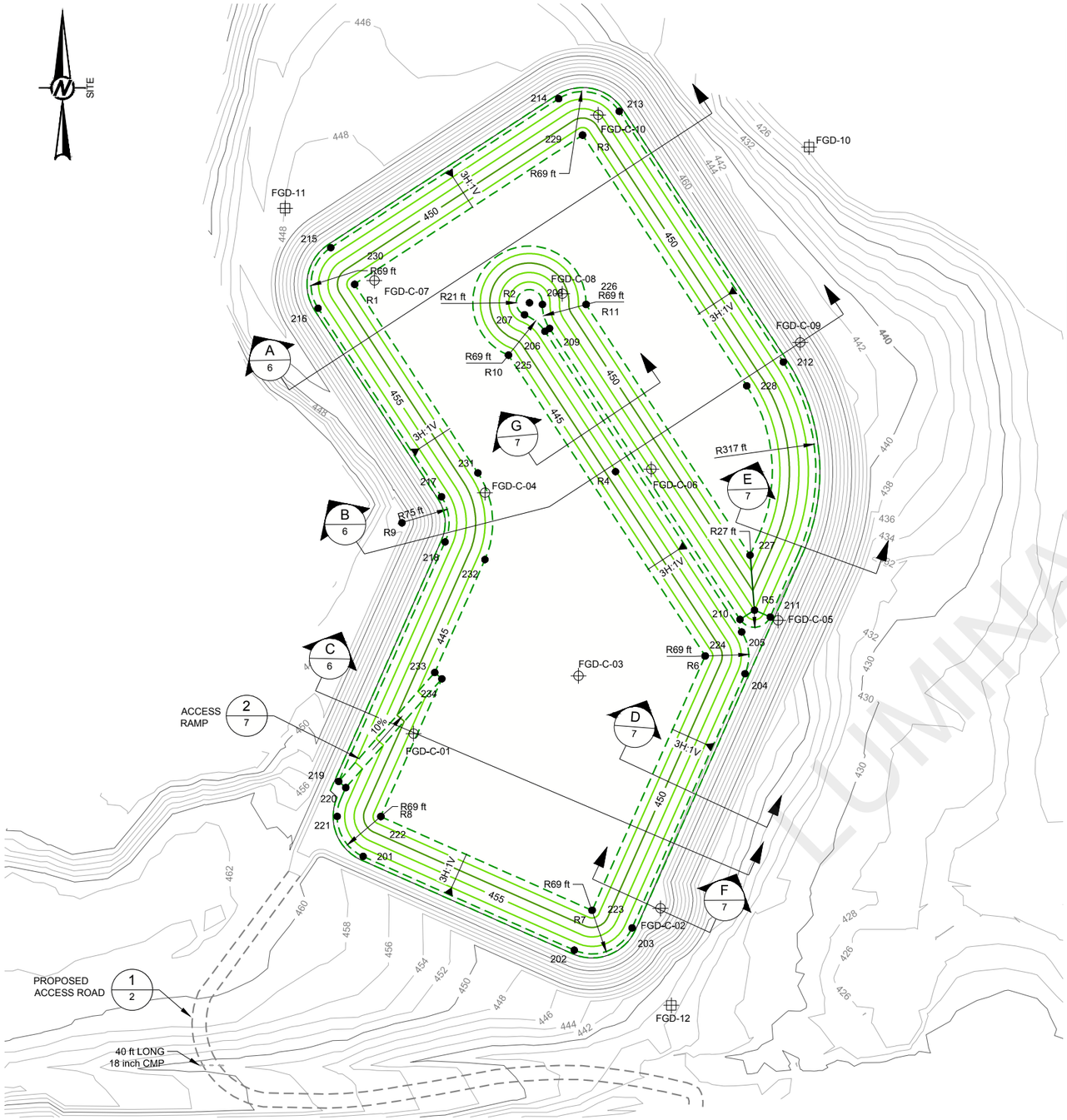
PROJECT No.	LUMINANT DRAWING NO	Rev.	3 of 7	FIGURE
1406296	A2YF00-0-CV-0-SW.PL-03	0		3

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

1 in

0

Path: \\houston\drafting_2014\1406296_Luminant FGD-C\PRODUCTION\B - POND\ | File Name: 1406296B003.dwg



CONTROL POINT TABLES

POINT	NORTHING	EASTING	ELEV.
201	4313.95	1380.70	464.00
202	4165.38	1715.16	464.00
203	4200.60	1806.66	464.00
204	4603.52	1985.64	464.00
205	4669.61	1980.30	464.00
206	5145.94	1668.74	464.00
207	5172.40	1636.39	464.00
208	5188.63	1664.67	464.00
209	5150.68	1675.98	464.00
210	4689.42	1977.67	464.00
211	4693.28	2025.51	464.00
212	5097.45	2046.18	464.00
213	5494.67	1786.37	464.00
214	5514.74	1690.41	464.00
215	5278.62	1329.42	464.00
216	5182.66	1309.35	464.00
217	4883.85	1504.79	464.00

POINT	NORTHING	EASTING	ELEV.
218	4812.35	1510.57	464.00
219	4432.81	1341.98	464.00
220	4422.89	1353.23	464.00
221	4377.31	1339.52	464.00
222	4377.01	1408.71	441.00
223	4228.61	1743.60	441.00
224	4631.84	1922.55	441.00
225	5108.26	1610.94	441.00
226	5188.53	1733.66	441.00
227	4791.24	1993.52	441.00
228	5059.68	1988.44	441.00
229	5456.99	1728.18	441.00
230	5220.43	1367.09	441.00
231	4921.62	1562.54	441.00
232	4784.33	1573.63	441.00
233	4605.31	1494.11	441.00
234	4595.39	1505.36	441.00

POINT	NORTHING	EASTING
R1	5220.61	1367.36
R2	5191.33	1644.22
R3	5457.05	1728.35
R4	4923.70	1780.54
R5	4704.11	2000.72
R6	4631.39	1922.46
R7	4228.44	1743.17
R8	4377.31	1408.84
R9	4842.52	1442.21
R10	5108.26	1610.94
R11	5188.63	1733.99

LEGEND

- CLAY LINER GRADE BREAK LINE
- 5 ft CLAY LINER CONTOUR
- 25 ft CLAY LINER CONTOUR
- 5 ft EXISTING CONTOUR
- 25 ft EXISTING CONTOUR
- 201 ● SURVEY CONTROL POINT
- FGD-C-01 BOREHOLE
- FGD-01 MONITORING WELL

NOTES

1. EXISTING GROUND TOPOGRAPHY IN THE VICINITY OF THE POND TAKEN FROM A GROUND SURVEY PERFORMED BY SAM, INC. ON OCTOBER 23, 2014 AND FEBRUARY 4, 2015.
2. PROPOSED CONTOURS SHOWN ARE TOP OF CLAY LINER.
3. A MINIMUM OF 2 ft OF COMPACTED CLAY LINER SHALL BE PLACED AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
4. CONTROL POINTS SHOWN ARE ON THE LOCAL COORDINATE PLANT GRID SYSTEM.

ISSUED FOR CONSTRUCTION

SCALE 0 100 200 FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
Luminant

CONSULTANT
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HOUSTON OFFICE
500 CENTURY PLAZA DR
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

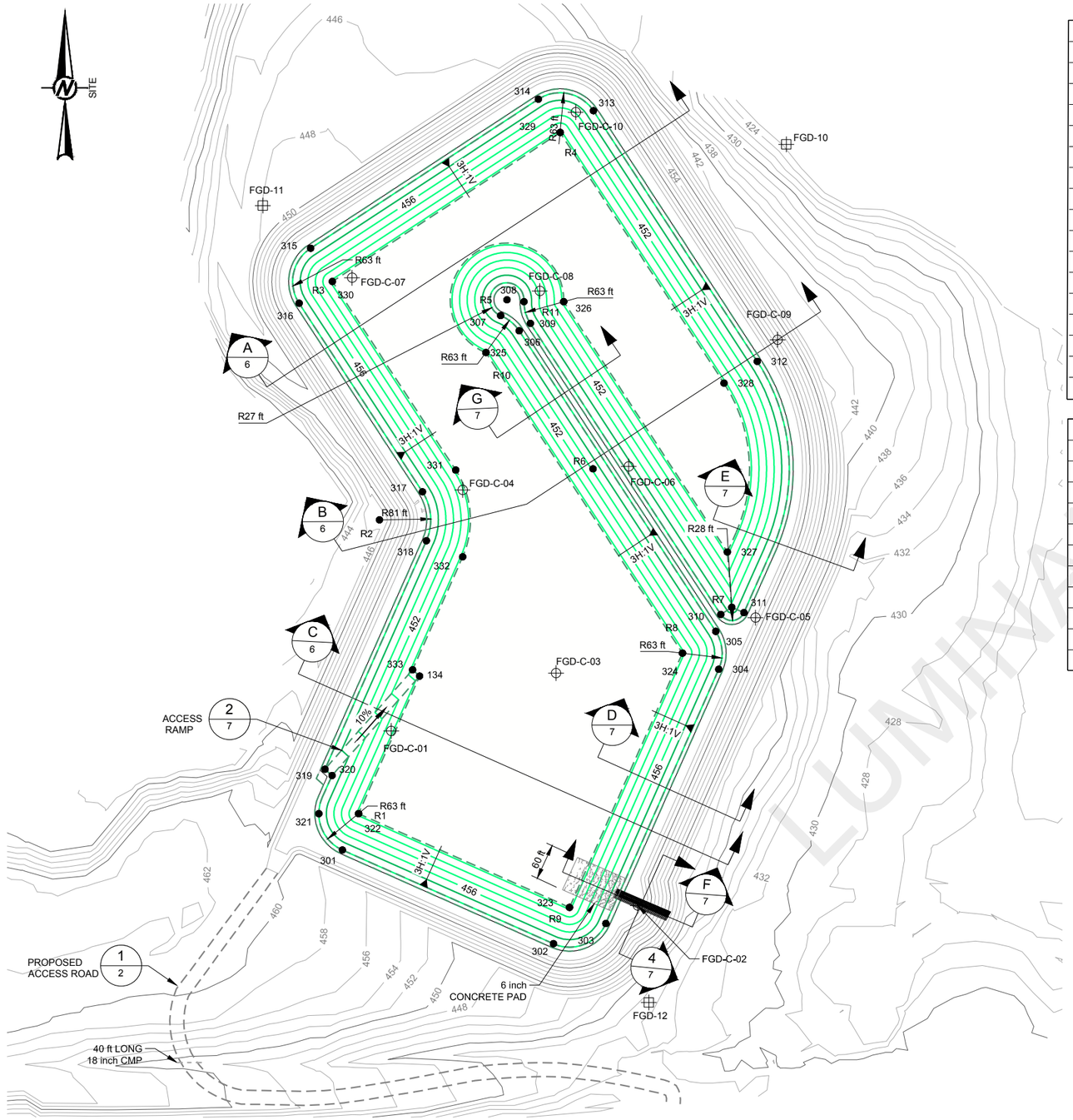
PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
CLAY LINER GRADING PLAN

PROJECT No.	LUMINANT DRAWIGN NO	Rev.		FIGURE
1406296	A2YF00-0-CV-0-SW.PL-04	0	4 of 7	4

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

Path: \\houston\drafting_2014\1406296_Luminant FGD-C\PRODUCTION\B - POND\ | File Name: 1406296B004.dwg



CONTROL POINT TABLES

POINT	NORTHING	EASTING	ELEV.
301	4319.73	1383.26	464.00
302	4171.16	1717.73	464.00
303	4203.16	1800.88	464.00
304	4606.08	1979.86	464.00
305	4666.14	1975.00	464.00
306	5142.48	1663.44	464.00
307	5166.52	1634.04	464.00
308	5188.63	1670.99	464.00
309	5154.14	1681.27	464.00
310	4692.88	1982.96	464.00
311	4695.85	2019.73	464.00
312	5093.99	2040.89	464.00
313	5491.21	1781.08	464.00
314	5509.44	1693.87	464.00
315	5273.33	1332.88	464.00
316	5186.12	1314.64	464.00
317	4887.31	1510.09	464.00

POINT	NORTHING	EASTING	ELEV.
318	4809.78	1516.35	464.00
319	4447.68	1355.51	464.00
320	4437.76	1366.76	464.00
321	4377.31	1345.84	464.00
322	4377.31	1408.84	443.00
323	4228.74	1743.30	443.00
324	4631.66	1922.28	443.00
325	5108.00	1610.72	443.00
326	5188.63	1733.99	443.00
327	4791.92	1993.47	443.00
328	5059.50	1988.16	443.00
329	5456.72	1728.35	443.00
330	5220.61	1367.36	443.00
331	4921.79	1562.81	443.00
332	4784.20	1573.93	443.00
333	4605.18	1494.40	443.00

POINT	NORTHING	EASTING
R1	4377.31	1408.84
R2	4842.79	1442.03
R3	5220.61	1367.36
R4	5456.72	1728.35
R5	5191.60	1644.04
R6	4923.70	1780.54
R7	4704.38	2000.54
R8	4631.66	1922.28
R9	4228.74	1743.30
R10	5108.00	1610.72
R11	5188.63	1733.99

LEGEND

- PROTECTIVE COVER GRADE BREAK LINE
- 5 ft PROTECTIVE COVER CONTOUR
- 25 ft PROTECTIVE COVER CONTOUR
- 5 ft EXISTING CONTOUR
- 25 ft EXISTING CONTOUR
- 301 ● SURVEY CONTROL POINT
- ⊕ FGD-C-01 BOREHOLE
- ⊞ FGD-01 MONITORING WELL

NOTES

1. EXISTING GROUND TOPOGRAPHY IN THE VICINITY OF POND IS TAKEN FROM A GROUND SURVEY PERFORMED BY SAM, INC. ON OCTOBER 23, 2014 FEBRUARY 4, 2015.
2. PROPOSED CONTOURS SHOWN ARE OF PROTECTIVE COVER .
3. A MINIMUM OF 2 ft OF PROTECTIVE COVER SHALL BE PLACED OVER SURVEYOR CERTIFIED TOP OF CLAY LINER IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
4. CONTROL POINTS SHOWN ARE ON THE LOCAL COORDINATE PLANT GRID SYSTEM.

ISSUED FOR CONSTRUCTION

SCALE 0 100 200 FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
Luminant

CONSULTANT
Golder Associates

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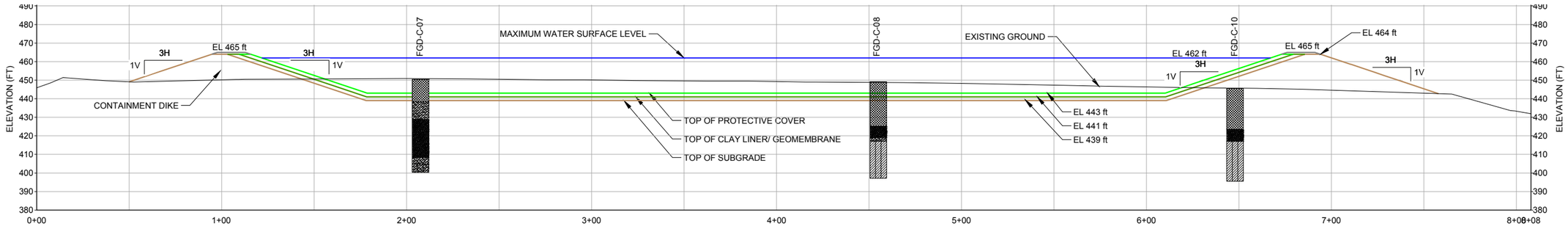
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

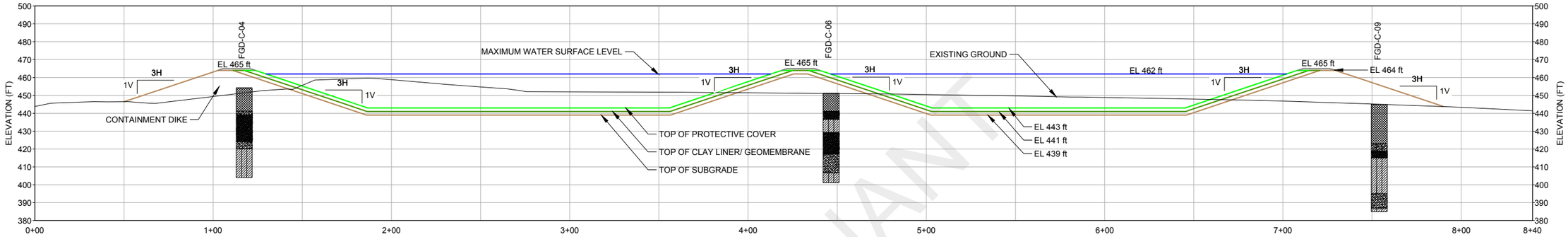
PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
PROTECTIVE COVER GRADING PLAN

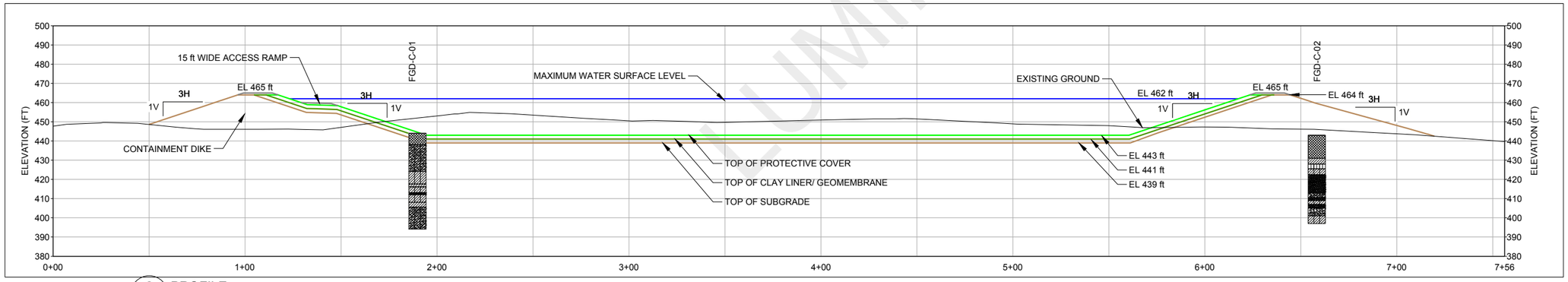
PROJECT No.	LUMINANT DRAWING NO	Rev.	5 of 7	FIGURE
1406296	A2YF00-00CV-0-SW.PL-05	0		5



SCALE 1" = 60' A/6 PROFILE



SCALE 1" = 60' B/6 PROFILE



SCALE 1" = 60' C/6 PROFILE

LEGEND

- POSSIBLE FILL, VERY STIFF
- SILT
- SAND
- CLAY
- SILTY SAND
- SILTY CLAY
- SANDY SILT
- SANDY CLAY
- CLAYEY SAND
- CLAYEY SILT
- SANDY SILTY CLAY

ISSUED FOR CONSTRUCTION

SCALE 0 30 60 FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

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JEFFREY B. FASSETT
85675
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TEXAS REGISTRATION F-2578

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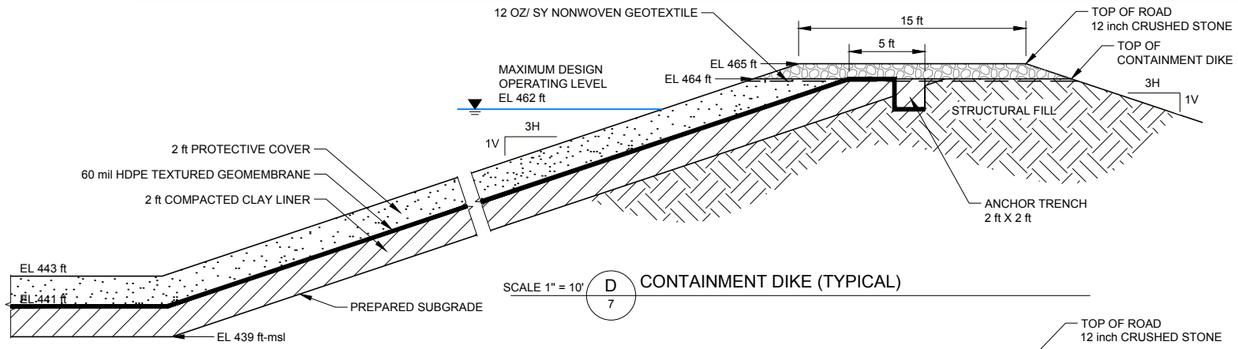
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

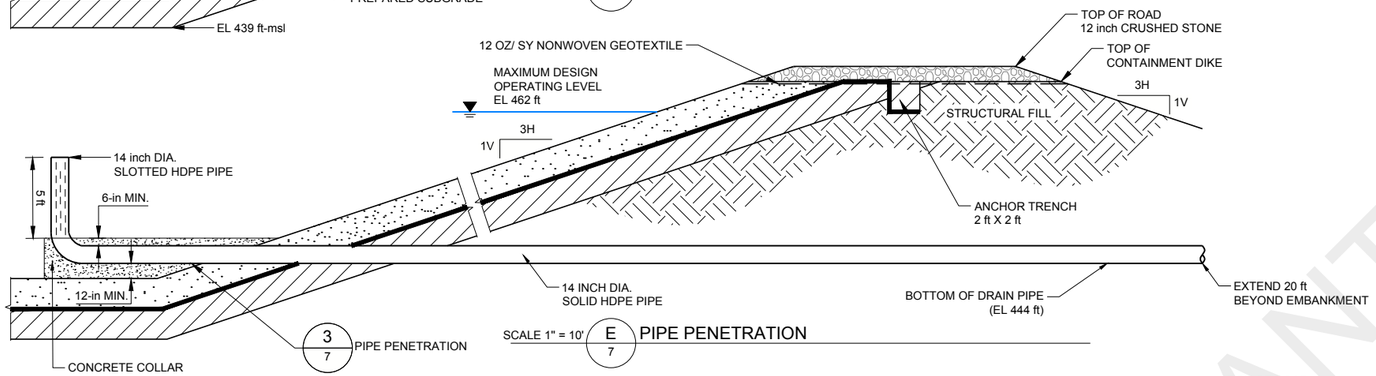
PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
PROFILES

PROJECT No.	LUMINANT DRAWING NO	Rev.		FIGURE
1406296	A2YF00-0-CV-0-SW.PL-06	0	6 of 7	6

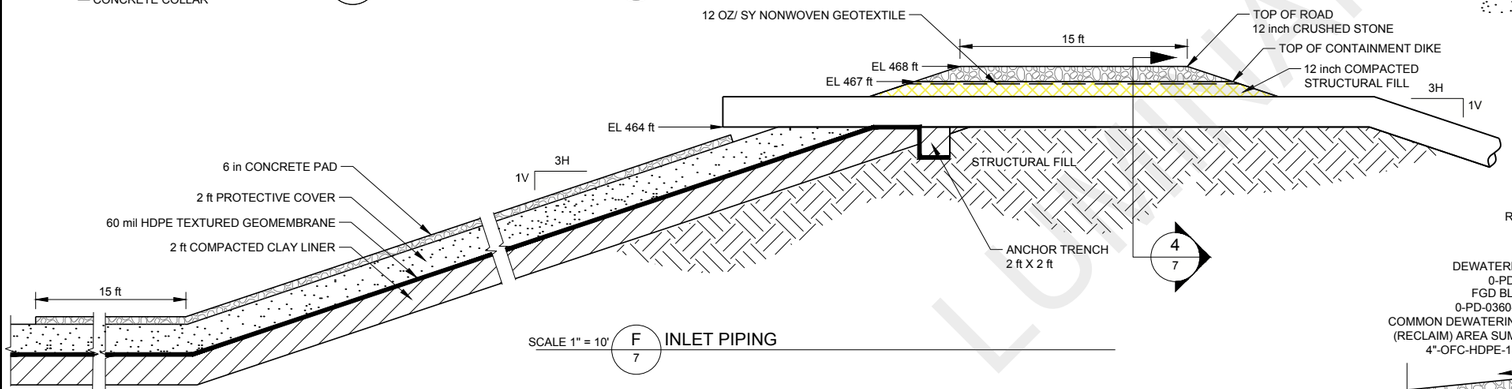


SCALE 1" = 10' D 7 CONTAINMENT DIKE (TYPICAL)



3 / 7 PIPE PENETRATION

SCALE 1" = 10' E 7 PIPE PENETRATION



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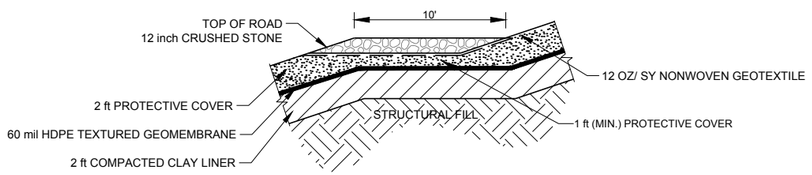
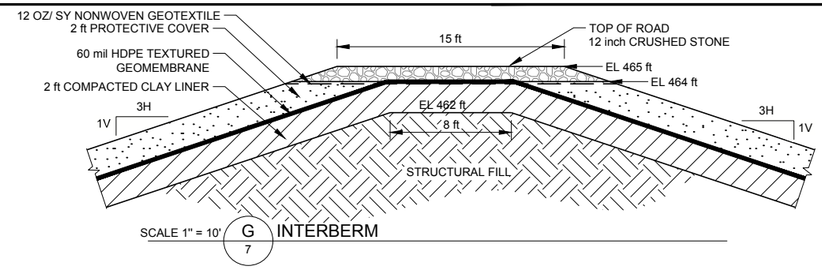
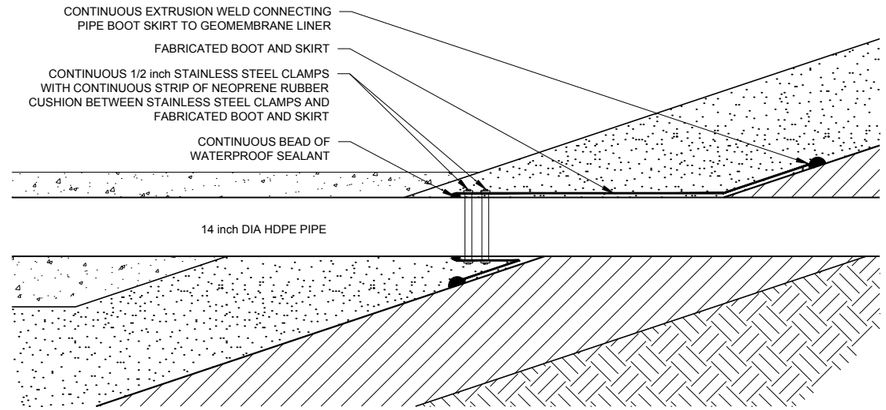


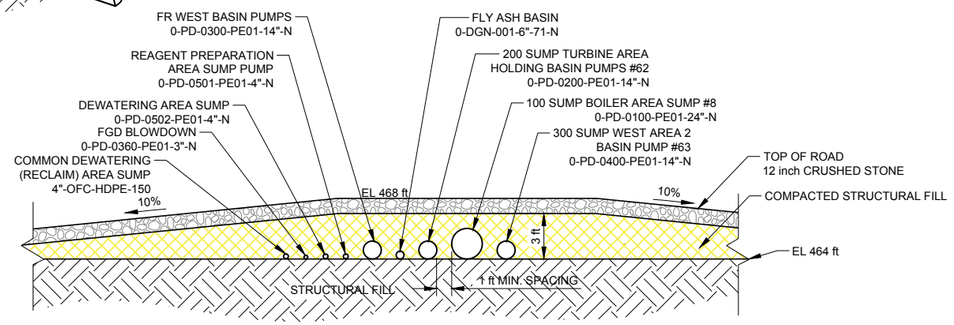
SCALE 1" = 10' 2 7 ACCESS RAMP



SCALE 1" = 10' G 7 INTERBERM



SCALE 1" = 3' 3 7 PIPE PENETRATION DETAIL



ISSUED FOR CONSTRUCTION

SCALE 1" = 10' 4 7 INLET PIPING

0 1.5 3
SCALE FEET

0 5 10
SCALE FEET

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
0	2015-04-29	ISSUED FOR CONSTRUCTION	AA	CEI	CEI	JBF
B	2015-04-23	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF
A	2015-03-30	ISSUED FOR CLIENT REVIEW	AA	CEI	CEI	JBF

SEAL

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED
PROFESSIONAL ENGINEER

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
Luminant

CONSULTANT
Golder Associates

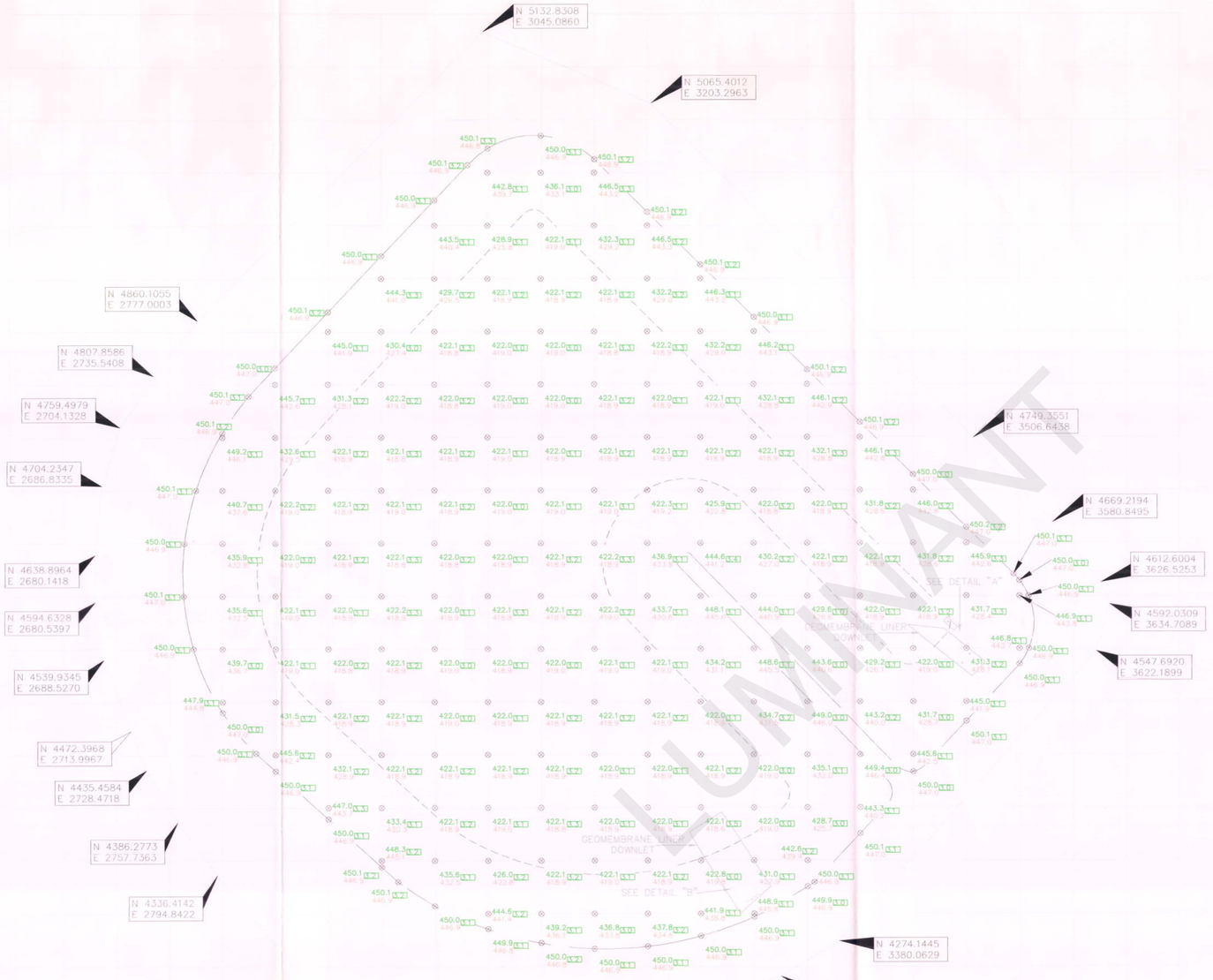
HOUSTON OFFICE
500 CENTURY PLAZA DR
HOUSTON, TEXAS 77073
USA
(281) 821-6868
www.golder.com

PROJECT
OAK GROVE STEAM ELECTRIC STATION
FGD-C POND
ROBERTSON COUNTY, TEXAS

TITLE
DETAILS

PROJECT No.	LUMINANT DRAWING NO	Rev.	7 of 7	FIGURE
1406296	A2YF00-0-CV-0-SW.PL-07	0		7

FDG A
AS BUILT DRAWINGS



GRAPHIC SCALE

60 0 30 60 120 240

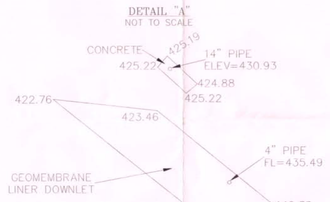
(IN FEET)
1 inch = 60 ft.

LEGEND

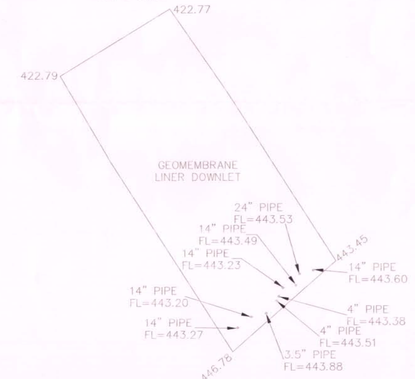
NORTHING N 10097536.58 | F.G.D. POND
EASTING E 3145808.31 | BOUNDARY

⊗ CERTIFIED CLAY LINER ELEVATION 547.0 | CLAY LINER THICKNESS
CERTIFIED SUBGRADE ELEVATION 545.0

DETAIL "A"
NOT TO SCALE



DETAIL "B"
NOT TO SCALE



STATE OF TEXAS
REGISTERED
ROBERT E. BOSSE
6351
PROFESSIONAL
LAND SURVEYOR

NO.	REVISIONS	BY	DATE

PROJECT: JAMES CONSTRUCTION
OAK GROVE FGD POND
JOB NUMBER: 28172-09
DATE: NOVEMBER 19, 2008
SCALE: 1" = 60'
SURVEYOR: R.E.B.
TECHNICIAN: G.HANSON
DRAWING: OAK GROVE POND.DWG
FIELDNOTES: N/A
PARTYCHIEF: J.SANDOVAL
FIELDBOOKS: 5293

SAM INC.
SURVEYING•AERIAL MAPPING•ENGINEERING
5508 WEST HIGHWAY 290
BUILDING B
AUSTIN TEXAS, 78735
(512) 447-0575
Fax: (512) 326-3029
EMAIL: SAM@SAMINC.BIZ

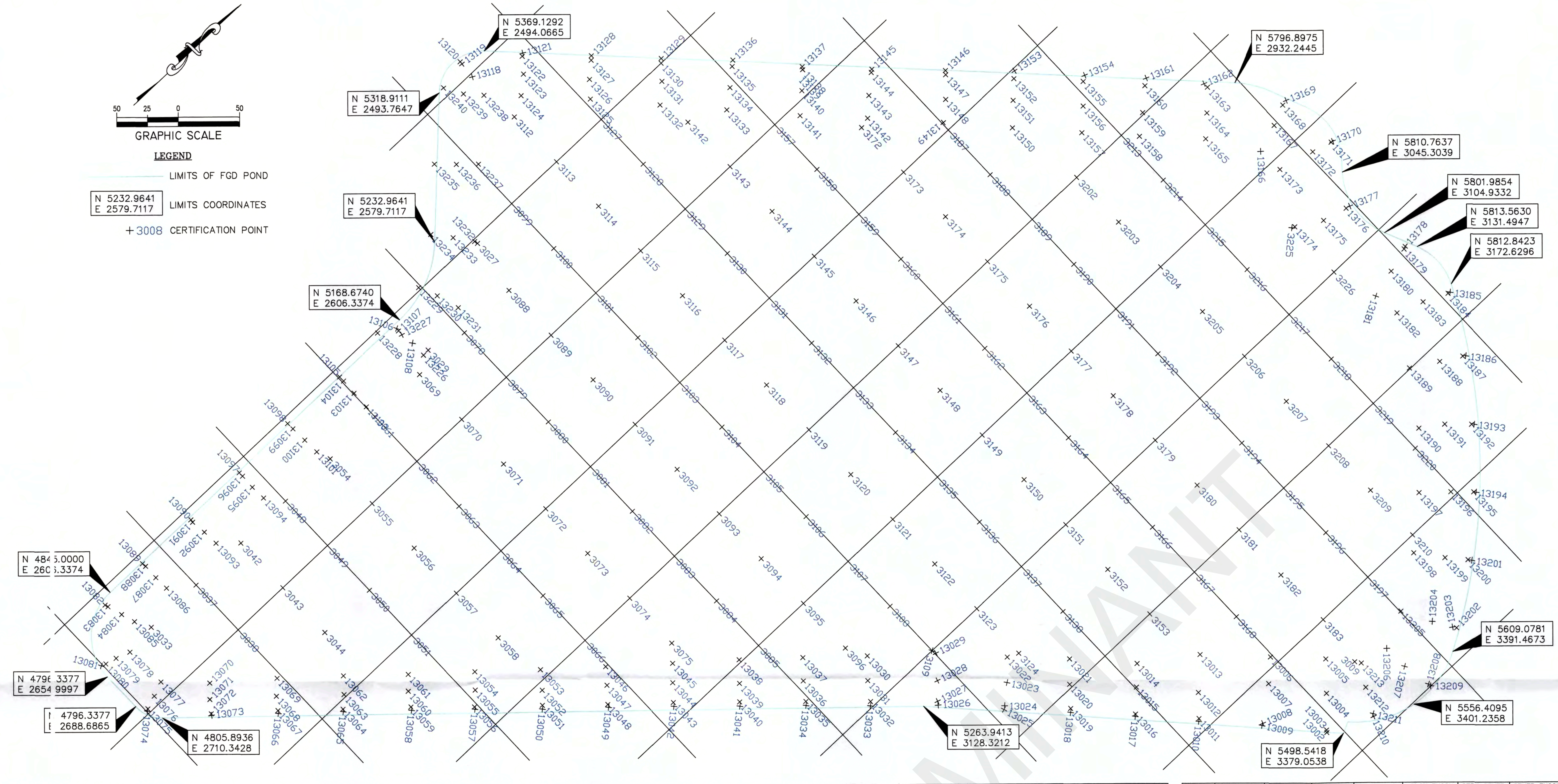
SUBGRADE AND CLAY LINER ELEVATIONS AS OF OCTOBER 23, 2008 OAK GROVE POWER PLANT – F.G.D. POND ROBERTSON COUNTY, TEXAS

SHEET 1
OF 1

DWG. NO.:

NOVEMBER 19, 2008

FDG B
AS BUILT DRAWINGS



POINT	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	COVER THICK
3009	554[illegible].05	3342.82	413.0	415.2	2.2	416.1	1.0
3027	525[illegible].61	2604.36	417.5	420.0	2.4	421.0	1.0
3029	516[illegible].67	2640.27	418.0	420.2	2.3	421.3	1.0
3033	4850.00	2650.00	419.7	422.0	2.3	423.0	1.0
3037	4900.00	2650.00	419.4	421.6	2.2	422.7	1.1
3038	4900.00	2700.00	419.2	421.3	2.1	422.4	1.2
3042	4950.00	2650.00	419.2	421.4	2.2	422.4	1.0
3043	4950.00	2700.00	419.0	421.1	2.1	422.2	1.1
3044	4950.00	2750.00	418.7	420.8	2.1	421.9	1.0
3048	5000.00	2650.00	418.9	421.1	2.2	422.1	1.1
3049	5000.00	2700.00	418.6	420.9	2.3	421.9	1.0
3050	5000.00	2750.00	418.2	420.6	2.3	421.6	1.0
3051	5000.00	2800.00	418.0	420.2	2.2	421.4	1.2
3054	5050.00	2650.00	418.4	420.8	2.4	421.9	1.0
3055	5050.00	2700.00	418.3	420.5	2.2	421.5	1.0
3056	5050.00	2750.00	418.1	420.2	2.1	421.4	1.2
3057	5050.00	2800.00	417.9	420.0	2.1	421.0	1.0
3058	5050.00	2850.00	417.5	419.7	2.2	420.9	1.1
3061	5100.00	2650.00	418.4	420.5	2.1	421.5	1.0
3062	5100.00	2700.00	417.9	420.1	2.3	421.3	1.2
3063	5100.00	2750.00	417.7	420.0	2.2	421.0	1.0
3064	5100.00	2800.00	417.4	419.7	2.4	420.9	1.2
3065	5100.00	2850.00	417.2	419.4	2.2	420.5	1.2
3066	5100.00	2900.00	416.9	419.1	2.3	420.2	1.0
3069	5150.00	2650.00	418.1	420.4	2.3	421.4	1.0
3070	5150.00	2700.00	417.7	419.9	2.2	421.1	1.1
3071	5150.00	2750.00	417.5	419.6	2.2	420.7	1.1
3072	5150.00	2800.00	417.3	419.5	2.2	420.5	1.0
3073	5150.00	2850.00	417.0	419.1	2.1	420.3	1.2
3074	5150.00	2900.00	416.8	418.8	2.0	419.9	1.1
3075	5150.00	2950.00	416.6	418.6	2.1	419.8	1.1
3078	5200.00	2650.00	417.7	419.9	2.2	421.1	1.2
3079	5200.00	2700.00	417.4	419.6	2.2	420.6	1.0
3080	5200.00	2750.00	417.1	419.4	2.3	420.5	1.2
3081	5200.00	2800.00	416.8	419.1	2.3	420.1	1.0
3082	5200.00	2850.00	416.7	418.9	2.2	419.9	1.1
3083	5200.00	2900.00	416.5	418.6	2.1	419.6	1.0
3084	5200.00	2950.00	416.1	418.4	2.3	419.5	1.1
3085	5200.00	3000.00	416.0	418.1	2.1	419.1	1.0
3088	5250.00	2650.00	417.4	419.7	2.3	420.8	1.0
3089	5250.00	2700.00	417.3	419.5	2.2	420.5	1.0
3090	5250.00	2750.00	417.0	419.1	2.1	420.1	1.0
3091	5250.00	2800.00	416.6	418.9	2.3	419.9	1.0
3092	5250.00	2850.00	416.3	418.6	2.3	419.6	1.0
3093	5250.00	2900.00	416.2	418.3	2.0	419.3	1.1
3094	5250.00	2950.00	415.8	418.1	2.3	419.1	1.1
3095	5250.00	3000.00	415.7	417.8	2.1	419.0	1.2
3096	5250.00	3050.00	415.5	417.6	2.1	419.0	1.4
3099	5300.00	2600.00	417.5	419.6	2.0	420.8	1.2
3100	5300.00	2650.00	417.2	419.5	2.3	420.4	1.0
3101	5300.00	2700.00	417.0	419.2	2.2	420.2	1.0
3102	5300.00	2750.00	416.8	418.9	2.1	419.9	1.0
3103	5300.00	2800.00	416.5	418.6	2.1	419.7	1.1
3104	5300.00	2850.00	416.1	418.3	2.2	419.6	1.3
3105	5300.00	2900.00	415.9	418.1	2.3	419.2	1.1
3106	5300.00	2950.00	415.5	417.8	2.2	418.7	1.0
3107	5300.00	3000.00	415.3	417.7	2.4	418.7	1.0
3108	5300.00	3050.00	415.2	417.3	2.0	418.3	1.1
3109	5300.00	3100.00	414.9	417.0	2.1	418.5	1.4
3112	5350.00	2550.00	417.3	419.6	2.3	420.8	1.2
3113	5350.00	2600.00	417.3	419.5	2.3	420.5	1.0

POINT	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	COVER THICK
3114	5350.00	2650.00	416.9	419.3	2.4	420.2	1.0
3115	5350.00	2700.00	416.6	418.9	2.3	419.9	1.1
3116	5350.00	2750.00	416.3	418.6	2.4	419.6	1.0
3117	5350.00	2800.00	416.2	418.3	2.0	419.3	1.0
3118	5350.00	2850.00	415.8	418.1	2.3	419.2	1.1
3119	5350.00	2900.00	415.6	417.9	2.3	418.9	1.0
3120	5350.00	2950.00	415.4	417.5	2.1	418.6	1.1
3121	5350.00	3000.00	415.0	417.4	2.3	418.3	1.0
3122	5350.00	3050.00	414.8	417.1	2.3	418.2	1.0
3123	5350.00	3100.00	414.7	416.8	2.1	417.8	1.0
3124	5350.00	3150.00	414.3	416.7	2.4	417.8	1.2
3127	5400.00	2600.00	416.9	419.1	2.2	420.1	1.0
3128	5400.00	2650.00	416.6	418.9	2.3	419.9	1.0
3129	5400.00	2700.00	416.2	418.6	2.4	419.6	1.0
3130	5400.00	2750.00	416.0	418.3	2.4	419.4	1.0
3131	5400.00	2800.00	415.8	418.1	2.3	419.1	1.0
3132	5400.00	2850.00	415.7	417.8	2.1	418.8	1.0
3133	5400.00	2900.00	415.3	417.6	2.3	418.6	1.0
3134	5400.00	2950.00	415.0	417.3	2.3	418.4	1.1
3135	5400.00	3000.00	414.9	417.0	2.1	418.0	1.0
3136	5400.00	3050.00	414.5	416.8	2.3	417.7	1.0
3137	5400.00	3100.00	414.3	416.4	2.2	417.5	1.1
3138	5400.00	3150.00	413.9	416.3	2.3	417.2	1.0
3142	5450.00	2650.00	416.4	418.6	2.2	419.7	1.1
3143	5450.00	2700.00	416.0	418.4	2.4	419.4	1.1
3144	5450.00	2750.00	415.9	418.0	2.1	419.1	1.2
3145	5450.00	2800.00	415.6	417.8	2.2	418.8	1.1
3146	5450.00	2850.00	415.2	417.5	2.3	418.5	1.0
3147	5450.00	2900.00	414.9	417.2	2.3	418.2	1.0
3148	5450.00	2950.00	414.8	417.0	2.2	418.0	1.0
3149	5450.00	3000.00	414.5	416.7	2.2	417.9	1.2
3150	5450.00	3050.00	414.2	416.5	2.4	417.7	1.2
3151	5450.00	3100.00	414.0	416.3	2.3	417.3	1.0
3152	5450.00	3150.00	413.7	415.9	2.2	417.1	1.2
3153	5450.00	3200.00	413.4	415.9	2.5	417.0	1.1
3157	5500.00	2700.00	415.8	418.1	2.3	419.2	1.0
3158	5500.00	2750.00	415.5	417.7	2.2	418.8	1.1
3159	5500.00	2800.00	415.4	417.5	2.1	418.6	1.2
3160	5500.00	2850.00	415.0	417.2	2.2	418.2	1.0
3161	5500.00	2900.00	414.7	417.1	2.4	418.1	1.0
3162	5500.00	2950.00	414.6	416.7	2.1	417.8	1.1
3163	5500.00	3000.00	414.2	416.5	2.3	417.4	1.0
3164	5500.00	3050.00	414.0	416.3	2.3	417.3	1.0
3165	5500.00	3100.00	413.8	415.9	2.1	417.0	1.1
3166	5500.00	3150.00	413.5	415.7	2.3	416.7	1.0
3167	5500.00	3200.00	413.1	415.4	2.3	416.5	1.1
3168	5500.00	3250.00	412.9	415.5	2.6	416.5	1.0
3172	5550.00	2750.00	415.3	417.6	2.3	418.5	1.0
3173	5550.00	2800.00	415.0	417.2	2.2	418.2	1.1
3174	5550.00	2850.00	414.7	416.9	2.2	418.0	1.1
3175	5550.00	2900.00	414.6	416.8	2.2	417.8	1.0
3176	5550.00	2950.00	414.1	416.4	2.3	417.5	1.1
3177	5550.00	3000.00	414.0	416.3	2.3	417.3	1.0
3178	5550.00	3050.00	413.8	416.0	2.1	417.0	1.0
3179	5550.00	3100.00	413.5	415.7	2.2	416.8	1.1
3180	5550.00	3150.00	413.2	415.4	2.2	416.4	1.0
3181	5550.00	3200.00	413.0	415.2	2.3	416.4	1.2
3182	5550.00	3250.00	412.8	415.1	2.3	416.1	1.0
3183	5550.00	3300.00	412.7	415.2	2.4	416.2	1.0
3187	5600.00	2800.00	414.7	417.0	2.3	418.1	1.1
3188	5600.00	2850.00	414.6	416.9	2.3	417.8	1.0

POINT	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	COVER THICK
3189	5600.00	2900.00	414.2	416.6	2.4	417.7	1.1
3190	5600.00	2950.00	413.9	416.2	2.2	417.2	1.1
3191	5600.00	3000.00	413.7	415.9	2.2	416.9	1.1
3192	5600.00	3050.00	413.4	415.6	2.3	416.6	1.0
3193	5600.00	3100.00	413.2	415.4	2.3	416.5	1.0
3194	5600.00	3150.00	413.1	415.2	2.1	416.2	1.0
3195	5600.00	3200.00	412.8	415.0	2.2	416.0	1.0
3196	5600.00	3250.00	412.9	415.1	2.2	416.1	1.0
3197	5600.00	3300.00	412.7	415.1	2.4	416.0	1.0
3202	5650.00	2900.00	413.9	416.2	2.2	417.2	1.0
3203	5650.00	2950.00	413.8	415.8	2.0	417.0	1.1
3204	5650.00	3000.00	413.4	415.6	2.2	416.6	1.0
3205	5650.00	3050.00	413.1	415.3	2.3	416.5	1.2
3206	5650.00	3100.00	412.9	415.1	2.3	416.2	1.0
3207	5650.00	3150.00	412.8	415.0	2.2	416.1	1.1
3208	5650.00	3200.00	412.9	415.1	2.1	416.1	1.0
3209	5650.00	3250.00	412.8	415.1	2.3	416.1	1.0
3210	5650.00	3300.00	412.8	415.0	2.3	416.1	1.0
3213	5700.00	2900.00	413.7	415.9	2.3	417.2	1.3
3214	5700.00	2950.00	413.3	415.7	2.4	416.7	1.0
3215	5700.00	3000.00	413.0	415.4	2.3	416.4	1.0
3216	5700.00	3050.00	412.8	415.1	2.3	416.2	1.0
3217	5700.00	3100.00	412.7	415.3	2.6	416.3	1.0
3218	5700.00	3150.00	412.9	415.0	2.1	416.1	1.1
3219	5700.00	3200.00	412.7	415.1	2.4	416.1	1.1
3220	5700.00	3250.00	412.9	415.0	2.1	416.0	1.0
3225	5750.00	3050.00	412.8	415.1	2.3	416.1	1.0
3226	5750.00	3100.00	412.8	415.2	2.4	416.2	1.0
13002	5489.11	3369.27	430.7	432.7	2.0	433.7	1.0
13003	5490.24	3367.64	428.3	430.4	2.1	431.7	1.3
13004	5510.72	3345.80	421.5	423.7	2.2	425.0	1.3
13005	5529.63	3324.87	412.9	415.0	2.1	416.2	1.3
13006	5498.03	3292.96	412.8	414.9	2.1	416.1	1.3
13007	5481.89	3307.88	419.8	422.1	2.3	423.6	1.6
13008	5456.25	3328.36	428.0	430.0	2.0	431.2	1.2
13009	5454.65	3329.13	N/A	430.6	N/A	431.7	1.1
13010	5419.19	3291.37	N/A	430.6	N/A	431.8	1.3
13011	5420.90	3289.73	427.8	429.9	2.1	431.0	1.1
13012	5435.08	3273.99	420.4	422.6	2.2	423.9	1.3
13013	5457.37	3252.18	413.3	415.5	2.2	417.0	1.5
13014	5414.87	3222.38	413.8	416.0	2.2	417.6	1.6
13015	5401.27	3236.12	420.1	422.1	2.0	423.7	1.6
13016	5385.62	3251.66	427.7	429.7	2.0	431.0	1.2
13017	5384.27	3252.95	N/A	430.3	N/A	431.4	1.2
13018	5348.17	3214.35	N/A	430.5	N/A	431.6	1.1
13019	5350.37	3211.99	426.8	429.0	2.2	430.7	1.8
13020	5363.21	3197.15	420.4	422.6	2.2	424.0	1.3
13021	5377.39	3181.89	414.2	416.2	2.0	417.7	1.6
13022	5341.06	3145.94	414.6	416.6	2.0	418.2	1.6
13023	5326.64	3160.93	421.1	423.1	2.0	424.8	1.8
13024	5312.32	3173.36	427.0	429.2	2.2	431.1	1.9
13025	5309.86	3175.27	N/A	431.1	N/A	432.1	1.0
13026	5273.20	3135.80	N/A	430.7	N/A	432.0	1.3
13027	5275.08	3133.23	427.0	429.2	2.2	431.0	1.8
13028	5286.48	3120.85	421.7	423.9	2.2	425.5	1.5
13029	5300.91	3103.69	415.1	417.1	2.0	418.7	1.6
13030	5258.72	3066.82	415.4	417.4	2.0	419.4	2.0
13031	5245.19	3081.78	421.7	423.8	2.1	425.2	1.5
13032	5235.16	3095.73	427.0	429.2	2.2	430.9	1.7
13033	5232.74	3098.31	N/A	431.0	N/A	432.1	1.1
13034	5194.57	3062.14	N/A	430.8	N/A	432.0	1.2

POINT	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	COVER THICK
13035	5196.60	3059.64	427.1	429.3	2.2	430.6	1.3
13036	5206.58	3046.01	421.4	423.5	2.1	424.8	1.3
13037	5219.37	3031.85	415.7	417.8	2.1	419.3	1.4
13038	5180.48	2997.71	416.1	418.3	2.2	419.6	1.3
13039	5167.40	3012.03	421.9	423.9	2.0	425.4	1.5
13040	5157.16	3023.08	426.8	429.0	2.2	430.4	1.4
13041	5154.94	3025.79	N/A	430.6	N/A	431.6	1.0
13042	5115.85	2988.94	N/A	430.4	N/A	431.5	1.0
13043	5117.68	2986.29	426.7	428.9	2.2	430.0	1.1
13044	5128.34	2974.26	421.3	423.5	2.2	424.9	1.4
13045	5139.19	2962.55	416.7	418.8	2.1	420.2	1.4
13046	5097.50	2927.25	417.0	419.2	2.2	420.3	1.1
13047	5087.79	2939.10	422.0	424.1	2.1	425.1	1.0
13048	5077.50	2950.93	427.0	429.1	2.1	430.7	1.6
13049	5076.49	2953.06	N/A	430.2	N/A	431.4	1.2
13050	5036.25	2917.19	N/A	430.7	N/A	431.7	1.1
13051	5038.30	2914.90	427.0	429.2	2.2	430.5	1.3
13052	5046.60	2905.90	423.0	425.2	2.2	426.4	1.2
13053	5057.12	2892.57	417.5	419.7	2.2	420.8	1.1
13054	5017.04	2857.04	417.8	420.1	2.3	421.3	1.3
13055	5007.05	2868.20	422.7	424.8	2.1	426.1	1.3
13056	4997.15	2877.75	427.2	429.4	2.2	431.0	1.6
13057	4996.21	2879.44	N/A	430.3	N/A	431.5	1.1
13058	4957.90	2845.02	N/A	430.5	N/A	431.4	1.0
13059	4959.30	2842.65	427.1	429.3	2.2	430.5	1.2
13060	4966.61	2831.80	422.8	424.9	2.1	426.2	1.2
13061	4976.05	2821.67	418.4	420.4	2.0	421.9	1.4
13062	4936.82	2786.19	418.5	420.6	2.1	422.1	1.5
13063	4926.59	2797.85	423.5	425.5	2.0	426.8	1.3
13064	4917.75	2806.02	427.4	429.6	2.0	431.1	1.5
13065	4916.68	2807.61	N/A	430.5	N/A	431.7	1.2
13066	4877.13	2772.34	N/A	430.8	N/A	431.9	1.0
13067	4878.40	2770.40	427.6	429.8	2.2	430.9	1.1
13068	4885.56	2761.00	423.5	425.6	2.1	427.0	1.5
13069	4896.14	2750.49	418.8	421.0	2.2	422.7	1.7
13070	4853.36	2715.90	418.9	421.1	2.2	423.8	2.6
13071	4844.19	2725.82	424.2	426.4	2.2	427.6	1.3
13072	4837.08	2735.05	427.9	430.1	2.2	431.6	1.6
13073	4836.35	2736.19	N/A	431.1	N/A	432.1	1.0
13074	4800.76	2697.82	N/A	430.8	N/A	431.8	1.0
13075	4802.14	2696.77	427.6	429.6	2.0	431.0	1.4
13076	4813.12	2692.83	423.5	425.7	2.2	427.2	1.5
13077	4825.16	2687.88	419.7	421.8	2.1	423.4	1.6
13078	4823.40	2652.82	420.4	422.4	2.0	423.7	1.3
13079	4811.75	2648.80	424.2	426.3	2.1	427.3	1.0
13080	4802.51	2646.35	427.2	429.4	2.2	430.8	1.5
13081	4798.79	2645.02	N/A	431.2	N/A	432.3	1.1
13082	4834.90	2611.00	N/A	430.5	N/A	431.5	1.0
13083	4835.68	2613.60	427.0	429.0	2.0	430.2	1.2
13084	4839.50	2625.88	422.6	424.7	2.1	426.1	1.4
13085	4843.14	2637.32	419.7	421.7	2.0	423.2	1.5
13086	4880.85	2635.29	419.5	421.7	2.2	423.1	1.4
13087	4880.37	2623.03	423.3	425.4	2.1	426.7	1.3
13088	4880.67	2610.56	427.6	429.8	2.2	430.9	1.1
13089	4880.21	2607.31	N/A	431.3	N/A	432.4	1.0
13090	4933.24	2608.28	N/A	431.0	N/A	432.1	1.0
13091	4933.03	2610.71	427.6	429.8	2.2	430.9	1.1
13092	4934.46	2623.14	423.7	425.7	2.0	426.8	1.1
13093	4935.15	2636.33	419.3	421.5	2.2	422.8	1.3
13094	4988.73	2635.89	419.4	421.5	2.1	422.7	1.2
13095	4988.09	2623.28	423.5	425.7	2.2	426.8	1.0

POINT	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	COVER THICK
13096	4988.43	2611.19	427.4	429.5	2.1	430.6	1.0
13097	4988.23	2607.41	N/A	431.2	N/A	432.2	1.0
13098	5044.42	2605.21	N/A	432.0	N/A	433.0	1.0
13099	5044.63	2611.31	427.3	429.3	2.0	430.8	1.4
13100	5045.26	2624.68	423.0	425.2	2.2	426.2	1.0
13101	5045.91	2638.39	418.8	421.0	2.2	422.1	1.1
13102	5100.54	2639.32	418.3	420.6	2.3	421.7	1.1
13103	5100.82	2624.34	423.0	425.0	2.0	426.1	1.1
13104	5101.38	2611.26	427.3	429.5	2.2	430.8	1.2
13105	5101.25	2606.63	N/A	431.4	N/A	432.4	1.0
13106	5162.12	2609.85	428.8	431.0	2.2	432.1	1.1
13107	5161.87	2612.30	426.9	429.1	2.2	430.4	1.3
13108	5163.35	2627.32	421.9	423.9	2.0	425.1	1.3
13118	5347.43	2502.58	422.6	424.8	2.2	426.2	1.4
13119	5348.58	2489.08	427.6	429.7	2.1	430.8	1.1
13120	5348.60	2486.78	N/A	430.2	N/A	431.3	1.1
13121	5390.59	2516.83	N/A	430.8	N/A	432.2	1.4
13122	5388.53	2518.46	428.0	430.1	2.1	431.3	1.2
13123	5379.27	2529.72	423.2	425.3	2.1	426.6	1.3
13124	5365.84	2541.20	417.7	419.9	2.2	421.3	1.4
13125	5404.94	2581.86	417.3	419.4	2.1	420.5	1.1
13126	5415.38	2569.66	422.6	424.7	2.1	425.8	1.1
13127	5427.07	2559.25	427.7	429.8	2.1	430.9	1.1
13128	5429.65	2556.66	N/A	431.1	N/A	432.1	1.0
13129	5469.68	2597.22	N/A	431.0	N/A	432.3	1.3
13130	5467.02	2599.97	427.6	429.7	2.1	431.0	1.2
13131	5457.39	2611.19	422.8	425.0	2.2	426.1	1.2
13132	5443.05	2624.17	416.6	418.8	2.2	419.9	1.1
13133	5479.76	2664.50	416.1	418.2	2.1	419.7	1.5
13134	5494.02	2653.10	421.8	423.9	2.1	425.2	1.3
13135	5507.16	2641.77	427.4	429.8	2.4	431.0	1.2
13136	5511.05	2638.36	N/A	431.2	N/A	432.3	1.1
13137	5548.52	2680.81	N/A	430.7	N/A	431.8	1.1
13138	5547.16	2682.84	427.3	429.6	2.3	431.0	1.4
13139	5547.11	2682.87	427.3	429.5	2.2	430.5	1.0
13140	5534.95	2694.88	421.9	424.0	2.1	425.2	1.3
13141	5519.94	2708.72	415.6	417.8	2.2	419.2	1.4
13142	5558.79	2747.85	415.4	417.4	2.0	418.7	1.3
13143	5572.25	2735.09	421.3	423.4	2.1	424.7	1.3
13144	5586.44	2722.79	427.5	429.6	2.1	430.9	1.3
13145	5588.58	2721.17	N/A	430.7	N/A	431.9	1.2
13146	5631.45	2763.20	N/A	430.9	N/A	432.2	1.4
13147	5629.27	2765.82	427.7	429.8	2.1	431.2	1.4
13148	5615.51	2780.42	420.9	423.1	2.2	424.5	1.4
13149	5601.22	2792.82	415.1	417.2	2.1	418.4	1.3
13150	5639.31	2834.64	414.5	416.5	2.0	417.9	1.4
13151	5654.98	2818.73	421.5	423.5	2.0	425.1	1.6
13152	5667.55	2806.33	427.3	429.3	2.0	430.9	1.6
13153	5672.32	2802.02	N/A	431.5	N/A	432.5	1.0
13154	5711.74	2843.81	N/A	431.5	N/A	432.5	1.0
13155	5707.37	2846.62	427.6	429.8	2.2	430.9	1.1
13156	5693.63	2861.24	421.0	423.1	2.1	424.2	1.1
13157	5678.04	2876.30	413.9	416.0	2.1	417.6	1.5
13158	5710.24	2910.70	413.6	415.8	2.2	417.1	1.3
13159	5725.27	2898.42	419.9	422.1	2.2	423.1	1.0
13160	5741.64	2883.69	427.1	429.2	2.1	430.4	1.3
13161	5746.66	2879.91	N/A	431.3	N/A	432.3	1.0
13162	5777.91	2915.60	N/A	430.6	N/A	431.8	1.3
13163	5778.03	2919.63	427.6	429.7	2.1	430.9	1.2
13164	5763.30	2934.55	420.7	422.7	2.0	423.8	1.1
13165	5748.21	2949.21	413.6	415.7	2.1	416.9	1.1
13166	5773.93	2987.40	412.8	414.9	2.1	416.6	1.6
13167	5796.64	2979.39	420.9	423.1	2.2	424.2	1.1
13168	5813.05	2972.08	427.2	429.4	2.2	430.3	1.0
13169	5817.66	2971.18	N/A	430.9	N/A	431.9	1.1
13170	5822.28	3021.53	N/A	429.7	N/A	431.3	1.6
13171	5820.84	3021.23	427.3	429.3	2.0	430.7	1.4
13172	5804.69	3016.51	421.6	423.6	2.0	425.2	1.6
13173	5775.44	3008.75	412.7	414.8	2.1	416.0	1.2
13174	5752.32	3051.07	412.7	414.9	2.2	416.2	1.3
13175	5772.74	3063.42	420.1	422.3	2.2	423.5	1.2
13176	5792.83	3068.98	427.0	429.2	2.2	430.4	1.2
13177	5796.14	3069.75	N/A	430.3	N/A	431.7	1.4
13178	5806.63	3124.66	N/A	430.0	N/A	431.2	1.2
13179	5804.34	3125.62	426.5	428.7	2.2	430.3	1.6
13180	5784.37	3131.51	420.2	422.2	2.0	423.4	1.2
13181	5761.42	3137.74	412.7	414.8	2.1	416.0	1.3
13182	5764.51	3159.55	412.9	415.1	2.2	416.1	1.0
13183	5786.13	3167.58	420.4	422.5	2.1	423.5	1.1
13184	5805.70	3176.50	427.3	429.4	2.1	430.8	1.4
13185	5807.57	3176.92	N/A	430.3	N/A	431.4	1.1
13186	5781.48	3223.31	N/A	430.1	N/A	431.4	1.3
13187	5779.47	3221.89	427.2	429.4	2.2	430.4	1.0
13188	5762.80	3212.20	421.0	423.0	2.0	424.1	1.1
13189	5741.18	3199.21	413.0	415.0	2.0	416.2	1.2
13190	5713.21	3240.19	412.9	415.0	2.1	416.7	1.7
13191	5730.81	3252.25	420.1	422.2	2.1	423.3	1.1
13192	5746.68	3267.31	426.8	428.9	2.1	430.7	1.7
13193	5748.35	3268.57	N/A	430.2	N/A	431.3	1.2
13194	5711.71	3309.87	N/A	430.3	N/A	431.5	1.2
13195	5710.27	3308.52	427.3	429.3	2.0	430.7	1.4
13196	5696.79	3295.75	421.4	423.6	2.2	424.6	1.0
13197	5677.41	3278.50	413.0	415.1	2.1	416.2	1.1
13198	5640.71	3311.27	412.8	415.0	2.2	416.1	1.2
13199	5656.58	3331.57	421.4	423.4	2.0	424.5	1.0
13200	5669.13	3345.56	427.2	429.2	2.0	430.9	1.7
13201	5671.09	3348.08	N/A	430.8	N/A	432.1	1.3
13202	5624.46	3379.57	N/A	430.6	N/A	431.6	1.0
13203	5622.49	3376.88	427.0	429.0	2.0	430.6	1.6
13204	5613.58	3362.23	421.5	423.5	2.0	424.7	1.1
13205	5600.72	3338.61	413.0	415.1	2.1	416.6	1.5
13206	5571.55	3352.81	412.9	415.0	2.1	416.7	1.7
13207	5572.02	3373.54	419.4	421.5	2.1	423.0	1.5
13208	5576.14	3397.52	427.4	429.5	2.1	431.0	1.5
13209	5576.49	3399.84	N/A	430.7	N/A	432.0	1.2
13210	5525.78	3386.03	N/A	430.5	N/A	431.5	1.0
13211	5526.93	3384.18	427.0	429.1	2.1	430.8	1.7
13212	5537.22	3364.36	419.6	421.8	2.2	423.1	1.3
13213	5548.26	3347.30	413.0	415.2	2.2	416.7	1.5
13226	5163.15	2640.63	419.7	421.8	2.1	422.8	1.0
13227	5161.70	2616.41	425.7	428.0	2.3	428.9	1.0
13228	5148.26	2601.86	430.1	432.1	2.0	433.1	1.0
13229	5197.99	2597.84	430.2	432.2	2.0	434.0	1.9
13230	5204.41	2613.15	424.9	427.1	2.2	428.1	1.0
13231	5210.27	2631.75	418.4	420.5	2.1	421.6	1.1
13232	5256.92	2601.58	418.3	420.4	2.1	422.0	1.6
13233	5246.25	2587.35	424.1	426.1	2.0	427.5	1.4
13234	5234.91	2573.04	430.2	432.3	2.1	433.3	1.0
13235	5276.18	2533.37	429.8	431.9	2.1	432.8	1.0
13236	5289.13	2545.58	424.0	426.0	2.0	427.4	1.4
13237	5302.35	2557.77	418.8	420.8	2.0	421.8	1.0
13238	5344.11	2520.06	419.8	422.1	2.3	423.2	1.1
13239	5332.64	2507.73	425.2	427.2	2.0	428.2	1.0
13240	5324.14	2493.17	N/A	430.7	N/A	432.0	1.3

STATE OF TEXAS REGISTERED S. KEVIN WENDELL 5500 PROFESSIONAL LAND SURVEYOR

Figure 12

NO.	REVISIONS	BY	DATE

PROJECT: GOLDER ASSOCIATES OAK GROVE FGD POND
JOB NUMBER: 31100-09
DATE: JANUARY 13, 2012
SCALE: 1" = 50'
SURVEYOR: G.VEDRO
TECHNICIAN: G.HANSON
DRAWING: FGD POND.DWG
FIELDNOTES: N/A
PARTYCHIEF: A.MANCERA
FIELDBOOKS: 811

SAM® INC.
SURVEYING•AERIAL MAPPING•ENGINEERING
4801 SOUTHWEST PARKWAY
PARKWAY TWO, SUITE 100
AUSTIN TEXAS, 78735
(512) 447-0575
FAX: (512) 326-3029
EMAIL: SAM@SAMINC.BIZ

SUBGRADE, CLAY LINER, AND PROTECTIVE COVER ELEVATIONS AS OF DECEMBER 7, 2011
OAK GROVE POWER PLANT
FGD POND
ROBERTSON COUNTY, TEXAS

SHEET 1 OF 1

DWG. NO.: G034-31100-09

JANUARY 13, 2012

FDG C
AS BUILT DRAWINGS

SURVEYING•AERIAL MAPPING•ENGINEERING
SAM
7101 ENVOY COURT
DALLAS, TEXAS 75247
(214) 631-7888
FAX: (214) 631-7103
EMAIL: SAM@SAM.BIZ

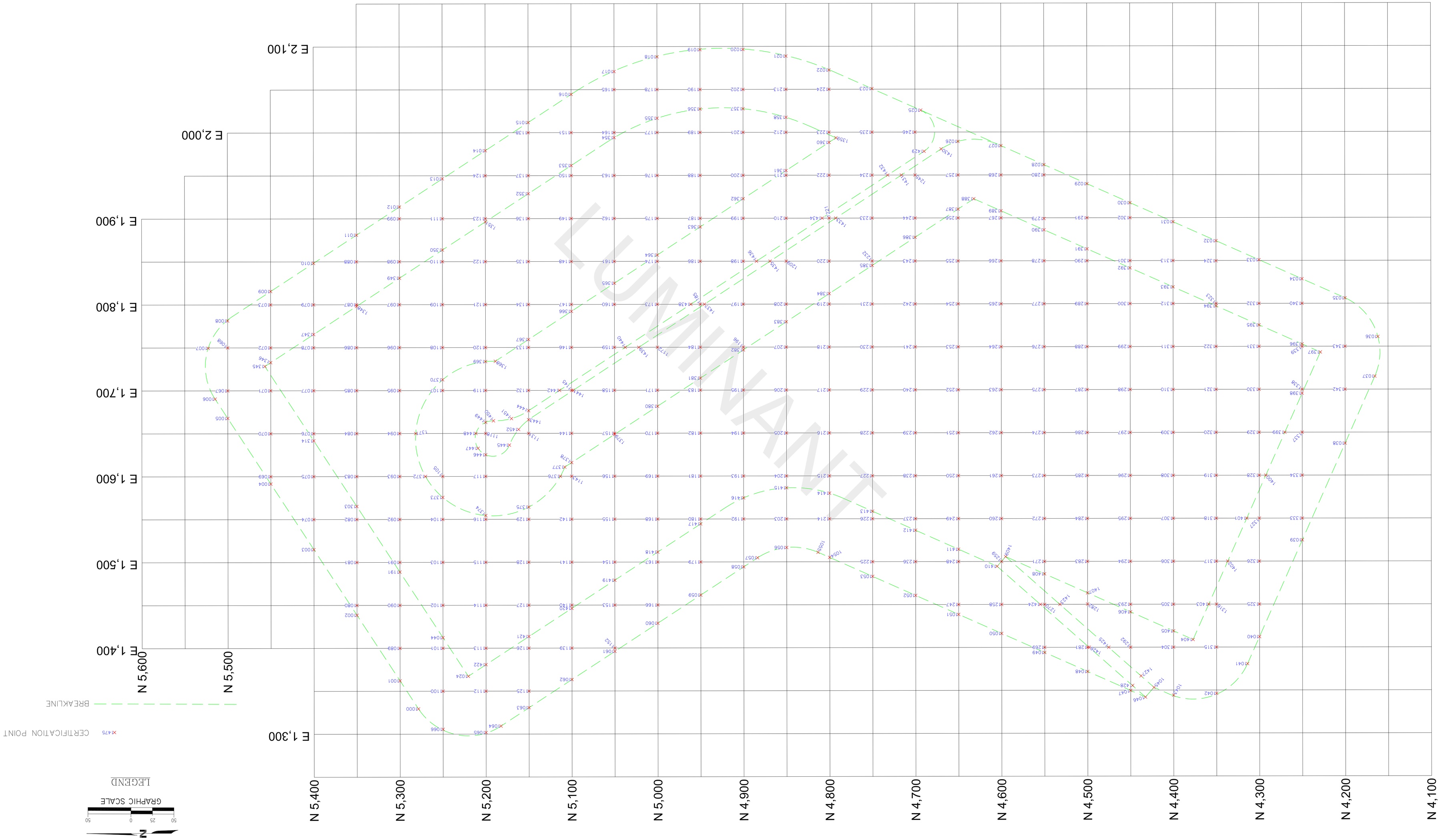
NO.	REVISIONS	BY	DATE

PROJECT: GOLDER ASSOCIATES
OAK GROVE FGD POND C
JOB NUMBER: 35813-09
DATE: AUGUST 18, 2016
SCALE: 1"=50'
SURVEYOR: S.K.W.
TECHNICIAN: W.G.H.
DRAWING: 35813 FGD POND C.DWG
FIELDNOTES: N/A
FIELDBOOKS: 9999
PARTYCHIEF: J.SANDOVAL

SUBGRADE AND CLAY LINER ELEVATIONS
AS OF SEPTEMBER 29, 2015
FGD POND C
OAK GROVE POWER PLANT
ROBERTSON COUNTY, TEXAS

SHEET 1 OF 2

DWG. NO.:35813-09



POINT No.	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	CERT THICK
1000	5278.62	1329.42	461.7	464.0	2.3	464.1	0.1
1001	5300.00	1362.10	461.8	464.1	2.3	464.1	0.0
1002	5350.00	1438.54	462.0	464.1	2.1	464.1	0.0
1003	5400.00	1514.99	461.7	464.0	2.4	464.1	0.1
1004	5450.00	1591.43	461.7	464.0	2.4	464.1	0.1
1005	5500.00	1667.88	461.8	464.1	2.3	464.1	0.0
1006	5514.74	1690.41	461.8	464.1	2.3	464.1	0.1
1007	5522.71	1749.59	461.7	464.0	2.3	464.1	0.1
1008	5500.00	1781.41	461.9	464.1	2.2	464.1	0.0
1009	5450.00	1815.59	461.8	464.1	2.3	464.1	0.0
1010	5400.00	1848.29	461.9	464.0	2.2	464.1	0.1
1011	5350.00	1880.99	461.7	464.1	2.4	464.1	0.0
1012	5300.00	1913.70	461.7	464.1	2.3	464.1	0.1
1013	5250.00	1946.40	461.8	464.0	2.3	464.1	0.1
1014	5200.00	1979.11	461.8	464.1	2.3	464.1	0.1
1015	5150.00	2011.81	461.8	464.0	2.3	464.1	0.1
1016	5100.00	2044.51	461.9	464.0	2.2	464.1	0.1
1017	5050.00	2071.01	461.8	464.1	2.3	464.1	0.0
1018	5000.00	2088.08	461.8	464.0	2.3	464.1	0.1
1019	4950.00	2096.34	461.8	464.0	2.2	464.1	0.1
1020	4900.00	2096.53	461.7	464.1	2.3	464.1	0.0
1021	4850.00	2088.74	461.8	464.1	2.4	464.1	0.0
1022	4800.00	2072.44	461.7	464.1	2.4	464.1	0.0
1023	4750.00	2050.70	462.0	464.1	2.1	464.1	0.0
1024	5220.61	1367.36	439.0	441.1	2.1	444.8	3.7
1025	4693.29	2025.51	461.8	464.0	2.2	464.1	0.1
1026	4650.00	1989.13	461.8	464.0	2.2	464.1	0.1
1027	4600.00	1984.07	461.9	464.1	2.1	464.1	0.1
1028	4550.00	1961.86	462.0	464.2	2.2	464.2	0.0
1029	4500.00	1939.65	461.9	464.0	2.1	464.1	0.1
1030	4450.00	1917.44	462.0	464.1	2.1	464.1	0.0
1031	4400.00	1895.23	461.7	464.1	2.3	464.1	0.0
1032	4350.00	1873.02	461.7	464.1	2.3	464.1	0.0
1033	4300.00	1850.81	461.9	464.0	2.1	464.1	0.1
1034	4250.00	1828.60	462.0	464.1	2.1	464.1	0.0
1035	4200.00	1806.31	461.9	464.3	2.4	464.3	0.0
1036	4161.78	1761.27	462.0	464.1	2.1	464.1	0.0
1037	4165.38	1715.16	461.9	464.0	2.1	464.1	0.1
1038	4200.00	1637.23	461.8	464.1	2.3	464.1	0.0
1039	4250.00	1524.67	461.9	464.0	2.2	464.1	0.1
1040	4300.00	1412.11	461.9	464.1	2.2	464.1	0.0
1041	4313.95	1380.70	461.8	464.0	2.2	464.1	0.1
1042	4350.00	1346.19	462.0	464.0	2.1	466.4	2.4
1043	4400.00	1344.10	462.0	464.1	2.1	466.1	2.1
1044	5250.00	1412.30	439.0	441.1	2.1	444.7	3.7
1045	4422.89	1353.23	462.0	464.1	2.2	466.2	2.0
1046	4432.81	1341.98	462.0	464.1	2.1	464.1	0.0
1047	4450.00	1349.62	461.8	464.2	2.3	464.2	0.0
1048	4500.00	1371.83	461.8	464.1	2.2	464.1	0.1
1049	4550.00	1394.04	461.8	464.2	2.4	464.2	0.0
1050	4600.00	1416.25	461.7	464.1	2.4	464.1	0.0
1051	4650.00	1438.46	461.8	464.1	2.3	464.1	0.0
1052	4700.00	1460.67	461.7	464.0	2.3	464.1	0.1
1053	4750.00	1482.88	461.7	464.0	2.3	464.1	0.1
1054	4800.00	1505.09	461.7	464.0	2.3	464.1	0.1
1055	4813.47	1511.06	461.7	464.0	2.3	464.1	0.0
1056	4850.00	1516.68	461.7	464.1	2.4	464.1	0.1
1057	4883.85	1504.79	461.7	464.0	2.4	464.1	0.1
1058	4900.00	1494.23	461.8	464.1	2.3	464.1	0.0
1059	4950.00	1461.52	461.8	464.0	2.2	464.1	0.1
1060	5000.00	1428.82	461.7	464.1	2.4	464.1	0.0
1061	5050.00	1396.12	461.8	464.1	2.3	464.1	0.1
1062	5100.00	1363.41	461.7	464.2	2.5	464.2	0.0
1063	5150.00	1330.71	461.8	464.0	2.2	464.1	0.1
1064	5182.66	1309.35	461.8	464.1	2.3	464.1	0.0
1065	5200.00	1301.82	461.8	464.1	2.3	464.1	0.0
1066	5250.00	1305.63	461.7	464.2	2.5	464.2	0.0
1067	5500.00	1700.00	456.1	458.3	2.2	460.6	2.3
1068	5500.00	1750.00	455.2	457.3	2.2	459.6	2.3
1069	5450.00	1600.00	460.2	462.5	2.3	464.7	2.2
1070	5450.00	1650.00	451.3	453.5	2.1	456.1	2.7
1071	5450.00	1700.00	442.2	444.3	2.1	447.7	3.4
1072	5450.00	1750.00	443.2	445.4	2.2	448.8	3.5
1073	5450.00	1800.00	457.6	459.7	2.1	461.7	2.0
1074	5400.00	1550.00	455.6	457.8	2.2	460.1	2.4
1075	5400.00	1600.00	446.5	448.6	2.1	451.9	3.3
1076	5400.00	1650.00	439.0	441.1	2.1	443.7	2.6
1077	5400.00	1700.00	439.0	441.1	2.1	443.3	2.2
1078	5400.00	1750.00	438.9	441.0	2.1	443.0	2.0
1079	5400.00	1800.00	448.5	450.7	2.2	453.2	2.5
1080	5350.00	1450.00	459.9	462.0	2.1	464.3	2.3
1081	5350.00	1500.00	450.8	453.0	2.2	455.8	2.8
1082	5350.00	1550.00	441.7	443.8	2.1	447.4	3.6
1083	5350.00	1600.00	438.9	441.0	2.1	443.3	2.3
1084	5350.00	1650.00	439.0	441.2	2.3	443.4	2.2
1085	5350.00	1700.00	438.9	441.2	2.2	443.2	2.1
1086	5350.00	1750.00	439.0	441.2	2.2	443.2	2.1
1087	5350.00	1800.00	439.4	441.6	2.2	444.9	3.3
1088	5350.00	1850.00	453.4	455.5	2.1	458.1	2.6
1089	5300.00	1400.00	455.1	457.1	2.0	459.9	2.7
1090	5300.00	1450.00	446.0	448.2	2.2	451.4	3.3
1091	5300.00	1500.00	439.0	441.2	2.2	443.4	2.2
1092	5300.00	1550.00	439.0	441.0	2.1	443.7	2.7
1093	5300.00	1600.00	439.0	441.1	2.2	444.3	3.2
1094	5300.00	1650.00	439.0	441.1	2.1	443.6	2.5
1095	5300.00	1700.00	439.0	441.2	2.2	444.0	2.8
1096	5300.00	1750.00	438.9	441.1	2.2	443.8	2.8
1097	5300.00	1800.00	438.9	441.0	2.2	443.3	2.3
1098	5300.00	1850.00	444.2	446.4	2.1	449.7	3.3
1099	5300.00	1900.00	458.2	460.4	2.2	462.7	2.3
1100	5250.00	1350.00	450.3	452.4	2.1	455.0	2.6
1101	5250.00	1400.00	441.2	443.5	2.3	446.7	3.3
1102	5250.00	1450.00	439.0	441.2	2.3	443.4	2.2
1103	5250.00	1500.00	439.0	441.2	2.2	443.6	2.4
1104	5250.00	1550.00	438.9	441.1	2.2	443.9	2.8
1105	5250.00	1600.00	444.4	446.8	2.4	450.7	3.9
1107	5250.00	1700.00	441.8	444.0	2.2	447.3	3.3
1108	5250.00	1750.00	439.0	441.1	2.1	443.3	2.2
1109	5250.00	1800.00	439.0	441.1	2.1	444.1	3.0
1110	5250.00	1850.00	438.9	441.1	2.2	443.2	2.1
1111	5250.00	1900.00	449.1	451.2	2.1	454.3	3.0
1112	5200.00	1350.00	447.5	449.7	2.2	452.9	3.2
1113	5200.00	1400.00	439.0	441.1	2.1	443.2	2.1
1114	5200.00	1450.00	438.9	441.0	2.1	443.5	2.5
1115	5200.00	1500.00	439.0	441.0	2.1	443.8	2.8
1116	5200.00	1550.00	439.0	441.2	2.2	443.6	2.5
1117	5200.00	1600.00	453.7	456.0	2.3	458.0	2.0
1118	5200.00	1650.00	461.9	464.0	2.1	464.1	0.1
1119	5200.00	1700.00	449.9	452.1	2.2	455.2	3.1
1120	5200.00	1750.00	438.9	441.1	2.1	443.2	2.2
1121	5200.00	1800.00	439.0	441.1	2.2	443.3	2.2
1122	5200.00	1850.00	438.9	441.1	2.2	443.6	2.5

POINT No.	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	CERT THICK
1123	5200.00	1900.00	439.9	442.0	2.1	445.7	3.7
1124	5200.00	1950.00	453.9	456.1	2.2	459.0	2.9
1125	5150.00	1350.00	456.6	458.9	2.3	461.4	2.5
1126	5150.00	1400.00	442.7	444.9	2.2	448.1	3.2
1127	5150.00	1450.00	438.9	441.1	2.1	443.3	2.2
1128	5150.00	1500.00	439.0	441.0	2.1	443.6	2.6
1129	5150.00	1550.00	439.0	441.1	2.1	443.6	2.5
1131	5150.00	1650.00	458.3	460.5	2.2	463.5	3.0
1132	5150.00	1700.00	455.5	457.6	2.1	460.5	2.9
1133	5150.00	1750.00	441.5	443.6	2.1	447.4	3.8
1134	5150.00	1800.00	438.9	441.2	2.2	443.4	2.3
1135	5150.00	1850.00	438.9	441.1	2.2	443.9	2.8
1136	5150.00	1900.00	438.9	441.0	2.1	443.3	2.3
1137	5150.00	1950.00	444.8	447.0	2.2	450.4	3.4
1138	5150.00	2000.00	458.7	460.7	2.0	463.5	2.7
1139	5100.00	1400.00	451.8	454.0	2.1	456.7	2.8
1140	5100.00	1450.00	439.0	441.2	2.2	443.8	2.7
1141	5100.00	1500.00	438.9	441.1	2.1	443.2	2.1
1142	5100.00	1550.00	439.0	441.1	2.1	444.1	3.0
1143	5100.00	1600.00	438.9	441.1	2.2	443.3	2.2
1144	5100.00	1650.00	448.4	450.7	2.3	454.6	3.9
1145	5100.00	1700.00	462.0	464.1	2.1	464.1	0.0
1146	5100.00	1750.00	450.6	452.8	2.1	456.2	3.4
1147	5100.00	1800.00	439.0	441.2	2.2	443.4	2.2
1148	5100.00	1850.00	438.9	441.1	2.1	443.1	2.1
1149	5100.00	1900.00	439.0	441.1	2.1	444.1	3.1
1150	5100.00	1950.00	438.9	441.1	2.1	443.3	2.2
1151	5100.00	2000.00	449.6	451.9	2.2	455.2	3.3
1152	5050.00	1400.00	460.9	463.0	2.1	464.1	1.1
1153	5050.00	1450.00	447.0	449.2	2.2	452.0	2.9
1154	5050.00	1500.00	439.0	441.2	2.3	443.4	2.2
1155	5050.00	1550.00	439.0	441.2	2.2	443.3	2.1
1156	5050.00	1600.00	439.0	441.1	2.1	444.0	2.9
1157	5050.00	1650.00	439.3	441.6	2.3	446.2	4.5
1158	5050.00	1700.00	453.2	455.4	2.2	459.1	3.6
1159	5050.00	1750.00	459.7	461.8	2.1	464.0	2.2
1160	5050.00	1800.00	445.8	448.0	2.2	451.8	3.8
1161	5050.00	1850.00	439.0	441.0	2.1	443.2	2.2
1162	5050.00	1900.00	439.0	441.1	2.1	443.5	2.4
1163	5050.00	1950.00	439.0	441.1	2.1	443.6	2.6
1164	5050.00	2000.00	440.7	442.8	2.1	447.0	4.2
1165	5050.00	2050.00	455.6	457.7	2.1	460.6	3.0
1166	5000.00	1450.00	456.1	458.3	2.2	460.5	2.3
1167	5000.00	1500.00	442.2	444.3	2.2	447.4	3.0
1168	5000.00	1550.00	439.0	441.1	2.1	443.5	2.3
1169	5000.00	1600.00	438.9	441.2	2.3	443.7	2.5
1170	5000.00	1650.00	438.9	441.1	2.1	443.4	2.3
1171	5000.00	1700.00	444.1	446.3	2.2	450.8	4.5
1172	5000.00	1750.00	457.9	460.4	2.4	462.5	2.2
1173	5000.00	1800.00	454.9	457.1	2.2	460.0	2.9
1174	5000.00	1850.00	441.0	443.2	2.2	447.1	4.0
1175	5000.00	1900.00	439.0	441.1	2.2	443.4	2.3
1176	5000.00	1950.00	439.0	441.0	2.0	444.0	3.0
1177	5000.00	2000.00	438.9	441.0	2.1	443.3	2.3
1178	5000.00	2050.00	449.6	451.8	2.2	455.3	3.4
1179	4950.00	1500.00	451.3	453.6	2.3	455.9	2.3
1180	4950.00	1550.00	439.0	441.2	2.2	443.2	2.1
1181	4950.00	1600.00	439.0	441.1	2.1	443.1	2.0
1182	4950.00	1650.00	438.9	441.1	2.2	444.0	2.8
1183	4950.00	1700.00	439.0	441.1	2.1	443.3	2.2
1184	4950.00	1750.00	448.9	451.1	2.2	455.1	3.9
1185	4950.00	1800.00	461.9	464.0	2.1	464.1	0.1
1186	4950.00	1850.00	450.1	452.2	2.1	455.5	3.3
1187	4950.00	1900.00	439.0	441.1	2.2	443.3	2.2
1188	4950.00	1950.00	438.9	441.1	2.1	444.2	3.1
1189	4950.00	2000.00	438.9	441.1	2.2	443.3	2.2
1190	4950.00	2050.00	446.5	448.7	2.2	452.1	3.4
1191	5300.00	1488.75	439.0	441.1	2.2	445.0	3.9
1192	4900.00	1550.00	446.1	448.5	2.5	450.9	2.4
1193	4900.00	1600.00	438.9	441.2	2.2	443.2	2.0
1194	4900.00	1650.00	439.0	441.2	2.2	443.4	2.2
1195	4900.00	1700.00	438.9	441.1	2.2	443.1	2.0
1196	4900.00	1750.00	439.9	442.1	2.2	446.4	4.3
1197	4900.00	1800.00	453.7	455.9	2.2	459.5	3.5
1198	4900.00	1850.00	459.2	461.3	2.1	463.9	2.5
1199	4900.00	1900.00	445.3	447.5	2.2	451.0	3.6
1200	4900.00	1950.00	438.9	441.0	2.1	443.5	2.5
1201	4900.00	2000.00	439.0	441.2	2.2	443.8	2.6
1202	4900.00	2050.00	446.5	448.6	2.1	452.0	3.4
1203	4850.00	1550.00	450.7	453.1	2.3	455.5	2.4
1204	4850.00	1600.00	439.0	441.2	2.2	443.4	2.1
1205	4850.00	1650.00	439.0	441.2	2.2	443.3	2.1
1206	4850.00	1700.00	439.0	441.2	2.2	443.9	2.8
1207	4850.00	1750.00	439.0	441.2	2.2	443.4	2.3
1208	4850.00	1800.00	444.6	446.9	2.3	450.8	4.0
1209	4850.00	1850.00	458.6	460.8	2.3	463.9	3.1
1210	4850.00	1900.00	454.3	456.6	2.3	459.6	3.0
1211	4850.00	1950.00	440.4	442.7	2.3	446.4	3.7
1212	4850.00	2000.00	439.0	441.1	2.1	443.2	2.1
1213	4850.00	2050.00	449.5	451.6	2.2	454.3	2.7
1214	4800.00	1550.00	448.3	450.5	2.2	453.3	2.8
1215	4800.00	1600.00	438.9	441.2	2.3	443.3	2.1
1216	4800.00	1650.00	439.0	441.2	2.2	443.3	2.1
1217	4800.00	1700.00	438.9	441.2	2.3	443.9	2.7
1218	4800.00	1750.00	438.9	441.1	2.2	443.3	2.1
1219	4800.00	1800.00	438.9	441.2	2.3	443.3	2.1
1220	4800.00	1850.00	449.4	451.6	2.2	455.3	3.7
1221	4800.00	1900.00	461.9	464.1	2.2	464.1	0.0
1222	4800.00	1950.00	449.4	451.8	2.3	454.7	2.9
1223	4800.00	2000.00	439.9	442.0	2.1	446.0	4.0
1224	4800.00	2050.00	455.1	457.3	2.2	459.5	2.3
1225	4750.00	1500.00	456.8	458.9	2.1	461.0	2.0
1226	4750.00	1550.00	441.6	443.9	2.2	446.8	2.9
1227	4750.00	1600.00	439.0	441.2	2.2	443.3	2.1
1228	4750.00	1650.00	439.0	441.2	2.2	443.3	2.1
1229	4750.00	1700.00	439.0	441.2	2.2	443.9	2.6
1230	4750.00	1750.00	438.9	441.1	2.2	443.3	2.2
1231	4750.00	1800.00	438.9	441.1	2.1	443.4	2.3
1232	4750.00	1850.00	440.4	442.5	2.1	446.7	4.1
1233	4750.00	1900.00	454.3	456.5	2.2	459.7	3.1
1234	4750.00	1950.00	458.6	460.9	2.2	463.5	2.6
1235	4750.00	2000.00	447.6	449.8	2.2	455.2	5.4
1236	4700.00	1500.00	450.1	452.2	2.1	454.8	2.6
1237	4700.00	1550.00	439.0	441.2	2.3	443.3	2.1
1238	4700.00	1600.00	438.9	441.2	2.3	443.3	2.1
1239	4700.00	1650.00	438.9	441.2	2.3	443.4	2.2
1240	4700.00	1700.00	439.0	441.2	2.2	444.1	2.9
1241	4700.00	1750.00	439.0	441.2	2.2	443.3	2.1
1242	4700.00	1800.00	439.0	441.1	2.1	443.4	2.3
1243	4700.00	1850.00	439.0	441.1	2.1	443.5	2.4
1244	4700.00	1900.00	445.2	447.5	2.3	451.2	3.7
1245	4700.00	1950.00	459.1	461.4	2.3	463.9	2.6

POINT No.	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	CERT THICK
1246	4700.00	2000.00	457.4	459.7	2.3	463.3	3.6
1247	4650.00	1450.00	458.5	460.7	2.3	462.8	2.0
1248	4650.00	1500.00	443.3	445.5	2.2	448.4	2.9
1249	4650.00	1550.00	439.0	441.2	2.2	443.3	2.2
1250	4650.00	1600.00	439.0	441.1	2.2	443.1	2.0
1251	4650.00	1650.00	439.0	441.1	2.1	443.3	2.2
1252	4650.00	1700.00	438.9	441.1	2.2	443.8	2.7
1253	4650.00	1750.00	439.0	441.1	2.1	443.4	2.3
1254	4650.00	1800.00	439.0	441.1	2.2	443.2	2.1
1255	4650.00	1850.00	439.0	441.2	2.2	443.2	2.1
1256	4650.00	1900.00	438.9	441.1	2.2	443.6	2.4
1257	4650.00	1950.00	450.0	452.2	2.2	455.9	3.7
1258	4600.00	1450.00	451.7	453.9	2.2	456.0	2.1
1259	4600.00	1500.00	439.0	441.2	2.2	444.9	3.7
1260	4600.00	1550.00	439.0	441.1	2.1	443.3	2.2
1261	4600.00	1600.00	438.9	441.1	2.2	443.3	2.2
1262	4600.00	1650.00	438.9	441.0	2.1	443.1	2.1
1263	4600.00	1700.00	439.0	441.1	2.1	443.4	2.3
1264	4600.00	1750.00	439.0	441.2	2.2	443.2	2.0
1265	4600.00	1800.00	439.0	441.1	2.2	443.2	2.1
1266	4600.00	1850.00	439.0	441.2	2.2	443.3	2.1
1267	4600.00	1900.00	439.0	441.1	2.1	443.2	2.1
1268	4600.00	1950.00	451.6	453.8	2.2	456.2	2.4
1269	4550.00	1400.00	460.0	462.2	2.3	464.1	1.9
1270	4550.00	1450.00	446.1	448.4	2.3	451.5	3.1
1271	4550.00	1500.00	438.9	441.2	2.3	443.5	2.2
1272	4550.00	1550.00	438.9	441.1	2.1	443.1	2.1
1273	4550.00	1600.00	439.0	441.2	2.2	443.2	2.0
1274	4550.00	1650.00	439.0	441.1	2.1	443.4	2.3
1275	4550.00	1700.00	439.0	441.2	2.2	443.2	2.0
1276	4550.00	1750.00	438.9	441.1	2.2	443.2	2.1
1277	4550.00	1800.00	439.0	441.1	2.1	443.4	2.3
1278	4550.00	1850.00	439.0	441.1	2.1	443.6	2.4
1279	4550.00	1899.14	442.9	445.3	2.3	448.5	3.3
1280	4550.00	1950.00	458.4	460.5	2.2	462.6	2.1
1281	4500.00	1400.00	453.4	455.7	2.3	458.6	2.9
1282	4500.00	1450.32	443.0	445.4	2.4	448.3	2.9
1283	4500.00	1500.00	439.0	441.2	2.2	443.5	2.3
1284	4500.00	1550.00	439.0	441.1	2.1	443.3	2.2
1285	4500.00	1600.00	439.0	441.1	2.1	444.5	3.4
1286	4500.00	1650.00	438.9	441.1	2.2	443.8	2.7
1287	4500.00	1700.00	438.9	441.1	2.1	443.2	2.1
1288	4500.00	1750.00	438.9	441.2	2.2	443.3	2.1
1289	4500.00	1800.00	438.9	441.1	2.2	443.3	2.1
1290	4500.00	1850.00	439.0	441.1	2.1	443.1	2.0
1291	4500.00	1900.00	449.9	452.2	2.2	455.0	2.8
1292	4450.00	1400.00	451.4	453.6	2.2	456.2	2.7
1293	4450.00	1450.00	438.9	441.1	2.2	451.6	10.5
1294	4450.00	1500.00	439.0	441.2	2.2	452.3	11.1
1295	4450.00	1550.00	438.9	441.1	2.2	450.2	9.0
1296	4450.00	1600.00	439.0	441.1	2.1	445.1	4.1
1297	4450.00	1650.00	438.9	441.2	2.2	443.3	2.1
1298	4450.00	1700.00	439.0	441.1	2.1	443.1	2.1
1299	4450.00	1750.00	439.0	441.1	2.2	443.2	2.1
1300	4450.00	1800.00	439.0	441.1	2.1	443.1	2.0
1301	4450.00	1850.00	441.5	443.8	2.2	446.8	3.1
1302	4450.00	1900.00	456.7	458.9	2.2	461.2	2.3
1303	5350.00	1565.19	439.0	441.1	2.2	444.8	3.7
1304	4400.00	1400.00	444.6	446.9	2.2	461.6	14.8
1305	4400.00	1450.00	439.0	441.2	2.2	457.8	16.6
1306	4400.00	1500.00	439.0	441.1	2.2	451.7	10.6
1307	4400.00	1550.00	439.0	441.2	2.1	444.4	3.3
1308	4400.00	1600.00	439.0	441.2	2.2	443.5	2.3
1309	4400.00	1650.00	438.9	441.1	2.2	443.2	2.1
1310	4400.00	1700.00	439.0	441.1	2.1	443.2	2.1
1311	4400.00	1750.00	438.9	441.0	2.1	443.3	2.3
1312	4400.00	1800.00	439.0	441.0	2.0	443.4	2.4
1313	4400.00	1850.00	448.2	450.5	2.3	453.1	2.6
1314	5400.00	1641.64	439.0	441.1	2.2	444.9	3.8
1315	4350.00	1400.00	448.4	450.7	2.3	459.7	9.0
1316	4350.00	1450.00	441.7	443.9	2.2	449.8	5.9
1317	4350.00	1500.00	439.0	441.2	2.2	443.3	2.1
1318	4350.00	1550.00	438.9	441.1	2.1	443.5	2.5
1319	4350.00	1600.00	438.9	441.2	2.3	443.3	2.1
1320	4350.00	1650.00	439.0	441.1	2.2	443.2	2.1
1321	4350.00	1700.00	439.0	441.2	2.2	443.5	2.4
1322	4350.00	1750.00	439.0	441.0	2.1	443.2	2.2
1323	4350.00	1800.00	439.8	442.1	2.3	445.6	3.5
1324	4350.00	1849.69	454.9	457.1	2.2	459.4	2.3
1325	4300.00	1450.00	456.8	459.1	2.2	461.4	2.4
1326	4300.00	1500.00	450.1	452.3	2.2	455.0	2.8
1327	4300.00	1550.00	443.3	445.6	2.3	448.8	3.3
1328	4300.00	1600.00	439.0	441.2	2.3	443.3	2.1
1329	4300.00	1650.00	439.0	441.1	2.1	443.3	2.2
1330	4300.00	1700.00	439.0	441.2	2.2	443.2	2.1
1331	4300.00	1750.00	439.0	441.2	2.2	443.3	2.1
1332	4300.00	1800.00	446.5	448.8	2.3	451.5	2.8
1333	4250.00	1550.00	458.6	460.8	2.2	463.2	2.4
1334	4250.00	1600.00	451.8	454.0	2.2	456.1	2.1
1337	4250.00	1650.00	445.1	447.4	2.3	450.4	3.0
1338	4250.00	1700.00	439.0	441.2	2.3	444.0	2.7
1339	4250.00	1750.00	439.0	441.2	2.2	444.4	3.2
1340	4250.00	1800.00	453.3	455.6	2.3	458.1	2.5
1342	4200.00	1700.00	453.5	455.7	2.2	458.0	2.3
1343	4200.00	1750.00	448.8	451.0	2.2	454.1	3.1
1345	5456.72	1728.35	438.9	441.1	2.2	445.1	4.0
1346	5450.00	1732.75	438.9	441.1	2.2	444.4	3.3
1347	5400.00	1765.45	438.9	441.2	2.3	444.1	3.0
1348	5350.00	1798.16	438.9	441.1	2.2	444.5	3.3
1349	5300.00	1830.86	438.9	441.1	2.2	444.7	3.6
1350	5250.00	1863.57	438.9	441.1	2.2	444.6	3.5
1351	5200.00	1896.27	438.9	441.2	2.3	444.9	3.8
1352	5150.00	1928.97	438.9	441.1	2.2	445.0	3.9
1353	5100.00	1961.68	438.9	441.1	2.2	445.1	4.0
1354	5050.00	1994.08	439.0	441.2	2.2	445.2	4.0
1355	5000.00	2016.61	439.0	441.2	2.2	445.1	3.9
1356	4950.00	2027.23	439.0	441.2	2.2	445.0	3.8
1357	4900.00	2027.50	439.1	441.2	2.1	445.4	4.2
1358	4850.00	2017.43	439.4	441.6	2.2	445.0	3.5
1359	4791.92	1993.47	439.0	441.1	2.1	446.0	4.9
1360	4800.00	1988.18	438.9	441.1	2.2	445.4	4.3
1361	4850.00	1955.48	438.9	441.1	2.2	445.1	4.1
1362	4900.00	1922.77	438.9	441.0	2.1	445.2	4.1
1363	4950.00	1890.07	438.9	441.1	2.2	445.3	4.2
1364	5000.00	1857.37	438.9	441.1	2.1	445.3	4.2
1365	5050.00	1824.66	438.9	441.1	2.2	445.2	4.1
1366	5100.00	1791.96	439.0	441.1	2.2	445.0	3.9
1367	5150.00	1759.26	438.9	441.1	2.2	445.2	4.1
1368	5188.63	1733.99	439.0	441.1	2.1	445.4	4.3
1369	5200.00	1733.65	439.0	441.1	2.2	444.9	3.8
1370	5250.00	1712.52	438.9	441.2	2.3	445.0	3.9
1371	5281.40	1650.00	439.0	441.1	2.1	445.8	4.7

POINT No.	NORTHING	EASTING	CERT SG	CERT CLAY	CLAY THICK	CERT COVER	CERT THICK
1371	5281.40	1650.00	439.0	441.1	2.1	445.8	4.7
1372	5270.09	1600.00	439.0	441.1	2.2	446.3	5.2
1373	5250.00	1575.56	439.0	441.1	2.1	445.3	4.2
1374	5200.00	1554.43	438.9	441.1	2.1	444.5	3.4
1375	5150.00	1564.23	438.9	441.1	2.2	443.8	2.7
1376	5113.11	1600.00	438.9	441.1	2.2	445.7	4.6
1377	5108.00	1610.72	438.9	441.1	2.2	445.9	4.9
1378	5100.00	1615.95	438.9	441.1	2.2	445.8	4.7
1379	5050.00	1648.65	438.9	441.2	2.3	445.6	4.5
1380	5000.00	1681.36	438.9	441.1	2.2	445.6	4.5
1381	4950.00	1714.06	438.9	441.1	2.2	445.7	4.6
1382	4900.00	1746.77	438.9	441.1	2.2	445.8	4.7
1383	4850.00	1779.47	438.9	441.1	2.2	445.9	4.8
1384	4800.00	1812.17	438.9	441.1	2.2	445.4	4.3
1385	4750.00	1844.88	438.9	441.1	2.2	445.4	4.3
1386	4700.00	1877.58	438.9	441.1	2.2	445.1	4.0
1387	4650.00	1910.28	438.9	441.1	2.2	445.2	4.1
1388	4631.66	1922.28	438.9	441.2	2.3	447.6	6.5
1389	4600.00	1908.22	438.9	441.1	2.2	443.2	2.1
1390	4550.00	1886.01	438.9	441.1	2.2	444.7	3.6
1391	4500.00	1863.80	438.9	441.1	2.2	444.7	3.6
1392	4450.00	1841.59	438.9	441.1	2.2	444.4	3.4
1393	4400.00	1819.38	438.9	441.1	2.2	444.6	3.5
1394	4350.00	1797.17	438.9	441.1	2.2	444.8	3.6
1395	4300.00	1774.96	438.9	441.1	2.1	444.3	3.2
1396	4250.00	1752.75	438.9	441.1	2.2	444.7	3.6
1397	4228.74	1743.30	438.9	441.2	2.2	445.5	4.4
1398	4250.00	1695.44	438.9	441.1	2.1	444.6	3.5
1399	4270.18	1650.00	438.9	441.1	2.2	444.6	3.4
1400	4292.39	1600.00	438.9	441.1	2.1	445.0	3.9
1401	4314.60	1550.00	438.9	441.1	2.1	444.8	3.7
1402	4336.81	1500.00	438.9	441.1	2.2	445.0	3.8
1403	4359.02	1450.00	438.9	441.1	2.2	451.6	10.4
1404	4377.31	1408.84	438.9	441.1	2.1	461.5	20.5
1405	4400.00	1418.92	438.9	441.1	2.2	461.0	19.9
1406	4450.00	1441.13	438.9	441.2	2.2	451.3	10.1
1407	4500.00	1463.34	438.9	441.1	2.1	444.4	3.4
1408	4550.00	1485.55	438.9	441.1	2.2	444.3	3.1
1409	4595.26	1505.66	438.9	441.1	2.1	444.5	3.4
1410	4605.18	1494.40	438.9	441.0	2.1	445.2	4.1
1411	4650.00	1514.31	438.9	441.1	2.2	444.3	3.2
1412	4700.00	1536.53	438.9	441.1	2.2	444.4	3.2
1413	4750.00	1558.74	438.9	441.1	2.1	444.8	3.7
1414	4800.00	1579.86	438.9	441.1	2.2	444.1	3.0
1415	4850.00	1586.17	438.9	441.2	2.2	444.4	3.3
1416	4900.00	1574.53	438.9	441.1	2.1	444.0	2.9
1417	4950.00	1544.36	438.9	441.1	2.2	444.3	3.1
1418	5000.00	1511.66	438.9	441.1	2.1	444.4	3.4
1419	5050.00	1478.95	438.9	441.1	2.1	444.5	3.5
1420	5100.00	1446.25	438.9	441.1	2.2	444.6	3.5
1421	5150.00	1413.55	438.9	441.1	2.2	444.6	3.5
1422	5200.00	1380.84	438.9	441.1	2.2	444.9	3.9
1423	4532.15	1450.00	447.3	449.5	2.2	451.6	2.1
1424	4554.83	1450.00	445.5	447.8	2.3	451.4	3.6
1425	4475.46	1400.00	454.8	457.0	2.2	459.1	2.1
1426	4498.13	1400.00	453.2	455.4	2.3	458.6	3.1
1427	4437.89	1366.61	459.9	462.0	2.1	464.1	2.1
1428	4447.68	1355.51	459.9	462.1	2.2	465.3	3.2
1429	4689.42	1977.67	461.9	464.1	2.2	464.1	0.0
1430	4669.61	1980.30	462.0	464.1	2.1	464.1	0.0
1431	4715.93	1950.00	461.9	464.1	2.2	464.1	0.0
1432	4731.73	1950.00	461.9	464.1	2.2	464.1	0.0
1433	4792.37	1900.00	461.9	464.2	2.3	464.2	0.2
1434	4808.17	1900.00	461.9	464.1	2.2	464.1	0.0
1435	4868.81	1850.00	462.0	464.2	2.2	464.2	0.0
1436	4884.62	1850.00	461.9	464.0	2.1	464.1	0.1
1437	4945.26	1800.00	461.9	464.1	2.2	464.1	0.0
1438	4961.06	1800.00	461.9	464.1	2.2	464.1	0.0
1439	5021.70	1750.00	461.9	464.2	2.3	464.2	0.0
1440	5037.50	1750.00	461.9	464.1	2.2	464.1	0.0
1441	5098.15	1700.00	461.9	464.0	2.1	464.1	0.1
1442	5113.95	1700.00	461.9	464.1	2.2	464.1	0.0
1443	5150.00	1665.87	462.0	464.0	2.1	464.1	0.1
1444	5150.00	1676.42	461.9	464.0	2.1	464.1	0.1
1445	5172.40	1636.39	461.9	464.1	2.2	464.1	0.0
1446	5200.00	1625.15	461.9	464.1	2.2	464.1	0.0
1447	5208.90	1632.72	461.9	464.1	2.2	464.1	0.0
1448	5211.40	1650.00	461.9	464.1	2.2	464.1	0.0
1449	5200.00	1662.93	461.9	464.2	2.3	464.2	0.0
1450	5190.92	1664.71	461.9	464.1	2.2	464.1	0.0
1451	5169.93	1667.24	461.9	464.1	2.2	464.1	0.0
1452	5161.67	1654.60	461.9	464.1	2.2	464.1	0.0

NO. | REVISIONS | BY | DATE

PROJECT: GOLDER ASSOCIATES
OAK GROVE FGD POND C
JOB NUMBER: 35813-09
DATE: AUGUST 18, 2016
SCALE: 1"=50'
SURVEYOR: S.K.W.
TECHNICIAN: W.G.H.
DRAWING: 35813 FGD POND C.DWG
FIELDNOTES: N/A
PARTYCHIEF: J.SANDOVAL
FIELDBOOKS: 9999

SAM®
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SUBGRADE AND CLAY LINER ELEVATIONS
AS OF SEPTEMBER 29, 2015
FGD POND C
OAK GROVE POWER PLANT
ROBERTSON COUNTY, TEXAS

SHEET 2 OF 2

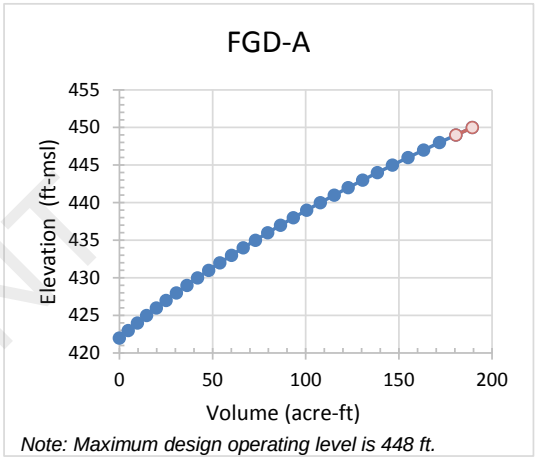
DWG. NO.:35813-09

ATTACHMENT 2
AREA CAPACITY CURVES

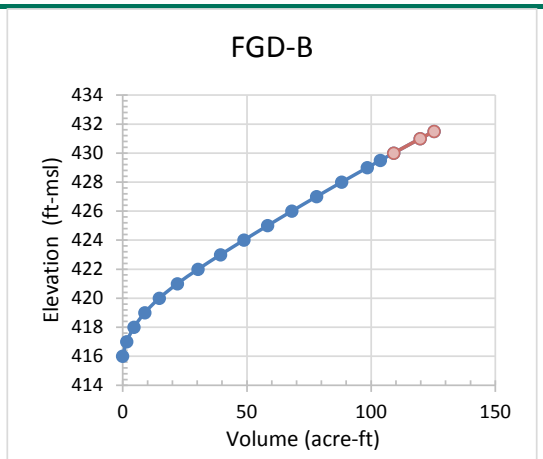
CALCULATION

Date:	July 5, 2016	**Made by:**	AGM
Project No.:	1648164	**Checked by:**	VK
Subject:	FGD-A, FGD-B, FGD-C Area Capacity Curves	**Reviewed by:**	JBF
Project Short Title:	Luminant CCR Support		

	Stage (ft)	Elevation (ft-msl)	Area (ft^2)	Incremental Volume (acre-ft)	Cumulative Volume (acre-ft)	Area Capacity Curve
FGD-A	1	422	203733	0.0	0	
	2	423	209,836	4.7	5	
	3	424	215,986	4.9	10	
	4	425	222,184	5.0	15	
	5	426	228,431	5.2	20	
	6	427	234,727	5.3	25	
	7	428	241,063	5.5	31	
	8	429	247,456	5.6	36	
	9	430	253,888	5.8	42	
	10	431	260,372	5.9	48	
	11	432	266,886	6.1	54	
	12	433	273,441	6.2	60	
	13	434	280,042	6.4	66	
	14	435	286,685	6.5	73	
	15	436	293,375	6.7	80	
	16	437	300,109	6.8	86	
	17	438	306,888	7.0	93	
	18	439	313,712	7.1	101	
	19	440	320,580	7.3	108	
	20	441	327,492	7.4	115	
	21	442	334,451	7.6	123	
	22	443	341,453	7.8	131	
	23	444	348,499	7.9	139	
	24	445	355,584	8.1	147	
	25	446	362,726	8.2	155	
	26	447	369,907	8.4	163	
	27	448	377,132	8.6	172	
	28	*449*	*384,402*	*8.7*	*181*	
	29	*450*	*391,789*	*8.9*	*190*	
FGD-B	1	416	39958	0	0	
	2	417	98233	2	2	
	3	418	158638	3	5	
	4	419	220911	4	9	
	5	420	285836	6	15	
	6	421	347894	7	22	
	7	422	383271	8	30	
	8	423	403466	9	39	
	9	424	411926	9	49	
	10	425	420443	10	58	
	11	426	429015	10	68	
	12	427	437649	10	78	
	13	428	446337	10	88	
	14	429	455083	10	99	
	14.5	429.5	459629	5	104	
	15	*430*	*463,885*	*5.3*	*109*	
	16	*431*	*472,743*	*10.8*	*120*	
	16.5	*431.5*	*486,669*	*5.5*	*125*	



Note: Maximum design operating level is 448 ft.

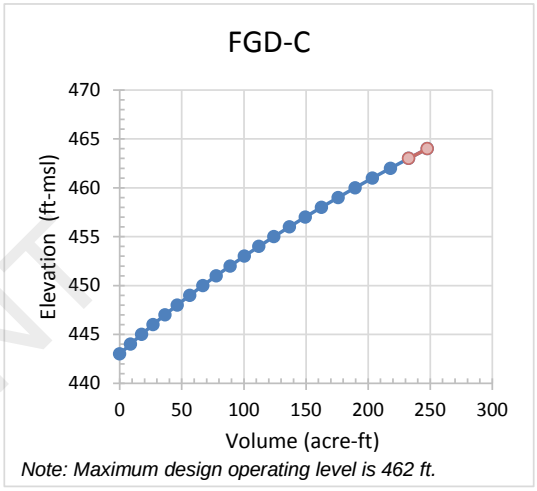


Note: Maximum design operating level is 429.5 ft.

CALCULATION

Date:	July 5, 2016	**Made by:**	AGM
Project No.:	1648164	**Checked by:**	VK
Subject:	FGD-A, FGD-B, FGD-C Area Capacity Curves	**Reviewed by:**	JBF
Project Short Title:	Luminant CCR Support		

	Stage (ft)	Elevation (ft-msl)	Area (ft^2)	Incremental Volume (acre-ft)	Cumulative Volume (acre-ft)	Area Capacity Curve
FGD-C	1	443	369,540	0	0	
	2	444	382,825	9	9	
	3	445	396,177	9	18	
	4	446	409,600	9	27	
	5	447	423,093	10	36	
	6	448	436,657	10	46	
	7	449	450,291	10	56	
	8	450	463,995	10	67	
	9	451	477,769	11	78	
	10	452	491,614	11	89	
	11	453	505,529	11	100	
	12	454	519,514	12	112	
	13	455	533,570	12	124	
	14	456	547,696	12	137	
	15	457	561,892	13	149	
	16	458	576,151	13	162	
	17	459	590,467	13	176	
	18	460	604,840	14	189	
	19	461	619,269	14	204	
	20	462	633,755	14	218	
	21	*463*	*648297*	*15*	*233*	
	22	*464*	*662896*	*15*	*248*	



Note: Maximum design operating level is 462 ft.

Professional Engineering Firm
Registration Number F-2578