

**ADDENDUM NO. 2
NOVEMBER 19, 2024**

**PROJECT: FORT GRIFFIN SUD
WATER TREATMENT PLANT – EVAPORATION PONDS**

BID DATE: DECEMBER 10, 2024 AT 1:30 PM

The following changes and/or additions shall be made to the Plans, Specifications, and Contract Documents for the above referenced project. Bidder shall acknowledge receipt of this Addendum by signing below and returning this Addendum with the Bid.

- 1) The pre-bid conference will be offered through Microsoft Teams with the following link:

Meeting ID: 229 225 949 850

Passcode: hLiJP3

Dial in by phone

[+1 323-892-2486,673965020#](tel:+13238922486673965020) United States, Los Angeles

Phone conference ID: 673 965 020#

The pre-bid conference will begin at 10:00 a.m. on November 20, 2024. The agenda for the meeting is attached.

- 2) A geotechnical report for this project is attached to this addendum,
- 3) The bid opening for this contract will be moved to December 10, at 1:30 PM. The location will not change.

Bidder's Acknowledgment

Date

Prepared by:

**JACOB | MARTIN
TBPE Firm No. 2448**



INTEGRITY
EXCELLENCE
TRUST

PRE-BID MEETING

Owner: Fort Griffin SUD
Project: WTP – Evaporation Ponds
Date & Time: November 20, 2024 at 10:00 AM
Location: 1180 County Road 109, Albany, TX 76430

AGENDA

- 1) Introductions
 - a) Owner: Fort Griffin SUD
 - i) Mark Gardenhire, General Manager
 - ii) Tyler George, Field Manager
 - b) Engineer: Jacob & Martin, LLC
 - i) Derek Turner, P.E. –Design Engineer and Project Manager; adt@jacobmartin.com
 - ii) Chris Estes – Construction Manager/Inspector; cestes@jacobmartin.com
- 2) Project Description:
 - a) This project consists of constructing evaporation ponds for a proposed water treatment plant facility.
- 3) Project Schedule:
 - a) Project Bid Date – **DECEMBER 10, 2024 AT 1:30 PM – 1180 County Road 109, Albany, TX 76430**
 - b) Project Award Date – **January 9, 2025 (projected)**
 - c) Notice to Proceed Date – **March 19, 2025 (projected)**
 - d) Project Completion Time – **180 working days**
- 4) Bidding Requirements:
 - a) 5% Bid Security
 - b) “Best Value” competitive bidding method – See Invitation for Bids for criteria
- 5) Copies of Plans:
 - a) Download documents (PDF format) from the Jacob & Martin web site at no cost.
 - b) Order one set of paper copies at Jacob & Martin office, 1925 Fort Worth Highway, Weatherford, Texas 76086, PH: (817) 594-9880 for a non-refundable cost of \$100.00 (full size plans).
 - c) To be eligible to bid all Contractors must register with Jacob & Martin and purchase a set of Contract Documents.
- 6) Addendums:
 - a) Addendum No.1: Issued on November 12, 2024



3465 Curry Lane
Abilene, TX 79606
325.695.1070

908 S. Main Street, Suite 100
Boerne, TX 78006
325.695.1070

4920 S. Loop 289, Suite 104
Lubbock, TX 79414
806.368.6375

1925 Fort Worth Highway
Weatherford, TX 76086
817.594.9880

March 6, 2017



JACOB | MARTIN
1508 Santa Fe Drive, Suite 203
Weatherford, Texas 76086

Attn: Mr. Derek Turner
P: [817] 594 9880
E: adt@jacobmartin.com

Re: Geotechnical Data Report
Proposed Evaporation Ponds
County Road 306
Breckenridge, Texas
Terracon Project Number: 95175017

Dear Mr. Turner:

This data report presents the results of our borings and laboratory test results for the planned evaporation ponds in Breckenridge Texas. This study was performed in general accordance with Terracon proposal number P95175017, dated on January 31, 2017.

Site Location and Project Description

ITEM	DESCRIPTION
Location	County Road 306 and Hancock Drive in Breckenridge, Texas (See Exhibit A-1, Appendix A) (Approximate GPS coordinates: 32.77246 N, 99.01863 W)
Existing Improvements	None; vacant land
Current ground cover	Grass
Existing topography	Unknown
Evaporation Ponds	A 10-acre evaporation pond is planned on the 60-acre site. The pond will be have a depth of about 6 feet.

Field Exploration Description

Subsurface conditions were explored by drilling twelve borings to depths of about 9 to 10 feet at the approximate locations indicated on the attached Exhibit A-2. The borings were drilled on February 17, 2017. The test locations were established in the field by measuring from available reference features and estimating right angles and using a hand-held GPS unit. The boring

locations should be considered accurate only to the degree implied by the methods employed to determine them.

The borings were performed using a truck-mounted drill rig. Samples of the soil encountered in the borings were obtained using push tube samplers and split-barrel samplers. The samples were tagged for identification, sealed to reduce moisture loss, and taken to the laboratory for further examination, testing, and classification. The consistency of bedrock was evaluated by the Texas Department of Transportation (TxDOT) cone penetration test. The boreholes were backfilled with soil cuttings upon completion of drilling.

Field logs of the borings were prepared by the drill crew. These logs include visual classifications of the materials encountered as well as interpretation of the subsurface conditions between samples. The boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on visual evaluation of the samples and laboratory test results. The boring logs are presented on the attached Exhibits A-3 through A-14. General notes to log terms and symbols are presented on Exhibit A-15.

Laboratory Testing

The boring logs and samples were reviewed by a geotechnical engineer who selected soil samples for testing. Tests were performed by technicians working under the direction of the engineer. A brief description of the tests performed follows.

Liquid and plastic limit tests (ASTM D4318), material passing a #200 mesh sieve (ASTM D 1140) and moisture content measurements (ASTM D2218) were made to aid in classifying the soils in accordance with the Unified Soil Classification System (USCS). The USCS is summarized on the attached Exhibit A-16. Strength and consistency of cohesive soils was measured by hand penetrometer tests, respectively. The results of the laboratory tests are presented on the attached boring logs.

Subsurface Conditions

The subsurface conditions generally consisted of lean clays, sandy lean clays, clayey sands and sandstone. Fat clays were present in the upper 3 to 4 feet in borings B-7 and B-9 and to a depth of 8 feet in boring B-12. Details of the subsurface conditions are shown on the attached logs. Groundwater was not encountered during drilling in the borings and they remained dry at completion.

Conditions encountered at the boring locations are indicated on the boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual.

Earthwork Construction Considerations


It is anticipated that most of excavations in the overburden soils for the proposed construction can be accomplished with conventional earthmoving equipment. In some areas, excavations will encounter sandstone layers and seams. The sandstone is hard and may be difficult to excavate. Excavations extending into the sandstone may require breaker hoes, trenchers and milling machines equipped with rock teeth. Line drilling can be used to control over break at the limits of the excavation. The sandstone may be very difficult to break down.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,

Terracon Consultants, Inc.

Texas Registration #3272



Cheryl C. Pedraza, P.E.
Senior Project Manager



Tim G. Abrams., P.E.
Senior Engineer

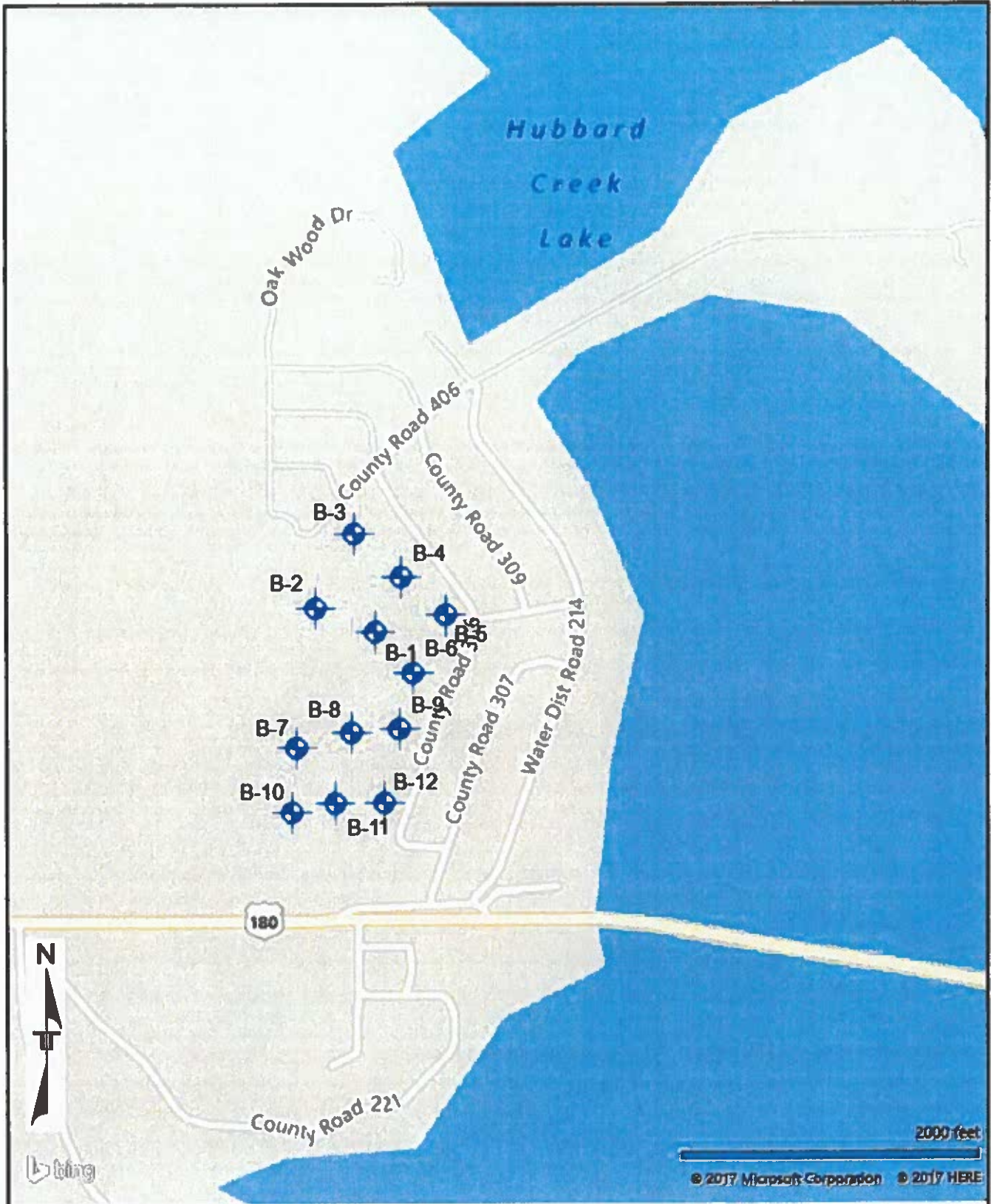


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager:	CCP	Project No.	95175017
Drawn by:	CCP	Scale:	AS SHOWN
Checked by:	TGA	File Name:	
Approved by:	TGA	Date:	3-6-17

Terracon
 2601 E Loop 820 N
 Fort Worth, TX 76118-6878

EXPLORATION PLAN

Proposed Evaporation Ponds
 County Road 306
 Breckenridge, TX

Exhibit
A-1



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager:	CCP	Project No.	95175017
Drawn by:	CCP	Scale:	AS SHOWN
Checked by:	TGA	File Name:	
Approved by:	TGA	Date:	3-6-17

Terracon
 2501 E Loop 820 N
 Fort Worth, TX 76118-0878

EXPLORATION PLAN
Proposed Evaporation Ponds County Road 306 Breckenridge, TX

Exhibit
A-2

BORING LOG NO. B-1

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77365° Longitude: -99.01784°	DEPTH (FL.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (lbf)	STRAIN (%)				
	LEAN CLAY (CL) , with sand, reddish brown, very stiff				2.5 (HP)			12		32-14-18	70	
					4.5+ (HP)							
	CLAYEY SAND (SC) , trace gravel, trace calcareous deposits, brown, dense	3.0			19-14-25 N=39			6			48	
		6.0										
	SANDY LEAN CLAY (CL) , shaley, tan, hard	7.0			16-20-50/6"			9				
	SANDSTONE , tan											
		8.9			50/5"							
	Boring Terminated at 8.9 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017.EVAPORATION PONDS.GPJ

BORING LOG NO. B-2

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77409° Longitude: -99.01915°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
4.0	LEAN CLAY (CL) , with sand and calcareous deposits, brown, hard				4.5+ (HP)				15		43-22-21	81
4.0					4.5+ (HP)	UC	13.55	7	12	122		
8.0	SANDY LEAN CLAY (CL) , trace gravel, with calcareous deposits, tan and brown, hard	5			4.5+ (HP)				9			
8.0					4.5+ (HP)				9		37-15-22	60
9.5	SANDY LEAN CLAY (CL) , with sandstone seams, tan, hard				14-23-24 N=47							
Boring Terminated at 9.5 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Backfilled with auger cuttings

See Appendix C for explanation of symbols and abbreviations

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-3

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77547° Longitude: -99.0183°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
2.0	SANDY LEAN CLAY (CL) , reddish brown, very stiff				2.75 (HP)				18			
3.0	SANDSTONE , tan			X	50/6"							
5.0	LEAN CLAY (CL) , shaley, with sand, tan and gray, hard				4.5+ (HP)				8	44-18-26	72	
6.0	SANDY LEAN CLAY (CL) , shaley, tan	5		X	17-20-50/4"							
9.6	SANDSTONE , tan			X	50/5"							
	Boring Terminated at 9.6 Feet			X	28-50/1"							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Backfilled with auger cuttings

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



2501 E Loop 820 N
Fort Worth, TX

Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-4

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77467° Longitude: -99.01727°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	6.0	5			2.0 (HP)			16				
	8.0	5			4.5+ (HP)	UC	17.90	9	17	113		
	10.0	5			4.5+ (HP)							
	6.0	5			4.5+ (HP)				13	52-18-34	91	
	8.0	5			4.5+ (HP)				11			
10.0		10			<i>Boring Terminated at 10 Feet</i>							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

<p>Advancement Method: Dry Auger</p>	<p>See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.</p>	<p>Notes:</p>
<p>Abandonment Method: Backfilled with auger cuttings</p>		
<p>WATER LEVEL OBSERVATIONS</p> <p><i>No water encountered during drilling</i></p> <p><i>Dry upon completion of drilling</i></p>	<p>2501 E Loop 820 N Fort Worth, TX</p>	<p>Boring Started: 2/17/2017</p> <p>Drill Rig:</p> <p>Project No.: 95175017</p>
		<p>Boring Completed: 2/17/2017</p> <p>Driller: StrataBore</p> <p>Exhibit: A-6</p>

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-5

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77397° Longitude: -99.01629°	DEPTH (ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	2.0	SANDY LEAN CLAY (CL) , reddish brown, very stiff			2.75 (HP)			12		28-13-15	51	
	4.0	SANDY LEAN CLAY (CL) , with gravel, reddish brown and tan, hard			4.5+ (HP)							
	5.0	POORLY GRADED SAND (SP) , poorly cemented, with clay layers, tan, dense			16-17-23 N=40			4				
	9.0	POORLY GRADED SAND (SP) , poorly cemented, with clay layers, tan, dense			17-15-24 N=39			5				52
	9.1	SANDSTONE , tan <i>Boring Terminated at 9.1 Feet</i>			50/1"							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations

Notes:

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. 95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-6

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77289° Longitude: -99.01701°	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	SANDY LEAN CLAY (CL) , reddish brown, very stiff	2.0			2.5 (HP)				19			
	CLAYEY SAND (SC) , with gravel, reddish brown and tan, hard				4.5+ (HP)							
		5.0			4.5+ (HP)			7		45-18-27	39	
					4.5+ (HP)			8				
	SANDY LEAN CLAY (CL) , tan, very stiff	9.5		X	18-13-13 N=26			6				
	Boring Terminated at 9.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Backfilled with auger cuttings

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



2501 E Loop 820 N
Fort Worth, TX

Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-7

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.7715° Longitude: -99.01957°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-P _i	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
3.0	FAT CLAY (CH) , with sand, dark brown, very stiff to hard				3.5 (HP)				16	52-21-31	80	
4.5					4.5+ (HP)							
7.0	SANDY LEAN CLAY (CL) , with sand, trace gravel, with calcareous deposits, reddish brown, very stiff				9-12-17 N=29				13			
10.0	SANDSTONE , tan				12-50				10		73	
10.0	Boring Terminated at 10 Feet				100/5"							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017.EVAPORATION PONDS.GPJ

BORING LOG NO. B-8

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77178° Longitude: -99.01836°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	PERCENT FINES
3.0	SANDY LEAN CLAY (CL) , reddish brown, hard				4.5+ (HP)							
6.0	SANDSTONE , with clay seams, tan	5		X	28-25-32 N=57			16				
10.0	LEAN CLAY (CL) , shaley, with sand, tan and gray, hard			X	12-17-21 N=38			9		35-15-20	71	
	4.5+ (HP)							6		48-21-27	88	
	Boring Terminated at 10 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_95175017_EVAPORATION PONDS.GPJ

BORING LOG NO. B-9

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77185° Longitude: -99.01731°	DEPTH (ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	PERCENT FINES
4.0	FAT CLAY (CH) , with sand and calcareous deposits, brown, stiff to hard				1.5 (HP)				21			
4.0					4.5+ (HP)				15		71-22-49	77
5.0	LEAN CLAY (CL) , with calcareous deposits, reddish brown and tan, hard				4.5+ (HP)							
5.0	LEAN CLAY (CL) , with sand and calcareous nodules and deposits, tan, hard			X	13-16-19 N=35				11		44-16-28	74
8.0	SANDY LEAN CLAY (CL) , shaley, tan, very stiff to hard				4.5+ (HP)							
8.0					4.5+ (HP)	UC	1.48	3.8	12	120		
10.0	Boring Terminated at 10 Feet	10										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



2501 E Loop 820 N
Fort Worth, TX

Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_95175017 EVAPORATION PONDS.GPJ

BORING LOG NO. B-10

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.7703° Longitude: -99.01967°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-Pi	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
3.0	LEAN CLAY (CL), with sand, reddish brown, hard				4.5+ (HP)				14		48-19-29	76
4.0	SANDY LEAN CLAY (CL), tan and orange, hard			X	4.5+ (HP)				13			
4.8	SANDSTONE, tan			X	12-27-50/4"							
	Boring Terminated at 4.75 Feet			X	100/ 25"							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Backfilled with auger cuttings

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. 95175017.EVAPORATION PONDS.GPJ

BORING LOG NO. B-11

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77047° Longitude: -99.01872°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	3.0	3.0			4.5+ (HP)			16				
	3.0	4.5			4.5+ (HP)			12			57	
	6.0	5.0	X		11-37-30 N=67					32-13-19		
	6.0	6.0	X		18-18-17 N=35							
	10.0	10.0			4.5+ (HP)			11		43-17-26	80	
Boring Terminated at 10 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Backfilled with auger cuttings

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



2501 E Loop 820 N
Fort Worth, TX

Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore

Project No.: 95175017

Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 95175017.EVAPORATION PONDS.GPJ

BORING LOG NO. B-12

PROJECT: Proposed Evaporation Ponds

CLIENT: Jacob & Martin, Ltd.
Weatherford, Texas

SITE: County Road 306
Breckenridge, Texas

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.77048° Longitude: -99.01764°	DEPTH (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	FAT CLAY (CH) , with sand, brown, medium stiff to very stiff				1.0 (HP)							
					2.5 (HP)	UC	1.54	11.1	21	109		
			5		3.5 (HP)				21		53-18-35	84
					4.0 (HP)	UC	3.35	4.5	16	118		
				4.25 (HP)				7		32-14-18	33	
		10										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Backfilled with auger cuttings

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

No water encountered during drilling
Dry upon completion of drilling



2501 E Loop 820 N
Fort Worth, TX

Boring Started: 2/17/2017

Boring Completed: 2/17/2017

Drill Rig:

Driller: StrataBore












Project No.: 95175017

Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL: 95175017.EVAPORATION PONDS.GPJ

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING			WATER LEVEL		Water Initially Encountered	FIELD TESTS	(HP) Hand Penetrometer
					Water Level After a Specified Period of Time		(T) Torvane
					Water Level After a Specified Period of Time		(b/f) Standard Penetration Test (blows per foot)
				Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.			(PID) Photo-Ionization Detector
							(OVA) Organic Vapor Analyzer
				(TCP) Texas Cone Penetrometer			

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS	RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
	Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Q_u , tsf	Standard Penetration or N-Value Blows/Ft.
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42
			Hard	> 4.00	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Soil Classification		
				Group Symbol	Group Name ^B	
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	$Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E	GW	Well-graded gravel ^F	
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GP	Poorly graded gravel ^F	
			Fines classify as CL or CH	GM	Silty gravel ^{F,G,H}	
		Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	$Cu \geq 8$ and $1 \leq Cc \leq 3$ ^E	GC	Clayey gravel ^{F,G,H}
	Sands with Fines: More than 12% fines ^D		Fines classify as ML or MH	SW	Well-graded sand ^I	
			Fines Classify as CL or CH	SP	Poorly graded sand ^I	
	Fine-Grained Soils: 50% or more passes the No. 200 sieve		Silts and Clays: Liquid limit less than 50	Inorganic:	$PI > 7$ and plots on or above "A" line ^J	SM
		$PI < 4$ or plots below "A" line ^J			SC	Clayey sand ^{G,H,I}
Organic:		Liquid limit - oven dried		< 0.75	CL	Lean clay ^{K,L,M}
		Liquid limit - not dried			ML	Silt ^{K,L,M}
Silts and Clays: Liquid limit 50 or more		Inorganic:	PI plots on or above "A" line	OL	Organic clay ^{K,L,M,N}	
			PI plots below "A" line	OH	Organic silt ^{K,L,M,O}	
		Organic:	Liquid limit - oven dried	< 0.75	CH	Fat clay ^{K,L,M}
			Liquid limit - not dried		MH	Elastic Silt ^{K,L,M}
Highly organic soils: Primarily organic matter, dark in color, and organic odor				OH	Organic clay ^{K,L,M,P}	
				PT	Organic silt ^{K,L,M,O}	
				PT	Peat	

- ^A Based on the material passing the 3-in. (75-mm) sieve
- ^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
- ^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
- ^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay
- ^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- ^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- ^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

- ^H If fines are organic, add "with organic fines" to group name.
- ^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- ^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
- ^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
- ^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.
- ^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- ^N $PI \geq 4$ and plots on or above "A" line.
- ^O $PI < 4$ or plots below "A" line.
- ^P PI plots on or above "A" line.
- ^Q PI plots below "A" line.

