Should any of the above information or assumptions be inconsistent with the planned construction, please let us know so that we may make any necessary modifications to this report.

3.0 SUBSURFACE CONDITIONS

3.1 Typical Profile

Conditions encountered at the boring locations are indicated on the boring logs. Stratification boundaries on the boring logs represent the approximate locations of changes in soil types; in-situ, the transition between materials may be gradual. Details for the boring locations can be found on the boring logs in Appendix A of this report. Based on the results of the borings, subsurface conditions at the project site can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Relative Density/ Consistency
Stratum I	4 to 8	Silty Sand; dark brown	Loose to Very Dense[2]
Stratum II	22	Silty Sand "CALICHE" or Silty Sand with Gravel "CALICHE"; reddish-brown	Very Dense[3]
Stratum III	42 to 46	Poorly Graded Sand with Silt "CALICHE"; light brown to brown and reddish-brown	Medium Dense to Very Dense[4]
Stratum IV	75[1]	Poorly Graded Sand with Silt "CALICHE"; light brown to brown	Very Dense[5]

[1]Borings were terminated within this stratum at the planned termination depth of approximately 75 feet bgs.

[2]Loose to very dense soils with standard penetration resistances (N-values) of 7 blows per foot (bpf) to more than 100 bpf were encountered in this stratum.

3Very dense soils with N-values of 50 bpf to more than 100 bpf were encountered in this stratum.

[4]Medium dense to very dense soils with N-values of 23 bpf and more than 100 bpf were encountered in this stratum.

[5]Very dense soils with N-values of 55 bpf to more than 100 bpf were encountered in this stratum.

3.2 Groundwater

The borings were advanced in the dry using hollow stem auger and air rotary drilling techniques that allow short-term groundwater observations to be made while drilling. Groundwater seepage was not observed during or at the completion of drilling.

These groundwater observations provide an indication of the groundwater conditions present at the time the borings were drilled. Groundwater conditions may be different at the time of construction because of seasonal variations in rainfall, runoff, irrigation, and other conditions not apparent at the time of drilling.

4.0 SEISMIC CONSIDERATIONS

Code Used	Site Classification
2012 International Building Code (IBC)[1]	C[2]

[1]In general accordance with the 2012 International Building Code, Section 1613.3.2

[2]The 2012 International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100 foot soil profile determination. The borings were extended to maximum depths of approximately 75 feet bgs and this seismic site class definition considers that very dense soils are below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration. Alternatively, a geophysical exploration could be utilized in order to attempt to justify a higher seismic site class.

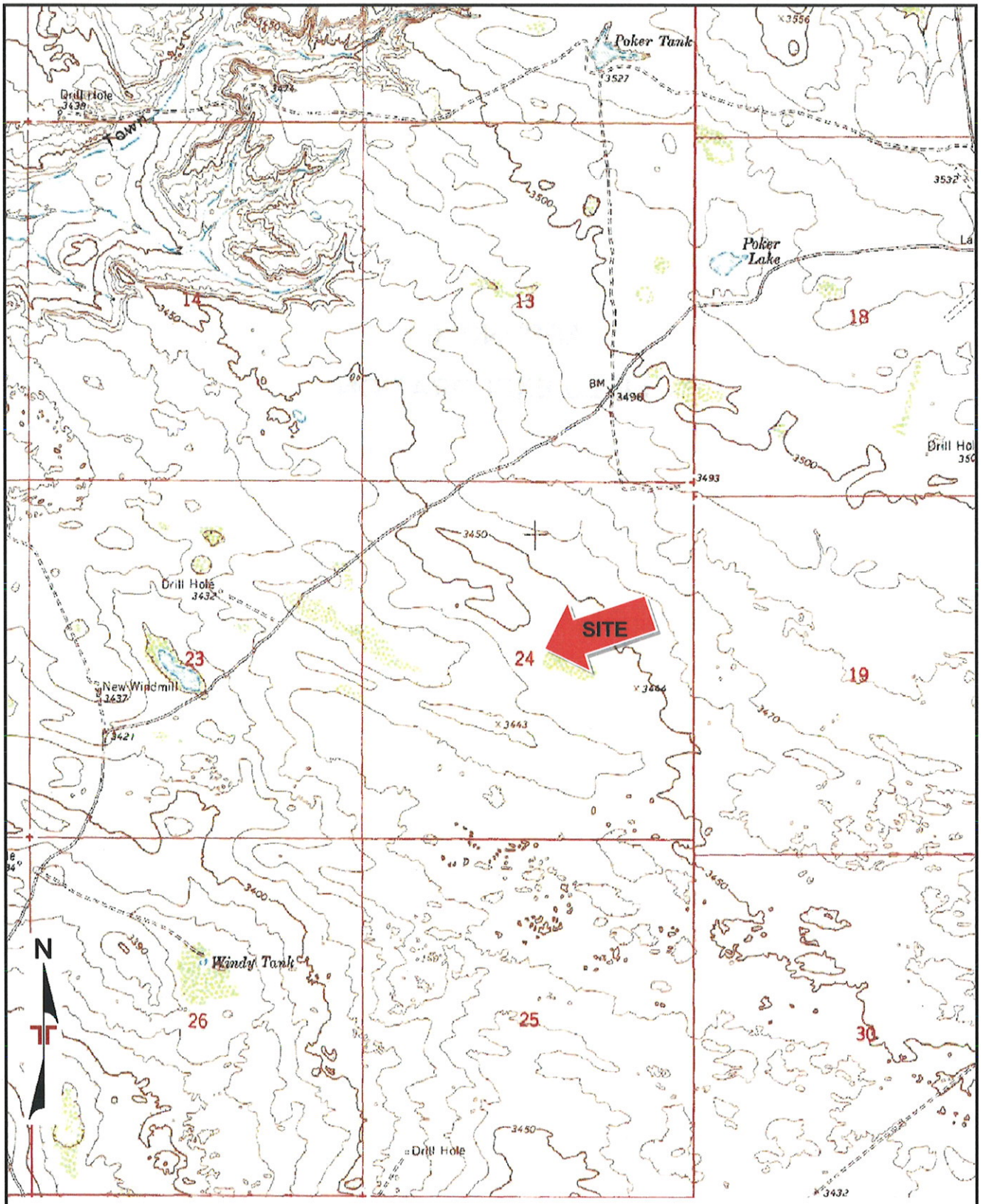
5.0 GENERAL COMMENTS

The data presented in this report are based upon the information obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur across the site or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If significant variations become apparent, it will be necessary to reevaluate the suitability of the site conditions for the proposed project.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the data contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the data of this report in writing.

APPENDIX A
FIELD EXPLORATION



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: BIG SINKS, NM (1/1/1968).

Project Manager: JT	Project No. A4175228	Terracon	SITE LOCATION PLAN	Exhibit
Drawn by: JT	Scale: 1"=2,000'	10400 State Highway 191	Proposed Frac Pond – PLU Central 1	A-1
Checked by: JT	File Name: SLP/EP	Midland, TX 79707-1497	NM-128 and Twin Wells Road	
Approved by: JDC	Date: 9/7/2017		Eddy County, NM	

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

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager:	JT
Drawn by:	JT
Checked by:	JT
Approved by:	JDC

Project No.	A4175228
Scale:	AS SHOWN
File Name:	SLP/EP
Date:	9/7/2017

Terracon
10400 State Highway 191
Midland, TX 79707-1497

EXPLORATION PLAN

Proposed Frac Pond – PLU Central 1
NM-128 and Twin Wells Road
Eddy County, NM

Exhibit
A-2

Date: 09/07/17 N:\CAD\MIDLAND\2017\a4175228-2.dwg Layout: BLP Current Layer: 0

SITE VICINITY MAP
SOURCE: GOOGLE MAPS, 2017.

0 250 500 FEET

APPROXIMATE SCALE

SOURCE: GOOGLE EARTH, IMAGERY DATE: 2/1/2017.

THIS DRAWING SHOULD NOT BE USED SEPARATELY FROM ORIGINAL REPORT.

NOTE: ALL BORING LOCATIONS ARE APPROXIMATE.

Project Mngr:	JT
Drawn By:	JJD
Checked By:	JT
Approved By:	JS

Project No.	A4175228-TASK 2
Scale:	AS SHOWN
Date:	09/07/17

Terracon
Consulting Engineers and Scientists
(Registration No.: F-3272)
10400 STATE HIGHWAY 191 MIDLAND, TX 79707
PH. (432-296-4142) FAX. (432-684-9608)

FIGURE 2.1 BORING LOCATION PLAN

PROPOSED FRAC POND-PLU CENTRAL 1 SITE
NM-128 AND TWIN WELLS ROAD
EDDY COUNTY, NEW MEXICO

EXHIBIT
A-3

Field Exploration Description

Subsurface conditions were explored by drilling two (2) borings at the approximate locations indicated on the Exploration Plan and Boring Location Plan presented on Exhibits A-2 and A-3 in this appendix. The field exploration was performed on August 29 and August 30, 2017. The test locations were established in the field by a representative of CDM Smith and verified by a representative of Terracon by measuring from available reference features and using a handheld GPS device. 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, utilizing hollow steam auger and air rotary drilling techniques. Samples of the soils encountered in the borings were obtained using split-spoon sampling procedures in accordance with standard penetration tests, utilizing an automatic hammer. The samples were tagged for identification, sealed to reduce moisture loss, and taken to the laboratory for further examination, testing, and classification. Following the completion of drilling, the borings were backfilled with soil cuttings.

A CME automatic SPT hammer was used to advance the split-barrel sampler in the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count (N) value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Field logs of the borings were prepared by a representative of Terracon. The logs included 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 laboratory evaluation of the samples. The boring logs are presented on Exhibits A-5 and A-6 in this appendix. General notes to log terms and symbols and other supporting documentation are included in Appendix C.

BORING LOG NO. B-3

PROJECT: Proposed Frac Pond - PLU Central 1 Site

CLIENT: CDM Smith
Houston, TX

SITE: 7.3 miles S of NM-128 and Twin Wells Road
Eddy County, NM

LOCATION See Exhibit A-4

Latitude: 32.20416° Longitude: -103.833°

Approximate Surface Elev: 3449 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0	3449	**SILTY SAND (SM)**, dark brown, loose	0	2-3-4 N=7			
		-dense to very dense below 2'	2	50/4"			
			5	24-22-22 N=44	6	NP	22
8.0	3441+/-		7	26-50/5"			
		SILTY SAND WITH GRAVEL, locally called "CALICHE" (SM), reddish-brown, very dense	10	21-24-26 N=50	2	NP	24
			15	20-34-50/6"			
22.0	3427+/-		20	50/6"			
		POORLY GRADED SAND WITH SILT (SP), light brown to brown, very dense	25	27-28-37 N=65			
		-medium dense at 30'	30	5-8-15 N=23	4	NP	11
		-dense below 35'	35	8-12-19 N=31			
42.0	3407+/-		40	12-21-27 N=48			
		POORLY GRADED SAND WITH SILT, locally called "caliche" (SP), light brown to brown, very dense	45	18-21-34 N=55			
			50	15-27-33 N=60			
			55	25-41-50 N=91	2	NP	9
			60	15-27-33/5"			
			65	27-39-44 N=83			
			70	24-50/6"			
75.0	3374+/-		75	10-28-34 N=62			
		Boring Terminated at 75 Feet					

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger and Air Rotary

Abandonment Method:
Boring backfilled with soil cuttings

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.
Elevation obtained from Google earth

Notes:
NP = Non-Plastic

WATER LEVEL OBSERVATIONS

No Groundwater Encountered During Drilling

Dry At Completion

Terracon
10400 State Highway 191
Midland, TX

Boring Started: 08-29-2017 | Boring Completed: 08-29-2017

Drill Rig: CME 75 | Driller: Manny

Project No.: A4175228 | Exhibit: A-5

BORING LOG NO. B-4

PROJECT: Proposed Frac Pond - PLU Central 1 Site

CLIENT: CDM Smith
Houston, TX

SITE: 7.3 miles S of NM-128 and Twin Wells Road
Eddy County, NM

LOCATION See Exhibit A-4

Latitude: 32.20287° Longitude: -103.833°

Approximate Surface Elev: 3447 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0	3447+/-	**SILTY SAND (SM)**, dark brown, loose
4.0	3443+/-	-medium dense at 2'
		SILTY SAND, locally called "caliche" (SM), reddish-brown, very dense
22.0	3425+/-	
		POORLY GRADED SAND WITH SILT, locally called "CALICHE" (SP), reddish-brown, very dense
		-dense at 40'
46.0	3401+/-	
		SILTY SAND, locally called "CALICHE" (SM), brown, very dense
75.0	3372+/-	
		Boring Terminated at 75 Feet

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0		2-2-3			
		N=5	2.4	NP	25
5		7-6-6			
		N=12			
		50/3"			
		50/5"			
10		50/6"	1	NP	28
15		50/5"			
20		21-23-28			
		N=51			
25		31-50/5"	4	NP	9
30		50/5"			
35		30-28-36			
		N=64			
40		4-23-26			
		N=49			
45		12-26-38			
		N=64			
50		15-35-50			
		N=85			
55		26-37-50/6"			
60		20-30-50/4"			
65		26-34-50/5"	2	NP	45
70		21-50/4"			
75		27-44-50/4"			

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger and Air Rotary

Abandonment Method:
Boring backfilled with soil cuttings

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.
Elevation obtained from Google earth

Notes:
NP = Non-Plastic

WATER LEVEL OBSERVATIONS

No Groundwater Encountered During Drilling

Dry At Completion

Terracon
10400 State Highway 191
Midland, TX

Boring Started: 08-29-2017 | Boring Completed: 08-30-2017

Drill Rig: CME 75 | Driller: Manny

Project No.: A4175228 | Exhibit: A-6

APPENDIX B
LABORATORY TESTING

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.

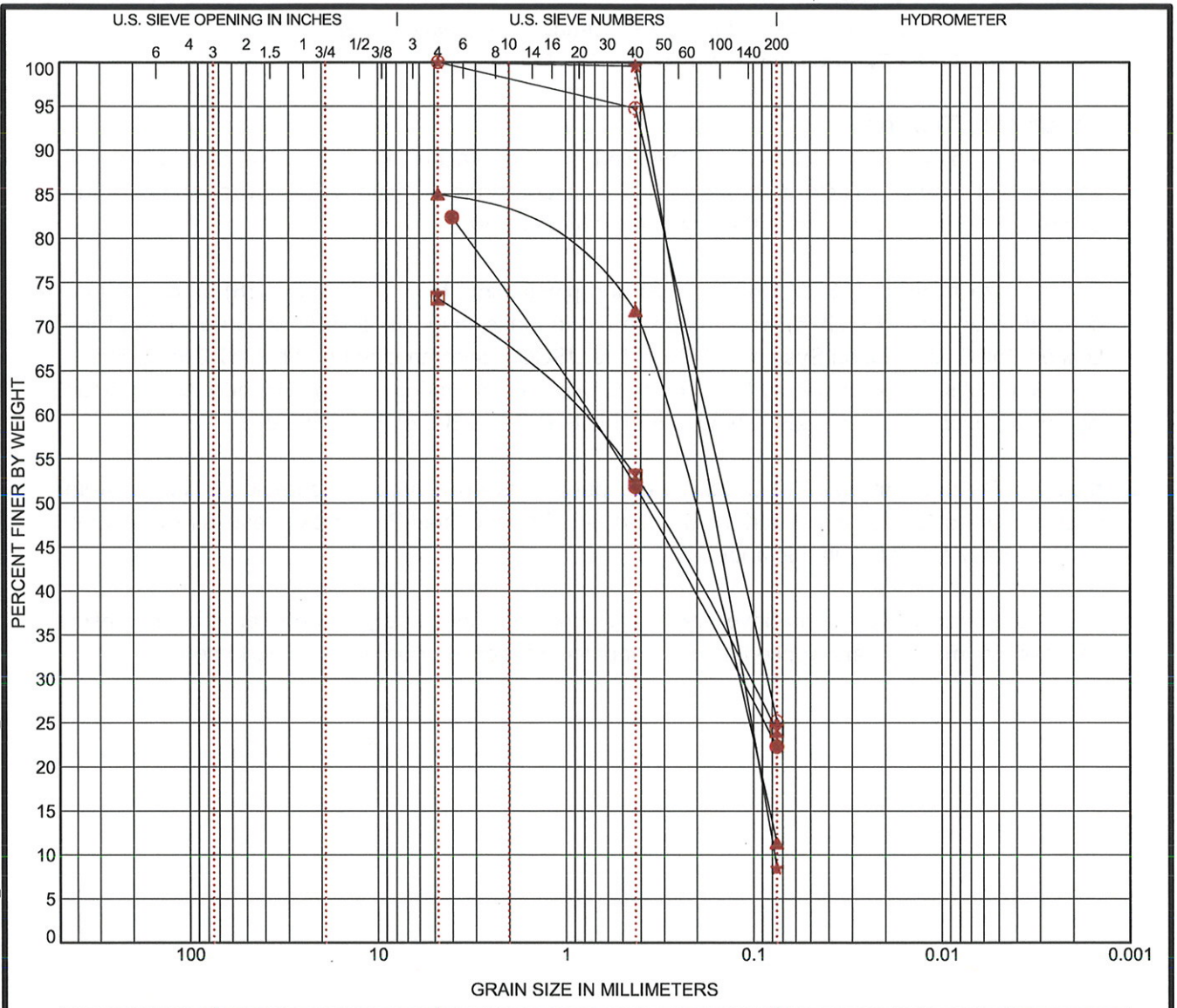
Particle size analysis (ASTM D422), liquid and plastic limit tests (ASTM D4318), and moisture content tests (ASTM D2216) were made to aid in classifying the soils in accordance with the Unified Soil Classification System (USCS). The USCS is summarized on Exhibit C-2 in Appendix C. The results of the laboratory tests are presented on the boring logs in Appendix A. The grain size distribution results are also shown on exhibits B-2 and B-3 of this appendix.

Modified Proctor tests (ASTM D1557) were performed on a bulk soil samples collected from depths of 10 to 12 feet bgs of borings B-3 and B-4. The modified Proctor test results are included on Exhibits B-4 and B-5 in this appendix.

Procedural standards noted above are for reference to methodology in general. In some cases variations to methods are applied as a result of local practice or professional judgment.

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



Boring ID	Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
B-3	4 - 5.5	SILTY SAND (SM)		NP	NP	NP		
B-3	10	SILTY SAND with GRAVEL (SM)		NP	NP	NP		
B-3	30 - 31.5	POORLY GRADED SAND with SILT (SP-SM)		NP	NP	NP	0.75	4.20
B-3	55 - 56.5	POORLY GRADED SAND with SILT (SP-SM)		NP	NP	NP	0.83	2.59
B-4	2 - 3.5	SILTY SAND (SM)		NP	NP	NP		

Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Fines	%Clay
B-3	4 - 5.5	4	0.774	0.118		0.0	60.1		22.3	
B-3	10	4.75	0.978	0.107		0.0	49.1		24.1	
B-3	30 - 31.5	4.75	0.303	0.128		0.0	73.7		11.4	
B-3	55 - 56.5	4.75	0.2	0.113	0.077	0.0	91.5		8.5	
B-4	2 - 3.5	4.75	0.179	0.085		0.0	74.8		25.2	

PROJECT: Proposed Frac Pond - PLU Central 1 Site

SITE: 7.3 miles S of NM-128 and Twin Wells Road
Eddy County, NM

Terracon
10400 State Highway 191
Midland, TX

PROJECT NUMBER: A4175228

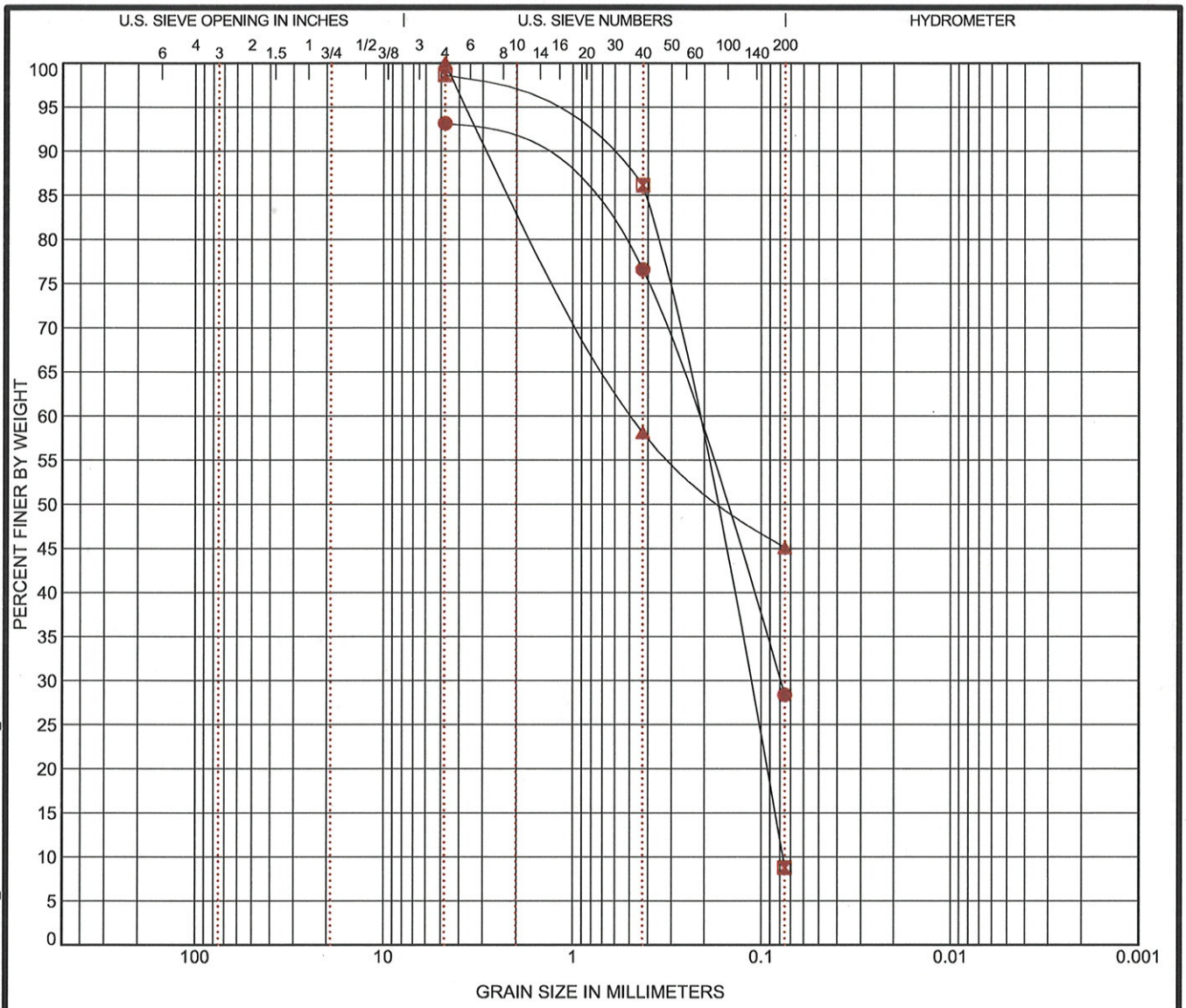
CLIENT: CDM Smith
Houston, TX

EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 A4175228_ TASK 2.GPJ TERRACON_DATATEMPLATE.GDT 9/7/17

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID	Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
B-4	10	SILTY SAND (SM)		NP	NP	NP		
B-4	25 - 25.9	POORLY GRADED SAND with SILT (SP-SM)		NP	NP	NP	0.80	3.07
B-4	65 - 66.4	SILTY SAND (SM)		NP	NP	NP		

Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Fines	%Clay
B-4	10	4.75	0.234	0.08		0.0	64.8		28.4	
B-4	25 - 25.9	4.75	0.237	0.121	0.077	0.0	89.8		8.8	
B-4	65 - 66.4	4.75	0.475			0.0	54.9		45.1	

PROJECT: Proposed Frac Pond - PLU Central 1 Site

SITE: 7.3 miles S of NM-128 and Twin Wells Road
Eddy County, NM

Terracon
10400 State Highway 191
Midland, TX

PROJECT NUMBER: A4175228

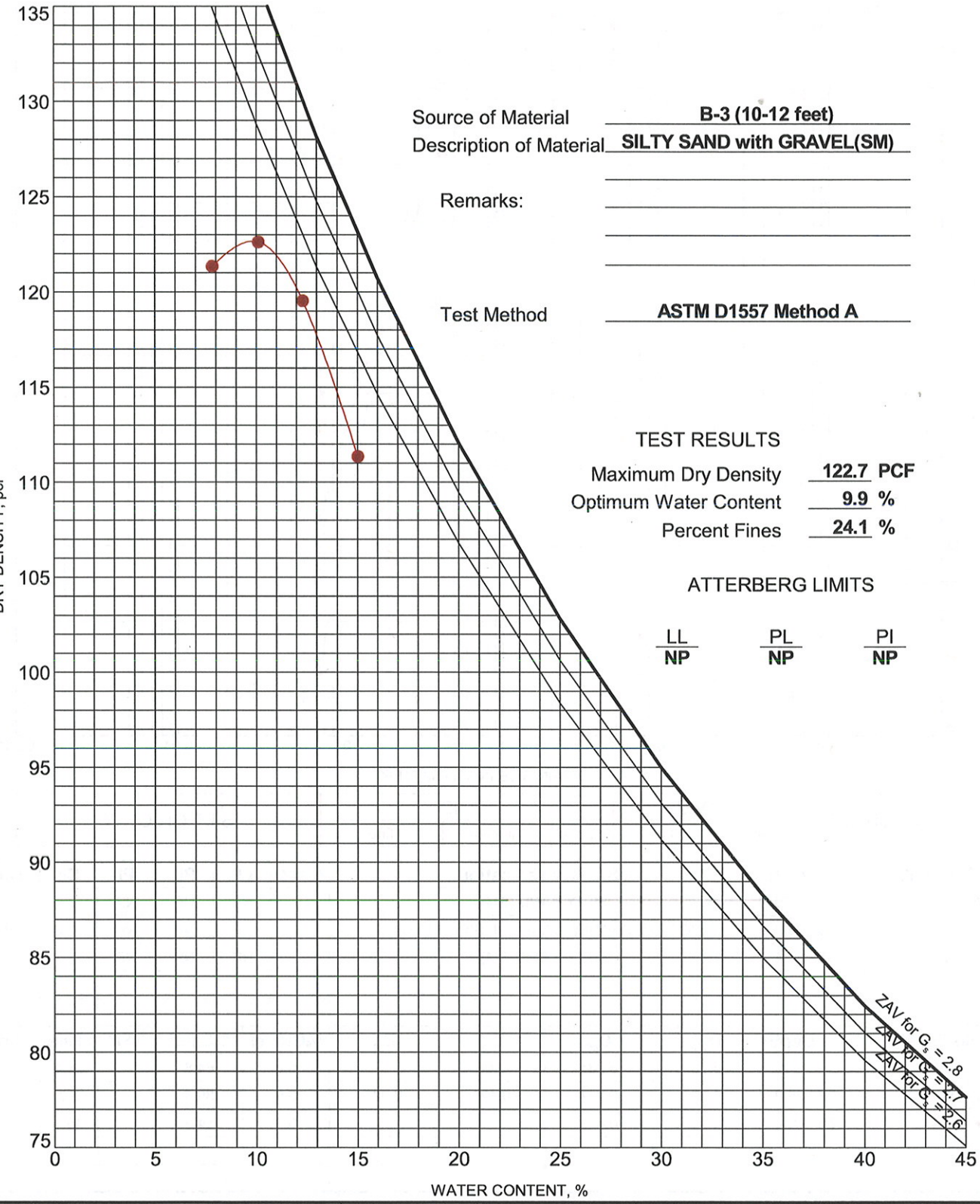
CLIENT: CDM Smith
Houston, TX

EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 A4175228_TASK 2.GPJ TERRACON_DATATEMPLATE.GDT 9/7/17

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **B-3 (10-12 feet)**

Description of Material: **SILTY SAND with GRAVEL(SM)**

Remarks:

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density	**122.7**	**PCF**
Optimum Water Content	**9.9**	**%**
Percent Fines	**24.1**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 A4175228_TASK 2.GPJ TERRACON_DATATEMPLATE.GDT 9/7/17

PROJECT: Proposed Frac Pond - PLU Central 1 Site

SITE: 7.3 miles S of NM-128 and Twin Wells Road
Eddy County, NM

Terracon
10400 State Highway 191
Midland, TX

PROJECT NUMBER: A4175228

CLIENT: CDM Smith
Houston, TX

EXHIBIT: B-4