



**GEOTECHNICAL ENGINEERING
SERVICES REPORT
NO. 1-40409**

**ABAJO-THORNBURG
SEWER LINE RE-DIRECT**

SANTA FE COUNTY, NEW MEXICO

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PREPARED FOR:

MOLZEN CORBIN

April 10, 2025
Job No. 1-40409

**Molzen Corbin
2701 Miles Rd. SE
Albuquerque, NM 87106**

Attn: Steven K. Morrow, PE

**RE: Geotechnical Engineering Services Report
Abajo-Thornburg Sewer Line Re-Direct
Santa Fe County, New Mexico**

Dear Mr. Morrow:

Submitted herein is the Geotechnical Engineering Services Report for the above referenced project. The report contains the results of our field investigation and laboratory testing as well as recommendations for excavation and backfill.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:
GEO-TEST, INC.

Patrick R. Whorton, PE



Reviewed By:

Patrick J. Byres, PE

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INTRODUCTION

This report presents the results of our geotechnical engineering services investigation performed by this firm for the proposed open trench and horizontal directional drilling (HDD) installation of a new domestic sewer line to be installed as part of the Abajo-Thornburg Re-Direct project in Santa Fe County, NM.

The objectives of this investigation were to classify the subsurface soils underlying the proposed trench and crossing sites as well as provide excavation and backfill criteria. The investigation includes subsurface exploration, selected soil sampling, laboratory testing of the samples, performing an engineering analysis and preparation of this report.

PROPOSED CONSTRUCTION

It is understood that the project consists of the installation of approximately 5,200 linear feet of new sanitary sewer line. A maximum installation depth of 25 feet is anticipated. The new sewer line will run along Highway 14 from the Abajo-Thornburg Lift Station to just south of Camino Vista Grande. There will be a HDD (or jack & bore) crossing of Highway 14. The remainder of the installation is anticipated to be performed via open trench installation.

Should project details vary significantly from those outlined above, this firm should be notified for review and revision of recommendations contained herein.

FIELD EXPLORATION

Ten (10) exploratory borings were drilled at the site to depths ranging from 25 to 35 feet below existing site grades. The locations borings are shown on the attached Boring Location Map, Figure 1. The soils encountered in the borings were continuously examined, visually classified and logged during the drilling operation. The boring logs are presented in a following section of this report. Drilling was accomplished using a truck mounted drill rig equipped with 2.25 inch inside diameter hollow stem auger. Subsurface soils were sampled at five foot intervals utilizing an open tube split barrel sampler driven by a standard penetration test hammer.

LABORATORY TESTING

Selected samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents and dry densities were determined to evaluate the various soil deposits with depth. The results of these tests are shown on the boring logs.

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Sieve analysis and Atterberg limits tests were performed to aid in soil classification. To aid in corrosion analysis, pH and laboratory resistivity testing as well as sulfate and chloride ion concentrations were determined. The results of these tests are presented in the Summary of Laboratory Results and on the individual test reports presented in a following section of this report.

SUBSURFACE CONDITIONS

The subsurface soils encountered within the exploratory borings consisted of low to medium plasticity sandy clay and silty sand, low plasticity silty, clayey sand and sandy, silty clay as well as non-plastic well and poorly graded sands with varying amounts of silt and gravel, non-plastic silty sand and silt with sand was also encountered.

The soils encountered did not follow a recurring stratigraphy with soil types varying in elevation and layer thickness from each location explored. See Boring Logs in a later section of this report for site specific subsurface stratigraphy.

Free groundwater was not encountered in the exploratory borings. Soil moisture contents were generally elevated with the clayey soils and increased with depth at most locations.

EXCAVATION & BACKFILL

The following general guidelines should be included in the project construction specifications to provide a basis for quality control for any required excavations and backfill. It is recommended that all backfill be placed and compacted under engineering observation and in accordance with the following:

- 1) Excavated slopes for foundation and utility construction should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Excavated temporary and permanent slopes should not exceed 1.5 to 1 (horizontal to vertical). The contractor should be responsible for all temporary trench slopes excavated along the proposed utility lines and the design of any required temporary shoring, as applicable. Shoring, bracing, and benching should be performed by the contractor in accordance with applicable safety standards.
- 2) Excavation of the subsurface soils may be accomplished using normal earthmoving equipment. Deeper dense and very dense soils may require additional effort, however, the need for rock breaking equipment is not anticipated given the results of this investigation.

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- 3) Once trench excavations are complete and prior to the placement of piping or bedding materials, all loose or disturbed soils in the bottom of the excavations should be removed so that undisturbed native soils are exposed throughout. Bedding and pipe embedment materials to be used around the pipes should conform to the pipe manufacturer's recommendations and should be placed and compacted in accordance with project specifications, local requirements or governing jurisdiction.
- 4) Excavated surficial soils may be used as backfill, however, processing to reduce moisture content may be required to meet the backfill specification below. Any imported backfill soil should be approved by the geotechnical engineer.
- 5) Backfill should be placed in maximum 12-inch loose lifts and compacted with approved compaction equipment. Lifts should be reduced to 8-inch loose lifts if handheld compaction equipment is used. All compaction of fill shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D-1557 and the moisture content of the backfill, during compaction, should be within 2 percent of the optimum moisture content, or in accordance with project specifications, local requirements or governing jurisdiction.
- 6) Tests for degree of compaction should be determined by the ASTM D-1556 method or ASTM D-6938. Observation and field tests should be performed during fill and backfill placement by the geotechnical engineer to assist the contractor in obtaining the required degree of compaction. If less than 95 percent is indicated, additional compaction effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

CLOSURE

Our conclusions, recommendations and opinions presented herein are:

- 1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.
- 2) Based upon an interpolation of soil conditions between and beyond the explorations.
- 3) Subject to confirmation of the conditions encountered during construction.
- 4) Based upon the assumption that sufficient observation will be provided during construction.

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- 5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

This report has been prepared for the sole use of Molzen Corbin, specifically to aid in the design of the Abajo-Thornburn Re-Direct project located in Santa Fe County, New Mexico, and not for the use by any third party without consent.

We make no other warranty, either expressed or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as they deem necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions encountered during construction appear to be different than indicated by this report, this office should be notified.

All soil samples will be discarded 60 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

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BORING LOCATION MAP



Abajo-Thornburg Re-Direct
Santa Fe, New Mexico
Job No. 1-40409

Figure 1



GEO-TEST
GEOTECHNICAL ENGINEERING
AND MATERIAL TESTING



Project: Abajo-Thornburg Re-Direct

Date: 03/17/2025

Project No: 1-40409

Elevation:

Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 1

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
5	[Hatched Pattern]	4-4-6	SS	10	8		SC	CLAYEY SAND, low plasticity, moderately firm, dry, light brown	10
10	[Dotted Pattern]	3-4-6	SS	10	3		SC-SM	SILTY, CLAYEY SAND with GRAVEL, low plasticity, moderately firm to firm, dry, brown	10
15	[Dotted Pattern]	13-12-11	SS	23	4				23
20	[Hatched Pattern]	4-6-6	SS	12	12		CL-ML	SANDY, SILTY CLAY, low plasticity, moderately firm, slightly moist, brown	12
25	[Hatched Pattern]	4-5-7	SS	12	12				12
30								Stopped Auger @ 24 feet Stopped Sampler @ 25.5 feet	
35									
40									

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

LEGEND

SS - Split Spoon
AC - Auger Cuttings

UD/SL - Undisturbed Sleeve

AMSL - Above Mean Sea Level

CS - Continuous Sampler

UD - Undisturbed

ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Abajo-Thornburg Re-Direct

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Elevation:

Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 2

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE					SUBSURFACE PROFILE					
			TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft				
									20	40	60	80	
0			AC		7			AC	5 inches ASPHALT over 8 inches MILLING BASE				
0			SM					SM	SILTY SAND, non-plastic, slightly moist, brown				
5			SS	2-2-7 9	2			SP	POORLY GRADED SAND, non-plastic, loose to medium dense, dry to slightly moist, reddish brown	9			
10			SS	7-8-12 20	6					20			
15			SS	6-8-7 15	11			SC-SM	SILTY, CLAYEY SAND, low plasticity, moderately firm, moist, brown	15			
20			SS	2-3-4 7	16			CL-ML	SANDY, SILTY CLAY, low plasticity, soft, moist, brown	7			
25			SS	10-13-15 28	1			SW-SM	WELL GRADED SAND with SILT and GRAVEL, non-plastic, medium dense, dry, reddish brown	28			
24									Stopped Auger @ 24 feet Stopped Sampler @ 25.5 feet				

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

LEGEND

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 3

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE					SUBSURFACE PROFILE		N blows/ft			
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	20	40	60	80
5			SS	4-8-8 16	10		SC	CLAYEY SAND, low plasticity, medium dense to very loose, moist, brown				
10			SS	4-2-2 4	11							
15			SS	4-2-3 5	3 19		SP	POORLY GRADED SAND, non-plastic, loose, dry, reddish brown				
20			SS	11-13-11 24	6		CL-ML	SANDY, SILTY CLAY, low plasticity, soft, moist, brown				
25			SS	7-7-6 13	3 15		SW-SM	WELL GRADED SAND with SILT and GRAVEL, non-plastic, medium dense to dense, dry, reddish brown * Clay lens at 25 feet				
30			SS	7-17-22 39	2							
35								Stopped Auger @ 29 feet Stopped Sampler @ 30.5 feet				
40												

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

LEGEND

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Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 4

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
5	AC		SS	2-2-1 3	16		CL	SANDY CLAY, low plasticity, very soft, moist, brown	3
10	UD		SS	3-4-3 7	15		ML	SILT with SAND, non-plastic, soft, moist, brown	7
15	UD		SS	4-6-7 13	2		SW-SM	WELL GRADED SAND with SILT, non-plastic, medium dense, dry, reddish brown * Gravel and Clay Lenses blow 25 feet	13
20	UD		SS	6-9-11 20	4				20
25	UD		SS	14-15-14 29	3				29
30	UD		SS	14-11-8 19	4				19
35								Stopped Auger @ 29 feet Stopped Sampler @ 30.5 feet	
40									

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 5

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	SAMPLE				USC	SUBSURFACE PROFILE	N blows/ft
				N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	DESCRIPTION			
5			SS	11-8-8 16	5		SW-SM	WELL GRADED SAND with SILT, non-plastic, medium dense, dry, reddish brown	16	
10			SS	1-2-2 4	17		CL	SANDY CLAY, low plasticity, very soft, moist, brown	4	
15			SS	14-16-14 30	1		SW-SM	WELL GRADED SAND with GRAVEL, non-plastic, medium dense, dry, reddish brown	30	
20			SS	4-7-9 16	16		CL-ML	SANDY, SILTY CLAY, low plasticity, firm, moist, brown	16	
25			SS	11-25-31 56	2		SW-SM	WELL GRADED SAND with SILT and GRAVEL, non-plastic, very dense, dry, reddish brown	56	
30			SS	3-4-5 9	25		SC-SM	CLAYEY SAND with SILT, low plastic, moderately firm, very moist, brown	9	
35			SS	11-17-11 28	15		SC	CLAYEY SAND with GRAVEL, low plasticity, firm, moist, brown	28	
40								Stopped Auger @ 34 feet Stopped Sampler @ 35.5 feet		

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

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Date: 03/18/2025

Project No: 1-40409

Elevation:

Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 6

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE					SUBSURFACE PROFILE		N blows/ft
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	
0-5	AC						CL	SANDY CLAY, medium plasticity, soft, moist, brown	
5-10	SS	4-7-5	SS	12	4		SW-SM	WELL GRADED SAND with SILT, non-plastic, medium dense, dry, reddish brown	12
10-15	SS	3-7-9	SS	16	3				16
15-20	SS	5-4-5	SS	9	8		SM	SILTY SAND, non-plastic, loose to medium dense, slightly moist, brown	9
20-25	SS	6-11-17	SS	28	7				28
25-30	SS	11-8-7	SS	15	22				15
30-35	SS	3-4-5	SS	9	27		CL-ML	SILTY CLAY with SAND, low plasticity, soft to firm, very moist, brown	9
35-40	SS	6-8-10	SS	18	16				18
							Stopped Auger @ 34 feet Stopped Sampler @ 35.5 feet		

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 7

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
5			SS	3-2-3 5	9		SC-SM	SILTY, CLAYEY SAND, low plasticity, soft to firm, moist, brown	5
10			SS	6-6-6 12	12				12
15			SS	5-6-10 16	12		SM	SILTY SAND, non-plastic, medium dense to dense, moist, brown	16
20			SS	11-17-20 37	16		SM	SILTY SAND with GRAVEL, non-plastic, dense to very dense, moist, dark brown	37
25			SS	15-50/6"	16				
24								Stopped Auger @ 24 feet Sampler REFUSAL @ 25 feet	
30									
35									
40									

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 8

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE					SUBSURFACE PROFILE		N blows/ft
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	
5			SS	5-7-8 15	15		SC	CLAYEY SAND, medium plasticity, moderately firm, moist, brown	15
10			SS	3-3-3 6	9		SC-SM	SILTY, CLAYEY SAND, low plasticity, soft, slightly moist, brown	6
15			SS	3-4-3 7	8				7
20			SS	4-4-9 13	11		CL-ML	SANDY, SILTY CLAY, low plasticity, moderately firm to firm, moist to very moist, light brown	13
25			SS	4-9-16 25	20				25
30								Stopped Auger @ 24 feet Stopped Sampler @ 25.5 feet	
35									
40									

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 9

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
5			SS	1-1-2 3	15 9		SC	CLAYEY SAND, medium plasticity, very soft, moist, brown	3
10			SS	8-12-8 20	2		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, medium dense, dry, reddish brown	20
15			SS	8-11-20 31	9		SC-SM	SILTY, CLAYEY SAND, low plasticity, very firm, slightly moist, brown	31
20			SS	15-17-11 28	6		SP	POORLY GRADED SAND, non-plastic, medium dense, moist, light brown	28
25			SS	11-24-31 55	16		SM	SILTY SAND, non-plastic, very dense, moist, brown	55
30								Stopped Auger @ 24 feet Stopped Sampler @ 25.5 feet	
35									
40									

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LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 10

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
5			SS	5-6-6 12	12		SC	CLAYEY SAND, medium plasticity, moderately firm to firm, moist to very moist, brown	12
10			SS	8-9-10 19	23				19
15			SS	10-12-24 36	12				36
20			SS	5-14-17 31	28		SM	SILTY SAND, non-plastic, dense, moist to very moist, brown	31
25			SS	17-16-14 30	16				30
30							Stopped Auger @ 24 feet Stopped Sampler @ 25.5 feet		
35									
40									

LOG OF TEST BORING 1-40409.GPJ GEO TEST.GDT 4/10/25

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve

AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
1	5.0		22.1														
1	10.0	SC-SM	3.3	22	7	20	25	40	73	86	95	96	100				
1	15.0		3.6														
1	20.0	CL-ML	11.7	24	7	55	66	79	95	99	100						
1	25.0		11.6														
2	2.0		7.4														
2	5.0	SP	1.8	NP	NP	3	5	15	80	95	100						
2	10.0		6.4														
2	15.0	SC	10.9	26	10	46	57	65	91	98	100						
2	20.0		15.7														
2	25.0		1.1														
3	5.0	SC	10.2	25	9	41	62	80	94	98	100						
3	10.0		10.8														
3	14.0	SP	2.7	NP	NP	5	8	37	93	96	99	100					
3	15.0		19.0														
3	20.0		5.5														
3	24.0		2.7														
3	25.0		14.9														
3	30.0	SW-SM	1.8	NP	NP	6	9	17	40	55	72	79	90	100			

SUMMARY OF LABORATORY RESULTS: 1-40409.GPJ GEO TEST.GDT 4/8/25



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Abajo-Thornburg Re-Direct
Location: Santa Fe, NM
Number: 1-40409

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
4	5.0		16.4														
4	10.0	ML	15.4	NP	NP	76	94	99	100								
4	15.0		1.7														
4	20.0	SW-SM	3.9	NP	NP	10	15	33	79	92	97	98	100				
4	25.0		3.2														
4	30.0		4.0														
5	5.0		4.6														
5	10.0	CL	17.2	25	8	57	65	76	90	93	94	96	100				
5	15.0		0.6														
5	20.0		16.2														
5	25.0	SW-SM	2.4	NP	NP	8	12	21	41	60	74	79	100				
5	30.0		24.5														
5	35.0	SC	14.7	28	10	33	37	47	70	80	86	91	95	100			
6	5.0	SW-SM	4.0	NP	NP	9	14	32	77	88	92	94	100				
6	10.0		3.1														
6	15.0	SM	7.8	NP	NP	37	76	93	100								
6	20.0	SM	6.7	NP	NP	17	27	44	61	70	77	78	86	86	100		
6	25.0		21.7														
6	30.0	CL-ML	26.6	24	7	72	80	87	99	100							

SUMMARY OF LABORATORY RESULTS: 1-40409.GPJ GEO TEST.GDT 4/8/25



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Abajo-Thornburg Re-Direct
Location: Santa Fe, NM
Number: 1-40409

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
6	35.0		16.2														
7	5.0	SC-SM	9.4	22	7	40	51	63	82	90	96	98	100				
7	10.0		11.8														
7	15.0	SM	12.0	NP	NP	31	53	76	93	98	100						
7	20.0		15.8														
7	25.0	SM	16.0	NP	NP	19	31	49	85	95	99	100					
8	5.0		15.4														
8	10.0	SC-SM	8.7	22	5	49	60	73	93	98	100						
8	15.0		8.2														
8	20.0	CL-ML	10.6	22	5	60	73	87	98	100							
8	25.0		19.8														
9	4.0		14.7														
9	5.0		9.3														
9	10.0	SP-SM	2.5	NP	NP	5	8	22	46	59	77	85	93	100			
9	15.0		8.6														
9	20.0		6.5														
9	25.0	SM	16.3	NP	NP	18	33	65	96	99	100						
10	5.0	SC	11.6	26	12	48	67	89	100								
10	10.0		22.8														

SUMMARY OF LABORATORY RESULTS: 1-40409.GPJ GEO TEST.GDT 4/8/25



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Abajo-Thornburg Re-Direct
Location: Santa Fe, NM
Number: 1-40409

SUMMARY OF LABORATORY RESULTS

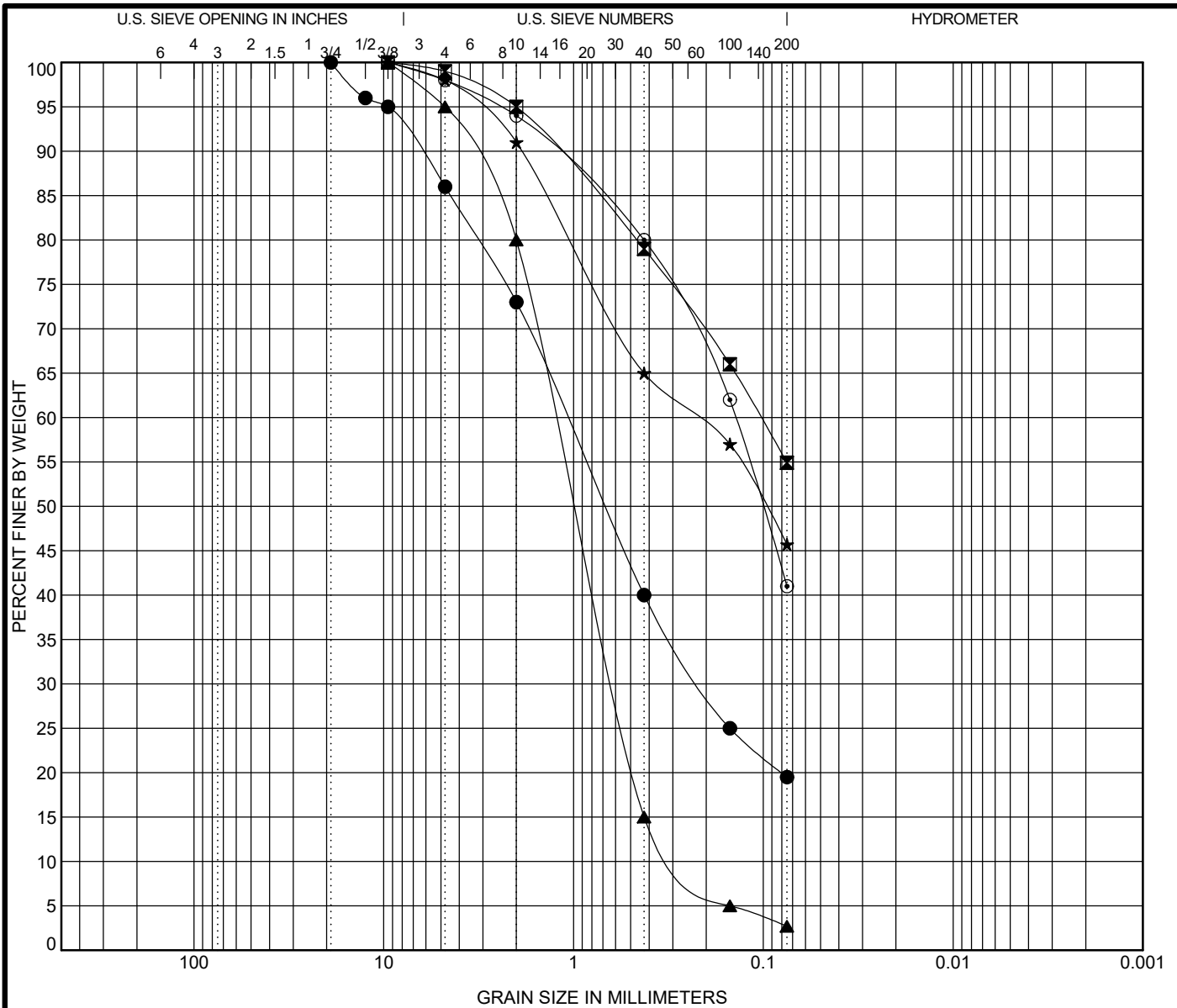
						SIEVE ANALYSIS PERCENT PASSING											
TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(%) MOIST	LL	PI	NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
10	15.0		12.3														
10	20.0	SM	28.3	NP	NP	50	61	76	97	100							
10	25.0		15.9														

SUMMARY OF LABORATORY RESULTS 1-40409.GPJ GEO TEST.GDT 4/8/25



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Abajo-Thornburg Re-Direct
Location: Santa Fe, NM
Number: 1-40409



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 1 10.0	SILTY, CLAYEY SAND(SC-SM)	22	15	7		
■ 1 20.0	SANDY SILTY CLAY(CL-ML)	24	17	7		
▲ 2 5.0	POORLY GRADED SAND(SP)	NP	NP	NP	1.18	4.92
★ 2 15.0	CLAYEY SAND(SC)	26	16	10		
⊙ 3 5.0	CLAYEY SAND(SC)	25	16	9		

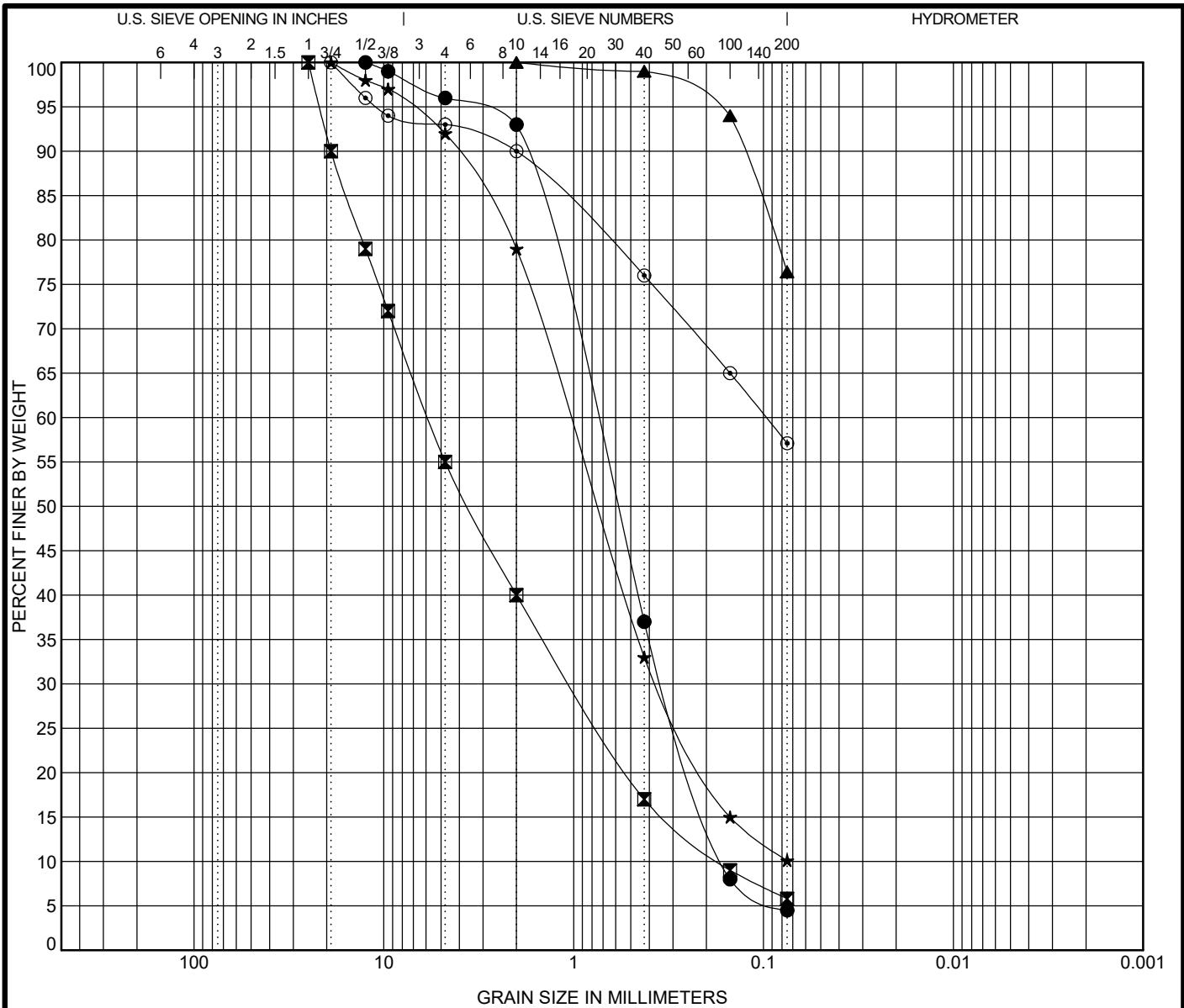
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 1 10.0	19	1.087	0.212		14.0	66.5	19.5	
■ 1 20.0	9.5	0.103			1.0	44.1	54.9	
▲ 2 5.0	9.5	1.242	0.608	0.252	5.0	92.3	2.7	
★ 2 15.0	9.5	0.222			2.0	52.3	45.7	
⊙ 3 5.0	9.5	0.14			2.0	57.0	41.0	



GRAIN SIZE DISTRIBUTION

Project: Abajo-Thornburg Re-Direct
 Location: Santa Fe, NM
 Number: 1-40409

U.S. GRAIN SIZE 1-40409.GPJ GEO TEST.GDT 4/8/25



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 3 14.0	POORLY GRADED SAND(SP)	NP	NP	NP	0.84	4.98
■ 3 30.0	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.05	34.09
▲ 4 10.0	SILT with SAND(ML)	NP	NP	NP		
★ 4 20.0	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP	1.64	14.27
⊙ 5 10.0	SANDY LEAN CLAY(CL)	25	17	8		

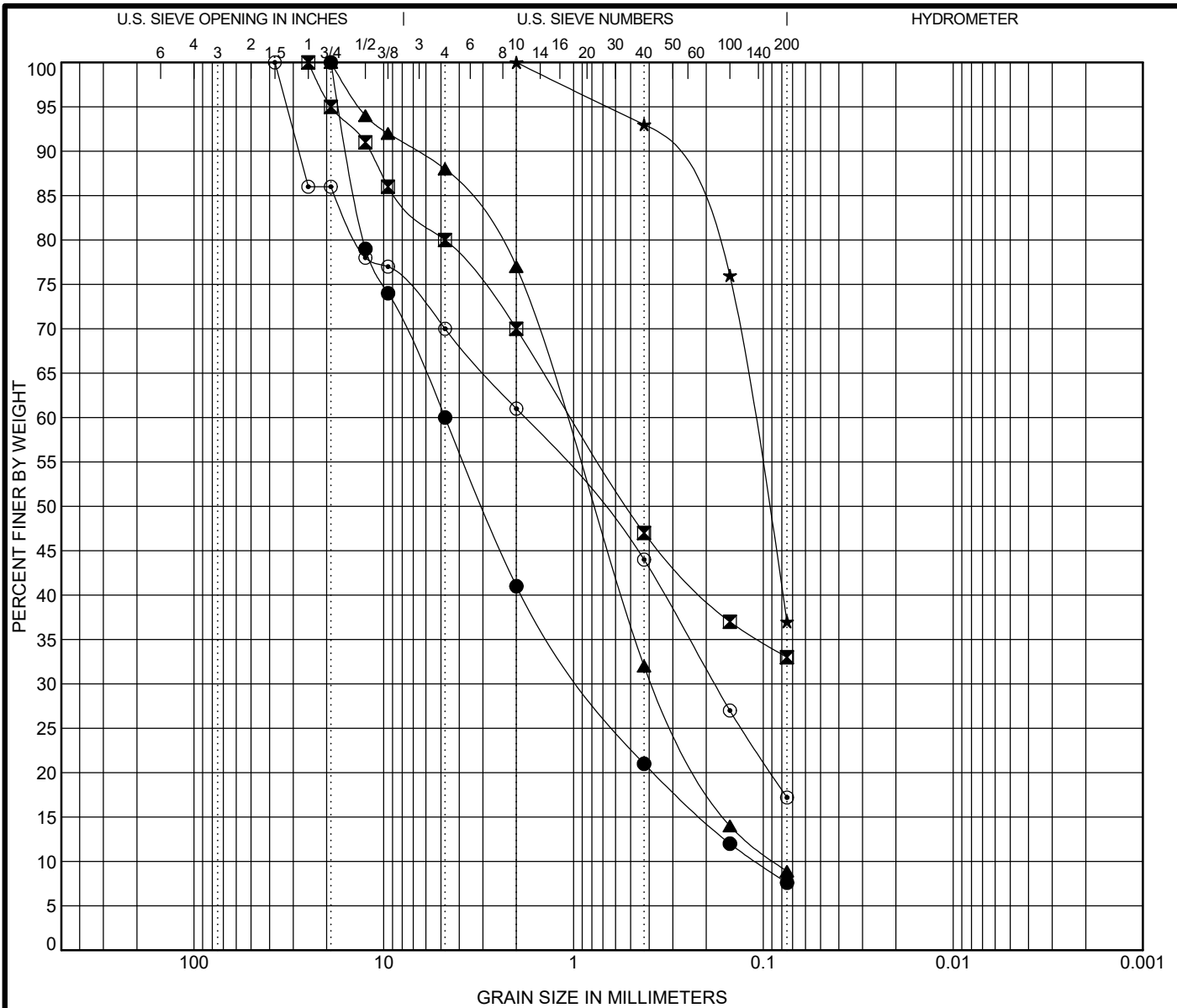
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3 14.0	12.5	0.803	0.331	0.161	4.0	91.5	4.5	
■ 3 30.0	25	5.824	1.02	0.171	45.0	49.2	5.8	
▲ 4 10.0	2				0.0	23.6	76.4	
★ 4 20.0	19	1.055	0.357		8.0	81.9	10.1	
⊙ 5 10.0	19	0.097			7.0	35.9	57.1	



GRAIN SIZE DISTRIBUTION

Project: Abajo-Thornburg Re-Direct
 Location: Santa Fe, NM
 Number: 1-40409

U.S. GRAIN SIZE 1-40409.GPJ GEO TEST.GDT 4/8/23



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 5 25.0	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.40	43.39
☒ 5 35.0	CLAYEY SAND with GRAVEL(SC)	28	18	10		
▲ 6 5.0	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP	1.48	12.79
★ 6 15.0	SILTY SAND(SM)	NP	NP	NP		
⊙ 6 20.0	SILTY SAND with GRAVEL(SM)	NP	NP	NP		

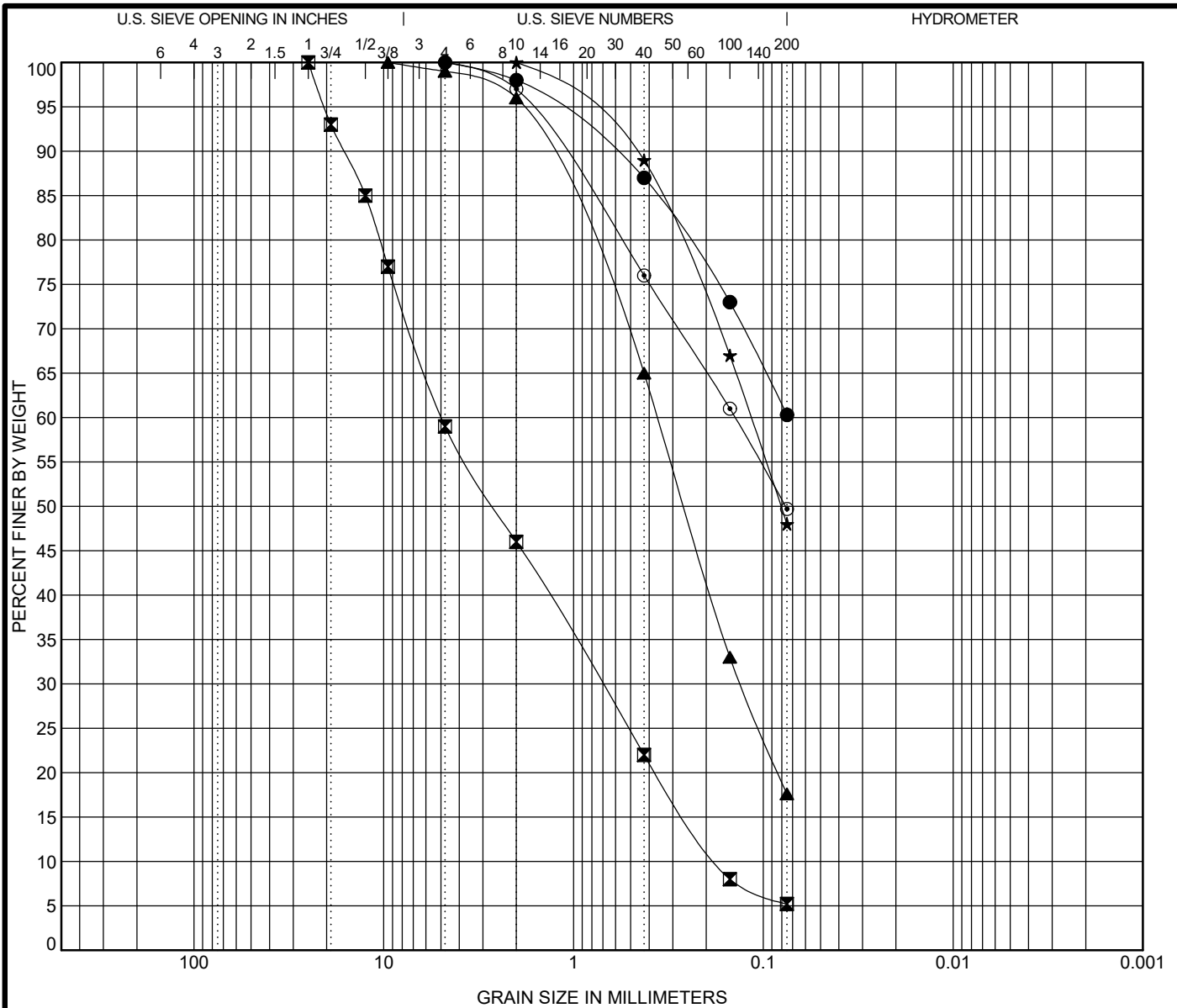
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 5 25.0	19	4.75	0.853	0.109	40.0	52.4	7.6	
☒ 5 35.0	25	1.02			20.0	47.0	33.0	
▲ 6 5.0	19	1.114	0.379	0.087	12.0	79.1	8.9	
★ 6 15.0	2	0.113			0.0	63.0	37.0	
⊙ 6 20.0	37.5	1.826	0.18		30.0	52.8	17.2	



GRAIN SIZE DISTRIBUTION

Project: Abajo-Thornburg Re-Direct
 Location: Santa Fe, NM
 Number: 1-40409

U.S. GRAIN SIZE 1-40409.GPJ GEO TEST.GDT 4/8/25



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 8 20.0	SANDY SILTY CLAY(CL-ML)	22	17	5		
■ 9 10.0	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.59	28.36
▲ 9 25.0	SILTY SAND(SM)	NP	NP	NP		
★ 10 5.0	CLAYEY SAND(SC)	26	14	12		
⊙ 10 20.0	SILTY SAND(SM)	NP	NP	NP		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 8 20.0	4.75				0.0	39.7	60.3	
■ 9 10.0	25	4.936	0.712	0.174	41.0	53.8	5.2	
▲ 9 25.0	9.5	0.361	0.131		1.0	81.4	17.6	
★ 10 5.0	2	0.116			0.0	52.0	48.0	
⊙ 10 20.0	4.75	0.141			0.0	50.3	49.7	



GRAIN SIZE DISTRIBUTION

Project: Abajo-Thornburg Re-Direct
 Location: Santa Fe, NM
 Number: 1-40409

U.S. GRAIN SIZE 1-40409.GPJ GEO TEST.GDT 4/8/25

Corrosion Data

Project: Abajo-Thornburg Re-Direct
Report # 1-40409 Lab #

Soil Resistivity (ASTM G-57)

Sample Location: NM-14 Area, Clay Soils

Wet Weight:	319.9 grams
Dry Weight:	286.4 grams
Water Content	11.70 %

<u>As-Received Condition</u>	
Potential Change	14.0 volts
Current:	0.018 amps
Resistivity:	778 ohm-cm

<u>Saturated Condition</u>	
Potential Change:	13.0 volts
Current:	0.02 amps
Resistivity:	650 ohm-cm

pH of Soil (ASTM G-51 & D-4972)

Sample Location: NM-14 Area, Clay Soils

Distilled Water Solution:	pH = 7.87
Calcium Chloride Solution:	pH = 7.71

Corrosion Data

Project: Abajo-Thornburg Re-Direct

Report # 1-40409

Lab #

Soil Resistivity (ASTM G-57)

Sample Location: NM-14 Area, Granular Soils

Wet Weight:	374.1 grams
Dry Weight:	344.2 grams
Water Content	8.69 %

<u>As-Received Condition</u>	
Potential Change	11.0 volts
Current:	0.002 amps
Resistivity:	5500 ohm-cm

<u>Saturated Condition</u>	
Potential Change:	12.0 volts
Current:	0.003 amps
Resistivity:	4000 ohm-cm

pH of Soil (ASTM G-51 & D-4972)

Sample Location: NM-14 Area, Granular Soils

Distilled Water Solution:	pH = 8.64
Calcium Chloride Solution:	pH = 7.87

Corrosion Data

Project: Abajo-Thornburg Re-Direct
Report # 1-40409 Lab #

Soil Resistivity (ASTM G-57)

Sample Location: NM-599 Area, Clay Soils

Wet Weight:	282.8 grams
Dry Weight:	255.5 grams
Water Content	10.68 %

<u>As-Received Condition</u>	
Potential Change	13.0 volts
Current:	0.01 amps
Resistivity:	1300 ohm-cm

<u>Saturated Condition</u>	
Potential Change:	13.0 volts
Current:	0.01 amps
Resistivity:	1300 ohm-cm

pH of Soil (ASTM G-51 & D-4972)

Sample Location: NM-599 Area, Clay Soils

Distilled Water Solution:	pH = 8.24
Calcium Chloride Solution:	pH = 7.92

Corrosion Data

Project: Abajo-Thornburg Re-Direct
Report # 1-40409 Lab #

Soil Resistivity (ASTM G-57)

Sample Location: NM-599 Area, Granular Soils

Wet Weight:	193.7 grams
Dry Weight:	188.6 grams
Water Content	2.70 %

<u>As-Received Condition</u>	
Potential Change	9.0 volts
Current:	0 amps
Resistivity:	Infinite ohm-cm

<u>Saturated Condition</u>	
Potential Change:	13.0 volts
Current:	0.002 amps
Resistivity:	6500 ohm-cm

pH of Soil (ASTM G-51 & D-4972)

Sample Location: NM-599 Area, Granular Soils

Distilled Water Solution:	pH = 8.79
Calcium Chloride Solution:	pH = 8.05



ANALYTICAL REPORT

PREPARED FOR

Attn: Patrick Whorton
Geo-Test Inc
3204 Richards Ln
Santa Fe, New Mexico 87507

Generated 3/25/2025 4:09:31 PM

JOB DESCRIPTION

Abajo-Thornburg Re-Direct

JOB NUMBER

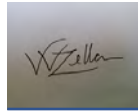
885-21888-1

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Authorized for release by
Victoria Zellar, Project Manager
Victoria.Zellar@et.eurofinsus.com
(505)345-3975



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Definitions/Glossary

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Geo-Test Inc
Project: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Job ID: 885-21888-1

Eurofins Albuquerque

Job Narrative 885-21888-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 3/21/2025 1:40 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 21.5°C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria: 1-40409, NM599, Clay Soil (885-21888-1), 1-40409, NM599, Granular Soils (885-21888-2), 1-40409, NM14, Clay Soils (885-21888-3) and 1-40409, NM14, Granular Soils (885-21888-4). There was no cooling media present in the cooler. The client was contacted regarding this issue, and the laboratory was instructed to proceed with analysis

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Client Sample Results

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Client Sample ID: 1-40409, NM599, Clay Soil

Lab Sample ID: 885-21888-1

Date Collected: 03/17/25 10:00

Matrix: Solid

Date Received: 03/21/25 13:40

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	42		7.5	mg/Kg		03/24/25 09:45	03/24/25 13:48	5
Sulfate	230		7.5	mg/Kg		03/24/25 09:45	03/24/25 13:48	5

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- 10
- 11

Client Sample Results

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Client Sample ID: 1-40409, NM599, Granular Soils

Lab Sample ID: 885-21888-2

Date Collected: 03/17/25 12:00

Matrix: Solid

Date Received: 03/21/25 13:40

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	20		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:07	5
Sulfate	71		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:07	5

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- 11

Client Sample Results

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Client Sample ID: 1-40409, NM14, Clay Soils

Lab Sample ID: 885-21888-3

Date Collected: 03/18/25 10:30

Matrix: Solid

Date Received: 03/21/25 13:40

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	53		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:27	5
Sulfate	24		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:27	5

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- 11

Client Sample Results

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Client Sample ID: 1-40409, NM14, Granular Soils

Lab Sample ID: 885-21888-4

Date Collected: 03/18/25 13:30

Matrix: Solid

Date Received: 03/21/25 13:40

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:47	5
Sulfate	28		7.5	mg/Kg		03/24/25 09:45	03/24/25 14:47	5

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- 10
- 11

QC Sample Results

Client: Geo-Test Inc
 Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-22937/1-A
Matrix: Solid
Analysis Batch: 22943

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 22937

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Chloride	ND		1.5	mg/Kg		03/24/25 09:45	03/24/25 10:50	1
Sulfate	ND		1.5	mg/Kg		03/24/25 09:45	03/24/25 10:50	1

Lab Sample ID: LCS 885-22937/3-A
Matrix: Solid
Analysis Batch: 22943

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 22937

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	15.0	14.7		mg/Kg		98	90 - 110
Sulfate	30.0	29.3		mg/Kg		98	90 - 110

Lab Sample ID: LLCS 885-22937/2-A
Matrix: Solid
Analysis Batch: 22943

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 22937

Analyte	Spike Added	LLCS	LLCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	1.50	1.50		mg/Kg		100	50 - 150
Sulfate	1.50	1.52		mg/Kg		101	50 - 150

QC Association Summary

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

HPLC/IC

Prep Batch: 22937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-21888-1	1-40409, NM599, Clay Soil	Total/NA	Solid	300_Prep	
885-21888-2	1-40409, NM599, Granular Soils	Total/NA	Solid	300_Prep	
885-21888-3	1-40409, NM14, Clay Soils	Total/NA	Solid	300_Prep	
885-21888-4	1-40409, NM14, Granular Soils	Total/NA	Solid	300_Prep	
MB 885-22937/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 885-22937/3-A	Lab Control Sample	Total/NA	Solid	300_Prep	
LLCS 885-22937/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Analysis Batch: 22943

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-21888-1	1-40409, NM599, Clay Soil	Total/NA	Solid	300.0	22937
885-21888-2	1-40409, NM599, Granular Soils	Total/NA	Solid	300.0	22937
885-21888-3	1-40409, NM14, Clay Soils	Total/NA	Solid	300.0	22937
885-21888-4	1-40409, NM14, Granular Soils	Total/NA	Solid	300.0	22937
MB 885-22937/1-A	Method Blank	Total/NA	Solid	300.0	22937
LCS 885-22937/3-A	Lab Control Sample	Total/NA	Solid	300.0	22937
LLCS 885-22937/2-A	Lab Control Sample	Total/NA	Solid	300.0	22937

Lab Chronicle

Client: Geo-Test Inc
 Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Client Sample ID: 1-40409, NM599, Clay Soil

Lab Sample ID: 885-21888-1

Date Collected: 03/17/25 10:00

Matrix: Solid

Date Received: 03/21/25 13:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			22937	DL	EET ALB	03/24/25 09:45
Total/NA	Analysis	300.0		5	22943	DL	EET ALB	03/24/25 13:48

Client Sample ID: 1-40409, NM599, Granular Soils

Lab Sample ID: 885-21888-2

Date Collected: 03/17/25 12:00

Matrix: Solid

Date Received: 03/21/25 13:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			22937	DL	EET ALB	03/24/25 09:45
Total/NA	Analysis	300.0		5	22943	DL	EET ALB	03/24/25 14:07

Client Sample ID: 1-40409, NM14, Clay Soils

Lab Sample ID: 885-21888-3

Date Collected: 03/18/25 10:30

Matrix: Solid

Date Received: 03/21/25 13:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			22937	DL	EET ALB	03/24/25 09:45
Total/NA	Analysis	300.0		5	22943	DL	EET ALB	03/24/25 14:27

Client Sample ID: 1-40409, NM14, Granular Soils

Lab Sample ID: 885-21888-4

Date Collected: 03/18/25 13:30

Matrix: Solid

Date Received: 03/21/25 13:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	300_Prep			22937	DL	EET ALB	03/24/25 09:45
Total/NA	Analysis	300.0		5	22943	DL	EET ALB	03/24/25 14:47

Laboratory References:

EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Geo-Test Inc
Project/Site: Abajo-Thornburg Re-Direct

Job ID: 885-21888-1

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-27-26
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
300.0	300_Prep	Solid	Chloride
300.0	300_Prep	Solid	Sulfate
Oregon	NELAP	NM100001	02-26-26

Login Sample Receipt Checklist

Client: Geo-Test Inc

Job Number: 885-21888-1

Login Number: 21888

List Source: Eurofins Albuquerque

List Number: 1

Creator: McQuiston, Steven

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Refer to Job Narrative for details.
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	

