EXHIBIT A

Geotechnical Investigation Report

Note: The following clarification is made within the Standard General Conditions (Article 5.03.B) in regard to the "technical data" provided in this Exhibit.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

Geotechnical Investigation

JAN - Cutter Intertie Water Supply Project
Jicarilla Apache Nation, New Mexico

Prepared for:
Souder, Miller & Associates

Project No.: 444317-2360000.03

June 12, 2017

NV5

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1.0 INTRODUCTION

This report presents the results of our geotechnical investigation for the JAN - Cutter Intertie Water Supply Project located within the Jicarilla Apache Nation, New Mexico.

The investigation was performed to determine site subsurface conditions and, based upon the conditions observed in the test holes, to develop geotechnical recommendations for:

Shallow Foundation Design;
Foundation Bearing Pressures;
Slab on Grade;
Site Grading;
Lateral Earth Pressures; and
Drainage.

The conclusions and recommendations presented are based on information provided to us regarding the proposed development, on subsurface conditions disclosed by the test holes, on laboratory testing, and upon the local standards of our profession at the time this report was prepared.

This investigation was not performed to determine the presence of potentially hazardous waste or radon gas. Determination of the presence of potentially hazardous materials is beyond the scope of this investigation and requires the use of exploration techniques and analytic testing which were not appropriate for this investigation. If desired, NV5 will perform an environmental audit of the site for an additional cost.

2.0 PROPOSED CONSTRUCTION

We anticipate construction will consist of two (2) at-grade 160,000-gallon water storage tanks and a two-room pre-fabricated chlorinator building. The project also includes the installation of nearly nine (9) miles of new water lines incorporating horizontal directional drilling (HDD) at four major wash crossings and the jack and bore technique for that portion of the water line passing below U.S. Highway 550 near the entrance to the Apache Nugget Travel Center Casino. The water storage tanks will be approximately 30 feet in diameter and 32 feet in height with the maximum water level at a height of 31.5 feet.

3.0 SITE CONDITIONS

The project site is located south and west of U.S. Highway 550. The water storage tanks and chlorinator building area is located at the west end of the project site and the proposed water line is oriented towards the east and continuing to the Apache Nugget Travel Center Casino property. The water storage tanks and chlorinator building are situated approximately 3.5 miles south of U.S. Highway 550 by way of an unpaved road within an area that is 4.3 miles southeast of Counselor. There are oil fields and storage tanks on either side of the unpaved road leading to the water storage tanks and chlorinator building site. The topography varies from relatively flat to gently sloping at the test hole locations near various arroyos where horizontal directional drilling may be required during installation of new water lines. Native vegetation includes pinon, juniper, sage and native grasses.

The surface soils were visually observed to be relatively loose and dry throughout the project site while conducting field investigations. Some rock outcroppings were noted within localized areas of the project site. Configuration of the overall project site is indicated on the Test Hole Location Maps, Figures 1 and 2.

4.0 SITE SUBSURFACE CONDITIONS

To explore the site subsurface conditions, ten (10) test holes were drilled at the approximate locations as shown on the Test Hole Location Maps, Figures 1 and 2. Five (5) test holes were drilled for use in foundation evaluation where the proposed water storage tanks and the chlorinator building are to be constructed. The remaining five (5) test holes were drilled for use in evaluating trenchless technology methods that may be considered during installation of the proposed water line.

The soils encountered in the test holes drilled at the proposed water tanks and chlorinator building locations consisted of silty sand (SM), silty, clayey sand (SC-SM), sandy, sandy silt (ML), silty clay (CL-ML) and sandy lean clay (CL). The sands were generally described as fine grained, dry to slightly moist and medium dense to very dense. The silts were generally described as dry to slightly moist and firm to hard. The silty clays were generally described as dry to slightly moist and firm. The lean clays were generally described as low to medium plasticity, dry to slightly moist and firm to very hard.

The soils encountered in the test holes drilled along the proposed water line route at those areas where horizontal directional drilling and jack and bore methods are proposed were visually classified according to ASTM D-2488 using visual-manual procedures. The subsurface soils appear to consist of primarily of sand (SM, SC-SM, SP-SM & SP-SC) with varying in amounts of silt and/or clay, sandy, silty clay (CL-ML), and lean clay (CL) with varying amounts of sand. No cobbles or boulders were encountered in test holes B-1 through B-4. Gravel and small cobbles were encountered within the lean clay with sand stratum at a depth of 4 to 6.5 feet in test hole B-5. The gravel and cobbles may be possible remnants of a former leach field installation within that general area.

Neither flowing groundwater nor bedrock was encountered in the test holes drilled to a depth of thirty-one (31) feet, the maximum depth of exploration within the water storage tanks and chlorinator building area, and to a depth of forty (40) feet, the maximum depth of exploration along the proposed water line. However, groundwater conditions may change with time due to precipitation, variations in groundwater level, seepage from ponding areas, or leaking utilities.

The test holes allow observation of a very small portion of the soils below the site. Significant variations in subsurface conditions may occur across the site, which were not disclosed by the test holes.

5.0 LABORATORY TESTING

A laboratory testing program was performed on samples obtained during the field investigation which appeared representative of the soils encountered in the test holes. The laboratory testing program was structured to determine the physical properties of the soils encountered in the test holes necessary for development of geotechnical recommendations.

The laboratory testing program included:

- Moisture Content;
- Dry Density;
- Sieve Analysis;
- Atterberg Limits; and
- Consolidation/Collapse.

Moisture Content and Dry Density tests were performed to evaluate the in-place soil density and moisture content. Test results help to evaluate settlement potential. Test results indicate the soils encountered in the test holes have an average dry density of 106 pcf. Natural moisture content ranged from 2.8 to 10.3 with an average of 5.5 percent. Test results are presented on the Logs of Test Holes, Figures 3 through 12, and are summarized on Table 1.

Sieve Analysis and Atterberg Limits tests were performed to confirm field soil classifications and to provide information on general physical soil properties. Laboratory test results are presented on Table 1.

Consolidation/Collapse tests were performed to evaluate structure settlement and to determine the effect of water on site soils. The results indicate that the tested soils generally exhibited slight to moderate compressibility under anticipated loads. Moderate additional settlement (collapse) occurred when the tested samples were inundated with water. Test results are presented on Figures 14 through 18.

6.0 FOUNDATIONS

If the recommendations presented in this report are implemented particularly those regarding site grading and drainage, the proposed Chlorinator Buildings may be supported on conventional spread and strip footings or turned down edge and the two 160,000-Gallon Water Storage Tanks may be supported on either reinforced concrete ring wall footings or a steel base with a steel retainer ring. The foundation for the Chlorinator Building should bear on a minimum thickness of three feet of structural fill. Ring wall footings, if used, for supporting the Water Storage Tanks should bear on a minimum thickness of four feet of structural fill. The base of the Water Storage Tanks should bear on a minimum thickness of six feet of structural fill. A four-inch layer of oil-treated sand should be provided below the tank base. Weep holes through the ring wall footings should be provided at frequent spacings or as recommended by the tank manufacturer. Structural fill should extend a minimum of three feet laterally beyond the edge of all footings and steel retainer rings. Foundations may be designed for an allowable bearing pressure of 2,000 pounds per square foot. This value may be increased by one-third for short-term loads due to wind and earthquakes. If it is not feasible to implement the site grading, drainage, and landscaping recommendations presented herein, an alternate foundation system may be required. This office should be contacted for additional recommendations.

The base of exterior footings for the proposed Chlorinator Building and reinforced concrete ring wall footings, if used for the Water Storage Tanks, should be embedded a minimum of thirty-six (36) inches below lowest adjacent grade. The base of interior footings within heated portions of the

Chlorinator Building should be embedded a minimum of twelve inches below finish pad grade. Spread and strip footings should be a minimum of twenty-four and eighteen inches wide, respectively. Turned down edges should be a minimum of twelve inches wide. However, local building codes may require greater dimensions.

Lateral foundation loads on the spread footings will be resisted by a combination of passive soil pressure against the sides of footings and friction along the base. A passive soil resistance of 300 pounds per cubic foot may be utilized for design for gravity loading. Frictional resistance may be determined by multiplying foundation dead load by a coefficient of friction of 0.40.

The spread footing foundations designed and constructed for the new building are not anticipated to settle more than one inch. Differential settlement should not exceed one-half of the above value. Foundations should be designed and constructed to tolerate the above settlement. Foundations should be designed by a qualified structural engineer.

Prior to fill placement and following footing excavation, the natural soils should be scarified to a depth of eight inches and moistened to near optimum moisture content (±3%), except where low to medium plasticity clays (CL) are exposed at the base of the required over-excavations. Where these clays are exposed, the clays should be scarified to a minimum depth of eight inches and moistened to not less than one percent below optimum moisture content and no greater than three percent above optimum moisture content. Where conditions allow, the exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557, except in those areas where the exposed subgrade soils consist of low to medium plasticity clays. The exposed clays, which have been scarified and moisture conditioned as specified above should then be compact to a minimum of 90% of maximum density as determined by ASTM D-1557. All fill below structures should be placed and compacted as detailed in the attached Appendix. Prior to pouring concrete footing excavations should be cleaned of any slough, loose soil, or debris. Footing excavations should be compacted as detailed in the attached Appendix.

The site soils will collapse if allowed to increase in moisture content. With appropriate site grading and drainage as detailed in this report the moisture content of the soils within six to seven feet of the ground surface may increase. The recommendations presented in this report for site preparation are the minimum we consider prudent to address this degree of moisture penetration. In the event moisture penetration to depths greater than seven feet occurs, movement substantially greater than quoted above will occur.

Based upon the results of this investigation, an International Building Code Site Classification of “D” may be utilized for design.

7.0 CONCRETE SLABS-ON-GRADE

Concrete slabs-on-grade may be utilized for the interior flooring of the proposed Chlorinator Building. Slabs of the proposed Chlorinator Building should bear on a minimum of four (4) feet of structural fill. Conventional slabs should be isolated from all foundations, stem walls, and utility lines. Monolithic slabs should be isolated from all utilities. Frequent joints should be scored or cut in slabs to control the location of cracks.

Thickened slabs may be utilized to support interior partitions. Thickened slabs should be a minimum of twelve inches in width and should be designed to exert a maximum earth pressure of 500 pounds per square foot. Wall loads on thickened slabs should not exceed 800 pounds per linear foot. The thickness and reinforcement should be determined by a qualified structural engineer.

Slabs should be adequately reinforced with steel. Slab reinforcement should be turned down into turned down edges.

For structural design of the floor slab, a modulus of subgrade reaction of 300 kips per cubic foot may be utilized. This value is for a 1' x 1' square. The above value may be modified for various effective widths based upon the following equation:

$$K_s = 300\left[\frac{B+1}{2B}\right]^2$$

K_s = Modulus of subgrade reaction (kips per cubic foot)

B = Effective width of loaded area

Slabs should bear on a minimum of four (4) feet of structural fill. Prior to placing slabs or structural fill, the natural soils should be stripped of vegetation, scarified to a depth of eight inches, and moistened to a near optimum moisture content (±3%), except where low to medium plasticity clays (CL) are exposed. Where these clays are exposed, the clays should be scarified to a minimum depth of eight inches and moistened to not less than one percent below optimum moisture content and no greater than three percent above optimum moisture content. The exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557, except in those areas where the exposed subgrade soils consist of medium to high plasticity clays. The exposed clays, which have been scarified and moisture conditioned as specified above should then be compact to a minimum of 90% of maximum density as determined by ASTM D-1557. All fill below slabs should be placed and compacted as detailed in the attached Appendix.

8.0 TRENCHLESS TECHNOLOGY METHODS

The subsurface conditions within those areas where trenchless technology methods are being considered for installing pipelines are anticipated to consist of primarily of sands, silts, silty clays and lean clays. Some amount of gravel and small cobbles were encountered between a depth of 4 and 6.5 feet in Test Hole B-5. The contractor may consider having additional investigations performed so as to determine whether the more granular materials are likely to persist along the full length of the pipe line within that area where trenchless technology methods are envisioned to be used.

9.0 EARTHWORK

9.1 General

The settlement estimates presented in this report are based upon the assumption that site earthwork will be performed as recommended in this report and the attached Appendix. Presented below is a summary of the site earthwork recommendations. Detailed earthwork procedures are presented in the attached Appendix.

Prior to commencing earthwork, the Contractor should obtain appropriate Proctor tests. Field density testing and evaluation of the suitability of the proposed materials performed prior to completion of the Proctor is "Preliminary" and may change based upon the results of the Proctor testing.

9.2 Clearing and Grubbing

Prior to placing structural fill, all borrow and fill areas should be stripped of vegetation and deleterious materials. All strippings should be hauled off-site or utilized in landscaped areas.

All existing utilities, septic tanks, leach fields, and disturbed soil should be removed from below the proposed amenities. The resulting excavations should be backfilled with compacted fill as detailed in the attached Appendix.

9.3 Excavation

We anticipate that on-site soils can be excavated with conventional earthwork equipment. Cobbles or boulders may be encountered during excavation. Cobbles and boulders should be disposed of off-site or utilized for landscaping. Cobbles and boulders should not be placed within structural fills. Cobbles and boulders as defined in ASTM D-2487.

9.4 Natural Ground Preparation

Prior to placing structural fill and subsequent to final grading in cut areas, the exposed soils should be scarified and moistened to a near optimum moisture content (±3%), except where low to medium plasticity clays (CL) are exposed. Where these clays are exposed, the clays should be scarified to a minimum depth of eight inches and moistened to not less than one percent below optimum moisture content and no greater than three percent above optimum moisture content. The exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557, except in those areas where the exposed subgrade soils consist of medium to high plasticity clays. The exposed clays, which have been scarified and moisture conditioned as specified above should then be compact to a minimum of 90% of maximum density as determined by ASTM D-1557. If vibratory compaction poses a threat to nearby structures, static compaction should be utilized.

9.5 Fill Placement and Compaction

Structural fill should be placed in horizontal lifts a maximum of eight inches in loose thickness, moisture conditioned to near optimum moisture content, and mechanically compacted. Fill below

footings and slabs should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557. The on-site soils are not anticipated to be suitable as structural fill. Imported soils may be blended with the existing soils, provided that the resulting blended material satisfies structural fill criteria.

9.6 Observation and Testing

Placement and compaction of structural fill should be observed and tested by a qualified geotechnical engineer or his representative. The purpose of the observation and testing is to confirm that the recommendations presented herein are followed and to provide supplemental recommendations, if subsurface conditions differ from those anticipated.

Foundation excavations should be observed by a qualified geotechnical engineer, or his representative, prior to placement of reinforcement or concrete. The purpose of the observation is to determine if the exposed soils are similar to those anticipated.

9.7 Frequency of Testing

Earthwork should be tested periodically to confirm the fill is compacted to the criteria presented in this report. Prior to placing fill, the natural ground should be moisture conditioned, compacted, and tested to confirm it is properly compacted. Fill should be placed in maximum eight-inch thick loose lifts, but in no case thicker than can be compacted with the equipment being utilized. Fill should be moisture conditioned and compacted as detailed in this report. Fill areas should be tested at maximum one-foot vertical intervals. If fill areas are worked at different times, each individual area should be tested. Following finish grading, the final surface should be tested. Following foundation excavation, the footing excavations should be tested. Utility trench backfill should be tested as necessary.

10.0 SITE GRADING AND DRAINAGE

The settlement estimates presented in this report assume the site will be graded to drain properly. If the site does not drain properly, structure settlement substantially greater than quoted in this report will occur.

To reduce the risk of structure settlement the site should be graded to rapidly drain away from amenities. Splash blocks should be utilized below down spouts and canales.

If ponding areas are required, they should be located as far away from amenities as possible, a minimum of ten feet. If these criteria cannot be met, this office should be contacted for supplemental recommendations.

Roof gutters and downspouts should be utilized. Roof gutters should discharge to a hard surface. Water should run off rapidly.

11.0 UTILITIES

The site soils are collapsible if allowed to increase in moisture content. If post-construction water or sewer line leaks occur, localized settlement will occur. Following installation, all water and sewer lines should be pressure checked for leaks. Any leaks found should be repaired.

Backfill in utility line trenches below slabs, driveways, and pavement should be compacted to a minimum of 90% of maximum density as determined by ASTM D-1557. Utility trenches should be as narrow as can be properly compacted. To reduce the possibility of breaking utility lines with compaction equipment, heavy compactors should not be utilized.

Utility trenches may not be compacted to the same degree as the remainder of the building pad. Therefore, wall footings, interior walls and thickened slabs should not be placed longitudinally over utility trenches. Column footings should not be placed over utility trenches.

12.0 TRENCHES AND EXCAVATIONS

All trenches greater than four feet in depth must be sloped, shored or braced or otherwise supported according to OSHA Construction and Safety Standards. Material excavated from the trench or spoil must be placed a minimum of two feet from the edge of the excavation. The spoil should be retained in an effective manner such that no loose material can fall into the excavation.

Temporary construction excavations less than eight feet deep should be sloped no steeper than 1½:1 (horizontal:vertical). If deeper excavations are required, this office should be contacted for supplemental recommendations. Limited raveling of slopes will occur particularly as the exposed soils dry out. Heavy equipment and material stockpiles should be located a minimum of five feet from the top of slope.

13.0 CLOSURE

This report was prepared for the exclusive use of our Client. The recommendations presented in this report are based upon the subsurface conditions disclosed by the test holes. Soil and groundwater conditions may vary between test holes and with time.

This report reflects our interpretation of the site subsurface conditions. We strongly recommend that prior to bidding all contractors perform their own subsurface investigation to form their own opinion of the site soil, rock, and groundwater conditions. Should contractors elect to use this report for construction, bidding or estimating purposes, they do so at their own risk.

In a southwest climate it is particularly important to protect the soils supporting the proposed structure from an increase in moisture content. If soils supporting the structure increase in moisture content due to any cause such as poor site drainage, ponding areas, or leaking utility lines, significant structural settlement and distress may occur.

If conditions are encountered during construction which differ from those presented herein, this office should be contacted for supplemental recommendations. The staff of NV5, Inc. is available for supplemental consultation as necessary.

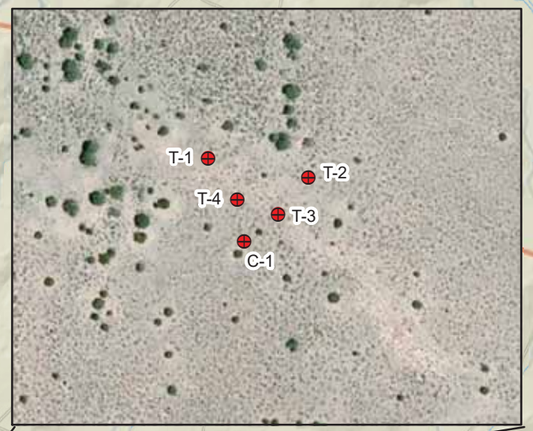
This office would be pleased to review site grading and drainage plans to evaluate conformance with the recommendations presented herein. All site earthwork should be observed by a qualified geotechnical engineer or his representative. NV5 would be pleased to provide these services.

Respectfully Submitted,
NV5, Inc.

06/12/17

Ralph L. Abeyta, P.E., M. ASCE
Senior Geotechnical Engineer

VICINITY MAP
NO SCALE



RIO ARRIBA
SANDOVAL

JICARILLA
APACHE
RESERVATION

Bia-J22

Bia-J24

Chacon Canyon

Cañon Largo

PROPOSED
TANK SITE

PROPOSED
JAN - CUTTER INTERTIE
WATER SUPPLY PROJECT

LEGEND

- Test Hole Location
- Probe Hole Location (See Figure 2 for Details)
- Proposed JAN - Cutter Intertie Water Supply Project

0 2,000 4,000 8,000 Feet
BASE MAP SCALE: 1" = 2000'

0 100 200 400 Feet
AERIAL INSET SCALE: 1" = 200'

N

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PROJECT NO.	444317-2360000.03
REVISED:	6/12/2017
DRAWN BY:	PD
CHECKED BY:	RLA
FILE NAME:	444317-2360000.03_01.MXD

TEST HOLE LOCATION MAP

JAN - CUTTER INTERTIE WATER SUPPLY PROJECT
JICARILLA APACHE NATION, NM

FIGURE
1

JICARILLA
APACHE
RESERVATION

Chacon Canyon

Bia-J22

PROPOSED
TANK SITE
(See Figure 1 for Details)

PROPOSED
JAN - CUTTER INTERTIE
WATER SUPPLY PROJECT

B-1

Chijuna Wash

B-2

Pato Wash

B-3

Tancosa Wash

BIA-24

B-4

Canon Largo

537

550

B-5

Bia-23

Pena Wash

LEGEND

- Test Hole Location (See Figure 1 for Details)
- Probe Hole Location
- Proposed JAN - Cutter Intertie Water Supply Project

0 1,500 3,000 6,000 Feet

BASE MAP SCALE: 1" = 2000'

0 100 200 400 Feet

AERIAL INSET SCALE: 1" = 200'

N

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PROJECT NO.	444317-2360000.03
REVISED:	6/12/2017
DRAWN BY:	PD
CHECKED BY:	RLA
FILE NAME:	444317-2360000.03_02.MXD

PROBE LOCATION MAP

JAN - CUTTER INTERTIE WATER SUPPLY PROJECT
JICARILLA APACHE NATION, NM

FIGURE
2

LOG OF TEST HOLE NO. T-1

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.627' N Easting: 107º 24.681' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	19	MC	111	7.0	1,2	CL	CLAY, sandy lean, firm, slightly moist, light brown
10	33	MC	106	5.3	1,2,5	SM	SAND, silty, fine grained, medium dense, slightly moist, light brown
15	20	S		3.8		ML	SILT, sandy, hard, dry, light brown
20	32	S		6.5		CL	CLAY, lean, low plasticity, very hard, dry, light brown
25	50/6"	S		7.2	1,2	SC-SM	SAND, silty, clayey with white calcareous intrusions, very dense, slightly moist, yellowish brown
30	50/6"	S		5.5		CL	CLAY, sandy lean, medium plasticity, very hard, dry, yellowish brown
	50/6"	S		10.3			
35							Bottom of hole 31'

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 3

LOG OF TEST HOLE NO. T-2

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.623' N Easting: 107º 24.654' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						CL-ML	CLAY, sandy, silty, firm, dry, light brown
	9	S		6.2			Increasing sand
5							
	23	MC	100	6.7			Slightly moist
	26	MC	101	6.7	1,2		
10							
	24	S		5.2	1,2	SM	SAND, silty, fine grained, medium dense, slightly moist, light brown
15							
	33	S		4.7		SC-SM	SAND, silty, clayey, dense, slightly moist, light brown
20							
	35	S		5.9		CL	CLAY, sandy lean with white calcareous intrusions, very hard, dry, light brown
25							
	26	S		4.7			
30							
	50/6"	S		3.2		SM	SAND, silty, fine grained, very dense, dry, very light brown
							Bottom of hole 30.5'
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 4

LOG OF TEST HOLE NO. T-3

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.615' N Easting: 107º 24.662' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	45	MC	107	3.8		SC-SM	SAND, silty, clayey, fine grained, medium dense, dry, light brown
10	27	S		6.9		CL-ML	CLAY, sandy, silty, hard, slightly moist, light brown
	19	MC	98	6.2	1,2,5		
15	15	S		5.8		SC-SM	SAND, silty, clayey, fine grained, medium dense, slightly moist, light brown
20	50/6"	S		4.6	1,2	SM	SAND, silty, calcareous nodules, very dense, slightly moist, light brown
25	50/6"	S		4.7			
30	50/6"	S		3.9			
	50/6"	S		2.8			Very light brown
35							Bottom of hole 30.5'

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 5

LOG OF TEST HOLE NO. T-4

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.618' N Easting: 107º 24.673' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SM	SAND, silty, fine grained, medium dense, slightly moist, light brown
	36	MC	111	4.7	1,2,5		
5							
	20	MC	109	4.7			
	18	S		4.3	1,2		
10							
	19	S		6.1			
15							
	50/6"	S		5.5			Very dense, light yellowish brown
20							
	50/6"	S		5.5			Very light brown
25							
	50/6"	S		9.0		CL	CLAY, sandy lean, very hard, medium plasticity, slightly moist, yellowish light brown
30							
	50/6"	S		4.8		SM	SAND, silty, fine grained, very dense, slightly moist, very light brown
							Bottom of hole 30.5'
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 6

LOG OF TEST HOLE NO. C-1

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.609' N Easting: 107º 24.671' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	22	MC	111	7.2	1,2	SM	SAND, silty, fine grained, medium dense, moist, light brown
	21	MC	106	5.2	1,2,5	ML	SILT, sandy, firm, slightly moist, light brown
10	20	S		4.7		CL-ML	CLAY, sandy, silty, firm, slightly moist, light brown
	27	S		5.8			
15	50/6"	S		6.5	1,2		
				4.2	1,2	SM	SAND, silty, fine grained, very dense, slightly moist, light yellowish brown
20	50/6"	S		4.1			
25							Bottom of hole 20.5'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 7

LOG OF TEST HOLE NO. B-1

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.435' N Easting: 107º 23.948' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5						CL	CLAY, lean with sand, low to medium plasticity, dry, light brown
10							
15						CL-ML	CLAY, sandy, silty, dry, light brown
20						SP-SM	SAND, poorly graded with silt, medium to fine grained, slightly moist, light brown
25							Trace gravel
30							
35						SC-SM	SAND, silty, clayey, trace gravel, fine grained, slightly moist, light brown
							Bottom of hole 35'

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 8

LOG OF TEST HOLE NO. B-2

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.327' N Easting: 107º 19.477' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5						CL	CLAY, lean with sand, medium plasticity, dry, light brown
10							
15						SC-SM	SAND, silty, clayey, fine grained, slightly moist, light brown
20							
25						SP-SC	SAND, poorly graded with silty clay, medium to fine grained, slightly moist, light brown
							Bottom of hole 25'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 9

LOG OF TEST HOLE NO. B-3

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.304' N Easting: 107º 18.951' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5						CL	CLAY, lean with sand, medium plasticity, dry, dark brown
10							
15							Sandy, light brown
20						SM	SAND, silty, fine grained, slightly moist, light brown
25						SP-SC	SAND, poorly graded with silty clay, slightly moist, light brown to brown
30							
35						SC-SM	SAND, silty, clayey, slightly moist, light brown to brown

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 10

LOG OF TEST HOLE NO. B-3 cont'd

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36° 9.304' N Easting: 107° 18.951' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
40						SC-SM	SAND, silty, clayey, silty moist, light brown to brown
45							Bottom of hole 40'
50							
55							
60							
65							
70							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 10 cont'd

LOG OF TEST HOLE NO. B-4

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.281' N Easting: 107º 18.175' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5						CL	CLAY, lean with sand, dry, light brown
10							Light grayish brown
15							
20						CL-ML	CLAY, silty with sand, slightly moist, grayish light brown
25							
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 11

LOG OF TEST HOLE NO. B-4 cont'd

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 9.281' N Easting: 107º 18.175' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
40						CL-ML	CLAY, silty with sand, slightly moist, light grayish brown
45							Bottom of hole 40'
50							
55							
60							
65							
70							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 11 cont'd

LOG OF TEST HOLE NO. B-5

Project: JAN - Cutter Intertie Water Supply Project
Project No.: 444317-2360000.03
Northing: 36º 8.810' N Easting: 107º 15.806' W
Date Drilled: 5/3/17
Depth to Groundwater: Not Encountered
Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5						CL	CLAY, lean with sand, dry, dark brown Gravel and small cobbles between 4 and 6.5 feet, possible remnants of former leach field
10							Sandy
15						SC-SM	SAND, silty, clayey, fine grained, slightly moist, light brown to brown
20							Bottom of hole 15'
25							
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 12

NOTES - LOGS OF TEST HOLES

Test hole locations were determined by compass bearing and pacing distances from known topographic points.

"Drilling Method" refers to the equipment utilized to advance the test hole. An eight-inch outside diameter, continuous flight, hollow-stem auger was utilized.

"S" under "Sample Type" indicates a Standard Penetration test (ASTM D-1586). The Standard Penetration sampler is 2 inches in outside diameter and 1 3/8 inches inside diameter.

"R" under "Sample Type" indicates a 3-inch outside diameter by 2.5-inch inside diameter sampler. The sampler is lined with 1-inch high brass rings.

"B" under "Sample Type" indicates a bulk sample.

"Blows Per Foot" indicates the number of blows of a 140-pound hammer falling 30 inches required to drive the indicated sampler 12 inches.

"NR" under "Blows/Foot" indicates that no sample was recovered.

"Dry Density PCF" indicates the laboratory determined soil dry density in pounds per cubic foot.

"Water Content %" indicates the laboratory determined soil moisture content in percent (ASTM D-2216).

"Unified Classification" indicates the field soil classification as per ASTM D-2488. When appropriate, the field classification is modified based upon subsequent laboratory tests.

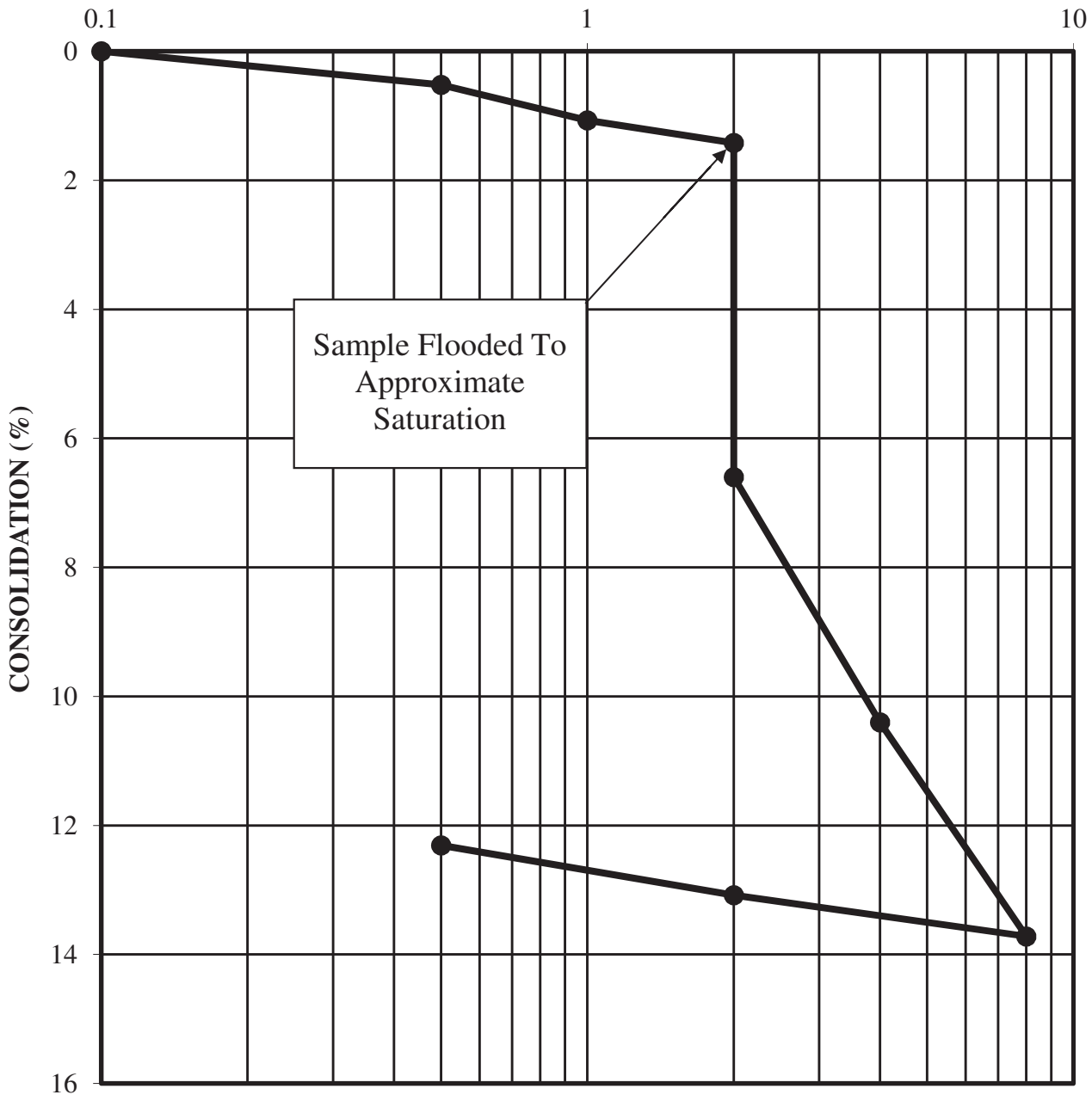
Variations in soil profile, consistency, and moisture content may occur between test holes. Subsurface conditions may also vary between test holes and with time.

Figure No.: 13

9019 Washington Street, Suite A
Albuquerque, NM 87113

Office: 505.344.7373
Fax: 505.344.1711

CONSOLIDATION TEST RESULTS

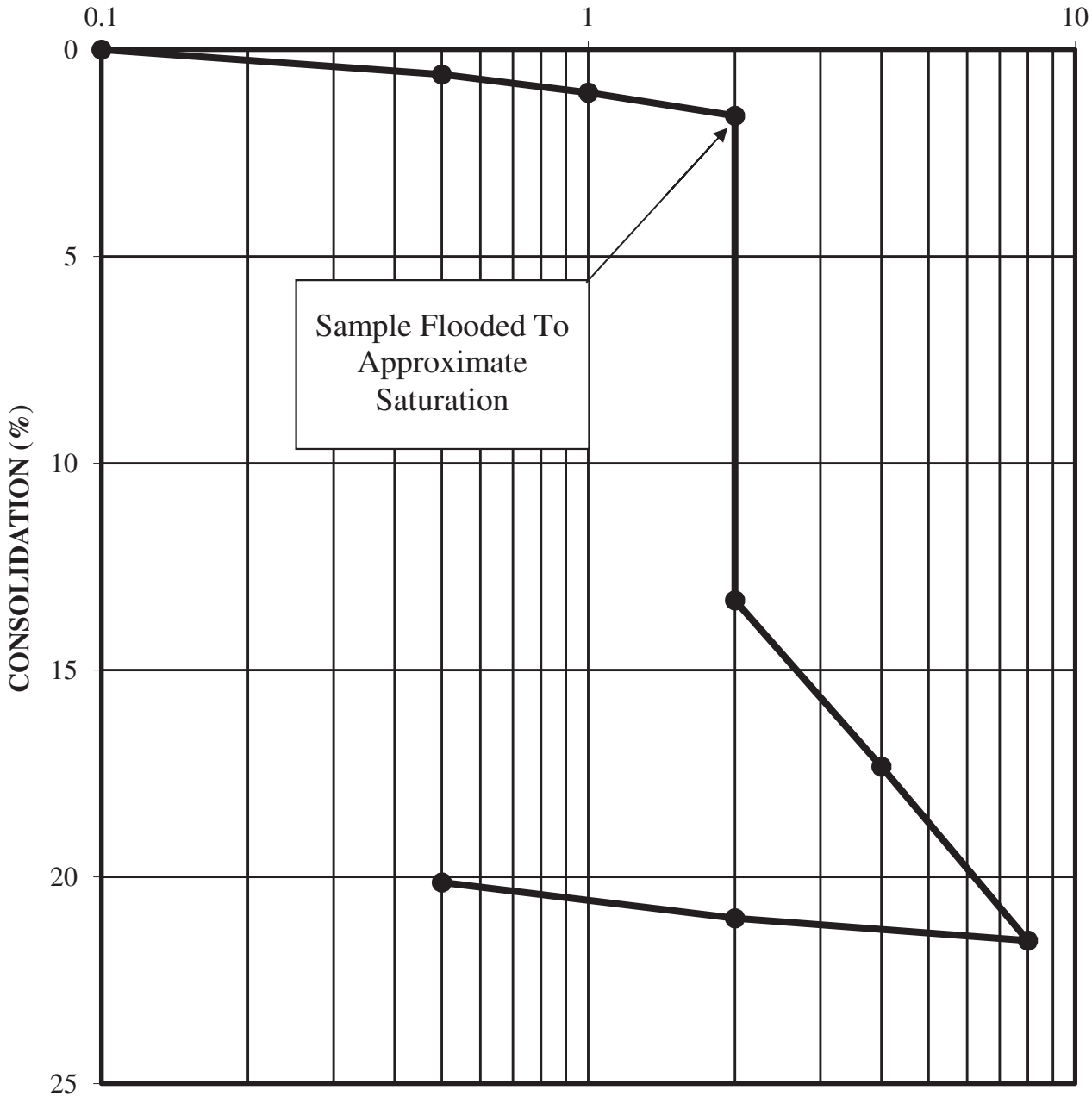


TEST HOLE NUMBER: T-1
SAMPLE DEPTH: 5.0 - 6.0 FEET
SOIL DESCRIPTION: Silty SAND (SM)
MOISTURE CONTENT: 5.3 %
BULK UNIT WEIGHT: 106 pcf

PROJECT: JAN - Cutter Intertie Water Supply Project
PROJECT NO.: 444317-2360000.03

FIGURE NO.: 14

CONSOLIDATION TEST RESULTS

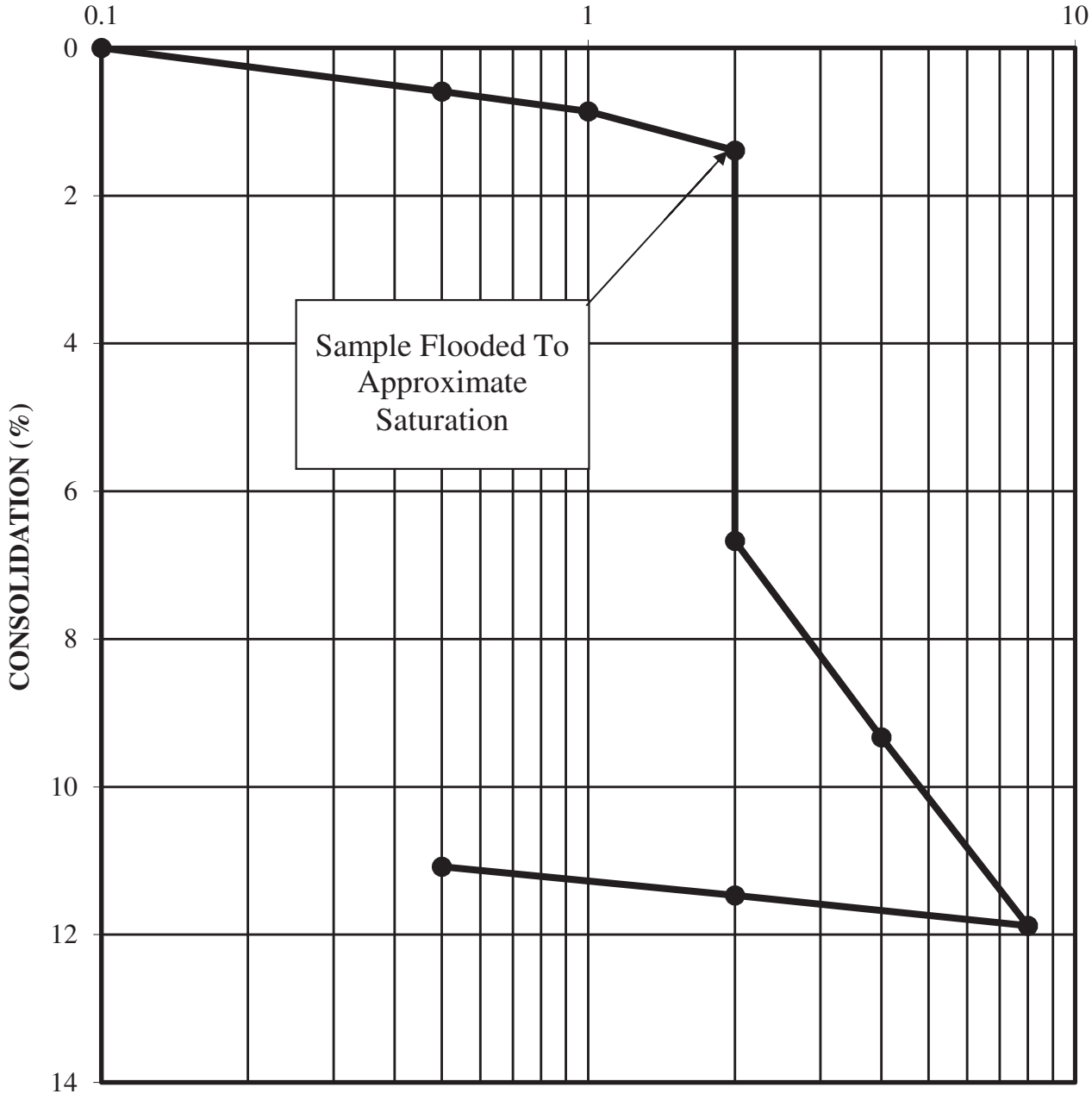


TEST HOLE NUMBER: T-2
SAMPLE DEPTH: 7.5 - 8.5 FEET
SOIL DESCRIPTION: Sandy, silty CLAY (CL-ML)
MOISTURE CONTENT: 6.7 %
BULK UNIT WEIGHT: 101 pcf

PROJECT: JAN - Cutter Intertie Water Supply Project
PROJECT NO.: 444317-2360000.03

FIGURE NO.: 15

CONSOLIDATION TEST RESULTS

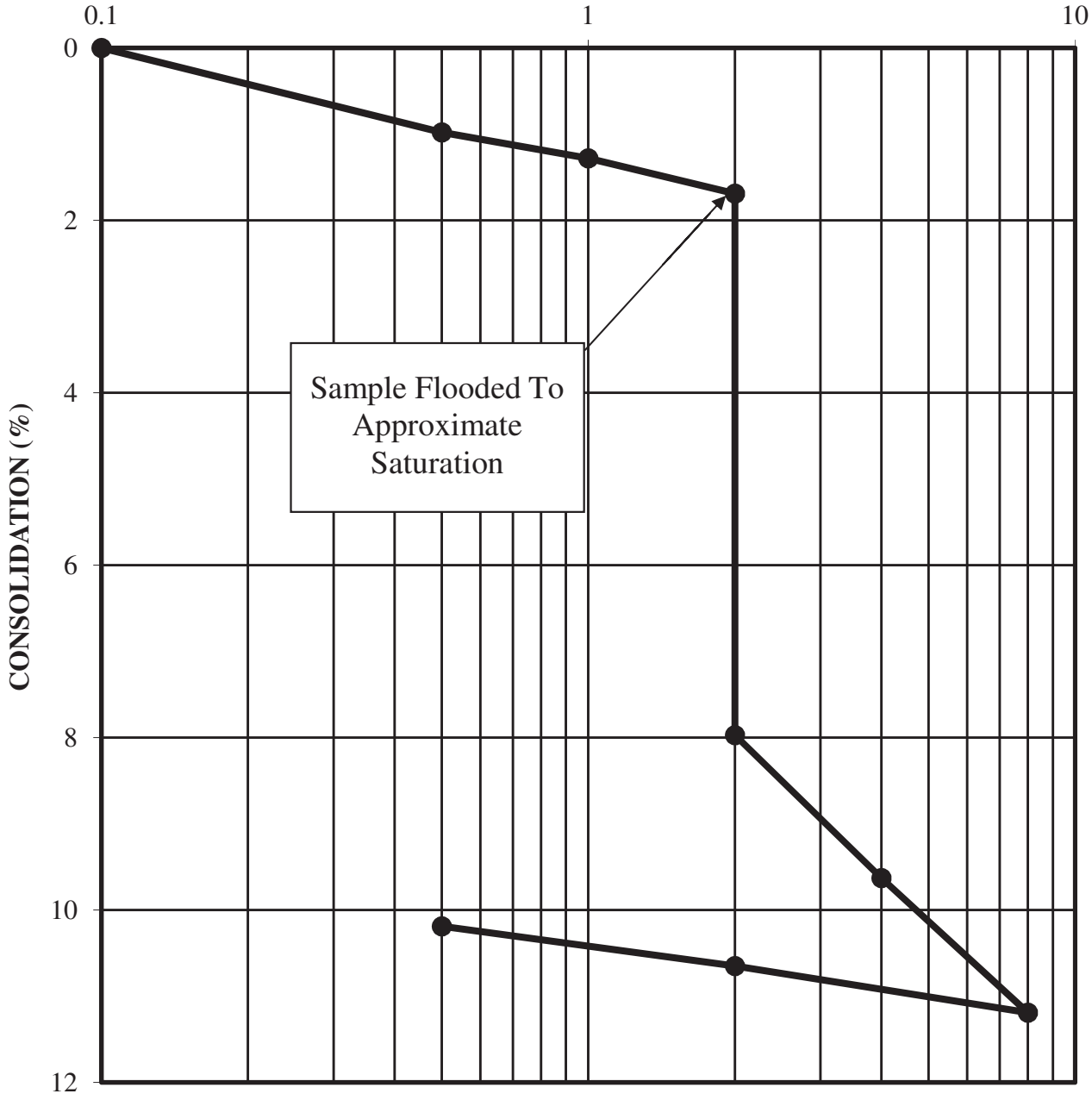


TEST HOLE NUMBER: T-3
SAMPLE DEPTH: 7.5 - 8.5 FEET
SOIL DESCRIPTION: Sandy, silty CLAY (CL-ML)
MOISTURE CONTENT: 6.2 %
BULK UNIT WEIGHT: 98 pcf

PROJECT: JAN - Cutter Intertie Water Supply Project
PROJECT NO.: 444317-2360000.03

FIGURE NO.: 16

CONSOLIDATION TEST RESULTS

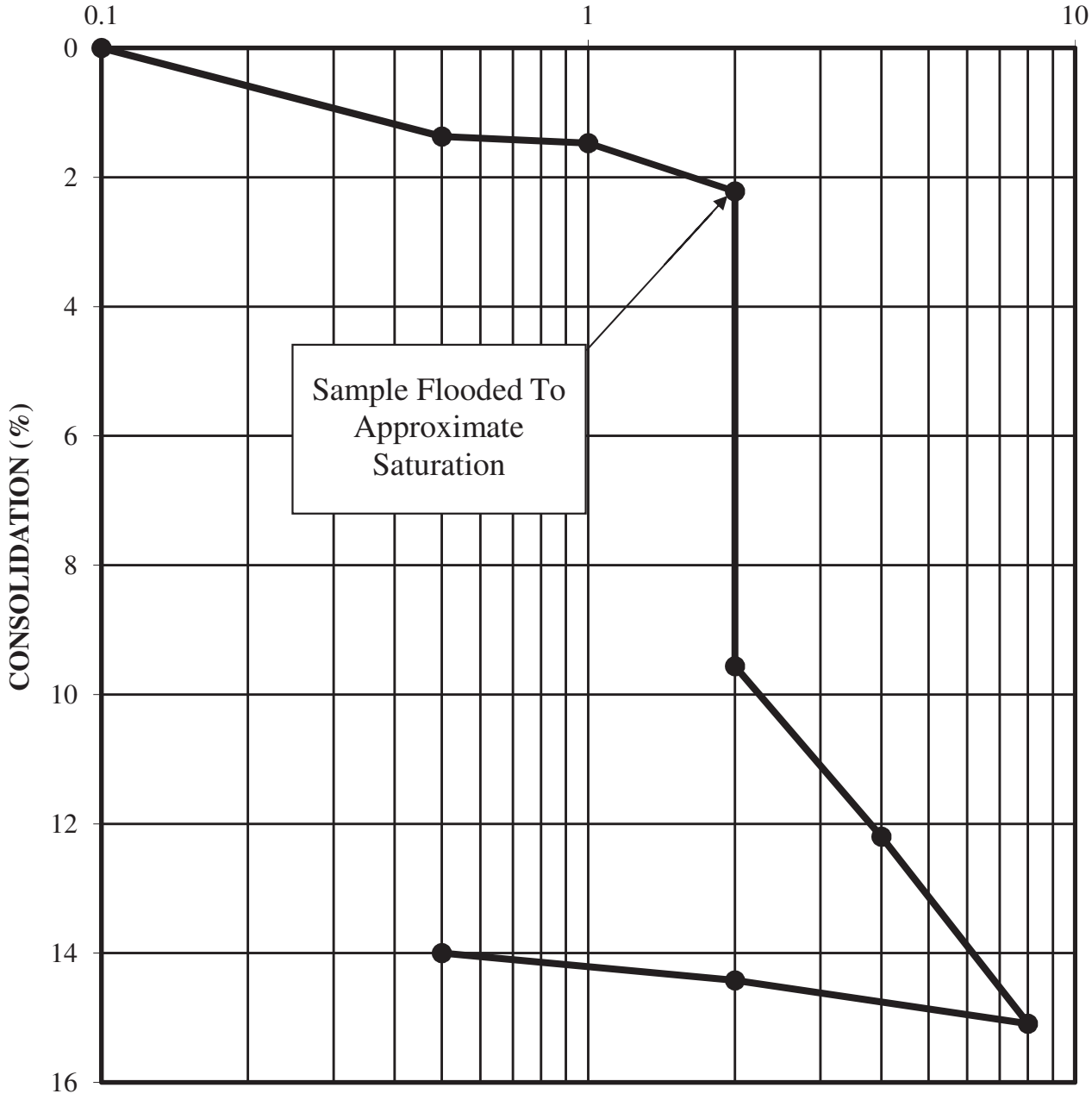


TEST HOLE NUMBER: T-4
SAMPLE DEPTH: 2.5 - 3.5 FEET
SOIL DESCRIPTION: Silty SAND (SM)
MOISTURE CONTENT: 4.7 %
BULK UNIT WEIGHT: 111 pcf

PROJECT: JAN - Cutter Intertie Water Supply Project
PROJECT NO.: 444317-2360000.03

FIGURE NO.: 17

CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: C-5
SAMPLE DEPTH: 5.0 - 6.0 FEET
SOIL DESCRIPTION: Sandy SILT (ML)
MOISTURE CONTENT: 5.2 %
BULK UNIT WEIGHT: 106 pcf

PROJECT: JAN - Cutter Intertie Water Supply Project
PROJECT NO.: 444317-2360000.03

FIGURE NO.: 18

SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
T1	2.5	CL	111	7.0	26	8							100	99	86	57.1	Sandy lean CLAY
T1	5	SM	106	5.3	NV	NP						100	99	91	68	42.9	Silty SAND
T1	10			3.8													
T1	15			6.5													
T1	20	SC-SM		7.2	26	6							100	86	49	37.3	Silty, clayey SAND
T1	25			5.5													
T1	30			10.3													
T2	2.5			6.2													
T2	5		100	6.7													
T2	7.5	CL-ML	101	6.7	26	6							100	99	89	60.5	Sandy, silty CLAY
T2	10	SM		5.2	23	3							100	92	69	47.5	Silty SAND
T2	15			4.7													
T2	20			5.9													
T2	25			4.7													
T2	30			3.2													
T3	2.5		107	3.8													
T3	5			6.9													
T3	7.5	CL-ML	98	6.2	24	4							100	97	76	52.5	Sandy, silty CLAY
T3	10			5.8													
T3	15	SM		4.6	NV	NP							100	83	37	32.4	Silty SAND

NV5 Project No.: 444317-2360000.03

Project: JAN - Cutter Intertie Water Supply Project **Table No.: 1**

SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
T3	20			4.7													
T3	25			3.9													
T3	30			2.8													
T4	2.5	SM	111	4.7	NV	NP							100	92	53	29.3	Silty SAND
T4	5		109	4.7													
T4	7.5	SM		4.3	NV	NP						100	99	87	53	32.0	Silty SAND
T4	10			6.1													
T4	15			5.5													
T4	20			5.5													
T4	25			9.0													
T4	30			4.8													
C-1	2.5 - 3.5	SM	111	7.2	NV	NP							100	93	67	44.7	Silty SAND
C-1	5.0 - 6.0	ML	106	5.2	NV	NP						100	99	92	73	57.4	Sandy SILT
C-1	7.5			4.7													
C-1	10			5.8													
C-1	15.0 - 15.5	CL-ML		6.5	25	6					100	99	99	96	81	65.8	Sandy, silty CLAY
C-1	15.5 - 16.5	SM		4.2	NV	NP							100	87	40	32.9	Silty SAND
C-1	20			4.1													

NV5 Project No.: 444317-2360000.03

Project: JAN - Cutter Intertie Water Supply Project **Table No.: 1**

APPENDIX
EARTHWORK PROCEDURES

General

The Geotechnical Engineer shall be the Owner's representative to observe and evaluate the earthwork operations. The Contractor shall cooperate with the Geotechnical Engineer in the performance of the Engineer's duties.

Clearing and Grubbing

Prior to placing structural fill all borrow areas and areas to receive structural fill shall be stripped of vegetation and deleterious materials. Strippings shall be hauled off-site or stockpiled for subsequent use in landscaped areas or nonstructural fill areas as designated by the Owner or his representative and approved by the Geotechnical Engineer.

Site Preparation - Fill Areas

Prior to placing structural fill the areas to be filled shall be scarified to a depth of eight inches and moisture conditioned as described below. The area to be filled shall then be compacted to a minimum of 95 percent of maximum density as determined by ASTM D-1557. If vibratory compaction techniques pose a threat to the structural integrity of nearby facilities a static compactor shall be used. Any soft or "spongy" areas shall be removed as directed by the Geotechnical Engineer and replaced with structural fill as described herein.

Site Preparation - Cut Areas

Following excavation to rough grade, all building and pavement areas shall be scarified to a depth of eight inches and moisture conditioned as described below. All building and paved areas shall be compacted to a minimum of 95 percent of maximum density as determined by ASTM D-1557. If vibratory compaction techniques pose a threat to the structural integrity of nearby facilities, a static compactor shall be used. Any soft or "spongy" areas shall be removed as directed by the Geotechnical Engineer and replaced with structural fill as described herein.

Foundation, Slab and Pavement Subgrade Preparation

Prior to placing reinforcement, footings, slabs, or pavement, the supporting soils shall be prepared, moisture conditioned, and compacted as described herein.

Fill Material

Fill material shall be nonexpansive soil which may be gravel, sand, silt or clay, or a combination there of.

Sieve Size	Percent Passing By Weight
4”	100
1”	90-100
No. 4	70-100
No. 200	10-40

Fill material shall exhibit a plasticity index of ten or less. No organic, frozen or

decomposable material shall be utilized. All fill material shall be approved by the Geotechnical Engineer.

Fill Placement

Fill material shall be blended as necessary to produce a homogeneous material. Fill material shall be spread in horizontal lifts no greater than eight inches in uncompacted thickness, but in no case thicker than can be properly compacted with the equipment to be utilized. If fill is to be placed on slopes steeper than 5:1 (horizontal:vertical) the natural ground shall be benched with minimum three foot wide benches at maximum two foot vertical intervals.

Moisture Conditioning

Fill material shall be dried or moistened as necessary, prior to compacting, to within ± three percent of optimum moisture content as determined by ASTM D-1557. Moisture shall be distributed uniformly throughout each lift.

Compaction

Structural fill shall be mechanically compacted to the following:

	Minimum Compaction ASTM D-1557
Foundation Support	95%
Slab Support	95%
Below Slab Utility Trenches	90%
General Site Grading	90%
Pavement Support	
Upper 8" of Subgrade	95%
All other fill below pavement	90%

Aggregate Base Course shall be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

Asphaltic concrete shall be compacted to a minimum of 96% of maximum Marshall Density (75 Blows).

Compaction by flooding and jetting is specifically prohibited unless authorized in advance by the Owner or his representative and the Geotechnical Engineer.

Observation and Testing

The Geotechnical Engineer or his representative shall perform field density tests with a frequency and at the locations he feels appropriate. The Geotechnical Engineer or his representative will perform Proctor tests on representative samples of all fill material. To minimize delays, the Earthwork Contractor is encouraged to submit soil samples prior to use for proctor testing.

EXHIBIT B

Soil and Rock Potholing Information

Note:
The following clarification is made within Article 1.3.K of Section 01 00 00 of the Technical Specifications with regard to soil and rock potholing information.

Data in Exhibit B – Soil and Rock Potholing Information identifies the results of the 'potholing' that was performed at various locations along the waterline alignment. Contractor is advised that test potholes reveal information about only a very small area, and sub-surface conditions between the test holes may vary. The results of the potholing are provided for Contractor's convenience only; they are not considered "Technical Data", as defined in Article 5.03 of the General Conditions, upon which the Contractor is entitled to base his/ her bid. Contractor shall not make any claims due to differing sub-surface conditions based on the information provided in Exhibit B.

JAN-Cutter Intertie "Soil & Rock Potholing Data"
JAN Reservation Boundary to Tee-Pee Juction, New Mexico
Completed March 7, 8, and 9, 2017
All coordinates are in NAD83 system zone 12N

Hole #	Station	Latitude	Longitude	Subsurface Conditions	Depth to Refusal
1	0+00	36° 9'33.62	107°24'42.84	Silty-sand underlain by soft sandstone	4.4 feet
2	5+43	36° 9'36.14	107°24'37.98	Silty-sand (no refusal)	None at 8 feet
3	10+68	36° 9'34.96	107°24'31.79	Silty-sand (no refusal)	None at 8 feet
4	18+03	36° 9'32.76	107°24'23.26	Slity-sand underlain by sandstone	6 feet
5	25+23	36° 9'30.74	107°24'14.80	Silty-sand (no refusal)	None at 8 feet
6	30+44	36° 9'29.48	107°24'8.64	Well graded medium sand (no refusal)	None at 8 feet
7	40+11	36° 9'26.21	107°23'57.59	Well graded medium sand (no refusal)	None at 8 feet
8	43+96	36° 9'25.74	107°23'52.94	Silty-Sand underlain by soft Sandstone	4.5 feet
9	53+54	36° 9'29.27	107°23'42.11	Sand-Clay mixtures underlain by Standstone	4.75 feet
10	59+01	36° 9'31.65	107°23'36.00	Sand underlain by Sandstone	4 feet
11	65+39	36° 9'34.20	107°23'29.00	Silty-Sand (no refusal)	None at 8 feet
12	68+89	36° 9'30.89	107°23'27.35	Sand-clay mixtures (no refusal)	None at 8 feet
13	71+64	36° 9'31.86	107°23'24.29	Sandy to Silty-Clay mixstures (no refusal)	None at 8 feet
14	83+24	36° 9'34.92	107°23'10.73	Sandy Loam (no refusal)	None at 8 feet
15	96+63	36° 9'37.36	107°22'54.72	Clay/ Sand (no refusal)	None at 8 feet
16	106+91	36° 9'38.28	107°22'42.05	Hard Clay/ Sand (no refusal)	None at 9.25 feet
17	111+63	36° 9'38.80	107°22'36.36	Sandy Loam underlain by Sandstone	5 feet
18	114+99	36° 9'39.14	107°22'32.30	Claystone	4.4 feet
19	119+68	36° 9'38.51	107°22'26.60	Sandstone Outcropping	2 feet
20	124+92	36° 9'37.82	107°22'20.25	Underlain Sandstone	5 feet
21	132+11	36° 9'36.90	107°22'11.64	Sand (no refusal)	None at 8 feet
22	140+01	36° 9'33.17	107°22'3.15	Underlain Sandstone	3.75 feet
23	147+97	36° 9'29.76	107°21'54.45	Sandy Loam (no refusal)	None at 8 feet
24	155+48	36° 9'26.54	107°21'46.05	Sand/ Clay (no refusal)	None at 8 feet
25	168+52	36° 9'20.67	107°21'32.21	Sandy Loam (no refusal)	None at 8 feet
26	180+90	36° 9'18.82	107°21'17.37	Sandy Loam (no refusal)	None at 9 feet
27	194+25	36° 9'17.32	107°21'1.11	Sandy Loam (no refusal)	None at 8 feet
28	201+74	36° 9'16.81	107°20'51.99	Underlain Sandstone	6.5 feet
29	207+44	36° 9'16.55	107°20'45.01	Underlain Sandstone	3 feet
30	214+67	36° 9'16.51	107°20'36.21	Claystone	7.5 feet
31	219+25	36° 9'16.36	107°20'30.67	Hard Sandy Loam (no refusal)	None at 8 feet
32	225+28	36° 9'15.89	107°20'23.34	Sand (no refusal)	None at 8.3 feet
33	240+31	36° 9'18.04	107°20'5.52	Hard Clay/ Sand (no refusal)	None at 8 feet
34	257+57	36° 9'18.69	107°19'44.53	Fine Sand/ Some Clay (no refusal)	None at 8.3 feet
35	285+05	36° 9'18.54	107°19'11.08	Dense Sandy Loam/ Clay (no refusal)	None at 8 feet
36	304+12	36° 9'18.64	107°18'47.86	Fine Sand/ Loam (no refusal)	None at 8.4 feet
37	308+01	36° 9'19.05	107°18'43.16	Clay/ Sand (no refusal)	None at 8 feet
38	310+09	36° 9'18.90	107°18'40.31	Bedrock Outcropping	0 feet
39	310+97	36° 9'18.85	107°18'39.24	Bedrock Outcropping	0 feet
40	312+13	36° 9'18.81	107°18'37.83	Fine SandY Loam (no refusal)	None at 8 feet
41	320+82	36° 9'18.37	107°18'27.54	Sandy Loam (no refusal)	None at 8 feet
42	349+85	36° 9'17.55	107°17'52.06	Clay/ Fine Sand (no refusal)	None at 8 feet
43	364+34	36° 9'17.03	107°17'34.52	Dense Clay/ Fine Sand (no refusal)	None at 8 feet
44	379+22	36° 9'17.69	107°17'16.46	Sand Loam (no refusal)	None at 8 feet
45	394+02	36° 9'12.91	107°16'59.63	Sandy Loam (no refusal)	None at 8 feet

EXHIBIT C

Submittal Cover Sheet
and Submittals Checklist

Note: Each item on the Submittal Checklist shall include an individual Submittal Cover Sheet

Contractor Submittal Form

Project: Jicarilla Apache Nation Cutter Intertie Water Supply ___ **Submittal No**: _____

Date: _____ **SMA Project No**: 6921433

Contractor: _____ **Number of Copies:** _____

Supplier: _____

Manufacturer: _____

Specification No: _____ **Drawing No.:** _____

Are there any deviations from the contract documents? **No ☐** **Yes ☐**
(Explain) _____

_____

_____

Product Description: _____

_____

Contractor Signed: _____

Engineer's Comments:

Review is limited to check for compliance with design concept. No changes from provisions of contract document are intended and Contractor remains responsible for compliance with revisions therein.

The Contractor is solely responsible for quantities; correctness of dimensions; verification of physical interrelation of elements of the work as required by the drawings and specifications and by field determination; fabrication procedures, construction methods, techniques and sequences. This review does not relieve the Contractor from these responsibilities.

Non-conformities and errors detected have been noted but such markings, or lack thereof, shall not relieve the Contractor from compliance with all requirements of the contract drawings and specifications.

- ☐ **No Exception Taken**
- ☐ **Submittal Rejected**
- ☐ **Correction Required As Noted**
- ☐ **Revise and Resubmit To Engineer**
- ☐ **Contractor Submit Specified Item**
- ☐ **Approved as Corrected**

_____

_____

_____

_____

_____

Engineer Signed: _____ **Date:** _____

SMA Engineering - Environmental Surveying				**Submittals Checklist** **Project Name:** **Jicarilla Apache Nation** **Cutter Intertie Water Supply Project** **Project Number:** **6921433**
Item	**Date Received**	**Approved**	**Not Approved**	**Comments**
Testing and Misc.				
Video of Existing Site Conditions				
Safety Plan				
Traffic Control Plan				
Copy of Construction Permits				
Copy of Encroachment Agreements				
Pipe fusion machine data logs and QA/QC report from fusible PVC pipe supplier				
Compaction				
Concrete				
Pressure Tests				
Disinfection Tests				
O&M Manuals				
Closeout Documents				
Site Civil / Earthwork				
Fill Material				
Engineered Fill Material				
Gravel				
Base Course				
Concrete Mix				
Rebar Reinforcement				
Site Fencing & Swinging Gates				
Stormwater Controls				
SWPPP Plan and updates				
Erosion Control				
Riprap/Cable Concrete Material				
Cable Concrete				
Wire cage material				
Epoxy-coated stakes				
Seed Mixture				
Water Storage Tank				
Tank Design Calculations (PE-sealed)				
Tank Design Drawings (PE-sealed)				
Tank Foundation Calcs (PE-sealed)				
Found. Shop Drawings (PE-sealed)				
Floor Penetration Drawings				
Concrete Mix, drawings, curing methods, tests				
Product Data				
Manufacture's Certificate				
Manufacture's Field Reports				
Project Record Documents				
Test Reports (vacuum, hydrostatic, etc.)				
Source Quality Control				
Paint Specifications				
Paint Schedule				
Independent NACE coatings inspector qualifications & certifications				
Independent NACE coatings inspector qualifications & certifications				
Cathodic Protection Design (by NACE Certified individual)				
Cathodic Protection Shop Drawings				
Cathodic Protection Product Data (anodes & test panels)				
Warrantees				

Item	Date Received	Approved	Not Approved	Comments
Waterline / Pipe Fittings				
PVC Waterline Pipe, Joints & Gaskets				
Petroleum Resistant Gaskets				
Fusible PVC Waterline Pipe				
FPVC Restraint Plan				
Fusible PVC Fusion technician qualification				
Fusible PVC fusion machines, data loggers,				
FPVC Fusion Destructive Testing Results				
PVC Sweeps				
Ductile Iron Pipe, Fittings, & Gaskets				
Plain Steel Pipe, Fittings, & Gaskets				
Galvanized Steel Pipe & Fittings				
Stainless Steel Pipe & Fittings				
Cement mortar linings for pipe & fittings				
Bituminous coatings for pipe & fittings				
Polyethylene jackets for pipe & fittings				
Cold-applied tape coatings for pipe & fittings				
Joint Restraints (incl. spacing)				
Detectable Warning Tape				
Tracer Wire				
Marker posts				
MJ Flange Adapter				
Tapping Saddles				
Horizontal Directional Drill (HDD) Shop Drawings				
HDD Installer Qualifications				
HDD Equipment/ machinery				
HDD work plan (methods, sequence of construction, etc.)				
HDD Permits (as required)				
HDD Contingency Plans				
Casing				
Casing Spacers				
Casing End Seals				
Valves				
Gate Valves				
Cast Iron Valve Box				
Meter Cans/Covers for Mainline Valves				
Mainline Valve placards (incl. proof)				
Site Valves placards (incl. proof)				
Open/shut-off valve tools				
Rubber Check Valves				
Air Valves				
Ball Valves				
Draft Damper				
(Meter) Pits and Covers for air valve assemblies				
Altitude Valve Vault Assembly:				
a. Concrete Vault, Ladder & Hatch				
b. Control Valve and Pilot System				
c. Annealed Stainless Steel Pilot Tubing, valves & fittings				
d. H Strainer				
e. Check Valve				
f. Dismantling Joint				
g. Ball and gate isolation valves				
g. Vacuum and Air Release Valves				

Important Note: The items listed on this form require submittal data. However, this list should not be considered all inclusive. If Technical Specifications or the Drawings include other submittal requirements, those must be met as well. Also, the Engineer may require additional submittals beyond those identified above and/or in the Specifications and Drawings.