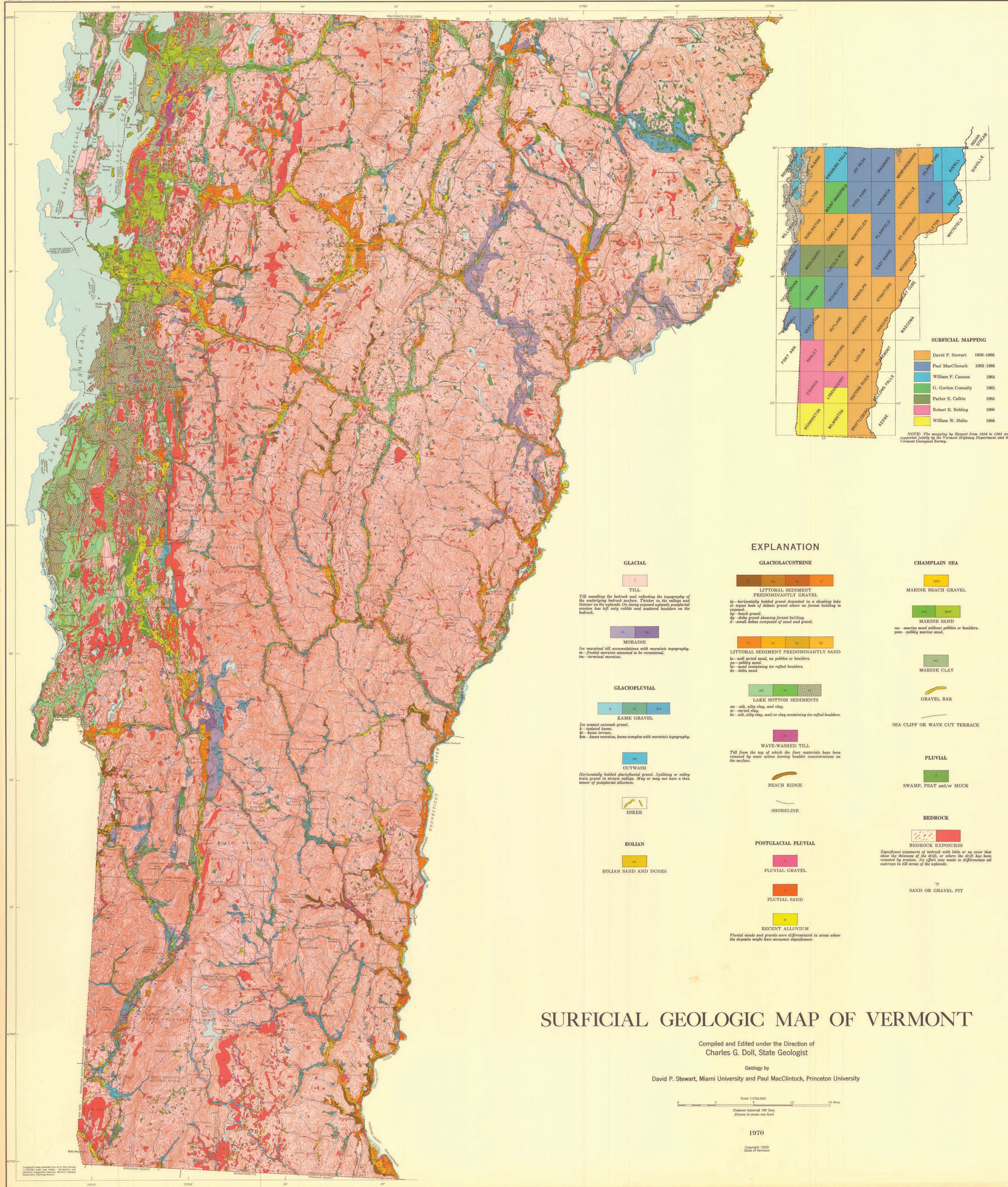
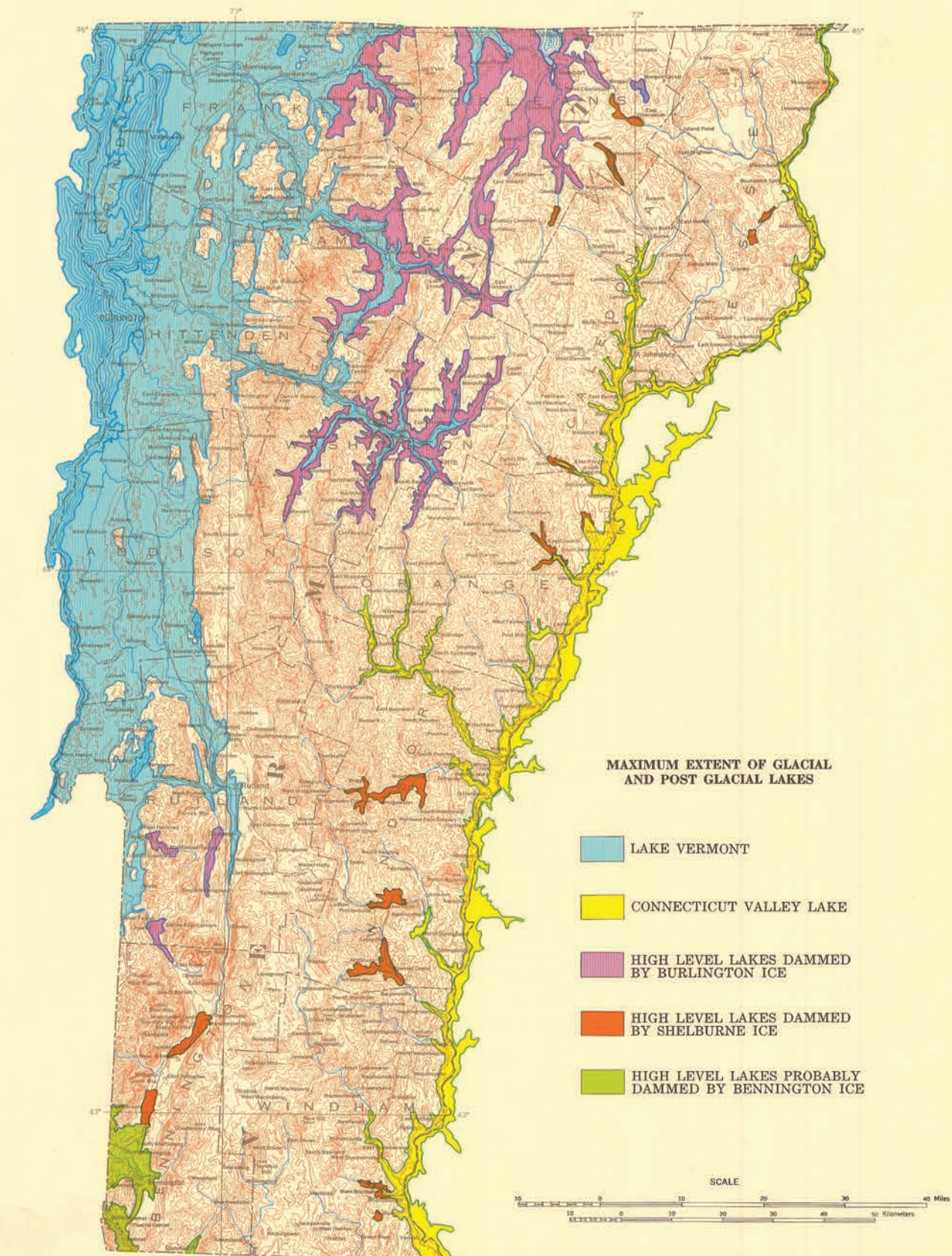
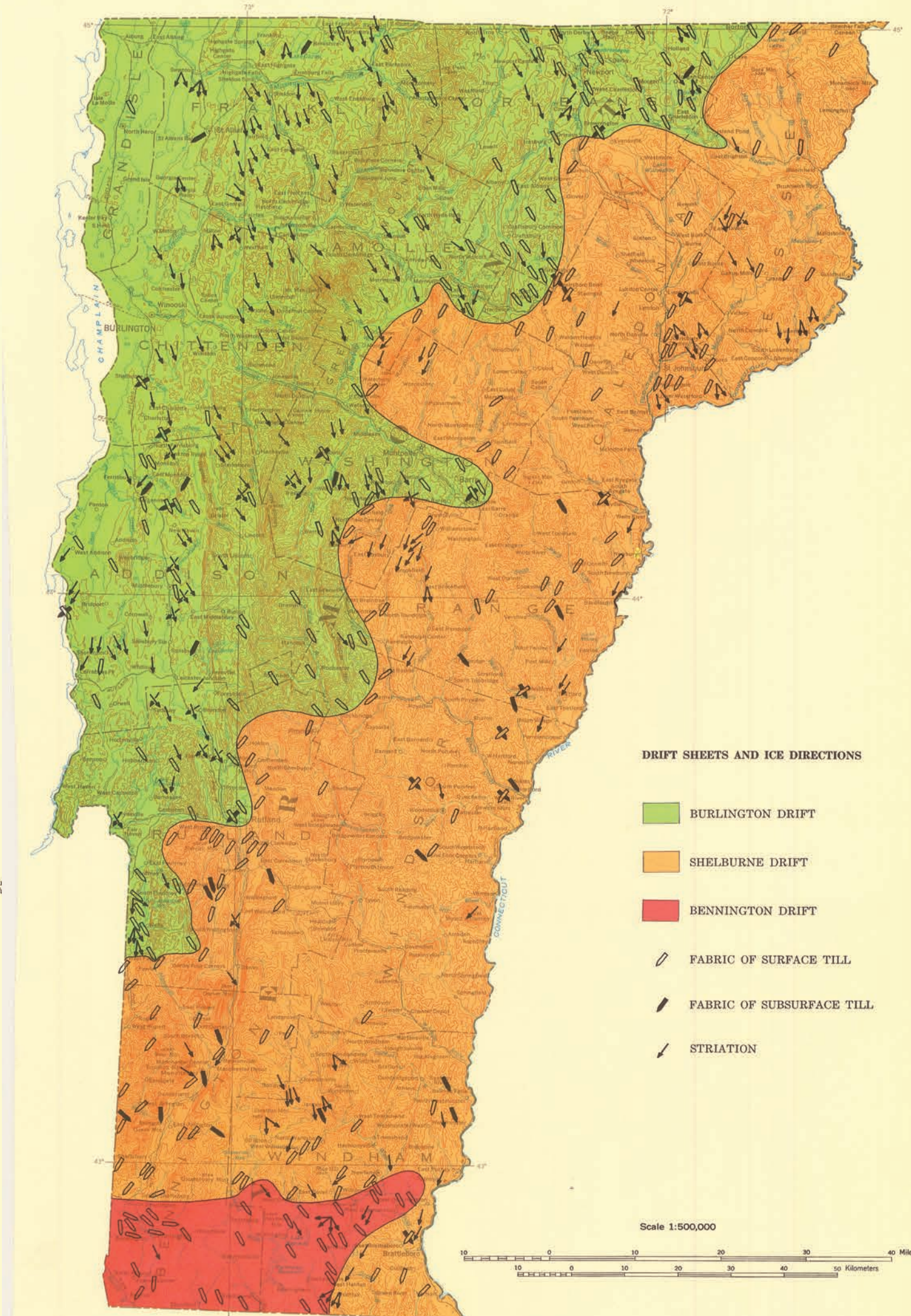




SURFICIAL GEOLOGIC MAP OF VERMONT

Compiled and Edited under the Direction of
Charles G. Doll, State GeologistGeology by
David P. Stewart, Miami University and Paul MacClintock, Princeton UniversityScale 1:500,000
Contour interval 100 feet
Distances in miles and feet

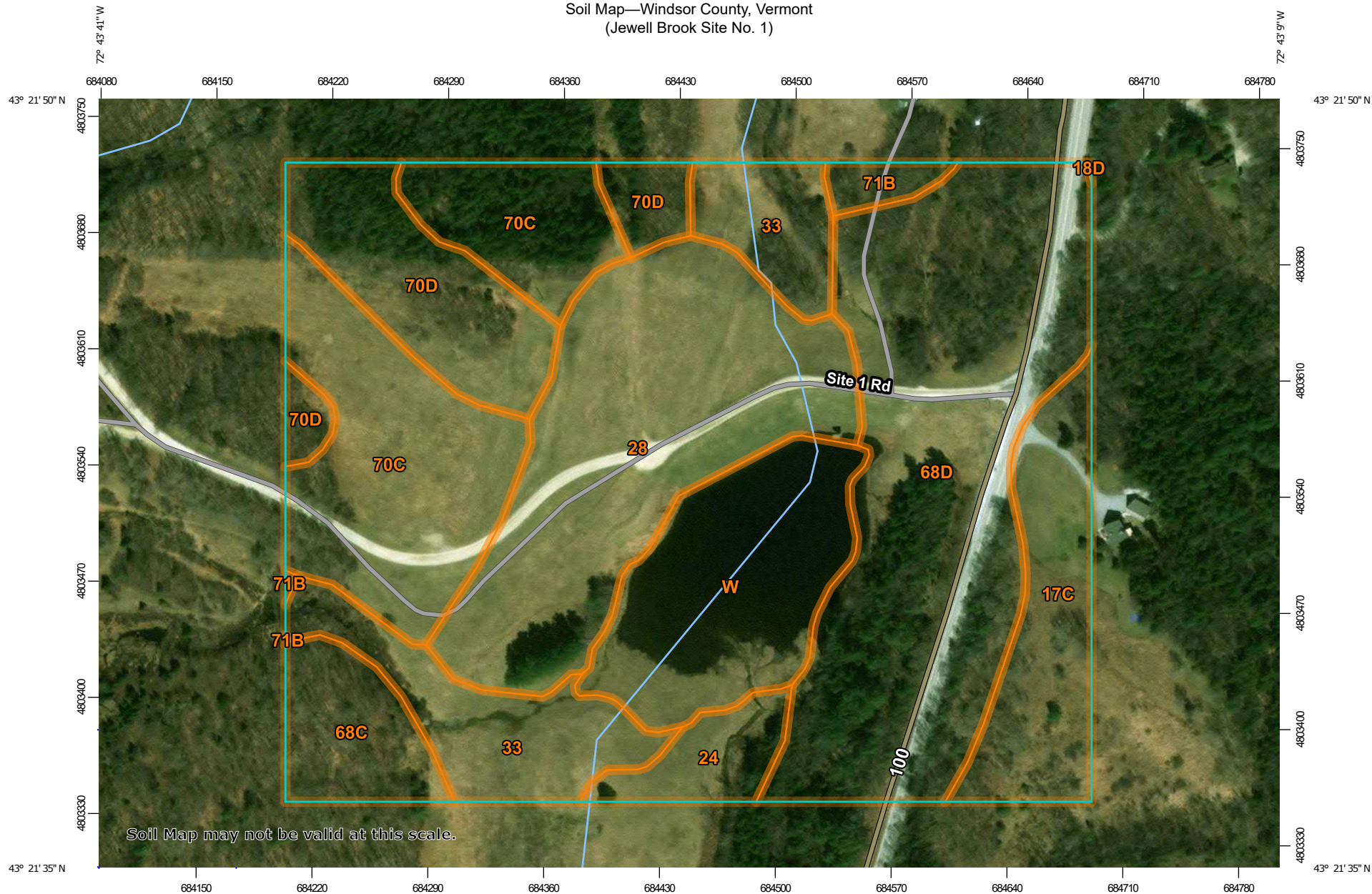
1970

Copyright 1969
State of Vermont

APPENDIX E

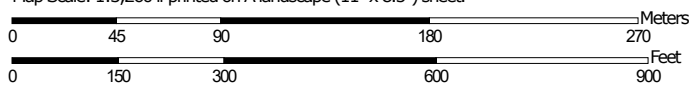
USDA NRCS WEB SOIL SURVEY DATA

Soil Map—Windsor County, Vermont
(Jewell Brook Site No. 1)



Soil Map may not be valid at this scale.

Map Scale: 1:3,260 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

1/10/2020
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Windsor County, Vermont

Survey Area Data: Version 23, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 17, 2012—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
17C	Peru, Skerry, and Colonel soils, 8 to 15 percent slopes	3.3	7.0%
18D	Becket fine sandy loam association, 15 to 35 percent slopes, very stony	0.0	0.0%
24	Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded	1.2	2.5%
28	Udorthents and Udipsamments	8.4	18.0%
33	Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded	4.2	9.1%
68C	Monadnock and Berkshire soils, 8 to 15 percent slopes	1.8	3.9%
68D	Monadnock and Berkshire soils, 15 to 25 percent slopes	11.5	24.7%
70C	Adams loamy sand, 8 to 15 percent slopes	7.1	15.3%
70D	Adams loamy sand, 15 to 25 percent slopes	4.0	8.7%
71B	Croghan and Sheepscot fine sandy loams, 0 to 8 percent slopes	0.5	1.0%
W	Water	4.6	9.9%
Totals for Area of Interest		46.6	100.0%

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Windsor County, Vermont

17C—Peru, Skerry, and Colonel soils, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w9qy

Elevation: 750 to 2,000 feet

Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Peru and similar soils: 55 percent
Skerry and similar soils: 20 percent
Colonel and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru**Setting**

Landform: Hills, mountains
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interflue
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or mica schist and/or phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bhs - 6 to 8 inches: fine sandy loam
Bs1 - 8 to 12 inches: fine sandy loam
Bs2 - 12 to 18 inches: fine sandy loam
Bs3 - 18 to 21 inches: fine sandy loam
BC - 21 to 24 inches: fine sandy loam
Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Skerry

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluvium

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and gneiss and/or schist over sandy lodgment till derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bs1 - 6 to 20 inches: gravelly fine sandy loam

Bs2 - 20 to 25 inches: gravelly fine sandy loam

Cd1 - 25 to 34 inches: gravelly loamy sand

Cd2 - 34 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 21 to 43 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 17 to 34 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Description of Colonel

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, side slope, nose slope, interfluvium

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Loamy lodgment till derived from granite and/or mica schist and/or phyllite

Typical profile

Ap - 0 to 7 inches: fine sandy loam

Bs1 - 7 to 9 inches: fine sandy loam

Bs2 - 9 to 12 inches: fine sandy loam
BC - 12 to 18 inches: gravelly fine sandy loam
Cd - 18 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to densic material
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Cabot

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, mountainflank, nose slope, side slope, interfluvium
Microfeatures of landform position: Closed depressions, closed depressions, open depressions, open depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Marlow

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, mountainflank, side slope, nose slope, interfluvium
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

18D—Becket fine sandy loam association, 15 to 35 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w9pt
Elevation: 460 to 1,510 feet

Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Becket, very stony, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Becket, Very Stony**Setting**

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy lodgment till derived from granite and gneiss and/or schist over sandy lodgment till derived from granite and gneiss and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
E - 2 to 4 inches: fine sandy loam
Bhs - 4 to 5 inches: fine sandy loam
Bs1 - 5 to 7 inches: fine sandy loam
Bs2 - 7 to 14 inches: fine sandy loam
Bs3 - 14 to 24 inches: gravelly sandy loam
BC - 24 to 33 inches: gravelly sandy loam
Cd - 33 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components**Skerry, very stony**

Percent of map unit: 15 percent

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainflank, side slope, nose slope

Microfeatures of landform position: Open depressions, open depressions

Down-slope shape: Convex, concave

Across-slope shape: Convex, concave

Hydric soil rating: No

Lyman, very stony

Percent of map unit: 5 percent

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountainflank, side slope, nose slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Monadnock, very stony

Percent of map unit: 5 percent

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope, summit

Landform position (three-dimensional): Mountainflank, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

24—Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded**Map Unit Setting**

National map unit symbol: 2qgvw

Elevation: 0 to 2,330 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 54 degrees F

Frost-free period: 80 to 160 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Podunk and similar soils: 83 percent

Minor components: 17 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Podunk

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium derived from schist and/or coarse-loamy alluvium derived from quartzite and/or coarse-loamy alluvium derived from granite and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam

Bw1 - 10 to 18 inches: fine sandy loam

Bw2 - 18 to 30 inches: fine sandy loam

C - 30 to 65 inches: loamy fine sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D

Hydric soil rating: No

Minor Components

Rumney

Percent of map unit: 6 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Microfeatures of landform position: Closed depressions

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: Yes

Ondawa

Percent of map unit: 5 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Microfeatures of landform position: Rises

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Hydric soil rating: No

Lovewell

Percent of map unit: 4 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Charles

Percent of map unit: 2 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Microfeatures of landform position: Closed depressions

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

28—Udorthents and Udipsamments**Map Unit Setting**

National map unit symbol: 9hnn

Elevation: 280 to 2,000 feet

Mean annual precipitation: 35 to 55 inches

Mean annual air temperature: 37 to 52 degrees F

Frost-free period: 90 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 43 percent

Udipsamments and similar soils: 42 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents**Setting**

Down-slope shape: Convex, concave, linear

Across-slope shape: Convex, concave

Parent material: Human transported material

Typical profile

H1 - 0 to 65 inches: gravelly sandy loam

Properties and qualities

Depth to restrictive feature: More than 80 inches

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.20 to 6.00 in/hr)

Depth to water table: About 24 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: A

Hydric soil rating: No

Description of Udipsamments**Setting**

Down-slope shape: Convex, linear, concave

Across-slope shape: Convex, concave

Parent material: Human transported material

Typical profile

H1 - 0 to 65 inches: sand

Properties and qualities

Depth to restrictive feature: More than 80 inches

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 99.90 in/hr)

Depth to water table: About 24 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components**Water**

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Unranked

Rock outcrop

Percent of map unit: 4 percent

Hydric soil rating: Unranked

Aquents

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Udifuvents

Percent of map unit: 3 percent

Landform: Flood plains

Hydric soil rating: No

33—Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2qgvs

Elevation: 0 to 2,440 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 54 degrees F

Frost-free period: 80 to 160 days

Farmland classification: Farmland of statewide importance, if drained

Map Unit Composition

Rumney and similar soils: 84 percent

Minor components: 16 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumney

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium derived from schist and/or coarse-loamy alluvium derived from quartzite and/or coarse-loamy alluvium derived from granite and gneiss

Typical profile

Ap - 0 to 9 inches: fine sandy loam

Bg1 - 9 to 20 inches: fine sandy loam

Bg2 - 20 to 30 inches: sandy loam

Cg - 30 to 65 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: B/D

Hydric soil rating: Yes

Minor Components**Medomak**

Percent of map unit: 6 percent

Landform: Flood plains

Microfeatures of landform position: Closed depressions

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: Yes

Podunk

Percent of map unit: 5 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Microfeatures of landform position: Rises

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Hydric soil rating: No

Charles

Percent of map unit: 3 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Ondawa

Percent of map unit: 2 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Microfeatures of landform position: Rises

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Hydric soil rating: No

68C—Monadnock and Berkshire soils, 8 to 15 percent slopes**Map Unit Setting**

National map unit symbol: 2w1mt

Elevation: 390 to 1,770 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 90 to 150 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Monadnock and similar soils: 45 percent

Berkshire and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monadnock

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank,
mountainbase, interfluvium, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial meltout till derived from
phyllite and/or granite and gneiss and/or mica schist over sandy
and gravelly supraglacial meltout till derived from phyllite and/or
granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam

Bs1 - 7 to 9 inches: fine sandy loam

Bs2 - 9 to 19 inches: gravelly fine sandy loam

BC - 19 to 22 inches: gravelly fine sandy loam

2C1 - 22 to 42 inches: gravelly loamy sand

2C2 - 42 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 15 to 30 inches to strongly contrasting
textural stratification

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Berkshire

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank,
mountainbase, side slope, nose slope, interfluvium

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial meltout till derived from
phyllite and/or granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bs1 - 7 to 13 inches: fine sandy loam
Bs2 - 13 to 21 inches: fine sandy loam
BC1 - 21 to 28 inches: fine sandy loam
BC2 - 28 to 33 inches: fine sandy loam
C - 33 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components**Skerry**

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope
Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Marlow

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tunbridge

Percent of map unit: 4 percent
Landform: Hills, mountains

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluve

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Colonel

Percent of map unit: 2 percent

Landform: Hills, mountains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, nose slope, side slope

Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions

Down-slope shape: Linear, concave

Across-slope shape: Concave

Hydric soil rating: No

68D—Monadnock and Berkshire soils, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wlmv

Elevation: 560 to 1,870 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 90 to 150 days

Farmland classification: Not prime farmland

Map Unit Composition

Monadnock and similar soils: 45 percent

Berkshire and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monadnock

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bs1 - 7 to 9 inches: fine sandy loam
Bs2 - 9 to 19 inches: gravelly fine sandy loam
BC - 19 to 22 inches: gravelly fine sandy loam
2C1 - 22 to 42 inches: gravelly loamy sand
2C2 - 42 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 30 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Berkshire**Setting**

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bs1 - 7 to 13 inches: fine sandy loam
Bs2 - 13 to 21 inches: fine sandy loam
BC1 - 21 to 28 inches: fine sandy loam
BC2 - 28 to 33 inches: fine sandy loam
C - 33 to 65 inches: fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components**Marlow**

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Peru

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Microfeatures of landform position: Open depressions, open depressions
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Tunbridge

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Colonel

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Microfeatures of landform position: Open depressions, open depressions

Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

70C—Adams loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wqn8
Elevation: 10 to 2,000 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Adams and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adams

Setting

Landform: Outwash terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits

Typical profile

Ap - 0 to 7 inches: loamy sand
Bs - 7 to 21 inches: sand
BC - 21 to 27 inches: sand
C - 27 to 65 inches: sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components**Colton**

Percent of map unit: 8 percent
Landform: Outwash terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Croghan

Percent of map unit: 3 percent
Landform: Outwash terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nicholville

Percent of map unit: 2 percent
Landform: Outwash terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sheepscot

Percent of map unit: 2 percent
Landform: Outwash terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

70D—Adams loamy sand, 15 to 25 percent slopes**Map Unit Setting**

National map unit symbol: 2wqnd
Elevation: 10 to 2,000 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Adams and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adams

Setting

Landform: Eskers

Landform position (two-dimensional): Backslope, summit

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits

Typical profile

Ap - 0 to 7 inches: loamy sand

Bs - 7 to 21 inches: sand

BC - 21 to 27 inches: sand

C - 27 to 65 inches: sand

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (1.42 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Croghan

Percent of map unit: 5 percent

Landform: Eskers

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Colton

Percent of map unit: 5 percent

Landform: Eskers

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

Salmon

Percent of map unit: 4 percent
Landform: Eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sheepscot

Percent of map unit: 1 percent
Landform: Eskers
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

71B—Croghan and Sheepscot fine sandy loams, 0 to 8 percent slopes**Map Unit Setting**

National map unit symbol: 9hs4
Elevation: 460 to 2,100 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Croghan and similar soils: 43 percent
Sheepscot and similar soils: 43 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Croghan**Setting**

Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 28 inches: loamy fine sand
H3 - 28 to 65 inches: fine sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 18 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A/D

Hydric soil rating: No

Description of Sheepscot**Setting**

Landform: Outwash terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

O1 - 0 to 2 inches: highly decomposed plant material

H1 - 2 to 7 inches: fine sandy loam

H2 - 7 to 11 inches: gravelly fine sandy loam

H3 - 11 to 32 inches: very gravelly coarse sand

H4 - 32 to 65 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 5.95 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components**Grange**

Percent of map unit: 3 percent

Landform: Outwash terraces, depressions, drainageways

Hydric soil rating: Yes

Adams

Percent of map unit: 3 percent

Landform: Outwash terraces

Hydric soil rating: No

Podunk

Percent of map unit: 3 percent

Landform: Flood plains

Hydric soil rating: No

Rumney

Percent of map unit: 2 percent

Landform: Flood plains

Hydric soil rating: Yes

Colton

Percent of map unit: 2 percent

Landform: Outwash terraces

Hydric soil rating: No

Irasburg

Percent of map unit: 1 percent

Landform: Outwash terraces

Hydric soil rating: No

W—Water**Map Unit Setting**

National map unit symbol: 9hsv

Mean annual precipitation: 35 to 59 inches

Mean annual air temperature: 37 to 52 degrees F

Frost-free period: 60 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Data Source Information

Soil Survey Area: Windsor County, Vermont

Survey Area Data: Version 23, Sep 16, 2019

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).



Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
17C—Peru, Skerry, and Colonel soils, 8 to 15 percent slopes														
Peru	55	C/D	0-6	Fine sandy loam, sandy loam, silt loam, loam	ML	A-4	0- 0- 0	0- 0- 0	83-91-100	83-91-100	66-80-96	40-55-69	0-33 -49	NP-3 -5
			6-8	Loam, sandy loam, fine sandy loam, very fine sandy loam	ML	A-4	0- 0- 0	0- 4- 53	49-93-93	47-92-92	37-81-87	21-54-58	0-37 -47	NP-3 -5
			8-12	Sandy loam, very fine sandy loam, loam, fine sandy loam	ML	A-4	0- 0- 0	0- 4- 51	51-93-93	49-93-93	37-79-84	22-51-58	0-0 -43	NP-0 -5
			12-18	Fine sandy loam, loam, sandy loam, very fine sandy loam	ML	A-4	0- 0- 0	0- 4- 50	52-93-93	50-93-93	38-79-85	22-51-58	0-0 -34	NP-0 -6
			18-21	Sandy loam, loam, very fine sandy loam, fine sandy loam	SM	A-4	0- 0- 0	0- 6- 50	52-85-92	50-84-92	38-71-83	23-49-58	0-0 -34	NP-0 -6
			21-24	Loam, very fine sandy loam, fine sandy loam, sandy loam	SM	A-4	0- 0- 0	0- 4- 43	59-88-94	57-88-94	44-75-86	24-47-57	0-0 -25	NP-0 -6

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			24-65	Fine sandy loam, sandy loam, loam, very fine sandy loam	SM	A-4	0- 0- 0	0- 4- 39	62-90-95	61-90-95	44-71-83	22-38-51	0-0 -23	NP-0 -6
Skerry	20	C/D	0-6	Fine sandy loam, sandy loam, gravelly fine sandy loam	SM	A-4	0- 0- 0	0- 5- 44	57-90-94	56-89-94	45-76-84	28-49-55	0-33 -50	NP-3 -5
			6-20	Gravelly fine sandy loam, fine sandy loam, sandy loam	SC-SM	A-4	0- 1- 50	0- 7- 50	52-79-93	50-78-92	40-66-82	25-43-54	0-26 -34	NP-5 -6
			20-25	Gravelly fine sandy loam, fine sandy loam, sandy loam	SM	A-4	0- 1- 50	0- 7- 50	52-71-92	50-69-91	41-59-84	26-38-57	0-0 -34	NP-0 -6
			25-34	Fine sandy loam, sandy loam, gravelly loamy sand, loamy fine sand, loamy coarse sand	SM	A-2-4	0- 1- 50	0- 5- 50	52-72-94	50-71-94	38-56-77	13-21-30	0-0 -18	NP-0 -2
			34-65	Fine sandy loam, sandy loam, loamy coarse sand, gravelly loamy sand, loamy fine sand	SM	A-2-4	0- 1- 50	0- 5- 50	52-72-94	50-71-94	38-56-77	13-21-30	0-0 -18	NP-0 -2
Colonel	15	D	0-7	Very fine sandy loam, loam, fine sandy loam, sandy loam	SM	A-4	0- 0- 0	0- 8- 43	58-91-96	56-91-95	44-78-88	24-48-58	0-0 -49	NP-0 -5
			7-9	Sandy loam, loam, fine sandy loam, very fine sandy loam	SM	A-4	0- 0- 0	0-10- 50	51-89-94	49-88-94	38-76-87	21-46-57	0-0 -43	NP-0 -5

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			9-12	Very fine sandy loam, fine sandy loam, loam, sandy loam	SM	A-4	0- 0- 0	0-10- 50	52-89-94	50-88-94	39-76-87	21-46-57	0-0 -34	NP-0 -6
			12-18	Loam, sandy loam, gravelly fine sandy loam, very fine sandy loam	SM	A-4	0- 0- 0	0- 7- 42	59-84-94	57-83-94	44-72-88	25-44-57	0-0 -25	NP-0 -6
			18-65	Loam, gravelly fine sandy loam, sandy loam, very fine sandy loam	SM	A-4	0- 0- 0	0- 6- 44	57-86-95	55-85-95	44-75-91	22-41-55	0-0 -23	NP-0 -6

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
18D--Becket fine sandy loam association, 15 to 35 percent slopes, very stony														
Becket, very stony	75	C	0-2	Slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			2-4	Loamy sand, fine sandy loam, sandy loam, gravelly fine sandy loam	ML	A-4	0- 0- 0	0- 0- 0	58-92-92	57-91-91	48-80-86	30-51-57	0-0 -36	NP-0 -6
			4-5	Fine sandy loam, sandy loam, gravelly fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	49-79-88	47-78-88	38-66-78	24-43-52	0-33 -43	NP-4 -5
			5-7	Fine sandy loam, gravelly fine sandy loam, sandy loam	SC-SM	A-4	0- 0- 0	0- 0- 0	52-80-89	50-79-89	40-67-79	25-43-52	0-26 -34	NP-5 -6
			7-14	Gravelly fine sandy loam, sandy loam, fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	52-80-89	50-79-89	41-67-82	26-43-55	0-0 -34	NP-0 -6
			14-24	Gravelly sandy loam, fine sandy loam, sandy loam	SC-SM	A-2-4	0- 0- 0	0- 0- 0	53-73-90	51-72-90	38-56-75	21-31-44	0-20 -29	NP-4 -6
			24-33	Fine sandy loam, sandy loam, loamy sand, gravelly sandy loam	SC-SM	A-2-4	0- 0- 0	0- 7- 36	58-69-92	56-67-91	42-52-76	22-29-45	0-20 -29	NP-4 -6

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			33-65	Fine sandy loam, very gravelly sandy loam, gravelly loamy sand, loamy fine sand	SM	A-2-4	0- 0- 0	0-13- 44	52-71-93	50-70-93	38-55-76	13-20-30	0-0 -18	NP-0 -2
24—Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded														
Podunk	83	B/D	0-10	Fine sandy loam, very fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	81-100-100	80-100-100	63-91-100	24-44-59	0-24 -34	NP-3 -9
			10-18	Fine sandy loam, very fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	82-100-100	82-100-100	62-88-100	23-41-57	0-19 -30	NP-1 -9
			18-30	Fine sandy loam, coarse sandy loam, very fine sandy loam, loamy fine sand	SM	A-2, A-4	0- 0- 0	0- 0- 0	82-100-100	82-100-100	62-88-100	23-41-57	0-17 -30	NP-1 -9
			30-65	Gravelly coarse sand, loamy fine sand, fine sandy loam, loamy sand	SM, SP-SM	A-4, A-2	0- 0- 0	0- 0- 0	44-100-100	41-100-100	34-92-100	11-36-45	0-0 -25	NP-0 -6
28—Udorthents and Udipsamments														
Udorthents	43	A	0-65	Gravelly sandy loam	GM, GP, ML, SM	A-1, A-2-4, A-3, A-4	—	0-10- 30	25-80-100	20-60-100	10-50-90	2-41- 80	0-18 -35	NP-5 -10
Udipsamments	42	A	0-65	Sand, gravelly sand	SP	A-1, A-3	—	0- 1- 2	85-93-100	50-80-100	25-58-90	0- 3- 5	0-7 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
33—Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded														
Rumney	84	B/D	0-9	Silt loam, loam, very fine sandy loam, fine sandy loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	79-100-100	57-100-100	46-91-100	17-40-54	0-31 -43	NP-3 -5
			9-20	Sandy loam, loam, very fine sandy loam, fine sandy loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	79-100-100	58-100-100	45-88-100	19-45-57	0-19 -27	NP-1 -6
			20-30	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	79-100-100	58-100-100	38-76-87	16-39-51	0-0 -27	NP-0 -6
			30-65	Loamy sand, loamy fine sand, gravelly loamy sand, stratified loamy sand to loamy fine sand	SP, SP-SM, SM	A-2, A-3, A-2-4	0- 0- 0	0- 0- 0	80-92-100	42-80-100	29-62-87	9-22- 35	0-0 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
68C--Monadnock and Berkshire soils, 8 to 15 percent slopes														
Monadnock	45	B	0-7	Fine sandy loam, sandy loam, gravelly fine sandy loam, silt loam	SM	A-4	0- 0- 0	0- 6- 48	66-91-100	65-91-100	55-79-94	32-46-58	0-0 -43	NP-0 -6
			7-9	Gravelly fine sandy loam, fine sandy loam, coarse sandy loam, loam	SM	A-4	0- 0- 0	0- 6- 24	59-89-100	57-88-100	49-77-94	28-45-58	0-0 -43	NP-0 -5
			9-19	Gravelly fine sandy loam, loam, coarse sandy loam	SM	A-4	0- 0- 0	0- 5- 23	61-72-100	60-71-100	51-62-94	29-36-58	0-0 -34	NP-0 -6
			19-22	Loam, fine sandy loam, gravelly fine sandy loam, sandy loam	SM	A-2-4	0- 0- 0	0- 7- 20	67-70-100	65-68-100	55-60-94	32-35-58	0-0 -25	NP-0 -6
			22-42	Loamy fine sand, gravelly loamy sand, loamy sand, loamy coarse sand	SM	A-2-4	0- 0- 0	0- 7- 23	38-71-94	35-69-94	28-56-76	11-21-30	0-0 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			42-65	Loamy fine sand, gravelly loamy sand, loamy sand, loamy coarse sand	SM	A-2-4	0- 0- 0	0- 7- 23	38-71-94	35-69-94	28-56-76	11-21-30	0-0 -14	NP
Berkshire	40	B	0-7	Fine sandy loam, gravelly fine sandy loam, sandy loam, loam	SM	A-4	0- 0- 0	0- 0- 0	54-92-92	52-92-92	45-80-87	26-47-54	0-0 -43	NP-0 -5
			7-13	Gravelly fine sandy loam, fine sandy loam, sandy loam, loam	SM	A-4	0- 0- 0	0- 0- 0	45-89-89	43-89-89	37-77-84	22-45-52	0-0 -43	NP-0 -5
			13-21	Loam, gravelly fine sandy loam, fine sandy loam, sandy loam	SM	A-4	0- 0- 0	0- 0- 0	47-90-90	44-89-89	38-78-85	22-45-53	0-0 -34	NP-0 -6
			21-28	Gravelly fine sandy loam, fine sandy loam, sandy loam, loam	SM	A-4	0- 0- 0	0- 0- 0	53-92-92	51-91-91	44-80-87	26-47-54	0-0 -27	NP-0 -6
			28-33	Sandy loam, loam, gravelly fine sandy loam, fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	53-92-92	52-92-92	44-80-87	26-47-54	0-0 -25	NP-0 -6
			33-65	Gravelly fine sandy loam, sandy loam, loam, fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	54-85-92	52-84-92	45-73-87	26-43-54	0-0 -23	NP-0 -6

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
68D--Monadnock and Berkshire soils, 15 to 25 percent slopes														
Monadnock	45	B	0-7	Fine sandy loam, sandy loam, silt loam, gravelly fine sandy loam	SM	A-4	0- 0- 0	0- 6- 48	66-91-100	65-91-100	55-79-94	32-46-58	0-0 -43	NP-0 -6
			7-9	Loam, gravelly fine sandy loam, coarse sandy loam, fine sandy loam	SM	A-4	0- 0- 0	0- 6- 24	59-89-100	57-88-100	49-77-94	28-45-58	0-0 -43	NP-0 -5
			9-19	Gravelly fine sandy loam, loam, coarse sandy loam	SM	A-4	0- 0- 0	0- 5- 23	61-72-100	60-71-100	51-62-94	29-36-58	0-0 -34	NP-0 -6
			19-22	Gravelly fine sandy loam, sandy loam, loam, fine sandy loam	SM	A-2-4	0- 0- 0	0- 7- 20	67-70-100	65-68-100	55-60-94	32-35-58	0-0 -25	NP-0 -6
			22-42	Loamy sand, loamy coarse sand, gravelly loamy sand, loamy fine sand	SM	A-2-4	0- 0- 0	0- 7- 23	38-71-94	35-69-94	28-56-76	11-21-30	0-0 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			42-65	Loamy coarse sand, loamy sand, loamy fine sand, gravelly loamy sand	SM	A-2-4	0- 0- 0	0- 7- 23	38-71-94	35-69-94	28-56-76	11-21-30	0-0 -14	NP
Berkshire	40	B	0-7	Gravelly fine sandy loam, sandy loam, loam, fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	54-92-92	52-92-92	45-80-87	26-47-54	0-0 -43	NP-0 -5
			7-13	Fine sandy loam, gravelly fine sandy loam, sandy loam, loam	SM	A-4	0- 0- 0	0- 0- 0	45-89-89	43-89-89	37-77-84	22-45-52	0-0 -43	NP-0 -5
			13-21	Sandy loam, loam, gravelly fine sandy loam, fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	47-90-90	44-89-89	38-78-85	22-45-53	0-0 -34	NP-0 -6
			21-28	Fine sandy loam, sandy loam, loam, gravelly fine sandy loam	SM	A-4	0- 0- 0	0- 0- 0	53-92-92	51-91-91	44-80-87	26-47-54	0-0 -27	NP-0 -6
			28-33	Gravelly fine sandy loam, fine sandy loam, sandy loam, loam	SM	A-4	0- 0- 0	0- 0- 0	53-92-92	52-92-92	44-80-87	26-47-54	0-0 -25	NP-0 -6
			33-65	Loam, gravelly fine sandy loam, fine sandy loam, sandy loam	SM	A-4	0- 0- 0	0- 0- 0	54-85-92	52-84-92	45-73-87	26-43-54	0-0 -23	NP-0 -6

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
70C—Adams loamy sand, 8 to 15 percent slopes														
Adams	85	A	0-7	Loamy fine sand, loamy sand	SM	A-2-4, A-2	0- 0- 0	0- 0- 0	90-94-100	80-89-100	67-76-88	22-27-32	0-23 -28	NP-2 -3
			7-21	Loamy fine sand, loamy sand, sand	SM	A-2, A-2-4	0- 0- 0	0- 0- 0	90-94-100	81-90-100	67-75-85	18-21-25	0-0 -23	NP-0 -2
			21-27	Sand, fine sand, loamy sand	SM	A-2-4, A-2	0- 0- 0	0- 0- 0	84-93-100	72-87-100	57-70-83	13-17-21	0-0 -19	NP-0 -1
			27-65	Gravelly coarse sand, sand	SW-SM, SP-SM	A-3, A-2-4, A-2	0- 0- 0	0- 0- 8	84-91-100	68-83-100	53-65-81	8-11- 15	0-0 -14	NP
70D—Adams loamy sand, 15 to 25 percent slopes														
Adams	85	A	0-7	Loamy sand, loamy fine sand	SM	A-2-4, A-2	0- 0- 0	0- 0- 0	90-94-100	80-89-100	67-76-88	22-27-32	0-23 -28	NP-2 -3
			7-21	Loamy sand, sand, loamy fine sand	SM	A-2, A-2-4	0- 0- 0	0- 0- 0	90-94-100	81-90-100	67-75-85	18-21-25	0-0 -23	NP-0 -2
			21-27	Fine sand, loamy sand, sand	SM	A-2-4, A-2	0- 0- 0	0- 0- 0	84-93-100	72-87-100	57-70-83	13-17-21	0-0 -19	NP-0 -1
			27-65	Gravelly coarse sand, sand	SW-SM, SP-SM	A-3, A-2-4, A-2	0- 0- 0	0- 0- 8	84-91-100	68-83-100	53-65-81	8-11- 15	0-0 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
71B—Croghan and Sheepscot fine sandy loams, 0 to 8 percent slopes														
Croghan	43	A/D	0-8	Fine sandy loam, loamy fine sand, loamy sand, fine sand, sand	SM, SP-SM, SW-SM	A-1, A-2-4, A-3, A-4	0- 0- 0	0- 0- 0	95-98-100	95-98-100	45-63-80	5-23- 40	0-7 -14	NP
			8-28	Loamy fine sand, fine sand, loamy sand, sand	SM, SP-SM, SW-SM	A-1, A-2-4, A-3, A-4	0- 0- 0	0- 0- 0	80-90-100	75-88-100	45-63-80	5-23- 40	0-7 -14	NP

Engineering Properties--Windsor County, Vermont														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			28-65	Fine sand, loamy sand, coarse sand, sand	SM, SP-SM, SW-SM	A-1, A-2-4, A-3	0- 0- 0	0- 0- 0	80-90-100	75-88-100	45-60-75	5-18- 30	0-7 -14	NP
Sheepscot	43	B	0-2	Slightly decomposed plant material, moderately decomposed plant material, highly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	98-100-100	97-100-100	45-65-85	20-40-60	—	—
			2-7	Fine sandy loam, sandy loam, very gravelly sandy loam, gravelly sandy loam, gravelly fine sandy loam, very gravelly fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2-4, A-4	0- 0- 0	0- 3- 5	80-90-95	75-85-90	45-65-85	20-40-60	0-8 -15	NP-3 -5
			7-11	Fine sandy loam, gravelly fine sandy loam, loamy fine sand, sandy loam, loamy sand, coarse sand, loamy coarse sand, gravelly loamy fine sand, gravelly sandy loam, gravelly loamy sand, gravelly sand, gravelly coarse sand, gravelly loamy coarse sand, very gravelly fine	GM, GP-GM, SM, SP-SM	A-1-a, A-2-4, A-1-b, A-4	0- 1- 1	0- 3- 5	40-80-95	35-63-90	20-48-75	5-28- 50	0-8 -15	NP-3 -5
				sandy loam, very gravelly loamy fine sand, very gravelly sandy loam, very gravelly loamy sand, very	Web Soil Survey National Cooperative Soil Survey									1/10/2020 Page 17 of 18



Data Source Information

Soil Survey Area: Windsor County, Vermont
Survey Area Data: Version 23, Sep 16, 2019



APPENDIX F
SEISMIC DATA

[← Latest Earthquakes](#)

M 6.5 - Central New Hampshire

1638-06-11 19:00:00 (UTC) | 43.400°N 71.600°W | - depth

Overview

Tops of chimneys were thrown down and dishes were knocked from shelves in the Salem-Lynn area, north of Boston, and at Plymouth, on the coast about 55 km southeast of Boston. At Plymouth, people had to hold on to posts to keep from falling. Ships near the coast reportedly were shaken. Also felt in Connecticut and Rhode Island. Aftershocks continued for 20 days. (Ref. 38, 59, 76.)

Interactive Map

Regional Information

Maximum observed Modified Mercalli Intensity (MMI) IX

Impact

From *Seismicity of the United States, 1568-1599 (Revised)*, by Carl W. Stover and Jerry L. Coffman, U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington, 1993.

The earthquake was also felt strongly at Trois-Rivières, Quebec.

Felt Report - Tell Us!

Adapted from Earthquake History of the United States, by Jerry L. Coffman, Carl A. von Hake and Carl W. Stover, National Oceanic and Atmospheric Administration and U.S. Geological Survey, Publication 41-1, Revised Edition, Reprinted with Supplement 1982, United States Government Printing Office, Washington, 1982.

Technical

Note that the original location for this event in the St. Lawrence Valley given by source USHS has been determined to be incorrect. Also, contemporary accounts of the event say it occurred about 1-2 PM local time, which corresponds to a UTC time of about 1900, instead of 0700 given by USHS.

Origin

[← Latest Earthquakes](#)

M 4.7 - New York

1931-04-20 19:54:30 (UTC) | 43.471°N 73.785°W | 5.0 km depth

Maximum observed Modified Mercalli Intensity (MMI) VII

Overview

[← Latest Earthquakes](#)

M 4.5 - New Hampshire

1982-01-19 00:14:42 (UTC) | 43.500°N 71.600°W | 8.0 km depth

Overview

Interactive Map

Regional Information

Impact

Felt Report - Tell Us!

ShakeMap

ShakeMap

Catalog	MMI	Source	Description
✓ ATLAS	V	ATLAS ²	1 km NW of Sanbornton, New Hampshire
US	VI	ATLAS ²	Shakemap Atlas v4

Slight damage (VI) at Bristol, Canaan, Danbury and Laconia, New Hampshire, also North Hartland and White River Junction, Vermont. Felt throughout most of New England, northeastern New York and as far as southern Quebec and northeastern Ontario.

Maximum observed Modified Mercalli Intensity (MMI) VI

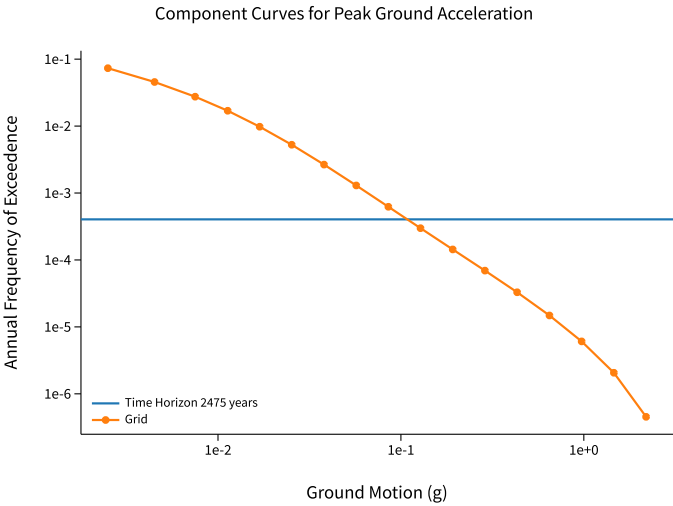
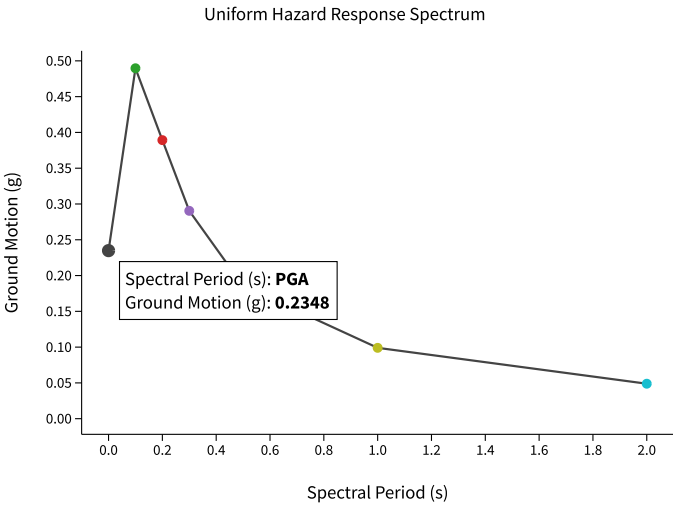
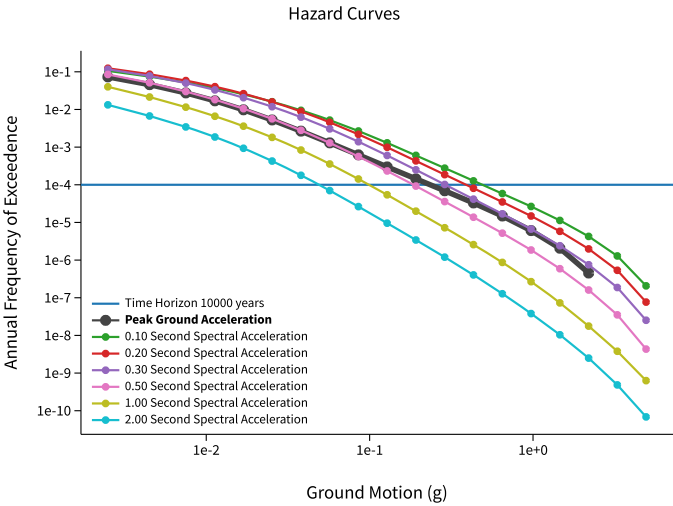
Unified Hazard Tool

 Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the [U.S. Seismic Design Maps web tools](#) (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

^ Input

Edition Dynamic: Conterminous U.S. 2014 (update) (v4.2.0)	Spectral Period Peak Ground Acceleration
Latitude Decimal degrees 43.363	Time Horizon Return period in years 10000
Longitude Decimal degrees, negative values for western longitudes -72.723	
Site Class 760 m/s (B/C boundary)	

^ Hazard Curve

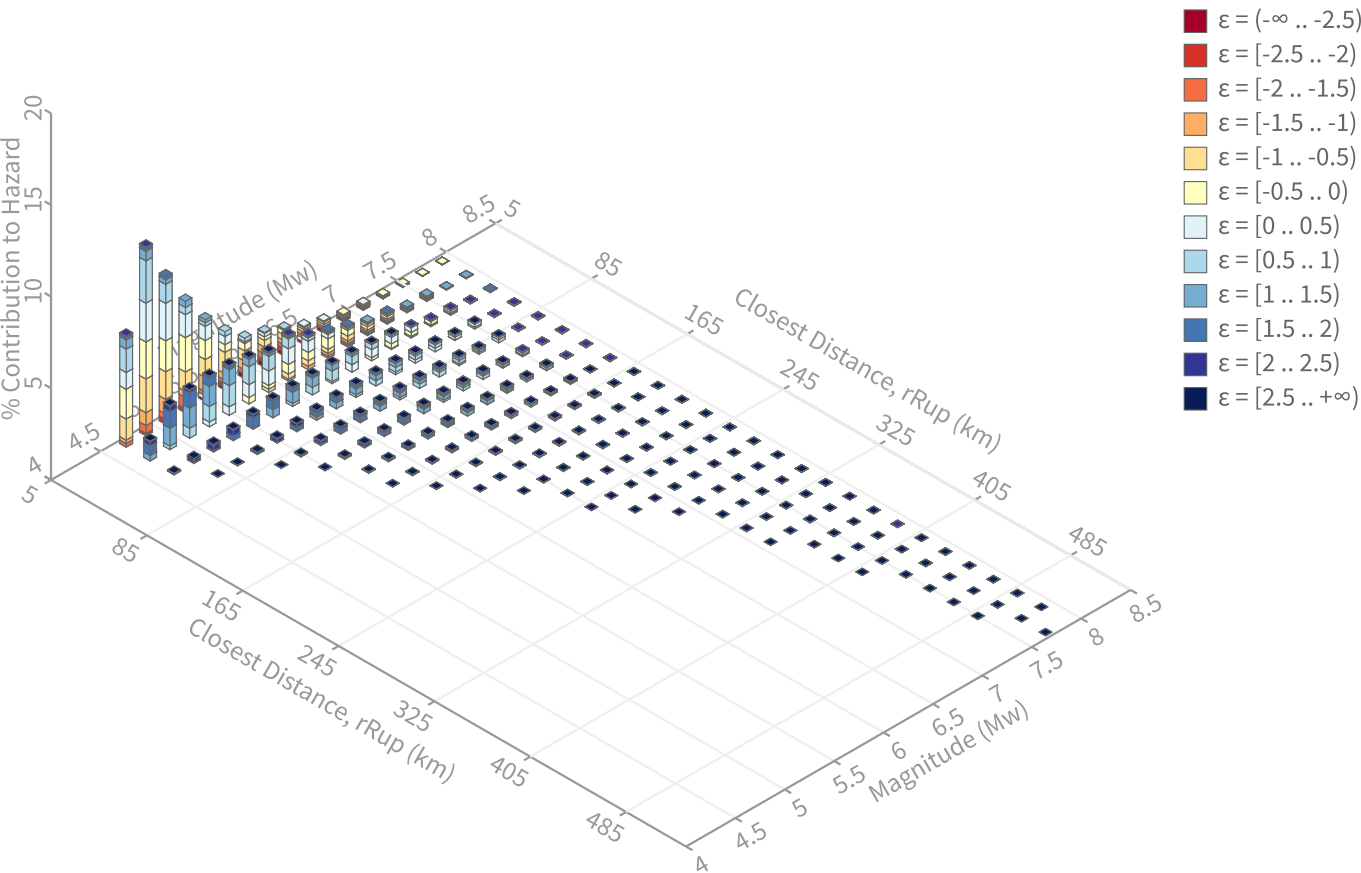


[View Raw Data](#)

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 10000 yrs
Exceedance rate: 0.0001 yr⁻¹
PGA ground motion: 0.23483278 g

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.88 %

Mode (largest m-r bin)

m: 4.9
r: 11.83 km
ε_m: -0.04 σ
Contribution: 10.29 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Recovered targets

Return period: 9996.0672 yrs
Exceedance rate: 0.00010003934 yr⁻¹

Mean (over all sources)

m: 5.77
r: 37.43 km
ε_m: 0.31 σ

Mode (largest m-r-ε_m bin)

m: 4.89
r: 17.23 km
ε_m: 0.7 σ
Contribution: 2.31 %

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set	Source	Type	r	m	ϵ_0	lon	lat	az	%
USGS Fixed Smoothing Zone 2 (opt)		Grid							32.77
	PointSourceFinite: -72.723, 43.520		17.60	5.41	0.12	72.723°W	43.520°N	0.00	5.23
	PointSourceFinite: -72.723, 43.430		8.86	5.21	-0.74	72.723°W	43.430°N	0.00	4.63
	PointSourceFinite: -72.723, 43.475		13.12	5.29	-0.24	72.723°W	43.475°N	0.00	3.38
	PointSourceFinite: -72.723, 43.610		26.59	5.67	0.53	72.723°W	43.610°N	0.00	2.70
	PointSourceFinite: -72.723, 43.565		22.11	5.53	0.36	72.723°W	43.565°N	0.00	2.19
	PointSourceFinite: -72.723, 43.385		5.57	5.16	-1.26	72.723°W	43.385°N	0.00	2.18
	PointSourceFinite: -72.723, 43.655		31.02	5.80	0.64	72.723°W	43.655°N	0.00	2.05
	PointSourceFinite: -72.723, 43.700		35.42	5.93	0.72	72.723°W	43.700°N	0.00	1.21
	PointSourceFinite: -72.723, 43.745		39.82	6.05	0.79	72.723°W	43.745°N	0.00	1.19
SSCn Fixed Smoothing Zone 4 (opt)		Grid							31.84
	PointSourceFinite: -72.723, 43.520		17.60	5.41	0.12	72.723°W	43.520°N	0.00	5.23
	PointSourceFinite: -72.723, 43.430		8.86	5.21	-0.74	72.723°W	43.430°N	0.00	4.63
	PointSourceFinite: -72.723, 43.475		13.12	5.29	-0.24	72.723°W	43.475°N	0.00	3.38
	PointSourceFinite: -72.723, 43.610		26.59	5.67	0.53	72.723°W	43.610°N	0.00	2.70
	PointSourceFinite: -72.723, 43.565		22.11	5.53	0.36	72.723°W	43.565°N	0.00	2.19
	PointSourceFinite: -72.723, 43.385		5.57	5.16	-1.26	72.723°W	43.385°N	0.00	2.18
	PointSourceFinite: -72.723, 43.655		31.02	5.80	0.64	72.723°W	43.655°N	0.00	2.05
	PointSourceFinite: -72.723, 43.700		35.42	5.93	0.72	72.723°W	43.700°N	0.00	1.21
	PointSourceFinite: -72.723, 43.745		39.82	6.05	0.79	72.723°W	43.745°N	0.00	1.06
USGS Adaptive Smoothing Zone 2 (opt)		Grid							17.25
	PointSourceFinite: -72.723, 43.520		17.60	5.41	0.12	72.723°W	43.520°N	0.00	2.34
	PointSourceFinite: -72.723, 43.430		8.86	5.21	-0.74	72.723°W	43.430°N	0.00	2.22
	PointSourceFinite: -72.723, 43.475		13.12	5.29	-0.24	72.723°W	43.475°N	0.00	1.50
	PointSourceFinite: -72.723, 43.610		26.59	5.67	0.53	72.723°W	43.610°N	0.00	1.21
	PointSourceFinite: -72.723, 43.565		22.11	5.53	0.36	72.723°W	43.565°N	0.00	1.05
SSCn Adaptive Smoothing Zone 4 (opt)		Grid							16.76
	PointSourceFinite: -72.723, 43.520		17.60	5.41	0.12	72.723°W	43.520°N	0.00	2.34
	PointSourceFinite: -72.723, 43.430		8.86	5.21	-0.74	72.723°W	43.430°N	0.00	2.22
	PointSourceFinite: -72.723, 43.475		13.12	5.29	-0.24	72.723°W	43.475°N	0.00	1.50
	PointSourceFinite: -72.723, 43.610		26.59	5.67	0.53	72.723°W	43.610°N	0.00	1.21
	PointSourceFinite: -72.723, 43.565		22.11	5.53	0.36	72.723°W	43.565°N	0.00	1.05

Unified Hazard Tool

 Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the [U.S. Seismic Design Maps web tools](#) (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

^ Input

Edition

Dynamic: Conterminous U.S. 2014 (update) (v4.2.0)

Latitude

Decimal degrees

43.363

Longitude

Decimal degrees, negative values for western longitudes

-72.723

Site Class

760 m/s (B/C boundary)

Spectral Period

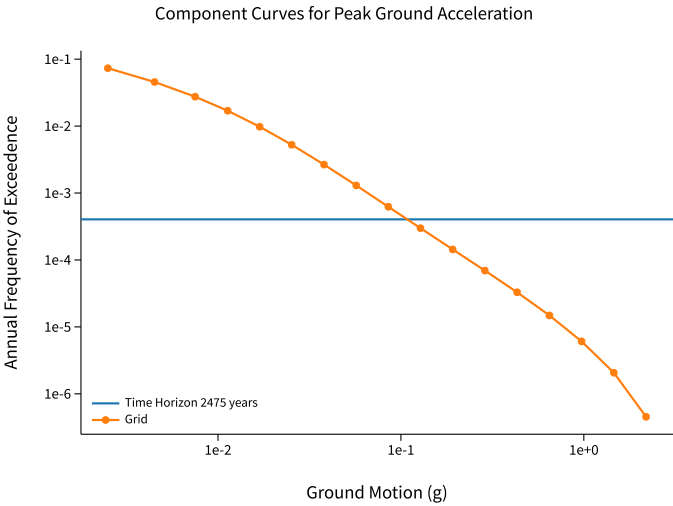
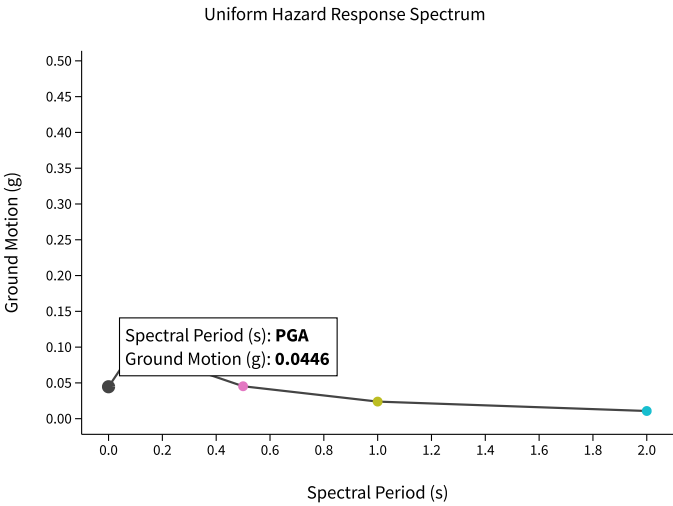
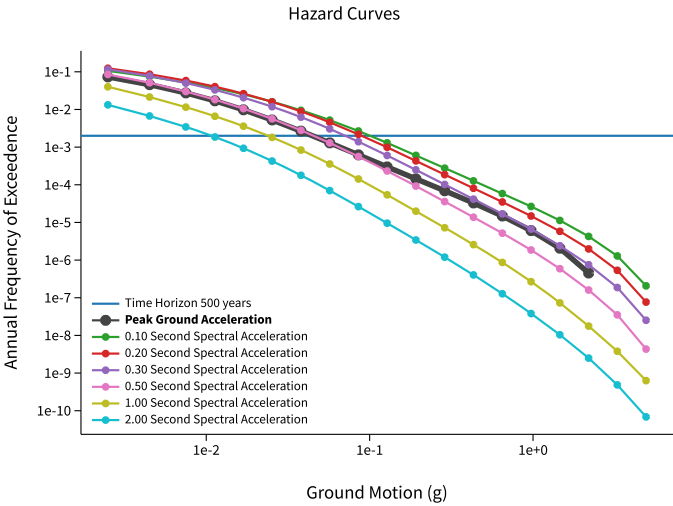
Peak Ground Acceleration

Time Horizon

Return period in years

500

^ Hazard Curve

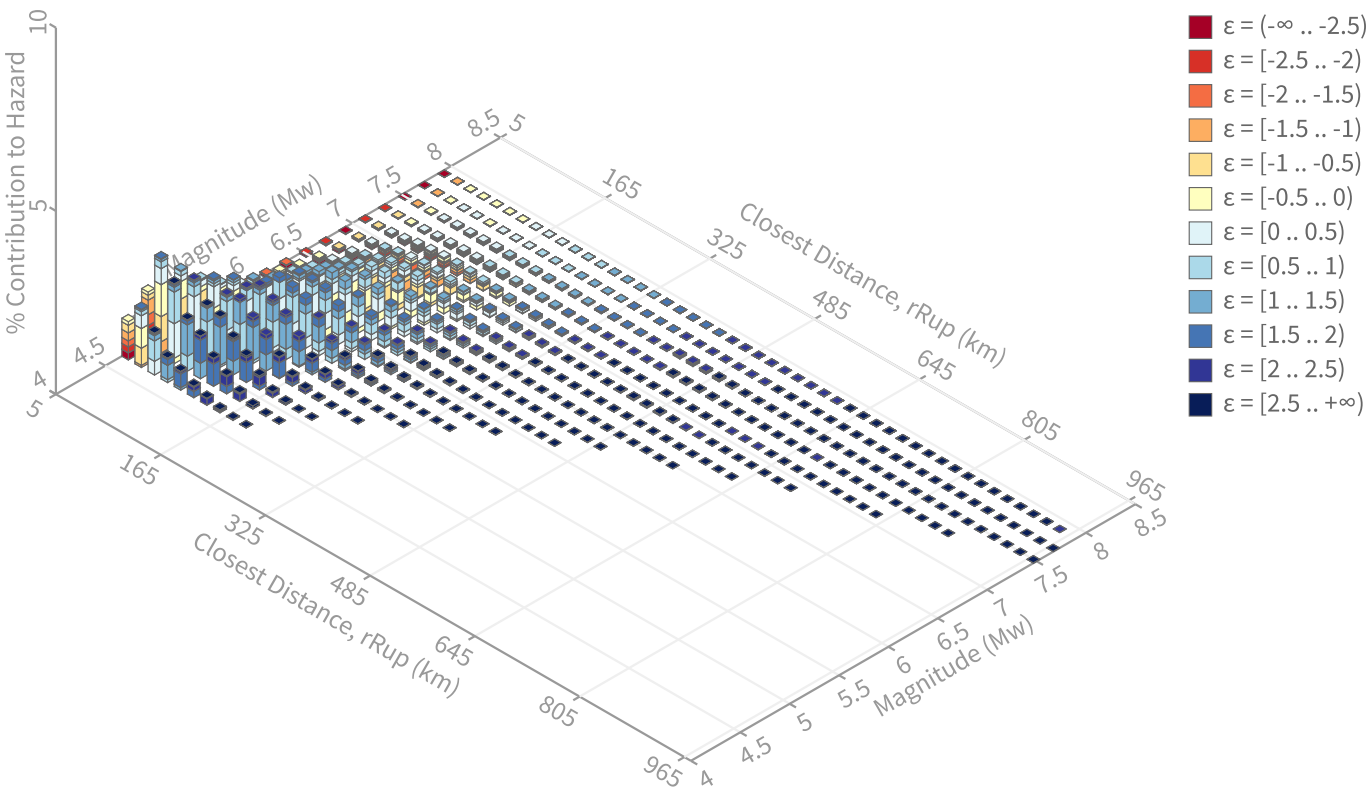


[View Raw Data](#)

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 500 yrs
Exceedance rate: 0.002 yr⁻¹
PGA ground motion: 0.044630254 g

Totals

Binned: 100 %
Residual: 0 %
Trace: 1.82 %

Mode (largest m-r bin)

m: 4.9
r: 30.6 km
ε_m: -0.35 σ
Contribution: 2.65 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Recovered targets

Return period: 498.36684 yrs
Exceedance rate: 0.002006554 yr⁻¹

Mean (over all sources)

m: 5.76
r: 106.92 km
ε_m: 0.22 σ

Mode (largest m-r-ε_m bin)

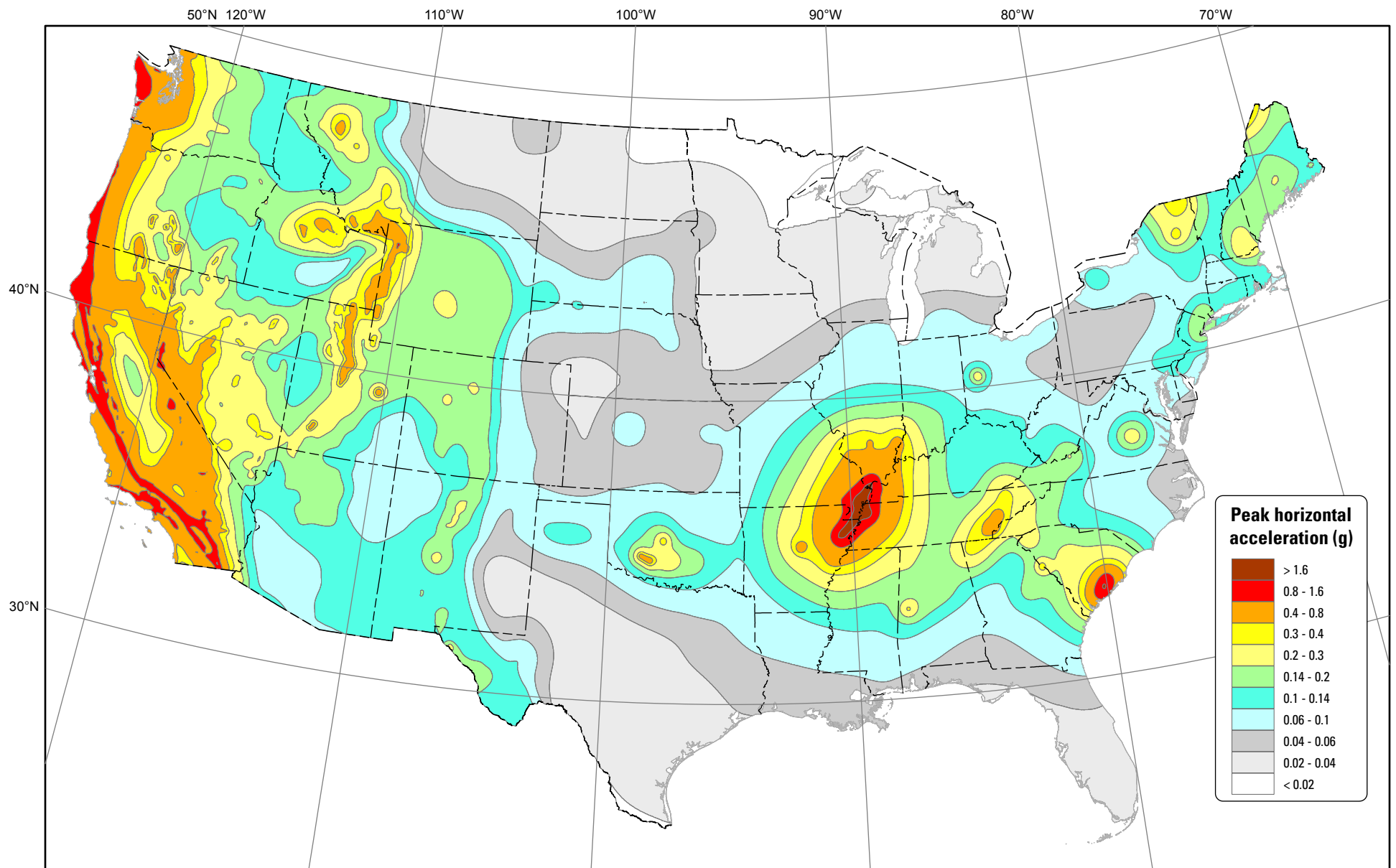
m: 5.1
r: 89.99 km
ε_m: 1.25 σ
Contribution: 1.04 %

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set	Source	Type	r	m	ϵ_0	lon	lat	az	%
USGS Fixed Smoothing Zone 2 (opt)		Grid							29.20
	PointSourceFinite: -72.723, 43.655		32.52	5.25	-0.68	72.723°W	43.655°N	0.00	1.11
	PointSourceFinite: -72.723, 43.610		27.65	5.21	-0.94	72.723°W	43.610°N	0.00	1.08
	PointSourceFinite: -72.723, 43.745		42.28	5.32	-0.31	72.723°W	43.745°N	0.00	1.02
	PointSourceFinite: -72.723, 43.835		52.03	5.41	-0.03	72.723°W	43.835°N	0.00	1.00
SSCn Fixed Smoothing Zone 4 (opt)		Grid							27.05
	PointSourceFinite: -72.723, 43.655		32.52	5.25	-0.68	72.723°W	43.655°N	0.00	1.11
	PointSourceFinite: -72.723, 43.610		27.65	5.21	-0.94	72.723°W	43.610°N	0.00	1.08
USGS Adaptive Smoothing Zone 2 (opt)		Grid							20.24
SSCn Adaptive Smoothing Zone 4 (opt)		Grid							19.30
SSCn Fixed Smoothing Zone 7 (opt)		Grid							2.21
SSCn Adaptive Smoothing Zone 7 (opt)		Grid							1.03



2018 National Seismic Hazard Model for the conterminous United States

Peak horizontal acceleration
with a 2% probability of exceedance in 50 years
NEHRP site class B/C ($V_{s30} = 760$ m/s)

APPENDIX G

SPT N-VALUE CORRELATION

By: <u>QDW</u>	Date: <u>12/19/19</u>	Subject: <u>Characterization of Soil Strength</u>	Sheet No.: <u>of 10</u>
Chkd By: <u>ZSG</u>	Date: <u>04/06/20</u>	<u>Jewell Brook Watershed Site No. 1</u>	Proj. No.: <u>172719-17</u>

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\[SPT N-Value Correlation.xlsx]Purpose

Characterization of Soil Strength Using SPT Correlation
Jewell Brook Watershed Site No. 1
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Purpose

The purpose of this calculation is to estimate the effective shear strength (i.e. friction angle ϕ' and cohesion c') of soils within the embankment, foundation, and auxiliary spillway at Jewell Brook Watershed Site No. 1 in Ludlow, Windsor County, Vermont. The calculation uses three methods to correlate standard penetration tests (SPTs) blow counts to friction angle values. The calculation is based on SPT results from seven borings that were drilled by DDK.

References

1. Das, B. 2011. *Principles of Foundation Engineering*. Stamford, CT: Cengage Learning.
2. *Manual on Estimating Soil Properties for Foundation Design*. Cornell University, Ithaca, New York.
3. Tan, C.K., Et al. *Geotechnical Engineering: Engineering Manual for Shallow Foundations*. Virginia Tech, Blacksburg, Virginia.
With information from: US Department of Navy (1982), *NAVFAC DM- 7.1-- Soil Mechanics*, Naval Facilities Engineering Command, VA, 348 pp. and Meyerhof G.G. (1956), *Penetration Tests and Bearing Capacity of Cohesionless Soils*, Proc., Journal of Soil Mechanics and Foundation Engineering, ASCE, Vol. 82, No. SM1, pp 1-11.

Correlation Between SPT Number and Friction Angle

Three methods were used to correlate the SPT number and friction angle and are outlined below.

Variables:

- N = measured penetration number
- N₆₀ = standard penetration number corrected for field conditions
- (N₁)₆₀ = standardized value of N₆₀
- C_N = correction factor
- η_H = hammer efficiency (%)
- η_B = correction for borehole diameter
- η_S = sampler correction
- η_R = correction for rod length
- Ø' = friction angle
- σ'_{vo} = effective overburden pressure to the center of each layer (psf)
- p_a = atmospheric pressure (2000 psf)

$$N_{60} = \frac{N \eta_H \eta_B \eta_S \eta_R}{60}$$

$$C_N = \sqrt{\frac{1}{\frac{\sigma'_{vo}}{p_a}}}$$

$$(N_1)_{60} = C_N N_{60}$$

$$\phi'_1 = 27.1 + 0.3(N_1)_{60} - 0.00054[(N_1)_{60}]^2 \quad \text{Peck, Hanson, and Thornburn (1974)}$$

$$\phi'_2 = \tan^{-1} \left[\frac{N_{60}}{12.2 + 20.3 \left(\frac{\sigma'_{vo}}{p_a} \right)} \right]^{0.34} \quad \text{Schmertmann (1975)}$$

$$\phi'_3 = \sqrt{20(N_1)_{60}} + 20 \quad \text{Hatanaka and Uchida (1996)}$$

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\SPT N-Value Correlation.xlsx Purpose

JB1-19-1

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{sat} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{H2O} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = Dry

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	16	0.06	4.00	0.75	12.00	48.00	40.3	43.9	51.0
2.0	4.0	3.00	14	0.19	2.31	0.75	10.50	24.25	34.1	40.9	42.0
4.0	6.0	5.00	14	0.31	1.79	0.75	10.50	18.78	32.5	39.5	39.4
6.0	8.0	7.00	22	0.44	1.51	0.75	16.50	24.95	34.2	42.6	42.3
8.0	10.0	9.00	22	0.56	1.33	0.75	16.50	22.00	33.4	41.5	41.0
10.0	12.0	11.00	34	0.69	1.21	0.75	25.50	30.75	35.8	44.8	44.8
12.0	14.0	13.00	26	0.81	1.11	0.75	19.50	21.63	33.3	41.2	40.8
14.0	16.0	15.00	32	0.94	1.03	0.85	27.20	28.09	35.1	43.7	43.7
16.0	18.0	17.00	40	1.06	0.97	0.85	34.00	32.98	36.4	45.1	45.7
18.0	20.0	19.00	27	1.19	0.92	0.85	22.95	21.06	33.2	40.6	40.5
20.0	22.0	21.00	34	1.31	0.87	0.95	32.30	28.19	35.1	43.2	43.7
22.0	24.0	23.00	40	1.44	0.83	0.95	38.00	31.69	36.1	44.2	45.2
24.0	26.0	25.00	30	1.56	0.80	0.95	28.50	22.80	33.7	40.8	41.4
26.0	28.0	27.00	29	1.69	0.77	0.95	27.55	21.21	33.2	39.9	40.6
28.0	30.0	29.00	30	1.81	0.74	0.95	28.50	21.17	33.2	39.8	40.6
30.0	32.0	31.00	27	1.94	0.72	0.95	25.65	18.43	32.4	38.3	39.2
32.0	34.0	33.00	34	2.06	0.70	1.00	34.00	23.67	33.9	40.5	41.8
34.0	36.0	35.00	36	2.19	0.68	1.00	36.00	24.34	34.1	40.6	42.1
36.0	38.0	37.00	31	2.31	0.66	1.00	31.00	20.39	33.0	38.8	40.2
38.0	40.0	39.00	26	2.44	0.64	1.00	26.00	16.65	31.9	36.7	38.3
40.0	42.0	41.00	11	2.56	0.62	1.00	11.00	6.87	29.1	28.8	31.7
42.0	44.0	43.00	19	2.69	0.61	1.00	19.00	11.59	30.5	33.1	35.2
44.0	46.0	45.00	22	2.81	0.60	1.00	22.00	13.12	30.9	34.1	36.2
46.0	48.0	47.00	26	2.94	0.58	1.00	26.00	15.17	31.5	35.3	37.4
48.0	50.0	49.00	31	3.06	0.57	1.00	31.00	17.71	32.2	36.6	38.8
52.0	54.0	53.00	25	3.31	0.55	1.00	25.00	13.74	31.1	34.0	36.6
54.0	56.0	55.00	31	3.44	0.54	1.00	31.00	16.72	32.0	35.7	38.3
56.0	58.0	57.00	35	3.56	0.53	1.00	35.00	18.54	32.5	36.5	39.3
Average =								21.9	33.4	39.3	40.6

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\SPT N-Value Correlation.xlsx Purpose

JB1-19-2

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{\text{sat}} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{\text{H}_2\text{O}} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = 53.9 ft

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	21	0.06	4.00	0.75	15.75	63.00	43.9	46.5	55.5
2.0	4.0	3.00	22	0.19	2.31	0.75	16.50	38.11	37.7	45.3	47.6
4.0	6.0	5.00	25	0.31	1.79	0.75	18.75	33.54	36.6	45.1	45.9
6.0	8.0	7.00	24	0.44	1.51	0.75	18.00	27.21	34.9	43.5	43.3
8.0	10.0	9.00	21	0.56	1.33	0.75	15.75	21.00	33.2	41.1	40.5
10.0	12.0	11.00	42	0.69	1.21	0.75	31.50	37.99	37.7	46.8	47.6
12.0	14.0	13.00	20	0.81	1.11	0.75	15.00	16.64	31.9	38.7	38.2
14.0	16.0	15.00	10	0.94	1.03	0.85	8.50	8.78	29.7	32.7	33.3
16.0	18.0	17.00	28	1.06	0.97	0.85	23.80	23.09	33.7	41.6	41.5
18.0	20.0	19.00	27	1.19	0.92	0.85	22.95	21.06	33.2	40.6	40.5
20.0	22.0	21.00	40	1.31	0.87	0.95	38.00	33.17	36.5	44.8	45.8
22.0	24.0	23.00	54	1.44	0.83	0.95	51.30	42.79	38.9	47.1	49.3
24.0	26.0	25.00	26	1.56	0.80	0.95	24.70	19.76	32.8	39.4	39.9
26.0	28.0	27.00	37	1.69	0.77	0.95	35.15	27.06	34.8	42.3	43.3
28.0	30.0	29.00	30	1.81	0.74	0.95	28.50	21.17	33.2	39.8	40.6
30.0	32.0	31.00	57	1.94	0.72	0.95	54.15	38.90	38.0	45.5	47.9
32.0	34.0	33.00	58	2.06	0.70	1.00	58.00	40.39	38.3	45.7	48.4
34.0	36.0	35.00	30	2.19	0.68	1.00	30.00	20.28	33.0	38.9	40.1
36.0	38.0	37.00	46	2.31	0.66	1.00	46.00	30.25	35.7	42.6	44.6
38.0	40.0	39.00	44	2.44	0.64	1.00	44.00	28.18	35.1	41.7	43.7
40.0	42.0	41.00	24	2.56	0.62	1.00	24.00	14.99	31.5	35.6	37.3
42.0	44.0	43.00	24	2.69	0.61	1.00	24.00	14.64	31.4	35.2	37.1
44.0	46.0	45.00	6	2.81	0.60	1.00	6.00	3.58	28.2	23.5	28.5
46.0	48.0	47.00	41	2.94	0.58	1.00	41.00	23.92	34.0	39.6	41.9
48.0	50.0	49.00	20	3.06	0.57	1.00	20.00	11.43	30.5	32.6	35.1
50.0	52.0	51.00	22	3.19	0.56	1.00	22.00	12.32	30.7	33.2	35.7
54.0	56.0	55.00	111	3.41	0.54	1.00	111.00	60.15	43.2	48.0	54.7
58.0	60.0	59.00	89	3.54	0.53	1.00	89.00	47.30	40.1	45.6	50.8
Average =								27.9	34.9	40.8	42.8

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\[SPT N-Value Correlation.xlsx]Purpose

JB1-19-4

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{\text{sat}} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{\text{H}_2\text{O}} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = 24.2 ft

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	7	0.06	4.00	0.75	5.25	21.00	33.2	36.0	40.5
2.0	4.0	3.00	18	0.19	2.31	0.75	13.50	31.18	35.9	43.3	45.0
4.0	6.0	5.00	23	0.31	1.79	0.75	17.25	30.86	35.8	44.3	44.8
6.0	8.0	7.00	21	0.44	1.51	0.75	15.75	23.81	33.9	42.2	41.8
10.0	12.0	11.00	25	0.69	1.21	0.75	18.75	22.61	33.6	41.8	41.3
12.0	14.0	13.00	32	0.81	1.11	0.75	24.00	26.63	34.7	43.3	43.1
14.0	16.0	15.00	24	0.94	1.03	0.85	20.40	21.07	33.2	40.9	40.5
16.0	18.0	17.00	25	1.06	0.97	0.85	21.25	20.62	33.1	40.5	40.3
18.0	20.0	19.00	51	1.19	0.92	0.85	43.35	39.78	38.2	46.7	48.2
20.0	22.0	21.00	29	1.31	0.87	0.95	27.55	24.05	34.0	41.7	41.9
22.0	24.0	23.00	24	1.44	0.83	0.95	22.80	19.02	32.6	39.2	39.5
24.0	26.0	25.00	14	1.54	0.81	0.95	13.30	10.72	30.3	33.8	34.6
26.0	28.0	27.00	22	1.61	0.79	0.95	20.90	16.49	31.9	37.7	38.2
34.0	36.0	35.00	88	1.88	0.73	1.00	88.00	64.22	44.1	50.4	55.8
Average =								26.6	34.6	41.5	42.5

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

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 Proj. No.: 172719-17

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\SPT N-Value Correlation.xlsx Purpose

JB1-19-201

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{\text{sat}} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{\text{H}_2\text{O}} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = Dry

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	4	0.06	4.00	0.75	3.00	12.00	30.6	31.0	35.5
2.0	4.0	3.00	14	0.19	2.31	0.75	10.50	24.25	34.1	40.9	42.0
4.0	6.0	5.00	27	0.31	1.79	0.75	20.25	36.22	37.3	45.9	46.9
6.0	8.0	7.00	32	0.44	1.51	0.75	24.00	36.28	37.3	46.3	46.9
8.0	10.0	9.00	33	0.56	1.33	0.75	24.75	33.00	36.4	45.5	45.7
10.0	12.0	11.00	19	0.69	1.21	0.75	14.25	17.19	32.1	39.1	38.5
12.0	14.0	13.00	23	0.81	1.11	0.75	17.25	19.14	32.6	40.1	39.6
14.0	16.0	15.00	8	0.94	1.03	0.85	6.80	7.02	29.2	30.8	31.9
16.0	18.0	17.00	9	1.06	0.97	0.85	7.65	7.42	29.3	31.1	32.2
18.0	20.0	19.00	8	1.19	0.92	0.85	6.80	6.24	29.0	29.5	31.2
20.0	22.0	21.00	6	1.31	0.87	0.95	5.70	4.98	28.6	27.5	30.0
22.0	24.0	23.00	11	1.44	0.83	0.95	10.45	8.72	29.7	32.1	33.2
24.0	26.0	25.00	10	1.56	0.80	0.95	9.50	7.60	29.3	30.7	32.3
26.0	28.0	27.00	12	1.69	0.77	0.95	11.40	8.78	29.7	31.8	33.2
28.0	30.0	29.00	10	1.81	0.74	0.95	9.50	7.06	29.2	29.8	31.9
30.0	32.0	31.00	9	1.94	0.72	0.95	8.55	6.14	28.9	28.5	31.1
32.0	34.0	33.00	13	2.06	0.70	1.00	13.00	9.05	29.8	31.6	33.5
34.0	36.0	35.00	12	2.19	0.68	1.00	12.00	8.11	29.5	30.5	32.7
36.0	38.0	37.00	40	2.31	0.66	1.00	40.00	26.30	34.6	41.2	42.9
38.0	40.0	39.00	42	2.44	0.64	1.00	42.00	26.90	34.8	41.3	43.2
Average =								15.6	31.6	35.3	36.7

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\[SPT N-Value Correlation.xlsx]Purpose

JB1-19-202

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{sat} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{H2O} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = Dry

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	8	0.06	4.00	0.75	6.00	24.00	34.0	37.2	41.9
2.0	4.0	3.00	23	0.19	2.31	0.75	17.25	39.84	38.2	45.7	48.2
4.0	6.0	5.00	13	0.31	1.79	0.75	9.75	17.44	32.2	38.8	38.7
6.0	8.0	7.00	9	0.44	1.51	0.75	6.75	10.21	30.1	34.2	34.3
8.0	10.0	9.00	7	0.56	1.33	0.75	5.25	7.00	29.2	31.0	31.8
10.0	12.0	11.00	10	0.69	1.21	0.75	7.50	9.05	29.8	33.2	33.5
12.0	14.0	13.00	10	0.81	1.11	0.75	7.50	8.32	29.6	32.4	32.9
14.0	16.0	15.00	8	0.94	1.03	0.85	6.80	7.02	29.2	30.8	31.9
16.0	18.0	17.00	10	1.06	0.97	0.85	8.50	8.25	29.5	32.0	32.8
18.0	20.0	19.00	16	1.19	0.92	0.85	13.60	12.48	30.8	35.6	35.8
Average =								14.4	31.2	35.1	36.2

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

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JB1-19-203

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{\text{sat}} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{\text{H}_2\text{O}} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = Dry

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	10	0.06	4.00	0.75	7.50	30.00	35.6	39.3	44.5
2.0	4.0	3.00	20	0.19	2.31	0.75	15.00	34.64	36.8	44.4	46.3
4.0	6.0	5.00	11	0.31	1.79	0.75	8.25	14.76	31.4	37.2	37.2
6.0	8.0	7.00	13	0.44	1.51	0.75	9.75	14.74	31.4	37.6	37.2
8.0	10.0	9.00	9	0.56	1.33	0.75	6.75	9.00	29.8	33.2	33.4
10.0	12.0	11.00	5	0.69	1.21	0.75	3.75	4.52	28.4	27.3	29.5
12.0	14.0	13.00	5	0.81	1.11	0.75	3.75	4.16	28.3	26.6	29.1
14.0	16.0	15.00	4	0.94	1.03	0.85	3.40	3.51	28.1	25.2	28.4
16.0	18.0	17.00	5	1.06	0.97	0.85	4.25	4.12	28.3	26.3	29.1
18.0	20.0	19.00	4	1.19	0.92	0.85	3.40	3.12	28.0	24.1	27.9
Average =								12.3	30.6	32.1	34.3

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
 Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
 Proj. No.: 172719-17

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JB1-19-204

Soil Properties

$\gamma =$ 125 pcf = 0.0625 tons/cf
 $\gamma_{sat} =$ 130 pcf = 0.0650 tons/cf
 $\gamma_{H2O} =$ 62.4 pcf = 0.0312 tons/cf
 $\gamma' =$ 67.6 pcf = 0.0338 tons/cf

Water Table Depth = Dry

Correction Factors (Reference 1)

$\eta_H =$ 60
 $\eta_B =$ 1
 $\eta_S =$ 1
 $\eta_R =$ Varies (see below)

Depth (feet)			N	σ'_{vo}/p_a (tsf)	C_N	η_R	N_{60}	$(N_1)_{60}$	Friction Angle ($^\circ$)		
Start	End	Center							ϕ'_1	ϕ'_2	ϕ'_3
0.0	2.0	1.00	18	0.06	4.00	0.75	13.50	54.00	41.7	45.0	52.9
2.0	4.0	3.00	17	0.19	2.31	0.75	12.75	29.44	35.5	42.8	44.3
4.0	6.0	5.00	7	0.31	1.79	0.75	5.25	9.39	29.9	33.1	33.7
6.0	8.0	7.00	4	0.44	1.51	0.75	3.00	4.54	28.4	27.3	29.5
8.0	10.0	9.00	7	0.56	1.33	0.75	5.25	7.00	29.2	31.0	31.8
10.0	12.0	11.00	13	0.69	1.21	0.75	9.75	11.76	30.6	35.6	35.3
12.0	14.0	13.00	6	0.81	1.11	0.75	4.50	4.99	28.6	28.0	30.0
14.0	16.0	15.00	3	0.94	1.03	0.85	2.55	2.63	27.9	23.1	27.3
18.0	20.0	19.00	48	1.19	0.92	0.85	40.80	37.44	37.6	46.1	47.4
Average =								17.9	32.1	34.7	36.9

DDK Engineering - JV

By: QDW Date: 12/19/19 Subject: Characterization of Soil Strength
Chkd By: ZSG Date: 04/06/20 Jewell Brook Watershed Site No. 1

Sheet No.: of 10
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Summary of Results

Calculation of Friction Angle - Correlation to Standard Penetration Tests (SPTs)							
				Estimated Friction Angle From SPTs ⁽²⁾			
Boring No.	G.S. Elevation ⁽¹⁾	Depth Range (ft)	Average $(N_1)_{60}$	ϕ'_1	ϕ'_2	ϕ'_3	Average ϕ'
JB1-19-1	1619.5	0.0-58.0	21.9	33.4	39.3	40.6	37.8
JB1-19-2	1619.0	0.0-60.0	27.9	34.9	40.8	42.8	39.5
JB1-19-4	1584.7	0.0-36.0	26.6	34.6	41.5	42.5	39.6
JB1-19-201	1608.7	0.0-40.0	15.6	31.6	35.3	36.7	34.5
JB1-19-202	1612.7	0.0-20.0	14.4	31.2	35.1	36.2	34.2
JB1-19-203	1612.9	0.0-20.0	12.3	30.6	32.1	34.3	32.3
JB1-19-204	1610.2	0.0-20.0	17.9	32.1	34.7	36.9	34.6

Notes:

⁽¹⁾ Represents the approx. elev. at the time the boring was advanced.

⁽²⁾ Friction angles estimated using 3 different methods:

ϕ'_1 Peck, Hanson, and Thornburn (1974)

ϕ'_2 Schmertmann (1975)

ϕ'_3 Hatanaka and Uchida (1996)

Max	42.8
Min	30.6
Average	36.1
Std. Dev.	3.8

APPENDIX H

SITES MATERIAL INPUT PARAMETERS CALCULATION

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 1 of 6
Chkd. By: QDW Date: 5/4/2020 SITES Material Properties Proj. No.: 172719-17
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SITES Material Input Parameters
Supplemental Watershed Plan and Environmental Document
Jewell Brook Watershed Site No. 1
Ludlow, Windsor County, Vermont

INTRODUCTION

The purpose of this calculation is to estimate the material input parameters to be used in the SITES analyses for the Jewell Brook Watershed Site No. 1 (Jewell Brook #1) located in Ludlow, Windsor County, Vermont. The material parameters are estimated based on empirical and historical data, subsurface exploration data, and results of laboratory tests performed on soil samples retrieved during the subsurface explorations performed by DDK Engineering - JV (DDK) in November 2019 and by NRCS in October 1965.

Borings JB1-19-201 through JB1-19-204 were performed in the auxiliary spillway at Jewell Brook #1. Borings were advanced to collect in-situ samples of spillway material for laboratory testing and classification. Borings JB1-19-1, JB1-19-2, and JB1-19-4 will not be considered in this calculation since they are outside of the auxiliary spillway area. Test Pit TP-101 was preformed prior to construction of Jewell Brook #1 and was located in the borrow area corresponding to the Layer 1 material. Due to the topsoil layer being very thin or nonexistent, no estimation of material parameters for topsoil was performed.

REFERENCES

- 1) Carter, Michael and Bentley, Stephen P., "Correlations of Soil Properties", John Wiley & Sons, Ltd., 2016
- 2) Das, Braja M., "Principles of Geotechnical Engineering (8th Ed.)", Cengage, 2010.
- 3) NRCS National Engineering Handbook Part 628, Chapter 52 "Field Procedures Guide for the Headcut Erodibility Index", (2001).
- 4) "SITES 2005 Water Resource Site Analysis Computer Program: User Guide", NRCS, October 2007.
- 5) "SPT Average N-Value Correlation", D'Appolonia, December 2019.

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 2 of 6
Chkd. By: QDW Date: 5/4/2020 SITES Material Properties Proj. No.: 172719-17
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SITES Input Parameters

Unit Weights of Soils

The unit weight of existing auxiliary spillway soils at Jewell Brook #1 were estimated using laboratory testing of disturbed (SpT) samples, as well as assumed void ratios for each soil type (Ref. 1 & 2). The 95% max dry unit weight based on Standard Proctor data is taken as the dry unit weight of Layer 1. The approximated dry unit weight is used for Layers 2, 3, and 4.

		From Standard Proctor		Approximated		
Layer	USCS Class.	Max Dry Unit Weight (lb./cu. Ft.)	95% Max Dry Unit Weight (lb./cu. Ft.)	Avg. G _s	Void Ratio (e) ⁽²⁾	Dry Unit Weight (lb./cu. Ft.)
1	SM/ML	115.25	109.49	2.74 ⁽¹⁾	0.65	103.6
2	SM	-	-	2.65 ⁽³⁾	0.65	100.2
3	ML	-	-	2.68 ⁽³⁾	0.5	111.5
4	GM	-	-	2.65 ⁽⁴⁾	0.4	118.1

⁽¹⁾ From 1965 NRCS Laboratory Testing

⁽²⁾ Based on values presented in Reference No. 2, Table 3.2

⁽³⁾ From Laboratory Index Testing Data

⁽⁴⁾ Assumed equal to Layer 2

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 3 of 6
 Chkd. By: QDW Date: 5/4/2020 SITES Material Properties Proj. No.: 172719-17
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Plasticity Index

The plasticity index of each soil type was estimated using average values from laboratory index testing data.

Layer	Boring	Sample ID	Atterberg Limits		
			USCS Symbol ⁽¹⁾	LL (%)	PI (%)
1	TP-101	101.1	Non-Plastic		
		101.2	ML	18	2
2	201	SpT-2/3	Non-Plastic		
		SpT-4/5/6	Non-Plastic		
		SpT-11	Non-Plastic		
		SpT-13/14	Non-Plastic		
	202	SpT-1	Non-Plastic		
		SpT-2	Non-Plastic		
		SpT-9/10	Non-Plastic		
	203	SpT-1	Non-Plastic		
		SpT-5/6	Non-Plastic		
	204	SpT-1/2	Non-Plastic		
		SpT-5/6/7	Non-Plastic		
3	203	SpT-2/3	Non-Plastic		
	204	SpT-3	Non-Plastic		
4	201	SpT-19/20	Non-Plastic		

Layer	Avg. PI (%)
1	1
2	N.P.
3	N.P.
4	N.P.

⁽¹⁾ This denotes the USCS symbol for the fines portion of each sample.

Clay Content (%)

The clay content of each soil type was determined using the average sieve and hydrometer results of each soil type from the laboratory index testing data.

Layer	Boring	Sample No.	USCS Class.	Clay Content (%)
1	TP-101	101.1	ML	3.00
		101.2	SM	11.00
2	201	SpT-2/3	SM	1.71
		SpT-11	ML	4.16
		SpT-16/17	ml	5.00
	202	SpT-1	SM	2.04
		SpT-9/10	SM	1.38
	203	SpT-8/9	ml	3.82
	204	SpT-1/2	SM	2.00
3	203	SpT-2/3	ML	5.51
	204	SpT-3	ML	4.57

Layer	Avg. Clay Content (%)
1	7.00
2	2.87
3	5.04
4 ⁽¹⁾	2.87

⁽¹⁾ Since no samples in Layer 4 underwent hydrometer testing, it was assumed that the clay content for Layer 4 was equivalent to that of Layer 2.

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 4 of 6
 Chkd. By: QDW Date: 5/4/2020 SITES Material Properties Proj. No.: 172719-17
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Headcut Erodibility Index

The headcut erodibility index was estimated using the procedures and typical values described in NRCS Part 628, Chapter 52 of the National Engineering Handbook. For factors which use soil characteristics (IDM, UCS, LL), this calculation uses the average value for each layer. (Ref. 3)

The equation given for the headcut erodibility index is:

$$K_h = M_s \times K_b \times K_d \times J_s \quad [52-1]$$

where:

M_s = material strength number of the earth material

K_b = block or particle size number

K_d = discontinuity or interparticle bond shear strength number

J_s = relative ground structure number

For cohesionless soil:

$$M_s = 1.7(\text{IDM})^{0.832} \quad (\text{MPa})$$

$$K_b = 1 \quad \text{Using cohesionless soil with } D < 0.1 \text{ m}$$

$$K_d = \tan(\Phi'_r) \quad \text{where:}$$

$$\Phi'_r = 169.58(\text{LL})^{-0.4925} \quad \text{For soils with clay content } < 20\%$$

$$J_s = 1 \quad \text{Intact soil}$$

Table 52-2 Material strength number, M_s , for cohesionless soil^{1/}

Relative density	Field identification tests	SPT ^{2/} N (blows/0.3 m) $\frac{1}{2}$	In situ deformation modulus (IDM) (MPa) ^{3/}	M_s ^{4/}
Very loose	Particles loosely packed. High percentage of voids. Very easily dislodged by hand. Matrix crumbles easily when scraped with point of geologic pick. Raveling often occurs on excavated faces.	< 5	< 0.005	< 0.02
Loose	Particles loosely packed. Some resistance to being dislodged by hand. Large number of voids. Matrix shows low resistance to penetration by point of geologic pick.	5 - 10	0.005 - 0.01	0.02 - 0.05
Medium dense	Particles closely packed. Difficult to dislodge individual particles by hand. Voids less apparent. Matrix has considerable resistance to penetration by point of geologic pick.	10 - 30	0.01 - 0.03	0.05 - 0.10
Dense	Particles very closely packed and occasionally very weakly cemented. Cannot dislodge individual particles by hand. The mass has very high resistance to penetration by point of geologic pick. Requires many blows of geologic pick to dislodge particles.	30 - 50	0.03 - 0.08	0.10 - 0.20
Very dense	Particles very densely packed and usually cemented together. Mass has high resistance to repeated blows of geologic pick. Requires power tools for excavation.	> 50	0.08 - 0.2	0.20 - 0.45

^{1/} Cohesionless soil is a material with a plasticity index (PI) less than or equal to 10. Use table 52-3 for cohesive soils.

^{2/} Standard Penetration Test, SPT (ASTM D 1586) used for most sandy-type cohesionless soils. In situ deformation modulus (IDM) (ASTM D 1194) used for most gravel-type soils and coarse detritus.

^{3/} M_s of a cohesionless soil is approximately determined from results of IDM testing by the following relationship:

$$M_s = 1.7 (\text{IDM})^{0.832} \quad \text{for IDM in MPa}$$

^{4/} Cohesionless soils in which blow counts are greater than 50 or IDM is greater than 200 kPa to be taken as rock, for which the hardness may be obtained from table 52-4.

^{5/} Correlation between SPT and IDM should be used as a guide only as results may vary in different geologic areas. Lab strength tests are recommended on soil materials to support SPT or field assessment tests.

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 5 of 6
 Chkd. By: QDW Date: 5/4/2020 SITES Material Properties Proj. No.: 172719-17
 N:\2017\172719-17 - Jewell Pond Watershed Plan\Jewell Site 1\SITES Material Input\SITES Material Input JB1 - Soil.xlsx

For cohesive soil:

$$M_s = 0.78(UCS)^{1.09} \quad (\text{MPa}) \quad \text{For UCS } (<= 10)$$

$$M_s = UCS \quad (\text{MPa}) \quad \text{For UCS } (>10)$$

$$K_b = 1 \quad \text{Massed cohesive soil}$$

$$K_d = \tan(\Phi'_r) \quad \text{where:}$$

$$\Phi'_r = 169.58(LL)^{-0.4925} \quad \text{For soils with clay content } <20\%$$

$$J_s = 1 \quad \text{Intact soil}$$

Table 52-3 Material strength number, M_s , for cohesive soil

Consistency	Field identification tests	SPT (blows/0.3 m)	Unconfined compressive strength (UCS) (kPa)	M_s
Very soft	Exudes between fingers when squeezed in hand.	< 2	< 40	< 0.02
Soft	Easily molded with fingers. Point of geologic pick easily pushed into shaft of handle.	2 - 4	40 - 80	0.02 - 0.05
Firm	Penetrated several centimeters by thumb with moderate pressure. Molded by fingers with some pressure.	4 - 8	80 - 150	0.05 - 0.10
Stiff	Indented by thumb with great effort. Point of geologic pick can be pushed in up to 1 centimeter. Very difficult to mold with fingers. Just penetrated with hand spade.	8 - 15	150 - 300	0.10 - 0.20
Very stiff	Indented only by thumbnail. Slight indentation by pushing point of geologic pick. Requires hand pick for excavation.	15 - 30	300 - 625	0.20 - 0.45

- Notes:**
1. Cohesive soil is material with a plasticity index (PI) greater than 10. Use table 52-2 for cohesionless soils.
 2. 1 kPa equals 1 kN/m².
 3. Vane shear strength (ASTM D 2573, field; ASTM D 4648, lab) also may be used for unconfined compressive strength (ASTM D 2166).
 4. Cohesive soils in which blow counts are greater than 30 or strengths greater than 625 kPa are to be taken as rock, for which the hardness can be obtained from table 52-4.
 5. Cohesive soils must be evaluated for hardness in the saturated condition.
 6. M_s of a cohesive soil also can be determined as the product of unconfined compressive strength (in MPa) times its coefficient of relative density. For most cohesive soils, M_s is approximately determined by:

$$M_s = 0.78(UCS)^{1.09} \text{ for } UCS \leq 10 \text{ MPa, and } M_s = UCS \text{ for } UCS > 10 \text{ MPa.}$$
 7. Correlation between SPT and UCS should only be used as a guide, as results may vary in geologic areas. Lab strength tests are recommended on soil materials to support SPT or field assessment tests. Vane shear strength values also are applicable in the lower strength ranges.

Layer	M_s	K_b	K_d	J_s	Headcut Erodibility Index
1	0.017	1	0.634	1	0.011
2	0.043	1	0.660	1	0.028
3	0.033	1	0.624	1	0.021
4	0.171	1	0.674	1	0.115

DDK Engineering - JV

By: ZSG Date: 4/21/2020 Subject: Jewell Brook Watershed Site No. 1 Sheet No.: 6 of 6
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Representative Diameter

The representative diameter was taken as the average diameter in which 75% of soil particles are equal to or smaller in diameter (D_{75}) for each soil layer. (Ref. 4)

Layer	Average D_{75} (in.)
1	0.009
2	0.012
3	0.004
4	0.325

**SITES Material Input Parameters
Jewell Brook Watershed Site No. 1
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont**

Project No. 172719-17

Layer	Avg. USCS	Dry Density (lb/cu.ft.)	Plasticity Index	Clay Content (%)	Head Cut Index	Representative Diameter (in.)
1	SM/ML	109.5	1	7.00	0.011	0.009
2	SM	100.2	N.P.	2.87	0.028	0.012
3	ML	111.5	N.P.	5.04	0.021	0.004
4	GM	118.1	N.P.	2.87	0.115	0.325

Sample Information																	
Layer	Boring	Sample ID	Blows				N-Value	Avg. N-Value ⁽⁴⁾	Avg. IDM (Mpa)	Avg. UCS (Mpa)	PI	Individual Φ r ⁽¹⁾	Φ r ⁽²⁾ (deg)	Use Φ r (deg)	D75 (in)	Avg. D75 ⁽⁴⁾ (in)	
			1	2	3	4											
1	201	SpT-1	1	1	3	5	4	4	0.004	N/A	-	32.4	32.4	32.4	0.009	0.009	
2	201	SpT-2	5	5	9	9	14	11.9	0.0119	N/A	0	39	34.0	33.4	0.017	0.012	
		SpT-3	9	12	15	11	27				0	43.3			0.009		
		SpT-4	14	14	18	21	32					43.5					
		SpT-5	14	18	15	14	33				0	42.5			-		
		SpT-6	5	8	11	12	19					36.6					
		SpT-7	9	12	11	12	23				-	37.4			-		
		SpT-8	4	4	4	4	8				-	30.6			0.010		
		SpT-9	4	4	5	6	9				-	30.9			-		
		SpT-10	4	4	4	2	8				-	29.9			-		
		SpT-11	3	3	3	3	6				0	28.7			0.004		
		SpT-12	4	5	6	6	11				-	31.6			-		
		SpT-13	4	5	5	5	10				0	30.8			0.016		
		SpT-14	6	6	6	7	12					31.6					
		SpT-15	4	4	6	5	10				-	30.3			-		
		SpT-16	4	4	5	5	9				-	29.5			0.005		
		SpT-17	5	7	6	5	13					31.6					
		SpT-18	5	5	7	9	12				-	30.9			-		
		202	SpT-1	2	3	5	6				8	0			37.7		34.2
	SpT-2		6	11	12	9	23				0	44.0			0.007		
	SpT-3		7	7	6	8	13				-	36.5			-		
	SpT-4		7	5	4	4	9				-	32.9			0.334		
	SpT-5		3	3	4	4	7					30.7					
	SpT-6		4	4	6	6	10				-	32.1			0.055		
	SpT-7		7	5	5	5	10					31.6					
	SpT-8		3	4	4	5	8				-	30.6			-		
	SpT-9		5	5	5	6	10				0	31.5			0.008		
	SpT-10		5	7	9	10	16					34.1					
	203	SpT-1	1	3	7	8	10				0	39.8			30.0		0.015
		SpT-5	5	5	4	3	9				0	32.1					0.007
		SpT-6	2	2	3	2	5					28.4					
		SpT-7	2	2	3	2	5				-	28.0					-
		SpT-8	3	2	2	3	4				-	27.2					0.006
		SpT-9	2	3	2	2	5					27.9					
		SpT-10	2	2	2	2	4				-	26.7					-
	204	SpT-1	6	9	9	9	18				0	46.5			34.5		0.008
		SpT-2	9	9	8	8	17					40.8					
		SpT-5	2	3	4	7	7				0	30.7					0.007
		SpT-6	4	7	6	3	13					33.8					
		SpT-7	1	3	3	3	6					28.9					
		SpT-8	2	2	1	1	3				-	26.1					-

Sample Information																
Layer	Boring	Sample ID	Blows				N-Value	Avg. N-Value ⁽⁴⁾	Avg. IDM (Mpa)	Avg. UCS (Mpa)	PI	Individual Φ'r ⁽¹⁾	Φ'r ⁽²⁾ (deg)	Use Φ'r (deg)	D75 (in)	Avg. D75 ⁽⁴⁾ (in)
			1	2	3	4										
3	203	SpT-2	8	8	12	12	20	8.75	0.00875	N/A	0	42.5	37.7	32.0 ⁽³⁾	0.003	0.004
		SpT-3	5	5	6	6	11					35.3			-	
		SpT-4	7	7	6	6	13					-			-	
	204	SpT-3	3	4	3	2	7				0	32.2	30.3		0.005	
		SpT-4	2	2	2	5	4					-			-	
4	201	SpT-19	4	11	29	29	40	43.3	0.0633	N/A	0	39.6	39.7	34.0 ⁽³⁾	0.354	0.325
		SpT-20	17	18	24	22	42					39.7			-	
	204	SpT-9	24	20	28	49	48				-	43.7	43.7		0.295	
		SpT-10	23	50/0.4			-					-			-	

⁽¹⁾ Avg. N-value calculation for Layer 3 excludeds value from JB1-19-203 SpT-2.

⁽²⁾ $\Phi'r$ calculated using SpT N-Value Correlation from Reference 5.

⁽³⁾ Assumed value for $\Phi'r$ from table 6.3, 6.4, and 6.5 of Reference 1.

⁽⁴⁾ Average D75 calculation for Layer 2 excludes value from JB1-19-202 SpT-4/5.

Report of Detailed Geologic Investigation – Rev. 1

Supplemental Watershed Plan and Environmental Document Jewell Brook Watershed Site No. 2

Ludlow, Windsor County, Vermont

National Inventory of Dams ID: VT00015

May 24, 2021



Jewell Brook Watershed Site No. 2

Submitted to:



**United States
Department of
Agriculture**

Natural Resources Conservation Service

USDA is an equal opportunity provider, employer, and lender.

Vermont State Office

365 Mountain Drive

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Appendix A – Boring Logs

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1.0 INTRODUCTION

DDK Engineering – JV (DDK) completed a subsurface investigation and developed geotechnical recommendations for Site No. 2 of the Jewell Brook Watershed (Jewell Brook No. 2) as part of the Supplemental Watershed Plan and Environmental Document. The Jewell Brook Watershed is located in Ludlow, Windsor County, Vermont and includes four independent high hazard earthen flood control dams, denoted as Jewell Brook No. 1, No. 2, No. 3, and No. 5 (there is no No. 4). Refer to Figure 1 for the location of Jewell Brook No. 2, as well as the locations of Jewell Brook No. 1, No. 3, and No. 5 for reference. The subsurface investigation at Jewell Brook No. 2 consisted of advancing seven borings within the dam embankment and foundation soils and six borings in the auxiliary spillway. Refer to Figure 2 for boring locations. Borings were not advanced in other ancillary areas, such as borrow areas, as part of this subsurface investigation.

DDK is under contract with the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) as the Architect-Engineer (A-E) to prepare a combined Supplemental Watershed Plan and Environmental Document for the Jewell Brook Watershed. The NRCS authorized DDK to perform the services described herein via Order No. 12FPC219F0156 dated September 23, 2019. DDK performed the services in general accordance with the Statement of Work Exhibit No. 2 – Geologic and Geotechnical Investigation Statement of Work provided by NRCS dated July 10, 2019 and our Revised Price Proposal dated September 12, 2019. This Report of Detailed Geologic Investigation for Jewell Brook No. 2 is the instrument of service for the Geologic and Geotechnical Investigation completed as part of Phase 1 – Identify Problems and Determine Objectives of the Supplemental Watershed Plan and Environmental Document. This report is only for Jewell Brook No. 2. Similar reports for Jewell Brook #1, #3, and #5 have been prepared under a separate cover for each.

Jewell Brook No. 2 (National Inventory of Dams ID VT00015 and Vermont Dam ID 117.06) is located on Grant Brook, a tributary of Jewell Brook, approximately 2.3 miles south-southwest of the Town of Ludlow, Vermont. The latitude and longitude in decimal degrees to the center of the project site is 43.3677 and -72.7267, respectively. Jewell Brook # 2 is a zoned earthen embankment with an approximate height of 72 feet and length of 1,170 feet. The upstream slope of the embankment is between 2.7 horizontal to 1 vertical (2.7H:1V) and 3.1H:1V, and the downstream slope is between 2.3H:1V and 2.6H:1V, respectively. The normal pool, auxiliary spillway, and top of dam are located at El. 1532.0, El. 1565.8, and El. 1573.1, respectively. All elevations are based on a topographic survey completed by DDK in 2019 in the North American Vertical Datum of 1988 (NAVD88). The principal spillway consists of a two stage cast-in-place concrete intake riser, 303-foot long and 30-inch diameter reinforced concrete pipe. The two stage principal spillway concrete intake riser has a 1'-0" by 1'-1" orifice at El. 1532.0, which controls the normal pool, and the riser crest is at El. 1559.2. The principal spillway pipe discharges into a reinforced concrete stilling basin which discharges into Grant Brook. There is also a pond drain located approximately 25 feet upstream of the principal spillway intake riser. The pond drain appears to connect to a 4-inch diameter cast iron water supply line that runs parallel to the principal spillway pipe. The auxiliary spillway is a 300-foot wide (bottom width), vegetated, trapezoidal earthen channel with

approximate side slopes of 3H:1V located on the left abutment of the embankment. Jewell Brook No. 2 is currently classified as a Class 1 (High Hazard Class) dam; therefore, the structure falls within the Group A structure site classification as described in Chapter 2 of Part 631 of the National Engineering Handbook.

The subsurface investigation was completed to explore and verify embankment and foundation conditions for the dam embankment and to characterize subsurface conditions within the auxiliary spillway to support evaluations of their stability and integrity. This report summarizes DDK's subsurface investigation and laboratory testing program, describes observed subsurface conditions, provides DDK's evaluation of site conditions as they pertain to the project, and provides recommendations concerning geotechnical aspects based on the findings of the subsurface investigation. This report also includes recommended parameters for use in the NRCS SITES analyses, evaluations of site seismic hazards and liquefaction potential, and discussion on the feasibility of using previously identified borrow areas as future sources of borrow material.

1.1 General

DDK performed subsurface investigation activities at Jewell Brook No. 2 between November 4, 2019 and November 22, 2019. Thirteen borings were completed as part of this investigation. Borings JB2-19-1, JB2-19-1A, JB2-19-2, JB2-19-3, JB2-19-4, JB2-19-5, and JB2-19-5A were completed to verify subsurface conditions related to the dam embankment and foundation soils, and to support evaluation of the seepage conditions and stability of the existing dam. Borings JB2-19-201, JB2-19-202, JB2-19-202A, JB2-19-203, JB2-19-203A, and JB1-19-204 were completed to verify subsurface conditions related to the auxiliary spillway and to support evaluation of the existing auxiliary spillway stability and erodibility. The subsurface exploration plan, included as Figure 2, presents the locations of the borings completed by DDK as well as the approximate locations of previously completed borings and test pits indicated on the NRCS As-Built drawings for the Jewell Brook No. 2 dam. Offset borings are denoted with an "A" after the boring number and are not shown on Figure 2 for clarity.

The purpose of the borings is to characterize the soil, rock, and groundwater conditions at their locations, obtain samples for geotechnical laboratory testing, and support the development of geotechnical design parameters for the performance of analyses. The borings were surveyed in the Vermont State Plane North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88). The surveyed coordinates and elevations of the borings are summarized in Table 1.

DDK subcontracted drilling services required to complete the borings to New England Boring Contractors (NEBC) out of Derry, New Hampshire. A DDK representative approved by the NRCS with knowledge of conducting geological investigations was on-site full-time during subsurface investigation activities. NEBC completed the borings using a Mobile B53 track-mounted ATV drill rig. The borings were advanced through soil using either 4.25" inside diameter (ID), 8" outside diameter (OD), hollow stem augers, or using the drive and wash method with 4" ID (4.5" OD) or 3" ID (3.5" OD) flush joint

casing with a side discharging roller bit and water or drilling mud to remove the cuttings. When the drive and wash drilling method was used to advance through soil, water was used to remove the cuttings in borings located within the Auxiliary Spillway and drilling mud was used to remove the cuttings in borings located within the dam embankment. The drive and wash method was only used when auger refusal was encountered at a depth shallower than the target drill depth due to encountering apparent cobbles or boulders. The drive and wash method was used in Boring JB2-19-1A from a depth of 40.7 feet where auger refusal was encountered to a depth of 46.0 feet where the boring was terminated. The drive and wash method was also used in offset Borings JB2-19-202A and JB2-19-203A because auger refusal was encountered prior to reaching the target drill depth in Borings JB2-19-202 and JB2-19-203. Given the difficult drilling conditions encountered in Borings JB2-19-202 and JB2-19-203 that resulted in auger refusal prior to reaching the target drill depth, Boring JB2-19-204 was completed using the drive and wash method

Disturbed soil samples were collected using a 2” OD split-barrel sampler and the standard penetration test (SPT) method with an automatic hammer drop system in accordance with ASTM D1586. Disturbed soil samples were used for field classification, estimation of soil density or consistency, and for laboratory testing. No rock coring was completed at Jewell Brook No. 2.

All borings were backfilled with a cement/bentonite grout mix using the tremie method. The boreholes were backfilled with grout to within 12 inches of the ground surface, and natural soil material was placed above the grout to the approximate existing ground surface to facilitate revegetation. Tremie pipe was installed to the final depth in boreholes located in the auxiliary spillway upon completion, and boreholes within the auxiliary spillway were left open a minimum of 24 hours and until the static water level stabilized. A water level measurement was taken in the auxiliary spillway borings after the 24 hours (minimum). Embankment boreholes were backfilled upon completion. The approximate volume of grout used to backfill each boring is recorded on the boring logs, which are included in Appendix A. Boring locations and other areas disturbed during the subsurface investigation were raked and ruts were smoothed out as practical by DDK and NEBC.

A DDK field representative classified all soils that were encountered based on split-barrel samples and visual observations of the cuttings. DDK’s field representative documented observed subsurface conditions and the results of drilling activities on the boring logs in Appendix A.

DDK subcontracted geotechnical laboratory testing on soil samples collected in the borings to Geotechnics, Inc. of East Pittsburgh, Pennsylvania. The complete laboratory test results are included as Appendix B. The laboratory index test results are summarized in Table 2. The geotechnical laboratory testing program consisted of:

- ▶ Moisture Content (ASTM D2216),
- ▶ Sieve Analysis (ASTM D6913),
- ▶ Hydrometer Analysis (ASTM D7928),

- ▶ Atterberg Limits (ASTM D4318),
- ▶ Unified Soil Classification System (ASTM D2487), and
- ▶ Specific Gravity (ASTM D854).

DDK intended on completing Crumb Test (ASTM D6572) to estimate potential dispersive characteristics of clayey soils, but based on the hydrometer and Atterberg limits test results, ASTM D6572 was not applicable to the subject soils.

1.2 Geology and Physiography

Jewell Brook No. 2 is located near the boundary of the Green Mountain and New England Upland, also known as the Vermont Piedmont, physiographic subdivisions of the New England physiographic province. The Green Mountain physiographic subdivision is characterized by steep, rugged mountains with average summit elevations of 2,000 feet. New England Upland physiographic subdivision, the largest physiographic region in the state, is described as a plateau dissected by streams and subdued by glaciation and is characterized by rolling hills and valleys with isolated mountains known as monadnocks that are generally comprised of granitic rocks. Bedrock throughout these physiographic subdivisions is generally comprised of metamorphic and sedimentary rocks. More specifically, bedrock beneath Jewell Brook No. 2 is classified as metasedimentary rock.

The bedrock beneath the site is comprised of the chlorite-muscovite phyllite and schist member and the quartz-pebble phyllite and wacke member of the Tyson Formation, which is Lower Cambrian to Neoproterozoic in age. The phyllite and schist member of the Tyson Formation can be found beneath the southern section of the embankment and is described as pale greenish-gray to yellowish-greenish-gray, chlorite-muscovite-quartz phyllite and schist containing beds of pebbly metawacke and magnetite phyllite. The phyllite and wacke member of the Tyson Formation is located beneath the northern section of the embankment and auxiliary spillway and is described as gray to grayish-green, biotite-chlorite-quartz-pebble phyllite and thinly bedded albitic metawacke.

Surficial deposits at Jewell Brook No. 2 are comprised of glacial till and kame moraine glaciofluvial deposits. The glacial till is mapped on the northwestern portion of the site where the auxiliary spillway is located, and generally reflects the topography of the underlying bedrock surface and thins when moving away from the center of the valley as described on the Surficial Geology Map of Vermont by Stewart and MacClintock (1970). The kame moraine glaciofluvial deposits are mapped on the majority of the site and are described as ice contact outwash gravel. Site-specific surficial and bedrock geologic maps derived from available published geology maps are presented on Figures 3 and 4. Available published geologic maps are included in Appendix C.

The USDA NRCS Web Soil Survey indicates that surficial soils at Jewell Brook No. 2, excluding human transported material, generally consist of Monadnock and Berkshire soils, and Adams loamy sand. Monadnock and Berkshire soils, located on the northern and western portions of the site, are typically

found on the slopes of hills and mountains and have a parent material of loamy supraglacial meltout till overlying sandy and gravelly supraglacial meltout till which are derived from phyllite, granite, gneiss, and/or mica schist. Adams loamy sand, located on the eastern and southern portions of the site, is found on outwash terraces and the slopes of eskers, and has a parent material of sandy glaciofluvial deposits. The Web Soil Survey Map, Map Unit Description, and Engineering Properties Table are included as Appendix D.

2.0 SUBSURFACE GEOLOGY

The following section presents a summary of subsurface conditions based on the borings completed as part of this subsurface investigation. The subsurface conditions encountered in the borings are described in the boring logs included as Appendix A and generalized in geotechnical profiles and cross sections presented on Figures 5, 6, and 7. Profiles and cross sections also include information from drill holes completed during previous subsurface investigations performed by others. A summary of the subsurface conditions within previously identified borrow areas based on existing geology reports and NRCS As-Built drawings is also included in this section. Refer to the boring logs in Appendix A for ground water levels recorded in the borings during drilling. Large variations in recorded ground water level on the boring logs are likely attributed to drilling methods used to complete each boring. The ground water levels recorded in borings completed using the drive and wash method or borings where rock was cored introduced water or drilling mud to the borehole which likely influenced the recorded ground water levels.

2.1 Embankment and Foundation

DDK completed Borings JB2-19-1, JB2-19-1A, JB2-19-2, JB2-19-3, JB2-19-4, JB2-19-5, and JB2-19-5A to characterize subsurface conditions in the dam embankment and foundation soils. JB2-19-1, JB2-19-1A, JB2-19-2, JB2-19-3, and JB2-19-4 were advanced through the embankment crest, and JB2-19-5 and JB2-19-5A were advanced on the downstream bench of the embankment. Boring JB2-19-4 was initially scheduled to be completed on the upstream bench, but due to winter weather conditions the drill rig could not safely access the scheduled boring location. The Boring JB2-19-4 location was moved to its as-drilled location as shown on Figure 2, which is between Borings JB2-19-2 and JB2-19-3, the further investigate the presence of very loose to loose soils encountered at Boring JB2-19-3. The purpose of moving Boring JB2-19-4 to it's as-drilled location was to collect additional information to better assess the extent of the very loose to loose soils encountered in Boring JB2-19-3. In total, one hundred nineteen (119) disturbed SPT samples were collected at the borings advanced through the dam's embankment. The locations of these borings are shown on Figure 2. The boring logs are presented in Appendix A. Borings denoted with an "A" after the boring number are offset borings.

At Borings JB2-19-1 through JB2-19-4, which were completed along the dam crest, 0.3 to 0.5 feet of topsoil was encountered underlain by embankment fill. The embankment fill encountered by DDK ranged in thickness from approximately 8 feet at Boring JB2-19-3, to 54 feet at Boring JB2-19-2, depending on where each boring was located along the dam crest in relation to the native valley before the dam was constructed. The embankment fill can be generalized as Silty Sand (SM) with varying amounts of gravel, compact to dense, light brown and brown, and dry to moist. Foundation soils beneath the embankment fill generally consisted of a mixture of Silty Sand and Silty Gravel with varying amounts of cobbles and boulders. The foundation soils were generally olive, brown, and gray in color, dry to moist, and dense except for Boring JB2-19-3. Foundation soils at Boring JB2-19-3 were very loose to loose, with some areas being compact, which may be contributed to the fact that Boring JB3-19-3 sampled

through the foundation soils along a steep side slope of the native valley. Borings JB2-19-1 through JB2-19-4 were terminated within the foundation soils. No rock was cored at Borings JB2-19-1 through JB2-19-4.

Borings JB2-19-5 and JB2-19-5A, which were completed on the downstream bench of the embankment at about El. 1530, encountered similar embankment fill and foundation soils as Borings JB2-19-1 through JB2-19-4. At Borings JB2-19-5 and JB2-19-5A, 0.6 feet of topsoil was encountered underlain by approximately 21 feet of Zone 2 embankment. The Zone 2 embankment fill can be generalized as Silty Sand (SM), compact to dense, light brown and brown, and dry to moist. Foundation soils beneath the embankment fill consisted of Silty Sand and Silty Gravel, dense, and dry to moist. The colors of the foundation soils in this area ranged from olive brown to brownish gray to reddish brown. Borings JB2-19-5 and JB2-19-5A were terminated within the foundation soils. No rock was cored at Borings JB2-19-5 and JB2-19-5A.

Geotechnical laboratory testing results indicate that the embankment fill at Jewell Brook No. 2 has a typical USCS classification of SM, average moisture content of 9.6%, average fines content of 34.9%, average specific gravity of 2.70, and non-plastic fines. The following ranges apply to the laboratory testing results for embankment fill: moisture contents between 6.1% and 13.5%, fines content between 21.0% and 48.3%, and specific gravities between 2.69 and 2.72. Geotechnical laboratory testing results indicate that the foundation soils at Jewell Brook No. 2 have a typical USCS classification of SM, with a few isolated samples having a USCS classification of GM. Foundation soils have an average moisture content of 10.7%, average fines content of 27.6%, and non-plastic fines. The following ranges apply to the laboratory testing for foundation soils: moisture contents between 2.1% and 17.8% and fines content between 11.4% and 40.3%

2.2 Auxiliary Spillway

DDK completed Borings JB2-19-201, JB2-19-202, JB2-19-202A, JB2-19-203, JB2-19-203A, and JB2-19-204 to characterize soil conditions in the auxiliary spillway. In total, fifty-four (54) disturbed SPT samples were collected from the borings at the auxiliary spillway. The locations of these borings are shown on Figure 2. The boring logs are presented in Appendix A. Borings denoted with an “A” after the boring number are offset borings.

At Borings JB2-19-201 through JB2-19-204, 0.3 to 0.5 feet of topsoil was encountered underlain by Glacial Till deposits. The Glacial Till deposits generally consists of layered Silty Sand (SM) and Sandy Silt (ML) materials. The Silty Sand and Sandy Silt material types are generally consistent from boring to boring based on laboratory index testing, but the layer thicknesses and number of layers within each boring is inconsistent. The Glacial Till deposits are light brown, brown, olive and gray, and dry to moist for both material types. The upper four to five feet of the Glacial Deposits are generally compact to dense. Borings JB2-19-202 through JB2-19-204 are located where borrow material was previously excavated to construct the dam embankment and indicate that the lower Glacial Till Deposits that are

below four to five feet in depth are generally dense to very dense. Boring JB2-19-201 is the downstream most boring completed in the Auxiliary Spillway where the existing ground surface is similar to the pre-construction ground surface. Boring JB2-19-201 indicates that the lower Glacial Till deposits that are four to five feet in depth are loose to compact, which may be attributed to the fact that these Glacial Till deposits are under lower confining stresses. Bedrock was not encountered in the Auxiliary Spillway borings completed at Site No. 2.

Geotechnical laboratory testing results for samples collected within the auxiliary spillway indicate a typical USCS classification of SM or ML with a few isolated samples having USCS classifications of GM and SW-SM. For the SM soils within the auxiliary spillway the average moisture content is 10.2%, average fines content is 37.6%, average specific gravity is 2.67, and non-plastic fines. The following ranges apply to the SM soils within the auxiliary spillway: moisture contents between 4.7% and 19.3%, fines contents between 21.8% and 49.1%, and specific gravities between 2.63 and 2.69. The ML soils within the auxiliary spillway have an average moisture content of 11.1%, average fines content of 55.1%, specific gravity of 2.70, and non-plastic fines. The following ranges apply to the ML soils within the auxiliary spillway: moisture contents between 7.7% and 16.2% and fines contents between 50.2% and 64.0%.

2.3 Borrow Areas

The original borrow areas at Jewell Brook No. 2 included the auxiliary spillway borrow, West Borrow Area, and a third borrow area located at the base of the sand kame terrace to the west and extending downstream into the floodplain as described in the NRCS October 1966 Geology Report. As stated in the NRCS October 1966 Geology Report, material within the auxiliary spillway borrow consisted of layers and lenses of silts, sand, gravel, cobbles, and boulders. The upper material was described as poorly stratified, highly permeable, interlocking, and blending “kame and kettle” type deposits. This material was underlain by dense till-like material. The dense till-like material was also encountered at Borings JB2-19-201, JB2-19-202, JB2-19-202A, JB2-19-203, JB2-19-203A, and JB2-19-204 completed by DDK within the existing auxiliary spillway; however, it appears the majority of the layered “kame and kettle” type deposits were excavated from the auxiliary spillway during construction. The NRCS October 1966 Geology Report separated the auxiliary spillway borrow into three areas: 47,000 cubic yards of dense glacial till described as silty sand with 25% gravel and 10% cobbles and boulders, 19,000 cubic yards of till-like material described as silty sand with 10% cobbles and 5% boulders, and 198,000 cubic yards of layered silts, sands, and gravels located above the till-like material within the auxiliary spillway. Laboratory testing results for testing performed by NRCS on representative soil samples from the auxiliary spillway borrow are presented in Table 3. The representative sample from the dense glacial till, Field Sample ID 215.1, was classified as silty sand (SM) with gravel, non-plastic fines, specific gravity of 2.71, maximum dry density of 126.5 pcf, and optimum moisture content of 9.0%. The representative sample from the till-like material, Field Sample ID 216.1, was classified as silty sand (SM) with gravel, non-plastic fines, specific gravity of 2.73, maximum dry density of 124.5 pcf, and optimum moisture content of 8.5%. Laboratory testing was performed on multiple samples from within the layered silts,

sands, and gravels. These samples generally classified as silty sand with non-plastic fines. Two samples from this area, Field Sample IDs 212.1 and 214.1, had specific gravities of 2.71 and 2.72, maximum dry densities of 117.0 and 108.0, and optimum moisture contents of 10.0 and 14.0, respectively.

Seven test pits, TP-125 through TP-131, were performed by NRCS within the West Borrow Area as part of the initial exploration. The NRCS October 1966 Geology Report states that an SM-ML till with 10 to 20 percent gravels and cobbles is present from approximately 4 to 14 feet in TP-126, TP-128, TP-129, and TP-130. The till underlies sandy, silty gravel with 20 to 90 percent cobbles and boulders. The NRCS October 1966 Geology Report and NRCS As-built drawings do not define the limits of the West Borrow Area or indicate a volume of borrow material available from the west borrow area. No laboratory testing was performed on samples collected from TP-125 through TP-131.

Five test pits, TP-132 through TP-136, were performed by the NRCS within the third borrow area. The NRCS October 1966 Geology Report described the location of the third borrow area as at the base of the sand kame terrace to the west and extending downstream into the floodplain. In TP-134, TP-135, and TP-136, very dense glacial till was encountered at depths between 4 and 5 feet. Laboratory testing results for testing performed by NRCS on representative soil samples from the borrow area are presented in Table 3. The representative samples, Field Sample IDs 134.2 and 136.1, classified as silty sand (SM) with 48 to 50 percent fines, liquid limits of 18 to 19, and plastic indices of 2 to 3. The NRCS October 1966 Geology Report and NRCS As-built drawings do not indicate a volume of borrow material available from the third borrow area.

3.0 INTERPRETATIONS AND CONCLUSIONS (FOR IN-SERVICE USE ONLY)

3.1 Interpretations

Using the information obtained from DDK's subsurface investigation, information from the NRCS October 1966 Geology Report and NRCS As-Built drawings, and results of geotechnical laboratory testing, DDK estimated engineering properties in Appendix G for the soil within the auxiliary spillway for use in the NRCS SITES analyses. Blow count values provided in the NRCS As-Built drawings for borings completed during previous subsurface explorations were excluded from the development of the recommended properties for the SITES analyses since the confining pressure in some zones has substantially changed as a result of excavation in the auxiliary spillway. Blow count values for SPT samples collected during DDK's subsurface investigation that were clearly influenced by coarse gravel, cobbles, and boulders were excluded from the development of the recommended properties for the SITES analyses. Recommended properties of site soils for the SITES analyses of the auxiliary spillway, including dry density, plasticity index, clay content, headcut erodibility index, and representative diameter, are calculated in Appendix G and summarized in Table 4. A subsurface profile of the auxiliary spillway is presented on Figure 7. DDK also performed a seismotectonic evaluation and seismic hazard assessment, assessed the liquefaction potential at the site, and evaluated the feasibility of using previously identified borrow areas. The results of these analyses are described in the following sections.

3.1.1 Seismotectonic Evaluation and Seismic Hazard Assessment

In accordance with Technical Release 210-60, "Earth Dams and Reservoirs" (TR-60), DDK compiled data from available resources on magnitude 4 or greater earthquakes and any active or capable faults within 62 miles (100 kilometers) of Jewell Brook No. 2. The USGS U.S. Quaternary Faults Map shows no active faults within 62 miles of Jewell Brook No. 2 and the NOAA Natural Hazards Database lists no significant earthquake within 62 miles of the site. Based on information presented by Wheeler (2006), no seismic/fault zones are located within 62 miles of the site have produced earthquakes with a magnitude of 4 or greater. The USGS Earthquake Hazards Program Map shows three documented earthquakes with a magnitude of 4 or greater within 62 miles of the site. The earliest recorded event occurred in 1638 and is listed as a magnitude (M) 6.5 earthquake with an approximate epicenter location of central New Hampshire. The earthquake had a maximum observed Modified Mercalli Intensity (MMI) of IX and was felt in the Boston area as well as Connecticut, Rhode Island, and Quebec. The second event, a M 4.7 earthquake with a maximum observed MMI of VII, occurred in New York in 1931. The most recent earthquake located within 62 miles of Jewell Brook No. 2 occurred in 1982 in New Hampshire. This M 4.5 earthquake had a maximum observed MMI of VI and was felt throughout the New England region, northeastern New York, southern Quebec, and northeastern Ontario. The approximate epicenter locations of these earthquakes are presented on Figure 8, and the data for each earthquake obtained from the USGS Earthquake Hazards Program is included in Appendix E.

The resources listed above are compiled from thousands of sources and include data on specific events dating back as far as 2150 B.C. Because it is impossible to have information on every major earthquake

and active fault of the Quaternary, which consists of the past 1.6 million years, the existing data cannot definitively evaluate the existence of Quaternary active faults. These resources have made a fair attempt to compile all available information on earthquakes and active faults for incorporation into seismic hazard analyses. Therefore, the existing data, while not definitive, is considered suitable to evaluate the existence of active faults at the site for design purposes. While three seismic events were identified within 62 miles of the site, a deterministic seismic hazard assessment (DSHA) to determine ground motions from these events cannot be performed since these events are not knowingly connected to a defined, specific seismic source or fault zone. Instead, a probabilistic seismic hazard assessment (PSHA) was used to estimate peak ground accelerations at the site as described in the following paragraph.

In accordance with Part 4 of TR-60, probabilistic seismic hazard curves were generated using the USGS Earthquake Hazards Program Unified Hazard Tool for the site based on return periods of 10,000 and 500 years. The input data, generated hazard curves, and deaggregation output are included in Appendix E. The peak ground accelerations at the site are 0.2361g for a return period of 10,000 years (0.5% probability of exceedance in 50 years) and 0.0446g for a return period of 500 years (10% probability of exceedance in 50 years) as presented on the seismic hazard curves. The Unified Hazard Tool assumes a default Site Class at the B/C boundary and does not provide values for other Site Classes. Jewell Brook No. 2 is assumed to fall within Site Class C based on average properties in the top 100 feet similar to very dense soil and soft rock. The ASCE 7 Hazard Tool (ASCE 7-16) provides an amplification factor (F_a) of 1.3 for the site assuming a classification of Site Class C. The corrected peak ground accelerations using the amplification factor are 0.3069g for a return period of 10,000 years and 0.0580g for a return period of 500 years.

3.1.2 Liquefaction Potential

Since the probable ground acceleration with 2 percent probability of exceedance in 50 years is between 10 and 20 percent of gravity (%g), the hazard class is high, and the effective dam height is greater than 20 feet, necessary information has been summarized below to evaluate the liquefaction potential of the site in accordance with 210-VI-NEH, Part 631, Chapter 2, Section 631.0207. Available information indicates no historic occurrences of liquefaction in the area of Jewell Brook No. 2. The distribution of surficial geologic units and soils at the sites is presented on the USDA NRCS Web Soil Survey Soil Maps in Appendix D and on the surficial geologic map in Figure 3. Active depositional areas at Jewell Brook No. 2 are likely limited to the location where Grant Brook enters the reservoir, and inactive, older terraces are mapped on the western half of the site and are classified as kame moraine deposits as shown on Figure 3. Surficial geologic units that are within active or recently active depositional areas are generally more prone to liquefaction because they are typically unconsolidated and have a higher likelihood of being saturated or becoming saturated. The peak ground acceleration for a 500-year return period (10% probability of exceedance in 50 years) obtained from the USGS Earthquake Hazards Program is 0.0446, which is less than 0.1g. Therefore, per 210-VI-NEH, Part 631, Chapter 2, Section 631.0207, preliminary assessments to document the presence of unconsolidated sediments in active depositional environments,

moderately consolidated Holocene-age sediments in inactive depositional environments, or late Pleistocene-age deposits that are approximately 15,000 to 12,000 years old are not required.

Since SPTs were performed as part of the geologic investigation and are acceptable as an initial screening for liquefaction potential, correlations were prepared using the SPT results to initially assess if subsurface conditions at the site exhibit liquefaction potential. See Appendix G for the SPT N-value correlations. Based on case-history data (Seed and Harder, 1990; Castro, 1995; Wride et al., 1999), flow slides resulting from large earthquakes have only occurred where $N_{1,60}$ (SPT blow count, or N-value, corrected for field procedures and overburden pressure) values were 13 or lower; thus, it is generally accepted that sand-like materials with $N_{1,60}$ values greater than 15 are not susceptible to strength loss. At Jewell Brook No. 2, the average $N_{1,60}$ values for all borings are above 15, except for Boring JB2-19-3. Excluding JB2-19-3, only four individual $N_{1,60}$ values are below 15. Since these four individual $N_{1,60}$ values do not represent a specific layer or zone, soils encountered in the borings at Jewell Brook No. 2, excluding those encountered in JB1-19-3, are likely not susceptible to strength loss. Boring JB2-19-3 encountered very loose to loose, with isolated compact zones, silty sand glacial till material from 10 feet to 40 feet. The very loose to loose glacial till materials could be attributed to the fact that Boring JB2-19-3 is located on the crest of the dam and sampled into native ground along a steep side slope of the native valley. At Boring JB2-19-3 samples between 10 feet and 40 feet all had an $N_{1,60}$ less than 15; therefore, strength loss should potentially be considered for these materials in future analyses.

3.1.3 Feasibility of Borrow Areas

As presented on the NRCS As-Built Drawings and bid schedule, the volume of fill required for construction at Jewell Brook No. 2, excluding drain fill, is 237,051 cubic yards. Using information presented in the October 1966 Geology Report, DDK estimates the maximum amount of fill available from the original borrow areas prior to construction was at least 264,000 cubic yards. This amount includes the quantities of 47,000, 19,000, and 198,000 cubic yards listed in the October 1966 Geology Report for the auxiliary spillway borrow area. These values indicate that the maximum amount of available material from the auxiliary spillway borrow area is approximately 26,949 cubic yards. Since the amounts of material available within the west borrow area and third borrow area were not specified in the October 1966 Geology Report or on the NRCS As-Built Drawings, the actual amount of borrow material remaining within these original borrow areas cannot be determined.

Use of the auxiliary spillway as a source of material for structural rehabilitation alternatives is not considered feasible unless the design of the alternative takes into account the removal of material from the auxiliary spillway and does not compromise the stability and structural integrity of the dam. If the auxiliary spillway is considered as a potential source of material, additional investigation and testing should be performed on the soils within the auxiliary spillway to calculate engineering parameters and estimate the volume of fill material available. Use of the West Borrow Area or third borrow area as sources of material is considered feasible if suitable material remains within the borrow areas. If the West Borrow Area, or third borrow area are considered as potential sources of material for any structural

rehabilitation alternatives, additional investigation and testing should be performed on the in-place soils to determine the soil classification, calculate engineering parameters, and estimate the volume of fill material available.

3.2 Conclusions (Recommendations)

Based on the subsurface conditions observed during the subsurface investigation described herein, our current design assumptions and understanding of the project, and the interpretations described in the previous section, DDK has developed the following conclusions that relate to key geotechnical features of the project.

- ▶ This Geologic Investigation generally confirmed consistent subsurface conditions as presented in the NRCS October 1966 Geology Report and on the NRCS As-Built Drawings.
- ▶ SITES analyses shall be performed using the recommended properties of site soils as calculated in Appendix G and as presented in Table 4 as applicable.
- ▶ Based on the results of the Seismotectonic Evaluation and Seismic Hazard Assessment, special seismic studies are not required.
- ▶ The embankment fill and foundation between 8 and 40 feet below the ground surface in Boring JB2-19-3 may exhibit liquefaction potential based on an initial screening using corrected SPT blow counts. Strength loss should potentially be considered for this layer in slope stability analyses.
- ▶ Using the auxiliary spillway as a source of borrow material is not considered feasible unless the design of the alternative takes into account the excavation and lowering of the auxiliary spillway and does not compromise the stability and structural integrity of the dam. If considered, additional investigation and testing should be performed on the soils within the auxiliary spillway to calculate engineering parameters and estimate the volume of fill material available.
- ▶ Using the West Borrow Area or third borrow area as sources of borrow material may be feasible. If considered, additional investigation and testing should be performed on the in-place soils to determine the soil classification, calculate engineering parameters, and estimate the volume of fill material available.
- ▶ If new structures for the dam rehabilitation are proposed that are susceptible to settlement, consolidation analyses should be performed on applicable soils to support the design.
- ▶ Additional geotechnical investigations using sonic drilling methods should be performed as necessary for the design of the rehabilitation plan after a rehabilitation alternative is selected and verified. The investigations should include proposed borrow areas. Additional geotechnical investigations in the auxiliary spillway should include borings that extend the minimum depth required by Part 531 of Title 210 – *National Engineering Manual and the Geologic Report*.

- ▶ Future geotechnical investigation should consider or include the installation of piezometers to monitor ground water and phreatic conditions of the dam.
- ▶ If new structures for the dam rehabilitation are proposed that are susceptible to settlement, consolidation analyses should be performed on applicable soils to support the design.
- ▶ The underdrain system for the auxiliary spillway should be investigated and assessed as part of the dam's rehabilitation design.

4.0 REPORT LIMITATIONS

DDK prepared this report for the exclusive use for and specific application to the Supplemental Watershed Plan and Environmental Document project for the Jewell Brook Watershed Site No. 2 located in Ludlow, Windsor County, Vermont. DDK is not responsible for use or interpretation of this report by any parties. The evaluation and recommendations contained in this report are based on the data obtained from the referenced subsurface investigation. The borings indicate subsurface conditions only at the specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata variations that may exist between such locations. The validity of the recommendations is based in part on assumptions about the stratigraphy between borings made by the geotechnical engineer. Such assumptions shall be confirmed during earthwork as part of construction. If subsurface conditions different from those described herein are noted during construction, recommendations in this report must be reevaluated. DDK must observe earthwork construction, particularly borrow area and fill areas, to confirm that our assumptions and recommendations are valid, or to modify them accordingly. DDK cannot assume responsibility or liability for the adequacy of recommendations if it does not observe construction.

If any changes in the nature, design, or location of the structure are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by DDK. DDK is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analyses without the express written authorization of DDK.

Our scope of services excludes testing or engineering evaluations associated with environmental conditions at the site, including the investigation or detection of the presence of any “biological pollutants” in or around the site where the phrase “biological pollutants” includes but is not limited to: molds, spores, fungi, bacteria and viruses, and the byproducts of any such biological organisms.

5.0 REFERENCES

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6.0 CLOSING

In preparing this report, the professional services of DDK has been performed, findings obtained, and recommendations prepared per generally accepted engineering principles and practices. This statement is instead of all warranties, either expressed or implied.

If you have questions, please call.

Respectfully Submitted,
DDK ENGINEERING – JV



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TABLES

Table 1
As-Drilled Boring Locations
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Boring	Northing (ft)	Easting (ft)	Ground Surface Elevation (ft)	Depth (ft)
JB2-19-1	316104.1	1580178.0	1573.8	9.4
JB2-19-1A	316098.3	1580178.4	1573.8	46.0
JB2-19-2	316352.2	1580137.3	1573.8	61.1
JB2-19-3	316647.5	1580087.5	1573.2	48.0
JB2-19-4	316531.0	1580109.9	1573.6	57.0
JB2-19-5	316370.7	1580252.9	1530.1	24.3
JB2-19-5A	316380.5	1580252.3	1530.2	25.8
JB2-19-201	317175.3	1580063.3	1557.9	20.0
JB2-19-202	317265.8	1579850.7	1560.5	13.0
JB2-19-202A	317262.9	1579847.6	1560.4	20.0
JB2-19-203	317033.5	1579857.2	1564.7	13.5
JB2-19-203A	317030.9	1579849.0	1565.1	18.2
JB2-19-204	317032.2	1579767.9	1565.9	48.9

- 1) Horizontal Datum: North American Datum of 1983 (NAD83) Vermont State Plane
- 2) Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
- 3) Boring locations surveyed using a Trimble GNSS System.

Table 2
Summary of Laboratory Index Test Results
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Sample Information				Test Results									
Boring	Sample ID	Depth		Water Content (%)	Sieve Analysis					Atterberg Limits			Specific Gravity
		From (ft)	To (ft)		USCS Symbol ⁽¹⁾	USCS Name	<#4 (%)	<#40 (%)	<#200 (%)	USCS Symbol (of fines)	LL (%)	PI (%)	
JB2-19-1	SpT-2/3	2.0	6.0	7.4	SM	Silty Sand	92.47	76.50	21.01	Non-Plastic			2.69
JB2-19-1A	SpT-3	14.0	16.0	6.1	-	-	-	-	-	-	-	-	-
	SpT-6/7	20.0	24.0	10.6	SM	Silty Sand	90.90	76.28	32.93	Non-Plastic			-
	SpT-11/12	30.0	34.0	10.0	-	-	-	-	-	-	-	-	2.72
	SpT-16	42.0	44.0	10.0	sm	Silty Sand w/ Gravel	76.78	60.82	30.57	-	-	-	-
JB2-19-2	SpT-2/3	2.0	6.0	10.7	SM	Silty Sand w/ Gravel	83.52	62.73	28.57	Non-Plastic			-
	SpT-7/8	12.0	16.0	8.1	-	-	-	-	-	-	-	-	2.69
	SpT-11/12	20.0	24.0	8.9	SM	Silty Sand	93.62	75.67	36.21	Non-Plastic			-
	SpT-15	28.0	30.0	8.0	-	-	-	-	-	-	-	-	-
	SpT-23/24	44.0	48.0	10.7	SM	Silty Sand	97.48	86.19	44.33	Non-Plastic			2.70
	SpT-28	54.0	56.0	11.9	SM	Silty Sand	89.03	76.35	32.45	Non-Plastic			-
	SpT-30	58.0	59.8	7.6	sm	Silty Sand w/ Gravel	80.69	58.63	26.29	-	-	-	-
JB2-19-3	SpT-3	4.0	6.0	8.3	-	-	-	-	-	-	-	-	-
	SpT-6/7/8	10.0	16.0	10.2	SM	Silty Sand	100.00	96.85	48.29	Non-Plastic			2.69
	SpT-14/15	26.0	30.0	13.5	sm	Silty Sand	95.72	74.39	39.64	-	-	-	2.74
	SpT-19/20	36.0	40.0	17.8	SM	Silty Sand	99.90	93.43	40.25	Non-Plastic			-
	SpT-23/24	44.0	48.0	2.1	GW-GM	Well-Graded Gravel w/ Silt and Sand	47.03	24.75	11.44	Non-Plastic			-
JB2-19-4	SpT-2/3	2.0	6.0	9.4	SM	Silty Sand	89.65	70.48	32.58	Non-Plastic			-
	SpT-6/7/8	12.0	18.0	10.2	SM	Silty Sand	95.79	81.39	41.57	Non-Plastic			-
	SpT-13/14	26.0	30.0	9.8	-	-	-	-	-	-	-	-	2.69
	SpT-19/20/21	38.0	44.0	10.8	SM	Silty Sand	88.80	72.03	28.79	Non-Plastic			2.69
	SpT-23/24	46.0	50.0	13.4	SM	Silty Sand	89.87	73.06	32.53	Non-Plastic			-
	SpT-25	50.0	52.0	12.5	-	-	-	-	-	-	-	-	-
	SpT-27/28	54.0	57.0	4.0	gm	Silty Gravel w/ Sand	52.62	30.77	14.45	-	-	-	-

Table 2
Summary of Laboratory Index Test Results
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Sample Information				Test Results									
Boring	Sample ID	Depth		Water Content (%)	Sieve Analysis					Atterberg Limits			Specific Gravity
		From (ft)	To (ft)		USCS Symbol ⁽¹⁾	USCS Name	<#4 (%)	<#40 (%)	<#200 (%)	USCS Symbol (of fines)	LL (%)	PI (%)	
JB2-19-5	SpT-2/3	2.0	6.0	10.9	SM	Silty Sand	90.70	73.56	32.04	Non-Plastic			2.70
	SpT-8/9/10	14.0	20.0	13.5	SM	Silty Sand	96.85	85.39	37.35	Non-Plastic			-
	SpT-12	22.0	23.8	15.5	sm	Silty Sand w/ Gravel	64.97	45.65	20.77	-	-	-	-
JB2-19-5A	SpT-1	24.0	25.8	9.1	gm	Silty Gravel w/ Sand	55.99	29.47	13.71	-	-	-	-
JB2-19-201	SpT-1/2	0.0	4.0	8.9	SM	Silty Sand	89.17	65.63	28.28	Non-Plastic			2.68
	SpT-3/4	4.0	8.0	4.7	SM	Silty Sand w/ Gravel	76.66	52.81	25.02	Non-Plastic			-
	SpT-5/6	8.0	12.0	13.4	ML	Sandy Silt	99.91	86.23	52.00	Non-Plastic			-
	SpT-9/10	16.0	20.0	11.5	SM	Silty Sand	89.46	60.41	21.76	Non-Plastic			2.68
JB2-19-202	SpT-1	0.0	2.0	6.1	SW-SM	Well-Graded Sand w/ Silt	94.41	38.36	6.51	Non-Plastic			-
	SpT-2	2.0	4.0	8.0	sw-sm	Well-Graded Sand w/ Silt	86.85	38.09	9.55	-	-	-	-
	SpT-5/6	8.0	11.6	7.9	SM	Silty Sand	92.12	73.62	46.40	Non-Plastic			2.67
JB2-19-202A	SpT-1/2/3	14.0	20.0	10.5	SM	Silty Sand w/ Gravel	84.18	70.04	45.60	Non-Plastic			-
JB2-19-203	SpT-1/2	0.0	4.0	9.2	SM	Silty Sand	88.32	70.70	30.83	Non-Plastic			2.69
	SpT-4/5	6.0	8.7	7.7	ML	Sandy Silt	93.77	76.36	51.63	Non-Plastic			-
	SpT-6/7	10.0	13.1	6.9	SM	Silty Sand	86.08	73.63	49.14	Non-Plastic			-
JB2-19-203A	SpT-1/2	14.0	17.2	16.2	ML	Sandy Silt	85.22	80.06	64.04	Non-Plastic			-
JB2-19-204	SpT-1/2	0.0	4.0	11.4	SM	Silty Sand	91.76	76.11	45.13	Non-Plastic			-
	SpT-4/5	6.0	8.8	11.0	ML	Sandy Silt	86.24	74.54	56.48	Non-Plastic			-
	SpT-6/7	10.0	12.9	9.4	ML	Sandy Silt	91.02	78.46	56.28	Non-Plastic			2.70
	SpT-9/10	18.0	22.0	8.9	SM	Silty Sand w/ Gravel	84.78	69.02	44.82	Non-Plastic			-
	SpT-13/14	26.0	30.0	8.9	ML	Sandy Silt	90.07	77.60	50.21	Non-Plastic			-
	SpT-15/16	30.0	33.4	19.3	SM	Silty Sand	98.80	95.32	36.84	Non-Plastic			2.63
	SpT-18/19	36.0	38.7	12.1	SM	Silty Sand	87.28	68.24	34.23	Non-Plastic			-
	SpT-23/24	46.0	48.9	11.3	SM	Silty Sand	86.18	71.01	42.74	Non-Plastic			-

Notes:

⁽¹⁾ Laboratory assumed Unified Soil Classification System (USCS) symbols for samples with sieve analysis testing but without Atterberg limits testing are shown as lowercase.

Table 3
Summary of Laboratory Test Results from Previous Exploration Performed by NRCS
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Field Sample ID	Laboratory No.	Test Results															
		Depth		Water Content	Sieve and Hydrometer Analysis					Atterberg Limits			Specific Gravity ⁽¹⁾	Max. Dry Unit Weight ⁽¹⁾ (pcf)	Optimum Moisture Content ⁽¹⁾ (%)	Friction Angle ⁽¹⁾ (deg)	Cohesion ⁽¹⁾ (psf)
		From (ft)	To (ft)		USCS Symbol	<#4 (%)	<#40 (%)	<#200 (%)	<0.002 mm (%)	USCS Symbol (of fines)	LL (%)	PI (%)					
DH-301 Jar 4	67W1546	3.0	4.5	10.1	-	100	98	24	0	-	-	-	-	-	-	-	-
DH-302 Jar 6	67W1547	7.5	9.0	5.6	-	46	16	6	1	-	-	-	-	-	-	-	-
DH-302 Jar 10	67W1548	13.5	15.0	19.6	-	100	100	57	3	-	-	-	-	-	-	-	-
3.1	67W1549	1.5	6.0	-	SM	95	82	41	3	Non-Plastic			-	-	-	-	-
8.1	67W1550	9.0	9.0	-	SP-SM	100	96	9	0	-	-	-	-	-	-	-	-
9.1	67W1551	8.5	8.5	-	SC-SM	83	70	47	12	CL-ML	20	7	2.75	124.5	10.5	24	350
11.1	67W1552	5.0	5.0	-	SC-SM	91	78	50	10	CL-ML	19	6	-	-	-	-	-
13.2	67W1553	17.0	17.0	-	CL-ML	93	86	58	12	CL-ML	20	7	-	-	-	-	-
15.1	67W1554	3.5	3.5	-	SP-SM	64	25	6	1	-	-	-	-	-	-	-	-
15.2	67W1555	7.5	7.5	-	ML	100	94	71	5	Non-Plastic			-	-	-	-	-
17.1	67W1556	7.0	18.0	-	SM	77	60	20	2	Non-Plastic			-	-	-	-	-
18.1	67W1557	17.0	18.0	-	GM	55	39	17	2	Non-Plastic			-	-	-	-	-
19.1	67W1558	10.0	11.0	-	SM	87	72	42	8	ML	16	0	-	-	-	-	-
20.1	67W1559	4.0	12.0	-	GW-GM	38	15	5	1	-	-	-	-	-	-	-	-
21.1	67W1560	4.0	5.0	-	SM	100	93	22	1	-	-	-	-	-	-	-	-
21.2	67W1561	5.0	6.0	-	SP-SM	64	16	8	1	-	-	-	-	-	-	-	-
21.3	67W1562	7.0	7.0	-	SP-SM	70	27	9	1	-	-	-	-	-	-	-	-
22.1	67W1563	5.0	8.5	-	SM	97	88	38	1	Non-Plastic			-	-	-	-	-
22.2	67W1564	4.0	8.0	-	SM	87	74	33	3	Non-Plastic			-	-	-	-	-
DH-91 Jar 8	67W1565	10.5	12.0	4.0	GP-GM	52	26	12	0	-	-	-	-	-	-	-	-
DH-91 Jar 14	67W1566	19.5	21.0	18.8	-	100	98	56	3	-	-	-	-	-	-	-	-
DH-91 Jar 17	67W1567	24.0	25.5	1.7	-	74	23	10	1	-	-	-	-	-	-	-	-
DH-91 Jar 24	67W1568	34.5	36.0	3.7	-	100	87	25	2	-	-	-	-	-	-	-	-
DH-91 Jar 30	67W1569	47.0	48.5	8.3	-	80	41	22	3	-	-	-	-	-	-	-	-
DH-91 Jar 36	67W1570	65.0	66.5	7.9	-	91	70	40	3	-	-	-	-	-	-	-	-
DH-92 Jar 10	67W1571	20.0	21.5	10.4	-	91	85	56	7	-	-	-	-	-	-	-	-
DH-93 Jar 12	67W1572	21.5	23.0	16.4	-	98	89	48	5	-	-	-	-	-	-	-	-
DH-94 Jar 11	67W1573	15.5	17.0	9.0	-	70	50	24	1	-	-	-	-	-	-	-	-

Table 3
Summary of Laboratory Test Results from Previous Exploration Performed by NRCS
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Field Sample ID	Laboratory No.	Test Results															
		Depth		Water Content (%)	Sieve and Hydrometer Analysis					Atterberg Limits			Specific Gravity ⁽¹⁾	Max. Dry Unit Weight ⁽¹⁾ (pcf)	Optimum Moisture Content ⁽¹⁾ (%)	Friction Angle ⁽¹⁾ (deg)	Cohesion ⁽¹⁾ (psf)
		From (ft)	To (ft)		USCS Symbol	<#4 (%)	<#40 (%)	<#200 (%)	<0.002 mm (%)	USCS Symbol (of fines)	LL (%)	PI (%)					
DH-96 Jar 12	67W1574	16.5	18.0	9.0	-	89	77	46	9	-	-	-	-	-	-	-	-
DH-97 Jar 4	67W1575	4.5	6.0	21.3	-	98	84	39	7	-	-	-	-	-	-	-	-
DH-97 Jar 11	67W1576	15.0	16.5	26.9	-	100	98	73	7	-	-	-	-	-	-	-	-
DH-97 Jar 20	67W1577	30.0	31.5	5.0	SW-SM	81	28	9	1	-	-	-	-	-	-	-	-
DH-97 Jar 26	67W1578	39.0	40.5	11.7	-	90	51	23	1	-	-	-	-	-	-	-	-
DH-97 Jar 31	67W1579	46.5	48.0	3.8	-	55	31	15	1	-	-	-	-	-	-	-	-
DH-604 Jar 7	67W1580	10.0	11.5	9.5	-	65	33	14	1	-	-	-	-	-	-	-	-
DH-604 Jar 11	67W1581	16.0	17.5	8.0	-	63	37	16	1	-	-	-	-	-	-	-	-
DH-204 Jar 16	67W1582	24.0	25.5	10.9	-	95	83	54	9	-	-	-	-	-	-	-	-
DH-205 Jar 22	67W1583	31.5	33.0	6.3	-	60	28	15	1	-	-	-	-	-	-	-	-
DH-210 Jar 3	67W1584	3.0	4.5	2.7	-	97	64	13	1	-	-	-	-	-	-	-	-
DH-210 Jar 9	67W1585	20.0	21.5	10.4	-	86	58	28	2	-	-	-	-	-	-	-	-
212.1	67W1586	8.5	13.2	-	SP-SM	80	38	7	1	-	-	-	2.71	117.0	10.0	-	-
213.1	67W1587	3.8	14.0	-	SM	100	77	29	1	Non-Plastic			-	-	-	-	-
214.1	67W1588	3.1	14.0	-	SM	100	98	43	1	Non-Plastic			2.72	108.0	14.0	-	-
215.1	67W1589	8.0	14.0	-	SM	71	54	27	5	Non-Plastic			2.71	126.5	9.0	30.5	350
216.1	67W1590	11.5	14.0	-	SM	75	56	25	5	Non-Plastic			2.73	124.5	8.5	32	200
219.1	67W1591	2.0	10.0	-	-	90	70	13	2	-	-	-	-	-	-	-	-
221.1	67W1592	8.3	14.2	-	SM	82	66	35	2	Non-Plastic			-	-	-	-	-
222.1	67W1593	13.0	15.0	-	SM	84	69	35	2	Non-Plastic			-	-	-	-	-
222.2	67W1594	8.0	9.0	-	ML	100	99	69	3	Non-Plastic			-	-	-	-	-
223.2	67W1595	4.0	6.0	-	SW-SM	91	35	8	1	-	-	-	-	-	-	-	-
223.4	67W1596	10.0	10.0	-	SM	86	70	38	2	Non-Plastic			-	-	-	-	-
134.2	67W1597	10.0	10.0	-	SM	86	72	48	11	ML	19	3	-	-	-	-	-
136.1	67W1598	6.0	10.0	-	SM	89	74	50	12	ML	18	2	-	-	-	-	-

⁽¹⁾ Testing performed on material passing the #4 sieve.

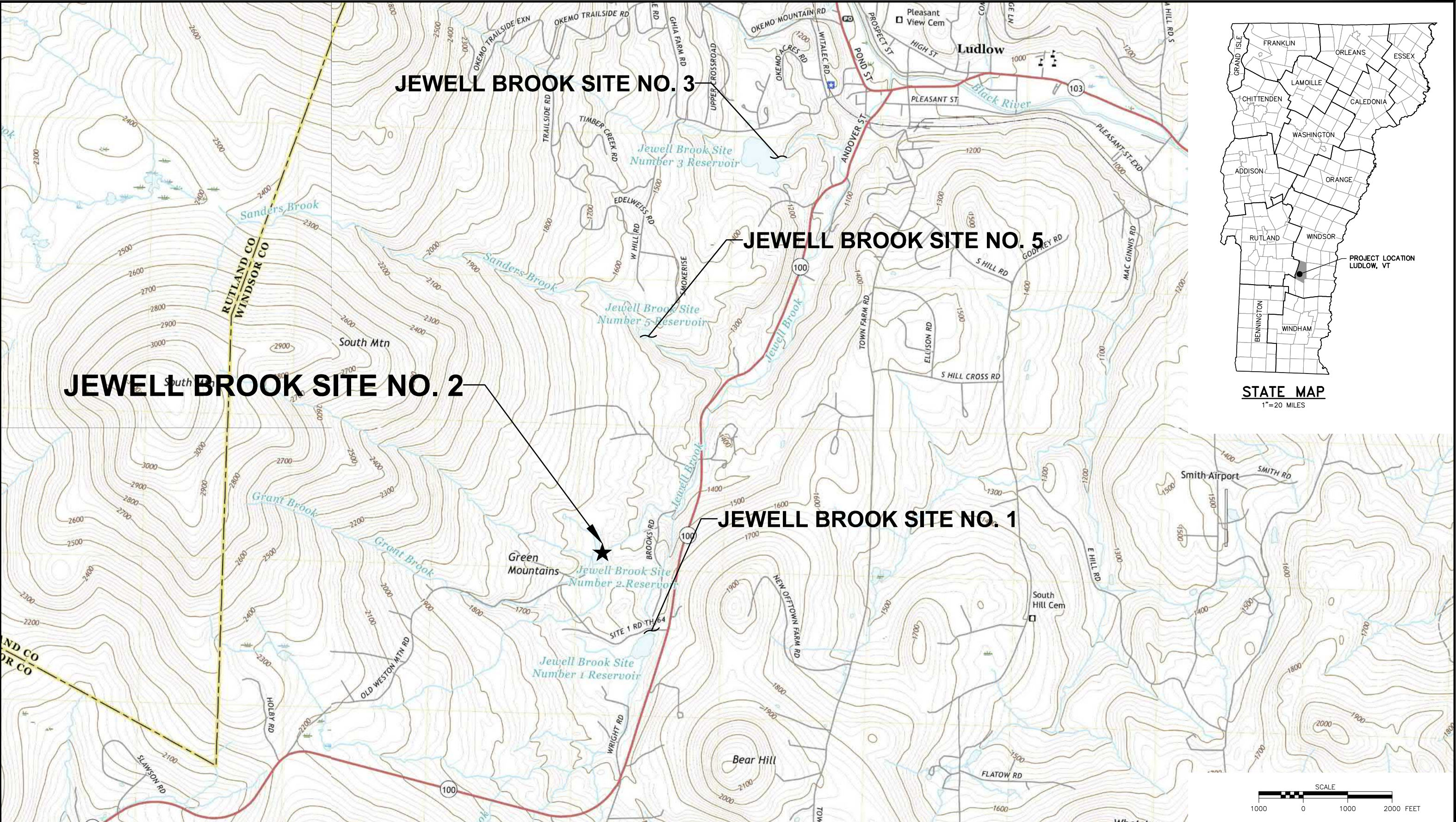
Table 4
Summary of Recommended Properties of Site Soils for SITES Analyses
Jewell Brook Watershed Site No. 2
Natural Resources Conservation Service
Ludlow, Windsor County, Vermont

Layer	Avg. USCS	Dry Density (lb/cu.ft.)	Plasticity Index	Clay Content (%)	Head Cut Index	Representative Diameter (in.)
1	SM	119.7	N.P.	4.80	0.046	0.061
2	ML	119.7	N.P.	12.61	0.281	0.022
3	SM	117.2	N.P.	4.80	0.304	0.026
4	SM/ML	111.5	N.P.	1.33	0.041	0.038

FIGURES

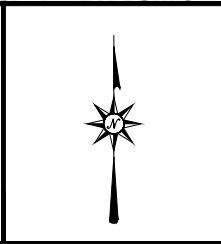
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NOTES / REVISIONS					
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SEAL:



PROJECT NUMBER: 172719-17
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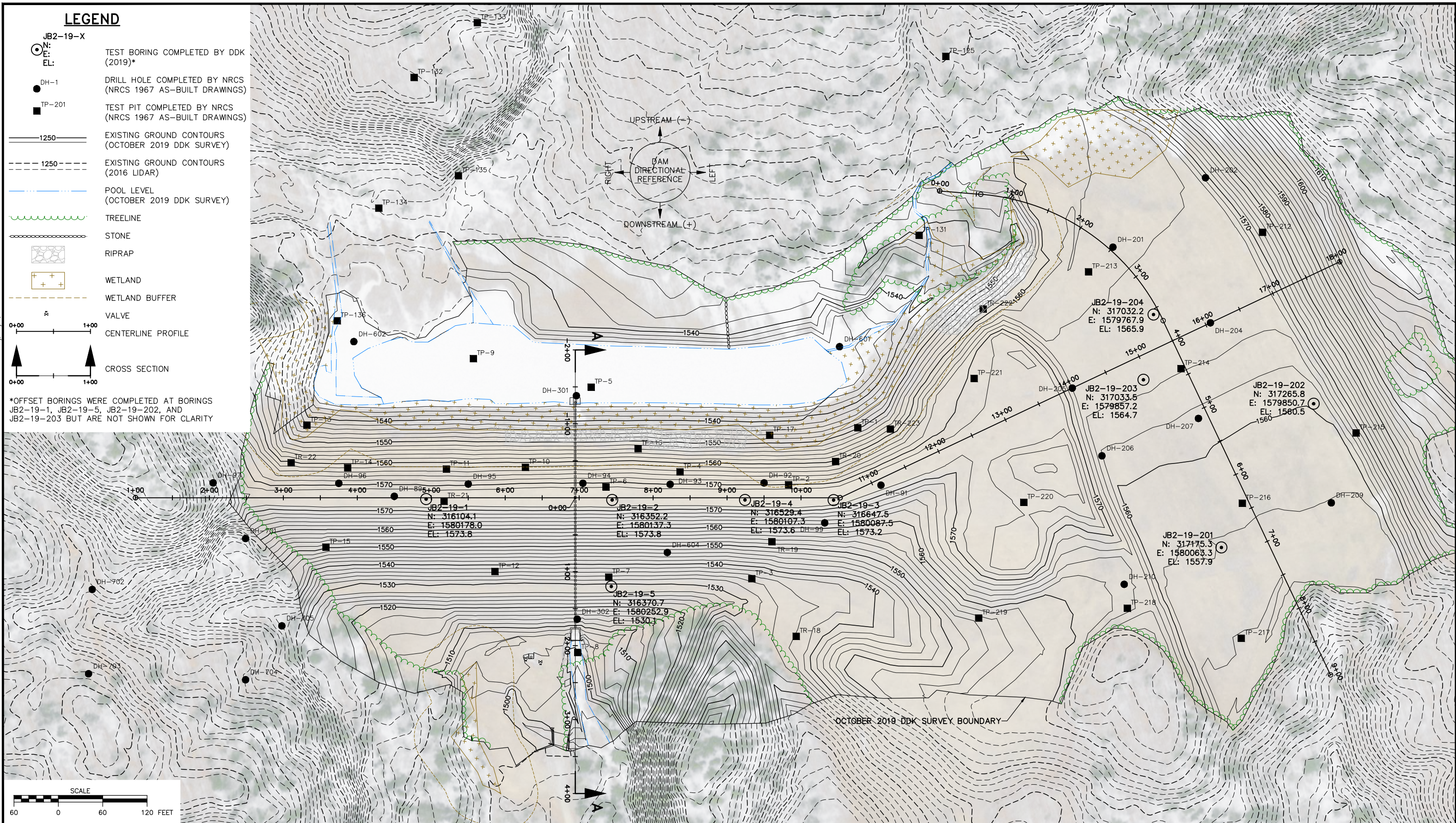
DRAWN BY: AA
CHECKED BY: QDW

DATE: 1/2/2020
DATE: 1/31/2020

JEWELL BROOK WATERSHED LUDLOW, WINDSOR COUNTY, VERMONT		
JEWELL BROOK SITE NO. 2 FIGURE 1 PROJECT LOCATION PLAN		
SCALE: AS SHOWN	FIGURE 1	REV 0

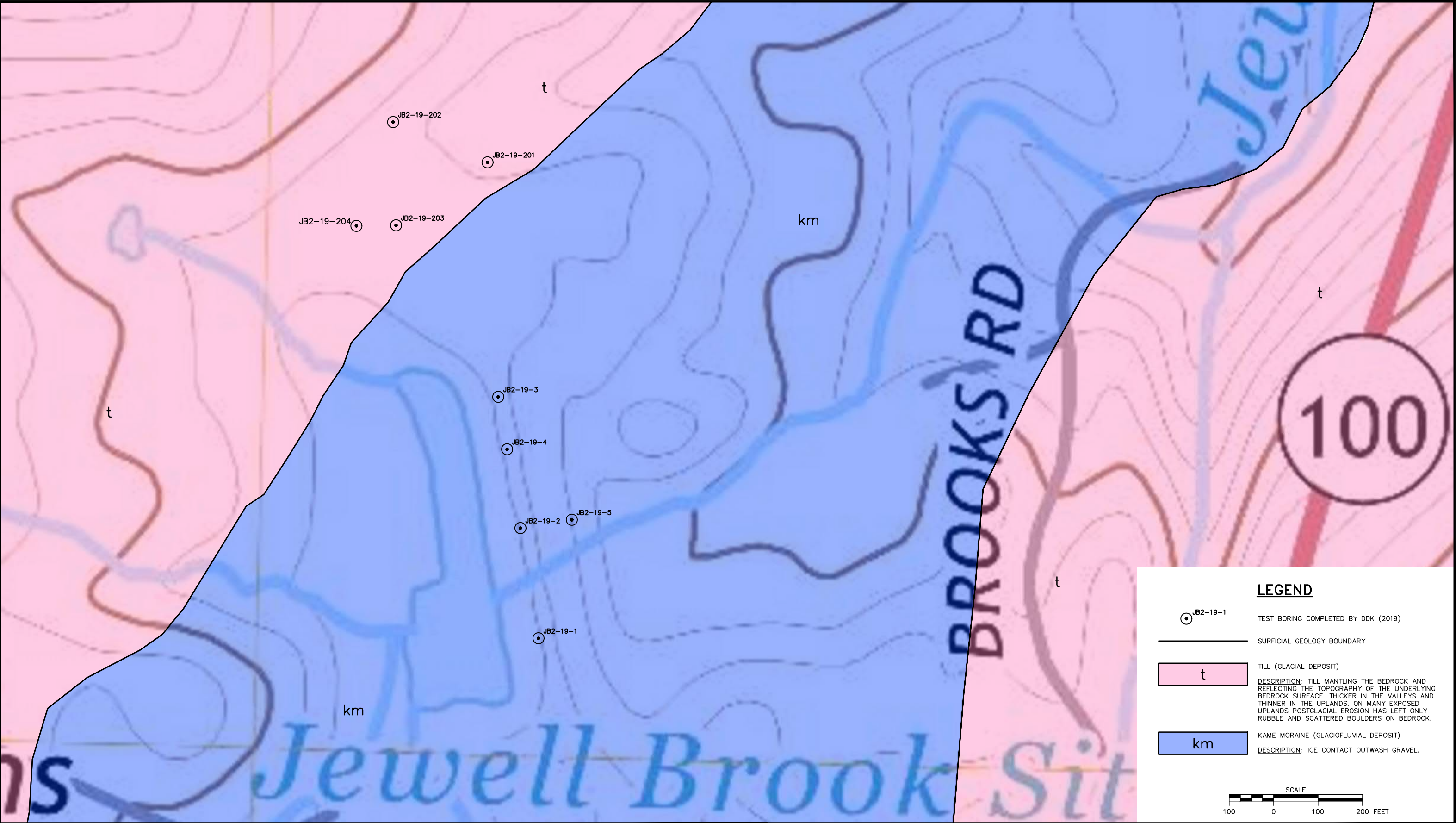
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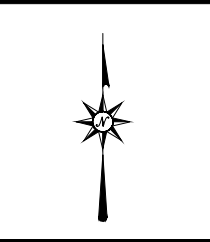
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NOTES / REVISIONS						
1. SURFICIAL GEOLOGY BOUNDARIES OBTAINED FROM THE VERMONT OPEN GEODATA PORTAL PREPARED BY THE VERMONT CENTER FOR GEOGRAPHIC INFORMATION.						
2. SURFICIAL GEOLOGY DESCRIPTIONS AND SYMBOLS OBTAINED FROM: STEWART, D.P. AND MACCLINTOCK, P., (1970), "SURFICIAL GEOLOGIC MAP OF VERMONT," VERMONT GEOLOGICAL SURVEY, DEPARTMENT OF WATER RESOURCES, SCALE 1:250,000.						
		4				
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		1				
ISSUED FOR	DATE	REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

SEAL:



PROJECT NUMBER: 172719-17

FILE NAME: Site 2 - Surficial Geology Plan.dwg

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Natural Resources Conservation Service

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DRAWN BY: AA

CHECKED BY: QDW

DATE: 1/2/2020

DATE: 1/31/2020

JEWELL BROOK WATERSHED

LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2

FIGURE 3

SURFICIAL GEOLOGIC MAP

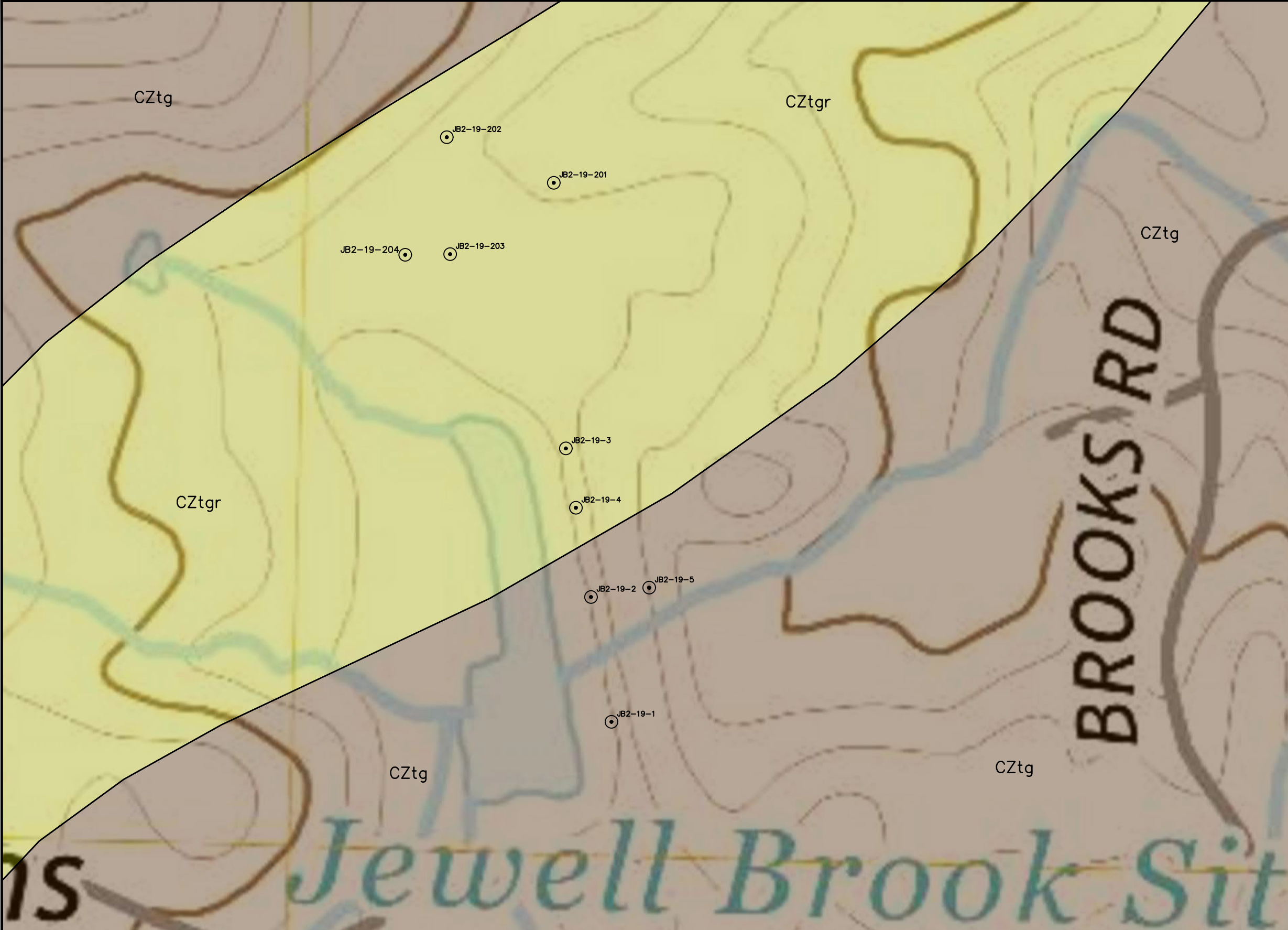
SCALE: AS SHOWN

FIGURE 3

REV 0

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LEGEND

- JB2-19-1 TEST BORING COMPLETED BY DDK (2019)
- BEDROCK GEOLOGY BOUNDARY
- THRUST FAULT

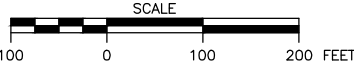
PLYMOUTH FORMATION (CAMBRIAN)

Cpfq FELDSPATHIC QUARTZITE MEMBER
DESCRIPTION: THINLY LAMINATED BUT MASSIVE-APPEARING, GRAY AND BROWNISH-GRAY TO TAN-WEATHERING FLAGGY BIOTITE-MUSCOVITE FELDSPATHIC QUARTZITE AND PHYLLITIC QUARTZITE. RESEMBLES FELDSPATHIC QUARTZITE OF THE DALTON FORMATION (CZdfq) AND SIMILAR QUARTZITE OF THE MOOSALAMOO FORMATION (CZmf) ABOVE THE FORESTDALE FORMATION.

TYSON FORMATION (LOWER CAMBRIAN AND NEOPROTEROZOIC)

CZtg CHLORITE-MUSCOVITE PHYLLITE AND SCHIST MEMBER
DESCRIPTION: PALE-GREENISH-GRAY TO YELLOWISH-GREENISH-GRAY, CHLORITE-MUSCOVITE-QUARTZ PHYLLITE AND SCHIST; LOCALLY CONTAINS BEDS OF PEBBLY METAWACKE AND MAGNETITE PHYLLITE. SIMILAR TO BUT FINER GRAINED THAN THE METAWACKE AND PHYLLITE MEMBER OF THE PINNACLE FORMATION (CZps).

CZtgr QUARTZ-PEBBLE PHYLLITE AND WACKE MEMBER
DESCRIPTION: GRAY TO GRAYISH-GREEN, BIOTITE-CHLORITE-QUARTZ-PEBBLE PHYLLITE; ALBITIC METAWACKE IS SIMILAR TO METAWACKE MEMBER OF THE PINNACLE FORMATION BUT MORE THINLY BEDDED AND CONTAINS LESS METAWACKE. ALBITIC BIOTITE-(CHLORITE)-QUARTZ GRANOFELS AND WACKE LOCALLY PRESENT.



- NOTES / REVISIONS**
- BEDROCK GEOLOGY BOUNDARIES OBTAINED FROM THE VERMONT OPEN GEODATA PORTAL PREPARED BY THE VERMONT CENTER FOR GEOGRAPHIC INFORMATION.
 - BEDROCK GEOLOGY DESCRIPTIONS AND SYMBOLS OBTAINED FROM: NATURAL RESOURCES ATLAS, VERMONT AGENCY OF NATURAL RESOURCES, VERMONT.GOV, RATCLIFFE, N.M., STANLEY, R.S., GALE, M.H., THOMPSON, P.J., AND WALSH, G.J., 2011, BEDROCK GEOLOGIC MAP OF VERMONT: U.S. GEOLOGICAL SURVEY SCIENTIFIC INVESTIGATIONS MAP 3184, 3 SHEETS, SCALE 1:100,000.

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FILE NAME: Site 2 - Bedrock Geology Plan.dwg



DRAWN BY: AA
CHECKED BY: QDW

DATE: 1/2/2020
DATE: 1/31/2020

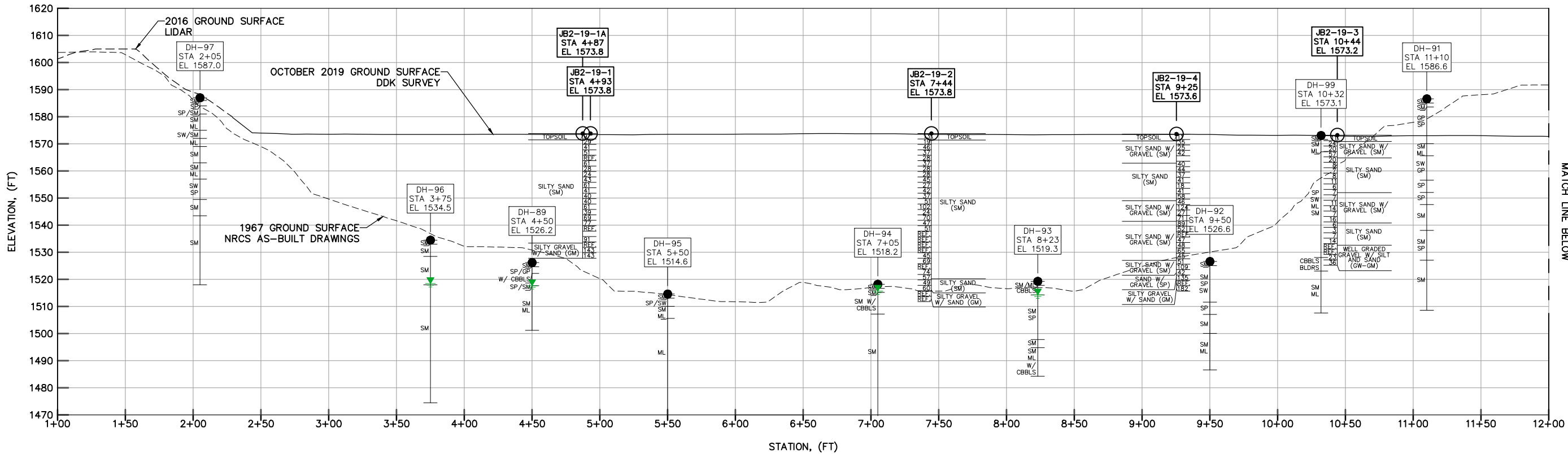
JEWELL BROOK WATERSHED
LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2
FIGURE 4
BEDROCK GEOLOGIC MAP

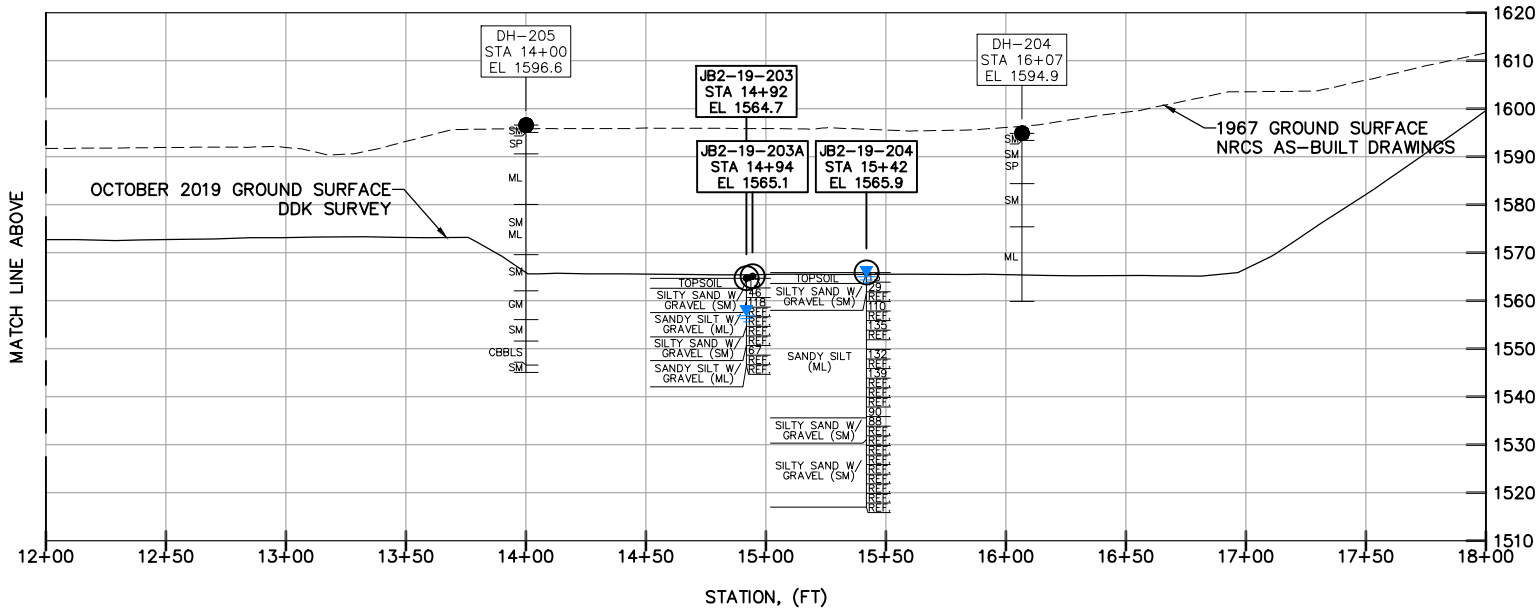
SCALE: AS SHOWN
FIGURE 4
REV 0

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EMBANKMENT PROFILE (STA 1+00 TO 12+00)



EMBANKMENT PROFILE (STA 12+00 TO 18+00)



LEGEND

- JB2-19-1 TEST BORING COMPLETED BY DDK (2019)
- DH-1 DRILL HOLE COMPLETED BY NRCS (NRCS 1967 AS-BUILT DRAWINGS)
- TP-201 TEST PIT COMPLETED BY NRCS (NRCS 1967 AS-BUILT DRAWINGS)
- Solid line: EXISTING GROUND SURFACE (OCTOBER 2019 DDK SURVEY)
- Dashed line: EXISTING GROUND SURFACE (2016 LIDAR)
- Dotted line: PRE-CONSTRUCTION GROUND SURFACE (NRCS 1967 AS-BUILT DRAWINGS)
- Blue triangle: WATER LEVEL IN BORING RECORDED BY DDK DURING DRILLING
- Green triangle: WATER LEVEL IN BORING OR TEST PIT RECORDED BY NRCS
- REF. REFUSAL

NOTES / REVISIONS

- HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- ALL ELEVATION DATA ON THIS DRAWING THAT WAS OBTAINED FROM THE NRCS 1967 AS-BUILT DRAWINGS HAS BEEN CONVERTED FROM THE NATIONAL GEODETIC DATUM OF 1929 (NGVD29) TO NAVD88. ELEVATION 0.0 IN NGVD29 IS EQUAL TO ELEVATION -0.3' IN NAVD88.
- BORING AND TEST PIT LOCATIONS AND LITHOLOGY FROM THE NRCS 1967 AS-BUILT DRAWINGS ARE APPROXIMATE.
- EXISTING GROUND SURFACE OUTSIDE OF DDK SURVEY OBTAINED FROM: VT CENTER FOR GEOGRAPHIC INFORMATION, VERMONT OPEN GEODATA PORTAL. DATE OF LIDAR SURVEY: 2016

ISSUED FOR	DATE	REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE
		4				
		3				
		2				
		1				

SEAL:

DDK
Engineering-JV

PROJECT NUMBER: 172719-17
FILE NAME: Site 2 - Plan-Profiles-Sections.dwg

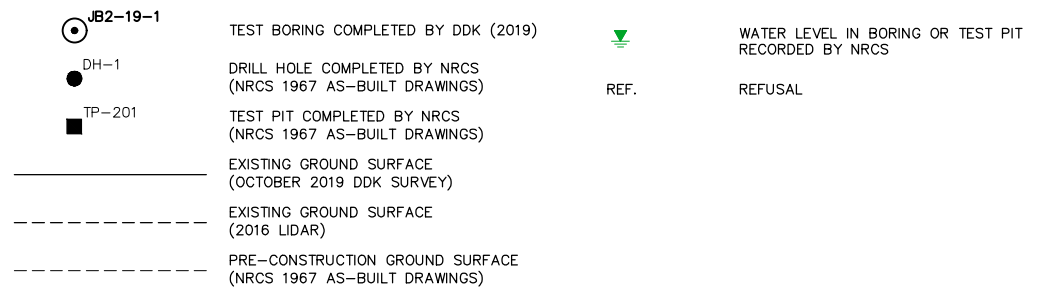
USDA
United States
Department of
Agriculture
Natural Resources Conservation Service
USDA is an equal opportunity provider, employer, and lender.

DRAWN BY: AA
CHECKED BY: QDW
DATE: 1/2/2020
DATE: 1/31/2020

JEWELL BROOK WATERSHED
LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2
FIGURE 5
EMBANKMENT PROFILE

SCALE: AS SHOWN
FIGURE 5
REV 0



NOTES / REVISIONS

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 2. ALL ELEVATION DATA ON THIS DRAWING THAT WAS OBTAINED FROM THE NRCS 1967 AS-BUILT DRAWINGS HAS BEEN CONVERTED FROM THE NATIONAL GEODETIC DATUM OF 1929 (NGVD29) TO NAVD88. ELEVATION 0.0 IN NGVD29 IS EQUAL TO ELEVATION -0.3' IN NAVD88.
 3. BORING AND TEST PIT LOCATIONS AND LITHOLOGY FROM THE NRCS 1967 AS-BUILT DRAWINGS ARE APPROXIMATE.
 4. EXISTING GROUND SURFACE OUTSIDE OF DDK SURVEY OBTAINED FROM: VT CENTER FOR GEOGRAPHIC INFORMATION, VERMONT OPEN GEODATA PORTAL.
- DATE OF LIDAR SURVEY: 2016

		4			
		3			
		2			
		1			
ISSUED FOR	DATE	REV.	REVISION DESCRIPTION	MADE BY	CHKD BY

SEAL:



PROJECT NUMBER: 172719-17

FILE NAME: Site 2 - Plan-Profiles-Sections.dwg



DRAWN BY: AA	DATE: 1/2/2020
CHECKED BY: QDW	DATE: 1/31/2020

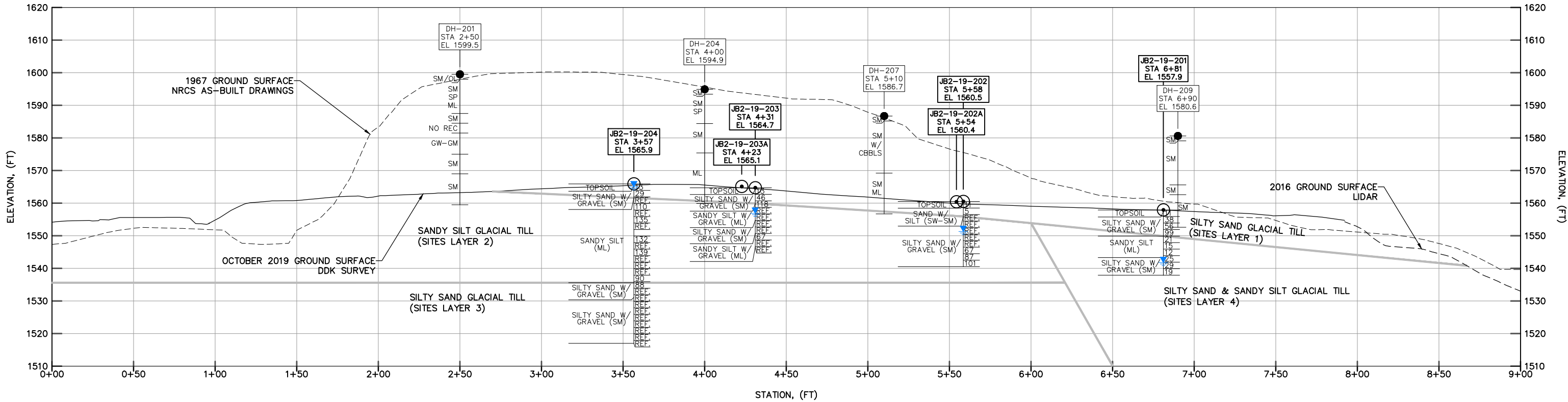
JEWELL BROOK WATERSHED
LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2
FIGURE 6
EMBANKMENT SECTION

SCALE: AS SHOWN	FIGURE 6	REV 0

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AUXILIARY SPILLWAY PROFILE



LEGEND

- JB2-19-1 TEST BORING COMPLETED BY DDK (2019)
- DH-1 DRILL HOLE COMPLETED BY NRCS (NRCS 1967 AS-BUILT DRAWINGS)
- TP-201 TEST PIT COMPLETED BY NRCS (NRCS 1967 AS-BUILT DRAWINGS)
- SOLID LINE EXISTING GROUND SURFACE (OCTOBER 2019 DDK SURVEY)
- DASHED LINE EXISTING GROUND SURFACE (2016 LIDAR)
- DOTTED LINE PRE-CONSTRUCTION GROUND SURFACE (NRCS 1967 AS-BUILT DRAWINGS)
- THICK SOLID LINE SITES ANALYSIS BOUNDARIES
- WATER LEVEL IN BORING RECORDED BY DDK DURING DRILLING
- REF. REFUSAL

NOTES / REVISIONS

- HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- ALL ELEVATION DATA ON THIS DRAWING THAT WAS OBTAINED FROM THE NRCS 1967 AS-BUILT DRAWINGS HAS BEEN CONVERTED FROM THE NATIONAL GEODETIC DATUM OF 1929 (NGVD29) TO NAVD88. ELEVATION 0.0 IN NGVD29 IS EQUAL TO ELEVATION -0.3' IN NAVD88.
- BORING AND TEST PIT LOCATIONS AND LITHOLOGY FROM THE NRCS 1967 AS-BUILT DRAWINGS ARE APPROXIMATE.
- EXISTING GROUND SURFACE OUTSIDE OF DDK SURVEY OBTAINED FROM: VT CENTER FOR GEOGRAPHIC INFORMATION, VERMONT OPEN GEODATA PORTAL. DATE OF LIDAR SURVEY: 2016

ISSUED FOR	DATE	REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE
		4				
		3				
		2				
		1				

SEAL:



PROJECT NUMBER: 172719-17
FILE NAME: Site 2 - Plan-Profiles-Sections.dwg



DRAWN BY: AA
CHECKED BY: QDW
DATE: 1/2/2020
DATE: 1/31/2020

JEWELL BROOK WATERSHED
LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2
FIGURE 7
AUXILIARY SPILLWAY PROFILE

SCALE: AS SHOWN
FIGURE 7
REV 0

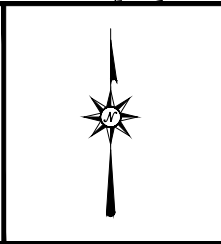
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NOTES / REVISIONS					
REFERENCE: ANSS COMPREHENSIVE EARTHQUAKE CATALOG (COMCAT), UNITED STATES GEOLOGICAL SURVEY, USGS EARTHQUAKE HAZARDS PROGRAM, ACCESSED 1/14/2020.					
		4			
		3			
		2			
		1			
ISSUED FOR	DATE	REV.	REVISION DESCRIPTION	MADE BY	CHKD BY
					DATE

SEAL:



PROJECT NUMBER: 172719-17
FILE NAME: Site 2 - Earthquake and Fault Map.dwg

Natural Resources Conservation Service
USDA is an equal opportunity provider, employer, and lender.

DRAWN BY: QDW
CHECKED BY: AA

DATE: 2/18/2020
DATE: 6/12/2020

JEWELL BROOK WATERSHED
LUDLOW, WINDSOR COUNTY, VERMONT

JEWELL BROOK SITE NO. 2
FIGURE 8
EARTHQUAKE AND FAULT MAP

SCALE: AS SHOWN
FIGURE 8
REV 0

APPENDIX A
BORING LOGS

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-1**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/13/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/13/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.764 ft.▼ **END OF DRILLING:** Dry(N) 316,104.14 (E) 1,580,178.00 ▼ **16hrs AFTER DRILLING:** Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft) RQD, ft (% RQD)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.3' Topsoil , Brown, Moist								
	SpT-1		Silty Sand, (SM) , Fine To Medium, Compact To Dense, Light Brown, Dry To Moist, [Embankment Fill], (0-10% gravel), (10% cobbles)		1.6 (80)	3-4-5-7 (9)					
	SpT-2			SM	2.0 (100)	13-15-14-17 (29)					
5	SpT-3		SpT-1: loose		1.3 (65)	8-19-22-25 (41)					
	SpT-4		5.4'-5.8': cobble		1.2 (60)	20-25-26-24 (51)					
	SpT-5		6.1'-6.4': cobble		1.1 (100)	15-20-50/0.1'					
			8.5'-8.8': cobble								
9.4			1564.4								
10			Auger Refusal at 9.4 feet. Bottom of Boring at 9.4 feet. 25 Gal. Grout Used								
15											
20											
25											
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-1A**

PAGE 1 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/14/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/15/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.846 ft.▼ **END OF DRILLING:** Dry**(N)** 316,098.31 **(E)** 1,580,178.45 ▼ **1hrs AFTER DRILLING:** Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft) RQD, ft (% RQD)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
5			Advanced augers to 10.0 ft. No sampling performed.								
10			10.0			1563.8					
	SpT-1		Silty Sand, (SM) , Fine To Medium, Compact To Dense, Light Brown And Grayish Brown, Dry To Moist, [Embankment Fill], (0-15% gravel)		0.2 (10)	84-29-32-26 (61)					
	SpT-2		10.0'-10.4': cobble		1.6 (80)	8-12-16-23 (28)					
15	SpT-3				1.8 (90)	10-11-13-17 (24)					
	SpT-4		17.2'-18.8': brown		1.2 (60)	15-21-22-26 (43)					
20	SpT-5		18.8'-20.7': olive brown		2.0 (100)	10-20-41-49 (61)					
	SpT-6			SM	2.0 (100)	24-21-20-23 (41)					
	SpT-7				2.0 (100)	13-18-22-23 (40)					
25	SpT-8				1.5 (75)	19-25-15-22 (40)					
	SpT-9				1.2 (60)	38-32-29-28 (61)					
30	SpT-10				0.7 (35)	19-17-22-22 (39)					
	SpT-11				2.0 (100)	15-32-37-42 (69)					
	SpT-12				1.8 (90)	32-35-42-46 (77)					
35	SpT-13				0.9	24-90/0.4'					

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

(Continued Next Page)

DDK ENGINEERING

(a small business joint venture)

28 North Main Street

Randolph, VT 05060

VISUAL CLASSIFICATION LOG**JB2-19-1A**

PAGE 2 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/14/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/15/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.846 ft.▼ **END OF DRILLING:** Dry(N) 316,098.31 (E) 1,580,178.45 ▼ **1hrs AFTER DRILLING:** Dry

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q _u (tsf)	▲ SPT N VALUE ▲						
						RQD, ft (% RQD)		20	40	60	80			
								PL	MC	LL				
								□ FINES CONTENT (%) □						
35								20	40	60	80			
40	SpT-14		Silty Sand, (SM), Fine To Medium, Compact To Dense, Light Brown And Grayish Brown, Dry To Moist, [Embankment Fill], (0-15% gravel)		(100)									
					2.0 (100)	21-54-37-41 (91)								
	SpT-15		40.4		1533.4	0.4 (100)		80/0.4'						
	SpT-16		Silty Gravel, (GM), With Sand, Fine To Coarse, Gray And Brown, Dry To Moist, [Glacial Till], (50-55% gravel)		sm	1.4 (70)		75-79-64-54 (143)	●	□				
40.4'-41.3': cobbles/boulder														
45	SpT-17		46.0	1527.8	2.0 (100)	61-67-76-104 (143)								
			Casing Refusal at 44.7 feet. Bottom of Boring at 46.0 feet. 115 Gal. Grout Used											
50														
55														
60														
65														
70														

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-2**

PAGE 1 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/11/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/12/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: Dry

ELEVATION: 1573.822 ft.

END OF DRILLING: Dry

(N) 316,352.16 (E) 1,580,137.26 1hrs AFTER DRILLING: Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST σ_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.4' Topsoil, Brown, Moist		1.1 (55)	3-6-7-11 (13)					
	SpT-1		Silty Sand, (SM), Fine To Medium, Compact To Very Dense, Light Brown And Brown, Dry To Moist, [Embankment Fill], (0-20% gravel)	SM	1.4 (70)	11-10-9-12 (19)					
	SpT-2				1.0 (50)	8-15-31-33 (46)					
5	SpT-3										
	SpT-4				1.8 (90)	17-19-18-17 (37)					
	SpT-5				1.8 (90)	8-13-15-13 (28)					
10	SpT-6				2.0 (100)	12-16-21-20 (37)					
	SpT-7				1.7 (85)	13-14-14-15 (28)					
	SpT-8				1.8 (90)	9-11-17-29 (28)					
15	SpT-9				1.7 (85)	18-21-24-31 (45)					
	SpT-10		19.6'-25.4': olive brown and grayish brown, higher silt content	SM	1.4 (70)	15-14-13-25 (27)					
	SpT-11				1.7 (85)	16-20-22-27 (42)					
	SpT-12				1.9 (95)	19-18-19-17 (37)					
25	SpT-13		26.7'-27.2': cobble		1.2 (60)	15-22-29-42 (51)					
	SpT-14				2.0 (100)	26-54-48-29 (102)					
	SpT-15				2.0 (100)	10-12-12-16 (24)					
30	SpT-16		33.1'-33.4': cobble		1.6 (80)	14-41-29-25 (70)					
	SpT-17				1.9 (95)	15-18-29-24 (47)					
					2.0	16-22-29-41					
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

(Continued Next Page)

Randolph, VT 05060

PAGE 2 OF 2

(N) 316,352.16 (E) 1,580,137.26 $\frac{\nabla}{\square}$ 1hrs AFTER DRILLING: Dry

CLIENT: NRCS

IRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-3**

PAGE 1 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/07/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/07/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.205 ft.▼ **END OF DRILLING:** Dry(N) 316,647.50 (E) 1,580,087.53 ▼ **1hrs AFTER DRILLING:** Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.3 Topsoil, Brown, Moist 1572.9		1.5 (75)	2-4-7-8 (11)					
	SpT-1		Silty Sand, (SM), With Gravel, Fine To Medium, Compact, Light Brown And Brown, Dry To Moist, [Embankment Fill], (10-20% gravel)		0.9 (45)	8-11-13-15 (24)					
	SpT-2				1.6 (80)	7-10-10-12 (20)					
5	SpT-3				1.1 (55)	15-21-36-28 (57)					
	SpT-4				2.0 (100)	8-11-9-9 (20)					
	SpT-5		Silty Sand, (SM), Fine, Loose, Light Brown And Tan, Dry To Moist, [Glacial Till], (0-5% gravel)		1.8 (90)	4-4-4-3 (8)					
10	SpT-6				1.8 (90)	3-3-4-5 (7)					
	SpT-7				1.9 (95)	3-4-4-4 (8)					
15	SpT-8		SpT-9: compact		1.1 (55)	3-5-6-5 (11)					
	SpT-9				1.9 (95)	4-3-3-2 (6)					
20	SpT-10				1.9 (95)	2-3-4-6 (7)					
	SpT-11				1.7 (85)	5-4-3-1 (7)					
	SpT-12		Silty Sand, (SM), With Gravel, Fine To Coarse, Loose To Compact, Light Brown, Moist, [Glacial Till], (0-30% gravel)		0.8 (40)	4-5-6-8 (11)					
25	SpT-13				1.4 (70)	6-8-6-5 (14)					
	SpT-14				1.3 (65)	3-3-4-5 (7)					
30	SpT-15		Silty Sand, (SM), Fine, Very Loose To Loose, Light Brown And Grayish Brown, Dry To Moist, [Glacial Till], (0-5% gravel)		1.2 (60)	4-9-7-4 (16)					
	SpT-16				1.2 (60)	3-2-4-4 (6)					
35	SpT-17				0.9	4-1-2-3					

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

(Continued Next Page)

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-3**

PAGE 2 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/07/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/07/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.205 ft.▼ **END OF DRILLING:** Dry(N) 316,647.50 (E) 1,580,087.53 ▼ **1hrs AFTER DRILLING:** Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
35	SpT-18		Silty Sand, (SM) , Fine, Very Loose To Loose, Light Brown And Grayish Brown, Dry To Moist, [Glacial Till], (0-5% gravel)		(45)	(3)					
	SpT-19			SM	1.6 (80)	2-4-3-4 (7)					
	SpT-20				1.6 (80)	3-6-8-12 (14)					
40	SpT-21		40.6 1532.6		0.8 (89)	10-70/0.4'					
	SpT-22		Well Graded Gravel, (GW-GM) , With Silt And Sand, Fine To Coarse, Compact To Dense, Olive Gray And Brownish Gray, Dry To Moist, [Glacial Till], (15% cobbles) (40-60% gravel)		1.0 (77)	71-86-90/0.3'					
45	SpT-23			GW-GM	0.6 (30)	34-11-12-11 (23)					
	SpT-24				1.0 (50)	29-11-25-27 (36)					
			48.0 1525.2								
50			Bottom of Boring at 48.0 feet. 190 Gal. Grout Used								
55											
60											
65											
70											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

DDK ENGINEERING

(a small business joint venture)

28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-4**

PAGE 1 OF 2

DATE STARTED: 11/19/2019 DRILLING CONTRACTOR: NEBC

DATE COMPLETED: 11/19/2019 DRILLER: Matt Soucy

LOGGED BY: AA

DRILLING METHOD: 4.25" ID HSA, 2" OD SBS (8")

CHECKED BY: QDW

CORING METHOD: N/A

LOCATION: Site 2 Main

GROUND WATER LEVELS:

Embankment

TIME OF DRILLING: N/A

ELEVATION: 1573.638 ft.

END OF DRILLING: Dry

(N) 316,530.99 (E) 1,580,109.85 17hrs AFTER DRILLING: Dry

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
0								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.5' Topsoil , Brown, Moist		1.9 (95)	2-4-7-9 (11)					
	SpT-1		Silty Sand, (SM) , With Gravel, Fine, Compact To Dense, Light Brown And Olive Brown, Dry To Moist, [Embankment Fill], (10-20% gravel) 2.5'-2.8': cobble	SM	1.4 (70)	9-20-15-16 (35)					
	SpT-2				1.5 (75)	11-13-12-19 (25)					
5	SpT-3				1.4 (70)	21-20-22-30 (42)					
	SpT-4										
			Skipped SpT sample from 8.0'-10.0' due to drilling conditions								
10			10.7'		1.6 (80)	20-23-17-24 (40)					
	SpT-5		Silty Sand, (SM) , Fine To Medium, Compact To Dense, Light Brown, Dry To Moist, [Embankment Fill], (0-10% gravel)	SM	1.8 (90)	23-21-23-27 (44)					
	SpT-6				1.7 (85)	16-18-19-18 (37)					
15	SpT-7				1.7 (85)	17-20-21-23 (41)					
	SpT-8				1.9 (95)	11-9-9-9 (18)					
	SpT-9		17.8'-18.5': Sandy Silt		1.8 (90)	13-17-24-26 (41)					
20	SpT-10		19.0'-19.3': Sandy Silt		1.9 (95)	18-24-34-35 (58)					
	SpT-11		22.9'-23.3': Sandy Silt		2.0 (100)	23-25-21-23 (46)					
	SpT-12		23.4'-24.6': Brown		2.0 (100)	33-63-61-40 (124)					
25	SpT-13		Silty Sand, (SM) , With Gravel, Fine To Medium, Compact To Dense, Olive Brown And Gray, Dry To Moist, [Embankment Fill], (10-20% gravel) 26.9'-27.3': cobble		1.8 (90)	11-12-15-21 (27)					
	SpT-14				1.8 (90)	22-34-37-52 (71)					
30	SpT-15				1.9 (95)	62-44-45-47 (89)					
	SpT-16				2.0	20-26-26-28					
35			31.1'-31.4': cobble								
			31.8'-32.2': cobble								
			32.2'								
			Silty Sand, (SM) , With Gravel, Fine To Medium, Dense, Light Brown And Grayish Brown, Dry To Moist, [Embankment Fill], (10-20% gravel)								

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

(Continued Next Page)

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28 North Main Street

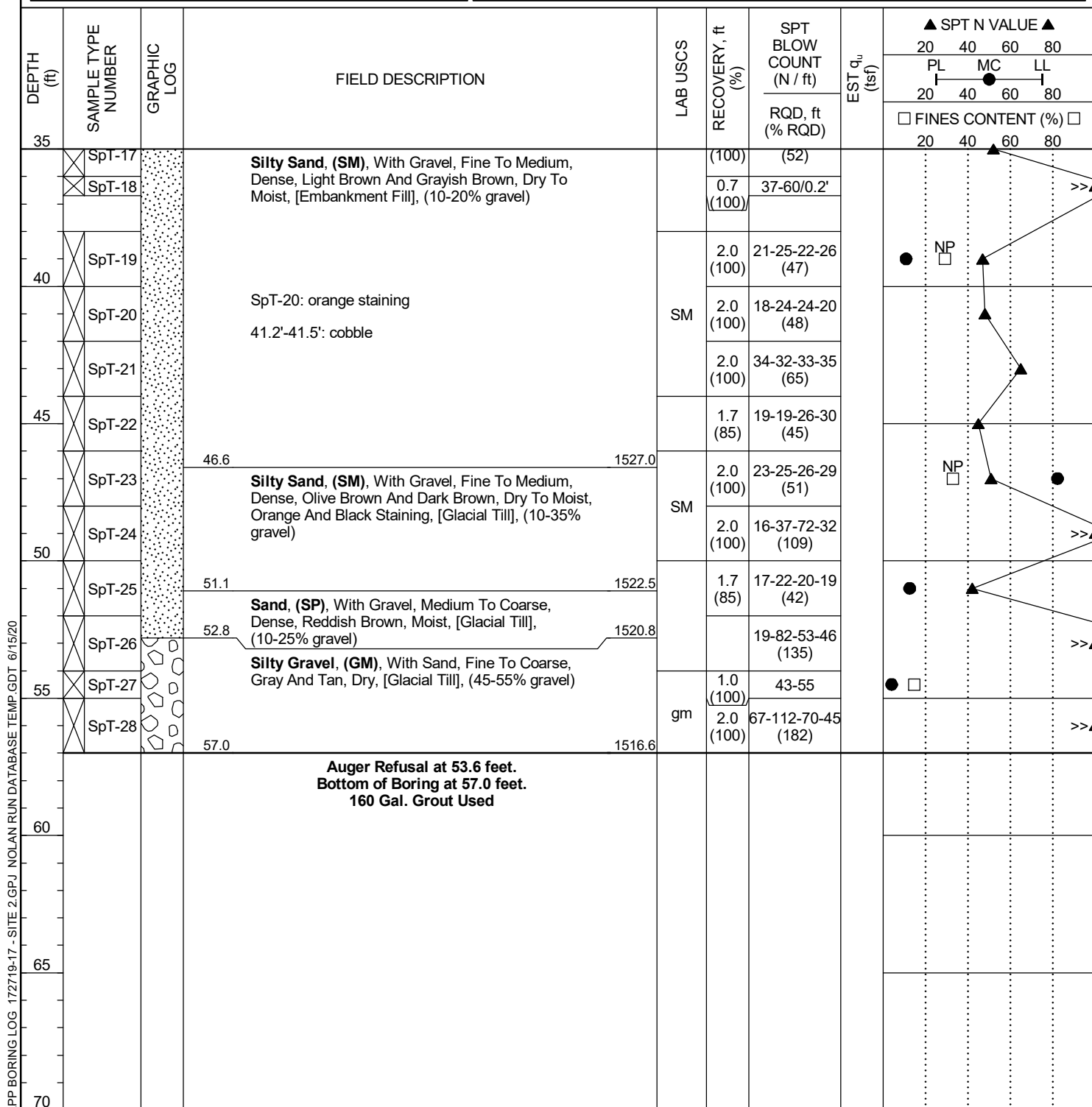
Randolph, VT 05060

VISUAL CLASSIFICATION LOG**JB2-19-4**

PAGE 2 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/19/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/19/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Main**GROUND WATER LEVELS:**

Embankment

TIME OF DRILLING: N/A**ELEVATION:** 1573.638 ft.▼ **END OF DRILLING:** Dry**(N)** 316,530.99 **(E)** 1,580,109.85 ▼ **17hrs AFTER DRILLING:** Dry

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

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28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-5**

PAGE 1 OF 1

DATE STARTED: 11/20/2019 DRILLING CONTRACTOR: NEBC

DATE COMPLETED: 11/20/2019 DRILLER: Matt Soucy

LOGGED BY: AA

DRILLING METHOD: 4.25" ID HSA, 2" OD SBS (8")

CHECKED BY: QDW

CORING METHOD: N/A

LOCATION: Site 2

GROUND WATER LEVELS:

Downstream Bench

TIME OF DRILLING: N/A

ELEVATION: 1530.102 ft.

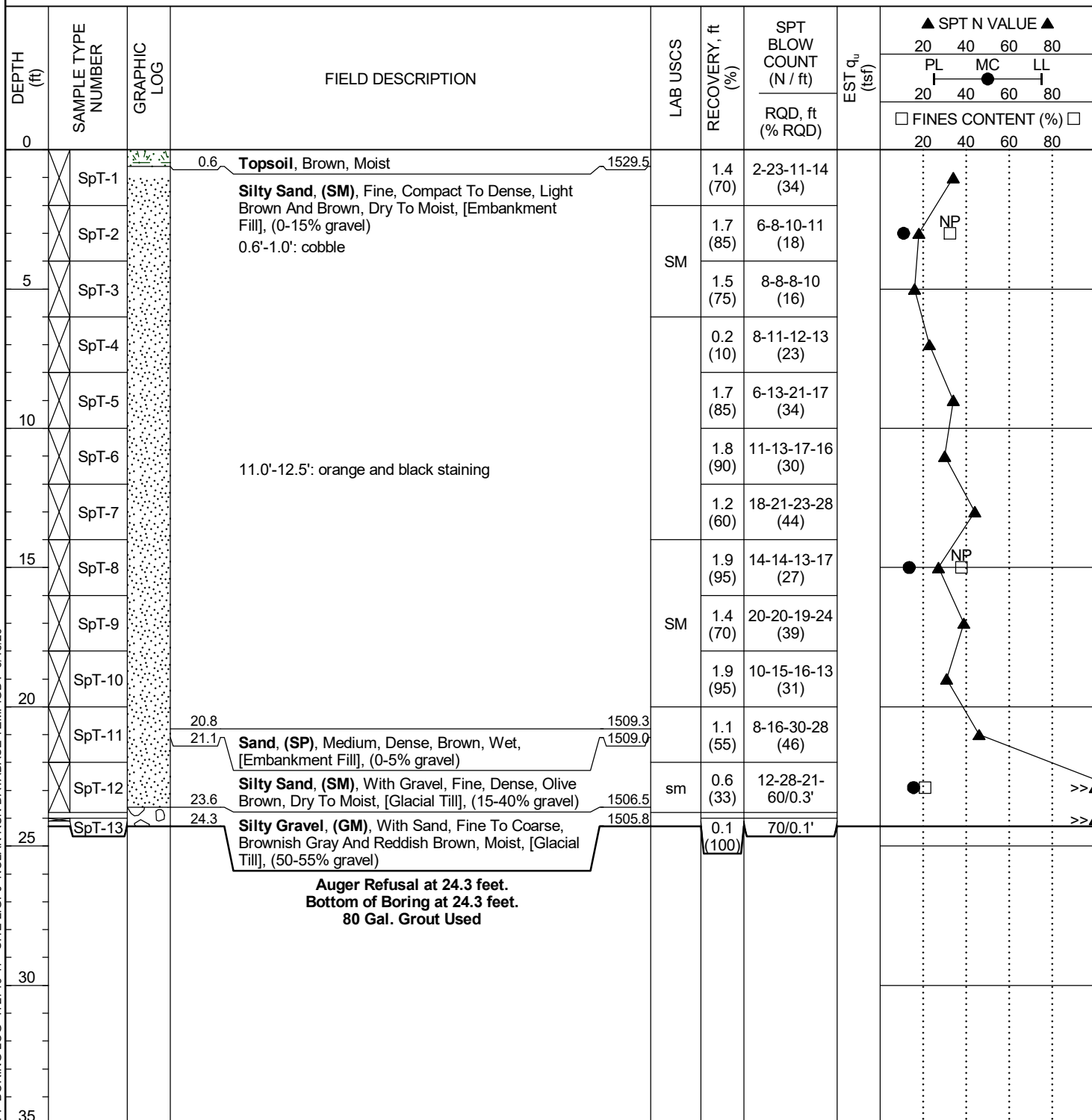
END OF DRILLING: Dry

(N) 316,370.66 (E) 1,580,252.92

AFTER DRILLING: N/A

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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VISUAL CLASSIFICATION LOG**JB2-19-5A**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/20/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/21/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2**GROUND WATER LEVELS:**

Downstream Bench

TIME OF DRILLING: N/A**ELEVATION:** 1530.159 ft.**END OF DRILLING:** Dry**(N)** 316,380.49 **(E)** 1,580,252.33**AFTER DRILLING:** N/A

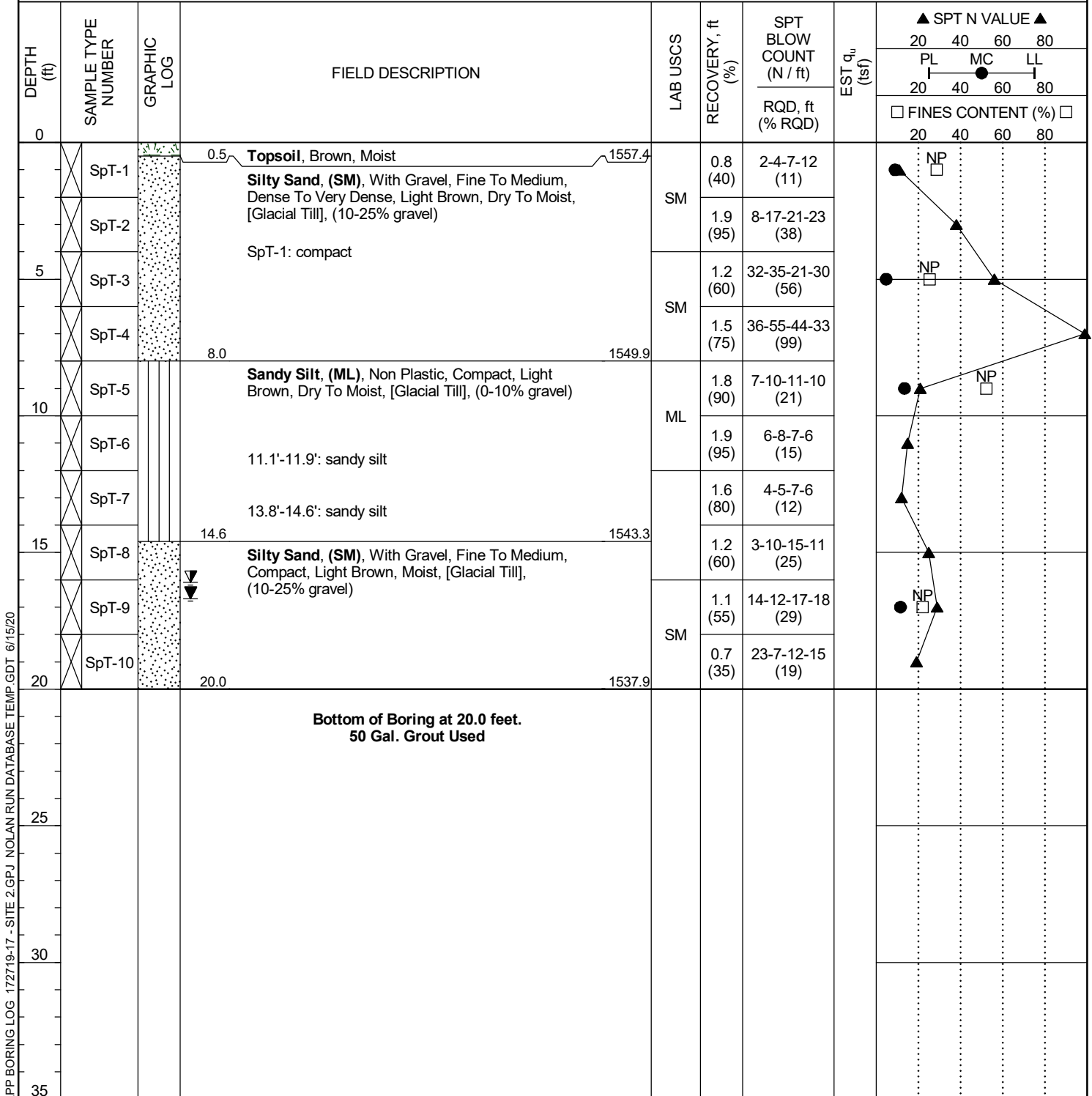
NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft) RQD, ft (% RQD)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
			Advanced augers to 24.0 ft. No sampling performed.								
5											
10											
15											
20											
24.0						1506.2					
25	SpT-1		Silty Gravel, (GM) , With Sand, Fine To Coarse, Subrounded To Subangular, Brownish Gray And Reddish Brown, Dry To Moist, [Glacial Till], (50-55% gravel)	gm		54-22-29-60/0.3'					>>▲
25.8			Auger Refusal at 25.8 feet. Bottom of Boring at 25.8 feet. 80 Gal. Grout Used								
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

PROJECT: Jewell Brook Watershed
PROJECT NUMBER: 172719-17
LOCATION: Ludlow, Windsor, VT
CLIENT: NRCS

DATE STARTED: 11/04/2019 **DRILLING CONTRACTOR:** NEBC
DATE COMPLETED: 11/04/2019 **DRILLER:** Matt Soucy
LOGGED BY: AA **DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")
CHECKED BY: QDW **CORING METHOD:** N/A
LOCATION: Site 2 Spillway **GROUND WATER LEVELS:**
TIME OF DRILLING: N/A
ELEVATION: 1557.882 ft. **END OF DRILLING:** 16.7 ft / El. 1541.2 ft
(N) 317,175.25 **(E)** 1,580,063.34 **50hrs AFTER DRILLING:** 16.1 ft / El. 1541.8 ft



Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-202**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/04/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/04/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:****TIME OF DRILLING:** N/A**ELEVATION:** 1560.484 ft.**END OF DRILLING:** Dry**(N)** 317,265.83 **(E)** 1,579,850.74 **36hrs AFTER DRILLING:** 9.2 ft / El. 1551.3 ft

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.4 Topsoil, Brown, Moist								
	SpT-1			SW-SM	1.5 (75)	2-4-7-3 (11)					
	SpT-2		Sand, (SW-SM), With Silt, Medium To Coarse, Loose, Brown, Moist To Wet, [Glacial Till], (0-15% gravel)	sw-sm	0.9 (45)	2-3-2-2 (5)					
5	SpT-3		4.6 Silty Sand, (SM), With Gravel, Fine, Olive And Gray, Dry To Moist, [Glacial Till], (5-20% gravel), (20% cobbles)		0.5 (26)	1-16-53- 50/0.4'					
	SpT-4				1.1 (92)	48-39-50/0.2'					
	SpT-5				0.9 (100)	16-50/0.4'					
10	SpT-6			SM	1.6 (100)	17-36-62- 50/0.1'					
	SpT-7				0.2 (100)	50/0.2'					
			13.0 Auger Refusal at 13 feet. Bottom of Boring at 13.0 feet. 35 Gal. Grout Used								
15											
20											
25											
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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VISUAL CLASSIFICATION LOG**JB2-19-202A**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/04/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/04/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4" Casing, 2" OD SBS (4.5")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:****TIME OF DRILLING:** N/A**ELEVATION:** 1560.35 ft.**END OF DRILLING:** 0.0 ft / El. 1560.4 ft**(N)** 317,262.88 **(E)** 1,579,847.63 **46hrs AFTER DRILLING:** 3.4 ft / El. 1557.0 ft

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft) RQD, ft (% RQD)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
			Advanced augers to 14.0 ft. No sampling performed.								
5											
10											
15	SpT-1		14.0			1546.4					
	SpT-2										
	SpT-3										
20			20.0			1540.4					
			Silty Sand, (SM) , With Gravel, Fine, Very Dense, Olive And Gray, Dry To Moist, [Glacial Till], (10-20% gravel)	SM	2.0 (100)	19-28-39-42 (67)					
					1.7 (85)	39-44-43-54 (87)					
					2.0 (100)	21-48-53-51 (101)					
			Bottom of Boring at 20.0 feet. 20 Gal. Grout Used								
25											
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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VISUAL CLASSIFICATION LOG**JB2-19-203**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/05/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/05/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4.25" ID HSA, 2" OD SBS (8")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:****TIME OF DRILLING:** N/A**ELEVATION:** 1564.68 ft.**END OF DRILLING:** Dry**(N)** 317,033.48 **(E)** 1,579,857.18 **29hrs AFTER DRILLING:** 7.8 ft / El. 1556.9 ft

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0			0.4 Topsoil, Brown, Moist								
	SpT-1		Silty Sand, (SM), With Gravel, Fine To Medium, Compact To Dense, Light Brown And Brown, Dry To Moist, [Glacial Till], (10-20% gravel)	SM	1.6 (80)	1-5-8-15 (13)					
	SpT-2				1.5 (75)	16-21-25-35 (46)					
5	SpT-3		Sandy Silt, (ML), With Gravel, Non Plastic, Grayish Brown, Dry To Moist, [Glacial Till], (5-20% gravel) 6.3'-6.6': cobble	ML	1.4 (70)	21-57-61-68 (118)					
	SpT-4				0.6 (100)	56-50/0.1'					
	SpT-5				0.7 (100)	29-50/0.2'					
10	SpT-6		Silty Sand, (SM), With Gravel, Fine To Medium, Light Brown And Brown, Dry To Moist, [Glacial Till], (10-30% gravel)	SM	1.6 (100)	44-61-67- 50/0.1'					
	SpT-7				1.1 (100)	62-68-50/0.1'					
13.5			Auger Refusal at 13.5 feet. Bottom of Boring at 13.5 feet. 35 Gal. Grout Used								
15											
20											
25											
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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VISUAL CLASSIFICATION LOG**JB2-19-203A**

PAGE 1 OF 1

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/05/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/05/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4" Casing, 2" OD SBS (4.5")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:****TIME OF DRILLING:** N/A**ELEVATION:** 1565.064 ft.**END OF DRILLING:** 2.8 ft / El. 1562.3 ft**(N)** 317,030.90 **(E)** 1,579,849.03 **27hrs AFTER DRILLING:** 6.9 ft / El. 1558.2 ft

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft) RQD, ft (% RQD)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
			Advanced augers to 14.0 ft. No sampling performed.								
5											
10											
15	SpT-1		14.0	1551.1							
	SpT-2		Sandy Silt, (ML) , With Gravel, Non Plastic, Light Brown And Brown, Dry To Moist, [Glacial Till], (10-20% gravel)	ML	1.4 (70)	19-35-32-31 (67)				NP	
	SpT-3		18.2	1546.9		0.9 (75)					>>
						50/0.2'					>>
20			Bottom of Boring at 18.2 feet. 20 Gal. Grout Used		0.2 (100)						
25											
30											
35											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

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28 North Main Street
Randolph, VT 05060**VISUAL CLASSIFICATION LOG****JB2-19-204**

PAGE 1 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/05/2019**DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/06/2019**DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4" Casing, 2" OD SBS (4.5")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:**▽ **TIME OF DRILLING:** 1.6 ft / El. 1564.3 ft**ELEVATION:** 1565.875 ft.▽ **END OF DRILLING:** 0.0 ft / El. 1565.9 ft(N) 317,032.23 (E) 1,579,767.90 ▽ **20hrs AFTER DRILLING:** 0.9 ft / El. 1565.0 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0											
	SpT-1		0.3' Topsoil , Brown, Moist		1.1 (55)	2-6-7-10 (13)					
	SpT-2		Silty Sand, (SM) , With Gravel, Fine To Medium, Compact, Light Brown, Dry To Moist, [Glacial Till], (5-20% gravel)	SM	1.8 (90)	11-14-15-21 (29)					
5	SpT-3		4.3' Sandy Silt, (ML) , Non Plastic, Very Dense, Olive And Gray, Dry To Moist, [Glacial Till], (5-20% gravel)		0.8 (100)	45-50/0.3'					
	SpT-4			ML	1.7 (85)	36-49-61-68 (110)					
	SpT-5				0.8 (100)	44-50/0.3'					
10	SpT-6			ML	1.7 (85)	32-69-66-61 (135)					
	SpT-7				0.7 (78)	57-70/0.4'					
15											
	SpT-8				1.8 (90)	37-63-69-72 (132)					
	SpT-9			SM	1.2 (67)	41-65-82- 80/0.3'					
20	SpT-10				1.8 (90)	39-61-78-84 (139)					
	SpT-11				0.3 (100)	60/0.3'					
25	SpT-12				0.9 (69)	43-84-70/0.3'					
	SpT-13			ML	0.8 (89)	46-90/0.4'					
	SpT-14				2.0 (100)	30-39-51-63 (90)					
30	SpT-15		30.3' Silty Sand, (SM) , With Gravel, Fine To Medium, Very Dense, Light Brown With Tan, Moist, [Glacial Till], with interbedded silt layers, (0-20% gravel)	SM	1.6 (80)	29-32-56-81 (88)					
	SpT-16				1.4 (100)	47-59-80/0.4'					
35	SpT-17		34.8'		0.8	48-80/0.3'					

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

(Continued Next Page)

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VISUAL CLASSIFICATION LOG**JB2-19-204**

PAGE 2 OF 2

PROJECT: Jewell Brook Watershed**PROJECT NUMBER:** 172719-17**LOCATION:** Ludlow, Windsor, VT**CLIENT:** NRCS**DATE STARTED:** 11/05/2019 **DRILLING CONTRACTOR:** NEBC**DATE COMPLETED:** 11/06/2019 **DRILLER:** Matt Soucy**LOGGED BY:** AA**DRILLING METHOD:** 4" Casing, 2" OD SBS (4.5")**CHECKED BY:** QDW**CORING METHOD:** N/A**LOCATION:** Site 2 Spillway**GROUND WATER LEVELS:**▽ **TIME OF DRILLING:** 1.6 ft / El. 1564.3 ft**ELEVATION:** 1565.875 ft.▽ **END OF DRILLING:** 0.0 ft / El. 1565.9 ft**(N)** 317,032.23 **(E)** 1,579,767.90 ▽ **20hrs AFTER DRILLING:** 0.9 ft / El. 1565.0 ft

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	FIELD DESCRIPTION	LAB USCS	RECOVERY, ft (%)	SPT BLOW COUNT (N / ft)	EST q_u (tsf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
						RQD, ft (% RQD)		20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
35					(100)						
	SpT-18		Silty Sand, (SM) , With Gravel, Fine To Medium, Light Brown And Olive, Moist, [Glacial Till], (10-30% gravel)	SM	0.6 (100)	62-60/0.1'		●	NP		>>▲
					0.7 (100)	72-80/0.2'					>>▲
	SpT-19										
40	SpT-20				0.4 (100)	80/0.4'					>>▲
	SpT-21				0.5 (83)	36-60/0.1'					>>▲
	SpT-22				0.2 (67)	80/0.3'					>>▲
45				SM	0.8 (100)	54-80/0.3'		●	NP		>>▲
	SpT-23										
	SpT-24				0.9 (100)	84-90/0.4'					>>▲
50			Bottom of Boring at 48.9 feet. 50 Gal. Grout Used								
55											
60											
65											
70											

Notes: Layer USCS Classification Based On ASTM D2487
Layer Density Based On Field SPT N-Values

NRCS - DAPP BORING LOG 172719-17 - SITE 2.GPJ NOLAN RUN DATABASE TEMP.GDT 6/15/20

APPENDIX B
LABORATORY TEST RESULTS

MOISTURE CONTENT

ASTM D 2216-10

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001

Lab ID:	042	043	044	045	046
Boring No.:	JB2-19-1	JB2-19-1A	JB2-19-1A	JB2-19-1A	JB2-19-1A
Depth (ft):	2.0-6.0	14.0-16.0	20.0-24.0	30.0-34.0	42.0-44.0
Sample No.:	SpT-2/3	SpT-3	SpT-6/7	SpT-11/12	SpT-16
Tare Number	22	40	26	18	3
Wt. of Tare & Wet Sample (g)	30.26	48.06	32.34	38.95	52.95
Wt. of Tare & Dry Sample (g)	28.75	45.78	30.06	36.19	48.90
Weight of Tare (g)	8.33	8.43	8.45	8.47	8.43
Weight of Water (g)	1.51	2.28	2.28	2.76	4.05
Weight of Dry Sample (g)	20.42	37.35	21.61	27.72	40.47
Water Content (%)	7.4	6.1	10.6	10.0	10.0

Lab ID	047	048	049	050	051
Boring No.	JB2-19-2	JB2-19-2	JB2-19-2	JB2-19-2	JB2-19-2
Depth (ft)	2.0-6.0	12.0-16.0	20.0-24.0	28.0-30.0	44.0-48.0
Sample No.	SpT-2/3	SpT-7/8	SpT-11/12	SpT-15	SpT-23/24
Tare Number	19	8	9	35	17
Wt. of Tare & Wet Sample (g)	28.58	37.37	26.30	37.02	29.71
Wt. of Tare & Dry Sample (g)	26.62	35.19	24.82	34.90	27.66
Weight of Tare (g)	8.30	8.31	8.22	8.44	8.52
Weight of Water (g)	1.96	2.18	1.48	2.12	2.05
Weight of Dry Sample (g)	18.32	26.88	16.60	26.46	19.14
Water Content (%)	10.7	8.1	8.9	8.0	10.7

Notes :

Tested By SG Date 1/14/20 Checked By JLK Date 1/15/20

MOISTURE CONTENT

ASTM D 2216-10

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001

Lab ID:	-052	-053	-054	-055	-056
Boring No.:	JB2-19-2	JB2-19-2	JB2-19-3	JB2-19-3	JB2-19-3
Depth (ft):	54.0-56.0	58.0-59.8	4.0-6.0	10.00-16.0	26.0-30.0
Sample No.:	SpT-28	SpT-30	SpT-3	SpT-6/7/8	SpT-14/15
Tare Number	4	30	34	29	42
Wt. of Tare & Wet Sample (g)	31.46	67.92	54.44	23.48	26.96
Wt. of Tare & Dry Sample (g)	29.00	63.72	50.93	22.08	24.76
Weight of Tare (g)	8.37	8.48	8.40	8.42	8.42
Weight of Water (g)	2.46	4.20	3.51	1.40	2.20
Weight of Dry Sample (g)	20.63	55.24	42.53	13.66	16.34
Water Content (%)	11.9	7.6	8.3	10.2	13.5

Lab ID	-057	-058	-059	-060	-061
Boring No.	JB2-19-3	JB2-19-3	JB2-19-4	JB2-19-4	JB2-19-4
Depth (ft)	36.0-40.0	44.0-48.0	2.0-6.0	12.0-18.0	26.0-30.0
Sample No.	SpT-19/20	SpT-23/24	SpT-2/3	SpT-6/7/8	SpT-13/14
Tare Number	39	43	49	28	31
Wt. of Tare & Wet Sample (g)	43.30	53.16	34.17	49.92	41.75
Wt. of Tare & Dry Sample (g)	38.03	52.24	31.95	46.09	38.78
Weight of Tare (g)	8.46	8.47	8.37	8.38	8.34
Weight of Water (g)	5.27	0.92	2.22	3.83	2.97
Weight of Dry Sample (g)	29.57	43.77	23.58	37.71	30.44
Water Content (%)	17.8	2.1	9.4	10.2	9.8

Notes :

Tested By SG Date 1/14/20 Checked By JLK Date 1/15/20

MOISTURE CONTENT

ASTM D 2216-10

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001

Lab ID:	-062	-063	-064	-065	-066
Boring No.:	JB2-19-4	JB2-19-4	JB2-19-4	JB2-19-4	JB2-19-5
Depth (ft):	38.0-44.0	46.0-50.0	50.0-52.0	54.0-57.0	2.0-6.0
Sample No.:	SpT-19/20/21	SpT-23/24	SpT-25	SpT-27/28	SpT-2/3
Tare Number	36	12	46	2	20
Wt. of Tare & Wet Sample (g)	34.73	35.50	66.03	95.62	43.36
Wt. of Tare & Dry Sample (g)	32.17	32.30	59.62	92.25	39.94
Weight of Tare (g)	8.47	8.46	8.44	8.30	8.44
Weight of Water (g)	2.56	3.20	6.41	3.37	3.42
Weight of Dry Sample (g)	23.70	23.84	51.18	83.95	31.50
Water Content (%)	10.8	13.4	12.5	4.0	10.9

Lab ID	-067	-068	-069	-070	-071
Boring No.	JB2-19-5	JB2-19-5	JB2-19-5A	JB2-19-201	JB2-19-201
Depth (ft)	14.0-20.0	22.0-23.8	24.0-25.8	0.0-4.0	4.0-8.0
Sample No.	SpT-8/9/10	SpT-12	SpT-1	SpT-1/2	SpT-3/4
Tare Number	16	14	38	17	35
Wt. of Tare & Wet Sample (g)	33.61	24.98	30.14	25.53	38.54
Wt. of Tare & Dry Sample (g)	30.59	22.76	28.32	24.13	37.19
Weight of Tare (g)	8.30	8.46	8.34	8.47	8.43
Weight of Water (g)	3.02	2.22	1.82	1.40	1.35
Weight of Dry Sample (g)	22.29	14.30	19.98	15.66	28.76
Water Content (%)	13.5	15.5	9.1	8.9	4.7

Notes :

Tested By SG Date 1/15/20 Checked By JLK Date 1/16/20

MOISTURE CONTENT

ASTM D 2216-10

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001

Lab ID:	-072	-073	-074	-075	-076
Boring No.:	JB2-19-201	JB2-19-201	JB2-19-202	JB2-19-202	JB2-19-202
Depth (ft):	8.0-12.0	16.0-20.0	0.0-2.0	2.0-4.0	8.0-11.6
Sample No.:	SpT-5/6	SpT-9/10	SpT-1	SpT-2	SpT-5/6
Tare Number	8	9	49	31	28
Wt. of Tare & Wet Sample (g)	28.23	41.55	14.08	33.36	23.51
Wt. of Tare & Dry Sample (g)	25.88	38.11	13.75	31.51	22.40
Weight of Tare (g)	8.30	8.21	8.37	8.34	8.31
Weight of Water (g)	2.35	3.44	0.33	1.85	1.11
Weight of Dry Sample (g)	17.58	29.90	5.38	23.17	14.09
Water Content (%)	13.4	11.5	6.1	8.0	7.9

Lab ID	-077	-078	-079	-080	-081
Boring No.	JB2-19-202A	JB2-19-203	JB2-19-203	JB2-19-203	JB2-19-203A
Depth (ft)	14.0-20.0	0.0-4.0	6.0-8.7	10.0-13.1	14.0-17.2
Sample No.	SpT-1/2/3	SpT-1/2	SpT-4/5	SpT-6/7	SpT-1/2
Tare Number	29	42	39	43	22
Wt. of Tare & Wet Sample (g)	36.95	35.06	35.03	30.13	31.46
Wt. of Tare & Dry Sample (g)	34.24	32.81	33.13	28.74	28.24
Weight of Tare (g)	8.43	8.43	8.45	8.48	8.33
Weight of Water (g)	2.71	2.25	1.90	1.39	3.22
Weight of Dry Sample (g)	25.81	24.38	24.68	20.26	19.91
Water Content (%)	10.5	9.2	7.7	6.9	16.2

Notes :

Tested By SG Date 1/15/20 Checked By JLK Date 1/16/20

MOISTURE CONTENT

ASTM D 2216-10

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001

Lab ID:	-082	-083	-084	-085	-086
Boring No.:	JB2-19-204	JB2-19-204	JB2-19-204	JB2-19-204	JB2-19-204
Depth (ft):	0.0-4.0	6.0-8.8	10.0-12.9	18.0-22.0	26.0-30.0
Sample No.:	SpT-1/2	SpT-4/5	SpT-6/7	SpT-9/10	SpT-13/14
Tare Number	40	26	18	3	34
Wt. of Tare & Wet Sample (g)	38.26	35.14	32.14	38.86	43.69
Wt. of Tare & Dry Sample (g)	35.20	32.49	30.10	36.37	40.81
Weight of Tare (g)	8.42	8.44	8.45	8.42	8.42
Weight of Water (g)	3.06	2.65	2.04	2.49	2.88
Weight of Dry Sample (g)	26.78	24.05	21.65	27.95	32.39
Water Content (%)	11.4	11.0	9.4	8.9	8.9

Lab ID	-087	-088	-089
Boring No.	JB2-19-204	JB2-19-204	JB2-19-204
Depth (ft)	30.0-33.4	36.0-38.7	46.0-48.9
Sample No.	SpT-15/16	SpT-18/19	SpT-23/24
Tare Number	30	19	4
Wt. of Tare & Wet Sample (g)	45.39	38.21	39.50
Wt. of Tare & Dry Sample (g)	39.42	34.99	36.33
Weight of Tare (g)	8.47	8.29	8.33
Weight of Water (g)	5.97	3.22	3.17
Weight of Dry Sample (g)	30.95	26.70	28.00
Water Content (%)	19.3	12.1	11.3

Notes :

Tested By SG Date 1/15/20 Checked By JLK Date 1/16/20

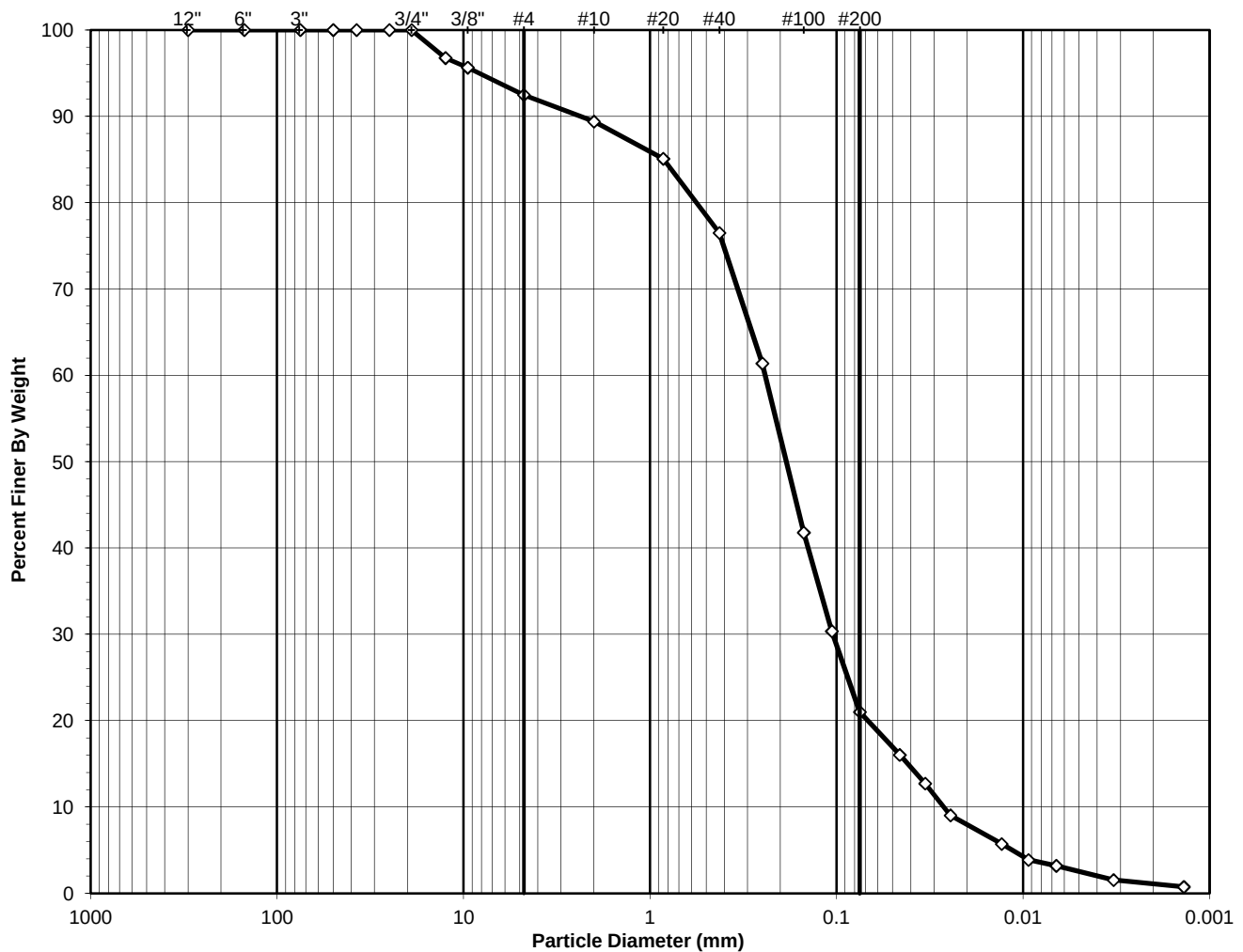
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-042

Boring No.: JB2-19-1
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.19

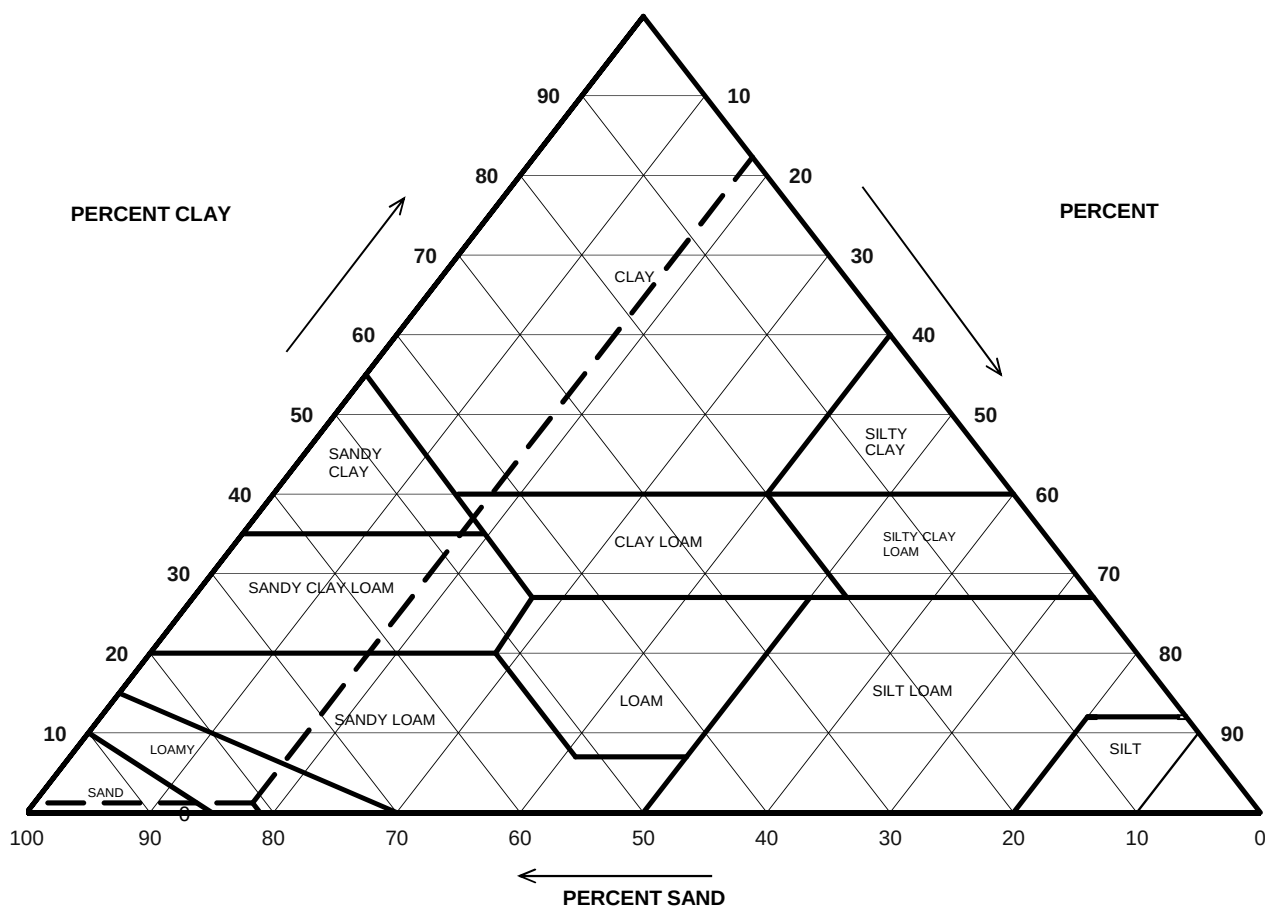
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-042

Boring No.: JB2-19-1
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	10.61	
2	89.39	Sand	72.48	81.08
0.05	16.91	Silt	15.82	17.70
0.002	1.09	Clay	1.09	1.22

USDA Classification: **LOAMY SAND**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-042

Boring No.: JB2-19-1
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1618	Tare No.:	NA	Tare No.:	1618	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	535.04	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	535.04	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	486.69	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	486.69	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.88	Weight of Tare (g):	NA	Weight of Tare (g):	147.88	Weight of Tare (g):	NA
Weight of Water (g):	48.35	Weight of Water (g):	NA	Weight of Water (g):	48.35	Weight of Water (g):	NA
Weight of Dry Soil (g):	338.81	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	338.81	Weight of Dry Soil (g):	NA
Moisture Content (%):	14.3	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	338.81	Total Dry Weight of Sample (g):	338.81	Dry Weight of Sample (g):	338.81	Total Dry Weight of Sample (g):	338.81
Tare No. (Sub-Specimen)	1618	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1618	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	535.04	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	535.04	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.88	Dry Weight of - 3/4" Sample (g):	338.81	Weight of Tare (g):	147.88	Dry Weight of - 3/4" Sample (g):	338.81
Sub-Specimen Wet Weight (g):	387.16	Dry Weight -3/4" +3/8" Sample (g):	14.77	Sub-Specimen Wet Weight (g):	387.16	Dry Weight -3/4" +3/8" Sample (g):	14.77
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	324.04	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	324.04
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	10.98	(**) 3.24	3.24	96.76	97
3/8"	9.5	3.79	1.12	4.36	95.64	96
#4	4.75	10.74	3.17	7.53	92.47	92
#10	2	10.43	3.08	10.61	89.39	89
#20	0.85	14.59	(**) 4.31	14.91	85.09	85
#40	0.425	29.10	8.59	23.50	76.50	76
#60	0.25	51.25	15.13	38.63	61.37	61
#100	0.15	66.36	19.59	58.22	41.78	42
#140	0.106	38.71	11.43	69.64	30.36	30
#200	0.075	31.69	9.35	78.99	21.01	21
Pan	-	71.17	21.01	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-1
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	2.0-6.0
Project No.:	2020-002-001	Sample No.:	SpT-2/3
Lab ID:	2020-002-001-042	Soil Color:	Brown

Elapsed Time (min)	Reading mm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	27.5	22.4	5.75	12.0	0.0459	76.3	16.0
2	23.0	22.4	5.75	12.8	0.0335	60.5	12.7
4	18.0	22.4	5.75	13.7	0.0245	43.0	9.0
15	13.5	22.4	5.75	14.5	0.0130	27.2	5.7
30	11.0	22.4	5.75	15.0	0.0094	18.4	3.9
60	10.0	22.6	5.67	15.1	0.0066	15.2	3.2
250	7.5	23.3	5.41	15.6	0.0033	7.3	1.5
1440	6.5	23.1	5.48	15.8	0.0014	3.6	0.7

Soil Specimen Data

Tare No.:	932	Percent Finer than # 200:	21.01
Wt. of Tare & Dry Material (g):	129.23		
Weight of Tare (g):	95.99	Specific Gravity:	2.69 Measured
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	28.24		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 205
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/20/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-042

Boring No.: JB2-19-1
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	22
Wt. of Tare & Wet Sample (g)	30.26
Wt. of Tare & Dry Sample (g)	28.75
Weight of Tare (g)	8.33
Weight of Water (g)	1.51
Weight of Dry Sample (g)	20.42

Water Content (%) **7.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/15/20* *Checked By* *JLK* *Date* *1/16/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-1
Client Reference:	NRCS- Jewell Brook 172719-17	Depth (ft):	2.0-6.0
Project No.:	2020-002-001	Sample No.:	SpT-2/3
Lab ID:	2020-002-001-042	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	746.52	749.09
Temperature (°C):	25.4	25.8
Weight of Pycnometer & Water (g):	683.93	684.43
Tare Number:	950	637
Weight of Tare & Dry Soil (g):	199.68	196.66
Weight of Tare (g):	98.59	95.17
Weight of Dry Soil (g):	101.09	101.49
Specific Gravity of Soil @ Measured Temperature:	2.626	2.756
Specific Gravity of Water @ Measured Temperature:	0.99695	0.99684
Conversion Factor for Measured Temperature:	0.99874	0.99864
Specific Gravity @ 20° Celsius:	2.629	2.760

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/20/20 Checked By JLK Date 1/21/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

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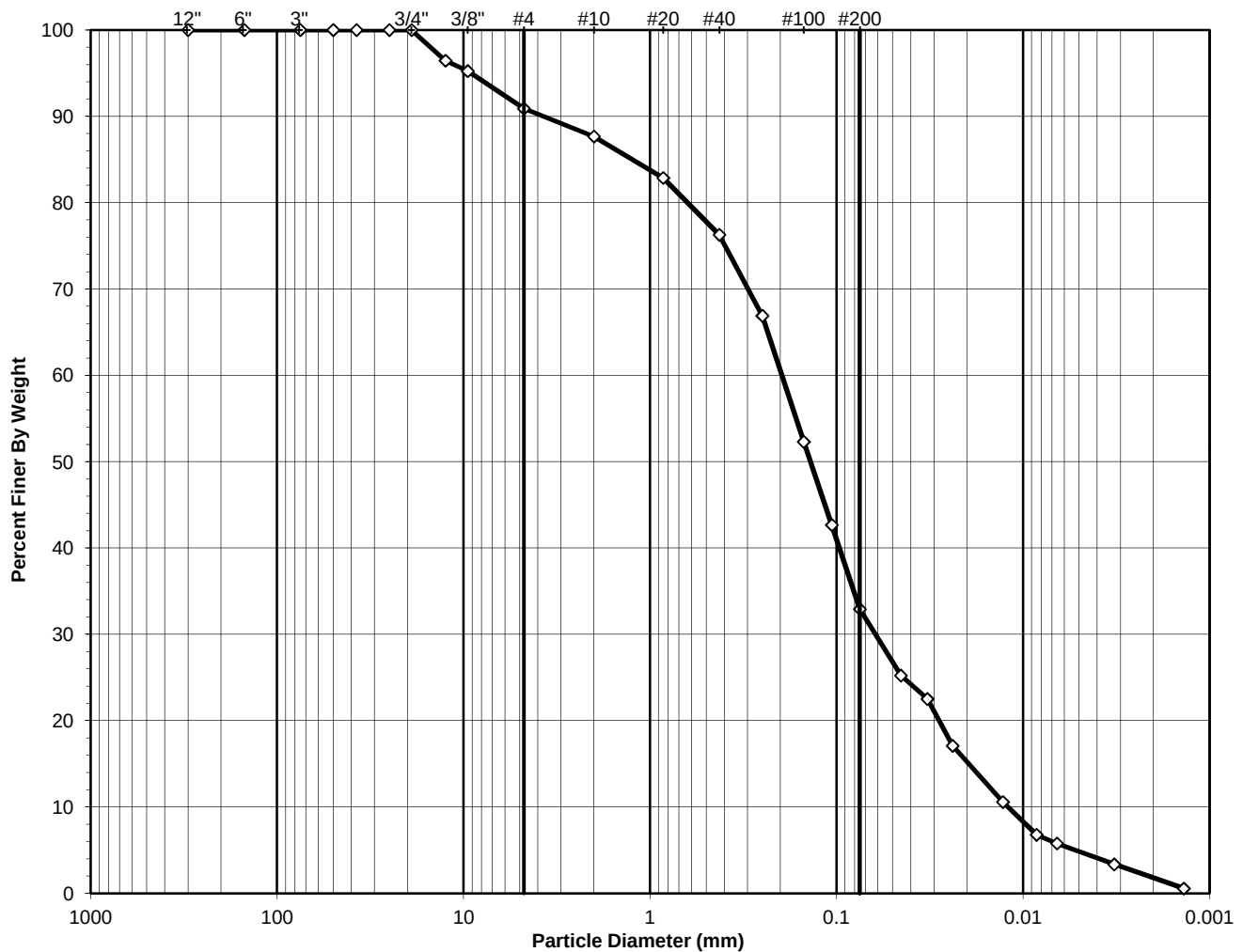
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-044

Boring No.: JB2-19-1A
 Depth (ft): 20.0-24.0
 Sample No.: SpT-6/7
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.14

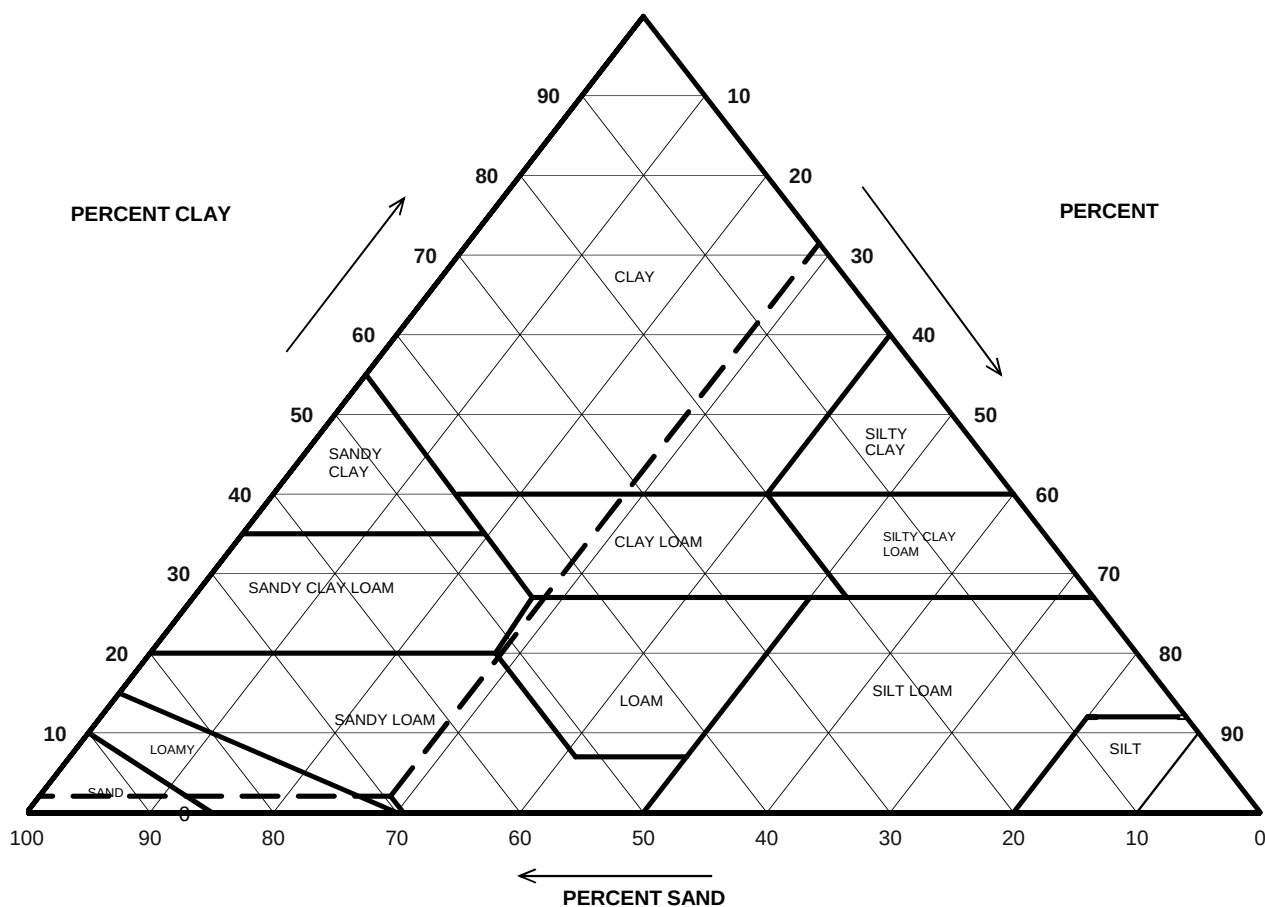
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By HL Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-044

Boring No.: JB2-19-1A
Depth (ft): 20.0-24.0
Sample No.: SpT-6/7
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	12.33	
2	87.67	Sand	60.91	69.47
0.05	26.76	Silt	24.98	28.49
0.002	1.78	Clay	1.78	2.03

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-044

Boring No.: JB2-19-1A
 Depth (ft): 20.0-24.0
 Sample No.: SpT-6/7
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1494	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	547.84	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	514.37	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	150.10	Weight of Tare (g):	NA
Weight of Water (g):	33.47	Weight of Water (g):	NA
Weight of Dry Soil (g):	364.27	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.2	Moisture Content (%):	0.0
Dry Weight of Sample (g):	364.27	Total Dry Weight of Sample (g):	364.27
Tare No. (Sub-Specimen)	1494	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	547.84	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	150.10	Dry Weight of - 3/4" Sample (g):	364.27
Sub-Specimen Wet Weight (g):	397.74	Dry Weight -3/4" +3/8" Sample (g):	17.32
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	346.95
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	12.93	(**) 3.55	3.55	96.45	96
3/8"	9.5	4.39	1.21	4.75	95.25	95
#4	4.75	15.83	4.35	9.10	90.90	91
#10	2	11.77	3.23	12.33	87.67	88
#20	0.85	17.49	(**) 4.80	17.13	82.87	83
#40	0.425	24.00	6.59	23.72	76.28	76
#60	0.25	34.17	9.38	33.10	66.90	67
#100	0.15	53.16	14.59	47.70	52.30	52
#140	0.106	35.11	9.64	57.33	42.67	43
#200	0.075	35.48	9.74	67.07	32.93	33
Pan	-	119.94	32.93	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By HL Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-044

Boring No.: JB2-19-1A
 Depth (ft): 20.0-24.0
 Sample No.: SpT-6/7
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	29.0	22.4	5.75	11.7	0.0452	76.6	25.2
2	26.5	22.4	5.75	12.2	0.0326	68.4	22.5
4	21.5	22.4	5.75	13.1	0.0239	51.9	17.1
15	15.5	22.4	5.75	14.1	0.0128	32.1	10.6
36	12.0	22.4	5.75	14.8	0.0085	20.6	6.8
60	11.0	22.6	5.67	15.0	0.0066	17.6	5.8
250	8.5	23.3	5.41	15.4	0.0032	10.2	3.4
1440	6.0	23.1	5.48	15.9	0.0014	1.7	0.6

Soil Specimen Data

Tare No.:	301	Percent Finer than # 200:	32.93
Wt. of Tare & Dry Material (g):	139.18		
Weight of Tare (g):	104.17	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	30.01		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 358
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-044

Boring No.: JB2-19-1A
Depth (ft): 20.0-24.0
Sample No.: SpT-6/7
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	26
Wt. of Tare & Wet Sample (g)	32.34
Wt. of Tare & Dry Sample (g)	30.06
Weight of Tare (g)	8.45
Weight of Water (g)	2.28
Weight of Dry Sample (g)	21.61

Water Content (%)	10.6

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/15/20	Checked By	JLK	Date	1/16/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-1A
Client Reference:	NRCS- Jewell Brook 172719-17	Depth (ft):	30.0-34.0
Project No.:	2020-002-001	Sample No.:	SpT-11/12
Lab ID:	2020-002-001-045	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	747.42	748.67
Temperature (°C):	25.7	25.7
Weight of Pycnometer & Water (g):	683.89	684.44
Tare Number:	692	700
Weight of Tare & Dry Soil (g):	195.18	187.86
Weight of Tare (g):	93.15	87.41
Weight of Dry Soil (g):	102.03	100.45
Specific Gravity of Soil @ Measured Temperature:	2.650	2.773
Specific Gravity of Water @ Measured Temperature:	0.99687	0.99687
Conversion Factor for Measured Temperature:	0.99866	0.99866
Specific Gravity @ 20° Celsius:	2.654	2.777

Average Specific Gravity @ 20° Celsius	2.72

Tested By TO Date 1/20/20 Checked By JLK Date 1/21/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

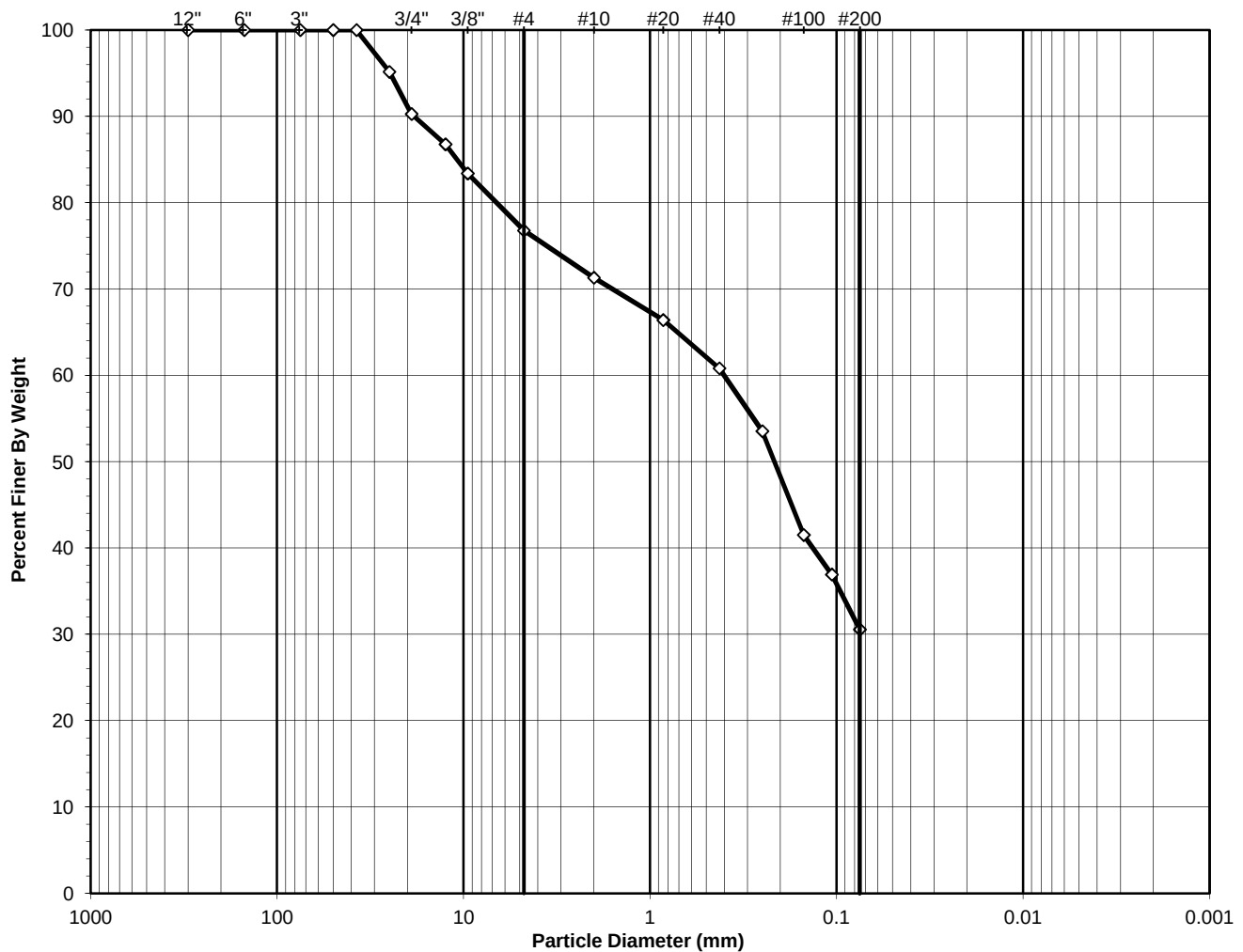
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-046

Boring No.: JB2-19-1A
 Depth (ft): 42.0-44.0
 Sample No.: SpT-16
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
sm, ASSUMED

D50 = 0.22

USCS Classification:
SILTY SAND WITH GRAVEL

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-046

Boring No.: JB2-19-1A
 Depth (ft): 42.0-44.0
 Sample No.: SpT-16
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1425	Tare No.:	NA	Tare No.:	1425	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	746.82	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	746.82	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	688.68	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	688.68	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.65	Weight of Tare (g):	NA	Weight of Tare (g):	144.65	Weight of Tare (g):	NA
Weight of Water (g):	58.14	Weight of Water (g):	NA	Weight of Water (g):	58.14	Weight of Water (g):	NA
Weight of Dry Soil (g):	544.03	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	544.03	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	544.03	Total Dry Weight of Sample (g):	544.03	Dry Weight of Sample (g):	544.03	Total Dry Weight of Sample (g):	544.03
Tare No. (Sub-Specimen)	1425	Wet Weight of +3/4" Sample (g):	58.58	Tare No. (Sub-Specimen)	1425	Wet Weight of +3/4" Sample (g):	58.58
Wt. of Tare & Wet Sub-Specimen (g):	746.82	Dry Weight of + 3/4" Sample (g):	52.92	Wt. of Tare & Wet Sub-Specimen (g):	746.82	Dry Weight of + 3/4" Sample (g):	52.92
Weight of Tare (g):	144.65	Dry Weight of - 3/4" Sample (g):	491.11	Weight of Tare (g):	144.65	Dry Weight of - 3/4" Sample (g):	491.11
Sub-Specimen Wet Weight (g):	602.17	Dry Weight -3/4" +3/8" Sample (g):	37.47	Sub-Specimen Wet Weight (g):	602.17	Dry Weight -3/4" +3/8" Sample (g):	37.47
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	457.28	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	457.28
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	26.36	4.85	4.85	95.15	95
3/4"	19	26.56	4.88	9.73	90.27	90
1/2"	12.5	19.09	(**) 3.51	13.24	86.76	87
3/8"	9.5	18.38	3.38	16.61	83.39	83
#4	4.75	35.91	6.60	23.22	76.78	77
#10	2	29.77	5.47	28.69	71.31	71
#20	0.85	26.69	(**) 4.91	33.59	66.41	66
#40	0.425	30.39	5.59	39.18	60.82	61
#60	0.25	39.64	7.29	46.47	53.53	54
#100	0.15	65.39	12.02	58.49	41.51	42
#140	0.106	24.92	4.58	63.07	36.93	37
#200	0.075	34.63	6.37	69.43	30.57	31
Pan	-	166.30	30.57	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20

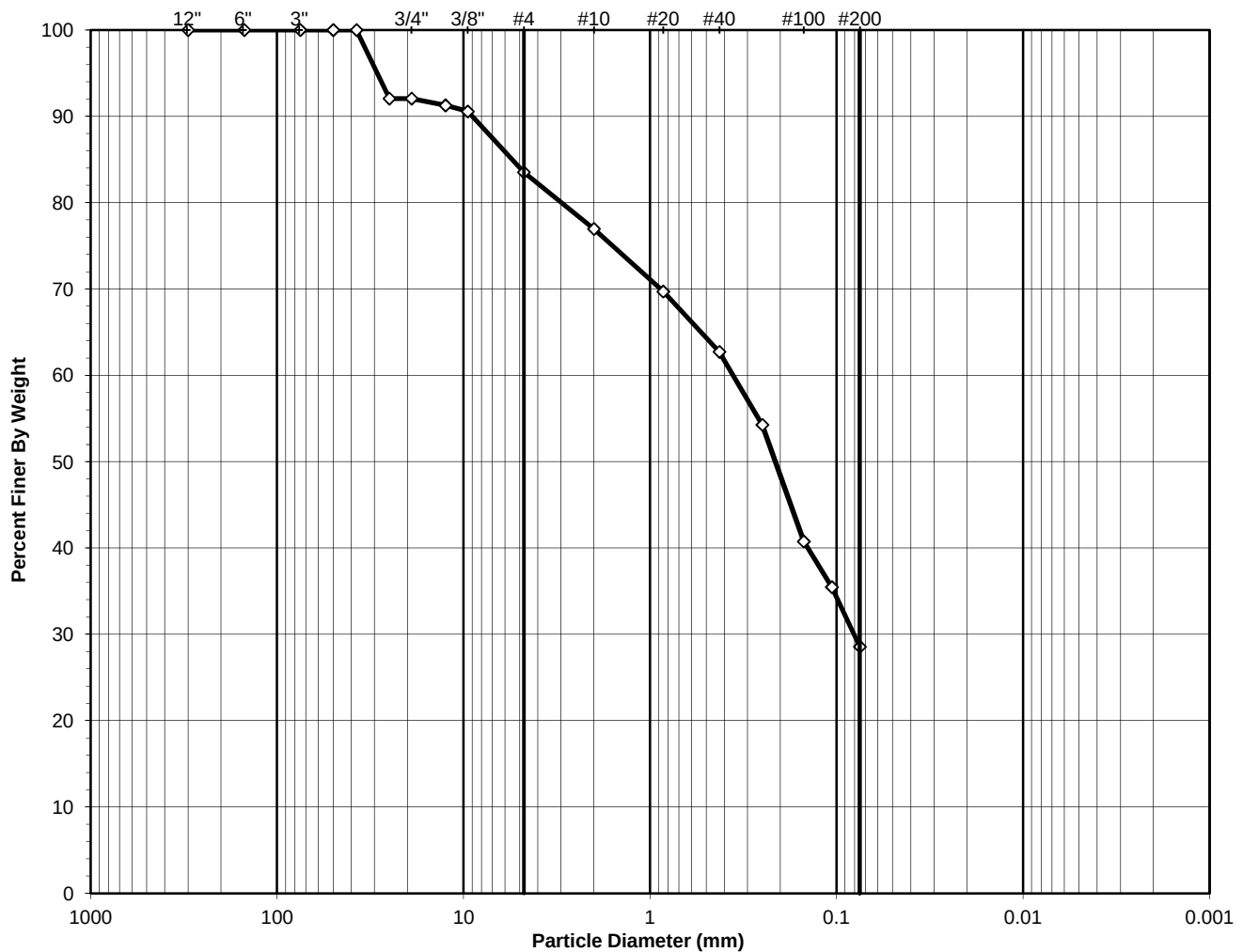
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-047

Boring No.: JB2-19-2
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.21

USCS Classification:
SILTY SAND WITH GRAVEL
(NON-PLASTIC FINES)

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20
page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-047

Boring No.: JB2-19-2
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1530	Tare No.:	NA	Tare No.:	1530	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	575.78	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	575.78	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	540.02	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	540.02	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.95	Weight of Tare (g):	NA	Weight of Tare (g):	147.95	Weight of Tare (g):	NA
Weight of Water (g):	35.76	Weight of Water (g):	NA	Weight of Water (g):	35.76	Weight of Water (g):	NA
Weight of Dry Soil (g):	392.07	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	392.07	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.1	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	392.07	Total Dry Weight of Sample (g):	392.07	Dry Weight of Sample (g):	392.07	Total Dry Weight of Sample (g):	392.07
Tare No. (Sub-Specimen)	1530	Wet Weight of +3/4" Sample (g):	33.98	Tare No. (Sub-Specimen)	1530	Wet Weight of +3/4" Sample (g):	33.98
Wt. of Tare & Wet Sub-Specimen (g):	575.78	Dry Weight of + 3/4" Sample (g):	31.14	Wt. of Tare & Wet Sub-Specimen (g):	575.78	Dry Weight of + 3/4" Sample (g):	31.14
Weight of Tare (g):	147.95	Dry Weight of - 3/4" Sample (g):	360.93	Weight of Tare (g):	147.95	Dry Weight of - 3/4" Sample (g):	360.93
Sub-Specimen Wet Weight (g):	427.83	Dry Weight -3/4" +3/8" Sample (g):	5.84	Sub-Specimen Wet Weight (g):	427.83	Dry Weight -3/4" +3/8" Sample (g):	5.84
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	355.55	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	355.55
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	31.14	7.94	7.94	92.06	92
3/4"	19	0.00	0.00	7.94	92.06	92
1/2"	12.5	3.08	(**) 0.79	8.73	91.27	91
3/8"	9.5	2.76	0.70	9.43	90.57	91
#4	4.75	27.63	7.05	16.48	83.52	84
#10	2	25.71	6.56	23.04	76.96	77
#20	0.85	28.42	(**) 7.25	30.29	69.71	70
#40	0.425	27.40	6.99	37.27	62.73	63
#60	0.25	33.16	8.46	45.73	54.27	54
#100	0.15	52.95	13.51	59.24	40.76	41
#140	0.106	20.73	5.29	64.52	35.48	35
#200	0.075	27.07	6.90	71.43	28.57	29
Pan	-	112.02	28.57	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-047

Boring No.: JB2-19-2
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	19
Wt. of Tare & Wet Sample (g)	28.58
Wt. of Tare & Dry Sample (g)	26.62
Weight of Tare (g)	8.30
Weight of Water (g)	1.96
Weight of Dry Sample (g)	18.32

Water Content (%)	10.7

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/15/20	Checked By	JLK	Date	1/16/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-2
Client Reference:	NRCS- Jewell Brook 172719-17	Depth (ft):	12.0-16.0
Project No.:	2020-002-001	Sample No.:	SpT-7/8
Lab ID:	2020-002-001-048	Visual Description:	Brown Clay

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	747.05	748.49
Temperature (°C):	24.3	24.5
Weight of Pycnometer & Water (g):	684.07	684.59
Tare Number:	686	2324
Weight of Tare & Dry Soil (g):	195.06	197.05
Weight of Tare (g):	93.49	96.37
Weight of Dry Soil (g):	101.57	100.68
Specific Gravity of Soil @ Measured Temperature:	2.632	2.737
Specific Gravity of Water @ Measured Temperature:	0.99723	0.99718
Conversion Factor for Measured Temperature:	0.99902	0.99897
Specific Gravity @ 20° Celsius:	2.635	2.740

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/17/20 Checked By JLK Date 1/20/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

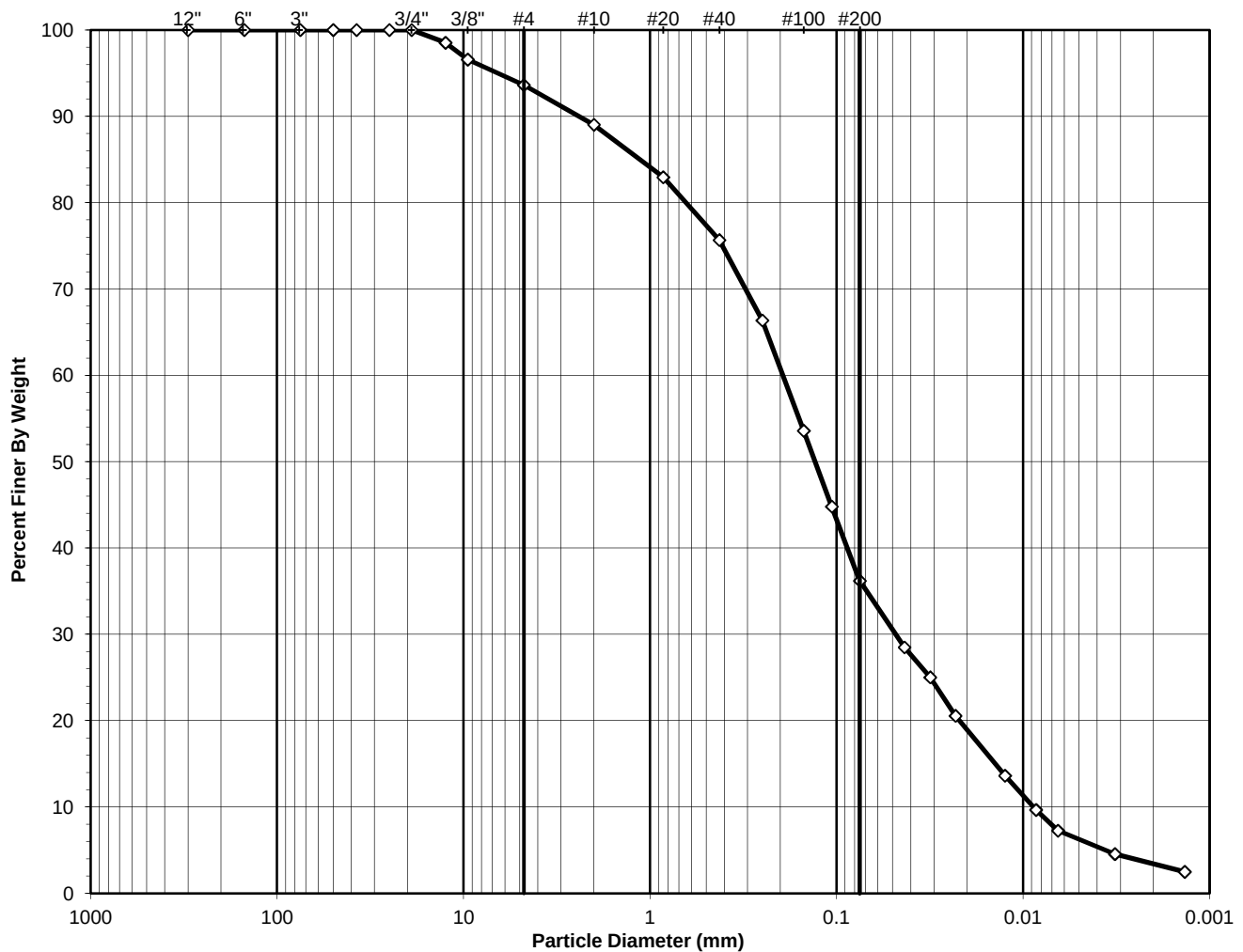
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-049

Boring No.: JB2-19-2
 Depth (ft): 20.0-24.0
 Sample No.: SpT-11/12
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.13

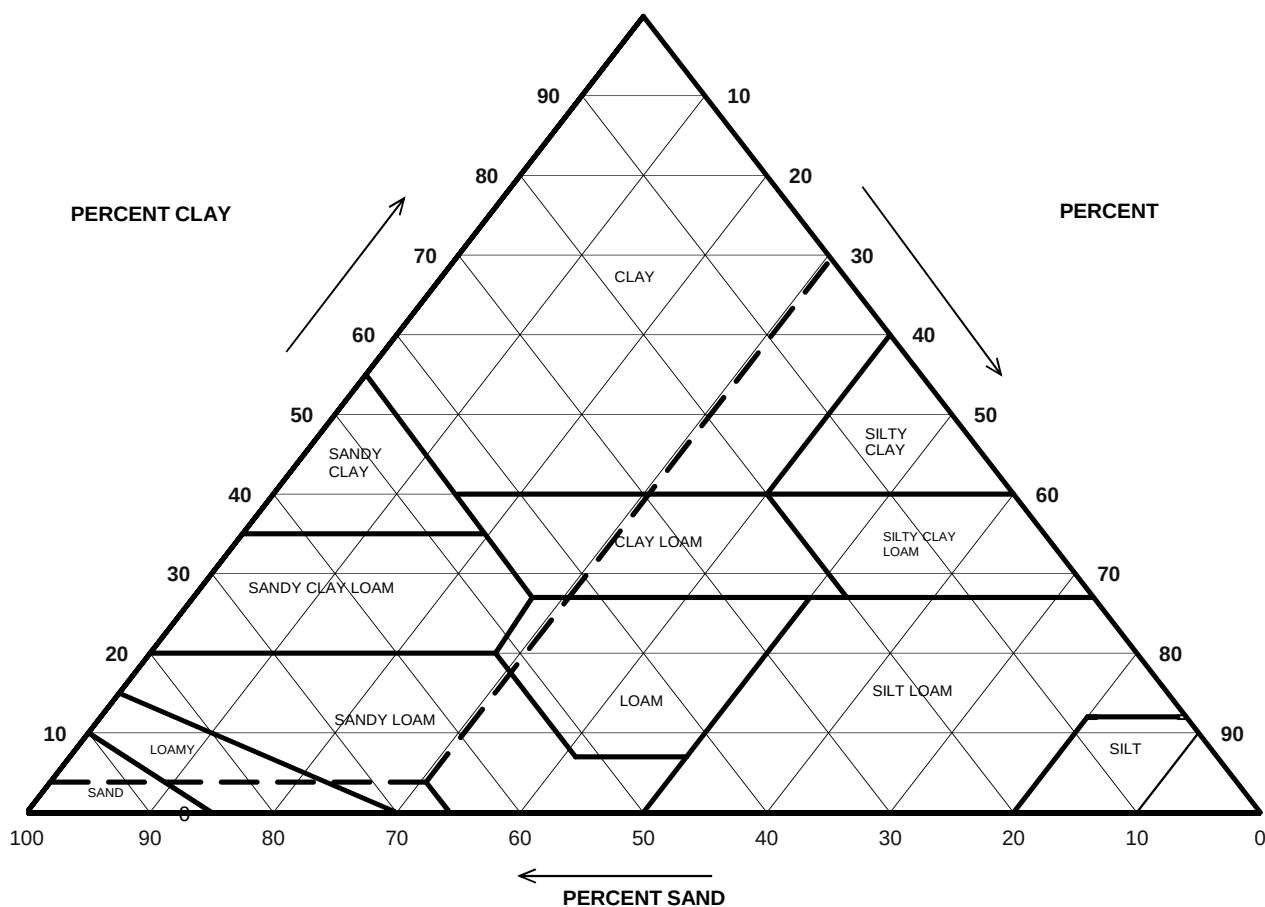
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-049

Boring No.: JB2-19-2
 Depth (ft): 20.0-24.0
 Sample No.: SpT-11/12
 Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	10.98	
2	89.02	Sand	58.50	65.71
0.05	30.53	Silt	27.11	30.45
0.002	3.42	Clay	3.42	3.84

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-049

Boring No.: JB2-19-2
 Depth (ft): 20.0-24.0
 Sample No.: SpT-11/12
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1518	Tare No.:	NA	Tare No.:	1518	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	464.77	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	464.77	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	438.94	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	438.94	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	148.05	Weight of Tare (g):	NA	Weight of Tare (g):	148.05	Weight of Tare (g):	NA
Weight of Water (g):	25.83	Weight of Water (g):	NA	Weight of Water (g):	25.83	Weight of Water (g):	NA
Weight of Dry Soil (g):	290.89	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	290.89	Weight of Dry Soil (g):	NA
Moisture Content (%):	8.9	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	290.89	Total Dry Weight of Sample (g):	290.89	Dry Weight of Sample (g):	290.89	Total Dry Weight of Sample (g):	290.89
Tare No. (Sub-Specimen)	1518	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1518	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	464.77	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	464.77	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	148.05	Dry Weight of - 3/4" Sample (g):	290.89	Weight of Tare (g):	148.05	Dry Weight of - 3/4" Sample (g):	290.89
Sub-Specimen Wet Weight (g):	316.72	Dry Weight -3/4" +3/8" Sample (g):	9.96	Sub-Specimen Wet Weight (g):	316.72	Dry Weight -3/4" +3/8" Sample (g):	9.96
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	280.93	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	280.93
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	4.29	(**) 1.47	1.47	98.53	99
3/8"	9.5	5.67	1.95	3.42	96.58	97
#4	4.75	8.60	2.96	6.38	93.62	94
#10	2	13.37	4.60	10.98	89.02	89
#20	0.85	17.68	(**) 6.08	17.05	82.95	83
#40	0.425	21.16	7.27	24.33	75.67	76
#60	0.25	27.08	9.31	33.64	66.36	66
#100	0.15	37.17	12.78	46.42	53.58	54
#140	0.106	25.55	8.78	55.20	44.80	45
#200	0.075	25.00	8.59	63.79	36.21	36
Pan	-	105.32	36.21	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-049

Boring No.: JB2-19-2
 Depth (ft): 20.0-24.0
 Sample No.: SpT-11/12
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	34.5	22.4	5.75	10.7	0.0432	78.7	28.5
2	31.0	22.4	5.75	11.4	0.0315	69.1	25.0
4	26.5	22.4	5.75	12.2	0.0230	56.8	20.6
15	19.5	22.4	5.75	13.4	0.0125	37.6	13.6
34	15.5	22.4	5.75	14.1	0.0085	26.7	9.7
60	13.0	22.6	5.67	14.6	0.0065	20.1	7.3
250	10.0	23.3	5.41	15.1	0.0032	12.6	4.6
1440	8.0	23.1	5.48	15.5	0.0014	6.9	2.5

Soil Specimen Data

Tare No.: 930 Percent Finer than # 200: 36.21
 Wt. of Tare & Dry Material (g): 136.09
 Weight of Tare (g): 94.96 Specific Gravity: 2.70 Assumed
 Weight of Deflocculant (g): 5.0
 Weight of Dry Material (g): 36.13

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H G- 1819
 Cylinder G- 353
 Thermometer G- 1505
 Balance G- 657
 #200 Sieve G- 1944
 Foam Inhibitor Used No

Tested By TO Date 1/16/20 Checked By KC Date 1/23/20
 page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-049

Boring No.: JB2-19-2
Depth (ft): 20.0-24.0
Sample No.: SpT-11/12
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	9
Wt. of Tare & Wet Sample (g)	26.30
Wt. of Tare & Dry Sample (g)	24.82
Weight of Tare (g)	8.22
Weight of Water (g)	1.48
Weight of Dry Sample (g)	16.60

Water Content (%) **8.9**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/15/20* *Checked By* *JLK* *Date* *1/16/20*

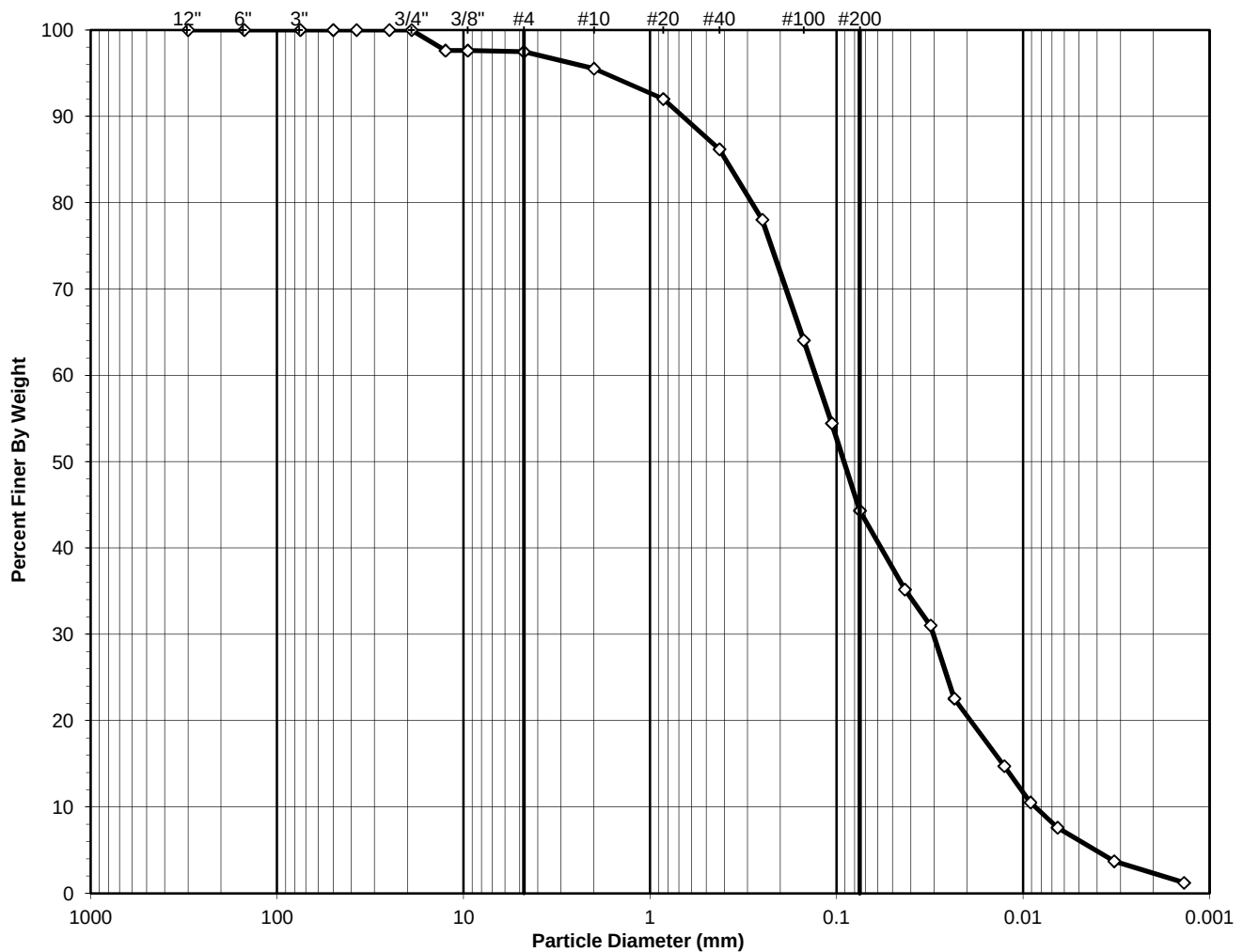
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-051

Boring No.: JB2-19-2
Depth (ft): 44.0-48.0
Sample No.: SpT-23/24
Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.09

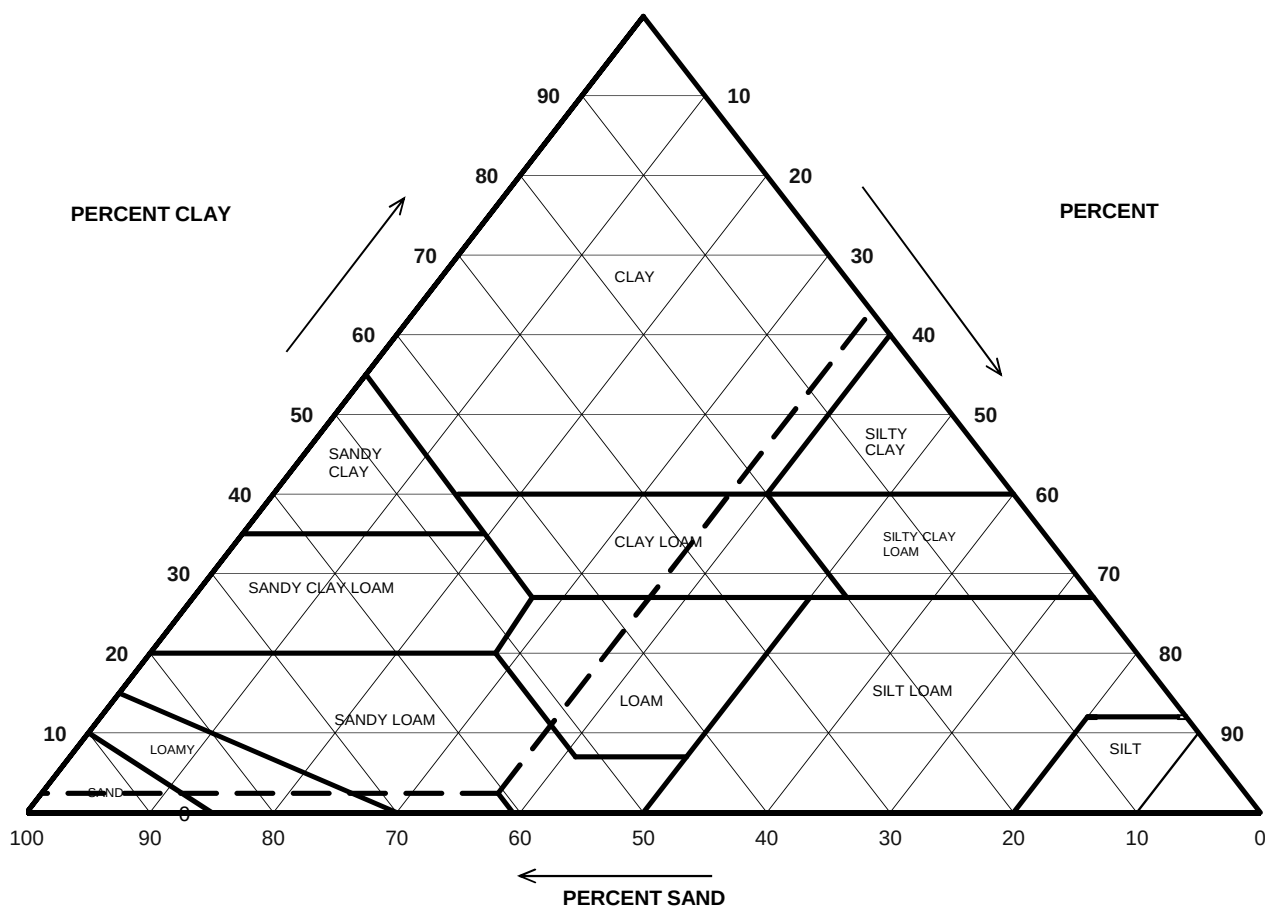
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-051

Boring No.: JB2-19-2
Depth (ft): 44.0-48.0
Sample No.: SpT-23/24
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	4.48	
2	95.52	Sand	57.87	60.58
0.05	37.65	Silt	35.33	36.99
0.002	2.32	Clay	2.32	2.43

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-051

Boring No.: JB2-19-2
 Depth (ft): 44.0-48.0
 Sample No.: SpT-23/24
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1612	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	432.24	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	392.01	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	148.08	Weight of Tare (g):	NA
Weight of Water (g):	40.23	Weight of Water (g):	NA
Weight of Dry Soil (g):	243.93	Weight of Dry Soil (g):	NA
Moisture Content (%):	16.5	Moisture Content (%):	0.0
Dry Weight of Sample (g):	243.93	Total Dry Weight of Sample (g):	243.93
Tare No. (Sub-Specimen)	1612	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	432.24	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	148.08	Dry Weight of - 3/4" Sample (g):	243.93
Sub-Specimen Wet Weight (g):	284.16	Dry Weight -3/4" +3/8" Sample (g):	5.82
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	238.11
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	5.82	(**)	2.39	97.61	98
3/8"	9.5	0.00	0.00	2.39	97.61	98
#4	4.75	0.33	0.14	2.52	97.48	97
#10	2	4.77	1.96	4.48	95.52	96
#20	0.85	8.57	(**)	7.99	92.01	92
#40	0.425	14.19	5.82	13.81	86.19	86
#60	0.25	19.93	8.17	21.98	78.02	78
#100	0.15	34.08	13.97	35.95	64.05	64
#140	0.106	23.45	9.61	45.56	54.44	54
#200	0.075	24.66	10.11	55.67	44.33	44
Pan	-	108.13	44.33	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-051

Boring No.: JB2-19-2
 Depth (ft): 44.0-48.0
 Sample No.: SpT-23/24
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	35.0	22.4	5.75	10.6	0.0431	79.4	35.2
2	31.5	22.4	5.75	11.3	0.0313	70.0	31.0
4	24.5	22.4	5.75	12.5	0.0234	50.9	22.6
15	18.0	22.4	5.75	13.7	0.0126	33.3	14.7
30	14.5	22.4	5.75	14.3	0.0091	23.8	10.5
60	12.0	22.6	5.67	14.8	0.0065	17.2	7.6
250	8.5	23.3	5.41	15.4	0.0032	8.4	3.7
1440	6.5	23.1	5.48	15.8	0.0014	2.8	1.2

Soil Specimen Data

Tare No.: 967 Percent Finer than # 200: 44.33
 Wt. of Tare & Dry Material (g): 140.06
 Weight of Tare (g): 98.62 Specific Gravity: 2.70 Measured
 Weight of Deflocculant (g): 5.0
 Weight of Dry Material (g): 36.44

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H G- 1819
 Cylinder G- 357
 Thermometer G- 1505
 Balance G- 657
 #200 Sieve G- 1944
 Foam Inhibitor Used No

Tested By TO Date 1/20/20 Checked By KC Date 1/23/20
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ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-051

Boring No.: JB2-19-2
Depth (ft): 44.0-48.0
Sample No.: SpT-23/24
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	17
Wt. of Tare & Wet Sample (g)	29.71
Wt. of Tare & Dry Sample (g)	27.66
Weight of Tare (g)	8.52
Weight of Water (g)	2.05
Weight of Dry Sample (g)	19.14

Water Content (%)	10.7

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/15/20	Checked By	JLK	Date	1/16/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-2
Client Reference:	NRCS- Jewell Brook 172719-17	Depth (ft):	44.0-48.0
Project No.:	2020-002-001	Sample No.:	SpT-23/24
Lab ID:	2020-002-001-051	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	745.88	748.84
Temperature (°C):	25.6	26.4
Weight of Pycnometer & Water (g):	683.90	684.35
Tare Number:	952	685
Weight of Tare & Dry Soil (g):	200.96	200.37
Weight of Tare (g):	101.29	99.11
Weight of Dry Soil (g):	99.67	101.26
Specific Gravity of Soil @ Measured Temperature:	2.644	2.754
Specific Gravity of Water @ Measured Temperature:	0.99690	0.99669
Conversion Factor for Measured Temperature:	0.99869	0.99848
Specific Gravity @ 20° Celsius:	2.648	2.758

Average Specific Gravity @ 20° Celsius	2.70

Tested By TO Date 1/17/20 Checked By JLK Date 1/20/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

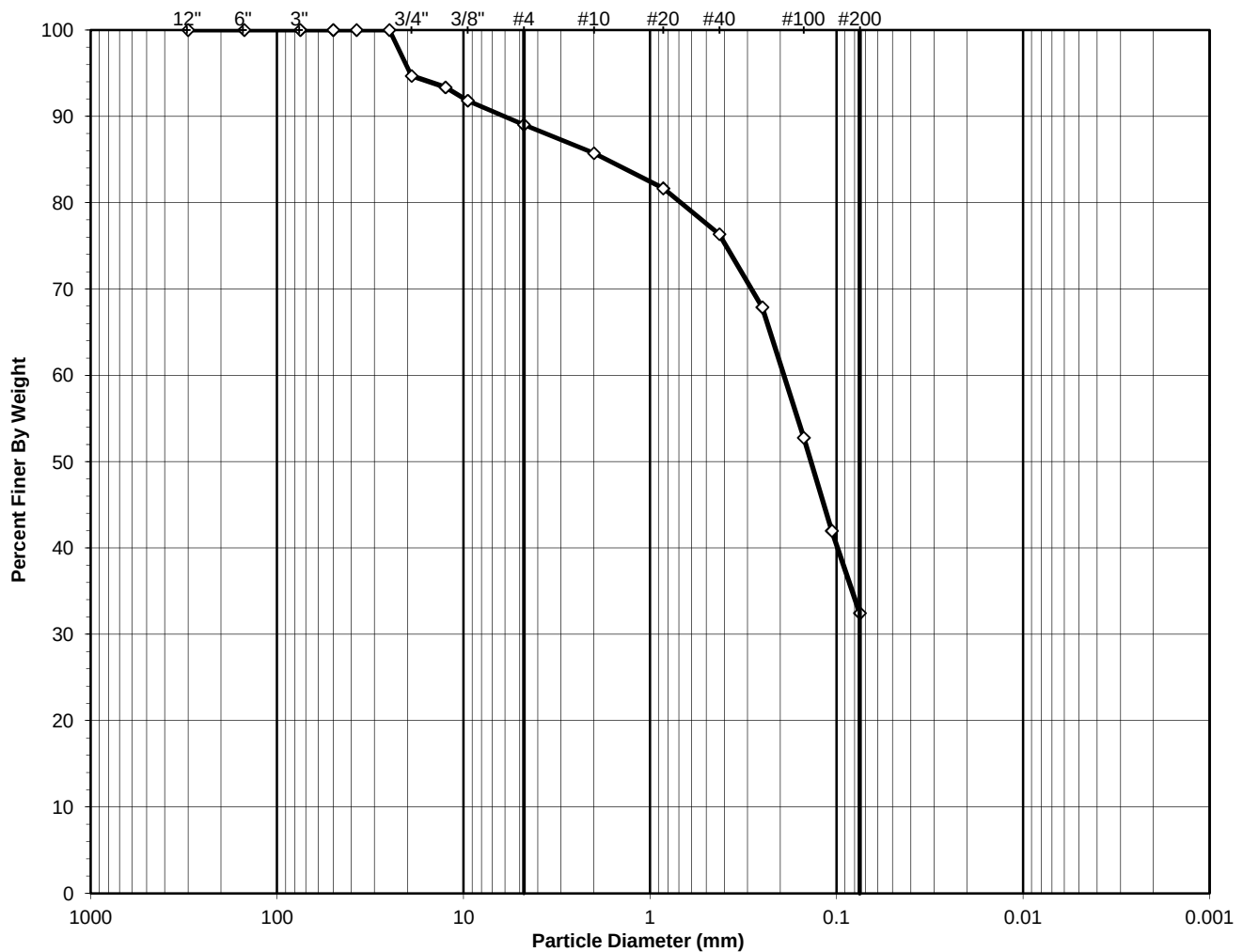
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-052

Boring No.: JB2-19-2
 Depth (ft): 54.0-56.0
 Sample No.: SpT-28
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.14

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-052

Boring No.: JB2-19-2
 Depth (ft): 54.0-56.0
 Sample No.: SpT-28
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1427	Tare No.:	NA	Tare No.:	1427	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	443.78	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	443.78	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	407.88	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	407.88	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.85	Weight of Tare (g):	NA	Weight of Tare (g):	145.85	Weight of Tare (g):	NA
Weight of Water (g):	35.90	Weight of Water (g):	NA	Weight of Water (g):	35.90	Weight of Water (g):	NA
Weight of Dry Soil (g):	262.03	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	262.03	Weight of Dry Soil (g):	NA
Moisture Content (%):	13.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	262.03	Total Dry Weight of Sample (g):	262.03	Dry Weight of Sample (g):	262.03	Total Dry Weight of Sample (g):	262.03
Tare No. (Sub-Specimen)	1427	Wet Weight of +3/4" Sample (g):	15.85	Tare No. (Sub-Specimen)	1427	Wet Weight of +3/4" Sample (g):	15.85
Wt. of Tare & Wet Sub-Specimen (g):	443.78	Dry Weight of + 3/4" Sample (g):	13.94	Wt. of Tare & Wet Sub-Specimen (g):	443.78	Dry Weight of + 3/4" Sample (g):	13.94
Weight of Tare (g):	145.85	Dry Weight of - 3/4" Sample (g):	248.09	Weight of Tare (g):	145.85	Dry Weight of - 3/4" Sample (g):	248.09
Sub-Specimen Wet Weight (g):	297.93	Dry Weight -3/4" +3/8" Sample (g):	7.50	Sub-Specimen Wet Weight (g):	297.93	Dry Weight -3/4" +3/8" Sample (g):	7.50
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	240.99	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	240.99
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	13.94	5.32	5.32	94.68	95
1/2"	12.5	3.47	(**)	6.64	93.36	93
3/8"	9.5	4.03	1.54	8.18	91.82	92
#4	4.75	7.31	2.79	10.97	89.03	89
#10	2	8.65	3.30	14.27	85.73	86
#20	0.85	10.65	(**)	18.34	81.66	82
#40	0.425	13.91	5.31	23.65	76.35	76
#60	0.25	22.20	8.47	32.12	67.88	68
#100	0.15	39.58	15.11	47.22	52.78	53
#140	0.106	28.25	10.78	58.00	42.00	42
#200	0.075	25.00	9.54	67.55	32.45	32
Pan	-	85.04	32.45	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-052

Boring No.: JB2-19-2
Depth (ft): 54.0-56.0
Sample No.: SpT-28
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	4
Wt. of Tare & Wet Sample (g)	31.46
Wt. of Tare & Dry Sample (g)	29.00
Weight of Tare (g)	8.37
Weight of Water (g)	2.46
Weight of Dry Sample (g)	20.63

Water Content (%)	11.9

NON - PLASTIC MATERIAL

<i>Tested By</i>	<i>FS</i>	<i>Date</i>	<i>1/15/20</i>	<i>Checked By</i>	<i>JLK</i>	<i>Date</i>	<i>1/16/20</i>

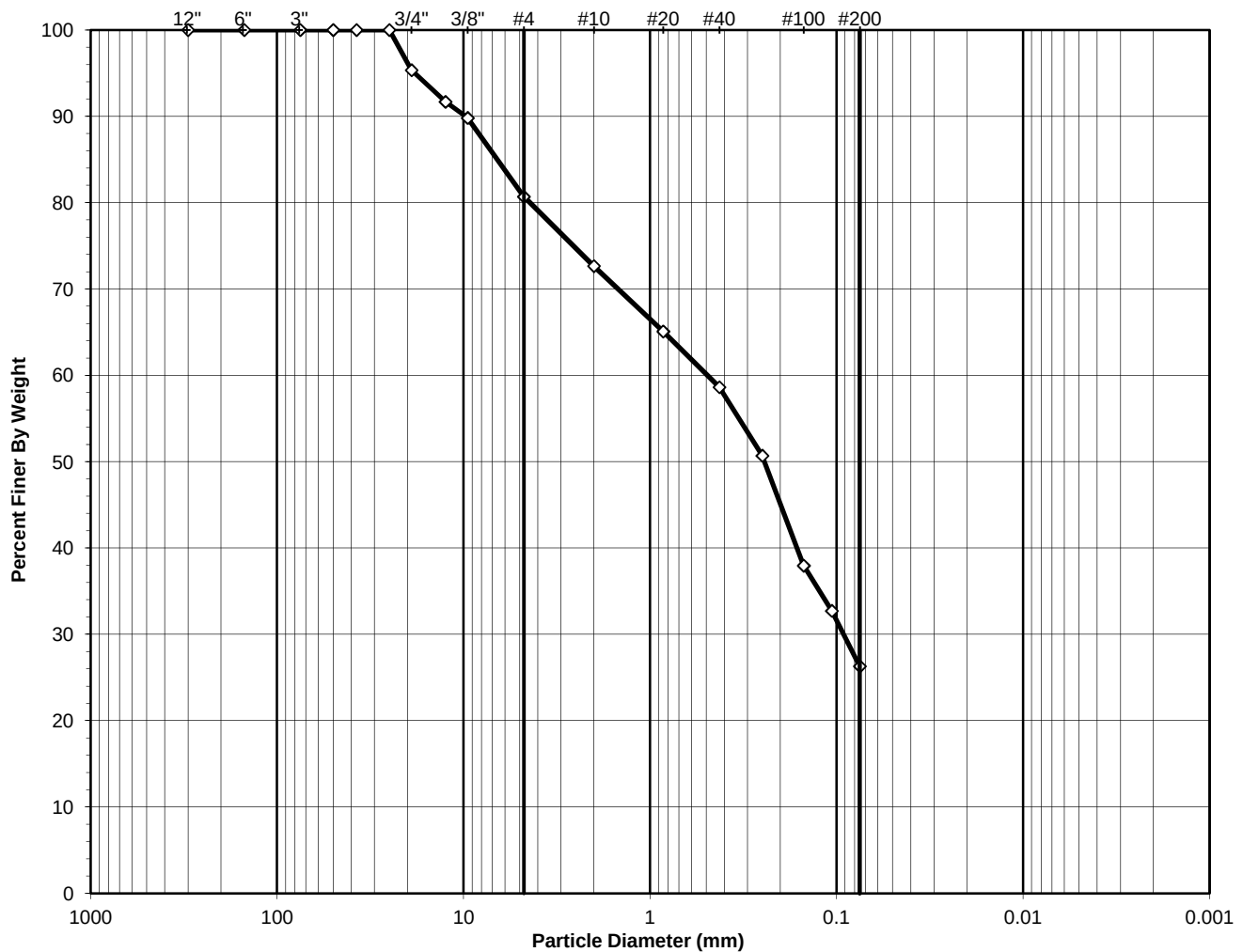
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-053

Boring No.: JB2-19-2
 Depth (ft): 58.0-59.8
 Sample No.: SpT-30
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
sm, ASSUMED

D50 = 0.24

USCS Classification:
SILTY SAND WITH GRAVEL

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-053

Boring No.: JB2-19-2
Depth (ft): 58.0-59.8
Sample No.: SpT-30
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1498	Tare No.:	NA	Tare No.:	1498	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	878.36	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	878.36	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	821.76	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	821.76	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	149.04	Weight of Tare (g):	NA	Weight of Tare (g):	149.04	Weight of Tare (g):	NA
Weight of Water (g):	56.60	Weight of Water (g):	NA	Weight of Water (g):	56.60	Weight of Water (g):	NA
Weight of Dry Soil (g):	672.72	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	672.72	Weight of Dry Soil (g):	NA
Moisture Content (%):	8.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	672.72	Total Dry Weight of Sample (g):	672.72	Dry Weight of Sample (g):	672.72	Total Dry Weight of Sample (g):	672.72
Tare No. (Sub-Specimen)	1498	Wet Weight of +3/4" Sample (g):	33.94	Tare No. (Sub-Specimen)	1498	Wet Weight of +3/4" Sample (g):	33.94
Wt. of Tare & Wet Sub-Specimen (g):	878.36	Dry Weight of + 3/4" Sample (g):	31.31	Wt. of Tare & Wet Sub-Specimen (g):	878.36	Dry Weight of + 3/4" Sample (g):	31.31
Weight of Tare (g):	149.04	Dry Weight of - 3/4" Sample (g):	641.41	Weight of Tare (g):	149.04	Dry Weight of - 3/4" Sample (g):	641.41
Sub-Specimen Wet Weight (g):	729.32	Dry Weight -3/4" +3/8" Sample (g):	37.22	Sub-Specimen Wet Weight (g):	729.32	Dry Weight -3/4" +3/8" Sample (g):	37.22
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	605.92	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	605.92
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	31.31	4.65	4.65	95.35	95
1/2"	12.5	24.62	(**)	8.31	91.69	92
3/8"	9.5	12.60	1.87	10.19	89.81	90
#4	4.75	61.38	9.12	19.31	80.69	81
#10	2	54.06	8.04	27.35	72.65	73
#20	0.85	50.91	(**)	34.91	65.09	65
#40	0.425	43.45	6.46	41.37	58.63	59
#60	0.25	53.35	7.93	49.30	50.70	51
#100	0.15	85.70	12.74	62.04	37.96	38
#140	0.106	35.21	5.23	67.28	32.72	33
#200	0.075	43.27	6.43	73.71	26.29	26
Pan	-	176.86	26.29	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

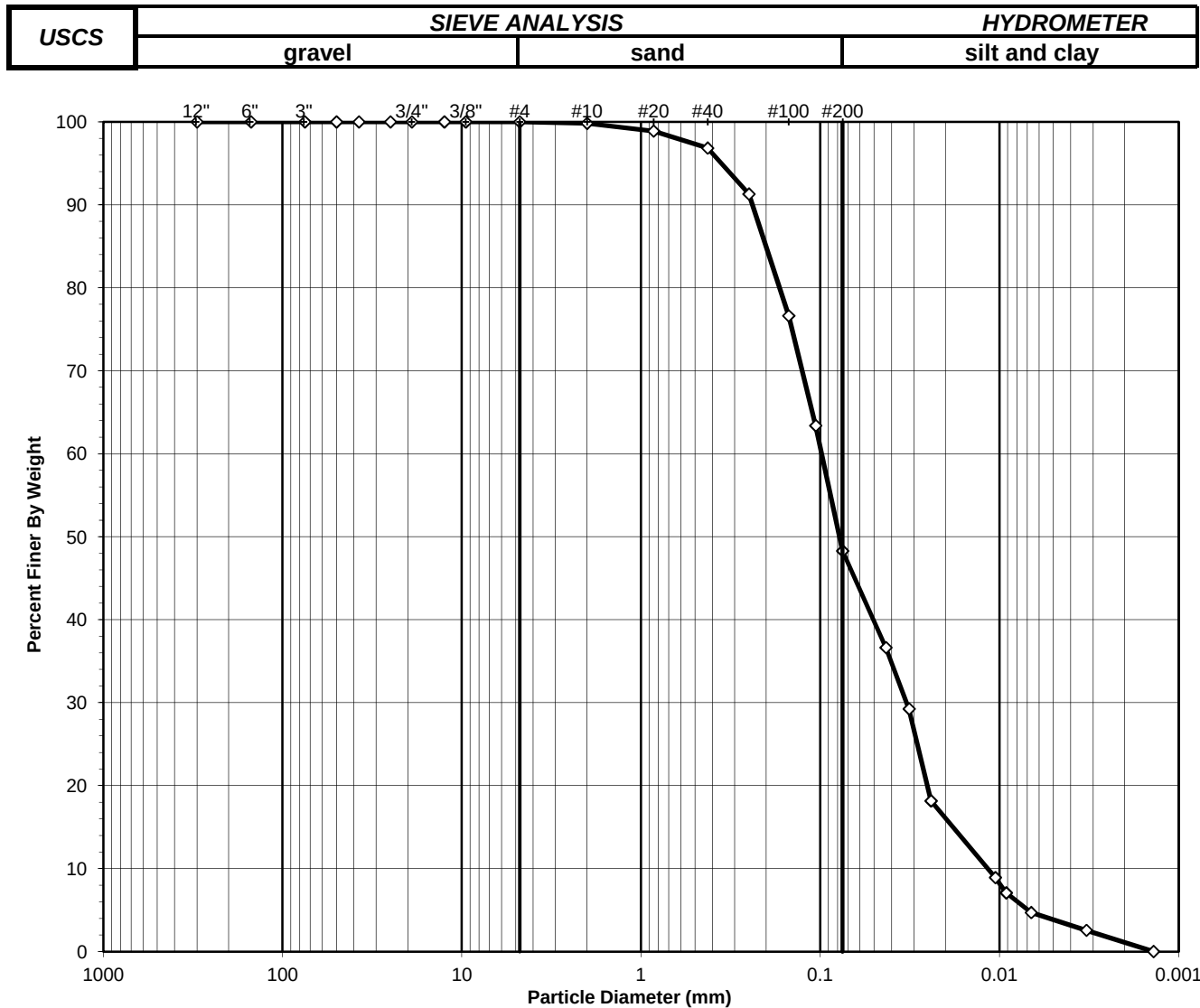
Tested By HL Date 1/16/20 Checked By KC Date 1/23/20

SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-055

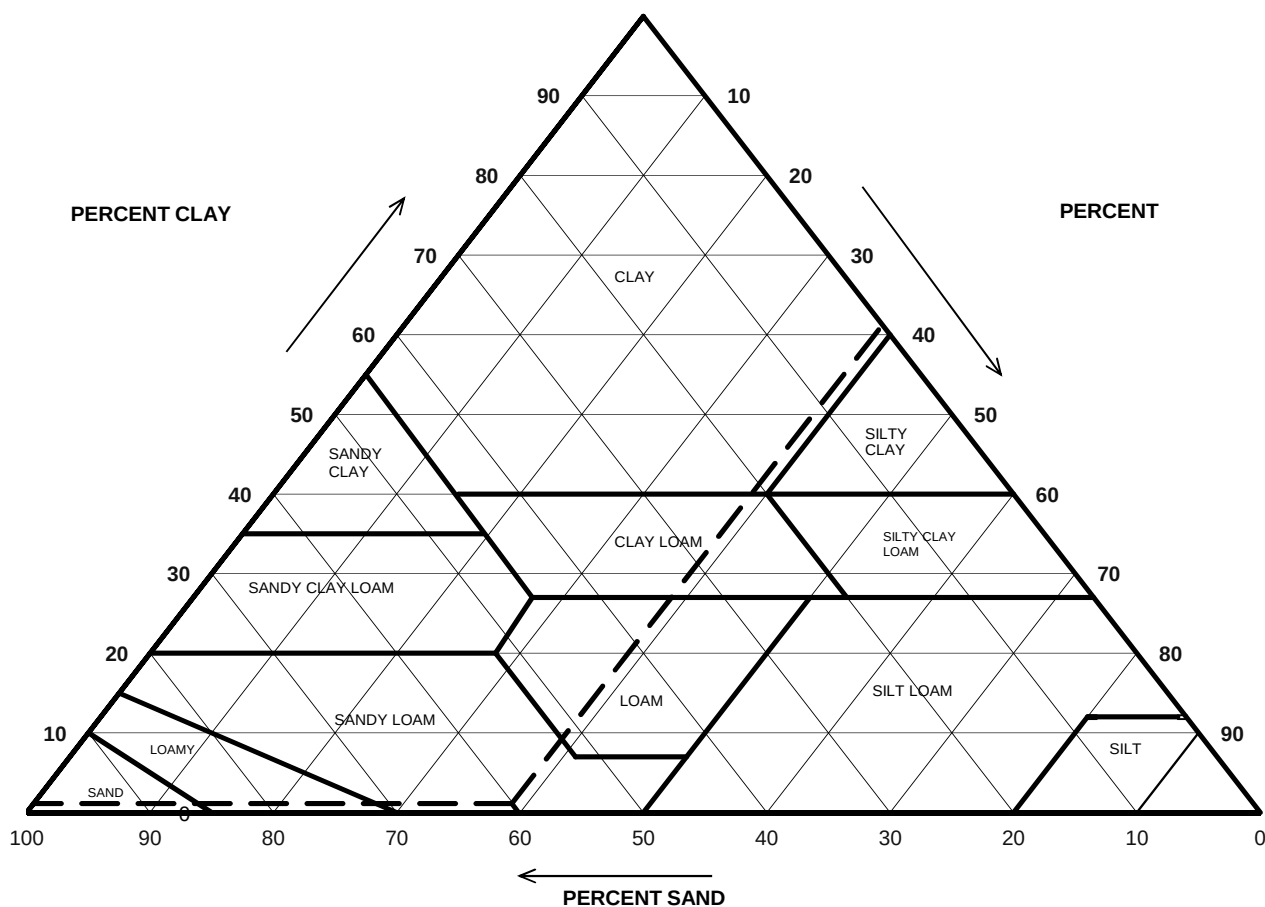
Boring No.: JB2-19-3
 Depth (ft): 10.0-16.0
 Sample No.: SpT-6/7/8
 Soil Color: Brown



USDA CLASSIFICATION CHART

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-055

Boring No.: JB2-19-3
 Depth (ft): 10.0-16.0
 Sample No.: SpT-6/7/8
 Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	0.18	
2	99.82	Sand	60.01	60.12
0.05	39.81	Silt	38.69	38.76
0.002	1.12	Clay	1.12	1.12

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-055

Boring No.: JB2-19-3
 Depth (ft): 10.0-16.0
 Sample No.: SpT-6/7/8
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2018	Tare No.:	NA	Tare No.:	2018	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	496.87	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	496.87	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	460.94	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	460.94	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.21	Weight of Tare (g):	NA	Weight of Tare (g):	147.21	Weight of Tare (g):	NA
Weight of Water (g):	35.93	Weight of Water (g):	NA	Weight of Water (g):	35.93	Weight of Water (g):	NA
Weight of Dry Soil (g):	313.73	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	313.73	Weight of Dry Soil (g):	NA
Moisture Content (%):	11.5	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	313.73	Total Dry Weight of Sample (g):	313.73	Dry Weight of Sample (g):	313.73	Total Dry Weight of Sample (g):	313.73
Tare No. (Sub-Specimen)	2018	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2018	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	496.87	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	496.87	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.21	Dry Weight of - 3/4" Sample (g):	313.73	Weight of Tare (g):	147.21	Dry Weight of - 3/4" Sample (g):	313.73
Sub-Specimen Wet Weight (g):	349.66	Dry Weight -3/4" +3/8" Sample (g):	0.00	Sub-Specimen Wet Weight (g):	349.66	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	313.73	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	313.73
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.0
6"	150	0.00	0.00	0.00	100.00	100.0
3"	75	0.00	0.00	0.00	100.00	100.0
2"	50	0.00	(*) 0.00	0.00	100.00	100.0
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.0
1"	25	0.00	0.00	0.00	100.00	100.0
3/4"	19	0.00	0.00	0.00	100.00	100.0
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100.0
3/8"	9.5	0.00	0.00	0.00	100.00	100.0
#4	4.75	0.00	0.00	0.00	100.00	100.0
#10	2	0.56	0.18	0.18	99.82	99.8
#20	0.85	2.93	(**) 0.93	1.11	98.89	98.9
#40	0.425	6.40	2.04	3.15	96.85	96.8
#60	0.25	17.38	5.54	8.69	91.31	91.3
#100	0.15	46.04	14.68	23.37	76.63	76.6
#140	0.106	41.55	13.24	36.61	63.39	63.4
#200	0.075	47.36	15.10	51.71	48.29	48.3
Pan	-	151.51	48.29	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-3
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	10.0-16.0
Project No.:	2020-002-001	Sample No.:	SpT-6/7/8
Lab ID:	2020-002-001-055	Soil Color:	Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	35.5	22.4	5.75	10.5	0.0430	75.9	36.6
2	29.5	22.4	5.75	11.6	0.0319	60.6	29.3
4	20.5	22.4	5.75	13.2	0.0241	37.6	18.2
23	13.0	22.4	5.75	14.6	0.0105	18.5	8.9
31	11.5	22.4	5.75	14.9	0.0092	14.7	7.1
60	9.5	22.6	5.67	15.2	0.0067	9.8	4.7
250	7.5	23.3	5.41	15.6	0.0033	5.3	2.6
1440	5.5	23.1	5.48	15.9	0.0014	0.0	0.0

Soil Specimen Data

Tare No.:	949	Percent Finer than # 200:	48.29
Wt. of Tare & Dry Material (g):	139.67		
Weight of Tare (g):	95.81	Specific Gravity:	2.69 Measured
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	38.86		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 209
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/20/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-055

Boring No.: JB2-19-3
Depth (ft): 10.0-16.0
Sample No.: SpT-6/7/8
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	29
Wt. of Tare & Wet Sample (g)	23.48
Wt. of Tare & Dry Sample (g)	22.08
Weight of Tare (g)	8.42
Weight of Water (g)	1.40
Weight of Dry Sample (g)	13.66

Water Content (%)	10.2

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/15/20	Checked By	JLK	Date	1/16/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-3
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	10.0-16.0
Project No.:	2020-002-001	Sample No.:	Spt-6/7/8
Lab ID:	2020-002-001-055	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	746.25	748.53
Temperature (°C):	25.7	26.1
Weight of Pycnometer & Water (g):	683.89	684.39
Tare Number:	1465	694
Weight of Tare & Dry Soil (g):	196.75	199.45
Weight of Tare (g):	96.12	98.59
Weight of Dry Soil (g):	100.63	100.86
Specific Gravity of Soil @ Measured Temperature:	2.629	2.747
Specific Gravity of Water @ Measured Temperature:	0.99687	0.99677
Conversion Factor for Measured Temperature:	0.99866	0.99856
Specific Gravity @ 20° Celsius:	2.633	2.751

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/21/20 Checked By BRB Date 1/22/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

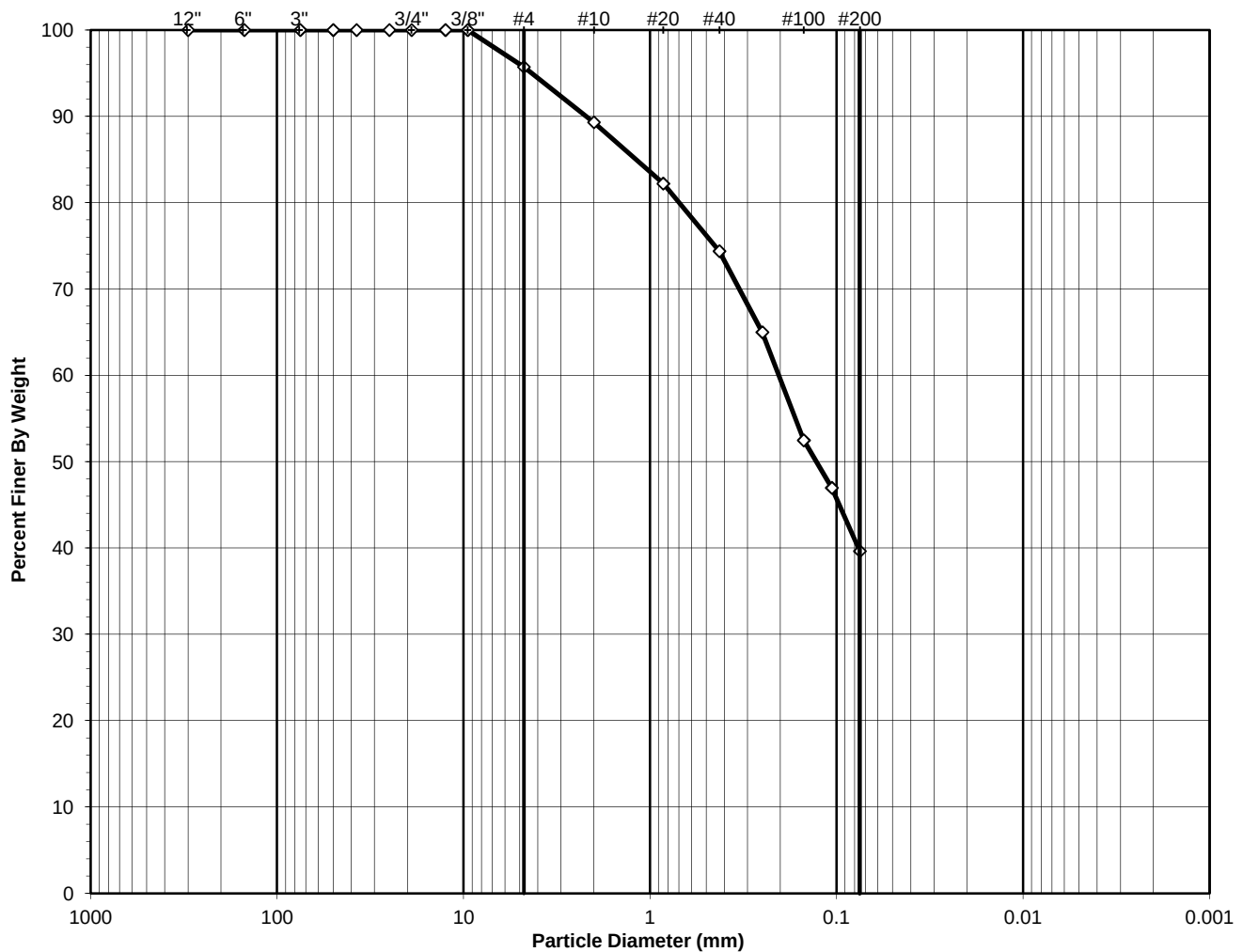
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-056

Boring No.: JB2-19-3
 Depth (ft): 26.0-30.0
 Sample No.: SpT-14/15
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
sm, ASSUMED

D50 = 0.13

USCS Classification:
SILTY SAND

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-056

Boring No.: JB2-19-3
 Depth (ft): 26.0-30.0
 Sample No.: SpT-14/15
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	2013	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	458.91	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	420.30	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.12	Weight of Tare (g):	NA
Weight of Water (g):	38.61	Weight of Water (g):	NA
Weight of Dry Soil (g):	276.18	Weight of Dry Soil (g):	NA
Moisture Content (%):	14.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	276.18	Total Dry Weight of Sample (g):	276.18
Tare No. (Sub-Specimen)	2013	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	458.91	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	144.12	Dry Weight of - 3/4" Sample (g):	276.18
Sub-Specimen Wet Weight (g):	314.79	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	276.18
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	0.00	(**)	0.00	100.00	100
3/8"	9.5	0.00	0.00	0.00	100.00	100
#4	4.75	11.82	4.28	4.28	95.72	96
#10	2	17.70	6.41	10.69	89.31	89
#20	0.85	19.60	(**)	17.79	82.21	82
#40	0.425	21.62	7.83	25.61	74.39	74
#60	0.25	25.95	9.40	35.01	64.99	65
#100	0.15	34.56	12.51	47.52	52.48	52
#140	0.106	15.21	5.51	53.03	46.97	47
#200	0.075	20.23	7.32	60.36	39.64	40
Pan	-	109.49	39.64	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-3
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	26.0-30.0
Project No.:	2020-002-001	Sample No.:	SpT-14/15
Lab ID:	2020-002-001-056	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	747.13	748.99
Temperature (°C):	25.4	25.8
Weight of Pycnometer & Water (g):	683.93	684.43
Tare Number:	649	506
Weight of Tare & Dry Soil (g):	194.82	197.69
Weight of Tare (g):	93.85	97.09
Weight of Dry Soil (g):	100.97	100.60
Specific Gravity of Soil @ Measured Temperature:	2.673	2.792
Specific Gravity of Water @ Measured Temperature:	0.99695	0.99684
Conversion Factor for Measured Temperature:	0.99874	0.99864
Specific Gravity @ 20° Celsius:	2.677	2.795

Average Specific Gravity @ 20° Celsius	2.74

Tested By TO Date 1/21/20 Checked By BRB Date 1/22/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

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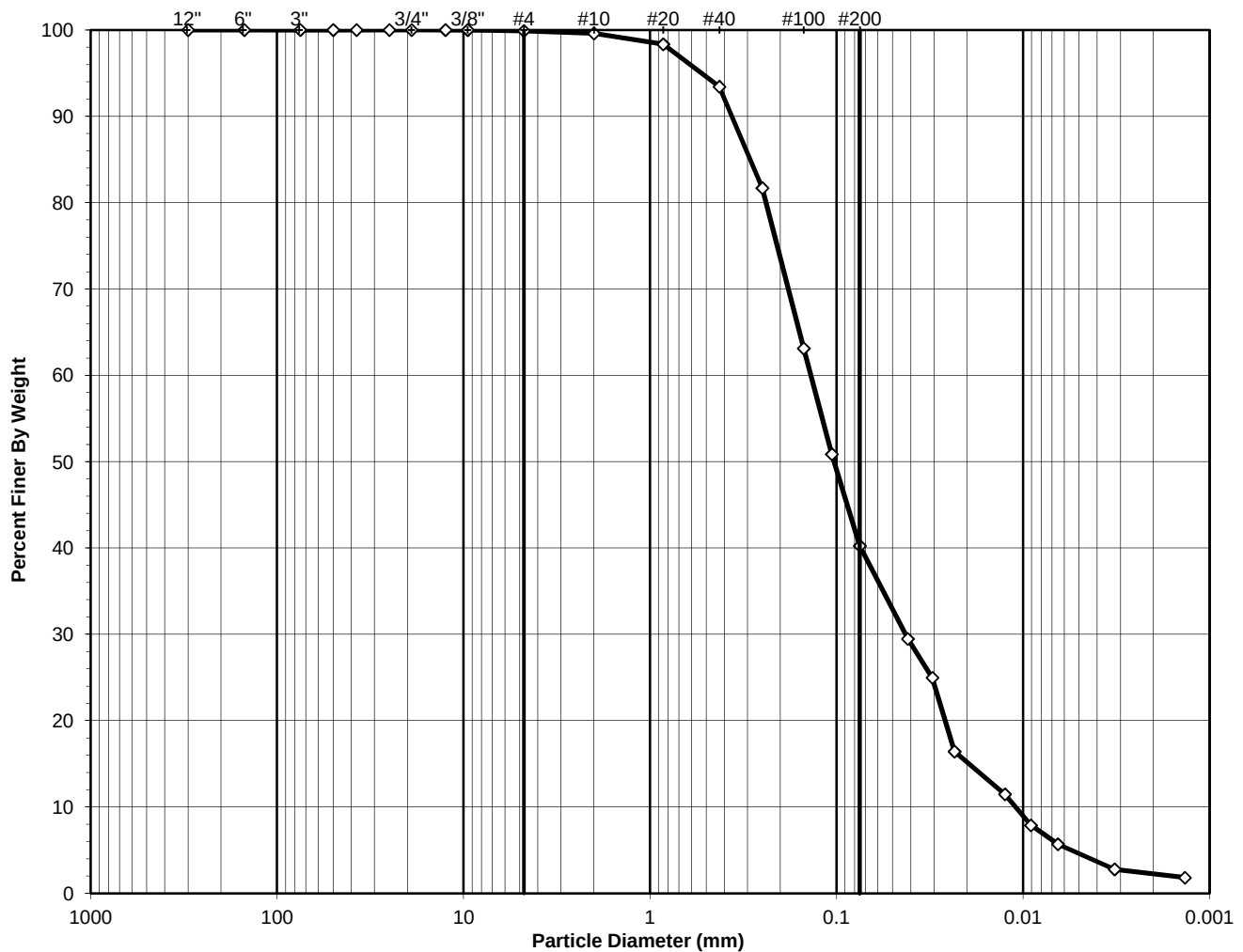
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-057

Boring No.: JB2-19-3
 Depth (ft): 36.0-40.0
 Sample No.: SpT-19/20
 Soil Color: Brown

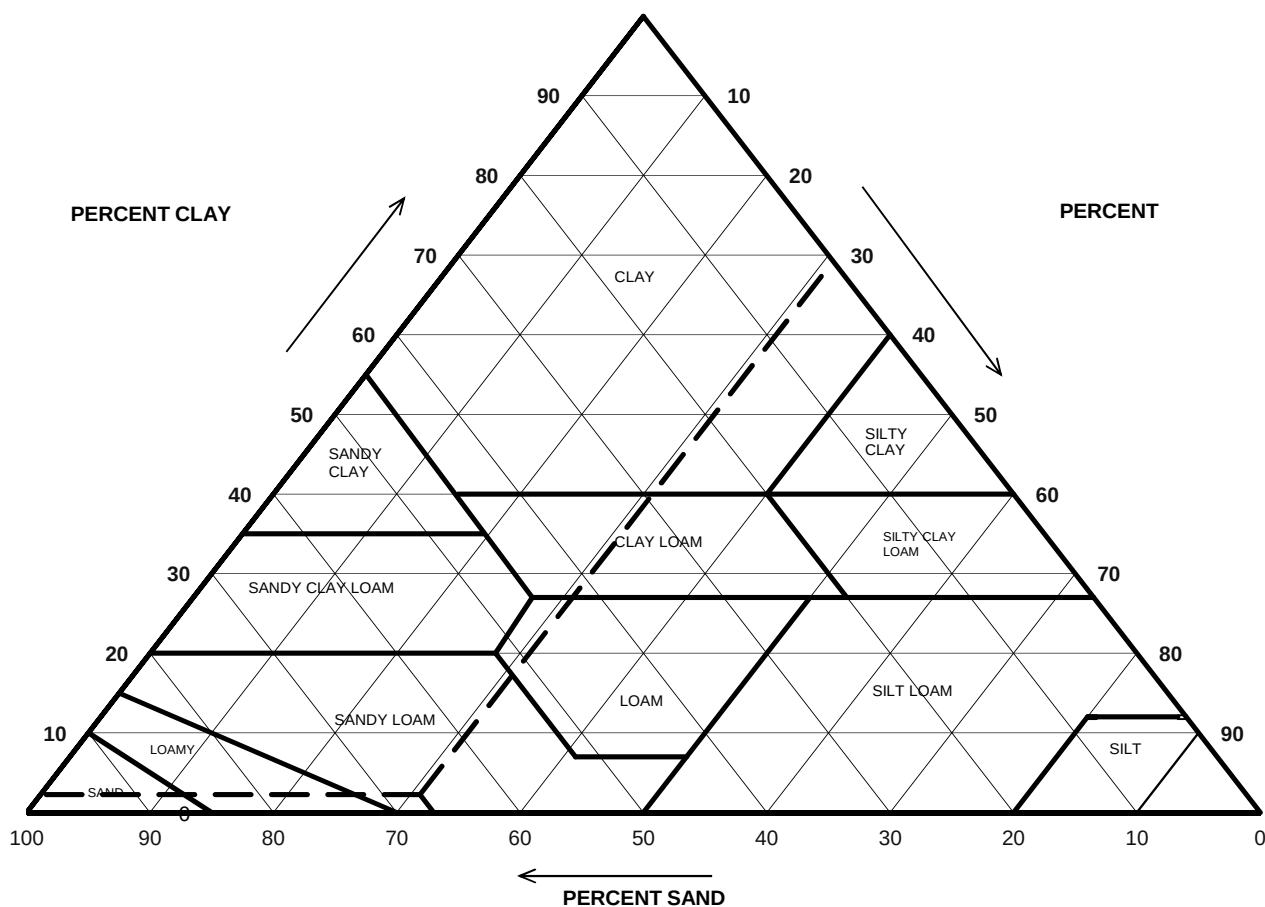
USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-057

Boring No.: JB2-19-3
Depth (ft): 36.0-40.0
Sample No.: SpT-19/20
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	0.40	
2	99.60	Sand	66.72	66.99
0.05	32.88	Silt	30.63	30.75
0.002	2.25	Clay	2.25	2.26

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-057

Boring No.: JB2-19-3
 Depth (ft): 36.0-40.0
 Sample No.: SpT-19/20
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1492	Tare No.:	NA	Tare No.:	1492	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	422.46	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	422.46	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	387.30	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	387.30	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.70	Weight of Tare (g):	NA	Weight of Tare (g):	146.70	Weight of Tare (g):	NA
Weight of Water (g):	35.16	Weight of Water (g):	NA	Weight of Water (g):	35.16	Weight of Water (g):	NA
Weight of Dry Soil (g):	240.60	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	240.60	Weight of Dry Soil (g):	NA
Moisture Content (%):	14.6	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	240.60	Total Dry Weight of Sample (g):	240.60	Dry Weight of Sample (g):	240.60	Total Dry Weight of Sample (g):	240.60
Tare No. (Sub-Specimen)	1492	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1492	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	422.46	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	422.46	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.70	Dry Weight of - 3/4" Sample (g):	240.60	Weight of Tare (g):	146.70	Dry Weight of - 3/4" Sample (g):	240.60
Sub-Specimen Wet Weight (g):	275.76	Dry Weight -3/4" +3/8" Sample (g):	0.00	Sub-Specimen Wet Weight (g):	275.76	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	240.60	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	240.60
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.0
6"	150	0.00	0.00	0.00	100.00	100.0
3"	75	0.00	0.00	0.00	100.00	100.0
2"	50	0.00	(*) 0.00	0.00	100.00	100.0
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.0
1"	25	0.00	0.00	0.00	100.00	100.0
3/4"	19	0.00	0.00	0.00	100.00	100.0
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100.0
3/8"	9.5	0.00	0.00	0.00	100.00	100.0
#4	4.75	0.25	0.10	0.10	99.90	99.9
#10	2	0.72	0.30	0.40	99.60	99.6
#20	0.85	3.00	(**) 1.25	1.65	98.35	98.3
#40	0.425	11.83	4.92	6.57	93.43	93.4
#60	0.25	28.25	11.74	18.31	81.69	81.7
#100	0.15	44.71	18.58	36.89	63.11	63.1
#140	0.106	29.46	12.24	49.14	50.86	50.9
#200	0.075	25.54	10.62	59.75	40.25	40.2
Pan	-	96.84	40.25	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-3
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	36.0-40.0
Project No.:	2020-002-001	Sample No.:	SpT-19/20
Lab ID:	2020-002-001-057	Soil Color:	Brown

Elapsed Time (min)	Reading mm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	38.5	22.4	5.75	9.9	0.0415	73.2	29.5
2	33.5	22.4	5.75	10.8	0.0306	62.0	25.0
4	24.0	22.4	5.75	12.5	0.0233	40.8	16.4
15	18.5	22.4	5.75	13.5	0.0125	28.5	11.5
30	14.5	22.4	5.75	14.2	0.0091	19.6	7.9
60	12.0	22.6	5.67	14.6	0.0065	14.1	5.7
250	8.5	23.3	5.41	15.3	0.0032	6.9	2.8
1440	7.5	23.1	5.48	15.4	0.0014	4.5	1.8

Soil Specimen Data

Tare No.:	686	Percent Finer than # 200:	40.25
Wt. of Tare & Dry Material (g):	142.82		
Weight of Tare (g):	93.59	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	44.23		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 1402
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

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ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-057

Boring No.: JB2-19-3
Depth (ft): 36.0-40.0
Sample No.: SpT-19/20
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	39
Wt. of Tare & Wet Sample (g)	43.30
Wt. of Tare & Dry Sample (g)	38.03
Weight of Tare (g)	8.46
Weight of Water (g)	5.27
Weight of Dry Sample (g)	29.57

Water Content (%)	17.8

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/15/20	Checked By	JLK	Date	1/16/20

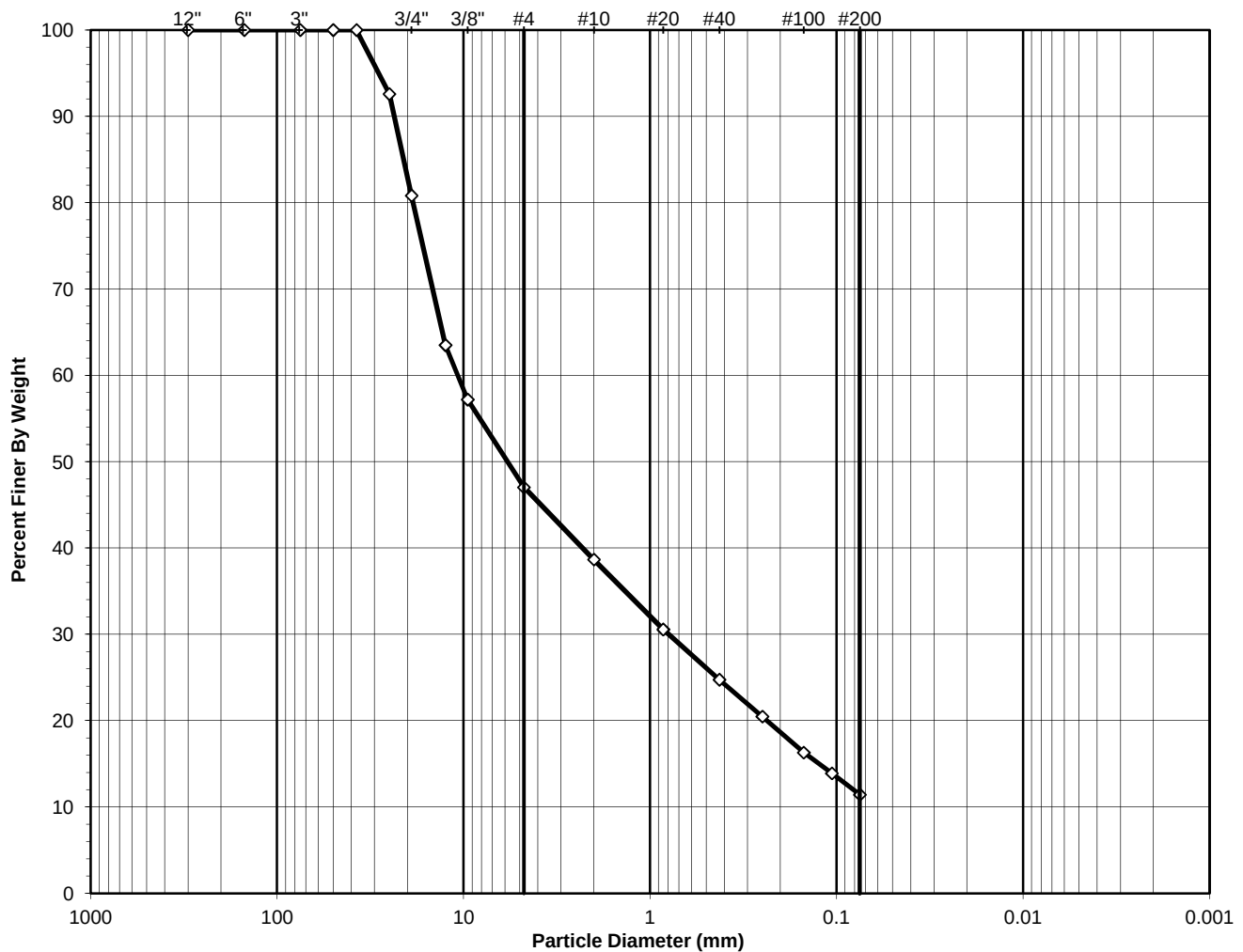
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-058

Boring No.: JB2-19-3
 Depth (ft): 44.0-48.0
 Sample No.: SpT-23/24
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
GW-GM, TESTED

D60 = 10.74 D50 = 5.82

D30 = 0.79 CU = 206.77

USCS Classification:
WELL-GRADED GRAVEL WITH SILT AND SAND
(NON-PLASTIC FINES)

D10 = 0.052

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-058

Boring No.: JB2-19-3
Depth (ft): 44.0-48.0
Sample No.: SpT-23/24
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1435	Tare No.:	NA	Tare No.:	1435	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	778.65	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	778.65	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	745.92	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	745.92	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.23	Weight of Tare (g):	NA	Weight of Tare (g):	145.23	Weight of Tare (g):	NA
Weight of Water (g):	32.73	Weight of Water (g):	NA	Weight of Water (g):	32.73	Weight of Water (g):	NA
Weight of Dry Soil (g):	600.69	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	600.69	Weight of Dry Soil (g):	NA
Moisture Content (%):	5.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	600.69	Total Dry Weight of Sample (g):	600.69	Dry Weight of Sample (g):	600.69	Total Dry Weight of Sample (g):	600.69
Tare No. (Sub-Specimen)	1435	Wet Weight of +3/4" Sample (g):	121.49	Tare No. (Sub-Specimen)	1435	Wet Weight of +3/4" Sample (g):	121.49
Wt. of Tare & Wet Sub-Specimen (g):	778.65	Dry Weight of + 3/4" Sample (g):	115.21	Wt. of Tare & Wet Sub-Specimen (g):	778.65	Dry Weight of + 3/4" Sample (g):	115.21
Weight of Tare (g):	145.23	Dry Weight of - 3/4" Sample (g):	485.48	Weight of Tare (g):	145.23	Dry Weight of - 3/4" Sample (g):	485.48
Sub-Specimen Wet Weight (g):	633.42	Dry Weight -3/4" +3/8" Sample (g):	141.94	Sub-Specimen Wet Weight (g):	633.42	Dry Weight -3/4" +3/8" Sample (g):	141.94
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	370.76	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	370.76
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	44.60	7.42	7.42	92.58	93
3/4"	19	70.61	11.75	19.18	80.82	81
1/2"	12.5	104.07	17.33	36.50	63.50	63
3/8"	9.5	37.87	6.30	42.81	57.19	57
#4	4.75	61.03	10.16	52.97	47.03	47
#10	2	50.25	8.37	61.33	38.67	39
#20	0.85	48.63	(**) 8.10	69.43	30.57	31
#40	0.425	34.95	5.82	75.25	24.75	25
#60	0.25	25.65	4.27	79.52	20.48	20
#100	0.15	25.08	4.18	83.69	16.31	16
#140	0.106	14.43	2.40	86.10	13.90	14
#200	0.075	14.82	2.47	88.56	11.44	11
Pan	-	68.70	11.44	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-058

Boring No.: JB2-19-3
Depth (ft): 44.0-48.0
Sample No.: SpT-23/24
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	43
Wt. of Tare & Wet Sample (g)	53.16
Wt. of Tare & Dry Sample (g)	52.24
Weight of Tare (g)	8.47
Weight of Water (g)	0.92
Weight of Dry Sample (g)	43.77

Water Content (%) **2.1**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/15/20* *Checked By* *JLK* *Date* *1/16/20*

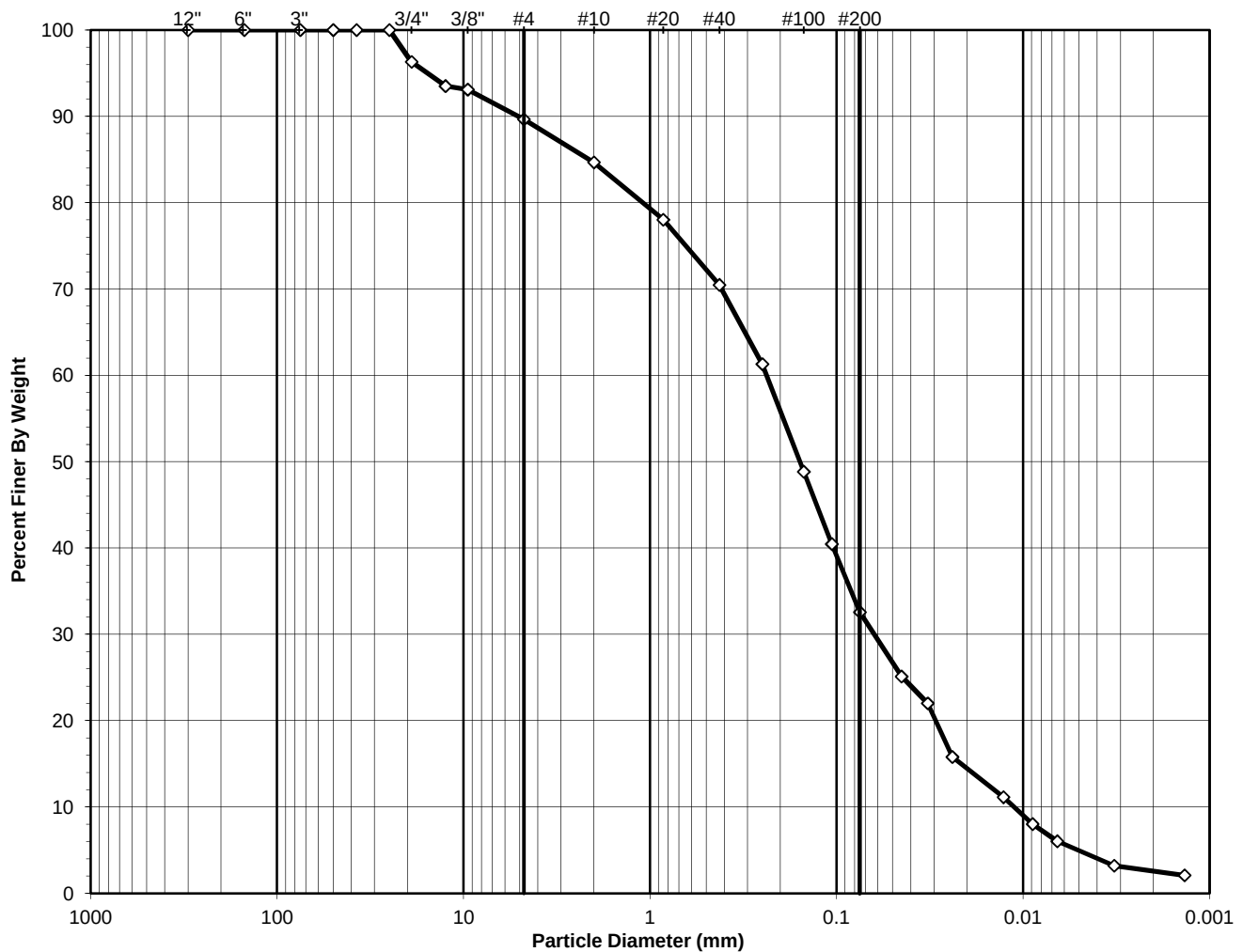
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-059

Boring No.: JB2-19-4
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.16

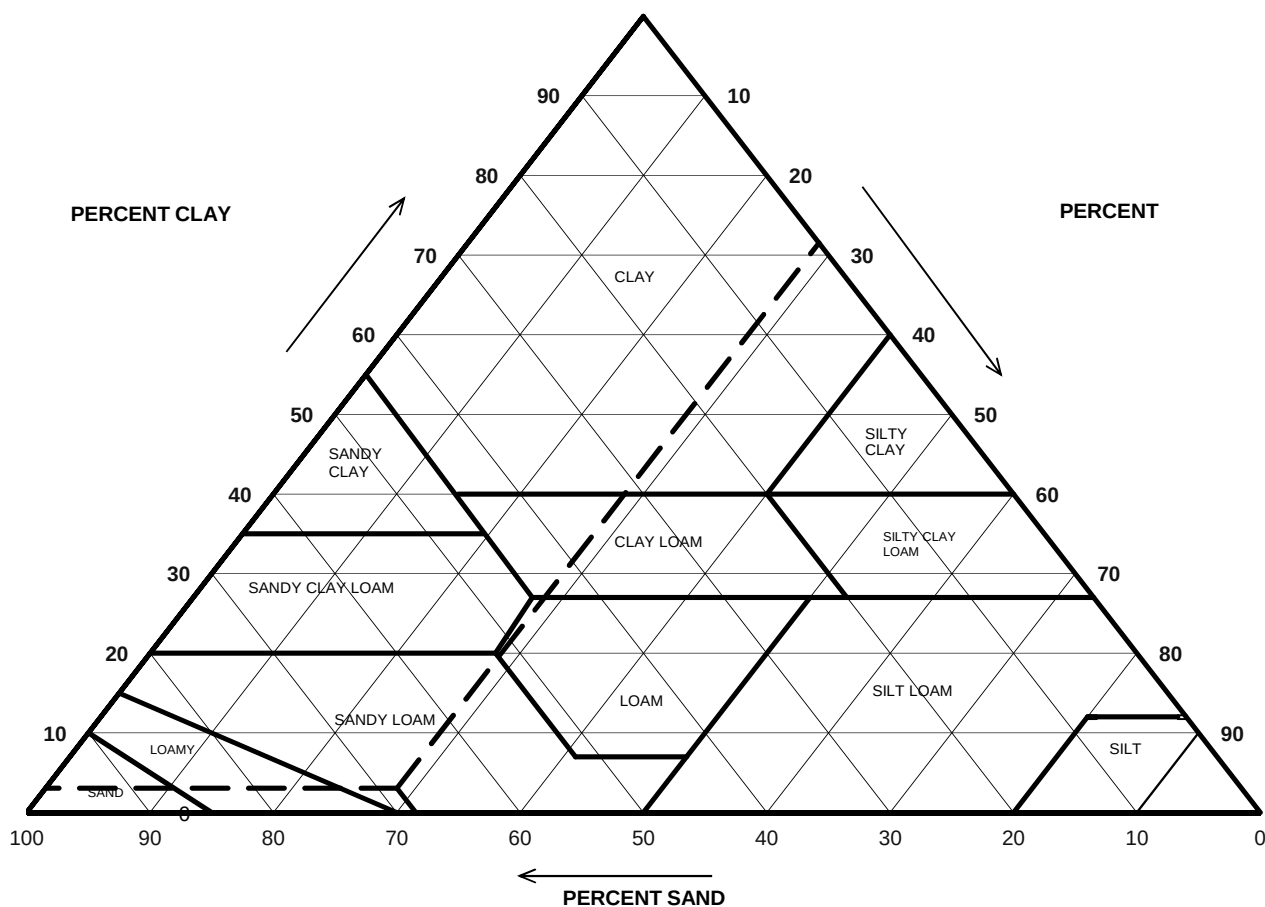
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-059

Boring No.: JB2-19-4
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	15.33	
2	84.67	Sand	57.97	68.47
0.05	26.70	Silt	24.12	28.49
0.002	2.58	Clay	2.58	3.05

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-059

Boring No.: JB2-19-4
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1462	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	517.00	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	484.42	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.56	Weight of Tare (g):	NA
Weight of Water (g):	32.58	Weight of Water (g):	NA
Weight of Dry Soil (g):	336.86	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.7	Moisture Content (%):	0.0
Dry Weight of Sample (g):	336.86	Total Dry Weight of Sample (g):	336.86
Tare No. (Sub-Specimen)	1462	Wet Weight of +3/4" Sample (g):	13.62
Wt. of Tare & Wet Sub-Specimen (g):	517.00	Dry Weight of + 3/4" Sample (g):	12.42
Weight of Tare (g):	147.56	Dry Weight of - 3/4" Sample (g):	324.44
Sub-Specimen Wet Weight (g):	369.44	Dry Weight -3/4" +3/8" Sample (g):	10.81
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	314.03
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	12.42	3.69	3.69	96.31	96
1/2"	12.5	9.46	(**) 2.81	6.50	93.50	94
3/8"	9.5	1.35	0.40	6.90	93.10	93
#4	4.75	11.62	3.45	10.35	89.65	90
#10	2	16.79	4.98	15.33	84.67	85
#20	0.85	22.36	(**) 6.64	21.97	78.03	78
#40	0.425	25.45	7.56	29.52	70.48	70
#60	0.25	30.93	9.18	38.70	61.30	61
#100	0.15	41.94	12.45	51.15	48.85	49
#140	0.106	28.23	8.38	59.54	40.46	40
#200	0.075	26.57	7.89	67.42	32.58	33
Pan	-	109.74	32.58	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-4
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	2.0-6.0
Project No.:	2020-002-001	Sample No.:	SpT-2/3
Lab ID:	2020-002-001-059	Soil Color:	Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	30.0	22.4	5.75	11.5	0.0448	77.1	25.1
2	27.0	22.4	5.75	12.1	0.0324	67.6	22.0
4	21.0	22.4	5.75	13.2	0.0239	48.5	15.8
15	16.5	22.4	5.75	14.0	0.0127	34.2	11.1
32	13.5	22.4	5.75	14.5	0.0089	24.7	8.0
60	11.5	22.6	5.67	14.9	0.0066	18.5	6.0
250	8.5	23.3	5.41	15.4	0.0032	9.8	3.2
1440	7.5	23.1	5.48	15.6	0.0014	6.4	2.1

Soil Specimen Data

Tare No.:	2324	Percent Finer than # 200:	32.58
Wt. of Tare & Dry Material (g):	132.52		
Weight of Tare (g):	96.42	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	31.10		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 206
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

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ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-059

Boring No.: JB2-19-4
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	49
Wt. of Tare & Wet Sample (g)	34.17
Wt. of Tare & Dry Sample (g)	31.95
Weight of Tare (g)	8.37
Weight of Water (g)	2.22
Weight of Dry Sample (g)	23.58

Water Content (%) **9.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/15/20* *Checked By* *JLK* *Date* *1/16/20*

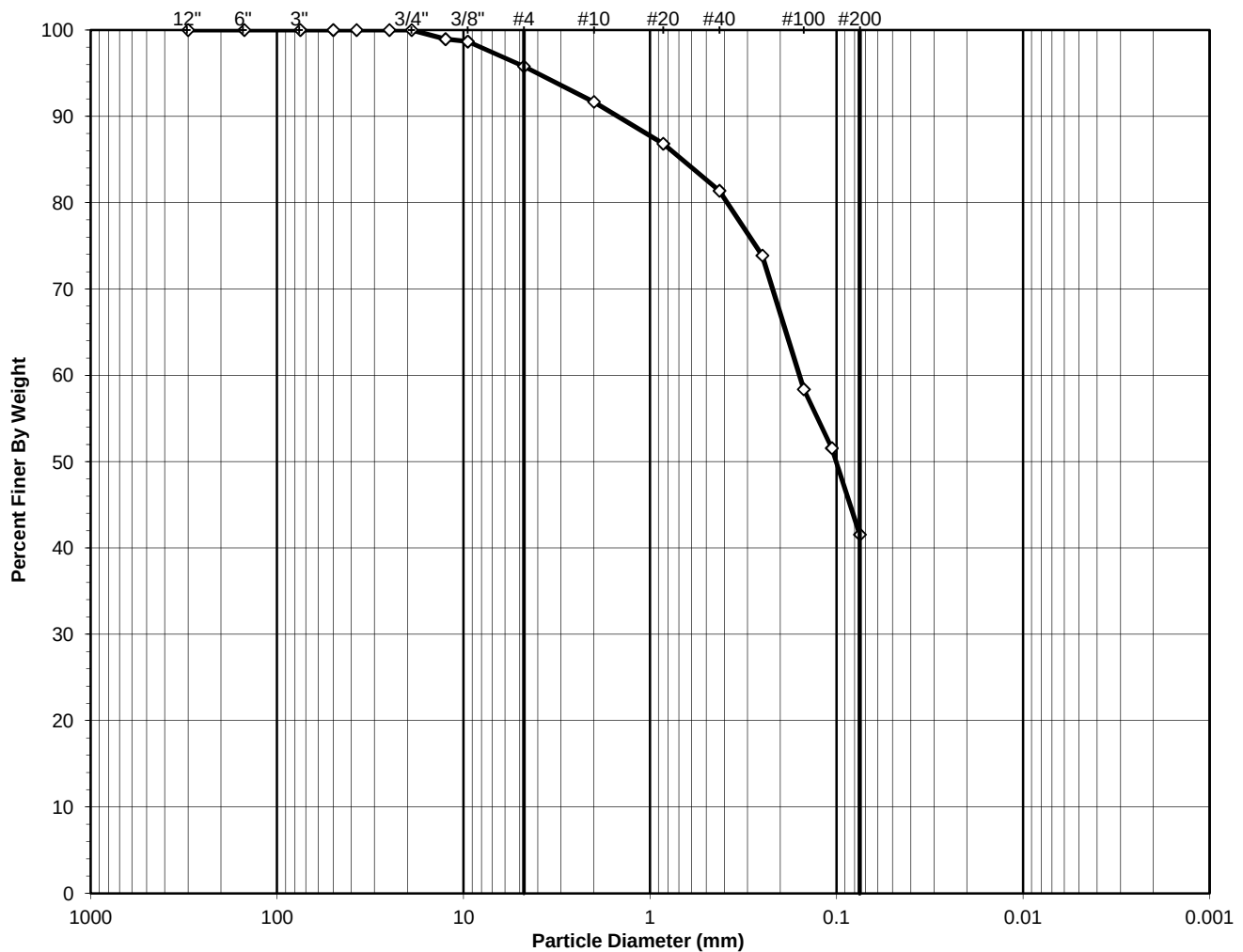
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-060

Boring No.: JB2-19-4
 Depth (ft): 12.0-18.0
 Sample No.: SpT-6/7/8
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.10

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-060

Boring No.: JB2-19-4
Depth (ft): 12.0-18.0
Sample No.: SpT-6/7/8
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1616	Tare No.:	NA	Tare No.:	1616	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	697.69	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	697.69	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	647.64	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	647.64	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	142.40	Weight of Tare (g):	NA	Weight of Tare (g):	142.40	Weight of Tare (g):	NA
Weight of Water (g):	50.05	Weight of Water (g):	NA	Weight of Water (g):	50.05	Weight of Water (g):	NA
Weight of Dry Soil (g):	505.24	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	505.24	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.9	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	505.24	Total Dry Weight of Sample (g):	505.24	Dry Weight of Sample (g):	505.24	Total Dry Weight of Sample (g):	505.24
Tare No. (Sub-Specimen)	1616	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1616	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	697.69	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	697.69	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	142.40	Dry Weight of - 3/4" Sample (g):	505.24	Weight of Tare (g):	142.40	Dry Weight of - 3/4" Sample (g):	505.24
Sub-Specimen Wet Weight (g):	555.29	Dry Weight -3/4" +3/8" Sample (g):	6.75	Sub-Specimen Wet Weight (g):	555.29	Dry Weight -3/4" +3/8" Sample (g):	6.75
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	498.49	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	498.49
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	5.33	(**) 1.05	1.05	98.95	99
3/8"	9.5	1.42	0.28	1.34	98.66	99
#4	4.75	14.54	2.88	4.21	95.79	96
#10	2	20.76	4.11	8.32	91.68	92
#20	0.85	24.47	(**) 4.84	13.17	86.83	87
#40	0.425	27.53	5.45	18.61	81.39	81
#60	0.25	37.93	7.51	26.12	73.88	74
#100	0.15	78.25	15.49	41.61	58.39	58
#140	0.106	34.44	6.82	48.43	51.57	52
#200	0.075	50.55	10.01	58.43	41.57	42
Pan	-	210.02	41.57	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By HL Date 1/16/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-060

Boring No.: JB2-19-4
Depth (ft): 12.0-18.0
Sample No.: SpT-6/7/8
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	28
Wt. of Tare & Wet Sample (g)	49.92
Wt. of Tare & Dry Sample (g)	46.09
Weight of Tare (g)	8.38
Weight of Water (g)	3.83
Weight of Dry Sample (g)	37.71

Water Content (%)	10.2

NON - PLASTIC MATERIAL

<i>Tested By</i>	<i>FS</i>	<i>Date</i>	<i>1/15/20</i>	<i>Checked By</i>	<i>JLK</i>	<i>Date</i>	<i>1/16/20</i>

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-4
Client Reference:	NRCS- Jewell Brook 172719-17	Depth (ft):	26.0-30.0
Project No.:	2020-002-001	Sample No.:	SpT-13/14
Lab ID:	2020-002-001-061	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	746.67	748.23
Temperature (°C):	24.6	24.6
Weight of Pycnometer & Water (g):	684.03	684.58
Tare Number:	672	687
Weight of Tare & Dry Soil (g):	195.8	195.11
Weight of Tare (g):	94.93	94.95
Weight of Dry Soil (g):	100.87	100.16
Specific Gravity of Soil @ Measured Temperature:	2.638	2.743
Specific Gravity of Water @ Measured Temperature:	0.99715	0.99715
Conversion Factor for Measured Temperature:	0.99895	0.99895
Specific Gravity @ 20° Celsius:	2.641	2.746

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/17/20 Checked By JLK Date 1/20/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

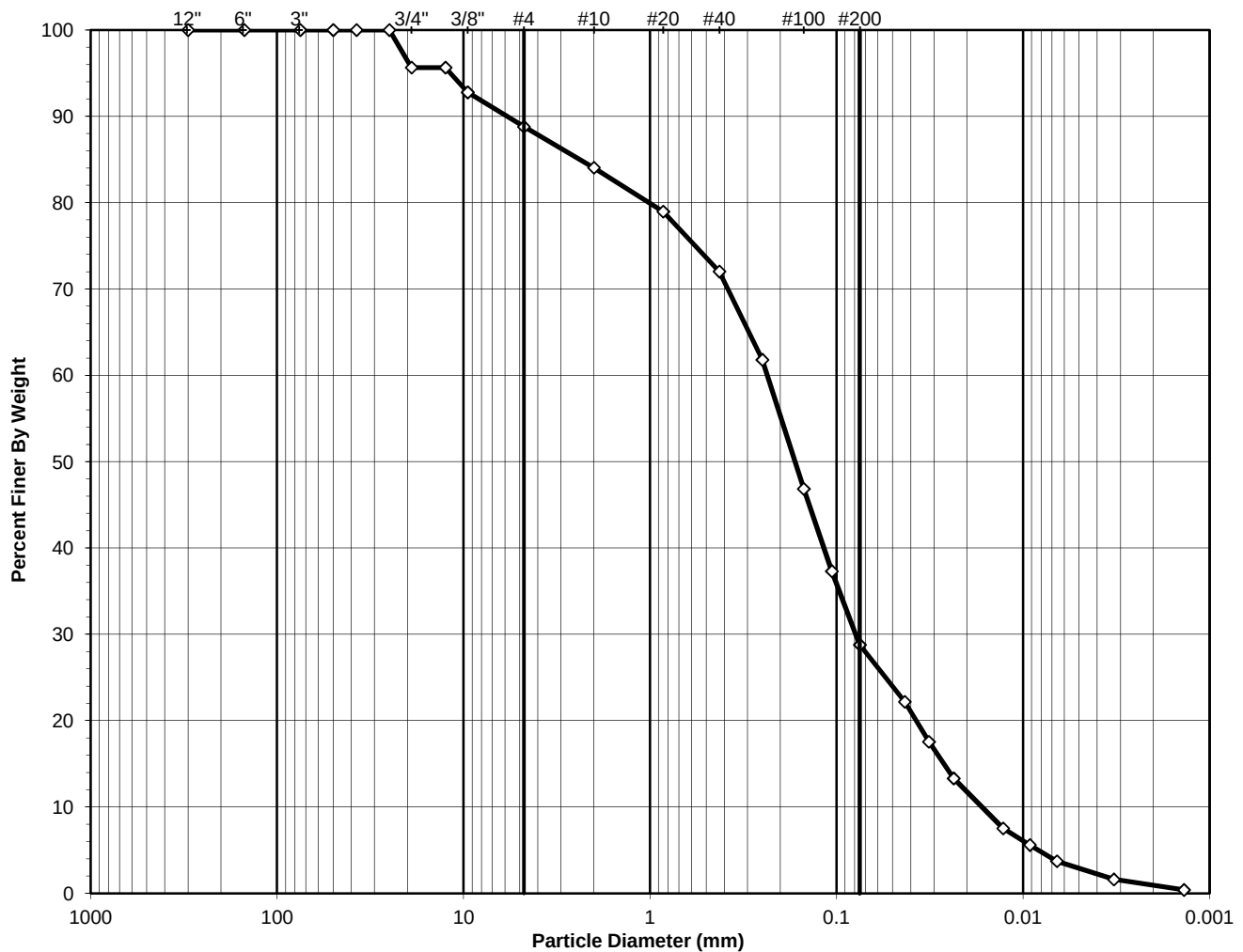
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-062

Boring No.: JB2-19-4
 Depth (ft): 38.0-44.0
 Sample No.: SpT-19/20/21
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.17

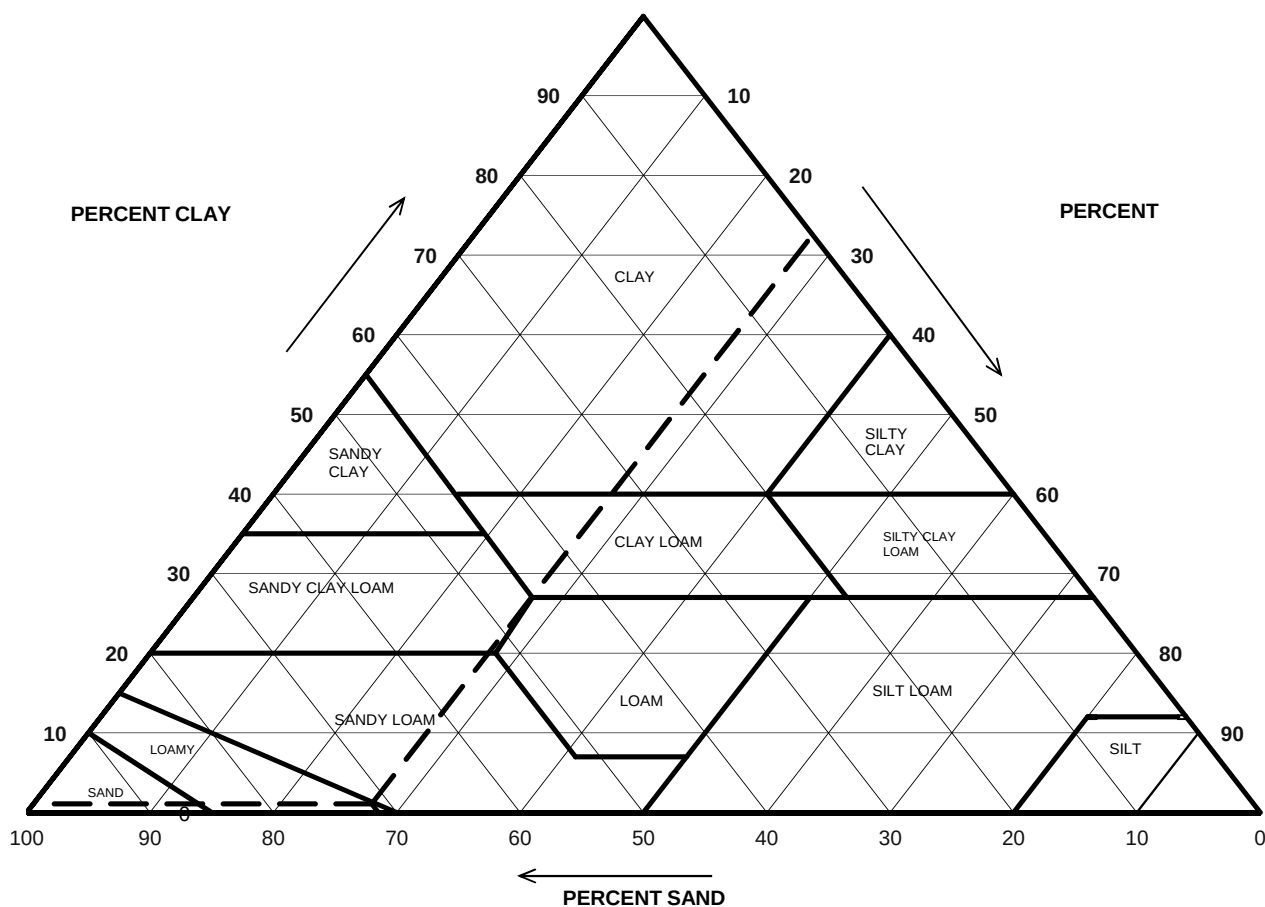
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-062

Boring No.: JB2-19-4
 Depth (ft): 38.0-44.0
 Sample No.: SpT-19/20/21
 Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	15.95	
2	84.05	Sand	60.09	71.49
0.05	23.96	Silt	23.03	27.41
0.002	0.93	Clay	0.93	1.10

USDA Classification: **LOAMY SAND**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-062

Boring No.: JB2-19-4
 Depth (ft): 38.0-44.0
 Sample No.: SpT-19/20/21
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1491	Tare No.:	NA	Tare No.:	1491	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	538.96	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	538.96	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	501.66	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	501.66	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	142.29	Weight of Tare (g):	NA	Weight of Tare (g):	142.29	Weight of Tare (g):	NA
Weight of Water (g):	37.30	Weight of Water (g):	NA	Weight of Water (g):	37.30	Weight of Water (g):	NA
Weight of Dry Soil (g):	359.37	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	359.37	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	359.37	Total Dry Weight of Sample (g):	359.37	Dry Weight of Sample (g):	359.37	Total Dry Weight of Sample (g):	359.37
Tare No. (Sub-Specimen)	1491	Wet Weight of +3/4" Sample (g):	17.26	Tare No. (Sub-Specimen)	1491	Wet Weight of +3/4" Sample (g):	17.26
Wt. of Tare & Wet Sub-Specimen (g):	538.96	Dry Weight of + 3/4" Sample (g):	15.64	Wt. of Tare & Wet Sub-Specimen (g):	538.96	Dry Weight of + 3/4" Sample (g):	15.64
Weight of Tare (g):	142.29	Dry Weight of - 3/4" Sample (g):	343.73	Weight of Tare (g):	142.29	Dry Weight of - 3/4" Sample (g):	343.73
Sub-Specimen Wet Weight (g):	396.67	Dry Weight -3/4" +3/8" Sample (g):	10.31	Sub-Specimen Wet Weight (g):	396.67	Dry Weight -3/4" +3/8" Sample (g):	10.31
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	333.87	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	333.87
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	15.64	4.35	4.35	95.65	96
1/2"	12.5	0.00	(**) 0.00	4.35	95.65	96
3/8"	9.5	10.31	2.87	7.22	92.78	93
#4	4.75	14.29	3.98	11.20	88.80	89
#10	2	17.08	4.75	15.95	84.05	84
#20	0.85	18.28	(**) 5.09	21.04	78.96	79
#40	0.425	24.92	6.93	27.97	72.03	72
#60	0.25	36.74	10.22	38.19	61.81	62
#100	0.15	53.72	14.95	53.14	46.86	47
#140	0.106	34.28	9.54	62.68	37.32	37
#200	0.075	30.65	8.53	71.21	28.79	29
Pan	-	103.46	28.79	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-4
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	38.0-44.0
Project No.:	2020-002-001	Sample No.:	SpT-19/20/21
Lab ID:	2020-002-001-062	Soil Color:	Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	34.5	22.4	5.75	10.6	0.0431	77.1	22.2
2	28.5	22.4	5.75	11.7	0.0320	61.0	17.6
4	23.0	22.4	5.75	12.7	0.0236	46.3	13.3
15	15.5	22.4	5.75	14.0	0.0128	26.1	7.5
30	13.0	22.4	5.75	14.5	0.0092	19.4	5.6
60	10.5	22.6	5.67	14.9	0.0066	12.9	3.7
250	7.5	23.3	5.41	15.4	0.0033	5.6	1.6
1440	6.0	23.1	5.48	15.7	0.0014	1.4	0.4

Soil Specimen Data

Tare No.:	968	Percent Finer than # 200:	28.79
Wt. of Tare & Dry Material (g):	140.16		
Weight of Tare (g):	98.19	Specific Gravity:	2.69 Measured
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	36.97		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 1402
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/20/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-062

Boring No.: JB2-19-4
Depth (ft): 38.0-44.0
Sample No.: SpT-19/20/21
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	36
Wt. of Tare & Wet Sample (g)	34.73
Wt. of Tare & Dry Sample (g)	32.17
Weight of Tare (g)	8.47
Weight of Water (g)	2.56
Weight of Dry Sample (g)	23.70

Water Content (%)	10.8

NON - PLASTIC MATERIAL

<i>Tested By</i>	<i>FS</i>	<i>Date</i>	<i>1/17/20</i>	<i>Checked By</i>	<i>JLK</i>	<i>Date</i>	<i>1/17/20</i>

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-4
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	38.0-44.0
Project No.:	2020-002-001	Sample No.:	SpT-19/20/21
Lab ID:	2020-002-001-062	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	747.87	748.53
Temperature (°C):	23.6	23.8
Weight of Pycnometer & Water (g):	684.15	684.68
Tare Number:	690	2343
Weight of Tare & Dry Soil (g):	196.62	192.47
Weight of Tare (g):	93.81	91.97
Weight of Dry Soil (g):	102.81	100.50
Specific Gravity of Soil @ Measured Temperature:	2.630	2.742
Specific Gravity of Water @ Measured Temperature:	0.99740	0.99735
Conversion Factor for Measured Temperature:	0.99919	0.99914
Specific Gravity @ 20° Celsius:	2.632	2.745

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/21/20 Checked By BRB Date 1/22/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

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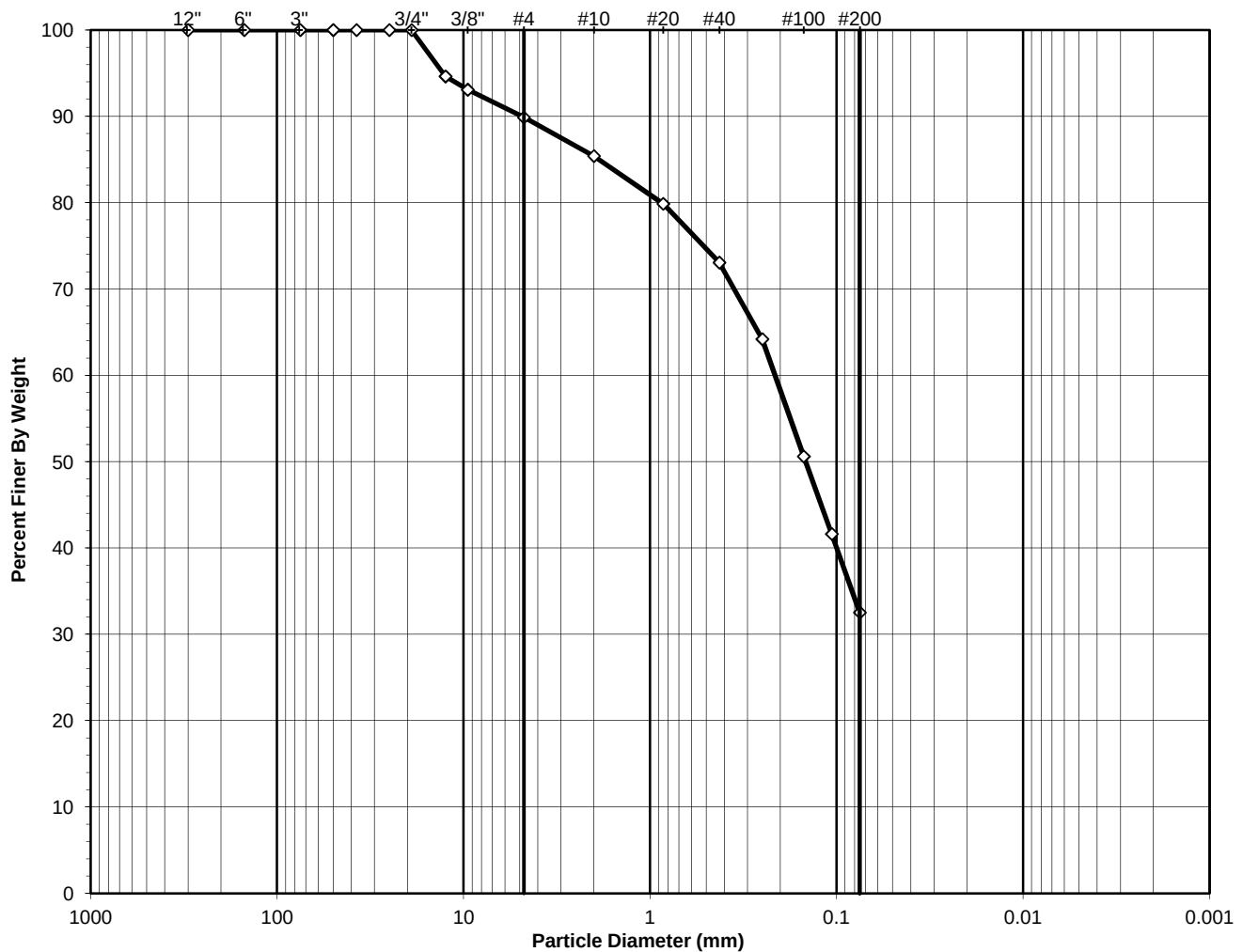
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-063

Boring No.: JB2-19-4
 Depth (ft): 46.0-50.0
 Sample No.: SpT-23/24
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.15

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-063

Boring No.: JB2-19-4
 Depth (ft): 46.0-50.0
 Sample No.: SpT-23/24
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1418	Tare No.:	NA	Tare No.:	1418	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	523.05	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	523.05	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	480.55	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	480.55	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.72	Weight of Tare (g):	NA	Weight of Tare (g):	144.72	Weight of Tare (g):	NA
Weight of Water (g):	42.50	Weight of Water (g):	NA	Weight of Water (g):	42.50	Weight of Water (g):	NA
Weight of Dry Soil (g):	335.83	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	335.83	Weight of Dry Soil (g):	NA
Moisture Content (%):	12.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	335.83	Total Dry Weight of Sample (g):	335.83	Dry Weight of Sample (g):	335.83	Total Dry Weight of Sample (g):	335.83
Tare No. (Sub-Specimen)	1418	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1418	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	523.05	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	523.05	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	144.72	Dry Weight of - 3/4" Sample (g):	335.83	Weight of Tare (g):	144.72	Dry Weight of - 3/4" Sample (g):	335.83
Sub-Specimen Wet Weight (g):	378.33	Dry Weight -3/4" +3/8" Sample (g):	23.23	Sub-Specimen Wet Weight (g):	378.33	Dry Weight -3/4" +3/8" Sample (g):	23.23
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	312.60	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	312.60
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	18.03	(**)	5.37	94.63	95
3/8"	9.5	5.20	1.55	6.92	93.08	93
#4	4.75	10.78	3.21	10.13	89.87	90
#10	2	15.00	4.47	14.59	85.41	85
#20	0.85	18.58	(**)	20.13	79.87	80
#40	0.425	22.87	6.81	26.94	73.06	73
#60	0.25	29.80	8.87	35.81	64.19	64
#100	0.15	45.61	13.58	49.39	50.61	51
#140	0.106	30.15	8.98	58.37	41.63	42
#200	0.075	30.55	9.10	67.47	32.53	33
Pan	-	109.26	32.53	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-063

Boring No.: JB2-19-4
Depth (ft): 46.0-50.0
Sample No.: SpT-23/24
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	12
Wt. of Tare & Wet Sample (g)	35.50
Wt. of Tare & Dry Sample (g)	32.30
Weight of Tare (g)	8.46
Weight of Water (g)	3.20
Weight of Dry Sample (g)	23.84

Water Content (%) **13.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/17/20* *Checked By* *JLK* *Date* *1/17/20*

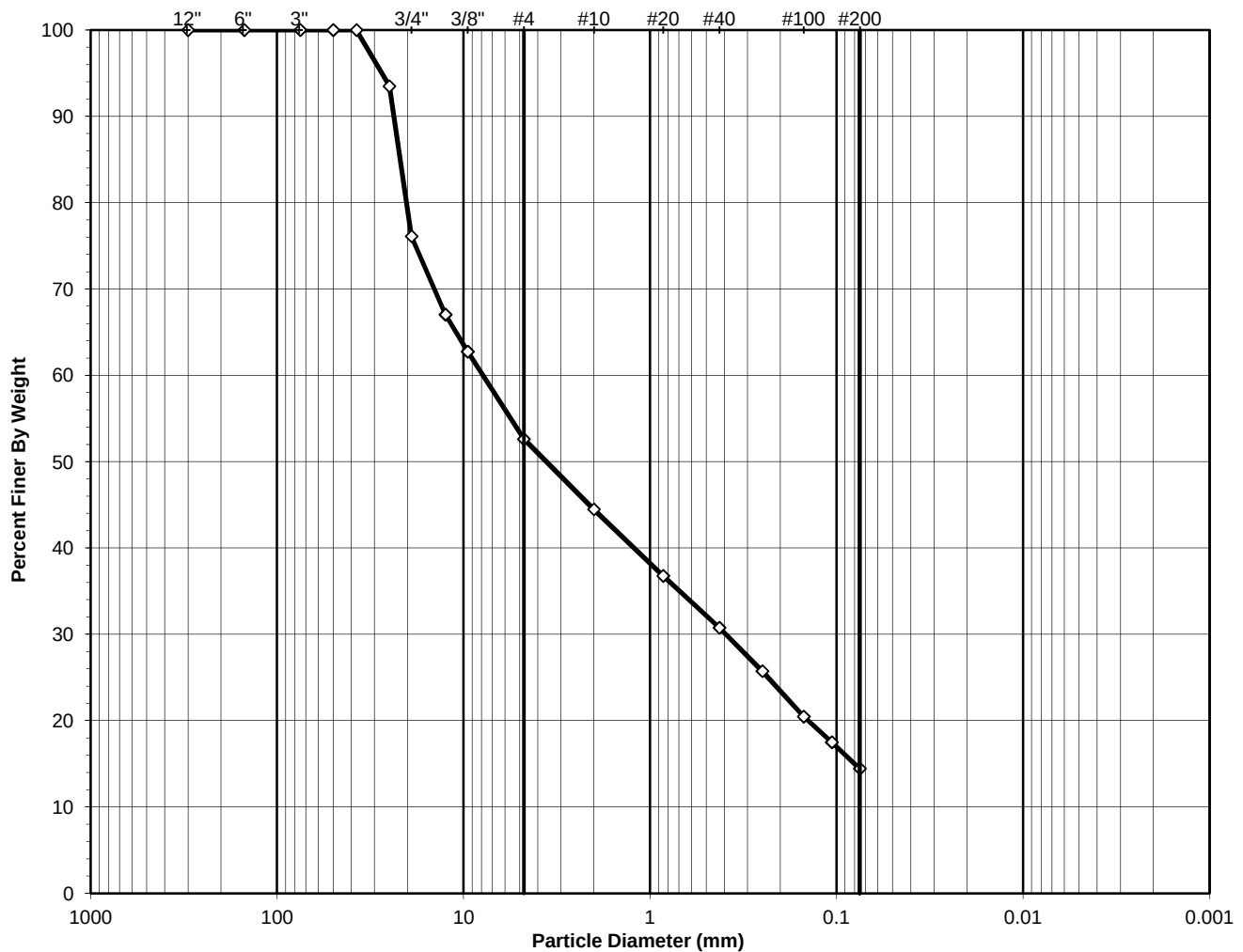
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-065

Boring No.: JB2-19-4
 Depth (ft): 54.0-57.0
 Sample No.: SpT-27/28
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
gm, ASSUMED

D50 = 3.60

USCS Classification:
SILTY GRAVEL WITH SAND

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-065

Boring No.: JB2-19-4
Depth (ft): 54.0-57.0
Sample No.: SpT-27/28
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1443	Tare No.:	NA	Tare No.:	1443	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	993.70	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	993.70	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	957.91	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	957.91	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.40	Weight of Tare (g):	NA	Weight of Tare (g):	144.40	Weight of Tare (g):	NA
Weight of Water (g):	35.79	Weight of Water (g):	NA	Weight of Water (g):	35.79	Weight of Water (g):	NA
Weight of Dry Soil (g):	813.51	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	813.51	Weight of Dry Soil (g):	NA
Moisture Content (%):	4.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	813.51	Total Dry Weight of Sample (g):	813.51	Dry Weight of Sample (g):	813.51	Total Dry Weight of Sample (g):	813.51
Tare No. (Sub-Specimen)	1443	Wet Weight of +3/4" Sample (g):	202.91	Tare No. (Sub-Specimen)	1443	Wet Weight of +3/4" Sample (g):	202.91
Wt. of Tare & Wet Sub-Specimen (g):	993.70	Dry Weight of + 3/4" Sample (g):	194.36	Wt. of Tare & Wet Sub-Specimen (g):	993.70	Dry Weight of + 3/4" Sample (g):	194.36
Weight of Tare (g):	144.40	Dry Weight of - 3/4" Sample (g):	619.15	Weight of Tare (g):	144.40	Dry Weight of - 3/4" Sample (g):	619.15
Sub-Specimen Wet Weight (g):	849.30	Dry Weight -3/4" +3/8" Sample (g):	108.66	Sub-Specimen Wet Weight (g):	849.30	Dry Weight -3/4" +3/8" Sample (g):	108.66
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	536.45	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	536.45
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	52.90	6.50	6.50	93.50	93
3/4"	19	141.46	17.39	23.89	76.11	76
1/2"	12.5	73.76	(**) 9.07	32.96	67.04	67
3/8"	9.5	34.90	4.29	37.25	62.75	63
#4	4.75	82.46	10.14	47.38	52.62	53
#10	2	66.15	8.13	55.52	44.48	44
#20	0.85	62.69	(**) 7.71	63.22	36.78	37
#40	0.425	48.84	6.00	69.23	30.77	31
#60	0.25	40.93	5.03	74.26	25.74	26
#100	0.15	42.85	5.27	79.52	20.48	20
#140	0.106	24.12	2.96	82.49	17.51	18
#200	0.075	24.89	3.06	85.55	14.45	14
Pan	-	117.56	14.45	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

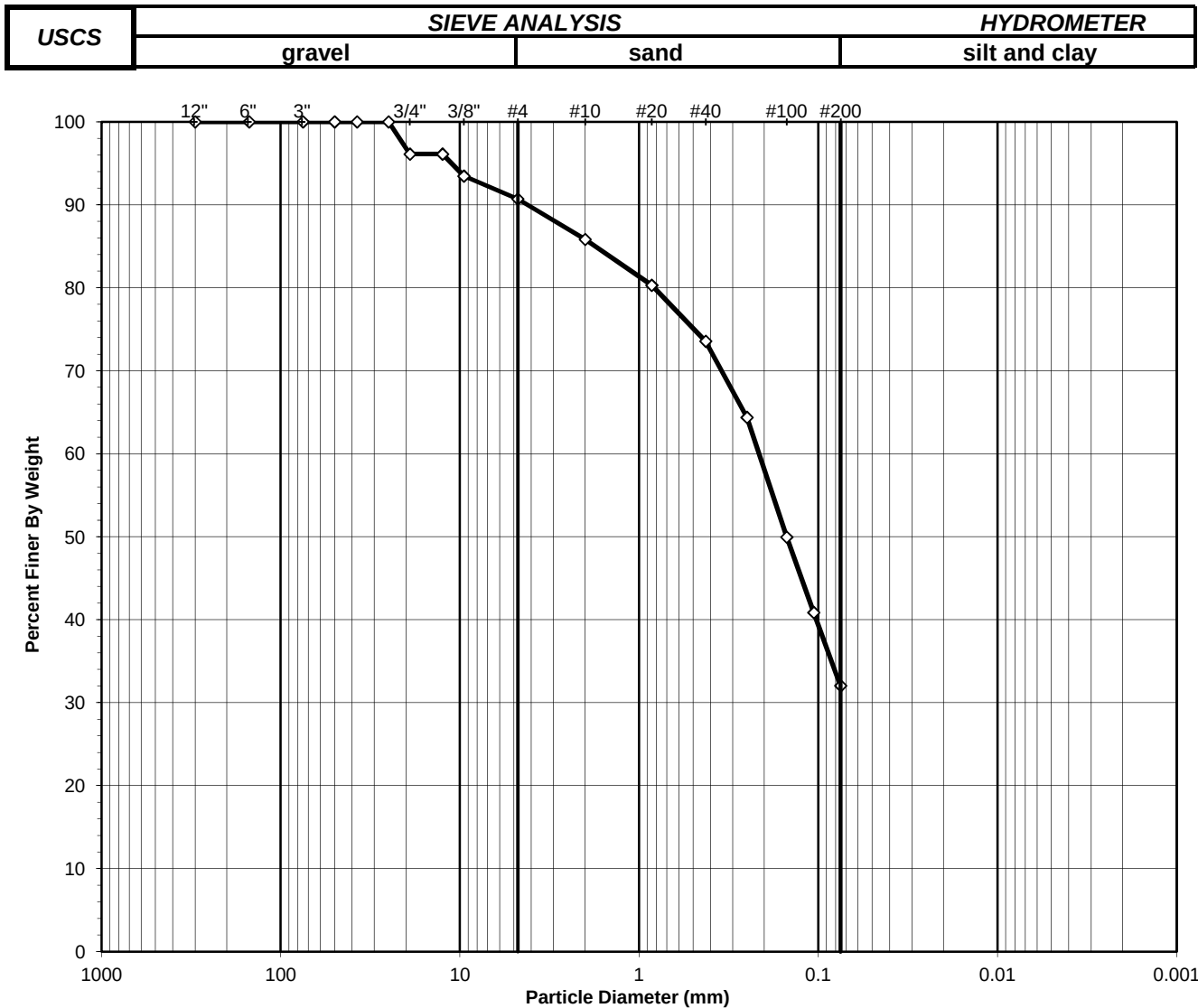
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SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-066

Boring No.: JB2-19-5
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown



USCS Symbol:
SM, TESTED

D50 = 0.15

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-066

Boring No.: JB2-19-5
 Depth (ft): 2.0-6.0
 Sample No.: SpT-2/3
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1552	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	464.45	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	426.19	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.30	Weight of Tare (g):	NA
Weight of Water (g):	38.26	Weight of Water (g):	NA
Weight of Dry Soil (g):	281.89	Weight of Dry Soil (g):	NA
Moisture Content (%):	13.6	Moisture Content (%):	0.0
Dry Weight of Sample (g):	281.89	Total Dry Weight of Sample (g):	281.89
Tare No. (Sub-Specimen)	1552	Wet Weight of +3/4" Sample (g):	12.44
Wt. of Tare & Wet Sub-Specimen (g):	464.45	Dry Weight of + 3/4" Sample (g):	10.95
Weight of Tare (g):	144.30	Dry Weight of - 3/4" Sample (g):	270.94
Sub-Specimen Wet Weight (g):	320.15	Dry Weight -3/4" +3/8" Sample (g):	7.47
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	263.76
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	10.95	3.88	3.88	96.12	96
1/2"	12.5	0.00	(**) 0.00	3.88	96.12	96
3/8"	9.5	7.47	2.65	6.53	93.47	93
#4	4.75	7.80	2.77	9.30	90.70	91
#10	2	13.71	4.86	14.17	85.83	86
#20	0.85	15.59	(**) 5.53	19.70	80.30	80
#40	0.425	19.01	6.74	26.44	73.56	74
#60	0.25	25.87	9.18	35.62	64.38	64
#100	0.15	40.69	14.43	50.05	49.95	50
#140	0.106	25.59	9.08	59.13	40.87	41
#200	0.075	24.90	8.83	67.96	32.04	32
Pan	-	90.31	32.04	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-066

Boring No.: JB2-19-5
Depth (ft): 2.0-6.0
Sample No.: SpT-2/3
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	20
Wt. of Tare & Wet Sample (g)	43.36
Wt. of Tare & Dry Sample (g)	39.94
Weight of Tare (g)	8.44
Weight of Water (g)	3.42
Weight of Dry Sample (g)	31.50

Water Content (%)	10.9

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/16/20	Checked By	JLK	Date	1/17/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-5
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	2.0-6.0
Project No.:	2020-002-001	Sample No.:	SpT-2/3
Lab ID:	2020-002-001-066	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	747.27	748.78
Temperature (°C):	24.1	24.4
Weight of Pycnometer & Water (g):	684.09	684.61
Tare Number:	1920	926
Weight of Tare & Dry Soil (g):	196.68	194.13
Weight of Tare (g):	94.93	93.62
Weight of Dry Soil (g):	101.75	100.51
Specific Gravity of Soil @ Measured Temperature:	2.638	2.766
Specific Gravity of Water @ Measured Temperature:	0.99728	0.99720
Conversion Factor for Measured Temperature:	0.99907	0.99900
Specific Gravity @ 20° Celsius:	2.640	2.769

Average Specific Gravity @ 20° Celsius	2.70

Tested By TO Date 1/21/20 Checked By BRB Date 1/22/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

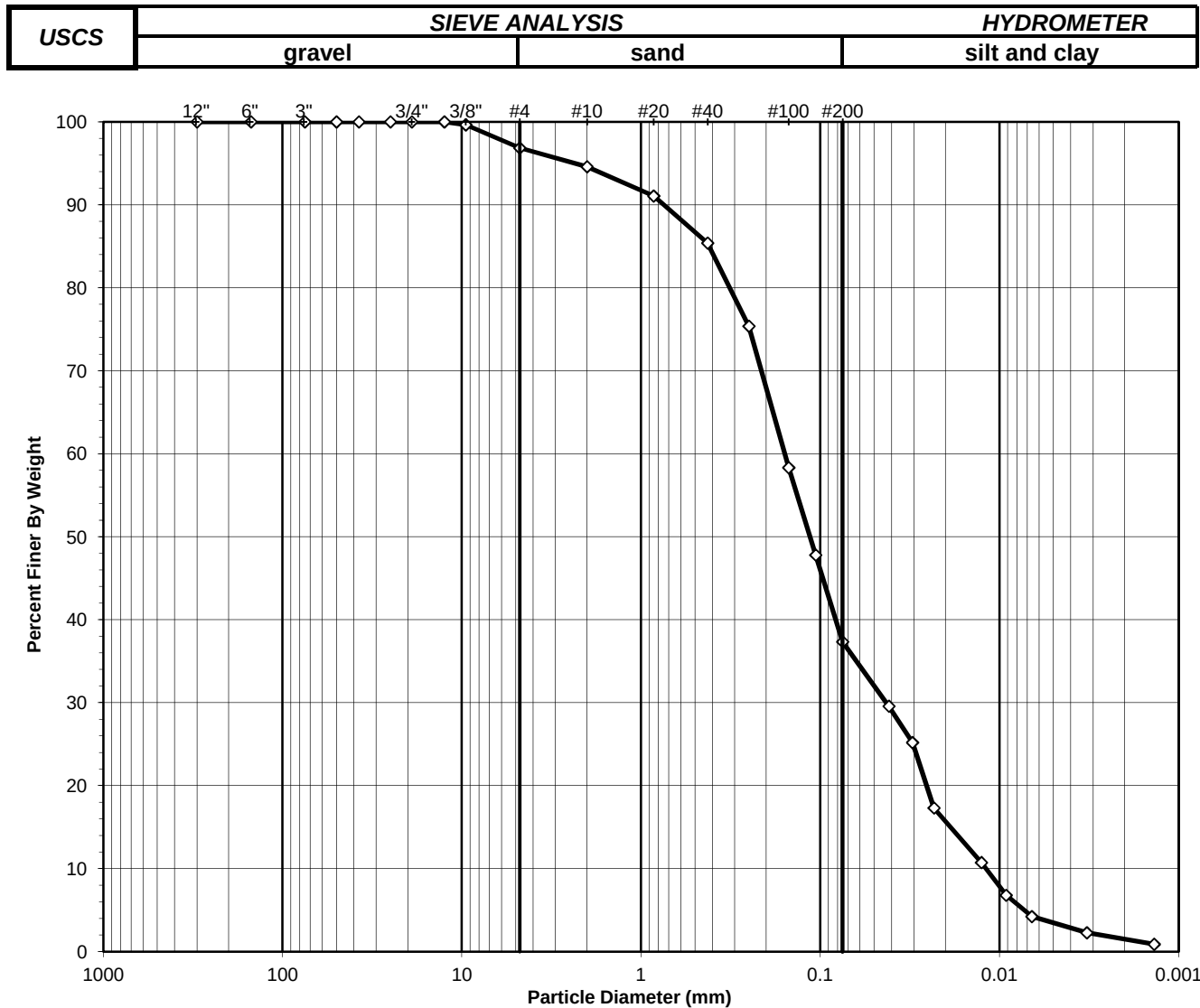
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SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-067

Boring No.: JB2-19-5
 Depth (ft): 14.0-20.0
 Sample No.: SpT-8/9/10
 Soil Color: Brown



USCS Symbol:
SM, TESTED

D50 = 0.11

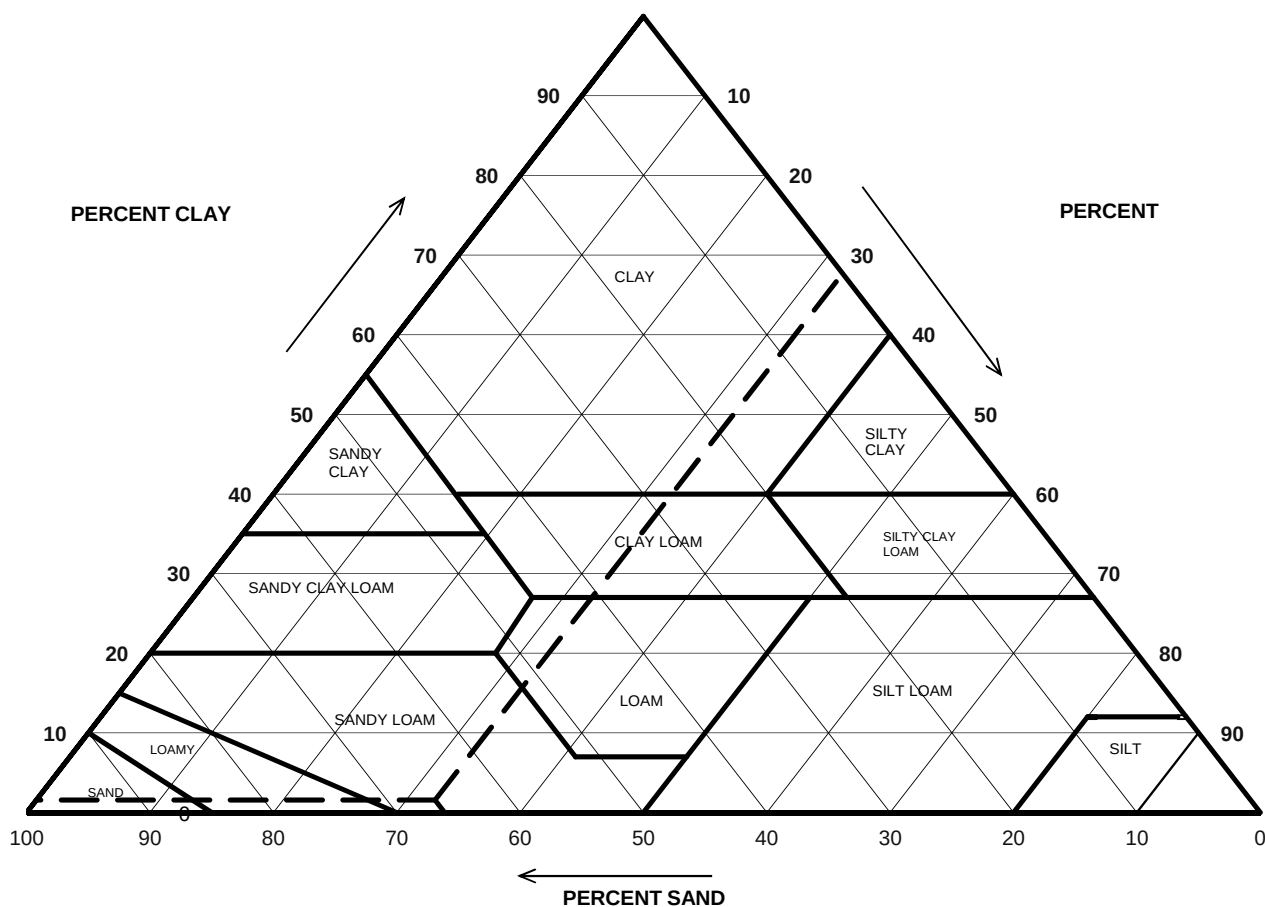
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
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USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-067

Boring No.: JB2-19-5
Depth (ft): 14.0-20.0
Sample No.: SpT-8/9/10
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	5.41	
2	94.59	Sand	62.54	66.12
0.05	32.05	Silt	30.56	32.30
0.002	1.49	Clay	1.49	1.58

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-067

Boring No.: JB2-19-5
 Depth (ft): 14.0-20.0
 Sample No.: SpT-8/9/10
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1446	Tare No.:	NA	Tare No.:	1446	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	710.84	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	710.84	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	640.34	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	640.34	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.54	Weight of Tare (g):	NA	Weight of Tare (g):	144.54	Weight of Tare (g):	NA
Weight of Water (g):	70.50	Weight of Water (g):	NA	Weight of Water (g):	70.50	Weight of Water (g):	NA
Weight of Dry Soil (g):	495.80	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	495.80	Weight of Dry Soil (g):	NA
Moisture Content (%):	14.2	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	495.80	Total Dry Weight of Sample (g):	495.80	Dry Weight of Sample (g):	495.80	Total Dry Weight of Sample (g):	495.80
Tare No. (Sub-Specimen)	1446	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1446	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	710.84	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	710.84	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	144.54	Dry Weight of - 3/4" Sample (g):	495.80	Weight of Tare (g):	144.54	Dry Weight of - 3/4" Sample (g):	495.80
Sub-Specimen Wet Weight (g):	566.30	Dry Weight -3/4" +3/8" Sample (g):	1.78	Sub-Specimen Wet Weight (g):	566.30	Dry Weight -3/4" +3/8" Sample (g):	1.78
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	494.02	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	494.02
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100
3/8"	9.5	1.78	0.36	0.36	99.64	100
#4	4.75	13.82	2.79	3.15	96.85	97
#10	2	11.20	2.26	5.41	94.59	95
#20	0.85	17.48	(**) 3.53	8.93	91.07	91
#40	0.425	28.14	5.68	14.61	85.39	85
#60	0.25	49.69	10.02	24.63	75.37	75
#100	0.15	84.49	17.04	41.67	58.33	58
#140	0.106	52.23	10.53	52.20	47.80	48
#200	0.075	51.80	10.45	62.65	37.35	37
Pan	-	185.17	37.35	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-067

Boring No.: JB2-19-5
 Depth (ft): 14.0-20.0
 Sample No.: SpT-8/9/10
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	39.5	22.4	5.75	9.8	0.0414	79.2	29.6
2	34.5	22.4	5.75	10.7	0.0306	67.5	25.2
4	25.5	22.4	5.75	12.3	0.0232	46.4	17.3
15	18.0	22.4	5.75	13.7	0.0126	28.8	10.7
30	13.5	22.4	5.75	14.5	0.0092	18.2	6.8
60	10.5	22.6	5.67	15.0	0.0066	11.3	4.2
250	8.0	23.3	5.41	15.5	0.0033	6.1	2.3
1440	6.5	23.1	5.48	15.8	0.0014	2.4	0.9

Soil Specimen Data

Tare No.:	644	Percent Finer than # 200:	37.35
Wt. of Tare & Dry Material (g):	145.59		
Weight of Tare (g):	98.45	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	42.14		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 204
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

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ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-067

Boring No.: JB2-19-5
Depth (ft): 14.0-20.0
Sample No.: SpT-8/9/10
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	16
Wt. of Tare & Wet Sample (g)	33.61
Wt. of Tare & Dry Sample (g)	30.59
Weight of Tare (g)	8.30
Weight of Water (g)	3.02
Weight of Dry Sample (g)	22.29

Water Content (%) **13.5**

NON - PLASTIC MATERIAL

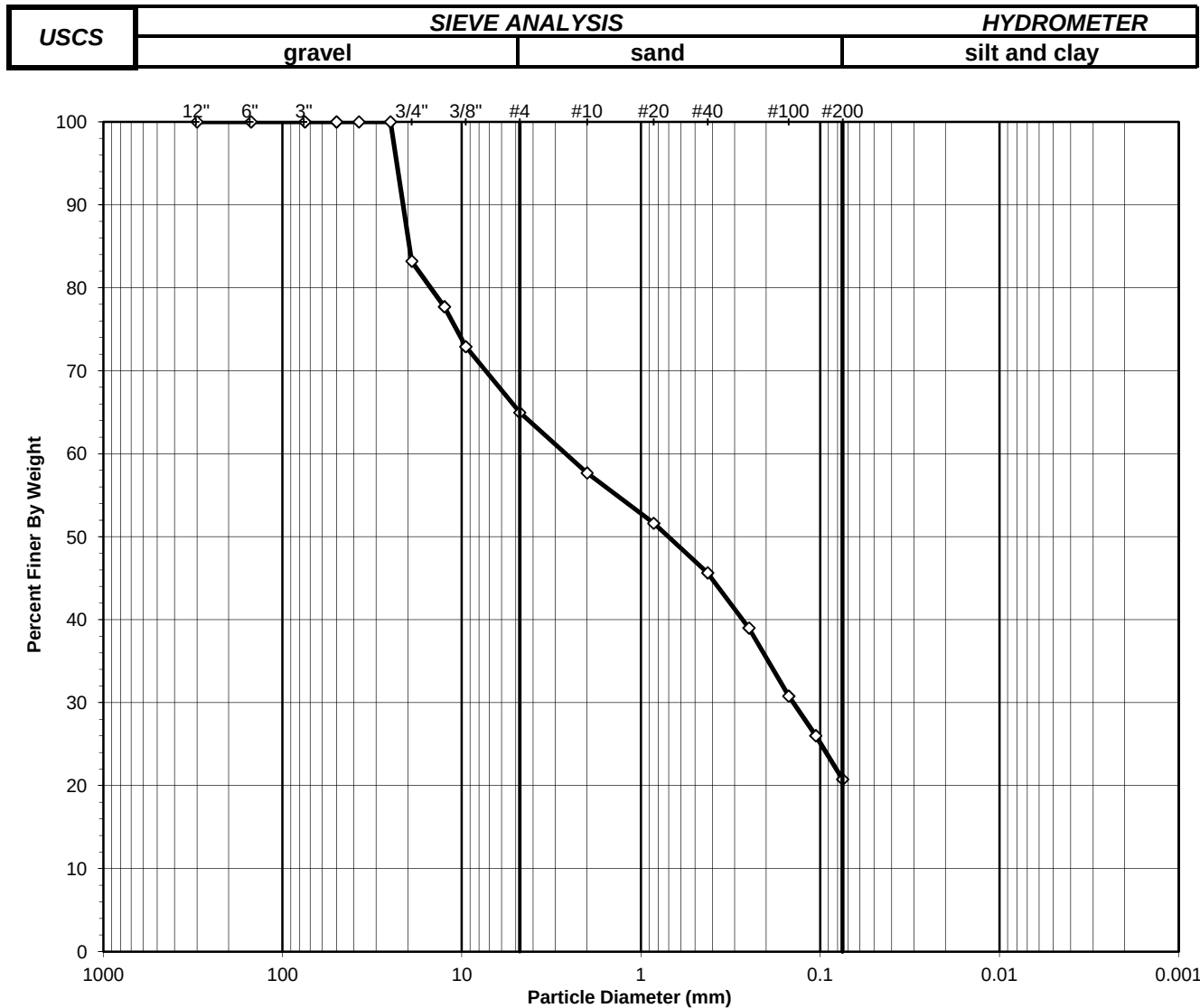
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SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-068

Boring No.: JB2-19-5
 Depth (ft): 22.0-23.8
 Sample No.: SpT-12
 Soil Color: Brown



USCS Symbol:
sm, ASSUMED

D50 = 0.70

USCS Classification:
SILTY SAND WITH GRAVEL

Tested By DS	Date 1/17/20	Checked By KC	Date 1/23/20

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WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-068

Boring No.: JB2-19-5
Depth (ft): 22.0-23.8
Sample No.: SpT-12
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1414	Tare No.:	NA	Tare No.:	1414	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	425.13	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	425.13	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	395.11	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	395.11	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.95	Weight of Tare (g):	NA	Weight of Tare (g):	144.95	Weight of Tare (g):	NA
Weight of Water (g):	30.02	Weight of Water (g):	NA	Weight of Water (g):	30.02	Weight of Water (g):	NA
Weight of Dry Soil (g):	250.16	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	250.16	Weight of Dry Soil (g):	NA
Moisture Content (%):	12.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	250.16	Total Dry Weight of Sample (g):	250.16	Dry Weight of Sample (g):	250.16	Total Dry Weight of Sample (g):	250.16
Tare No. (Sub-Specimen)	1414	Wet Weight of +3/4" Sample (g):	47.04	Tare No. (Sub-Specimen)	1414	Wet Weight of +3/4" Sample (g):	47.04
Wt. of Tare & Wet Sub-Specimen (g):	425.13	Dry Weight of + 3/4" Sample (g):	42.00	Wt. of Tare & Wet Sub-Specimen (g):	425.13	Dry Weight of + 3/4" Sample (g):	42.00
Weight of Tare (g):	144.95	Dry Weight of - 3/4" Sample (g):	208.16	Weight of Tare (g):	144.95	Dry Weight of - 3/4" Sample (g):	208.16
Sub-Specimen Wet Weight (g):	280.18	Dry Weight -3/4" +3/8" Sample (g):	25.77	Sub-Specimen Wet Weight (g):	280.18	Dry Weight -3/4" +3/8" Sample (g):	25.77
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	186.72	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	186.72
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	42.00	16.79	16.79	83.21	83
1/2"	12.5	13.72	(**)	22.27	77.73	78
3/8"	9.5	12.05	4.82	27.09	72.91	73
#4	4.75	19.87	7.94	35.03	64.97	65
#10	2	18.20	7.28	42.31	57.69	58
#20	0.85	15.17	(**)	48.37	51.63	52
#40	0.425	14.94	5.97	54.35	45.65	46
#60	0.25	16.64	6.65	61.00	39.00	39
#100	0.15	20.52	8.20	69.20	30.80	31
#140	0.106	11.93	4.77	73.97	26.03	26
#200	0.075	13.17	5.26	79.23	20.77	21
Pan	-	51.95	20.77	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

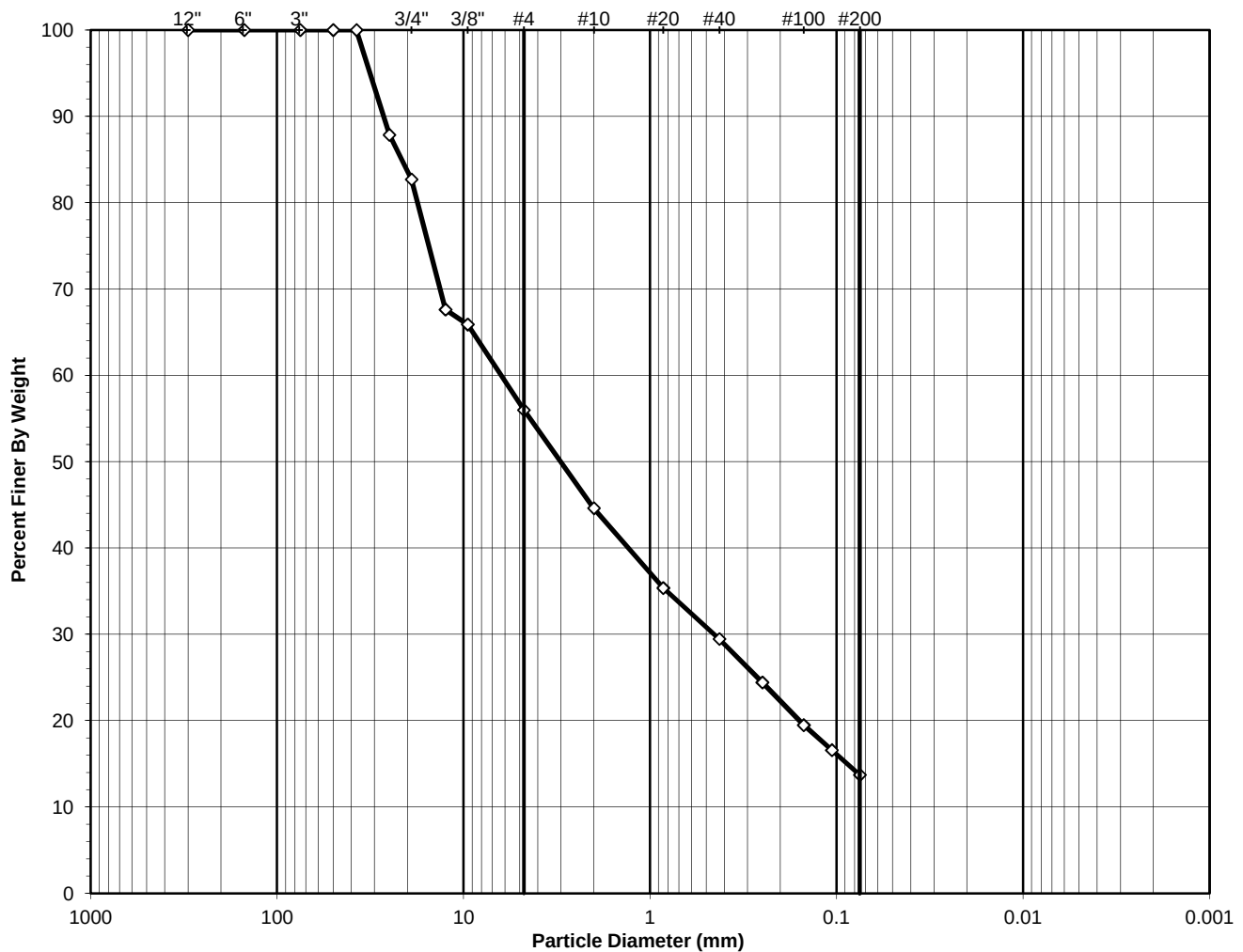
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-069

Boring No.: JB2-19-5A
 Depth (ft): 24.0-25.8
 Sample No.: SpT-1
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
gm, ASSUMED

D50 = 3.01

USCS Classification:
SILTY GRAVEL WITH SAND

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-069

Boring No.: JB2-19-5A
Depth (ft): 24.0-25.8
Sample No.: SpT-1
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1477	Tare No.:	NA	Tare No.:	1477	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	408.31	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	408.31	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	388.99	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	388.99	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.22	Weight of Tare (g):	NA	Weight of Tare (g):	144.22	Weight of Tare (g):	NA
Weight of Water (g):	19.32	Weight of Water (g):	NA	Weight of Water (g):	19.32	Weight of Water (g):	NA
Weight of Dry Soil (g):	244.77	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	244.77	Weight of Dry Soil (g):	NA
Moisture Content (%):	7.9	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	244.77	Total Dry Weight of Sample (g):	244.77	Dry Weight of Sample (g):	244.77	Total Dry Weight of Sample (g):	244.77
Tare No. (Sub-Specimen)	1477	Wet Weight of +3/4" Sample (g):	45.69	Tare No. (Sub-Specimen)	1477	Wet Weight of +3/4" Sample (g):	45.69
Wt. of Tare & Wet Sub-Specimen (g):	408.31	Dry Weight of + 3/4" Sample (g):	42.35	Wt. of Tare & Wet Sub-Specimen (g):	408.31	Dry Weight of + 3/4" Sample (g):	42.35
Weight of Tare (g):	144.22	Dry Weight of - 3/4" Sample (g):	202.42	Weight of Tare (g):	144.22	Dry Weight of - 3/4" Sample (g):	202.42
Sub-Specimen Wet Weight (g):	264.09	Dry Weight -3/4" +3/8" Sample (g):	41.13	Sub-Specimen Wet Weight (g):	264.09	Dry Weight -3/4" +3/8" Sample (g):	41.13
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	168.41	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	168.41
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	29.72	12.14	12.14	87.86	88
3/4"	19	12.63	5.16	17.30	82.70	83
1/2"	12.5	36.90	15.08	32.38	67.62	68
3/8"	9.5	4.23	(**) 1.73	34.11	65.89	66
#4	4.75	24.25	9.91	44.01	55.99	56
#10	2	27.84	11.37	55.39	44.61	45
#20	0.85	22.62	(**) 9.24	64.63	35.37	35
#40	0.425	14.45	5.90	70.53	29.47	29
#60	0.25	12.32	5.03	75.56	24.44	24
#100	0.15	12.11	4.95	80.51	19.49	19
#140	0.106	7.08	2.89	83.40	16.60	17
#200	0.075	7.05	2.88	86.29	13.71	14
Pan	-	33.57	13.71	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

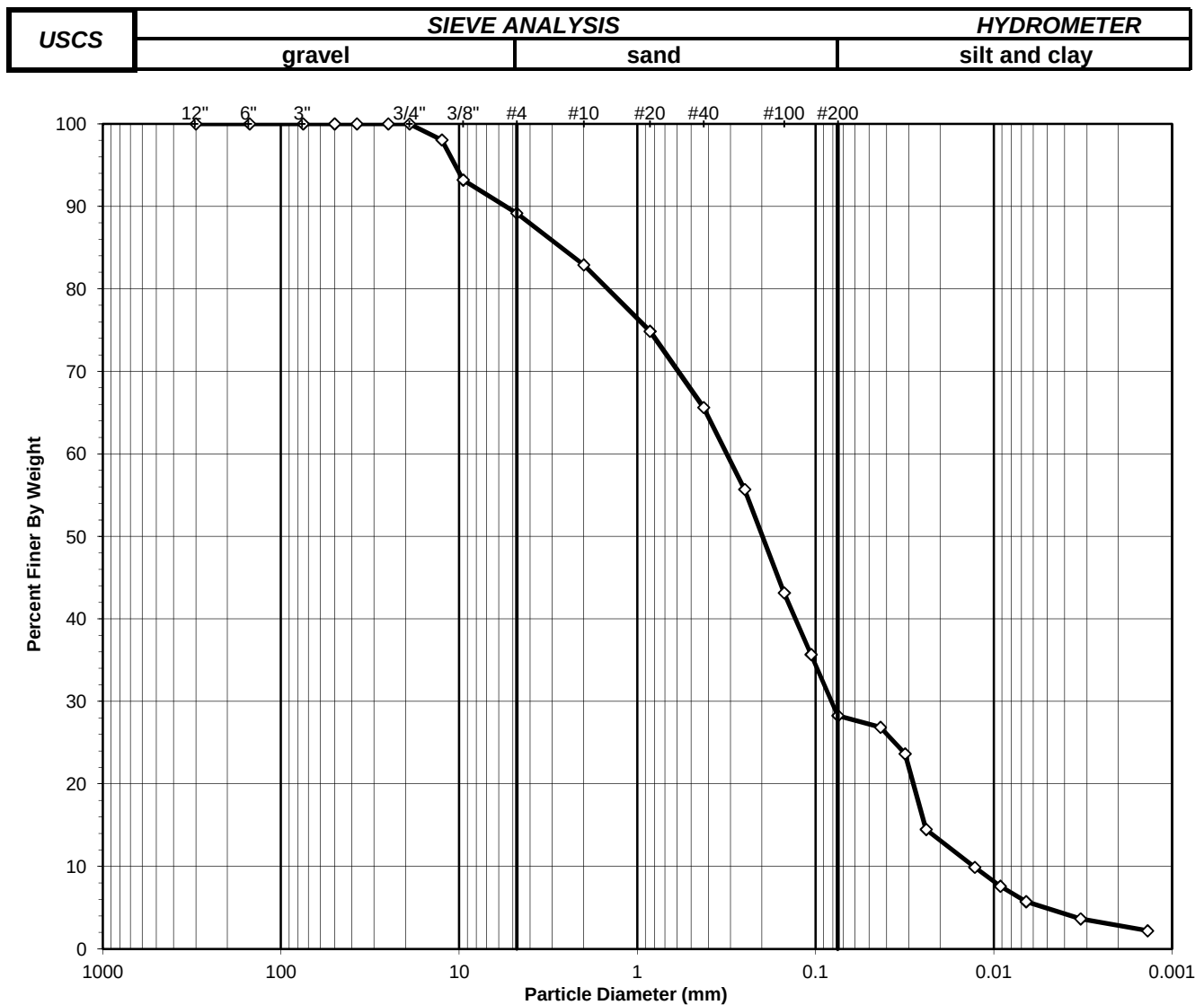
Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-070

Boring No.: JB2-19-201
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Soil Color: Brown



USCS Symbol:
SM, TESTED

D50 = 0.20

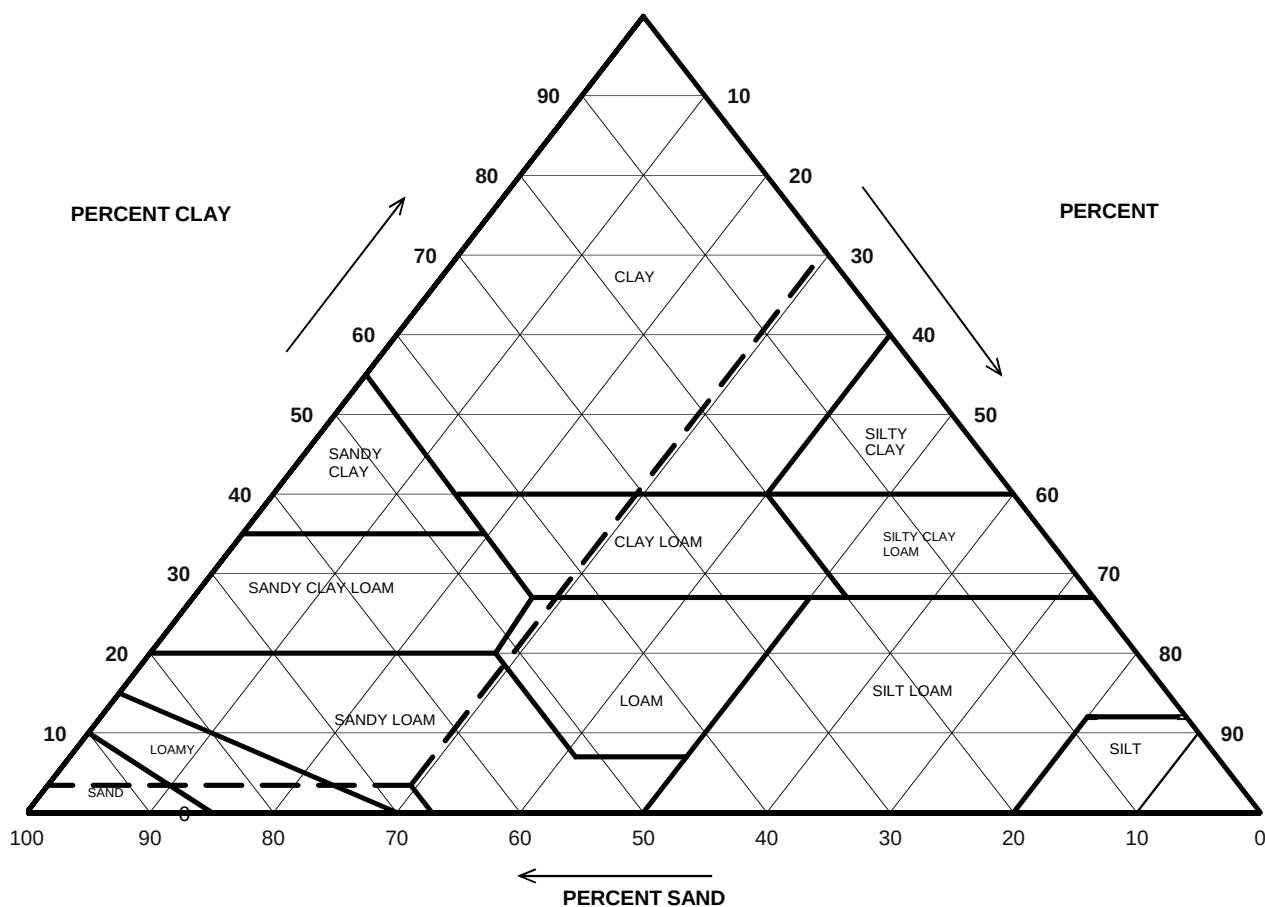
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By	DS	Date	1/20/20	Checked By	KC	Date	1/23/20
<i>page 1 of 4</i>		DCN: CT-S73J, DATE 5/22/17, REV. 1e					

USDA CLASSIFICATION CHART

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-070

Boring No.: JB2-19-201
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	17.09	
2	82.91	Sand	55.68	67.15
0.05	27.24	Silt	24.40	29.43
0.002	2.83	Clay	2.83	3.42

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-070

Boring No.: JB2-19-201
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2032	Tare No.:	NA	Tare No.:	2032	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	397.37	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	397.37	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	373.14	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	373.14	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.24	Weight of Tare (g):	NA	Weight of Tare (g):	146.24	Weight of Tare (g):	NA
Weight of Water (g):	24.23	Weight of Water (g):	NA	Weight of Water (g):	24.23	Weight of Water (g):	NA
Weight of Dry Soil (g):	226.90	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	226.90	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	226.90	Total Dry Weight of Sample (g):	226.90	Dry Weight of Sample (g):	226.90	Total Dry Weight of Sample (g):	226.90
Tare No. (Sub-Specimen)	2032	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2032	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	397.37	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	397.37	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.24	Dry Weight of - 3/4" Sample (g):	226.90	Weight of Tare (g):	146.24	Dry Weight of - 3/4" Sample (g):	226.90
Sub-Specimen Wet Weight (g):	251.13	Dry Weight -3/4" +3/8" Sample (g):	15.42	Sub-Specimen Wet Weight (g):	251.13	Dry Weight -3/4" +3/8" Sample (g):	15.42
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	211.48	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	211.48
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	4.42	(**)	1.95	98.05	98
3/8"	9.5	11.00	4.85	6.80	93.20	93
#4	4.75	9.15	4.03	10.83	89.17	89
#10	2	14.20	6.26	17.09	82.91	83
#20	0.85	18.26	(**)	25.13	74.87	75
#40	0.425	20.96	9.24	34.37	65.63	66
#60	0.25	22.53	9.93	44.30	55.70	56
#100	0.15	28.46	12.54	56.84	43.16	43
#140	0.106	16.94	7.47	64.31	35.69	36
#200	0.075	16.82	7.41	71.72	28.28	28
Pan	-	64.16	28.28	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-070

Boring No.: JB2-19-201
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	35.0	22.5	5.71	10.6	0.0433	95.0	26.9
2	31.5	22.5	5.71	11.3	0.0315	83.7	23.7
4	21.5	22.5	5.71	13.1	0.0240	51.2	14.5
15	16.5	22.5	5.71	14.0	0.0128	35.0	9.9
30	14.0	22.5	5.71	14.4	0.0092	26.9	7.6
60	12.0	22.4	5.75	14.8	0.0066	20.3	5.7
250	9.5	23.0	5.52	15.2	0.0033	12.9	3.6
1440	8.0	22.8	5.60	15.5	0.0014	7.8	2.2

Soil Specimen Data

Tare No.:	925	Percent Finer than # 200:	28.28
Wt. of Tare & Dry Material (g):	132.83		
Weight of Tare (g):	97.21	Specific Gravity:	2.68 Measured
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	30.62		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 375
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/21/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-070

Boring No.: JB2-19-201
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	17
Wt. of Tare & Wet Sample (g)	25.53
Wt. of Tare & Dry Sample (g)	24.13
Weight of Tare (g)	8.47
Weight of Water (g)	1.40
Weight of Dry Sample (g)	15.66

Water Content (%) **8.9**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-201
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	0.0-4.0
Project No.:	2020-002-001	Sample No.:	SpT-1/2
Lab ID:	2020-002-001-070	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	731.8	737.71
Temperature (°C):	25.3	25.8
Weight of Pycnometer & Water (g):	683.94	684.43
Tare Number:	659	1466
Weight of Tare & Dry Soil (g):	171	191.66
Weight of Tare (g):	93.39	107.97
Weight of Dry Soil (g):	77.61	83.69
Specific Gravity of Soil @ Measured Temperature:	2.609	2.752
Specific Gravity of Water @ Measured Temperature:	0.99698	0.99684
Conversion Factor for Measured Temperature:	0.99877	0.99864
Specific Gravity @ 20° Celsius:	2.612	2.756

Average Specific Gravity @ 20° Celsius	2.68

Tested By TO Date 1/21/20 Checked By BRB Date 1/22/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

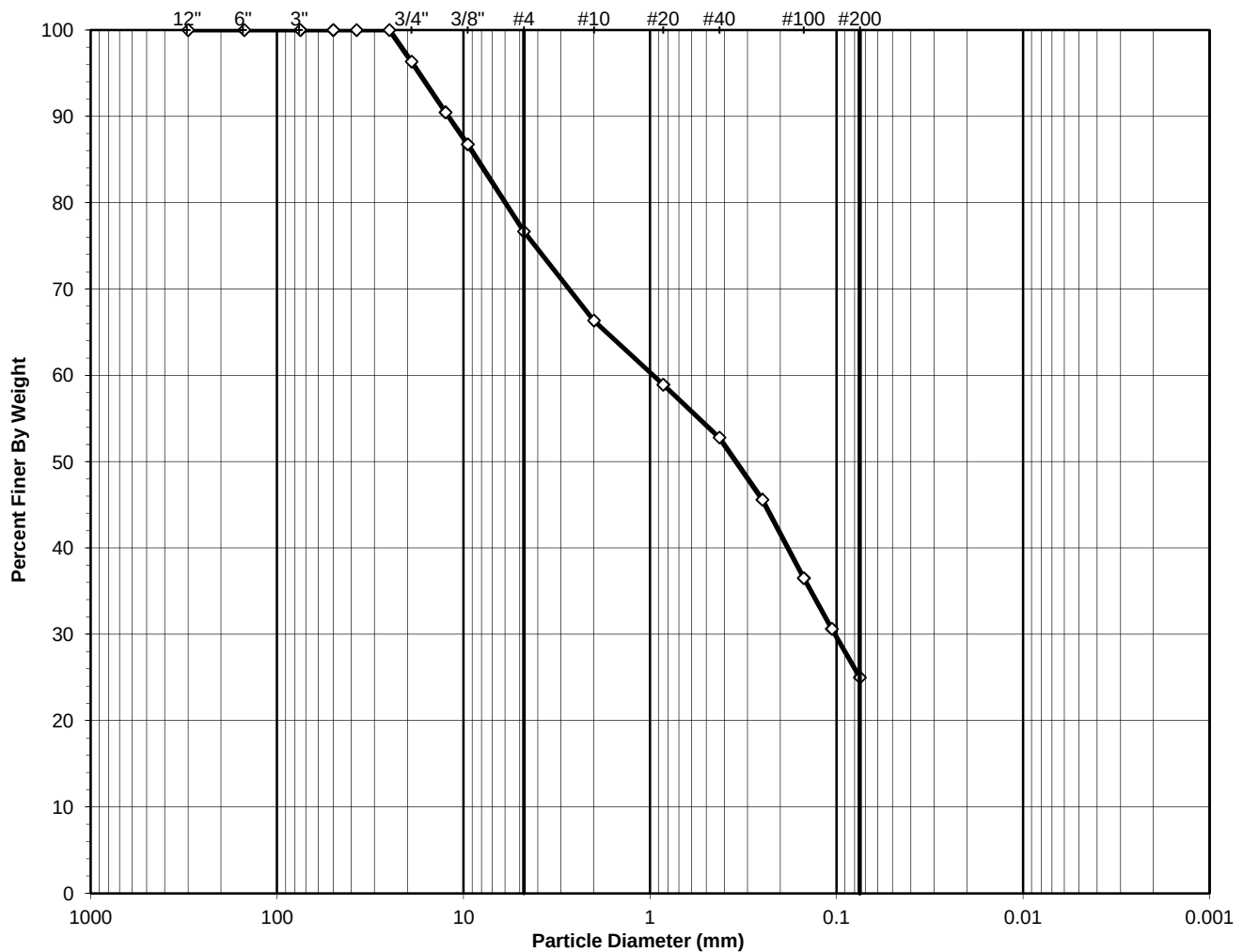
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-071

Boring No.: JB2-19-201
 Depth (ft): 4.0-8.0
 Sample No.: SpT-3/4
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.35

USCS Classification:
SILTY SAND WITH GRAVEL
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-071

Boring No.: JB2-19-201
 Depth (ft): 4.0-8.0
 Sample No.: SpT-3/4
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1432	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	461.40	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	446.08	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.45	Weight of Tare (g):	NA
Weight of Water (g):	15.32	Weight of Water (g):	NA
Weight of Dry Soil (g):	301.63	Weight of Dry Soil (g):	NA
Moisture Content (%):	5.1	Moisture Content (%):	0.0
Dry Weight of Sample (g):	301.63	Total Dry Weight of Sample (g):	301.63
Tare No. (Sub-Specimen)	1432	Wet Weight of +3/4" Sample (g):	11.60
Wt. of Tare & Wet Sub-Specimen (g):	461.40	Dry Weight of + 3/4" Sample (g):	11.04
Weight of Tare (g):	144.45	Dry Weight of - 3/4" Sample (g):	290.59
Sub-Specimen Wet Weight (g):	316.95	Dry Weight -3/4" +3/8" Sample (g):	28.88
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	262.77
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	11.04	3.66	3.66	96.34	96
1/2"	12.5	17.69	(**) 5.86	9.52	90.48	90
3/8"	9.5	11.19	3.71	13.23	86.77	87
#4	4.75	30.47	10.10	23.34	76.66	77
#10	2	31.12	10.32	33.65	66.35	66
#20	0.85	22.40	(**) 7.43	41.08	58.92	59
#40	0.425	18.44	6.11	47.19	52.81	53
#60	0.25	21.71	7.20	54.39	45.61	46
#100	0.15	27.41	9.09	63.48	36.52	37
#140	0.106	17.74	5.88	69.36	30.64	31
#200	0.075	16.95	5.62	74.98	25.02	25
Pan	-	75.47	25.02	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-071

Boring No.: JB2-19-201
Depth (ft): 4.0-8.0
Sample No.: SpT-3/4
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	35
Wt. of Tare & Wet Sample (g)	38.54
Wt. of Tare & Dry Sample (g)	37.19
Weight of Tare (g)	8.43
Weight of Water (g)	1.35
Weight of Dry Sample (g)	28.76

Water Content (%)	4.7

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/17/20	Checked By	JLK	Date	1/17/20

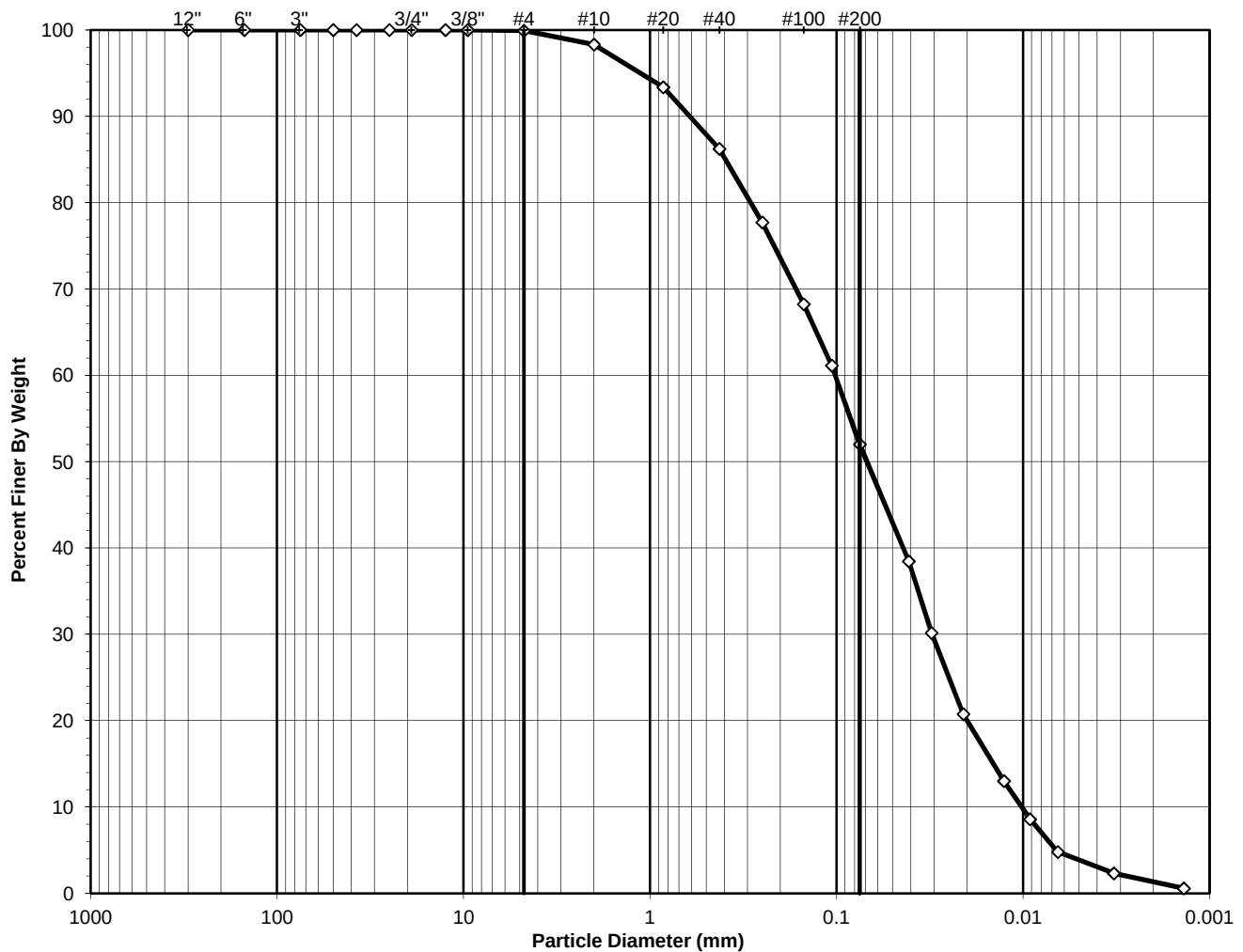
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-072

Boring No.: JB2-19-201
 Depth (ft): 8.0-12.0
 Sample No.: SpT-5/6
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
ML, TESTED

D50 = 0.07

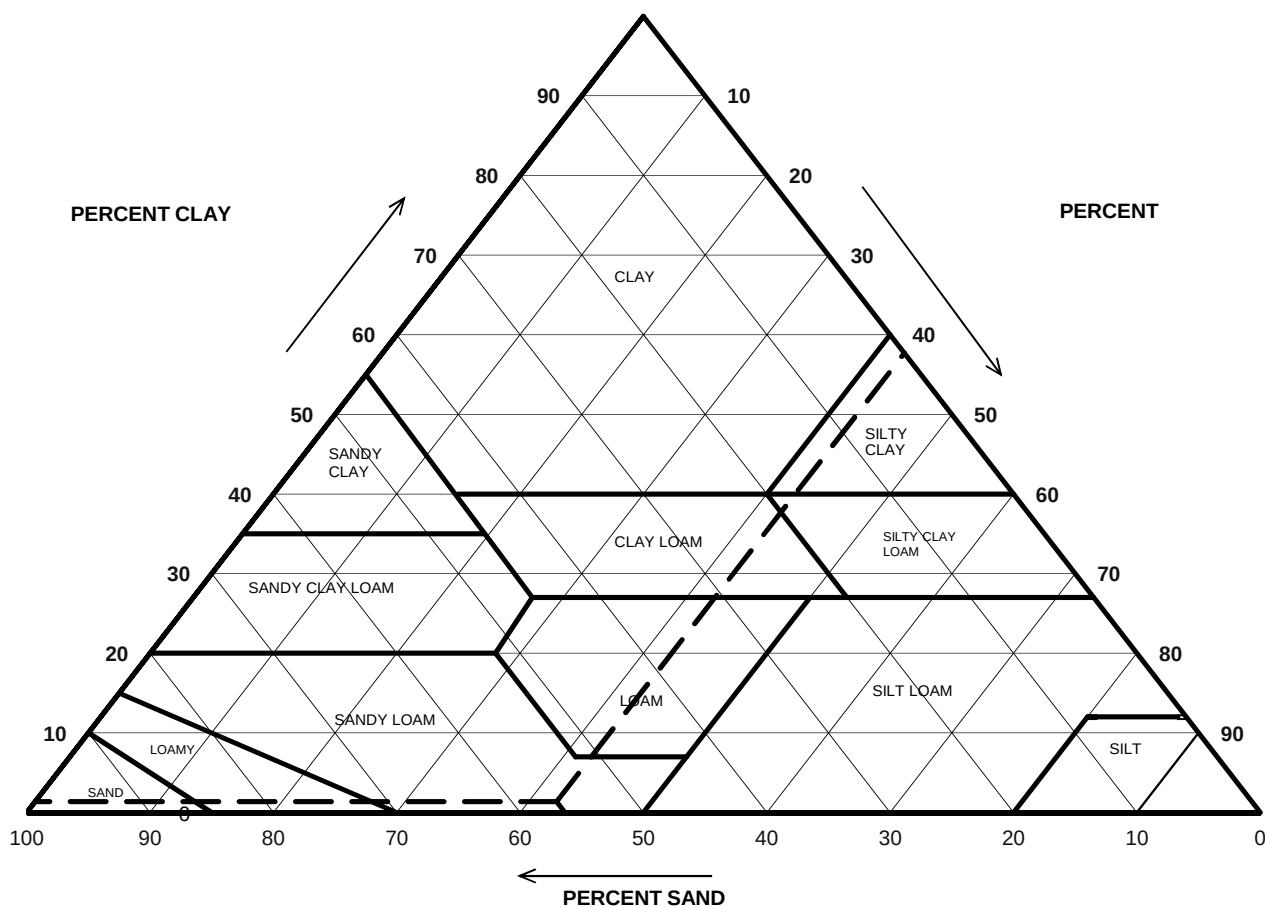
USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-072

Boring No.: JB2-19-201
Depth (ft): 8.0-12.0
Sample No.: SpT-5/6
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	1.69	
2	98.31	Sand	55.40	56.35
0.05	42.91	Silt	41.58	42.29
0.002	1.33	Clay	1.33	1.35

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-072

Boring No.: JB2-19-201
 Depth (ft): 8.0-12.0
 Sample No.: SpT-5/6
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1463	Tare No.:	NA	Tare No.:	1463	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	369.17	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	369.17	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	342.55	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	342.55	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.42	Weight of Tare (g):	NA	Weight of Tare (g):	147.42	Weight of Tare (g):	NA
Weight of Water (g):	26.62	Weight of Water (g):	NA	Weight of Water (g):	26.62	Weight of Water (g):	NA
Weight of Dry Soil (g):	195.13	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	195.13	Weight of Dry Soil (g):	NA
Moisture Content (%):	13.6	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	195.13	Total Dry Weight of Sample (g):	195.13	Dry Weight of Sample (g):	195.13	Total Dry Weight of Sample (g):	195.13
Tare No. (Sub-Specimen)	1463	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1463	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	369.17	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	369.17	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.42	Dry Weight of - 3/4" Sample (g):	195.13	Weight of Tare (g):	147.42	Dry Weight of - 3/4" Sample (g):	195.13
Sub-Specimen Wet Weight (g):	221.75	Dry Weight -3/4" +3/8" Sample (g):	0.00	Sub-Specimen Wet Weight (g):	221.75	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	195.13	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	195.13
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.0
6"	150	0.00	0.00	0.00	100.00	100.0
3"	75	0.00	0.00	0.00	100.00	100.0
2"	50	0.00	(*) 0.00	0.00	100.00	100.0
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.0
1"	25	0.00	0.00	0.00	100.00	100.0
3/4"	19	0.00	0.00	0.00	100.00	100.0
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100.0
3/8"	9.5	0.00	0.00	0.00	100.00	100.0
#4	4.75	0.17	0.09	0.09	99.91	99.9
#10	2	3.12	1.60	1.69	98.31	98.3
#20	0.85	9.65	(**) 4.95	6.63	93.37	93.4
#40	0.425	13.92	7.13	13.77	86.23	86.2
#60	0.25	16.64	8.53	22.29	77.71	77.7
#100	0.15	18.48	9.47	31.76	68.24	68.2
#140	0.106	13.87	7.11	38.87	61.13	61.1
#200	0.075	17.82	9.13	48.00	52.00	52.0
Pan	-	101.46	52.00	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-072

Boring No.: JB2-19-201
 Depth (ft): 8.0-12.0
 Sample No.: SpT-5/6
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	40.5	22.4	5.75	9.6	0.0410	74.0	38.5
2	33.0	22.4	5.75	11.0	0.0310	58.0	30.2
5	24.5	22.4	5.75	12.5	0.0209	39.9	20.8
15	17.5	22.4	5.75	13.8	0.0127	25.0	13.0
30	13.5	22.4	5.75	14.5	0.0092	16.5	8.6
62	10.0	22.6	5.67	15.1	0.0065	9.2	4.8
250	7.5	23.3	5.41	15.6	0.0033	4.5	2.3
1440	6.0	23.1	5.48	15.8	0.0014	1.1	0.6

Soil Specimen Data

Tare No.: 687 Percent Finer than # 200: 52.00
 Wt. of Tare & Dry Material (g): 146.46
 Weight of Tare (g): 95.00 Specific Gravity: 2.70 Assumed
 Weight of Deflocculant (g): 5.0
 Weight of Dry Material (g): 46.46

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H G- 1819
 Cylinder G- 355
 Thermometer G- 1505
 Balance G- 657
 #200 Sieve G- 1944
 Foam Inhibitor Used No

Tested By TO Date 1/16/20 Checked By KC Date 1/23/20
 page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-072

Boring No.: JB2-19-201
Depth (ft): 8.0-12.0
Sample No.: SpT-5/6
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	8
Wt. of Tare & Wet Sample (g)	28.23
Wt. of Tare & Dry Sample (g)	25.88
Weight of Tare (g)	8.30
Weight of Water (g)	2.35
Weight of Dry Sample (g)	17.58

Water Content (%) **13.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/17/20* *Checked By* *JLK* *Date* *1/17/20*

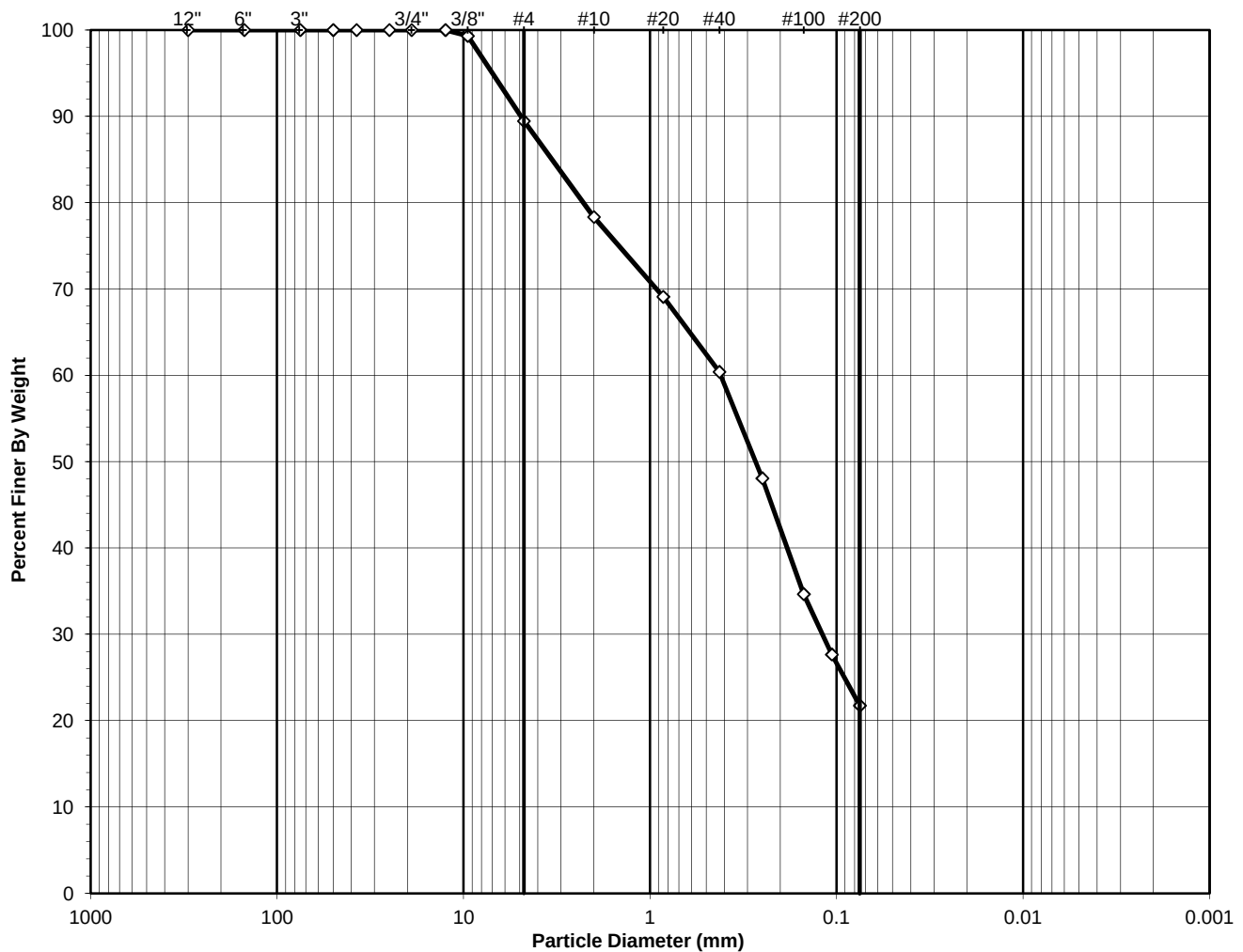
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-073

Boring No.: JB2-19-201
 Depth (ft): 16.0-20.0
 Sample No.: SpT-9/10
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.27

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-073

Boring No.: JB2-19-201
 Depth (ft): 16.0-20.0
 Sample No.: SpT-9/10
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2027	Tare No.:	NA	Tare No.:	2027	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	469.22	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	469.22	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	442.23	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	442.23	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.33	Weight of Tare (g):	NA	Weight of Tare (g):	147.33	Weight of Tare (g):	NA
Weight of Water (g):	26.99	Weight of Water (g):	NA	Weight of Water (g):	26.99	Weight of Water (g):	NA
Weight of Dry Soil (g):	294.90	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	294.90	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.2	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	294.90	Total Dry Weight of Sample (g):	294.90	Dry Weight of Sample (g):	294.90	Total Dry Weight of Sample (g):	294.90
Tare No. (Sub-Specimen)	2027	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2027	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	469.22	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	469.22	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.33	Dry Weight of - 3/4" Sample (g):	294.90	Weight of Tare (g):	147.33	Dry Weight of - 3/4" Sample (g):	294.90
Sub-Specimen Wet Weight (g):	321.89	Dry Weight -3/4" +3/8" Sample (g):	2.01	Sub-Specimen Wet Weight (g):	321.89	Dry Weight -3/4" +3/8" Sample (g):	2.01
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	292.89	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	292.89
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100
3/8"	9.5	2.01	0.68	0.68	99.32	99
#4	4.75	29.06	9.85	10.54	89.46	89
#10	2	32.79	11.12	21.65	78.35	78
#20	0.85	27.27	(**) 9.25	30.90	69.10	69
#40	0.425	25.62	8.69	39.59	60.41	60
#60	0.25	36.36	12.33	51.92	48.08	48
#100	0.15	39.55	13.41	65.33	34.67	35
#140	0.106	20.64	7.00	72.33	27.67	28
#200	0.075	17.44	5.91	78.24	21.76	22
Pan	-	64.16	21.76	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-073

Boring No.: JB2-19-201
Depth (ft): 16.0-20.0
Sample No.: SpT-9/10
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	9
Wt. of Tare & Wet Sample (g)	41.55
Wt. of Tare & Dry Sample (g)	38.11
Weight of Tare (g)	8.21
Weight of Water (g)	3.44
Weight of Dry Sample (g)	29.90

Water Content (%)	11.5

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/16/20	Checked By	JLK	Date	1/17/20

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-201
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	16.0-20.0
Project No.:	2020-002-001	Sample No.:	SpT-9/10
Lab ID:	2020-002-001-073	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	746.72	749.28
Temperature (°C):	24.3	24.7
Weight of Pycnometer & Water (g):	684.07	684.57
Tare Number:	969	653
Weight of Tare & Dry Soil (g):	201.48	195.58
Weight of Tare (g):	100.15	93.47
Weight of Dry Soil (g):	101.33	102.11
Specific Gravity of Soil @ Measured Temperature:	2.620	2.730
Specific Gravity of Water @ Measured Temperature:	0.99723	0.99713
Conversion Factor for Measured Temperature:	0.99902	0.99892
Specific Gravity @ 20° Celsius:	2.622	2.733

Average Specific Gravity @ 20° Celsius	2.68

Tested By TO Date 1/22/20 Checked By BRB Date 1/24/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

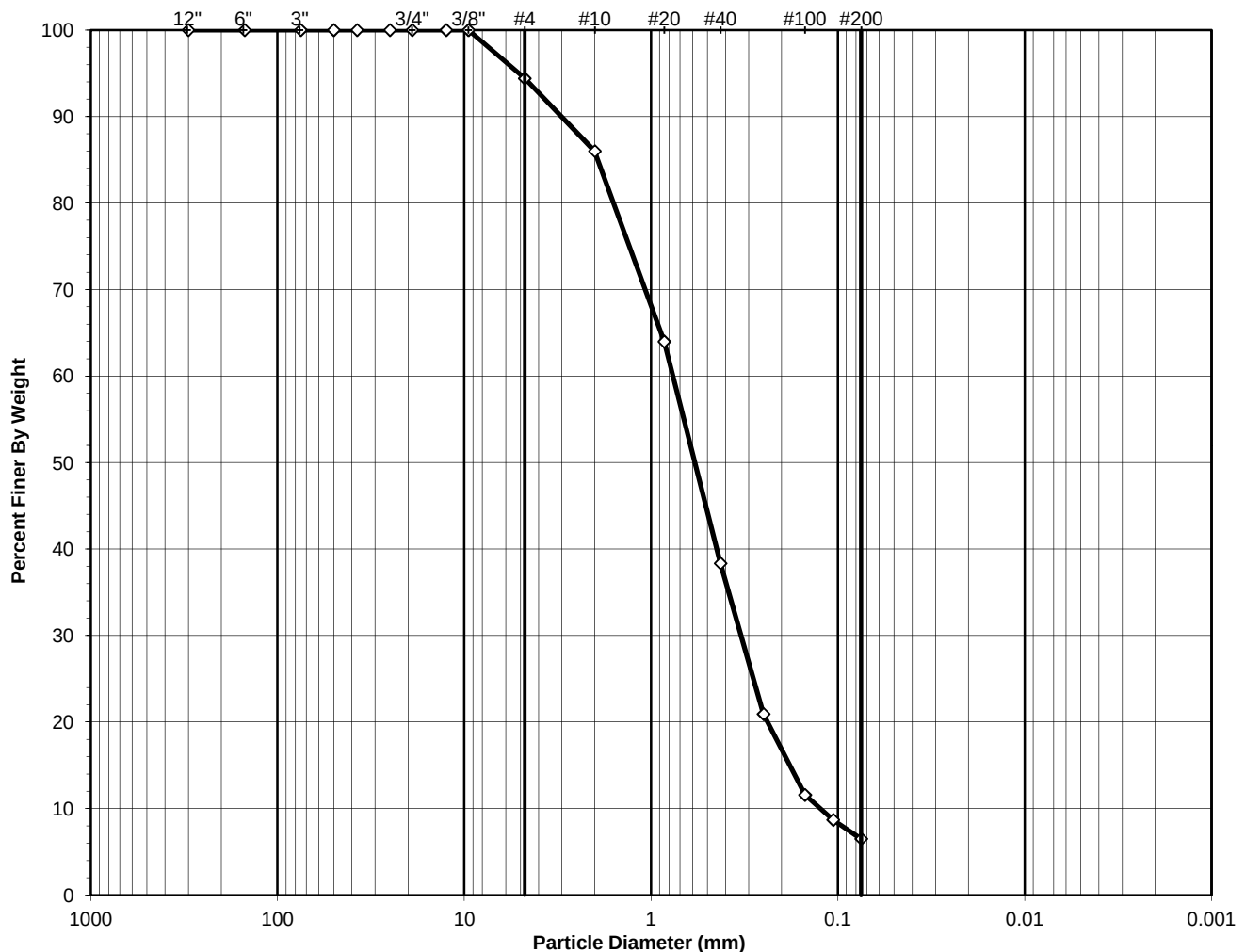
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-074

Boring No.: JB2-19-202
 Depth (ft): 0.0-2.0
 Sample No.: SpT-1
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SW-SM, TESTED

D60 = 0.76 D50 = 0.58

D30 = 0.33 CU = 6.16

USCS Classification:
WELL-GRADED SAND WITH SILT
(NON-PLASTIC FINES) Insufficient Fines to run Hydrometer

D10 = 0.124

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-074

Boring No.: JB2-19-202
Depth (ft): 0.0-2.0
Sample No.: SpT-1
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2015	Tare No.:	NA	Tare No.:	2015	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	256.76	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	256.76	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	249.04	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	249.04	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.40	Weight of Tare (g):	NA	Weight of Tare (g):	145.40	Weight of Tare (g):	NA
Weight of Water (g):	7.72	Weight of Water (g):	NA	Weight of Water (g):	7.72	Weight of Water (g):	NA
Weight of Dry Soil (g):	103.64	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	103.64	Weight of Dry Soil (g):	NA
Moisture Content (%):	7.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	103.64	Total Dry Weight of Sample (g):	103.64	Dry Weight of Sample (g):	103.64	Total Dry Weight of Sample (g):	103.64
Tare No. (Sub-Specimen)	2015	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2015	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	256.76	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	256.76	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	145.40	Dry Weight of - 3/4" Sample (g):	103.64	Weight of Tare (g):	145.40	Dry Weight of - 3/4" Sample (g):	103.64
Sub-Specimen Wet Weight (g):	111.36	Dry Weight -3/4" +3/8" Sample (g):	0.00	Sub-Specimen Wet Weight (g):	111.36	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	103.64	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	103.64
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	0.00	(**)	0.00	100.00	100
3/8"	9.5	0.00	0.00	0.00	100.00	100
#4	4.75	5.79	5.59	5.59	94.41	94
#10	2	8.72	8.41	14.00	86.00	86
#20	0.85	22.80	(**)	36.00	64.00	64
#40	0.425	26.57	25.64	61.64	38.36	38
#60	0.25	18.07	17.44	79.07	20.93	21
#100	0.15	9.68	9.34	88.41	11.59	12
#140	0.106	2.99	2.88	91.30	8.70	9
#200	0.075	2.27	2.19	93.49	6.51	7
Pan	-	6.75	6.51	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-074

Boring No.: JB2-19-202
Depth (ft): 0.0-2.0
Sample No.: SpT-1
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	49
Wt. of Tare & Wet Sample (g)	14.08
Wt. of Tare & Dry Sample (g)	13.75
Weight of Tare (g)	8.37
Weight of Water (g)	0.33
Weight of Dry Sample (g)	5.38

Water Content (%) **6.1**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

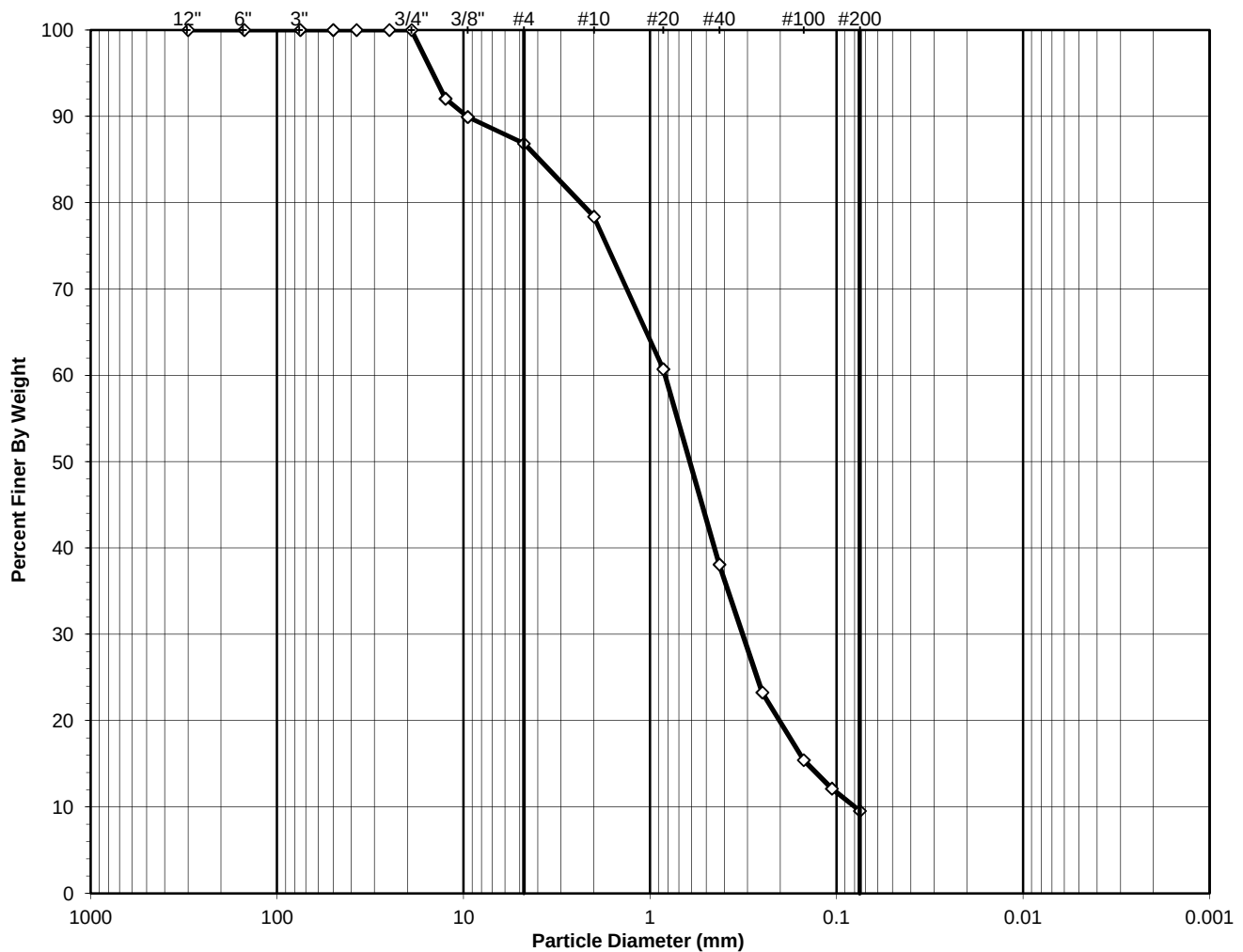
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-075

Boring No.: JB2-19-202
 Depth (ft): 2.0-4.0
 Sample No.: SpT-2
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
sw-sm, ASSUMED

D60 = 0.83 D50 = 0.61

D30 = 0.32 CU = 10.44

USCS Classification:
WELL-GRADED SAND WITH SILT

D10 = 0.08

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-075

Boring No.: JB2-19-202
Depth (ft): 2.0-4.0
Sample No.: SpT-2
Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1523	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	491.32	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	465.80	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	143.03	Weight of Tare (g):	NA
Weight of Water (g):	25.52	Weight of Water (g):	NA
Weight of Dry Soil (g):	322.77	Weight of Dry Soil (g):	NA
Moisture Content (%):	7.9	Moisture Content (%):	0.0
Dry Weight of Sample (g):	322.77	Total Dry Weight of Sample (g):	322.77
Tare No. (Sub-Specimen)	1523	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	491.32	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	143.03	Dry Weight of - 3/4" Sample (g):	322.77
Sub-Specimen Wet Weight (g):	348.29	Dry Weight -3/4" +3/8" Sample (g):	32.52
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	290.25
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	25.68	(**)	7.96	92.04	92
3/8"	9.5	6.84	2.12	10.08	89.92	90
#4	4.75	9.94	3.08	13.15	86.85	87
#10	2	27.30	8.46	21.61	78.39	78
#20	0.85	57.02	(**)	39.28	60.72	61
#40	0.425	73.05	22.63	61.91	38.09	38
#60	0.25	47.85	14.82	76.74	23.26	23
#100	0.15	25.29	7.84	84.57	15.43	15
#140	0.106	10.64	3.30	87.87	12.13	12
#200	0.075	8.33	2.58	90.45	9.55	10
Pan	-	30.83	9.55	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

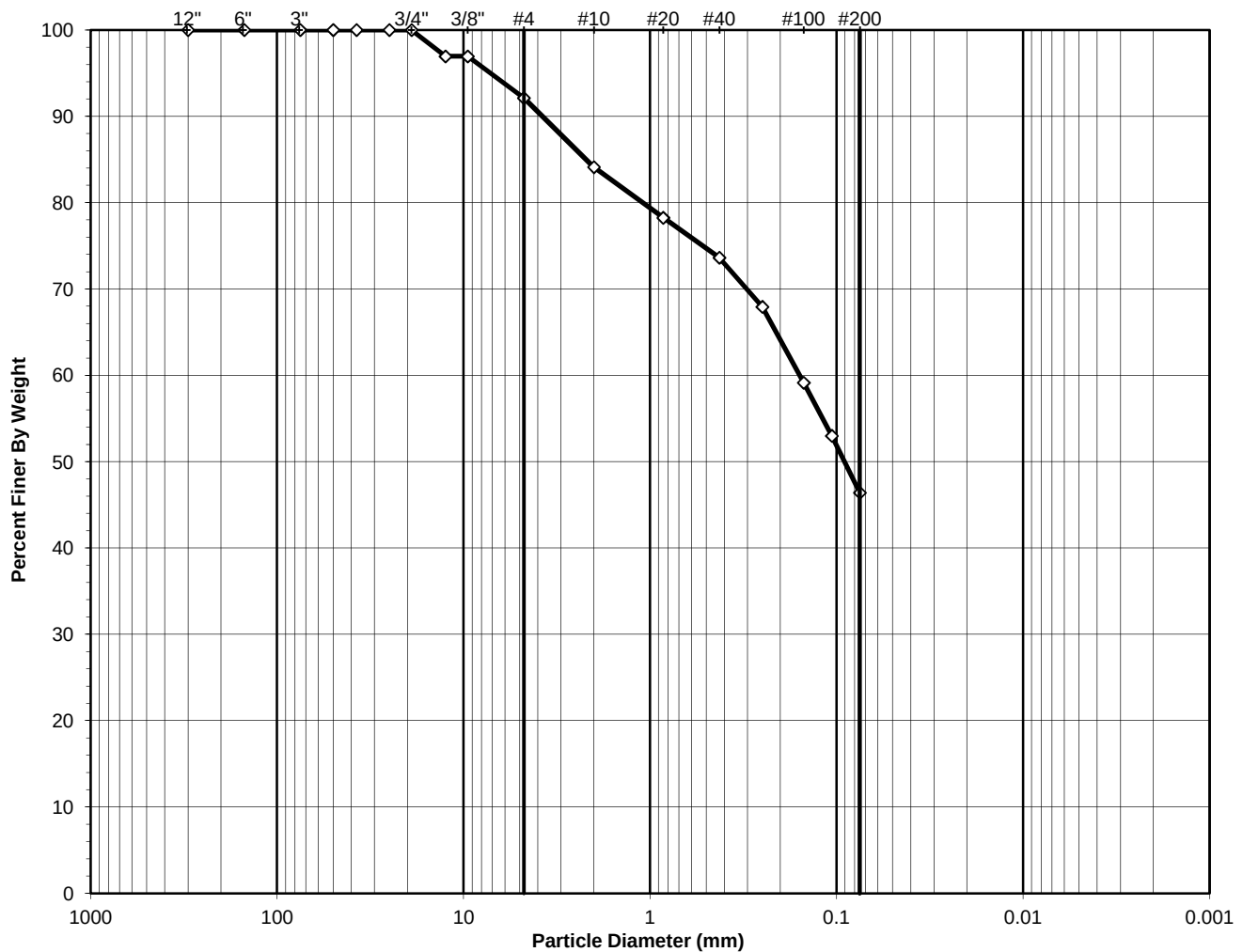
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-076

Boring No.: JB2-19-202
 Depth (ft): 8.0-11.6
 Sample No.: SpT-5/6
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.09

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-076

Boring No.: JB2-19-202
 Depth (ft): 8.0-11.6
 Sample No.: SpT-5/6
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1433	Tare No.:	NA	Tare No.:	1433	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	364.43	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	364.43	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	347.48	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	347.48	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.49	Weight of Tare (g):	NA	Weight of Tare (g):	144.49	Weight of Tare (g):	NA
Weight of Water (g):	16.95	Weight of Water (g):	NA	Weight of Water (g):	16.95	Weight of Water (g):	NA
Weight of Dry Soil (g):	202.99	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	202.99	Weight of Dry Soil (g):	NA
Moisture Content (%):	8.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	202.99	Total Dry Weight of Sample (g):	202.99	Dry Weight of Sample (g):	202.99	Total Dry Weight of Sample (g):	202.99
Tare No. (Sub-Specimen)	1433	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1433	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	364.43	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	364.43	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	144.49	Dry Weight of - 3/4" Sample (g):	202.99	Weight of Tare (g):	144.49	Dry Weight of - 3/4" Sample (g):	202.99
Sub-Specimen Wet Weight (g):	219.94	Dry Weight -3/4" +3/8" Sample (g):	6.20	Sub-Specimen Wet Weight (g):	219.94	Dry Weight -3/4" +3/8" Sample (g):	6.20
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	196.79	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	196.79
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	6.20	(**)	3.05	96.95	97
3/8"	9.5	0.00	0.00	3.05	96.95	97
#4	4.75	9.80	4.83	7.88	92.12	92
#10	2	16.25	8.01	15.89	84.11	84
#20	0.85	11.90	(**)	21.75	78.25	78
#40	0.425	9.39	4.63	26.38	73.62	74
#60	0.25	11.55	5.69	32.07	67.93	68
#100	0.15	17.85	8.79	40.86	59.14	59
#140	0.106	12.48	6.15	47.01	52.99	53
#200	0.075	13.38	6.59	53.60	46.40	46
Pan	-	94.19	46.40	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-076

Boring No.: JB2-19-202
Depth (ft): 8.0-11.6
Sample No.: SpT-5/6
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	28
Wt. of Tare & Wet Sample (g)	23.51
Wt. of Tare & Dry Sample (g)	22.40
Weight of Tare (g)	8.31
Weight of Water (g)	1.11
Weight of Dry Sample (g)	14.09

Water Content (%) **7.9**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-202
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	8.0-11.6
Project No.:	2020-002-001	Sample No.:	SpT-5/6
Lab ID:	2020-002-001-076	Visual Description:	Brown Sandy Clay

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	731.79	732.97
Temperature (°C):	25.1	25.5
Weight of Pycnometer & Water (g):	683.97	684.47
Tare Number:	692	700
Weight of Tare & Dry Soil (g):	170.9	163.84
Weight of Tare (g):	93.11	87.41
Weight of Dry Soil (g):	77.79	76.43
Specific Gravity of Soil @ Measured Temperature:	2.596	2.737
Specific Gravity of Water @ Measured Temperature:	0.99703	0.99692
Conversion Factor for Measured Temperature:	0.99882	0.99871
Specific Gravity @ 20° Celsius:	2.599	2.740

Average Specific Gravity @ 20° Celsius

2.67

Tested By TO Date 1/22/20 Checked By BRB Date 1/24/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

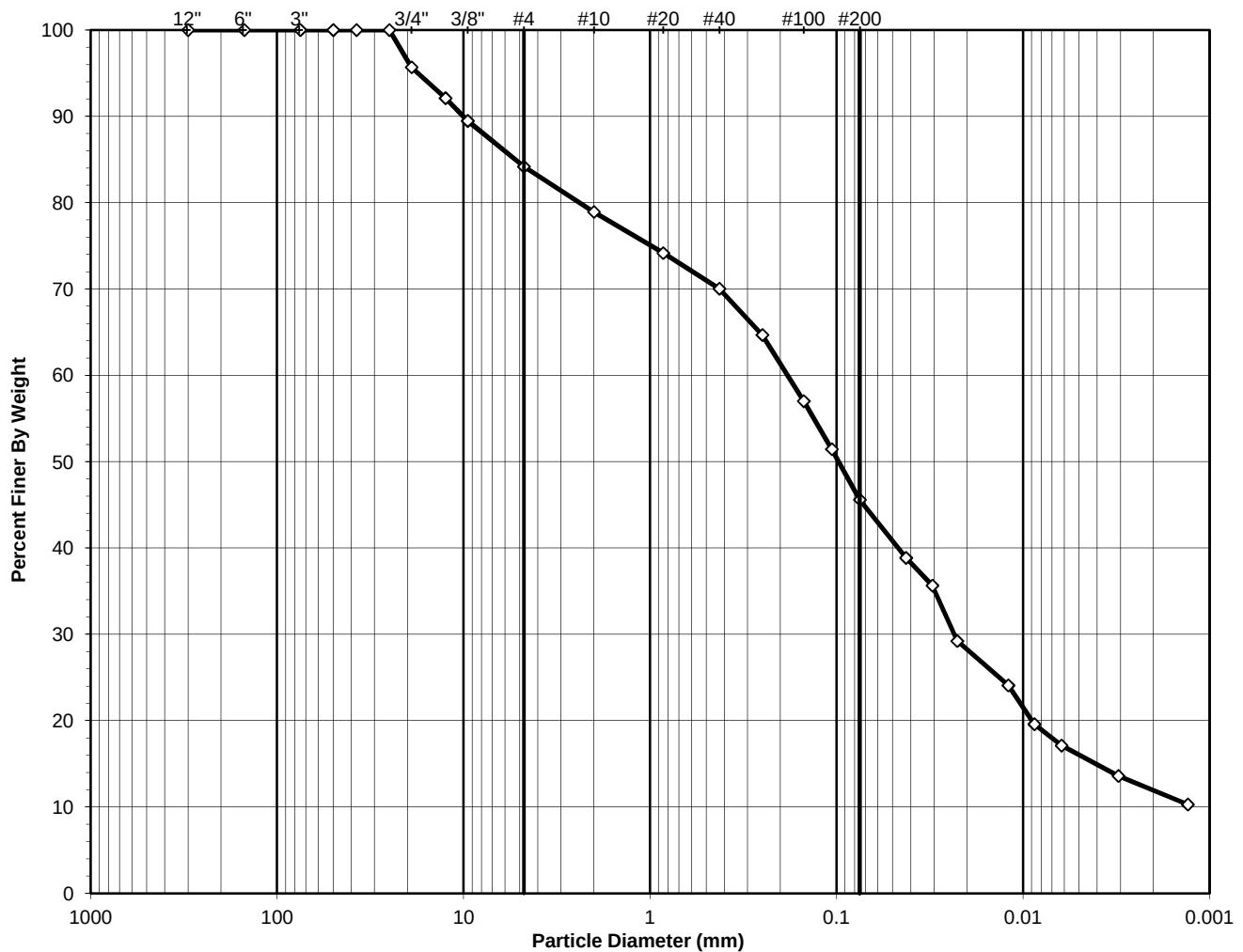
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-077

Boring No.: JB2-19-202A
 Depth (ft): 14.0-20.0
 Sample No.: SpT-1/2/3
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.10

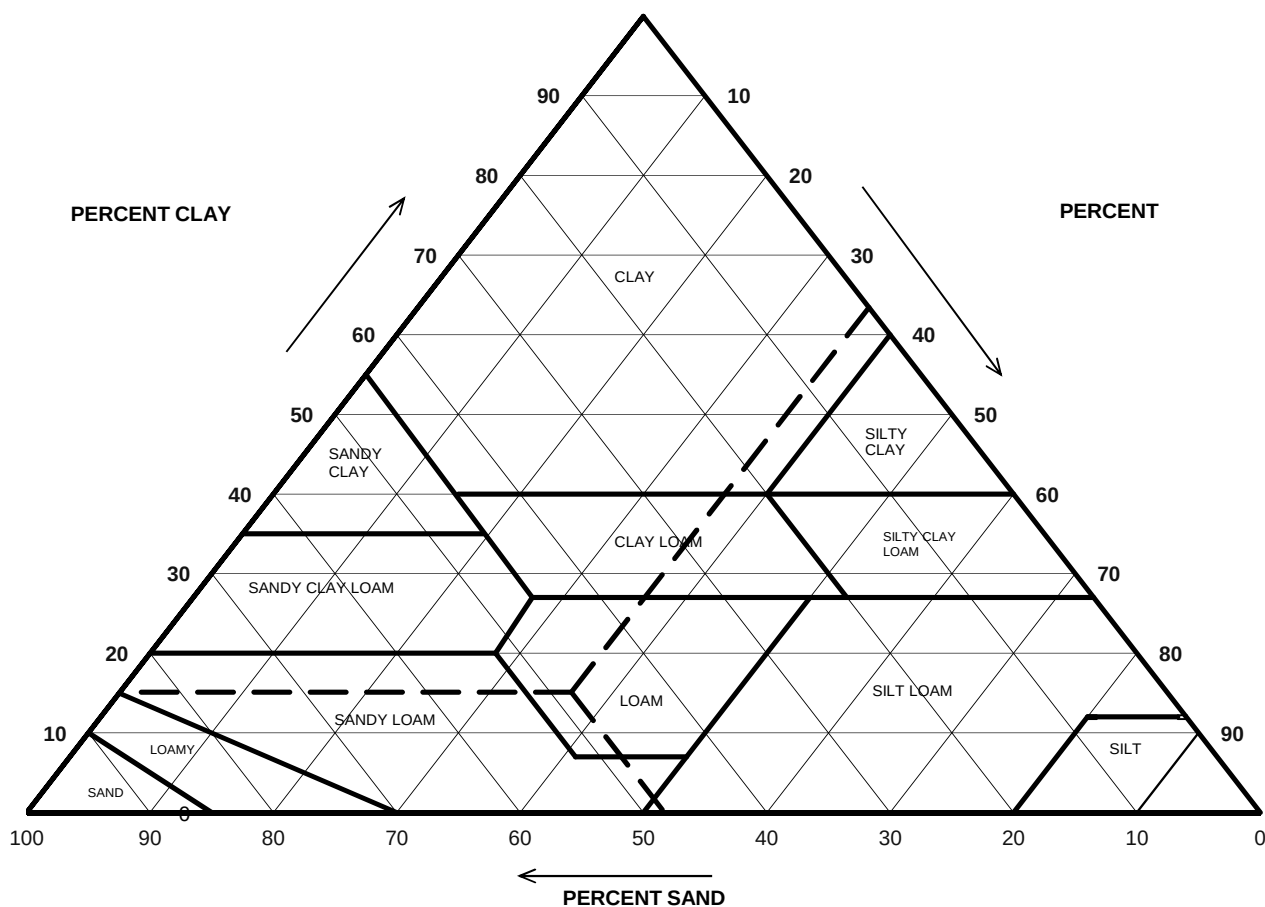
USCS Classification:
SILTY SAND WITH GRAVEL
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-077

Boring No.: JB2-19-202A
Depth (ft): 14.0-20.0
Sample No.: SpT-1/2/3
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	21.07	
2	78.93	Sand	38.12	48.30
0.05	40.81	Silt	28.87	36.58
0.002	11.94	Clay	11.94	15.12

USDA Classification: **LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-077

Boring No.: JB2-19-202A
 Depth (ft): 14.0-20.0
 Sample No.: SpT-1/2/3
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1510	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	490.63	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	460.72	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.21	Weight of Tare (g):	NA
Weight of Water (g):	29.91	Weight of Water (g):	NA
Weight of Dry Soil (g):	313.51	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.5	Moisture Content (%):	0.0
Dry Weight of Sample (g):	313.51	Total Dry Weight of Sample (g):	313.51
Tare No. (Sub-Specimen)	1510	Wet Weight of +3/4" Sample (g):	14.82
Wt. of Tare & Wet Sub-Specimen (g):	490.63	Dry Weight of + 3/4" Sample (g):	13.53
Weight of Tare (g):	147.21	Dry Weight of - 3/4" Sample (g):	299.98
Sub-Specimen Wet Weight (g):	343.42	Dry Weight -3/4" +3/8" Sample (g):	19.47
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	281.35
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	13.53	4.32	4.32	95.68	96
1/2"	12.5	11.22	(**)	7.89	92.11	92
3/8"	9.5	8.25	2.63	10.53	89.47	89
#4	4.75	16.60	5.29	15.82	84.18	84
#10	2	16.46	5.25	21.07	78.93	79
#20	0.85	14.94	(**)	25.84	74.16	74
#40	0.425	12.94	4.13	29.96	70.04	70
#60	0.25	16.79	5.36	35.32	64.68	65
#100	0.15	24.03	7.66	42.98	57.02	57
#140	0.106	17.46	5.57	48.55	51.45	51
#200	0.075	18.34	5.85	54.40	45.60	46
Pan	-	142.95	45.60	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client:	D'Appolonia	Boring No.:	JB2-19-202A
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	14.0-20.0
Project No.:	2020-002-001	Sample No.:	SpT-1/2/3
Lab ID:	2020-002-001-077	Soil Color:	Brown

Elapsed Time (min)	Reading mm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	36.0	22.4	5.75	10.3	0.0424	85.2	38.9
2	33.5	22.4	5.75	10.8	0.0306	78.2	35.7
4	28.5	22.4	5.75	11.7	0.0225	64.1	29.2
15	24.5	22.4	5.75	12.4	0.0120	52.8	24.1
30	21.0	22.4	5.75	13.0	0.0087	43.0	19.6
60	19.0	22.6	5.67	13.4	0.0062	37.5	17.1
250	16.0	23.3	5.41	13.9	0.0031	29.8	13.6
1440	13.5	23.1	5.48	14.4	0.0013	22.6	10.3

Soil Specimen Data

Tare No.:	672	Percent Finer than # 200:	45.60
Wt. of Tare & Dry Material (g):	135.21		
Weight of Tare (g):	95.11	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	35.10		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 1402
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-077

Boring No.: JB2-19-202A
Depth (ft): 14.0-20.0
Sample No.: SpT-1/2/3
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	29
Wt. of Tare & Wet Sample (g)	36.95
Wt. of Tare & Dry Sample (g)	34.24
Weight of Tare (g)	8.43
Weight of Water (g)	2.71
Weight of Dry Sample (g)	25.81

Water Content (%)	10.5

NON - PLASTIC MATERIAL

<i>Tested By</i>	<i>FS</i>	<i>Date</i>	<i>1/17/20</i>	<i>Checked By</i>	<i>JLK</i>	<i>Date</i>	<i>1/17/20</i>

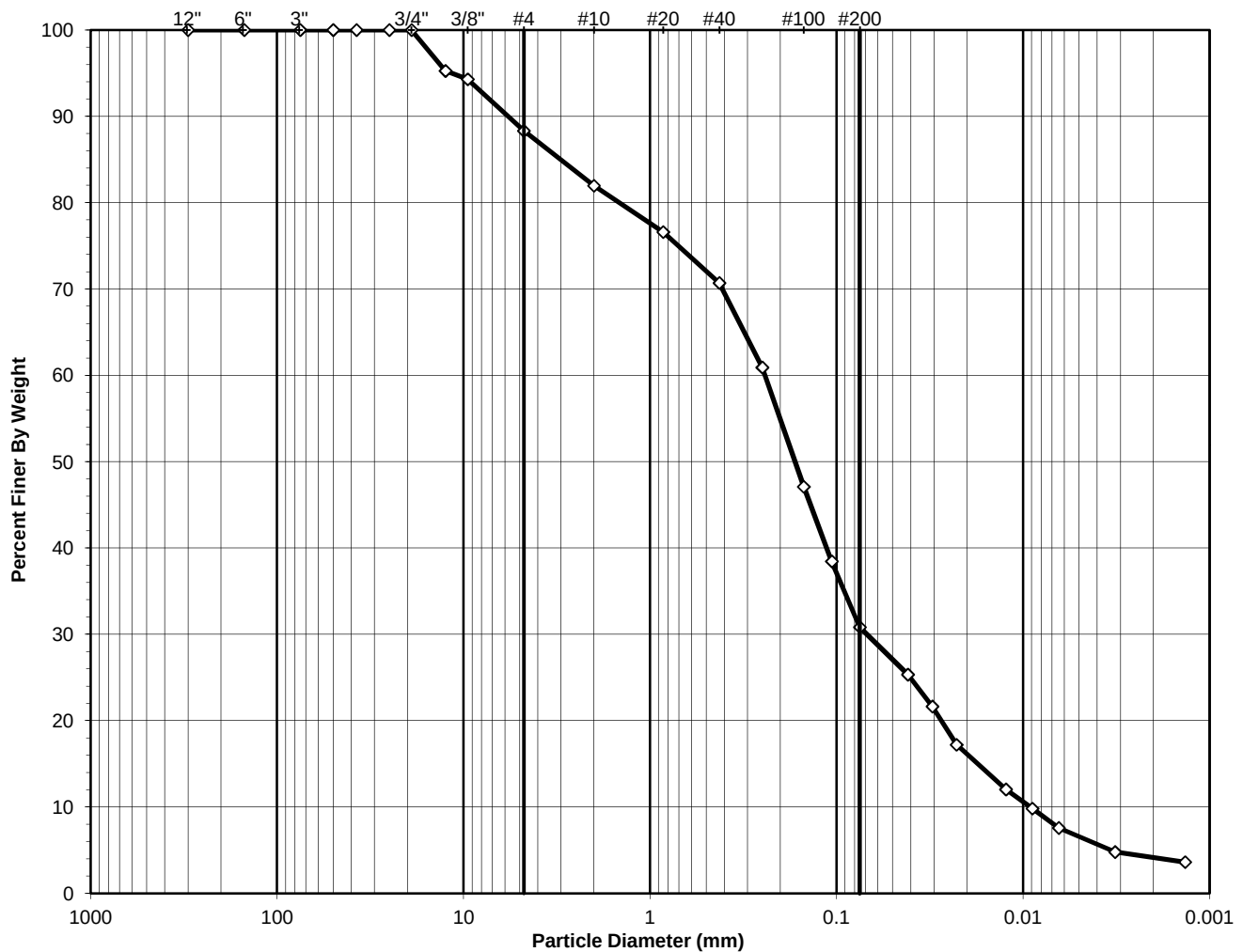
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-078

Boring No.: JB2-19-203
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.17

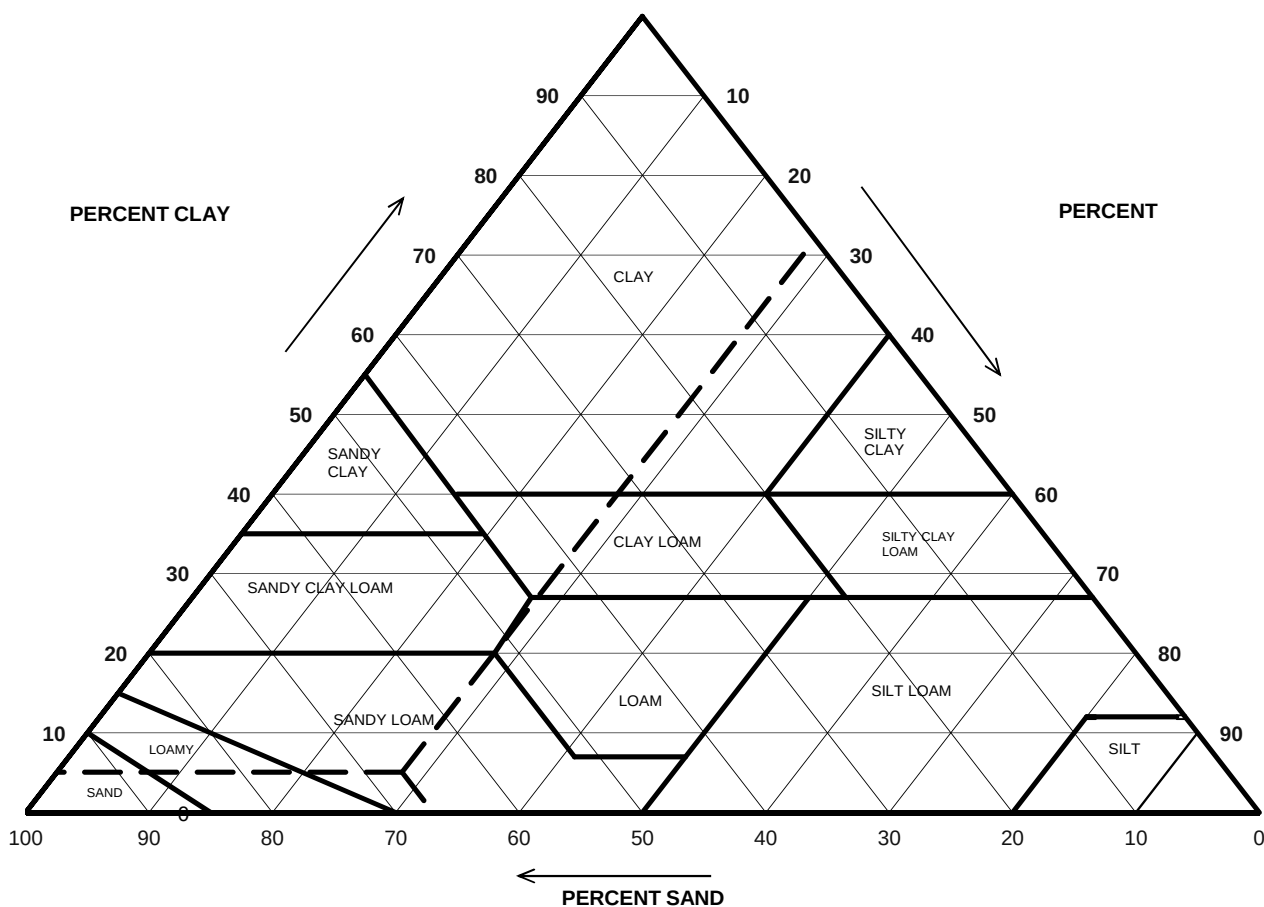
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-078

Boring No.: JB2-19-203
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	18.03	
2	81.97	Sand	54.89	66.96
0.05	27.08	Silt	22.93	27.97
0.002	4.15	Clay	4.15	5.06

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-078

Boring No.: JB2-19-203
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2040	Tare No.:	NA	Tare No.:	2040	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	443.53	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	443.53	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	417.16	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	417.16	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.32	Weight of Tare (g):	NA	Weight of Tare (g):	146.32	Weight of Tare (g):	NA
Weight of Water (g):	26.37	Weight of Water (g):	NA	Weight of Water (g):	26.37	Weight of Water (g):	NA
Weight of Dry Soil (g):	270.84	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	270.84	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	270.84	Total Dry Weight of Sample (g):	270.84	Dry Weight of Sample (g):	270.84	Total Dry Weight of Sample (g):	270.84
Tare No. (Sub-Specimen)	2040	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2040	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	443.53	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	443.53	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.32	Dry Weight of - 3/4" Sample (g):	270.84	Weight of Tare (g):	146.32	Dry Weight of - 3/4" Sample (g):	270.84
Sub-Specimen Wet Weight (g):	297.21	Dry Weight -3/4" +3/8" Sample (g):	15.46	Sub-Specimen Wet Weight (g):	297.21	Dry Weight -3/4" +3/8" Sample (g):	15.46
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	255.38	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	255.38
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	12.83	(**)	4.74	95.26	95
3/8"	9.5	2.63	0.97	5.71	94.29	94
#4	4.75	16.17	5.97	11.68	88.32	88
#10	2	17.21	6.35	18.03	81.97	82
#20	0.85	14.55	(**)	23.40	76.60	77
#40	0.425	15.97	5.90	29.30	70.70	71
#60	0.25	26.51	9.79	39.09	60.91	61
#100	0.15	37.41	13.81	52.90	47.10	47
#140	0.106	23.42	8.65	61.55	38.45	38
#200	0.075	20.65	7.62	69.17	30.83	31
Pan	-	83.49	30.83	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-078

Boring No.: JB2-19-203
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	40.0	22.5	5.71	9.8	0.0414	82.2	25.3
2	35.0	22.5	5.71	10.7	0.0306	70.2	21.6
4	29.0	22.5	5.71	11.7	0.0227	55.8	17.2
15	22.0	22.5	5.71	13.0	0.0123	39.1	12.0
30	19.0	22.5	5.71	13.5	0.0089	31.9	9.8
60	16.0	22.4	5.75	14.1	0.0064	24.6	7.6
250	12.0	23.0	5.52	14.8	0.0032	15.5	4.8
1440	10.5	22.8	5.60	15.1	0.0014	11.8	3.6

Soil Specimen Data

Tare No.:	970	Percent Finer than # 200:	30.83
Wt. of Tare & Dry Material (g):	145.47		
Weight of Tare (g):	99.04	Specific Gravity:	2.68 Measured
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	41.43		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 773
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/21/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-078

Boring No.: JB2-19-203
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	42
Wt. of Tare & Wet Sample (g)	35.06
Wt. of Tare & Dry Sample (g)	32.81
Weight of Tare (g)	8.43
Weight of Water (g)	2.25
Weight of Dry Sample (g)	24.38

Water Content (%) **9.2**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-203
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	0.0-4.0
Project No.:	2020-002-001	Sample No.:	SpT-1/2
Lab ID:	2020-002-001-078	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	746.05	743.59
Temperature (°C):	26.2	26.5
Weight of Pycnometer & Water (g):	683.82	684.33
Tare Number:	947	950
Weight of Tare & Dry Soil (g):	198.59	191.91
Weight of Tare (g):	98.03	98.62
Weight of Dry Soil (g):	100.56	93.29
Specific Gravity of Soil @ Measured Temperature:	2.623	2.741
Specific Gravity of Water @ Measured Temperature:	0.99674	0.99666
Conversion Factor for Measured Temperature:	0.99853	0.99845
Specific Gravity @ 20° Celsius:	2.627	2.745

Average Specific Gravity @ 20° Celsius	2.69

Tested By TO Date 1/22/20 Checked By BRB Date 1/24/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

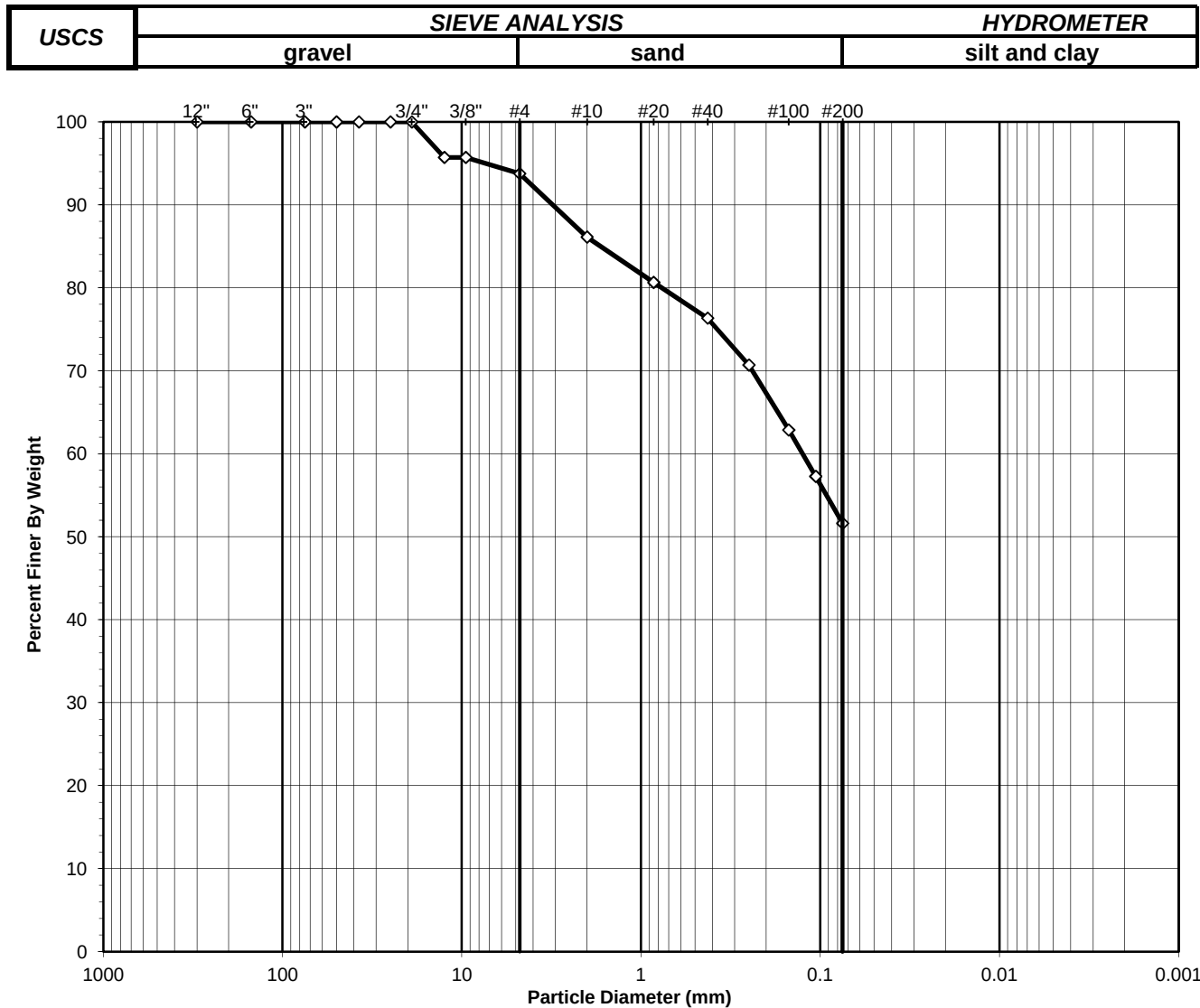
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SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-079

Boring No.: JB2-19-203
 Depth (ft): 6.0-8.7
 Sample No.: SpT-4/5
 Soil Color: Brown



USCS Symbol:
ML, TESTED

D50 = 0.07

USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-079

Boring No.: JB2-19-203
 Depth (ft): 6.0-8.7
 Sample No.: SpT-4/5
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1528	Tare No.:	NA	Tare No.:	1528	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	410.97	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	410.97	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	390.49	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	390.49	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.42	Weight of Tare (g):	NA	Weight of Tare (g):	146.42	Weight of Tare (g):	NA
Weight of Water (g):	20.48	Weight of Water (g):	NA	Weight of Water (g):	20.48	Weight of Water (g):	NA
Weight of Dry Soil (g):	244.07	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	244.07	Weight of Dry Soil (g):	NA
Moisture Content (%):	8.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	244.07	Total Dry Weight of Sample (g):	244.07	Dry Weight of Sample (g):	244.07	Total Dry Weight of Sample (g):	244.07
Tare No. (Sub-Specimen)	1528	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1528	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	410.97	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	410.97	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.42	Dry Weight of - 3/4" Sample (g):	244.07	Weight of Tare (g):	146.42	Dry Weight of - 3/4" Sample (g):	244.07
Sub-Specimen Wet Weight (g):	264.55	Dry Weight -3/4" +3/8" Sample (g):	10.44	Sub-Specimen Wet Weight (g):	264.55	Dry Weight -3/4" +3/8" Sample (g):	10.44
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	233.63	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	233.63
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	10.44	(**)	4.28	95.72	96
3/8"	9.5	0.00	0.00	4.28	95.72	96
#4	4.75	4.77	1.95	6.23	93.77	94
#10	2	18.65	7.64	13.87	86.13	86
#20	0.85	13.34	(**)	19.34	80.66	81
#40	0.425	10.51	4.31	23.64	76.36	76
#60	0.25	13.80	5.65	29.30	70.70	71
#100	0.15	19.09	7.82	37.12	62.88	63
#140	0.106	13.66	5.60	42.72	57.28	57
#200	0.075	13.80	5.65	48.37	51.63	52
Pan	-	126.01	51.63	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-079

Boring No.: JB2-19-203
Depth (ft): 6.0-8.7
Sample No.: SpT-4/5
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	39
Wt. of Tare & Wet Sample (g)	35.03
Wt. of Tare & Dry Sample (g)	33.13
Weight of Tare (g)	8.45
Weight of Water (g)	1.90
Weight of Dry Sample (g)	24.68

Water Content (%)	7.7

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/17/20	Checked By	JLK	Date	1/17/20

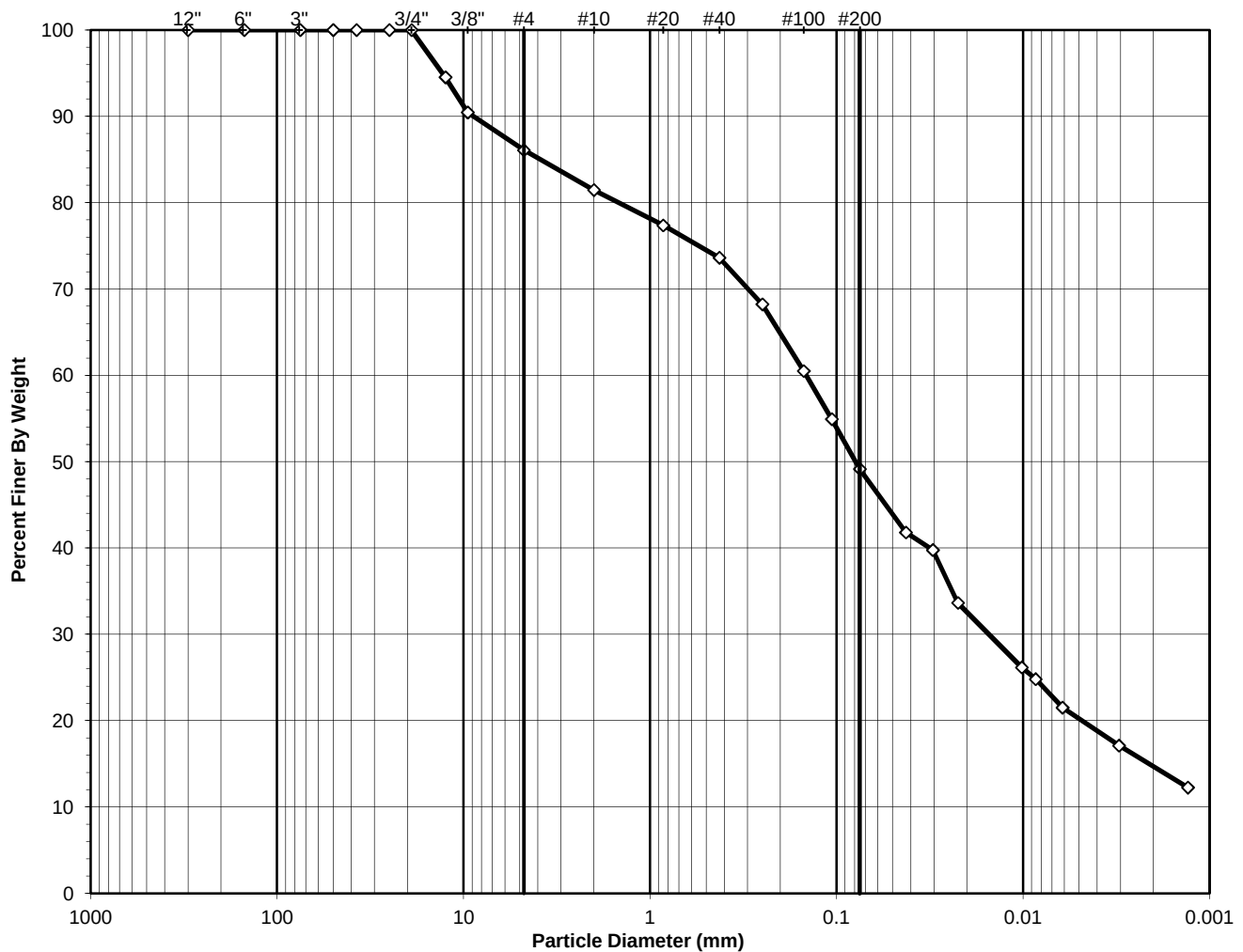
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-080

Boring No.: JB2-19-203
 Depth (ft): 10.0-13.1
 Sample No.: SpT-6/7
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.08

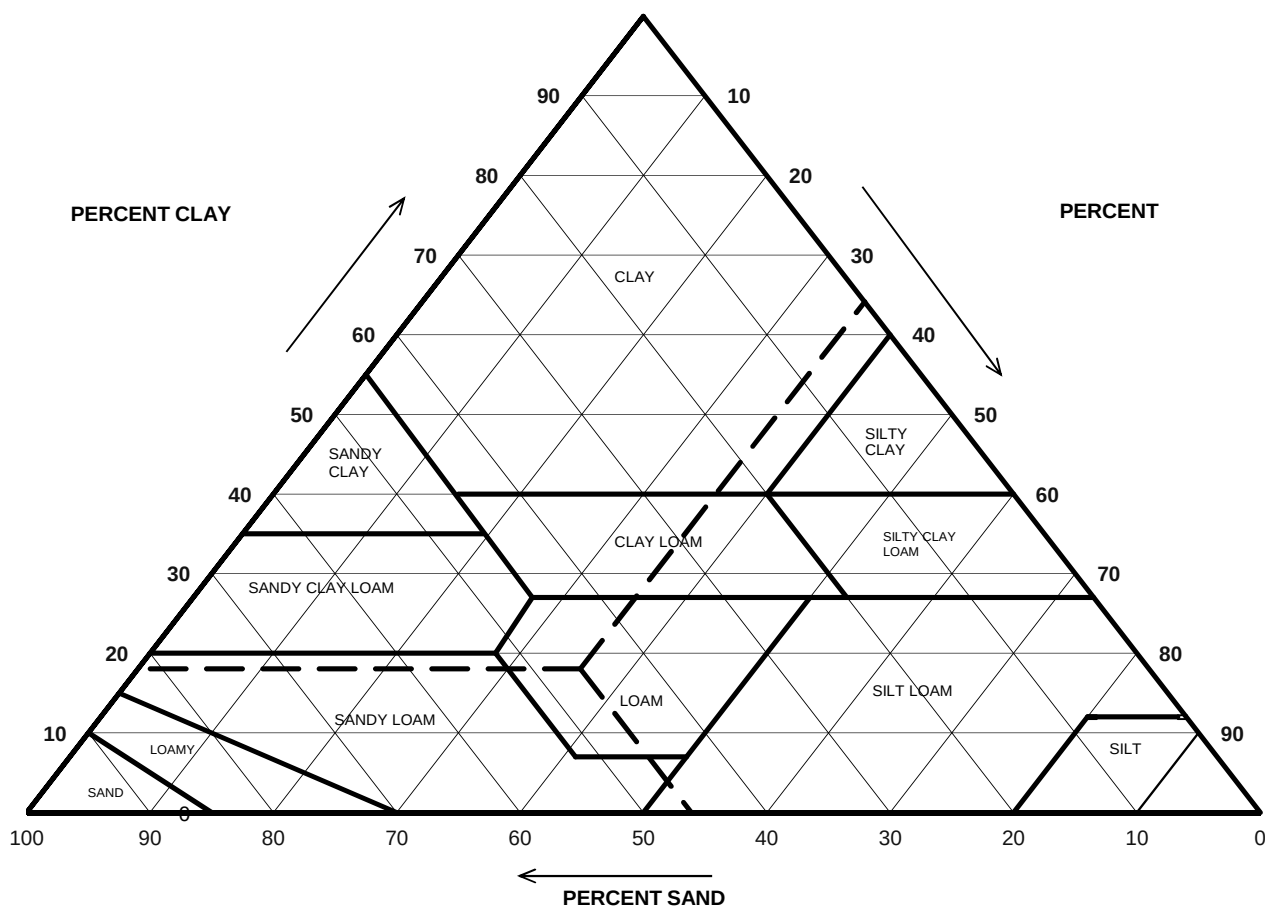
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-080

Boring No.: JB2-19-203
Depth (ft): 10.0-13.1
Sample No.: SpT-6/7
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	18.53	
2	81.47	Sand	37.56	46.11
0.05	43.90	Silt	29.21	35.86
0.002	14.69	Clay	14.69	18.03

USDA Classification: **LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-080

Boring No.: JB2-19-203
Depth (ft): 10.0-13.1
Sample No.: SpT-6/7
Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1485	Tare No.:	NA	Tare No.:	1485	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	423.95	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	423.95	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	407.05	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	407.05	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.63	Weight of Tare (g):	NA	Weight of Tare (g):	147.63	Weight of Tare (g):	NA
Weight of Water (g):	16.90	Weight of Water (g):	NA	Weight of Water (g):	16.90	Weight of Water (g):	NA
Weight of Dry Soil (g):	259.42	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	259.42	Weight of Dry Soil (g):	NA
Moisture Content (%):	6.5	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	259.42	Total Dry Weight of Sample (g):	259.42	Dry Weight of Sample (g):	259.42	Total Dry Weight of Sample (g):	259.42
Tare No. (Sub-Specimen)	1485	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1485	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	423.95	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	423.95	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.63	Dry Weight of - 3/4" Sample (g):	259.42	Weight of Tare (g):	147.63	Dry Weight of - 3/4" Sample (g):	259.42
Sub-Specimen Wet Weight (g):	276.32	Dry Weight -3/4" +3/8" Sample (g):	24.76	Sub-Specimen Wet Weight (g):	276.32	Dry Weight -3/4" +3/8" Sample (g):	24.76
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	234.66	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	234.66
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	14.20	(**)	5.47	94.53	95
3/8"	9.5	10.56	4.07	9.54	90.46	90
#4	4.75	11.35	4.38	13.92	86.08	86
#10	2	11.97	4.61	18.53	81.47	81
#20	0.85	10.63	(**)	22.63	77.37	77
#40	0.425	9.71	3.74	26.37	73.63	74
#60	0.25	14.00	5.40	31.77	68.23	68
#100	0.15	20.04	7.72	39.50	60.50	61
#140	0.106	14.47	5.58	45.07	54.93	55
#200	0.075	15.00	5.78	50.86	49.14	49
Pan	-	127.49	49.14	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-080

Boring No.: JB2-19-203
 Depth (ft): 10.0-13.1
 Sample No.: SpT-6/7
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	36.5	22.4	5.75	10.4	0.0425	85.1	41.8
2	35.0	22.4	5.75	10.6	0.0304	80.9	39.8
4	30.5	22.4	5.75	11.4	0.0223	68.5	33.6
21	25.0	22.4	5.75	12.4	0.0102	53.3	26.2
30	24.0	22.4	5.75	12.6	0.0086	50.5	24.8
60	21.5	22.6	5.67	13.1	0.0061	43.8	21.5
250	18.0	23.3	5.41	13.7	0.0031	34.8	17.1
1440	14.5	23.1	5.48	14.3	0.0013	24.9	12.3

Soil Specimen Data

Tare No.:	704	Percent Finer than # 200:	49.14
Wt. of Tare & Dry Material (g):	131.27		
Weight of Tare (g):	90.52	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	35.75		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 207
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-080

Boring No.: JB2-19-203
Depth (ft): 10.0-13.1
Sample No.: SpT-6/7
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	43
Wt. of Tare & Wet Sample (g)	30.13
Wt. of Tare & Dry Sample (g)	28.74
Weight of Tare (g)	8.48
Weight of Water (g)	1.39
Weight of Dry Sample (g)	20.26

Water Content (%)	6.9

NON - PLASTIC MATERIAL

<i>Tested By</i>	<i>FS</i>	<i>Date</i>	<i>1/17/20</i>	<i>Checked By</i>	<i>JLK</i>	<i>Date</i>	<i>1/17/20</i>

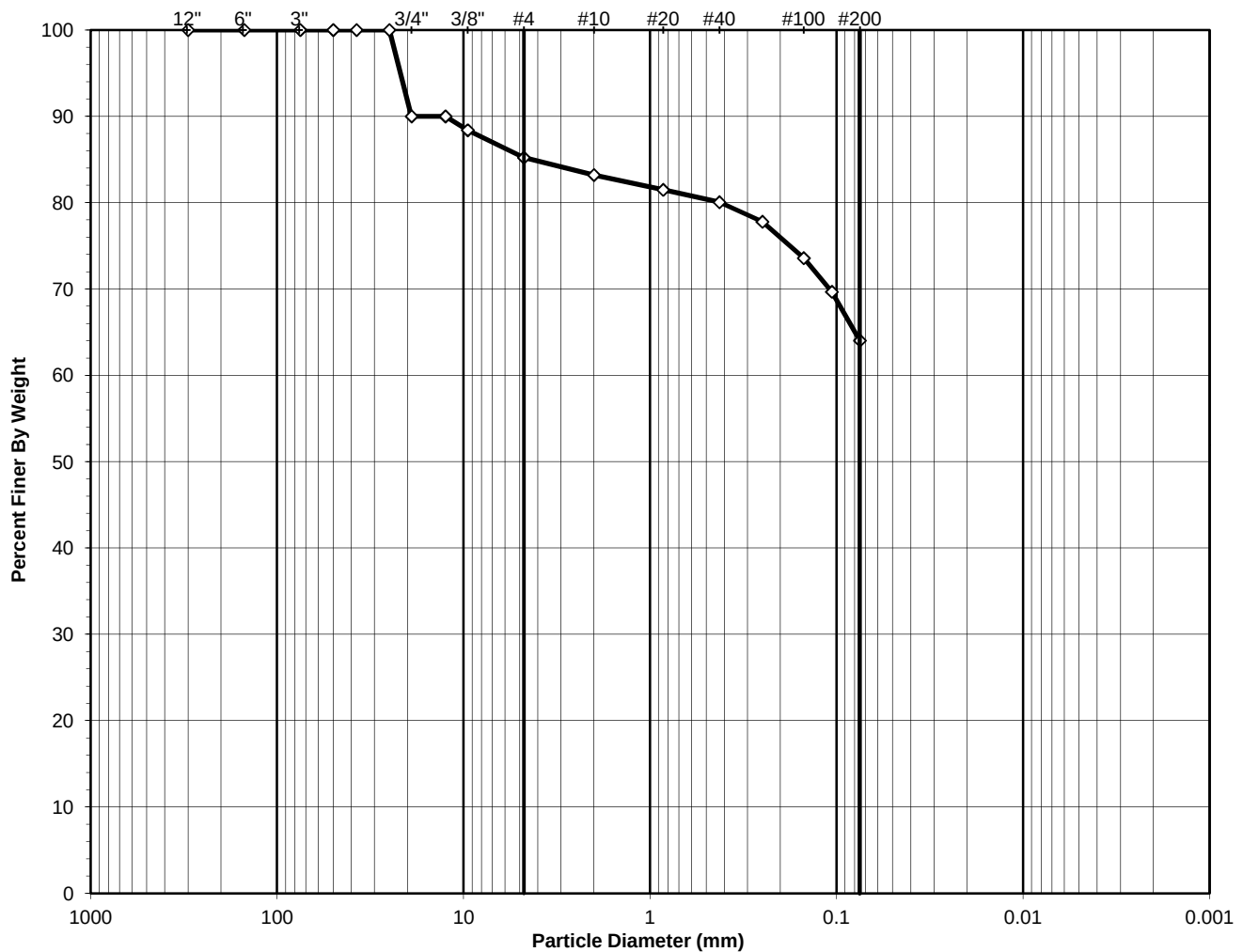
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-081

Boring No.: JB2-19-203A
 Depth (ft): 14.0-17.2
 Sample No.: SpT-1/2
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
ML, TESTED

D50 = 0.04

USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-081

Boring No.: JB2-19-203A
 Depth (ft): 14.0-17.2
 Sample No.: SpT-1/2
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2038	Tare No.:	NA	Tare No.:	2038	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	380.10	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	380.10	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	350.77	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	350.77	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.43	Weight of Tare (g):	NA	Weight of Tare (g):	146.43	Weight of Tare (g):	NA
Weight of Water (g):	29.33	Weight of Water (g):	NA	Weight of Water (g):	29.33	Weight of Water (g):	NA
Weight of Dry Soil (g):	204.34	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	204.34	Weight of Dry Soil (g):	NA
Moisture Content (%):	14.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	204.34	Total Dry Weight of Sample (g):	204.34	Dry Weight of Sample (g):	204.34	Total Dry Weight of Sample (g):	204.34
Tare No. (Sub-Specimen)	2038	Wet Weight of +3/4" Sample (g):	23.37	Tare No. (Sub-Specimen)	2038	Wet Weight of +3/4" Sample (g):	23.37
Wt. of Tare & Wet Sub-Specimen (g):	380.10	Dry Weight of + 3/4" Sample (g):	20.44	Wt. of Tare & Wet Sub-Specimen (g):	380.10	Dry Weight of + 3/4" Sample (g):	20.44
Weight of Tare (g):	146.43	Dry Weight of - 3/4" Sample (g):	183.90	Weight of Tare (g):	146.43	Dry Weight of - 3/4" Sample (g):	183.90
Sub-Specimen Wet Weight (g):	233.67	Dry Weight -3/4" +3/8" Sample (g):	3.27	Sub-Specimen Wet Weight (g):	233.67	Dry Weight -3/4" +3/8" Sample (g):	3.27
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	180.96	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	180.96
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	20.44	10.00	10.00	90.00	90
1/2"	12.5	0.00	(**) 0.00	10.00	90.00	90
3/8"	9.5	3.27	1.60	11.60	88.40	88
#4	4.75	6.50	3.18	14.78	85.22	85
#10	2	4.11	2.01	16.80	83.20	83
#20	0.85	3.51	(**) 1.72	18.51	81.49	81
#40	0.425	2.92	1.43	19.94	80.06	80
#60	0.25	4.63	2.27	22.21	77.79	78
#100	0.15	8.61	4.21	26.42	73.58	74
#140	0.106	7.97	3.90	30.32	69.68	70
#200	0.075	11.53	5.64	35.96	64.04	64
Pan	-	130.85	64.04	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-081

Boring No.: JB2-19-203A
Depth (ft): 14.0-17.2
Sample No.: SpT-1/2
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	22
Wt. of Tare & Wet Sample (g)	31.46
Wt. of Tare & Dry Sample (g)	28.24
Weight of Tare (g)	8.33
Weight of Water (g)	3.22
Weight of Dry Sample (g)	19.91

Water Content (%)	16.2

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/17/20	Checked By	JLK	Date	1/17/20

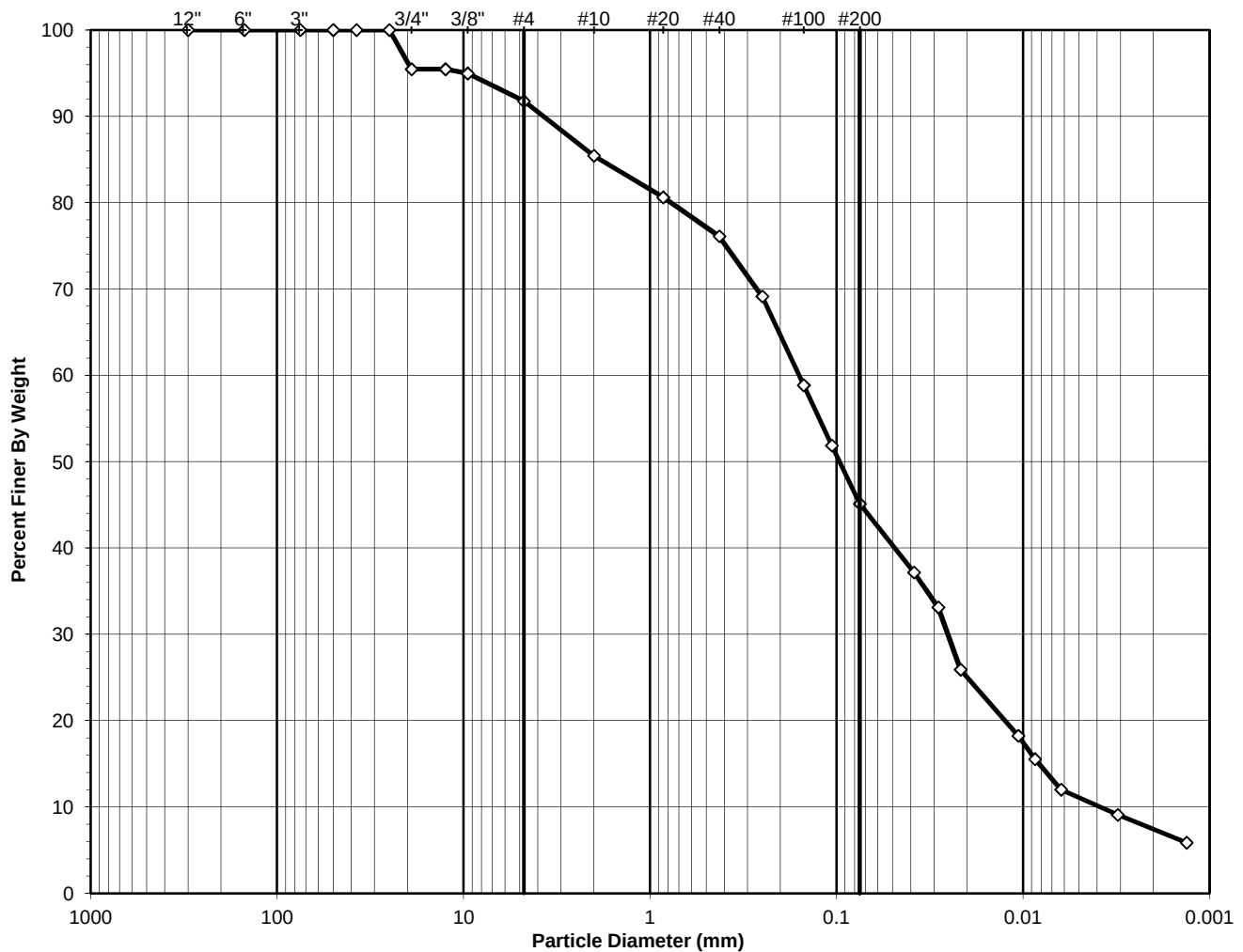
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-082

Boring No.: JB2-19-204
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.10

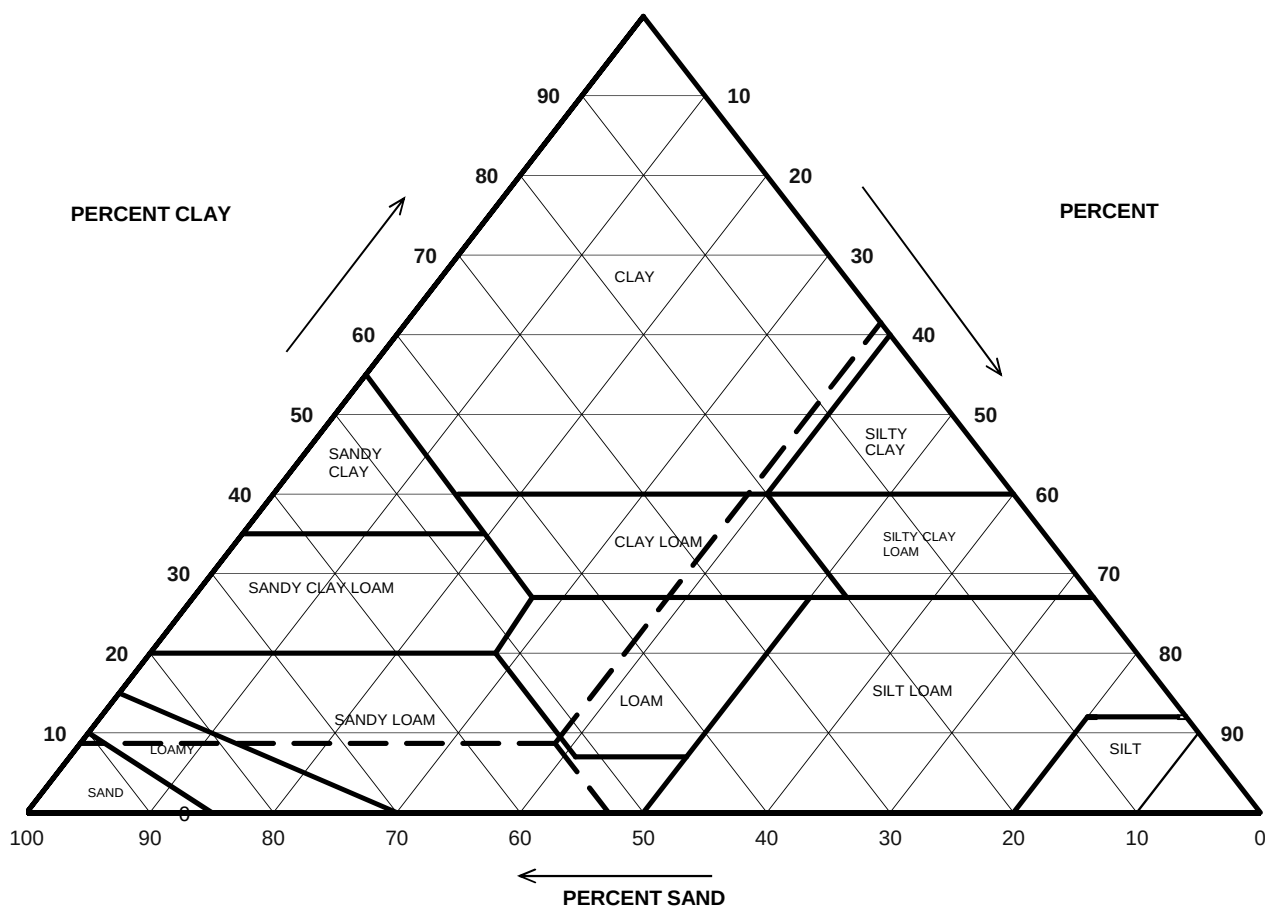
USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-082

Boring No.: JB2-19-204
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	14.56	
2	85.44	Sand	45.13	52.83
0.05	40.30	Silt	32.88	38.48
0.002	7.43	Clay	7.43	8.69

USDA Classification: **SANDY LOAM**

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-082

Boring No.: JB2-19-204
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1547	Tare No.:	NA	Tare No.:	1547	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	417.38	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	417.38	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	389.72	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	389.72	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.09	Weight of Tare (g):	NA	Weight of Tare (g):	146.09	Weight of Tare (g):	NA
Weight of Water (g):	27.66	Weight of Water (g):	NA	Weight of Water (g):	27.66	Weight of Water (g):	NA
Weight of Dry Soil (g):	243.63	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	243.63	Weight of Dry Soil (g):	NA
Moisture Content (%):	11.4	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	243.63	Total Dry Weight of Sample (g):	243.63	Dry Weight of Sample (g):	243.63	Total Dry Weight of Sample (g):	243.63
Tare No. (Sub-Specimen)	1547	Wet Weight of +3/4" Sample (g):	12.33	Tare No. (Sub-Specimen)	1547	Wet Weight of +3/4" Sample (g):	12.33
Wt. of Tare & Wet Sub-Specimen (g):	417.38	Dry Weight of + 3/4" Sample (g):	11.07	Wt. of Tare & Wet Sub-Specimen (g):	417.38	Dry Weight of + 3/4" Sample (g):	11.07
Weight of Tare (g):	146.09	Dry Weight of - 3/4" Sample (g):	232.56	Weight of Tare (g):	146.09	Dry Weight of - 3/4" Sample (g):	232.56
Sub-Specimen Wet Weight (g):	271.29	Dry Weight -3/4" +3/8" Sample (g):	1.20	Sub-Specimen Wet Weight (g):	271.29	Dry Weight -3/4" +3/8" Sample (g):	1.20
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	231.41	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	231.41
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	11.07	4.54	4.54	95.46	95
1/2"	12.5	0.00	(**) 0.00	4.54	95.46	95
3/8"	9.5	1.20	0.49	5.04	94.96	95
#4	4.75	7.81	3.21	8.24	91.76	92
#10	2	15.40	6.32	14.56	85.44	85
#20	0.85	11.75	(**) 4.82	19.39	80.61	81
#40	0.425	10.97	4.50	23.89	76.11	76
#60	0.25	16.98	6.97	30.86	69.14	69
#100	0.15	25.07	10.29	41.15	58.85	59
#140	0.106	17.01	6.98	48.13	51.87	52
#200	0.075	16.43	6.74	54.87	45.13	45
Pan	-	109.94	45.13	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-082

Boring No.: JB2-19-204
 Depth (ft): 0.0-4.0
 Sample No.: SpT-1/2
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	47.0	22.4	5.75	8.5	0.0384	82.4	37.2
2	42.5	22.4	5.75	9.3	0.0284	73.4	33.1
4	34.5	22.4	5.75	10.7	0.0216	57.4	25.9
19	26.0	22.4	5.75	12.3	0.0106	40.4	18.3
30	23.0	22.4	5.75	12.8	0.0086	34.5	15.5
60	19.0	22.6	5.67	13.5	0.0063	26.6	12.0
250	15.5	23.3	5.41	14.1	0.0031	20.2	9.1
1440	12.0	23.1	5.48	14.8	0.0013	13.0	5.9

Soil Specimen Data

Tare No.:	889	Percent Finer than # 200:	45.13
Wt. of Tare & Dry Material (g):	153.47		
Weight of Tare (g):	98.95	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	49.52		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 199
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/16/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-082

Boring No.: JB2-19-204
Depth (ft): 0.0-4.0
Sample No.: SpT-1/2
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	40
Wt. of Tare & Wet Sample (g)	38.26
Wt. of Tare & Dry Sample (g)	35.20
Weight of Tare (g)	8.42
Weight of Water (g)	3.06
Weight of Dry Sample (g)	26.78

Water Content (%) **11.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/17/20* *Checked By* *JLK* *Date* *1/17/20*

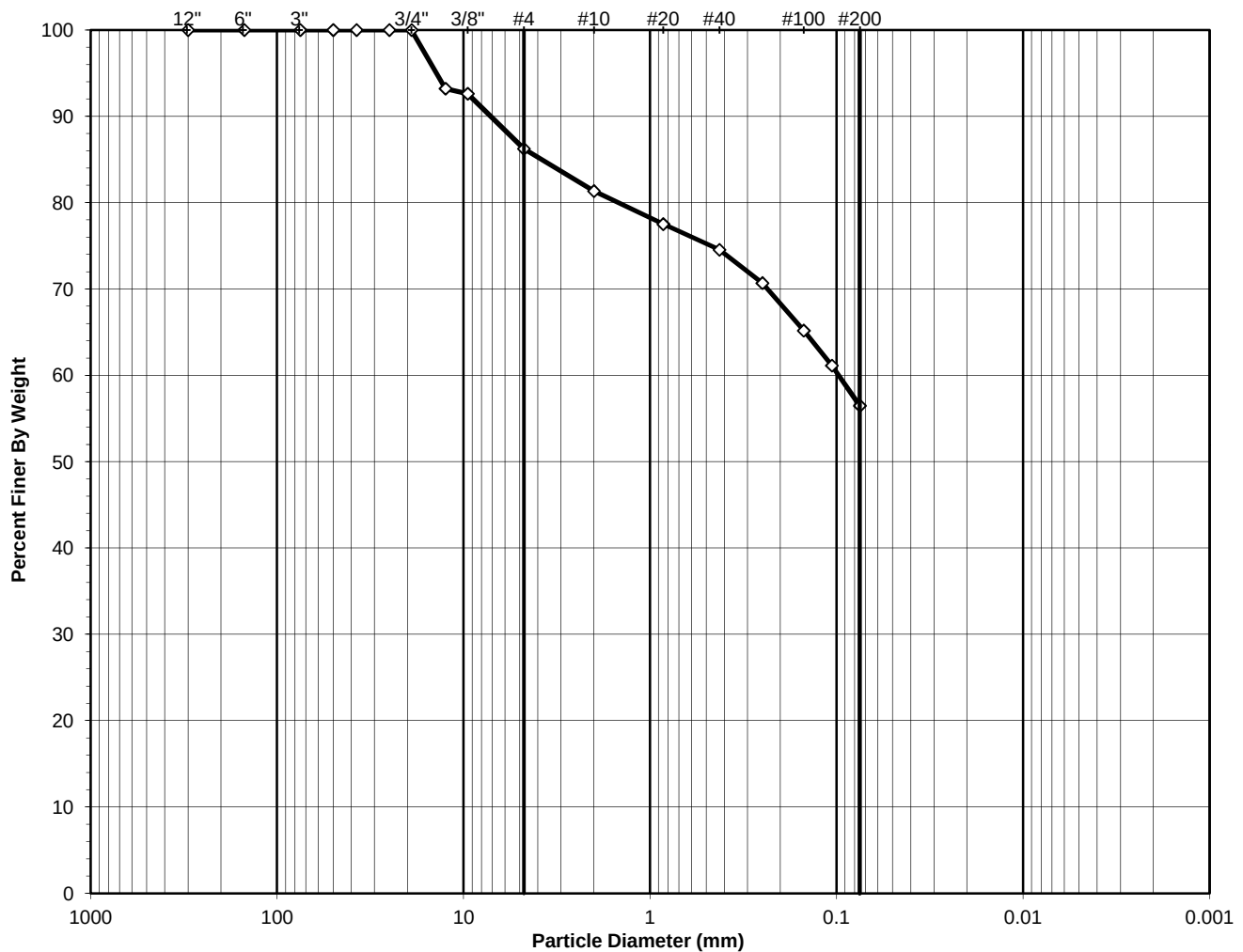
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-083

Boring No.: JB2-19-204
 Depth (ft): 6.0-8.8
 Sample No.: SpT-4/5
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
ML, TESTED

D50 = 0.05

USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-083

Boring No.: JB2-19-204
 Depth (ft): 6.0-8.8
 Sample No.: SpT-4/5
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1495	Tare No.:	NA	Tare No.:	1495	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	377.61	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	377.61	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	356.60	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	356.60	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.78	Weight of Tare (g):	NA	Weight of Tare (g):	146.78	Weight of Tare (g):	NA
Weight of Water (g):	21.01	Weight of Water (g):	NA	Weight of Water (g):	21.01	Weight of Water (g):	NA
Weight of Dry Soil (g):	209.82	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	209.82	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	209.82	Total Dry Weight of Sample (g):	209.82	Dry Weight of Sample (g):	209.82	Total Dry Weight of Sample (g):	209.82
Tare No. (Sub-Specimen)	1495	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1495	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	377.61	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	377.61	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.78	Dry Weight of - 3/4" Sample (g):	209.82	Weight of Tare (g):	146.78	Dry Weight of - 3/4" Sample (g):	209.82
Sub-Specimen Wet Weight (g):	230.83	Dry Weight -3/4" +3/8" Sample (g):	15.49	Sub-Specimen Wet Weight (g):	230.83	Dry Weight -3/4" +3/8" Sample (g):	15.49
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	194.33	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	194.33
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	14.24	(**) 6.79	6.79	93.21	93
3/8"	9.5	1.25	0.60	7.38	92.62	93
#4	4.75	13.39	6.38	13.76	86.24	86
#10	2	10.26	4.89	18.65	81.35	81
#20	0.85	8.03	(**) 3.83	22.48	77.52	78
#40	0.425	6.24	2.97	25.46	74.54	75
#60	0.25	8.09	3.86	29.31	70.69	71
#100	0.15	11.55	5.50	34.82	65.18	65
#140	0.106	8.49	4.05	38.86	61.14	61
#200	0.075	9.77	4.66	43.52	56.48	56
Pan	-	118.51	56.48	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-083

Boring No.: JB2-19-204
Depth (ft): 6.0-8.8
Sample No.: SpT-4/5
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	26
Wt. of Tare & Wet Sample (g)	35.14
Wt. of Tare & Dry Sample (g)	32.49
Weight of Tare (g)	8.44
Weight of Water (g)	2.65
Weight of Dry Sample (g)	24.05

Water Content (%)	11.0

NON - PLASTIC MATERIAL

Tested By	FS	Date	1/17/20	Checked By	JLK	Date	1/17/20

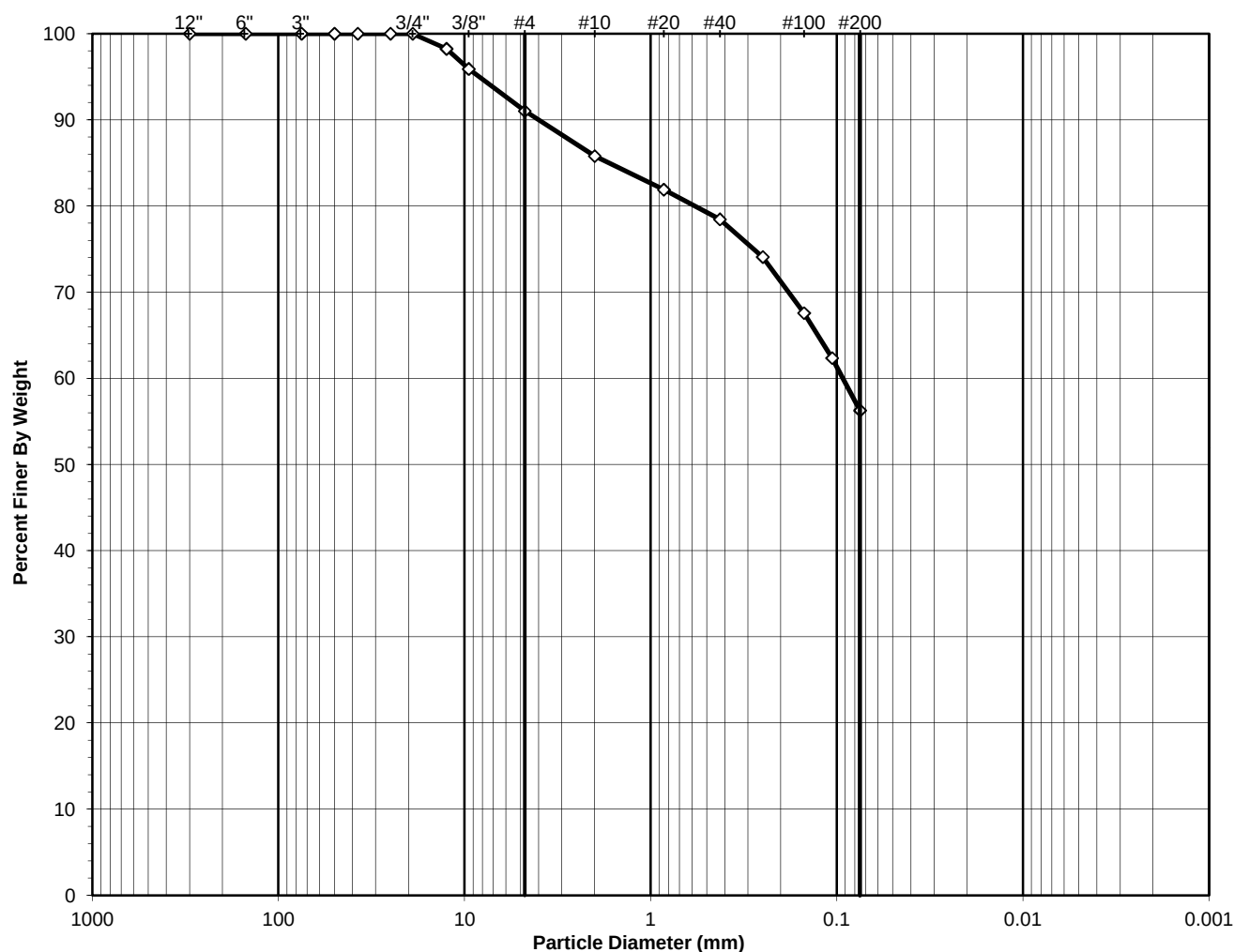
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-084

Boring No.: JB2-19-204
 Depth (ft): 10.0-12.9
 Sample No.: SpT-6/7
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
ML, TESTED

D50 = 0.05

USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-084

Boring No.: JB2-19-204
 Depth (ft): 10.0-12.9
 Sample No.: SpT-6/7
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1531	Tare No.:	NA	Tare No.:	1531	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	404.47	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	404.47	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	380.08	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	380.08	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.70	Weight of Tare (g):	NA	Weight of Tare (g):	147.70	Weight of Tare (g):	NA
Weight of Water (g):	24.39	Weight of Water (g):	NA	Weight of Water (g):	24.39	Weight of Water (g):	NA
Weight of Dry Soil (g):	232.38	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	232.38	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.5	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	232.38	Total Dry Weight of Sample (g):	232.38	Dry Weight of Sample (g):	232.38	Total Dry Weight of Sample (g):	232.38
Tare No. (Sub-Specimen)	1531	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1531	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	404.47	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	404.47	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	147.70	Dry Weight of - 3/4" Sample (g):	232.38	Weight of Tare (g):	147.70	Dry Weight of - 3/4" Sample (g):	232.38
Sub-Specimen Wet Weight (g):	256.77	Dry Weight -3/4" +3/8" Sample (g):	9.51	Sub-Specimen Wet Weight (g):	256.77	Dry Weight -3/4" +3/8" Sample (g):	9.51
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	222.87	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	222.87
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	4.08	(**) 1.76	1.76	98.24	98
3/8"	9.5	5.43	2.34	4.09	95.91	96
#4	4.75	11.35	4.88	8.98	91.02	91
#10	2	12.14	5.22	14.20	85.80	86
#20	0.85	9.06	(**) 3.90	18.10	81.90	82
#40	0.425	8.00	3.44	21.54	78.46	78
#60	0.25	10.16	4.37	25.91	74.09	74
#100	0.15	15.13	6.51	32.43	67.57	68
#140	0.106	12.13	5.22	37.65	62.35	62
#200	0.075	14.12	6.08	43.72	56.28	56
Pan	-	130.78	56.28	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-084

Boring No.: JB2-19-204
Depth (ft): 10.0-12.9
Sample No.: SpT-6/7
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	18
Wt. of Tare & Wet Sample (g)	32.14
Wt. of Tare & Dry Sample (g)	30.10
Weight of Tare (g)	8.45
Weight of Water (g)	2.04
Weight of Dry Sample (g)	21.65

Water Content (%) **9.4**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-204
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	10.0-12.9
Project No.:	2020-002-001	Sample No.:	SpT-6/7
Lab ID:	2020-002-001-084	Visual Description:	Brown Sandy Clay

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	738.49	742.5
Temperature (°C):	26.6	26.5
Weight of Pycnometer & Water (g):	683.77	684.33
Tare Number:	685	695
Weight of Tare & Dry Soil (g):	187.09	181.68
Weight of Tare (g):	99.03	90.37
Weight of Dry Soil (g):	88.06	91.31
Specific Gravity of Soil @ Measured Temperature:	2.641	2.755
Specific Gravity of Water @ Measured Temperature:	0.99663	0.99666
Conversion Factor for Measured Temperature:	0.99842	0.99845
Specific Gravity @ 20° Celsius:	2.645	2.759

Average Specific Gravity @ 20° Celsius

2.70

Tested By TO Date 1/22/20 Checked By BRB Date 1/24/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

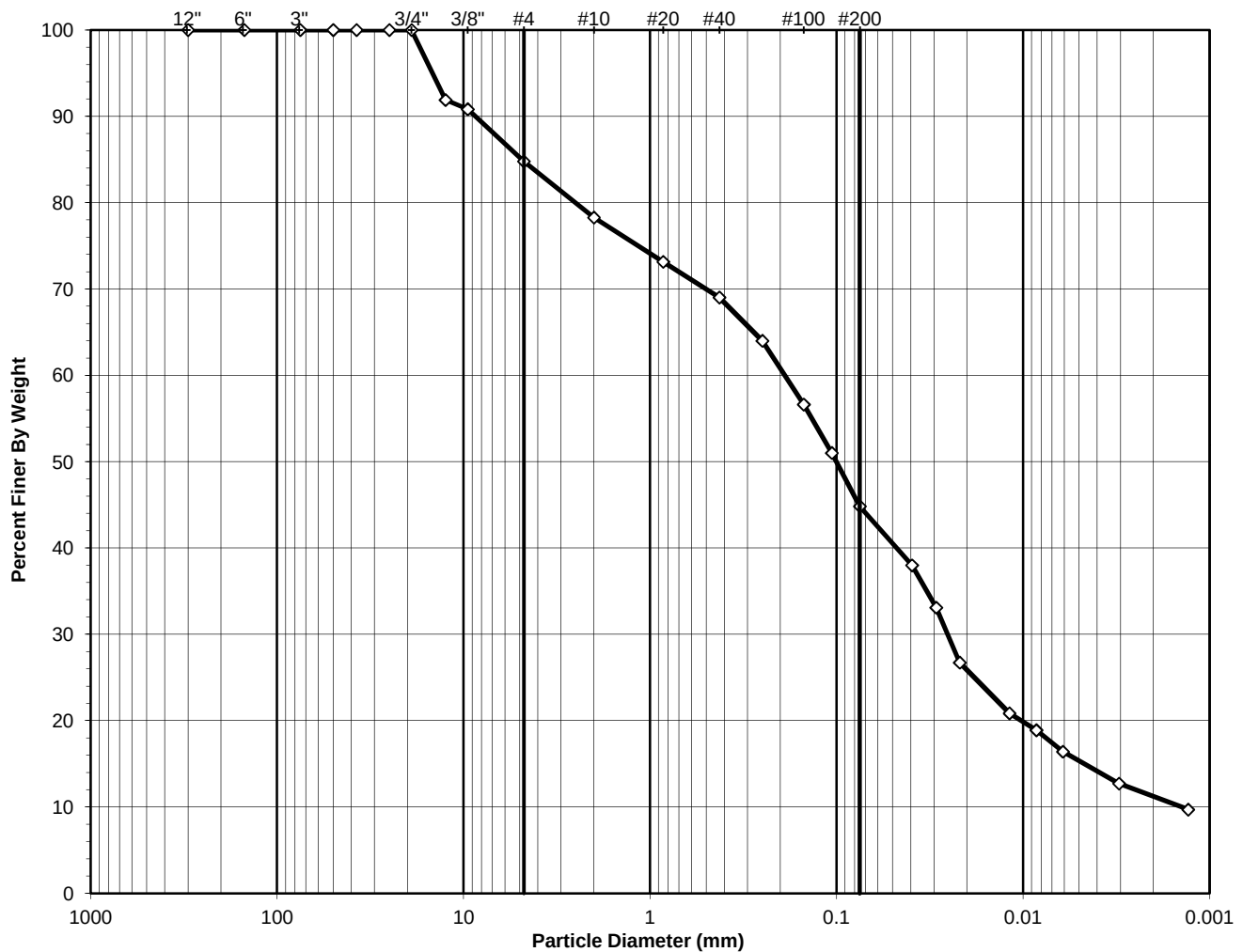
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-085

Boring No.: JB2-19-204
 Depth (ft): 18.0-22.0
 Sample No.: SpT-9/10
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.10

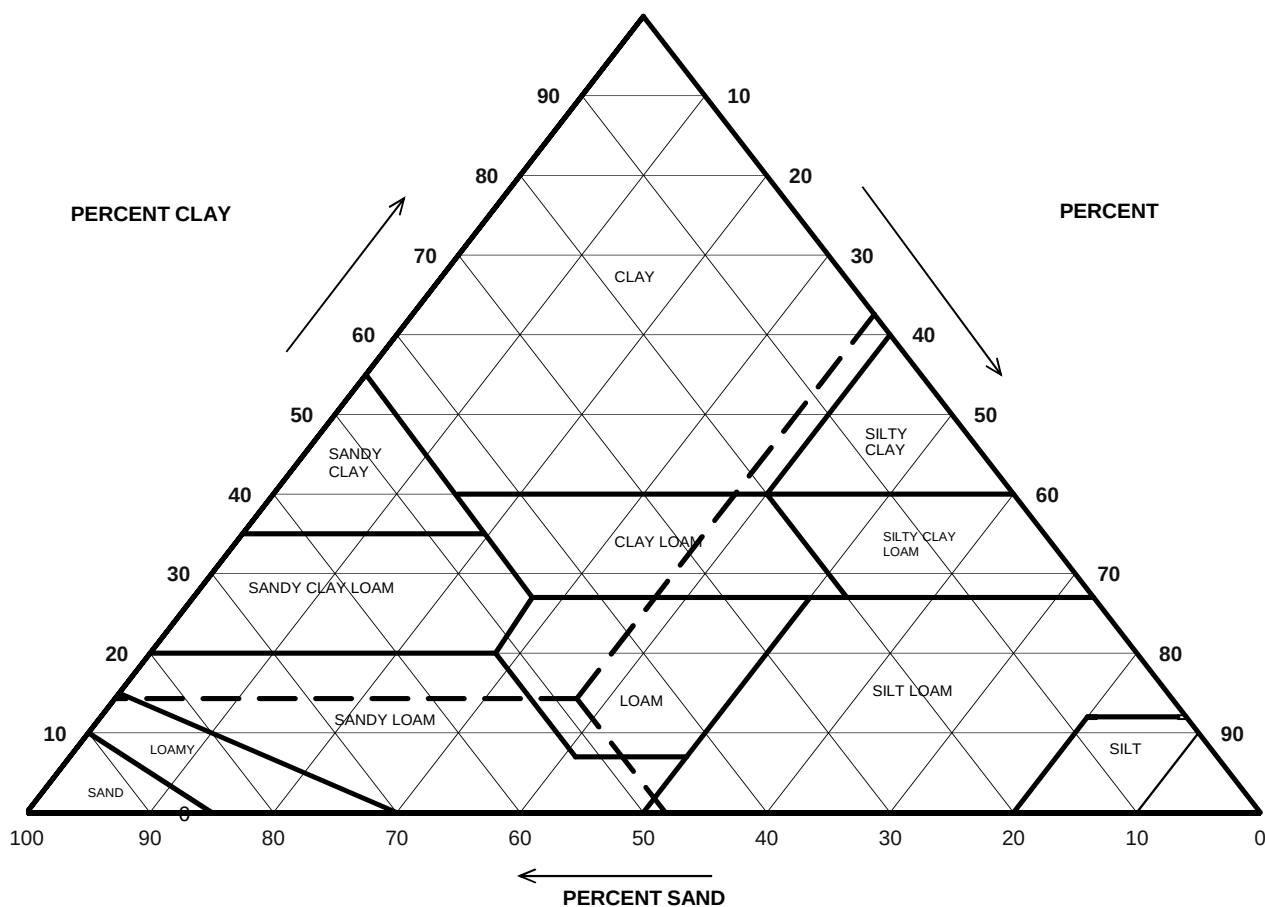
USCS Classification:
SILTY SAND WITH GRAVEL
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 4 DCN: CT-S73J, DATE 5/22/17, REV. 1e

USDA CLASSIFICATION CHART

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-085

Boring No.: JB2-19-204
Depth (ft): 18.0-22.0
Sample No.: SpT-9/10
Soil Color: Brown



USDA SUMMARY				
Particle Size (mm)	Percent Finer		Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classification
		Gravel	21.72	
2	78.28	Sand	37.75	48.23
0.05	40.52	Silt	29.31	37.44
0.002	11.21	Clay	11.21	14.33

USDA Classification: LOAM

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-085

Boring No.: JB2-19-204
 Depth (ft): 18.0-22.0
 Sample No.: SpT-9/10
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2026	Tare No.:	NA	Tare No.:	2026	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	550.61	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	550.61	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	515.70	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	515.70	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	148.19	Weight of Tare (g):	NA	Weight of Tare (g):	148.19	Weight of Tare (g):	NA
Weight of Water (g):	34.91	Weight of Water (g):	NA	Weight of Water (g):	34.91	Weight of Water (g):	NA
Weight of Dry Soil (g):	367.51	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	367.51	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.5	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	367.51	Total Dry Weight of Sample (g):	367.51	Dry Weight of Sample (g):	367.51	Total Dry Weight of Sample (g):	367.51
Tare No. (Sub-Specimen)	2026	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2026	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	550.61	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	550.61	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	148.19	Dry Weight of - 3/4" Sample (g):	367.51	Weight of Tare (g):	148.19	Dry Weight of - 3/4" Sample (g):	367.51
Sub-Specimen Wet Weight (g):	402.42	Dry Weight -3/4" +3/8" Sample (g):	33.73	Sub-Specimen Wet Weight (g):	402.42	Dry Weight -3/4" +3/8" Sample (g):	33.73
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	333.78	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	333.78
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	29.80	(**)	8.11	91.89	92
3/8"	9.5	3.93	1.07	9.18	90.82	91
#4	4.75	22.22	6.05	15.22	84.78	85
#10	2	23.88	6.50	21.72	78.28	78
#20	0.85	18.86	(**)	26.85	73.15	73
#40	0.425	15.16	4.13	30.98	69.02	69
#60	0.25	18.45	5.02	36.00	64.00	64
#100	0.15	27.12	7.38	43.38	56.62	57
#140	0.106	20.63	5.61	48.99	51.01	51
#200	0.075	22.74	6.19	55.18	44.82	45
Pan	-	164.72	44.82	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

HYDROMETER ANALYSIS

ASTM D7928-17

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-085

Boring No.: JB2-19-204
 Depth (ft): 18.0-22.0
 Sample No.: SpT-9/10
 Soil Color: Brown

Elapsed Time (min)	Reading rm	Temp. (C°)	Offset rd,m	Effective Depth, Hm (cm)	D (mm)	Mass Percent (%) Finer, Nm	Mass Percent (%) Finer, Nm'
0	NA	NA	NA	NA	NA	NA	NA
1	44.5	22.5	5.71	8.9	0.0394	84.8	38.0
2	39.5	22.5	5.71	9.8	0.0292	73.8	33.1
4	33.0	22.5	5.71	11.0	0.0219	59.6	26.7
15	27.0	22.5	5.71	12.1	0.0118	46.5	20.9
30	25.0	22.5	5.71	12.4	0.0085	42.2	18.9
60	22.5	22.4	5.75	12.9	0.0061	36.6	16.4
250	18.5	23.0	5.52	13.6	0.0031	28.4	12.7
1440	15.5	22.8	5.60	14.1	0.0013	21.6	9.7

Soil Specimen Data

Tare No.:	679	Percent Finer than # 200:	44.82
Wt. of Tare & Dry Material (g):	142.90		
Weight of Tare (g):	92.65	Specific Gravity:	2.70 Assumed
Weight of Deflocculant (g):	5.0		
Weight of Dry Material (g):	45.25		

Notes: Hydrometer test is performed on - # 200 sieve material.

Hydrometer - 152H	G- 1819
Cylinder	G- 356
Thermometer	G- 1505
Balance	G- 657
#200 Sieve	G- 1944
Foam Inhibitor Used	No

Tested By	TO	Date	1/21/20	Checked By	KC	Date	1/23/20

page 4 of 4

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-085

Boring No.: JB2-19-204
Depth (ft): 18.0-22.0
Sample No.: SpT-9/10
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	3
Wt. of Tare & Wet Sample (g)	38.86
Wt. of Tare & Dry Sample (g)	36.37
Weight of Tare (g)	8.42
Weight of Water (g)	2.49
Weight of Dry Sample (g)	27.95

Water Content (%) **8.9**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

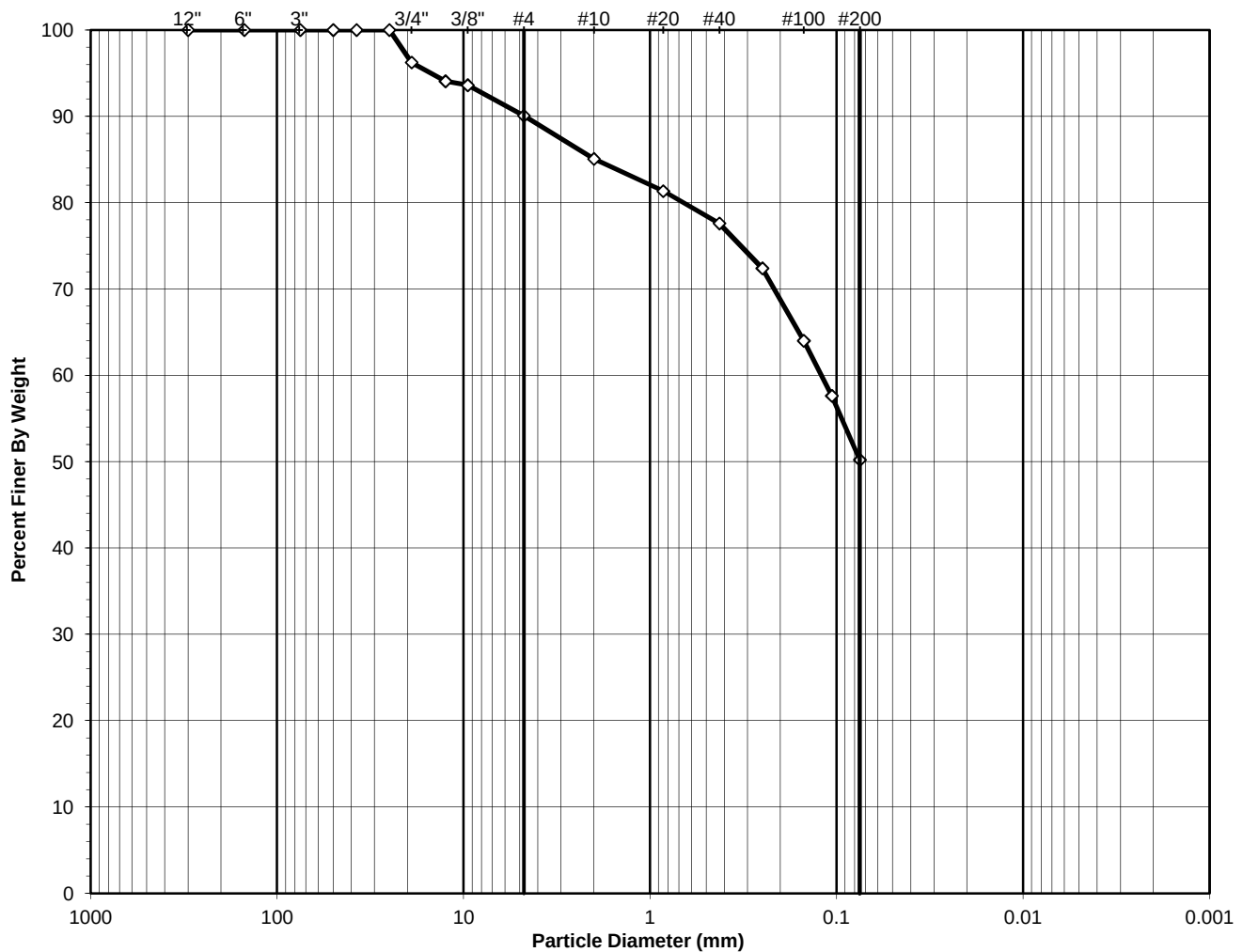
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-086

Boring No.: JB2-19-204
 Depth (ft): 26.0-30.0
 Sample No.: SpT-13/14
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
ML, TESTED

D50 = 0.07

USCS Classification:
SANDY SILT
(NON-PLASTIC FINES)

Tested By DS Date 1/21/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-086

Boring No.: JB2-19-204
 Depth (ft): 26.0-30.0
 Sample No.: SpT-13/14
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1540	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	559.57	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	523.33	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.02	Weight of Tare (g):	NA
Weight of Water (g):	36.24	Weight of Water (g):	NA
Weight of Dry Soil (g):	376.31	Weight of Dry Soil (g):	NA
Moisture Content (%):	9.6	Moisture Content (%):	0.0
Dry Weight of Sample (g):	376.31	Total Dry Weight of Sample (g):	376.31
Tare No. (Sub-Specimen)	1540	Wet Weight of +3/4" Sample (g):	15.50
Wt. of Tare & Wet Sub-Specimen (g):	559.57	Dry Weight of + 3/4" Sample (g):	14.14
Weight of Tare (g):	147.02	Dry Weight of - 3/4" Sample (g):	362.17
Sub-Specimen Wet Weight (g):	412.55	Dry Weight -3/4" +3/8" Sample (g):	9.92
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	352.62
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	14.14	3.76	3.76	96.24	96
1/2"	12.5	8.20	(**) 2.18	5.94	94.06	94
3/8"	9.5	1.72	0.46	6.39	93.61	94
#4	4.75	13.30	3.53	9.93	90.07	90
#10	2	18.82	5.00	14.93	85.07	85
#20	0.85	14.05	(**) 3.73	18.66	81.34	81
#40	0.425	14.07	3.74	22.40	77.60	78
#60	0.25	19.57	5.20	27.60	72.40	72
#100	0.15	31.57	8.39	35.99	64.01	64
#140	0.106	24.00	6.38	42.37	57.63	58
#200	0.075	27.92	7.42	49.79	50.21	50
Pan	-	188.95	50.21	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/21/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-086

Boring No.: JB2-19-204
Depth (ft): 26.0-30.0
Sample No.: SpT-13/14
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	34
Wt. of Tare & Wet Sample (g)	43.69
Wt. of Tare & Dry Sample (g)	40.81
Weight of Tare (g)	8.42
Weight of Water (g)	2.88
Weight of Dry Sample (g)	32.39

Water Content (%) **8.9**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

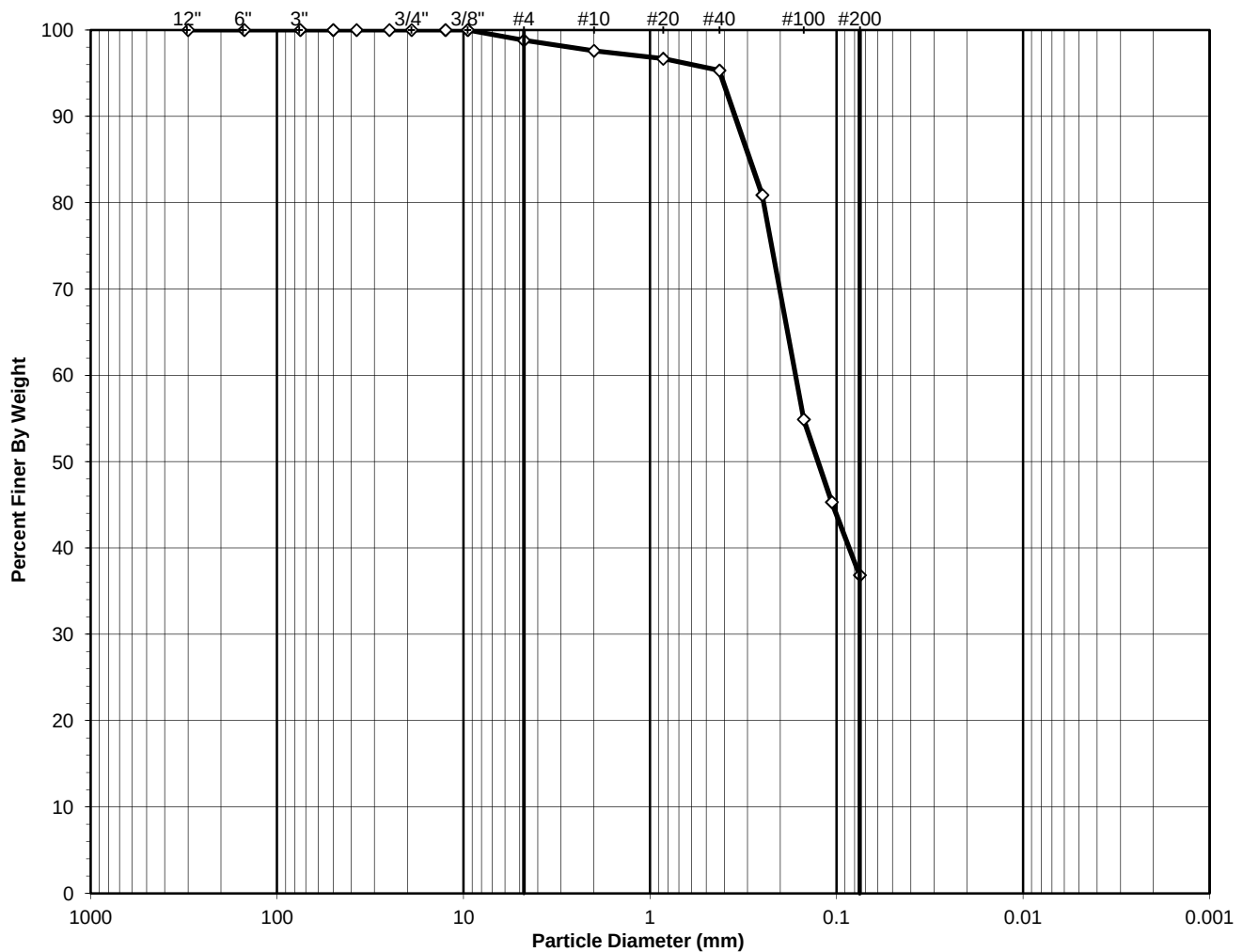
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-087

Boring No.: JB2-19-204
 Depth (ft): 30.0-33.4
 Sample No.: SpT-15/16
 Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.13

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20
 page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-087

Boring No.: JB2-19-204
 Depth (ft): 30.0-33.4
 Sample No.: SpT-15/16
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1483	Tare No.:	NA	Tare No.:	1483	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	455.59	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	455.59	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	423.18	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	423.18	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.23	Weight of Tare (g):	NA	Weight of Tare (g):	145.23	Weight of Tare (g):	NA
Weight of Water (g):	32.41	Weight of Water (g):	NA	Weight of Water (g):	32.41	Weight of Water (g):	NA
Weight of Dry Soil (g):	277.95	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	277.95	Weight of Dry Soil (g):	NA
Moisture Content (%):	11.7	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	277.95	Total Dry Weight of Sample (g):	277.95	Dry Weight of Sample (g):	277.95	Total Dry Weight of Sample (g):	277.95
Tare No. (Sub-Specimen)	1483	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	1483	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	455.59	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	455.59	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	145.23	Dry Weight of - 3/4" Sample (g):	277.95	Weight of Tare (g):	145.23	Dry Weight of - 3/4" Sample (g):	277.95
Sub-Specimen Wet Weight (g):	310.36	Dry Weight -3/4" +3/8" Sample (g):	0.00	Sub-Specimen Wet Weight (g):	310.36	Dry Weight -3/4" +3/8" Sample (g):	0.00
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	277.95	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	277.95
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	0.00	(**) 0.00	0.00	100.00	100
3/8"	9.5	0.00	0.00	0.00	100.00	100
#4	4.75	3.33	1.20	1.20	98.80	99
#10	2	3.36	1.21	2.41	97.59	98
#20	0.85	2.56	(**) 0.92	3.33	96.67	97
#40	0.425	3.76	1.35	4.68	95.32	95
#60	0.25	40.15	14.45	19.13	80.87	81
#100	0.15	72.21	25.98	45.11	54.89	55
#140	0.106	26.63	9.58	54.69	45.31	45
#200	0.075	23.54	8.47	63.16	36.84	37
Pan	-	102.41	36.84	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/20/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-087

Boring No.: JB2-19-204
Depth (ft): 30.0-33.4
Sample No.: SpT-15/16
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	30
Wt. of Tare & Wet Sample (g)	45.39
Wt. of Tare & Dry Sample (g)	39.42
Weight of Tare (g)	8.47
Weight of Water (g)	5.97
Weight of Dry Sample (g)	30.95

Water Content (%) **19.3**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/16/20* *Checked By* *JLK* *Date* *1/17/20*

SPECIFIC GRAVITY

ASTM D 854-14

Client:	D'Appolonia	Boring No.:	JB2-19-204
Client Reference:	NRCS-Jewell Brook 172719-17	Depth (ft):	30.0-33.4
Project No.:	2020-002-001	Sample No.:	SpT-15/16
Lab ID:	2020-002-001-087	Visual Description:	Brown Sand

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	G 1917	G 1991
Weight of Pycnometer & Soil & Water (g):	727.65	731.79
Temperature (°C):	26.2	26.3
Weight of Pycnometer & Water (g):	683.82	684.36
Tare Number:	927	952
Weight of Tare & Dry Soil (g):	168.5	176.34
Weight of Tare (g):	96.27	101.16
Weight of Dry Soil (g):	72.23	75.18
Specific Gravity of Soil @ Measured Temperature:	2.543	2.709
Specific Gravity of Water @ Measured Temperature:	0.99674	0.99671
Conversion Factor for Measured Temperature:	0.99853	0.99850
Specific Gravity @ 20° Celsius:	2.547	2.713

Average Specific Gravity @ 20° Celsius	2.63

Tested By TO Date 1/22/20 Checked By BRB Date 1/24/20

DCN: CT-S5 Date: 3/26/18 Revision: 21

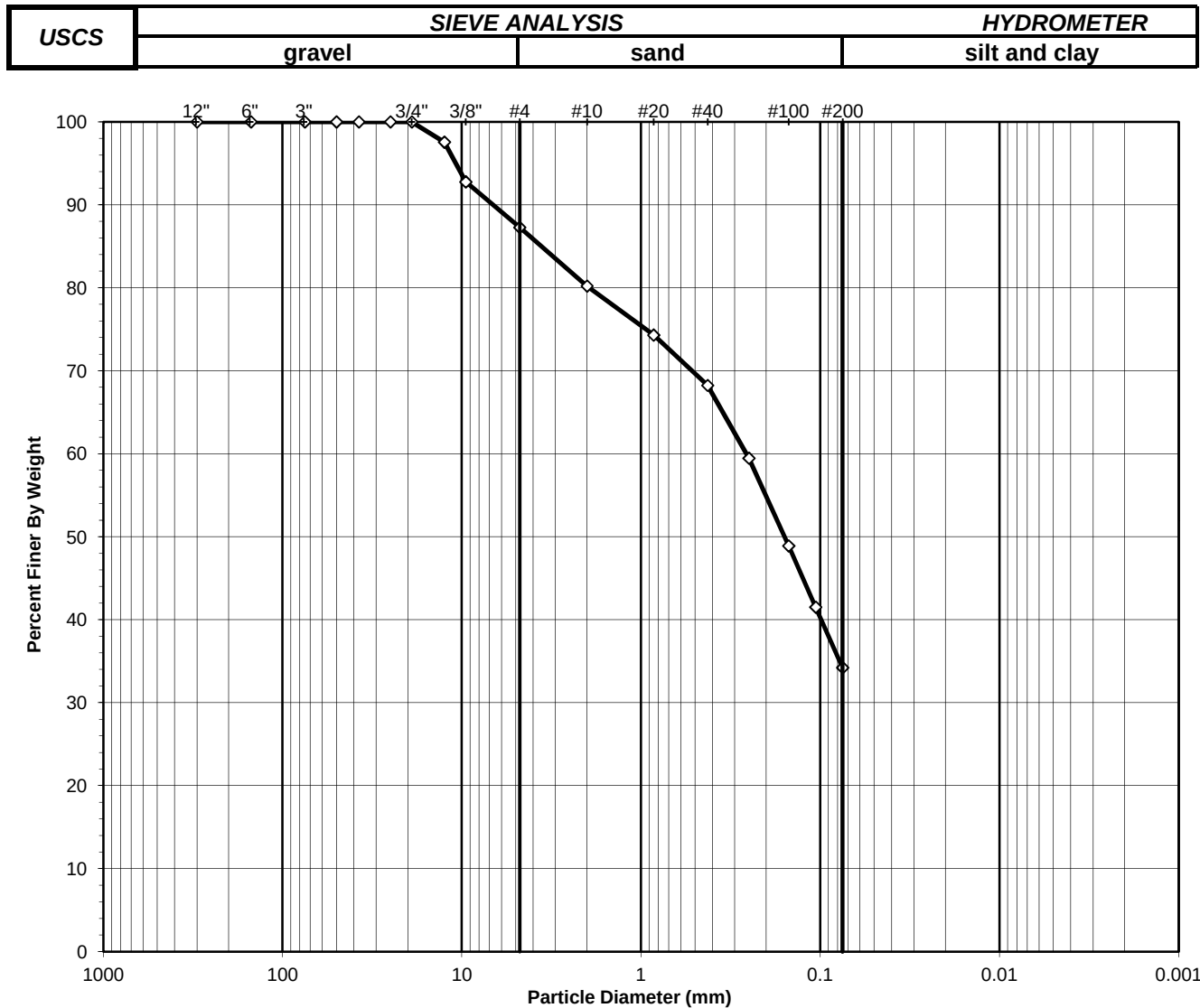
S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-088

Boring No.: JB2-19-204
 Depth (ft): 36.0-38.7
 Sample No.: SpT-18/19
 Soil Color: Brown



USCS Symbol:
SM, TESTED

D50 = 0.16

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-088

Boring No.: JB2-19-204
 Depth (ft): 36.0-38.7
 Sample No.: SpT-18/19
 Soil Color: Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	2036	Tare No.:	NA	Tare No.:	2036	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	489.85	Weight of Tare & Wet Sample (g):	NA	Wt. of Tare & Wet Sample (g):	489.85	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	455.01	Weight of Tare & Dry Sample (g):	NA	Wt. of Tare & Dry Sample (g):	455.01	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.80	Weight of Tare (g):	NA	Weight of Tare (g):	146.80	Weight of Tare (g):	NA
Weight of Water (g):	34.84	Weight of Water (g):	NA	Weight of Water (g):	34.84	Weight of Water (g):	NA
Weight of Dry Soil (g):	308.21	Weight of Dry Soil (g):	NA	Weight of Dry Soil (g):	308.21	Weight of Dry Soil (g):	NA
Moisture Content (%):	11.3	Moisture Content (%):	0.0	Moisture Content (%):	0.0	Moisture Content (%):	0.0
Dry Weight of Sample (g):	308.21	Total Dry Weight of Sample (g):	308.21	Dry Weight of Sample (g):	308.21	Total Dry Weight of Sample (g):	308.21
Tare No. (Sub-Specimen)	2036	Wet Weight of +3/4" Sample (g):	0.00	Tare No. (Sub-Specimen)	2036	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	489.85	Dry Weight of + 3/4" Sample (g):	0.00	Wt. of Tare & Wet Sub-Specimen (g):	489.85	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	146.80	Dry Weight of - 3/4" Sample (g):	308.21	Weight of Tare (g):	146.80	Dry Weight of - 3/4" Sample (g):	308.21
Sub-Specimen Wet Weight (g):	343.05	Dry Weight -3/4" +3/8" Sample (g):	22.28	Sub-Specimen Wet Weight (g):	343.05	Dry Weight -3/4" +3/8" Sample (g):	22.28
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	285.93	Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	285.93
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA	Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA	Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA			Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*) 0.00	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	7.52	(**) 2.44	2.44	97.56	98
3/8"	9.5	14.76	4.79	7.23	92.77	93
#4	4.75	16.93	5.49	12.72	87.28	87
#10	2	21.77	7.06	19.79	80.21	80
#20	0.85	18.20	(**) 5.91	25.69	74.31	74
#40	0.425	18.70	6.07	31.76	68.24	68
#60	0.25	27.04	8.77	40.53	59.47	59
#100	0.15	32.57	10.57	51.10	48.90	49
#140	0.106	22.77	7.39	58.49	41.51	42
#200	0.075	22.46	7.29	65.77	34.23	34
Pan	-	105.49	34.23	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-088

Boring No.: JB2-19-204
Depth (ft): 36.0-38.7
Sample No.: SpT-18/19
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	19
Wt. of Tare & Wet Sample (g)	38.21
Wt. of Tare & Dry Sample (g)	34.99
Weight of Tare (g)	8.29
Weight of Water (g)	3.22
Weight of Dry Sample (g)	26.70

Water Content (%) **12.1**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/17/20* *Checked By* *JLK* *Date* *1/17/20*

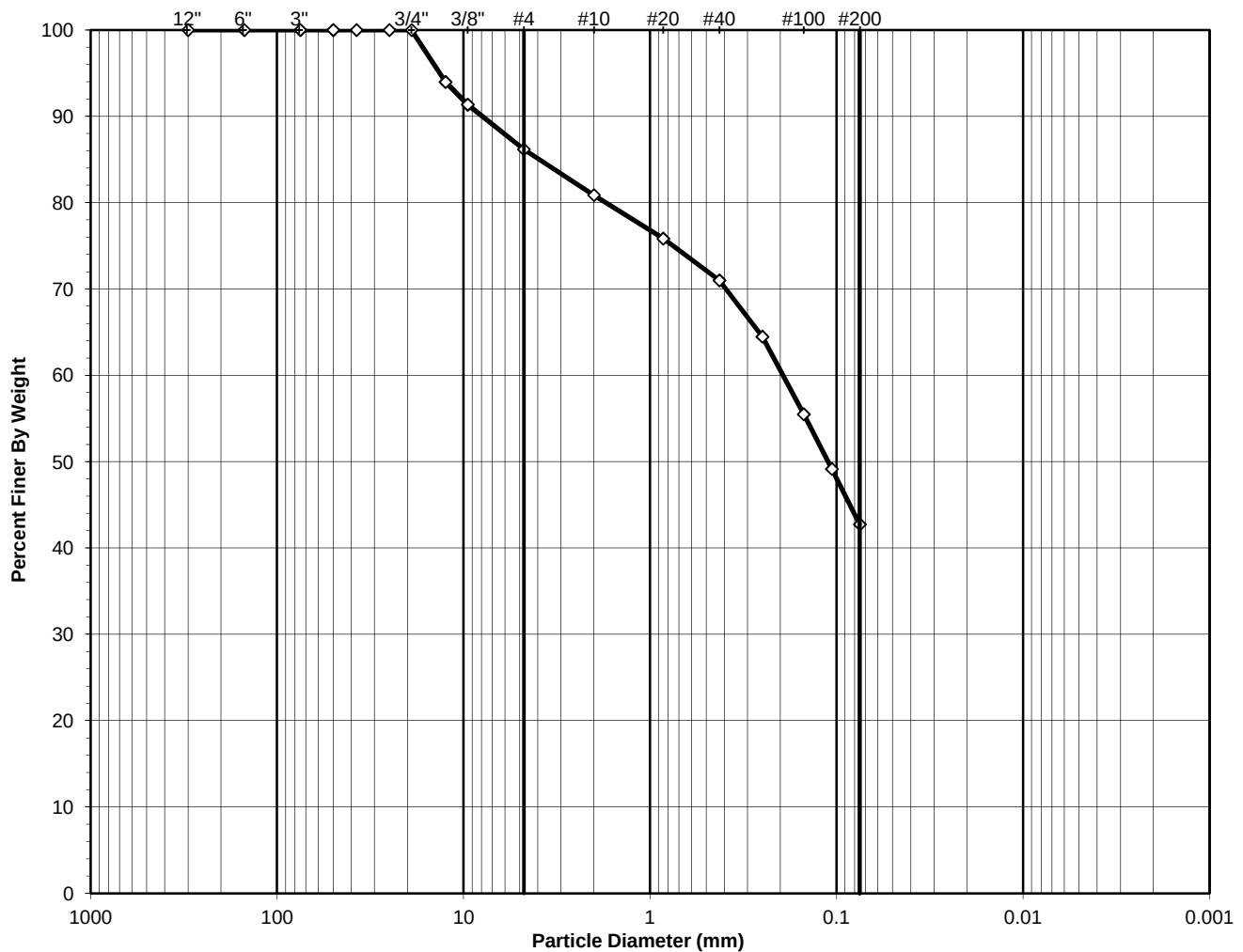
SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client: D'Appolonia
Client Reference: NRCS-Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-089

Boring No.: JB2-19-204
Depth (ft): 46.0-48.9
Sample No.: SpT-23/24
Soil Color: Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
SM, TESTED

D50 = 0.11

USCS Classification:
SILTY SAND
(NON-PLASTIC FINES)

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20
page 1 of 2 DCN: CT-S73J, DATE 5/22/17, REV. 1e

WASH SIEVE ANALYSIS

ASTM D6913-17



Client: D'Appolonia
 Client Reference: NRCS-Jewell Brook 172719-17
 Project No.: 2020-002-001
 Lab ID: 2020-002-001-089

Boring No.: JB2-19-204
 Depth (ft): 46.0-48.9
 Sample No.: SpT-23/24
 Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1516	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	452.03	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	423.52	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	142.84	Weight of Tare (g):	NA
Weight of Water (g):	28.51	Weight of Water (g):	NA
Weight of Dry Soil (g):	280.68	Weight of Dry Soil (g):	NA
Moisture Content (%):	10.2	Moisture Content (%):	0.0
Dry Weight of Sample (g):	280.68	Total Dry Weight of Sample (g):	280.68
Tare No. (Sub-Specimen)	1516	Wet Weight of +3/4" Sample (g):	0.00
Wt. of Tare & Wet Sub-Specimen (g):	452.03	Dry Weight of + 3/4" Sample (g):	0.00
Weight of Tare (g):	142.84	Dry Weight of - 3/4" Sample (g):	280.68
Sub-Specimen Wet Weight (g):	309.19	Dry Weight -3/4" +3/8" Sample (g):	24.25
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	256.43
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA
Sub-Specimen -3/8" Wet Weight (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	(*)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	16.88	(**)	6.01	93.99	94
3/8"	9.5	7.37	2.63	8.64	91.36	91
#4	4.75	14.55	5.18	13.82	86.18	86
#10	2	14.86	5.29	19.12	80.88	81
#20	0.85	14.15	(**)	24.16	75.84	76
#40	0.425	13.57	4.83	28.99	71.01	71
#60	0.25	18.30	6.52	35.51	64.49	64
#100	0.15	25.23	8.99	44.50	55.50	55
#140	0.106	17.78	6.33	50.84	49.16	49
#200	0.075	18.03	6.42	57.26	42.74	43
Pan	-	119.96	42.74	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DS Date 1/17/20 Checked By KC Date 1/23/20

ATTERBERG LIMITS

ASTM D 4318-17

Client: D'Appolonia
Client Reference: NRCS- Jewell Brook 172719-17
Project No.: 2020-002-001
Lab ID: 2020-002-001-089

Boring No.: JB2-19-204
Depth (ft): 46.0-48.9
Sample No.: SpT-23/24
Color: Brown
(Minus No. 40 sieve material)

As Received Water Content

Tare Number	4
Wt. of Tare & Wet Sample (g)	39.50
Wt. of Tare & Dry Sample (g)	36.33
Weight of Tare (g)	8.33
Weight of Water (g)	3.17
Weight of Dry Sample (g)	28.00

Water Content (%) **11.3**

NON - PLASTIC MATERIAL

Tested By *FS* *Date* *1/17/20* *Checked By* *JLK* *Date* *1/17/20*

APPENDIX C
GEOLOGIC MAPS