

City Watersheds of Sonoma Valley, Phase 1 (Fryer Creek) Site Investigation for Wetland Enhancement Site (Montini Pasture) Summary and Next Steps

June 12, 2014

As part of the City Watersheds of Sonoma Valley Fryer Creek Project (Fryer Creek Project), the Sonoma County Water Agency has conducted hydrogeological site investigations on a portion of the Montini Open Space Preserve (Montini pasture) to evaluate soil and groundwater conditions. The project's objectives at the Montini pasture site (adjacent to Fifth Street West near Verano Avenue in the City of Sonoma) include groundwater recharge for water supply resilience, short term stormwater detention for flood alleviation, and wetland enhancement. The investigation was required for the design of the groundwater recharge aspects of the project. The site investigation included soil borings, laboratory analyses, monitoring wells, and infiltration tests to assess groundwater level, soil characteristics, permeability, and infiltration potential. The attached report, prepared by Daniel B. Stephens & Associates, describes the results of the field investigation at the Montini site. This summary is intended to provide a general overview of the results, what they mean, and next steps.

What do the results say? The results of the site investigation indicate that the subsurface materials beneath the site pose challenges to achieving recharge benefits at the scale anticipated for the original project concept. The original project concept was based on the best available information at that time which was *The Sonoma Valley Groundwater Recharge Potential Mapping Project* (February 2011), developed by the Sonoma Ecology Center in coordination with the Sonoma County Water Agency, California Department of Water Resources (DWR), United States Geological Survey, California Geologic Survey, and project consultants. The project's original detention concept will provide some level of recharge that could be enhanced further by providing a connection through the lowest permeability materials that are present closer to the ground surface. Project enhancement elements that target recharge at depths with higher permeability might include an infiltration trench, infiltration gallery or dry wells. Regardless, while groundwater recharge currently occurs at the site, and more can be achieved with an appropriate project design, it will be difficult to achieve the levels of recharge initially estimated at the Montini site.

What does this mean? The Fryer Creek Project is part of a broad, overarching vision developed in concert with the stakeholder-led Sonoma Valley Basin Advisory Panel, the Zone 3a Flood Advisory Group, and the North Bay Water Reuse Authority to achieve watershed and water supply resiliency

across Sonoma Valley. Multi-benefit projects are envisioned in a variety of locations across Sonoma Valley. The Fryer Creek Project represents one aspect in realizing this larger vision.

The Fryer Creek Project concept anticipates achieving multiple watershed benefits. In addition to recharging groundwater, the multiple community and environmental benefits include: a) flood reduction through storm drain modification/improvements and through short-term stormwater detention; b) habitat and wetland enhancement through revegetation and fish passage improvement; and c) improved public access and educational opportunities at the Montini Preserve through trail improvements and interpretive signage.

Although, the groundwater recharge potential of the Montini pasture site is less than anticipated, the site investigation results do not affect the other benefits that the Montini site can still provide, including flood hazard reduction and wetland enhancement. The Fryer Creek Project is still in the conceptual stage and the project partners and design team are continuing to assess opportunities to provide groundwater recharge as part of this multi-benefit project.

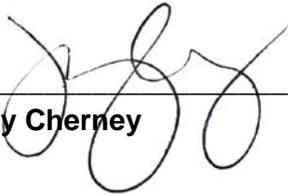
What are the next steps? Project partners are currently evaluating a range of design concepts to maximize groundwater recharge at the Montini pasture site. However, in view of the site's recharge limitations, partners are also evaluating other sites within the Fryer Creek watershed that may be able to provide groundwater recharge benefits more comparable to the recharge benefits anticipated for the original project concept. Additional hydrogeological investigations have been initiated to evaluate two other sites located along the east fork of the Fryer Creek Watershed. These sites are located in the vicinity of First Street East and First Street West, north of Spain Street and include a parcel north of the Field of Dreams within the Montini Open Space Preserve and an undeveloped portion of the Sonoma Valley Veterans Facility parcel. These investigations are being funded as part of the Water Agency's broader Groundwater Recharge/Stormwater Management Initiative, outside of the DWR-funded City Watersheds of Sonoma Valley Fryer Creek grant project.

Concurrently, the project team is refining the flood reduction elements of the project based on updated and more detailed hydrologic modeling, new information on existing flooding, community input, and evaluation of design modifications. Project partners welcome public comment and participation, and additional community input will be sought to further refine the project concepts ahead of commencing detailed design.

City Watersheds Project Site Investigation – Montini Site

May 23, 2014

Jenny Cherney



John T. Kay, P.G.
California, No. 8821



Daniel B. Stephens & Associates, Inc.

P.O. Box 256 • Petaluma, California 94953-0256



Table of Contents

Section	Page
1. Introduction	1
2. Site Investigation Summary	2
2.1 Advancement of Soil Borings and Installation of Monitor Wells	3
2.2 Analyses of Soil Texture and Hydraulic Properties	3
2.3 Collection/Monitoring of Water Level Data	4
2.4 Collection of Groundwater Quality Samples for Laboratory Analyses	4
2.5 Infiltration Rate Testing.....	4
3. Detailed Site Investigation Methods.....	4
3.1 Installation of Monitor Well Pairs	5
3.1.1 Collection of Soil Samples for Hydraulic and Geotechnical Properties Analysis.....	5
3.1.2 Soil Hydraulic Properties and Chemical Analyses	6
3.1.3 Installation of Monitor Wells	7
3.1.4 Collection of Water Samples for Chemical Analysis	8
3.1.5 Water Level Monitoring	9
3.2 Infiltration Test.....	9
3.2.1 Test Plot Area Preparation.....	10
3.2.2 Test Execution	10
3.2.3 Neutron Probe Logging.....	11
4. Site Investigation Findings	11
4.1 Geologic Logs.....	12
4.2 Laboratory Analyses of Soil Samples	12
4.2.1 Hydraulic Properties Analyses	12
4.2.2 Nitrate Analyses.....	13
4.3 Chemical Analyses of Water Samples	13
4.4 Water Level Monitoring.....	14
4.5 Infiltration Tests	14
4.5.1 Falling-Head Tests.....	14
4.5.2 Moisture Sensor Profiles.....	15
4.5.3 Neutron Probe Profiles.....	15
5. Synthesis of Site Investigation Findings.....	15
References.....	16



List of Figures

Figure

- 1 Site Location
- 2 Site Investigation Elements
- 3a Groundwater Elevation - All Wells
- 3b Groundwater Elevation at MON-MW-01S and MON-MW-01D January 2014

List of Tables

Table

- 1 Monitoring Well Construction
- 2 Summary of Tests Performed
- 3 Summary of Hydraulic Conductivity
- 4 Nitrate in Soil
- 5 Groundwater Chemistry
- 6 Manual Water Level Measurements

List of Appendices

- A Photographs
- C Boring Logs
- D Soil Properties
- E Chemistry



City Watersheds Project Site Investigation – Montini Site

1. Introduction

This Site Investigation Report describes field activities that were conducted in December 2013 on behalf of Sonoma County Water Agency (the Agency) to characterize the nature of soil moisture movement through the unsaturated (vadose) zone at the Montini Open Space Preserve (Montini site), shown in Figure 1, in support of the City Watersheds of Sonoma Valley Project. This work involved collection of field data that assist in the characterization of soil water movement through the unsaturated zone. This information provides an improved understanding of the surface and subsurface hydrogeology of the site and thus facilitating the development of a project concept for wetland and grassland enhancement, stormwater capture, and enhanced groundwater recharge.

The investigation included the following elements:

1. Installation of four groundwater monitor wells (MON-MW-01S, MON-MW-01D, MON-MW-02S and MON-MW-03S)
2. Advancement of one soil boring (MON-B-01)
3. Analyses of soil texture and hydraulic and geotechnical properties of soils collected from borings during well installation
4. Automated collection of water level data and groundwater quality samples from each well for laboratory analyses
5. Testing of surface infiltration rates using three 10-foot by 10-foot test plots



The locations of the wells, boring and infiltration test plots are shown on the attached site map (Figure 2). The following sections describe the general overall project background, briefly summarize the investigation, provide detailed descriptions of each element of the field work, summarize results of the investigation, and list the data collected.

2. Site Investigation Summary

The investigation characterizes local hydrogeologic and subsurface hydraulic properties and existing conditions at the Montini site located in the City of Sonoma immediately north of Montini Way and adjacent to the General Vallejo State Park (Figure 1). The goal of the site investigation at the Montini site was to characterize the hydrogeologic conditions at the site that are needed to evaluate the site's ability to recharge groundwater and support wetland and grassland features. This investigation also provides the information needed to identify and assess project alternatives that will reduce flooding along the main stem of Fryer Creek by capturing and diverting stormwater runoff and enhancing groundwater recharge and water supply reliability by slowing and sinking water into the ground before it enters Fryer Creek. The site investigation and continued well monitoring provide necessary and valuable information pertaining to soil characteristics, permeability, recharge potential and rates, and localized groundwater conditions. The information obtained during the investigation and continued well monitoring will be used by the design engineers and planners to develop an effective and appropriate design for the wetlands enhancement/recharge feature and the grassland restoration work at the Montini site.

The site investigation includes the activities summarized in Section 2 below and is described in more detail in Section 3. The findings of the Montini site investigation at the area discussed in section 4 and summarized in Section 5. The initial field work took 9 days.



City Watersheds Project Site Investigation – Montini Site

1. Introduction

This Site Investigation Report describes field activities that were conducted in December 2013 on behalf of Sonoma County Water Agency (the Agency) to characterize the nature of soil moisture movement through the unsaturated (vadose) zone at the Montini Open Space Preserve (Montini site), shown in Figure 1, in support of the City Watersheds of Sonoma Valley Project. This work involved collection of field data that assist in the characterization of soil water movement through the unsaturated zone. This information provides an improved understanding of the surface and subsurface hydrogeology of the site and thus facilitating the development of a project concept for wetland and grassland enhancement, stormwater capture, and enhanced groundwater recharge.

The investigation included the following elements:

1. Installation of four groundwater monitor wells (MON-MW-01S, MON-MW-01D, MON-MW-02S and MON-MW-03S)
2. Advancement of one soil boring (MON-B-01)
3. Analyses of soil texture and hydraulic and geotechnical properties of soils collected from borings during well installation
4. Automated collection of water level data and groundwater quality samples from each well for laboratory analyses
5. Testing of surface infiltration rates using three 10-foot by 10-foot test plots



The locations of the wells, boring and infiltration test plots are shown on the attached site map (Figure 2). The following sections describe the general overall project background, briefly summarize the investigation, provide detailed descriptions of each element of the field work, summarize results of the investigation, and list the data collected.

2. Site Investigation Summary

The investigation characterizes local hydrogeologic and subsurface hydraulic properties and existing conditions at the Montini site located in the City of Sonoma immediately north of Montini Way and adjacent to the General Vallejo State Park (Figure 1). The goal of the site investigation at the Montini site was to characterize the hydrogeologic conditions at the site that are needed to evaluate the site's ability to recharge groundwater and support wetland and grassland features. This investigation also provides the information needed to identify and assess project alternatives that will reduce flooding along the main stem of Fryer Creek by capturing and diverting stormwater runoff and enhancing groundwater recharge and water supply reliability by slowing and sinking water into the ground before it enters Fryer Creek. The site investigation and continued well monitoring provide necessary and valuable information pertaining to soil characteristics, permeability, recharge potential and rates, and localized groundwater conditions. The information obtained during the investigation and continued well monitoring will be used by the design engineers and planners to develop an effective and appropriate design for the wetlands enhancement/recharge feature and the grassland restoration work at the Montini site.

The site investigation includes the activities summarized in Section 2 below and is described in more detail in Section 3. The findings of the Montini site investigation at the area discussed in section 4 and summarized in Section 5. The initial field work took 9 days.



2.1 Advancement of Soil Borings and Installation of Monitor Wells

A sonic drill rig¹ was used to advance five bore holes, four of which were used to install groundwater monitor wells. For each monitor well, a 2-inch-diameter polyvinyl chloride (PVC) well was installed. Finished wells were covered with a steel cap flush with the ground. Excess sediments from the coring were dispersed on site, at a location requested by Mr. Montini on another part of his property.

The monitor wells permitted by Permit & Resource Management District of Sonoma County (PRMD) are owned by the Agency, who will be responsible for their continued maintenance and monitoring. Management of these wells will be performed by the Agency and its contractors, in cooperation with SCAPOSD and the City of Sonoma, and consultations with Mr. Montini as appropriate. Agency staff and its contractors will closely coordinate any future monitoring activities (including access and timing) to least impact agricultural activities and operations.

2.2 Analyses of Soil Texture and Hydraulic Properties

The process of drilling the wells with the sonic drill rig produced a continuous approximately 4-inch-diameter soil core sample for each boring in the monitor well pairs, from which geologic logs were recorded. Undisturbed soil samples for analysis were collected every 10 feet and/or at lithologic contacts in the boring for MON-MW-01D and every 5 feet and/or at lithologic contacts in the boring for MON-MW-01S, MON-MW-02S and MON-MW-03S using an 18-inch spoon sampler with a 3-inch diameter. Grab samples were collected from the soil boring MON-B-01 every 5 feet and/or at lithologic contacts. Soil core samples were submitted for laboratory soil properties analyses. Specific laboratory tests and results are listed in the detailed site investigation description.

¹ A sonic drill rig works by sending high frequency resonant vibrations down the drill string to the drill bit. These vibrations fluidize the soil particles at the bit face and outside of the bit, allowing for fast and easy penetration through most geological formations and providing a high-quality continuous core sample.



2.3 Collection/Monitoring of Water Level Data

Water level measurement, well purging, and groundwater sampling were conducted after well development. Manual water levels were measured using an electronic water level meter. Schlumberger Mini Diver water level recorders, which are battery powered, self-contained transducers with dataloggers, were installed at each monitor well. The dataloggers were set up for deployment and downloaded using a laptop computer.

2.4 Collection of Groundwater Quality Samples for Laboratory Analyses

Groundwater sampling was completed using a bailer and dedicated $\frac{5}{8}$ inch polyethylene tubing. Groundwater samples were collected from each well using low-flow sampling methodology and retained for water quality analyses as described in Section 4.

2.5 Infiltration Rate Testing

Three infiltration tests were performed using 10-foot by 10-foot shallow infiltration test plots dug with a backhoe at MON-INF-01, MON-INF-02 and MON-INF-03 (Figure 2). Each test involved adding 12 inches of water to the plot from a water tank and monitoring the water depth changes through time visually and with Schlumberger Mini Diver electronic water level recorders. Following the test, the pits were refilled by the backhoe, and the surface was returned to surface grade and seeded with an appropriate native seed mix identified by Sonoma Ecology Center. Test pit construction, infiltration testing and site restoration took a total of 9 days.

3. Detailed Site Investigation Methods

The work included in this site investigation has been divided into two general tasks as follows:

1. Installation of monitor well pairs
2. Constant head infiltration tests



Detailed investigation descriptions for each task and their related sub-tasks are discussed in the following sections.

Field activities were documented in field notes which are included in Appendix A. All drilling was conducted in the presence of DBS&A personnel, under the direct oversight of a California Professional Geologist. Prior to all drilling operations, local utility locators identified and marked the locations of any underground cables, pipes, or utility installations in the area of the proposed excavation.

3.1 Installation of Monitor Well Pairs

Four monitor wells were installed at the Montini site (Figure 2). Two monitor wells, MON-1S and MON-1D, were installed within a few feet of each other as a well pair: one screened in the shallow aquifer (shallow [S] well) and the other screened in the deep aquifer (deep [D] well).

Work associated with drilling and completion of the monitor well pairs has been divided into individual sub-tasks as follows:

- Installation of monitoring wells
- Collection of soil samples for hydraulic properties analysis
- Collection of water samples for chemical analysis
- Water level monitoring
- Soil disposal

Work specific to each of these tasks is described in detail in Sections 5.1.1 through 5.1.5.

3.1.1 Collection of Soil Samples for Hydraulic and Geotechnical Properties Analysis

Drilling was conducted by National Exploration Wells & Pumps (National) using a sonic drill rig. A sonic drill rig was used to collect continuous approximately 6-inch-diameter soil core samples, and a geologic log was prepared for each boring. As MON-1S was within 8 feet of MON-1D, visual comparisons of the core samples were made during drilling and the geologic log for



MON-1S was assumed to be the same as for the deeper well MON-1S. Undisturbed soil samples for analysis were collected every 10 feet MON-1D and at every 5 feet and/or at lithologic contacts in the borings for shallow monitor wells MON-2S and MON-3S and boring MON-B-1.

Undisturbed samples for laboratory analysis of hydraulic properties were collected using an 18-inch-long split-spoon sampler, fitted with three 6-inch stainless steel sleeves. The sonic rig drilled down to the specified interval, the drill stem was pulled out of the boring, and a split spoon sampler hydraulically pushed into the material at the bottom of the boring, the split spoon sampler and sample were removed from the boring and drilling continued until the next sample interval was reached. A 3-inch-diameter sampler was used. When the 3-inch-diameter spoon encountered refusal, grab samples were collected at select intervals and/or geologic contacts instead.

3.1.2 Soil Hydraulic Properties and Chemical Analyses

Soil samples collected in the split spoon were described and logged in the field according to ASTM D-2488. The samples were sent by FedEx to the DBS&A soil testing laboratory for storage and for analytical and hydraulic properties analyses. In the event of low recovery in the split spoon (less than 50 percent recovery), an additional 1-gallon grab sample were collected from the core and transported to the DBS&A laboratory for storage along with the split-spoon samples.

DBS&A laboratory personnel sub-sampled the samples to conduct hydraulic properties analyses. Hydraulic properties analyses included:

- Particle size analysis
- Volumetric and gravimetric water content
- Dry bulk density
- Total porosity
- Atterberg limits



- Rigid wall saturated hydraulic conductivity

Particle size analyses were conducted on select samples. The results of the sieve analyses were used to delineate different soil types (grain size distributions). Saturated hydraulic conductivity analyses were conducted on selected major soil types identified during the investigation.

Soil samples for nitrate analysis were collected at 6 inches, 5 feet, and 10 feet bgs from Mon-B-01. The soil samples were placed in quart-sized zipper-sealed bags (each sample double-bagged) and placed on ice, and a chain of custody documentation was completed. A courier from BC Laboratories took control of the samples at the end of the day and delivered the samples to the laboratory for analysis. Nitrate analyses were conducted using EPA Method 300.

All remaining samples will be retained for at least 8 months for future testing, if desired.

3.1.3 Installation of Monitor Wells

Monitor wells were installed in the borings described above. Well construction is summarized in Table 3. Monitor well casings were constructed of 2-inch schedule 40 PVC blank casing with a 0.020-inch slot size and screened intervals were determined based on water-bearing zones identified in the field.

The well screen was surrounded by appropriate-sized filter pack to 3 feet above the screened interval. The remainder of the well was backfilled with cement-bentonite slurry to approximately 1 foot bgs.

Monitor well MON-2S was completed in a manner that enables monitoring of soil moisture conditions using both automated soil moisture sensors, and manual neutron probe measurements. A 0.02-inch slot size screen with a 20-foot screened interval was placed between 35 and 55 feet below ground surface (bgs). The well screen was surrounded by appropriate sized filter pack based on the screen aperture size to 2 feet above the screen. A 4.5-foot interval of bentonite chips was placed on top of the filter pack and hydrated. Above the



hydrated bentonite, a series of fine sand (20/40) and hydrated bentonite chip layers were installed. The fine sand layers enable automated soil moisture sensor readings, and the bentonite layers prevent vertical migration of fluids down the annulus. Soil moisture sensors were installed at depths of 5, 10, 20, 30, and 40 feet bgs and connected to a datalogger. The Agency provided the soil moisture sensors and dataloggers. The sensors were attached to the outside of the well casing at the time of installation. A 3-foot interval of fine sand was emplaced around each sensor (1.5 feet above and 1.5 below). The remainder of the boring was filled with hydrated bentonite chips to approximately 1 foot bgs.

The casing of all monitor wells was sealed at the bottom with an end cap. Each well was finished with a steel vault and 2-foot-square concrete pad. The concrete pad was installed a few inches below the top of the well, which was flush with ground surface. The concrete pads were covered by a few inches of dirt, and the covers painted brown, minimizing its visibility and leaving only the well access cover visible.

After well installation, wells were developed using rig-assisted wireline surging, bailing, and pumping to flush and remove mobile particles that are artifacts of the drilling process from the well. This process was necessary to obtain groundwater samples that are as similar as possible to in situ conditions.

All cuttings generated by drilling activities were spread on-site with the permission and at the location designated by Mr. Montini.

3.1.4 Collection of Water Samples for Chemical Analysis

Groundwater sampling was completed using a submersible pump and dedicated 5/8 inch polyethylene tubing. This equipment was decontaminated between samples. Groundwater samples were collected from each well using low-flow sampling methodology and retained for the following analyses:

- Major cations (magnesium, calcium, sodium, and potassium)
- Major anions (chloride, sulfate, and bicarbonate)



- Minor ions (iron, manganese, fluoride, boron, phosphate, and nitrogen species)
- Physical properties (total hardness, total alkalinity, pH, specific conductance, total dissolved solids, color, odor, turbidity, and MBAS)
- Trace ions (aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, zinc).
- Total coliform bacteria
- Trihalomethanes (THMs) and haloacetic acids (HAAs)

Upon collection, each sample container was properly labeled and placed on ice in a sample cooler, and a chain of custody documentation completed. At the end of the day, a courier from BC Laboratories took control of the samples and delivered the samples to the laboratory for analysis.

3.1.5 Water Level Monitoring

Water level measurement, well purging, and groundwater sampling were conducted after well development at all four wells. Water levels were measured manually using an electronic water level meter. Manual water level measurements are tabulated in Table 5. .

The Agency purchased water level recorders to provide continuous water level records and were installed by DBS&A.

The water level recorders are battery powered, self-contained transducers with dataloggers. The dataloggers were set up for deployment and downloaded using a laptop computer. The Agency will download and perform future maintenance on the recorders.

3.2 Infiltration Test

Three large-scale falling head infiltration tests were conducted at the Montini site (Figure 2) to refine estimates of vertical infiltration of recharge water. The tests were designed to account for structural variability in soils, which may include macro-scale preferential flow paths that are not characterized using smaller-scale tests, such as analysis of soil cores and measurements using



portable infiltrometers. The infiltration test areas were prepared and the tests conducted as close as possible to the location of one of the monitor well pairs installed during this site investigation (Figure 2).

The infiltration test plot area dimensions were an approximately 10-foot by 10-foot-square test plot area (100 ft²).

In order to estimate vertical infiltration of water at a macro scale, the test required sufficient infiltration volume for a sufficient duration to reach steady-state conditions under the test plot area and to register in the adjacent monitoring well. There were several approaches being utilized as part of the infiltration test to develop an understanding of how recharge water infiltrates to the water table in the proposed project area:

- Monitoring water levels in the nearby shallow monitor well
- Monitoring moisture content using moisture sensors on the outside of MON-MW-02S, the shallow monitor well near MON-INF-02
- Neutron probe logging in MON-MW-02S, the shallow monitor well near MON-INF-02

3.2.1 Test Plot Area Preparation

An approximately 10-foot by 10-foot square test plot area (100 ft²) was constructed to pond water at a depth of approximately 12 inches. The test areas were excavated using a backhoe to breach the compacted surficial soil layer for the infiltration test plot area. The Agency provided the backhoe needed to prepare the test plots.

3.2.2 Test Execution

Water for the infiltration test was supplied by a nearby hydrant. Water was added manually, to a depth of 12 inches. The height of ponded water was monitored continuously using a Schlumberger mini diver pressure transducer and datalogger attached to a wooden stake in the center of the test plot, with measurements recorded once every 10 seconds. The wooden stake was marked on inch intervals and used to manually measure water levels.



3.2.3 Neutron Probe Logging

The shallow monitor well MON-2S was also used to collect neutron logs at select intervals. A neutron log is a geophysical method of logging subsurface conditions and can be quite useful for monitoring the movement of water as it infiltrates the ground. It involves lowering a neutron probe into an access casing, in this case the monitor well, and recording neutron count rates at select intervals. The intervals were at 5, 10, 20, 30 and 40 feet bgs. Neutron probe measurements are tabulated in Table 7.

After the infiltration test, the test plots were refilled using the backhoe, and the surface was returned to grade and seeded with an appropriate native seed mix identified by Sonoma Ecology Center.

4. Site Investigation Findings

The following categories of data were obtained during the investigation described below:

- Geologic logs of borings
- Hydraulic properties analyses
- Nitrate analyses of soil samples
- Laboratory analyses of water samples
- Water level monitoring
- Infiltration tests
- Moisture sensor profiles
- Neutron probe profiles

Locations of all investigation activities are shown in Figure 2. The following sections present the data collected for each category listed above. Details of field activities were documented in field notes (Appendix A) and photographs (Appendix B).



4.1 Geologic Logs

Geologic logs were prepared for monitor wells MON-01D (127 feet), MON-MW-02S (58 feet), and MON-MW-03S (50 feet) and boring MON-B-01 (50 feet). As MON-1S (75 feet) was within 8 feet of MON-1D, visual comparisons of the core samples were made during drilling and the geologic log for MON-1S was assumed to be the same as for the deeper well MON-1S. The lithology consists of silt, sand, clay and gravel and is generally classified as sandy silt or elastic silt with sand from ground surface to 75 feet below ground surface (bgs). Silty sand and clayey sand with gravel were found below 75 ft bgs to the total depth explored of 127 feet with grain size and percent of gravel increasing with depth. Well construction details are summarized in Table 1. Boring logs and well construction diagrams were prepared and are included in Appendix C.

4.2 Laboratory Analyses of Soil Samples

4.2.1 Hydraulic Properties Analyses

Table 2 summarizes the samples collected and analyses conducted during the site investigation. Hydraulic conductivity, a key parameter related to groundwater infiltration, ranged between $3.8\text{E-}08$ and $5.4\text{E-}03$ cm/sec ($1.1\text{E-}04$ and $1.5\text{E+}01$ feet/day), which are consistent with published value for the materials identified (Domenico and Schwartz, 1990). According to Klute (1986) and Stephens (1996), constant head tests are more reliable for higher hydraulic conductivity materials and falling head tests best apply to soils with lower hydraulic conductivity. Accordingly, samples with higher hydraulic conductivity values based on permeability were run using a constant head test and those with lower hydraulic conductivity were run using a falling head test per ASTMd 2434m. Relatively higher conductivity zones were present between approximately 16 and 30 feet bgs in all wells and the boring (although these general conditions varied by location) and below 75 feet bgs (only MON-MW-01S and -01D went this deep). Results of hydraulic properties analyses are tabulated in Table 3 and detailed laboratory results are included in Appendix D.



4.2.2 Nitrate Analyses

Nitrate is a compound sometimes associated with agricultural land use. Soil samples for nitrate analysis were collected at 6 inches, 5 feet, and 10 feet bgs from Mon-B-01. The nitrate concentrations in soil ranged between 3.7 and 8.7 mg/kg, with concentrations decreasing with depth. Results of nitrate analyses in soil are tabulated in Table 4 and detailed laboratory results are included in Appendix E.

4.3 Chemical Analyses of Water Samples

Groundwater is of generally good water quality although several constituents are present in groundwater slightly above or near regulatory limits. Although Nitrate as N is present in the groundwater, all concentrations are well below the Maximum Contaminant Level (MCL) for groundwater of 10 milligrams per liter (mg/L). The highest concentration (1.7 mg/L) is found in the deepest well, MON-MW-01D. Arsenic and chromium, naturally occurring metals frequently associated with volcanic rocks common in Sonoma Valley, are present in groundwater, indicating that recharge and mixing of waters with lower concentrations of these constituents could provide groundwater quality benefits. Arsenic concentrations range from <7.8 micrograms per liter ($\mu\text{g/L}$) to 15 $\mu\text{g/L}$ which are near and slightly above the regulatory limit of 10 $\mu\text{g/L}$. Total chromium concentrations range between 3.1 $\mu\text{g/L}$ and 53 $\mu\text{g/L}$; the MCL for total chromium is 50 $\mu\text{g/L}$. The sample from the location nearest the volcanic bedrock found in the hills, MON-MW-03S (53 $\mu\text{g/L}$) was significantly higher than the others (3.1 $\mu\text{g/L}$ to 8.7 $\mu\text{g/L}$ at wells MON-MW-01S, MON-MW-01D and MON-MW-02S), suggesting naturally occurring chromium is the likely source for this concentration. The higher concentration may also be the result of higher turbidity found in the groundwater sample from MON-MW-03S. Results of chemical analyses in groundwater are tabulated in Table 5 and detailed laboratory results are included in Appendix E.



4.4 Water Level Monitoring

Manual and continuous water level measurements were conducted after well development at all four wells. Well construction information and manual water surface measurements are summarized in Table 6 and water level monitoring data are shown in Figure 3a. Both a shallow water bearing zone (encountered at 35 to 55 feet bgs) and a deeper water bearing zone (encountered at 102 feet bgs in well MW-01D) were encountered at the Montini site. Both horizons were confined, with water levels after stabilization rising above the depth of the water bearing zone. On December 21 (after well stabilization), depth to water was approximately 40, 40, 11 and 21 feet bgs at MON-MW-01D, MON-MW-01S, MON-MW-02S and MON-MW-03S, respectively (Figure 3a). Although the water bearing zones in well MON-MW-01S and MON-MW-01D initially appeared to be distinct, monitoring data indicates they may be in communication with each other. Water levels were slightly higher in MON-MW-01S (screened at 55 to 75 feet bgs) than in MON-MW-01D (screened at 95 to 125 feet bgs), which is screened at a similar depth as the top of the Montini domestic well screen interval. The water levels in the wells tracked closely, however, and during pumping of the Montini domestic well, the water level in MON-MW-01S responded similarly but exhibited less drawdown than MON-MW-01D (Figure 3b).

4.5 Infiltration Tests

4.5.1 *Falling-Head Tests*

The falling-head infiltration tests conducted at the infiltration test pits indicated infiltration rates that range between 1.7×10^{-4} and 2.7×10^{-6} cm/s) at the Montini site and correspond to published values of the materials observed in the bottom of the infiltration tests areas (Domenico and Schwartz, 1990). Hydraulic conductivity of the material at the base of the infiltration test area based on the results of the infiltration tests are tabulated in Table 3.



4.5.2 Moisture Sensor Profiles

Soil moisture sensor data were obtained from MON-MW-02S. This data was collected to augment the monitoring of the infiltration test conducted within a few feet of the monitor well, MON-INF-02. Continued recording of soil moisture data will monitor how water infiltrates on an ongoing basis. Limited data is currently available from the soil moisture sensors as the heavy rain in early February led to inundation of the datalogger. A datalogger was reinstalled enclosed in a dry bag but was similarly impacted by moisture. A datalogger has been reinstalled posted on an aboveground stake and will continue to collect soil moisture data in the future.

4.5.3 Neutron Probe Profiles

Neutron probe data were obtained from MON-MW-02S. This data was collected to augment the monitoring of the infiltration test conducted within a few feet of the monitor well, MON-INF-02. Neutron data did not show soil moisture changes during the field investigation.

5. Synthesis of Site Investigation Findings

The results of the Montini site investigation indicate that the subsurface materials beneath the site pose certain challenges to achieving recharge benefits at the scale discussed in the 1E grant application. While groundwater recharge currently occurs, and more can be achieved with an appropriate project design, it will be difficult to achieve the levels of recharge originally estimated for the Montini site that were based on prior assessments. The conceptual project that was originally anticipated will provide some level of recharge, but that amount could be enhanced by bypassing some of the lowest permeability materials that are present closer to the surface and including elements often used in similar types of projects that target recharge at horizons of relatively higher permeability using practices such as an infiltration trench, infiltration gallery or dry wells.



References

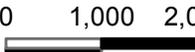
Domenico, P.A. and F.W. Schwartz. 1998. *Physical and chemical hydrogeology*, Second edition. John Wiley & Sons, Inc., New York.

Klute, A., ed. 1986. *Methods of soil analysis, Part 1: Physical and mineralogical methods*, Second edition. American Society of Agronomy, Inc. and Soil Science Society of America, Inc., Madison, WI.

Stephens, D.B. 1996. *Vadose zone hydrology*. CRC Press Inc., Boca Raton, FL.

Figures




 0 1,000 2,000 Feet

Explanation
 Site
 Park
 Stream

Note: Aerial photography dated 2009 from USDA.

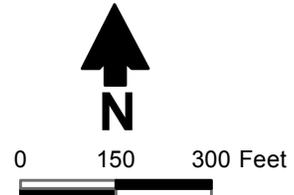
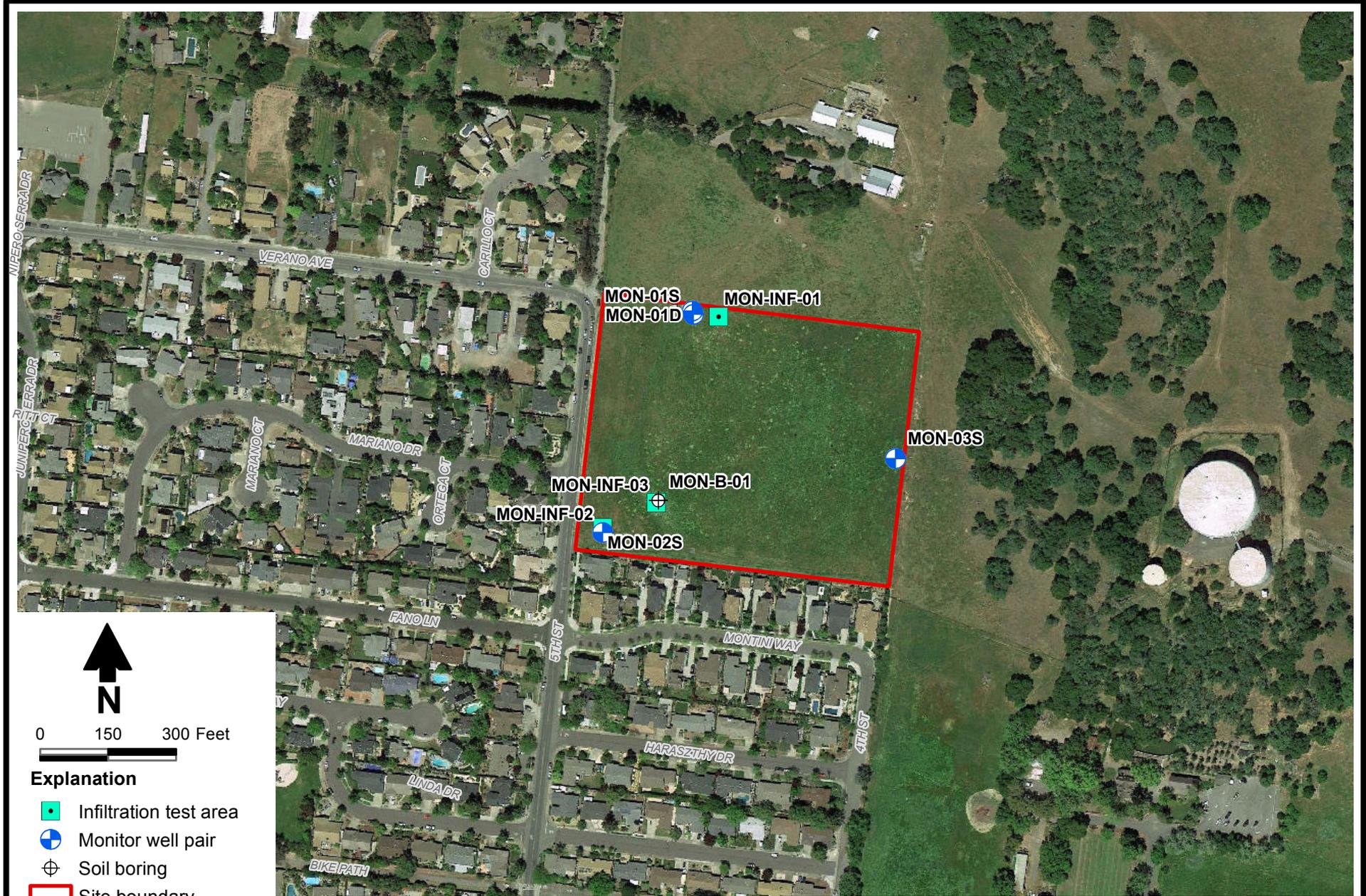
CITY WATERSHEDS OF
SONOMA VALLEY PHASE 1
Site Location



Daniel B. Stephens & Associates, Inc.
5/23/2014 JN WR10.0085

Figure 1

S:\Projects\WR10.0085_SCWA\GIS\MXDs\Figures\CityWatersheds_FieldWorkPlan\Fig01_AreaMap_Montini.mxd



- Explanation**
- Infiltration test area
 - Monitor well pair
 - Soil boring
 - Site boundary

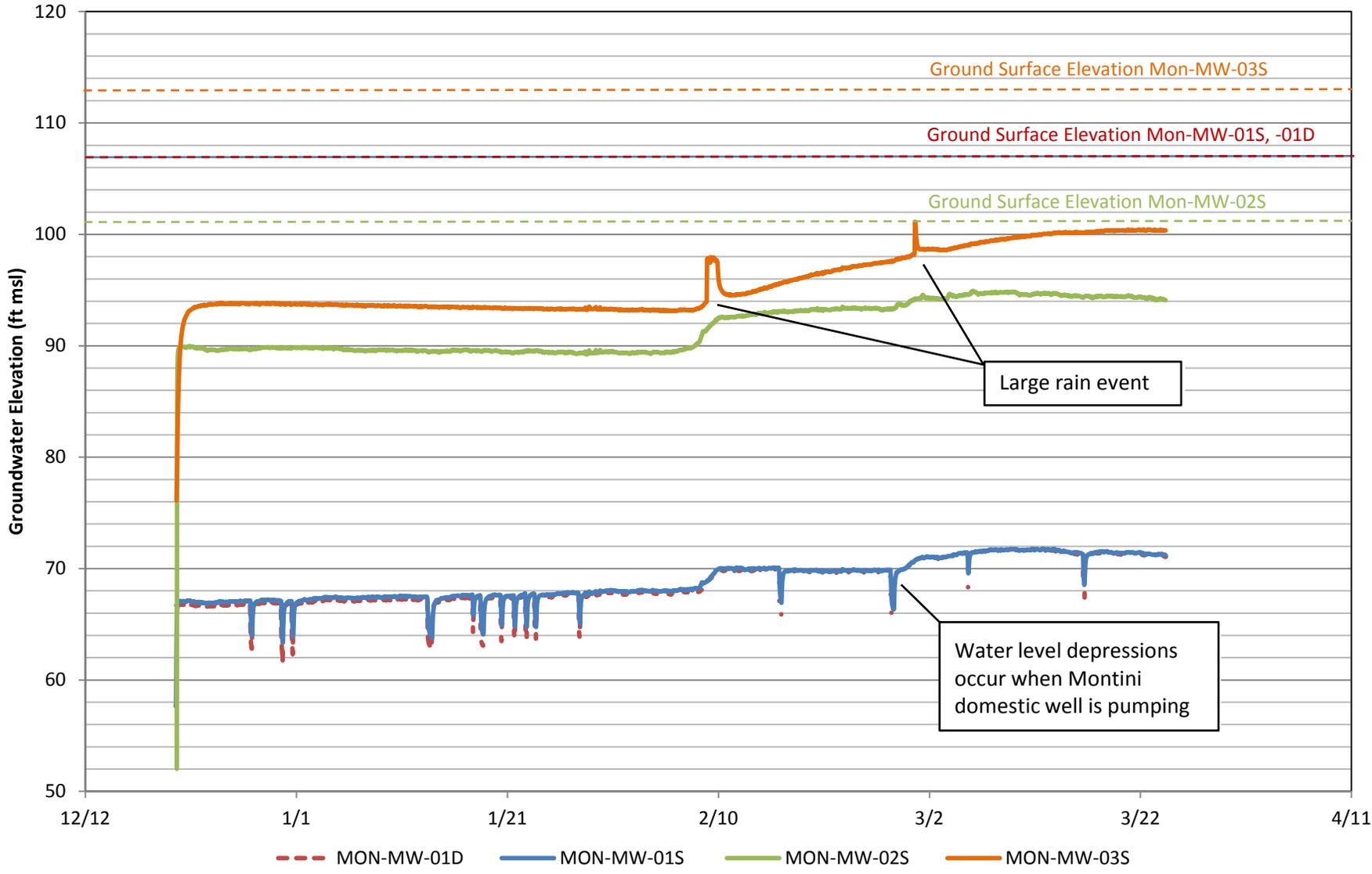
Note: Aerial photography dated April 16, 2013 from Google Earth.

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Montini Site
Site Investigation Elements

Figure 2

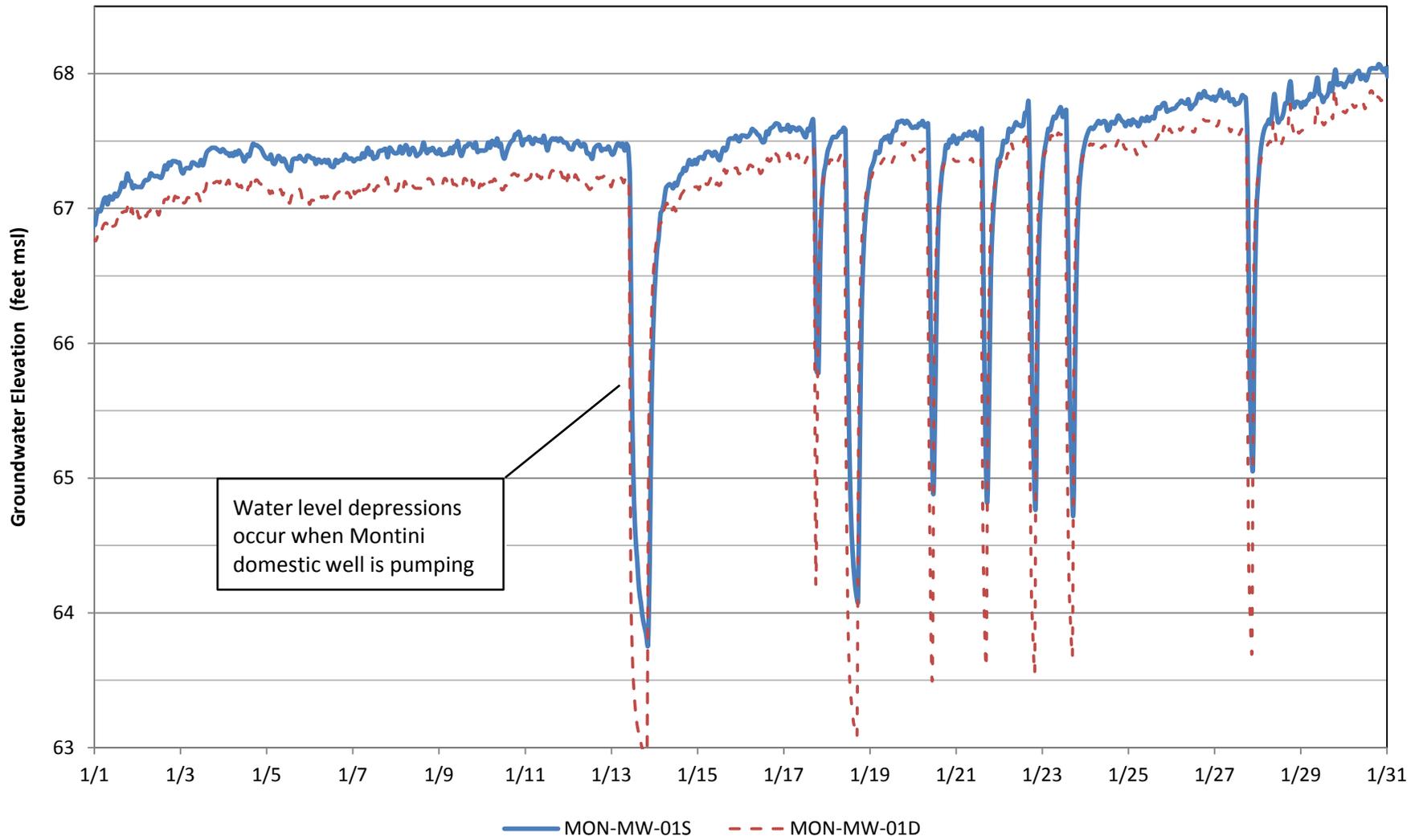


Figure 3a: Groundwater Elevation - All Wells



Note: ft msl feet mean sea level (NAVD 88)

**Figure 3b: Groundwater Elevation at MON-MW-01S and MON-MW-01D
January 2014**



Note: ft msl feet mean sea level (NAVD 88)

Tables



Table 1. Monitoring Well Construction

Well ID	Date Completed	Depth Drilled (ft bgs)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Filter Pack Interval (ft bgs)	Location		Surface Elevation (ft msl) ¹	Depth to First Water (ft bgs) ²
						Latitude	Longitude		
MW-01D	12/12/2013	127	125	95-125	92-127	38.30174	122.46594	106.8	65/102
MW-01S	12/18/2013	80	75	55-75	52-80	38.30175	122.46397	106.8	70
MW-02S	12/13/2013	60	58	38-58	36-60	38.30048	122.46676	101.2	42
MW-03S	12/16/2013	51	50	35-50	32-51	38.30080	122.46450	112.8	40

ft bgs Feet below ground surface
 ft msl Feet mean sea level (NAVD88)

Note:

- 1) Elevation determined from detailed site survey completed in 2010.
- 2) Depth to first water is depth at which water bearing zone was encountered.



Table 2. Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties ¹			Saturated Hydraulic Conductivity ²			Moisture Characteristics ³							Particle Size ⁴			Specific Gravity ⁵		Air Perm- eability	Atterberg Limits	Proctor Compaction			
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K _{unsat}	DS	WS	H	F				C		
MON-3S-40.5-41-SS	X	X			X											X	X	X				X		
MON-3S-41-41.5-SS																								
MON-3S-45-45.5-SS																								
MON-3S-45.5-46-SS																								
MON-3S-46-46.5-SS																								
MON-B-01-0.5-1-Bag																								
MON-B-01-5.0-6-Bag																X	X						X	
MON-B-01-10-11.0-Bag	X	X			X											X	X	X					X	
MON-B-01-16-17-Bag	X	X		X												X	X	X					X	
MON-B-01-20-21-Bag																X	X						X	
MON-B-01-27-28-Bag	X	X		X												X	X	X					X	
MON-B-01-29-30-Bag																X	X						X	
MON-B-01-35-36-Bag	X	X			X											X	X	X					X	
MON-B-01-43-44-Bag																X	X						X	

¹ G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

² CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

³ HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, K_{unsat} = Calculated Unsaturated Hydraulic Conductivity

⁴ DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

⁵ F = Fine (<4.75mm), C = Coarse (>4.75mm)



Table 3. Summary of Hydraulic Conductivity

Sample ID	Saturated Hydraulic Conductivity (cm/sec)	Saturated Hydraulic Conductivity (ft/day)	Test Type		
			Constant Head	Falling Head	Infiltration Test
MON-1D-10.5-11-SS	2.1E-06	5.9E-03		X	
MON-1D-20.5-21-SS	6.8E-08	1.9E-04		X	
MON-1D-30-30.5-SS	1.4E-04	4.1E-01	X		
MON-1D-45.5-46-SS	7.9E-05	2.2E-01	X		
MON-1D-65.5-66-SS	3.8E-08	1.1E-04		X	
MON-1D-85.5-86-SS	4.7E-05	1.3E-01	X		
MON-1D-102-103-Bag	5.9E-05	1.7E-01	X		
MON-1D-119.5-120.5-Bag (Moderate)	5.4E-03	1.5E+01	X		
MON-1D-119.5-120.5-Bag (Firm)	6.6E-06	1.9E-02		X	
MON-2S-10.5-11-SS	2.1E-05	5.9E-02		X	
MON-2S-21-21.5-SS	6.6E-05	1.9E-01	X		
MON-2S-26-26.5-SS	1.2E-05	3.4E-02		X	
MON-2S-31-31.5-SS	7.6E-05	2.2E-01	X		
MON-2S-40-40.5-SS	7.1E-06	2.0E-02		X	
MON-3S-21-21.5-SS	9.0E-06	2.6E-02		X	
MON-3S-40.5-41-SS	8.5E-05	2.4E-01		X	
MON-B-01-10-11.0-Bag	9.9E-07	2.8E-03		X	
MON-B-01-16-17-Bag	2.5E-03	7.0E+00	X		
MON-B-01-27-28-Bag	2.3E-04	6.4E-01	X		
MON-B-01-35-36-Bag	5.5E-05	1.6E-01		X	
MON-INF-01	2.7E-06	7.6E-03			X
MON-INF-02	8.6E-05	2.4E-01			X
MON-INF-03	1.7E-04	4.8E-01			X



Table 4. Nitrate in Soil

Sample ID	Date Sampled	Analyte	Concentration	Units
MON-B-01 0.5-1 ft	12/18/2013	Nitrate as N	6.0	mg/kg
MON-B-01 5-5.5 ft	12/18/2013	Nitrate as N	8.7	mg/kg
MON-B-01 10-10.5 ft	12/18/2013	Nitrate as N	3.7	mg/kg

Analyses performed using EPA Method 300.0
mg/kg Milligrams per kilogram



Table 5. Groundwater Chemistry

Analyte	Method	Units	MON-01D	MON-01D Dup	MW-01S	MW-02S	MW-03S
<i>Date Sampled</i>			<i>12/20/2013</i>	<i>12/20/2013</i>	<i>12/20/2013</i>	<i>12/20/2013</i>	<i>12/20/2013</i>
Bromodichloromethane	EPA-524.2	µg/L	<0.14	<0.14	<0.14	<0.14	<0.14
Bromoform	EPA-524.2	µg/L	<0.27	<0.27	<0.27	<0.27	<0.27
Chloroform	EPA-524.2	µg/L	<0.12	<0.12	<0.12	<0.12	<0.12
Dibromochloromethane	EPA-524.2	µg/L	<0.13	<0.13	<0.13	<0.13	<0.13
Total Trihalomethanes	EPA-524.2	µg/L	<0.63	<0.63	<0.63	<0.63	<0.63
Dibromoacetic acid	EPA-552.3	µg/L	<0.42	<0.42	<0.42	<0.42	<0.42
Dichloroacetic acid	EPA-552.3	µg/L	<0.37	<0.37	<0.37	<0.37	<0.37
Monobromoacetic acid	EPA-552.3	µg/L	<0.32	<0.32	<0.32	<0.32	<0.32
Monochloroacetic acid	EPA-552.3	µg/L	<0.43	<0.43	<0.43	<0.43	<0.43
Total HAA's (Summation)	EPA-552.3	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroacetic acid	EPA-552.3	µg/L	<0.37	<0.37	<0.37	<0.37	<0.37
Total Aluminum	EPA-6010B	µg/L	370	430	510	940	14000
Total Antimony	EPA-6010B	µg/L	<8.5	<8.5	<8.5	<8.5	<8.5
Total Arsenic	EPA-6010B	µg/L	<7.8	7.8	12	15	13
Total Barium	EPA-6010B	µg/L	12	12	11	44	69
Total Beryllium	EPA-6010B	µg/L	<0.50	<0.50	<0.50	<0.50	0.97
Total Boron	EPA-6010B	µg/L	63	64	98	150	94
Total Cadmium	EPA-6010B	µg/L	<1.1	<1.1	<1.1	<1.1	<1.1
Total Calcium	EPA-6010B	mg/L	15	15	18	19	15
Total Chromium	EPA-6010B	µg/L	3.1	3.1	8.7	4.9	53
Total Cobalt	EPA-6010B	µg/L	<1.3	<1.3	<1.3	<1.3	11
Total Copper	EPA-6010B	µg/L	<1.1	<1.1	1.6	3.2	39
Total Iron	EPA-6010B	µg/L	650	730	750	1400	19000
Total Lead	EPA-6010B	µg/L	<4.0	<4.0	<4.0	<4.0	8.6



Table 5. Groundwater Chemistry

Analyte	Method	Units	MON-01D	MON-01D Dup	MW-01S	MW-02S	MW-03S
Total Magnesium	EPA-6010B	mg/L	8.9	8.8	8.6	12	15
Total Manganese	EPA-6010B	µg/L	80	83	18	120	500
Total Molybdenum	EPA-6010B	µg/L	15	16	35	56	16
Total Nickel	EPA-6010B	µg/L	<2.0	<2.0	<2.0	<2.0	41
Total Potassium	EPA-6010B	mg/L	4.0	4.0	6.2	5.3	6.9
Total Selenium	EPA-6010B	µg/L	<15	<15	17	<15	<15
Total Silver	EPA-6010B	µg/L	<1.9	<1.9	<1.9	<1.9	<1.9
Total Sodium	EPA-6010B	mg/L	21	21	44	44	25
Total Thallium	EPA-6010B	µg/L	<24	<24	<24	<24	<24
Total Vanadium	EPA-6010B	µg/L	21	22	23	6.3	40
Total Zinc	EPA-6010B	µg/L	9.4	11	17	12	62
Total Mercury	EPA-7470A	µg/L	<0.024	<0.024	<0.024	<0.024	<0.024
Chloride	EPA-300.0	mg/L	11	11	43	26	19
Fluoride	EPA-300.0	mg/L	0.39	0.33	0.41	0.46	0.40
Nitrate as N	EPA-300.0	mg/L	1.7	1.7	0.40	0.12	0.063
Sulfate	EPA-300.0	mg/L	7.3	7.4	15	8.1	5.4
Total Kjeldahl Nitrogen	EPA-351.2	mg/L	<0.083	<0.083	0.091	<0.083	0.20
Nitrite as N	EPA-353.2	µg/L	15	15	<10	<10	<10
Total Nitrogen	Calc	mg/L	1.6	1.6	0.50	<0.10	0.27
Total Phosphate	EPA-365.4	mg/L	0.36	0.36	0.81	0.44	1.2
MBAS	EPA-425.1	mg/L	<0.030	<0.015	0.015	<0.015	<0.015
pH	EPA-150.1	pH Units	7.27	7.28	7.96	7.93	7.59
Turbidity	EPA-180.1	NTU	5.9	7.2	15	15	260
Hardness as CaCO3	Calc	mg/L	74	73	79	95	100
Bicarbonate	SM-2320B	mg/L	120	120	120	160	120



Table 5. Groundwater Chemistry

Analyte	Method	Units	MON-01D	MON-01D Dup	MW-01S	MW-02S	MW-03S
Total Alkalinity as CaCO ₃	SM-2320B	mg/L	94	94	100	130	100
Electrical Conductivity @ 25 C	SM-2510B	µS/cm	243	244	365	349	260
Total Dissolved Solids @ 180 C	SM-2540C	mg/L	210	200	250	220	200
Color	SM-2120B	Color Units	1.0	2.0	2.0	2.0	3.0
Odor	SM-2150B	Odor Units	No Obs Odor	No Obs Odor	No Obs Odor	No Obs Odor	4.0

Dup = Duplicate

µg/L Micrograms per liter

mg/L Milligrams per liter

NTU Nephelometric turbidity units

µS/cm Microsiemens per centimeter

< Compound is not detected at the Method Detection Limit posted



Table 6. Manual Water Level Measurements

Manual Depth to Waters (ft btoc) ¹								
Date	Time	MON- MW-01S	Time	MON- MW-01D	Time	MON- MW-02S	Time	MON- MW-03S
12/20/2013	16:54	40.38	16:52	40.00	16:36	18.14	16:17	33.16
1/17/2014	-	-	9:59	39.44	10:10	11.63	-	-
1/28/2014	10:38	39.07	10:38	39.36	10:52	11.9	10:46	19.51
3/24/2014	11:13	35.4	11:11	35.8	10:52	7.14	11:03	12.44
5/2/2014	-	-	11:14	35.1	10:53	7.08	11:00	11.8

1. ft btoc feet below top of casing

Note: Depth to water measurements post well development

Appendix A

Photo Album

1_JC_Camera





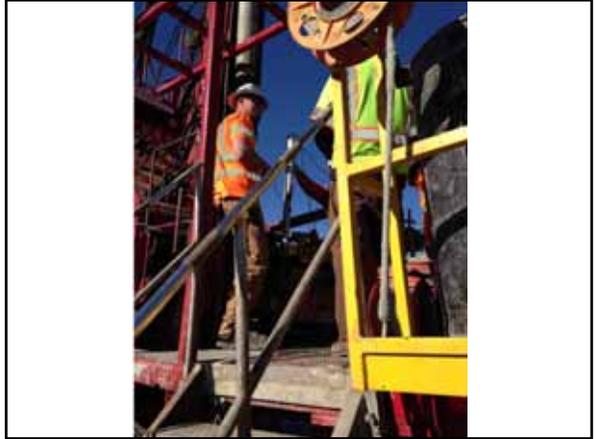




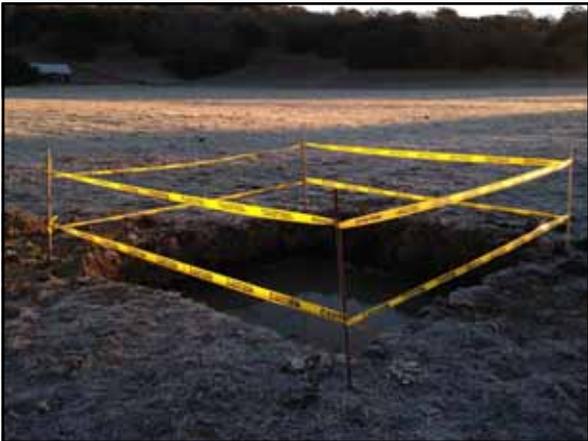












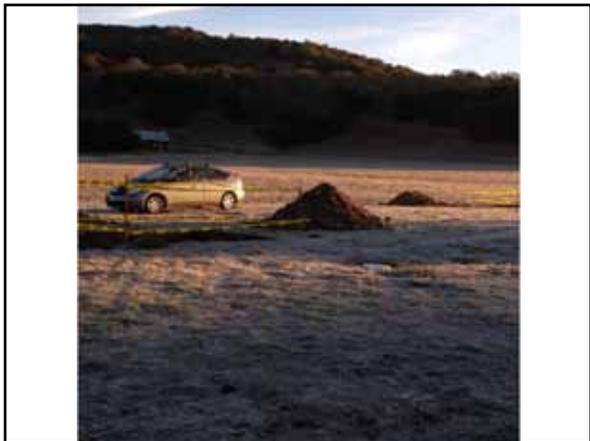




















































Photo Album

2_JK_Camera











































Photo Album

3_BA_Camera







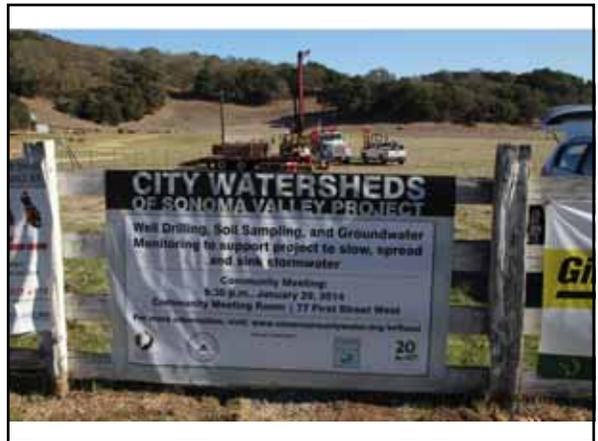


Photo Album

4_PK_Camera









Appendix B

		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (feet bgs)	Sample Depth (feet bgs)	Comments and Lithology
	0			100	0-0.5		Top soil, dark brown (7.5YR 3/2), clay 15%, silt 75%, sand 10%, squishy, moist.
			Grab at 5'	100	1.5-6		Silty sand, light olive brown (2.5Y 5/4), clay 5%, silt 45%, sand 55%, squishy, moist.
			Grab @10'	100	6-12		Sandy silt, olive brown (2.5Y 4/4), moist, dense, hard with zones that are squishy decreasing moisture with depth, clay 15%, silt 65%, sand 15% coarse-grained, gravel 5%.
				100	12-15		Sandy silt, olive (5Y 4/3), clay 15%, silt 70%, sand 15%, dense, very hard, slightly moist.
			Grab at 15'	100	15-20		Silt with sand and gravel, olive brown (2.5Y 4/3), clay 10%, silt 40%, sand 30%, gravel 20%, angular to 1" diameter increasing to 3" diameter at 20', crumbly, slightly moist.
			Grab @ 20'	100	20-22		Silt with sand, light olive brown (2.5Y 5/4), clay <5%, silt 45%, sand 50%, slightly moist.
				100	22-25		Same as above, but harder and drier with depth slightly moist, harder but once broken crumbles.
				100	25-26		Same as above with mottled very dark greenish gray (Gley 1 3/10 GY) 70%/30% (Gley 1), clay <5%, silt 15%, sand 80%, hard, crumbly when broken, slightly moist.
			Grab @ 27'	100	26-28		Silty sand with fine gravel, very dark greenish gray (Gley 1 3/10 GY), clay <5%, silt 15%, sand 70%, gravel 10% fine, crumbly, increasing grain size with depth, slightly moist.
			Grab @29'	100	28-30		Silt with clay, dark greenish gray (Gley 1 4/5G -/1), clay 40%, silt 45%, sand 10%, gravel 5% fine, hard, slightly moist.?
				100	30-31		Silt with sand, dark greenish gray (Gley 1 4/5G -/1), much less clay, clay <5%, silt 45%, sand 40%, gravel 10% up to 1/2" diameter, crumbly, slightly moist.
				100	31-33		Silt with sand, dark gray (Gley 1 4/N), clay 15%, silt 65%, sand 20%, hard but crumbles when broken, slightly moist.
		Grab @35'	100	33-40		Clayey silt, dark greenish gray (Gley 2 4/10 BG), clay 40%, silt 50%, sand 10%, slightly moist, compact but then crumbles with zones of higher clay and moisture.	
			100	40-42		Same as above with more crumbling, no wetter zones, slightly moist, clay 20%, silt 70%, sand 10%.	
		Grab @ 43'	100	42-50		Same as interval 33'-40', slightly moist, no wetter zones. Wet only at very bottom of hole.	

Geologist: J. Cherney
 Driller: National
 Date completed: 12/18/13

Drilling method: Sonic
 Diameter:
 Sampling device:

Northing:
 Easting:
 Elevation:

bgs = below ground surface
 HA = hand auger
 SS = split spoon

**CITY WATERSHEDS OF
 SONOMA VALLEY PHASE 1
 Boring: Mon-B-01**



Daniel B. Stephens & Associates, Inc.

3-07-14

JN WR10.0085.13

		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (ft bgs)	Depth (ft bgs)	Comments and Lithology
	0						Ground surface
				50	0-1.5		Top soil, dark brown (7.5YR 3/2), clay 10%, silt 80%, sand 10% fine-grained, moist.
				80	1.5-6.5		Clayey sand with fine gravel, light yellowish brown (2.5Y 6/4), clay 30%, silt 30%, sand 20%, gravel 10% up to 1/2" diameter, slightly moist, slight HCl RXN.
				80	6.5-9		Same as above, moisture increases with depth, no HCl RXN.
				80	9-10	10-11.5	Silty clay, light olive brown (2.5Y 5/6), clay 40%, silt 20%, sand 20%, gravel 20%, black (basalt?), no HCl RXN.
		16/25/40	SS		10-15		Silt, light olive brown (2.5Y 5/6) and roots with dark reddish gray (10R 3/1) inclusions, clay 30%, silt 60%, gravel 10%, reddish gray, 1/4" diameter, slightly moist, slight HCL RXN.
				70	15-17		Same as above without gravel, clay 40%, silt 60%, slightly moist, no HCl RXN.
				100	17-20	20-21.5	Silt, greenish gray (Gley 1 5/10 GY) with inclusions of olive brown (2.5Y 4/3), clay 30%, silt 60%, sand 10%, moist, no HCl RXN.
		3/10/2014	SS	50	20-25		Silty clay, dark greenish gray (Gley 1 4/5 GY) with olive brown (2.5Y 4/3) inclusions, clay 60%, silt 35%, sand 5%.
					25-31	30-31.5	Clayey silt, dark greenish gray (Gley 1 4/5 GY) with highly weathered rock fragments that were dark yellow brown (10YR 4/6), clay 40%, silt 50%, sand 5%, gravel 5%, hard, moist.
		1/10/2029	SS		31-31.5		Silt, very dark brown (10YR 2/2), collected in split spoon rings, does not appear present in regular cuttings.
				80	31.5-35		Silt with sand, dark greenish gray (Gley 1 4/5 GY), clay 40%, silt 40%, sand 30%, gravel 20%, with less weathered larger clasts, red clasts to 1" diameter, moist, no HCl RXN.
				90	35-36		Sandy silt with gravel, dark reddish brown (5YR 3/3), clay 15%, silt 55%, sand 15%, gravel 15% up to 3/4" diameter, moist, slight HCl RXN.
				100	36-37.5		Sandy silt, very dark grayish brown (10YR 3/2), clay 20%, silt 60%, sand 20%, moist, organics: sticks, roots.
				100	37.5-40	40-41.5	Silty sand, dark greenish gray (Gley 1 4/5 GY), clay 15%, silt 35%, sand 40%, petrified wood fragments 10% up to 1/2", slight HCl RXN.
	16/13/19	SS	100	40-44		Sandy silt with gravel, light yellowish brown (2.5Y 6/4), clay 20%, silt 40%, sand 10%, gravel 30% up to 1.5" diameter clasts both red and light brown, slightly moist, no HCl RXN.	
			100	44-45		Mottled silty clay: green 70%, olive (5Y 5/3); brown/red 15%, dark brown (7.5YR 3/2); Yellow 10%, yellowish brown (10YR 5/6); black 10%; green: clay 70%, silt 15%, sand 15%; brown: clay 50%, silt 35%, sand 15%; yellow: silt, gravels mixed with green, moist, slight HCl RXN.	
			80	45-48.5	45-46.5	Silt, olive (5Y 5/3), clay 45%, silt 35%, sand 5%, gravel 5% up to 1/2" diameter, significantly wetter (maybe added by driller - 1, 5 gallons at 45'), no HCl RXN.	
	1/8/2014	SS		48.5-50		Silty clay, same as interval 44'-45', mottled yellow 50%, green 30%, brown 20%, moister than 0'-45', less wet than interval 45'-48.5', softer, no HCl RXN.	

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/12/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30174
 Longitude: 122.45694
 Elevation: 106.8 ft. msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Boring: MON-MW-01D



		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (ft bgs)	Depth (ft bgs)	Comments and Lithology	
	50	3/13/1939	SS	50	50-54	50-54	Silt, dark gray (7.5YR 4/1), noticeably less clay, clay 15%, silt 75%, sand 10%, moist, dryer than 45'-50'.	
					54-56	55-56.5	Silty sand with silica veins running through it, pale yellow (5Y 7/4), clay 20%, silt 30%, sand 40%, semi-cemented silica veins 10%, very hard, moist. May be silica replacement of old organic material.	
						56-60	60-62	Clayey silt, dark greenish gray (Gley 1 4/5 GY), clay 30%, silt 70%, semi-hard, moist, very slight HCl RXN, some mottling with yellowish brown streaks, much clayer than dark greenish gray, clay 80%, silt 20%, squishy soft, moist.
						60-62	62-65	Silty clay, dark brown (7.5YR 3/2), clay 50%, silt 35%, sand 15%, hard to break with hands, moist, slight HCl RXN.
		15/25/45	SS		62-65	65-67	65-66.5	Silt with sand, pale yellow (5Y 7/4), clay 20%, silt 30%, sand 40%, hard to break with hands, moist, getting dryer?, slight HCl RXN.
						65-67	67-70	Clayey silt, dark greenish gray (Gley 1 4/5 GY), clay 40%, silt 50%, sand 10%, squishy soft, moist, no HCl RXN.
						67-70	75-76.5	Silt, light olive brown (2.5Y 4/4), clay 30%, silt 50%, sand 20%, hard, cannot break with hands, lightly cemented, moist, very slight HCl RXN.
						75-76.5	70-83	Sandy silt, dark brown (10YR 3/3), clay 15%, silt 55%, sand 25%, black gravel 5% up to 1/4" diameter, crumbly, moist, slight HCl RXN.
		6/36/57	SS	70	70-83	83-84	85-86.5	Sandy silt, light olive brown (2.5Y 5/4), clay 20%, silt 55%, sand 20%, silica 50%, semi-hard, moist, pink/white inclusions, organics: looks like old roots, no HCl RXN.
		30/86/	SS Refusal @ 85.5'	70	84-87.5	87.5-89	90	Sandy silt with gravel, yellowish brown (10YR 5/3), clay 5%, silt 55%, sand 30%, gravel 10% up to 1/4" diameter, clasts of very dark grayish brown gravel and weathered gravel, gravel content and diameter increases with depth to 95', moist.
			Grab @ 92.5'	90	87.5-89	90	90	Sandy silt with gravel, yellowish brown (10YR 5/3), clay 5%, silt 50%, sand 30%, gravel 15% up to 1/2" diameter, clasts of very dark grayish brown gravel and weathered gravel, gravel content and diameter increases with depth to 95', moist.
						90	92.5	Sandy silt with gravel, clay 5%, silt 45%, sand 30%, gravel 20% up to 3/4" diameter, rig chatter at 89', can break with hands, moist.
						92.5-95	95-96.5	Silty sand and gravel, clay 5%, silt 40%, sand 30%, gravel 25% up to 2" diameter, dryer broken by drilling, hard, moist, no HCl RXN.
		30/86/	SS Refusal @ 95'-96.5'	100	95-96.5	97.5-100	97.5-100	Sandy gravel, very dark gray (5Y 1/3), silt 15%, sand 30%, gravel 55% up to 3" diameter, moist.
		Grab @ 95'					Sandy gravel, dark reddish brown (2.5YR 3/4), clay 15%, silt 5%, sand 10%, gravel 70% up to 4" diameter, some clasts of cemented hard volcanics, very hard, slight HCl RXN. Porphyritic, pink color with lots of black, white, yellow porphyries, dry jagged cuttings, moist.	

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/12/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30174
 Longitude: 122.45694
 Elevation: 106.8 ft. msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Boring: MON-MW-01D



		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (ft bgs)	Depth (ft bgs)	Comments and Lithology
	100		Grab	100	100-105		Same as above with increased gravel, clay 15%, gravel 75%, mushy, not hard, no HCl RXN, large bolder (12" diameter) shattered, dry jagged cuttings. Suspect saturated zone 102'-103'.
	110			100	105-110		Same as above but drier, clay 5%, silt 45%, sand 25%, gravel 25%, smaller up to 1/2" diameter, can break with hands, no HCl RXN, slightly moist.
				100	110-114		Same as above, wetter wet where clay content highest (110'-112'), moist to very wet, no HCl RXN.
				100	114-115		Sand, strong brown (7.5YR 5/6), clay 5%, silt 10%, sand 80% coarse-grained, well sorted, gravel 5% up to 1/4" diameter, soft, friable, very wet.
						119.5-120	Sand, yellowish brown (10YR 5/8), primarily sand with varying amounts of gravel, clay and silt (not more than 5%). Several gravelless zones that are saturated 118'-121', 122'-124', not hard/cemented, very distinct from other materials encountered - sand, sand 60%, clay/silt 5%, gravel 35%.
		50/-/-	Grab	100	115-125		
			Refusal after 2" @ 125'		125-127		Sandy gravel, dark reddish brown (2.5YR 3/4), hard, same as 97.5'-114', but harder, more angular, semi-cemented, very moist but not saturated, silt 10%, sand 40%, gravel 50% up to 1/4" diameter.

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/12/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30174
 Longitude: 122.45694
 Elevation: 106.8 ft. msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Boring: MON-MW-01D



		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (ft bgs)	Depth (ft bgs)	Comments and Lithology
<p>Ground surface</p> <p>Bentonite/cement grout 0'-52'</p> <p>6" Borehole 0'-80'</p> <p>2" PVC blank casing 0'-55'</p> <p>0</p> <p>10</p> <p>20</p> <p>30</p> <p>40</p> <p>50</p> <p>Feet below ground surface</p>	0			50	0-1.5		Top soil, dark brown (7.5YR 3/2), clay 10%, silt 80%, sand 10% fine-grained, moist.
				80	1.5-6.5		Clayey sand with fine gravel, light yellowish brown (2.5Y 6/4), clay 30%, silt 30%, sand 20%, gravel 10% up to 1/2" diameter, slightly moist, slight HCl RXN.
				80	6.5-9		Same as above, moisture increases with depth, no HCl RXN.
				80	9-10	10-11.5	Silty clay, light olive brown (2.5Y 5/6), clay 40%, silt 20%, sand 20%, gravel 20%, black (basalt?), no HCl RXN.
		16/25/40	SS		10-15		Silt, light olive brown (2.5Y 5/6) and roots with dark reddish gray (10R 3/1) inclusions, clay 30%, silt 60%, gravel 10%, reddish gray, 1/4" diameter, slightly moist, slight HCL RXN.
					70	15-17	Same as above without gravel, clay 40%, silt 60%, slightly moist, no HCl RXN.
					100	17-20	Silt, greenish gray (Gley 1 5/10 GY) with inclusions of olive brown (2.5Y 4/3), clay 30%, silt 60%, sand 10%, moist, no HCl RXN.
		3/10/2014	SS	50	20-25	20-21.5	Silty clay, dark greenish gray (Gley1 4/5 GY) with olive brown (2.5Y 4/3) inclusions, clay 60%, silt 35%, sand 5%.
						25-31	Clayey silt, dark greenish gray (Gley 1 4/5 GY) with highly weathered rock fragments that were dark yellow brown (10YR 4/6), clay 40%, silt 50%, sand 5%, gravel 5%, hard, moist.
		1/10/2029	SS		31-31.5	30-31.5	Silt, very dark brown (10YR 2/2), collected in split spoon rings, does not appear present in regular cuttings.
					80	31.5-35	Silt with sand, dark greenish gray (Gley 1 4/5 GY), clay 40%, silt 40%, sand 30%, gravel 20%, with less weathered larger clasts, red clasts to 1" diameter, moist, no HCl RXN.
					90	35-36	Sandy silt with gravel, dark reddish brown (5YR 3/3), clay 15%, silt 55%, sand 15%, gravel 15% up to 3/4" diameter, moist, slight HCl RXN.
					100	36-37.5	Sandy silt, very dark grayish brown (10YR 3/2), clay 20%, silt 60%, sand 20%, moist, organics: sticks, roots.
					100	37.5-40	Silty sand, dark greenish gray (Gley 1 4/5 GY), clay 15%, silt 35%, sand 40%, petrified wood fragments 10% up to 1/2", slight HCl RXN.
		16/13/19	SS	100	40-44	40-41.5	Sandy silt with gravel, light yellowish brown (2.5Y 6/4), clay 20%, silt 40%, sand 10%, gravel 30% up to 1.5" diameter clasts both red and light brown, slightly moist, no HCl RXN.
				100	44-45	Mottled silty clay: green 70%, olive (5Y 5/3); brown/red 15%, dark brown (7.5YR 3/2); Yellow 10%, yellowish brown (10YR 5/6); black 10%; green: clay 70%, silt 15%, sand 15%; brown: clay 50%, silt 35%, sand 15%; yellow: silt, gravels mixed with green, moist, slight HCl RXN.	
	1/8/2014	SS	80	45-48.5	45-46.5	Silt, olive (5Y 5/3), clay 45%, silt 35%, sand 5%, gravel 5% up to 1/2" diameter, significantly wetter (maybe pidded driller - 1.5 gallons at 45'), no HCl RXN.	
				100	48.5-50	Silty clay, same as interval 44'-45', mottled yellow 50%, green 30%, brown 20%, moister than 0'-45', less wet than interval 45'-48.5', softer, no HCl RXN.	

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/18/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30175
 Longitude: 122.46397
 Elevation: 106.8 ft msl (determined from 2010 detailed site survey)

**CITY WATERSHEDS OF
 SONOMA VALLEY PHASE 1
 Boring: MON-MW-01S**



		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (ft bgs)	Depth (ft bgs)	Comments and Lithology
				50	50-54		Silt, dark gray (7.5YR 4/1), noticeably less clay, clay 15%, silt 75%, sand 10%, moist, dryer than 45'-50'.
		3/13/1939	SS		54-56	55-56.5	Silty sand with silica veins running through it, pale yellow (5Y 7/4), clay 20%, silt 30%, sand 40%, semi-cemented silica veins 10%, very hard, moist. May be silica replacement of old organic material.
					56-60	60-62	Clayey silt, dark greenish gray (Gley 1 4/5 GY), clay 30%, silt 70%, semi-hard, moist, very slight HCl RXN, some mottling with yellowish brown streaks, much clayer than dark greenish gray, clay 80%, silt 20%, squishy soft, moist.
					62-65	65-67	Silty clay, dark brown (7.5YR 3/2), clay 50%, silt 35%, sand 15%, hard to break with hands, moist, slight HCl RXN.
		15/25/45	SS		65-67	65-66.5	Silt with sand, pale yellow (5Y 7/4), clay 20%, silt 30%, sand 40%, hard to break with hands, moist, getting dryer?, slight HCl RXN.
					67-70	67-70	Clayey silt, dark greenish gray (Gley 1 4/5 GY), clay 40%, silt 50%, sand 10%, squishy soft, moist, no HCl RXN.
						75-76	Silt, light olive brown (2.5Y 4/4), clay 30%, silt 50%, sand 20%, hard, cannot break with hands, lightly cemented, moist, very slight HCl RXN.
							Sandy silt, dark brown (10YR 3/3), clay 15%, silt 55%, sand 25%, black gravel 5% up to 1/4" diameter, crumbly, moist, slight HCl RXN.

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/18/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30175
 Longitude: 122.46397
 Elevation: 106.8 ft msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Boring: MON-MW-01S



	Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (feet bgs)	Depth (feet bgs)	Comments and Lithology
0						Ground surface
0.0'-3.5'						Puregold medium bentonite chips
3.5'-6.5'		HA	50	0-5		Top soil, dark brown (7.5YR 3/2), clay 10%, silt 80%, sand 10%, hand augured (HA), moist.
6.5'-8.5'	3/50/-	SS	50	5-8	5-6.5	Sandy silt, light olive brown (2.5Y 5/4), clay 5%, silt 55%, sand 45%, soft, crumbly, slightly moist, slight HCl RXN.
8.5'-11.5'					10-11.5	Silt, olive brown (2.5Y 5/4), more clay than above, clay 15%, silt 70%, sand 15%, hard, slightly moist.
11.5'-18.5'	16/31/47	SS	80	8-17	15-16.5	?
18.5'-21.5'			100	17-20	20-21.5	Sandy silt, dark greenish gray (5G 4/1), clay 5%, silt 80%, sand 15%, hard, dry, no HCl RXN.
21.5'-28.5'	23/41/43	SS	100	20-25	20-21.5	Sandy silt, saturated zone near 25', split spoon sampler wet, driller noticed water on equipment, same as above, increasing clay, moister, softer with depth, no HCl RXN, clay 5-20% increasing with depth, silt 65-80% increasing with depth, sand 0-30% decreasing with depth.
28.5'-31.5'	15/50/-	SS	90	25-26	25-26.5	Gravelly silt interval, yellowish brown (10YR 5/6), cobbles up to 2" diameter, well rounded, fine-grained volcanics, cannot break with hammer, slightly moist.
31.5'-36'			100	26-33	30-31.5	Silt with sand, olive (5Y 5/4), clay 20%, silt 40%, sand 40%, moist.
36'-60'	50/-/-		90	33-35	35	Silt with coarse sand, olive brown (2.5Y 4/3), easy to break with hands, moist.
38'-58'					35	Silt, dark greenish gray (5G 4/1), very similar to 17'-25', easy to break with hands, drier and harder than 39'-40', clay 5%, silt 80%, sand 15%.
	50/-/-	SS	100	35-40	40-41.5	Same as above. Very soft and moist at 42'-44', harder and drier but still moist at 44'-50', alternating sections of hardness and moisture content softer material is wetter and higher clay content, wet section 55'-58'.
						DTW=42.0 ft bgs
						0.020" Slot screen

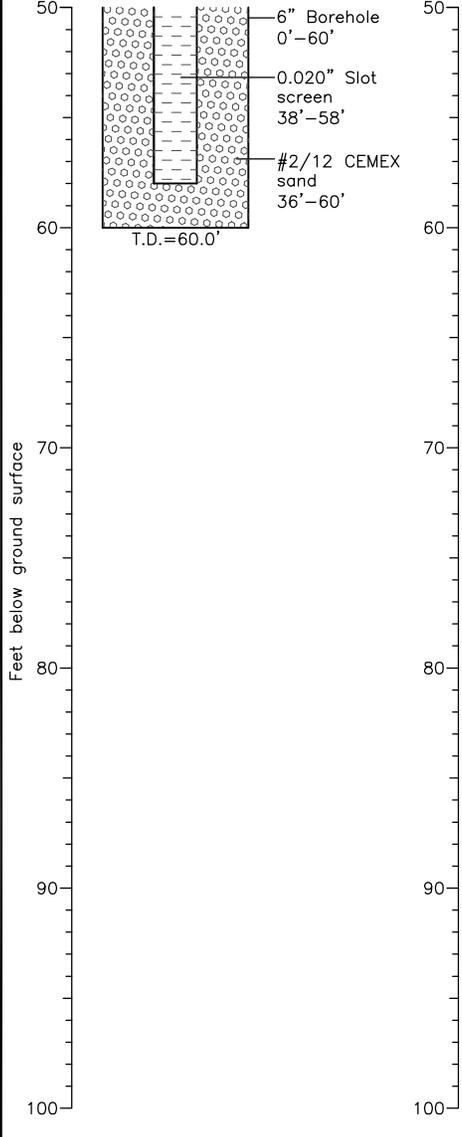
Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/13/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30048
 Longitude: 122.46676
 Elevation: 101.2 ft msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1 Boring: MON-MW-02S



	Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (feet bgs)	Depth (feet bgs)	Comments and Lithology
 <p>50 60 70 80 90 100</p> <p>feet below ground surface</p> <p>6" Borehole 0'-60'</p> <p>0.020" Slot screen 38'-58'</p> <p>#2/12 CEMEX sand 36'-60'</p> <p>T.D.=60.0'</p>	<p>20/25/38</p>	<p>SS Grab @ 43', 56.5'</p>		<p>40-60</p>		

Geologist: J. Kay/J. Cherney
 Driller: National
 Date completed: 12/13/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30048
 Longitude: 122.46676
 Elevation: 101.2 ft msl (determined from 2010 detailed site survey)

**CITY WATERSHEDS OF
 SONOMA VALLEY PHASE 1
 Boring: MON-MW-02S**



Diagram		Blow Counts	Sampling Device	Sample Recovery (%)	Sample Interval (feet bgs)	Depth (feet bgs)	Comments and Lithology
	0						Ground surface
				50	0-3		Top soil, reddish brown (5YR 4/4), clay 15%, silt 70%, sand 10%, gravel 5% up to 1/2" diameter, dry.
		15/28/50	SS	100	3-7	5-6.5	Silty sand with gravel, light yellowish brown (10YR 6/4), clay 5%, silt 35%, sand 45%, gravel 15% friable up to 3/4" diameter, crumbly, dry.
				100	7-10		Silt, yellowish brown (10YR 5/4), clay 15%, silt 70%, sand 15%, hard, slightly moist.
		9/36/43	SS	100	10-12.5	10-11.5	Silty sand, yellowish brown (10YR 5/4), increasing sand with depth, clay 5%, silt 40%, sand 50%, gravel 5% fine, crumbly, dry.
				100	12.5-15		Sand and silt with gravel, brown (10YR 5/3), matrix with weathered gravel easily broken/crumbled, dry, increasing grain size with depth, clay 5%, silt 20%, sand 25%, gravel 50%: multi-colored, rounded to angular up to 1/2" diameter.
				80	15-20	15-16.5	Sandy silt with gravel, yellowish brown (10YR 5/4), clay 10%, silt 50%, sand 30%, gravel 10% up to 1/8" diameter, slightly moist, moisture increases with depth.
		15/50/-	SS		15-20	20-21.5	Sandy silt with clay nodules, reddish brown matrix 50% (5YR 4/3) with brown clay nodules 50% (10YR 5/3), matrix: clay 15%, sand 15%, silt 55%, gravel 15%, rounded to 1/2" diameter, crumbly, slightly moist; nodules: clay 45%, silt 45%, sand 10%.
		28/30/-	SS	30	20-23		Clayey silt, light olive brown (2.5Y 5/3), clay 40%, silt 50%, sand 10%, hard, slightly moist.
				80	23-25	25-26.5	Silt with clay nodules, brown nodules 70%, olive brown (2.5Y 4/3) in red matrix 30% (7.5YR 4/3), nodules: clay 70%, silt 30%, moist; matrix: clay 50%, silt 30%, sand 10%, gravel 10%, rounded to 1/2" diameter, hard.
		15-28-37	SS	40	25-28		Silt, grayish brown (2.5Y 5/2), clay 40%, silt 50%, sand 10%, hard, moist.
				60	28-30	30-31.5	Silt with clay nodules, brown nodules 70%, olive brown (2.5Y 4/3) in red matrix 30%, reddish brown (5YR 4/3), nodules: clay 70%, silt 30%, moist; matrix: clay 55%, silt 35%, sand 10%.
		13/22/34	SS	80	30-31	30-31.5	Clay with sand and silt nodules, clay 60%, dark greenish gray (Gley 1 4/10 GY) with red nodules 40%, reddish brown (5YR 4/3), clay: clay 60%, silt 35%, sand <5%, sticky, very moist; nodules: clay 10%, silt 50%, sand 40%, coarse, dry.
			60	31-32.5	35-36.5	Clay and silt, dark greenish gray (Gley 1 4/10 GY), clay 40%, silt 50%, sand 10%, hard, slightly moist.	
	10/18/2020	SS	100	32.5-37.5	35-36.5	Sandy silt, olive brown (2.5Y 4/3), clay 25%, silt 55%, sand 20%, crumbly, slightly moist. Wet at 40', after lunch.	
			60	37.5-40	40-41.5	Sandy silt, reddish brown (5YR 4/3), clay 20%, silt 50%, sand 20%, gravel 10%, subangular/subrounded, crumbly, very moist.	
			100	40-45		Silty clay, dark greenish gray (Gley 1 4/5 GY), clay 60%, silt 25%, sand 15%, very moist.	
	16/31/50	SS		40-45		Clayey silt, dark greenish gray (Gley 1 4/5 GY), clay 40%, silt 50%, sand 10%, crumbly, moist.	
			80	45-47			
			80	47-50			

Geologist: J. Cherney/P. Kaiser
 Driller: National
 Date completed: 12/16/13

Drilling method: Sonic
 Diameter: 6"
 ft bgs = feet below ground surface
 ft msl = feet below mean sea level (NAVD88)
 HA = hand auger
 SS = split spoon

DTW = depth to water at which water bearing zone was encountered
 Latitude: 38.30080
 Longitude: 122.46450
 Elevation: 112.8 ft msl (determined from 2010 detailed site survey)

CITY WATERSHEDS OF SONOMA VALLEY PHASE 1
Boring: MON-MW-03S



Appendix C

Laboratory Report for SCWA City Watersheds

WR10.0085.13-Montini

March 10, 2014



Daniel B. Stephens & Associates, Inc.

4400 Alameda Blvd. NE, Suite C • Albuquerque, New Mexico 87113



March 10, 2014

Jenny Cherney
Daniel B. Stephens & Associates, Inc.
6020 Academy Rd. N.E.
Albuquerque, NM 87109
(505) 822-9400

Re: DBS&A Laboratory Report for Daniel B. Stephens & Associates, Inc. SCWA Watersheds Montini

Dear Ms. Cherney:

Enclosed is the report for the Daniel B. Stephens & Associates, Inc. SCWA Watersheds Montini samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to DBS&A and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory

4400 Alameda Blvd. NE, Suite C
Albuquerque, NM 87113

505-889-7752
FAX 505-889-0258

Summaries



Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties ¹			Saturated Hydraulic Conductivity ²			Moisture Characteristics ³							Particle Size ⁴			Specific Gravity ⁵		Air Perm- eability	Atterberg Limits	Proctor Compaction		
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K _{unsat}	DS	WS	H	F				C	
MON-1D-10-10.5-SS															X	X						X	
MON-1D-10.5-11-SS	X	X			X													X					
MON-1D-11-11.5-SS																							
MON-1D-20-20.5-SS															X	X						X	
MON-1D-20.5-21-SS	X	X			X													X					
MON-1D-21-21.5-SS																							
MON-1D-30-30.5-SS	X	X		X														X	X				
MON-1D-30.5-31-SS															X	X						X	
MON-1D-31-31.5-SS																							
MON-1D-40-41.5-SS																							
MON-1D-40.5-41-SS															X	X						X	
MON-1D-41-41.5-SS																							
MON-1D-45-45.5-SS															X	X						X	
MON-1D-45.5-46-SS	X	X		X														X					
MON-1D-46-46.5-SS																							

¹ G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

² CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

³ HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, K_{unsat} = Calculated Unsaturated Hydraulic Conductivity

⁴ DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

⁵ F = Fine (<4.75mm), C = Coarse (>4.75mm)



Summary of Tests Performed (Continued)

Laboratory Sample Number	Initial Soil Properties ¹			Saturated Hydraulic Conductivity ²			Moisture Characteristics ³							Particle Size ⁴			Specific Gravity ⁵		Air Perm- eability	Atterberg Limits	Proctor Compaction		
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K _{unsat}	DS	WS	H	F				C	
MON-1D-55-55.5-SS															X	X						X	
MON-1D-55.5-56-SS																							
MON-1D-56-56.5-SS																							
MON-1D-65-65.5-SS															X	X						X	
MON-1D-65.5-66-SS	X	X			X													X					
MON-1D-75-75.5-SS															X	X						X	
MON-1D-75.5-76-SS																							
MON-1D-76-76.5-SS																							
MON-1D-85-85.5-SS																							
MON-1D-85-87.5-Bag															X	X						X	
MON-1D-85.5-86-SS	X	X		X														X	X				
MON-1D-92.5-95-Bag															X	X						X	
MON-1D-95-96-Bag																							
MON-1D-102-103-Bag	X	X		X											X	X		X	X			X	
MON-1D-119.5-120.5-Bag															X	X		X	X			X	

¹ G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

² CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

³ HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, K_{unsat} = Calculated Unsaturated Hydraulic Conductivity

⁴ DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

⁵ F = Fine (<4.75mm), C = Coarse (>4.75mm)



Notes

Sample Receipt:

Eighty nine samples were received on January 8, 2014. Seventy three of the samples each arrived in a 2.5" x 6" stainless steel sleeve sealed with plastic end caps and tape, and the remaining sixteen samples arrived in 1-gallon Ziploc bags, double bagged.

Testing Notes:

Thirty samples were subjected to particle size analysis and Atterberg limits testing. Nineteen of these samples were then subjected to initial properties, saturated hydraulic conductivity, and specific gravity testing. Sample ID's include the designation of 'Bag' or 'SS' to indicate that the material was received either in a bag or in a stainless steel sleeve.

A pipe cutter was used to obtain an intact portion of material from the original sleeves of twelve of the samples, to be used for the initial properties and saturated hydraulic conductivity measurements. Sub-samples for initial properties and saturated hydraulic conductivity testing were obtained for six of the samples, that either had limited homogeneous material remaining in the original sleeve or no sleeve present, by gently advancing a small diameter testing sleeve into an intact portion of material (from the original sleeve or from an intact clod in the original bag). Since there was no intact material present for one of the samples (MON-1D-119.5-120.5-Bag), two sub-samples were prepared for initial properties and saturated hydraulic properties testing, by remolding the material into testing rings to bracket a moderate compaction and a firm compaction.

Particle diameter calculations in the hydrometer portion of the testing are based either on the use of the measured specific gravity results performed using material finer than 4.75mm, or on the use of an assumed specific gravity value of 2.65 if the specific gravity was not measured.



Summary of Sample Preparation/Volume Changes

Sample Number	Initial Sample Data ¹		Volume Change Post Saturation ²		
	Moisture Content (%, g/g)	Dry Bulk Density (g/cm ³)	Dry Bulk Density (g/cm ³)	% Volume Change (%)	% of Initial Density (%)
MON-1D-10.5-11-SS	36.9	1.31	1.31	---	100%
MON-1D-20.5-21-SS	32.9	1.41	1.41	---	100%
MON-1D-30-30.5-SS	32.0	1.19	1.19	---	100%
MON-1D-45.5-46-SS	61.6	0.92	0.92	---	100%
MON-1D-65.5-66-SS	44.3	1.21	1.21	---	100%
MON-1D-85.5-86-SS	35.9	1.29	1.29	---	100%
MON-1D-102-103-Bag	28.1	1.46	1.46	---	100%
MON-1D-119.5-120.5-Bag (Moderate)	59.3	0.87	0.87	---	100%
MON-1D-119.5-120.5-Bag (Firm)	60.2	0.97	0.97	---	100%
MON-2S-10.5-11-SS	29.6	1.43	1.43	---	100%
MON-2S-21-21.5-SS	32.3	1.32	1.32	---	100%
MON-2S-26-26.5-SS	38.1	1.29	1.29	---	100%
MON-2S-31-31.5-SS	45.7	1.10	1.10	---	100%
MON-2S-40-40.5-SS	59.5	0.99	0.99	---	100%
MON-3S-21-21.5-SS	31.4	1.37	1.37	---	100%
MON-3S-40.5-41-SS	31.3	1.39	1.39	---	100%
MON-B-01-10-11.0-Bag	27.8	1.43	1.43	---	100%
MON-B-01-16-17-Bag	31.0	1.33	1.33	---	100%
MON-B-01-27-28-Bag	36.3	1.20	1.20	---	100%
MON-B-01-35-36-Bag	28.0	1.47	1.47	---	100%

¹Initial Sample Data: The as received or remolded (MON-1D-119.5-120.5-Bag) dry bulk density and moisture content.

²Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.



**Summary of Initial Moisture Content, Dry Bulk Density
Wet Bulk Density and Calculated Porosity**

Sample Number	Moisture Content				Dry Bulk Density (g/cm ³)	Wet Bulk Density (g/cm ³)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)			
MON-1D-10.5-11-SS	36.9	48.2	---	---	1.31	1.79	52.0
MON-1D-20.5-21-SS	32.9	46.5	---	---	1.41	1.88	48.0
MON-1D-30-30.5-SS	32.0	37.9	---	---	1.19	1.57	54.8
MON-1D-45.5-46-SS	61.6	56.8	---	---	0.92	1.49	65.1
MON-1D-65.5-66-SS	44.3	53.7	---	---	1.21	1.75	55.5
MON-1D-85.5-86-SS	35.9	46.1	---	---	1.29	1.75	50.9
MON-1D-102-103-Bag	28.1	41.1	---	---	1.46	1.87	44.2
MON-1D-119.5-120.5-Bag (Moderate)	NA	NA	59.3	51.5	0.87	1.38	63.7
MON-1D-119.5-120.5-Bag (Firm)	NA	NA	60.2	58.6	0.97	1.56	59.4
MON-2S-10.5-11-SS	29.6	42.3	---	---	1.43	1.85	48.1
MON-2S-21-21.5-SS	32.3	42.5	---	---	1.32	1.74	51.9
MON-2S-26-26.5-SS	38.1	49.4	---	---	1.29	1.79	52.2

NA = Not analyzed

--- = This sample was not remolded



**Summary of Initial Moisture Content, Dry Bulk Density
Wet Bulk Density and Calculated Porosity (Continued)**

Sample Number	Moisture Content				Dry Bulk Density (g/cm ³)	Wet Bulk Density (g/cm ³)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)			
MON-2S-31-31.5-SS	45.7	50.5	---	---	1.10	1.61	54.8
MON-2S-40-40.5-SS	59.5	58.8	---	---	0.99	1.58	63.2
MON-3S-21-21.5-SS	31.4	43.1	---	---	1.37	1.81	47.9
MON-3S-40.5-41-SS	31.3	43.4	---	---	1.39	1.82	47.9
MON-B-01-10-11.0-Bag	27.8	39.7	---	---	1.43	1.83	47.3
MON-B-01-16-17-Bag	31.0	41.1	---	---	1.33	1.74	51.0
MON-B-01-27-28-Bag	36.3	43.3	---	---	1.20	1.63	55.2
MON-B-01-35-36-Bag	28.0	41.0	---	---	1.47	1.87	46.1

NA = Not analyzed

--- = This sample was not remolded



Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K _{sat} (cm/sec)	Oversize Corrected K _{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
MON-1D-10.5-11-SS	2.1E-06	NA		X
MON-1D-20.5-21-SS	6.8E-08	NA		X
MON-1D-30-30.5-SS	1.4E-04	NA	X	
MON-1D-45.5-46-SS	7.9E-05	NA	X	
MON-1D-65.5-66-SS	3.8E-08	NA		X
MON-1D-85.5-86-SS	4.7E-05	NA	X	
MON-1D-102-103-Bag	5.9E-05	NA	X	
MON-1D-119.5-120.5-Bag (Moderate)	5.4E-03	NA	X	
MON-1D-119.5-120.5-Bag (Firm)	6.6E-06	NA		X
MON-2S-10.5-11-SS	2.1E-05	NA		X
MON-2S-21-21.5-SS	6.6E-05	NA	X	
MON-2S-26-26.5-SS	1.2E-05	NA		X
MON-2S-31-31.5-SS	7.6E-05	NA	X	
MON-2S-40-40.5-SS	7.1E-06	NA		X
MON-3S-21-21.5-SS	9.0E-06	NA		X
MON-3S-40.5-41-SS	8.5E-05	NA		X
MON-B-01-10-11.0-Bag	9.9E-07	NA		X
MON-B-01-16-17-Bag	2.5E-03	NA	X	
MON-B-01-27-28-Bag	2.3E-04	NA	X	
MON-B-01-35-36-Bag	5.5E-05	NA		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NR = Not requested

NA = Not applicable



Summary of Particle Size Characteristics

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-1D-10-10.5-SS	0.0049	0.028	0.052	11	0.66	WS/H	Elastic silt with sand (MH)s	Silt Loam
MON-1D-20-20.5-SS	0.00020	0.0032	0.0053	27	0.80	WS/H	Fat clay (CH)	Silty Clay (Est)
MON-1D-30.5-31-SS	0.0014	0.031	0.055	39	0.77	WS/H	Sandy silt s(ML)	Silt Loam † (Est)
MON-1D-40.5-41-SS	0.0040	0.062	0.069	17	7.0	WS/H	Sandy silt s(ML)	Sandy Loam
MON-1D-45-45.5-SS	0.00039	0.0053	0.0088	23	1.5	WS/H	Elastic silt with sand (MH)s	Clay Loam (Est)
MON-1D-55-55.5-SS	0.00056	0.0063	0.012	21	0.93	WS/H	Elastic silt with sand (MH)s	Loam (Est)
MON-1D-65-65.5-SS	0.0015	0.015	0.053	35	0.19	WS/H	Elastic silt with sand (MH)s	Loam
MON-1D-75-75.5-SS	0.0030	0.19	0.33	110	1.2	WS/H	Silty sand (SM)	Sandy Loam
MON-1D-85-87.5-Bag	0.0047	0.29	0.49	104	1.6	WS/H	Silty sand (SM)	Sandy Loam †
MON-1D-92.5-95-Bag	0.00086	0.087	0.26	302	0.37	WS/H	Silty sand (SM)	Loam † (Est)
MON-1D-102-103-Bag	0.0018	0.21	0.66	367	0.27	WS/H	Clayey sand with gravel (SC)g	Loam †

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material



Summary of Particle Size Characteristics (Continued)

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-1D-119.5-120.5-Bag	0.0074	0.35	0.66	89	0.64	WS/H	Silty sand (SM)	Sandy Loam †
MON-2S-5.5-6-SS	0.0011	0.0071	0.014	13	0.62	WS/H	Elastic silt with sand (MH)s	Loam (Est)
MON-2S-10.5-11-SS	0.0024	0.011	0.014	5.8	1.1	WS/H	Silt (ML)	Silt Loam
MON-2S-21-21.5-SS	0.0019	0.028	0.052	27	0.70	WS/H	Elastic silt with sand (MH)s	Loam
MON-2S-25.5-26-SS	0.011	0.072	0.094	8.5	1.5	WS/H	Sandy silt s(ML)	Sandy Loam
MON-2S-31-31.5-SS	0.0033	0.067	0.12	36	1.6	WS/H	Sandy elastic silt s(MH)	Sandy Loam
MON-2S-40-40.5-SS	0.0024	0.026	0.045	19	0.91	WS/H	Elastic silt with sand (MH)s	Silt Loam
MON-3S-10.5-11-SS	0.0013	0.018	0.030	23	0.92	WS/H	Elastic silt (MH)	Silt Loam (Est)
MON-3S-20.5-21-SS	0.0018	0.010	0.013	7.2	1.5	WS/H	Elastic silt (MH)	Silt Loam
MON-3S-30.5-31-SS	0.0029	0.012	0.017	5.9	1.0	WS/H	Silt (ML)	Silt Loam
MON-3S-40.5-41-SS	0.0067	0.055	0.071	11	1.1	WS/H	Sandy silt s(ML)	Sandy Loam

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material



Summary of Particle Size Characteristics (Continued)

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-B-01-5.0-6-Bag	0.00072	0.0088	0.013	18	1.4	WS/H	Lean clay (CL)	Silt Loam (Est)
MON-B-01-10-11.0-Bag	0.00039	0.0097	0.013	33	2.3	WS/H	Elastic silt (MH)	Silt Loam (Est)
MON-B-01-16-17-Bag	0.0043	0.037	0.057	13	1.0	WS/H	Sandy silt s(ML)	Silt Loam
MON-B-01-20-21-Bag	0.0033	0.072	0.13	39	1.1	WS/H	Sandy silt s(ML)	Sandy Loam
MON-B-01-27-28-Bag	0.0039	0.20	0.37	95	1.0	WS/H	Silty sand (SM)	Sandy Loam
MON-B-01-29-30-Bag	0.0013	0.013	0.021	16	0.92	WS/H	Elastic silt with sand (MH)s	Silt Loam (Est)
MON-B-01-35-36-Bag	0.0026	0.021	0.032	12	1.2	WS/H	Silt with sand (ML)s	Silt Loam
MON-B-01-43-44-Bag	0.0021	0.016	0.034	16	0.61	WS/H	Silt with sand (ML)s	Silt Loam

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material



Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MON-1D-10-10.5-SS	0.0	28.4	68.2	3.4
MON-1D-20-20.5-SS	0.0	1.0	58.6	40.4
MON-1D-30.5-31-SS	8.8	23.5	55.3	12.4
MON-1D-40.5-41-SS	0.0	31.6	64.7	3.7
MON-1D-45-45.5-SS	0.2	15.6	55.6	28.6
MON-1D-55-55.5-SS	0.7	17.9	55.1	26.3
MON-1D-65-65.5-SS	0.0	25.4	60.4	14.2
MON-1D-75-75.5-SS	0.6	61.8	30.1	7.5
MON-1D-85-87.5-Bag	5.6	62.0	27.5	5.0
MON-1D-92.5-95-Bag	9.1	42.0	33.2	15.7
MON-1D-102-103-Bag	15.9	42.1	31.2	10.9
MON-1D-119.5-120.5-Bag	8.6	58.3	30.4	2.7
MON-2S-5.5-6-SS	0.0	25.1	54.5	20.4
MON-2S-10.5-11-SS	0.0	2.4	89.1	8.5
MON-2S-21-21.5-SS	0.0	24.3	65.3	10.4
MON-2S-25.5-26-SS	0.0	48.2	51.8	0.0

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.



Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MON-2S-31-31.5-SS	0.0	45.7	47.2	7.0
MON-2S-40-40.5-SS	0.5	25.3	65.2	9.0
MON-3S-10.5-11-SS	0.0	7.9	78.4	13.7
MON-3S-20.5-21-SS	0.0	0.5	88.5	11.0
MON-3S-30.5-31-SS	0.0	4.2	89.5	6.3
MON-3S-40.5-41-SS	0.2	37.8	61.6	0.4
MON-B-01-5.0-6-Bag	0.0	1.0	80.0	19.0
MON-B-01-10-11.0-Bag	0.0	6.8	71.4	21.8
MON-B-01-16-17-Bag	0.0	34.1	61.0	4.9
MON-B-01-20-21-Bag	0.0	49.1	44.6	6.3
MON-B-01-27-28-Bag	0.5	61.7	32.5	5.3
MON-B-01-29-30-Bag	0.0	22.6	62.2	15.2
MON-B-01-35-36-Bag	0.0	28.1	63.5	8.4
MON-B-01-43-44-Bag	0.0	17.1	73.3	9.6

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.



Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MON-1D-10-10.5-SS	51	35	16	MH
MON-1D-20-20.5-SS	84	30	54	CH
MON-1D-30.5-31-SS	36	26	10	ML
MON-1D-40.5-41-SS	---	---	---	ML
MON-1D-45-45.5-SS	71	34	37	MH
MON-1D-55-55.5-SS	61	36	25	MH
MON-1D-65-65.5-SS	70	43	27	MH
MON-1D-75-75.5-SS	54	38	16	MH
MON-1D-85-87.5-Bag	---	---	---	ML
MON-1D-92.5-95-Bag	32	24	8	ML
MON-1D-102-103-Bag	31	22	9	CL
MON-1D-119.5-120.5-Bag	---	---	---	ML
MON-2S-5.5-6-SS	58	37	21	MH
MON-2S-10.5-11-SS	49	31	18	ML
MON-2S-21-21.5-SS	55	34	21	MH
MON-2S-25.5-26-SS	---	---	---	ML
MON-2S-31-31.5-SS	62	39	23	MH
MON-2S-40-40.5-SS	65	46	19	MH
MON-3S-10.5-11-SS	72	40	32	MH
MON-3S-20.5-21-SS	53	34	19	MH

--- = Soil requires visual-manual classification due to non-plasticity



Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MON-3S-30.5-31-SS	48	32	16	ML
MON-3S-40.5-41-SS	---	---	---	ML
MON-B-01-5.0-6-Bag	49	27	22	CL
MON-B-01-10-11.0-Bag	52	29	23	MH
MON-B-01-16-17-Bag	---	---	---	ML
MON-B-01-20-21-Bag	---	---	---	ML
MON-B-01-27-28-Bag	45	37	8	ML
MON-B-01-29-30-Bag	55	36	19	MH
MON-B-01-35-36-Bag	48	34	14	ML
MON-B-01-43-44-Bag	45	28	17	ML

--- = Soil requires visual-manual classification due to non-plasticity



Summary of Specific Gravity Tests

Sample Number	<4.75mm			>4.75mm			Bulk Sample
	Specific Gravity	Particle Size	% of Bulk Sample	Specific Gravity	Particle Size	% of Bulk Sample	Specific Gravity*
MON-1D-10.5-11-SS	2.73	<4.75mm	100.0	---	>4.75mm	0.0	2.73
MON-1D-20.5-21-SS	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-1D-30-30.5-SS	2.62	<4.75mm	91.2	2.68	>4.75mm	8.8	2.63
MON-1D-45.5-46-SS	2.65	<4.75mm	99.8	---	>4.75mm	0.2	2.65
MON-1D-65.5-66-SS	2.74	<4.75mm	100.0	---	>4.75mm	0.0	2.74
MON-1D-85.5-86-SS	2.62	<4.75mm	94.4	2.60	>4.75mm	5.6	2.62
MON-1D-102-103-Bag	2.63	<4.75mm	84.1	2.57	>4.75mm	15.9	2.62
MON-1D-119.5-120.5-Bag	2.42	<4.75mm	91.4	2.13	>4.75mm	8.6	2.40
MON-2S-10.5-11-SS	2.76	<4.75mm	100.0	---	>4.75mm	0.0	2.76
MON-2S-21-21.5-SS	2.74	<4.75mm	100.0	---	>4.75mm	0.0	2.74
MON-2S-26-26.5-SS	2.71	<4.75mm	100.0	---	>4.75mm	0.0	2.71
MON-2S-31-31.5-SS	2.45	<4.75mm	100.0	---	>4.75mm	0.0	2.45
MON-2S-40-40.5-SS	2.69	<4.75mm	99.5	---	>4.75mm	0.5	2.69
MON-3S-21-21.5-SS	2.64	<4.75mm	100.0	---	>4.75mm	0.0	2.64
MON-3S-40.5-41-SS	2.67	<4.75mm	99.8	---	>4.75mm	0.2	2.67
MON-B-01-10-11.0-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-B-01-16-17-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-B-01-27-28-Bag	2.67	<4.75mm	99.5	---	>4.75mm	0.5	2.67
MON-B-01-35-36-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72

*Weighted average, if more than one fraction tested

--- = Unnecessary since specified fraction < 5% of composite mass

Initial Properties



**Summary of Initial Moisture Content, Dry Bulk Density
Wet Bulk Density and Calculated Porosity**

Sample Number	Moisture Content				Dry Bulk Density (g/cm ³)	Wet Bulk Density (g/cm ³)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)			
MON-1D-10.5-11-SS	36.9	48.2	---	---	1.31	1.79	52.0
MON-1D-20.5-21-SS	32.9	46.5	---	---	1.41	1.88	48.0
MON-1D-30-30.5-SS	32.0	37.9	---	---	1.19	1.57	54.8
MON-1D-45.5-46-SS	61.6	56.8	---	---	0.92	1.49	65.1
MON-1D-65.5-66-SS	44.3	53.7	---	---	1.21	1.75	55.5
MON-1D-85.5-86-SS	35.9	46.1	---	---	1.29	1.75	50.9
MON-1D-102-103-Bag	28.1	41.1	---	---	1.46	1.87	44.2
MON-1D-119.5-120.5-Bag (Moderate)	NA	NA	59.3	51.5	0.87	1.38	63.7
MON-1D-119.5-120.5-Bag (Firm)	NA	NA	60.2	58.6	0.97	1.56	59.4
MON-2S-10.5-11-SS	29.6	42.3	---	---	1.43	1.85	48.1
MON-2S-21-21.5-SS	32.3	42.5	---	---	1.32	1.74	51.9
MON-2S-26-26.5-SS	38.1	49.4	---	---	1.29	1.79	52.2

NA = Not analyzed

--- = This sample was not remolded



**Summary of Initial Moisture Content, Dry Bulk Density
Wet Bulk Density and Calculated Porosity (Continued)**

Sample Number	Moisture Content				Dry Bulk Density (g/cm ³)	Wet Bulk Density (g/cm ³)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)	Gravimetric (%, g/g)	Volumetric (%, cm ³ /cm ³)			
MON-2S-31-31.5-SS	45.7	50.5	---	---	1.10	1.61	54.8
MON-2S-40-40.5-SS	59.5	58.8	---	---	0.99	1.58	63.2
MON-3S-21-21.5-SS	31.4	43.1	---	---	1.37	1.81	47.9
MON-3S-40.5-41-SS	31.3	43.4	---	---	1.39	1.82	47.9
MON-B-01-10-11.0-Bag	27.8	39.7	---	---	1.43	1.83	47.3
MON-B-01-16-17-Bag	31.0	41.1	---	---	1.33	1.74	51.0
MON-B-01-27-28-Bag	36.3	43.3	---	---	1.20	1.63	55.2
MON-B-01-35-36-Bag	28.0	41.0	---	---	1.47	1.87	46.1

NA = Not analyzed

--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-10.5-11-SS
Date Sampled: 12/10/2013
Depth (ft): 10.5-11

Table with 3 columns: Test Date, As Received, Remolded. Rows include Field weight* of sample (g), Tare weight, ring (g), Tare weight, pan/plate (g), Tare weight, other (g), Dry weight of sample (g), Sample volume (cm³), and Measured particle density (g/cm³).

Table with 2 columns: Property, Value. Rows include Gravimetric Moisture Content (% g/g), Volumetric Moisture Content (% vol), Dry bulk density (g/cm³), Wet bulk density (g/cm³), Calculated Porosity (% vol), and Percent Saturation.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
NA = Not analyzed
--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-20.5-21-SS
Date Sampled: 12/10/2013
Depth (ft): 20.5-21

	<u>As Received</u>	<u>Remolded</u>
Test Date:	26-Feb-14	---
Field weight* of sample (g):	281.45	
Tare weight, ring (g):	69.13	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	159.73	
Sample volume (cm ³):	113.17	
Measured particle density (g/cm ³):	2.71	

Gravimetric Moisture Content (% g/g):	32.9
Volumetric Moisture Content (% vol):	46.5
Dry bulk density (g/cm ³):	1.41
Wet bulk density (g/cm ³):	1.88
Calculated Porosity (% vol):	48.0
Percent Saturation:	96.9

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-30-30.5-SS
Date Sampled: 12/10/2013
Depth (ft): 30-30.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	146.02	
Tare weight, ring (g):	41.69	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	79.06	
Sample volume (cm ³):	66.64	
Measured particle density (g/cm ³):	2.63	
<hr/>		
Gravimetric Moisture Content (% g/g):	32.0	
Volumetric Moisture Content (% vol):	37.9	
Dry bulk density (g/cm ³):	1.19	
Wet bulk density (g/cm ³):	1.57	
Calculated Porosity (% vol):	54.8	
Percent Saturation:	69.2	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-45.5-46-SS
Date Sampled: 12/10/2013
Depth (ft): 45.5-46

Table with 3 columns: Test Date, As Received, Remolded. Rows include Field weight* of sample (g), Tare weight, ring (g), Tare weight, pan/plate (g), Tare weight, other (g), Dry weight of sample (g), Sample volume (cm^3), and Measured particle density (g/cm^3).

Table with 2 columns: Property, Value. Rows include Gravimetric Moisture Content (% g/g), Volumetric Moisture Content (% vol), Dry bulk density (g/cm^3), Wet bulk density (g/cm^3), Calculated Porosity (% vol), and Percent Saturation.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
NA = Not analyzed
--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-65.5-66-SS
Date Sampled: 12/10/2013
Depth (ft): 65.5-66

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	197.80	
Tare weight, ring (g):	51.77	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	101.23	
Sample volume (cm ³):	83.38	
Measured particle density (g/cm ³):	2.73	
<hr/>		
Gravimetric Moisture Content (% g/g):	44.3	
Volumetric Moisture Content (% vol):	53.7	
Dry bulk density (g/cm ³):	1.21	
Wet bulk density (g/cm ³):	1.75	
Calculated Porosity (% vol):	55.5	
Percent Saturation:	96.7	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-85.5-86-SS
Date Sampled: 12/11/2013
Depth (ft): 85.5-86

Table with 3 columns: Test Date, As Received, Remolded. Rows include Field weight* of sample (g), Tare weight, ring (g), Tare weight, pan/plate (g), Tare weight, other (g), Dry weight of sample (g), Sample volume (cm³), and Measured particle density (g/cm³).

Table with 2 columns: Property, Value. Rows include Gravimetric Moisture Content (% g/g), Volumetric Moisture Content (% vol), Dry bulk density (g/cm³), Wet bulk density (g/cm³), Calculated Porosity (% vol), and Percent Saturation.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
NA = Not analyzed
--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-102-103-Bag
Date Sampled: 12/11/2013
Depth (ft): 102-103

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	223.25	
Tare weight, ring (g):	44.37	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	139.62	
Sample volume (cm ³):	95.55	
Measured particle density (g/cm ³):	2.62	
<hr/>		
Gravimetric Moisture Content (% g/g):	28.1	
Volumetric Moisture Content (% vol):	41.1	
Dry bulk density (g/cm ³):	1.46	
Wet bulk density (g/cm ³):	1.87	
Calculated Porosity (% vol):	44.2	
Percent Saturation:	92.9	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



**Data for Initial Moisture Content,
Bulk Density, Porosity, and Percent Saturation**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag (Moderate)
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	NA	28-Feb-14
Field weight* of sample (g):		357.50
Tare weight, ring (g):		106.96
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		157.28
Sample volume (cm ³):		180.94
Measured particle density (g/cm ³):		2.40
<hr/>		
Gravimetric Moisture Content (% g/g):		59.3
Volumetric Moisture Content (% vol):		51.5
Dry bulk density (g/cm ³):		0.87
Wet bulk density (g/cm ³):		1.38
Calculated Porosity (% vol):		63.7
Percent Saturation:		80.9
<hr/>		
Laboratory analysis by:		D. O'Dowd
Data entered by:		D. O'Dowd
Checked by:		J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



**Data for Initial Moisture Content,
Bulk Density, Porosity, and Percent Saturation**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag (Firm)
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	NA	28-Feb-14
Field weight* of sample (g):		374.63
Tare weight, ring (g):		112.05
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		163.90
Sample volume (cm ³):		168.38
Measured particle density (g/cm ³):		2.40
<hr/>		
Gravimetric Moisture Content (% g/g):		60.2
Volumetric Moisture Content (% vol):		58.6
Dry bulk density (g/cm ³):		0.97
Wet bulk density (g/cm ³):		1.56
Calculated Porosity (% vol):		59.4
Percent Saturation:		98.7
<hr/>		
Laboratory analysis by:		D. O'Dowd
Data entered by:		D. O'Dowd
Checked by:		J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-10.5-11-SS
Date Sampled: 12/12/2013
Depth (ft): 10.5-11

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	224.47	
Tare weight, ring (g):	56.00	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	129.99	
Sample volume (cm ³):	91.07	
Measured particle density (g/cm ³):	2.75	

Gravimetric Moisture Content (% g/g):	29.6
Volumetric Moisture Content (% vol):	42.3
Dry bulk density (g/cm ³):	1.43
Wet bulk density (g/cm ³):	1.85
Calculated Porosity (% vol):	48.1
Percent Saturation:	87.8

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-21-21.5-SS
Date Sampled: 12/12/2013
Depth (ft): 21-21.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	194.65	
Tare weight, ring (g):	50.46	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	108.97	
Sample volume (cm ³):	82.82	
Measured particle density (g/cm ³):	2.74	

Gravimetric Moisture Content (% g/g):	32.3
Volumetric Moisture Content (% vol):	42.5
Dry bulk density (g/cm ³):	1.32
Wet bulk density (g/cm ³):	1.74
Calculated Porosity (% vol):	51.9
Percent Saturation:	81.9

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-26-26.5-SS
Date Sampled: 12/12/2013
Depth (ft): 26-26.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	190.21	
Tare weight, ring (g):	48.86	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	102.32	
Sample volume (cm ³):	79.05	
Measured particle density (g/cm ³):	2.71	
<hr/>		
Gravimetric Moisture Content (% g/g):	38.1	
Volumetric Moisture Content (% vol):	49.4	
Dry bulk density (g/cm ³):	1.29	
Wet bulk density (g/cm ³):	1.79	
Calculated Porosity (% vol):	52.2	
Percent Saturation:	94.7	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-31-31.5-SS
Date Sampled: 12/12/2013
Depth (ft): 31-31.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	223.79	
Tare weight, ring (g):	62.50	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	110.68	
Sample volume (cm ³):	100.18	
Measured particle density (g/cm ³):	2.44	
<hr/>		
Gravimetric Moisture Content (% g/g):	45.7	
Volumetric Moisture Content (% vol):	50.5	
Dry bulk density (g/cm ³):	1.10	
Wet bulk density (g/cm ³):	1.61	
Calculated Porosity (% vol):	54.8	
Percent Saturation:	92.3	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



**Data for Initial Moisture Content,
Bulk Density, Porosity, and Percent Saturation**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-40-40.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 40-40.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	168.84	
Tare weight, ring (g):	47.46	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	76.11	
Sample volume (cm ³):	77.03	
Measured particle density (g/cm ³):	2.68	
<hr/>		
Gravimetric Moisture Content (% g/g):	59.5	
Volumetric Moisture Content (% vol):	58.8	
Dry bulk density (g/cm ³):	0.99	
Wet bulk density (g/cm ³):	1.58	
Calculated Porosity (% vol):	63.2	
Percent Saturation:	93.1	

Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-21-21.5-SS
Date Sampled: 12/17/2013
Depth (ft): 21-21.5

	<u>As Received</u>	<u>Remolded</u>
Test Date:	28-Feb-14	---
Field weight* of sample (g):	173.93	
Tare weight, ring (g):	43.98	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	98.92	
Sample volume (cm ³):	71.99	
Measured particle density (g/cm ³):	2.64	
<hr/>		
Gravimetric Moisture Content (% g/g):	31.4	
Volumetric Moisture Content (% vol):	43.1	
Dry bulk density (g/cm ³):	1.37	
Wet bulk density (g/cm ³):	1.81	
Calculated Porosity (% vol):	47.9	
Percent Saturation:	90.0	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-40.5-41-SS
Date Sampled: 12/18/2013
Depth (ft): 40.5-41

Table with 3 columns: Test Date, As Received, Remolded. Rows include Field weight* of sample (g), Tare weight, ring (g), Tare weight, pan/plate (g), Tare weight, other (g), Dry weight of sample (g), Sample volume (cm^3), and Measured particle density (g/cm^3).

Summary table with 2 columns: Parameter, Value. Rows include Gravimetric Moisture Content (% g/g), Volumetric Moisture Content (% vol), Dry bulk density (g/cm^3), Wet bulk density (g/cm^3), Calculated Porosity (% vol), and Percent Saturation.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
NA = Not analyzed
--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-10-11.0-Bag
Date Sampled: 12/18/2013
Depth (ft): 10-11.0

	<u>As Received</u>	<u>Remolded</u>
Test Date:	3-Mar-14	---
Field weight* of sample (g):	256.50	
Tare weight, ring (g):	51.94	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	160.10	
Sample volume (cm ³):	111.96	
Measured particle density (g/cm ³):	2.71	

Gravimetric Moisture Content (% g/g):	27.8
Volumetric Moisture Content (% vol):	39.7
Dry bulk density (g/cm ³):	1.43
Wet bulk density (g/cm ³):	1.83
Calculated Porosity (% vol):	47.3
Percent Saturation:	84.0

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-16-17-Bag
Date Sampled: 12/18/2013
Depth (ft): 16-17

Table with 3 columns: Test Date, As Received, Remolded. Rows include Field weight* of sample (g), Tare weight, ring (g), Tare weight, pan/plate (g), Tare weight, other (g), Dry weight of sample (g), Sample volume (cm^3), and Measured particle density (g/cm^3).

Table with 2 columns: Parameter, Value. Rows include Gravimetric Moisture Content (% g/g), Volumetric Moisture Content (% vol), Dry bulk density (g/cm^3), Wet bulk density (g/cm^3), Calculated Porosity (% vol), and Percent Saturation.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
NA = Not analyzed
--- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-27-28-Bag
Date Sampled: 12/18/2013
Depth (ft): 27-28

	<u>As Received</u>	<u>Remolded</u>
Test Date:	3-Mar-14	---
Field weight* of sample (g):	243.82	
Tare weight, ring (g):	63.67	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	132.22	
Sample volume (cm ³):	110.62	
Measured particle density (g/cm ³):	2.67	
<hr/>		
Gravimetric Moisture Content (% g/g):	36.3	
Volumetric Moisture Content (% vol):	43.3	
Dry bulk density (g/cm ³):	1.20	
Wet bulk density (g/cm ³):	1.63	
Calculated Porosity (% vol):	55.2	
Percent Saturation:	78.5	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded



Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-35-36-Bag
Date Sampled: 12/18/2013
Depth (ft): 35-36

	<u>As Received</u>	<u>Remolded</u>
Test Date:	3-Mar-14	---
Field weight* of sample (g):	279.48	
Tare weight, ring (g):	54.74	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	175.63	
Sample volume (cm ³):	119.87	
Measured particle density (g/cm ³):	2.72	

Gravimetric Moisture Content (% g/g):	28.0
Volumetric Moisture Content (% vol):	41.0
Dry bulk density (g/cm ³):	1.47
Wet bulk density (g/cm ³):	1.87
Calculated Porosity (% vol):	46.1
Percent Saturation:	88.9

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

- * Weight including tares
- NA = Not analyzed
- = This sample was not remolded

Saturated Hydraulic Conductivity



Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K _{sat} (cm/sec)	Oversize Corrected K _{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
MON-1D-10.5-11-SS	2.1E-06	NA		X
MON-1D-20.5-21-SS	6.8E-08	NA		X
MON-1D-30-30.5-SS	1.4E-04	NA	X	
MON-1D-45.5-46-SS	7.9E-05	NA	X	
MON-1D-65.5-66-SS	3.8E-08	NA		X
MON-1D-85.5-86-SS	4.7E-05	NA	X	
MON-1D-102-103-Bag	5.9E-05	NA	X	
MON-1D-119.5-120.5-Bag (Moderate)	5.4E-03	NA	X	
MON-1D-119.5-120.5-Bag (Firm)	6.6E-06	NA		X
MON-2S-10.5-11-SS	2.1E-05	NA		X
MON-2S-21-21.5-SS	6.6E-05	NA	X	
MON-2S-26-26.5-SS	1.2E-05	NA		X
MON-2S-31-31.5-SS	7.6E-05	NA	X	
MON-2S-40-40.5-SS	7.1E-06	NA		X
MON-3S-21-21.5-SS	9.0E-06	NA		X
MON-3S-40.5-41-SS	8.5E-05	NA		X
MON-B-01-10-11.0-Bag	9.9E-07	NA		X
MON-B-01-16-17-Bag	2.5E-03	NA	X	
MON-B-01-27-28-Bag	2.3E-04	NA	X	
MON-B-01-35-36-Bag	5.5E-05	NA		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NR = Not requested

NA = Not applicable



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-10.5-11-SS
 Date Sampled: 12/10/2013
 Depth (ft): 10.5-11

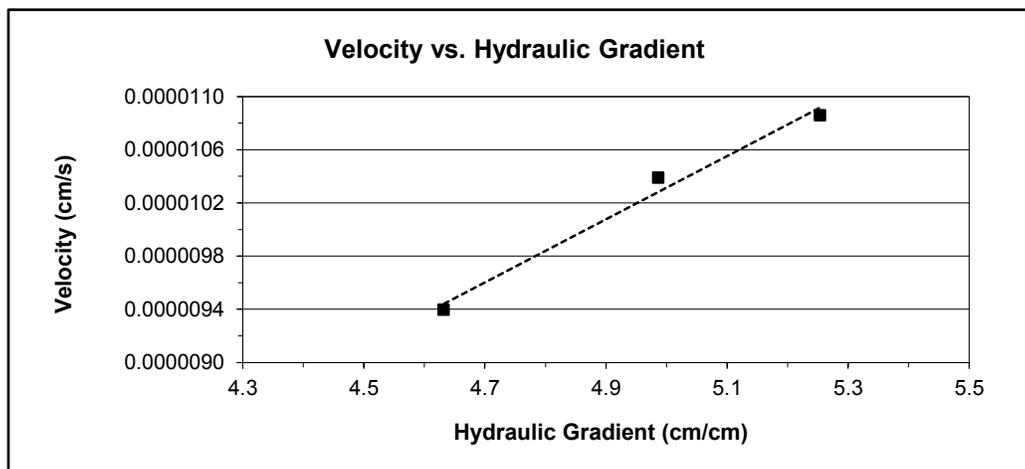
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 0.6
 Sample length (cm): 3.74
 Sample x-sectional area (cm²): 29.04
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:54:30	19.5	20.5	19.9	1110	2.1E-06	2.1E-06
5-Mar-14	10:13:00	19.5	20	19.4			
Test # 2:							
5-Mar-14	10:13:00	19.5	20	19.4	3480	2.1E-06	2.1E-06
5-Mar-14	11:11:00	19.5	18.5	17.9			
Test # 3:							
5-Mar-14	11:11:00	19.5	18.5	17.9	2950	2.0E-06	2.1E-06
5-Mar-14	12:00:10	19.5	17.35	16.8			

Average Ksat (cm/sec): 2.1E-06
 Oversize Corrected Ksat (cm/sec): NA

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-20.5-21-SS
 Date Sampled: 12/10/2013
 Depth (ft): 20.5-21

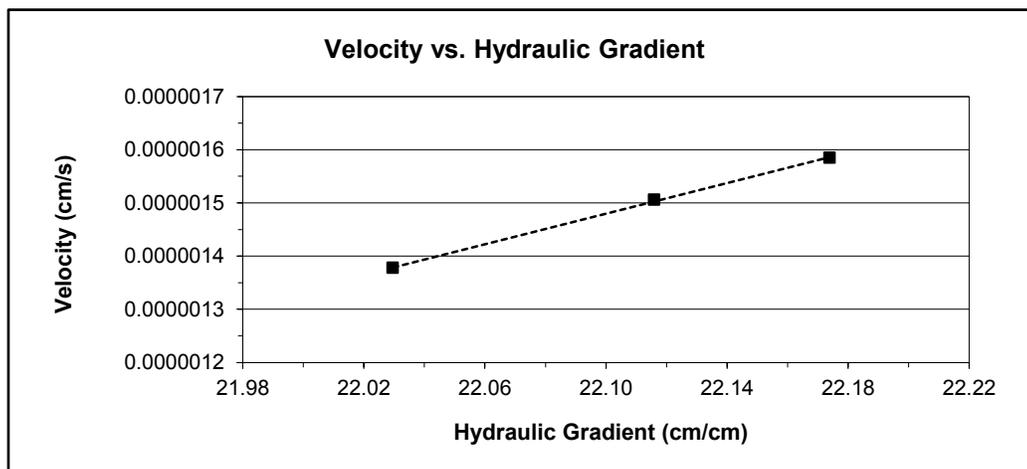
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 0.8
 Sample length (cm): 3.88
 Sample x-sectional area (cm²): 29.17
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	10:13:50	19.5	86.95	86.2	3484	7.1E-08	7.2E-08
5-Mar-14	11:11:54	19.5	86.72	85.9			
Test # 2:							
5-Mar-14	11:11:54	19.5	86.72	85.9	3506	6.8E-08	6.9E-08
5-Mar-14	12:10:20	19.5	86.5	85.7			
Test # 3:							
5-Mar-14	12:10:20	19.5	86.5	85.7	7840	6.3E-08	6.3E-08
5-Mar-14	14:21:00	19.5	86.05	85.3			

Average Ksat (cm/sec): 6.8E-08
Upsize Corrected Ksat (cm/sec): NA

Comments:

- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-30-30.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 30-30.5

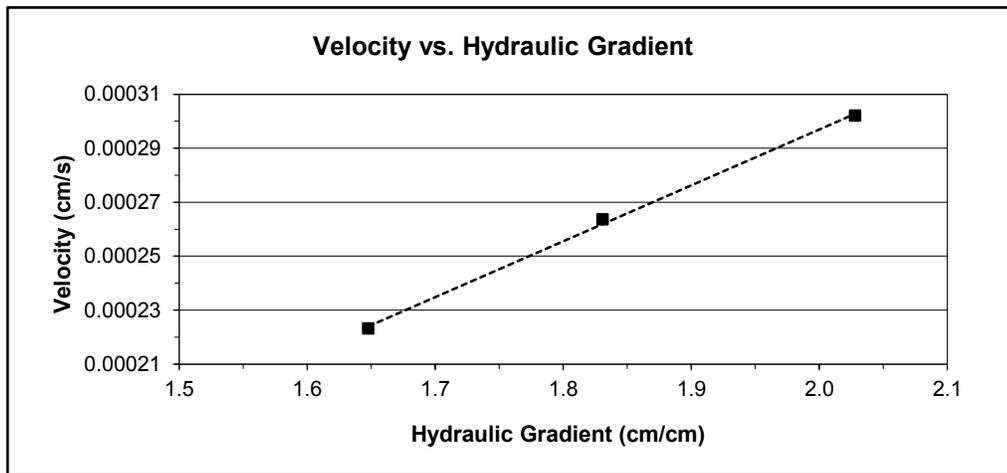
Type of water used: TAP
 Collection vessel tare (g): 10.94
 Sample length (cm): 3.55
 Sample diameter (cm): 4.89
 Sample x-sectional area (cm²): 18.77

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:44:04	19.5	7.2	12.55	1.6	284	1.5E-04	1.5E-04
5-Mar-14	12:48:48							
Test # 2:								
5-Mar-14	14:15:05	19.5	6.5	12.81	1.9	378	1.4E-04	1.5E-04
5-Mar-14	14:21:23							
Test # 3:								
5-Mar-14	14:40:10	19.5	5.85	12.23	1.3	308	1.4E-04	1.4E-04
5-Mar-14	14:45:18							

Average Ksat (cm/sec): 1.4E-04
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-45.5-46-SS
 Date Sampled: 12/10/2013
 Depth (ft): 45.5-46

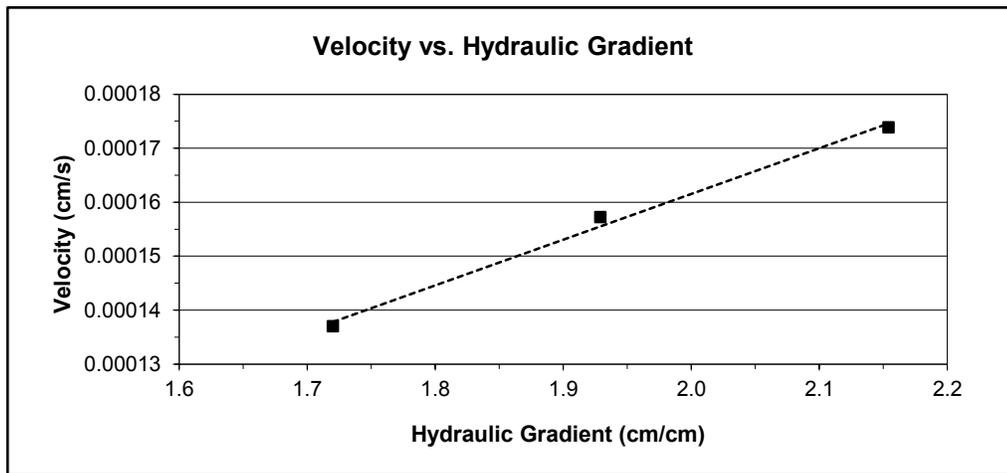
Type of water used: TAP
 Collection vessel tare (g): 10.98
 Sample length (cm): 3.11
 Sample diameter (cm): 6.09
 Sample x-sectional area (cm²): 29.11

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:43:36	19.5	6.7	12.70	1.7	350	7.8E-05	8.0E-05
5-Mar-14	12:49:26							
Test # 2:								
5-Mar-14	14:15:21	19.5	6	12.42	1.4	325	7.9E-05	8.0E-05
5-Mar-14	14:20:46							
Test # 3:								
5-Mar-14	14:40:25	19.5	5.35	12.24	1.3	328	7.7E-05	7.8E-05
5-Mar-14	14:45:53							

Average Ksat (cm/sec): 7.9E-05
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-65.5-66-SS
 Date Sampled: 12/10/2013
 Depth (ft): 65.5-66

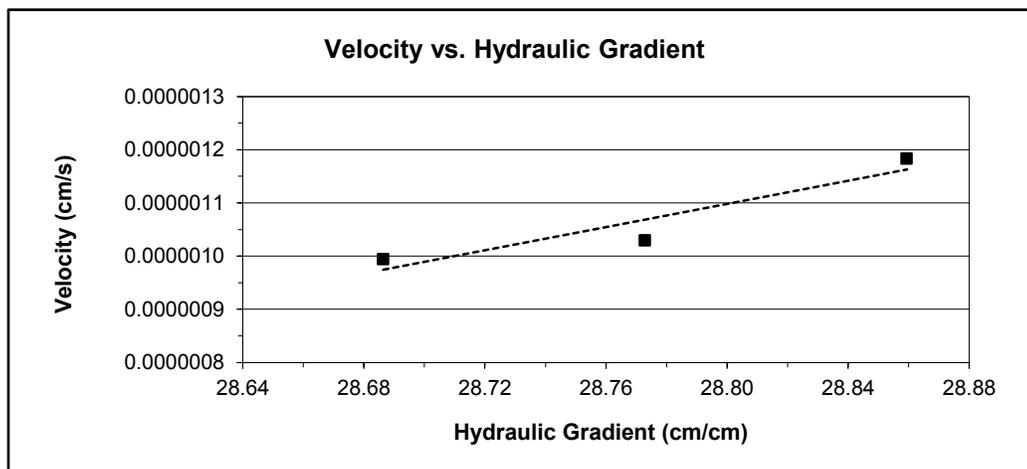
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 4.0
 Sample length (cm): 2.89
 Sample x-sectional area (cm²): 28.86
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	11:11:24	19.5	87.45	83.5	3076	4.1E-08	4.2E-08
5-Mar-14	12:02:40	19.5	87.3	83.3			
Test # 2:							
5-Mar-14	12:02:40	19.5	87.3	83.3	8250	3.6E-08	3.6E-08
5-Mar-14	14:20:10	19.5	86.95	83.0			
Test # 3:							
5-Mar-14	14:20:10	19.5	86.95	83.0	3660	3.5E-08	3.5E-08
5-Mar-14	15:21:10	19.5	86.8	82.8			

Average Ksat (cm/sec): 3.8E-08
Upsize Corrected Ksat (cm/sec): NA

Comments:

- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-85.5-86-SS
 Date Sampled: 12/11/2013
 Depth (ft): 85.5-86

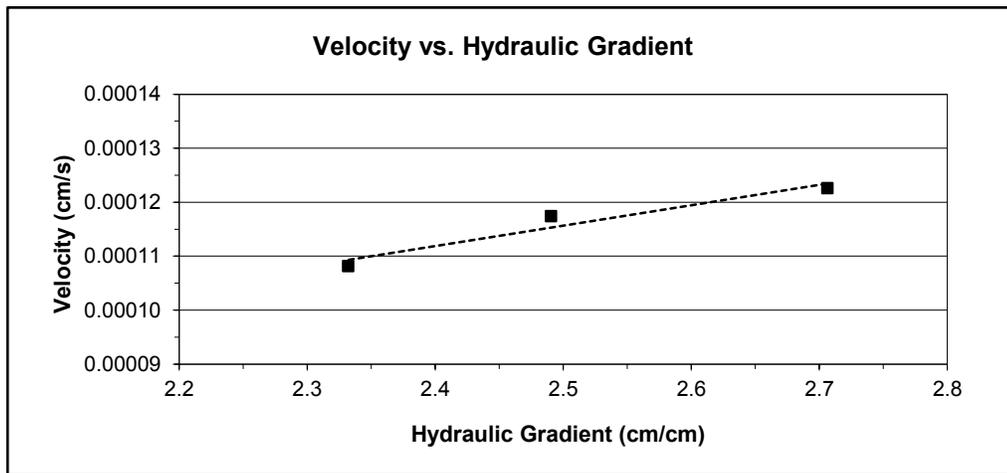
Type of water used: TAP
 Collection vessel tare (g): 11.03
 Sample length (cm): 3.47
 Sample diameter (cm): 6.11
 Sample x-sectional area (cm²): 29.27

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
6-Mar-14	13:38:41	19.5	9.4	13.99	3.0	825	4.5E-05	4.6E-05
6-Mar-14	13:52:26							
Test # 2:								
6-Mar-14	14:05:36	19.5	8.65	11.92	0.9	259	4.7E-05	4.8E-05
6-Mar-14	14:09:55							
Test # 3:								
6-Mar-14	14:22:31	19.5	8.1	12.16	1.1	357	4.6E-05	4.7E-05
6-Mar-14	14:28:28							

Average Ksat (cm/sec): 4.7E-05
Upsize Corrected Ksat (cm/sec): NA

Comments:

- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-102-103-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 102-103

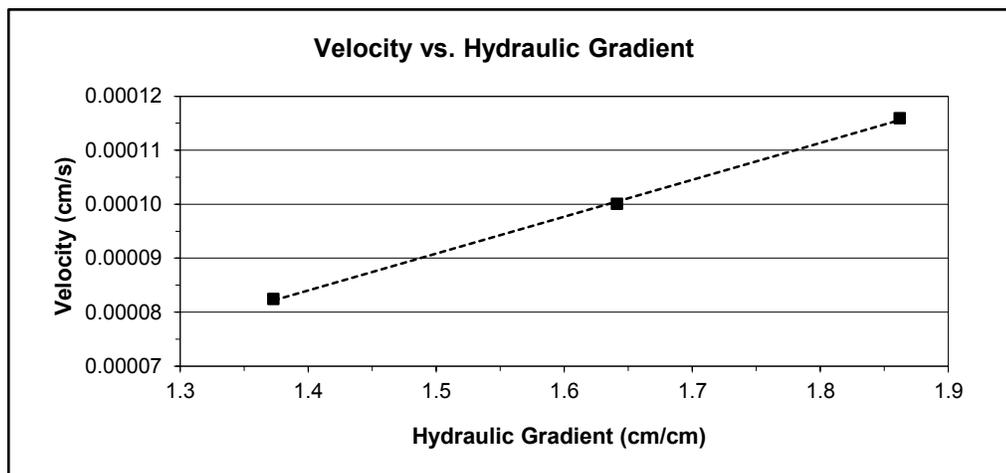
Type of water used: TAP
 Collection vessel tare (g): 10.96
 Sample length (cm): 3.17
 Sample diameter (cm): 6.20
 Sample x-sectional area (cm²): 30.16

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:44:45	19.5	5.9	12.06	1.1	329	6.0E-05	6.0E-05
5-Mar-14	12:50:14							
Test # 2:								
5-Mar-14	14:14:25	19.5	5.2	12.39	1.4	499	5.8E-05	5.9E-05
5-Mar-14	14:22:44							
Test # 3:								
5-Mar-14	14:38:27	19.5	4.35	11.84	0.9	377	5.6E-05	5.7E-05
5-Mar-14	14:44:44							

Average Ksat (cm/sec): 5.9E-05
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-119.5-120.5-Bag (Moderate)
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5

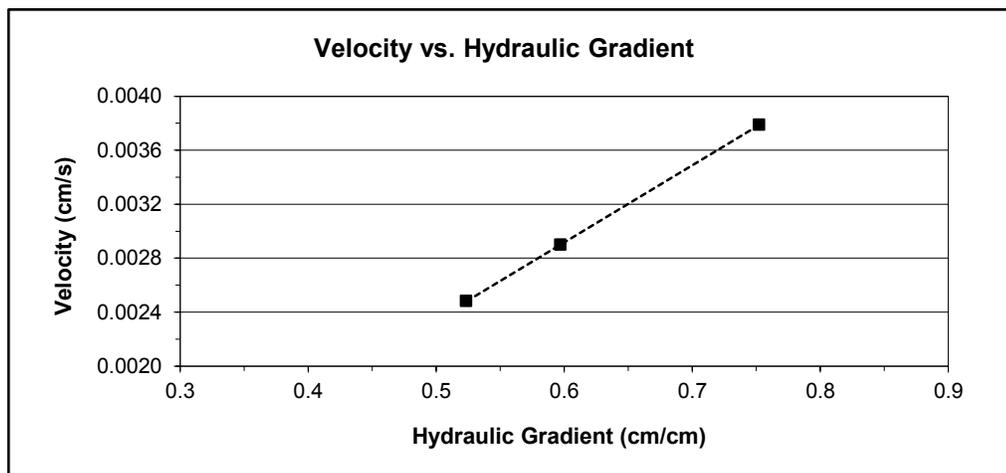
Type of water used: TAP
 Collection vessel tare (g): 11.01
 Sample length (cm): 6.12
 Sample diameter (cm): 6.13
 Sample x-sectional area (cm²): 29.55

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:45:32	19.5	4.3	19.07	8.1	72	5.4E-03	5.5E-03
5-Mar-14	12:46:44							
Test # 2:								
5-Mar-14	14:15:31	19.5	3.35	16.15	5.1	60	5.3E-03	5.4E-03
5-Mar-14	14:16:31							
Test # 3:								
5-Mar-14	14:41:03	19.5	2.9	15.41	4.4	60	5.2E-03	5.3E-03
5-Mar-14	14:42:03							

Average Ksat (cm/sec): 5.4E-03
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-1D-119.5-120.5-Bag (Firm)
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5

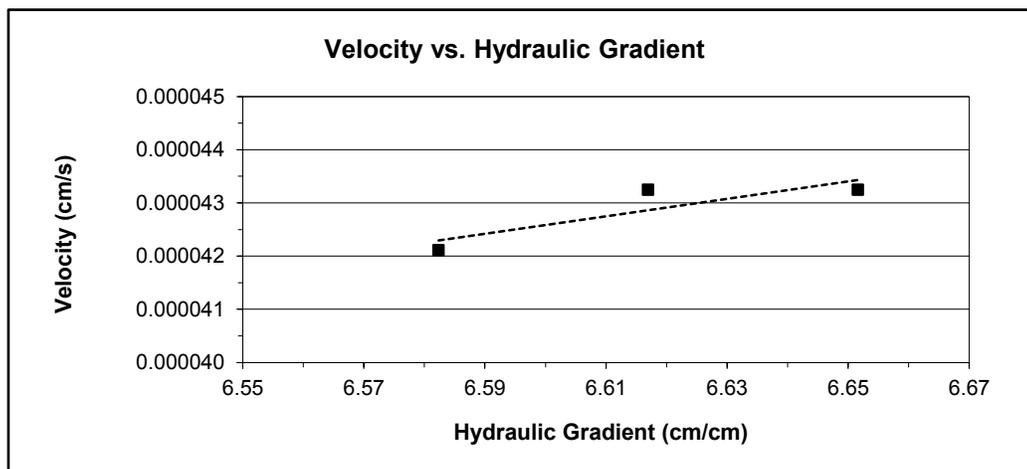
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 3.6
 Sample length (cm): 5.77
 Sample x-sectional area (cm²): 29.17
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
7-Mar-14	9:12:56	19.5	42.1	38.5	111	6.5E-06	6.6E-06
7-Mar-14	9:14:47	19.5	41.9	38.3			
Test # 2:							
7-Mar-14	9:14:47	19.5	41.9	38.3	111	6.5E-06	6.6E-06
7-Mar-14	9:16:38	19.5	41.7	38.1			
Test # 3:							
7-Mar-14	9:16:38	19.5	41.7	38.1	114	6.4E-06	6.5E-06
7-Mar-14	9:18:32	19.5	41.5	37.9			

Average Ksat (cm/sec): 6.6E-06
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-2S-10.5-11-SS
 Date Sampled: 12/12/2013
 Depth (ft): 10.5-11

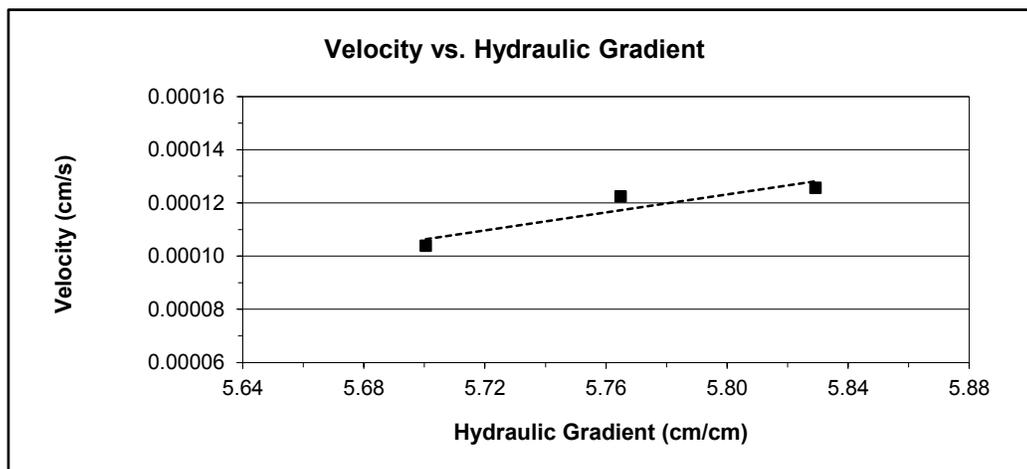
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 1.0
 Sample length (cm): 3.11
 Sample x-sectional area (cm²): 29.33
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
7-Mar-14	8:52:52	19.5	19.2	18.2	38	2.2E-05	2.2E-05
7-Mar-14	8:53:30	19.5	19	18.0			
Test # 2:							
7-Mar-14	8:53:30	19.5	19	18.0	39	2.1E-05	2.2E-05
7-Mar-14	8:54:09	19.5	18.8	17.8			
Test # 3:							
7-Mar-14	8:54:09	19.5	18.8	17.8	46	1.8E-05	1.8E-05
7-Mar-14	8:54:55	19.5	18.6	17.6			

Average Ksat (cm/sec): 2.1E-05
Upsize Corrected Ksat (cm/sec): NA

Comments:

- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-2S-21-21.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 21-21.5

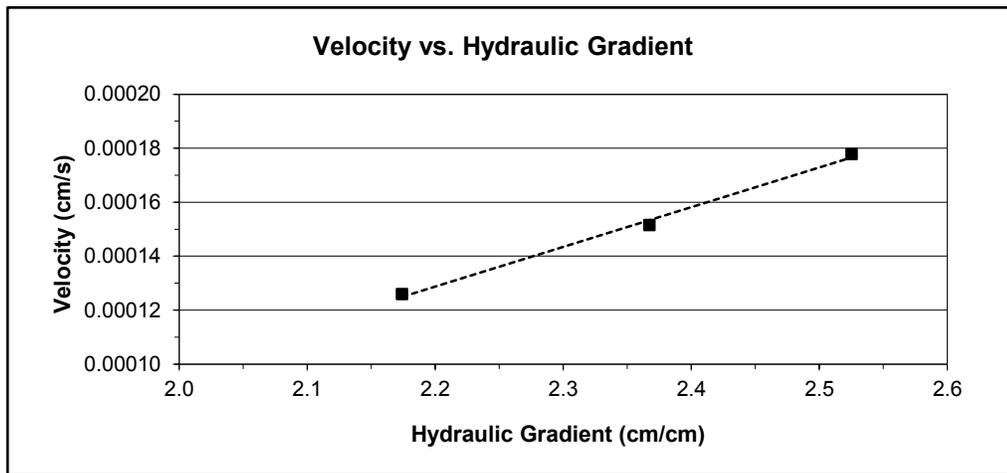
Type of water used: TAP
 Collection vessel tare (g): 11.02
 Sample length (cm): 2.85
 Sample diameter (cm): 6.09
 Sample x-sectional area (cm²): 29.08

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:44:16	19.5	7.05	12.25	1.2	238	7.2E-05	7.3E-05
5-Mar-14	12:48:14							
Test # 2:								
5-Mar-14	14:14:47	19.5	6.6	12.94	1.9	436	6.5E-05	6.6E-05
5-Mar-14	14:22:03							
Test # 3:								
5-Mar-14	14:38:41	19.5	6.05	12.40	1.4	377	5.9E-05	6.0E-05
5-Mar-14	14:44:58							

Average Ksat (cm/sec): **6.6E-05**
 Oversize Corrected Ksat (cm/sec): **NA**

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-2S-26-26.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 26-26.5

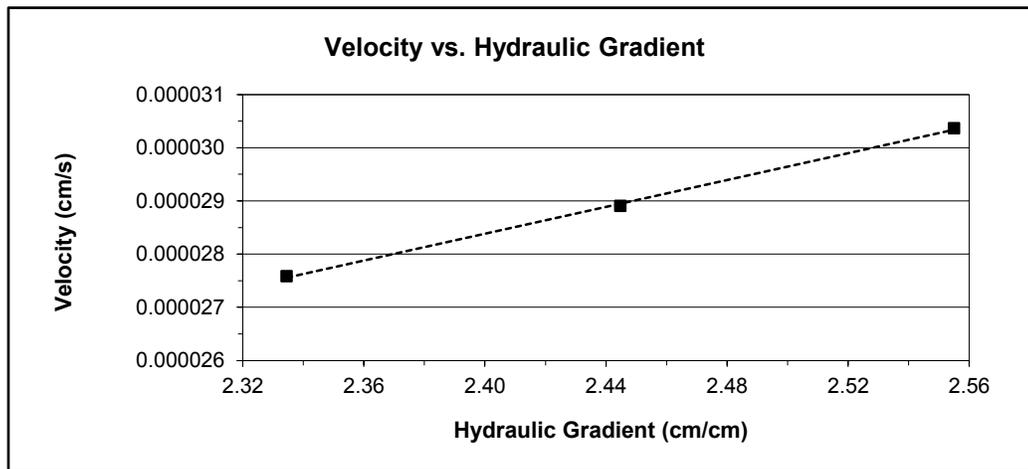
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 2.2
 Sample length (cm): 2.72
 Sample x-sectional area (cm²): 29.06
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:39:02	19.5	9.3	7.1	238	1.2E-05	1.2E-05
5-Mar-14	9:43:00	19.5	9	6.8			
Test # 2:							
5-Mar-14	9:43:00	19.5	9	6.8	250	1.2E-05	1.2E-05
5-Mar-14	9:47:10	19.5	8.7	6.5			
Test # 3:							
5-Mar-14	9:47:10	19.5	8.7	6.5	262	1.2E-05	1.2E-05
5-Mar-14	9:51:32	19.5	8.4	6.2			

Average Ksat (cm/sec): 1.2E-05
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-2S-31-31.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 31-31.5

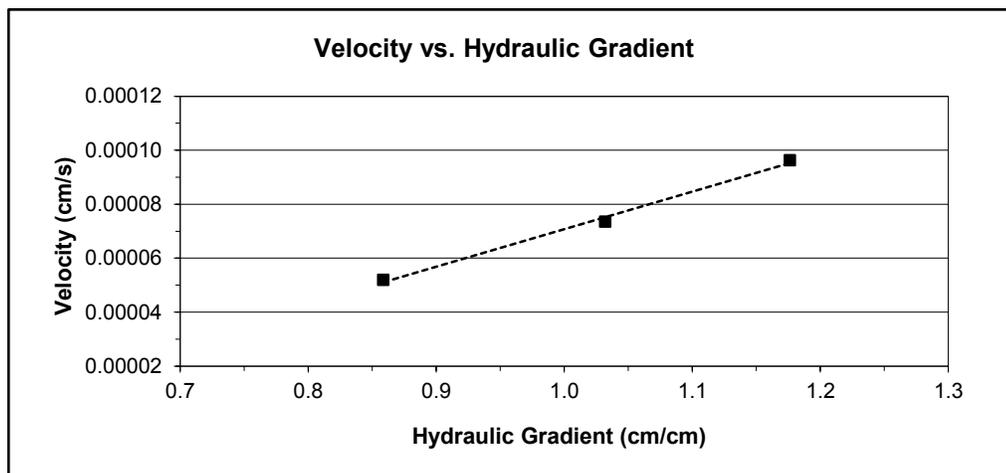
Type of water used: TAP
 Collection vessel tare (g): 10.93
 Sample length (cm): 3.46
 Sample diameter (cm): 6.07
 Sample x-sectional area (cm²): 28.94

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
6-Mar-14	13:33:32	19.5	3.9	11.76	0.8	298	8.5E-05	8.7E-05
6-Mar-14	13:38:30							
Test # 2:								
6-Mar-14	13:48:07	19.5	3.4	12.67	1.7	819	7.5E-05	7.6E-05
6-Mar-14	14:01:46							
Test # 3:								
6-Mar-14	14:14:08	19.5	2.8	11.43	0.5	333	6.4E-05	6.5E-05
6-Mar-14	14:19:41							

Average Ksat (cm/sec): 7.6E-05
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-2S-40-40.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 40-40.5

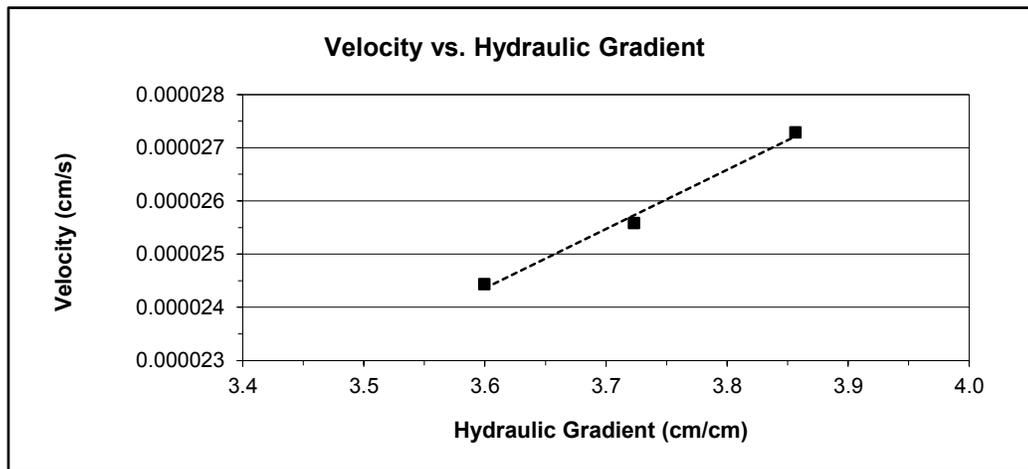
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 2.0
 Sample length (cm): 2.63
 Sample x-sectional area (cm²): 29.32
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:27:30	19.5	12.2	10.2	350	7.2E-06	7.3E-06
5-Mar-14	9:33:20	19.5	11.8	9.8			
Test # 2:							
5-Mar-14	9:33:20	19.5	11.8	9.8	280	7.0E-06	7.1E-06
5-Mar-14	9:38:00	19.5	11.5	9.5			
Test # 3:							
5-Mar-14	9:38:00	19.5	11.5	9.5	342	6.9E-06	7.0E-06
5-Mar-14	9:43:42	19.5	11.15	9.2			

Average Ksat (cm/sec): 7.1E-06
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-3S-21-21.5-SS
 Date Sampled: 12/17/2013
 Depth (ft): 21-21.5

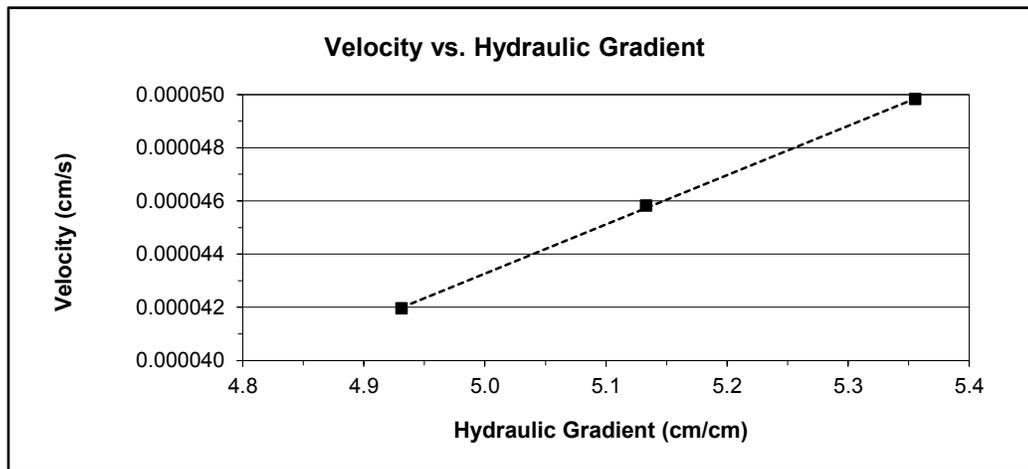
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 1.8
 Sample length (cm): 2.47
 Sample x-sectional area (cm²): 29.10
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:27:15	19.5	15.4	13.6	338	9.3E-06	9.4E-06
5-Mar-14	9:32:53	19.5	14.7	12.9			
Test # 2:							
5-Mar-14	9:32:53	19.5	14.7	12.9	210	8.9E-06	9.1E-06
5-Mar-14	9:36:23	19.5	14.3	12.5			
Test # 3:							
5-Mar-14	9:36:23	19.5	14.3	12.5	344	8.5E-06	8.6E-06
5-Mar-14	9:42:07	19.5	13.7	11.9			

Average Ksat (cm/sec): 9.0E-06
Upsize Corrected Ksat (cm/sec): NA

Comments:

- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-3S-40.5-41-SS
 Date Sampled: 12/18/2013
 Depth (ft): 40.5-41

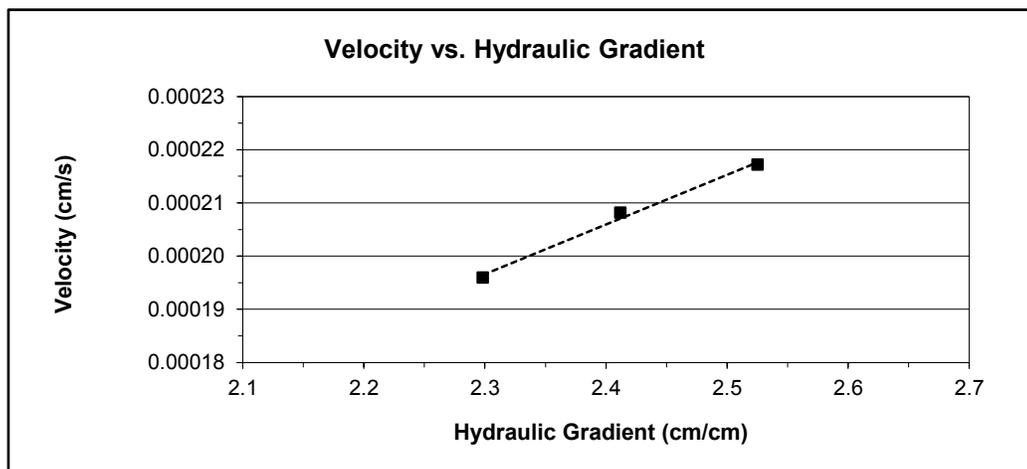
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 6.8
 Sample length (cm): 3.52
 Sample x-sectional area (cm²): 29.33
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
7-Mar-14	9:00:37	19.5	15.9	9.1	45	8.4E-05	8.5E-05
7-Mar-14	9:01:22	19.5	15.5	8.7			
Test # 2:							
7-Mar-14	9:01:22	19.5	15.5	8.7	47	8.4E-05	8.5E-05
7-Mar-14	9:02:09	19.5	15.1	8.3			
Test # 3:							
7-Mar-14	9:02:09	19.5	15.1	8.3	50	8.3E-05	8.4E-05
7-Mar-14	9:02:59	19.5	14.7	7.9			

Average Ksat (cm/sec): 8.5E-05
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-B-01-10-11.0-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 10-11.0

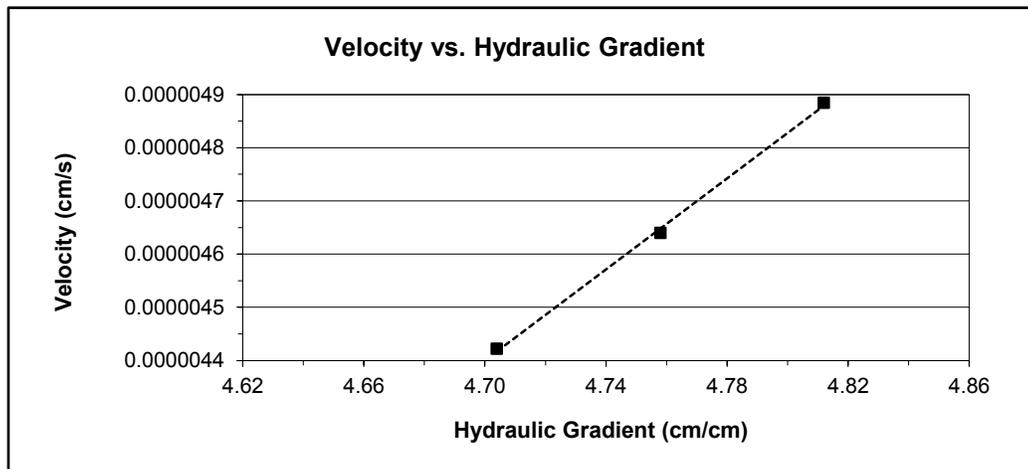
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 2.0
 Sample length (cm): 3.70
 Sample x-sectional area (cm²): 30.27
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:25:00	19.5	19.9	17.9	947	1.0E-06	1.0E-06
5-Mar-14	9:40:47	19.5	19.7	17.7			
Test # 2:							
5-Mar-14	9:40:47	19.5	19.7	17.7	997	9.8E-07	9.9E-07
5-Mar-14	9:57:24	19.5	19.5	17.5			
Test # 3:							
5-Mar-14	9:57:24	19.5	19.5	17.5	1046	9.4E-07	9.5E-07
5-Mar-14	10:14:50	19.5	19.3	17.3			

Average Ksat (cm/sec): 9.9E-07
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-B-01-16-17-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 16-17

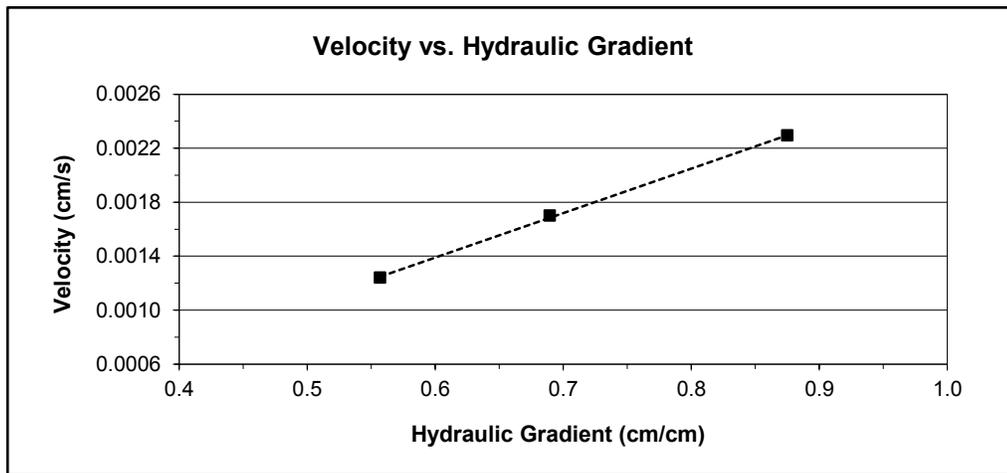
Type of water used: TAP
 Collection vessel tare (g): 11.02
 Sample length (cm): 3.77
 Sample diameter (cm): 6.15
 Sample x-sectional area (cm²): 29.73

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:45:16	19.5	3.3	15.11	4.1	60	2.6E-03	2.7E-03
5-Mar-14	12:46:16							
Test # 2:								
5-Mar-14	14:17:10	19.5	2.6	14.05	3.0	60	2.5E-03	2.5E-03
5-Mar-14	14:18:10							
Test # 3:								
5-Mar-14	14:37:18	19.5	2.1	13.23	2.2	60	2.2E-03	2.3E-03
5-Mar-14	14:38:18							

Average Ksat (cm/sec): 2.5E-03
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Constant Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-B-01-27-28-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 27-28

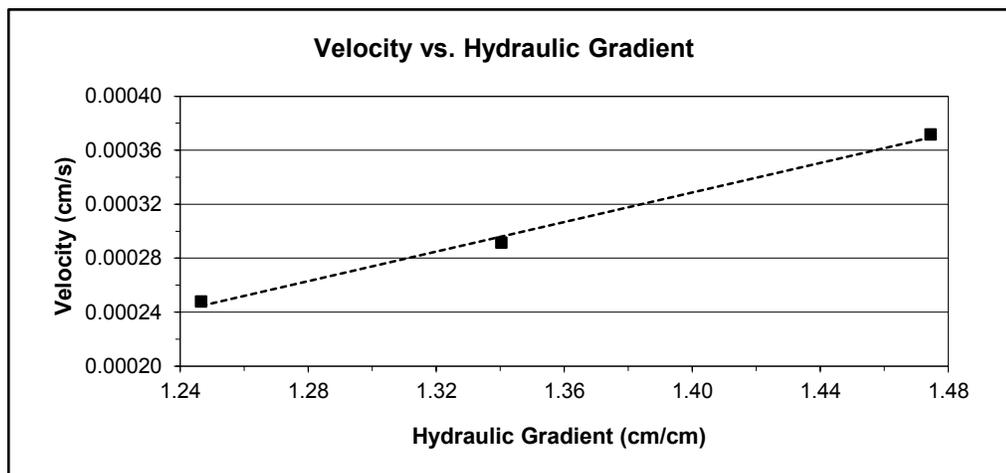
Type of water used: TAP
 Collection vessel tare (g): 10.96
 Sample length (cm): 3.73
 Sample diameter (cm): 6.15
 Sample x-sectional area (cm²): 29.66

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm ³)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
5-Mar-14	12:45:08	19.5	5.5	12.37	1.4	128	2.5E-04	2.6E-04
5-Mar-14	12:47:16							
Test # 2:								
5-Mar-14	14:17:01	19.5	5	14.20	3.2	375	2.2E-04	2.2E-04
5-Mar-14	14:23:16							
Test # 3:								
5-Mar-14	14:37:06	19.5	4.65	13.53	2.6	350	2.0E-04	2.0E-04
5-Mar-14	14:42:56							

Average Ksat (cm/sec): 2.3E-04
 Oversize Corrected Ksat (cm/sec): NA

Comments:

- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
- NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines



Saturated Hydraulic Conductivity Falling Head Method

Job name: SCWA - Montini
 Job number: WR10.0085.13
 Sample number: MON-B-01-35-36-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 35-36

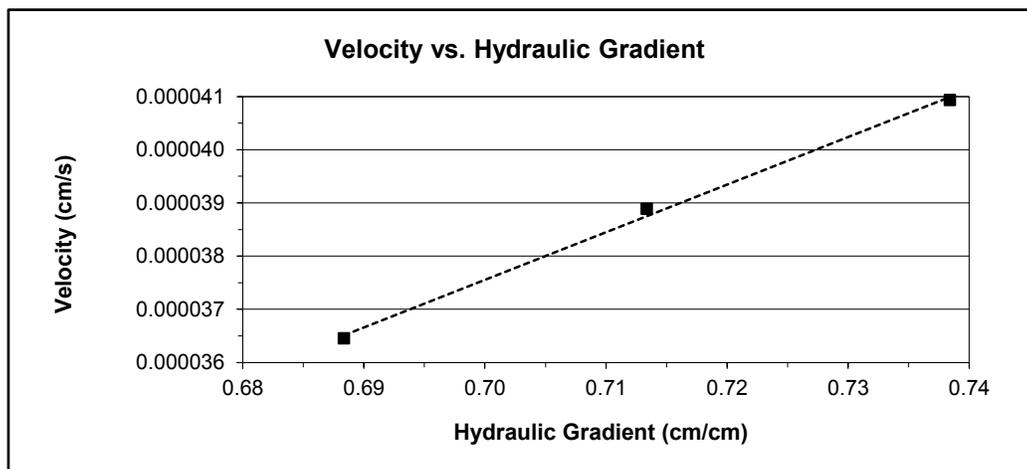
Type of water used: TAP
 Backpressure (psi): 0.0
 Offset (cm): 6.7
 Sample length (cm): 4.00
 Sample x-sectional area (cm²): 30.01
 Reservoir x-sectional area (cm²): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
5-Mar-14	9:51:22	19.5	9.7	3.0	57	5.5E-05	5.6E-05
5-Mar-14	9:52:19	19.5	9.6	2.9			
Test # 2:							
5-Mar-14	9:52:19	19.5	9.6	2.9	60	5.5E-05	5.5E-05
5-Mar-14	9:53:19	19.5	9.5	2.8			
Test # 3:							
5-Mar-14	9:53:19	19.5	9.5	2.8	64	5.3E-05	5.4E-05
5-Mar-14	9:54:23	19.5	9.4	2.7			

Average Ksat (cm/sec): 5.5E-05
Upsize Corrected Ksat (cm/sec): NA

Comments:

--- = Upsize correction is unnecessary since coarse fraction < 5% of composite mass
 NA = Not applicable



Laboratory analysis by: D. O'Dowd
 Data entered by: D. O'Dowd
 Checked by: J. Hines

Particle Size Analysis



Summary of Particle Size Characteristics

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-1D-10-10.5-SS	0.0049	0.028	0.052	11	0.66	WS/H	Elastic silt with sand (MH)s	Silt Loam
MON-1D-20-20.5-SS	0.00020	0.0032	0.0053	27	0.80	WS/H	Fat clay (CH)	Silty Clay (Est)
MON-1D-30.5-31-SS	0.0014	0.031	0.055	39	0.77	WS/H	Sandy silt s(ML)	Silt Loam [†] (Est)
MON-1D-40.5-41-SS	0.0040	0.062	0.069	17	7.0	WS/H	Sandy silt s(ML)	Sandy Loam
MON-1D-45-45.5-SS	0.00039	0.0053	0.0088	23	1.5	WS/H	Elastic silt with sand (MH)s	Clay Loam (Est)
MON-1D-55-55.5-SS	0.00056	0.0063	0.012	21	0.93	WS/H	Elastic silt with sand (MH)s	Loam (Est)
MON-1D-65-65.5-SS	0.0015	0.015	0.053	35	0.19	WS/H	Elastic silt with sand (MH)s	Loam
MON-1D-75-75.5-SS	0.0030	0.19	0.33	110	1.2	WS/H	Silty sand (SM)	Sandy Loam
MON-1D-85-87.5-Bag	0.0047	0.29	0.49	104	1.6	WS/H	Silty sand (SM)	Sandy Loam [†]
MON-1D-92.5-95-Bag	0.00086	0.087	0.26	302	0.37	WS/H	Silty sand (SM)	Loam [†] (Est)
MON-1D-102-103-Bag	0.0018	0.21	0.66	367	0.27	WS/H	Clayey sand with gravel (SC)g	Loam [†]

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

[†] Greater than 10% of sample is coarse material



Summary of Particle Size Characteristics (Continued)

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-1D-119.5-120.5-Bag	0.0074	0.35	0.66	89	0.64	WS/H	Silty sand (SM)	Sandy Loam †
MON-2S-5.5-6-SS	0.0011	0.0071	0.014	13	0.62	WS/H	Elastic silt with sand (MH)s	Loam (Est)
MON-2S-10.5-11-SS	0.0024	0.011	0.014	5.8	1.1	WS/H	Silt (ML)	Silt Loam
MON-2S-21-21.5-SS	0.0019	0.028	0.052	27	0.70	WS/H	Elastic silt with sand (MH)s	Loam
MON-2S-25.5-26-SS	0.011	0.072	0.094	8.5	1.5	WS/H	Sandy silt s(ML)	Sandy Loam
MON-2S-31-31.5-SS	0.0033	0.067	0.12	36	1.6	WS/H	Sandy elastic silt s(MH)	Sandy Loam
MON-2S-40-40.5-SS	0.0024	0.026	0.045	19	0.91	WS/H	Elastic silt with sand (MH)s	Silt Loam
MON-3S-10.5-11-SS	0.0013	0.018	0.030	23	0.92	WS/H	Elastic silt (MH)	Silt Loam (Est)
MON-3S-20.5-21-SS	0.0018	0.010	0.013	7.2	1.5	WS/H	Elastic silt (MH)	Silt Loam
MON-3S-30.5-31-SS	0.0029	0.012	0.017	5.9	1.0	WS/H	Silt (ML)	Silt Loam
MON-3S-40.5-41-SS	0.0067	0.055	0.071	11	1.1	WS/H	Sandy silt s(ML)	Sandy Loam

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material



Summary of Particle Size Characteristics (Continued)

Sample Number	d ₁₀ (mm)	d ₅₀ (mm)	d ₆₀ (mm)	C _u	C _c	Method	ASTM Classification	USDA Classification
MON-B-01-5.0-6-Bag	0.00072	0.0088	0.013	18	1.4	WS/H	Lean clay (CL)	Silt Loam (Est)
MON-B-01-10-11.0-Bag	0.00039	0.0097	0.013	33	2.3	WS/H	Elastic silt (MH)	Silt Loam (Est)
MON-B-01-16-17-Bag	0.0043	0.037	0.057	13	1.0	WS/H	Sandy silt s(ML)	Silt Loam
MON-B-01-20-21-Bag	0.0033	0.072	0.13	39	1.1	WS/H	Sandy silt s(ML)	Sandy Loam
MON-B-01-27-28-Bag	0.0039	0.20	0.37	95	1.0	WS/H	Silty sand (SM)	Sandy Loam
MON-B-01-29-30-Bag	0.0013	0.013	0.021	16	0.92	WS/H	Elastic silt with sand (MH)s	Silt Loam (Est)
MON-B-01-35-36-Bag	0.0026	0.021	0.032	12	1.2	WS/H	Silt with sand (ML)s	Silt Loam
MON-B-01-43-44-Bag	0.0021	0.016	0.034	16	0.61	WS/H	Silt with sand (ML)s	Silt Loam

d₅₀ = Median particle diameter

Est = Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material



Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MON-1D-10-10.5-SS	0.0	28.4	68.2	3.4
MON-1D-20-20.5-SS	0.0	1.0	58.6	40.4
MON-1D-30.5-31-SS	8.8	23.5	55.3	12.4
MON-1D-40.5-41-SS	0.0	31.6	64.7	3.7
MON-1D-45-45.5-SS	0.2	15.6	55.6	28.6
MON-1D-55-55.5-SS	0.7	17.9	55.1	26.3
MON-1D-65-65.5-SS	0.0	25.4	60.4	14.2
MON-1D-75-75.5-SS	0.6	61.8	30.1	7.5
MON-1D-85-87.5-Bag	5.6	62.0	27.5	5.0
MON-1D-92.5-95-Bag	9.1	42.0	33.2	15.7
MON-1D-102-103-Bag	15.9	42.1	31.2	10.9
MON-1D-119.5-120.5-Bag	8.6	58.3	30.4	2.7
MON-2S-5.5-6-SS	0.0	25.1	54.5	20.4
MON-2S-10.5-11-SS	0.0	2.4	89.1	8.5
MON-2S-21-21.5-SS	0.0	24.3	65.3	10.4
MON-2S-25.5-26-SS	0.0	48.2	51.8	0.0

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.



Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MON-2S-31-31.5-SS	0.0	45.7	47.2	7.0
MON-2S-40-40.5-SS	0.5	25.3	65.2	9.0
MON-3S-10.5-11-SS	0.0	7.9	78.4	13.7
MON-3S-20.5-21-SS	0.0	0.5	88.5	11.0
MON-3S-30.5-31-SS	0.0	4.2	89.5	6.3
MON-3S-40.5-41-SS	0.2	37.8	61.6	0.4
MON-B-01-5.0-6-Bag	0.0	1.0	80.0	19.0
MON-B-01-10-11.0-Bag	0.0	6.8	71.4	21.8
MON-B-01-16-17-Bag	0.0	34.1	61.0	4.9
MON-B-01-20-21-Bag	0.0	49.1	44.6	6.3
MON-B-01-27-28-Bag	0.5	61.7	32.5	5.3
MON-B-01-29-30-Bag	0.0	22.6	62.2	15.2
MON-B-01-35-36-Bag	0.0	28.1	63.5	8.4
MON-B-01-43-44-Bag	0.0	17.1	73.3	9.6

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-10-10.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 10-10.5
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 196.74
 Weight Passing #10 (g): 196.74
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 35.94
 Calculated Weight of Sieve Sample (g): 35.94

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	196.74	100.00
	2"	50	0.00	0.00	196.74	100.00
	1.5"	38.1	0.00	0.00	196.74	100.00
	1"	25	0.00	0.00	196.74	100.00
	3/4"	19.0	0.00	0.00	196.74	100.00
	3/8"	9.5	0.00	0.00	196.74	100.00
	4	4.75	0.00	0.00	196.74	100.00
	10	2.00	0.00	0.00	196.74	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	2.08	2.08	33.86	94.21
	40	0.425	3.48	5.56	30.38	84.53
	60	0.250	2.01	7.57	28.37	78.94
	140	0.106	2.09	9.66	26.28	73.12
	200	0.075	0.55	10.21	25.73	71.59
	dry pan			0.17	10.38	25.56
wet pan				25.56	0.00	

d₁₀ (mm): 0.0049 d₅₀ (mm): 0.028
 d₁₆ (mm): 0.0074 d₆₀ (mm): 0.052
 d₃₀ (mm): 0.013 d₈₄ (mm): 0.40

Median Particle Diameter--d₅₀ (mm): 0.028
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 11
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.66
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.15

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-10-10.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 10-10.5
 Test Date: 30-Jan-14
 Start Time: 9:42

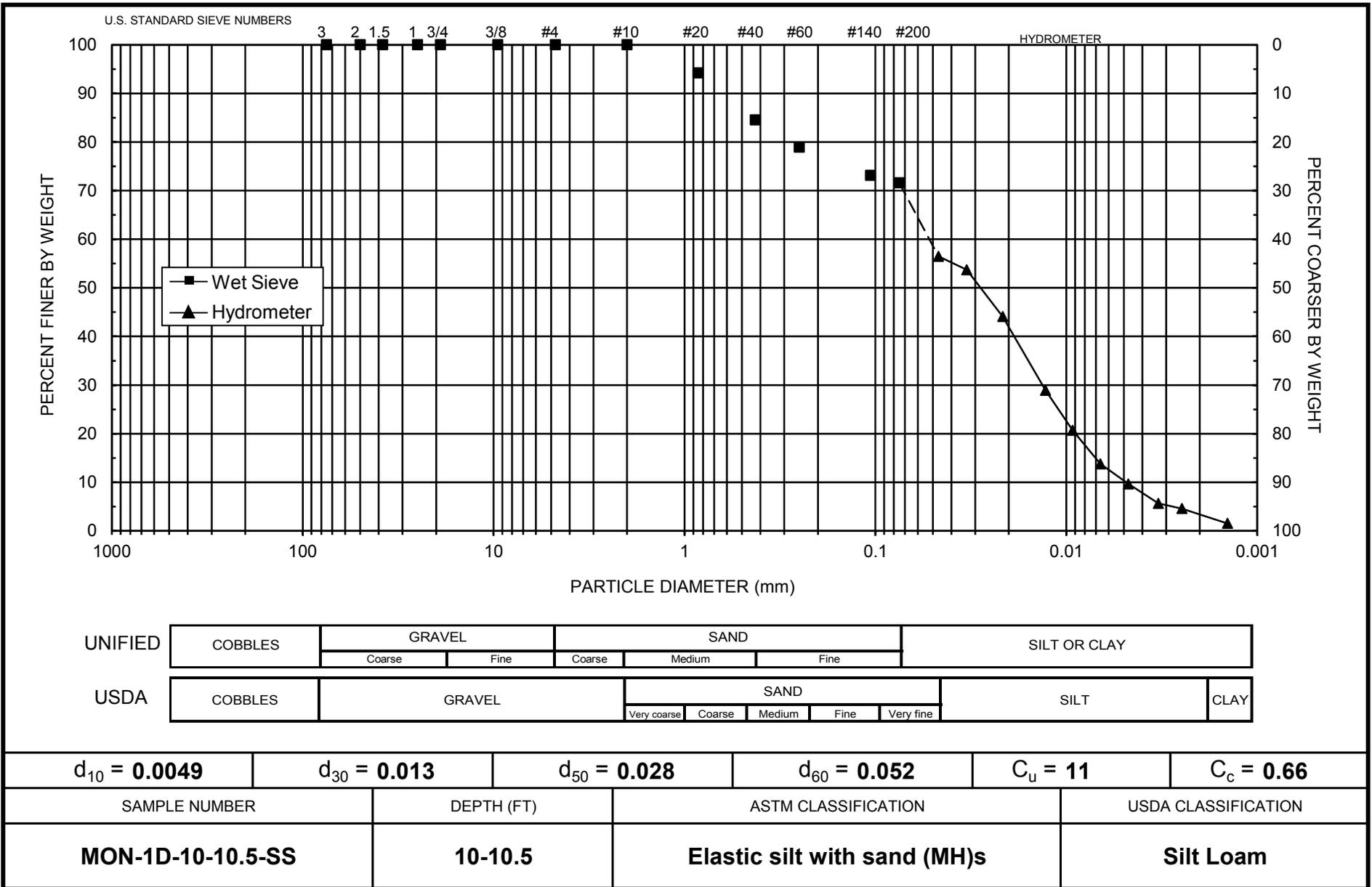
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.72
 Initial Wt. (g): 35.94
 Total Sample Wt. (g): 196.74
 Wt. Passing #10 (g): 196.74

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
30-Jan-14	1	19.4	26.0	5.5	20.5	12.0	0.04670	56.5	56.5
	2	19.4	25.0	5.5	19.5	12.2	0.03325	53.7	53.7
	5	19.4	21.5	5.5	16.0	12.8	0.02152	44.1	44.1
	15	19.4	16.0	5.5	10.5	13.7	0.01285	28.9	28.9
	30	19.4	13.0	5.5	7.5	14.2	0.00925	20.7	20.7
	60	19.4	10.5	5.5	5.0	14.6	0.00663	13.8	13.8
	120	19.4	9.0	5.5	3.5	14.8	0.00473	9.6	9.6
	250	19.7	7.5	5.5	2.1	15.1	0.00329	5.6	5.6
	435	20.4	7.0	5.3	1.7	15.2	0.00248	4.6	4.6
31-Jan-14	1346	19.7	6.0	5.5	0.6	15.3	0.00143	1.5	1.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-20-20.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 20-20.5
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 222.82
 Weight Passing #10 (g): 222.80
 Weight Retained #10 (g): 0.02
 Weight of Hydrometer Sample (g): 35.43
 Calculated Weight of Sieve Sample (g): 35.43

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	222.82	100.00
	2"	50	0.00	0.00	222.82	100.00
	1.5"	38.1	0.00	0.00	222.82	100.00
	1"	25	0.00	0.00	222.82	100.00
	3/4"	19.0	0.00	0.00	222.82	100.00
	3/8"	9.5	0.00	0.00	222.82	100.00
	4	4.75	0.00	0.00	222.82	100.00
	10	2.00	0.02	0.02	222.80	99.99
-10	(Based on calculated sieve wt.)					
	20	0.85	0.02	0.02	35.41	99.93
	40	0.425	0.02	0.04	35.39	99.88
	60	0.250	0.06	0.10	35.33	99.71
	140	0.106	0.12	0.22	35.21	99.37
	200	0.075	0.14	0.36	35.07	98.98
	dry pan		0.03	0.39	35.04	
wet pan			35.04	0.00		

d₁₀ (mm): 0.00020 d₅₀ (mm): 0.0032
 d₁₆ (mm): 0.00032 d₆₀ (mm): 0.0053
 d₃₀ (mm): 0.00092 d₈₄ (mm): 0.016

Median Particle Diameter--d₅₀ (mm): 0.0032
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 27
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.80
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.0065

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
 USDA Soil Classification: Silty Clay

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-20-20.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 20-20.5
 Test Date: 30-Jan-14
 Start Time: 9:54

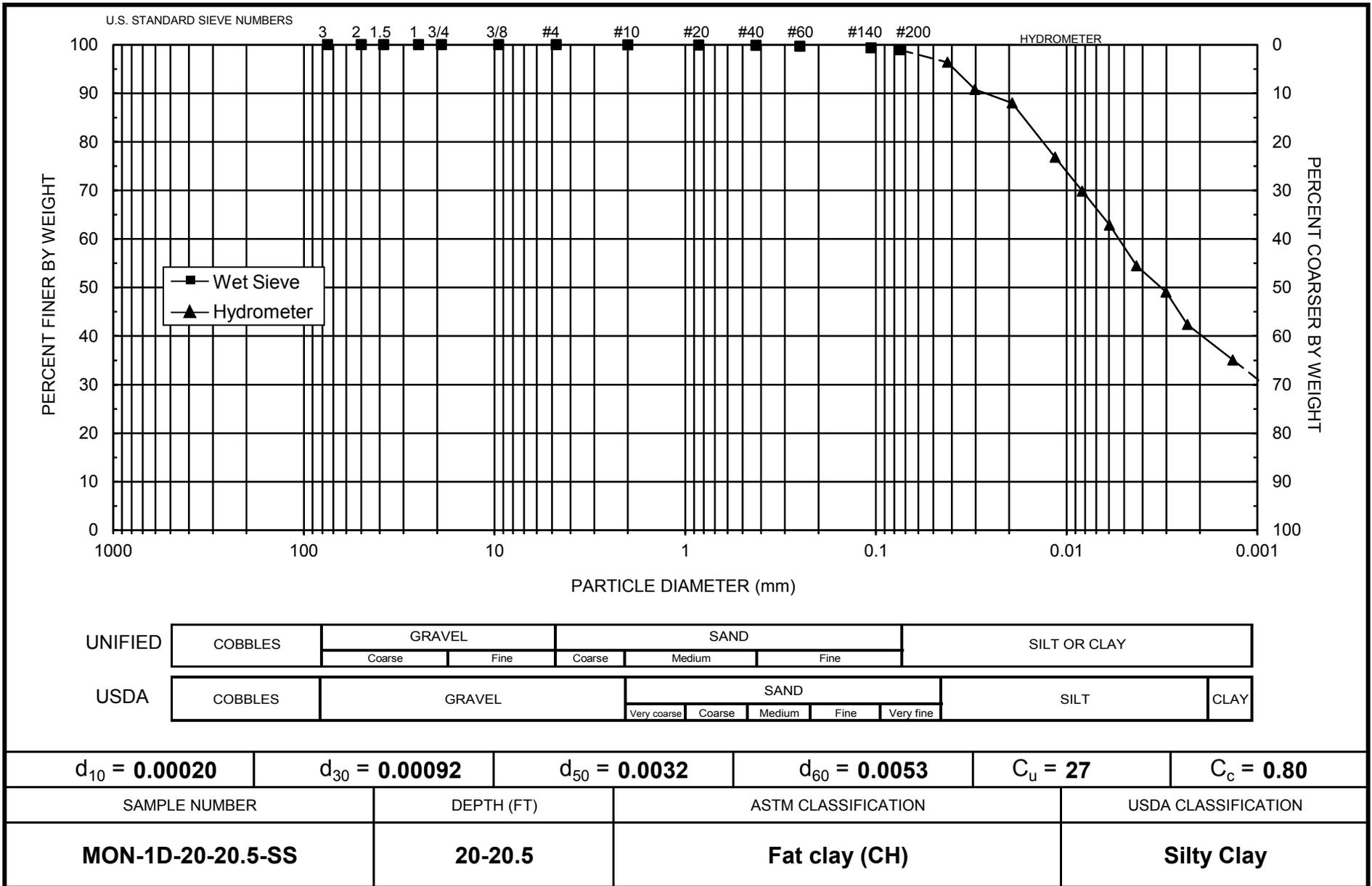
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.71
 Initial Wt. (g): 35.43
 Total Sample Wt. (g): 222.82
 Wt. Passing #10 (g): 222.80

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
30-Jan-14	1	19.4	40.0	5.5	34.5	9.7	0.04212	96.4	96.4
	2	19.4	38.0	5.5	32.5	10.1	0.03028	90.8	90.8
	5	19.4	37.0	5.5	31.5	10.2	0.01930	88.0	88.0
	15	19.4	33.0	5.5	27.5	10.9	0.01150	76.8	76.8
	30	19.4	30.5	5.5	25.0	11.3	0.00828	69.9	69.8
	60	19.4	28.0	5.5	22.5	11.7	0.00596	62.9	62.9
	120	19.4	25.0	5.5	19.5	12.2	0.00430	54.5	54.5
	250	19.7	23.0	5.4	17.6	12.5	0.00301	49.1	49.1
	425	20.4	20.5	5.3	15.2	12.9	0.00232	42.4	42.4
31-Jan-14	1335	19.7	18.0	5.5	12.6	13.3	0.00134	35.1	35.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-30.5-31-SS
 Date Sampled: 12/10/2013
 Depth (ft): 30.5-31
 Test Date: 6-Feb-14

Initial Dry Weight of Sample (g): 208.55
 Weight Passing #10 (g): 168.96
 Weight Retained #10 (g): 39.59
 Weight of Hydrometer Sample (g): 35.97
 Calculated Weight of Sieve Sample (g): 44.40

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	208.55	100.00
	2"	50	0.00	0.00	208.55	100.00
	1.5"	38.1	0.00	0.00	208.55	100.00
	1"	25	0.00	0.00	208.55	100.00
	3/4"	19.0	0.00	0.00	208.55	100.00
	3/8"	9.5	4.47	4.47	204.08	97.86
	4	4.75	13.95	18.42	190.13	91.17
	10	2.00	21.17	39.59	168.96	81.02
-10	(Based on calculated sieve wt.)					
	20	0.85	0.03	8.46	35.94	80.95
	40	0.425	0.65	9.11	35.29	79.48
	60	0.250	1.76	10.87	33.53	75.52
	140	0.106	2.75	13.62	30.78	69.33
	200	0.075	0.75	14.37	30.03	67.64
	dry pan			0.28	14.65	29.75
wet pan				29.75	0.00	

d₁₀ (mm): 0.0014 d₅₀ (mm): 0.031
 d₁₆ (mm): 0.0030 d₆₀ (mm): 0.055
 d₃₀ (mm): 0.0077 d₈₄ (mm): 2.6

Median Particle Diameter--d₅₀ (mm): 0.031
 Uniformity Coefficient, C_u--[d₆₀/d₁₀] (mm): 39
 Coefficient of Curvature, C_c--[(d₃₀)²/(d₁₀*d₆₀)] (mm): 0.77
 Mean Particle Diameter--[(d₁₆+d₅₀+d₈₄)/3] (mm): 0.88

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Silt Loam †

† Greater than 10% of sample is coarse material

Laboratory analysis by: J. Bray
 Data entered by: J. Hines
 Checked by: C. Krous



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-30.5-31-SS
 Date Sampled: 12/10/2013
 Depth (ft): 30.5-31
 Test Date: 4-Feb-14
 Start Time: 9:18

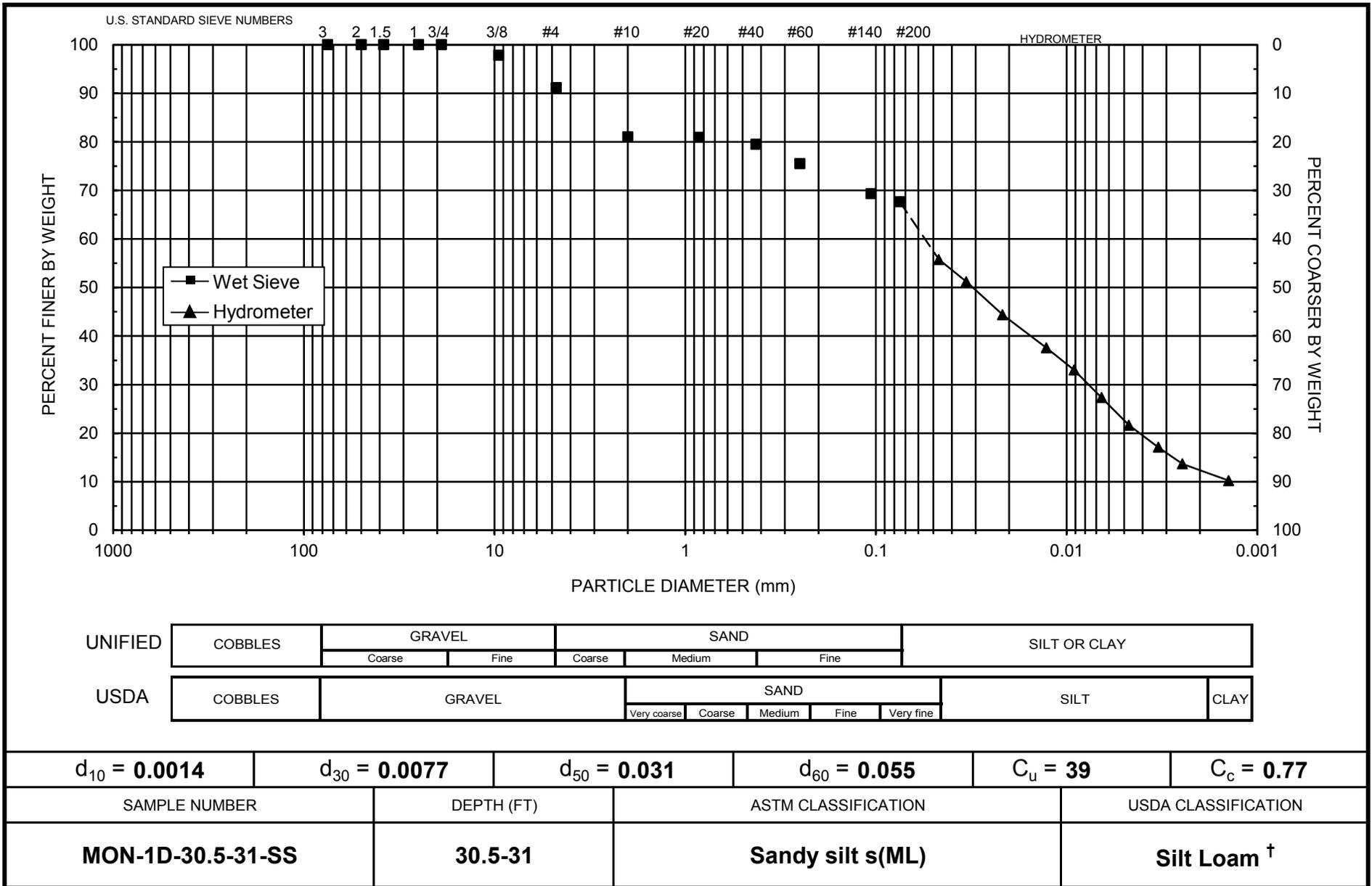
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.62
 Initial Wt. (g): 35.97
 Total Sample Wt. (g): 208.55
 Wt. Passing #10 (g): 168.96

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
4-Feb-14	1	19.5	30.0	5.5	24.5	11.4	0.04680	68.8	55.8
	2	19.5	28.0	5.5	22.5	11.7	0.03356	63.2	51.2
	5	19.5	25.0	5.5	19.5	12.2	0.02167	54.8	44.4
	15	19.5	22.0	5.5	16.5	12.7	0.01276	46.4	37.6
	30	19.5	20.0	5.5	14.5	13.0	0.00914	40.7	33.0
	60	19.5	17.5	5.5	12.0	13.4	0.00656	33.7	27.3
	120	19.5	15.0	5.5	9.5	13.8	0.00471	26.7	21.6
	250	19.5	13.0	5.5	7.5	14.2	0.00330	21.1	17.1
	455	19.5	11.5	5.5	6.0	14.4	0.00247	16.9	13.7
5-Feb-14	1420	19.3	10.0	5.5	4.5	14.7	0.00141	12.6	10.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: J. Hines
 Checked by: C. Krous



† Greater than 10% of sample is coarse material

Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-40.5-41-SS
 Date Sampled: 12/10/2013
 Depth (ft): 40.5-41
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 237.49
 Weight Passing #10 (g): 237.49
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 34.52
 Calculated Weight of Sieve Sample (g): 34.52

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	237.49	100.00	
	2"	50	0.00	0.00	237.49	100.00	
	1.5"	38.1	0.00	0.00	237.49	100.00	
	1"	25	0.00	0.00	237.49	100.00	
	3/4"	19.0	0.00	0.00	237.49	100.00	
	3/8"	9.5	0.00	0.00	237.49	100.00	
	4	4.75	0.00	0.00	237.49	100.00	
	10	2.00	0.00	0.00	237.49	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	0.64	0.64	33.88	98.15	
	40	0.425	3.30	3.94	30.58	88.59	
	60	0.250	3.60	7.54	26.98	78.16	
	140	0.106	2.96	10.50	24.02	69.58	
	200	0.075	0.42	10.92	23.60	68.37	
	dry pan			0.13	11.05	23.47	
	wet pan				23.47	0.00	

d₁₀ (mm): 0.0040 d₅₀ (mm): 0.062
 d₁₆ (mm): 0.0061 d₆₀ (mm): 0.069
 d₃₀ (mm): 0.044 d₈₄ (mm): 0.34

Median Particle Diameter--d₅₀ (mm): 0.062
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 17
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 7.0
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.14

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-40.5-41-SS
 Date Sampled: 12/10/2013
 Depth (ft): 40.5-41
 Test Date: 30-Jan-14
 Start Time: 9:00

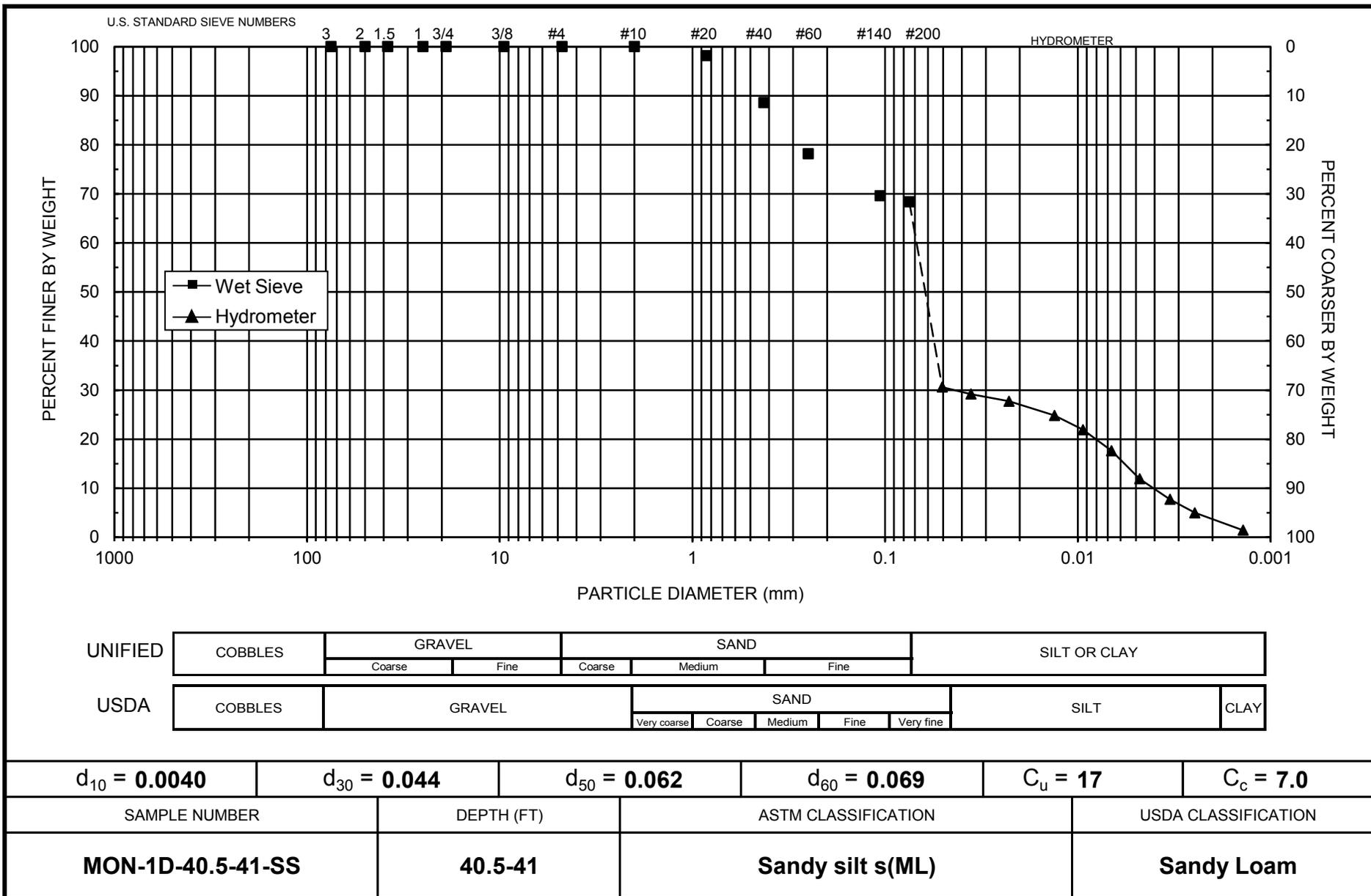
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 34.52
 Total Sample Wt. (g): 237.49
 Wt. Passing #10 (g): 237.49

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.8	16.0	5.4	10.6	13.7	0.05055	30.6	30.6
	2	19.8	15.5	5.4	10.1	13.8	0.03585	29.2	29.2
	5	19.8	15.0	5.4	9.6	13.8	0.02274	27.7	27.7
	15	19.8	14.0	5.4	8.6	14.0	0.01321	24.8	24.8
	30	19.8	13.0	5.4	7.6	14.2	0.00939	21.9	21.9
	60	19.9	11.5	5.4	6.1	14.4	0.00669	17.6	17.6
	120	20.1	9.5	5.4	4.1	14.7	0.00477	11.9	11.9
	250	20.3	8.0	5.3	2.7	15.0	0.00332	7.7	7.7
	454	20.7	7.0	5.3	1.7	15.2	0.00247	5.0	5.0
	1-Feb-14	1507	19.3	6.0	5.5	0.5	15.3	0.00139	1.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-45-45.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 45-45.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 126.03
 Weight Passing #10 (g): 125.74
 Weight Retained #10 (g): 0.29
 Weight of Hydrometer Sample (g): 35.01
 Calculated Weight of Sieve Sample (g): 35.09

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	126.03	100.00
	2"	50	0.00	0.00	126.03	100.00
	1.5"	38.1	0.00	0.00	126.03	100.00
	1"	25	0.00	0.00	126.03	100.00
	3/4"	19.0	0.00	0.00	126.03	100.00
	3/8"	9.5	0.00	0.00	126.03	100.00
	4	4.75	0.26	0.26	125.77	99.79
	10	2.00	0.03	0.29	125.74	99.77
-10	(Based on calculated sieve wt.)					
	20	0.85	0.74	0.82	34.27	97.66
	40	0.425	1.32	2.14	32.95	93.90
	60	0.250	1.21	3.35	31.74	90.45
	140	0.106	1.70	5.05	30.04	85.61
	200	0.075	0.50	5.55	29.54	84.18
	dry pan			0.10	5.65	29.44
wet pan				29.44	0.00	

d₁₀ (mm): 0.00039 d₅₀ (mm): 0.0053
 d₁₆ (mm): 0.00066 d₆₀ (mm): 0.0088
 d₃₀ (mm): 0.0023 d₈₄ (mm): 0.074

Median Particle Diameter--d₅₀ (mm): 0.0053
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 23
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.5
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.027

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Clay Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: J. Hines
 Checked by: C. Krous



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-45-45.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 45-45.5
 Test Date: 3-Feb-14
 Start Time: 9:12

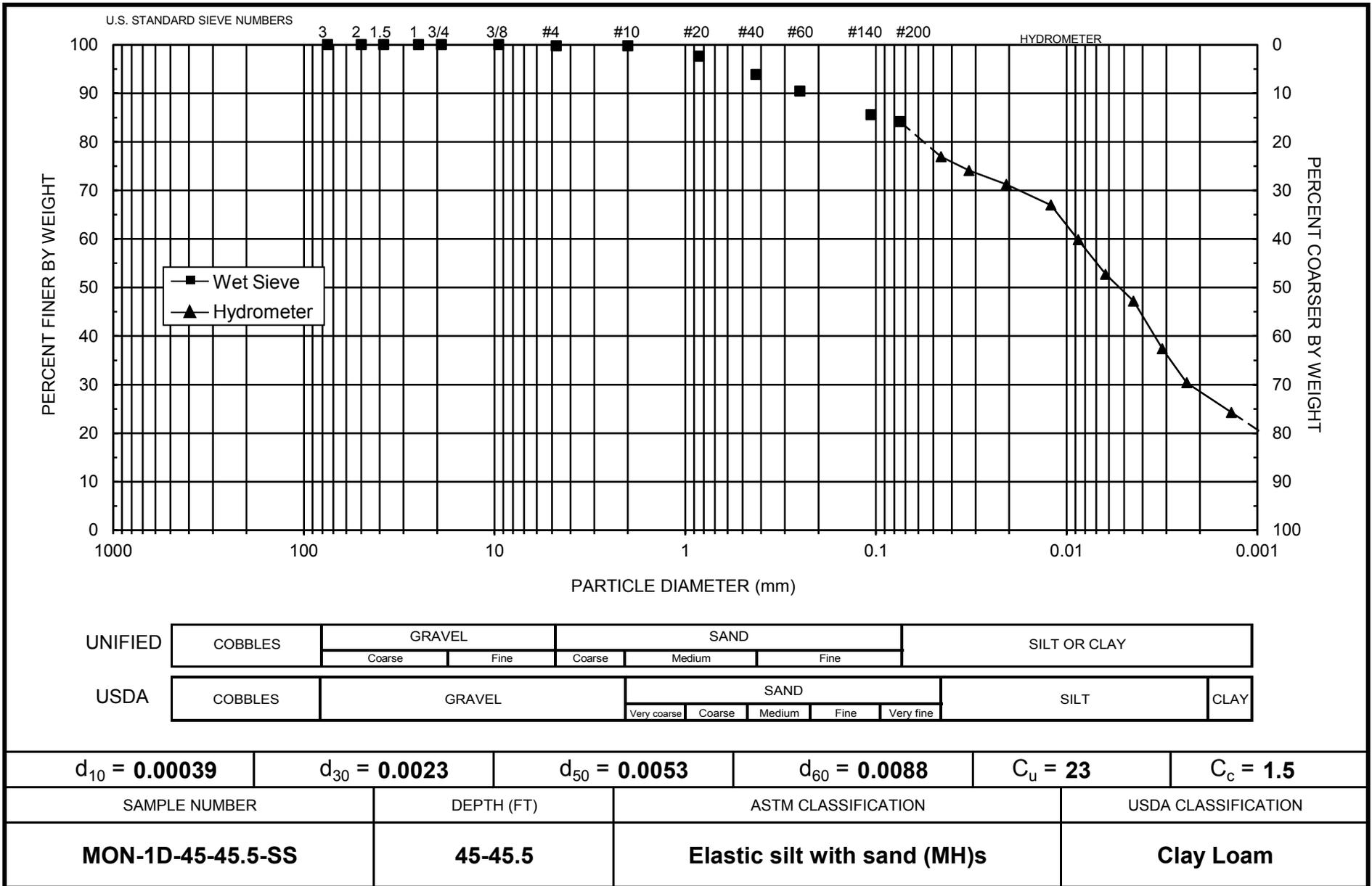
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.64
 Initial Wt. (g): 35.01
 Total Sample Wt. (g): 126.03
 Wt. Passing #10 (g): 125.74

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	32.5	5.5	27.0	11.0	0.04560	77.1	76.9
	2	19.4	31.5	5.5	26.0	11.1	0.03248	74.3	74.1
	5	19.4	30.5	5.5	25.0	11.3	0.02069	71.4	71.2
	15	19.4	29.0	5.5	23.5	11.5	0.01208	67.1	67.0
	30	19.4	26.5	5.5	21.0	12.0	0.00869	60.0	59.8
	60	19.4	24.0	5.5	18.5	12.4	0.00625	52.8	52.7
	120	19.7	22.0	5.4	16.6	12.7	0.00446	47.3	47.2
	250	20.0	18.5	5.4	13.1	13.3	0.00315	37.4	37.4
	460	20.3	16.0	5.3	10.7	13.7	0.00234	30.4	30.4
4-Feb-14	1417	19.5	14.0	5.5	8.5	14.0	0.00137	24.3	24.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: J. Hines
 Checked by: C. Krous



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-55-55.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 55-55.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 165.19
 Weight Passing #10 (g): 163.46
 Weight Retained #10 (g): 1.73
 Weight of Hydrometer Sample (g): 36.80
 Calculated Weight of Sieve Sample (g): 37.19

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	165.19	100.00
	2"	50	0.00	0.00	165.19	100.00
	1.5"	38.1	0.00	0.00	165.19	100.00
	1"	25	0.00	0.00	165.19	100.00
	3/4"	19.0	0.00	0.00	165.19	100.00
	3/8"	9.5	0.00	0.00	165.19	100.00
	4	4.75	1.20	1.20	163.99	99.27
	10	2.00	0.53	1.73	163.46	98.95
-10	(Based on calculated sieve wt.)					
	20	0.85	1.24	1.63	35.56	95.62
	40	0.425	1.28	2.91	34.28	92.18
	60	0.250	1.21	4.12	33.07	88.92
	140	0.106	2.05	6.17	31.02	83.41
	200	0.075	0.74	6.91	30.28	81.42
	dry pan			0.22	7.13	30.06
wet pan				30.06	0.00	

d₁₀ (mm): 0.00056 d₅₀ (mm): 0.0063
 d₁₆ (mm): 0.00090 d₆₀ (mm): 0.012
 d₃₀ (mm): 0.0025 d₈₄ (mm): 0.12

Median Particle Diameter--d₅₀ (mm): 0.0063
 Uniformity Coefficient, C_u--[d₆₀/d₁₀] (mm): 21
 Coefficient of Curvature, C_c--[(d₃₀)²/(d₁₀*d₆₀)] (mm): 0.93
 Mean Particle Diameter--[(d₁₆+d₅₀+d₈₄)/3] (mm): 0.042

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Loam

Laboratory analysis by: J. Bray
 Data entered by: J. Hines
 Checked by: C. Krous



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-55-55.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 55-55.5
 Test Date: 3-Feb-14
 Start Time: 9:36

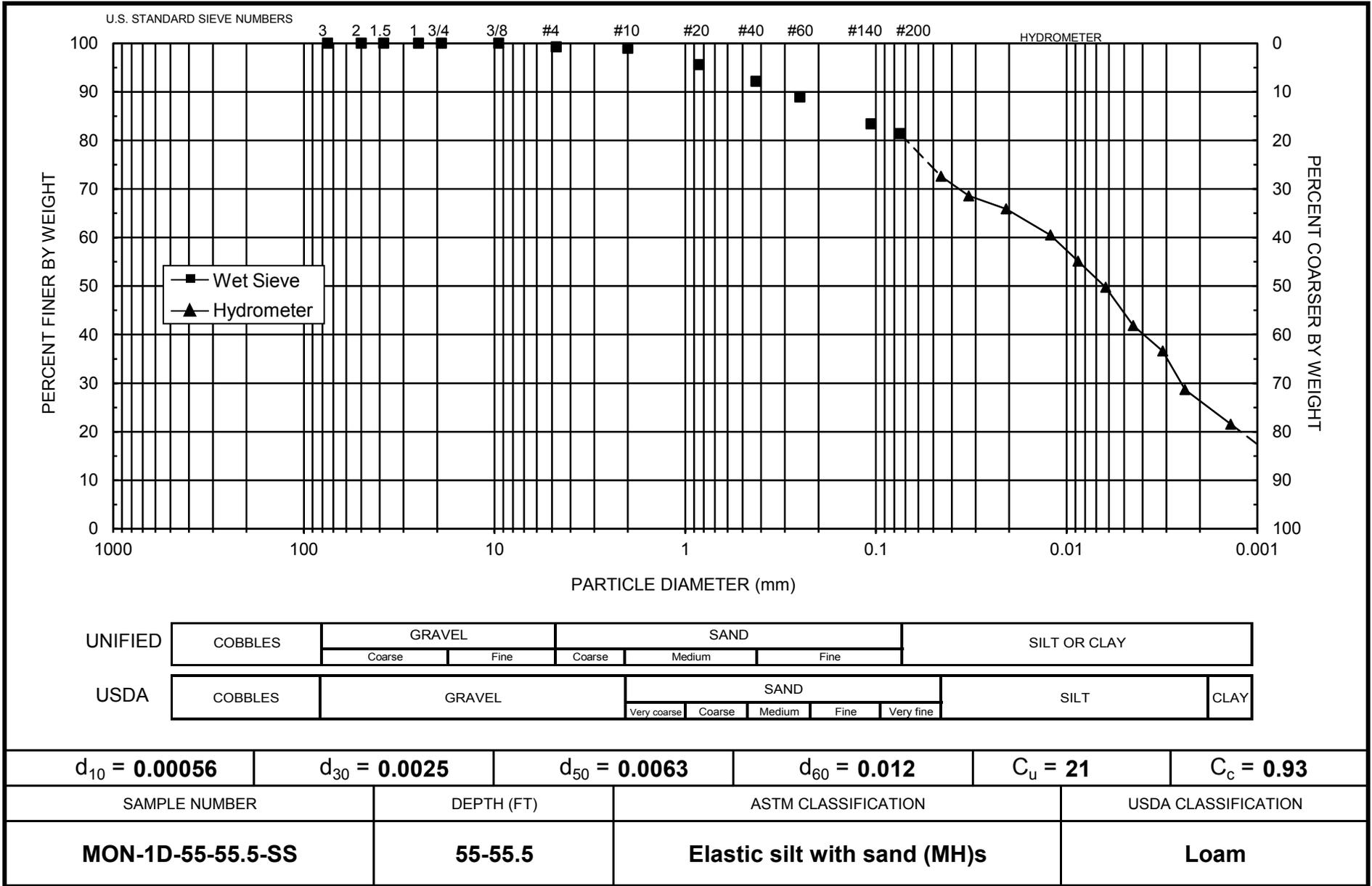
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 36.80
 Total Sample Wt. (g): 165.19
 Wt. Passing #10 (g): 163.46

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	32.5	5.5	27.0	11.0	0.04553	73.4	72.6
	2	19.4	31.0	5.5	25.5	11.2	0.03255	69.3	68.6
	5	19.4	30.0	5.5	24.5	11.4	0.02074	66.6	65.9
	15	19.4	28.0	5.5	22.5	11.7	0.01214	61.1	60.5
	30	19.4	26.0	5.5	20.5	12.0	0.00871	55.7	55.1
	60	19.4	24.0	5.5	18.5	12.4	0.00624	50.3	49.7
	120	19.8	21.0	5.4	15.6	12.9	0.00447	42.3	41.9
	250	20.0	19.0	5.4	13.6	13.2	0.00313	37.0	36.6
	440	20.3	16.0	5.3	10.7	13.7	0.00239	29.0	28.7
4-Feb-14	1397	19.5	13.5	5.5	8.0	14.1	0.00138	21.8	21.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: J. Hines
 Checked by: C. Krous



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-65-65.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 65-65.5
 Test Date: 6-Feb-14

Initial Dry Weight of Sample (g): 193.27
 Weight Passing #10 (g): 193.27
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 43.03
 Calculated Weight of Sieve Sample (g): 43.03

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	193.27	100.00	
	2"	50	0.00	0.00	193.27	100.00	
	1.5"	38.1	0.00	0.00	193.27	100.00	
	1"	25	0.00	0.00	193.27	100.00	
	3/4"	19.0	0.00	0.00	193.27	100.00	
	3/8"	9.5	0.00	0.00	193.27	100.00	
	4	4.75	0.00	0.00	193.27	100.00	
	10	2.00	0.00	0.00	193.27	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	1.76	1.76	41.27	95.91	
	40	0.425	3.72	5.48	37.55	87.26	
	60	0.250	2.72	8.20	34.83	80.94	
	140	0.106	2.29	10.49	32.54	75.62	
	200	0.075	0.46	10.95	32.08	74.55	
	dry pan			0.05	11.00	32.03	
	wet pan				32.03	0.00	

d₁₀ (mm): 0.0015 d₅₀ (mm): 0.015
 d₁₆ (mm): 0.0022 d₆₀ (mm): 0.053
 d₃₀ (mm): 0.0039 d₈₄ (mm): 0.32

Median Particle Diameter--d₅₀ (mm): 0.015
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 35
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.19
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 0.11

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: J. Hines
 Checked by: C. Krous



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-65-65.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 65-65.5
 Test Date: 4-Feb-14
 Start Time: 9:30

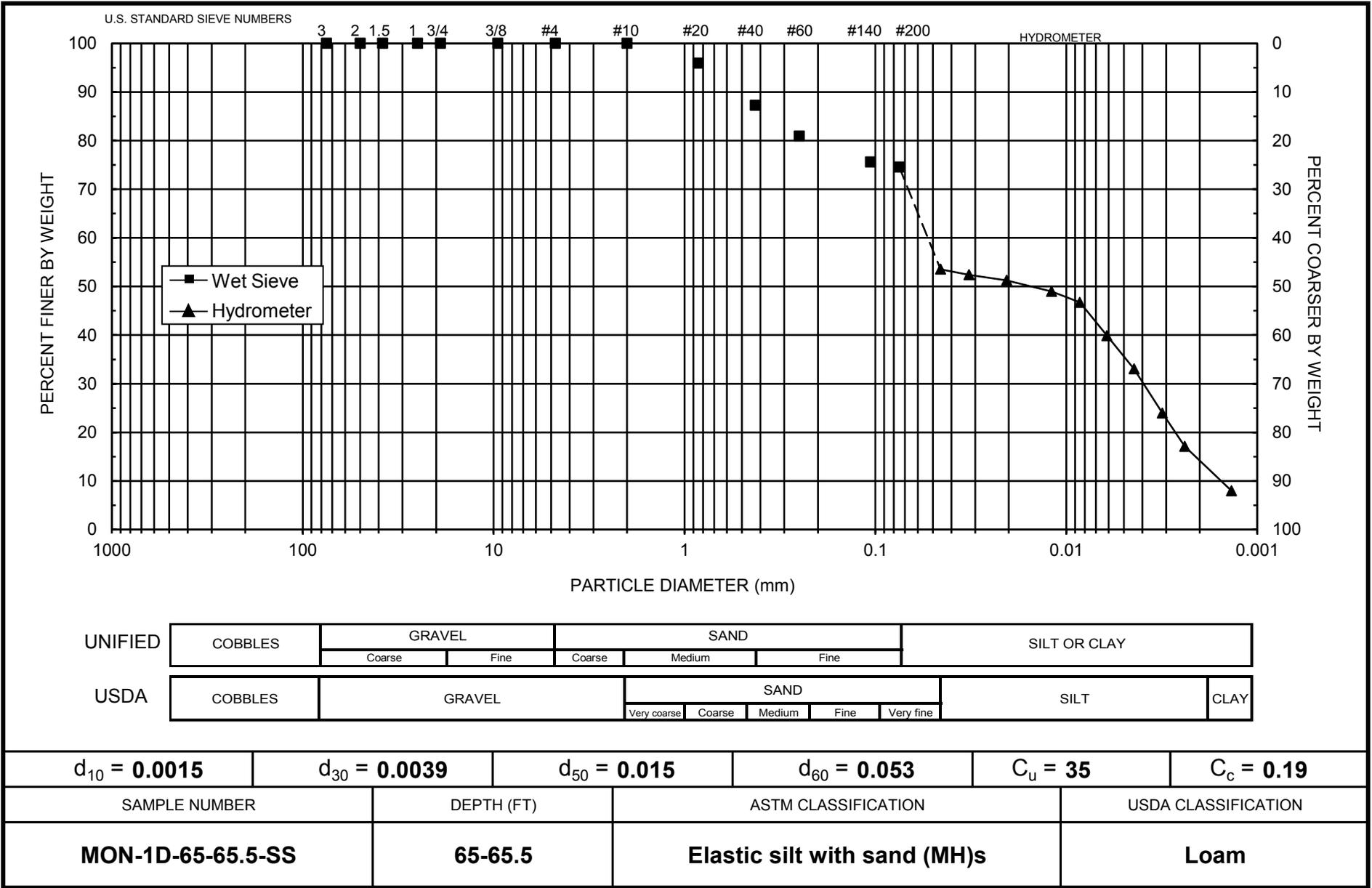
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.73
 Initial Wt. (g): 43.03
 Total Sample Wt. (g): 193.27
 Wt. Passing #10 (g): 193.27

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
4-Feb-14	1	19.5	29.0	5.5	23.5	11.5	0.04555	53.5	53.5
	2	19.5	28.5	5.5	23.0	11.6	0.03232	52.4	52.4
	5	19.5	28.0	5.5	22.5	11.7	0.02051	51.3	51.3
	15	19.5	27.0	5.5	21.5	11.9	0.01193	49.0	49.0
	30	19.5	26.0	5.5	20.5	12.0	0.00849	46.7	46.7
	60	19.5	23.0	5.5	17.5	12.5	0.00613	39.9	39.9
	120	19.5	20.0	5.5	14.5	13.0	0.00442	33.0	33.0
	250	19.5	16.0	5.5	10.5	13.7	0.00314	23.9	23.9
	443	19.5	13.0	5.5	7.5	14.2	0.00240	17.1	17.1
5-Feb-14	1441	19.3	9.0	5.5	3.5	14.8	0.00136	7.9	7.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: J. Hines
 Checked by: C. Krous



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-75-75.5-SS
 Date Sampled: 12/11/2013
 Depth (ft): 75-75.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 176.45
 Weight Passing #10 (g): 172.94
 Weight Retained #10 (g): 3.51
 Weight of Hydrometer Sample (g): 42.44
 Calculated Weight of Sieve Sample (g): 43.30

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	176.45	100.00
	2"	50	0.00	0.00	176.45	100.00
	1.5"	38.1	0.00	0.00	176.45	100.00
	1"	25	0.00	0.00	176.45	100.00
	3/4"	19.0	0.00	0.00	176.45	100.00
	3/8"	9.5	0.00	0.00	176.45	100.00
	4	4.75	1.11	1.11	175.34	99.37
	10	2.00	2.40	3.51	172.94	98.01
-10	(Based on calculated sieve wt.)					
	20	0.85	7.56	8.42	34.88	80.55
	40	0.425	6.68	15.10	28.20	65.12
	60	0.250	4.83	19.93	23.37	53.97
	140	0.106	5.56	25.49	17.81	41.13
	200	0.075	1.54	27.03	16.27	37.57
	dry pan			0.22	27.25	16.05
wet pan				16.05	0.00	

d₁₀ (mm): 0.0030 d₅₀ (mm): 0.19
 d₁₆ (mm): 0.0058 d₆₀ (mm): 0.33
 d₃₀ (mm): 0.035 d₈₄ (mm): 1.0

Median Particle Diameter--d₅₀ (mm): 0.19
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 110
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.2
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.40

Classification of fines: MH

ASTM Soil Classification: Silty sand (SM)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-75-75.5-SS
 Date Sampled: 12/11/2013
 Depth (ft): 75-75.5
 Test Date: 3-Feb-14
 Start Time: 9:18

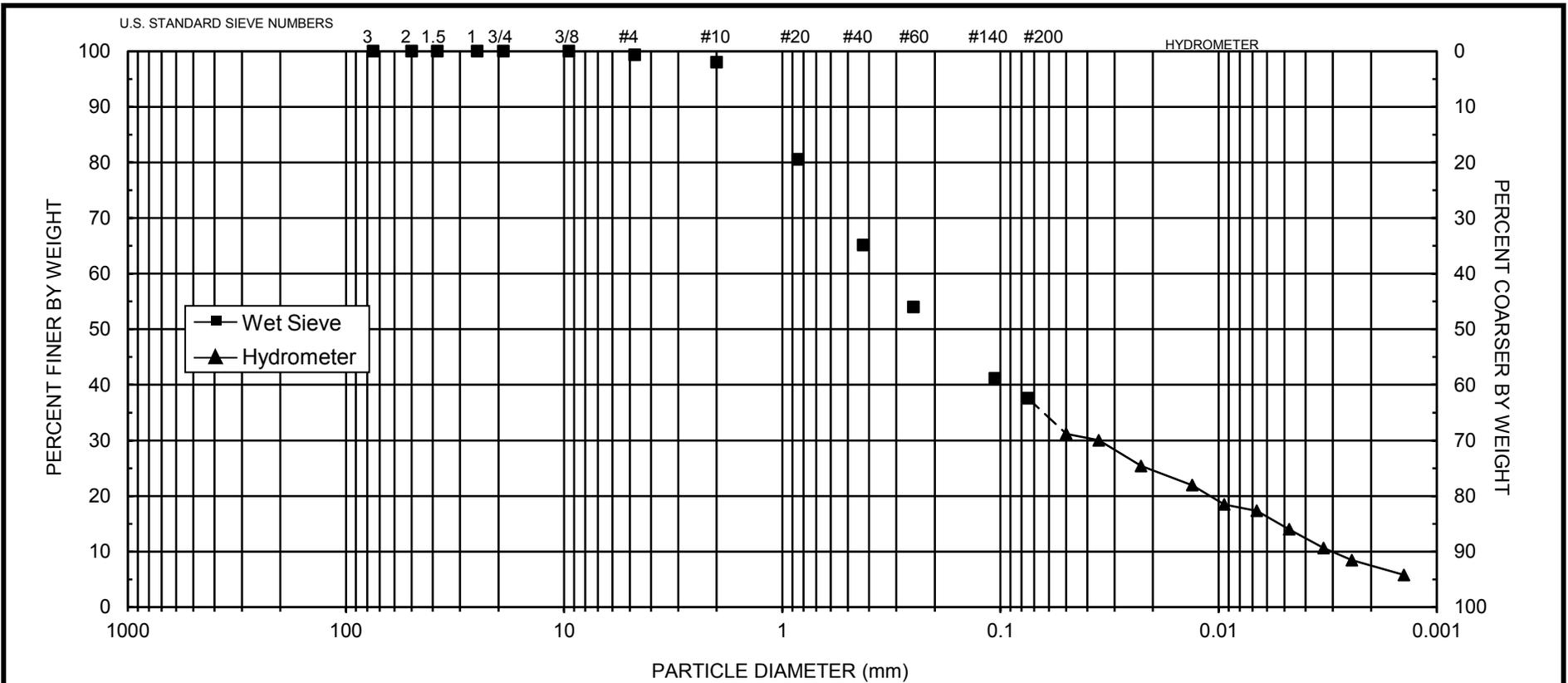
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 42.44
 Total Sample Wt. (g): 176.45
 Wt. Passing #10 (g): 172.94

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	19.0	5.5	13.5	13.2	0.04991	31.8	31.2
	2	19.4	18.5	5.5	13.0	13.3	0.03540	30.6	30.0
	5	19.4	16.5	5.5	11.0	13.6	0.02266	25.9	25.4
	15	19.4	15.0	5.5	9.5	13.8	0.01320	22.4	21.9
	30	19.4	13.5	5.5	8.0	14.1	0.00942	18.9	18.5
	60	19.4	13.0	5.5	7.5	14.2	0.00668	17.7	17.3
	120	19.7	11.5	5.4	6.1	14.4	0.00474	14.3	14.0
	250	20.0	10.0	5.4	4.6	14.7	0.00330	10.9	10.6
	455	20.3	9.0	5.3	3.7	14.8	0.00245	8.6	8.5
4-Feb-14	1412	19.5	8.0	5.5	2.5	15.0	0.00141	5.9	5.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY
		Very coarse	Coarse	Medium	Fine	Very fine				

$d_{10} = 0.0030$	$d_{30} = 0.035$	$d_{50} = 0.19$	$d_{60} = 0.33$	$C_u = 110$	$C_c = 1.2$
SAMPLE NUMBER		DEPTH (FT)	ASTM CLASSIFICATION		USDA CLASSIFICATION
MON-1D-75-75.5-SS		75-75.5	Silty sand (SM)		Sandy Loam



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-85-87.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 85-87.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 803.27
 Weight Passing #10 (g): 698.96
 Weight Retained #10 (g): 104.31
 Weight of Hydrometer Sample (g): 67.06
 Calculated Weight of Sieve Sample (g): 77.07

Shape: Rounded
 Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	803.27	100.00
	2"	50	0.00	0.00	803.27	100.00
	1.5"	38.1	0.00	0.00	803.27	100.00
	1"	25	0.00	0.00	803.27	100.00
	3/4"	19.0	0.00	0.00	803.27	100.00
	3/8"	9.5	17.64	17.64	785.63	97.80
	4	4.75	27.09	44.73	758.54	94.43
	10	2.00	59.58	104.31	698.96	87.01
-10	(Based on calculated sieve wt.)					
	20	0.85	11.87	21.88	55.19	71.61
	40	0.425	11.25	33.13	43.94	57.01
	60	0.250	7.75	40.88	36.19	46.96
	140	0.106	8.67	49.55	27.52	35.71
	200	0.075	2.53	52.08	24.99	32.43
	dry pan			0.45	52.53	24.54
wet pan				24.54	0.00	

d₁₀ (mm): 0.0047 d₅₀ (mm): 0.29
 d₁₆ (mm): 0.011 d₆₀ (mm): 0.49
 d₃₀ (mm): 0.061 d₈₄ (mm): 1.7

Median Particle Diameter--d₅₀ (mm): 0.29
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 104
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.6
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.67

Classification of fines (visual method): ML

ASTM Soil Classification: Silty sand (SM)
 USDA Soil Classification: Sandy Loam †

† Greater than 10% of sample is coarse material

Laboratory analysis by: J. Bray/S. Hanhardt
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-85-87.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 85-87.5
 Test Date: 31-Jan-14
 Start Time: 9:54

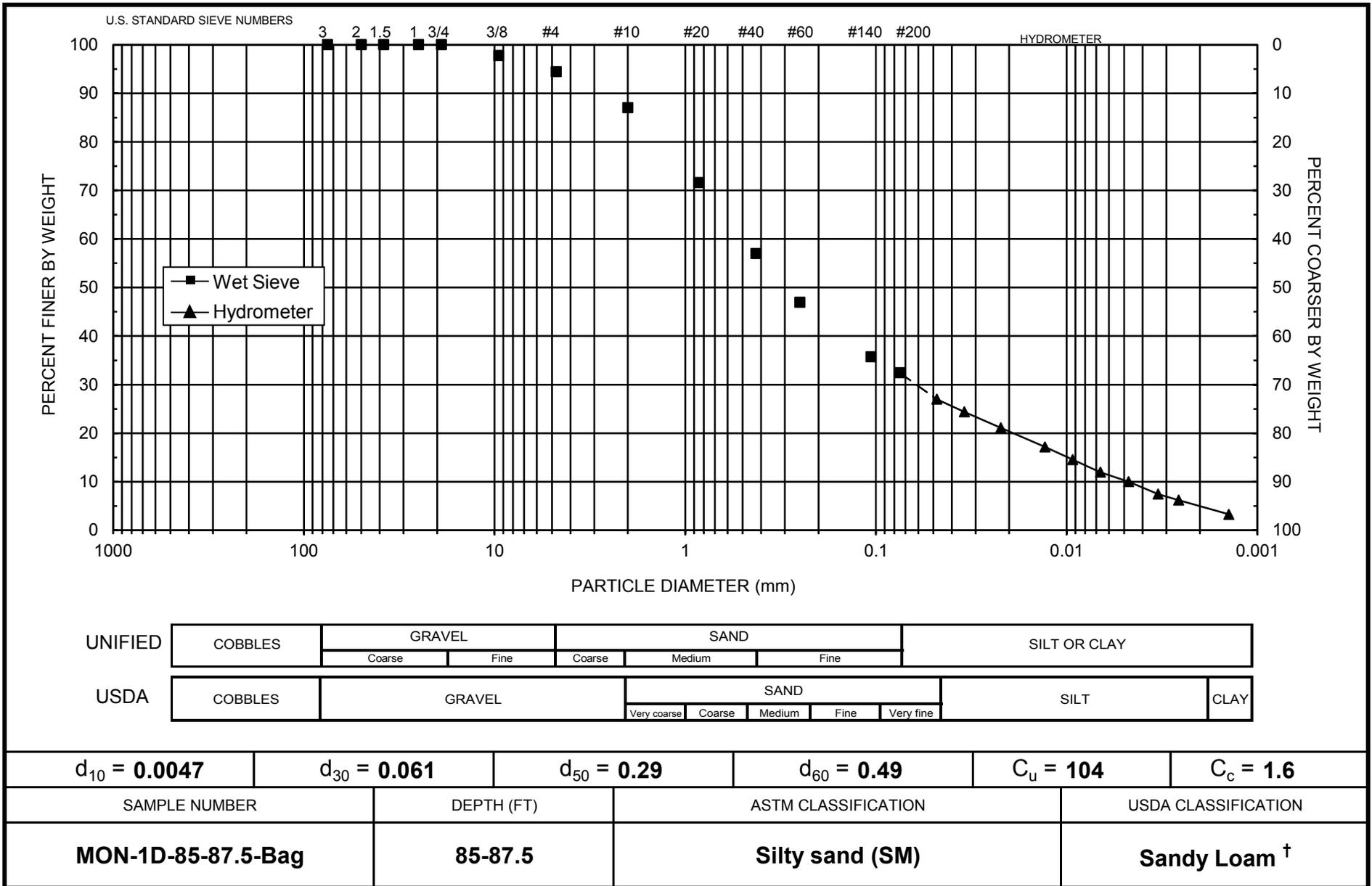
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.61
 Initial Wt. (g): 67.06
 Total Sample Wt. (g): 803.27
 Wt. Passing #10 (g): 698.96

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.9	26.0	5.4	20.6	12.0	0.04793	31.0	27.0
	2	19.9	24.0	5.4	18.6	12.4	0.03435	28.0	24.4
	5	19.9	21.5	5.4	16.1	12.8	0.02208	24.2	21.1
	15	20.0	18.5	5.4	13.1	13.3	0.01298	19.7	17.2
	30	20.0	16.5	5.4	11.1	13.6	0.00929	16.7	14.5
	60	20.0	14.5	5.4	9.1	13.9	0.00665	13.7	11.9
	120	20.2	13.0	5.4	7.6	14.2	0.00473	11.5	10.0
	250	20.4	11.0	5.3	5.7	14.5	0.00331	8.5	7.4
	411	20.7	10.0	5.3	4.7	14.7	0.00258	7.1	6.2
1-Feb-14	1462	19.3	8.0	5.5	2.5	15.0	0.00141	3.8	3.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



† Greater than 10% of sample is coarse material



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-92.5-95-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 92.5-95
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 800.83
 Weight Passing #10 (g): 659.37
 Weight Retained #10 (g): 141.46
 Weight of Hydrometer Sample (g): 66.84
 Calculated Weight of Sieve Sample (g): 81.18

Shape: Angular
 Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	800.83	100.00
	2"	50	0.00	0.00	800.83	100.00
	1.5"	38.1	0.00	0.00	800.83	100.00
	1"	25	0.00	0.00	800.83	100.00
	3/4"	19.0	0.00	0.00	800.83	100.00
	3/8"	9.5	34.38	34.38	766.45	95.71
	4	4.75	38.59	72.97	727.86	90.89
	10	2.00	68.49	141.46	659.37	82.34
-10	(Based on calculated sieve wt.)					
	20	0.85	7.47	21.81	59.37	73.13
	40	0.425	6.21	28.02	53.16	65.48
	60	0.250	4.70	32.72	48.46	59.69
	140	0.106	6.61	39.33	41.85	51.55
	200	0.075	2.16	41.49	39.69	48.89
	dry pan			0.22	41.71	39.47
wet pan				39.47	0.00	

d₁₀ (mm): 0.00086 d₅₀ (mm): 0.087
 d₁₆ (mm): 0.0021 d₆₀ (mm): 0.26
 d₃₀ (mm): 0.0091 d₈₄ (mm): 2.4

Median Particle Diameter--d₅₀ (mm): 0.087
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 302
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.37
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.83

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: ML

ASTM Soil Classification: Silty sand (SM)
 USDA Soil Classification: Loam †

† Greater than 10% of sample is coarse material

Laboratory analysis by: J. Bray/S. Hanhardt
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-92.5-95-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 92.5-95
 Test Date: 31-Jan-14
 Start Time: 9:48

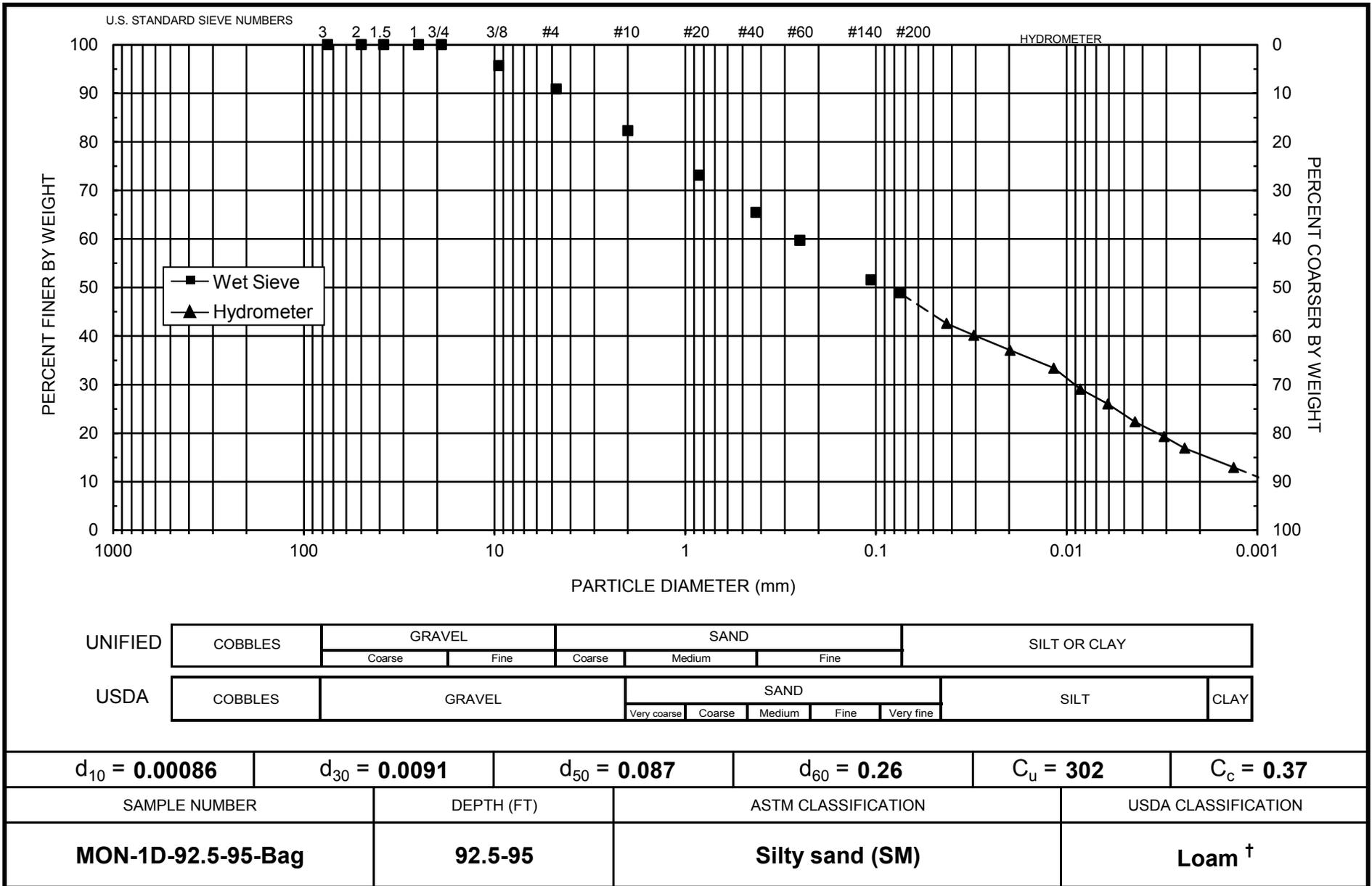
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 66.84
 Total Sample Wt. (g): 800.83
 Wt. Passing #10 (g): 659.37

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.9	40.0	5.4	34.6	9.7	0.04261	51.8	42.6
	2	19.9	38.0	5.4	32.6	10.1	0.03063	48.8	40.1
	5	19.9	35.5	5.4	30.1	10.5	0.01976	45.0	37.1
	15	20.0	32.5	5.4	27.1	11.0	0.01167	40.5	33.4
	30	20.0	29.0	5.4	23.6	11.5	0.00846	35.3	29.1
	60	20.0	26.5	5.4	21.1	12.0	0.00609	31.6	26.0
	120	20.2	23.5	5.4	18.1	12.4	0.00438	27.1	22.3
	250	20.4	21.0	5.3	15.7	12.9	0.00308	23.4	19.3
	416	20.7	19.0	5.3	13.7	13.2	0.00240	20.5	16.9
1-Feb-14	1467	19.3	16.0	5.5	10.5	13.7	0.00133	15.7	12.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



† Greater than 10% of sample is coarse material

Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-102-103-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 102-103
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 811.61
 Weight Passing #10 (g): 582.37
 Weight Retained #10 (g): 229.24
 Weight of Hydrometer Sample (g): 41.89
 Calculated Weight of Sieve Sample (g): 58.38

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	811.61	100.00
	2"	50	0.00	0.00	811.61	100.00
	1.5"	38.1	0.00	0.00	811.61	100.00
	1"	25	0.00	0.00	811.61	100.00
	3/4"	19.0	11.69	11.69	799.92	98.56
	3/8"	9.5	41.95	53.64	757.97	93.39
	4	4.75	75.05	128.69	682.92	84.14
	10	2.00	100.55	229.24	582.37	71.75
-10			(Based on calculated sieve wt.)			
	20	0.85	5.51	22.00	36.38	62.32
	40	0.425	3.70	25.70	32.68	55.98
	60	0.250	2.54	28.24	30.14	51.63
	140	0.106	4.13	32.37	26.01	44.55
	200	0.075	1.46	33.83	24.55	42.05
	dry pan		0.18	34.01	24.37	
	wet pan			24.37	0.00	

d₁₀ (mm): 0.0018 d₅₀ (mm): 0.21
 d₁₆ (mm): 0.0037 d₆₀ (mm): 0.66
 d₃₀ (mm): 0.018 d₈₄ (mm): 4.7

Median Particle Diameter--d₅₀ (mm): 0.21
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 367
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.27
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 1.6

Classification of fines: CL

ASTM Soil Classification: Clayey sand with gravel (SC)g
 USDA Soil Classification: Loam †

† Greater than 10% of sample is coarse material

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: J. Hines
 Checked by: C. Krous



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-102-103-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 102-103
 Test Date: 3-Feb-14
 Start Time: 9:42

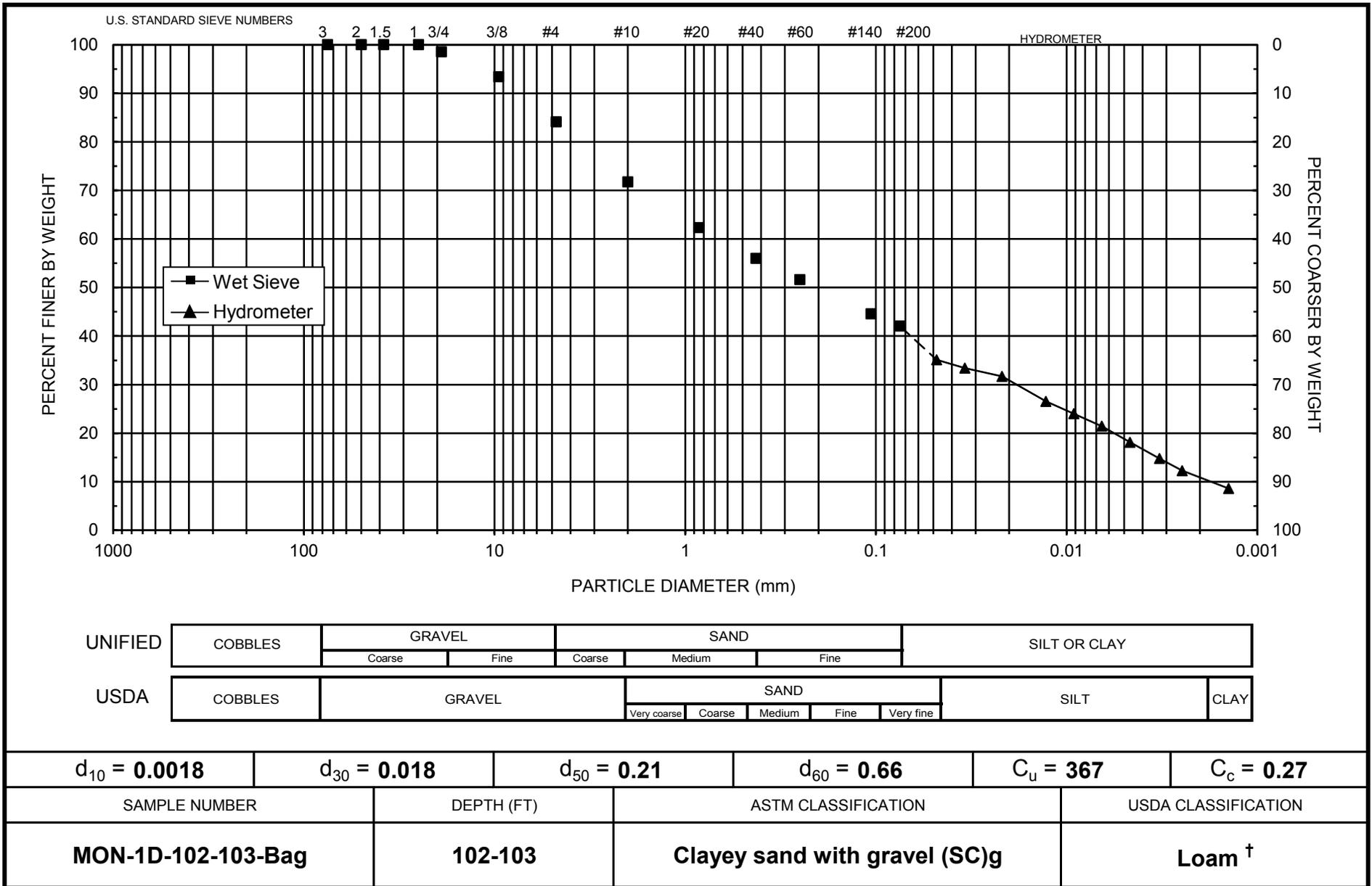
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.63
 Initial Wt. (g): 41.89
 Total Sample Wt. (g): 811.61
 Wt. Passing #10 (g): 582.37

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	26.0	5.5	20.5	12.0	0.04805	48.9	35.1
	2	19.4	25.0	5.5	19.5	12.2	0.03420	46.6	33.4
	5	19.4	24.0	5.5	18.5	12.4	0.02178	44.2	31.7
	15	19.4	21.0	5.5	15.5	12.9	0.01282	37.0	26.6
	30	19.4	19.5	5.5	14.0	13.1	0.00915	33.4	24.0
	60	19.4	18.0	5.5	12.5	13.3	0.00653	29.8	21.4
	120	19.8	16.0	5.4	10.6	13.7	0.00465	25.2	18.1
	250	20.0	14.0	5.4	8.6	14.0	0.00325	20.6	14.7
	435	20.3	12.5	5.3	7.2	14.3	0.00247	17.1	12.3
	4-Feb-14	1392	19.5	10.5	5.5	5.0	14.6	0.00142	12.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: J. Hines
 Checked by: C. Krous



† Greater than 10% of sample is coarse material



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 587.65
 Weight Passing #10 (g): 472.63
 Weight Retained #10 (g): 115.02
 Weight of Hydrometer Sample (g): 65.76
 Calculated Weight of Sieve Sample (g): 81.76

Shape: Rounded
 Hardness: Weathered and friable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	587.65	100.00	
	2"	50	0.00	0.00	587.65	100.00	
	1.5"	38.1	0.00	0.00	587.65	100.00	
	1"	25	0.00	0.00	587.65	100.00	
	3/4"	19.0	7.14	7.14	580.51	98.78	
	3/8"	9.5	11.90	19.04	568.61	96.76	
	4	4.75	31.33	50.37	537.28	91.43	
	10	2.00	64.65	115.02	472.63	80.43	
-10	(Based on calculated sieve wt.)						
	20	0.85	13.35	29.35	52.41	64.10	
	40	0.425	9.26	38.61	43.15	52.77	
	60	0.250	5.83	44.44	37.32	45.64	
	140	0.106	7.65	52.09	29.67	36.29	
	200	0.075	2.59	54.68	27.08	33.12	
	dry pan			0.41	55.09	26.67	
	wet pan				26.67	0.00	

d₁₀ (mm): 0.0074 d₅₀ (mm): 0.35
 d₁₆ (mm): 0.014 d₆₀ (mm): 0.66
 d₃₀ (mm): 0.056 d₈₄ (mm): 2.6

Median Particle Diameter--d₅₀ (mm): 0.35
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 89
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.64
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.99

Classification of fines (visual method): ML

ASTM Soil Classification: Silty sand (SM)
 USDA Soil Classification: Sandy Loam †

† Greater than 10% of sample is coarse material

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5
 Test Date: 31-Jan-14
 Start Time: 9:36

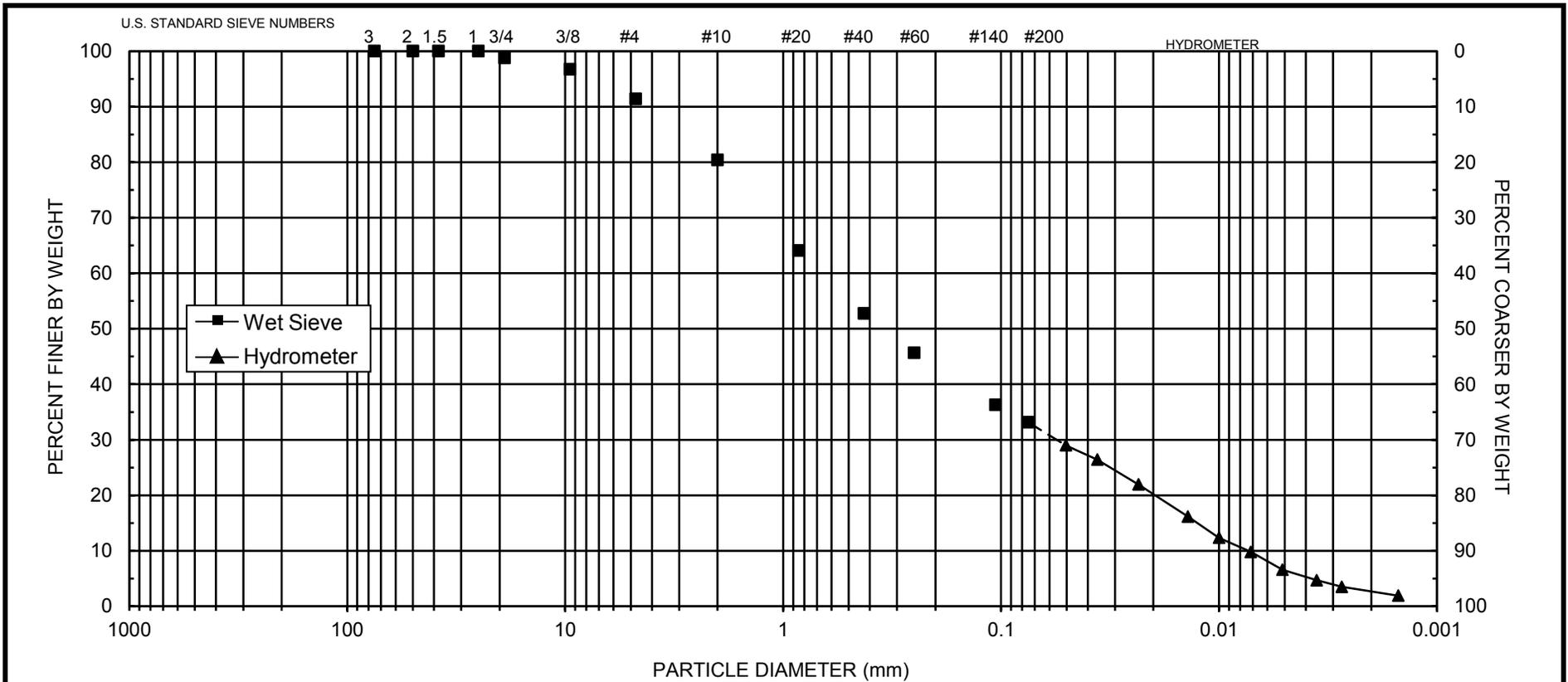
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.42
 Initial Wt. (g): 65.76
 Total Sample Wt. (g): 587.65
 Wt. Passing #10 (g): 472.63

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.9	28.0	5.4	22.6	11.7	0.05039	36.1	29.0
	2	19.9	26.0	5.4	20.6	12.0	0.03613	32.9	26.4
	5	19.9	22.5	5.4	17.1	12.6	0.02339	27.3	21.9
	15	19.9	18.0	5.4	12.6	13.3	0.01388	20.1	16.2
	30	20.0	15.0	5.4	9.6	13.8	0.00999	15.3	12.3
	60	20.0	13.0	5.4	7.6	14.2	0.00714	12.2	9.8
	120	20.1	10.5	5.4	5.1	14.6	0.00511	8.2	6.6
	250	20.3	9.0	5.3	3.7	14.8	0.00356	5.8	4.7
	426	20.7	8.0	5.3	2.7	15.0	0.00273	4.3	3.5
	1-Feb-14	1477	19.3	7.0	5.5	1.5	15.2	0.00150	2.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY
				Very coarse	Coarse	Medium	Fine	Very fine		

$d_{10} = 0.0074$	$d_{30} = 0.056$	$d_{50} = 0.35$	$d_{60} = 0.66$	$C_u = 89$	$C_c = 0.64$
SAMPLE NUMBER	DEPTH (FT)	ASTM CLASSIFICATION		USDA CLASSIFICATION	
MON-1D-119.5-120.5-Bag	119.5-120.5	Silty sand (SM)		Sandy Loam[†]	

† Greater than 10% of sample is coarse material



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-5.5-6-SS
 Date Sampled: 12/12/2013
 Depth (ft): 5.5-6
 Test Date: 6-Feb-14

Initial Dry Weight of Sample (g): 224.38
 Weight Passing #10 (g): 224.38
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 35.92
 Calculated Weight of Sieve Sample (g): 35.92

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	224.38	100.00	
	2"	50	0.00	0.00	224.38	100.00	
	1.5"	38.1	0.00	0.00	224.38	100.00	
	1"	25	0.00	0.00	224.38	100.00	
	3/4"	19.0	0.00	0.00	224.38	100.00	
	3/8"	9.5	0.00	0.00	224.38	100.00	
	4	4.75	0.00	0.00	224.38	100.00	
	10	2.00	0.00	0.00	224.38	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	2.58	2.58	33.34	92.82	
	40	0.425	1.64	4.22	31.70	88.25	
	60	0.250	1.35	5.57	30.35	84.49	
	140	0.106	2.44	8.01	27.91	77.70	
	200	0.075	1.00	9.01	26.91	74.92	
	dry pan			0.18	9.19	26.73	
	wet pan				26.73	0.00	

d₁₀ (mm): 0.0011 d₅₀ (mm): 0.0071
 d₁₆ (mm): 0.0016 d₆₀ (mm): 0.014
 d₃₀ (mm): 0.0031 d₈₄ (mm): 0.23

Median Particle Diameter--d₅₀ (mm): 0.0071
 Uniformity Coefficient, C_u--[d₆₀/d₁₀] (mm): 13
 Coefficient of Curvature, C_c--[(d₃₀)²/(d₁₀*d₆₀)] (mm): 0.62
 Mean Particle Diameter--[(d₁₆+d₅₀+d₈₄)/3] (mm): 0.080

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-5.5-6-SS
 Date Sampled: 12/12/2013
 Depth (ft): 5.5-6
 Test Date: 4-Feb-14
 Start Time: 9:12

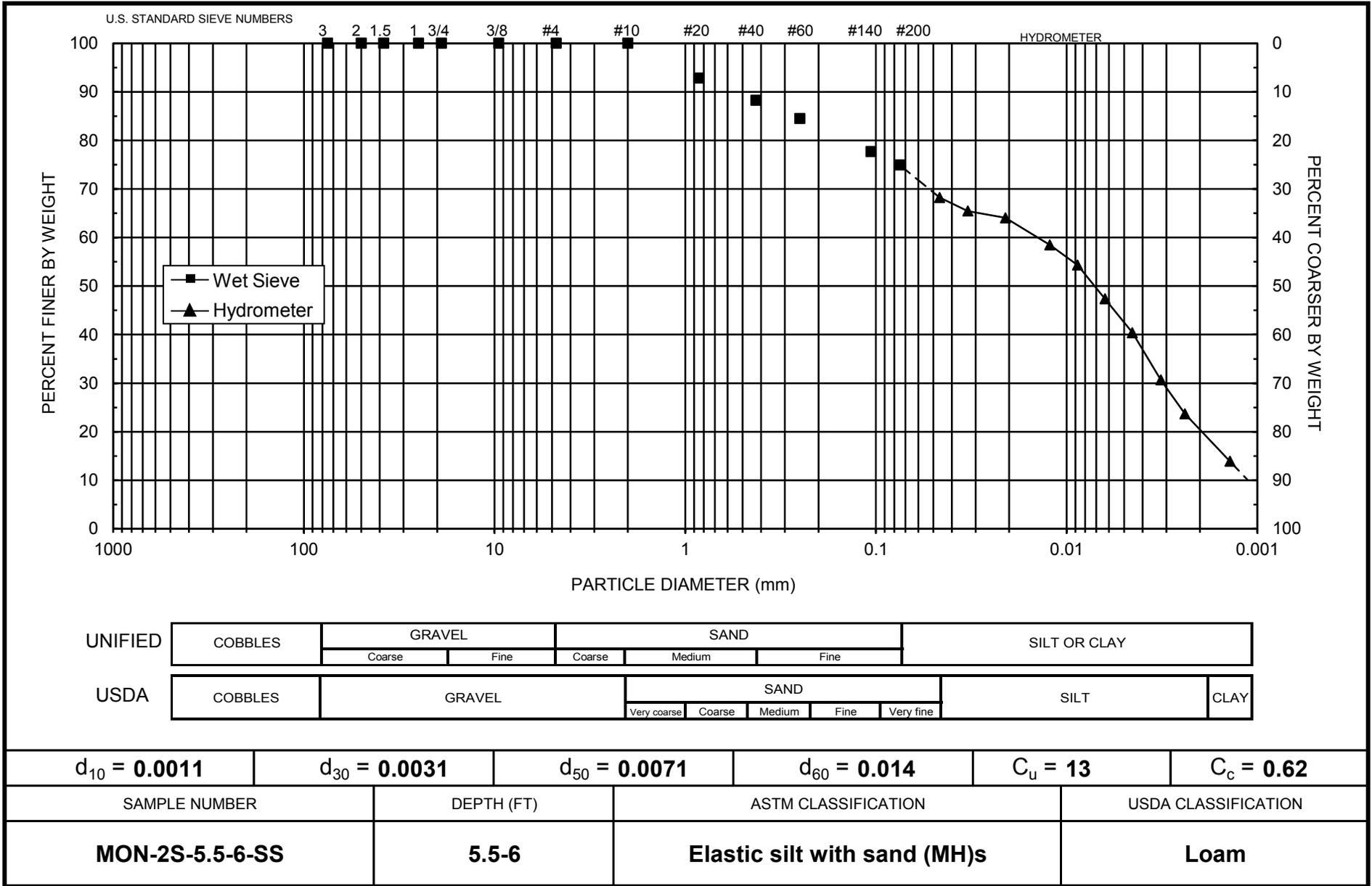
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 35.92
 Total Sample Wt. (g): 224.38
 Wt. Passing #10 (g): 224.38

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
4-Feb-14	1	19.5	30.0	5.5	24.5	11.4	0.04631	68.2	68.2
	2	19.5	29.0	5.5	23.5	11.5	0.03298	65.5	65.5
	5	19.5	28.5	5.5	23.0	11.6	0.02093	64.1	64.1
	15	19.5	26.5	5.5	21.0	12.0	0.01226	58.5	58.5
	30	19.5	25.0	5.5	19.5	12.2	0.00875	54.3	54.3
	60	19.5	22.5	5.5	17.0	12.6	0.00629	47.4	47.4
	120	19.5	20.0	5.5	14.5	13.0	0.00452	40.4	40.4
	250	19.5	16.5	5.5	11.0	13.6	0.00320	30.7	30.7
	460	19.5	14.0	5.5	8.5	14.0	0.00240	23.7	23.7
5-Feb-14	1424	19.3	10.5	5.5	5.0	14.6	0.00139	13.9	13.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.





**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-10.5-11-SS
 Date Sampled: 12/12/2013
 Depth (ft): 10.5-11
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 199.75
 Weight Passing #10 (g): 199.75
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 45.51
 Calculated Weight of Sieve Sample (g): 45.51

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	199.75	100.00
	2"	50	0.00	0.00	199.75	100.00
	1.5"	38.1	0.00	0.00	199.75	100.00
	1"	25	0.00	0.00	199.75	100.00
	3/4"	19.0	0.00	0.00	199.75	100.00
	3/8"	9.5	0.00	0.00	199.75	100.00
	4	4.75	0.00	0.00	199.75	100.00
	10	2.00	0.00	0.00	199.75	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	0.00	0.00	45.51	100.00
	40	0.425	0.03	0.03	45.48	99.93
	60	0.250	0.12	0.15	45.36	99.67
	140	0.106	0.62	0.77	44.74	98.31
	200	0.075	0.32	1.09	44.42	97.60
	dry pan		0.09	1.18	44.33	
wet pan			44.33	0.00		

d₁₀ (mm): 0.0024 d₅₀ (mm): 0.011
 d₁₆ (mm): 0.0035 d₆₀ (mm): 0.014
 d₃₀ (mm): 0.0062 d₈₄ (mm): 0.049

Median Particle Diameter--d₅₀ (mm): 0.011
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 5.8
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.1
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 0.021

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-10.5-11-SS
 Date Sampled: 12/12/2013
 Depth (ft): 10.5-11
 Test Date: 3-Feb-14
 Start Time: 9:30

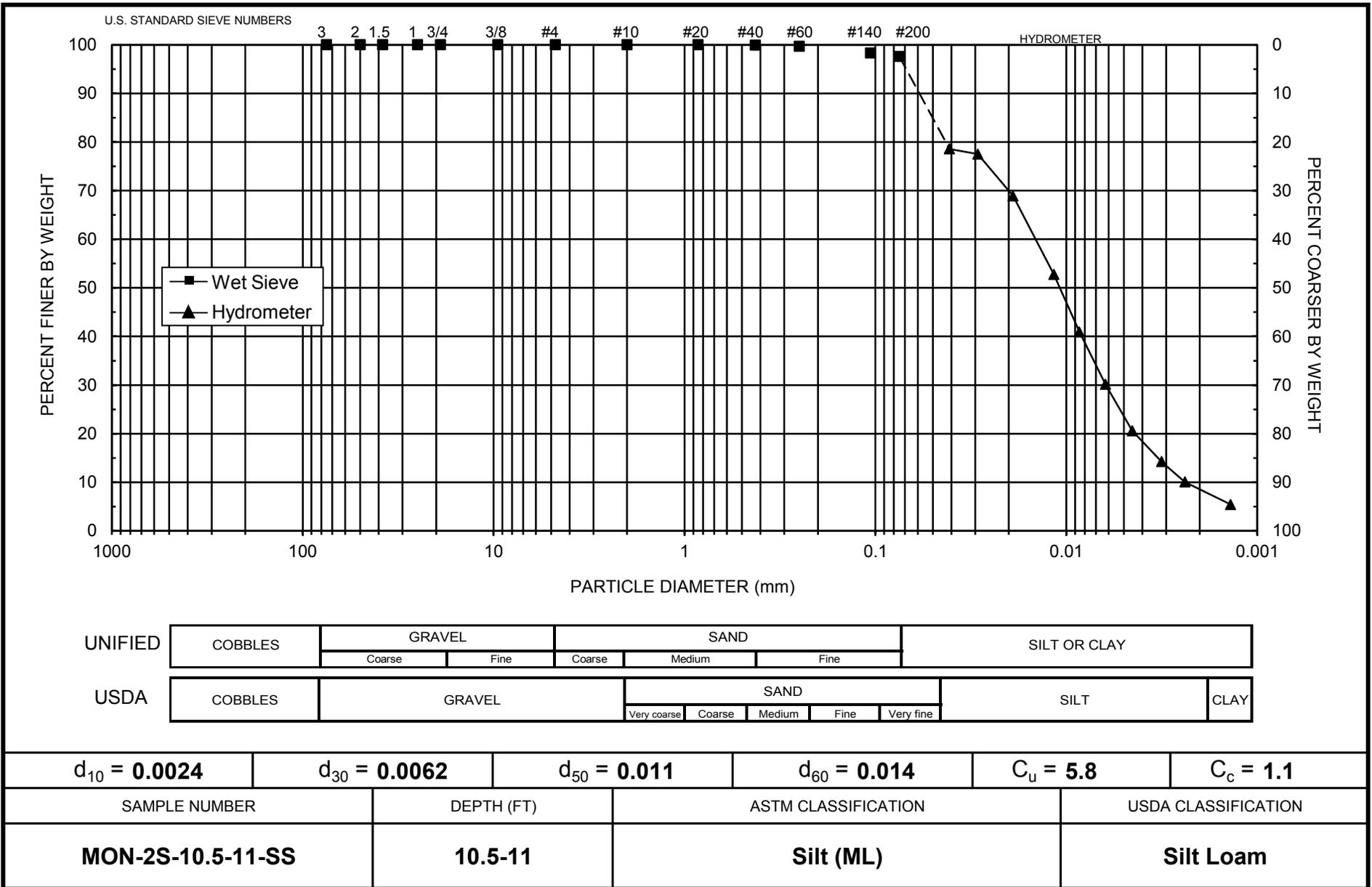
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.75
 Initial Wt. (g): 45.51
 Total Sample Wt. (g): 199.75
 Wt. Passing #10 (g): 199.75

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	42.0	5.5	36.5	9.4	0.04093	78.6	78.6
	2	19.4	41.5	5.5	36.0	9.5	0.02907	77.5	77.5
	5	19.4	37.5	5.5	32.0	10.2	0.01901	68.9	68.9
	15	19.4	30.0	5.5	24.5	11.4	0.01162	52.8	52.8
	30	19.4	24.5	5.5	19.0	12.3	0.00854	40.9	40.9
	60	19.4	19.5	5.5	14.0	13.1	0.00623	30.1	30.1
	120	19.7	15.0	5.4	9.6	13.8	0.00451	20.6	20.6
	250	20.0	12.0	5.4	6.6	14.3	0.00317	14.2	14.2
	445	20.3	10.0	5.3	4.7	14.7	0.00239	10.0	10.0
	4-Feb-14	1402	19.5	8.0	5.5	2.5	15.0	0.00138	5.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-21-21.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 21-21.5
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 216.63
 Weight Passing #10 (g): 216.63
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 36.77
 Calculated Weight of Sieve Sample (g): 36.77

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	216.63	100.00
	2"	50	0.00	0.00	216.63	100.00
	1.5"	38.1	0.00	0.00	216.63	100.00
	1"	25	0.00	0.00	216.63	100.00
	3/4"	19.0	0.00	0.00	216.63	100.00
	3/8"	9.5	0.00	0.00	216.63	100.00
	4	4.75	0.00	0.00	216.63	100.00
	10	2.00	0.00	0.00	216.63	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	0.66	0.66	36.11	98.21
	40	0.425	2.41	3.07	33.70	91.65
	60	0.250	2.43	5.50	31.27	85.04
	140	0.106	2.66	8.16	28.61	77.81
	200	0.075	0.78	8.94	27.83	75.69
	dry pan		0.29	9.23	27.54	
	wet pan			27.54	0.00	

d₁₀ (mm): 0.0019 d₅₀ (mm): 0.028
 d₁₆ (mm): 0.0031 d₆₀ (mm): 0.052
 d₃₀ (mm): 0.0083 d₈₄ (mm): 0.22

Median Particle Diameter--d₅₀ (mm): 0.028
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 27
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.70
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.084

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Loam

Laboratory analysis by: A. Bisoglio/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-21-21.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 21-21.5
 Test Date: 3-Feb-14
 Start Time: 9:48

Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.74
 Initial Wt. (g): 36.77
 Total Sample Wt. (g): 216.63
 Wt. Passing #10 (g): 216.63

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	26.0	5.5	20.5	12.0	0.04646	54.6	54.6
	2	19.4	25.0	5.5	19.5	12.2	0.03308	52.0	52.0
	5	19.4	23.0	5.5	17.5	12.5	0.02120	46.6	46.6
	15	19.4	20.5	5.5	15.0	12.9	0.01244	40.0	40.0
	30	19.4	17.0	5.5	11.5	13.5	0.00899	30.6	30.6
	60	19.5	16.0	5.5	10.5	13.7	0.00639	28.0	28.0
	120	19.8	14.0	5.4	8.6	14.0	0.00455	22.8	22.8
	250	20.1	11.5	5.4	6.1	14.4	0.00318	16.3	16.3
	430	20.3	10.0	5.3	4.7	14.7	0.00244	12.4	12.4
4-Feb-14	1388	19.5	8.0	5.5	2.5	15.0	0.00139	6.7	6.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-25.5-26-SS
 Date Sampled: 12/12/2013
 Depth (ft): 25.5-26
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 273.35
 Weight Passing #10 (g): 273.35
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 40.40
 Calculated Weight of Sieve Sample (g): 40.40

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	273.35	100.00
	2"	50	0.00	0.00	273.35	100.00
	1.5"	38.1	0.00	0.00	273.35	100.00
	1"	25	0.00	0.00	273.35	100.00
	3/4"	19.0	0.00	0.00	273.35	100.00
	3/8"	9.5	0.00	0.00	273.35	100.00
	4	4.75	0.00	0.00	273.35	100.00
	10	2.00	0.00	0.00	273.35	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	3.51	3.51	36.89	91.31
	40	0.425	2.73	6.24	34.16	84.55
	60	0.250	1.50	7.74	32.66	80.84
	140	0.106	6.71	14.45	25.95	64.23
	200	0.075	5.03	19.48	20.92	51.78
	dry pan		0.61	20.09	20.31	
	wet pan			20.31	0.00	

d₁₀ (mm): 0.011 d₅₀ (mm): 0.072
 d₁₆ (mm): 0.017 d₆₀ (mm): 0.094
 d₃₀ (mm): 0.039 d₈₄ (mm): 0.39

Median Particle Diameter--d₅₀ (mm): 0.072
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 8.5
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.5
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 0.16

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-25.5-26-SS
 Date Sampled: 12/12/2013
 Depth (ft): 25.5-26
 Test Date: 3-Feb-14
 Start Time: 9:24

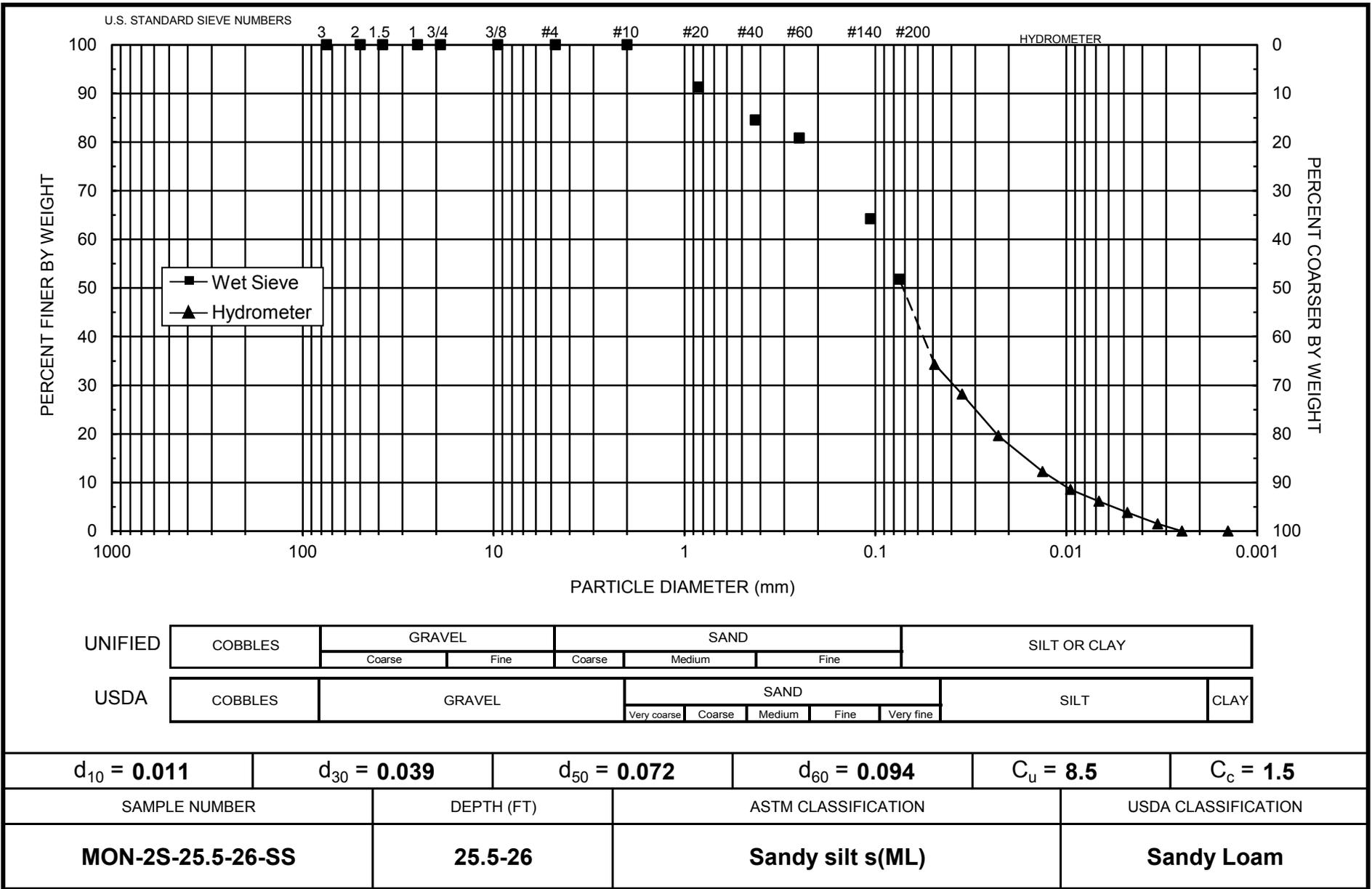
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.71
 Initial Wt. (g): 40.40
 Total Sample Wt. (g): 273.35
 Wt. Passing #10 (g): 273.35

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	19.5	5.5	14.0	13.1	0.04894	34.3	34.3
	2	19.4	17.0	5.5	11.5	13.5	0.03514	28.2	28.2
	5	19.4	13.5	5.5	8.0	14.1	0.02269	19.6	19.6
	15	19.4	10.5	5.5	5.0	14.6	0.01333	12.3	12.3
	30	19.4	9.0	5.5	3.5	14.8	0.00950	8.6	8.6
	60	19.5	8.0	5.5	2.5	15.0	0.00675	6.2	6.2
	120	19.7	7.0	5.4	1.6	15.2	0.00478	3.8	3.8
	250	20.0	6.0	5.4	0.6	15.3	0.00332	1.5	1.5
	450	20.3	5.0	5.0	0.0	15.5	0.00248	0.0	0.0
4-Feb-14	1407	19.5	4.5	4.5	0.0	15.6	0.00142	0.0	0.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-31-31.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 31-31.5
 Test Date: 6-Feb-14

Initial Dry Weight of Sample (g): 191.66
 Weight Passing #10 (g): 191.66
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 37.34
 Calculated Weight of Sieve Sample (g): 37.34

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	191.66	100.00	
	2"	50	0.00	0.00	191.66	100.00	
	1.5"	38.1	0.00	0.00	191.66	100.00	
	1"	25	0.00	0.00	191.66	100.00	
	3/4"	19.0	0.00	0.00	191.66	100.00	
	3/8"	9.5	0.00	0.00	191.66	100.00	
	4	4.75	0.00	0.00	191.66	100.00	
	10	2.00	0.00	0.00	191.66	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	3.70	3.70	33.64	90.09	
	40	0.425	3.98	7.68	29.66	79.43	
	60	0.250	3.54	11.22	26.12	69.95	
	140	0.106	4.46	15.68	21.66	58.01	
	200	0.075	1.40	17.08	20.26	54.26	
	dry pan			0.39	17.47	19.87	
	wet pan				19.87	0.00	

d₁₀ (mm): 0.0033 d₅₀ (mm): 0.067
 d₁₆ (mm): 0.0075 d₆₀ (mm): 0.12
 d₃₀ (mm): 0.025 d₈₄ (mm): 0.57

Median Particle Diameter--d₅₀ (mm): 0.067
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 36
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.6
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.21

Classification of fines: MH

ASTM Soil Classification: Sandy elastic silt s(MH)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-31-31.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 31-31.5
 Test Date: 31-Jan-14
 Start Time: 9:24

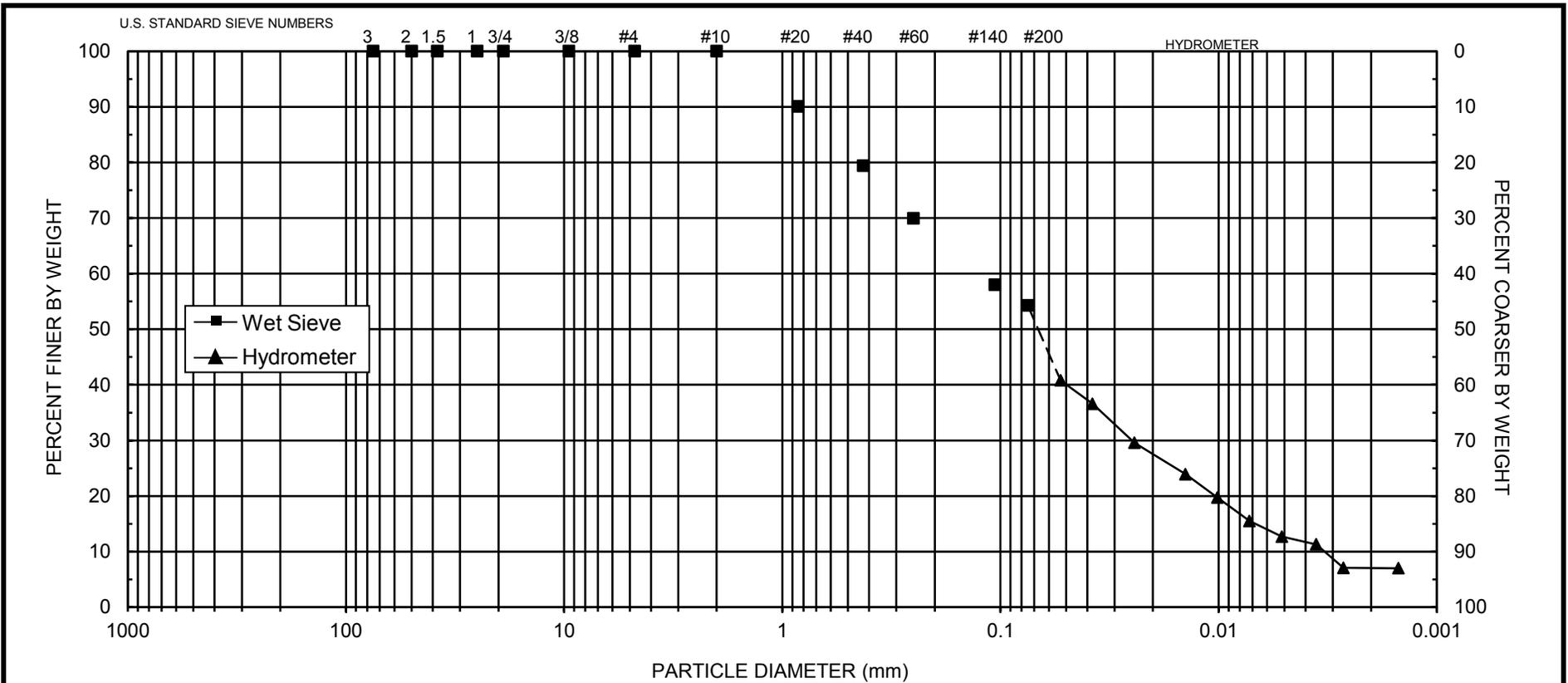
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.44
 Initial Wt. (g): 37.34
 Total Sample Wt. (g): 191.66
 Wt. Passing #10 (g): 191.66

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
4-Feb-14	1	19.5	20.0	5.5	14.5	13.0	0.05300	40.8	40.8
	2	19.5	18.5	5.5	13.0	13.3	0.03783	36.6	36.6
	5	19.5	16.0	5.5	10.5	13.7	0.02429	29.6	29.6
	15	19.5	14.0	5.5	8.5	14.0	0.01419	23.9	23.9
	30	19.5	12.5	5.5	7.0	14.3	0.01012	19.7	19.7
	60	19.5	11.0	5.5	5.5	14.5	0.00722	15.5	15.5
	120	19.5	10.0	5.5	4.5	14.7	0.00513	12.7	12.7
	250	19.5	9.5	5.5	4.0	14.7	0.00357	11.3	11.3
	450	19.5	8.0	5.5	2.5	15.0	0.00268	7.1	7.1
5-Feb-14	1443	19.3	8.0	5.5	2.5	15.0	0.00150	7.0	7.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY
				Very coarse	Coarse	Medium	Fine	Very fine		

$d_{10} = 0.0033$	$d_{30} = 0.025$	$d_{50} = 0.067$	$d_{60} = 0.12$	$C_u = 36$	$C_c = 1.6$
SAMPLE NUMBER	DEPTH (FT)	ASTM CLASSIFICATION		USDA CLASSIFICATION	
MON-2S-31-31.5-SS	31-31.5	Sandy elastic silt s(MH)		Sandy Loam	



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-40-40.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 40-40.5
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 151.03
 Weight Passing #10 (g): 150.11
 Weight Retained #10 (g): 0.92
 Weight of Hydrometer Sample (g): 35.83
 Calculated Weight of Sieve Sample (g): 36.05

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	151.03	100.00
	2"	50	0.00	0.00	151.03	100.00
	1.5"	38.1	0.00	0.00	151.03	100.00
	1"	25	0.00	0.00	151.03	100.00
	3/4"	19.0	0.00	0.00	151.03	100.00
	3/8"	9.5	0.00	0.00	151.03	100.00
	4	4.75	0.75	0.75	150.28	99.50
	10	2.00	0.17	0.92	150.11	99.39
-10	(Based on calculated sieve wt.)					
	20	0.85	0.62	0.84	35.21	97.67
	40	0.425	1.05	1.89	34.16	94.76
	60	0.250	1.70	3.59	32.46	90.04
	140	0.106	4.07	7.66	28.39	78.75
	200	0.075	1.65	9.31	26.74	74.18
	dry pan		0.56	9.87	26.18	
	wet pan			26.18	0.00	

d₁₀ (mm): 0.0024 d₅₀ (mm): 0.026
 d₁₆ (mm): 0.0048 d₆₀ (mm): 0.045
 d₃₀ (mm): 0.0099 d₈₄ (mm): 0.16

Median Particle Diameter--d₅₀ (mm): 0.026
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 19
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.91
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.064

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-40-40.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 40-40.5
 Test Date: 31-Jan-14
 Start Time: 9:24

Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.68
 Initial Wt. (g): 35.83
 Total Sample Wt. (g): 151.03
 Wt. Passing #10 (g): 150.11

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.8	27.5	5.4	22.1	11.8	0.04649	61.0	60.6
	2	19.8	25.5	5.4	20.1	12.1	0.03332	55.5	55.1
	5	19.8	22.0	5.4	16.6	12.7	0.02157	45.8	45.5
	15	19.9	19.0	5.4	13.6	13.2	0.01268	37.5	37.3
	30	19.9	15.5	5.4	10.1	13.8	0.00916	27.9	27.7
	60	20.0	13.5	5.4	8.1	14.1	0.00655	22.4	22.2
	120	20.1	11.0	5.4	5.6	14.5	0.00469	15.5	15.4
	250	20.3	9.5	5.3	4.2	14.7	0.00326	11.5	11.4
	434	20.7	9.0	5.3	3.7	14.8	0.00247	10.3	10.2
	1-Feb-14	1487	19.3	8.0	5.5	2.5	15.0	0.00137	6.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-10.5-11-SS
 Date Sampled: 12/16/2013
 Depth (ft): 10.5-11
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 168.49
 Weight Passing #10 (g): 168.49
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 33.66
 Calculated Weight of Sieve Sample (g): 33.66

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	168.49	100.00
	2"	50	0.00	0.00	168.49	100.00
	1.5"	38.1	0.00	0.00	168.49	100.00
	1"	25	0.00	0.00	168.49	100.00
	3/4"	19.0	0.00	0.00	168.49	100.00
	3/8"	9.5	0.00	0.00	168.49	100.00
	4	4.75	0.00	0.00	168.49	100.00
	10	2.00	0.00	0.00	168.49	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	0.18	0.18	33.48	99.47
	40	0.425	0.35	0.53	33.13	98.43
	60	0.250	0.39	0.92	32.74	97.27
	140	0.106	1.09	2.01	31.65	94.03
	200	0.075	0.64	2.65	31.01	92.13
	dry pan		0.17	2.82	30.84	
	wet pan			30.84	0.00	

d₁₀ (mm): 0.0013 d₅₀ (mm): 0.018
 d₁₆ (mm): 0.0025 d₆₀ (mm): 0.030
 d₃₀ (mm): 0.0060 d₈₄ (mm): 0.064

Median Particle Diameter--d₅₀ (mm): 0.018
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 23
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.92
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.028

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt (MH)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-10.5-11-SS
 Date Sampled: 12/16/2013
 Depth (ft): 10.5-11
 Test Date: 31-Jan-14
 Start Time: 9:18

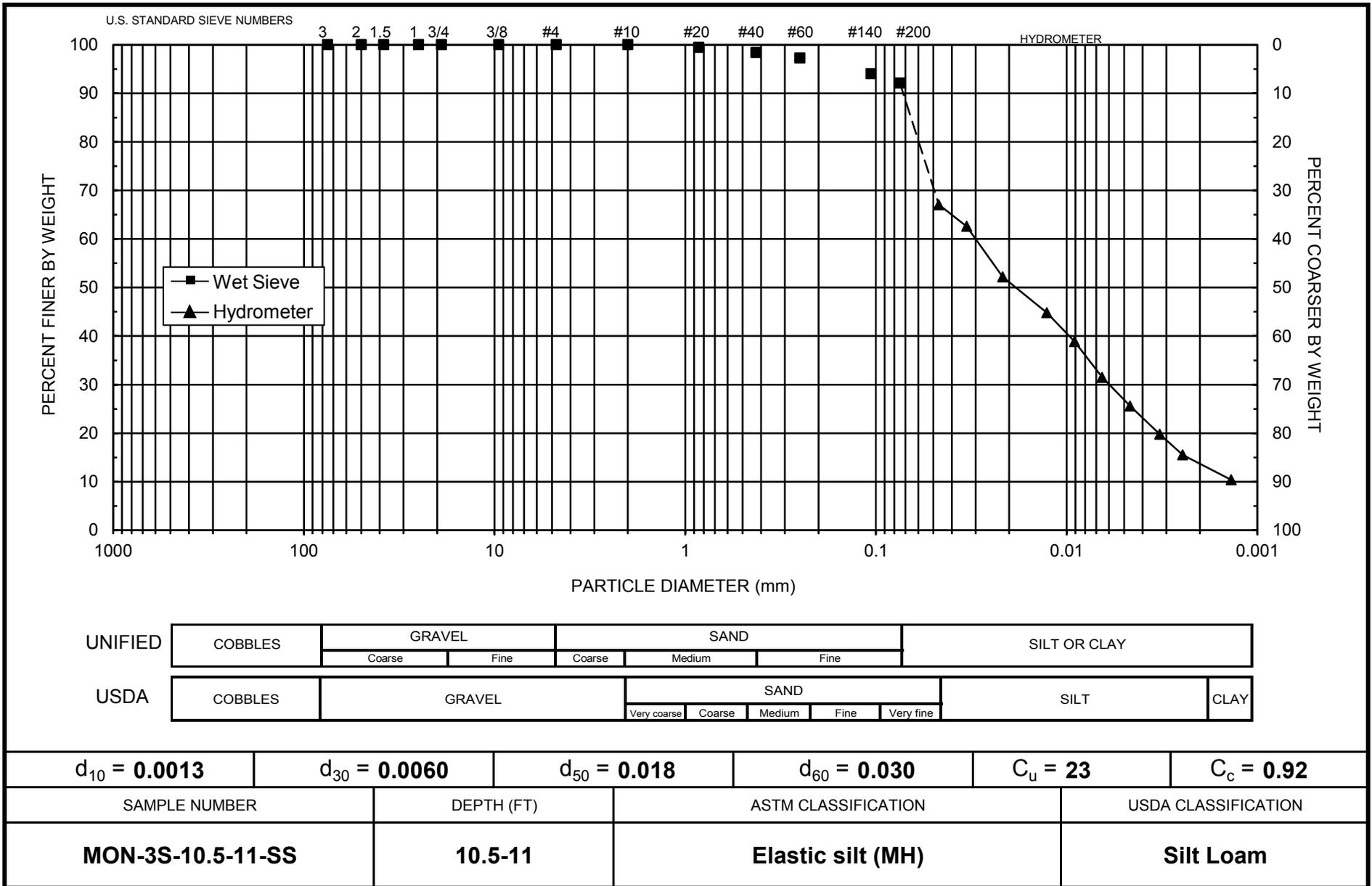
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 33.66
 Total Sample Wt. (g): 168.49
 Wt. Passing #10 (g): 168.49

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.8	28.0	5.4	22.6	11.7	0.04677	67.1	67.1
	2	19.8	26.5	5.4	21.1	12.0	0.03342	62.6	62.6
	5	19.8	23.0	5.4	17.6	12.5	0.02164	52.2	52.2
	15	19.9	20.5	5.4	15.1	12.9	0.01269	44.8	44.8
	30	19.9	18.5	5.4	13.1	13.3	0.00908	38.9	38.9
	60	20.0	16.0	5.4	10.6	13.7	0.00651	31.5	31.5
	120	20.1	14.0	5.4	8.6	14.0	0.00465	25.6	25.6
	250	20.3	12.0	5.3	6.7	14.3	0.00325	19.8	19.8
	439	20.7	10.5	5.3	5.2	14.6	0.00246	15.5	15.5
	1-Feb-14	1492	19.3	9.0	5.5	3.5	14.8	0.00137	10.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-20.5-21-SS
 Date Sampled: 12/16/2013
 Depth (ft): 20.5-21
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 174.14
 Weight Passing #10 (g): 174.14
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 35.00
 Calculated Weight of Sieve Sample (g): 35.00
 Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	174.14	100.00	
	2"	50	0.00	0.00	174.14	100.00	
	1.5"	38.1	0.00	0.00	174.14	100.00	
	1"	25	0.00	0.00	174.14	100.00	
	3/4"	19.0	0.00	0.00	174.14	100.00	
	3/8"	9.5	0.00	0.00	174.14	100.00	
	4	4.75	0.00	0.00	174.14	100.00	
	10	2.00	0.00	0.00	174.14	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	0.01	0.01	34.99	99.97	
	40	0.425	0.01	0.02	34.98	99.94	
	60	0.250	0.02	0.04	34.96	99.89	
	140	0.106	0.08	0.12	34.88	99.66	
	200	0.075	0.05	0.17	34.83	99.51	
	dry pan			0.01	0.18	34.82	
	wet pan				34.82	0.00	

d₁₀ (mm): 0.0018 d₅₀ (mm): 0.010
 d₁₆ (mm): 0.0032 d₆₀ (mm): 0.013
 d₃₀ (mm): 0.0059 d₈₄ (mm): 0.042

Median Particle Diameter--d₅₀ (mm): 0.010
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 7.2
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.5
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.018

Classification of fines: MH

ASTM Soil Classification: Elastic silt (MH)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-20.5-21-SS
 Date Sampled: 12/16/2013
 Depth (ft): 20.5-21
 Test Date: 31-Jan-14
 Start Time: 9:42

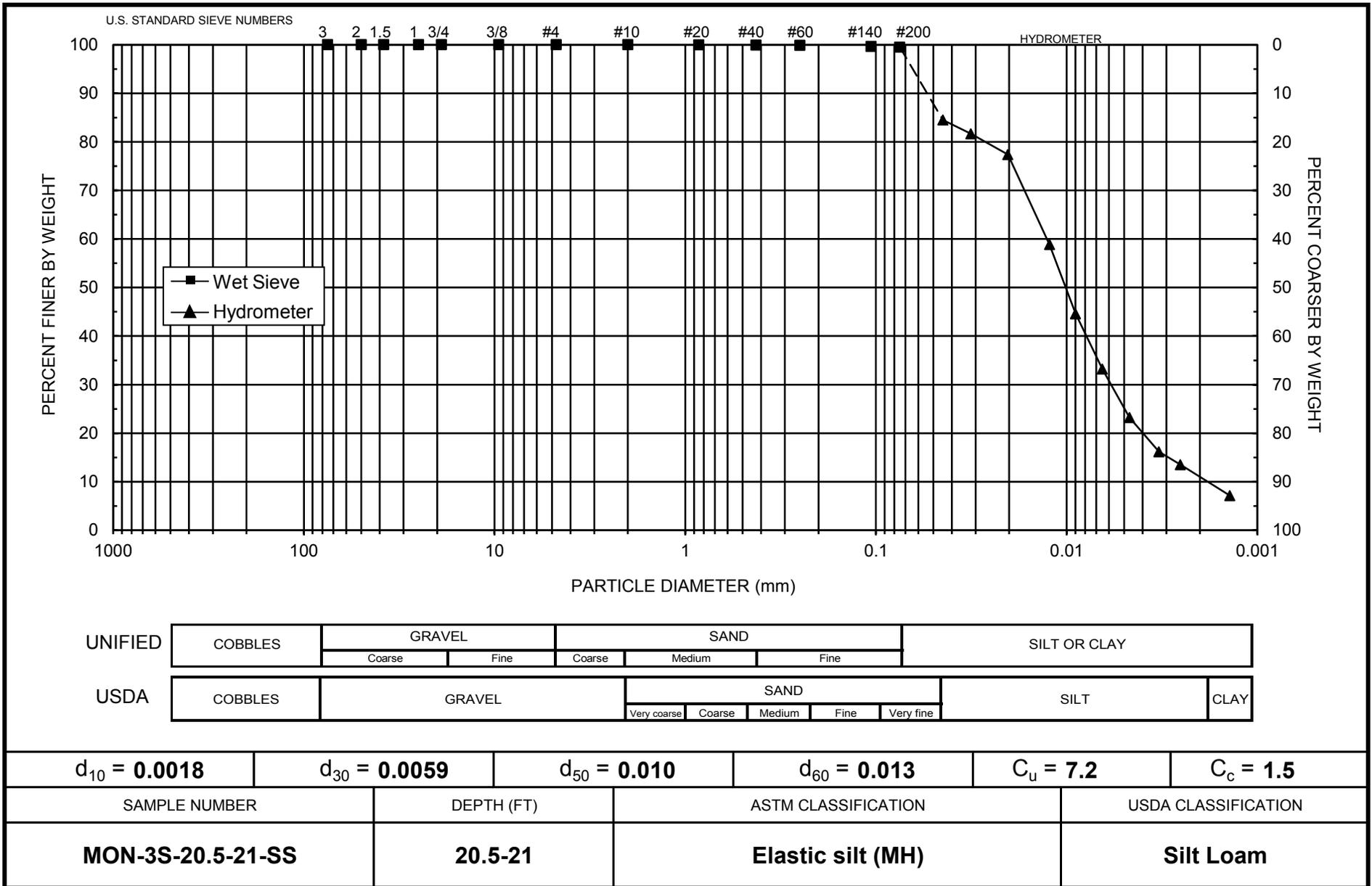
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.64
 Initial Wt. (g): 35.00
 Total Sample Wt. (g): 174.14
 Wt. Passing #10 (g): 174.14

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.9	35.0	5.4	29.6	10.6	0.04459	84.5	84.5
	2	19.9	34.0	5.4	28.6	10.7	0.03177	81.7	81.7
	5	19.9	32.5	5.4	27.1	11.0	0.02032	77.4	77.4
	15	19.9	26.0	5.4	20.6	12.0	0.01228	58.8	58.8
	30	20.0	21.0	5.4	15.6	12.9	0.00897	44.6	44.6
	60	20.0	17.0	5.4	11.6	13.5	0.00650	33.2	33.2
	120	20.1	13.5	5.4	8.1	14.1	0.00468	23.2	23.2
	250	20.4	11.0	5.3	5.7	14.5	0.00328	16.2	16.2
	421	20.7	10.0	5.3	4.7	14.7	0.00253	13.5	13.5
1-Feb-14	1472	19.3	8.0	5.5	2.5	15.0	0.00139	7.1	7.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-30.5-31-SS
 Date Sampled: 12/17/2013
 Depth (ft): 30.5-31
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 175.44
 Weight Passing #10 (g): 175.44
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 35.41
 Calculated Weight of Sieve Sample (g): 35.41

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	175.44	100.00
	2"	50	0.00	0.00	175.44	100.00
	1.5"	38.1	0.00	0.00	175.44	100.00
	1"	25	0.00	0.00	175.44	100.00
	3/4"	19.0	0.00	0.00	175.44	100.00
	3/8"	9.5	0.00	0.00	175.44	100.00
	4	4.75	0.00	0.00	175.44	100.00
	10	2.00	0.00	0.00	175.44	100.00
-10	(Based on calculated sieve wt.)					
	20	0.85	0.03	0.03	35.38	99.92
	40	0.425	0.22	0.25	35.16	99.29
	60	0.250	0.32	0.57	34.84	98.39
	140	0.106	0.70	1.27	34.14	96.41
	200	0.075	0.20	1.47	33.94	95.85
	dry pan			0.08	1.55	33.86
wet pan				33.86	0.00	

d₁₀ (mm): 0.0029 d₅₀ (mm): 0.012
 d₁₆ (mm): 0.0041 d₆₀ (mm): 0.017
 d₃₀ (mm): 0.0071 d₈₄ (mm): 0.057

Median Particle Diameter--d₅₀ (mm): 0.012
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 5.9
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.0
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 0.024

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-30.5-31-SS
 Date Sampled: 12/17/2013
 Depth (ft): 30.5-31
 Test Date: 31-Jan-14
 Start Time: 9:30

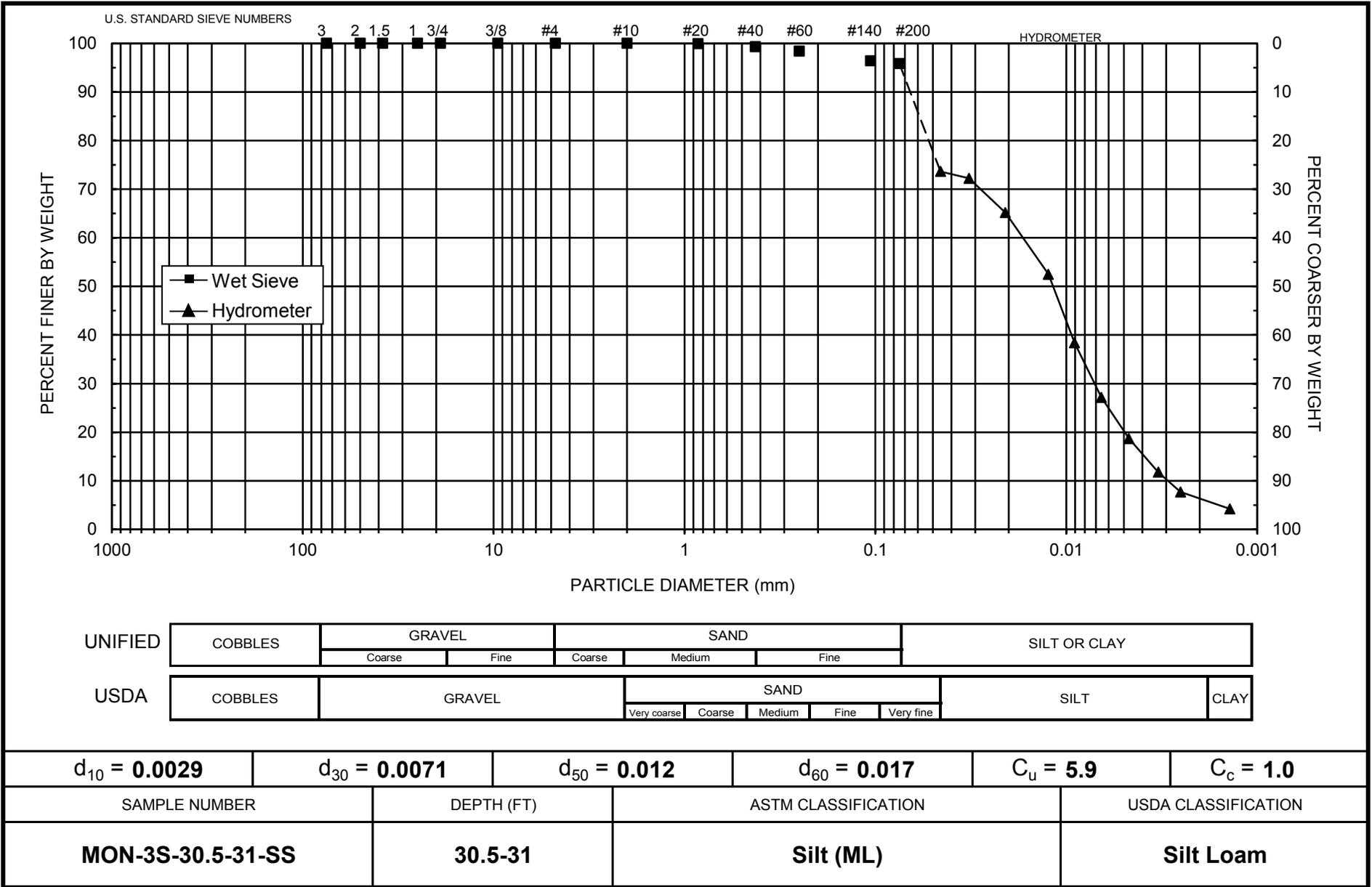
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 35.41
 Total Sample Wt. (g): 175.44
 Wt. Passing #10 (g): 175.44

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.9	31.5	5.4	26.1	11.1	0.04558	73.7	73.7
	2	19.9	31.0	5.4	25.6	11.2	0.03235	72.2	72.2
	5	19.9	28.5	5.4	23.1	11.6	0.02083	65.2	65.2
	15	19.9	24.0	5.4	18.6	12.4	0.01240	52.5	52.5
	30	19.9	19.0	5.4	13.6	13.2	0.00905	38.4	38.4
	60	20.0	15.0	5.4	9.6	13.8	0.00655	27.1	27.1
	120	20.1	12.0	5.4	6.6	14.3	0.00470	18.7	18.7
	250	20.3	9.5	5.3	4.2	14.7	0.00330	11.7	11.7
	430	20.7	8.0	5.3	2.7	15.0	0.00252	7.7	7.7
1-Feb-14	1482	19.3	7.0	5.5	1.5	15.2	0.00139	4.2	4.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-40.5-41-SS
 Date Sampled: 12/18/2013
 Depth (ft): 40.5-41
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 175.51
 Weight Passing #10 (g): 174.22
 Weight Retained #10 (g): 1.29
 Weight of Hydrometer Sample (g): 35.35
 Calculated Weight of Sieve Sample (g): 35.61

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	175.51	100.00
	2"	50	0.00	0.00	175.51	100.00
	1.5"	38.1	0.00	0.00	175.51	100.00
	1"	25	0.00	0.00	175.51	100.00
	3/4"	19.0	0.00	0.00	175.51	100.00
	3/8"	9.5	0.00	0.00	175.51	100.00
	4	4.75	0.42	0.42	175.09	99.76
	10	2.00	0.87	1.29	174.22	99.26
-10	(Based on calculated sieve wt.)					
	20	0.85	0.95	1.21	34.40	96.60
	40	0.425	2.68	3.89	31.72	89.07
	60	0.250	2.88	6.77	28.84	80.98
	140	0.106	4.81	11.58	24.03	67.48
	200	0.075	1.95	13.53	22.08	62.00
	dry pan		0.31	13.84	21.77	
	wet pan			21.77	0.00	

d₁₀ (mm): 0.0067 d₅₀ (mm): 0.055
 d₁₆ (mm): 0.011 d₆₀ (mm): 0.071
 d₃₀ (mm): 0.023 d₈₄ (mm): 0.30

Median Particle Diameter--d₅₀ (mm): 0.055
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 11
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.1
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3 (mm): 0.12

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-40.5-41-SS
 Date Sampled: 12/18/2013
 Depth (ft): 40.5-41
 Test Date: 31-Jan-14
 Start Time: 9:06

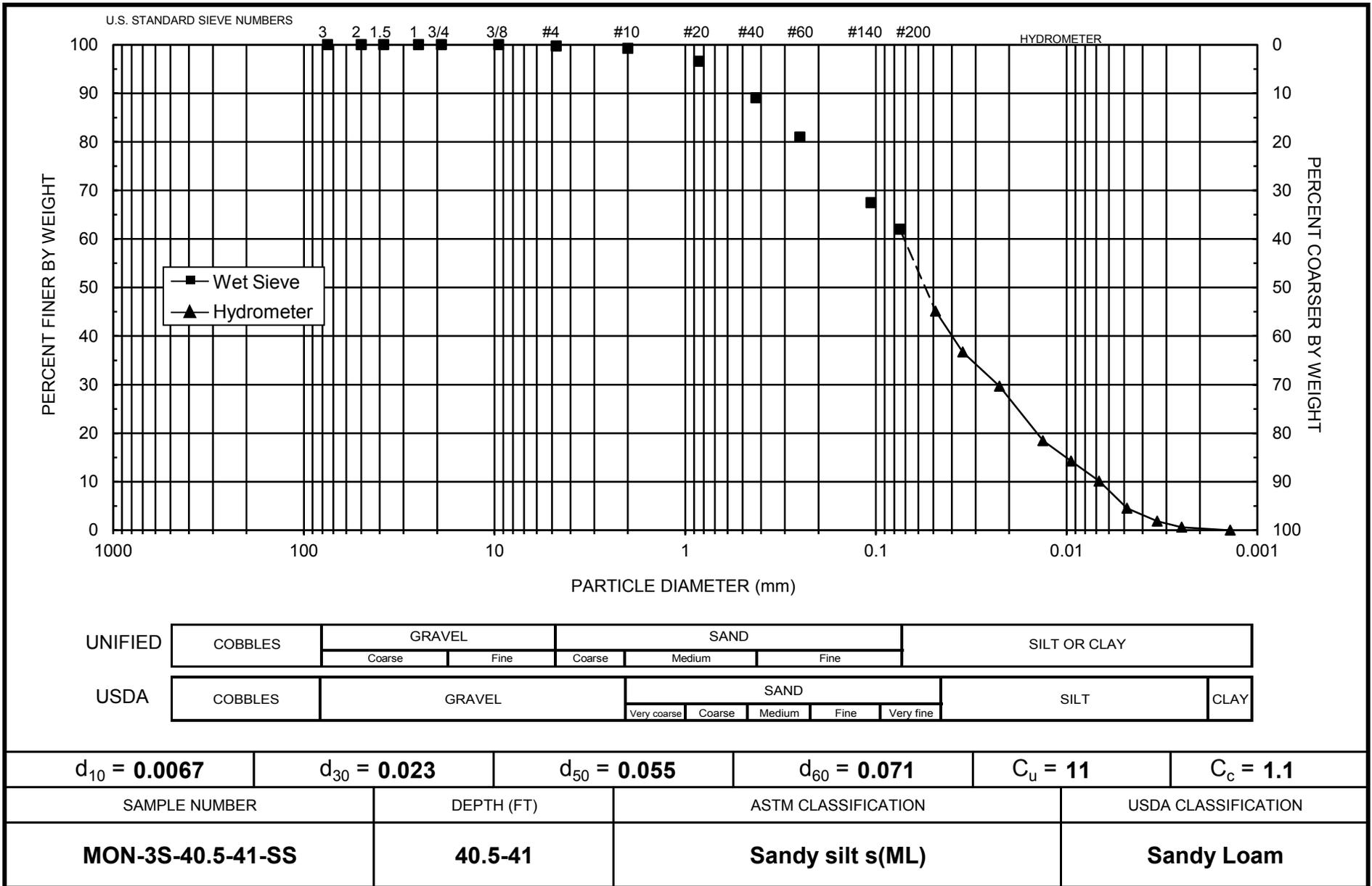
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.66
 Initial Wt. (g): 35.35
 Total Sample Wt. (g): 175.51
 Wt. Passing #10 (g): 174.22

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.8	21.5	5.4	16.1	12.8	0.04866	45.5	45.1
	2	19.8	18.5	5.4	13.1	13.3	0.03506	37.0	36.7
	5	19.8	16.0	5.4	10.6	13.7	0.02252	29.9	29.7
	15	19.8	12.0	5.4	6.6	14.3	0.01331	18.6	18.4
	30	19.9	10.5	5.4	5.1	14.6	0.00948	14.4	14.3
	60	20.0	9.0	5.4	3.6	14.8	0.00675	10.2	10.1
	120	20.1	7.0	5.4	1.6	15.2	0.00482	4.6	4.5
	250	20.3	6.0	5.3	0.7	15.3	0.00335	1.9	1.9
	449	20.7	5.5	5.3	0.2	15.4	0.00249	0.6	0.6
	1-Feb-14	1502	19.3	5.5	5.5	0.0	15.4	0.00139	0.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-5.0-6-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 5.0-6
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 543.00
 Weight Passing #10 (g): 542.57
 Weight Retained #10 (g): 0.43
 Weight of Hydrometer Sample (g): 34.84
 Calculated Weight of Sieve Sample (g): 34.87
 Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	543.00	100.00
	2"	50	0.00	0.00	543.00	100.00
	1.5"	38.1	0.00	0.00	543.00	100.00
	1"	25	0.00	0.00	543.00	100.00
	3/4"	19.0	0.00	0.00	543.00	100.00
	3/8"	9.5	0.00	0.00	543.00	100.00
	4	4.75	0.00	0.00	543.00	100.00
	10	2.00	0.43	0.43	542.57	99.92
-10	(Based on calculated sieve wt.)					
	20	0.85	0.03	0.06	34.81	99.83
	40	0.425	0.01	0.07	34.80	99.81
	60	0.250	0.01	0.08	34.79	99.78
	140	0.106	0.11	0.19	34.68	99.46
	200	0.075	0.17	0.36	34.51	98.97
	dry pan		0.04	0.40	34.47	
	wet pan			34.47	0.00	

d₁₀ (mm): 0.00072 d₅₀ (mm): 0.0088
 d₁₆ (mm): 0.0014 d₆₀ (mm): 0.013
 d₃₀ (mm): 0.0036 d₈₄ (mm): 0.030

Median Particle Diameter--d₅₀ (mm): 0.0088
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 18
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.4
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.013

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-5.0-6-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 5.0-6
 Test Date: 3-Feb-14
 Start Time: 9:06

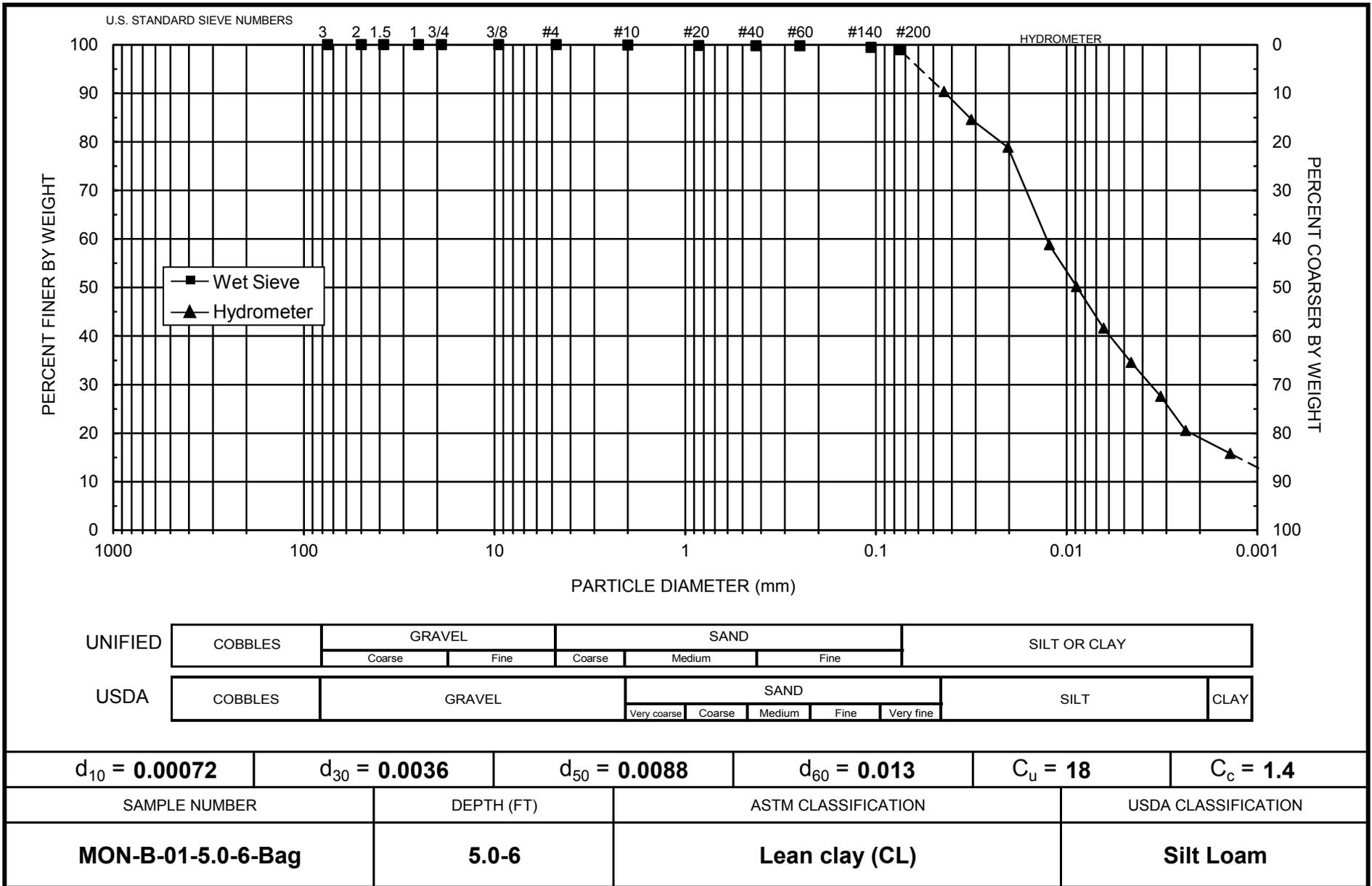
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 34.84
 Total Sample Wt. (g): 543.00
 Wt. Passing #10 (g): 542.57

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	37.0	5.5	31.5	10.2	0.04397	90.4	90.3
	2	19.4	35.0	5.5	29.5	10.6	0.03159	84.7	84.6
	5	19.4	33.0	5.5	27.5	10.9	0.02028	78.9	78.9
	15	19.4	26.0	5.5	20.5	12.0	0.01231	58.8	58.8
	30	19.4	23.0	5.5	17.5	12.5	0.00888	50.2	50.2
	60	19.5	20.0	5.5	14.5	13.0	0.00639	41.6	41.6
	120	19.7	17.5	5.5	12.1	13.4	0.00458	34.6	34.6
	250	20.0	15.0	5.4	9.6	13.8	0.00321	27.6	27.6
	465	20.3	12.5	5.3	7.2	14.3	0.00238	20.6	20.5
4-Feb-14	1422	19.5	11.0	5.5	5.5	14.5	0.00139	15.8	15.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-10-11.0-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 10-11.0
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 638.09
 Weight Passing #10 (g): 637.49
 Weight Retained #10 (g): 0.60
 Weight of Hydrometer Sample (g): 41.87
 Calculated Weight of Sieve Sample (g): 41.91

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	638.09	100.00
	2"	50	0.00	0.00	638.09	100.00
	1.5"	38.1	0.00	0.00	638.09	100.00
	1"	25	0.00	0.00	638.09	100.00
	3/4"	19.0	0.00	0.00	638.09	100.00
	3/8"	9.5	0.00	0.00	638.09	100.00
	4	4.75	0.00	0.00	638.09	100.00
	10	2.00	0.60	0.60	637.49	99.91
-10	(Based on calculated sieve wt.)					
	20	0.85	0.05	0.09	41.82	99.79
	40	0.425	0.09	0.18	41.73	99.57
	60	0.250	0.17	0.35	41.56	99.17
	140	0.106	1.35	1.70	40.21	95.95
	200	0.075	1.13	2.83	39.08	93.25
	dry pan		0.16	2.99	38.92	
	wet pan			38.92	0.00	

d₁₀ (mm): 0.00039 d₅₀ (mm): 0.0097
 d₁₆ (mm): 0.00090 d₆₀ (mm): 0.013
 d₃₀ (mm): 0.0034 d₈₄ (mm): 0.050

Median Particle Diameter--d₅₀ (mm): 0.0097
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 33
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 2.3
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.020

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt (MH)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-10-11.0-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 10-11.0
 Test Date: 3-Feb-14
 Start Time: 9:00

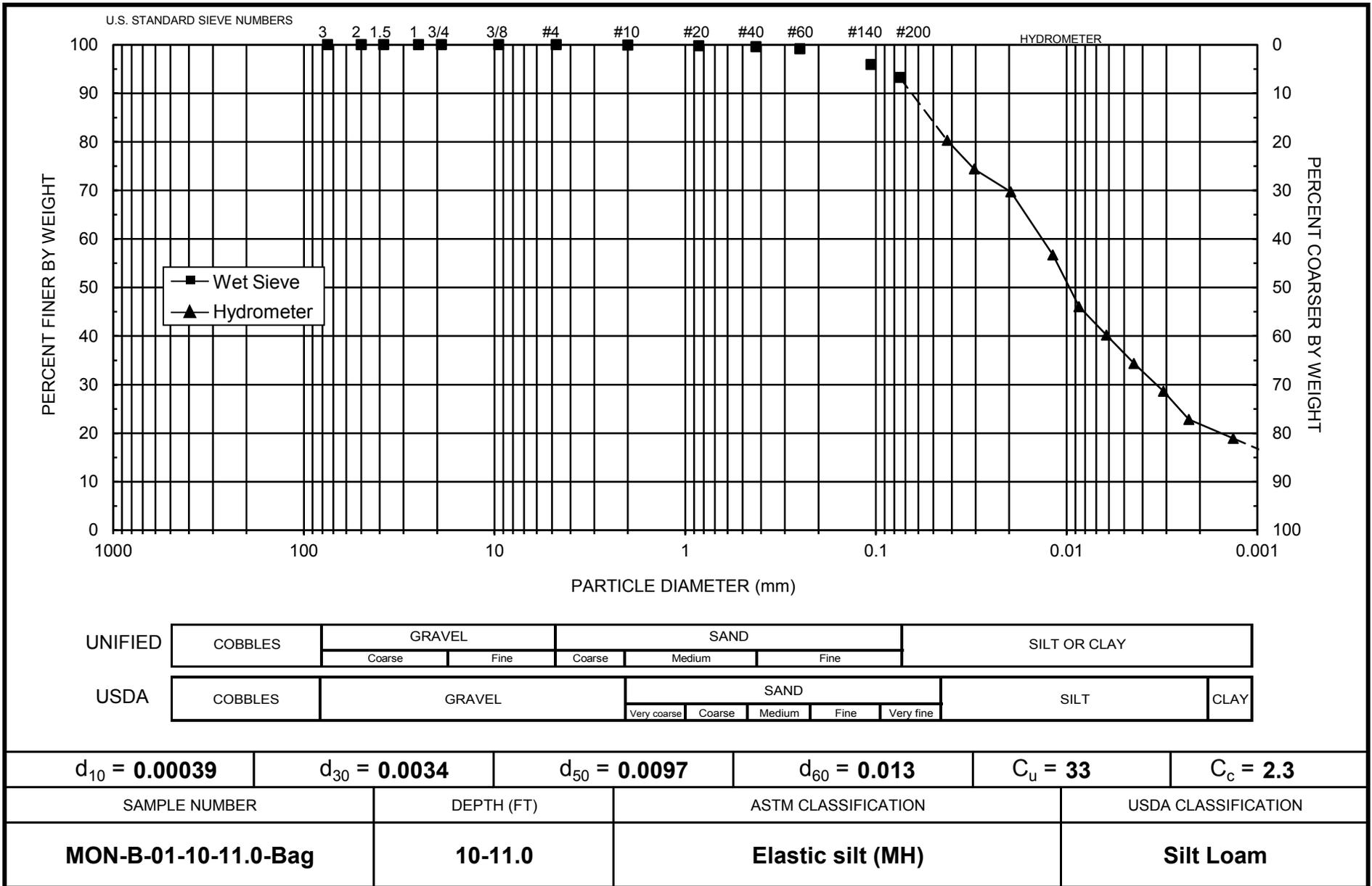
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.71
 Initial Wt. (g): 41.87
 Total Sample Wt. (g): 638.09
 Wt. Passing #10 (g): 637.49

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	39.5	5.5	34.0	9.8	0.04228	80.4	80.3
	2	19.4	37.0	5.5	31.5	10.2	0.03051	74.5	74.4
	5	19.4	35.0	5.5	29.5	10.6	0.01961	69.8	69.7
	15	19.4	29.5	5.5	24.0	11.5	0.01179	56.7	56.7
	30	19.4	25.0	5.5	19.5	12.2	0.00860	46.1	46.1
	60	19.5	22.5	5.5	17.0	12.6	0.00618	40.2	40.2
	120	19.6	20.0	5.5	14.5	13.0	0.00443	34.4	34.3
	250	20.0	17.5	5.4	12.1	13.4	0.00310	28.6	28.6
	470	20.3	15.0	5.3	9.7	13.8	0.00229	22.8	22.8
4-Feb-14	1427	19.5	13.5	5.5	8.0	14.1	0.00134	18.9	18.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-16-17-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 16-17
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 796.56
 Weight Passing #10 (g): 796.21
 Weight Retained #10 (g): 0.35
 Weight of Hydrometer Sample (g): 68.95
 Calculated Weight of Sieve Sample (g): 68.98

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	796.56	100.00
	2"	50	0.00	0.00	796.56	100.00
	1.5"	38.1	0.00	0.00	796.56	100.00
	1"	25	0.00	0.00	796.56	100.00
	3/4"	19.0	0.00	0.00	796.56	100.00
	3/8"	9.5	0.00	0.00	796.56	100.00
	4	4.75	0.00	0.00	796.56	100.00
	10	2.00	0.35	0.35	796.21	99.96
-10	(Based on calculated sieve wt.)					
	20	0.85	8.13	8.16	60.82	88.17
	40	0.425	5.96	14.12	54.86	79.53
	60	0.250	3.20	17.32	51.66	74.89
	140	0.106	4.05	21.37	47.61	69.02
	200	0.075	2.14	23.51	45.47	65.92
	dry pan			0.45	23.96	45.02
wet pan				45.02	0.00	

d₁₀ (mm): 0.0043 d₅₀ (mm): 0.037
 d₁₆ (mm): 0.0081 d₆₀ (mm): 0.057
 d₃₀ (mm): 0.016 d₈₄ (mm): 0.61

Median Particle Diameter--d₅₀ (mm): 0.037
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 13
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.0
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.22

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/S. Hanhardt
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-16-17-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 16-17
 Test Date: 30-Jan-14
 Start Time: 9:24

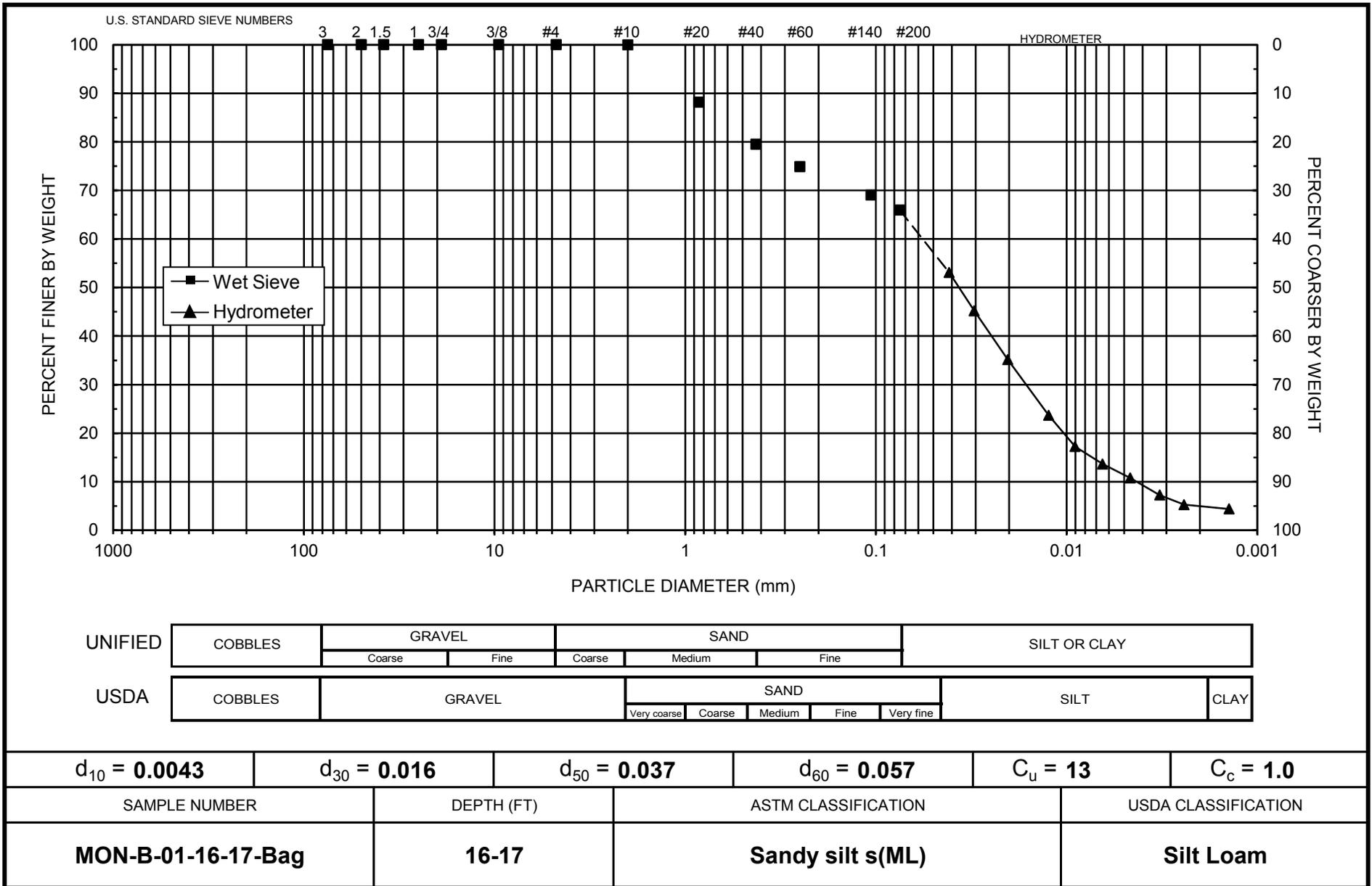
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.71
 Initial Wt. (g): 68.95
 Total Sample Wt. (g): 796.56
 Wt. Passing #10 (g): 796.21

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
30-Jan-14	1	19.3	42.5	5.5	37.0	9.3	0.04125	53.1	53.1
	2	19.3	37.0	5.5	31.5	10.2	0.03055	45.2	45.2
	5	19.4	30.0	5.5	24.5	11.4	0.02036	35.2	35.2
	15	19.4	22.0	5.5	16.5	12.7	0.01241	23.7	23.7
	30	19.4	17.5	5.5	12.0	13.4	0.00903	17.2	17.2
	60	19.4	15.0	5.5	9.5	13.8	0.00648	13.6	13.6
	120	19.4	13.0	5.5	7.5	14.2	0.00463	10.8	10.8
	250	19.6	10.5	5.5	5.0	14.6	0.00325	7.2	7.2
	450	20.3	9.0	5.3	3.7	14.8	0.00242	5.3	5.3
31-Jan-14	1362	19.7	8.5	5.5	3.1	14.9	0.00141	4.4	4.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-20-21-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 20-21
 Test Date: 3-Feb-14

Initial Dry Weight of Sample (g): 677.70
 Weight Passing #10 (g): 672.80
 Weight Retained #10 (g): 4.90
 Weight of Hydrometer Sample (g): 69.77
 Calculated Weight of Sieve Sample (g): 70.28

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	677.70	100.00
	2"	50	0.00	0.00	677.70	100.00
	1.5"	38.1	0.00	0.00	677.70	100.00
	1"	25	0.00	0.00	677.70	100.00
	3/4"	19.0	0.00	0.00	677.70	100.00
	3/8"	9.5	0.00	0.00	677.70	100.00
	4	4.75	0.00	0.00	677.70	100.00
	10	2.00	4.90	4.90	672.80	99.28
-10	(Based on calculated sieve wt.)					
	20	0.85	5.72	6.23	64.05	91.14
	40	0.425	8.19	14.42	55.86	79.48
	60	0.250	6.32	20.74	49.54	70.49
	140	0.106	9.91	30.65	39.63	56.39
	200	0.075	3.83	34.48	35.80	50.94
	dry pan		0.42	34.90	35.38	
	wet pan			35.38	0.00	

d₁₀ (mm): 0.0033 d₅₀ (mm): 0.072
 d₁₆ (mm): 0.0078 d₆₀ (mm): 0.13
 d₃₀ (mm): 0.022 d₈₄ (mm): 0.56

Median Particle Diameter--d₅₀ (mm): 0.072
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 39
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.1
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.21

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: S. Hanhardt/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-20-21-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 20-21
 Test Date: 30-Jan-14
 Start Time: 9:18

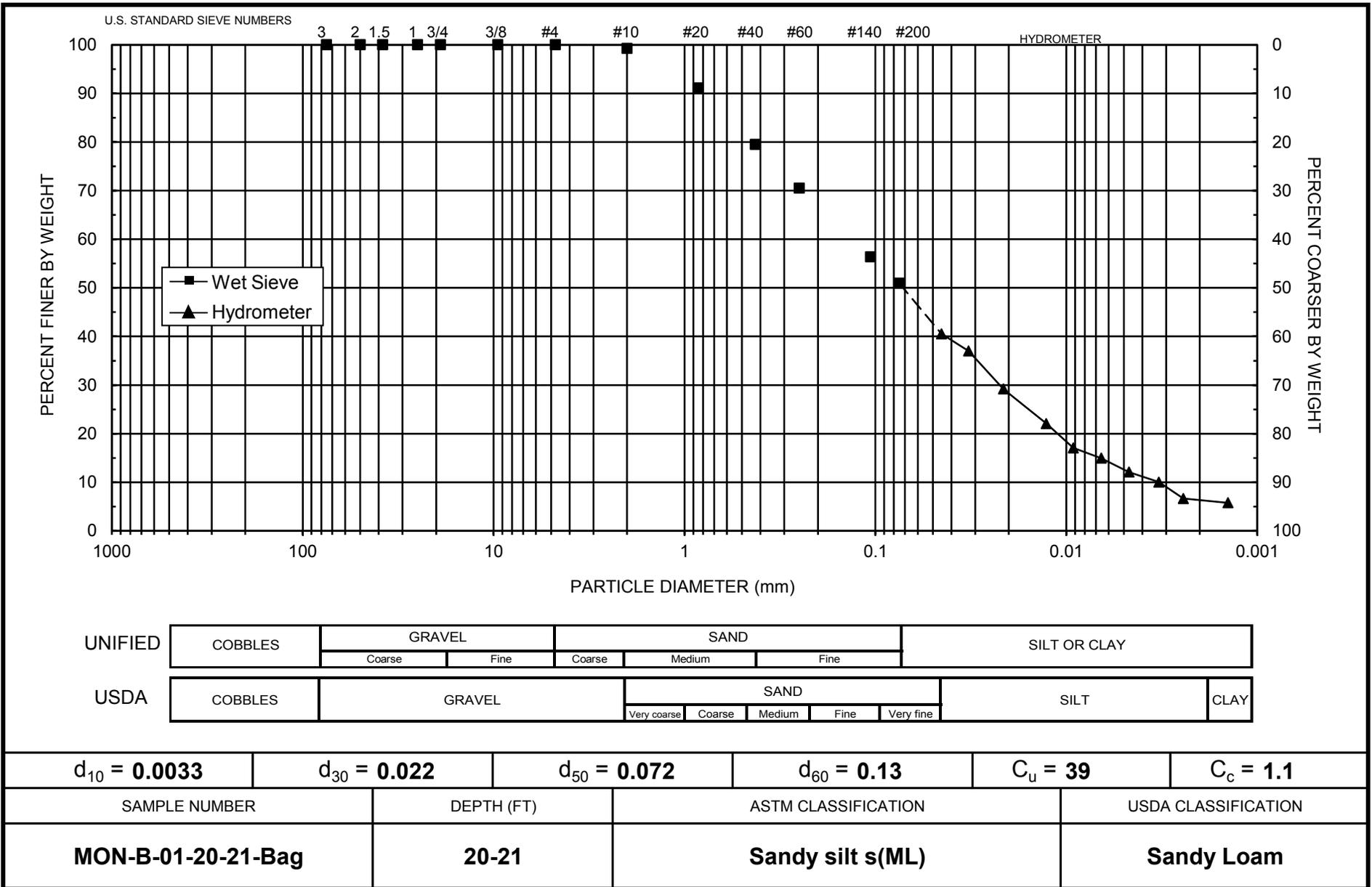
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 69.77
 Total Sample Wt. (g): 677.70
 Wt. Passing #10 (g): 672.80

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
30-Jan-14	1	19.3	34.0	5.5	28.5	10.7	0.04504	40.8	40.5
	2	19.3	31.5	5.5	26.0	11.1	0.03245	37.3	37.0
	5	19.4	26.0	5.5	20.5	12.0	0.02133	29.4	29.2
	15	19.4	21.0	5.5	15.5	12.9	0.01272	22.2	22.1
	30	19.4	17.5	5.5	12.0	13.4	0.00920	17.2	17.1
	60	19.4	16.0	5.5	10.5	13.7	0.00656	15.0	14.9
	120	19.4	14.0	5.5	8.5	14.0	0.00469	12.2	12.1
	250	19.6	12.5	5.5	7.0	14.3	0.00327	10.1	10.0
	455	20.3	10.0	5.3	4.7	14.7	0.00244	6.7	6.6
31-Jan-14	1368	19.7	9.5	5.5	4.1	14.7	0.00142	5.8	5.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-27-28-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 27-28
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 831.05
 Weight Passing #10 (g): 780.47
 Weight Retained #10 (g): 50.58
 Weight of Hydrometer Sample (g): 70.87
 Calculated Weight of Sieve Sample (g): 75.46

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	831.05	100.00
	2"	50	0.00	0.00	831.05	100.00
	1.5"	38.1	0.00	0.00	831.05	100.00
	1"	25	0.00	0.00	831.05	100.00
	3/4"	19.0	0.00	0.00	831.05	100.00
	3/8"	9.5	0.00	0.00	831.05	100.00
	4	4.75	4.25	4.25	826.80	99.49
	10	2.00	46.33	50.58	780.47	93.91
-10	(Based on calculated sieve wt.)					
	20	0.85	12.55	17.14	58.32	77.28
	40	0.425	11.12	28.26	47.20	62.55
	60	0.250	7.06	35.32	40.14	53.19
	140	0.106	8.91	44.23	31.23	41.38
	200	0.075	2.69	46.92	28.54	37.82
	dry pan			0.31	47.23	28.23
wet pan				28.23	0.00	

d₁₀ (mm): 0.0039 d₅₀ (mm): 0.20
 d₁₆ (mm): 0.0085 d₆₀ (mm): 0.37
 d₃₀ (mm): 0.038 d₈₄ (mm): 1.2

Median Particle Diameter--d₅₀ (mm): 0.20
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 95
 Coefficient of Curvature, Cc--[(d₃₀)²/(d₁₀*d₆₀)] (mm): 1.0
 Mean Particle Diameter--[(d₁₆+d₅₀+d₈₄)/3] (mm): 0.47

Classification of fines: ML

ASTM Soil Classification: Silty sand (SM)
 USDA Soil Classification: Sandy Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-27-28-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 27-28
 Test Date: 29-Jan-14
 Start Time: 9:18

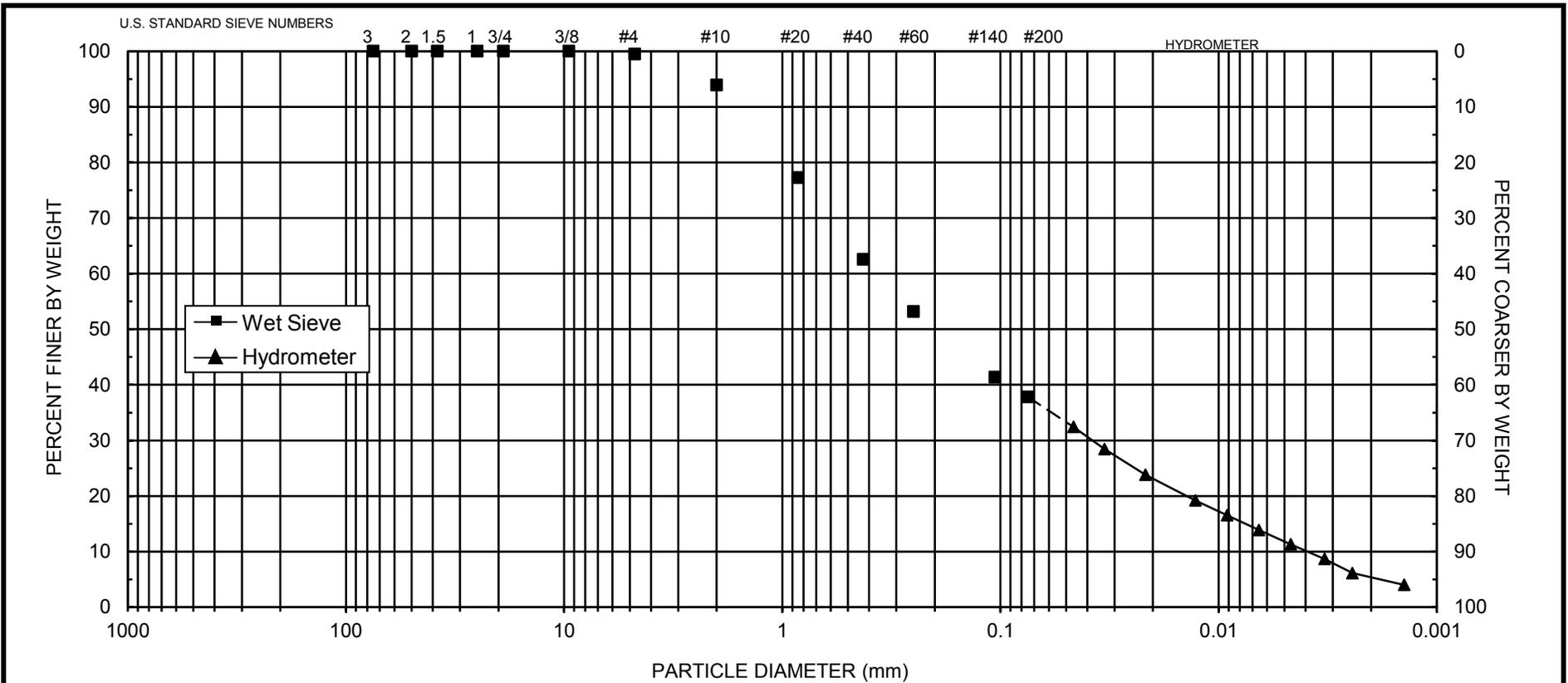
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.67
 Initial Wt. (g): 70.87
 Total Sample Wt. (g): 831.05
 Wt. Passing #10 (g): 780.47

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
29-Jan-14	1	19.2	30.0	5.5	24.5	11.4	0.04619	34.5	32.4
	2	19.2	27.0	5.5	21.5	11.9	0.03336	30.3	28.5
	5	19.2	23.5	5.5	18.0	12.4	0.02160	25.4	23.8
	15	19.2	20.0	5.5	14.5	13.0	0.01276	20.4	19.2
	30	19.2	18.0	5.5	12.5	13.3	0.00913	17.6	16.5
	60	19.2	16.0	5.5	10.5	13.7	0.00654	14.8	13.9
	120	19.5	14.0	5.5	8.5	14.0	0.00466	12.0	11.3
	250	19.6	12.0	5.5	6.5	14.3	0.00326	9.2	8.7
	455	20.0	10.0	5.4	4.6	14.7	0.00243	6.5	6.1
30-Jan-14	1399	19.5	8.5	5.5	3.0	14.9	0.00141	4.2	4.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY
				Very coarse	Coarse	Medium	Fine	Very fine		

$d_{10} = 0.0039$	$d_{30} = 0.038$	$d_{50} = 0.20$	$d_{60} = 0.37$	$C_u = 95$	$C_c = 1.0$
SAMPLE NUMBER		DEPTH (FT)	ASTM CLASSIFICATION		USDA CLASSIFICATION
MON-B-01-27-28-Bag		27-28	Silty sand (SM)		Sandy Loam



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-29-30-Bag
 Date Sampled: 12/19/2013
 Depth (ft): 29-30
 Test Date: 4-Feb-14

Initial Dry Weight of Sample (g): 707.59
 Weight Passing #10 (g): 706.51
 Weight Retained #10 (g): 1.08
 Weight of Hydrometer Sample (g): 59.10
 Calculated Weight of Sieve Sample (g): 59.19

Shape: Rounded
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	707.59	100.00
	2"	50	0.00	0.00	707.59	100.00
	1.5"	38.1	0.00	0.00	707.59	100.00
	1"	25	0.00	0.00	707.59	100.00
	3/4"	19.0	0.00	0.00	707.59	100.00
	3/8"	9.5	0.00	0.00	707.59	100.00
	4	4.75	0.00	0.00	707.59	100.00
	10	2.00	1.08	1.08	706.51	99.85
-10	(Based on calculated sieve wt.)					
	20	0.85	3.69	3.78	55.41	93.61
	40	0.425	3.61	7.39	51.80	87.51
	60	0.250	2.38	9.77	49.42	83.49
	140	0.106	2.82	12.59	46.60	78.73
	200	0.075	0.80	13.39	45.80	77.38
	dry pan			0.22	13.61	45.58
wet pan				45.58	0.00	

d₁₀ (mm): 0.0013 d₅₀ (mm): 0.013
 d₁₆ (mm): 0.0021 d₆₀ (mm): 0.021
 d₃₀ (mm): 0.0050 d₈₄ (mm): 0.27

Median Particle Diameter--d₅₀ (mm): 0.013
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 16
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.92
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.095

Note: Reported values for d₁₀, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d₁₀ diameter

Classification of fines: MH

ASTM Soil Classification: Elastic silt with sand (MH)s
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/S. Hanhardt
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-29-30-Bag
 Date Sampled: 12/19/2013
 Depth (ft): 29-30
 Test Date: 29-Jan-14
 Start Time: 9:12

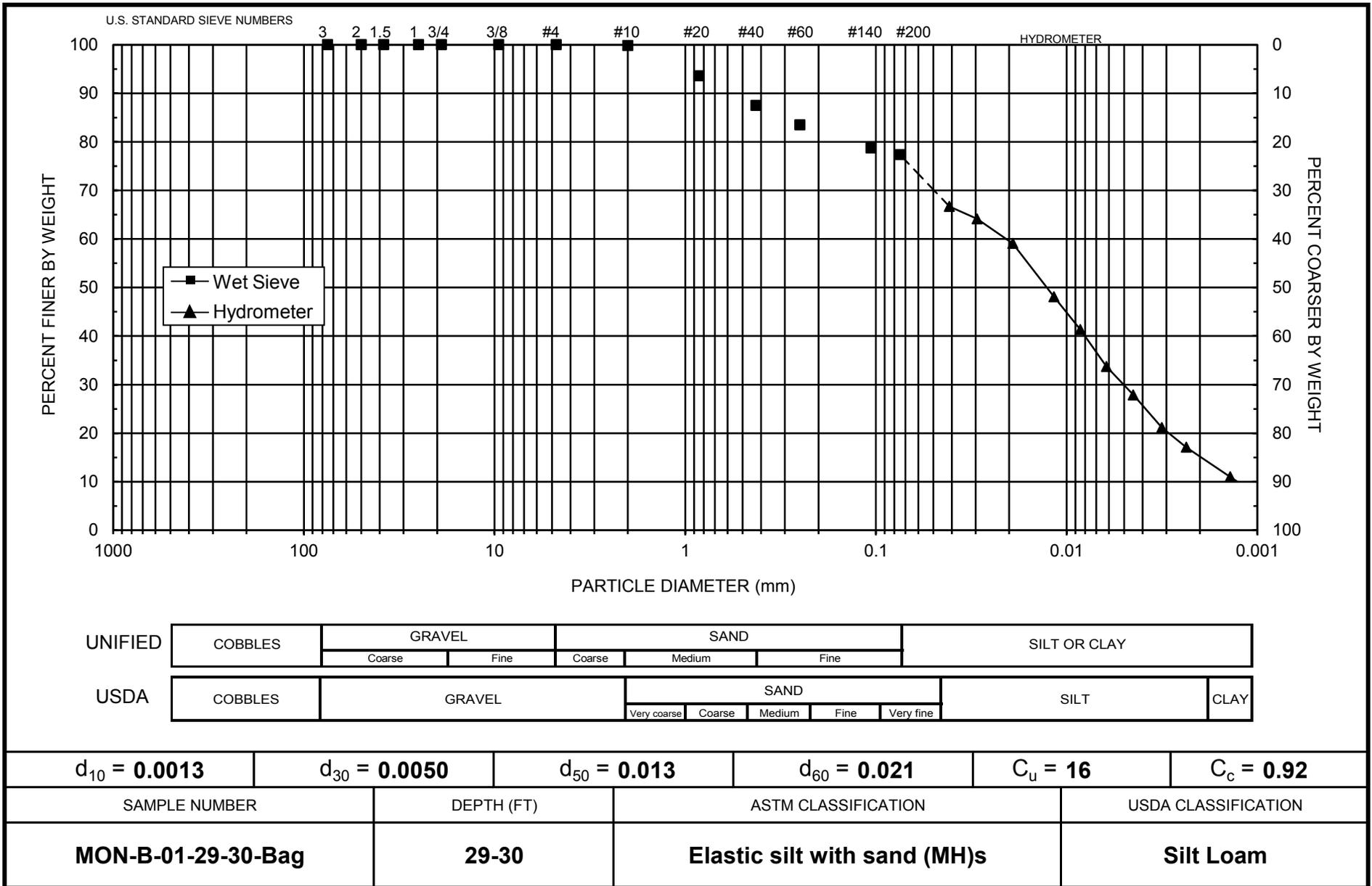
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 59.10
 Total Sample Wt. (g): 707.59
 Wt. Passing #10 (g): 706.51

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
29-Jan-14	1	19.2	45.0	5.5	39.5	8.9	0.04113	66.8	66.7
	2	19.2	43.5	5.5	38.0	9.2	0.02948	64.2	64.1
	5	19.2	40.5	5.5	35.0	9.7	0.01914	59.2	59.1
	15	19.2	34.0	5.5	28.5	10.7	0.01164	48.2	48.1
	30	19.2	30.0	5.5	24.5	11.4	0.00848	41.4	41.3
	60	19.2	25.5	5.5	20.0	12.1	0.00619	33.8	33.7
	120	19.4	22.0	5.5	16.5	12.7	0.00447	27.9	27.9
	250	19.6	18.0	5.5	12.5	13.3	0.00317	21.2	21.2
	460	20.0	15.5	5.4	10.1	13.8	0.00236	17.1	17.1
30-Jan-14	1404	19.5	12.0	5.5	6.5	14.3	0.00139	11.0	11.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Note: Reported values for d_{10} , C_u , C_c , and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-35-36-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 35-36
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 743.43
 Weight Passing #10 (g): 742.88
 Weight Retained #10 (g): 0.55
 Weight of Hydrometer Sample (g): 69.19
 Calculated Weight of Sieve Sample (g): 69.24

Shape: Angular
 Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10	3"	75	0.00	0.00	743.43	100.00
	2"	50	0.00	0.00	743.43	100.00
	1.5"	38.1	0.00	0.00	743.43	100.00
	1"	25	0.00	0.00	743.43	100.00
	3/4"	19.0	0.00	0.00	743.43	100.00
	3/8"	9.5	0.00	0.00	743.43	100.00
	4	4.75	0.00	0.00	743.43	100.00
	10	2.00	0.55	0.55	742.88	99.93
-10	(Based on calculated sieve wt.)					
	20	0.85	5.42	5.47	63.77	92.10
	40	0.425	5.37	10.84	58.40	84.34
	60	0.250	3.06	13.90	55.34	79.92
	140	0.106	3.81	17.71	51.53	74.42
	200	0.075	1.75	19.46	49.78	71.89
	dry pan			0.55	20.01	49.23
wet pan				49.23	0.00	

d₁₀ (mm): 0.0026 d₅₀ (mm): 0.021
 d₁₆ (mm): 0.0043 d₆₀ (mm): 0.032
 d₃₀ (mm): 0.0099 d₈₄ (mm): 0.41

Median Particle Diameter--d₅₀ (mm): 0.021
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 12
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 1.2
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.15

Classification of fines: ML

ASTM Soil Classification: Silt with sand (ML)s
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/S. Hanhardt
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-35-36-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 35-36
 Test Date: 3-Feb-14
 Start Time: 9:54

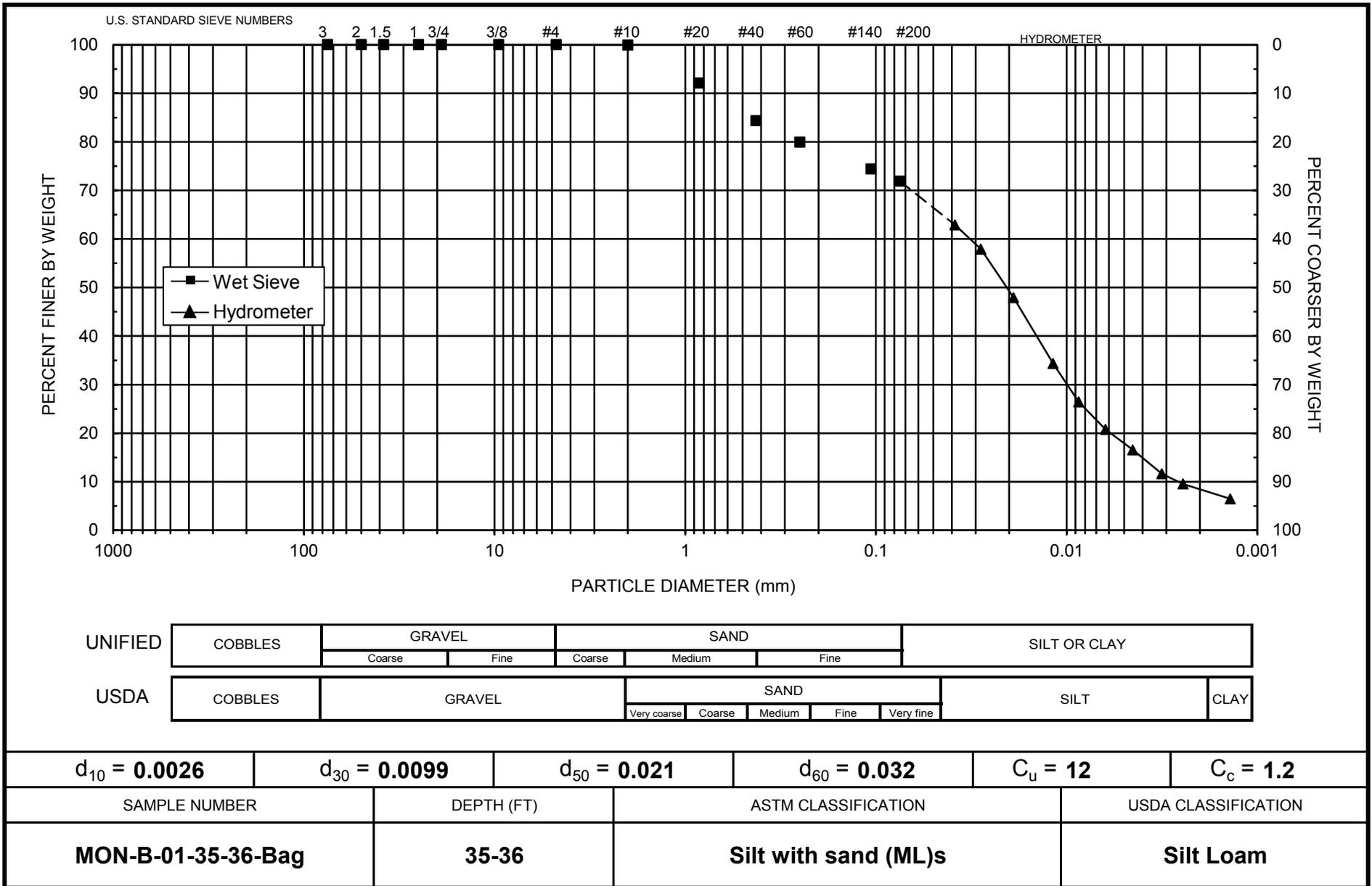
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Measured particle density: 2.72
 Initial Wt. (g): 69.19
 Total Sample Wt. (g): 743.43
 Wt. Passing #10 (g): 742.88

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
3-Feb-14	1	19.4	49.5	5.5	44.0	8.2	0.03853	63.0	62.9
	2	19.4	46.0	5.5	40.5	8.8	0.02818	57.9	57.9
	5	19.4	39.0	5.5	33.5	9.9	0.01896	47.9	47.9
	15	19.4	29.5	5.5	24.0	11.5	0.01177	34.3	34.3
	30	19.4	24.0	5.5	18.5	12.4	0.00865	26.5	26.5
	60	19.6	20.0	5.5	14.5	13.0	0.00626	20.8	20.8
	120	19.8	17.0	5.4	11.6	13.5	0.00449	16.6	16.5
	250	20.1	13.5	5.4	8.1	14.1	0.00316	11.6	11.6
	423	20.3	12.0	5.3	6.7	14.3	0.00245	9.5	9.5
4-Feb-14	1383	19.5	10.0	5.5	4.5	14.7	0.00138	6.5	6.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.



**Particle Size Analysis
Wet Sieve Data (#10 Split)**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-43-44-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 43-44
 Test Date: 5-Feb-14

Initial Dry Weight of Sample (g): 836.14
 Weight Passing #10 (g): 836.14
 Weight Retained #10 (g): 0.00
 Weight of Hydrometer Sample (g): 55.18
 Calculated Weight of Sieve Sample (g): 55.18

Shape: Angular
 Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing	
+10	3"	75	0.00	0.00	836.14	100.00	
	2"	50	0.00	0.00	836.14	100.00	
	1.5"	38.1	0.00	0.00	836.14	100.00	
	1"	25	0.00	0.00	836.14	100.00	
	3/4"	19.0	0.00	0.00	836.14	100.00	
	3/8"	9.5	0.00	0.00	836.14	100.00	
	4	4.75	0.00	0.00	836.14	100.00	
	10	2.00	0.00	0.00	836.14	100.00	
-10	(Based on calculated sieve wt.)						
	20	0.85	0.47	0.47	54.71	99.15	
	40	0.425	2.03	2.50	52.68	95.47	
	60	0.250	2.63	5.13	50.05	90.70	
	140	0.106	3.40	8.53	46.65	84.54	
	200	0.075	0.90	9.43	45.75	82.91	
	dry pan			0.29	9.72	45.46	
	wet pan				45.46	0.00	

d₁₀ (mm): 0.0021 d₅₀ (mm): 0.016
 d₁₆ (mm): 0.0033 d₆₀ (mm): 0.034
 d₃₀ (mm): 0.0066 d₈₄ (mm): 0.094

Median Particle Diameter--d₅₀ (mm): 0.016
 Uniformity Coefficient, Cu--[d₆₀/d₁₀] (mm): 16
 Coefficient of Curvature, Cc--[d₃₀²/(d₁₀*d₆₀)] (mm): 0.61
 Mean Particle Diameter--[d₁₆+d₅₀+d₈₄]/3] (mm): 0.038

Classification of fines: ML

ASTM Soil Classification: Silt with sand (ML)s
 USDA Soil Classification: Silt Loam

Laboratory analysis by: J. Bray/C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



**Particle Size Analysis
Hydrometer Data**

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-43-44-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 43-44
 Test Date: 31-Jan-14
 Start Time: 9:12

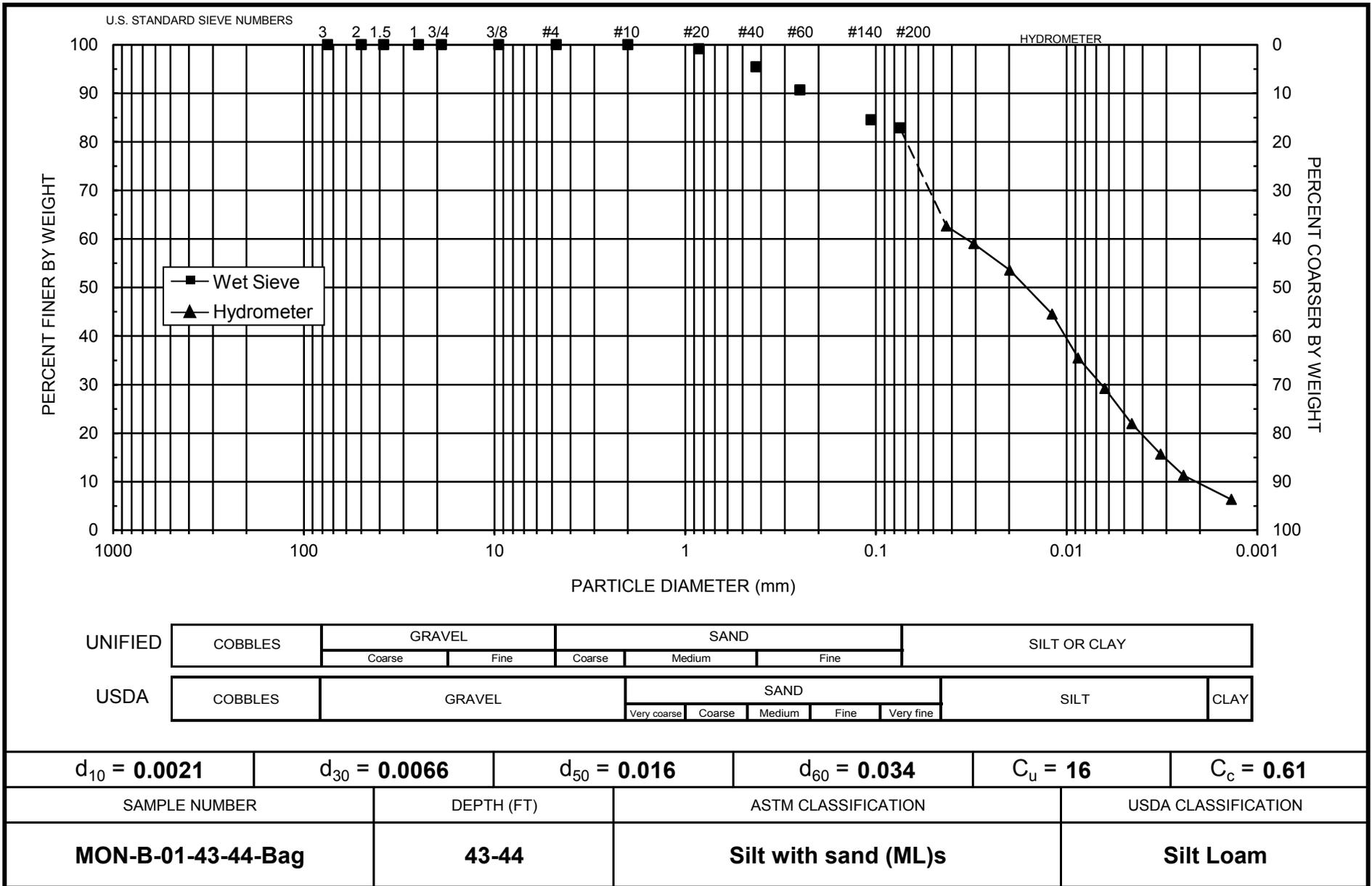
Type of Water Used: DISTILLED
 Reaction with H₂O₂: NA
 Dispersant*: (NaPO₃)₆
 Assumed particle density: 2.65
 Initial Wt. (g): 55.18
 Total Sample Wt. (g): 836.14
 Wt. Passing #10 (g): 836.14

Date	Time (min)	Temp (°C)	R (g/L)	R _L (g/L)	R _{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
31-Jan-14	1	19.8	40.0	5.4	34.6	9.7	0.04266	62.6	62.6
	2	19.8	38.0	5.4	32.6	10.1	0.03067	59.0	59.0
	5	19.8	35.0	5.4	29.6	10.6	0.01987	53.6	53.6
	15	19.8	30.0	5.4	24.6	11.4	0.01191	44.5	44.5
	30	19.9	25.0	5.4	19.6	12.2	0.00871	35.5	35.5
	60	20.0	21.5	5.4	16.1	12.8	0.00630	29.2	29.2
	120	20.1	17.5	5.4	12.1	13.4	0.00455	21.9	21.9
	250	20.3	14.0	5.3	8.7	14.0	0.00321	15.7	15.7
	444	20.7	11.5	5.3	6.2	14.4	0.00243	11.3	11.3
	1-Feb-14	1497	19.3	9.0	5.5	3.5	14.8	0.00137	6.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: A. Bisoglio
 Data entered by: C. Krous
 Checked by: J. Hines



Daniel B. Stephens & Associates, Inc.

Atterberg Limits/ Identification of Fines



Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MON-1D-10-10.5-SS	51	35	16	MH
MON-1D-20-20.5-SS	84	30	54	CH
MON-1D-30.5-31-SS	36	26	10	ML
MON-1D-40.5-41-SS	---	---	---	ML
MON-1D-45-45.5-SS	71	34	37	MH
MON-1D-55-55.5-SS	61	36	25	MH
MON-1D-65-65.5-SS	70	43	27	MH
MON-1D-75-75.5-SS	54	38	16	MH
MON-1D-85-87.5-Bag	---	---	---	ML
MON-1D-92.5-95-Bag	32	24	8	ML
MON-1D-102-103-Bag	31	22	9	CL
MON-1D-119.5-120.5-Bag	---	---	---	ML
MON-2S-5.5-6-SS	58	37	21	MH
MON-2S-10.5-11-SS	49	31	18	ML
MON-2S-21-21.5-SS	55	34	21	MH
MON-2S-25.5-26-SS	---	---	---	ML
MON-2S-31-31.5-SS	62	39	23	MH
MON-2S-40-40.5-SS	65	46	19	MH
MON-3S-10.5-11-SS	72	40	32	MH
MON-3S-20.5-21-SS	53	34	19	MH

--- = Soil requires visual-manual classification due to non-plasticity



Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MON-3S-30.5-31-SS	48	32	16	ML
MON-3S-40.5-41-SS	---	---	---	ML
MON-B-01-5.0-6-Bag	49	27	22	CL
MON-B-01-10-11.0-Bag	52	29	23	MH
MON-B-01-16-17-Bag	---	---	---	ML
MON-B-01-20-21-Bag	---	---	---	ML
MON-B-01-27-28-Bag	45	37	8	ML
MON-B-01-29-30-Bag	55	36	19	MH
MON-B-01-35-36-Bag	48	34	14	ML
MON-B-01-43-44-Bag	45	28	17	ML

--- = Soil requires visual-manual classification due to non-plasticity



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-10-10.5-SS
Date Sampled: 12/10/2013
Depth (ft): 10-10.5
Test Date: 5-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	21	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.92	132.12	130.92
Weight of pan plus dry soil (g)	121.59	126.73	125.88
Weight of pan (g):	114.95	116.27	116.32
Gravimetric moisture content (% g/g):	50.15	51.53	52.72
Liquid Limit:	51		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.23	118.39
Weight of pan plus dry soil (g)	121.48	116.78
Weight of pan (g):	116.49	112.26
Gravimetric moisture content (% g/g):	35.07	35.62
Plastic Limit:	35	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 51
Plastic Limit: 35
Plasticity Index: 16
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-20-20.5-SS
Date Sampled: 12/10/2013
Depth (ft): 20-20.5
Test Date: 5-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	129.87	133.02	126.46
Weight of pan plus dry soil (g)	124.59	126.04	121.19
Weight of pan (g):	117.96	117.74	115.17
Gravimetric moisture content (% g/g):	79.64	84.10	87.54
Liquid Limit:	84		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.97	123.54
Weight of pan plus dry soil (g)	120.24	121.92
Weight of pan (g):	114.44	116.45
Gravimetric moisture content (% g/g):	29.83	29.62
Plastic Limit:	30	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 84
Plastic Limit: 30
Plasticity Index: 54
Classification: CH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-30.5-31-SS
Date Sampled: 12/10/2013
Depth (ft): 30.5-31
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	28	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.17	126.68	131.29
Weight of pan plus dry soil (g)	120.29	123.95	127.22
Weight of pan (g):	114.95	116.27	116.32
Gravimetric moisture content (% g/g):	35.21	35.55	37.34
Liquid Limit:	36		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.29	118.05
Weight of pan plus dry soil (g)	121.08	116.84
Weight of pan (g):	116.49	112.26
Gravimetric moisture content (% g/g):	26.36	26.42
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 36
Plastic Limit: 26
Plasticity Index: 10
Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-40.5-41-SS
Date Sampled: 12/10/2013
Depth (ft): 40.5-41
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---
Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-40.5-41-SS
Date Sampled: 12/10/2013
Depth (ft): 40.5-41
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Olive Brown (2.5Y 4/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-45-45.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 45-45.5
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	23	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.72	124.24	125.65
Weight of pan plus dry soil (g)	118.96	119.77	120.21
Weight of pan (g):	112.16	113.46	112.69
Gravimetric moisture content (% g/g):	70.00	70.84	72.34
Liquid Limit:	71		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	118.11	124.28
Weight of pan plus dry soil (g)	116.46	122.66
Weight of pan (g):	111.64	117.96
Gravimetric moisture content (% g/g):	34.23	34.47
Plastic Limit:	34	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 71
 Plastic Limit: 34
 Plasticity Index: 37
 Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-55-55.5-SS
Date Sampled: 12/10/2013
Depth (ft): 55-55.5
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	27	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	127.12	124.16	127.99
Weight of pan plus dry soil (g)	123.20	121.20	123.49
Weight of pan (g):	116.51	116.37	116.44
Gravimetric moisture content (% g/g):	58.59	61.28	63.83
Liquid Limit:	61		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.86	122.02
Weight of pan plus dry soil (g)	119.40	120.26
Weight of pan (g):	115.32	115.30
Gravimetric moisture content (% g/g):	35.78	35.48
Plastic Limit:	36	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 61
Plastic Limit: 36
Plasticity Index: 25
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-65-65.5-SS
Date Sampled: 12/10/2013
Depth (ft): 65-65.5
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	29	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.49	122.35	127.51
Weight of pan plus dry soil (g)	122.35	117.54	122.88
Weight of pan (g):	116.31	110.68	116.42
Gravimetric moisture content (% g/g):	68.54	70.12	71.67
Liquid Limit:	70		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.86	124.28
Weight of pan plus dry soil (g)	119.62	122.25
Weight of pan (g):	114.40	117.49
Gravimetric moisture content (% g/g):	42.91	42.65
Plastic Limit:	43	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 70
Plastic Limit: 43
Plasticity Index: 27
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-75-75.5-SS
Date Sampled: 12/11/2013
Depth (ft): 75-75.5
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	27	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.66	121.00	124.31
Weight of pan plus dry soil (g)	122.10	117.71	121.02
Weight of pan (g):	117.19	111.62	115.15
Gravimetric moisture content (% g/g):	52.14	54.02	56.05
Liquid Limit:	54		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.83	123.23
Weight of pan plus dry soil (g)	119.31	121.65
Weight of pan (g):	115.28	117.44
Gravimetric moisture content (% g/g):	37.72	37.53
Plastic Limit:	38	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 54
Plastic Limit: 38
Plasticity Index: 16
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-85-87.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 85-87.5
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
 Liquid Limit: ---
 Plastic Limit: ---
 Plasticity Index: ---
 Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-85-87.5-Bag
Date Sampled: 12/11/2013
Depth (ft): 85-87.5
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Yellowish Brown (10YR 3/4)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-92.5-95-Bag
Date Sampled: 12/11/2013
Depth (ft): 92.5-95
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	27	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.14	129.94	129.43
Weight of pan plus dry soil (g)	118.51	127.18	126.19
Weight of pan (g):	113.21	118.40	116.28
Gravimetric moisture content (% g/g):	30.75	31.44	32.69
Liquid Limit:	32		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.21	119.35
Weight of pan plus dry soil (g)	117.85	117.96
Weight of pan (g):	112.29	112.29
Gravimetric moisture content (% g/g):	24.46	24.51
Plastic Limit:	24	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 32
Plastic Limit: 24
Plasticity Index: 8
Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-102-103-Bag
Date Sampled: 12/11/2013
Depth (ft): 102-103
Test Date: 4-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	23	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	133.05	129.99	123.87
Weight of pan plus dry soil (g)	129.48	127.25	121.10
Weight of pan (g):	117.69	118.39	112.56
Gravimetric moisture content (% g/g):	30.28	30.93	32.44
Liquid Limit:	31		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.75	122.53
Weight of pan plus dry soil (g)	123.33	121.19
Weight of pan (g):	116.86	115.10
Gravimetric moisture content (% g/g):	21.95	22.00
Plastic Limit:	22	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 31
Plastic Limit: 22
Plasticity Index: 9
Classification: CL

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
 Liquid Limit: ---
 Plastic Limit: ---
 Plasticity Index: ---
 Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-1D-119.5-120.5-Bag
Date Sampled: 12/11/2013
Depth (ft): 119.5-120.5
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Light Yellowish Brown (10 YR 6/4)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-5.5-6-SS
 Date Sampled: 12/12/2013
 Depth (ft): 5.5-6
 Test Date: 4-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	23	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.63	125.79	124.02
Weight of pan plus dry soil (g)	119.89	123.07	121.22
Weight of pan (g):	113.21	118.40	116.57
Gravimetric moisture content (% g/g):	55.99	58.24	60.22
Liquid Limit:	58		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.16	124.25
Weight of pan plus dry soil (g)	117.30	122.11
Weight of pan (g):	112.29	116.43
Gravimetric moisture content (% g/g):	37.13	37.68
Plastic Limit:	37	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 58
 Plastic Limit: 37
 Plasticity Index: 21
 Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: S. Hanhardt
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-10.5-11-SS
 Date Sampled: 12/12/2013
 Depth (ft): 10.5-11
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	23	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.02	125.68	131.27
Weight of pan plus dry soil (g)	119.14	121.94	128.07
Weight of pan (g):	113.16	114.41	121.84
Gravimetric moisture content (% g/g):	48.16	49.67	51.36
Liquid Limit:	49		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.10	126.04
Weight of pan plus dry soil (g)	118.49	124.09
Weight of pan (g):	113.24	117.81
Gravimetric moisture content (% g/g):	30.67	31.05
Plastic Limit:	31	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 49
 Plastic Limit: 31
 Plasticity Index: 18
 Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-21-21.5-SS
Date Sampled: 12/12/2013
Depth (ft): 21-21.5
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	27	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.29	126.53	130.09
Weight of pan plus dry soil (g)	120.33	122.59	125.16
Weight of pan (g):	112.67	115.35	116.43
Gravimetric moisture content (% g/g):	51.70	54.42	56.47
Liquid Limit:	55		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.39	120.77
Weight of pan plus dry soil (g)	118.49	119.08
Weight of pan (g):	112.86	114.02
Gravimetric moisture content (% g/g):	33.75	33.40
Plastic Limit:	34	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 55
Plastic Limit: 34
Plasticity Index: 21
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-25.5-26-SS
Date Sampled: 12/12/2013
Depth (ft): 25.5-26
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---
Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-25.5-26-SS
Date Sampled: 12/12/2013
Depth (ft): 25.5-26
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Olive Brown (2.5 Y 3/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Low
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-31-31.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 31-31.5
 Test Date: 4-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	37	28	22
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	118.97	123.43	122.98
Weight of pan plus dry soil (g)	116.42	120.70	120.13
Weight of pan (g):	112.01	116.33	115.57
Gravimetric moisture content (% g/g):	57.82	62.47	62.50
Liquid Limit:	62		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.17	117.86
Weight of pan plus dry soil (g)	120.85	116.56
Weight of pan (g):	117.45	113.19
Gravimetric moisture content (% g/g):	38.82	38.58
Plastic Limit:	39	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 62
 Plastic Limit: 39
 Plasticity Index: 23
 Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: S. Hanhardt
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-2S-40-40.5-SS
Date Sampled: 12/12/2013
Depth (ft): 40-40.5
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	29	23
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.28	124.08	126.76
Weight of pan plus dry soil (g)	117.13	121.05	122.71
Weight of pan (g):	112.01	116.33	116.57
Gravimetric moisture content (% g/g):	61.52	64.19	65.96
Liquid Limit:	65		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.09	123.18
Weight of pan plus dry soil (g)	122.00	121.05
Weight of pan (g):	117.45	116.43
Gravimetric moisture content (% g/g):	45.93	46.10
Plastic Limit:	46	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: 65
Plastic Limit: 46
Plasticity Index: 19
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-10.5-11-SS
Date Sampled: 12/16/2013
Depth (ft): 10.5-11
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	37	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.27	122.19	127.68
Weight of pan plus dry soil (g)	116.55	118.40	122.51
Weight of pan (g):	111.20	113.14	115.57
Gravimetric moisture content (% g/g):	69.53	72.05	74.50
Liquid Limit:	72		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.86	119.48
Weight of pan plus dry soil (g)	121.69	117.32
Weight of pan (g):	116.31	111.86
Gravimetric moisture content (% g/g):	40.33	39.56
Plastic Limit:	40	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 72
Plastic Limit: 40
Plasticity Index: 32
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-20.5-21-SS
Date Sampled: 12/16/2013
Depth (ft): 20.5-21
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	128.32	124.59	124.90
Weight of pan plus dry soil (g)	124.82	121.31	121.52
Weight of pan (g):	117.93	115.13	115.31
Gravimetric moisture content (% g/g):	50.80	53.07	54.43
Liquid Limit:	53		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.83	122.67
Weight of pan plus dry soil (g)	118.00	120.53
Weight of pan (g):	112.70	114.28
Gravimetric moisture content (% g/g):	34.53	34.24
Plastic Limit:	34	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: 53
Plastic Limit: 34
Plasticity Index: 19
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-30.5-31-SS
Date Sampled: 12/17/2013
Depth (ft): 30.5-31
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	28	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.53	126.01	126.15
Weight of pan plus dry soil (g)	121.41	123.19	122.94
Weight of pan (g):	116.79	117.16	116.50
Gravimetric moisture content (% g/g):	45.89	46.77	49.84
Liquid Limit:	48		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.16	124.42
Weight of pan plus dry soil (g)	118.84	122.78
Weight of pan (g):	114.81	117.69
Gravimetric moisture content (% g/g):	32.75	32.22
Plastic Limit:	32	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 48
Plastic Limit: 32
Plasticity Index: 16
Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-40.5-41-SS
Date Sampled: 12/18/2013
Depth (ft): 40.5-41
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---
Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-3S-40.5-41-SS
Date Sampled: 12/18/2013
Depth (ft): 40.5-41
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Brown (10YR 3/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-5.0-6-Bag
Date Sampled: 12/18/2013
Depth (ft): 5.0-6
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	128.03	128.11	131.40
Weight of pan plus dry soil (g)	124.79	124.72	125.90
Weight of pan (g):	117.96	117.74	115.17
Gravimetric moisture content (% g/g):	47.44	48.57	51.26
Liquid Limit:	49		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.37	125.62
Weight of pan plus dry soil (g)	119.89	123.65
Weight of pan (g):	114.44	116.45
Gravimetric moisture content (% g/g):	27.16	27.36
Plastic Limit:	27	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 49
Plastic Limit: 27
Plasticity Index: 22
Classification: CL

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-10-11.0-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 10-11.0
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	27	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.28	120.54	120.01
Weight of pan plus dry soil (g)	121.53	117.17	116.36
Weight of pan (g):	116.00	110.60	109.63
Gravimetric moisture content (% g/g):	49.73	51.29	54.23
Liquid Limit:	52		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.28	120.36
Weight of pan plus dry soil (g)	122.57	118.62
Weight of pan (g):	116.69	112.64
Gravimetric moisture content (% g/g):	29.08	29.10
Plastic Limit:	29	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 52
 Plastic Limit: 29
 Plasticity Index: 23
 Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-16-17-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 16-17
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
 Liquid Limit: ---
 Plastic Limit: ---
 Plasticity Index: ---
 Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-16-17-Bag
Date Sampled: 12/18/2013
Depth (ft): 16-17
Test Date: 6-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Olive Brown (2.5Y 4/4)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-20-21-Bag
Date Sampled: 12/18/2013
Depth (ft): 20-21
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve
Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---
Classification (Visual Method): ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



**Data for Description and Identification of Fines
(Visual-Manual Procedure)**

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-20-21-Bag
Date Sampled: 12/18/2013
Depth (ft): 20-21
Test Date: 5-Feb-14

Visual-manual classification of material passing the #40 sieve in lieu of
Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Light Olive Brown (2.5Y 5/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: None

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-27-28-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 27-28
 Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	24	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.30	127.59	125.26
Weight of pan plus dry soil (g)	117.86	124.39	121.78
Weight of pan (g):	112.30	117.25	114.23
Gravimetric moisture content (% g/g):	43.88	44.82	46.09
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	117.90	121.80
Weight of pan plus dry soil (g)	116.67	120.25
Weight of pan (g):	113.30	116.13
Gravimetric moisture content (% g/g):	36.50	37.62
Plastic Limit:	37	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
 Plastic Limit: 37
 Plasticity Index: 8
 Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
 Data entered by: C. Krous
 Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-29-30-Bag
Date Sampled: 12/19/2013
Depth (ft): 29-30
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	23	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.28	127.61	124.90
Weight of pan plus dry soil (g)	117.88	123.62	119.72
Weight of pan (g):	113.39	116.50	110.58
Gravimetric moisture content (% g/g):	53.45	56.04	56.67
Liquid Limit:	55		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.23	116.36
Weight of pan plus dry soil (g)	121.52	114.94
Weight of pan (g):	116.70	111.00
Gravimetric moisture content (% g/g):	35.48	36.04
Plastic Limit:	36	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 55
Plastic Limit: 36
Plasticity Index: 19
Classification: MH

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-35-36-Bag
Date Sampled: 12/18/2013
Depth (ft): 35-36
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	37	26	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	121.39	124.31	127.82
Weight of pan plus dry soil (g)	118.52	122.03	123.32
Weight of pan (g):	112.30	117.25	114.23
Gravimetric moisture content (% g/g):	46.14	47.70	49.50
Liquid Limit:	48		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.28	123.71
Weight of pan plus dry soil (g)	119.23	121.77
Weight of pan (g):	113.30	116.13
Gravimetric moisture content (% g/g):	34.57	34.40
Plastic Limit:	34	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 48
Plastic Limit: 34
Plasticity Index: 14
Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



Atterberg Limits

Job Name: SCWA - Montini
Job Number: WR10.0085.13
Sample Number: MON-B-01-43-44-Bag
Date Sampled: 12/18/2013
Depth (ft): 43-44
Test Date: 6-Feb-14

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	24	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.52	128.92	122.32
Weight of pan plus dry soil (g)	121.16	125.05	118.57
Weight of pan (g):	113.39	116.50	110.58
Gravimetric moisture content (% g/g):	43.24	45.26	46.93
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	126.63	119.81
Weight of pan plus dry soil (g)	124.45	117.89
Weight of pan (g):	116.70	111.00
Gravimetric moisture content (% g/g):	28.13	27.87
Plastic Limit:	28	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 28
Plasticity Index: 17
Classification: ML

Comments:

- = Soil requires visual-manual classification due to non-plasticity
- * = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Specific Gravity



Summary of Specific Gravity Tests

Sample Number	<4.75mm			>4.75mm			Bulk Sample
	Specific Gravity	Particle Size	% of Bulk Sample	Specific Gravity	Particle Size	% of Bulk Sample	Specific Gravity*
MON-1D-10.5-11-SS	2.73	<4.75mm	100.0	---	>4.75mm	0.0	2.73
MON-1D-20.5-21-SS	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-1D-30-30.5-SS	2.62	<4.75mm	91.2	2.68	>4.75mm	8.8	2.63
MON-1D-45.5-46-SS	2.65	<4.75mm	99.8	---	>4.75mm	0.2	2.65
MON-1D-65.5-66-SS	2.74	<4.75mm	100.0	---	>4.75mm	0.0	2.74
MON-1D-85.5-86-SS	2.62	<4.75mm	94.4	2.60	>4.75mm	5.6	2.62
MON-1D-102-103-Bag	2.63	<4.75mm	84.1	2.57	>4.75mm	15.9	2.62
MON-1D-119.5-120.5-Bag	2.42	<4.75mm	91.4	2.13	>4.75mm	8.6	2.40
MON-2S-10.5-11-SS	2.76	<4.75mm	100.0	---	>4.75mm	0.0	2.76
MON-2S-21-21.5-SS	2.74	<4.75mm	100.0	---	>4.75mm	0.0	2.74
MON-2S-26-26.5-SS	2.71	<4.75mm	100.0	---	>4.75mm	0.0	2.71
MON-2S-31-31.5-SS	2.45	<4.75mm	100.0	---	>4.75mm	0.0	2.45
MON-2S-40-40.5-SS	2.69	<4.75mm	99.5	---	>4.75mm	0.5	2.69
MON-3S-21-21.5-SS	2.64	<4.75mm	100.0	---	>4.75mm	0.0	2.64
MON-3S-40.5-41-SS	2.67	<4.75mm	99.8	---	>4.75mm	0.2	2.67
MON-B-01-10-11.0-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-B-01-16-17-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72
MON-B-01-27-28-Bag	2.67	<4.75mm	99.5	---	>4.75mm	0.5	2.67
MON-B-01-35-36-Bag	2.72	<4.75mm	100.0	---	>4.75mm	0.0	2.72

*Weighted average, if more than one fraction tested

--- = Unnecessary since specified fraction < 5% of composite mass



Data for Specific Gravity of Sample: MON-1D-10.5-11-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-10.5-11-SS
 Date Sampled: 12/10/2013
 Depth (ft): 10.5-11

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	93.61	93.29
Weight of pycnometer filled w/soil (g):	136.54	134.62
Weight of pycnometer filled w/soil & water (g):	370.04	368.78
Weight of pycnometer filled w/water (g):	342.87	342.60
Specific Gravity (g/g):	2.72	2.73
Observed temperature (°C):	20.80	20.40
Density of water at observed temperature (g/cm ³):	0.9980	0.9981
Correction factor, K:	0.9998	0.9999
Specific Gravity at 20°C (g/g):	2.72	2.73
Average Specific Gravity (g/g):	2.73	
Average Particle Density (g/cm ³):	2.72	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---
Specific Gravity (Apparent):	2.73	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.72	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-1D-20.5-21-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-20.5-21-SS
 Date Sampled: 12/10/2013
 Depth (ft): 20.5-21

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	93.89	94.53
Weight of pycnometer filled w/soil (g):	136.60	135.44
Weight of pycnometer filled w/soil & water (g):	370.25	369.66
Weight of pycnometer filled w/water (g):	343.24	343.82
Specific Gravity (g/g):	2.72	2.71
Observed temperature (°C):	19.40	20.90
Density of water at observed temperature (g/cm ³):	0.9983	0.9980
Correction factor, K:	1.0001	0.9998
Specific Gravity at 20°C (g/g):	2.72	2.71
Average Specific Gravity (g/g):	2.72	
Average Particle Density (g/cm ³):	2.71	

ASTM C127 (>4.75mm) Fraction

	Test Date:	
Percent of Test Sample (% g/g):	---	0.0
Percent of Bulk Sample (% g/g):	---	0.0
Tare Weight (g):	---	---
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	---
Saturated Apparent mass in Water & Tare (g):	---	---
Oven Dry (OD) mass in Air & Tare (g):	---	---
SSD Specific Gravity (g/g):	---	---
Apparent Specific Gravity (g/g):	---	---
OD Specific Gravity (g/g):	---	---
Percent Absorption (%):	---	---
Observed Temperature (°C):	---	---
Density of water at observed temperature (g/m ³):	---	---
Correction Factor, K:	---	---
Specific Gravity (Apparent), Corrected to 20° C:	---	---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	---
Specific Gravity (Apparent):	2.72	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.71	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-1D-30-30.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-30-30.5-SS
 Date Sampled: 12/10/2013
 Depth (ft): 30-30.5

ASTM D854 (<4.75mm Fraction)

Test Date: 6-Feb-14		
Percent of Test Sample (% g/g):	91.2	
Percent of Bulk Sample (% g/g):	91.2	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	95.80	93.69
Weight of pycnometer filled w/soil (g):	124.50	123.81
Weight of pycnometer filled w/soil & water (g):	362.86	361.66
Weight of pycnometer filled w/water (g):	345.11	343.03
Specific Gravity (g/g):	2.62	2.62
Observed temperature (°C):	19.50	20.45
Density of water at observed temperature (g/cm ³):	0.9983	0.9981
Correction factor, K:	1.0001	0.9999
Specific Gravity at 20°C (g/g):	2.62	2.62
Average Specific Gravity (g/g):	2.62	
Average Particle Density (g/cm ³):	2.62	

ASTM C127 (>4.75mm) Fraction

Test Date: 26-Feb-14	
Percent of Test Sample (% g/g):	8.8
Percent of Bulk Sample (% g/g):	8.8
Tare Weight (g):	0.00
Saturated Surface Dry (SSD) mass in Air & Tare (g):	19.46
Saturated Apparent mass in Water & Tare (g):	11.36
Oven Dry (OD) mass in Air & Tare (g):	18.12
SSD Specific Gravity (g/g):	2.40
Apparent Specific Gravity (g/g):	2.68
OD Specific Gravity (g/g):	2.24
Percent Absorption (%):	6.9
Observed Temperature (°C):	20.0
Density of water at observed temperature (g/m ³):	0.9982
Correction Factor, K:	1.0000
Specific Gravity (Apparent), Corrected to 20° C:	2.68
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	2.68

Specific Gravity (Apparent): 2.63 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.62



Data for Specific Gravity of Sample: MON-1D-45.5-46-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-45.5-46-SS
 Date Sampled: 12/10/2013
 Depth (ft): 45.5-46

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	99.8	
Percent of Bulk Sample (% g/g):	99.8	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.14	92.93
Weight of pycnometer filled w/soil (g):	132.23	133.27
Weight of pycnometer filled w/soil & water (g):	366.46	367.46
Weight of pycnometer filled w/water (g):	341.52	342.33
Specific Gravity (g/g):	2.65	2.65
Observed temperature (°C):	19.70	19.80
Density of water at observed temperature (g/cm ³):	0.9983	0.9982
Correction factor, K:	1.0001	1.0000
Specific Gravity at 20°C (g/g):	2.65	2.65
Average Specific Gravity (g/g):	2.65	
Average Particle Density (g/cm ³):	2.64	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.2
Percent of Bulk Sample (% g/g):		0.2
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---

--- = Test unnecessary since specified fraction <5% of composite mass.

Specific Gravity (Apparent): 2.65 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.64



Data for Specific Gravity of Sample: MON-1D-65.5-66-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-65.5-66-SS
 Date Sampled: 12/10/2013
 Depth (ft): 65.5-66

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	91.32	92.33
Weight of pycnometer filled w/soil (g):	132.03	133.65
Weight of pycnometer filled w/soil & water (g):	366.57	367.86
Weight of pycnometer filled w/water (g):	340.76	341.63
Specific Gravity (g/g):	2.73	2.74
Observed temperature (°C):	19.45	19.85
Density of water at observed temperature (g/cm ³):	0.9983	0.9982
Correction factor, K:	1.0001	1.0000
Specific Gravity at 20°C (g/g):	2.73	2.74
Average Specific Gravity (g/g):	2.74	
Average Particle Density (g/cm ³):	2.73	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---
Specific Gravity (Apparent):	2.74	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.73	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-1D-85.5-86-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-85.5-86-SS
 Date Sampled: 12/11/2013
 Depth (ft): 85.5-86

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Feb-14	
Percent of Test Sample (% g/g):	94.4	
Percent of Bulk Sample (% g/g):	94.4	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	93.56	95.42
Weight of pycnometer filled w/soil (g):	134.63	135.68
Weight of pycnometer filled w/soil & water (g):	368.39	369.56
Weight of pycnometer filled w/water (g):	343.03	344.69
Specific Gravity (g/g):	2.61	2.62
Observed temperature (°C):	19.40	20.55
Density of water at observed temperature (g/cm ³):	0.9983	0.9981
Correction factor, K:	1.0001	0.9999
Specific Gravity at 20°C (g/g):	2.62	2.62
Average Specific Gravity (g/g):	2.62	
Average Particle Density (g/cm ³):	2.61	

ASTM C127 (>4.75mm) Fraction

	Test Date: 26-Feb-14
Percent of Test Sample (% g/g):	5.6
Percent of Bulk Sample (% g/g):	5.6
Tare Weight (g):	0.00
Saturated Surface Dry (SSD) mass in Air & Tare (g):	47.00
Saturated Apparent mass in Water & Tare (g):	26.94
Oven Dry (OD) mass in Air & Tare (g):	43.73
SSD Specific Gravity (g/g):	2.34
Apparent Specific Gravity (g/g):	2.60
OD Specific Gravity (g/g):	2.18
Percent Absorption (%):	7.0
Observed Temperature (°C):	20.1
Density of water at observed temperature (g/m ³):	0.9982
Correction Factor, K:	1.0000
Specific Gravity (Apparent), Corrected to 20° C:	2.60
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	2.60

Specific Gravity (Apparent): 2.62 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.61



Data for Specific Gravity of Sample: MON-1D-102-103-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-102-103-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 102-103

ASTM D854 (<4.75mm Fraction)

Test Date: 5-Mar-14		
Percent of Test Sample (% g/g):	84.1	
Percent of Bulk Sample (% g/g):	84.1	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.90	90.72
Weight of pycnometer filled w/soil (g):	133.40	132.53
Weight of pycnometer filled w/soil & water (g):	367.44	366.04
Weight of pycnometer filled w/water (g):	342.31	340.16
Specific Gravity (g/g):	2.64	2.62
Observed temperature (°C):	19.80	19.90
Density of water at observed temperature (g/cm ³):	0.9982	0.9982
Correction factor, K:	1.0000	1.0000
Specific Gravity at 20°C (g/g):	2.64	2.62
Average Specific Gravity (g/g):	2.63	
Average Particle Density (g/cm ³):	2.63	

ASTM C127 (>4.75mm) Fraction

Test Date: 26-Feb-14	
Percent of Test Sample (% g/g):	15.9
Percent of Bulk Sample (% g/g):	15.9
Tare Weight (g):	0.00
Saturated Surface Dry (SSD) mass in Air & Tare (g):	143.62
Saturated Apparent mass in Water & Tare (g):	76.20
Oven Dry (OD) mass in Air & Tare (g):	124.63
SSD Specific Gravity (g/g):	2.13
Apparent Specific Gravity (g/g):	2.57
OD Specific Gravity (g/g):	1.85
Percent Absorption (%):	13.2
Observed Temperature (°C):	20.05
Density of water at observed temperature (g/m ³):	0.9982
Correction Factor, K:	1.0000
Specific Gravity (Apparent), Corrected to 20° C:	2.57
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	2.57

Specific Gravity (Apparent): 2.62 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.62



Data for Specific Gravity of Sample: MON-1D-119.5-120.5-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-1D-119.5-120.5-Bag
 Date Sampled: 12/11/2013
 Depth (ft): 119.5-120.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	91.4	
Percent of Bulk Sample (% g/g):	91.4	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	93.25	92.15
Weight of pycnometer filled w/soil (g):	133.66	132.25
Weight of pycnometer filled w/soil & water (g):	366.32	365.06
Weight of pycnometer filled w/water (g):	342.58	341.50
Specific Gravity (g/g):	2.42	2.42
Observed temperature (°C):	19.50	20.75
Density of water at observed temperature (g/cm ³):	0.9983	0.9980
Correction factor, K:	1.0001	0.9998
Specific Gravity at 20°C (g/g):	2.42	2.42
Average Specific Gravity (g/g):	2.42	
Average Particle Density (g/cm ³):	2.42	

ASTM C127 (>4.75mm) Fraction

	Test Date: 26-Feb-14
Percent of Test Sample (% g/g):	8.6
Percent of Bulk Sample (% g/g):	8.6
Tare Weight (g):	0.00
Saturated Surface Dry (SSD) mass in Air & Tare (g):	65.39
Saturated Apparent mass in Water & Tare (g):	23.10
Oven Dry (OD) mass in Air & Tare (g):	43.50
SSD Specific Gravity (g/g):	1.55
Apparent Specific Gravity (g/g):	2.13
OD Specific Gravity (g/g):	1.03
Percent Absorption (%):	33.5
Observed Temperature (°C):	20.05
Density of water at observed temperature (g/m ³):	0.9982
Correction Factor, K:	1.0000
Specific Gravity (Apparent), Corrected to 20° C:	2.13
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	2.13

Specific Gravity (Apparent): 2.40 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.39



Data for Specific Gravity of Sample: MON-2S-10.5-11-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-10.5-11-SS
 Date Sampled: 12/12/2013
 Depth (ft): 10.5-11

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.89	94.40
Weight of pycnometer filled w/soil (g):	133.30	134.42
Weight of pycnometer filled w/soil & water (g):	368.05	369.26
Weight of pycnometer filled w/water (g):	342.25	343.82
Specific Gravity (g/g):	2.77	2.75
Observed temperature (°C):	19.70	19.60
Density of water at observed temperature (g/cm ³):	0.9983	0.9983
Correction factor, K:	1.0001	1.0001
Specific Gravity at 20°C (g/g):	2.77	2.75
Average Specific Gravity (g/g):	2.76	
Average Particle Density (g/cm ³):	2.75	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---

--- = Test unnecessary since specified fraction <5% of composite mass.

Specific Gravity (Apparent): 2.76 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.75

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-2S-21-21.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-21-21.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 21-21.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	90.23	92.06
Weight of pycnometer filled w/soil (g):	130.70	132.52
Weight of pycnometer filled w/soil & water (g):	365.31	367.08
Weight of pycnometer filled w/water (g):	339.56	341.41
Specific Gravity (g/g):	2.75	2.74
Observed temperature (°C):	19.50	19.90
Density of water at observed temperature (g/cm ³):	0.9983	0.9982
Correction factor, K:	1.0001	1.0000
Specific Gravity at 20°C (g/g):	2.75	2.74
Average Specific Gravity (g/g):	2.74	
Average Particle Density (g/cm ³):	2.74	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---
Specific Gravity (Apparent):	2.74	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.74	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-2S-26-26.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-26-26.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 26-26.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	90.97	93.56
Weight of pycnometer filled w/soil (g):	131.20	133.85
Weight of pycnometer filled w/soil & water (g):	365.64	368.28
Weight of pycnometer filled w/water (g):	340.22	342.89
Specific Gravity (g/g):	2.72	2.70
Observed temperature (°C):	20.90	20.85
Density of water at observed temperature (g/cm ³):	0.9980	0.9980
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.72	2.70
Average Specific Gravity (g/g):	2.71	
Average Particle Density (g/cm ³):	2.71	

ASTM C127 (>4.75mm) Fraction

	Test Date: ---	
Percent of Test Sample (% g/g):	0.0	
Percent of Bulk Sample (% g/g):	0.0	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m ³):	---	
Correction Factor, K:	---	
Specific Gravity (Apparent), Corrected to 20° C:	---	
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	
Specific Gravity (Apparent):	2.71	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.71	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-2S-31-31.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-31-31.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 31-31.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	93.60	93.37
Weight of pycnometer filled w/soil (g):	134.56	136.52
Weight of pycnometer filled w/soil & water (g):	367.09	368.11
Weight of pycnometer filled w/water (g):	342.85	342.62
Specific Gravity (g/g):	2.45	2.44
Observed temperature (°C):	20.95	20.80
Density of water at observed temperature (g/cm ³):	0.9980	0.9980
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.45	2.44
Average Specific Gravity (g/g):	2.45	
Average Particle Density (g/cm ³):	2.44	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---
Specific Gravity (Apparent):	2.45	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.44	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-2S-40-40.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-2S-40-40.5-SS
 Date Sampled: 12/12/2013
 Depth (ft): 40-40.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	99.5	
Percent of Bulk Sample (% g/g):	99.5	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	91.51	93.69
Weight of pycnometer filled w/soil (g):	133.04	134.06
Weight of pycnometer filled w/soil & water (g):	366.91	368.41
Weight of pycnometer filled w/water (g):	340.86	343.04
Specific Gravity (g/g):	2.68	2.69
Observed temperature (°C):	19.85	19.40
Density of water at observed temperature (g/cm ³):	0.9982	0.9983
Correction factor, K:	1.0000	1.0001
Specific Gravity at 20°C (g/g):	2.68	2.69
Average Specific Gravity (g/g):	2.69	
Average Particle Density (g/cm ³):	2.68	

ASTM C127 (>4.75mm) Fraction

	Test Date: ---	
Percent of Test Sample (% g/g):	0.5	
Percent of Bulk Sample (% g/g):	0.5	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m ³):	---	
Correction Factor, K:	---	
Specific Gravity (Apparent), Corrected to 20° C:	---	
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	
Specific Gravity (Apparent):	2.69	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.68	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-3S-21-21.5-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-21-21.5-SS
 Date Sampled: 12/17/2013
 Depth (ft): 21-21.5

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.22	90.88
Weight of pycnometer filled w/soil (g):	132.28	132.39
Weight of pycnometer filled w/soil & water (g):	366.44	366.08
Weight of pycnometer filled w/water (g):	341.59	340.25
Specific Gravity (g/g):	2.63	2.65
Observed temperature (°C):	20.80	20.80
Density of water at observed temperature (g/cm ³):	0.9980	0.9980
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.63	2.65
Average Specific Gravity (g/g):	2.64	
Average Particle Density (g/cm ³):	2.64	

ASTM C127 (>4.75mm) Fraction

	Test Date:	
Percent of Test Sample (% g/g):	---	0.0
Percent of Bulk Sample (% g/g):	---	0.0
Tare Weight (g):	---	---
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	---
Saturated Apparent mass in Water & Tare (g):	---	---
Oven Dry (OD) mass in Air & Tare (g):	---	---
SSD Specific Gravity (g/g):	---	---
Apparent Specific Gravity (g/g):	---	---
OD Specific Gravity (g/g):	---	---
Percent Absorption (%):	---	---
Observed Temperature (°C):	---	---
Density of water at observed temperature (g/m ³):	---	---
Correction Factor, K:	---	---
Specific Gravity (Apparent), Corrected to 20° C:	---	---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	---
Specific Gravity (Apparent):	2.64	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.64	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-3S-40.5-41-SS

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-3S-40.5-41-SS
 Date Sampled: 12/18/2013
 Depth (ft): 40.5-41

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	99.8	
Percent of Bulk Sample (% g/g):	99.8	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	91.38	91.07
Weight of pycnometer filled w/soil (g):	137.16	138.94
Weight of pycnometer filled w/soil & water (g):	369.38	370.27
Weight of pycnometer filled w/water (g):	340.74	340.37
Specific Gravity (g/g):	2.67	2.66
Observed temperature (°C):	19.75	19.70
Density of water at observed temperature (g/cm ³):	0.9983	0.9983
Correction factor, K:	1.0001	1.0001
Specific Gravity at 20°C (g/g):	2.67	2.66
Average Specific Gravity (g/g):	2.67	
Average Particle Density (g/cm ³):	2.66	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.2
Percent of Bulk Sample (% g/g):		0.2
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---

--- = Test unnecessary since specified fraction <5% of composite mass.

Specific Gravity (Apparent): 2.67 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.66



Data for Specific Gravity of Sample: MON-B-01-10-11.0-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-10-11.0-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 10-11.0

ASTM D854 (<4.75mm Fraction)

	Test Date: 6-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	94.22	94.99
Weight of pycnometer filled w/soil (g):	135.12	135.08
Weight of pycnometer filled w/soil & water (g):	369.31	369.68
Weight of pycnometer filled w/water (g):	343.47	344.33
Specific Gravity (g/g):	2.72	2.72
Observed temperature (°C):	20.60	20.20
Density of water at observed temperature (g/cm ³):	0.9981	0.9982
Correction factor, K:	0.9999	1.0000
Specific Gravity at 20°C (g/g):	2.72	2.72
Average Specific Gravity (g/g):	2.72	
Average Particle Density (g/cm ³):	2.71	

ASTM C127 (>4.75mm) Fraction

	Test Date: ---	
Percent of Test Sample (% g/g):	0.0	
Percent of Bulk Sample (% g/g):	0.0	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m ³):	---	
Correction Factor, K:	---	
Specific Gravity (Apparent), Corrected to 20° C:	---	
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	
Specific Gravity (Apparent):	2.72	
Particle Density (Apparent) (g/cm ³):	2.71	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-B-01-16-17-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-16-17-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 16-17

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.80	93.98
Weight of pycnometer filled w/soil (g):	135.70	134.78
Weight of pycnometer filled w/soil & water (g):	369.33	369.12
Weight of pycnometer filled w/water (g):	342.24	343.33
Specific Gravity (g/g):	2.71	2.72
Observed temperature (°C):	19.50	19.55
Density of water at observed temperature (g/cm ³):	0.9983	0.9983
Correction factor, K:	1.0001	1.0001
Specific Gravity at 20°C (g/g):	2.71	2.72
Average Specific Gravity (g/g):	2.72	
Average Particle Density (g/cm ³):	2.71	

ASTM C127 (>4.75mm) Fraction

	Test Date:	
Percent of Test Sample (% g/g):	---	0.0
Percent of Bulk Sample (% g/g):	---	0.0
Tare Weight (g):	---	---
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	---
Saturated Apparent mass in Water & Tare (g):	---	---
Oven Dry (OD) mass in Air & Tare (g):	---	---
SSD Specific Gravity (g/g):	---	---
Apparent Specific Gravity (g/g):	---	---
OD Specific Gravity (g/g):	---	---
Percent Absorption (%):	---	---
Observed Temperature (°C):	---	---
Density of water at observed temperature (g/m ³):	---	---
Correction Factor, K:	---	---
Specific Gravity (Apparent), Corrected to 20° C:	---	---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):	---	---
Specific Gravity (Apparent):	2.72	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.71	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-B-01-27-28-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-27-28-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 27-28

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	99.5	
Percent of Bulk Sample (% g/g):	99.5	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	92.40	94.25
Weight of pycnometer filled w/soil (g):	132.49	135.74
Weight of pycnometer filled w/soil & water (g):	366.87	369.56
Weight of pycnometer filled w/water (g):	341.79	343.57
Specific Gravity (g/g):	2.67	2.68
Observed temperature (°C):	19.50	19.65
Density of water at observed temperature (g/cm ³):	0.9983	0.9983
Correction factor, K:	1.0001	1.0001
Specific Gravity at 20°C (g/g):	2.67	2.68
Average Specific Gravity (g/g):	2.67	
Average Particle Density (g/cm ³):	2.67	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.5
Percent of Bulk Sample (% g/g):		0.5
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---
Specific Gravity (Apparent):	2.67	* Weighted Average
Particle Density (Apparent) (g/cm ³):	2.67	

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines



Data for Specific Gravity of Sample: MON-B-01-35-36-Bag

Job Name: SCWA - Montini
 Job Number: WR10.0085.13
 Sample Number: MON-B-01-35-36-Bag
 Date Sampled: 12/18/2013
 Depth (ft): 35-36

ASTM D854 (<4.75mm Fraction)

	Test Date: 5-Mar-14	
Percent of Test Sample (% g/g):	100.0	
Percent of Bulk Sample (% g/g):	100.0	
	<i>Trial 1</i>	<i>Trial 2</i>
Weight of pycnometer filled w/air (g):	99.59	93.58
Weight of pycnometer filled w/soil (g):	149.83	144.56
Weight of pycnometer filled w/soil & water (g):	380.67	375.20
Weight of pycnometer filled w/water (g):	348.85	342.97
Specific Gravity (g/g):	2.73	2.72
Observed temperature (°C):	19.90	19.40
Density of water at observed temperature (g/cm ³):	0.9982	0.9983
Correction factor, K:	1.0000	1.0001
Specific Gravity at 20°C (g/g):	2.73	2.72
Average Specific Gravity (g/g):	2.72	
Average Particle Density (g/cm ³):	2.72	

ASTM C127 (>4.75mm) Fraction

	Test Date:	---
Percent of Test Sample (% g/g):		0.0
Percent of Bulk Sample (% g/g):		0.0
Tare Weight (g):		---
Saturated Surface Dry (SSD) mass in Air & Tare (g):		---
Saturated Apparent mass in Water & Tare (g):		---
Oven Dry (OD) mass in Air & Tare (g):		---
SSD Specific Gravity (g/g):		---
Apparent Specific Gravity (g/g):		---
OD Specific Gravity (g/g):		---
Percent Absorption (%):		---
Observed Temperature (°C):		---
Density of water at observed temperature (g/m ³):		---
Correction Factor, K:		---
Specific Gravity (Apparent), Corrected to 20° C:		---
Particle Density (Apparent), Corrected to 20° C (g/cm ³):		---

--- = Test unnecessary since specified fraction <5% of composite mass.

Specific Gravity (Apparent): 2.72 * Weighted Average
 Particle Density (Apparent) (g/cm³): 2.72

Laboratory analysis by: C. Krous
 Data entered by: C. Krous
 Checked by: J. Hines

Laboratory Tests and Methods



Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity:	
Constant Head: (Rigid Wall)	ASTM D 2434 (modified apparatus)
Falling Head: (Rigid Wall)	Klute, A. and C. Dirksen. 1986. Hydraulic Conductivity and Diffusivity: Laboratory Methods. Chp. 28, pp. 700-703, in A. Klute (ed.), Methods of Soil Analysis, Part 1, American Society of Agronomy, Madison, WI
Specific Gravity Fine:	ASTM D854
Specific Gravity Coarse:	ASTM C127
Particle Size Analysis:	ASTM D422
USCS (ASTM) Classification:	ASTM D422, ASTM D2487
USDA Classification:	ASTM D422, USDA Soil Textural Triangle
Atterberg Limits:	ASTM D4318
Visual-Manual Description:	ASTM D2488

Appendix D

Chain of Custody Form

Report To: SCWA
 Client: SCWA
 Attn:
 Street Address: MONTANI RANCH
 City, State, Zip:
 Phone: 707-322-5017 Fax:
 Email Address:
 Work Order #: 13-27842

Project #: WR10.0085.13
 Project Name: CITY WATERSHEDS
 Sampler(s):
JENNY CHERNEY
Phil Kaiser

Analysis Requested	
Substrate	
ANIONS 1703, MBAS	
Color	
OPOR	
Total Metals	
HAA 5	
TTHM	
TICN	
Nitrate	

Comments:

Sample #	Description	Date Sampled	Time Sampled
B-01-05	SOIL MON-B-01 0.5-1 ft	12/18/13	13:15
B-01-05	SOIL MON-B-01 5-5.5 ft	12/18/13	13:15
B-01-10	SOIL MON-B-01 10-10.5 ft	12/18/13	13:25
MON-10	WELL MONITORING	12/20/13	11:15
MON-10	WELL MONITORING	12/20/13	11:30
MON-15	WELL MONITORING	12/20/13	13:20
MON-35	WELL MONITORING	12/20/13	14:10
MON-25	WELL MONITORING	12/20/13	15:40
	TRIP BLANK	12/20/13	15:40

Sample Matrix	Turnaround # of work days*	Are there any tests with holding times less than or equal to 48 hours? <input type="checkbox"/> Yes <input type="checkbox"/> No	Notes		
				Soil	Sludge
X	10				
X	10				
X	10				
X	10				
X	10				
X	10				
X	10				
X	10				
X	10				
X	10				

SHORT HOLDING TIME
 Cr⁶⁺ NO₂ NO₃ OP SS
 DO Cl₂ BOD MBAS COT

CHK BY: [Signature]
 DISTRIBUTION: MAINTENANCE TDS
 SUB-OUT

Billing Same as above
 Client: DBS & A
 Address: 216 Simon
 City: PETALUMA State CA Zip 94952
 Attn: Jenny Chorney
 PO#: WR10.0085.13 Ph 113

EDF Required? Geotracker
 Yes No
 Send Copy to State of CA? (EDT)
 Yes No

Global ID (Needed for EDF)		System # (Needed for EDT)	
1. Relinquished By	Date	Time	1. Received By
<u>Phil Kaiser</u>	<u>12/20</u>	<u>16:03</u>	<u>[Signature]</u>
2. Relinquished By	Date	Time	2. Received By
			<u>[Signature]</u>
3. Relinquished By	Date	Time	3. Received By

Submission #: 13-27842

SHIPPING INFORMATION
 Federal Express UPS Hand Delivery
 BC Lab Field Service Other (Specify) INTAC

SHIPPING CONTAINER
 Ice Chest None Box
 Other (Specify) _____

FREE LIQUID
 YES NO

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals Ice Chest Containers None Comments: _____
 Intact? Yes No Intact? Yes No

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No

COC Received
 YES NO

Emissivity: 0.95 Contained PT, PE Thermometer ID: 11207
 Temperature: (A) 0.4 °C (C) 0.5 °C

Date/Time: 12/23/13 09:50
 Analyst Init: MA

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL				BC	BC	BC				
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS				CD	CD	CD				
PT INORGANIC CHEMICAL METALS										
PT CYANIDE				DE	DE	DE				
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PTA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										A(2)
40ml VOA VIAL				A(3)	A(3)	A(3)				
QT EPA 413.1, 413.2, 418.1				EF	EF	EF				
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER 8OZ HAAS	A	A	A	FG	FG					
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments: _____
 Sample Numbering Completed By: MA/MAI Date/Time: 12/23/13 08:15
 A = Actual / C = Corrected

Submission #: 13-27842

SHIPPING INFORMATION

Federal Express UPS Hand Delivery
 BC Lab Field Service Other (Specify) NTAL

SHIPPING CONTAINER

Ice Chest None Box
 Other (Specify) _____

FREE LIQUID

YES NO

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals Ice Chest Containers None Comments: _____
 Intact? Yes No Intact? Yes No

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No

COC Received
 YES NO

Emissivity: 0.95 Container: PT PE Thermometer ID: TH207 Date/Time: 12/23/13 09:50
 Temperature: (A) 0.3 °C / (C) 0.4 °C Analyst Init: MA

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL							BC	BC		
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS							ED	ED	MA 12/23/13	
PT INORGANIC CHEMICAL METALS										
PT CYANIDE							DE	DE	DE	
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL						A3	A3	A3		
QT EPA 413.1, 413.2, 418.1										
PT ODOR							EF	EF		
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER 8OZ HAAS						FG	FG	FG		
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments: _____
 Sample Numbering Completed By: MA/MA Date/Time: 12/23/13 @ 09:15
 A = Actual / C = Corrected



Date of Report: 01/13/2014

Jenny Cherney

Daniel B. Stephens & Associates

P.O. Box 256

Petaluma, CA 94953

Client Project: WR10.0085.13

BCL Project: City Watersheds Montini Ranch

BCL Work Order: 1327842

Invoice ID: B163895

Enclosed are the results of analyses for samples received by the laboratory on 12/21/2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014; AK UST101



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	4
Laboratory / Client Sample Cross Reference.....	7

Sample Results

1327842-01 - MON-B-01 0.5-1 ft	
Chemical Analysis.....	9
1327842-02 - MON-B-01 5-5.5 ft	
Chemical Analysis.....	10
1327842-03 - MON-B-01 10-10.5 ft	
Chemical Analysis.....	11
1327842-04 - MON-1D	
Volatile Organic Analysis (EPA Method 524.2).....	12
Halogenated Acetic Acids (Method EPA-552.3).....	13
Water Analysis (General Chemistry).....	14
Metals Analysis.....	16
1327842-05 - MON-1D Dup	
Volatile Organic Analysis (EPA Method 524.2).....	17
Halogenated Acetic Acids (Method EPA-552.3).....	18
Water Analysis (General Chemistry).....	19
Metals Analysis.....	21
1327842-06 - MON-1S	
Volatile Organic Analysis (EPA Method 524.2).....	22
Halogenated Acetic Acids (Method EPA-552.3).....	23
Water Analysis (General Chemistry).....	24
Metals Analysis.....	26
1327842-07 - MON-3S	
Volatile Organic Analysis (EPA Method 524.2).....	27
Halogenated Acetic Acids (Method EPA-552.3).....	28
Water Analysis (General Chemistry).....	29
Metals Analysis.....	31
1327842-08 - MON-2S	
Volatile Organic Analysis (EPA Method 524.2).....	32
Halogenated Acetic Acids (Method EPA-552.3).....	33
Water Analysis (General Chemistry).....	34
Metals Analysis.....	36
1327842-09 - Trip Blank	
Volatile Organic Analysis (EPA Method 524.2).....	37

Quality Control Reports

Volatile Organic Analysis (EPA Method 524.2)	
Method Blank Analysis.....	38
Laboratory Control Sample.....	39
Precision and Accuracy.....	40
Halogenated Acetic Acids (Method EPA-552.3)	
Method Blank Analysis.....	41
Laboratory Control Sample.....	42
Precision and Accuracy.....	43
Chemical Analysis	
Method Blank Analysis.....	44
Laboratory Control Sample.....	45
Precision and Accuracy.....	46
Water Analysis (General Chemistry)	
Method Blank Analysis.....	47
Laboratory Control Sample.....	49
Precision and Accuracy.....	50



Table of Contents

Metals Analysis

Method Blank Analysis.....	53
Laboratory Control Sample.....	54
Precision and Accuracy.....	55

Notes

Notes and Definitions.....	57
----------------------------	----



BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 15 07/01/13 Page 1 of 2

Submission #: 13-27842

SHIPPING INFORMATION
 Federal Express UPS Hand Delivery
 BC Lab Field Service Other (Specify) INTAC

SHIPPING CONTAINER
 Ice Chest None Box
 Other (Specify) _____

FREE LIQUID
 YES NO

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals Ice Chest Containers None Comments: _____
 Intact? Yes No Intact? Yes No

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No

COC Received
 YES NO

Emissivity: 0.95 Contained PT PE Thermometer ID: H207 Date/Time: 12/23/13 09:50
 Temperature: (A) 04 °C (C) 0.5 °C Analyst Initial: MA

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL				BC	BC	BC				
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS				CD	CD	CD				
PT-INORGANIC-CHEMICAL-METALS				DE	DE	DE				
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										A(2)
40ml VOA VIAL TRAVEL BLANK				A3	A3	A3				
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1				FF	FF	FF				
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER 8oz HAAS	A	A	A	FG	FG					
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments: _____

Sample Numbering Completed By: MA/MLL Date/Time: 12/23/13 08:15

△ = Actual / C = Corrected



BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 15 07/01/13 Page 2 Of 2

Submission #: 13-27842

SHIPPING INFORMATION Federal Express <input type="checkbox"/> UPS <input type="checkbox"/> Hand Delivery <input type="checkbox"/> BC Lab Field Service <input type="checkbox"/> Other <input checked="" type="checkbox"/> (Specify) <u>NTCAL</u>		SHIPPING CONTAINER Ice Chest <input checked="" type="checkbox"/> None <input type="checkbox"/> Box <input type="checkbox"/> Other <input type="checkbox"/> (Specify) _____	FREE LIQUID YES <input type="checkbox"/> NO <input type="checkbox"/>
---	--	---	--

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals Ice Chest Containers None Comments: _____
 Intact? Yes No Intact? Yes No

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No

COC Received YES NO

Emissivity 0.95 Container PT PE Thermometer ID TH207 Date/Time 12/23/13 09:50
 Temperature: (A) 0.3 °C / (C) 0.4 °C Analyst Init MA

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL								BC	BC	
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS								FD	FD	MA 12/23/13
PT INORGANIC CHEMICAL METALS										
PT CYANIDE								DE	DE	DE
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK								A3	A3	A3
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1								KE	KE	
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER 802 HAAS								FG	FG	FG
8 OZ. JAR										MA 12/23/13
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments: _____
 Sample Numbering Completed By: MA/MA Date/Time: 12/23/13 09:15
 A = Actual / C = Corrected

{S:\MyDOCS\WordPerfect\LAB_DOCS\FORMS\SAMREC15}



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			Receive Date:	
1327842-01	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/18/2013 13:15
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-B-01 0.5-1 ft		Lab Matrix:	Solids
	Sampled By:	---		Sample Type:	Soil
1327842-02	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/18/2013 13:15
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-B-01 5-5.5 ft		Lab Matrix:	Solids
	Sampled By:	---		Sample Type:	Soil
1327842-03	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/18/2013 13:25
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-B-01 10-10.5 ft		Lab Matrix:	Solids
	Sampled By:	---		Sample Type:	Soil
1327842-04	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/20/2013 11:15
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-1D		Lab Matrix:	Water
	Sampled By:	---		Sample Type:	Water
1327842-05	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/20/2013 11:30
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-1D Dup		Lab Matrix:	Water
	Sampled By:	---		Sample Type:	Water
1327842-06	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/20/2013 13:20
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-1S		Lab Matrix:	Water
	Sampled By:	---		Sample Type:	Water
1327842-07	COC Number:	---		12/21/2013 09:30	
	Project Number:	---		Sampling Date:	12/20/2013 14:10
	Sampling Location:	---		Sample Depth:	---
	Sampling Point:	MON-3S		Lab Matrix:	Water
	Sampled By:	---		Sample Type:	Water



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1327842-08	COC Number:	---	Receive Date:	12/21/2013 09:30
	Project Number:	---	Sampling Date:	12/20/2013 15:40
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MON-2S	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
1327842-09	COC Number:	---	Receive Date:	12/21/2013 09:30
	Project Number:	---	Sampling Date:	12/20/2013 15:40
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Trip Blank	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

BCL Sample ID: 1327842-01	Client Sample Name: MON-B-01 0.5-1 ft, 12/18/2013 1:15:00PM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Nitrate as N	6.0	mg/kg	1.0	0.26	EPA-300.0	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-300.0	12/26/13	12/27/13 09:48	LD1	IC2	1	BWL1940



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

BCL Sample ID: 1327842-02	Client Sample Name: MON-B-01 5-5.5 ft, 12/18/2013 1:15:00PM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Nitrate as N	8.7	mg/kg	1.0	0.26	EPA-300.0	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-300.0	12/26/13	12/27/13 10:02	LD1	IC2	1	BWL1940

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

BCL Sample ID: 1327842-03	Client Sample Name: MON-B-01 10-10.5 ft, 12/18/2013 1:25:00PM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Nitrate as N	3.7	mg/kg	1.0	0.26	EPA-300.0	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-300.0	12/26/13	12/27/13 10:16	LD1	IC2	1	BWL1940

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-04	Client Sample Name: MON-1D, 12/20/2013 11:15:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	99.6	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	102	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	77.7	%	80 - 120 (LCL - UCL)		EPA-524.2		S09	1

Run #	Method	Prep Date	Run			Dilution	QC
			Date/Time	Analyst	Instrument		Batch ID
1	EPA-524.2	12/30/13	12/30/13 19:33	MGC	MS-V5	1	BWL1969

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

BCL Sample ID: 1327842-04		Client Sample Name: MON-1D, 12/20/2013 11:15:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dibromoacetic acid	ND	ug/L	1.0	0.42	EPA-552.3	ND		1
Dichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Monobromoacetic acid	ND	ug/L	1.0	0.32	EPA-552.3	ND		1
Monochloroacetic acid	ND	ug/L	1.0	0.43	EPA-552.3	ND		1
Trichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Total HAA's (Summation)	ND	ug/L	1.0	1.0	EPA-552.3	ND		1
2,3-Dibromopropionic acid (Surrogate)	62.0	%	70 - 130 (LCL - UCL)		EPA-552.3		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-552.3	12/30/13	01/09/14 02:44	rds	GC-3	1	BWL2126

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-04	Client Sample Name: MON-1D, 12/20/2013 11:15:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Calcium	15	mg/L	0.10	0.015	EPA-6010B	ND		1
Total Magnesium	8.9	mg/L	0.050	0.019	EPA-6010B	ND		1
Total Sodium	21	mg/L	0.50	0.051	EPA-6010B	ND		1
Total Potassium	4.0	mg/L	1.0	0.13	EPA-6010B	ND		1
Bicarbonate	120	mg/L	5.0	5.0	SM-2320B	ND		2
Total Alkalinity as CaCO3	94	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	11	mg/L	0.50	0.067	EPA-300.0	0.15		3
Fluoride	0.39	mg/L	0.050	0.014	EPA-300.0	ND		3
Nitrate as N	1.7	mg/L	0.10	0.025	EPA-300.0	ND		3
Sulfate	7.3	mg/L	1.0	0.18	EPA-300.0	0.26		3
Hardness as CaCO3	74	mg/L	0.50	0.10	Calc	ND		4
pH	7.27	pH Units	0.05	0.05	EPA-150.1		S05	5
Electrical Conductivity @ 25 C	243	umhos/cm	1.00	1.00	SM-2510B			6
Total Dissolved Solids @ 180 C	210	mg/L	10	10	SM-2540C	ND		7
Color	1.0	Color Units	1.0	1.0	SM-2120B			8
Odor	No Obs Odor	Odor Units	1.0	1.0	SM-2150B	ND		9
Turbidity	5.9	NT Units	0.10	0.10	EPA-180.1			10
MBAS	ND	mg/L	0.20	0.030	EPA-425.1	ND	A01	11
Total Nitrogen	1.6	mg/L	0.30	0.10	Calc	ND		12
Total Kjeldahl Nitrogen	ND	mg/L	0.20	0.083	EPA-351.2	ND		13
Nitrite as N	15	ug/L	50	10	EPA-353.2	ND	J	14
Total Phosphate	0.36	mg/L	0.15	0.048	EPA-365.4	ND		15

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-04	Client Sample Name: MON-1D, 12/20/2013 11:15:00AM
----------------------------------	--

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-6010B	12/26/13	12/27/13 10:53		ARD	PE-OP1	1	BWL1892
2	SM-2320B	12/24/13	12/24/13 09:20		RML	MET-1	1	BWL1823
3	EPA-300.0	12/21/13	12/21/13 13:21		LD1	IC1	1	BWL1705
4	Calc	12/24/13	01/06/14 15:56		TMS	Calc	1	BWL1834
5	EPA-150.1	12/24/13	12/24/13 09:20		RML	MET-1	1	BWL1823
6	SM-2510B	12/24/13	12/24/13 09:20		RML	MET-1	1	BWL1823
7	SM-2540C	12/24/13	12/24/13 09:30		FRP	MANUAL	1	BWL1799
8	SM-2120B	12/21/13	12/21/13 09:50		MAA	MANUAL	1	BWL1884
9	SM-2150B	12/24/13	12/24/13 07:40		RML	MANUAL	1	BWL1881
10	EPA-180.1	12/21/13	12/21/13 09:50		MAA	MANUAL	1	BWL1880
11	EPA-425.1	12/21/13	12/21/13 15:00		JMN	MANUAL	2	BWL1962
12	Calc	12/24/13	01/06/14 15:52		TMS	Calc	1	BWL1834
13	EPA-351.2	12/27/13	12/30/13 11:02		sdu	sc-1	1	BWL1965
14	EPA-353.2	12/21/13	12/21/13 12:39		LD1	KONE-1	1	BWL1731
15	EPA-365.4	12/31/13	01/03/14 08:30		sdu	sc-1	1	BWL1981

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

BCL Sample ID: 1327842-04	Client Sample Name: MON-1D, 12/20/2013 11:15:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Aluminum	370	ug/L	50	26	EPA-6010B	ND		1
Total Antimony	ND	ug/L	100	8.5	EPA-6010B	ND		2
Total Arsenic	ND	ug/L	50	7.8	EPA-6010B	ND		2
Total Barium	12	ug/L	10	3.5	EPA-6010B	ND		2
Total Beryllium	ND	ug/L	10	0.50	EPA-6010B	ND		2
Total Boron	63	ug/L	100	13	EPA-6010B	ND	J	2
Total Cadmium	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Chromium	3.1	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Cobalt	ND	ug/L	50	1.3	EPA-6010B	ND		2
Total Copper	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Iron	650	ug/L	50	30	EPA-6010B	ND		1
Total Lead	ND	ug/L	50	4.0	EPA-6010B	ND		2
Total Manganese	80	ug/L	10	4.0	EPA-6010B	ND		2
Total Mercury	ND	ug/L	0.20	0.024	EPA-7470A	ND		3
Total Molybdenum	15	ug/L	50	1.2	EPA-6010B	ND	J	2
Total Nickel	ND	ug/L	10	2.0	EPA-6010B	ND		2
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		2
Total Silver	ND	ug/L	10	1.9	EPA-6010B	ND		2
Total Thallium	ND	ug/L	100	24	EPA-6010B	ND		2
Total Vanadium	21	ug/L	10	2.2	EPA-6010B	ND		2
Total Zinc	9.4	ug/L	50	2.3	EPA-6010B	ND	J	2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	12/31/13	01/02/14 10:17	ARD	PE-OP1	1	BWL2111
2	EPA-6010B	12/26/13	12/27/13 10:53	ARD	PE-OP1	1	BWL1892
3	EPA-7470A	12/26/13	12/27/13 10:03	MEV	CETAC1	1	BWL1873

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-05 **Client Sample Name:** MON-1D Dup, 12/20/2013 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	98.6	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	102	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	77.0	%	80 - 120 (LCL - UCL)		EPA-524.2		S09	1

Run #	Method	Prep Date	Run			Dilution	QC
			Date/Time	Analyst	Instrument		Batch ID
1	EPA-524.2	12/30/13	12/30/13 19:56	MGC	MS-V5	1	BWL1969

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

BCL Sample ID: 1327842-05		Client Sample Name: MON-1D Dup, 12/20/2013 11:30:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dibromoacetic acid	ND	ug/L	1.0	0.42	EPA-552.3	ND		1
Dichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Monobromoacetic acid	ND	ug/L	1.0	0.32	EPA-552.3	ND		1
Monochloroacetic acid	ND	ug/L	1.0	0.43	EPA-552.3	ND		1
Trichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Total HAA's (Summation)	ND	ug/L	1.0	1.0	EPA-552.3	ND		1
2,3-Dibromopropionic acid (Surrogate)	26.9	%	70 - 130 (LCL - UCL)		EPA-552.3		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-552.3	12/30/13	01/09/14 03:05	rds	GC-3	1	BWL2126

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-05		Client Sample Name: MON-1D Dup, 12/20/2013 11:30:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Calcium	15	mg/L	0.10	0.015	EPA-6010B	ND		1
Total Magnesium	8.8	mg/L	0.050	0.019	EPA-6010B	ND		1
Total Sodium	21	mg/L	0.50	0.051	EPA-6010B	ND		1
Total Potassium	4.0	mg/L	1.0	0.13	EPA-6010B	ND		1
Bicarbonate	120	mg/L	5.0	5.0	SM-2320B	ND		2
Total Alkalinity as CaCO3	94	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	11	mg/L	0.50	0.067	EPA-300.0	0.15		3
Fluoride	0.33	mg/L	0.050	0.014	EPA-300.0	ND		3
Nitrate as N	1.7	mg/L	0.10	0.025	EPA-300.0	ND		3
Sulfate	7.4	mg/L	1.0	0.18	EPA-300.0	0.26		3
Hardness as CaCO3	73	mg/L	0.50	0.10	Calc	ND		4
pH	7.28	pH Units	0.05	0.05	EPA-150.1		S05	5
Electrical Conductivity @ 25 C	244	umhos/cm	1.00	1.00	SM-2510B			6
Total Dissolved Solids @ 180 C	200	mg/L	10	10	SM-2540C	ND		7
Color	2.0	Color Units	1.0	1.0	SM-2120B			8
Odor	No Obs Odor	Odor Units	1.0	1.0	SM-2150B	ND		9
Turbidity	7.2	NT Units	0.10	0.10	EPA-180.1			10
MBAS	ND	mg/L	0.10	0.015	EPA-425.1	ND		11
Total Nitrogen	1.6	mg/L	0.30	0.10	Calc	ND		12
Total Kjeldahl Nitrogen	ND	mg/L	0.20	0.083	EPA-351.2	ND		13
Nitrite as N	15	ug/L	50	10	EPA-353.2	ND	J	14
Total Phosphate	0.36	mg/L	0.15	0.048	EPA-365.4	ND		15

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-05	Client Sample Name: MON-1D Dup, 12/20/2013 11:30:00AM
----------------------------------	--

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-6010B	12/26/13	12/27/13	11:03	ARD	PE-OP1	1	BWL1892
2	SM-2320B	12/24/13	12/24/13	09:26	RML	MET-1	1	BWL1823
3	EPA-300.0	12/21/13	12/21/13	14:31	LD1	IC1	1	BWL1705
4	Calc	12/24/13	01/06/14	16:00	TMS	Calc	1	BWL1834
5	EPA-150.1	12/24/13	12/24/13	09:26	RML	MET-1	1	BWL1823
6	SM-2510B	12/24/13	12/24/13	09:26	RML	MET-1	1	BWL1823
7	SM-2540C	12/24/13	12/24/13	09:30	FRP	MANUAL	1	BWL1799
8	SM-2120B	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1884
9	SM-2150B	12/24/13	12/24/13	07:40	RML	MANUAL	1	BWL1881
10	EPA-180.1	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1880
11	EPA-425.1	12/21/13	12/21/13	15:00	JMN	MANUAL	1	BWL1962
12	Calc	12/24/13	01/06/14	15:52	TMS	Calc	1	BWL1834
13	EPA-351.2	12/27/13	12/30/13	11:06	sdu	sc-1	1	BWL1965
14	EPA-353.2	12/21/13	12/21/13	12:39	LD1	KONE-1	1	BWL1731
15	EPA-365.4	12/31/13	01/03/14	08:32	sdu	sc-1	1	BWL1981

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

BCL Sample ID: 1327842-05	Client Sample Name: MON-1D Dup, 12/20/2013 11:30:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Aluminum	430	ug/L	50	26	EPA-6010B	ND		1
Total Antimony	ND	ug/L	100	8.5	EPA-6010B	ND		2
Total Arsenic	7.8	ug/L	50	7.8	EPA-6010B	ND	J	2
Total Barium	12	ug/L	10	3.5	EPA-6010B	ND		2
Total Beryllium	ND	ug/L	10	0.50	EPA-6010B	ND		2
Total Boron	64	ug/L	100	13	EPA-6010B	ND	J	2
Total Cadmium	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Chromium	3.1	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Cobalt	ND	ug/L	50	1.3	EPA-6010B	ND		2
Total Copper	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Iron	730	ug/L	50	30	EPA-6010B	ND		1
Total Lead	ND	ug/L	50	4.0	EPA-6010B	ND		2
Total Manganese	83	ug/L	10	4.0	EPA-6010B	ND		2
Total Mercury	ND	ug/L	0.20	0.024	EPA-7470A	ND		3
Total Molybdenum	16	ug/L	50	1.2	EPA-6010B	ND	J	2
Total Nickel	ND	ug/L	10	2.0	EPA-6010B	ND		2
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		2
Total Silver	ND	ug/L	10	1.9	EPA-6010B	ND		2
Total Thallium	ND	ug/L	100	24	EPA-6010B	ND		2
Total Vanadium	22	ug/L	10	2.2	EPA-6010B	ND		2
Total Zinc	11	ug/L	50	2.3	EPA-6010B	ND	J	2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	12/31/13	01/02/14 10:19	ARD	PE-OP1	1	BWL2111
2	EPA-6010B	12/26/13	12/27/13 11:03	ARD	PE-OP1	1	BWL1892
3	EPA-7470A	12/26/13	12/27/13 10:05	MEV	CETAC1	1	BWL1873

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-06 **Client Sample Name:** MON-1S, 12/20/2013 1:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	104	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	102	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	82.3	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run			Dilution	QC
			Date/Time	Analyst	Instrument		Batch ID
1	EPA-524.2	12/30/13	12/30/13 20:18	MGC	MS-V5	1	BWL1969

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

BCL Sample ID: 1327842-06		Client Sample Name: MON-1S, 12/20/2013 1:20:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dibromoacetic acid	ND	ug/L	1.0	0.42	EPA-552.3	ND		1
Dichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Monobromoacetic acid	ND	ug/L	1.0	0.32	EPA-552.3	ND		1
Monochloroacetic acid	ND	ug/L	1.0	0.43	EPA-552.3	ND		1
Trichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Total HAA's (Summation)	ND	ug/L	1.0	1.0	EPA-552.3	ND		1
2,3-Dibromopropionic acid (Surrogate)	19.7	%	70 - 130 (LCL - UCL)		EPA-552.3		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-552.3	12/30/13	01/09/14 04:30	rds	GC-3	1	BWL2126

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-06		Client Sample Name: MON-1S, 12/20/2013 1:20:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Calcium	18	mg/L	0.10	0.015	EPA-6010B	ND		1
Total Magnesium	8.6	mg/L	0.050	0.019	EPA-6010B	ND		1
Total Sodium	44	mg/L	0.50	0.051	EPA-6010B	ND		1
Total Potassium	6.2	mg/L	1.0	0.13	EPA-6010B	ND		1
Bicarbonate	120	mg/L	5.0	5.0	SM-2320B	ND		2
Total Alkalinity as CaCO3	100	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	43	mg/L	0.50	0.067	EPA-300.0	0.15		3
Fluoride	0.41	mg/L	0.050	0.014	EPA-300.0	ND		3
Nitrate as N	0.40	mg/L	0.10	0.025	EPA-300.0	ND		3
Sulfate	15	mg/L	1.0	0.18	EPA-300.0	0.26		3
Hardness as CaCO3	79	mg/L	0.50	0.10	Calc	ND		4
pH	7.96	pH Units	0.05	0.05	EPA-150.1		S05	5
Electrical Conductivity @ 25 C	365	umhos/cm	1.00	1.00	SM-2510B			6
Total Dissolved Solids @ 180 C	250	mg/L	20	20	SM-2540C	ND		7
Color	2.0	Color Units	1.0	1.0	SM-2120B			8
Odor	No Obs Odor	Odor Units	1.0	1.0	SM-2150B	ND		9
Turbidity	15	NT Units	0.10	0.10	EPA-180.1			10
MBAS	0.015	mg/L	0.10	0.015	EPA-425.1	ND	J	11
Total Nitrogen	0.50	mg/L	0.30	0.10	Calc	ND		12
Total Kjeldahl Nitrogen	0.091	mg/L	0.20	0.083	EPA-351.2	ND	J	13
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND		14
Total Phosphate	0.81	mg/L	0.15	0.048	EPA-365.4	ND		15

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-06	Client Sample Name: MON-1S, 12/20/2013 1:20:00PM
----------------------------------	---

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-6010B	12/26/13	12/27/13	11:05	ARD	PE-OP1	1	BWL1892
2	SM-2320B	12/24/13	12/24/13	09:32	RML	MET-1	1	BWL1823
3	EPA-300.0	12/21/13	12/21/13	14:49	LD1	IC1	1	BWL1705
4	Calc	12/24/13	01/06/14	16:00	TMS	Calc	1	BWL1834
5	EPA-150.1	12/24/13	12/24/13	09:32	RML	MET-1	1	BWL1823
6	SM-2510B	12/24/13	12/24/13	09:32	RML	MET-1	1	BWL1823
7	SM-2540C	12/24/13	12/24/13	09:30	FRP	MANUAL	2	BWL1799
8	SM-2120B	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1884
9	SM-2150B	12/24/13	12/24/13	07:40	RML	MANUAL	1	BWL1881
10	EPA-180.1	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1880
11	EPA-425.1	12/21/13	12/21/13	15:00	JMN	MANUAL	1	BWL1962
12	Calc	12/24/13	01/06/14	15:52	TMS	Calc	1	BWL1834
13	EPA-351.2	12/27/13	12/30/13	11:07	sdu	sc-1	1	BWL1965
14	EPA-353.2	12/21/13	12/21/13	12:39	LD1	KONE-1	1	BWL1731
15	EPA-365.4	12/31/13	01/03/14	08:33	sdu	sc-1	1	BWL1981



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

BCL Sample ID: 1327842-06	Client Sample Name: MON-1S, 12/20/2013 1:20:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Aluminum	510	ug/L	50	26	EPA-6010B	ND		1
Total Antimony	ND	ug/L	100	8.5	EPA-6010B	ND		2
Total Arsenic	12	ug/L	50	7.8	EPA-6010B	ND	J	2
Total Barium	11	ug/L	10	3.5	EPA-6010B	ND		2
Total Beryllium	ND	ug/L	10	0.50	EPA-6010B	ND		2
Total Boron	98	ug/L	100	13	EPA-6010B	ND	J	2
Total Cadmium	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Chromium	8.7	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Cobalt	ND	ug/L	50	1.3	EPA-6010B	ND		2
Total Copper	1.6	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Iron	750	ug/L	50	30	EPA-6010B	ND		1
Total Lead	ND	ug/L	50	4.0	EPA-6010B	ND		2
Total Manganese	18	ug/L	10	4.0	EPA-6010B	ND		2
Total Mercury	ND	ug/L	0.20	0.024	EPA-7470A	ND		3
Total Molybdenum	35	ug/L	50	1.2	EPA-6010B	ND	J	2
Total Nickel	ND	ug/L	10	2.0	EPA-6010B	ND		2
Total Selenium	17	ug/L	100	15	EPA-6010B	ND	J	2
Total Silver	ND	ug/L	10	1.9	EPA-6010B	ND		2
Total Thallium	ND	ug/L	100	24	EPA-6010B	ND		2
Total Vanadium	23	ug/L	10	2.2	EPA-6010B	ND		2
Total Zinc	17	ug/L	50	2.3	EPA-6010B	ND	J	2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	12/31/13	01/02/14 10:20	ARD	PE-OP1	1	BWL2111
2	EPA-6010B	12/26/13	12/27/13 11:05	ARD	PE-OP1	1	BWL1892
3	EPA-7470A	12/26/13	12/27/13 10:16	MEV	CETAC1	1	BWL1874

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-07	Client Sample Name: MON-3S, 12/20/2013 2:10:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	102	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	101	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	82.7	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run		Instrument	Dilution	QC
			Date/Time	Analyst			Batch ID
1	EPA-524.2	12/30/13	12/30/13 20:41	MGC	MS-V5	1	BWL1969



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

BCL Sample ID: 1327842-07		Client Sample Name: MON-3S, 12/20/2013 2:10:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dibromoacetic acid	ND	ug/L	1.0	0.42	EPA-552.3	ND		1
Dichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Monobromoacetic acid	ND	ug/L	1.0	0.32	EPA-552.3	ND		1
Monochloroacetic acid	ND	ug/L	1.0	0.43	EPA-552.3	ND		1
Trichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Total HAA's (Summation)	ND	ug/L	1.0	1.0	EPA-552.3	ND		1
2,3-Dibromopropionic acid (Surrogate)	28.5	%	70 - 130 (LCL - UCL)		EPA-552.3		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-552.3	12/30/13	01/09/14 04:51	rds	GC-3	1	BWL2126

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-07		Client Sample Name: MON-3S, 12/20/2013 2:10:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Calcium	15	mg/L	0.10	0.015	EPA-6010B	ND		1
Total Magnesium	15	mg/L	0.050	0.019	EPA-6010B	0.049		1
Total Sodium	25	mg/L	0.50	0.051	EPA-6010B	ND		1
Total Potassium	6.9	mg/L	1.0	0.13	EPA-6010B	ND		1
Bicarbonate	120	mg/L	5.0	5.0	SM-2320B	ND		2
Total Alkalinity as CaCO3	100	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	19	mg/L	0.50	0.067	EPA-300.0	0.38		3
Fluoride	0.40	mg/L	0.050	0.014	EPA-300.0	ND		3
Nitrate as N	0.063	mg/L	0.10	0.025	EPA-300.0	ND	J	4
Sulfate	5.4	mg/L	1.0	0.18	EPA-300.0	0.36		3
Hardness as CaCO3	100	mg/L	0.50	0.10	Calc	ND		5
pH	7.59	pH Units	0.05	0.05	EPA-150.1		S05	6
Electrical Conductivity @ 25 C	260	umhos/cm	1.00	1.00	SM-2510B			7
Total Dissolved Solids @ 180 C	200	mg/L	10	10	SM-2540C	ND		8
Color	3.0	Color Units	1.0	1.0	SM-2120B			9
Odor	4.0	Odor Units	1.0	1.0	SM-2150B	ND		10
Turbidity	260	NT Units	1.0	1.0	EPA-180.1		A01	11
MBAS	ND	mg/L	0.10	0.015	EPA-425.1	ND		12
Total Nitrogen	0.27	mg/L	0.30	0.10	Calc	ND	J	13
Total Kjeldahl Nitrogen	0.20	mg/L	0.20	0.083	EPA-351.2	ND		14
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND		15
Total Phosphate	1.2	mg/L	0.15	0.048	EPA-365.4	ND		16

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-07	Client Sample Name: MON-3S, 12/20/2013 2:10:00PM
----------------------------------	---

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-6010B	01/07/14	01/08/14	13:29	JRG	PE-OP2	1	BXA0204
2	SM-2320B	12/24/13	12/24/13	09:38	RML	MET-1	1	BWL1823
3	EPA-300.0	01/09/14	01/09/14	14:15	LD1	IC5	1	BXA0520
4	EPA-300.0	12/21/13	12/21/13	15:07	LD1	IC1	1	BWL1705
5	Calc	12/24/13	01/10/14	15:00	TMS	Calc	1	BWL1834
6	EPA-150.1	12/24/13	12/24/13	09:38	RML	MET-1	1	BWL1823
7	SM-2510B	12/24/13	12/24/13	09:38	RML	MET-1	1	BWL1823
8	SM-2540C	12/24/13	12/24/13	09:30	FRP	MANUAL	1	BWL1799
9	SM-2120B	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1884
10	SM-2150B	12/24/13	12/24/13	07:40	RML	MANUAL	1	BWL1881
11	EPA-180.1	12/21/13	12/21/13	09:50	MAA	MANUAL	10	BWL1880
12	EPA-425.1	12/21/13	12/21/13	15:00	JMN	MANUAL	1	BWL1962
13	Calc	12/24/13	01/06/14	15:52	TMS	Calc	1	BWL1834
14	EPA-351.2	12/27/13	12/30/13	11:10	sdu	sc-1	1	BWL1965
15	EPA-353.2	12/21/13	12/21/13	12:39	LD1	KONE-1	1	BWL1731
16	EPA-365.4	12/31/13	01/03/14	08:35	sdu	sc-1	1	BWL1981

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

BCL Sample ID: 1327842-07	Client Sample Name: MON-3S, 12/20/2013 2:10:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Aluminum	14000	ug/L	50	26	EPA-6010B	ND		1
Total Antimony	ND	ug/L	100	8.5	EPA-6010B	ND		2
Total Arsenic	13	ug/L	50	7.8	EPA-6010B	ND	J	2
Total Barium	69	ug/L	10	3.5	EPA-6010B	ND		2
Total Beryllium	0.97	ug/L	10	0.50	EPA-6010B	ND	J	2
Total Boron	94	ug/L	100	13	EPA-6010B	ND	J	2
Total Cadmium	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Chromium	53	ug/L	10	1.1	EPA-6010B	ND		2
Total Cobalt	11	ug/L	50	1.3	EPA-6010B	ND	J	2
Total Copper	39	ug/L	10	1.1	EPA-6010B	ND		2
Total Iron	19000	ug/L	50	30	EPA-6010B	ND		1
Total Lead	8.6	ug/L	50	4.0	EPA-6010B	ND	J	2
Total Manganese	500	ug/L	10	4.0	EPA-6010B	ND		2
Total Mercury	ND	ug/L	0.20	0.024	EPA-7470A	ND		3
Total Molybdenum	16	ug/L	50	1.2	EPA-6010B	ND	J	2
Total Nickel	41	ug/L	10	2.0	EPA-6010B	ND		2
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		2
Total Silver	ND	ug/L	10	1.9	EPA-6010B	ND		2
Total Thallium	ND	ug/L	100	24	EPA-6010B	ND		2
Total Vanadium	40	ug/L	10	2.2	EPA-6010B	ND		2
Total Zinc	62	ug/L	50	2.3	EPA-6010B	ND		2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	12/31/13	01/02/14 10:28	ARD	PE-OP1	1	BWL2111
2	EPA-6010B	12/26/13	12/27/13 12:05	ARD	PE-OP1	1	BWL1892
3	EPA-7470A	12/26/13	12/27/13 10:34	MEV	CETAC1	1	BWL1874

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-08	Client Sample Name: MON-2S, 12/20/2013 3:40:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	103	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	99.8	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	79.4	%	80 - 120 (LCL - UCL)		EPA-524.2		S09	1

Run #	Method	Prep Date	Run		Instrument	Dilution	QC
			Date/Time	Analyst			Batch ID
1	EPA-524.2	12/30/13	12/30/13 21:03	MGC	MS-V5	1	BWL1969

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

BCL Sample ID: 1327842-08		Client Sample Name: MON-2S, 12/20/2013 3:40:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dibromoacetic acid	ND	ug/L	1.0	0.42	EPA-552.3	ND		1
Dichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Monobromoacetic acid	ND	ug/L	1.0	0.32	EPA-552.3	ND		1
Monochloroacetic acid	ND	ug/L	1.0	0.43	EPA-552.3	ND		1
Trichloroacetic acid	ND	ug/L	1.0	0.37	EPA-552.3	ND		1
Total HAA's (Summation)	ND	ug/L	1.0	1.0	EPA-552.3	ND		1
2,3-Dibromopropionic acid (Surrogate)	17.0	%	70 - 130 (LCL - UCL)		EPA-552.3		S09	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-552.3	12/30/13	01/09/14 05:12	rds	GC-3	1	BWL2126

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-08		Client Sample Name: MON-2S, 12/20/2013 3:40:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Calcium	19	mg/L	0.10	0.015	EPA-6010B	ND		1
Total Magnesium	12	mg/L	0.050	0.019	EPA-6010B	ND		1
Total Sodium	44	mg/L	0.50	0.051	EPA-6010B	ND		1
Total Potassium	5.3	mg/L	1.0	0.13	EPA-6010B	ND		1
Bicarbonate	160	mg/L	5.0	5.0	SM-2320B	ND		2
Total Alkalinity as CaCO3	130	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	26	mg/L	0.50	0.067	EPA-300.0	0.15		3
Fluoride	0.46	mg/L	0.050	0.014	EPA-300.0	ND		3
Nitrate as N	0.12	mg/L	0.10	0.025	EPA-300.0	ND		3
Sulfate	8.1	mg/L	1.0	0.18	EPA-300.0	0.26		3
Hardness as CaCO3	95	mg/L	0.50	0.10	Calc	ND		4
pH	7.93	pH Units	0.05	0.05	EPA-150.1		S05	5
Electrical Conductivity @ 25 C	349	umhos/cm	1.00	1.00	SM-2510B			6
Total Dissolved Solids @ 180 C	220	mg/L	20	20	SM-2540C	ND		7
Color	2.0	Color Units	1.0	1.0	SM-2120B			8
Odor	No Obs Odor	Odor Units	1.0	1.0	SM-2150B	ND		9
Turbidity	15	NT Units	0.10	0.10	EPA-180.1			10
MBAS	ND	mg/L	0.10	0.015	EPA-425.1	ND		11
Total Nitrogen	ND	mg/L	0.30	0.10	Calc	ND		12
Total Kjeldahl Nitrogen	ND	mg/L	0.20	0.083	EPA-351.2	ND		13
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND		14
Total Phosphate	0.44	mg/L	0.15	0.048	EPA-365.4	ND		15

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

BCL Sample ID: 1327842-08	Client Sample Name: MON-2S, 12/20/2013 3:40:00PM
----------------------------------	---

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-6010B	12/26/13	12/27/13	12:07	ARD	PE-OP1	1	BWL1892
2	SM-2320B	12/24/13	12/24/13	09:44	RML	MET-1	1	BWL1823
3	EPA-300.0	12/21/13	12/21/13	15:59	LD1	IC1	1	BWL1705
4	Calc	12/24/13	01/06/14	16:00	TMS	Calc	1	BWL1834
5	EPA-150.1	12/24/13	12/24/13	09:44	RML	MET-1	1	BWL1823
6	SM-2510B	12/24/13	12/24/13	09:44	RML	MET-1	1	BWL1823
7	SM-2540C	12/24/13	12/24/13	09:30	FRP	MANUAL	2	BWL1799
8	SM-2120B	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1884
9	SM-2150B	12/24/13	12/24/13	07:40	RML	MANUAL	1	BWL1881
10	EPA-180.1	12/21/13	12/21/13	09:50	MAA	MANUAL	1	BWL1880
11	EPA-425.1	12/21/13	12/21/13	15:00	JMN	MANUAL	1	BWL1962
12	Calc	12/24/13	01/06/14	15:52	TMS	Calc	1	BWL1834
13	EPA-351.2	12/27/13	12/30/13	11:11	sdu	sc-1	1	BWL1965
14	EPA-353.2	12/21/13	12/21/13	12:39	LD1	KONE-1	1	BWL1731
15	EPA-365.4	12/31/13	01/03/14	08:36	sdu	sc-1	1	BWL1981

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

BCL Sample ID: 1327842-08	Client Sample Name: MON-2S, 12/20/2013 3:40:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Aluminum	940	ug/L	50	26	EPA-6010B	ND		1
Total Antimony	ND	ug/L	100	8.5	EPA-6010B	ND		2
Total Arsenic	15	ug/L	50	7.8	EPA-6010B	ND	J	2
Total Barium	44	ug/L	10	3.5	EPA-6010B	ND		2
Total Beryllium	ND	ug/L	10	0.50	EPA-6010B	ND		2
Total Boron	150	ug/L	100	13	EPA-6010B	ND		2
Total Cadmium	ND	ug/L	10	1.1	EPA-6010B	ND		2
Total Chromium	4.9	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Cobalt	ND	ug/L	50	1.3	EPA-6010B	ND		2
Total Copper	3.2	ug/L	10	1.1	EPA-6010B	ND	J	2
Total Iron	1400	ug/L	50	30	EPA-6010B	ND		1
Total Lead	ND	ug/L	50	4.0	EPA-6010B	ND		2
Total Manganese	120	ug/L	10	4.0	EPA-6010B	ND		2
Total Mercury	ND	ug/L	0.20	0.024	EPA-7470A	ND		3
Total Molybdenum	56	ug/L	50	1.2	EPA-6010B	ND		2
Total Nickel	ND	ug/L	10	2.0	EPA-6010B	ND		2
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		2
Total Silver	ND	ug/L	10	1.9	EPA-6010B	ND		2
Total Thallium	ND	ug/L	100	24	EPA-6010B	ND		2
Total Vanadium	6.3	ug/L	10	2.2	EPA-6010B	ND	J	2
Total Zinc	12	ug/L	50	2.3	EPA-6010B	ND	J	2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	12/31/13	01/02/14 10:06	ARD	PE-OP1	1	BWL2111
2	EPA-6010B	12/26/13	12/27/13 12:07	ARD	PE-OP1	1	BWL1892
3	EPA-7470A	12/26/13	12/27/13 10:36	MEV	CETAC1	1	BWL1874

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1327842-09	Client Sample Name: Trip Blank, 12/20/2013 3:40:00PM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bromodichloromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.63	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	102	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	99.2	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	77.8	%	80 - 120 (LCL - UCL)		EPA-524.2		S09	1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-524.2	12/30/13	12/30/13	21:26	MGC	MS-V5	1	BWL1969



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWL1969						
Bromodichloromethane	BWL1969-BLK1	ND	ug/L	0.50	0.14	
Bromoform	BWL1969-BLK1	ND	ug/L	0.50	0.27	
Chloroform	BWL1969-BLK1	ND	ug/L	0.50	0.12	
Dibromochloromethane	BWL1969-BLK1	ND	ug/L	0.50	0.13	
Total Trihalomethanes	BWL1969-BLK1	ND	ug/L	2.0	0.63	
1,2-Dichloroethane-d4 (Surrogate)	BWL1969-BLK1	99.8	%	75 - 125 (LCL - UCL)		
Toluene-d8 (Surrogate)	BWL1969-BLK1	98.9	%	80 - 120 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BWL1969-BLK1	81.4	%	80 - 120 (LCL - UCL)		



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab	Quals
								Percent Recovery	RPD		
QC Batch ID: BWL1969											
Bromodichloromethane	BWL1969-BS1	LCS	26.840	25.000	ug/L	107		70 - 130			
Bromoform	BWL1969-BS1	LCS	25.230	25.000	ug/L	101		70 - 130			
Chloroform	BWL1969-BS1	LCS	24.890	25.000	ug/L	99.6		70 - 130			
Dibromochloromethane	BWL1969-BS1	LCS	23.800	25.000	ug/L	95.2		70 - 130			
1,2-Dichloroethane-d4 (Surrogate)	BWL1969-BS1	LCS	9.9800	10.000	ug/L	99.8		75 - 125			
Toluene-d8 (Surrogate)	BWL1969-BS1	LCS	10.180	10.000	ug/L	102		80 - 120			
4-Bromofluorobenzene (Surrogate)	BWL1969-BS1	LCS	10.440	10.000	ug/L	104		80 - 120			



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery		Lab
								RPD	Percent Recovery	
QC Batch ID: BWL1969		Used client sample: N								
Bromodichloromethane	MS	1327961-01	18.620	46.260	25.000	ug/L		111		70 - 130
	MSD	1327961-01	18.620	48.410	25.000	ug/L	4.5	119	20	70 - 130
Bromoform	MS	1327961-01	ND	27.620	25.000	ug/L		110		70 - 130
	MSD	1327961-01	ND	29.490	25.000	ug/L	6.5	118	20	70 - 130
Chloroform	MS	1327961-01	21.840	43.920	25.000	ug/L		88.3		70 - 130
	MSD	1327961-01	21.840	45.370	25.000	ug/L	3.2	94.1	20	70 - 130
Dibromochloromethane	MS	1327961-01	8.9900	34.070	25.000	ug/L		100		70 - 130
	MSD	1327961-01	8.9900	35.290	25.000	ug/L	3.5	105	20	70 - 130
1,2-Dichloroethane-d4 (Surrogate)	MS	1327961-01	ND	9.7600	10.000	ug/L		97.6		75 - 125
	MSD	1327961-01	ND	9.9900	10.000	ug/L	2.3	99.9		75 - 125
Toluene-d8 (Surrogate)	MS	1327961-01	ND	10.060	10.000	ug/L		101		80 - 120
	MSD	1327961-01	ND	10.130	10.000	ug/L	0.7	101		80 - 120
4-Bromofluorobenzene (Surrogate)	MS	1327961-01	ND	9.7200	10.000	ug/L		97.2		80 - 120
	MSD	1327961-01	ND	10.260	10.000	ug/L	5.4	103		80 - 120



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWL2126						
Dibromoacetic acid	BWL2126-BLK1	ND	ug/L	1.0	0.42	
Dichloroacetic acid	BWL2126-BLK1	ND	ug/L	1.0	0.37	
Monobromoacetic acid	BWL2126-BLK1	ND	ug/L	1.0	0.32	
Monochloroacetic acid	BWL2126-BLK1	ND	ug/L	1.0	0.43	
Trichloroacetic acid	BWL2126-BLK1	ND	ug/L	1.0	0.37	
Total HAA's (Summation)	BWL2126-BLK1	ND	ug/L	1.0	1.0	
2,3-Dibromopropionic acid (Surrogate)	BWL2126-BLK1	102	%		70 - 130 (LCL - UCL)	



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: BWL2126										
Dibromoacetic acid	BWL2126-BS1	LCS	12.869	15.000	ug/L	85.8		70	130	
Dichloroacetic acid	BWL2126-BS1	LCS	11.437	15.000	ug/L	76.2		70	130	
Monobromoacetic acid	BWL2126-BS1	LCS	13.102	15.000	ug/L	87.3		70	130	
Monochloroacetic acid	BWL2126-BS1	LCS	12.126	15.000	ug/L	80.8		70	130	
Trichloroacetic acid	BWL2126-BS1	LCS	11.067	15.000	ug/L	73.8		70	130	
2,3-Dibromopropionic acid (Surrogate)	BWL2126-BS1	LCS	15.358	15.000	ug/L	102		70	130	



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Halogenated Acetic Acids (Method EPA-552.3)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery		Lab
								RPD	Percent Recovery	
QC Batch ID: BWL2126		Used client sample: N								
Dibromoacetic acid	MS	1325870-65	ND	12.842	15.000	ug/L		85.6		70 - 130
	MSD	1325870-65	ND	12.538	15.000	ug/L	2.4	83.6	30	70 - 130
Dichloroacetic acid	MS	1325870-65	ND	11.286	15.000	ug/L		75.2		70 - 130
	MSD	1325870-65	ND	11.054	15.000	ug/L	2.1	73.7	30	70 - 130
Monobromoacetic acid	MS	1325870-65	ND	12.513	15.000	ug/L		83.4		70 - 130
	MSD	1325870-65	ND	12.698	15.000	ug/L	1.5	84.7	30	70 - 130
Monochloroacetic acid	MS	1325870-65	ND	11.482	15.000	ug/L		76.5		70 - 130
	MSD	1325870-65	ND	12.086	15.000	ug/L	5.1	80.6	30	70 - 130
Trichloroacetic acid	MS	1325870-65	ND	10.782	15.000	ug/L		71.9		70 - 130
	MSD	1325870-65	ND	10.826	15.000	ug/L	0.4	72.2	30	70 - 130
2,3-Dibromopropionic acid (Surrogate)	MS	1325870-65	ND	15.813	15.000	ug/L		105		70 - 130
	MSD	1325870-65	ND	15.524	15.000	ug/L	1.8	103		70 - 130



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWL1940						
Nitrate as N	BWL1940-BLK1	ND	mg/kg	1.0	0.26	



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: BWL1940										
Nitrate as N	BWL1940-BS1	LCS	5.4280	5.0000	mg/kg	109		90 - 110		



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Chemical Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: BWL1940		Used client sample: N									
Nitrate as N	DUP	1327949-08	393.35	389.20		mg/kg	1.1		20		
	MS	1327949-08	393.35	659.04	252.53	mg/kg		105		80 - 120	
	MSD	1327949-08	393.35	657.83	252.53	mg/kg	0.2	105	20	80 - 120	



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWL1705						
Chloride	BWL1705-BLK1	0.14800	mg/L	0.50	0.067	J
Fluoride	BWL1705-BLK1	ND	mg/L	0.050	0.014	
Nitrate as N	BWL1705-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BWL1705-BLK1	0.26400	mg/L	1.0	0.18	J
QC Batch ID: BWL1731						
Nitrite as N	BWL1731-BLK1	ND	ug/L	50	10	
QC Batch ID: BWL1799						
Total Dissolved Solids @ 180 C	BWL1799-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BWL1823						
Bicarbonate	BWL1823-BLK1	ND	mg/L	5.0	5.0	
Total Alkalinity as CaCO3	BWL1823-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BWL1834						
Hardness as CaCO3	BWL1834-BLK1	ND	mg/L	0.50	0.10	
Total Nitrogen	BWL1834-BLK1	ND	mg/L	0.30	0.10	
QC Batch ID: BWL1881						
Odor	BWL1881-BLK1	ND	Odor Units	1.0	1.0	
QC Batch ID: BWL1892						
Total Calcium	BWL1892-BLK1	ND	mg/L	0.10	0.015	
Total Magnesium	BWL1892-BLK1	ND	mg/L	0.050	0.019	
Total Sodium	BWL1892-BLK1	ND	mg/L	0.50	0.051	
Total Potassium	BWL1892-BLK1	ND	mg/L	1.0	0.13	
QC Batch ID: BWL1962						
MBAS	BWL1962-BLK1	ND	mg/L	0.10	0.015	
QC Batch ID: BWL1965						
Total Kjeldahl Nitrogen	BWL1965-BLK1	ND	mg/L	0.20	0.083	
QC Batch ID: BWL1981						
Total Phosphate	BWL1981-BLK1	ND	mg/L	0.15	0.048	
QC Batch ID: BXA0204						
Total Calcium	BXA0204-BLK1	ND	mg/L	0.10	0.015	
Total Magnesium	BXA0204-BLK1	0.048608	mg/L	0.050	0.019	J

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXA0204						
Total Sodium	BXA0204-BLK1	ND	mg/L	0.50	0.051	
Total Potassium	BXA0204-BLK1	ND	mg/L	1.0	0.13	
QC Batch ID: BXA0520						
Chloride	BXA0520-BLK1	0.38100	mg/L	0.50	0.067	J
Fluoride	BXA0520-BLK1	ND	mg/L	0.050	0.014	
Sulfate	BXA0520-BLK1	0.35800	mg/L	1.0	0.18	J



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
QC Batch ID: BWL1705										
Chloride	BWL1705-BS1	LCS	51.976	50.000	mg/L	104		90 - 110		
Fluoride	BWL1705-BS1	LCS	0.91400	1.0000	mg/L	91.4		90 - 110		
Nitrate as N	BWL1705-BS1	LCS	5.0760	5.0000	mg/L	102		90 - 110		
Sulfate	BWL1705-BS1	LCS	101.87	100.00	mg/L	102		90 - 110		
QC Batch ID: BWL1731										
Nitrite as N	BWL1731-BS1	LCS	494.26	500.00	ug/L	98.9		90 - 110		
QC Batch ID: BWL1799										
Total Dissolved Solids @ 180 C	BWL1799-BS1	LCS	545.00	586.00	mg/L	93.0		90 - 110		
QC Batch ID: BWL1823										
Total Alkalinity as CaCO3	BWL1823-BS3	LCS	95.840	100.00	mg/L	95.8		90 - 110		
pH	BWL1823-BS2	LCS	7.0200	7.0000	pH Units	100		95 - 105		
Electrical Conductivity @ 25 C	BWL1823-BS1	LCS	302.20	303.00	umhos/cm	99.7		90 - 110		
QC Batch ID: BWL1892										
Total Calcium	BWL1892-BS1	LCS	9.6759	10.000	mg/L	96.8		85 - 115		
Total Magnesium	BWL1892-BS1	LCS	9.6485	10.000	mg/L	96.5		85 - 115		
Total Sodium	BWL1892-BS1	LCS	9.8356	10.000	mg/L	98.4		85 - 115		
Total Potassium	BWL1892-BS1	LCS	9.8447	10.000	mg/L	98.4		85 - 115		
QC Batch ID: BWL1962										
MBAS	BWL1962-BS1	LCS	0.19570	0.20000	mg/L	97.8		85 - 115		
QC Batch ID: BWL1965										
Total Kjeldahl Nitrogen	BWL1965-BS1	LCS	2.0913	2.0000	mg/L	105		90 - 110		
QC Batch ID: BWL1981										
Total Phosphate	BWL1981-BS1	LCS	3.2811	3.0660	mg/L	107		85 - 115		
QC Batch ID: BXA0204										
Total Calcium	BXA0204-BS1	LCS	10.078	10.000	mg/L	101		85 - 115		
Total Magnesium	BXA0204-BS1	LCS	10.147	10.000	mg/L	101		85 - 115		
Total Sodium	BXA0204-BS1	LCS	8.9198	10.000	mg/L	89.2		85 - 115		
Total Potassium	BXA0204-BS1	LCS	9.3341	10.000	mg/L	93.3		85 - 115		
QC Batch ID: BXA0520										
Chloride	BXA0520-BS1	LCS	52.430	50.000	mg/L	105		90 - 110		
Fluoride	BXA0520-BS1	LCS	1.0450	1.0000	mg/L	104		90 - 110		
Sulfate	BXA0520-BS1	LCS	102.55	100.00	mg/L	103		90 - 110		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry) Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab Quals
								Percent Recovery	Percent Recovery	
QC Batch ID: BWL1705		Used client sample: Y - Description: MON-1D, 12/20/2013 11:15								
Chloride	DUP	1327842-04	10.833	10.782		mg/L	0.5		10	
	MS	1327842-04	10.833	66.018	50.505	mg/L		109		80 - 120
	MSD	1327842-04	10.833	66.056	50.505	mg/L	0.1	109	10	80 - 120
Fluoride	DUP	1327842-04	0.38700	0.37400		mg/L	3.4		10	
	MS	1327842-04	0.38700	1.2737	1.0101	mg/L		87.8		80 - 120
	MSD	1327842-04	0.38700	1.3303	1.0101	mg/L	4.3	93.4	10	80 - 120
Nitrate as N	DUP	1327842-04	1.6540	1.6280		mg/L	1.6		10	
	MS	1327842-04	1.6540	6.8879	5.0505	mg/L		104		80 - 120
	MSD	1327842-04	1.6540	6.8949	5.0505	mg/L	0.1	104	10	80 - 120
Sulfate	DUP	1327842-04	7.2790	7.1320		mg/L	2.0		10	
	MS	1327842-04	7.2790	113.23	101.01	mg/L		105		80 - 120
	MSD	1327842-04	7.2790	113.17	101.01	mg/L	0.0	105	10	80 - 120
QC Batch ID: BWL1731		Used client sample: N								
Nitrite as N	DUP	1327827-28	ND	ND		ug/L			10	
	MS	1327827-28	ND	524.63	526.32	ug/L		99.7		90 - 110
	MSD	1327827-28	ND	523.07	526.32	ug/L	0.3	99.4	10	90 - 110
QC Batch ID: BWL1799		Used client sample: N								
Total Dissolved Solids @ 180 C	DUP	1327784-02	610.00	610.00		mg/L	0		10	
QC Batch ID: BWL1823		Used client sample: N								
Bicarbonate	DUP	1327928-01	25.227	24.861		mg/L	1.5		10	
Total Alkalinity as CaCO3	DUP	1327928-01	20.690	20.390		mg/L	1.5		10	
pH	DUP	1327928-01	6.9400	6.9600		pH Units	0.3		20	
Electrical Conductivity @ 25 C	DUP	1327928-01	3368.0	3404.0		umhos/cm	1.1		10	
QC Batch ID: BWL1880		Used client sample: N								
Turbidity	DUP	1327841-01	8.2600	8.3300		NT Units	0.8		10	
QC Batch ID: BWL1884		Used client sample: Y - Description: MON-1D, 12/20/2013 11:15								
Color	DUP	1327842-04	1.0000	1.0000		Color Units	0		20	
QC Batch ID: BWL1892		Used client sample: Y - Description: MON-1D, 12/20/2013 11:15								
Total Calcium	DUP	1327842-04	14.863	14.427		mg/L	3.0		20	
	MS	1327842-04	14.863	23.494	10.000	mg/L		86.3		75 - 125
	MSD	1327842-04	14.863	24.605	10.000	mg/L	4.6	97.4	20	75 - 125
Total Magnesium	DUP	1327842-04	8.9030	8.5317		mg/L	4.3		20	
	MS	1327842-04	8.9030	17.748	10.000	mg/L		88.4		75 - 125
	MSD	1327842-04	8.9030	18.433	10.000	mg/L	3.8	95.3	20	75 - 125

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Table with columns: Constituent, Type, Source Sample ID, Source Result, Result, Spike Added, Units, RPD, Percent Recovery, Control Limits RPD, Percent Recovery, Lab Qualls. Includes QC Batch IDs: BWL1892, BWL1962, BWL1965, BWL1981, BXA0204, BXA0520.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: BXA0520		Used client sample: N									
Sulfate	DUP	1400657-01	106.20	106.83		mg/L	0.6		10		
	MS	1400657-01	106.20	216.76	101.01	mg/L		109		80 - 120	
	MSD	1400657-01	106.20	216.58	101.01	mg/L	0.1	109	10	80 - 120	



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BWL1873						
Total Mercury	BWL1873-BLK1	ND	ug/L	0.20	0.024	
QC Batch ID: BWL1874						
Total Mercury	BWL1874-BLK1	ND	ug/L	0.20	0.024	
QC Batch ID: BWL1892						
Total Antimony	BWL1892-BLK1	ND	ug/L	100	8.5	
Total Arsenic	BWL1892-BLK1	ND	ug/L	50	7.8	
Total Barium	BWL1892-BLK1	ND	ug/L	10	3.5	
Total Beryllium	BWL1892-BLK1	ND	ug/L	10	0.50	
Total Boron	BWL1892-BLK1	ND	ug/L	100	13	
Total Cadmium	BWL1892-BLK1	ND	ug/L	10	1.1	
Total Chromium	BWL1892-BLK1	ND	ug/L	10	1.1	
Total Cobalt	BWL1892-BLK1	ND	ug/L	50	1.3	
Total Copper	BWL1892-BLK1	ND	ug/L	10	1.1	
Total Lead	BWL1892-BLK1	ND	ug/L	50	4.0	
Total Manganese	BWL1892-BLK1	ND	ug/L	10	4.0	
Total Molybdenum	BWL1892-BLK1	ND	ug/L	50	1.2	
Total Nickel	BWL1892-BLK1	ND	ug/L	10	2.0	
Total Selenium	BWL1892-BLK1	ND	ug/L	100	15	
Total Silver	BWL1892-BLK1	ND	ug/L	10	1.9	
Total Thallium	BWL1892-BLK1	ND	ug/L	100	24	
Total Vanadium	BWL1892-BLK1	ND	ug/L	10	2.2	
Total Zinc	BWL1892-BLK1	ND	ug/L	50	2.3	
QC Batch ID: BWL2111						
Total Aluminum	BWL2111-BLK1	ND	ug/L	50	26	
Total Iron	BWL2111-BLK1	ND	ug/L	50	30	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
QC Batch ID: BWL1873										
Total Mercury	BWL1873-BS1	LCS	1.0000	1.0000	ug/L	100		85 - 115		
QC Batch ID: BWL1874										
Total Mercury	BWL1874-BS1	LCS	1.1150	1.0000	ug/L	112		85 - 115		
QC Batch ID: BWL1892										
Total Antimony	BWL1892-BS1	LCS	386.78	400.00	ug/L	96.7		85 - 115		
Total Arsenic	BWL1892-BS1	LCS	191.32	200.00	ug/L	95.7		85 - 115		
Total Barium	BWL1892-BS1	LCS	402.81	400.00	ug/L	101		85 - 115		
Total Beryllium	BWL1892-BS1	LCS	200.53	200.00	ug/L	100		85 - 115		
Total Boron	BWL1892-BS1	LCS	959.65	1000.0	ug/L	96.0		85 - 115		
Total Cadmium	BWL1892-BS1	LCS	201.68	200.00	ug/L	101		85 - 115		
Total Chromium	BWL1892-BS1	LCS	204.37	200.00	ug/L	102		85 - 115		
Total Cobalt	BWL1892-BS1	LCS	204.37	200.00	ug/L	102		85 - 115		
Total Copper	BWL1892-BS1	LCS	386.57	400.00	ug/L	96.6		85 - 115		
Total Lead	BWL1892-BS1	LCS	425.56	400.00	ug/L	106		85 - 115		
Total Manganese	BWL1892-BS1	LCS	477.39	500.00	ug/L	95.5		85 - 115		
Total Molybdenum	BWL1892-BS1	LCS	205.80	200.00	ug/L	103		85 - 115		
Total Nickel	BWL1892-BS1	LCS	412.58	400.00	ug/L	103		85 - 115		
Total Selenium	BWL1892-BS1	LCS	195.47	200.00	ug/L	97.7		85 - 115		
Total Silver	BWL1892-BS1	LCS	101.34	100.00	ug/L	101		85 - 115		
Total Thallium	BWL1892-BS1	LCS	419.20	400.00	ug/L	105		85 - 115		
Total Vanadium	BWL1892-BS1	LCS	205.93	200.00	ug/L	103		85 - 115		
Total Zinc	BWL1892-BS1	LCS	510.19	500.00	ug/L	102		85 - 115		
QC Batch ID: BWL2111										
Total Aluminum	BWL2111-BS1	LCS	972.23	1000.0	ug/L	97.2		85 - 115		
Total Iron	BWL2111-BS1	LCS	1018.5	1000.0	ug/L	102		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab Quals
								Percent Recovery	Percent Recovery	
QC Batch ID: BWL1873		Used client sample: N								
Total Mercury	DUP	1327926-01	ND	ND		ug/L			20	
	MS	1327926-01	ND	0.94750	1.0000	ug/L		94.8		70 - 130
	MSD	1327926-01	ND	0.98750	1.0000	ug/L	4.1	98.8	20	70 - 130
QC Batch ID: BWL1874		Used client sample: Y - Description: MON-1S, 12/20/2013 13:20								
Total Mercury	DUP	1327842-06	ND	ND		ug/L			20	
	MS	1327842-06	ND	1.1900	1.0000	ug/L		119		70 - 130
	MSD	1327842-06	ND	1.1950	1.0000	ug/L	0.4	120	20	70 - 130
QC Batch ID: BWL1892		Used client sample: Y - Description: MON-1D, 12/20/2013 11:15								
Total Antimony	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	371.47	400.00	ug/L		92.9		75 - 125
	MSD	1327842-04	ND	393.95	400.00	ug/L	5.9	98.5	20	75 - 125
Total Arsenic	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	184.15	200.00	ug/L		92.1		75 - 125
	MSD	1327842-04	ND	203.36	200.00	ug/L	9.9	102	20	75 - 125
Total Barium	DUP	1327842-04	11.642	9.1840		ug/L	23.6		20	J,A02
	MS	1327842-04	11.642	389.95	400.00	ug/L		94.6		75 - 125
	MSD	1327842-04	11.642	410.00	400.00	ug/L	5.0	99.6	20	75 - 125
Total Beryllium	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	197.02	200.00	ug/L		98.5		75 - 125
	MSD	1327842-04	ND	204.49	200.00	ug/L	3.7	102	20	75 - 125
Total Boron	DUP	1327842-04	63.132	60.620		ug/L	4.1		20	J
	MS	1327842-04	63.132	975.32	1000.0	ug/L		91.2		75 - 125
	MSD	1327842-04	63.132	1006.1	1000.0	ug/L	3.1	94.3	20	75 - 125
Total Cadmium	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	191.33	200.00	ug/L		95.7		75 - 125
	MSD	1327842-04	ND	197.45	200.00	ug/L	3.2	98.7	20	75 - 125
Total Chromium	DUP	1327842-04	3.1451	3.0665		ug/L	2.5		20	J
	MS	1327842-04	3.1451	198.69	200.00	ug/L		97.8		75 - 125
	MSD	1327842-04	3.1451	203.16	200.00	ug/L	2.2	100	20	75 - 125
Total Cobalt	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	193.91	200.00	ug/L		97.0		75 - 125
	MSD	1327842-04	ND	201.51	200.00	ug/L	3.8	101	20	75 - 125
Total Copper	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	370.01	400.00	ug/L		92.5		75 - 125
	MSD	1327842-04	ND	380.77	400.00	ug/L	2.9	95.2	20	75 - 125
Total Lead	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	400.02	400.00	ug/L		100		75 - 125
	MSD	1327842-04	ND	409.22	400.00	ug/L	2.3	102	20	75 - 125

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Metals Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab Quals
								Percent Recovery	Percent Recovery	
QC Batch ID: BWL1892		Used client sample: Y - Description: MON-1D, 12/20/2013 11:15								
Total Manganese	DUP	1327842-04	80.071	78.775		ug/L	1.6		20	
	MS	1327842-04	80.071	540.76	500.00	ug/L		92.1		75 - 125
	MSD	1327842-04	80.071	562.41	500.00	ug/L	3.9	96.5	20	75 - 125
Total Molybdenum	DUP	1327842-04	15.292	15.582		ug/L	1.9		20	J
	MS	1327842-04	15.292	208.44	200.00	ug/L		96.6		75 - 125
	MSD	1327842-04	15.292	216.05	200.00	ug/L	3.6	100	20	75 - 125
Total Nickel	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	400.61	400.00	ug/L		100		75 - 125
	MSD	1327842-04	ND	415.77	400.00	ug/L	3.7	104	20	75 - 125
Total Selenium	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	165.33	200.00	ug/L		82.7		75 - 125
	MSD	1327842-04	ND	184.13	200.00	ug/L	10.8	92.1	20	75 - 125
Total Silver	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	97.485	100.00	ug/L		97.5		75 - 125
	MSD	1327842-04	ND	99.157	100.00	ug/L	1.7	99.2	20	75 - 125
Total Thallium	DUP	1327842-04	ND	ND		ug/L			20	
	MS	1327842-04	ND	406.91	400.00	ug/L		102		75 - 125
	MSD	1327842-04	ND	415.40	400.00	ug/L	2.1	104	20	75 - 125
Total Vanadium	DUP	1327842-04	20.932	20.414		ug/L	2.5		20	
	MS	1327842-04	20.932	221.56	200.00	ug/L		100		75 - 125
	MSD	1327842-04	20.932	226.88	200.00	ug/L	2.4	103	20	75 - 125
Total Zinc	DUP	1327842-04	9.4036	9.2367		ug/L	1.8		20	J
	MS	1327842-04	9.4036	503.10	500.00	ug/L		98.7		75 - 125
	MSD	1327842-04	9.4036	521.69	500.00	ug/L	3.6	102	20	75 - 125
QC Batch ID: BWL2111		Used client sample: Y - Description: MON-2S, 12/20/2013 15:40								
Total Aluminum	DUP	1327842-08RE1	937.42	975.95		ug/L	4.0		20	
	MS	1327842-08RE1	937.42	3282.8	1000.0	ug/L		235		75 - 125 Q03
	MSD	1327842-08RE1	937.42	3374.5	1000.0	ug/L	2.8	244	20	75 - 125 Q03
Total Iron	DUP	1327842-08RE1	1419.1	1433.8		ug/L	1.0		20	
	MS	1327842-08RE1	1419.1	2934.9	1000.0	ug/L		152		75 - 125 Q03
	MSD	1327842-08RE1	1419.1	3038.2	1000.0	ug/L	3.5	162	20	75 - 125 Q03

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 01/13/2014 11:10
Project: City Watersheds Montini Ranch
Project Number: WR10.0085.13
Project Manager: Jenny Cherney

Notes And Definitions

- J Estimated Value (CLP Flag)
- MDL Method Detection Limit
- ND Analyte Not Detected at or above the reporting limit
- PQL Practical Quantitation Limit
- RPD Relative Percent Difference
- A01 PQL's and MDL's are raised due to sample dilution.
- A02 The difference between duplicate readings is less than the PQL.
- Q03 Matrix spike recovery(s) is(are) not within the control limits.
- S05 The sample holding time was exceeded.
- S09 The surrogate recovery on the sample for this compound was not within the control limits.



Date of Report: 12/27/2013

Jenny Cherney

Daniel B. Stephens & Associates

P.O. Box 256

Petaluma, CA 94953

Project: City Watersheds Montini Ranch

BC Work Order: 1328064

Invoice ID:

Enclosed are the results of analyses for samples received by the laboratory on 12/20/2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014; AK UST101



Table of Contents

Sample Information

Laboratory / Client Sample Cross Reference..... 3

Subcontract Reports

wo_1328064_sub_bsk.pdf..... 4

Notes

Notes and Definitions..... 10



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 12/27/2013 13:43
Project: City Watersheds Montini Ranch
Project Number: [none]
Project Manager: Jenny Cherney

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1328064-01	COC Number:	---	Receive Date:	12/20/2013 19:20
	Project Number:	---	Sampling Date:	12/20/2013 11:25
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MON-1D	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
1328064-02	COC Number:	---	Receive Date:	12/20/2013 19:20
	Project Number:	---	Sampling Date:	12/20/2013 11:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MON-1D DUP	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
1328064-03	COC Number:	---	Receive Date:	12/20/2013 19:20
	Project Number:	---	Sampling Date:	12/20/2013 11:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MON-1S	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
1328064-04	COC Number:	---	Receive Date:	12/20/2013 19:20
	Project Number:	---	Sampling Date:	12/20/2013 14:10
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MON-3S	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water



S3L0116

12/24/2013

Tina Green
BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308

Invoice
S301565

Dear Tina Green,

Thank you for selecting BSK Associates for your analytical testing needs. We have prepared this report in response to your request for analytical services. Enclosed are the results of analyses for samples received by the laboratory on 12/24/2013 19:20.

If additional clarification of any information is required, please contact your Client Services Representative, Brenda Hamilton at (916) 853-9293.

BSK ASSOCIATES

Brenda Hamilton
Sacramento Lab Manager

S3L0116 FINAL 12242013 1209

3140 Gold Camp Drive # 160

Rancho Cordova, CA 95670

(916) 853-9293

FAX (916) 853-9297

www.bsklabs.com

An Employee-Owned Company | Analytical Testing | Construction Observation

Page 1 of 6



Certificate of Analysis

Tina Green
BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308

Report Issue Date: 12/24/2013 12:09
Received Date: 12/24/2013
Received Time: 19:20

Lab Sample ID: S3L0116-01 Client Project: DB Stephens
Sample Date: 12/24/2013 11:25 Sampled by: Client
Sample Type: Other Matrix: Ground Water
Sample Control Qualifiers: MC1.6
Sample Description: MON-1D

Microbiology

Table with 8 columns: Analyte, Method, Result, RL, Units, Batch, Prepared, Qual. Rows include Coliform, Total and E.Coli by 1x10 MTF (Colilert), E. Coli, and Total Coliform.

Lab Sample ID: S3L0116-02 Client Project: DB Stephens
Sample Date: 12/24/2013 11:30 Sampled by: Client
Sample Type: Other Matrix: Ground Water
Sample Control Qualifiers: MC1.6
Sample Description: MON-1D DUP

Microbiology

Table with 8 columns: Analyte, Method, Result, RL, Units, Batch, Prepared, Qual. Rows include Coliform, Total and E.Coli by 1x10 MTF (Colilert), E. Coli, and Total Coliform.

Lab Sample ID: S3L0116-03 Client Project: DB Stephens
Sample Date: 12/24/2013 13:20 Sampled by: Client
Sample Type: Other Matrix: Ground Water
Sample Control Qualifiers: MC1.6
Sample Description: MON-1S

Microbiology

Table with 8 columns: Analyte, Method, Result, RL, Units, Batch, Prepared, Qual. Rows include Coliform, Total and E.Coli by 1x10 MTF (Colilert), E. Coli, and Total Coliform.

S3L0116 FINAL 12242013 1209

3140 Gold Camp Drive # 160

Rancho Cordova, CA 95670

(916) 853-9293

FAX (916) 853-9297

www.bsklabs.com

An Employee-Owned Company | Analytical Testing | Construction Observation



Certificate of Analysis

Tina Green
BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308

Report Issue Date: 12/24/2013 12:09
Received Date: 12/24/2013
Received Time: 19:20

Lab Sample ID: S3L0116-04 **Client Project:** DB Stephens
Sample Date: 12/24/2013 14:10 **Sampled by:** Client
Sample Type: Other **Matrix:** Ground Water
Sample Control Qualifiers: MC1.6
Sample Description: MON-3S

Microbiology

Analyte	Method	Result	RL	Units	Batch	Prepared	Qual
Coliform, Total and E.Coli by 1x10 MTF (Colilert)							
*E. Coli	SM 9223B	<1.1	1.1	MPN/100 mL	S300527	12/20/13 23:09	
*Total Coliform	SM 9223B	>23	1.1	MPN/100 mL	S300527	12/20/13 23:09	

Lab Sample ID: S3L0116-05 **Client Project:** DB Stephens
Sample Date: 12/24/2013 15:40 **Sampled by:** Client
Sample Type: Other **Matrix:** Ground Water
Sample Control Qualifiers: MC1.6
Sample Description: MON-2S

Microbiology

Analyte	Method	Result	RL	Units	Batch	Prepared	Qual
Coliform, Total and E.Coli by 1x10 MTF (Colilert)							
*E. Coli	SM 9223B	12	1.1	MPN/100 mL	S300527	12/20/13 23:09	
*Total Coliform	SM 9223B	>23	1.1	MPN/100 mL	S300527	12/20/13 23:09	

S3L0116 FINAL 12242013 1209

3140 Gold Camp Drive # 160

Rancho Cordova, CA 95670

(916) 853-9293

FAX (916) 853-9297

www.bsklabs.com

An Employee-Owned Company | Analytical Testing | Construction Observation



Certificate of Analysis

12/24/2013

Notes:

- The Chain of Custody document and Sample Integrity Sheet are part of the analytical report.
Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.
Sample(s) received, prepared, and analyzed within the method specified criteria unless otherwise noted within this report.
The results relate only to the samples analyzed in accordance with test(s) requested by the client on the Chain of Custody document. Any analytical quality control exceptions to method criteria that are to be considered when evaluating these results have been flagged and are defined in the data qualifiers section.
All results are expressed on wet weight basis unless otherwise specified.
All positive results for EPA Methods 504.1 and 524.2 require the analysis of a Field Reagent Blank (FRB) to confirm that the results are not a contamination error from field sampling steps. If Field Reagent Blanks were not submitted with the samples, this method requirement has not been performed.
Results contained in this analytical report must be reproduced in its entirety.
Samples collected by BSK Analytical Laboratories were collected in accordance with the BSK Sampling and Collection Standard Operating Procedures.
BSK Analytical Laboratories certifies that the test results contained in this report meet all requirements of the NELAC Standards for applicable certified drinking water chemistry analyses unless qualified or noted in the Case Narrative.
Analytical data contained in this report may be used for regulatory purposes to meet the requirements of the Federal or State drinking water, wastewater, and hazardous waste programs.
J-value is equivalent to DNQ (Detected, not quantified) which is a trace value. A trace value is an analyte detected between the MDL and the laboratory reporting limit. This result is of an unknown data quality and is only qualitative (estimated). Baseline noise, calibration curve extrapolation below the lowest calibrator, method blank detections, and integration artifacts can all produce apparent DNQ values, which contribute to the un-reliability of these values.
(1) - Residual chlorine and pH analysis have a 15 minute holding time for both drinking and waste water samples as defined by the EPA and 40 CFR 136. Waste water and ground water (monitoring well) samples must be field filtered to meet the 15 minute holding time for dissolved metals.
* - This is not a NELAP accredited analyte.
Summations of analytes (i.e. Total Trihalomethanes) may appear to add individual amounts incorrectly, due to rounding of analyte values occurring before or after the total value is calculated, as well as rounding of the total value.
RL Multiplier is the factor used to adjust the reporting limit (RL) due to variations in sample preparation procedures and dilutions required for matrix interferences.

Certifications: Please refer to our website for a copy of our Accredited Fields of Testing for each certification.

Table with 4 columns: State, Accreditation, ID, and Agency. Rows include State of California - ELAP, State of Nevada, State of California - ELAP (Rancho Cordova), State of Hawaii, State of California - NELAP, State of Oregon, and State of Washington.

Definitions and Flags for Data Qualifiers

Table defining data qualifiers: mg/L (Milligrams/Liter), mg/Kg (Milligrams/Kilogram), µg/L (Micrograms/Liter), µg/Kg (Micrograms/Kilogram), % (Percent Recovered), NR (Non-Reportable), MDL (Method Detection Limit), RL (Reporting Limit), ND (None Detected), pCi/L (Picocuries per Liter), RL Mult (RL Multiplier), MDA95 (Min. Detected Activity), MPN (Most Probable Number), CFU (Colony Forming Unit), Absent (Less than 1 CFU/100mLs), Present (1 or more CFU/100mLs).

MC1.6 A residual chlorine result was not provided to the lab.

S3L0116 FINAL 12242013 1209

3140 Gold Camp Drive # 160 Rancho Cordova, CA 95670 (916) 853-9293 FAX (916) 853-9297 www.bsklabs.com

An Employee-Owned Company | Analytical Testing | Construction Observation

Page 5 of 6



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Daniel B. Stephens & Associates
P.O. Box 256
Petaluma, CA 94953

Reported: 12/27/2013 13:43
Project: City Watersheds Montini Ranch
Project Number: [none]
Project Manager: Jenny Cherney

Notes And Definitions