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Revision 0

SEDIMENT PROPERTIES: E AREA COMPLETION PROJECT

M. Millings
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K. Dixon

APRIL 2011

Savannah River National Laboratory
Savannah River Nuclear Solutions
Aiken, SC 29808

Prepared for the U.S. Department of Energy Under Contract Number DE-AC09-08SR22470

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ADS	Analytical Development Section
ARRA	American Recovery and Reinvestment Act
bls	below land surface
CA	composite analysis
cm/s	centimeters per second
ECP	E Area Completion Project
ERTS	Environmental Restoration Technology Section
ft	feet
GCU	Gordon Confining Unit
g/cm^3	grams per cubic centimeter
ELLWF	E Area Low Level Waste Facility
LAZ	Lower Aquifer Zone
LLF	low level radioactive waste facility
mg/kg	milligrams per kilogram
mm	millimeters
msl	mean sea level
MWMF	Mixed Waste Management Facility
PA	performance assessment
ppm	part per million
SA	special analysis
SWMD	Solid Waste Management Division
TCCZ	Tan Clay Confining Zone
UAZ	Upper Aquifer Zone
USCS	Unified Soil Classification System
XRD	x-ray diffraction
XRF	x-ray fluorescence

1.0 EXECUTIVE SUMMARY

To accommodate a future need for additional waste disposal facilities at the Savannah River Site, the Solid Waste Management Division (SWMD) designated nine additional plots for development (Kasraii 2007; SRS 2010); these plots are collectively known as the E Area Completion Project (ECP). Subsurface samples were collected from ECP plots 6, 7, 8 and 9 (Figure 1) for chemical and physical property analyses to support Performance Assessment (PA) and Special Analyses (SA) modeling. This document summarizes the sampling and analysis scheme and the resultant data, and provides interpretations of the data particularly in reference to existing soil property data. Analytical data in this document include: gamma log, cone penetrometer log, grain size (sieve and hydrometer), water retention, saturated hydraulic conductivity (falling head permeameter), porosity, dry bulk density, total organic carbon, x-ray diffraction, and x-ray fluorescence data.

SRNL provided technical and safety oversight for the fieldwork, which included completion of eight soil borings, four geophysical logs, and the collection of 522 feet of core and 33 Shelby tubes from ECP plots 6, 7, 8, and 9. Boart Longyear provided sonic drilling and logging services. Two soil borings were completed at each location. The first set of boreholes extended into (but did not fully penetrate) the Warley Hill Formation. These boreholes were continuously cored, then geophysically (gamma ray) logged. The recovered core was split, photographed, and described; one half of the core was archived at SRS's Core Lab facilities, and the remaining half was consumed as necessary for testing at SRS and off-site labs. Core descriptions and geophysical data were used to calculate target elevations for Shelby tube samples, which were obtained from the second set of boreholes. Shelby tubes were shipped to MACTEC Engineering and Consulting Inc. (MACTEC) in Atlanta for physical property testing. SRNL deployed their Site Characterization and Analysis Penetrometer System (SCAPS) cone penetrometer test (CPT) truck at ECP plots 6, 7, 8 and 9 to collect inferred lithology data for the vadose zone.

Results from this study are used to make recommendations for future modeling efforts involving the ECP plots. The conceptual model of the ECP hydrogeology differs from the conceptual model of the current ELLWF disposal area in that for the ECP plots,

- the topography (ground surface) is generally lower in elevation;
- The Upland and top of Tobacco Road lithostratigraphic units are missing (eroded);
- The water table occurs lower in elevation (i.e., it occurs in lower stratigraphic units);
- and the Tan Clay Confining Zone (TCCZ) often occurs within the vadose zone (rather than in the saturated zone).

Due to the difference in the hydrogeology between the current ELLWF location and the ECP plots, different vadose zone properties are recommended for the ECP plots versus the properties recommended by Phifer et al. (2006) for the current disposal units. Results from this study do not invalidate or conflict with the current PA's use of the Upper and Lower Vadose Zone properties as described by Phifer et al. (2006) for the current ELLWF disposal units.

The following modeling recommendations are made for future modeling of the ECP plots where vadose zone properties are required:

- If a single vadose zone property is preferred, the properties described by Phifer et al. (2006) for the Upper Vadose Zone encompass the general physical properties of the combined sands and clays in the ECP vadose zone sediments despite the differences in hydrostratigraphic units.
- If a dual zone system is preferred, a combination of the Lower Zone properties and the Clay properties described by Phifer et al. (2006) are appropriate for modeling the physical properties of the ECP vadose zone. The Clay properties would be assigned to the Tan Clay Confining Zone (TCCZ) and any other significant clay layers, while the Lower Zone properties would be assigned for the remainder of the vadose zone.

No immediate updates or changes are recommended for the saturated zone properties for modeling of the ECP plots. The hydrogeology and saturated hydraulic conductivity values resulting from the ECP work are consistent with existing data for the area.

The following recommendations are provided for consideration in future work:

- When the database is next updated, we recommend checking/refining hydrostratigraphic interpretations (picks) in addition to revising physical property data for both the vadose zone and saturated zone.
- Results from this work suggest that separate ECP vadose zone properties may be appropriate for the various ECP plots. Consideration should be given to the fact that the plots toward the northwest (ECP plots 6, 7 and 8) all have the TCCZ within the vadose zone whereas the TCCZ occurs within the saturated zone to the east (ECP plot 9).
- Further data may be needed at ECP plot 7. No CPT was able to be performed at this location. In addition, physical property data collected tended to show a bias toward the finer-grained sediments.

2.0 BACKGROUND

The Savannah River Site's solid low-level radioactive waste (LLW) complex is situated in E Area; centrally located in the General Separations Area (GSA), E Area includes various facilities for storage, packaging, and disposal of LLW. Waste forecasts (WSRC 2007) indicate a need – within the next decade – for additional trench waste disposal capacity. To accommodate this need, the Solid Waste Management Division (SWMD) designated nine plots for development within the area described in a 2007 report on the 100-acre expansion of the E-Area Low-Level Waste Facility (ELLWF) (Kasraii 2007; SRS 2010). Known collectively as the E Area Completion Project (ECP), these nine plots are located inside the established administrative boundary for E Area (Figure 1). Development of LLW facilities in this area is consistent with the land use envisioned by the US Department of Energy in the National Environmental Policy Act (NEPA) Waste Management Environmental Impact Statement ((USDOE 1995).

For all DOE facilities that managed or disposed of LLW after 26 September 1988, US DOE Manual 435.1 (USDOE 1999) establishes performance requirements, including allowable doses

to the public from all exposure pathways. This manual mandates a site-specific performance assessment (PA; WSRC 2008) that demonstrate compliance with these performance requirements. The development of additional LLW disposal trenches in E Area will require revision of the existing PA via a special analysis (SA) that predicts the performance of these added facilities. The SA will calculate the expected release of radionuclides from waste trenches over time and the subsequent fate of these radionuclides in various media (soil, groundwater, air, etc). These calculations are used to establish radionuclide inventory limits for waste burial trenches and to demonstrate in a prospective manner that LLW disposal will not contravene the performance requirements of DOE Manual 435.1.

Although some subsurface data existed for the ECP plots, the data were "piecemeal," having been collected to support various site-specific and general characterization efforts during the last 20 years. To ensure accurate and reliable inputs into the SA model, additional samples and subsurface physical property data were collected from ECP plots 6, 7, 8, and 9; these four plots were determined by SWMD to be the highest priority for development of new waste disposal capacity.

This work was funded by the American Recovery and Reinvestment Act (ARRA).

3.0 ECP FIELDWORK

SRNL provided technical and safety oversight for the completion of eight soil borings, four geophysical logs, and the collection of 522 feet of core and 33 Shelby tubes from ECP plots 6, 7, 8 and 9. These plots were chosen for detailed sampling and characterization because they were determined by SWMD to be the highest priority for development of new waste disposal areas, and/or because there is a paucity of complete and relevant data in these plots. Boart Longyear provided sonic drilling and logging services.

SRNL also used their Site Characterization and Analysis Penetrometer System (SCAPS) cone penetrometer test (CPT) truck at each of the four ECP plots 6, 7, 8 and 9 to characterize the vadose zone. The CPT truck consists of a direct push technology that hydraulically advances a 2.25 inch diameter rod into the subsurface for subsurface characterization without the need for and hazards of rotating equipment. The CPT technology allows for quick and cost-effective characterization of the subsurface by providing measurements soil "behavior," from which soil lithology may be inferred.

CPT measurements include tip resistance, sleeve resistance, friction ratio (ratio of sleeve resistance to tip resistance), pore pressure and electrical resistivity; these measurements are correlated with cores from nearby borings to infer sediment types. In general, clays have a low tip, high friction ratio and high pore pressure responses. In contrast, sands have high tip, low friction ratio and low pore pressure responses. Electrical resistivity can also provide information regarding sediment type. Electrical resistivity measurements are influenced by the amount of moisture in pore spaces in addition to water chemistry. In the vadose zone, lower electrical resistivity measurements are often observed in clays where capillary forces of the small pores retain soil moisture. Higher electrical resistivity measurements are observed in vadose zone sands because pore spaces are filled primarily with air.

Figure 2 shows the locations of the drill sites at ECP plots 6, 7, 8 and 9. Two soil borings were completed at each location. The first set of boreholes extended into (but did not fully penetrate) the Warley Hill Formation. These boreholes were continuously cored, then geophysically (gamma ray) logged. The recovered core was split, photographed, and described; one half of the core was archived at SRS's Core Lab facilities, and the remaining half was consumed as necessary for testing at SRS and off-site labs. Core descriptions and geophysical data were used to calculate target elevations for Shelby tube samples, 33 of which were obtained from the second set of boreholes. Shelby tubes were shipped to MACTEC in Atlanta for physical property testing. At each of the ECP sites, a SCAPS CPT push was attempted adjacent to the rotosonic drill location. At ECP7, the initial CPT push hit refusal at approximately 15 ft bls; another location was attempted but also failed. Hence, no CPT data are available for the ECP7 location.

Table 1 summarizes the sampling and analysis scheme and much of the resultant data, which are scrutinized in subsequent sections of this report. These data, as discussed and amended in this report, may be used as quantitative inputs for SA modeling.

4.0 VADOSE ZONE PROPERTIES

4.1 GEOLOGY FROM ECP WORK

The existing E-Area Low Level Waste facility (ELLWF) is located on high ground between two streams. Beneath this topographic ridge is a groundwater divide, on either side of which shallow groundwater flow diverges toward Upper Three Runs to the north and Fourmile Branch to the south. Near the divide, the water table occurs above the Tan Clay Confining Zone (TCCZ), in the Upper Aquifer Zone (UAZ). To the north of the divide – and beneath ECP sites 6, 7, 8, and 9 – the water table occurs beneath the TCCZ, in the Lower Aquifer Zone (LAZ). Figure 3 illustrates this local hydrostratigraphic regime.

Most of the ECP plots are topographically lower than the existing ELLWF; in ECP plots 6, 7, 8, and 9, the uppermost 20-40 feet of soil – which typically includes the Upland Unit and part of the Tobacco Road Formation – has been eroded and the water table is, accordingly, lower in the stratigraphic section. Consequently, the vadose zone and saturated zone may have different physical properties in the ECP plots compared to the existing LLWF plots.

The report *Hydraulic Property Data Package for the E-Area and Z-Area Soils, Cementitious Materials, and Waste Zones* (Phifer et al. 2006) provides hydraulic property estimates for the vadose zone soils in E Area. These property estimates includes porosity, dry bulk density, particle density, saturated hydraulic conductivity and characteristic curves. For simplicity, Phifer et al. (2006) designated sediments above an elevation of 264 ft msl as the "Upper Vadose Zone" and sediments below 264 ft msl to the water table as "Lower Vadose Zone." This division was based on available CPT logs, visual core descriptions and grain size analyses, but it was independent of lithostratigraphic picks (and did not distinguish the TCCZ or any physical properties thereof). Figure 4 illustrates the fine-grained "Upper Vadose Zone and coarse-grained Lower Vadose Zone that constitute the dual-zone approach. Using this approach, all of the ECP vadose zone samples would be assigned to the Lower Vadose Zone. This report compares the

physical properties of ECP vadose zone samples to the Upper and Lower Vadose Zone properties described by Phifer et al. (2006) to determine the most appropriate dataset for the ECP plots.

The first borehole at each ECP location was cored and gamma logged, and the core described and sampled for thin section microscopy, x-ray diffraction (XRD), x-ray fluorescence (XRF), and dry sieve analyses. Shelby tube samples were collected at a second borehole at each ECP location. SCAPS CPTs were completed (or attempted) at immediately adjacent locations or nearby. Figure 5 through Figure 8 present CPT logs, gamma logs, and soil property data for the vadose zone at each of the ECP locations. *(These figures do not include soil property data or log data for the saturated zone.)* At ECP7, a CPT push could not be performed and no CPT data are available. Soil property data shown on these figures include the material description, USCS classification, saturated vertical hydraulic conductivity in centimeters/second (cm/s), porosity, and the percent mud or fines (<0.074 millimeters [mm] in diameter).

At ECP locations 6, 7, and 8, the TCCZ occurs within the vadose zone. Table 2 provides the depth and elevation of the water table and TCCZ for each of the soil boring locations.

4.2 BULK PROPERTY DATA

4.2.1 Grain Size

Sediment grain size data can provide insight regarding the physical properties of the subsurface. MACTEC conducted sieve and hydrometer analyses on Shelby tube samples from ECP locations 6, 7, 8 and 9 (Attachment G). SRNL's Environmental Restoration Technology Section (ERTS) also performed foot-by-foot dry sieve analyses on core from ECP locations 8 and 9. MACTEC's grain size data were compared with field descriptions (Attachment A), CPT logs (Attachment B), gamma logs (Attachment C), , and SRNL's dry sieve results (Attachment H).

Soil texture can be classified using an approach developed by the U. S. Department of Agriculture (USDA). The USDA system defines 12 basic textural groups, which can be shown in graphical form on a textural triangle. Figure 9 is a textural triangle showing the relative amounts of sand, silt, and clay in ECP samples and comparing those with the Upper and Lower Vadose Zone sediment data from Phifer et al. (2006).[1]

The Upper Vadose Zone defined by Phifer et al. (2006) consists of clay-rich sediments (sandy clay loams and some clay) while the Lower Vadose Zone consists of more sand-rich sediments (generally ≥70% sand) with <10% to 30% clay and minor (generally ≤10%) silt. The VL-26 grain size data show that the vadose zone in this area near Slit Trench 1 most closely resembles the Lower Vadose Zone described by Phifer et al., although a greater percentage of clay is

[1] The USDA and MACTEC use slightly different particle sizes to bound the clay, silt and sand fractions.

	MACTEC	USDA
clay	<0.002mm	<0.005mm
silt	0.002 mm to 0.05 mm	0.005 mm to 0.074 mm
sand	0.05 mm to 2.0 mm	0.074 to 4.75 mm

present. Most of the VL-26 samples are loamy sands or sandy loams with a few sands and sandy clay loams.

The relative abundance and distribution of clay in the vadose zone are of particular interest because clay, especially when concentrated in discrete strata, can effectively retard or impede the downward flow of water through the vadose zone.

Table 3 summarizes grain size data for ECP samples with 20% or greater mud (clay + silt) content. Of these 11 samples, four were within or near the TCCZ and four samples were associated with other fine-grained zones. The gamma ray and CPT friction and pore pressure logs show the expected positive responses for the clay rich zones from which these samples were taken. However, three other samples with mud fractions exceeding 20% lacked these typical geophysical (CPT or gamma ray) signatures. This lack of consistency points to the heterogeneous nature of the sediments, and illustrates the difficulties in using only one diagnostic technique to characterize the nature of subsurface sediments.

Grain size analyses effectively describe the range of sediment particle sizes, however these analyses provide no insight regarding how the various grain sizes are distributed throughout the sample (e.g., fine grains uniformly interspersed throughout the sample, concentrated in clumps, or deposited as drapes on top of coarser grained layers).

4.2.2 Dry Bulk Density

Dry bulk density is a measure of the mass of dried sediments divided by the volume they occupy (including pore spaces). Mineral composition and compaction affect a sample's dry density and so sample heterogeneity and sample handling must be considered when reviewing dry bulk density results.

MACTEC conducted initial dry bulk density analyses on ECP Shelby tube samples (Attachment G, "TP-4 Unit Weight of Sample" datasheets). Figure 10 provides results from these analyses and compares them with the Upper and Lower Vadose Zone data from Phifer et al. (2006) and data from the recent VL-26 characterization. The ECP sediment bulk densities are similar to those noted by Phifer et al. for their Upper and Lower Vadose Zone; ECP mean bulk density varies by less than +/-3 sigma from that of the Upper and Lower Vadose Zone. It is interesting to note that the bulk densities for ECP7 samples seem distinctly bi-modal, plotting at either end of the calculated Upper and Lower Zone populations (+/-3 sigma).

MACTEC also conducted additional dry bulk density measurements as part of the water retention and hydraulic conductivity analyses. Sub-sampling, sample handling, and analytical tests themselves can affect the dry bulk density. In some cases, the tested sample is unrepresentative of the original bulk sample. Initial dry bulk density sample measurements were compared with the measurements made for the hydraulic conductivity and water retention tests. Figure 11 and Figure 12 show these comparisons, respectively, along with a middle line representing a one-to-one relationship (meaning the measurements are the same) and dashed lines representing +/-5% difference.

The initial bulk density dataset and the hydraulic conductivity bulk density dataset plot within the +/-5% region (Figure 11). However, it is noteworthy that the points comparing these two datasets all plot above the one-to-one line, meaning that the dry bulk densities measured as part of hydraulic conductivity tests were slightly higher than the initial sample measurements. This difference could be due to compaction (reduction in volume) that took place during the hydraulic conductivity tests.

For the water retention tests, six samples plotted outside of the +/-5% region (Figure 12). These differences in bulk density data could suggest that the sediments used in the two bulk density tests were slightly different (i.e., not necessarily representative of each other). Alternatively, these differences could also suggest that several of the sediment samples were compacted during the water retention tests (e.g., preparation or handling of sediments). All of the water retention data were included in this evaluation despite the fact that six of the sample plotted beyond the +/-5% region.

4.2.3 Porosity

Porosity values reflect laboratory measurements of the total volume of pore space in the soil samples. MACTEC conducted porosity measurements on ECP Shelby tube samples (Attachment G, "TP-4 Unit Weight of Sample" datasheets). Figure 13 provides results from these analyses and compares them with Upper and Lower Zone data from Phifer et al. (2006) and the recent VL-26 characterization. The ECP sediment porosities appear similar to those of the Upper and Lower Zone, with a sample mean that plots within +/-3 sigma of the Upper Zone and Lower Zone sample means. As with the dry bulk density measurements, the porosities for ECP7 samples plot at the ends of the calculated Upper Zone and Lower Zone populations (+/-3 sigma).

4.3 SATURATED HYDRAULIC CONDUCTIVITY

MACTEC conducted saturated hydraulic conductivity (K_{SAT}) measurements on ECP Shelby tube samples (Attachment G). Figure 14 provides results from these analyses and compares them with all Upper Zone, Lower Zone, and Clay property data from Phifer et al. (2006) and the recent VL-26 characterization. In addition, these figures show the geometric means of the calculated saturated vertical (Kv) and horizontal (Kh) hydraulic conductivities recommended by Phifer et al. for the Upper Zone, Lower Zone and Clay. It is important to note that the Kh and Kv values calculated by Phifer et al. for the Upper Zone and Lower zone are based on textural properties and layer thicknesses at one representative location, and that an upscaling methodology (using power-average exponents $p_h = 0.59$ and $p_v = -0.33$) was applied to these data to account for the spatial variability in permeability typical of coastal plain sediments.

ECP samples and samples from VL-26 near Slit Trench 1 tend to have lower saturated hydraulic conductivities (K_{SAT}) than the Lower Zone defined by Phifer et al. However, these ECP data fall within the range of values reported for the Upper Zone. The difference between ECP sediments and the Lower Zone is expected because Phifer et al. did not include the TCCZ in their vadose zone interpretations while it is included in the ECP characterization.

4.4 WATER RETENTION

MACTEC measured moisture retention properties for the ECP and VL-26 sediment samples (Attachment G). As part of the outflow extraction tests, Dixon (2010) fit the measured moisture retention data for the ECP and VL-26 sediment samples using the latest version of RETC (RETention Curve) computer code (USDA 1998).

RETC incorporates van Genuchten's closed form analytical expression that predicts soil moisture content as a function of pressure. The relationship is given as:

$$\theta(h) = \theta_r + \frac{\theta_s - \theta_r}{\left[1 + (\alpha h)^n\right]^m} \qquad h \le 0 \tag{1}$$

$$\theta(h) = \theta_s \qquad h > 0 \tag{2}$$

where $\theta(h)$ is moisture content at the pressure head h, θ_r is residual moisture content, θ_s is the saturated moisture content, h is pressure head, α is a constant related to the inverse of the air-entry pressure, and n is a measure of the pore-size distribution. The constraint $m = 1 - 1/n$ was used in these analyses as suggested by van Genuchten (1980) and van Genuchten et al. (1991).

The predicted moisture retention curves were based on moisture retention data only; no unsaturated hydraulic conductivity data were available for the samples. RETC's van Genuchten $m = 1 - 1/n$ retention curve model was used to estimate curve fitting parameters ($\theta_r, \theta_s, \alpha, n$) for each sample. Table 4 provides the estimated curve fitting parameters for the ECP and VL-26 samples.

The curve fitting parameters ($\theta_r, \theta_s, \alpha, n$) from RETC were used to calculate the effective saturation (or reduced water content), S_e, at incremental pressure heads according to

$$S_e = \frac{S - S_r}{1 - S_r} = \frac{1}{\left[1 + (\alpha h)^n\right]^m} \tag{3}$$

where S_r denotes residual saturation. Using S_e, the relative hydraulic conductivity (K_r) was calculated at incremental pressure heads using the Mualem-van Genuchten type function

$$K_r = S_e^L \left[1 - \left(1 - S_e^{1/m}\right)^m\right]^2 \tag{4}$$

where L is an empirical pore-connectivity parameter and assumed to be 0.5.

Saturation (S) was calculated at various pressure heads according to

$$S = S_r + \left(\frac{1 - S_r}{\left[1 + (\alpha h)^n \right]^m} \right) \quad (5)$$

where residual saturation, S_r, is equal to θ_r / θ_s (the residual moisture content divided by the saturated moisture content).

MACTEC's measured saturated hydraulic conductivity (K_{SAT}) was used with the relative hydraulic conductivity (K_r) to calculate hydraulic conductivity for each of the samples.

$$K = (K_r)(K_{SAT}) \quad (6)$$

Figure 15 shows the calculated hydraulic conductivity function (K) versus suction for all of the ECP and VL-26 samples along with the Upper Zone, Lower Zone and Clay curves. At suction values observed in E Area's vadose zone (~50-200 cm, Phifer et al. 2006), many of the curves fall between the Clay and Upper Zone curves. A few fall below the Clay curve and a few are above the Lower Zone curve.

Figure 16 provides curves for samples that appear to be Lower Zone according to the CPT log response. Similarly, Figure 17 shows curves for samples that appear to be associated with the TCCZ or another clay zone according to the CPT log response. Samples that were collected in zones where it was unclear (e.g., a zone that transitions between clay and sand) were not included on the graphs. In addition, samples where data may have been questionable were also not included on the graphs (e.g., ECP8 54-55 ft which had "sand" like responses on both the gamma log and CPT logs, a fairly elevated saturated hydraulic conductivity [1E-4 cm/s] that would be expected in a "sand," a hydraulic conductivity versus suction curve similar to the Lower Zone as would be expected from a "sand," but a large clay fraction (34%) according to the grain size analyses).

Dixon (2010) tested five of the ECP sediments to determine van Genuchten properties using a transient, multi-step cumulative outflow extraction method and Hydrus-1D computer code (Šimůnek et al. 2008). The advantage of the outflow extraction method over traditional techniques (like the falling head permeameter test used by MACTEC) is that the outflow extraction method provides information about relative permeability. Figure 18 compares the outflow extraction data with the Upper Zone, Lower Zone and Clay curves. This figure shows only the four vadose zone samples tested. At suction levels ~50-200 cm, two samples are similar to the Lower Zone while the other two samples lie between the Upper Zone and Clay curves.

4.5 MINERALOGY, ELEMENTAL ANALYSIS, AND ORGANIC CONTENT

SRNL's Analytical Development Section (ADS) performed x-ray diffraction (XRD) and x-ray fluorescence (XRF) analyses on select vadose zone samples. XRD results indicate that ECP vadose zone sediments consist primarily of quartz, kaolinite and illite (aluminosilicate minerals), goethite (iron oxyhydroxide), and anatase (titanium dioxide). XRF results showed a similar composition, with silicon (Si), aluminum (Al), and iron (Fe) as primary constituent elements. A few samples also contained notable zirconium (Zr), indicating the presence of zircon ($ZrSiO_4$), a

common detrital mineral in sedimentary rocks. Zircons can contain trace amounts of naturally occurring radioactive uranium (U) and thorium (Th). SRNL ADS's XRD and XRF data are included at Attachment D and Attachment E, respectively.

As a follow-up to the XRF analyses, SRNL's ERTS performed screening level analyses on ECP8 vadose zone samples using a Thermo Fisher Scientific Niton XLS-3T XRF spectrometer. Constituents detected were barium (Ba), iron (Fe), lead (Pb), potassium (K), rubidium (Rb), strontium (Sr), thorium (Th), uranium (U), vanadium (V), and zirconium (Zr). The XRF data reflect relative (not absolute) constituent concentrations owing to the reduction in instrument sensitivity from the plastic through which the sediments were analyzed.

MACTEC measured the percent organic matter on ECP Shelby tube samples (Attachment G, "Organic Content" datasheets). Organic matter in the ECP vadose zone sediments varied between 0.2% and 3% with a median value of 0.9%, a mode of 1.1%, and an average of 1.1%.

4.6 DETAILED ASSESSMENT OF ECP8 LOCATION

Of the four ECP locations characterized, the largest and most robust dataset is associated with site ECP8. The complete dataset available for this location includes: CPT and gamma ray logs; depth-discrete soil property (especially particle size) data; XRD mineralogy; XRF elemental analyses; and thin-section petrographic images. Due to the natural heterogeneities in geologic media, as well as man-made variability introduced by sampling and analytical techniques, it would be imprudent to use the data from ECP8 alone as *a priori* evidence of conditions at other ECP sites or at E Area in general. However, it is worthwhile to examine and interpret these data collectively. Attachment J includes an evaluation and interpretation of all available data for ECP8.

4.7 VADOSE ZONE RECOMMENDATIONS

Due to the difference in the hydrogeology between the current ELLWF location and the ECP plots, different vadose zone properties are recommended for the ECP plots versus the properties recommended by Phifer et al. (2006) for the current ELLWF disposal units. It is important to note that results from this study do not invalidate or conflict with the current PA's use of the Upper and Lower Vadose Zone properties as described by Phifer et al. (2006) for the current ELLWF disposal units.

Recommendations for future modeling of the ECP plots where vadose zone properties are required are provided below and summarized in Figure 26.

- If a single vadose zone property is preferred, the properties described by Phifer et al. (2006) for the Upper Vadose Zone are the most appropriate dataset for the ECP vadose zone. Like Phifer et al.'s Upper Vadose Zone, the ECP vadose zone contains sands and clays and therefore from a physical property standpoint are similar to the Upper Vadose Zone (despite the difference in lithostratigraphic and hydrostratigraphic units). Refer to Figure 9, Figure 10, Figure 13, Figure 14, and Figure 15.
- If a dual zone system is preferred, a combination of the Lower Zone properties and the Clay properties from Phifer et al. (2006) are appropriate (refer to Figure 14, Figure 16 and Figure 17). The Clay properties would be assigned to the TCCZ and any other

significant clay layers while the Lower Zone properties would be assigned for the remainder of the vadose zone.

The following recommendations are provided for consideration in future work:

- The new ECP data summarized in (and attached to) this report should be used to revise vadose zone properties in the next update to the model database.
- Results from this work suggest that separate ECP vadose zone properties may be appropriate for the various ECP plots. Consideration should be given to the fact that the plots toward the northwest (ECP plots 6, 7 and 8) all have the TCCZ within the vadose zone whereas the TCCZ occurs within the saturated zone to the east (ECP plot 9).
- Further data may be needed at ECP plot 7. No CPT was able to be performed at this location. In addition, physical property data collected tended to show a bias toward the finer-grained sediments.

5.0 SATURATED ZONE PROPERTIES

5.1 GEOLOGY

Continuous soil borings, gamma ray logs, and soil property data provide insight into the hydrogeology of the saturated zone beneath the ECP plots, and allow comparison with data used in the GSA PORFLOW model. An east-to-west correlation panel (Figure 19) shows gamma ray logs for the four ECP borings and gamma ray logs and lithologic descriptions for the two nearest borings used in the GSA PORFLOW model. This figure shows the general continuity of various stratigraphic units across the ECP sites, but also illustrates the variation in stratigraphic thickness and gamma log signature owing to natural geologic heterogeneities.

An important finding of this work – one that corroborates conclusions of previous GSA modeling efforts – is that the TCCZ (part of the Dry Branch Formation) varies in thickness, composition, and relative stratigraphic position in the study area. Beneath relatively "high ground" portions of E Area (for example, Mixed Waste Management Facility, Old Burial Ground, E-Area Vaults), the TCCZ typically occurs in the saturated zone, supporting an unconfined water table aquifer ("Upper Aquifer Zone" of the Upper Three Runs Aquifer) and acting as a semi-confining unit for the "Lower Aquifer Zone." At locations with lower ground elevations, however, and particularly to the north-northwest of the slit trenches, the water table surface occurs stratigraphically beneath the TCCZ, and there is no groundwater above the TCCZ (with the possible exception of locally or ephemerally perched water).

Field observations indicate that the TCCZ supports a thin (<10 ft) water table beneath the ECP9 test site (located in the southern corner of area ECP9); to the west-northwest, at the three other sites characterized (ECP8, ECP7, and ECP6), the TCCZ occurs in the vadose zone. Whether it occurs in the vadose or saturated zone, the thickness, continuity, and texture of the TCCZ are important considerations for contaminant transport modeling. Figure 20 shows core samples of the TCCZ from several ECP locations.

The results of the ECP fieldwork also corroborate previous observations regarding the mixed carbonate-siliciclastic strata (McBean Formation or Santee limestone) deeper in the saturated zone. These mixed carbonate-siliciclastic zones are similar to those noted in nearby borings used in the GSA PORFLOW model. Carbonate content (shells, shell hash, lime mud) in these zones is greater in cores from ECP6 and ECP8 to the west, sporadic in core from ECP7, and has been largely replaced by silica in core from ECP9. These lateral, vertical, and mineralogical variations are consistent with observations by Thayer et al. (1993), who noted nine different textural and/or mineralogical microfacies in these strata.

It is important to note that none of these carbonate zones consist of pure limestone or calcium carbonate and that no void spaces were found in these carbonate zones. Figure 21 and Figure 22 show core samples of mixed carbonate-siliciclastic zones from several ECP locations.

The four ECP borings terminated in the Green Clay or Gordon Confining Unit (correlative with the Warley Hill lithostratigraphic formation). The top of the Gordon Confining Unit (GCU) was interpreted to be between 140 and 150 ft msl, which is consistent with interpretations used in the GSA PORFLOW model. Table 5 shows the elevations ("picks") for the top of the GCU, as interpreted from ECP fieldwork. Figure 23 is a comparison between these ECP picks and those from the GSA PORFLOW database. Figure 24 shows core samples of the GCU at several ECP locations.

5.2 GRAIN SIZE

MACTEC conducted sieve and hydrometer analyses on Shelby tube samples recovered from the saturated zone (Attachment G). Results from these analyses are plotted on a textural triangle in Figure 25. Although the data are somewhat sparse, some general trends are evident. Confining or semi-confining units tend to have greater silt and/or clay content. Samples from the Upper Aquifer Zone have very high sand content (~90%), while samples from the LAZ plot are generally loamy sands with clay contents ranging between 10% and 35%.

5.3 SATURATED HYDRAULIC CONDUCTIVITY

Laboratory hydraulic conductivity measurements of ECP samples (included at Attachment G) are compared with historical laboratory and field measurements in Table 6. Jaegge et al. (1987) and Dennehy et al. (1989) summarized hydraulic conductivity data collected during earlier (circa 1970s-1980s) laboratory and field studies. Aadland et al. (1995) and Denham (1999) offer similar summaries of hydrogeologic data.

Historical hydraulic conductivity data can be difficult to evaluate because documentation of sample collection and analysis is often lacking. Dennehy et al. (1989) noted that, in the datasets they reviewed, hydraulic conductivities were measured using both constant and falling head permeameter tests. However, these tests were conducted on excavated samples that were oven-dried, sieved, and then compacted into a PVC cylinder. Data generated by such techniques may be considerably different from measurements made on undisturbed Shelby tube samples (as for this report). Consequently, the hydraulic conductivities summarized in Table 6 show a range of values.

Notwithstanding any variations due to analytical effects, the ECP hydraulic conductivity dataset is quite consistent with previous data for the various hydrogeologic units. The range of hydraulic conductivity values for ECP LAZ samples is larger than the range observed in the historical dataset, but this range likely reflects the natural geologic heterogeneity of these mixed carbonate-siliciclastic strata.

5.4 SATURATED ZONE RECOMMENDATIONS

The saturated hydraulic conductivity values and hydrogeologic interpretations from the ECP work are consistent with existing data and with the parameters of the GSA model database for the area. No immediate updates or changes are recommended for the saturated zone properties. However, with the next update to the GSA model database, the following items should be considered in the revision:

- Hydrostratigraphic picks: The ECP picks should be added to the database. At a minimum, these picks should include the top of the TCCZ, the LAZ, and the GCU.
- Physical property data related to permeability: The ECP dataset offers additional laboratory measurements of saturated hydraulic conductivity for the various aquifers, semi-confining units, and confining units; these data should be added to the database. Grain size data (sieve and hydrometer) and foot-by-foot dry sieve data are also available; these data may be related to permeability and should be considered for incorporation into the database.
- Physical property data and geochemical data related to sorption: ECP grain size data, total organic carbon analyses, and XRD/XRF data may be useful in updates of the sorption criteria.
- Further delineation of the LAZ: If the mixed carbonate-siliciclastic zone is identifiable and remarkably different from area to area, this zone could perhaps be further delineated within the model.

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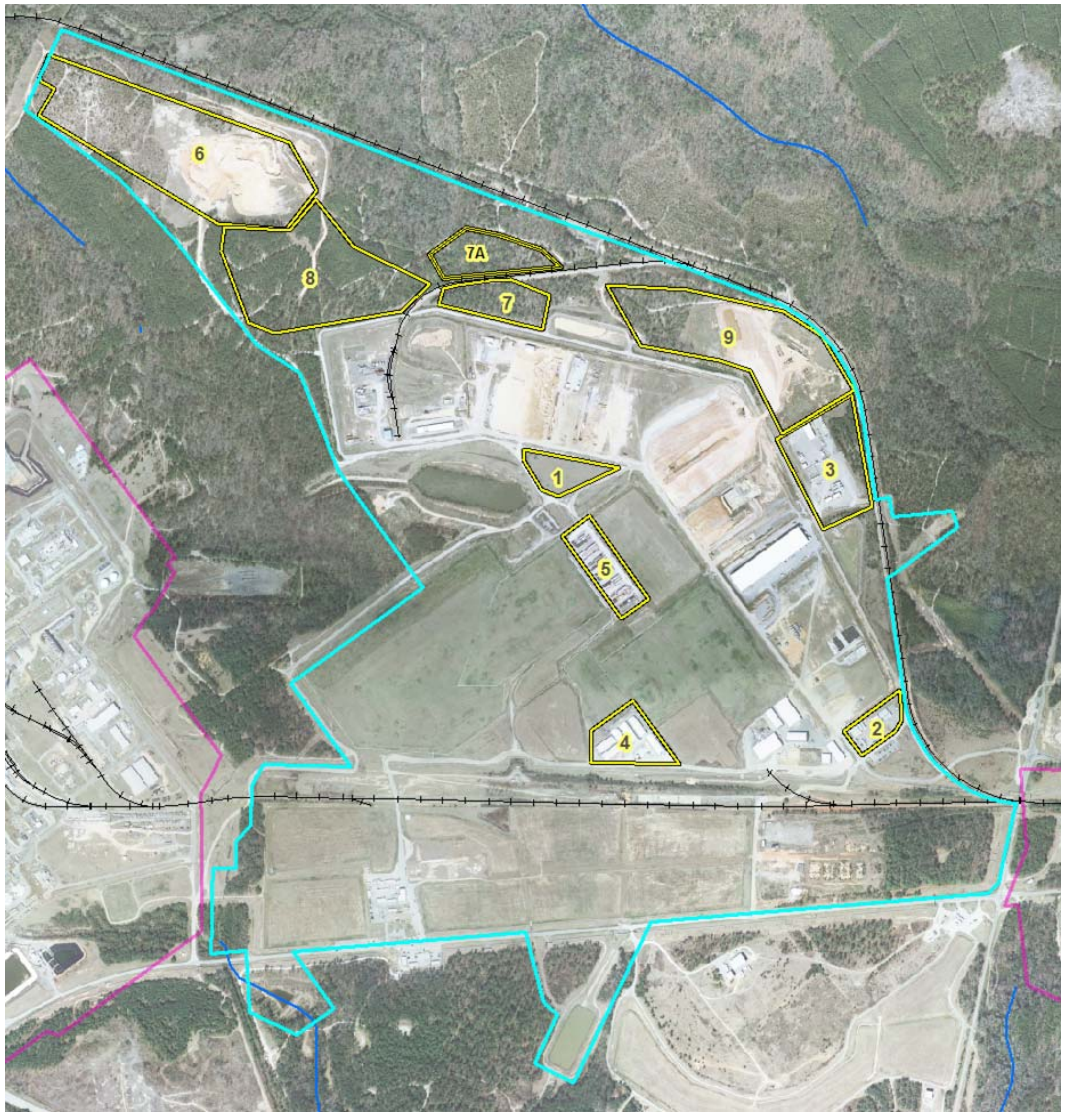


Figure 1. ECP Plots (yellow) inside the E Area Boundary (light blue)

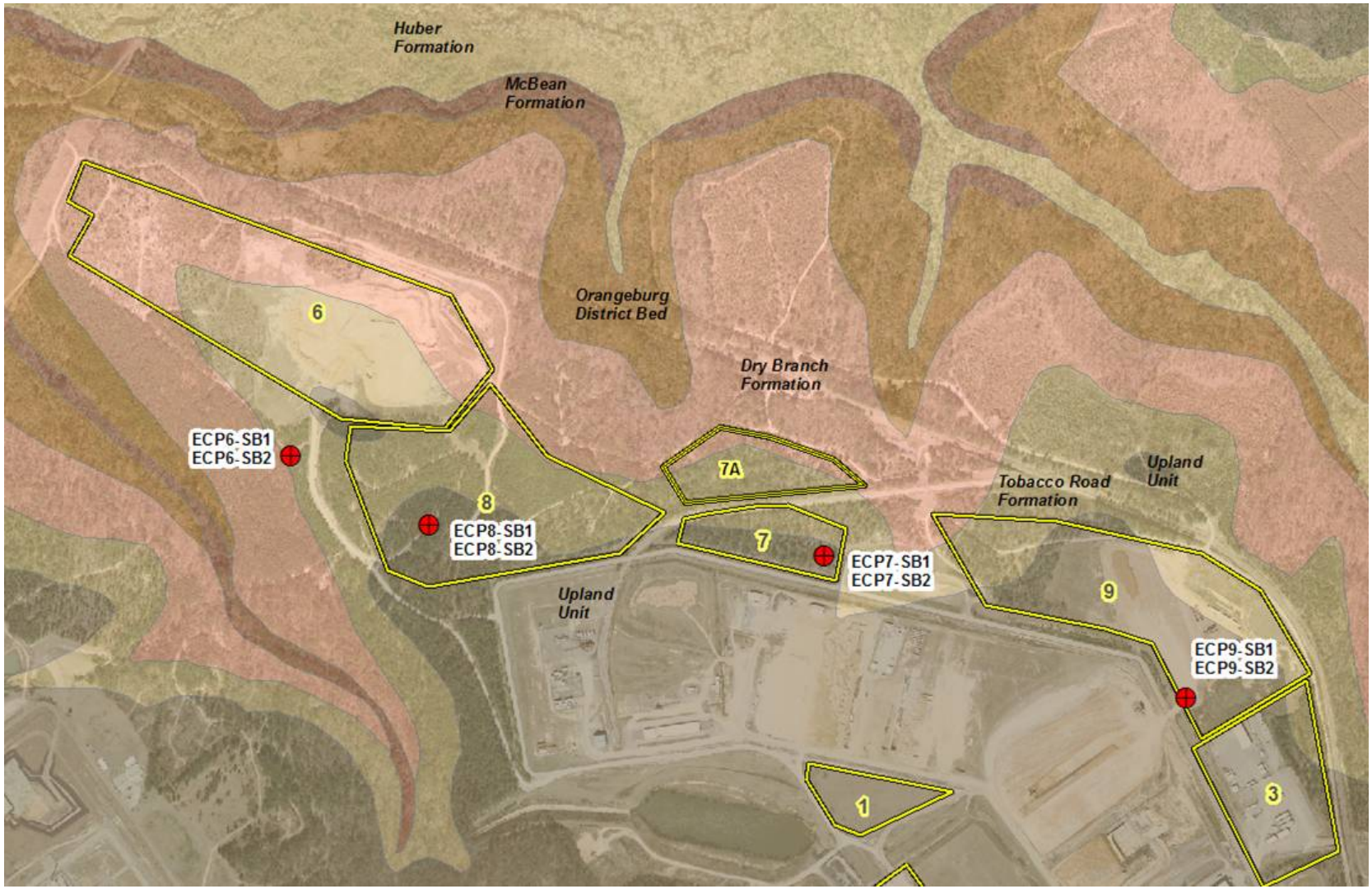
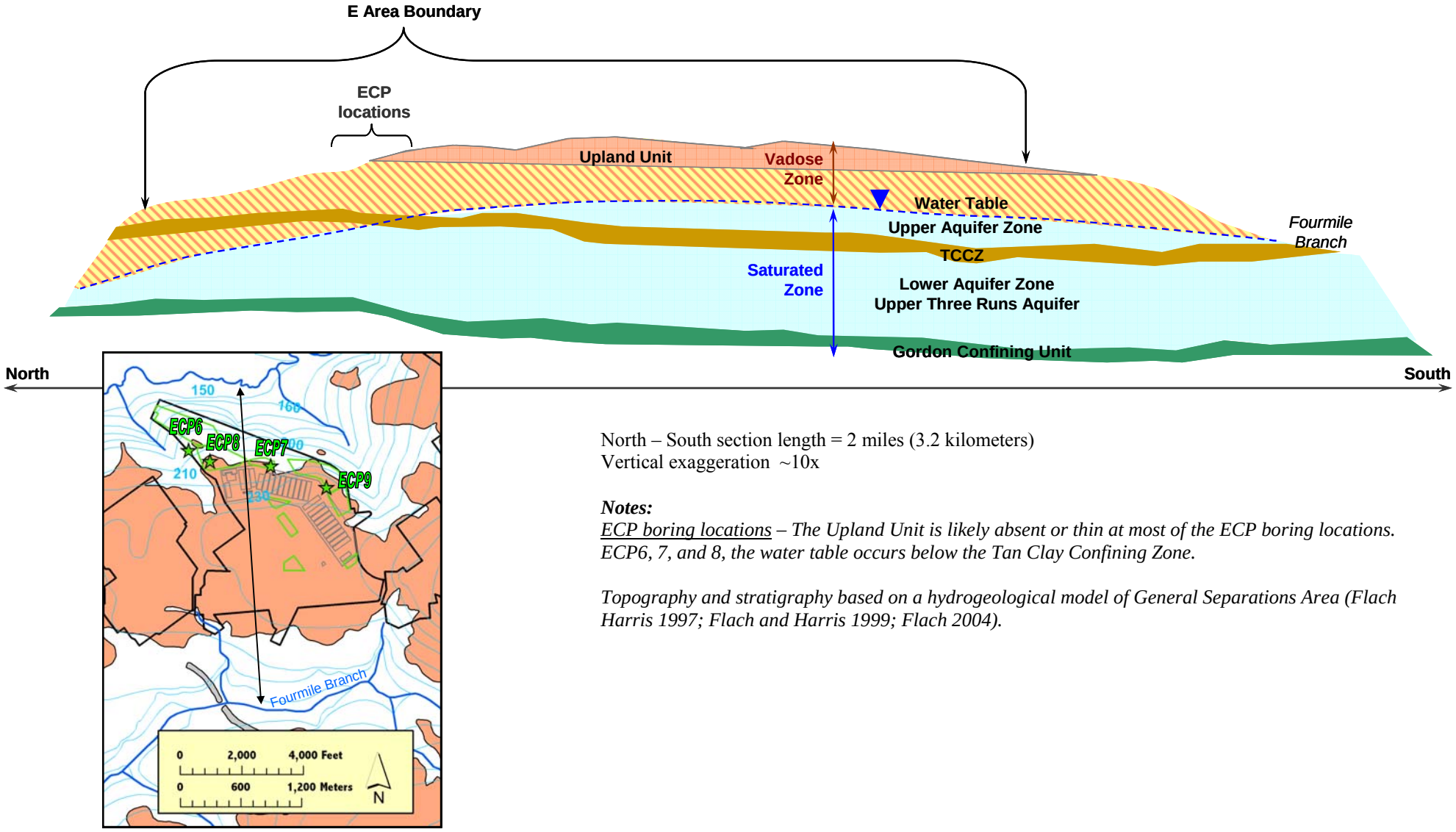


Figure 2. Locations of ECP Characterization Locations in Relation to Outcrop Geology



North – South section length = 2 miles (3.2 kilometers)
Vertical exaggeration ~10x

Notes:
ECP boring locations – The Upland Unit is likely absent or thin at most of the ECP boring locations. ECP6, 7, and 8, the water table occurs below the Tan Clay Confining Zone.

Topography and stratigraphy based on a hydrogeological model of General Separations Area (Flach Harris 1997; Flach and Harris 1999; Flach 2004).

Figure 3. Generalized Hydrogeology for ECP Locations

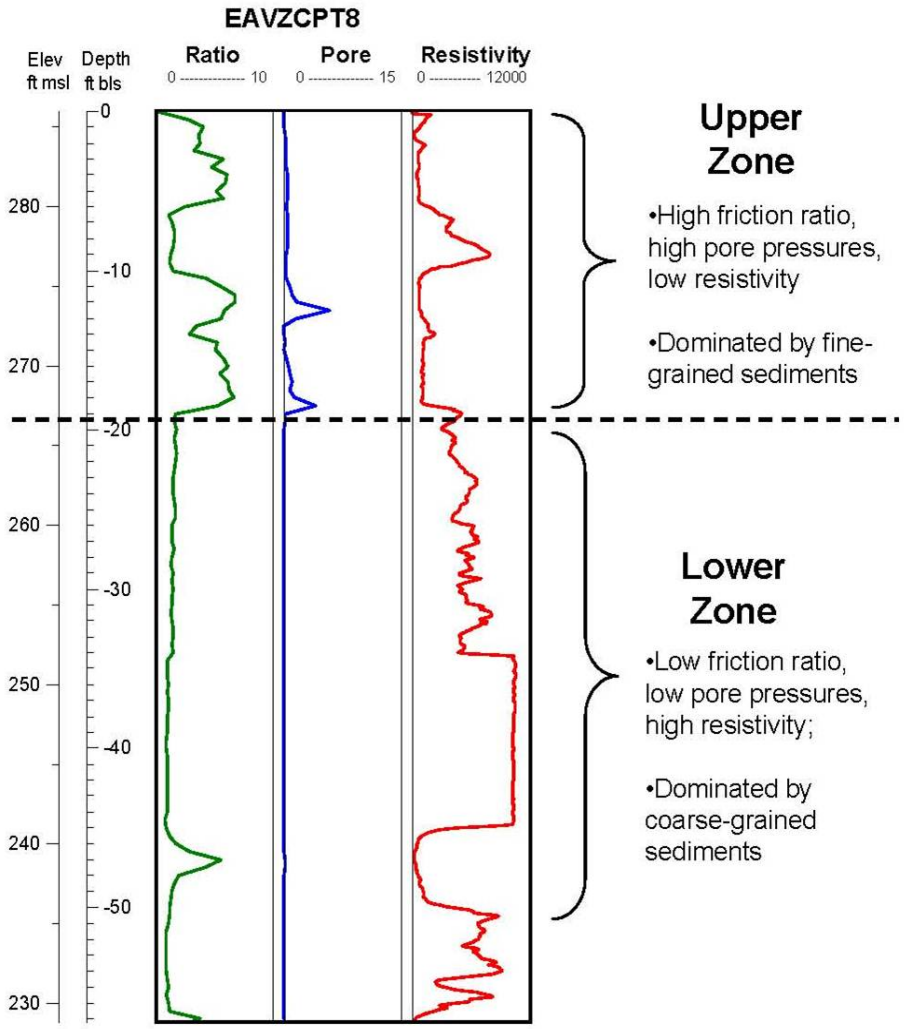


Figure 4. Example of Two System Vadose Zone

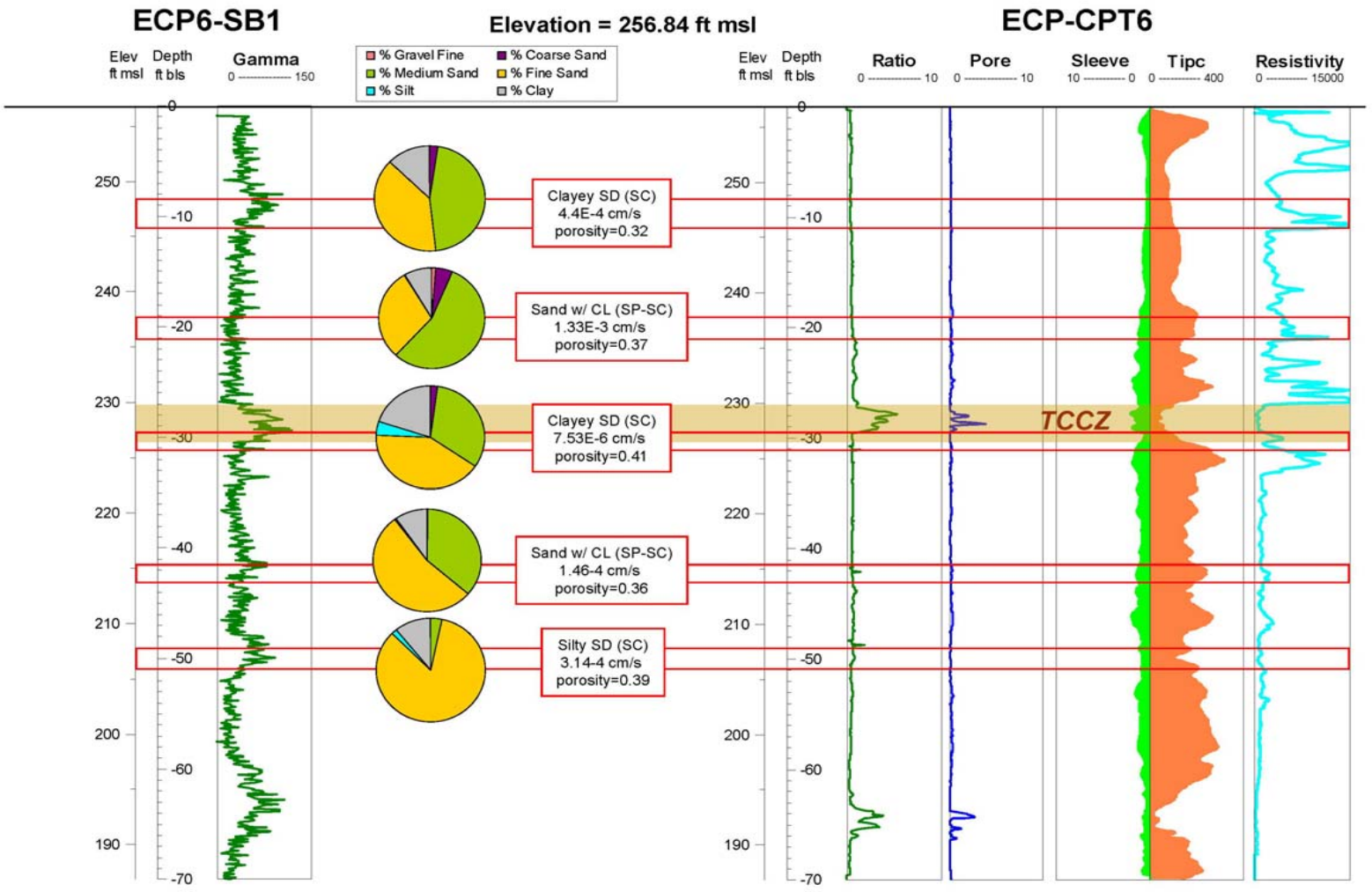


Figure 5. Characterization Data at ECP6

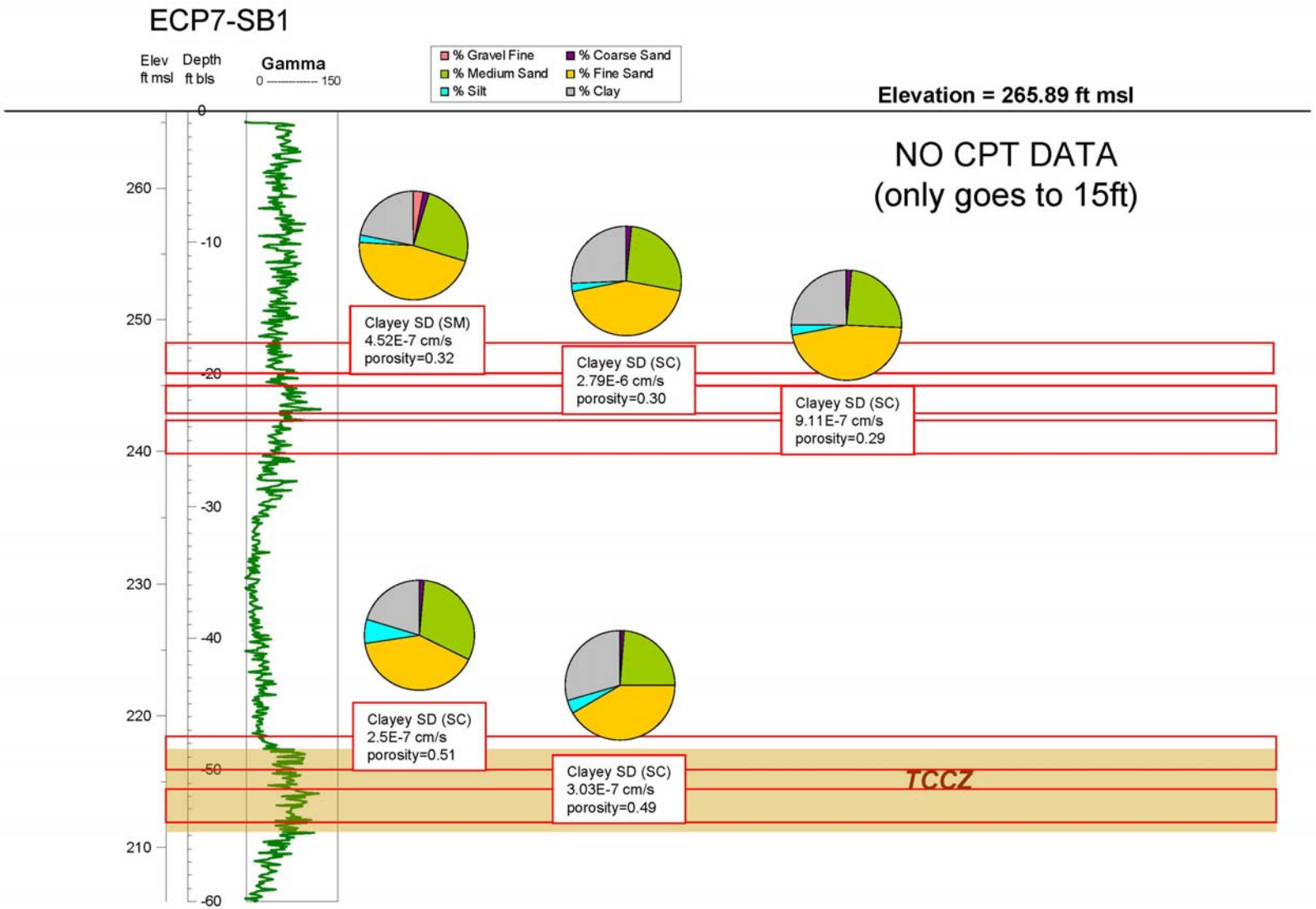


Figure 6. Characterization Data at ECP7

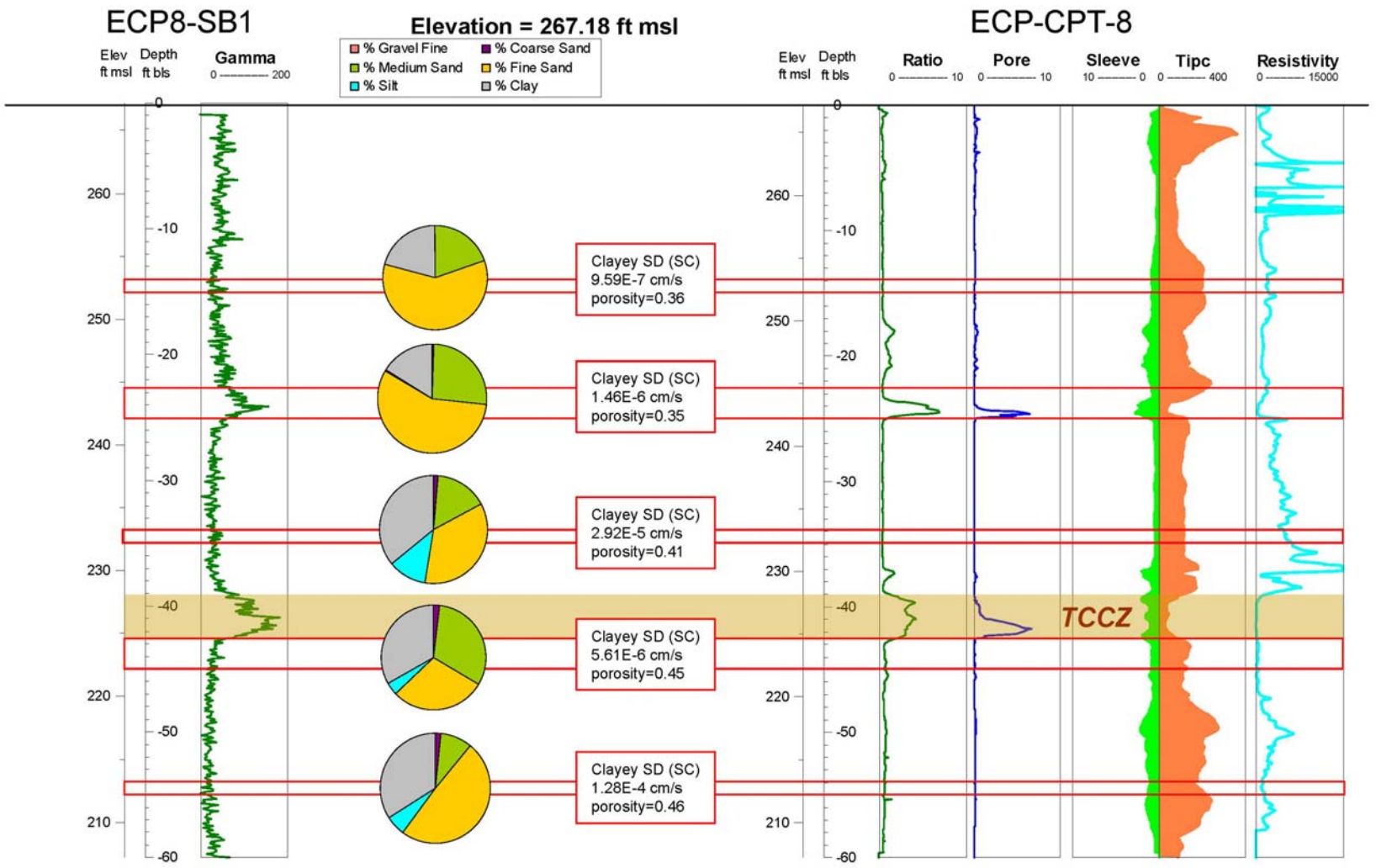


Figure 7. Characterization Data at ECP8

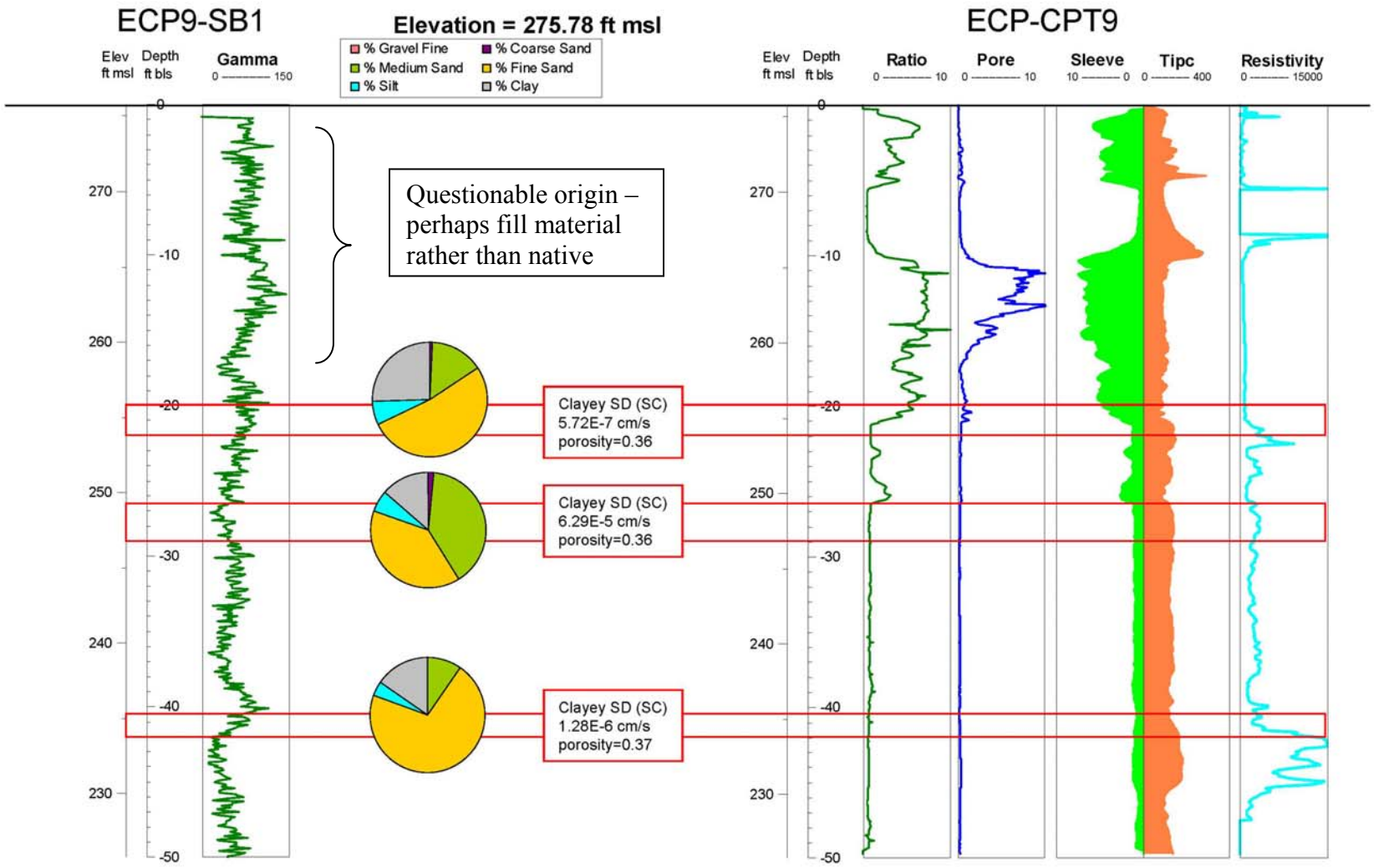


Figure 8. Characterization Data at ECP9

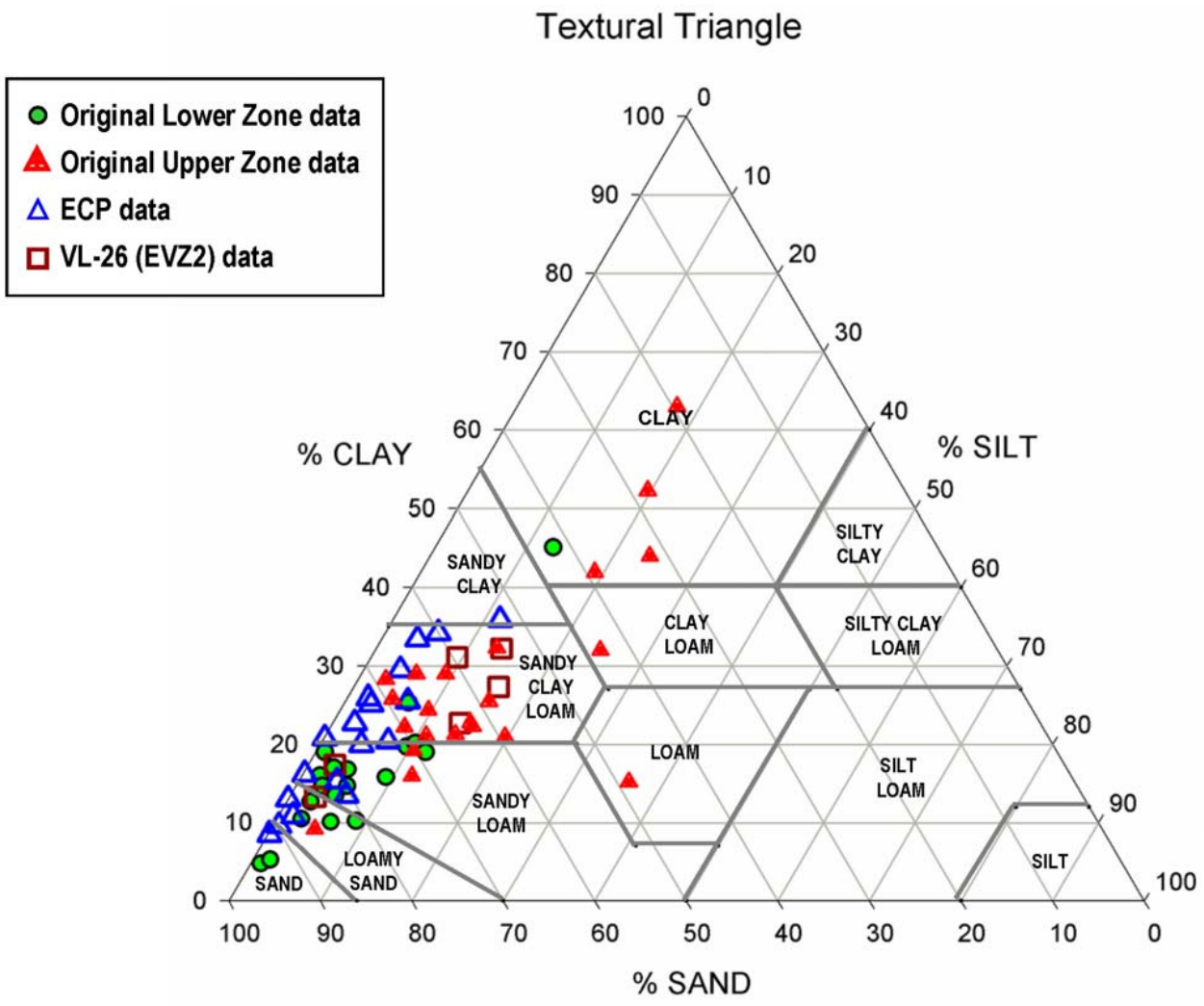


Figure 9. Textural Triangle for Upper Zone, Lower Zone and ECP Sediments

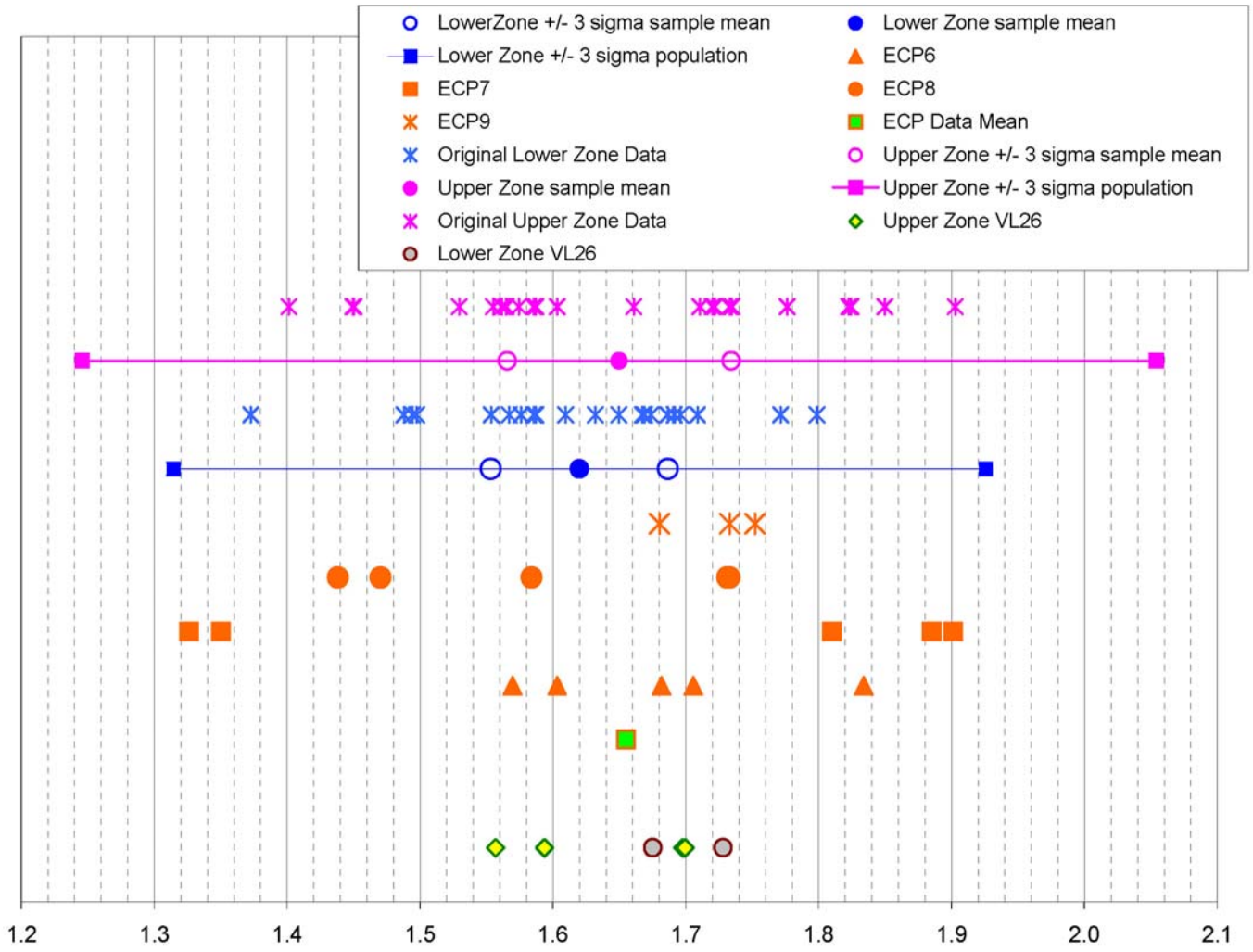


Figure 10. Dry Bulk Density (g/cm^3) for Upper Zone, Lower Zone and ECP Sediments

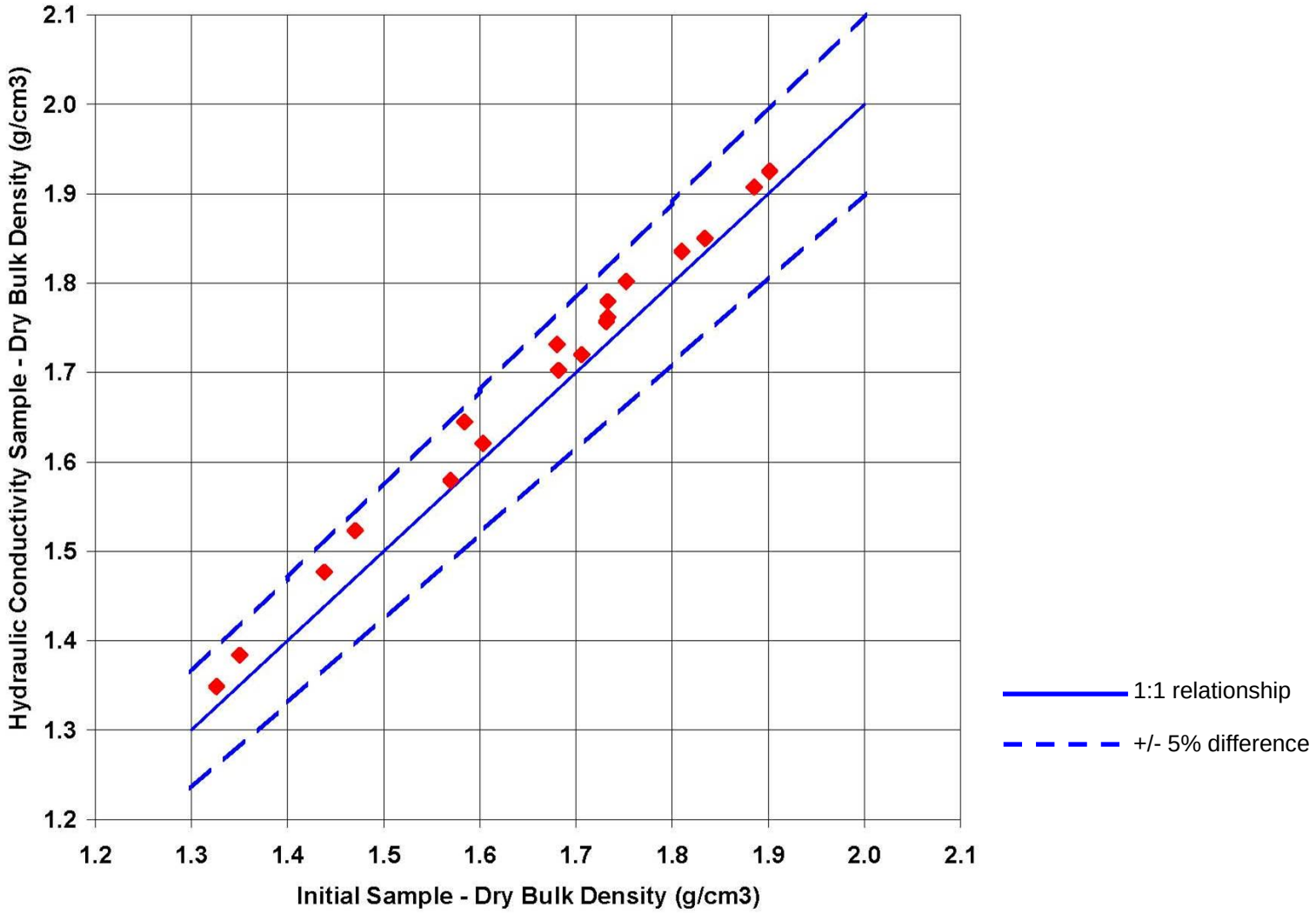


Figure 11. Initial Sample Bulk Density vs Bulk Density of Hydraulic Conductivity Samples

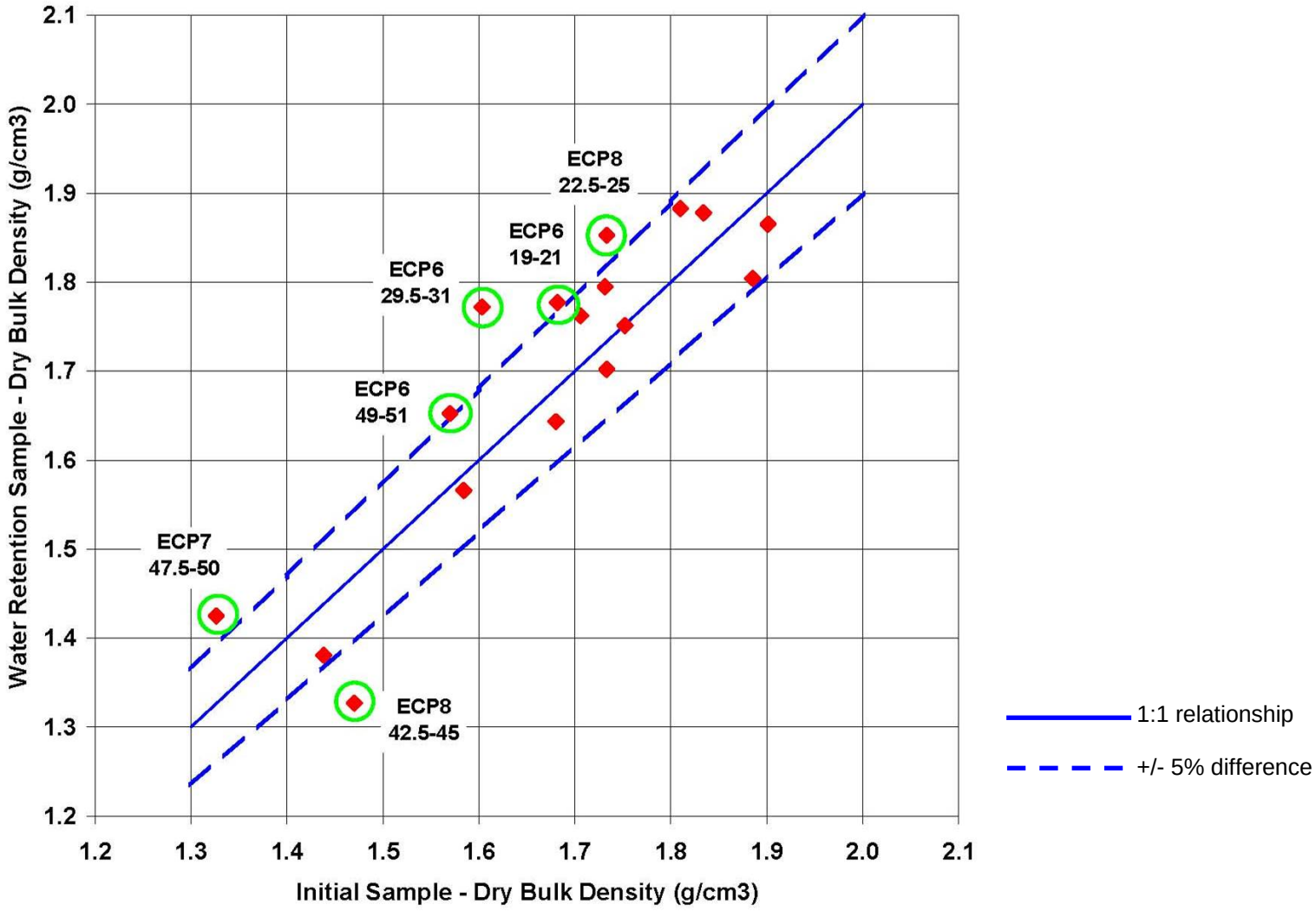


Figure 12. Initial Sample Bulk Density vs Bulk Density of Water Retention Samples

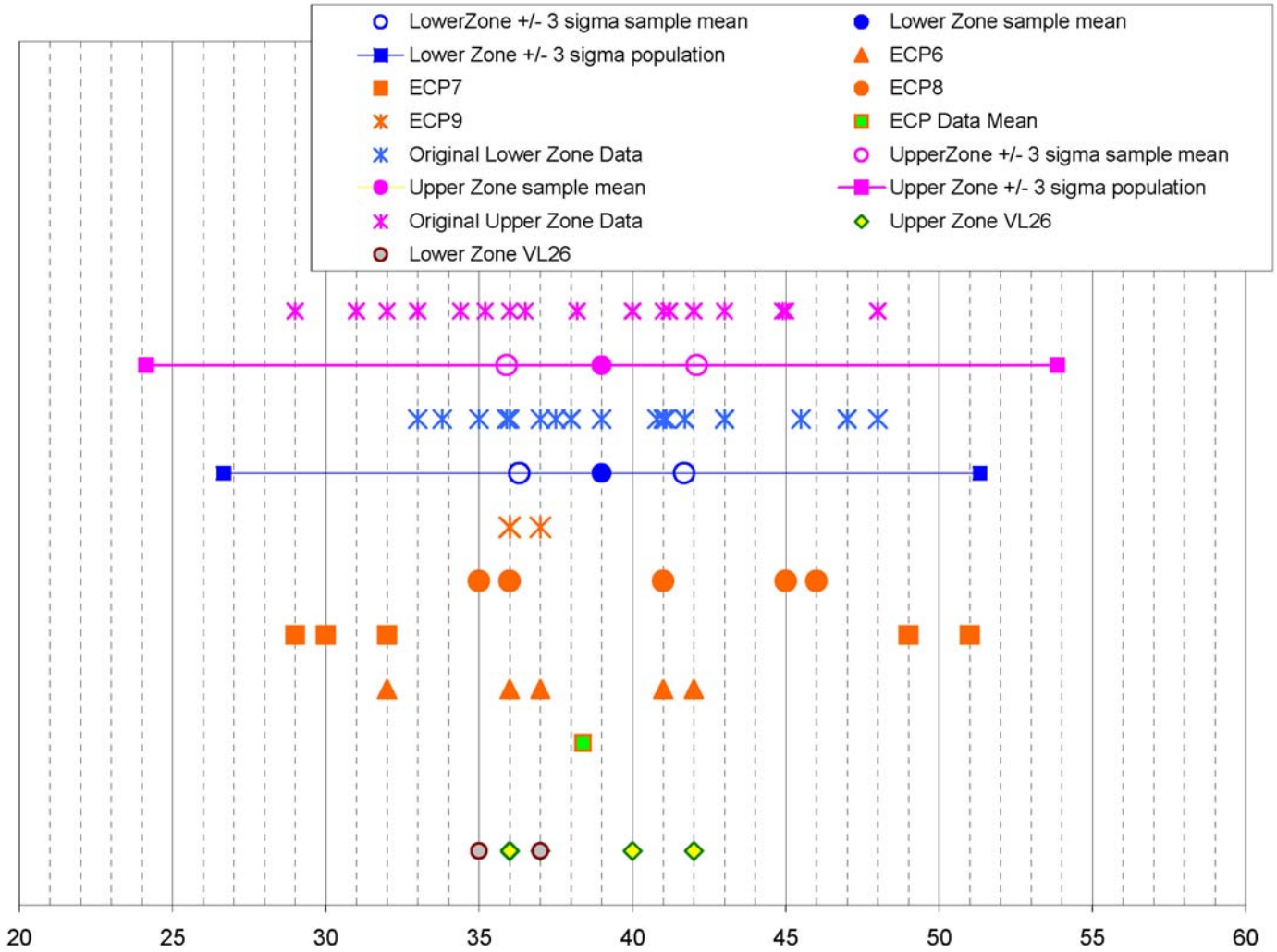


Figure 13. Porosity (%) for Upper Zone, Lower Zone and ECP Sediments

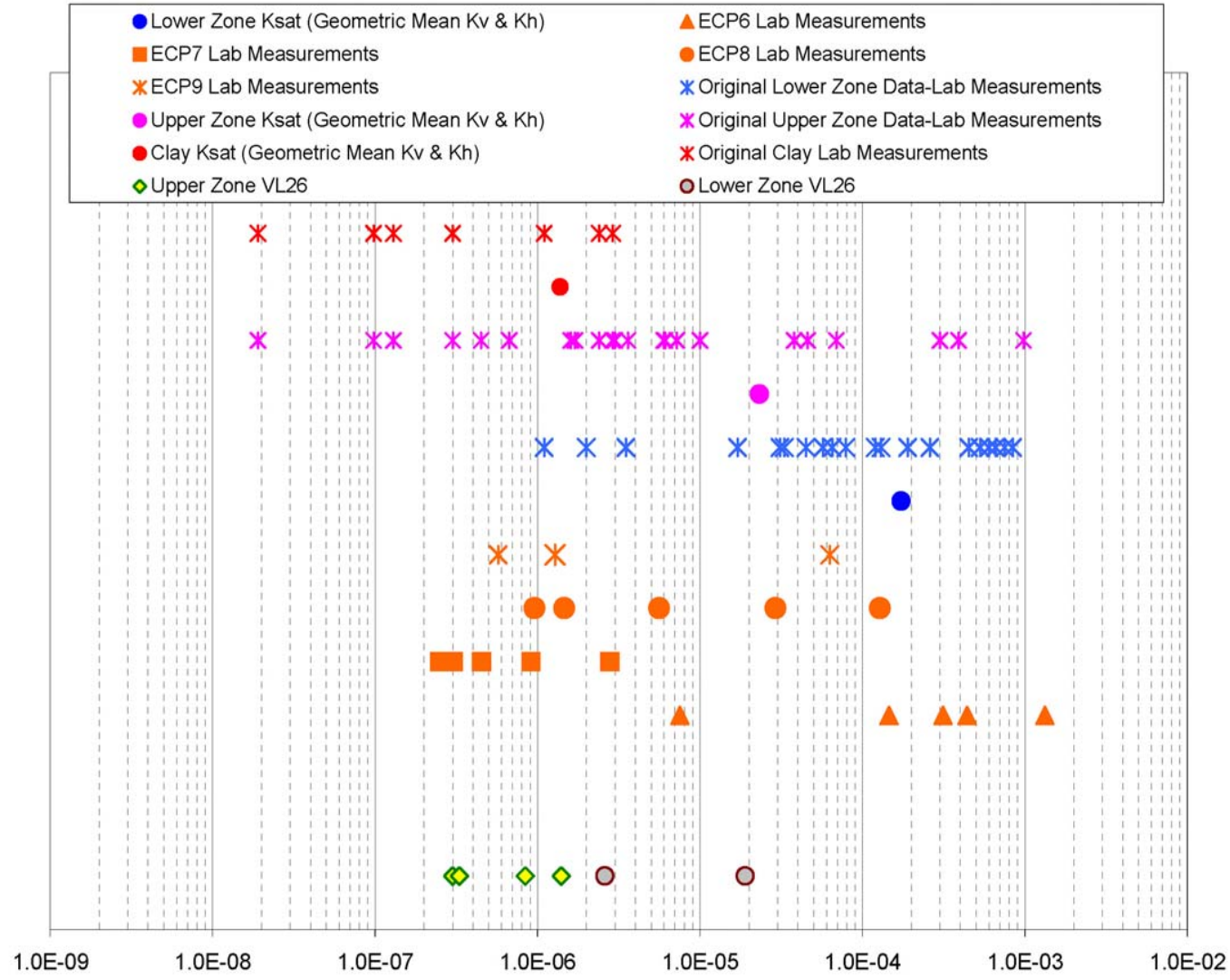


Figure 14. Hydraulic Conductivity (cm/s) for Upper Zone, Lower Zone and ECP Sediments

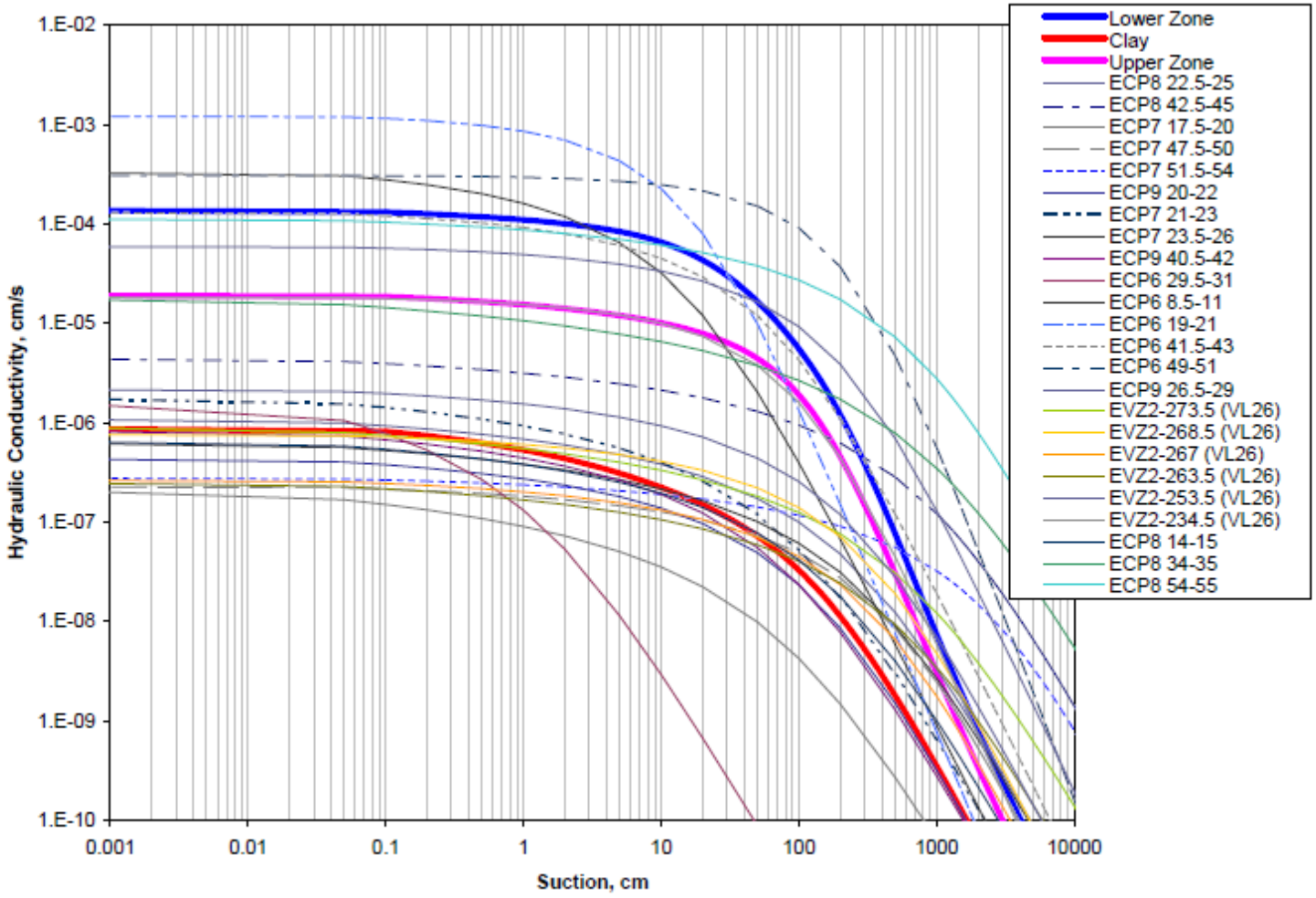


Figure 15. Hydraulic Conductivity Function (K) Versus Suction for the Upper Zone, Lower Zone, Clay and ECP Sediments

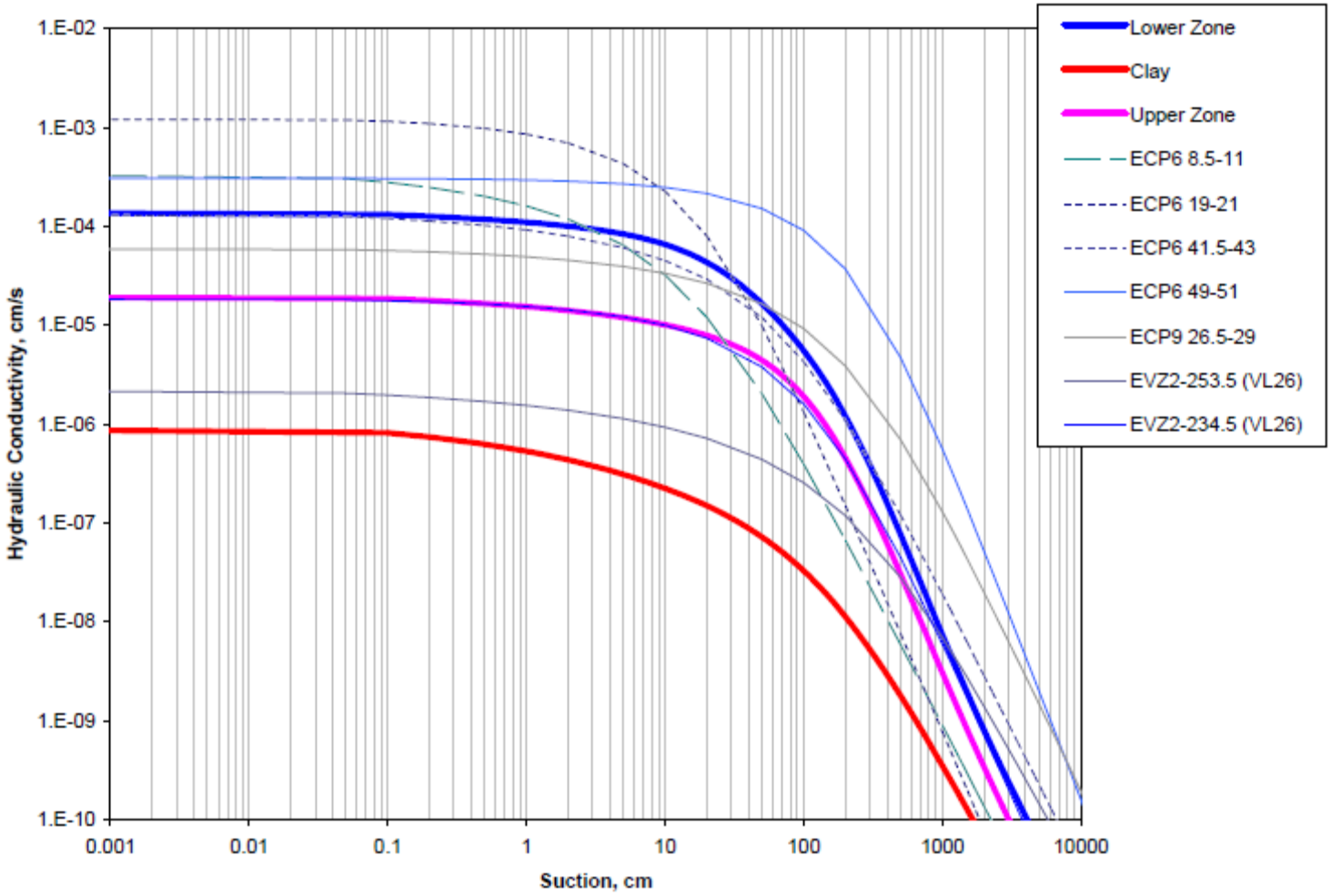


Figure 16. Hydraulic Conductivity Function (K) Versus Suction for ECP Sediments Categorized as Lower Zone

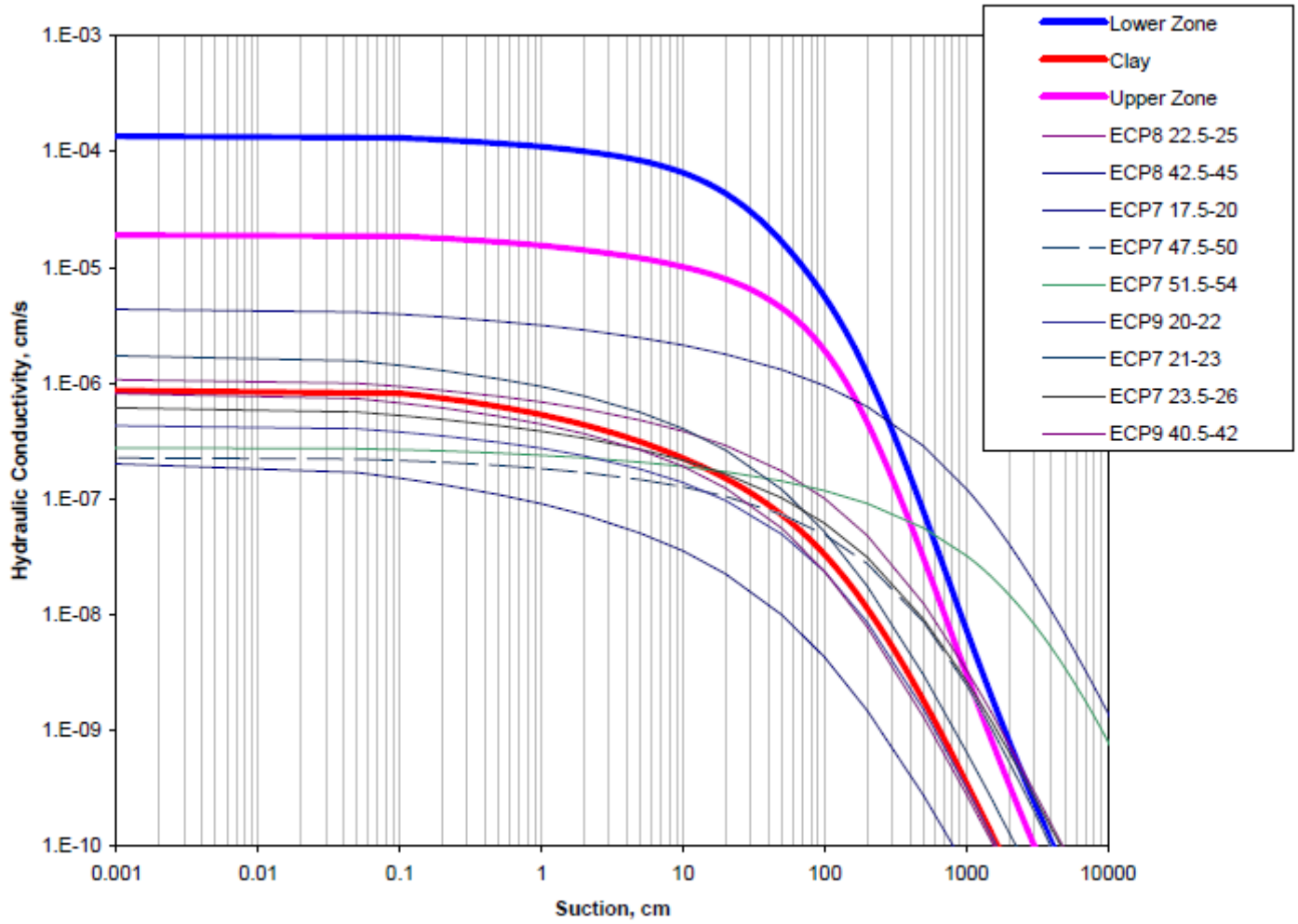


Figure 17. Hydraulic Conductivity Function (K) Versus Suction for ECP Sediments Categorized as Clay

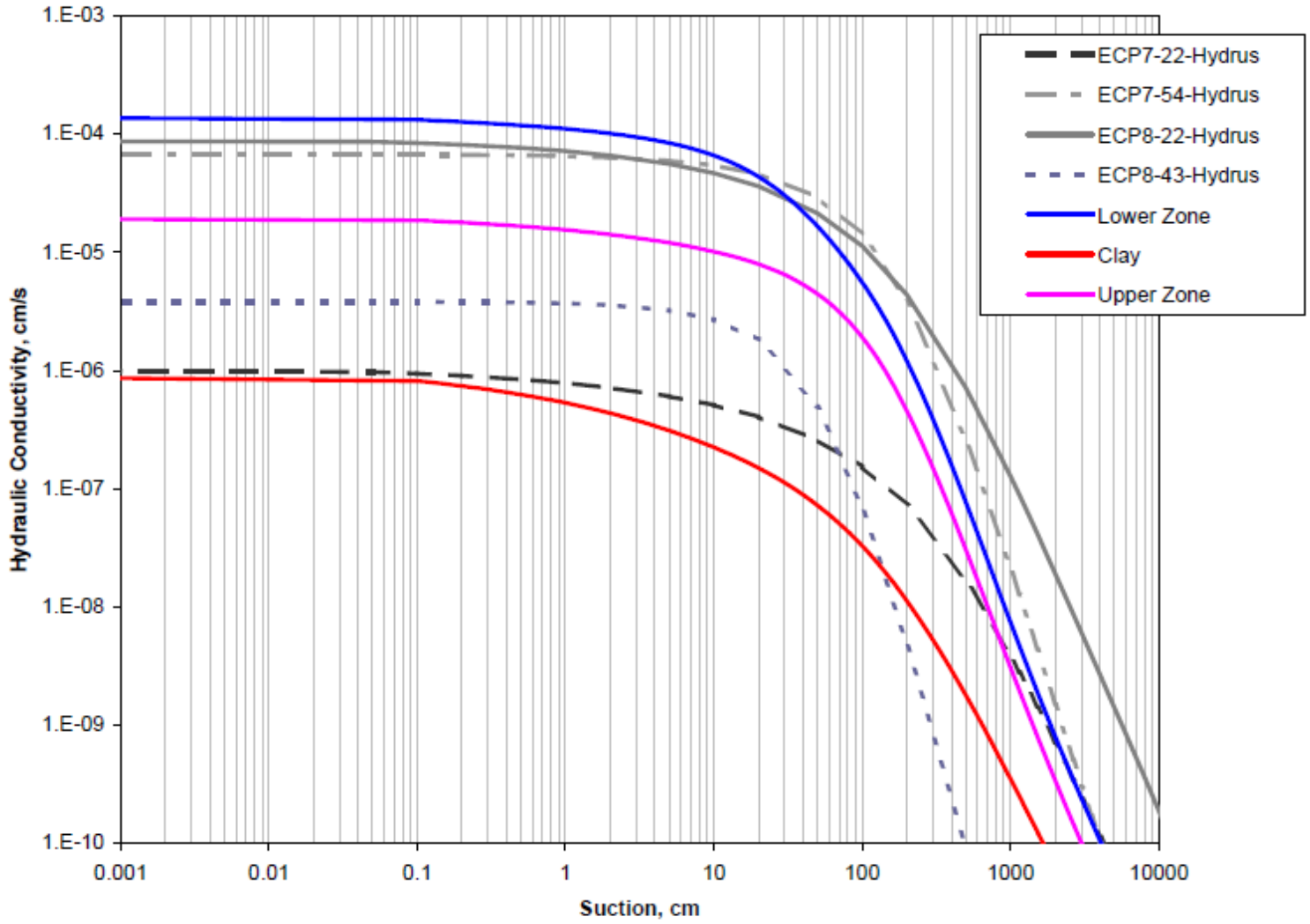
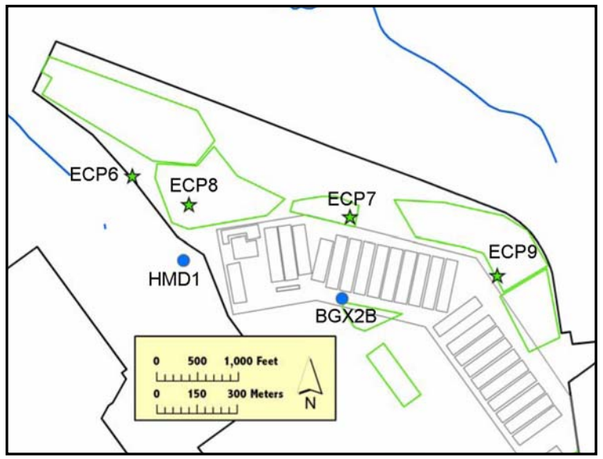


Figure 18. Hydraulic Conductivity Function (K) Versus Suction for the Outflow Extraction Test Samples



Notes: Orange zone = Tan Clay Confining Zone; blue shaded zones and sections reflect carbonate-siliciclastic mixes; grey zone = Green Clay/Gordon Confining Unit; pink stars = approximate depths of Shelby tube samples; blue line and triangle = approximate water table at the time of the ECP characterization work.

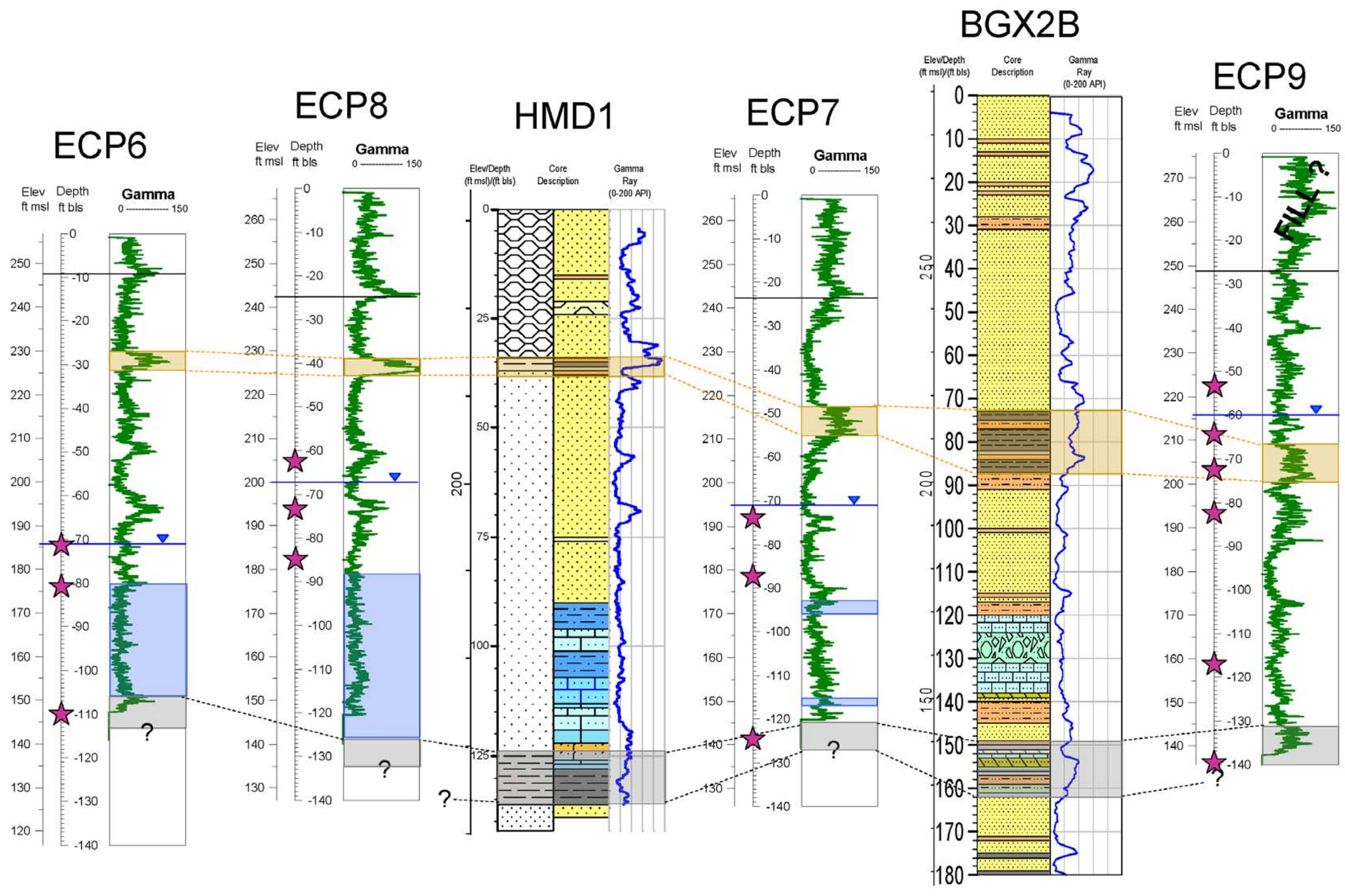


Figure 19. Correlation Panel for ECP Borings and GSA PORFLOW Model Borings

Figure 20. Core Photos of the TCCZ

Figure 21. Core Photos of the Mixed Carbonate-Siliciclastic Zone (ECP6 and ECP8)

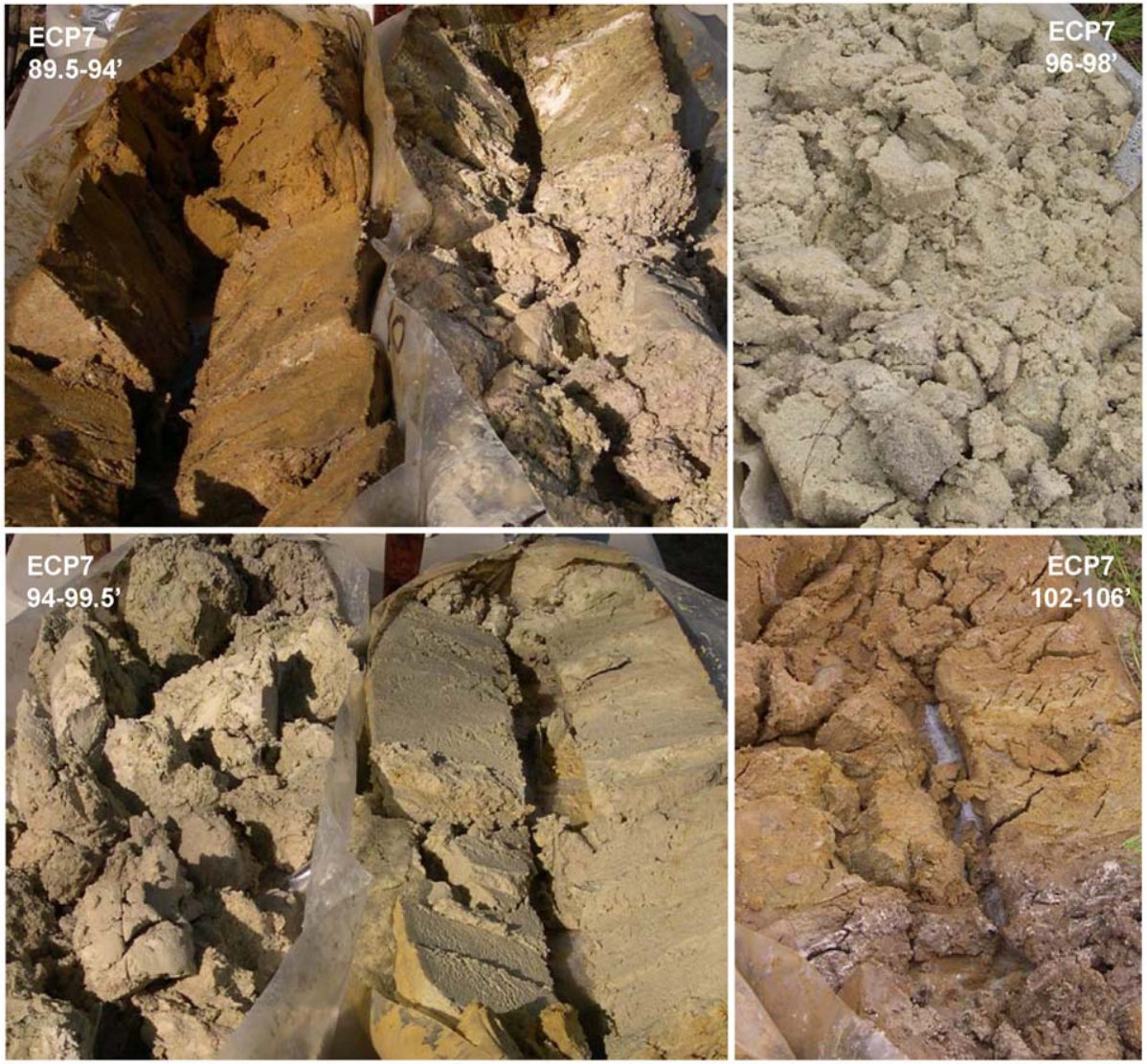


Figure 22. Core Photos of the Mixed Carbonate-Siliciclastic Zone (ECP7 and ECP9)

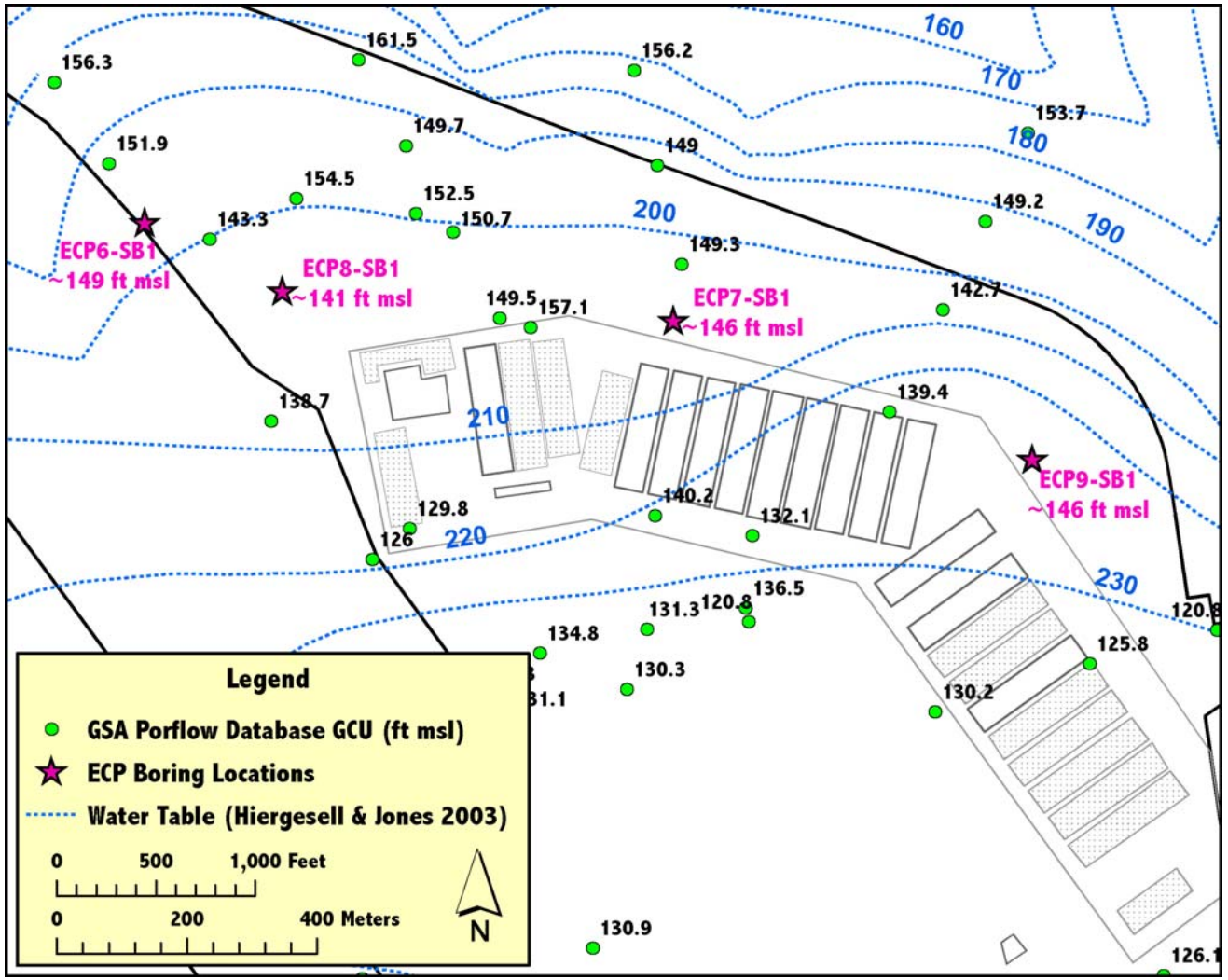


Figure 23. GCU Picks: ECP Locations and GSA Porflow Database

Figure 24. Core Photos of the GCU

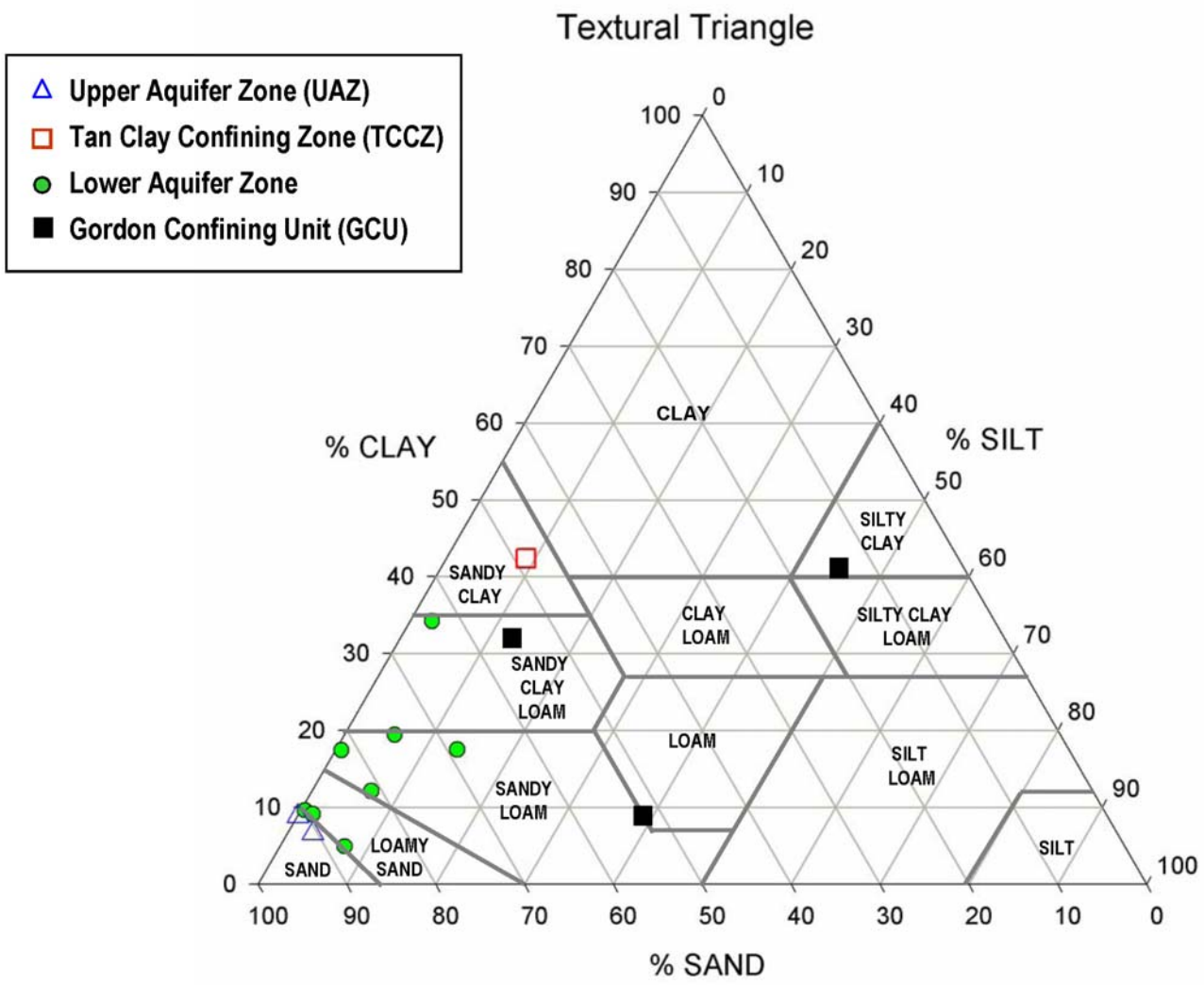


Figure 25. Textural Triangle for ECP Saturated Zone Sediments

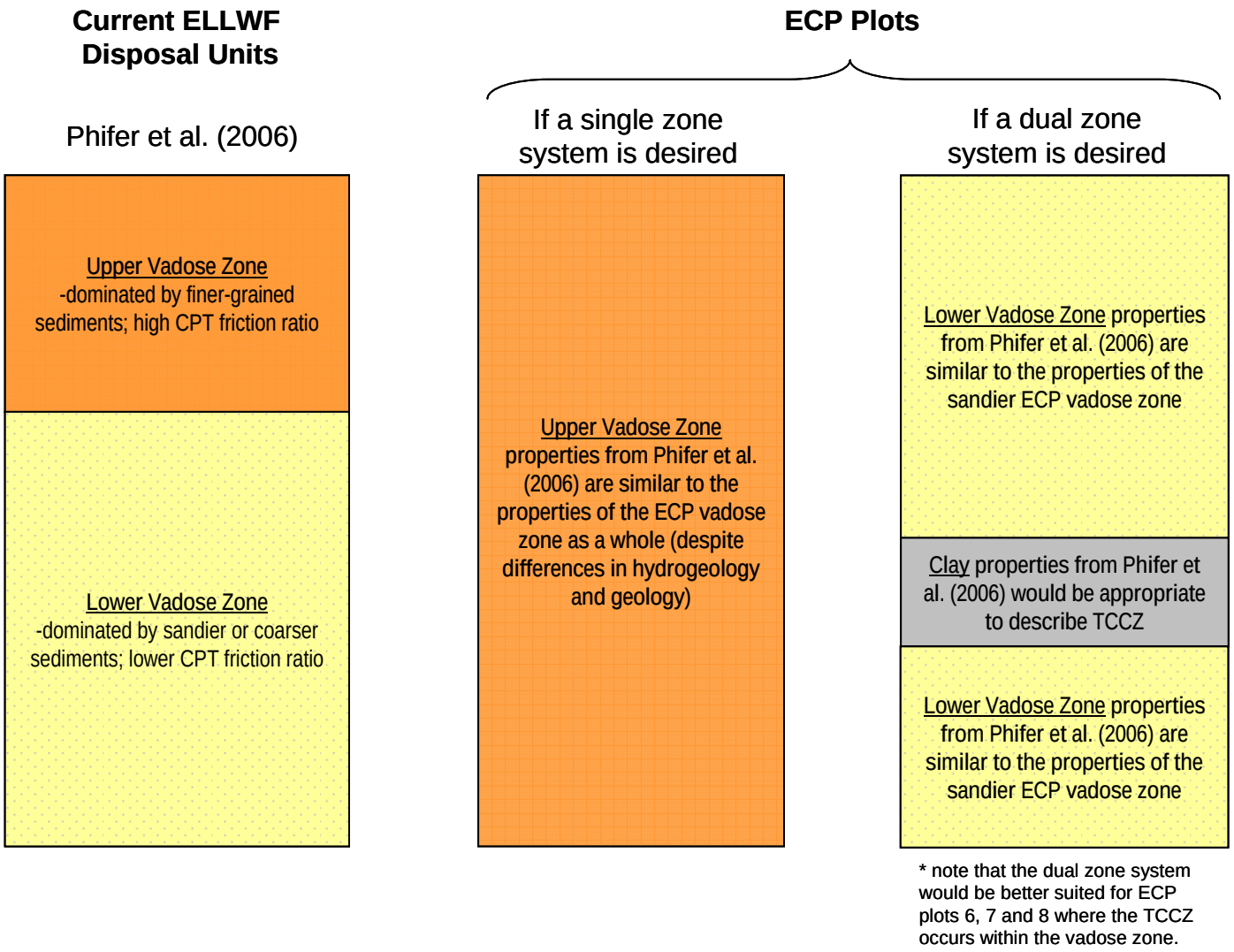


Figure 26. Recommendations for Vadose Zone Properties for Current ELLWF (Phifer et al. 2006) and the ECP Plots

Table 1. Geotechnical Data Summary

ID	Depth (ft bls)	Elevation (ft msl)	Mineralogy	Moisture Content[1] (%)	Organic Matter[1] (%)	Water Retention[2] Initial Moisture (% by Vol.)	Applied Pressure (bars) 0.1	0.5	1	5	10	15	Description (USCS)[3]	Hydraulic Conductivity[4] (cm/sec)
							Retained Water (% by volume)							
ECP6-SB1	8.5-11	248.3-245.8		12.7	0.7	27.1	18.3	13	10.9	7.9	7.1	6.6	Brown Clayey Sand (SC)	4.41E-04
	19-21	237.8-235.8		13.2	0.5	19	20	11.7	10.1	7.4	6.9	6.3	Yellowish Brown Poorly Graded Sand with Clay (SP-SC)	1.33E-03
	29.5-31	227.3-225.3		14.1	0.7	21.2	26.1	22	20.5	16.5	15	14.4	Yellowish Brown Sand (top 5 in) Brown and Purple Clayey Sand (SC) (bottom 13 in)*	7.53E-06
	41.5-43	215.3-213.8		17.3	1.1	34.6	29.5	21.6	17.2	10.6	9.1	8.4	Yellowish Brown Clayey Sand (top 7 in) Yellowish Brown Poorly Graded Sand with Clay (SP-SC) (middle 10 in)* Yellow Poorly Graded Sand (bottom 10 in)	1.46E-04
	49-51	207.8-205.8		23	1.1	32.6	31.3	23.1	18.3	11.5	9.6	9.3	Yellow Silty Sand (SC)	3.14E-04
	70.5-73	186.3-183.8		22.6	0.2	44.3	37.2	13.5	9.3	5.4	4.6	4.3	Yellow Silty Sand (SM)	1.12E-04
	80.5-83	176.3-173.8		41.2	1	59.6	58.7	55.6	51.8	33	27.1	24.1	Tan Clayey Sand (SC)	1.31E-07
	109-111	147.8-145.8		43.3	4.1	42	44.8	41.8	39.2	31.4	29.2	27.3	Gray Poorly Sorted Sand (top 4 in) Light Gray Gravel with Sand (middle 9 in) Dark Gray Elastic Silt (MH) (bottom 8 in)*	2.64E-08
ECP7-SB1	17.5-20	258.5-256.0		15.4	0.9	29.5	27.2	24.9	23.5	19.8	17.8	16.8	Reddish Brown Clayey Sand (SM)	4.52E-07
	21-23	255.0-253.0		13.2	0.6	34.7	30.2	27.5	25.3	19.2	16.7	15.4	Tan Clayey Sand (top 4 in) Red Clayey Sand (SC) (bottom 20 in)	2.79E-06
	23.5-26	252.5-250.0		15	1	34.9	32.6	30.9	29.2	24.1	20.8	19.3	Reddish Brown Clayey Sand (SC)	9.11E-07
	47.5-50	228.5-226.0		27.4	1.1	44.3	45.3	40.7	36.3	24.2	20.4	19	Yellow Sand with Clay (top 10 in) Yellow Clayey Sand (SC) (bottom 17 in)*	2.50E-07
	51.4-54	224.6-222.0	quartz kaolinite illite goethite anatase	32.4	1.8	64	68	65.6	63.4	55.1	48.7	44.6	Yellow Sand (top 12 in) Yellow Clayey Sand (SC) (bottom 13 in)	3.03E-07
	73.5-76	202.5-200.0	quartz kaolinite illite goethite anatase	21.2	0.2	34.2	30.7	22.5	16.8	10.7	8.7	8.2	Yellowish Tan Poorly Graded Sand with Silt (SP-SM)	1.50E-06
	86.5-89	189.5-187.0	quartz fluorapatite rectorite calcite	27.1	0.8	43.2	44.6	42.1	40.6	31.5	27.1	24.5	Tan Clayey Sand (SC)	2.75E-06
	123.5-126	152.5-150.0	quartz kaolinite brushite goethite	23.4	0.4	39.3	39.2	37.3	35.3	24.7	21	18.6	Dark Gray Clayey Sand (SC)	2.39E-07

NOTES:

* Geotechnical analysis performed on this section of the sample.

1 - ASTM D2974-07a
2 - ASTM D3152-72 (2000)
3 - MACTEC Technical Procedure TP-06
4 - ASTM D5084-03 (Method C)
5 - US COE EM1110-2-1906
6 - ASTM D422 (2007)
7 - ASTM D4318 (05)

Source: MACTEC 2009. "Test Report - ECP Geological Characterization Subcontract No. AC54317N, Delivery Order No. 8 MACTEC Project No. 6155-08-0031.08." December 11, 2009. Atlanta, GA

vadose zone
capillary fringe
saturated zone

Table 1 (continued). Geotechnical Data Summary

ID	Depth (ft bls)	Elevation (ft msl)	Mineralogy	Moisture Content[1] (%)	Organic Matter[1] (%)	Water Retention[2] Initial Moisture (% by Vol.)	Applied Pressure (bars) 0.1	0.5	1	5	10	15	Description (USCS)[3]	Hydraulic Conductivity[4] (cm/sec)
							Retained Water (% by volume)							
ECP8-SB1	14-15	253.2-252.2		14.7	0.8	33.2	30.8	28.4	26	19.9	17.9	17	Brown Clayey Sand (top 9 in) wet Brown Clayey Sand (SC) (bottom 8 in)*	9.59E-07
	22.5-25	244.7-242.2	quartz kaolinite illite goethite anatase	17.5	0.6	31.7	31	28.5	25.7	19.9	17.7	16.7	Brown Clayey Sand (SC)	1.46E-06
	34-35	233.2-232.2		23.5	1.5	39.8	41.3	40.4	38.9	34.3	32.2	31.2	Brown Sand with Clay (wet) (top 4 in) Brown Clayey Sand (SC) (bottom 8 in)*	2.92E-05
	42.5-45	224.7-222.2	quartz kaolinite illite goethite anatase	30.9	0.9	51.8	53.1	51.7	49.5	40.6	36.4	35.1	Yellowish Brown Clayey Sand (SC) (top 13 in)* Tan Clayey Sand (bottom 14 in)	5.61E-06
	54-55	213.2-212.2	quartz kaolinite illite goethite anatase	34.1	3	46.7	47.1	45.1	42.4	32	28.3	25.8	Brownish Tan Clayey Sand (SC) (top 6 in)* Brown Sand with Clay (bottom 4 in)	1.28E-04
	61.5-63	205.7-204.2	quartz kaolinite illite goethite anatase	20.1	0.4	35.3	31.4	22.5	17.8	10.9	8.8	8.3	Brown Poorly Graded Sand with Silt (SP-SM)	1.56E-04
	72.5-75	194.7-192.2		23.1	1	38.2	39	37	34.8	25.7	21.9	20.6	Yellow Clayey Sand (SC)	1.85E-05
	83.5-85	183.7-182.2	quartz kaolinite illite	30.7	0.5	41.9	40.8	37	30.3	18.4	15.1	13.9	Yellow Clayey Sand (SC)	7.62E-06
ECP9-SB1	20-22	255.8-253.8	quartz kaolinite illite	16.8	0.9	29.4	36.2	33.1	31.6	27.1	25.8	25.3	Brown Clayey Sand (SC)	5.72E-07
	26.5-29	249.3-246.8		11.4	1.9	28.1	28.1	22.9	19.8	14.7	12.6	11.1	Yellowish Brown Clayey Sand (SC)	6.29E-05
	40.5-42	235.3-233.8		15.8	0.2	29.5	28	23.1	21.1	16.7	14.4	13.2	Reddish Brown Clayey Sand (SC)	1.28E-06
	51.5-53.5	224.3-222.3		17.2	0.6	29	29	18.4	15.8	11.1	9.3	8.1	Brown Poorly Graded Sand with Silt (SP-SM)	3.54E-04
	61.5-64	214.3-211.8		19.1	0.3	32.8	26.2	17.1	13.3	7.9	6	5.4	Tan Poorly Graded Sand with Clay (SP-SC)	3.76E-04
	70.5-73	205.3-202.8		36.6	1.9	55	57.8	56.3	55.3	49.7	44.9	41.4	Tan Sandy Elastic Silt with Sand Layers (MH)	4.93E-08
	80.5-83	195.3-192.8		38.1	1.1	47.8	43.9	35.8	31.7	21.6	18.7	16.6	Tan Silty Sand (SM)	8.88E-07
	115.5-118	160.3-157.8		25.3	0.5	42.9	40.3	30	22.8	14.3	12.8	11.5	Tan Silty Sand (SM)	1.26E-05
	140.5-143	135.3-132.8		31.6	0.9	47.7	47	45.3	42.3	26.3	22.1	20.3	Yellowish Brown Clayey Sand (SC)	5.09E-07

NOTES:

* Geotechnical analysis performed on this section of the sample.

1 - ASTM D2974-07a
2 - ASTM D3152-72 (2000)
3 - MACTEC Technical Procedure TP-06
4 - ASTM D5084-03 (Method C)
5 - US COE EM1110-2-1906
6 - ASTM D422 (2007)
7 - ASTM D4318 (05)

Source: MACTEC 2009. "Test Report - ECP Geological Characterization Subcontract No. AC54317N, Delivery Order No. 8 MACTEC Project No. 6155-08-0031.08." December 11, 2009. Atlanta, GA

vadose zone
capillary fringe
saturated zone

Table 1 (continued). Geotechnical Data Summary

ID	Depth (ft bls)	Elevation (ft msl)	Wet Density (pcf)	Dry Density (pcf)	Specific Gravity	Porosity[5]	Particle Size Distribution[6]											Atterberg Limits[7]		
							Sieve Analysis								Hydrometer					
							% Cobbles	% Gravel Coarse	% Gravel Fine	% Coarse Sand	% Medium Sand	% Fine Sand	% Silt	% Clay	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Natural Moisture Content (%)	Liquid Limit	Plasticity Index
ECP6-SB1	8.5-11	248.3-245.8	129.2	114.5	2.68	0.32	--	--	--	2.6	45.8	39.3	--	13.0	12.4	27	19	12.4	27	8
	19-21	237.8-235.8	119.8	105	2.69	0.37	--	--	1.3	5.1	55.3	29.7	0.2	8.4	12.8	30	18	12.8	30	12
	29.5-31	227.3-225.3	112.8	100.1	2.71	0.41	--	--	--	2.1	32.3	41.1	4.5	20.0	13.8	49	22	13.8	49	27
	41.5-43	215.3-213.8	125.8	106.5	2.68	0.36	--	--	--	0.3	36.2	53.2	0.7	9.6	17.1	29	20	17.1	29	9
	49-51	207.8-205.8	122.2	98	2.69	0.42	--	--	--	0.1	3.2	84.2	1.6	10.9	22.8	NV	NP	22.8	No Value (NV)	Nonplastic (NP)
	70.5-73	186.3-183.8	118.6	96.5	2.69	0.42	--	--	--	0.2	5.2	82.4	7.3	4.9	22.6	NV	NP	22.6	NV	NP
	80.5-83	176.3-173.8	108	75.5	2.67	0.55	--	--	0.2	0.6	2.3	67.6	6.1	23.2	41.0	58	25	41.0	58	33
	109-111	147.8-145.8	112.7	83.9	2.62	0.49	--	--	--	0.3	2.5	11.3	44.8	41.1	44.7	97	44	44.7	97	53
ECP7-SB1	17.5-20	258.5-256.0	131.1	113	2.68	0.32	--	--	3.1	1.5	25.0	46.1	2.3	22.0	14.6	37	17	14.6	37	20
	21-23	255.0-253.0	133.6	117.7	2.68	0.3	--	--	--	1.8	26.3	43.7	2.3	25.9	24.2	43	20	24.2	43	23
	23.5-26	252.5-250.0	135	118.7	2.68	0.29	--	--	--	1.7	24.2	46.0	3.0	25.1	15.7	40	17	15.7	40	23
	47.5-50	228.5-226.0	109.2	82.8	2.69	0.51	--	--	--	1.3	31.0	40.1	7.2	20.4	24.5	70	26	24.5	70	44
	51.4-54	224.6-222.0	111.6	84.3	2.63	0.49	--	--	0.2	1.0	23.7	41.7	4.0	29.4	31.9	78	35	31.9	78	43
	73.5-76	202.5-200.0	119.7	96.4	2.66	0.42	--	--	--	3.7	22.2	64.0	0.5	9.6	22.4	37	25	22.4	37	12
	86.5-89	189.5-187.0	120.4	94.9	2.64	0.42	--	--	--	0.5	9.0	65.4	5.7	19.4	25.0	58	21	25.0	58	37
	123.5-126	152.5-150.0	120.9	95.1	2.66	0.43	--	--	2.9	2.7	6.4	41.6	37.8	8.6	23.4	47	23	23.4	47	24

NOTES:

* Geotechnical analysis performed on this section of the sample.

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7 - ASTM D4318 (05)

Source: MACTEC 2009. "Test Report - ECP Geological Characterization Subcontract No. AC54317N, Delivery Order No. 8 MACTEC Project No. 6155-08-0031.08." December 11, 2009. Atlanta, GA

vadose zone
capillary fringe
saturated zone

Table 1 (continued). Geotechnical Data Summary

ID	Depth (ft bls)	Elevation (ft msl)	Wet Density (pcf)	Dry Density (pcf)	Specific Gravity	Porosity[5]	Particle Size Distribution[6]											Atterberg Limits[7]		
							Sieve Analysis								Hydrometer					
							% Cobbles	% Gravel Coarse	% Gravel Fine	% Coarse Sand	% Medium Sand	% Fine Sand	% Silt	% Clay	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Natural Moisture Content (%)	Liquid Limit	Plasticity Index
ECP8-SB1	14-15	253.2-252.2	129.1	108.1	2.71	0.36	--	--	--	--	19.7	59.4	0.1	20.8	13.8	30	17	13.8	30	13
	22.5-25	244.7-242.2	128.9	108.2	2.68	0.35	--	--	--	0.5	26.1	57.0	0.2	16.2	17.8	29	21	17.8	29	8
	34-35	233.2-232.2	121.7	98.9	2.7	0.41	--	--	--	1.4	15.9	35.1	11.7	35.9	25.2	54	25	25.2	54	29
	42.5-45	224.7-222.2	118.1	91.8	2.66	0.45	--	--	--	1.9	31.6	29.2	3.9	33.4	30.7	90	35	30.7	90	55
	54-55	213.2-212.2	116.3	89.8	2.65	0.46	--	--	--	1.6	9.5	48.9	5.8	34.2	31.8	59	25	31.8	59	34
	61.5-63	205.7-204.2	119	98	2.67	0.41	--	--	--	1.0	20.3	68.0	1.6	9.1	19.5	NV	NP	19.5	NV	NP
	72.5-75	194.7-192.2	120.2	96.2	2.69	0.43	--	--	--	0.5	7.4	74.0	0.7	17.4	22.9	38	22	22.9	38	16
	83.5-85	183.7-182.2	121.2	92.7	2.69	0.45	--	--	--	0.1	2.9	65.8	13.7	17.5	31.5	40	24	31.5	40	16
ECP9-SB1	20-22	255.8-253.8	127.9	108.2	2.71	0.36	--	--	--	0.7	15.2	51.8	6.8	25.5	17.3	47	21	17.3	47	26
	26.5-29	249.3-246.8	122.9	109.4	2.72	0.36	--	--	--	1.6	39.6	39.2	6.1	13.5	11.2	45	23	11.2	45	22
	40.5-42	235.3-233.8	119.9	104.9	2.68	0.37	--	--	--	0.1	9.7	70.7	4.2	15.3	15.5	33	20	15.5	33	13
	51.5-53.5	224.3-222.3	119.2	101.4	2.68	0.39	--	--	--	0.1	26.4	64.6	0.1	8.8	17.1	NV	NP	17.1	NV	NP
	61.5-64	214.3-211.8	125	103.5	2.68	0.38	--	--	--	1.8	70.0	18.7	2.9	6.6	19.2	52	23	19.2	52	29
	70.5-73	205.3-202.8	116.6	89	2.7	0.47	--	--	--	2.3	23.5	22.8	9.0	42.4	40.0	98	50	40.0	98	48
	80.5-83	195.3-192.8	109.5	81	2.65	0.51	--	--	--	--	0.4	62.9	2.5	34.2	39.9	65	40	39.9	65	25
	115.5-118	160.3-157.8	118.2	91.5	2.69	0.46	--	--	--	0.5	5.8	74.9	6.7	12.1	24.1	36	26	26.5	36	10
	140.5-143	135.3-132.8	120.3	88.2	2.64	0.46	--	--	0.2	0.3	6.3	48.9	12.6	31.7	31.0	44	24	31.0	44	20

NOTES:

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vadose zone
capillary fringe
saturated zone

Table 2. Water Table and TCCZ Picks

Location	Ground Elevation (ft msl)	Approximate Water Table		Top TCCZ	
		Depth (ft bls)	Elevation (ft msl)	Depth (ft bls)	Elevation (ft msl)
ECP6-SB1	256.84	71	185.84	27	229.8
ECP7-SB1	265.89	61	204.89	48.5	217.4
ECP8-SB1	267.18	67	200.18	39	228.2
ECP9-SB1	275.78	60	215.78	66.5	209.3

Note: Water table identified between 66-76 ft bls for ECP6-SB1 and between 55-65 ft bls for ECP9-SB1 on the field logs.

Table 3. ECP Samples with Greater Than 20% Mud (Silt+Clay)

Location	Depth (ft bls)	Elevation (ft msl)	% Mud (Silt+Clay)	Comment - Fines Content
ECP8	14-15	253.2-252.2	20.9	described as sand with some clay on the field logs; a more clay-rich section than the sediments above and below
ECP7	17.5-20	258.5-256.0	24.3	collected in zone with higher gamma log response
ECP6	29.5-31	227.3-225.3	24.5	collected near/within TCCZ
ECP7	47.5-50	228.5-226.0	27.6	collected near/within TCCZ
ECP7	23.5-26	252.5-250.0	28.1	collected in zone with higher gamma log response
ECP7	21-23	255.0-253.0	28.2	collected in zone with higher gamma log response
ECP9	20-22	255.8-253.8	32.3	collected near zone with higher gamma and friction ratio log response
ECP7	51.4-54	224.6-222.0	33.4	collected near/within TCCZ
ECP8	42.5-45	224.7-222.2	37.3	collected near/within TCCZ
ECP8	54-55	213.2-212.2	40	described as predominantly a fine to medium sand; dark grey, clay-rich layer at 52’
ECP8	34-35	233.2-232.2	47.6	described as predominantly a fine to medium sand with minor amounts of clay (26-38’)

Table 4. Van Genuchten Parameters Determined from Moisture Retention Data using RETC

Sample	θ_s	θ_r	α	n	m	r^2
ECP6 8.5-11	0.27141	0.02814	0.04081	1.29052	0.22512	1.000
ECP6 19-21	0.37000	0.05370	0.03991	1.52300	0.34340	0.999
ECP6 29.5-31	0.40998	0.00000	0.39354	1.11933	0.10661	0.999
ECP6 41.5-43	0.34453	0.01270	0.00870	1.32338	0.24436	0.999
ECP6 49-51	0.32634	0.07266	0.00321	1.65596	0.39612	1.000
ECP7 17.5-20	0.29209	0.00000	0.00628	1.11699	0.10474	0.995
ECP7 21-23	0.33916	0.00000	0.00605	1.16831	0.14406	0.988
ECP7 23.5-26	0.34077	0.00000	0.00180	1.16526	0.14182	0.990
ECP7 47.5-50	0.45869	0.00000	0.00143	1.29259	0.22636	0.996
ECP7 51.5-54	0.66126	0.00000	0.00025	1.26502	0.20950	0.982
ECP8 14-15	0.32527	0.00000	0.00308	1.17147	0.14637	0.997
ECP8 22.5-25	0.31766	0.00000	0.00224	1.18460	0.15583	0.999
ECP8 34-35	0.40837	0.00000	0.00057	1.12481	0.11096	0.981
ECP8 42.5-45	0.52845	0.00000	0.00061	1.18779	0.15810	0.992
ECP8 54-55	0.47256	0.00000	0.00080	1.24032	0.19376	0.998
ECP9 20-22	0.35942	0.15558	0.00457	1.21816	0.17909	0.999
ECP9 26.5-29	0.28572	0.06349	0.00309	1.37612	0.27332	0.996
ECP9 40.5-42	0.29662	0.00000	0.00634	1.17268	0.14725	0.998
EVZ2 273.5-272 (VL26)	0.38550	0.00000	0.00081	1.13842	0.12159	0.996
EVZ2 268.5-267 (VL26)	0.40040	0.00000	0.00189	1.30151	0.23166	1.000
EVZ2 267-265.5 (VL26)	0.40563	0.00000	0.00175	1.26921	0.21211	0.991
EVZ2 263.5-262 (VL26)	0.45170	0.00000	0.00094	1.17850	0.15146	0.998
EVZ2 253.5-252 (VL26)	0.38626	0.00000	0.00241	1.24454	0.19649	0.999
EVZ2 234.5-233 (VL26)	0.35209	0.07010	0.00603	1.45984	0.31499	0.998

θ_r is residual moisture content (cm^3/cm^3), θ_s is the saturated moisture content (cm^3/cm^3), h is pressure head, α is a constant related to the inverse of the air-entry pressure (1/cm), n is a measure of the pore-size distribution and $m = 1 - 1/n$.

Table 5. GCU Picks

Location	Ground Elevation (ft msl)	Depth to GCU (ft)	Elevation GCU (ft msl)
ECP6-SB1	256.84	108	148.8
ECP7-SB1	265.89	120	145.9
ECP8-SB1	267.18	126	141.2
ECP9-SB1	275.78	130	145.8

Table 6. Summary of Saturated Hydraulic Conductivity (cm/s)

Geologic Unit	Hydrogeologic Unit	Regional Data (Christensen and Gordon 1983)	Laboratory Data (D'Appoloni a 1981)	Slug Test Data (Parizek and Root 1986)	Small-scale Pump Test Data (Parizek and Root 1986)	Model Determined from Field Data (INTERA 1985)	Laboratory Data (Dennehy et al. 1989)	Model Determined (Jaegge et al. 1987)	Approximate Global Average from GSA PORFLOW Model	ECP Data
Upland Unit		--	--	--		--	1.2E-3	--	--	--
Barnwell Group	Upper Aquifer Zone (UAZ)	3.E-5 to 3.E-3	1.2E-4 (sand) 8.2E-7 (clay)	7.6E-4 (median) 3.2E-5 to 5.1E-3 (range; n=17)	2.0E-4 (median) 8.1E-5 to 8.4E-4 (range; n=8)	--	1.2E-4	2.3E-4 to 1.3E-3	3.5E-3	3.5E-4 3.8E-4
Tan Clay (in Barnwell)	Tan Clay Confining Zone (TCCZ)	--	1.4E-6 cm/s			--	--	2.5E-7 to 6.0E-7	2.1E-6	4.9E-8
McBean Formation (Santee Formation)	Lower Aquifer Zone (LAZ)	3.E-5 to 3.E-3	--	3.4E-4 (median) 3.3E-4 to 5.6E-3 (range; n=23)	2.4E-4 (median) 1.6E-5 to 2.0E-3 (range; n=17)	3.E-6 to 3.E-2 cm/s	--	1.4E-3	4.6E-3	8.9E-7 1.3E-5 1.6E-4 1.8E-5 7.6E-6 2.7E-6 1.5E-6 1.1E-4 1.3E-7
Green Clay (Warley Hill Formation)	Gordon Confining Unit (GCU)	--	--	--		3.E-8 to 3.E-6 cm/s	--	3.0E-8 to 7.8E-8	3.5E-9	5.1E-7 3.0E-7 2.6E-8

Notes: green = ECP6; red = ECP7; blue = ECP8; black = ECP9.

Attachment A: Field Geologic Logs

OSR 30-27# (2-12-97)

NEP-2D
26.04 VWT

Field Geologic Log

Project: E AREA COMPLETION PROJECT ECP		Date: 6 AUG 09	Sheet: 1 of 6
Well Number: ECP6-SB1	Location: E Area	Drilling Subcontractor: BOART LONGYEAR	
Logs Prepared By: M. Atkinson / L. Bagwell		Driller: Overcash	
Company: SRNL		Drilling Method: RotoSonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	0			Soil with roots	
	1				
	2			Fill crusher run	
	3			medium sand 7.5YR 5/6	
Run 1	4			medium sand 5YR 5/8	
	5				
	6				
	7				
	8			medium sand with clay Not cohesive clay ~10%. Quartz gravel. 5YR 5/8	Shelby Tube B-11
	9			medium to coarse sand No clay. Contact with blue rock. 7.5YR 6/6	
Run 2	10			clayey medium sand, 15% clay. Somewhat cohesive 5YR 5/8	
	1				
	2				
	3				
	4			same as above with less clay, more orange, less red medium sand, stiff clay 5YR 5/8	
	5				
	6			Medium sand with red clay in balls Otherwise very clean 7.5YR 6/8	
	7			clayey medium sand. Somewhat cohesive. Clay 20% redder than above 5YR 5/8	
	8			fine sand and some silt. <5% clay, yellower than above 10YR 6/8	Shelby Tube 18-21
Run 3	9			clean medium and fine sand. wet. very little clay. 10YR 6/6	
	20				

OSR 30-27# (2-12-97)

Field Geologic Log

Project		Date	Sheet
E Area Completion Project ECP		6 Aug 09	2 of 6
Well Number	**Location**	**Drilling Subcontractor**	
ECPG-SB1	E Area	Boart Longyear	
Logs Prepared By		**Driller**	
M Atkinson / L. Bagwell		Overcash	
Company		**Drilling Method**	
SRNL		Robosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	2 0				
	1			Same as above but more clay. 5-10% clay 7.5YR 6/8	
	2			medium and coarse sand, some small round pebbles. Clay color 2.5YR 4/8	
Run 3	3			clean fine sand no clay 7.5YR 7/8	
	4				
	5				
	6			fine and medium sand, no clay. Very clean. 7.5YR 6/8	
	7			fine and medium sand, no clay. Some laminations of sands. 10YR 7/8	
	8				Shelby 28-31 Tan clay
Run 4	9			clayey fine sand and silt. Cohesive. Finer downward, more clay content at bottom. 5YR 4/4. Veins of purple (10R 4/4) slightly cemented sand and clay.	
	3 0				
	1				
	2			Red fine to coarse sandy clay, moderately cohesive. 10R 4/6. Some pebbles	
	3			Poorly sorted medium to coarse sand and no clay. Some pebbles. 2.5YR 5/6	
	4				
	5			clean well-sorted fine and medium sands no clay. 7.5YR 6/8. Banded with evidence of iron-rich minerals. Typical Brwidin sand	
	6				
	7				
	8			Some carbonaceous material	
Run 5	9			finer-grained layers. 10% clay. laminated concretions.	
	4 0			very wet, evidence of perched water table	

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E Area Completion Project	6 Aug 09	3 of 6
Well Number ECPG-SB1	**Location** E Area	**Drilling Subcontractor** Boart Longyear
Logs Prepared By M. Atkinson / L. Bagwell		**Driller** Overcash
Company SRNL		**Drilling Method** Robosonic

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run5	4.0				
				clayey silty fine sand not cohesive. 5YR 5/6	
	1			clayey silt and fine sand. Not cohesive 5YR 5/6	
	2			Fine and medium sand with less clay than above.	
	3			~~Color~~ color grades from 5YR 5/4 (top) to 7.5YR 6/8 (bottom)	
	4				
	5				
	6				
	7				
	8				
Run6	9				
	5 0			coarsening upward sequence. Clean, mod, well-sorted fine and medium sand in upper foot. 7.5YR 6/8	
				Silt + fine sand 50'-51'; not cohesive, 10% clay	
	1			20% clay mix of fine sand and silt	Shelby tube on log 48-51
	2			Silty sandy clay. Pebbles common (small) white clay	
	3			Sand (Kaolinite) that is cohesive. Some carbonaceous material	
				clean medium sand. No clay. 7.5YR 6/4	
	4				
	5			clean medium sand <5% clay. 7.5YR 7/8	
	6				
				2 cm thick layer of carbon material + white Kaolinite clay	
	7				
	8				
Run7	9			medium to coarse sand fining upward. Some small pebbles at bottom. Some clay <10%, not cohesive	
	6 0				
		61'			

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
F Area Completion Project	6 Aug 09	4 of 6
Well Number	**Location**	**Drilling Subcontractor**
ECPG-SB1	F Area	Boart Longyear
Logs Prepared By	**Driller**	
M. Atkinson / L. Bagwell	Overcash	
Company	**Drilling Method**	
SRNL	Rotosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	6 0			↓ 5'-6' on preceding page	Shelby Tube 60-63
Run 7	1				
	2	△		clayey silty fine and medium sand. Scattered black carbon material, perhaps ash. Finer upward. 7.5YR 6/8	
	3			clayey fine and medium sand. Mottled Munsell with white Kaolinite clay and dark carbon material and possibly heavy minerals. Charcoal ash at 62'. 7.5YR 6/8	
	4				
	5				
	6			higher clay content than above silty fine sandy clay. Mildly cohesive to cohesive. Clay ≈ 35% 7.5YR 6/8	
	7				
	8			At 67½, distinct carbon ash layer mixed in with sand and clay medium to coarse sand. Clay < 10%. Clasts of carbon ash material. Some 5mm thick clay drapes of Kaolinite. Parting 3 inch layer of silty sandy clay.	
	9			Grades from 7.5YR 8/2 (top) to 7.5YR 4/6 (bottom)	
Run 8	7 0			↓ ↓	Shelby Tube 70-73
	1			70.5-76 wet silty fine sand & clay not cohesive (less than 10-15%); clasts of carbon material (presumably ash) some clay drapes 7.5YR 6/6	
	2			(Significant more silty-clay rich zone at 71.5'	
	3			↓ ↓	
	4				
	5			bottom inch of 70.5-76 — very clean silt & fine sand 2.5Y 8/2	
	6			76-77 more clay than above; clayey silt & fine sand; not cohesive; 5YR 5/4 laminated (original sedimentary structure present - big ripple or dewatering)	
	7			77-78 silty fine sand & clay; moderately cohesive 10YR 6/6 possible heavy minerals or carbon rich grains	
	8			78-78½ 10YR 7/8 v. fine sand & silt little clay (<10%) not cohesive	
	9			78½-79 fine sand & little clay (<10%) not cohesive 10YR 8/2 ranges to 10YR 7/4	
	8 0			79-80 dense clayey silt & fine sand heavy min or carbon grains 5Y 7/3	* collected box (thin section) ~79½

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Field Geologic Log

Project: E Area Completion Project		Date: 6 Aug 09	Sheet: 5 of 6
Well Number: ECP6-SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: Atkinson / Bagwell		Driller: Overcash	
Company: SRNL		Drilling Method: Rotosonic	

Fm Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run 9	80			80-95' abrupt transition to stiff clayey fine carbonate & clastic sands some cohesive clay (<20% clay) weak rx w/ HCl 5Y 8/3 section contains significant carbonate gravels, moderate rx w/ HCl in mid section (~86), hard crystalline carbonate gravels	Shelby Tube 80-83
	88			88' more crumbly slightly pinkish (4" thick)	
	89			~89' a lot more nodules (silicified carbonate nodule); in places less rx (more cherty nodules); found turretella & pelecypod	
	90			same description down to 95'	
Run 10	96			96-97 micritic limestone; highly rx	
	97			97-98 Sandy silty clay sticky/cohesive clay w/ med-fine sand. some carbonate content, some molds of cemented sands. weak to moderate rx 2.5Y 8/2	
	98			98-101 silty fine sandy clay. very cohesive; weak rx w/ HCl; some gravel sized limestone; 2.5Y 7/2; oyster shells	
	100				

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Field Geologic Log

Project: E Area Completion Project		Date: 6 Aug 09	Sheet: 6 of 6
Well Number: ECP6-SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M. Atkinson / L. Bagwell / M. Millings		Driller: Overcash	
Company: SRNL		Drilling Method: Rotosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	100			101 - 102'12 same as above	
	1				
	2				
	3			102'12 - 103 silty clay w/ interbeds of limestone gravel pieces 2.5Y 7/2	
	4			103 - 104'12 coarse grained silty sand w/ some gravel & minor amounts of shell hash; weak rx	104'12 top of Pole Bluff ???
Rw 12	5		104'12	to 106 clayey fine sand & silt; some cohesiveness shell hash; poorly sorted	
	6			weak to moderate HCl rxn 2.5YR 7/2	
9 9	7				
	8			Abrupt contact with Warley Hill Fm. Shell hash. Some carbonate content in clay. Clay & shells react w/ 1% HCl Fine and medium sandy clay. May be more silt and sand than clay. Not cohesive. Some carbonaceous content. Some layers have little clay. Some eroded pebbles.	
	110				Shelby Tube 110-113
	1				FAIL - collected
Rw 12				Laminated dry dense clay. No silt. 5Y 4/1 Silt fraction increases downward	
	2				
	3				
	4			Somewhat wet. Clayey fine sandy silt 5Y 5/1	
	5				
	6			Laminated dry dense clay. No Silt. 5Y 4/1	
	7			Sticky cohesive silty sandy clay. 5Y 4/1	
	TD 8			TD Silified silty clay stone. 5Y 4/1	
	9				
	120				

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Field Geologic Log

elev 265.89

Project		Date	Sheet
E-Area Completion Project		13 Aug. 2009	1 of 7
Well Number	**Location**	**Drilling Subcontractor**	
ECP 7 - SB1	E-Area	Board Longyear	
Logs Prepared By		**Driller**	
M MILLINGS / L BAGWELL		Travis Overcash	
Company		**Drilling Method**	
SRNL		rotosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	0			FILL / MOVED EARTH MED. SAND	
	1			silt & sand & soil	
	2	FILL			
	3				
Run 1	4				
	5			6-7 probably also fill, but cleaner, med. sand 7.5YR 8/2	
	6			7-14 upper part possibly moved/reworked	
	7				
	8			hard dense silty fine sandy clay w/ pebbles & cobbles 2.5YR 4/8	UPLAND UNIT
Run 2	9				
	10				
	1				
	2				
	3			similar 14-17 ~~same~~ as above (texture) but more sand 2.5YR 5/8 clayey med sand	
	4				
	5			at 16' qtz pebbles & white sand	
	6				
	17			17-20 more clay rich; clays in layers some pebbles. beginning of mottling & start of interbeds of sand 7.5YR 6/8	
Run 3	8				
	9				
	20				

OSR 30-27# (2-12-97)

Field Geologic Log

Project		Date	Sheet
E-Area Completion Project		13 August 2009	2 of 7
Well Number	**Location**	**Drilling Subcontractor**	
ECP7-SB1	E Area	Boart Longyear	
Logs Prepared By		**Driller**	
M Millings / L Bagwell		Travis Overcash	
Company		**Drilling Method**	
SRNL		rotosonic	

Fm Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	20			same as above	
	1				
Rw 3	2				
	3				
	4			24-27 clayey med Sand (clay <5%)	
	5			some zones w/ more clay & fine silt	
	6			5YR 5/6	
	7			27-31 clayey med sand (clay <5%)	
	8			some zones w/ more clay & fine silt	
	9			toward bottom coarsens (so fining upward)	
Rw 4	30			bottom coarse sand has higher clay fraction (~10% clay)	
	1		31-32.5	5YR 5/6	
	2			31-33' fining upward (continuation of	
	3			27-31 coarse sand at top w/ 10% fines	
	4			to pure sugar sand w/ no clay at 33'	
	5			gradational color change 5YR 5/6 top	
	6			to 7.5YR 6/6 at bottom!; some dark grey	
	7			at 33' (clay?)	
	8			at 32.5 coarse sand w/ 10% clay that is	
Rw 5	9			medium to dark clay (or possibly some	
	40			carbon material) 7.5YR 5/4	
				34-46 mostly clean coarse sugar sand	
				(<5% to zero clay/fines) ranges in color	
				7.5YR 6/8 at top to 10YR 7/4 at bottom	
				at 35' layer of silt & fine sand — enough clay that turned into little brick — clay enough to feel it - talc-like	
				at 37' layer of red clay mixed w/ coarse sand	

Field Geologic Log

Project: E-Area Completion Project		Date: 13 Aug. 2009	Sheet: 3 of 7
Well Number: ECP7-SB1	Location: E-Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Travis Overcash	
Company: SRNL		Drilling Method: rotosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	40			continuation of above	
	1			41-43 clean fine to med sand (clay < 5%) some silt 10YR 7/6	
	2				
Run 5	3			44-47 med sand; some clay; somewhat cohesive (10-15% clay) more clay in zones/laminated	
	4			color variable 5YR 5/8 at top to 7.5YR 6/6 in middle & bottom	
	5				
	6				
	7			47-50.5 coarsening upward sequence - coarse clean angular sand grades at top less than 5% clay at top 7.5YR 6/6	
	8			grading downward clay content inc. downward grain size decreases downward; color 7.5YR 5/6	
Run 6	9			toward bottom ~ 10-15% clay in middle;	
	50		50.5	fine sand, silt, clay at bottom (equal amts) wet some dark carbon material; some small pebbles	
	1			50.5-52 interbedded pure clay & med. fine sand; pure clay (zero silt); clay occurs in layers up to 5" thick; mixed into clay is organic matter (woody debris & carbon ash but some silt in it); pure other color: 10YR 7/6 clay is finely laminated/fissile; somewhat moist mixed in w/ some layers are also pebbles	Upper Clay of Tan Clay
	2				
	3				
	4				
	5			52-53 subequal portions of clay, silt & fine sand; entire appearance is mottled → light grey to white.	
	6			clay may be gray and is sticky/cohesive; some carbon material in layers; can see fine sedimentary structures (either heavy mins, clays or charcoal ash) laminae	
	7			53-54 thick layers of pure clay; some individual layers up to 2" thick; no silt	laminae: TAN CLAY 10YR 6/8 (MORE)
Run 7	8				
	9		54-55	grades back into previous unit; subequal portions of med fine sands & clays some pebbles, mottled carbon material	
	60			55-57 fining upward sequence - top almost pure clay w/ some silt (silty clay 5-10% silt) grades downward into interlayed sticky greyish clay; med & coarse sand in equal % at 57 med & fine sand w/ ~10% clay; charcoal & charcoal ash	

57-63 silty fine sand clays ; fining upward sequence
top 10YR 6/8 clay & silt & fine sand w/
carbon material in zones esp. at 57.5'
downward – less clay & more white clay filling
matrix
at 59' ~20% clay
at 63' into clean med to coarse sand w/ less
than 5% clay 10YR 7/6
63 – next page

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Field Geologic Log

Project: EnArea Completion Project		Date: 13 August 2009	Sheet: 4 of 7
Well Number: ECP7 SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Travis Overlash	
Company: SRNL		Drilling Method: rotosonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run 7	60			63-64.5 med & fine sand & clay (clay some more clay rich zones in layers up to 2" thick); prominent/abrupt contact w/ finely laminated silt/clay/carbon-ash at 64.5 (contact marks the top of fining upward sequence) & bottom is ?	15%) color 10YR 6/6
	1				
	2				
	3				(*) somewhere between 63 & 69' got significantly wetter - Pt Water Table?
	4				
	5			64.5-67 grades downward into med. sand, <10% clay & carbon ash at 67'	
	6		67-72	67-72 clean coarse sugar sand no clay 10YR 7/4	
	7				
Run 8	70				
	1				
	2			72-73 med sand & silt & clay; white sticky clay in some zones; pebbles; carbon material; ~~mostly~~ clay ~25% 10YR 7/6	
	3			73-74.5 fine sand & silt; not much clay <5% scattered carbon material; well sorted; no pebbles 10YR 7/8	
	4			74.5-77 poorly sorted; clay, med & coarse sand, small pebbles; scattered charcoal (not much) rounded	↓color grades to 10YR 6/4
	5				
	6			77-80 clean med & coarse sugar sand (clay <5% generally) but are clay-rich layers 10YR 7/6	
	7				
Run 9	8				
	9				
	80				

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Field Geologic Log

Project: E Area Completion Project		Date: 14 August 2009	Sheet 5 of 7
Well Number: ECP7 SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Travis Overcash	
Company: SRNL		Drilling Method: rotosonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run 9	80–87			finer at the bottom (fine is med sand)	
Run 10	87–97			88-89 silty fine sandy clay; very cohesive mostly clay; sand content inc toward bottom; charcoal & carbon ash scattered throughout 10YR 4/4 89-90.5 clayey fine sand & silt (clay ~ 15-20%) 10YR 5/6 90.5-92 silty fine sandy clay - subequal portions; scattered charcoal throughout; 8" layer of cleaner sand at bottom; sand is 10YR 6/8; clay is kaki grey 10.5YR 7/2 - mottled; clean sand at bottom 10YR 5/4 92-93 clayey med & coarse sand some small pebbles; layer of pure fine white clay & silt at 92' (~1/2" thick) pebbles not rounded 5Y 7/3	
			93-96	shell fragments & carbonate grains; mud does not appear to react w/ HCl; some SiO2 nodules (cherty); cherty clayey shell hash; clay very sticky & cohesive but whole section is crumbly & poorly sorted; mud is clay; some shell fragments rx some not; chert layer pieces; zones of nearly pure clay	into: Santee/Tinker? for sure
Run 11	97–100		96-100	96-100 fining upward sequence; top dry silt & fine sand; weak HCl rx.; occasional gravel or silicified nodules; significant chert layer at 97' (2" thick) or silicified zone; bottom (at 99.5) color is gradational to 2.5Y 7/6 ... (clay < 10%) - all clastic	

color 5Y 7/2

Field Geologic Log

Project: E Area Completion Project		Date: 14 Aug 2009	Sheet 6 of 7
Well Number: EZP7 SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Travis Overcash	
Company: SRNL		Drilling Method: Rotosonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	100			100-103 very fine sand & silt wet or some clay? - difficult to tell <15% clay; a few zones that are more clay rich w/ clay blebs/drapes/rip up clasts 2.5Y7/6	
	1				
	2			103 - 106.5 like above but more clay content including thicker more clay-rich lenses clay 15-20%	
	3				
	4			106.5 3" thick clean medium sand	
Run 11	5			106.5 - 107 dry crumbly silty clayey fine sand some silicified zones/areas; some small pebbles color mottled - mostly 2.5Y7/4	
	6	107-112.5		107 - 112.5 very fine sand & silt, crumbly clay content <10%; intervals of interlayers of fine sand & silts & thicker, dry, silty clays up to 1cm or 2cm thick; variable color 2.5Y 6/8 to 2.5Y 7/2	
	7				
	8				
	9				
Run 12	110				
	1				
	2		112-117	112-117 clay content much less grain size coarser; cleaner medium sand 10YR 5/8 oxidized color (orangish brown)	
	3			at 113 color change to dark grey to grey green 5Y 5/1 silicified nodule of silt and fine sand	
	4			~~clay content increases w/ depth~~ fine sand & silt w/ layers of clean sand (115' 2" layer clean sand) some color 5Y 5/1, some small pebbles	
	5				
	6				
	7		117-	at 117 layer of cleaner coarser sand w/ some small gravel & rx shell fragments	
Run 13	8		117-126	med sand w/ variable clay content <5% to layers of clay ~15% gravels or silicified sands; silicified shell fragments (no carbonate left) scattered throughout 5Y 5/1 interlayered = more sandy layers & less sandy layers	
	9				
	120				

118 - 120 section is more clay rich but w/ considerable silt & fine sand dry; some heavy mins or carbon material

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Field Geologic Log

Project: E-Area Completion Project		Date: 14 August 2009	Sheet: 7 of 7
Well Number: ELP7 SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Travis Overcash	
Company: SRNL		Drilling Method: rotosonic	

Fm Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	120			at 121.5 prominent silicified layer - gravel size silicified chunks - (large 2cm siltstone pieces) same to 126	
	1				
	2				
	3				
	4				
	5				
	6			126-127 silty dry friable clay 5Y 4/1 Still some fine & medium sand	
	7			bottom of core	
	8				
	9				
	130				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	0				

OSR 30-27# (2-12-97)

Field Geologic Log

Project: E AREA COMPLETION PROJECT		Date: 3 AUG 09	Sheet: 1 1 of 7
Well Number: ECP8-SB1	Location: E AREA	Drilling Subcontractor: BOART LONGYEAR	
Logs Prepared By: L.BAGWELL/M.MILLINGS/		Driller: OVERCASH	
Company: SRNL		Drilling Method: SONIC	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	0			0-2' Hand Augered	
	1				
	2			2-7' fine sand & coarse silt 7.5YR 5/8	
	3				
	4				
Run 1	5				
	6				
	7				
	8	upland TR sand		7-8' clayey silt ? fine sand w/ gravel (occasional) cohesive 7.5YR 5/8	at 8'-tentative contact btw/ upland & TR Sand
	9			8-9' WET, fine-med. Sands 10YR 6/6	+9'-2" thick grey-brown with some carbonaceous material
Run 2	+0			9-10' silty clay; stiff, dry 5YR 4/6	
	1			10-12' clayey silt 5YR 5/8	
	2			12'-13' clayey medium sand brick red 10R4/6	
	3			13-14' med. sand, some clay 7.5YR 5/6	
	4				
	5			14-18' clayey med. sand (clayier than above) brick red 10R 4/6	
	6				
	7				
	8				starting photos 18-20'
Run 3	9			18-19' clayey silt, very cohesive, interbeds of white clay 7.5YR 5/8	
	20			19-20' clayey silt, interbeds of white clay 10R 4/6	20-23' photo

Shelby tube 13'11" (6)

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E Area Completion Project	3 Aug 09	2 of 7
Well Number ECP8-SB1	**Location** E Area	**Drilling Subcontractor** Boart longyear
Logs Prepared By L Bagwell / M Millings		**Driller** Overcash
Company SRNL		**Drilling Method** Sonic

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	20			20-22' Clayey fine sd, fining upward to clayey silt 7.5 YR 5/8	
	1				
	2				
Run 3	3			22-25½' fine sand & clay, clayier at bottom somewhat cohesive 5YR 4/6	23-25 photo
	4				① 23-2
	5		a few pebbles		
	6			25½-26' clay (almost pure very little silt) laminated brick red & ochre colors brittle & somewhat cohesive; contains a few small pebbles	at ~26' contact with TR & Dry Branch
	7			26'-38' fine to med sand with some clay (~10% clay)	26-28 photo
	8			(at 27' thin layer charcoal - ash) grades from 10YR 6/4 at the top 2.5 YR 5/6 near bottom	28-32 photo
	9				
	30				
Run 4	1				② 30-32
	2				
	3				
	4				
	5				
	6				
	7				
	8			38-39.5' med to course sand w/ pebbles; clean little clay 7.5YR 6/6	See next page
Run 5	9			39.5' - clayey fine sand w/ some clay balls	
	40			40-40.5' clayey silt 5YR 5/0	

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Field Geologic Log

Project: E Area Completion Project		Date: 3 Aug 09	Sheet: 3 of 7
Well Number: ECP8-SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Overcash	
Company: SRNL		Drilling Method: Sonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	40			41-44 TCCZ upper	TCCZ — (*) near shelby tube (3)
	41			41-42½ pure ochre clay very little silt 10YR 6/6 cohesive	
				42½-43 silty clay (same color) very cohesive	
Run 5	42			43-44 sandy pebbly clay (same color) very cohesive	
	43				
	44			44-45½ clayey silty med. sand cohesive 7.5 YR 5/6	
	45			45½-46 fine to med sand w/ some 10YR 6/6 clay not cohesive (10% clay?)	
	46			46-48 fine to med. sand some carbonaceous (charcoal?) at 47' little clay not cohesive 10YR 6/6 -no photo for 46-48'	
	47				
	48			48-55' fine to med. sand w/ layer of dark grey (charcoal ash?) clayey at 52'; mostly very clean sand, VERY LOOSE SAND	
	49				
Run 6	50			10YR 6/6 at top	
	51			10YR 7/8 at bottom	
	52				
	53				
	54			no clay at bottom	$1-54. (4)
	55				
	56			55-58' fine sand minor clay light brown color 10YR 5/8	
	57				
	58				
	59			58-61' clean m-c sand no clay fining upward 10YR 8/4	
Run 7	60				

STOP FOR 3 Aug 2009

OSR 30-27# (2-12-97)

Field Geologic Log

Project: E Area Completion Project		Date: 4 Aug 2009	Sheet: 4 of 7
Well Number: ECP8-SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Overcash	
Company: SRNL		Drilling Method: Sonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	0			previous page has 60-61'	
	61			61-63 med. sand & clay not cohesive (5-10% clay?) 5YR 5/6	
	2			at 63½ pure stiff clay (6" thick) 7.5YR 6/8	
Run 7	3			rest of interval down to 65 mod. sand 7.5yr 5/8 6 inch clay has organic layer (1-2mm)	60½-63½ (5)
	4			lamina, perhaps charcoal, sub	
	5				
				clayey medium sand, somewhat cohesive. 2.5YR 4/6	
	6				
				medium sand, some clay (<10%), with few small pebbles 7.5YR 6/6	
	7				
	8			medium to coarse sand, 5-10% clay, 7.5YR 5/6	
	9				
	70				
Run 8	1			clay (laminated) with some fine to medium sand	71-74 (7)
	2			Sandy clay. Finer upward. 7.5YR 5/8	
				Target for shelby tube	
	3			more sand-rich, distinct from above 7.5YR 5/8	
	4				
				Coarsening upward. Medium sand at top (quartz and feldspathic)	
	5			Stringers of clay. Clay is cohesive. 10% clay at top	
	6			fining to 30-40% clay at bottom. 7.5YR 6/6.	
				Near bottom color grades to 7.5YR 5/4	
	7				
				medium sand, some clay, not cohesive (10% clay), quartz	
	8			sand with clay stringers & some altered feldspar grains. 7.5YR 6/6	
Run 9				very fine sand and silt, 10%-15% clay 10YR 6/8	
	9			Very clean medium to coarse quartz sand (no clay) 10YR 7/4	
	80			fine-grained clay silt: 10YR 6/8 <5% fine heavy minerals	

OSR 30-27# (2-12-97)

Field Geologic Log

Project: E Area Completion Project		Date: 4 Aug 2009	Sheet: 5 of 7
Well Number: ECP8-SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: Overcash	
Company: SRNL		Drilling Method: Sonic	

Fm Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	80			80-84' on previous page	
	1				
Rw 9	2				
	3			Interspersed Kaolin pockets	
	4				
	5			clean, fine-med sand, well-sorted, <10% clay 10YR 7/6	Shelby 85-88 (10)
	6			Organic matter at 85½ feet	
	7				
	8			87-88' fine sand & silt light red 2.5YR well sorted, little clay (<5% clay) 6/3	
	9	Tim's Branch		~88 — strong contact w/ upper sample, ???	upper sample ? carbonate sediments
Rw 10	90			88-89 med. size carbonate & qtz sands (more qtz than carbonate) weak reaction indurated & slightly cemented in places minor shell hash light pink-white 5YR 8/1	Tim's Branch member
	1			89-99' mixed qtz/detrital (clastic) fine sand & silt - weak reaction	
	2			some small pebbles - starting at 91' down to 99'	
	3			clays are moderately cohesive silicified in some places	
	4			light greenish grey 5Y 7/2 more clastic & fine sand at top of sequence & more carbonates toward bottom	
	5			at 95' 4" section has few to common iron stained pockets (pockets contain sands & clays that are bright orange in color)	
	6				
	7				picture taken of bright orange sands/clays
	8				
Rw 11	9				
	100				

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E Area Completion Project	8/4/09	6 of 7

Well Number	Location	Drilling Subcontractor
ECPB-SB1	E Area	Boart Longyear

Logs Prepared By	Driller
M Millings / L Bagwell	Overcash

Company	Drilling Method
SRNL	Sonic

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run 11	100 – 104			99-106' mixed carbonate & clastics fine sands - & silts, some heavy minerals 15% clay? - moderately cohesive, weakly to moderately reactive w/ HCl very clayey in sections - some stones are slightly cemented - gravels - not detrital } weak to Cherty Limestone } moderate - shell hash particularly 101 - 104'	collect sample for thin section
	104 – 107	TINS Branch		106-108' - clayey fine sand & silt some shell debris; very weak to absent reaction w/ HCl; silicified in places (probably not detrital cherts, but in place cherts) - they are round (cemented around shell?) 2.5Y 7/4 light greenish brown.	
Run 12	107 – 111	TINS Branch		108 - 110 clayey silts & fine sands mod cohesive; weak to absent HCl, a few gravels or silicified/cherty nodules; in places more clay rich & cohesive; a few Fe-oxides pockets near bottom (110') coarse sands; less shell hash in 108 - 110 than above. Same color as above	collected 109' *sample - rounded silicified sample
	111 – 113	Blue Bluff		110 - 111½' carbonate & clastic sands & silts clay is friable (dry & crumbly); more shell hash than above; weak to moderate reaction w/ HCl 2.5Y 6/4	
	113 – 116	Blue Bluff		111½ - 115' strong color change w/ last interval olive green to grey; clay w/ silt & fine sands significant shell hash & mod. reaction to HCl throughout. more indurated & probably silicified toward bottom 5Y 6/1	*collected sample at 116½
	116 – 117 (LM)	Blue Bluff		116 - 116½ = 6" zone - (silicified?) a lot of shell hash and highly reactive w/ HCl Shelly Limestone color same	
	117 – 118			116½ to 117½ clayey silty sand w/ some small granules; shell hash & strong rx w/ HCl. color same as above	
Run 13	118 – 120			117½ to 119 silty sandy clay w/ small granules; dry; strong reaction w/ HCl lighter in color - 5Y 7/1 cemented in places	

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E Area Completion Project	8/4/09	7 of 7

Well Number	Location	Drilling Subcontractor
ECPB SB1	E Area	Boart Longyear

Logs Prepared By	Driller
M Millings / L Bagwell	Overcash

Company	Drilling Method
SRNL	Sonic

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Run 13	120	Blue Bluff		119-121' mostly clay (olive green); some silt	silty clay
				abundant shell hash; cohesive;	
	1			moderate reaction w/ HCl (probably	
				shells); oysters/mollusks included in	
	2			shells; more sandy at top & more shells	
				at bottom 5Y 5/1	
	3			121-126 dry clayey silt (more silt than	
				clay) laminated in places; traces of	
	4			carbonate, little shell hash; weak to	
				absent reaction w/ HCl; dark olive	
	5			grey green 5Y 4/1; beginning to have more	
				mica	
	6	Warley Hill		126-126½ = 6" hard silty clay; not very	CONTACT betw Tinker/Santee &
				cohesive; friable; some mica; sparse	Warley Hill/Green Clay
	7			shell hash; no reaction w/ HCl 5Y 4/1	
				126½ through 128 = fine sandy clay	
	8			dark green; micaceous; dry & crumbly	
			END OF HOLE	no reaction w/ HCl some carbonaceous	
	9			or organic matter; a few small	
				granules & pebbles	
	130				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	0				

125-17
(8) she
128-
131
(9) she'
push one shells after the other

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E AREA COMPLETION PROJECT (ECP)	10 AUG 09	1 of 8
Well Number ECP9-SB1	**Location** E AREA	**Drilling Subcontractor** BOART LONGYEAR
Logs Prepared By M Millings / L Bagwell		**Driller** David Wilcox
Company SRNL		**Drilling Method** SONIC

Fm Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
Fm 1	0			0-6' reworked - came out of ET/EAX clay w/ silt & gravel (mostly clay) 2.5YR 5/6	
	1			6" Thin layer crush/run - old road	
	2				
	3				
	4				
	5				
	6			6-10.5 fine sand (mostly) w/ some clay 10YR 6/8	
	7				
	8				
Fm 2	9				
	10				
	1			10.5-15.5 hard dry clay slightly cohesive, mottled brick red, ocher, light grey 2.5YR 5/6 (mottled areas - pure kaolin?) very little silt	
	2				
	3				
	4				
	5				
	6			15.5-18 coarser grained, sandy clay w/ kaolin interbeds & blobs not cohesive (50% coarser grained sand) 2.5 5/8	
	7				
	8				
Fm 3	9			18-24 dry clay slightly cohesive w/ fine and medium sand, few small pebbles; 5YR 5/8	
	20				

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E-Area Completion Project	10 Aug 09	2 of 8
Well Number	**Location**	**Drilling Subcontractor**
ECP 9 - SB1	E-Area	Boart Longyear
Logs Prepared By		**Driller**
M Millings / L Bagwell		David Wilcox
Company		**Drilling Method**
SRNL		Sonic

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	20			5YR 5/8	
	1				
	2				
Run 3	3			at 23' 3" zone very clay-rich w/ silt & fine sand & pure kaolin layers	
	4			24'-26.5' medium sand · some clay (10%) v. well sorted; sand = qtz & feldspathic 7.5YR 6/8	
	5				
	6			↓ 26.5'-28' same texture; diff. color 2.5YR 6/6	
	7			↓	
	8			28-31' fine medium to coarse sand & cohesive clay (clay ~10-15%); lots of white (presumably kaolin) filling interstitial spaces; some sand lost in recovery 10YR 7/6	
	9			↓	
	30				
Run 4	1			31'-33.5' (same as 24-26.5') 7.5YR 6/8 color & same texture	
	2			↓	
	3			33.5-35.5 same as 26.5-32' zone 2.5YR 6/6 & same texture	
	4				
	5				
	6			35.5-38' same as 24-26.5' zone 7.5YR 6/8, clay in thin lamina	
	7				
	8				
	9			38-43' fine & med. sand · much wetter 38-39' than the above but top of the run so could be drilling fluid vs. perched H_2O; either more clay or more cohesive bed/wetter 2.5YR 5/6	
Run 5	40				

OSR 30-27# (2-12-97)

Field Geologic Log

elev 275.78 ft msl - 85ft higher

Project		Date	Sheet
E Area Completion Project		10 Aug 09	3 of 8
Well Number	**Location**	**Drilling Subcontractor**	
ECP9-531	E Area	Boart Longyear	
Logs Prepared By		**Driller**	
N Millings / L Bagwell		David Wilcox	
Company		**Drilling Method**	
SRNL		SONIC	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	40			kaolin clay appears in stringers & thin beds near bottom (43')	
	1				
	2				
run 5	3			43-45' fine sand & silt w/ ~10% clay 2.5YR 6/7 white clays appear as thin laminae/stringers - some up to ½cm thick	
	4				
	5			45-45½ zone w/ less clay than above medium & fine sand 10YR 6/8 some indurated cemented/silicified zones incl. both sand & clay grains; some pure white clay beds up to 1cm thick	
	6				
	7			45½-46 v. clean fine & med. sand <10% clay 2.5 YR 4/8	
	8			46-48 med. sand v. little clay <5% clay well sorted some possible dk. brown clay balls 7.5YR 6/8	
	9				
6	50			48-49 wet @ bot top of run - silty sandy clay; cohesive 7.5YR 5/6	
	1			49-52 fine to med. sand & clay; clay ~20%; cohesive; a little more clay rich at top of zone 5YR 5/4	
	2			52-54½ clean fine & med. sand 7.5YR 6/8	
	3				
	4				
	5			54½-56 gradational change same texture fine to med sand but clay is purplish & some white clay/silt horizons; overall 5YR 5/6 & purplish clay zones are 10R 4/4	
	6			56-58 abrupt contact - change in color silt & fine sand; little clay 5-10%; not cohesive; purplish red 10R 4/4; more clay at bottom of zone 7.5 YR 6/6	
	7				
	8				
7	9			58-63 med & coarse sand w/ varying amts of clay; clay occurs as white & gray interstitial clay (esp zones of 59', 61'-63') some charcoal ash = dk grey; some horizons have pure clay drapes; 7.5YR 6/6	
	60				

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E Area Completion Project	10 Aug 09	4 of 8
Well Number ECPG-SB1	**Location** E-Area	**Drilling Subcontractor** Boart Longyear
Logs Prepared By M Millings / L Bagwell		**Driller** David Wilcox
Company SRNL		**Drilling Method** Sonic

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	60				
	1				
	2				
				at bottom (63') very clean; little clay	
Run 7	3			63-64' coarse sand; clean little clay 7.5 6/6	Irwinton Sand?
	4			64-65' interval of interbedded pure clay & med to coarse sands; some carbon material assoc. w/ clay; clay layer: 100% finely bedded or laminated; layers w/ mixed clay & sand still 25% clay 7.5 YR 7/6	Upper clay of Tan Clay?
	5				
	6				
				65-66 med & coarse sand w/ some rounded qtz pebbles. some carbon material; zones w/ white (kaolin?) material 10YR 6/6	
	7				
	8				
	9			66-66.5 six inch section finer grained fine to med sand w/ few rounded pebbles,	
Run 8	70		a lot of	→ chunks carbon ash/charcoal; higher clay content than above (clay ~ 25%) cohesive; 10YR 6/6	
	1			66.5-68 fine to med sand; some silt; little clay (<5%) 10YR 6/6; some clasts of pure clay & clay drapes possibly	
	2				
	3			68-69 interbedded med & coarse sand small rounded qtz pebbles interbedded w/ pure clay, clay zones up to 1" thick; clay finely laminated; very cohesive; no silt some charcoal chunks & ash 2.5Y 7/4	Lower Clay of Tan Clay?
	4				
	5				
				69-73 interbedded pure clay & layers of (mm thick to inch thick) med & coarse sand clay is finely laminated / fissile; no silt; thin layers of carbon (charcoal ash); clay is 2.5Y 7/4; sands are 10YR 6/8	more of Lower Clay
	6				
	7				
	8			73-75 clay - varying amts of med sand very cohesive/sticky, qtz pebbles; nearly pure clay in some places; charcoal ash & charcoal throughout!; 2.5Y 7/2 at top to 10YR 8/2 at bottom	
Run 9	9				
	80			75-76 same as above (73-75')	

76-78 Crumbly white & light grey clay w/ fine med & coarse sand; small pebbles; clay interspersed throughout but also as balls, drapes & rip-up clasts carbon material throughout → all clay/no silt

at 76' chunk of charcoal ⊛sample collected
78–79' red to coarse clayey sand; not cohesive;
<10% clay 10YR 6/4

OSR 30-27# (2-12-97)

Field Geologic Log

Project		Date	Sheet
E-Area Completion		10 Aug 2009	5 of 8
Well Number	**Location**	**Drilling Subcontractor**	
ECP9 SB1	E Area	Boart Longyear	
Logs Prepared By		**Driller**	
M Millings / L Bagwell		Wilcox	
Company		**Drilling Method**	
SRNL		Sonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	80			79-83' interbedded fine (very) sand & silt & clay finely interlaated & fissile	
	1			82' zone 3" thick includes thin layers of pure clay carbon material scattered throughout 2.5YR 7/4	
	2			83-85 interclated clay & med sand; clay layers up to 2" thick (pure clay/no silt)	
Run 9	3			clay 2.5Y 8/4 sands are 10YR 6/8 clays are finely laminated/fissile/brittle	
	4				
	5			85-88 fine & med sand w/ clay (<10% clay) carbon material throughout; 5Y 7/4	
	6				
	7				
	8			88-91 fine & med sandy clay; sticky; cohesive; clay content ~30%; fine grained ash/carbon material throughout 2.5Y 6/4	
	9				
Run 10	90				
	1			91-92 White to light gray clay w/ coarse sand & small pebbles; charcoal/fine grained carbon material throughout; ~30% clay 2.5Y 8/2	
	2			92-96 fining upward sequence; grades into overlying formation but color very diff. 2.5Y 7/2 top - clay ~30%; toward botton coarse to med well sorted sand/little clay no carbon material; some rounded pebbles	
	3				
	4				
	5				
	6			96-96.5 6" zone of fine to med grained sand 10-15% clay matrix 2.5Y 5/0; traces of heavy min slightly cohesive — description by Amidon	
	7			96.5-98 fine to med sand; trace of heavy min 10% clay matrix; coarse slightly cohesive 2.5Y 8/2	
	8			98-99 same = fine to med coarse grained sand but color more brown 10YR 6/6 slightly cohesive ~10% clay matrix some clay balls (small); some very coarse sand (<5%)	
Run 11	9			99-99.5 fine to med coarse grained sand little cohesiveness (<5% clay) SANDIER/CLEANER traces of heavy min; white sand 2.5YR 8/0	
	100			99.5-101 very similar to 98-99 zone except less/to no very coarse sand	

OSR 30-27# (2-12-97)

Field Geologic Log

Project	Date	Sheet
E-Area Completion Project	11 Aug 2009	6 of 8
Well Number	**Location**	**Drilling Subcontractor**
ECPG SB1	E Area	Boart Longyear
Logs Prepared By	**Driller**	
M Millings / L Bagwell	David Wilcox	
Company	**Drilling Method**	
SRNL	rotosonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	100				
	1			101 - 103.5 fine to med. silty sand; some cohesiveness 20-25% clay; clay stringers [illegible] sand 10YR 8/4	
Run 11	2				
	3				
	4			103.5 - 104 Silty clay; very cohesive; clay laminae present · carboniferous - carbon material	
	5			bottom 4" clay goes from K-feldspar to kaolin clay 10YR 4/4 clay stringer clays 7.5Y 8/6 silty clays (aka laminae)	
	6			104 - 106 silty sand; cohesive 15-20% clay matrix; top of section (6") clayier than bottom part 10YR 5/8	
	7				
	8			106 - 106.5 top 4" clayey silt; very cohesive organic material present 7.5YR 4/4	
	9			106.5 - 107 silty clay; very cohesive; organic material 2.5Y 7/4	
Run 12	110			107 - 107.5' clay silt & clay nodules; very cohesive · organic matter; interstitial coarse grains (sands) 5YR 4/3	
	1			107.5 - 109 silty sand; 15% clay; some clay stringers · cohesive; sticky; some medium sands (15%); trace mica 10YR 7/8	
	2				
	3			109 110 silty sand; cohesive; interbedded w/ clay stringers & med to coarse sands trace mica & perhaps heavy minerals 10YR 7/6	
	4				
	5			110 - 111.5 more thick interbeds of clay (up to 2") mixed w/ interbeds of fine sands; slightly cohesive 10YR 7/6 traces of carbon material w/in clay laminae	
	6				
	7			111.5 - 112 silty sand · slightly cohesive (5-10% clay) interwoven clay drapes; trace mica trace organic material 10YR 7/6	
	8			112 - 113.5 fine grained silty sand interwoven clays w/ carbon material; slightly cohesive (5-10% clay or less) 10YR 8/8	
Run 13	9				
	120			113.5 - 116 silty sand; fine to med. Sand slightly to not cohesive; trace heavies 2.5Y 8/6; loose sand	

116 - 118.5 fine grained silty sand; more cohesive (10-15% clay) than above; denser (not as loose); trace heavies 2.5Y 8/6 · Fe-oxide staining (nodules) →

118.5 - 119 fine to med. gr sands
cohesive ~20% clay pebbles
partially silicified nodules (pebble-sized) ⊗
~10% coarse grained sand 2.54 6/8
confirmed SiO2 w/ HCl

119 - see next sheet for description
to 125.5

OSR 30-27# (2-12-97)

Field Geologic Log

Project: E Area Completion Project		Date: 11 Aug 2009	Sheet: 7 of 8
Well Number: EC09 SB1	Location: E Area	Drilling Subcontractor: Brart Longyear	
Logs Prepared By: M Millings / L Bagwell		Driller: David Wilcox	
Company: SRNL		Drilling Method: Sonic	

Fin Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	12 0			119-125.5 fine grained silty sand; cohesive; drapes of clay laminae; ~20% clay; trace mica, trace heavies w/ sand; trace carbon material w/ clays 2.5Y 6/6	
	1				
	2				
	3			increasing amt of clay as go deeper two 2" zones 124.5 & 125 = fine to med. grained sands; loose; some partially silicified	confirmed SiO_2 w/ HCl (*)
Run 13	4			lower part more Fe-oxides specs/nodules	
	5			clayey silt 125.5 - 127.5 ~~silty clay~~; trace mica; very cohesive; dense 5Y 7/3	
	6				
	7			127.5 - 129 fine grained silty sand; trace mica; trace clay drapes.	
	8			Fe-oxide nodules throughout; 2.5Y 7/8	
	9			129 - 129.5 fine grained silty sand Fe-oxide staining; partially silicified	confirmed SiO_2 w/ HCl (*)
	13 0			nodules clay balls; very cohesive.	
	1			129.5-133 fine grained clayey silt; clay drapes; Fe staining; partially silicified	
Run 14	2			nodules; slightly cohesive (~15% clay) trace heavies	confirmed
	3			133 → 2" band loose silty sand; lots of large silicified material 10YR 7/8	SiO_2 w/ HCl (*)
	4			133 - 135 clayey silt; very dense; cohesive; trace heavies; tubella internal mold/cast 2.5Y 7/6 → silicified?	(*) yes, SiO_2 confirmed w/ HCl
	5		135 =	1/2" layer sugary sand; fine to med grained; 5-10% clay very loose. 2.5Y 7/6	
	6		135 - 136	~~fine~~ fine grained clay/silt; numerous interbedded clays; 5-10% to med grained sands; clay = 2.5Y 6/2, sand = 2.5Y 6/6; very dense & hard	
	7			↳ 1/2 to 1" in thickness	
	8			white patches ??? calcareous? yes; carbonate material present (sands)	(*)
Run 15	9			136 - 136.5 med coarse sand; 4.5% clay; v. large & abundant silicified material?; 10YR 6/8	slightly to mod reactive w/ HCl (*)
	14 0			136.5 - 137 fine grained silty sand; trace mica; 2.5Y 7/6; bottom of run 1" thick = clayey silt layer w/ color 5Y 7/2	

~137 - 137.5 → 1" thick med coarse sand like previous coarse sand zone; same color

137.5 - fine grained silty sand; not cohesive; dense. 5Y 7/4

139-141 clay silt; fine grained; Fe-bands toward top
coarse sand (5%) throughout
↳ correspond to coarse grained parts vs. surrounding material & matrix

~ 139.5 at 6" band laminated clay

~141 fine grained silty sand w/ few clay lenses
cohesive all the way through (139-141')

top section clay color = 5Y 7/1
sand = 2.5Y 6/8

~140-140.5 trace amts of mica

OSR 30-27# (2-12-97)

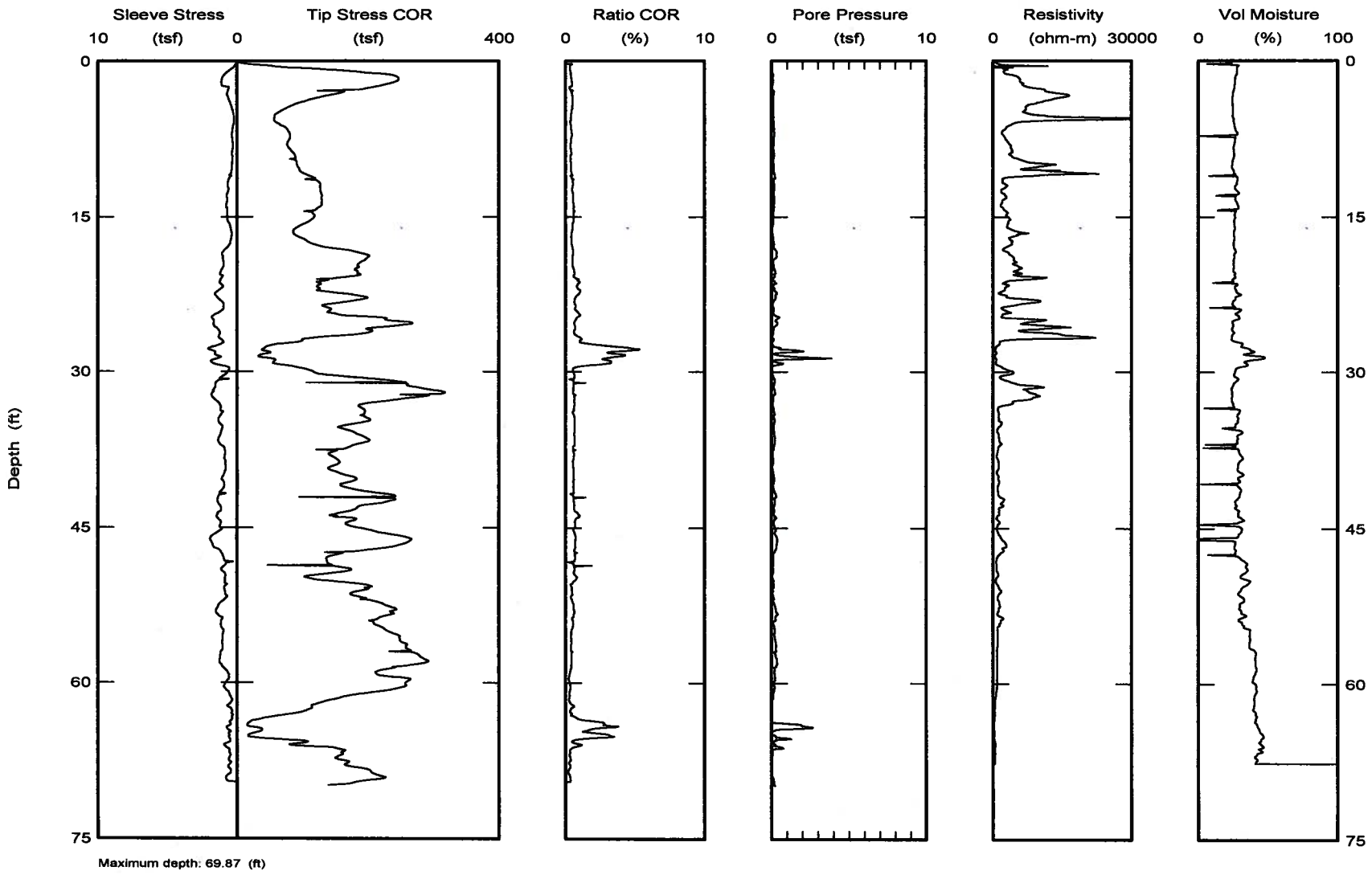
Field Geologic Log

Project: E Area Completion Project		Date: 11 Aug 2009	Sheet: 3 of 8
Well Number: ECP9 SB1	Location: E Area	Drilling Subcontractor: Boart Longyear	
Logs Prepared By: L Bagwell / M Millings		Driller: David Wilcox	
Company: SRNL		Drilling Method: rotosonic	

Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	Drilling Comments/Remarks
	140			141-143 fine grained clay silt 2.5Y 3/0 trace mica; bands in 142' section med to coarse sands; very cohesive; dense;	
	1				
	2				
	3			143-144 fine to med silty sand; Fe-oxide bands/stains; interwoven clays/cohesive; 10YR 5/6	top of Congaree?
	4				
Run 15	5			144-145 fine to med grained sand 20% clay = sticky/cohesive; 5% coarse grained 7.5YR 5/8	
	6				
	7			145-148 med to coarse grained sand; <10% clay; ~~coarser~~ cleaner toward bottom; trace heavies; 7.5YR 6/8	
	8				
	9	End of core			
Run 16	150				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	160				

Attachment B: Cone Penetrometer Logs

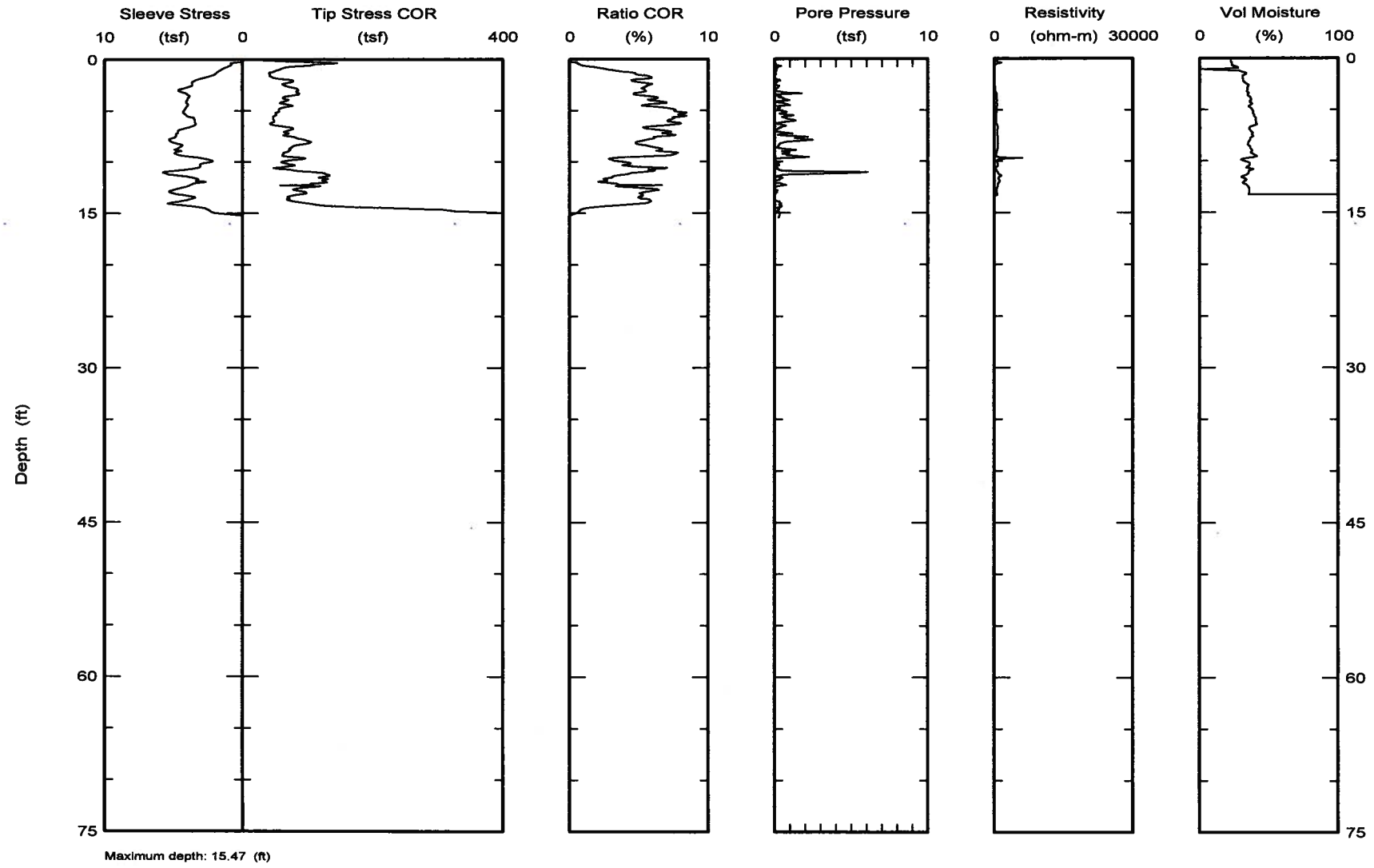
SRNL Environmental Sciences & Bio Tech Savannah River National Lab Aiken, SC 29808 803-725-5178 www.srnl.doe.gov	Northing: 79930.57 Easting: 57056.62 Elevation: 256.84 Client: LAURA BAGWELL Job Site: ECP6-CP1	Date: 11/Aug/2009 Test ID: ECP6-CP1 Project: E-AREA



Maximum depth: 69.87 (ft)

Test ID: ECP6-CP1
File: ECPT6-CP1.ecp

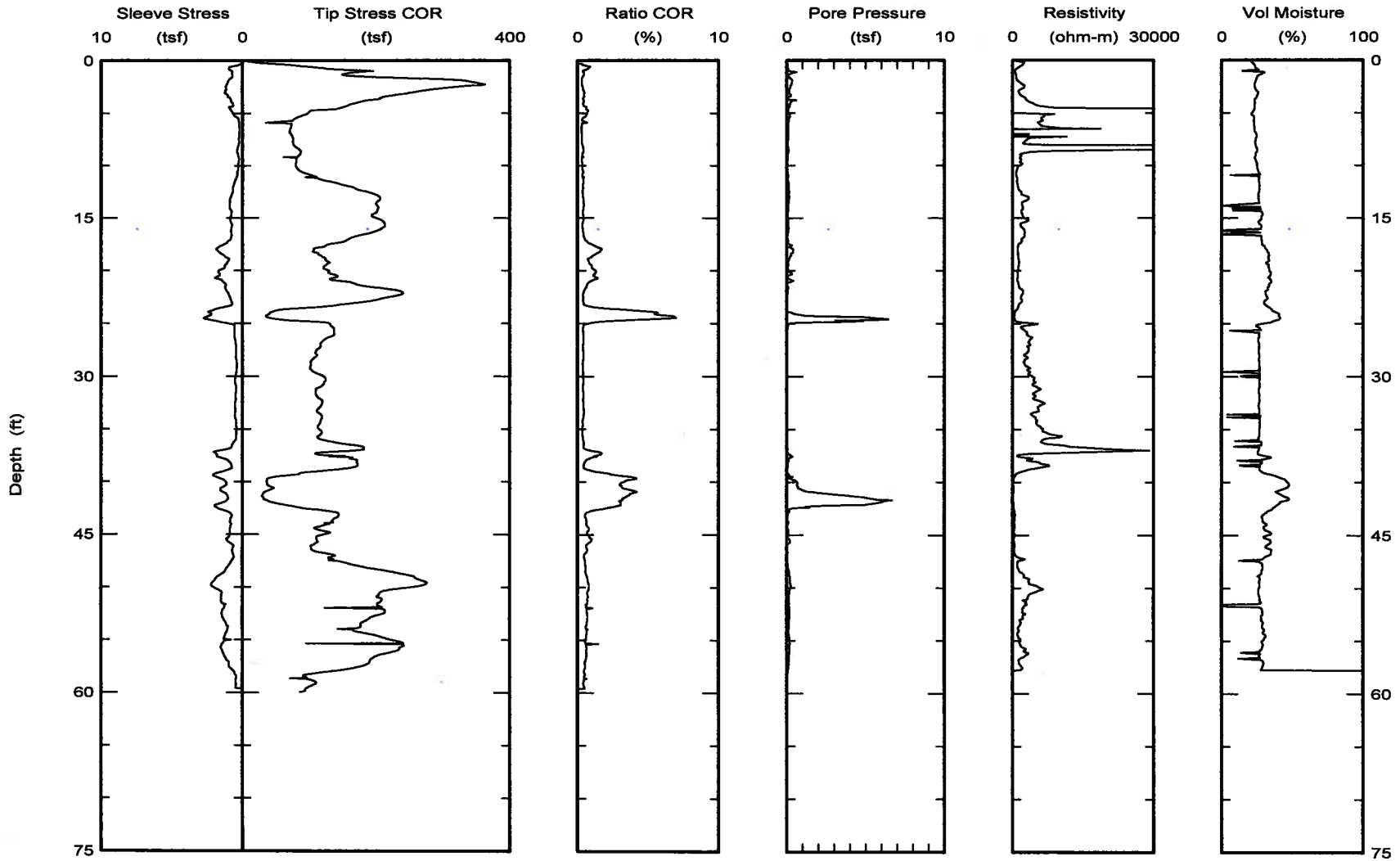
SRNL Environmental Sciences & Bio Tech Savannah River National Lab Aiken, SC 29808 803-725-5178 www.srnl.doe.gov	Northing: 77806.36 Easting: 58876.45 Elevation: 276.00	Date: 13/Aug/2009 Test ID: ECP7-CP1 Project: E-AREA
	Client: LAURA BAGWELL Job Site: ECP7-CP1	



Maximum depth: 15.47 (ft)

Test ID: ECP7-CP1
File: ECPT7-CP1.ecp

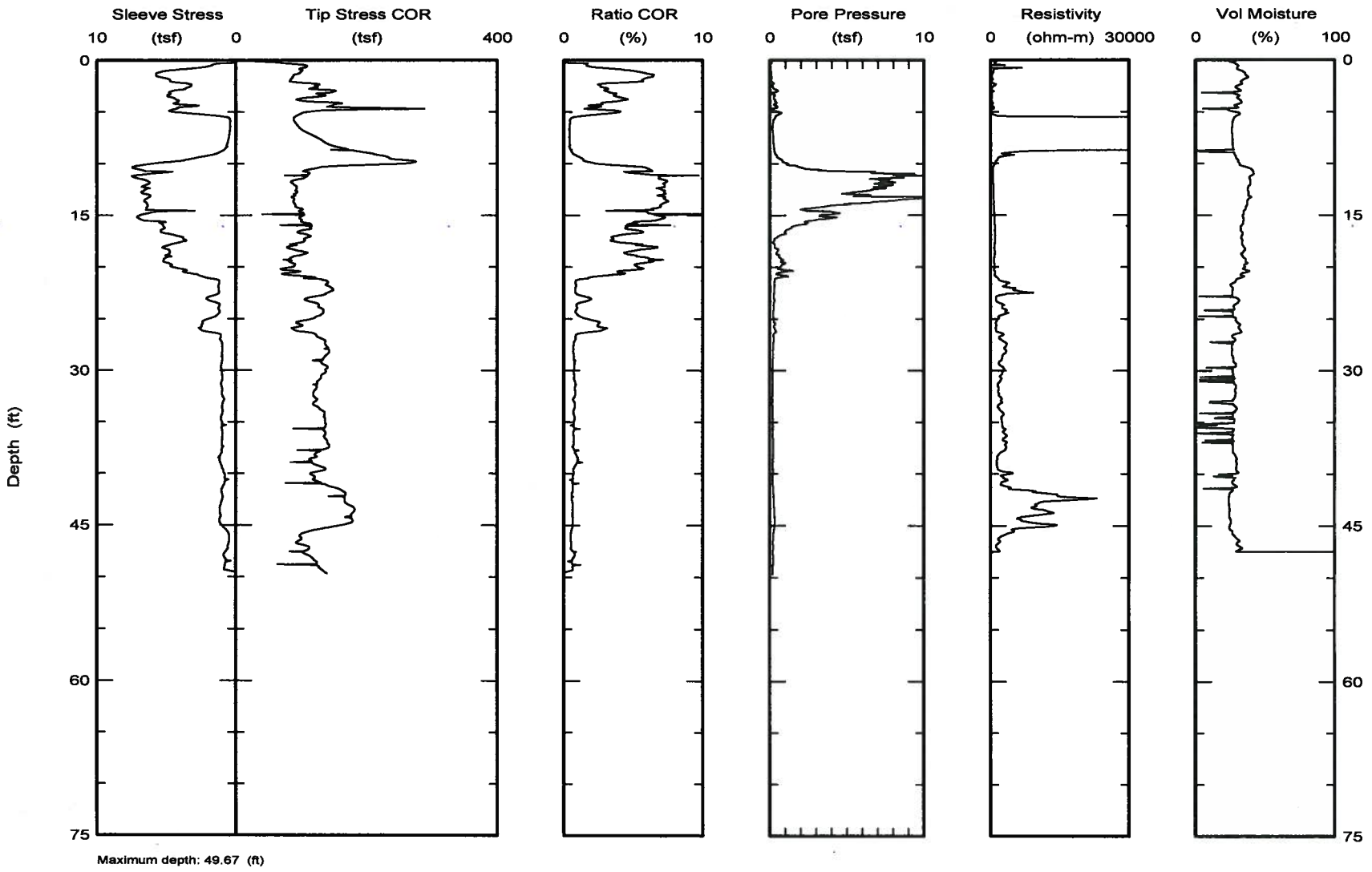
SRNL	Environmental Sciences & Bio Tech Savannah River National Lab Aiken, SC 29808 803-725-5178 www.srnl.doe.gov	Northing: 79238.73 Easting: 57412.72 Elevation: 267.18	Date: 10/Aug/2009 Test ID: ECP8-CP1 Project: E-AREA
		Client: LAURA BAGWELL Job Site: ECP8-CP1	



Maximum depth: 59.96 (ft)

Test ID: ECP8-CP1
File: ECPT8-CP1.ecp

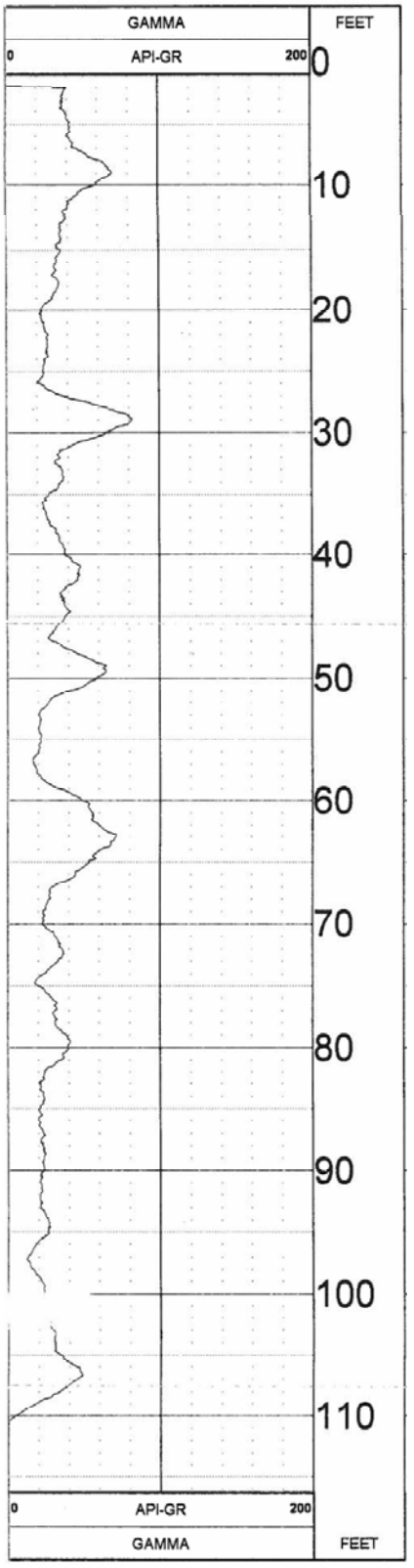
SRNL Environmental Sciences & Bio Tech Savannah River National Lab Aiken, SC 29808 803-725-5178 www.srnl.doe.gov	Northing: 76318.72 Easting: 59962.90 Elevation: 275.78	Date: 13/Aug/2009 Test ID: ECP9-CP1 Project: E-AREA
	Client: LAURA BAGWELL Job Site: ECP9-CP1	



Maximum depth: 49.67 (ft)

Test ID: ECP9-CP1
File: ECPT9-CP1.ecp

Attachment C: Geophysical Logs



Century GEOPHYSICAL CORP.

century-geo.com

ECP-6SB1

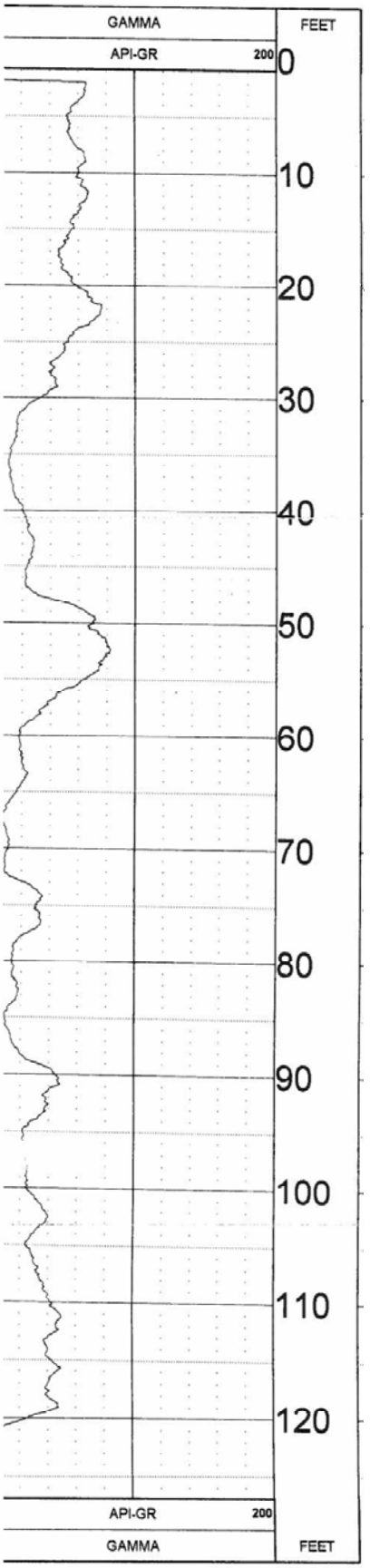
COMPANY	: BoartLongyear		OTHER SERVICES:
WELL	: ECP-6SB1		None
FIELD	: None		None
COUNTY	: Aiken		None
STATE	: SC		
LOCATION	: E-area		
SECTION	: None		
TOWNSHIP	: None		
RANGE	: None		
API NO.	: None		
UNIQUE WELL ID.	: None		
PERMANENT DATUM	: None	ELEVATION KB: None	
LOG MEASURED FROM:	None	ELEVATION DF: None	
DRL MEASURED FROM :	None	ELEVATION GL: 256.84	
DATE	: 06/07/09		
RUN NO.	: 2		
DEPTH DRILLER	: 118'		
BIT SIZE	: 6"		
LOG TOP	: 0.90		
LOG BOTTOM	: 116.10		
CASING OD	: 6"		
CASING BOTTOM	: 118'		
CASING TYPE	: Steel		
BOREHOLE FLUID	: 0		
RM TEMPERATURE	: 0		
MUD RES	: 0		
WITNESSED BY	: None		
RECORDED BY	: Wilcox		
REMARKS 1	: run#1		
REMARKS 2	: None		

Century GEOPHYSICAL CORP.

century-geo.com

ECP7-SB1

COMPANY	: BoartLongyear		OTHER SERVICES:
WELL	: ECP7-SB1		None
FIELD	: None		None
COUNTY	: Aiken		None
STATE	: SC		
LOCATION	: E-area		
SECTION	: None		
TOWNSHIP	: None		
RANGE	: None		
API NO.	: None		
UNIQUE WELL ID.	: None		
PERMANENT DATUM	: None	ELEVATION KB:	None
LOG MEASURED FROM:	None	ELEVATION DF:	None
DRL MEASURED FROM:	None	ELEVATION GL:	265.89
DATE	: 08/14/09		
RUN NO.	: 1		
DEPTH DRILLER	: 127'		
BIT SIZE	: 6"		
LOG TOP	: 0.80		
LOG BOTTOM	: 126.70		
CASING OD	: 6"		
CASING BOTTOM	: 127'		
CASING TYPE	: Steel		
BOREHOLE FLUID	: 0		
RM TEMPERATURE	: 0		
MUD RES	: 0		
WITNESSED BY	: None		
RECORDED BY	: Wilcox		
REMARKS 1	: run#1		



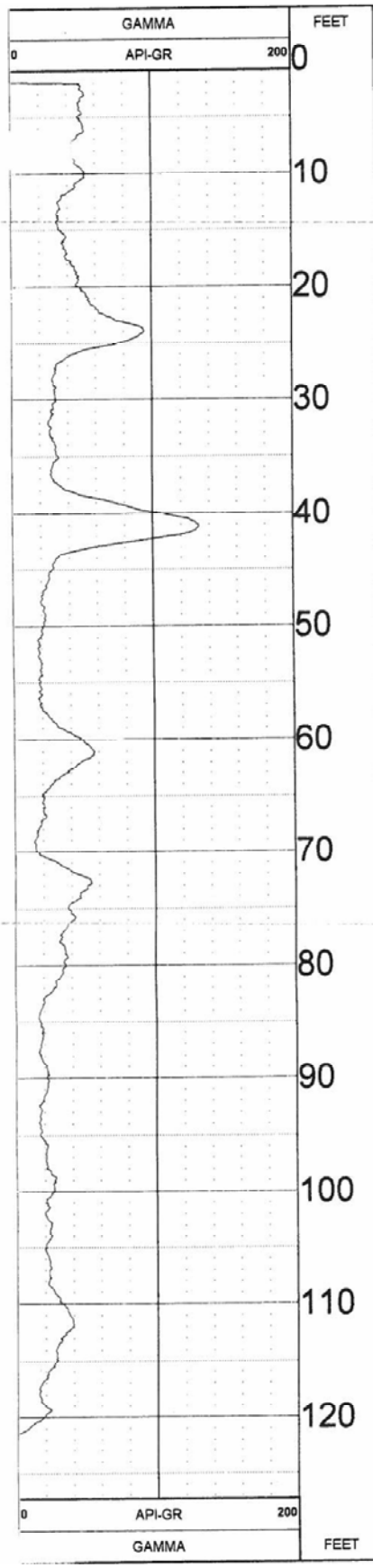
Century GEOPHYSICAL CORP.

century-geo.com

ECP-8SB1

COMPANY	: BoartLongyear		OTHER SERVICES:
WELL	: ECP-8SB1		None
FIELD	: None		None
COUNTY	: Aiken		None
STATE	: SC		
LOCATION	: E-area		
SECTION	: None		
TOWNSHIP	: None		
RANGE	: None		
API NO.	: None		
UNIQUE WELL ID.	: None		
PERMANENT DATUM	: None	ELEVATION KB:	None
LOG MEASURED FROM:	None	ELEVATION DF:	None
DRL MEASURED FROM:	None	ELEVATION GL:	267.18'
DATE	: 08/04/09		
RUN NO.	: 1		
DEPTH DRILLER	: 128'		
BIT SIZE	: 6"		
LOG TOP	: 0.90		
LOG BOTTOM	: 127.10		
CASING OD	: 6"		
CASING BOTTOM	: 128'		
CASING TYPE	: Steel		
BOREHOLE FLUID	: 0		
RM TEMPERATURE	: 0		
MUD RES	: 0		
WITNESSED BY	: None		
RECORDED BY	: Wilcox		
REMARKS 1	: run#1		
REMARKS 2	: None		

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



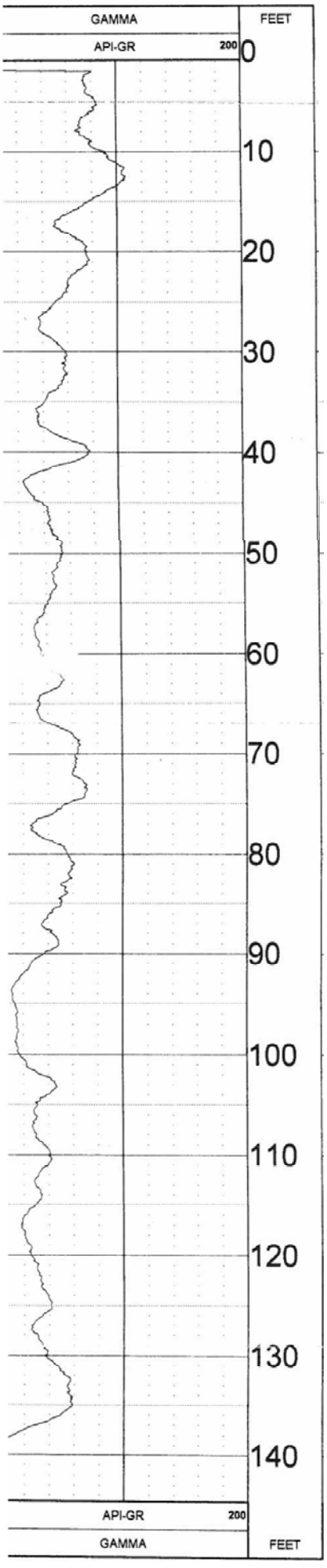
Century GEOPHYSICAL CORP.

century-geo.com

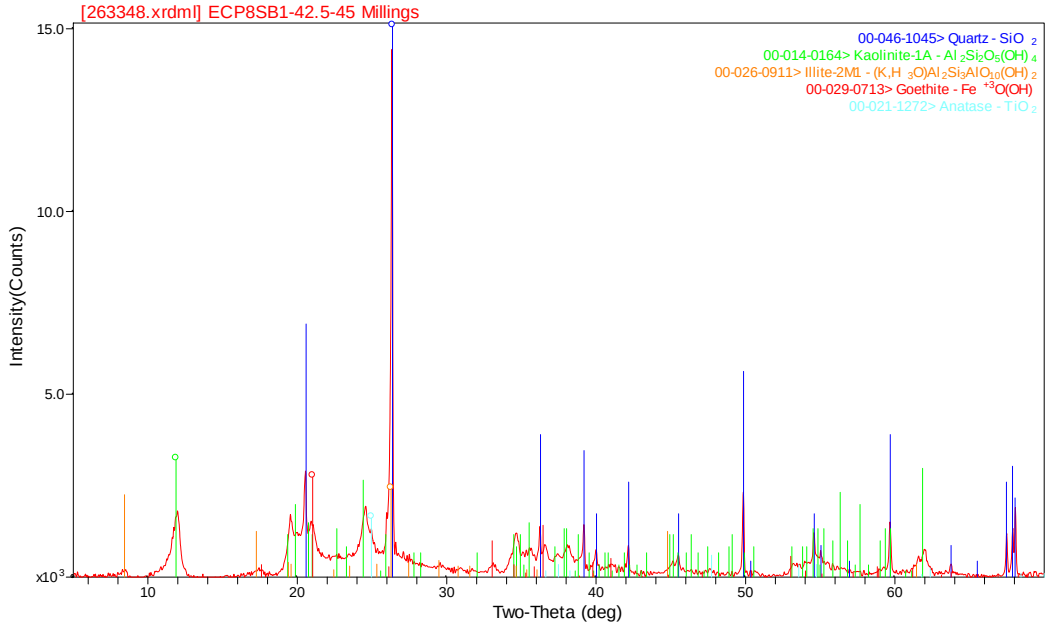
ECP-9SB1

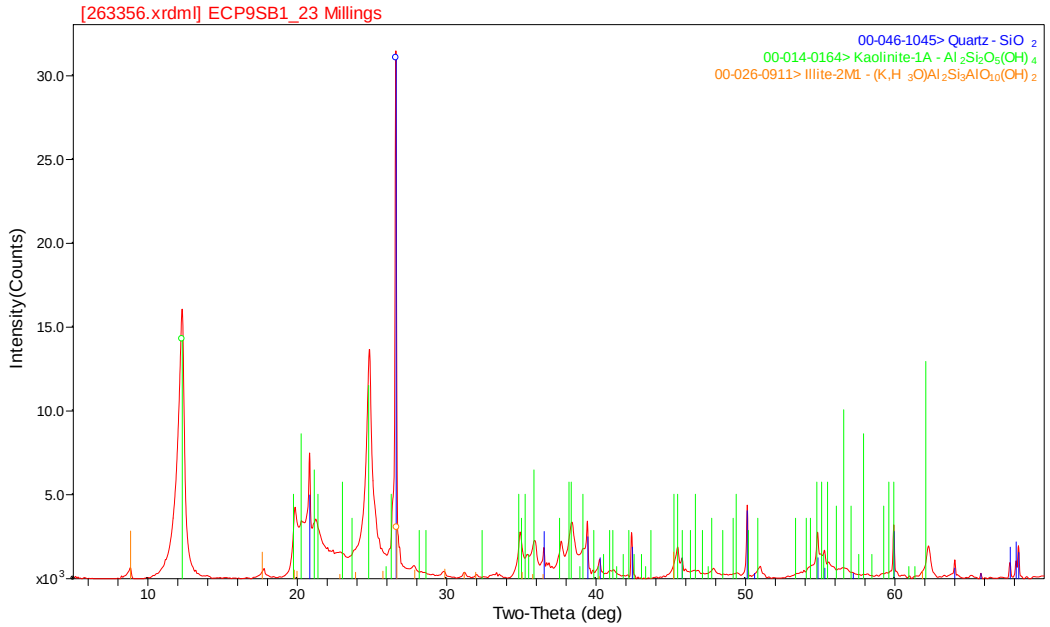
COMPANY	: BoartLongyear		OTHER SERVICES
WELL	: ECP-9SB1		None
FIELD	: None		None
COUNTY	: Aiken		None
STATE	: SC		
LOCATION	: E-area		
SECTION	: None		
TOWNSHIP	: None		
RANGE	: None		
API NO.	: None		
UNIQUE WELL ID	: None		
PERMANENT DATUM	: None	ELEVATION KB:	None
LOG MEASURED FROM	: None	ELEVATION DF:	None
DRL MEASURED FROM	: None	ELEVATION GL:	275.78
DATE	: 08/11/09		
RUN NO.	: 1		
DEPTH DRILLER	: 148'		
BIT SIZE	: 6"		
LOG TOP	: 0.80		
LOG BOTTOM	: 144.40		
CASING OD	: 6"		
CASING BOTTOM	: 148'		
CASING TYPE	: Steel		
BOREHOLE FLUID	: 0		
RM TEMPERATURE	: 0		
MUD RES	: 0		
WITNESSED BY	: None		
RECORDED BY	: Wilcox		
REMARKS 1	: run#1		
REMARKS 2	: None		

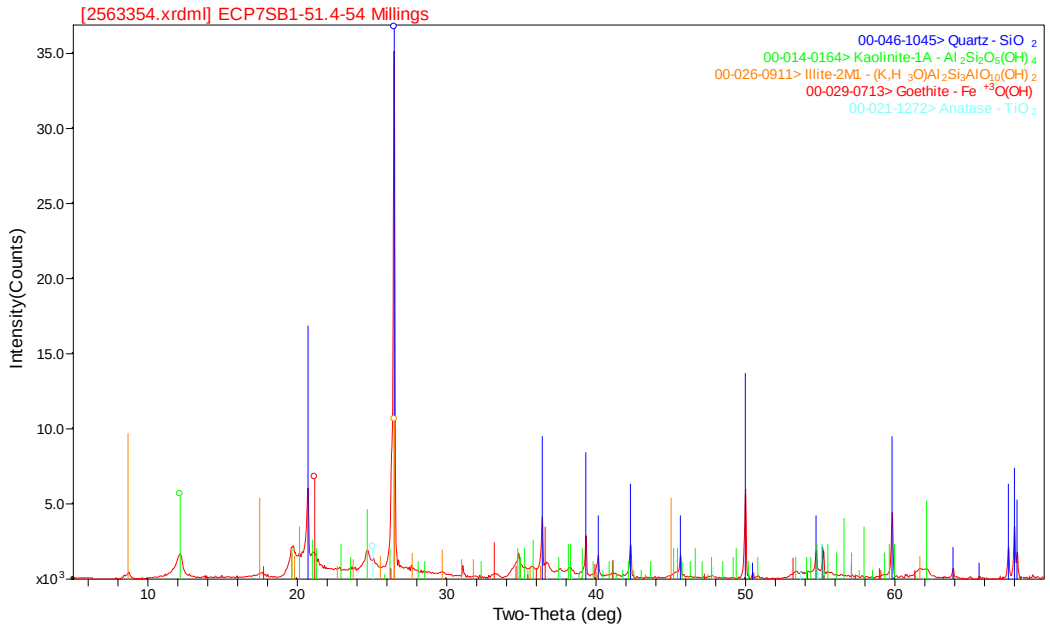
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

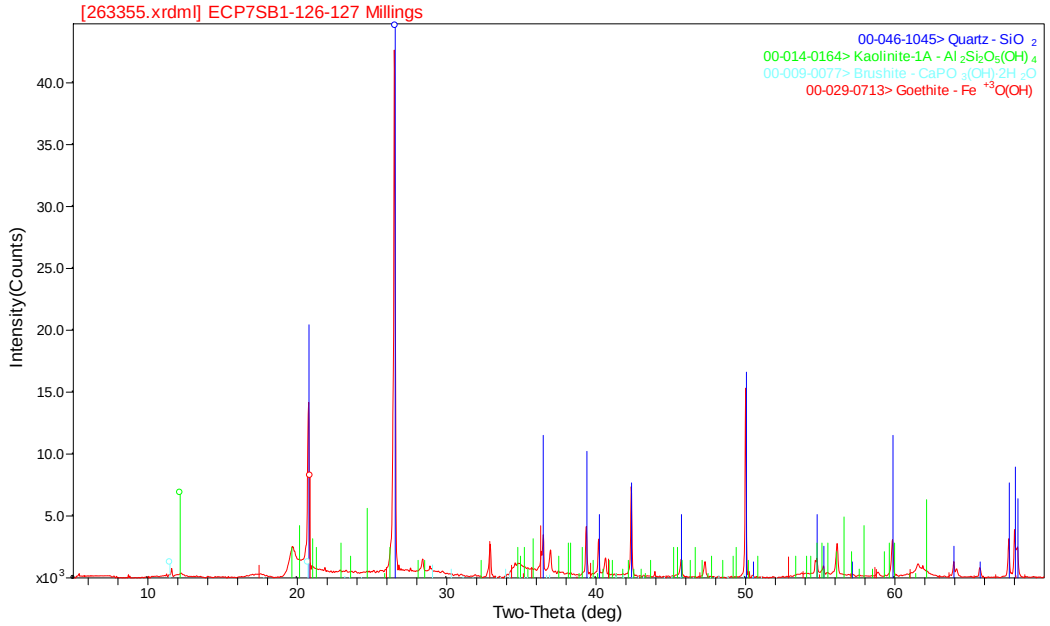


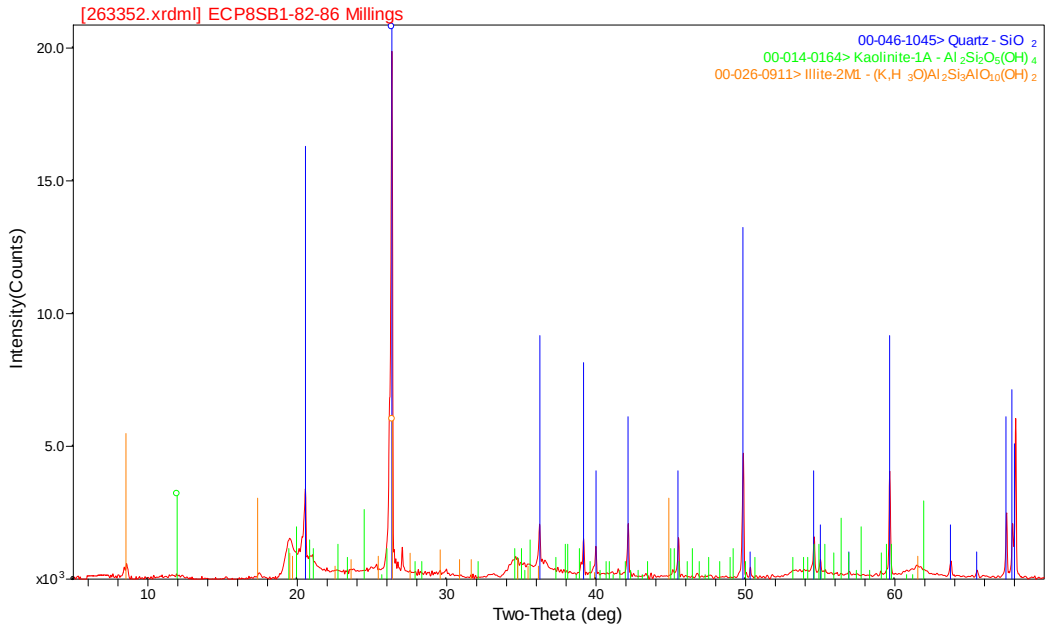
Attachment D: XRD (SRNL ADS)

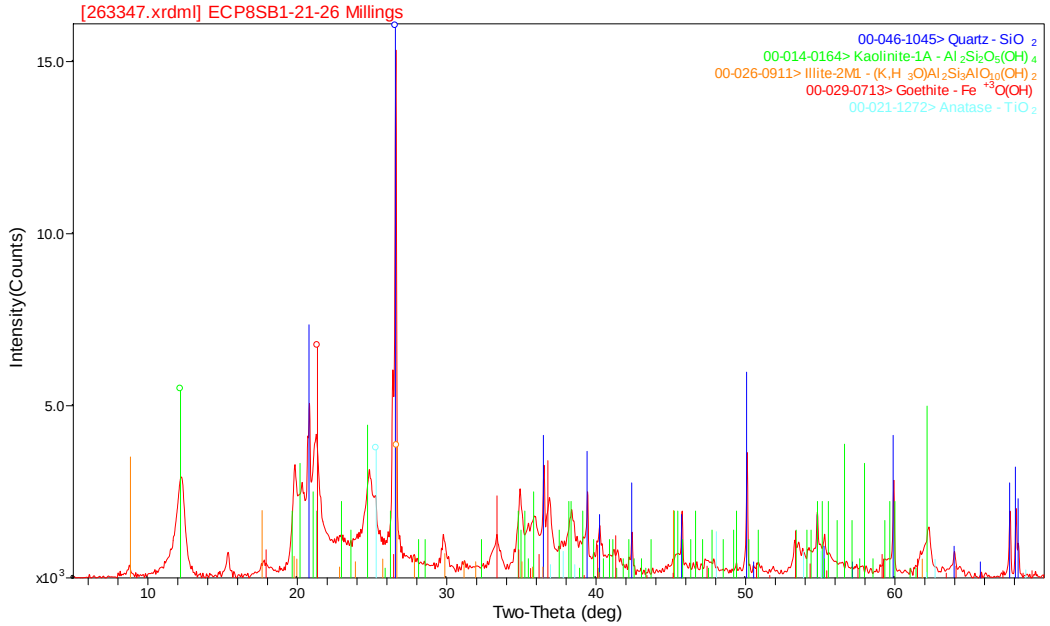

[263348.xrdml] ECP8SB1-42.5-45 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
x10 3
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)

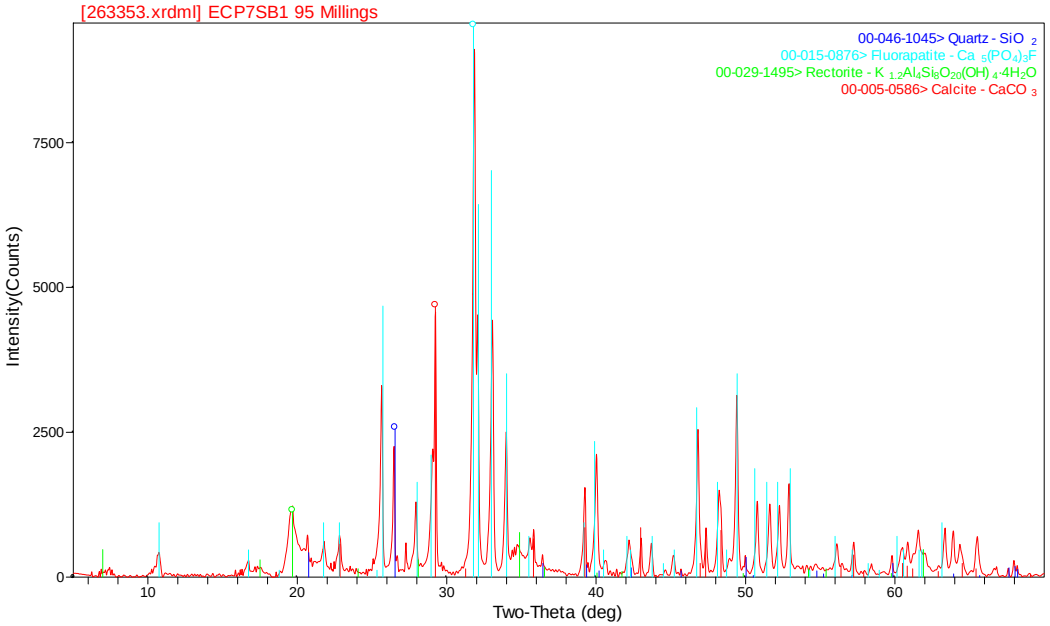

[263356.xrdml] ECP9SB1_23 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
Intensity(Counts)
x10 3
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)

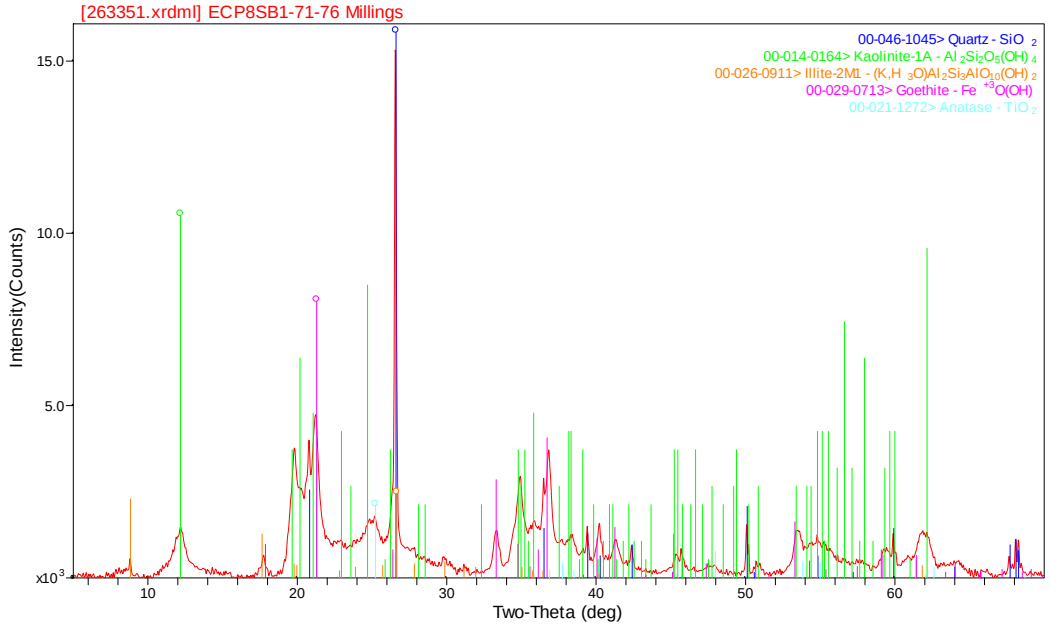

[2563354.xrdml] ECP7SB1-51.4-54 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
x10 3
35.0
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)

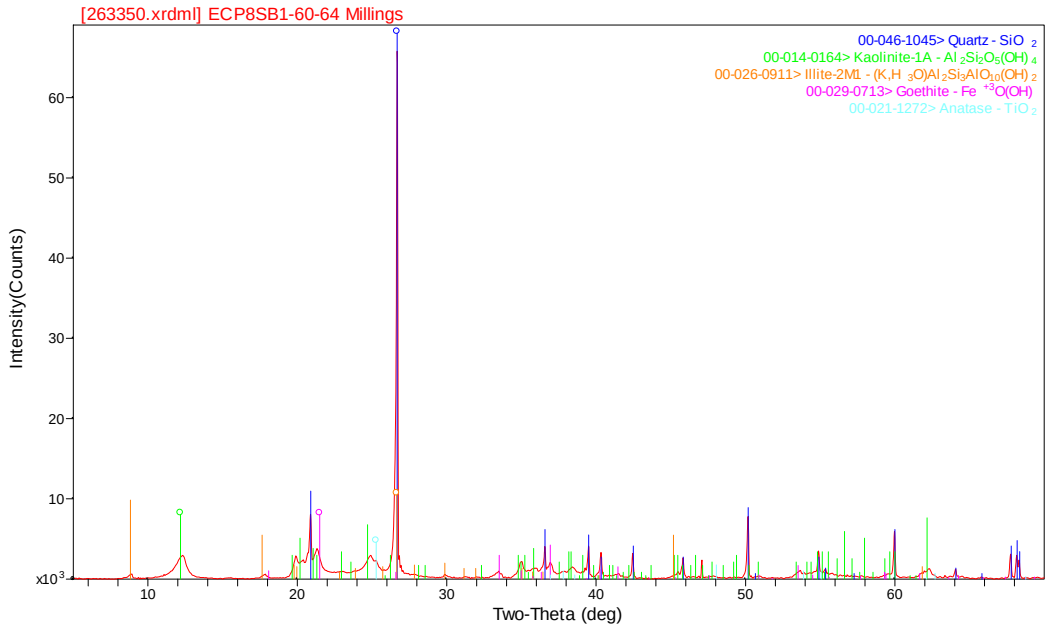

[263355.xrdml] ECP7SB1-126-127 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-009-0077> Brushite - CaPO 3(OH)·2H 2O
00-029-0713> Goethite - Fe +3O(OH)
Intensity(Counts)
x10 3
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)

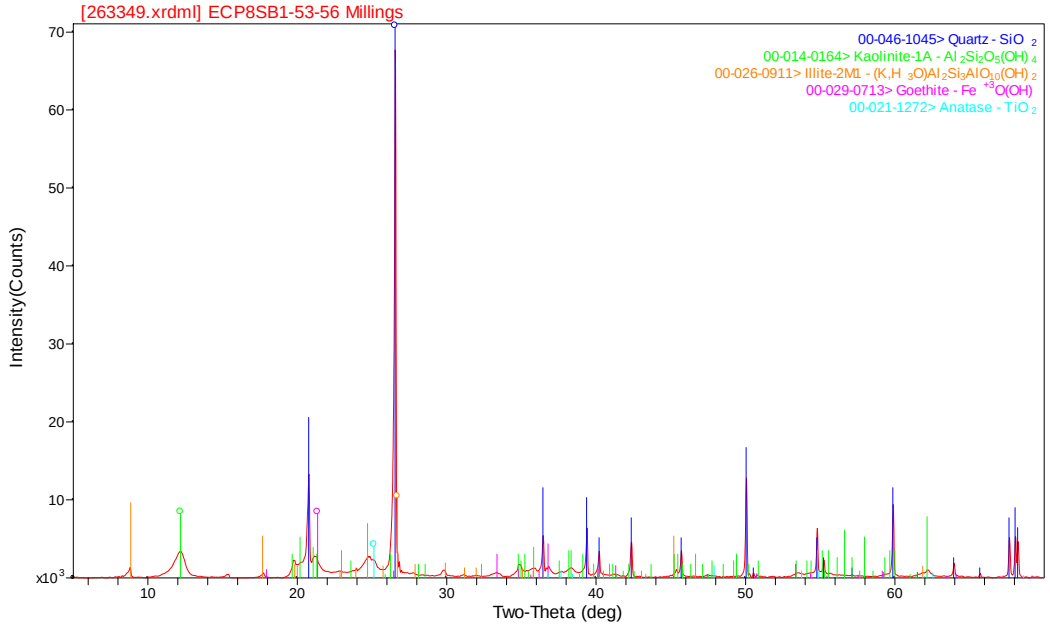

[263352.xrdml] ECP8SB1-82-86 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
Intensity(Counts)
x10^3
20.0
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)


[263347.xrdml] ECP8SB1-21-26 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
x10^3
15.0
10.0
5.0
10
20
30
40
50
60
Two-Theta (deg)


[263353.xrdml] ECP7SB1 95 Millings
00-046-1045> Quartz - SiO 2
00-015-0876> Fluorapatite - Ca 5(PO4)3F
00-029-1495> Rectorite - K 1.2Al4Si8O20(OH) 4·4H2O
00-005-0586> Calcite - CaCO 3
Intensity(Counts)
7500
5000
2500
0
10
20
30
40
50
60
Two-Theta (deg)


[263351.xrdml] ECP8SB1-71-76 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
15.0
10.0
5.0
x10^3
10
20
30
40
50
60
Two-Theta (deg)


[263350.xrdml] ECP8SB1-60-64 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
x10-3
Two-Theta (deg)


[263349.xrdml] ECP8SB1-53-56 Millings
00-046-1045> Quartz - SiO 2
00-014-0164> Kaolinite-1A - Al 2Si2O5(OH) 4
00-026-0911> Illite-2M1 - (K,H 3O)Al2Si3AlO10(OH) 2
00-029-0713> Goethite - Fe +3O(OH)
00-021-1272> Anatase - TiO 2
Intensity(Counts)
x10-3
Two-Theta (deg)

Attachment E: XRF (SRNL ADS)

Sample ID	Boring	Sample Depth (ft bls)	SiO_2 (wt%)	Al_2O_3 (wt%)	Fe_2O_3 (wt%)	MnO (wt%)	MgO (wt%)	CaO (wt%)	Na_2O (wt%)	K_2O (wt%)	TiO_2 (wt%)	P_2O_5 (wt%)	LOI (wt%)	Zr (ppm)
263361	ECP8-SB1	14-15	94.40	2.56	1.49	0.002	0.051	0.041	0.036	0.094	0.115	0.026	1.18	22
263360	ECP8-SB1	22-23	91.35	3.38	2.89	0.011	0.064	0.049	nd	0.131	0.207	0.136	1.72	65
263359	ECP8-SB1	34-35	95.88	1.70	1.02	0.011	0.050	0.051	nd	0.083	0.247	0.131	0.79	142
263358	ECP8-SB1	53-54	97.44	1.18	0.57	0.001	nd	0.047	nd	0.082	0.074	0.050	0.49	13
263357	ECP8-SB1	60-61	98.57	0.44	0.52	0.004	0.034	0.043	0.054	0.050	0.104	0.021	0.15	58

SiO2: Silicon Dioxide (Quartz)
Al2O3: Aluminum Oxide
Fe2O3: Iron Oxide
MnO: Manganese Oxide
MgO: Magnesium Oxide
CaO: Calcium Oxide
Na2O: Sodium Oxide
K2O: Potassium Oxide
TiO2: Titanium Dioxide
P2O5: Potassium Pentoxide (aka. Phosphorus)
LOI:
Zr: Zirconium

nd: non detect

Attachment F: Core Photos


ECP7-SB1
elev 265.89
top
bottom


bottom
top
ECP6-SB1
elev 256.84


ECPG-SB1
0-4'
5'-8'

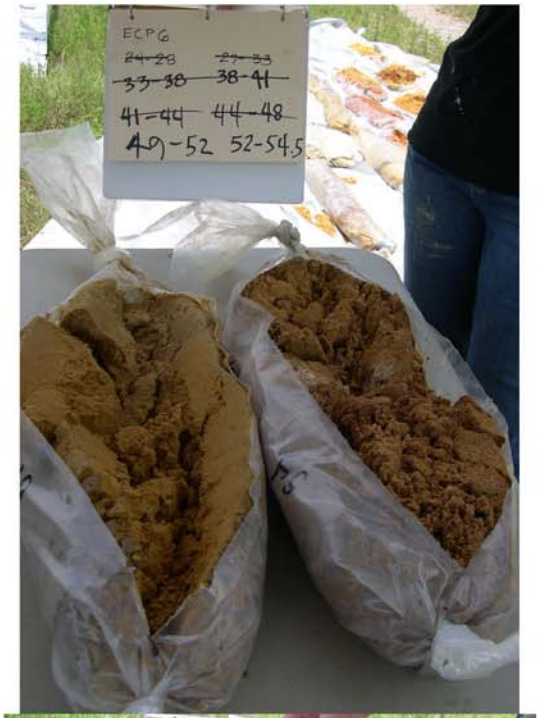

ECPG-SB1
~~0-4'~~
~~5'-8'~~
8'-11'
12'-15'


15-19
19-23


ECPG
24-28
29-33


ECPG
~~24-28~~
~~29-33~~
33-38
38-41


ECPG
~~24-28~~
~~29-33~~
~~33-38~~
~~38-41~~
41-44
44-48


ECP6
24-28 27-33
33-38 38-41
41-44 44-48
49-52 52-54.5


ECP-6
54.5-58 58-62


ECP-6
54.5-58 58-62
62-65 65-67


ECP-6
54.5-58 58-62
62-65 65-67
67-68 68-70


ECP-6
54.5-58 58-62
62-65 65-67
67-68 68-70
70-72.5 72.5-75


ECP6 SB1
75-78 78-80


ECP6 SB1
~~75-78 78-80~~
80-84 84-86.5


ECP6 SB1
~~75-78 78-80~~
80-84 84-86.5
86.5-88 88-89


ECP6 SB1
~~75-78 78-80~~
~~80-84 84-86.5~~
~~86.5-88 88-89~~
89-92 92-95


ECP6 SB1
95-98 98-101


ECP6 SB1
~~95-98 98-101~~
101-103 103-106


ECP6 SB1
~~95-98 98-101~~
~~101-103 103-106~~
~~106 107 109 112~~


ECP6 SB1
~~95-98 98-101~~
~~101-103 103-106~~
~~106 107 109 112~~
112-115 115-118 TD


ECP7 SB1
0-3 4-7


ECP7 SB1
0-3 4-7


ECP7 SB1
~~0-3 4-7~~
7-11 11-14

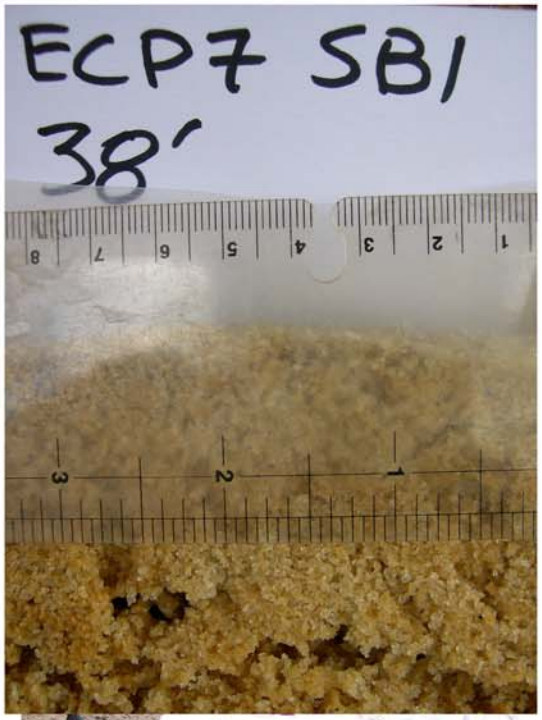

ECP7 SB1
~~0-3 4-7~~
~~7-11 11-14~~
14-17 17-20


ECP7 SB1
~~0-3 4-7~~
~~7-11 11-14~~
~~14-17 17-20~~
20-24 24-27


ECP7 SB1
27-31 31-33


ECP7 SBI
27-31 31-33
34-37 37-40


ECP7 SBI
38'


ECP7 SBI
38'


ECP7 SBI
27-31 31-33
34-37 37-40


27-31 31-33
34-37 37-40
40-44 44-47


ECP7 SBI
27-31 31-33
34-37 37-40
40-44 44-47
47-50 50-53

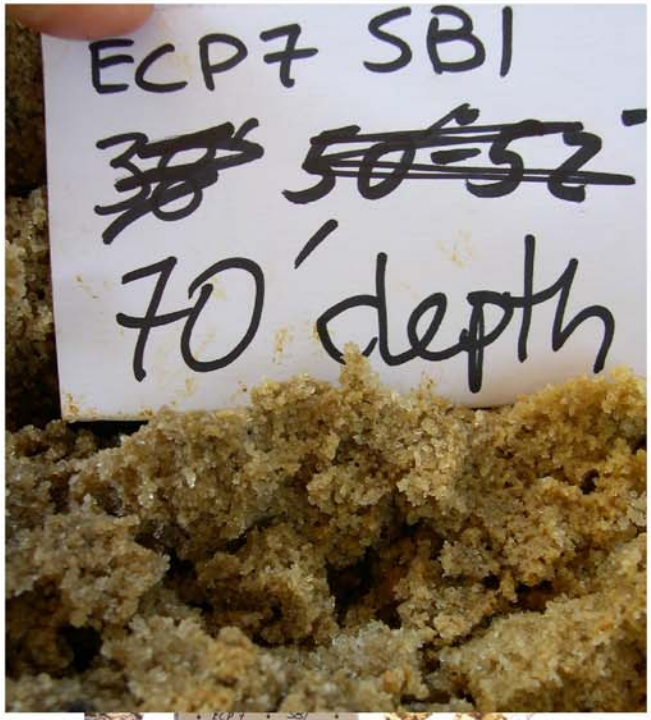

ECP7 SBI
~~35~~ 50-52

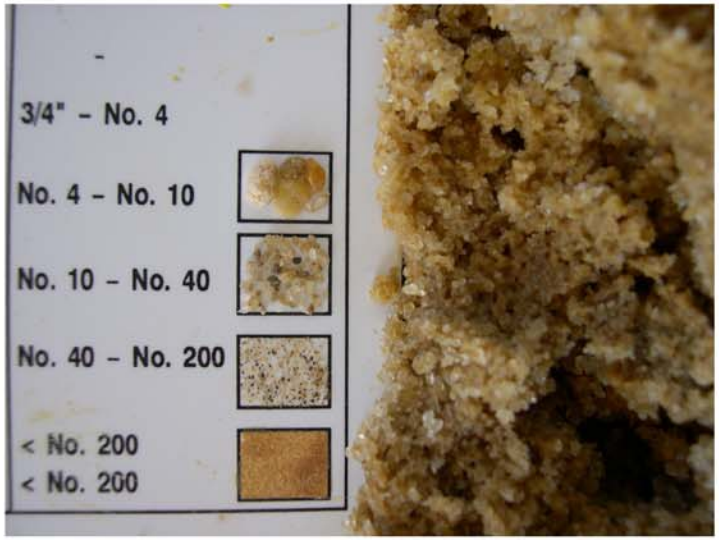

ECP7 SBI
27-31 31-33
34-37 37-40
40-44 44-47
47-50 50-53
53-54 54-57


ECP7 SBI
27-31 31-33
34-37 37-40
40-44 44-47
47-50 50-53
53-54 54-57


ECP7 SBI
57-59.5 59.5-63


ECP7 SBI
57-59.5 59.5-63
63-67 67-69


ECP7 SBI
70' depth


3/4" - No. 4
No. 4 - No. 10
No. 10 - No. 40
No. 40 - No. 200
< No. 200
< No. 200


ECP7 SBI
57-59.5 59.5-63
63-67 67-69
69-71 71-74


57-59.5 59.5-63
63-67 67-69
69-71 71-74
74-77 77-81


57-59.5 59.5-63
63-67 67-69
69-71 71-74
74-77 77-81
81-83 83-85


ECP7 SBI
85-87 87-89.5


87
87.5


ECP7 SB1
~~85-87~~ ~~87-87.5~~
89.5-92 92-94
H6


ECP7 SB1
~~85-87~~ ~~87-87.5~~
~~89.5-92~~ ~~92-94~~
94-97 97-99.5


ECP7 SB1
~~85-87~~ ~~87-87.5~~
~~89.5-92~~ ~~92-94~~
94-97 97-99.5


ECP7 SB1
~~85-87~~ ~~87-87.5~~
~~89.5-92~~ ~~92-94~~
~~94-97~~ ~~97-99.5~~
99.5-102 102-105


ECP7 SB1
105-107 107-110


105-107 107-110


110-113 113-117


110-113 113-117


~~105-107 107-110~~
~~110-113 113-117~~
117-118 118-121


ECP7 SB1
~~105-107 107-110~~
~~110-113 113-117~~
~~117-118 118-121~~
121-124 124-127


18-20


20-23


23-25


ECP8-SB1


ECP8-SB1
28-32


ECP8-SB1
32-38


ECP8-SB1


TAN CLAY


44-46


ECP8-SB1
48-52


ECP8-SB1
53-58


ECP8-SB1


ECP8-SB1
61-64


61-64


ECP8-SB1


64-66'
ECP8-SB1


ECP8-SB1
67-68'


ECP8-SB1
68-71'


68-71'


71-73'


74-76'


ECP8-SB1
77'-78'


ECP8-SB1
79-81'


ECP8-SB1
79-81'


81 - 84'
83
84


81 - 84'
83
84


85 - 86'

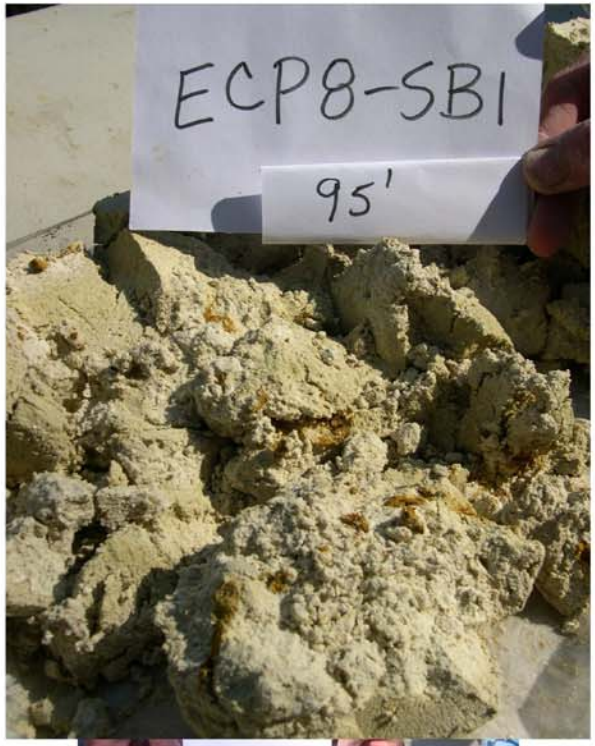

ECP8-SB1
87 - 88'
88


ECP8-SB1
89' - 90'


ECP8-SB1
91' - 93'


93' - 96'


96' - 99'


ECP8-SB1
95'


99'- 101'
ECP8-SB1


ECP8-SB1
104' - 106'


ECP8-SB1
101' - 104'


104' - 106'


106' - 108'


108' - 110'


ECP8-SB1


ECP8-SB1


ECP8-SB1
117' - 119'


119' - 121'


119' - 121'


121' - 123'


ECP8-SB1


ECP8-SB1
126' - 128'


ECP 9
SBI
1-5
5-8


ECP 9
SBI
1-5
5-8
8-10.5
10.5-14


ECP 9
SBI
14-16
16-18


ECP 9
SBI
8-10.5
10.5-14
16-18
18-21
21-24

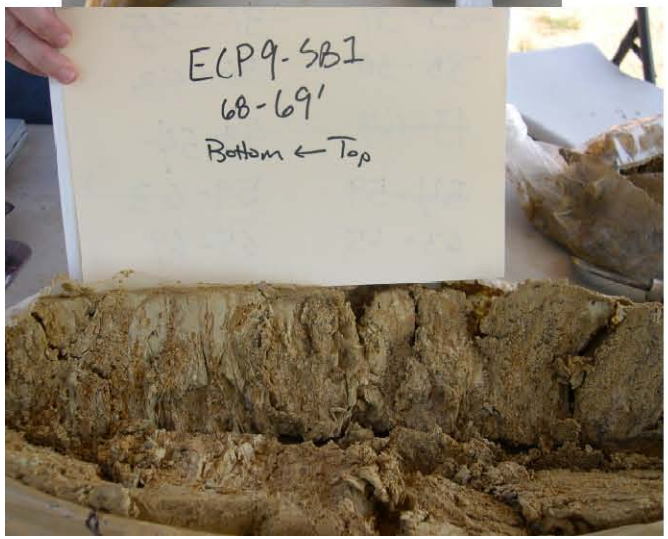

ECP 9
SBI
25-31
31-35


ECP 9
SBI
35-38
38-43


ECP9 SB1
25-31 31-35
35-39 39-43
43-49 49-54


ECP9 SB1
25-31 31-35
35-39 39-43
43-49 49-54
54-59 59-63


64-65'
Bottom
Top


ECP9-SB1
68-69'
Bottom ← Top

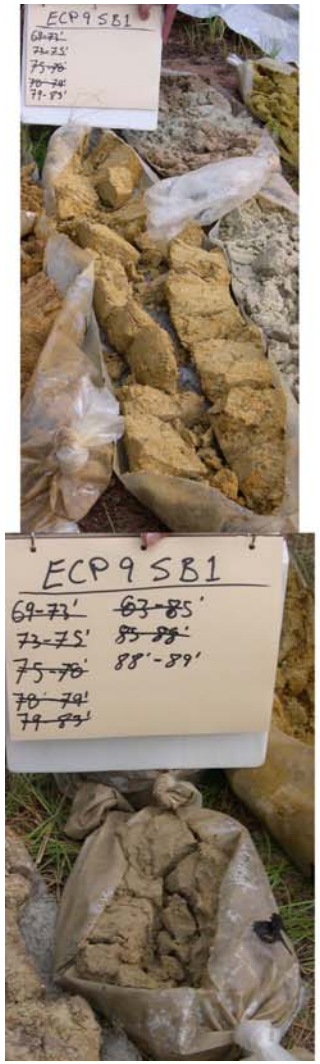

ECP 9 SB1
69-73'
73-75'


ECP 9 SB1
69-73'


ECP 9 SB1
69-73'
73-75'
75-78'


ECP 9 SB1
69-73'


ECP 9 SB1
69-73'
73-75'
75-78'
78'-79'


ECP 9 SB1
69-71'
73-75'
75-78'
78-79'
79-83'
ECP 9 SB1
69-71' 83-85'
73-75' 85-88'
75-78' 88'-89'
78-79'
79-83'


ECP 9 SB1
69-71' 83-85'
73-75'
75-78'
78-79'
79-83'
ECP 9 SB1
69-71' 83-85'
73-75' 85-88'
75-78' 88-89'
78-79' 89-93'
79-83'


ECP 9 SB1
69-71' 83-85'
73-75' 85-88'
75-78'
78-79'
79-83'
ECP 9 SB1
69-71' 83-85'
73-75' 85-88'
75-78' 88-89'
78-79' 89-93'
79-83' 93-96'


ECP9- SB1
96'-98'


ECP9- SB1
98'-100'


ECP9- SB1
100'-103'


ECP9- SB1
103-106'


ECP9- SB1
106-108'


ECP9- SB1


ECP9-SB1


ECP9-SB1


ECP9-SB1


ECP9-SB1


ECP9-SB1


ECP9-SB1


ECP9- SB1
123-126'
126'-128'
128-130'


ECP9- SB1


ECP9- SB1


ECP9- SB1
136-138'


ECP9- SB1
136-138'
138-141'


ECP9- SB1
136-138'
138-141'
141'-144'
ECP9- SB1
136-138'
138-141'
144'-146'
144'-148'

Attachment G: Geotechnical Laboratory Results (MACTEC)

MACTEC

engineering and constructing a better tomorrow

December 11, 2009

Savannah River Nuclear Solutions
Bldg. 730-2B Room 1086
Aiken, SC 29808

Attention: Mr. Jim Mason, Site Geotechnical Services
Subject: **Test Report – ECP Geological Characterization**
Subcontract No. AC54317N, Delivery Order No. 8
MACTEC Project No. 6155-08-0031

Dear Mr. Mason:

MACTEC Engineering & Consulting, Inc. (MACTEC) has completed the assigned testing services for Delivery Order No. 8, Subcontract No. AC54317N. The test results are included in Attachment 1. An equipment list used in this Delivery Order is included in Attachment 2. The tests performed in this Delivery Order are listed below along with applicable ASTM or other procedures:

Sieve Analysis/Hydrometer	ASTM D422
Total Organic Carbon	ASTM D2974
Atterberg Limits	ASTM D4318
Capillary Moisture Relationship	ASTM D2325/3152
Permeability – Falling Head	ASTM D4767
Tube Logging	MACTEC TP-06
Porosity	US COE EM1110-2-1906

These tests were performed in accordance with the above referenced contract order and MACTEC's Quality Assurance Manual (QAM) Revision 1.

This letter transmits revised reports where typographical errors were corrected.

We appreciate the opportunity of serving your geotechnical laboratory testing needs. If you have questions, please contact us.

Sincerely,

MACTEC Engineering and Consulting, Inc.

Jianren Wang
Principal

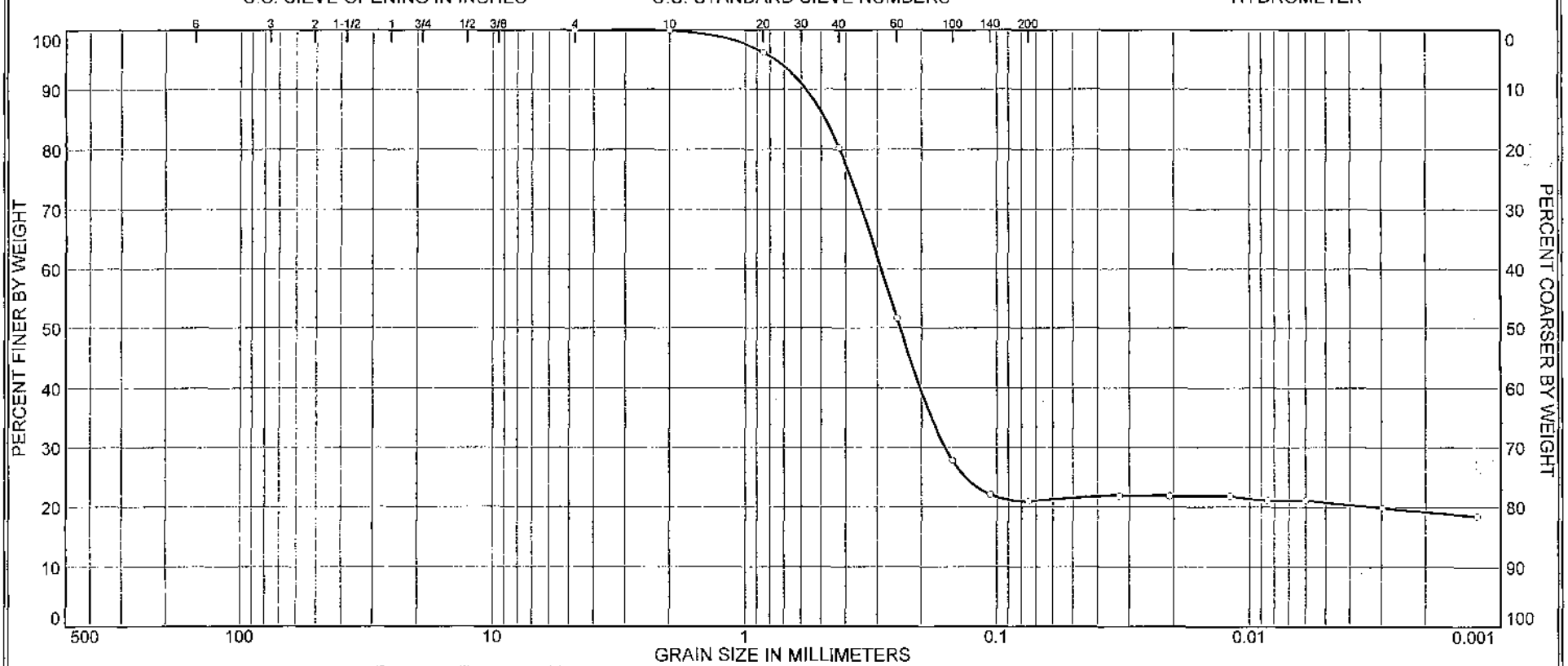
John Lynch
Laboratory Manager

Cc: SRNS
Vendor Documents
Building 704-IN/Room 137
Aiken, SC 29808

MACTEC Engineering and Consulting, Inc.
396 Plasters Avenue, NE • Atlanta, GA 30324 • Phone: 404-873-4761 • Fax: 404-817-0221

ATTACHMENT 1

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.0	19.7	59.4	0.1	20.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	14-15 ft	8/28/09	SC	Brown Clayey Sand	13.8	30	17

Client SRNS

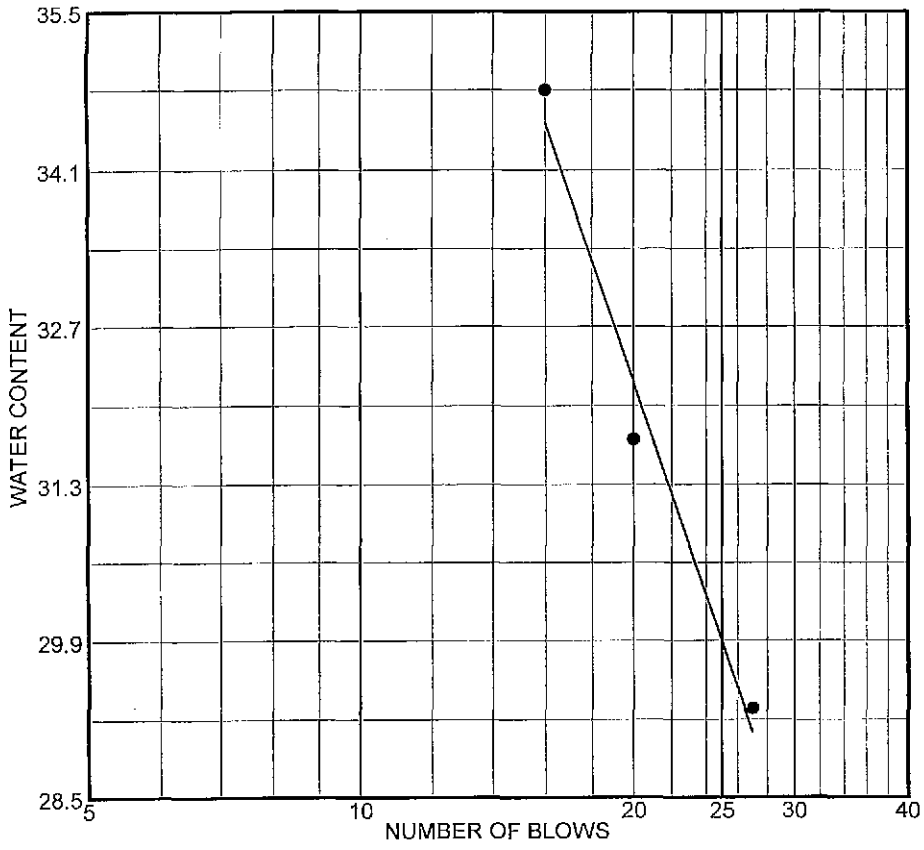
Project ECP Geologic Characterization

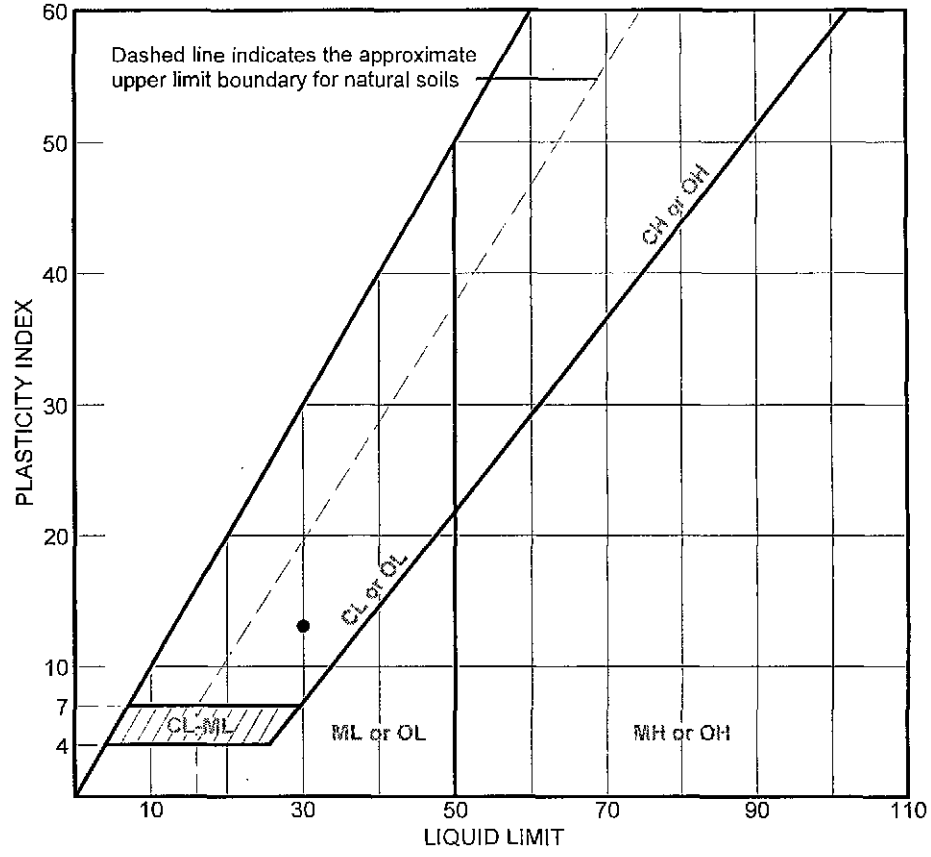
Project No. 6155-08-0031.08 Lab No. 9786

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	14-15 ft	8/28/09	SC	Brown Clayey Sand	13.8	30	13

Client SRNS

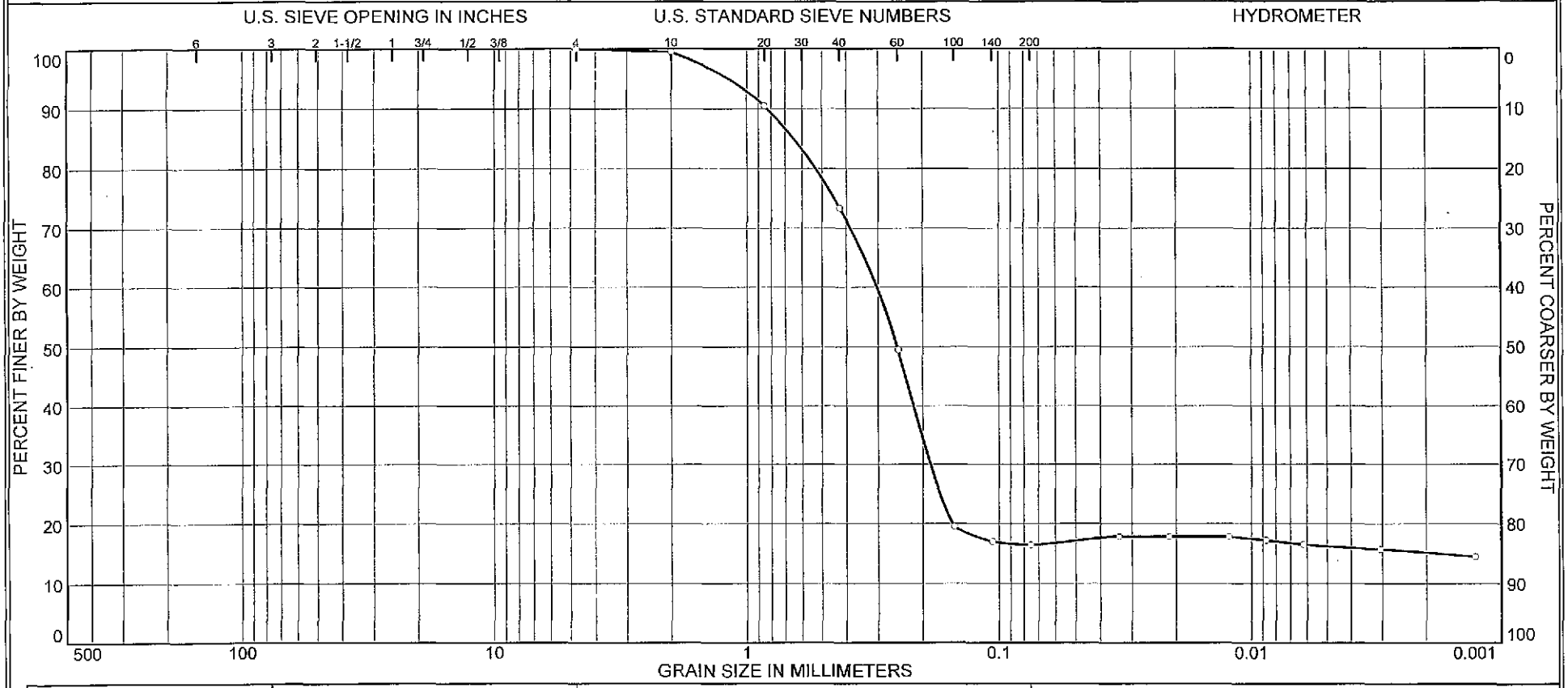
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9786

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.5	26.1	57.0	0.2	16.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	22.5-25 ft	8/28/09	SC	Brown Clayey Sand	17.8	29	21

Client SRNS

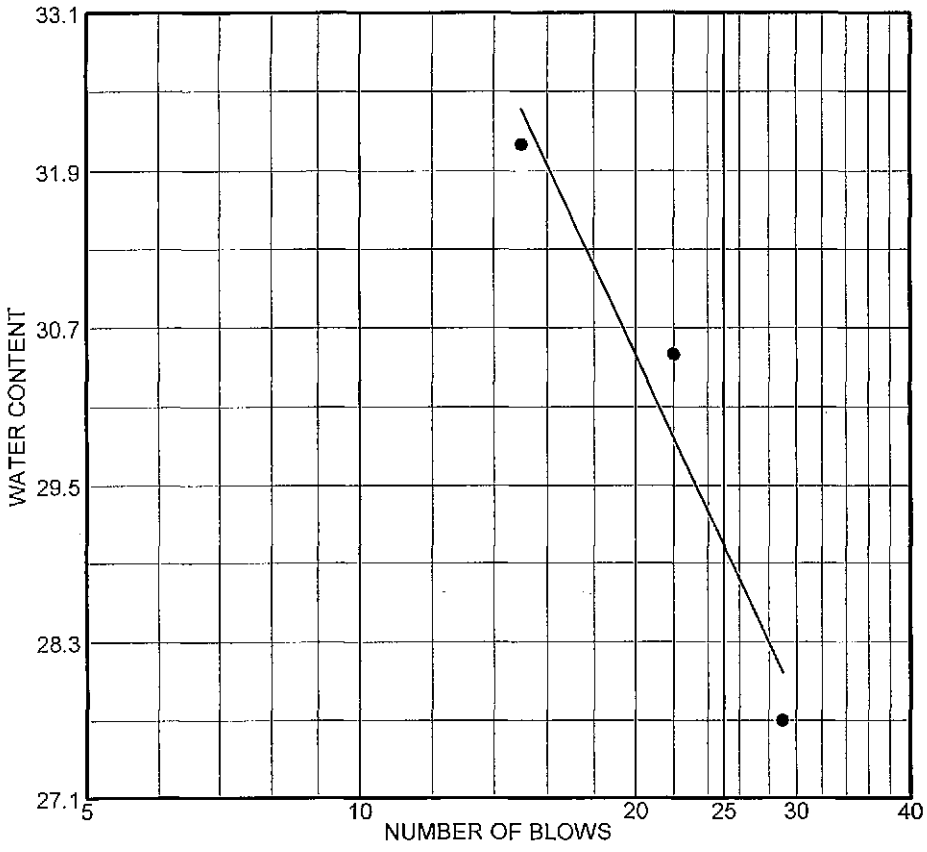
Project ECP Geologic Characterization

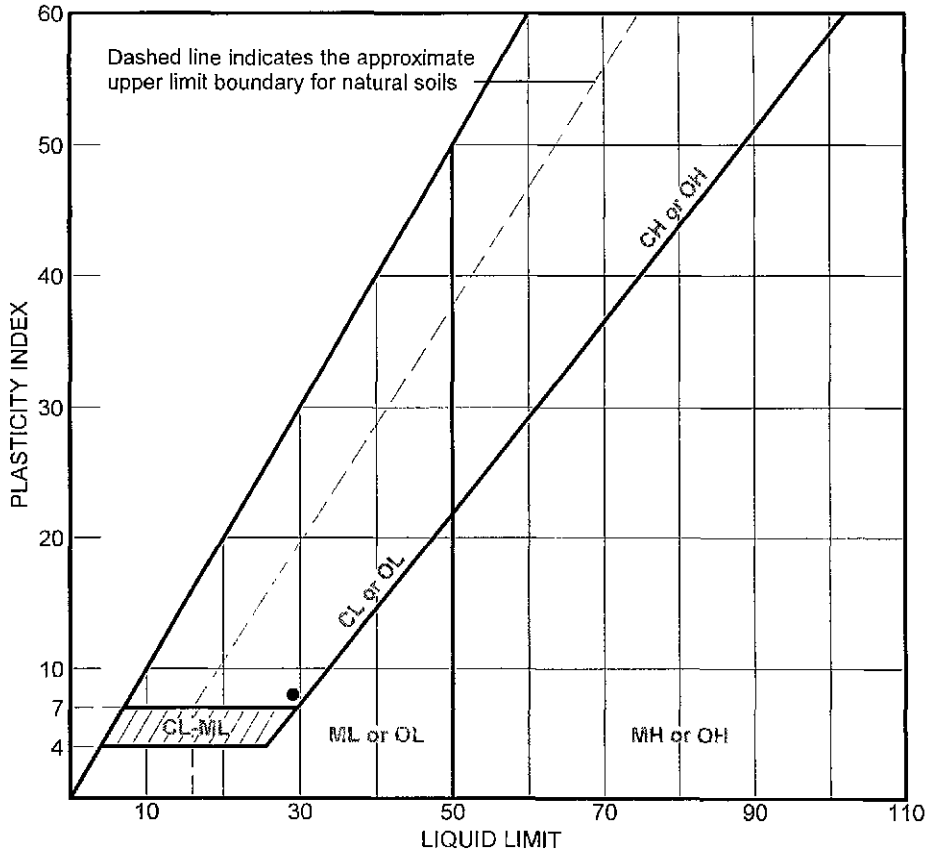
Project No. 6155-08-0031.08 Lab No. 9787

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP8/SB2	UD	22.5-25 ft	8/28/09	SC	Brown Clayey Sand	17.8	29	8

Client SRNS

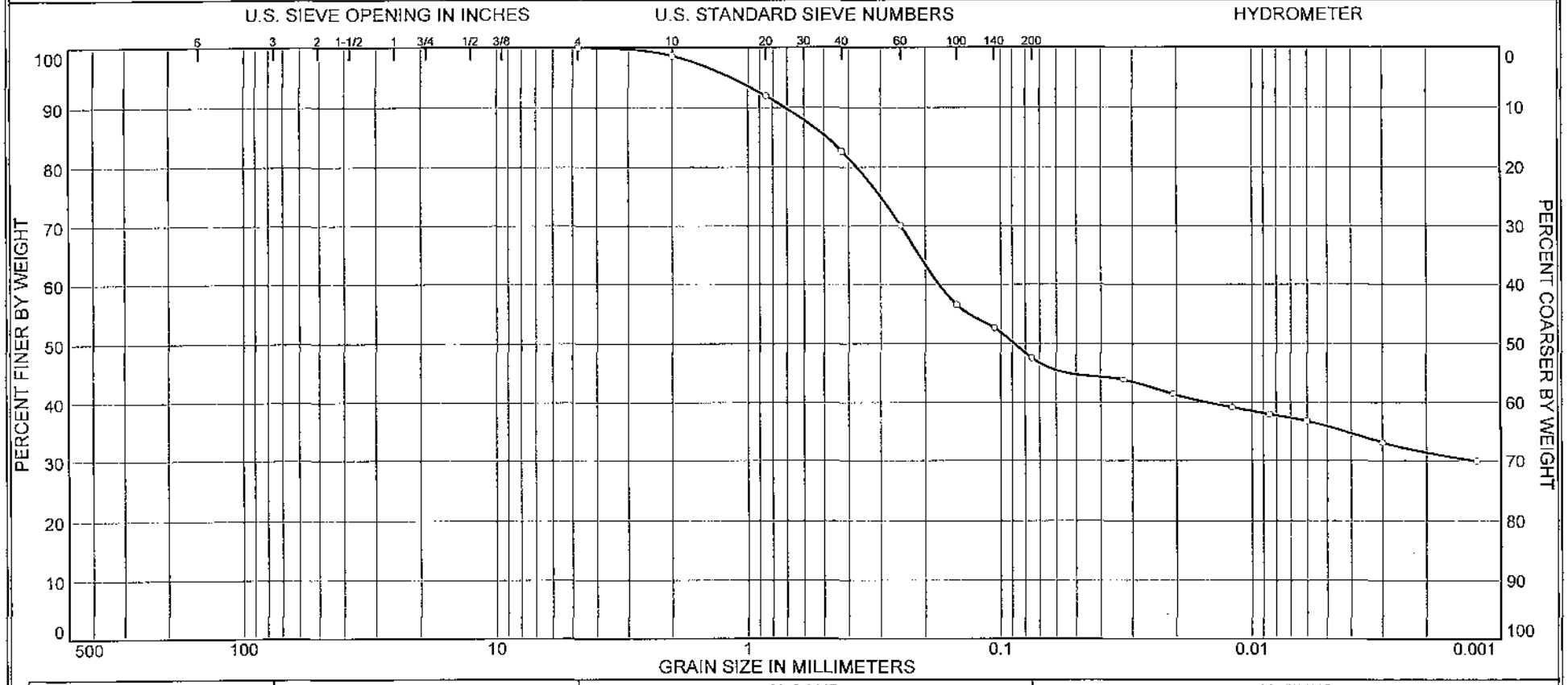
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9787

MACTEC ENGINEERING AND CONSULTING, INC.

• tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.4	15.9	35.1	11.7	35.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	34-35 ft	8/28/09	SC	Brown Clayey Sand	25.2	54	25

Client SRNS

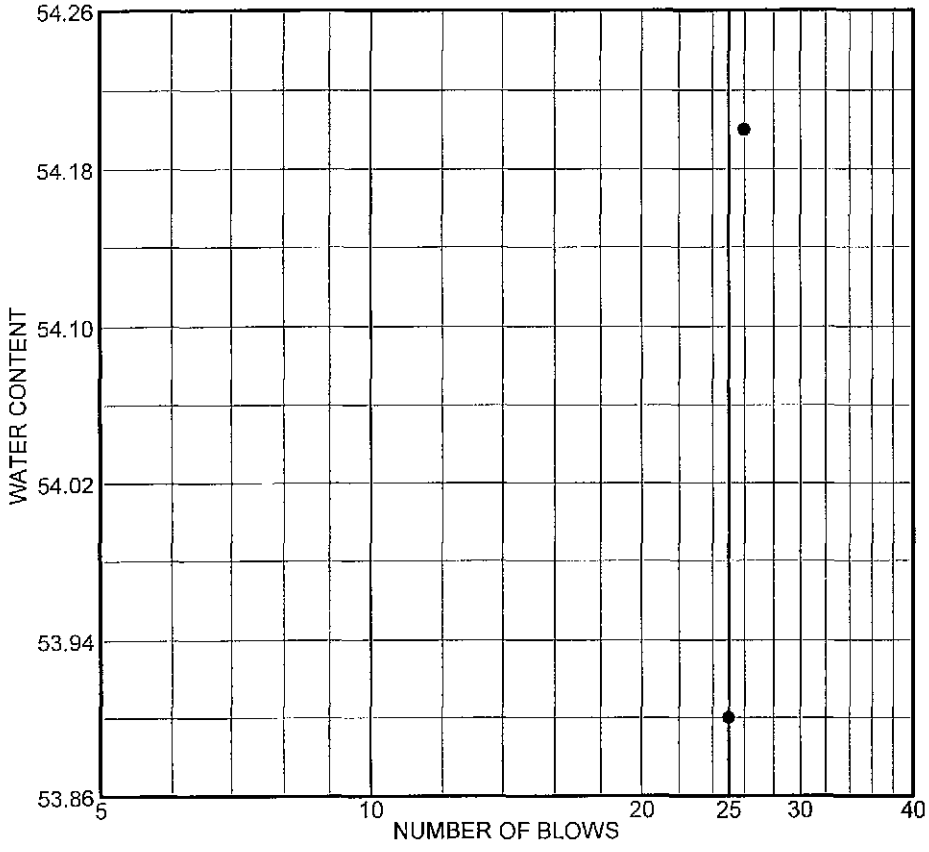
Project ECP Geologic Characterization

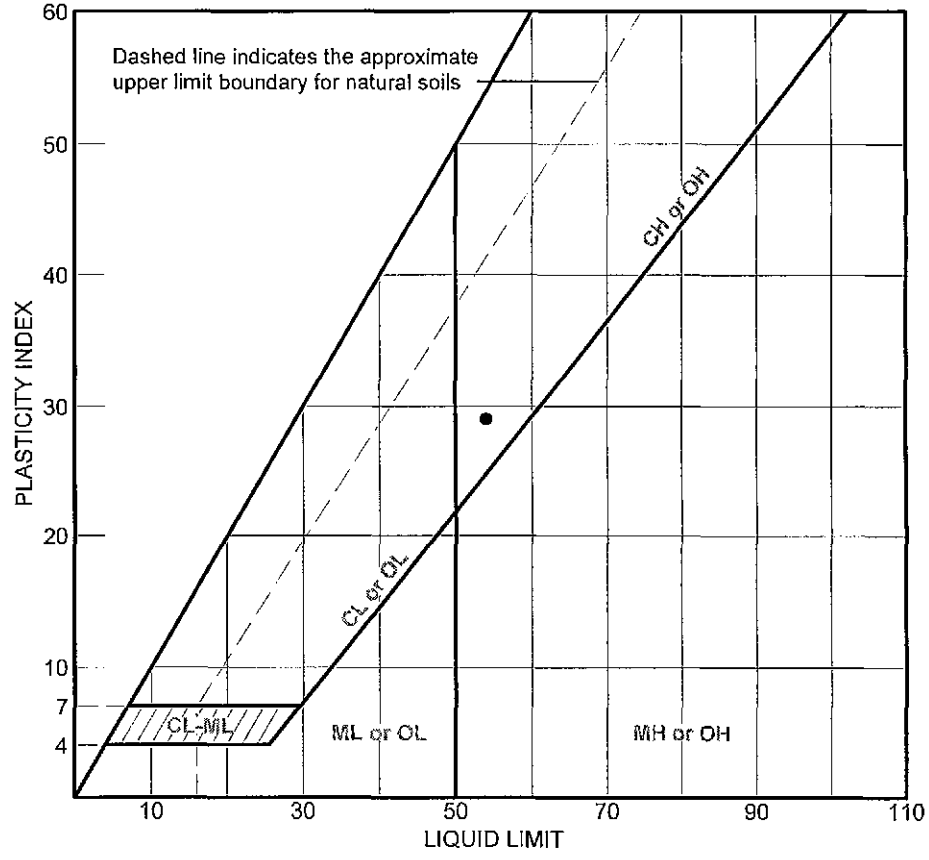
Project No. 6155-08-0031.08 Lab No. 9788

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	34-35 ft	8/28/09	SC	Brown Clayey Sand	25.2	54	29

Client SRNS

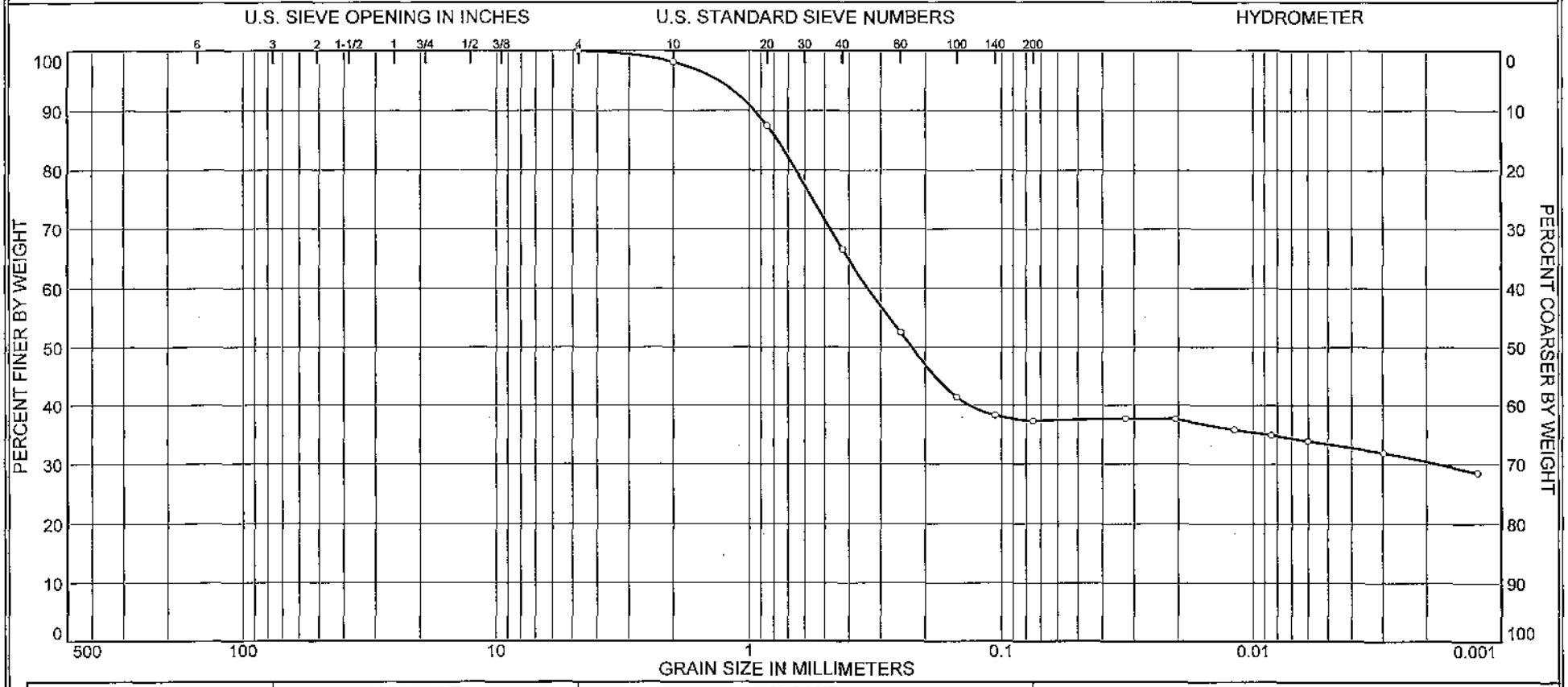
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9788

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.9	31.6	29.2	3.9	33.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	42.5-45 ft	8/28/09	SC	Yellowish Brown Clayey Sand	30.7	90	35

Client SRNS

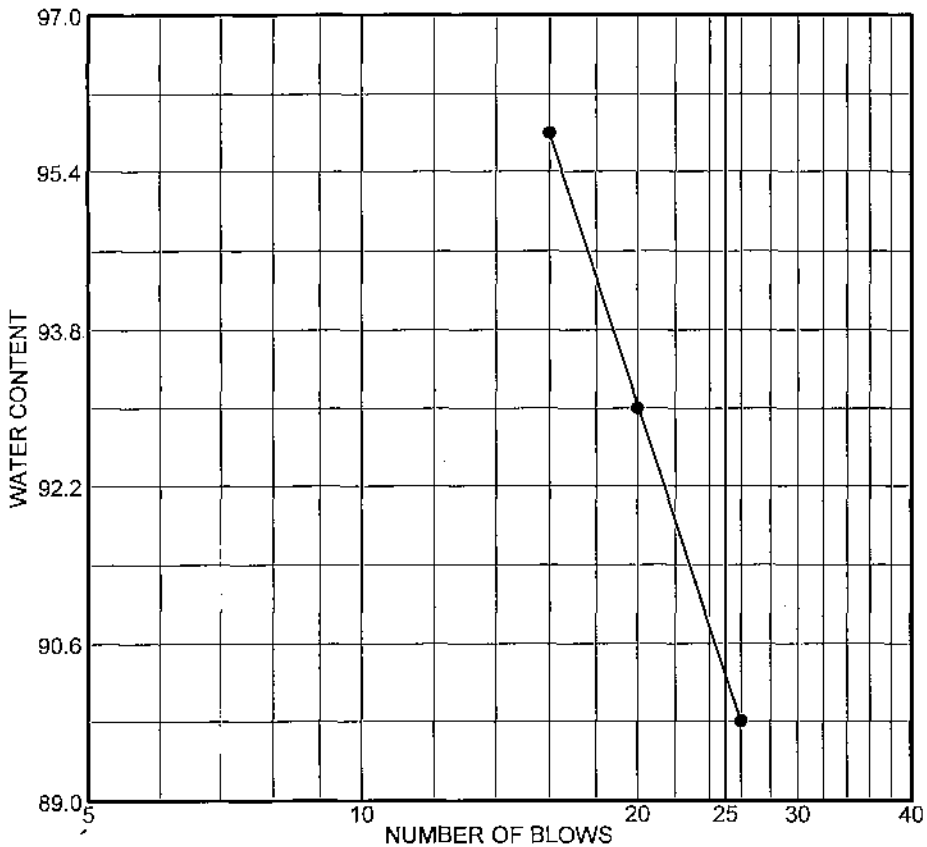
Project ECP Geologic Characterization

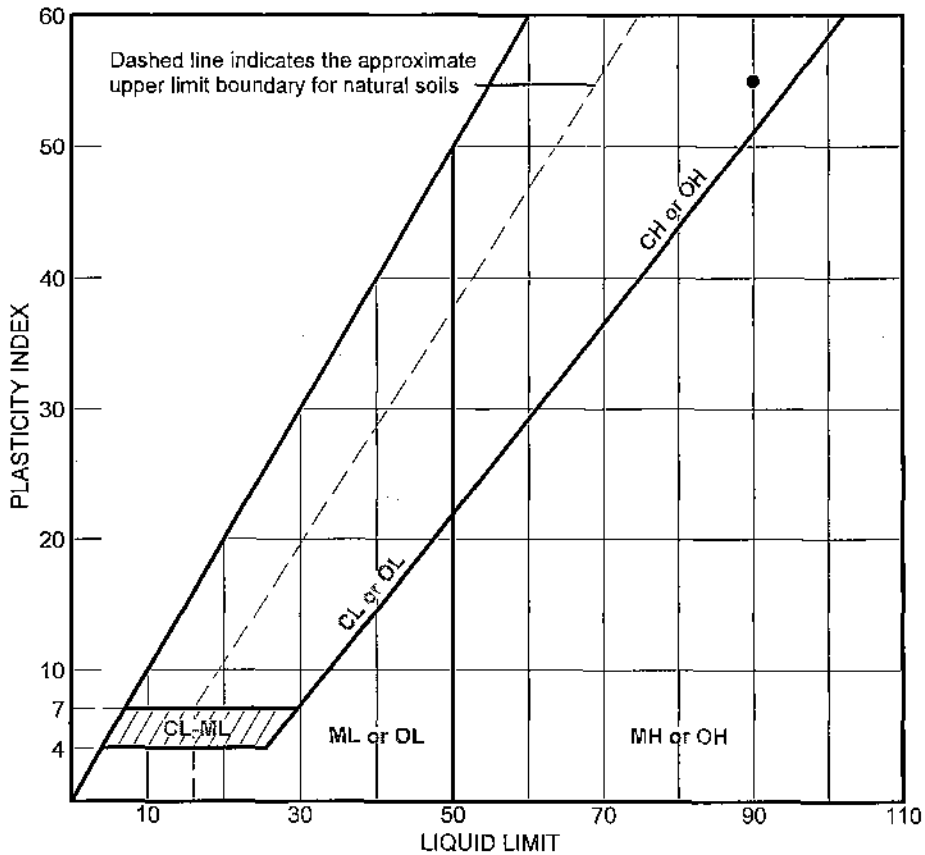
Project No. 6155-08-0031.08 | Lab No. 9789

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	42.5-45 ft	8/28/09	SC	Yellowish Brown Clayey Sand	30.7	90	55

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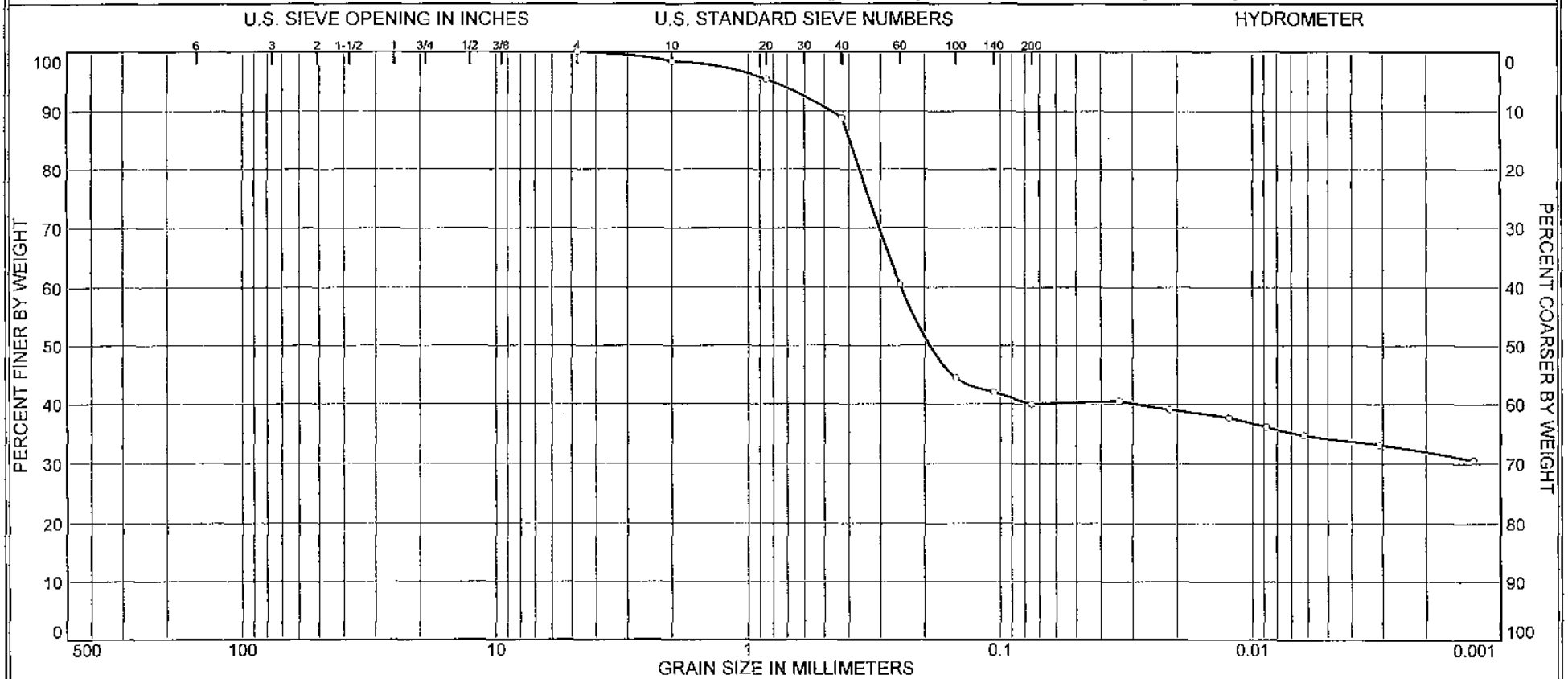
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9789

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed by: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.6	9.5	48.9	5.8	34.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	54-55 ft	8/28/09	SC	Brownish Tan Clayey Sand	31.8	59	25

Client SRNS

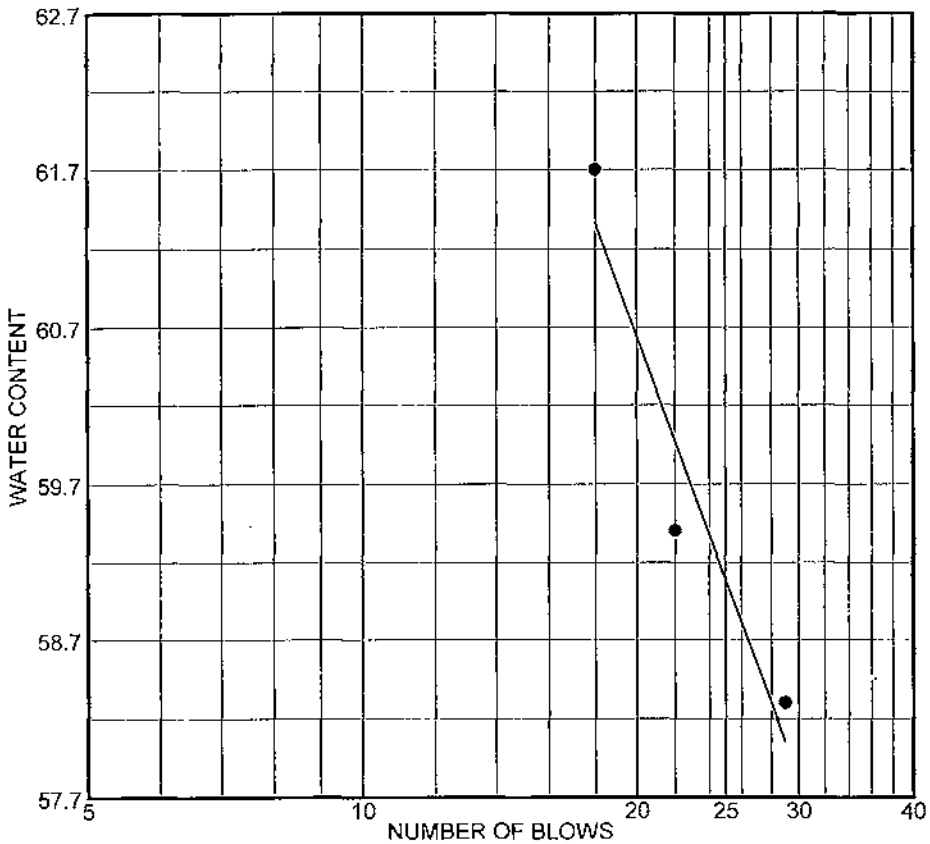
Project ECP Geologic Characterization

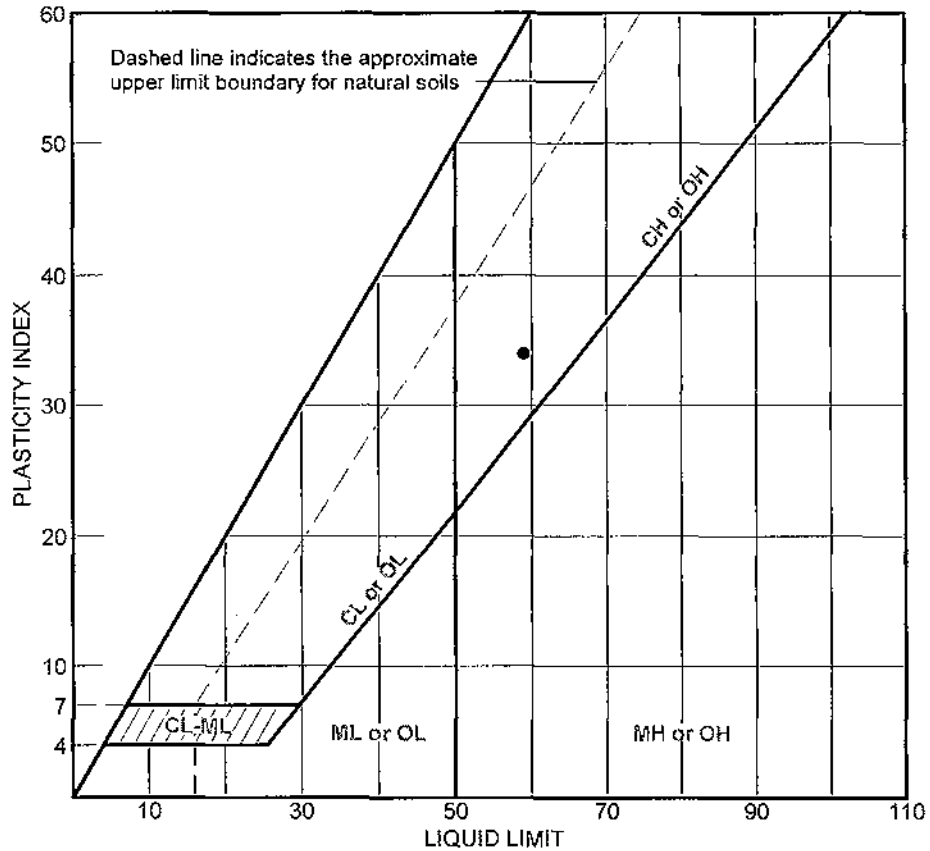
Project No. 6155-08-0031.08 Lab No. 9790

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP8/SB2	UD	54-55 ft	8/28/09	SC	Brownish Tan Clayey Sand	31.8	59	34

Client SRNS

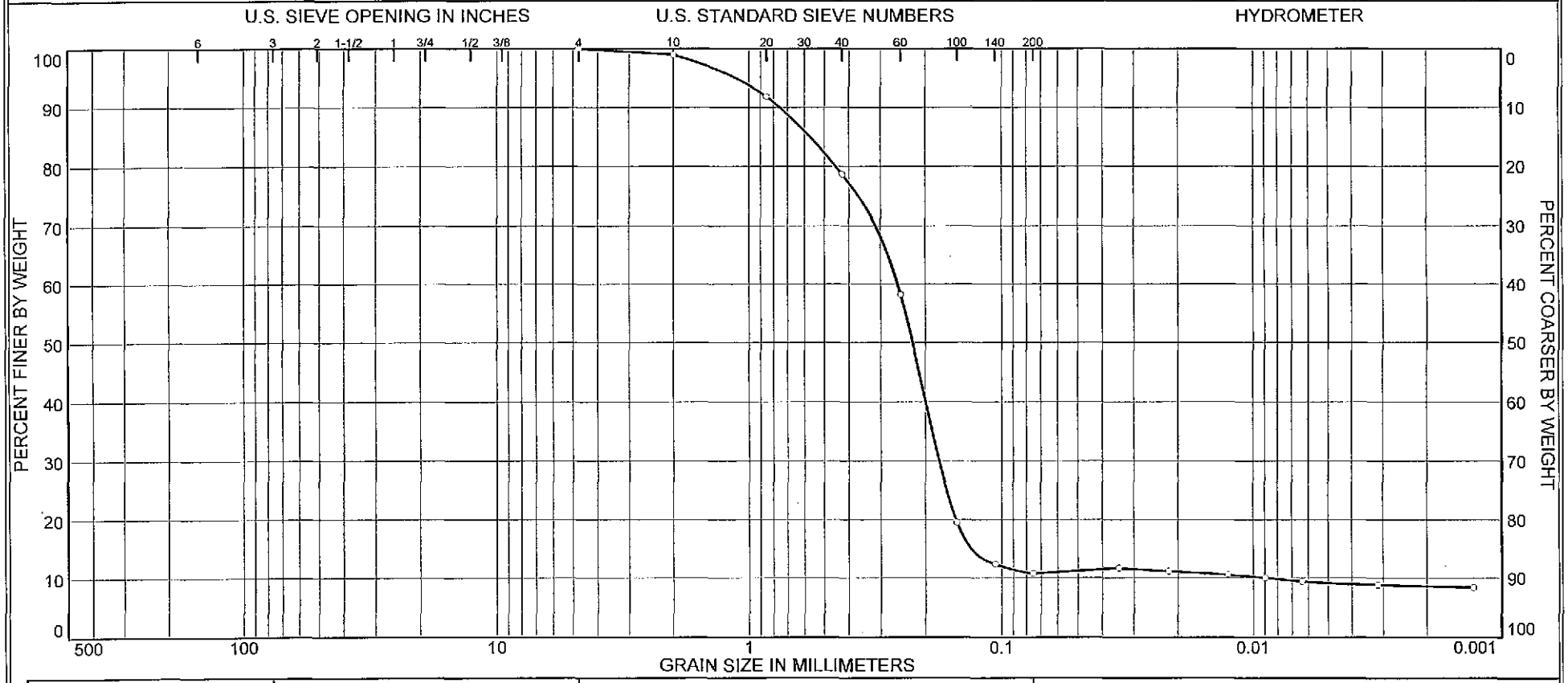
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9790

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.0	20.3	68.0	1.6	9.1

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	61.5-63 ft	8/28/09	SP-SM	Brown Poorly Graded Sand with Silt	19.5	NV	NP

Client SRNS

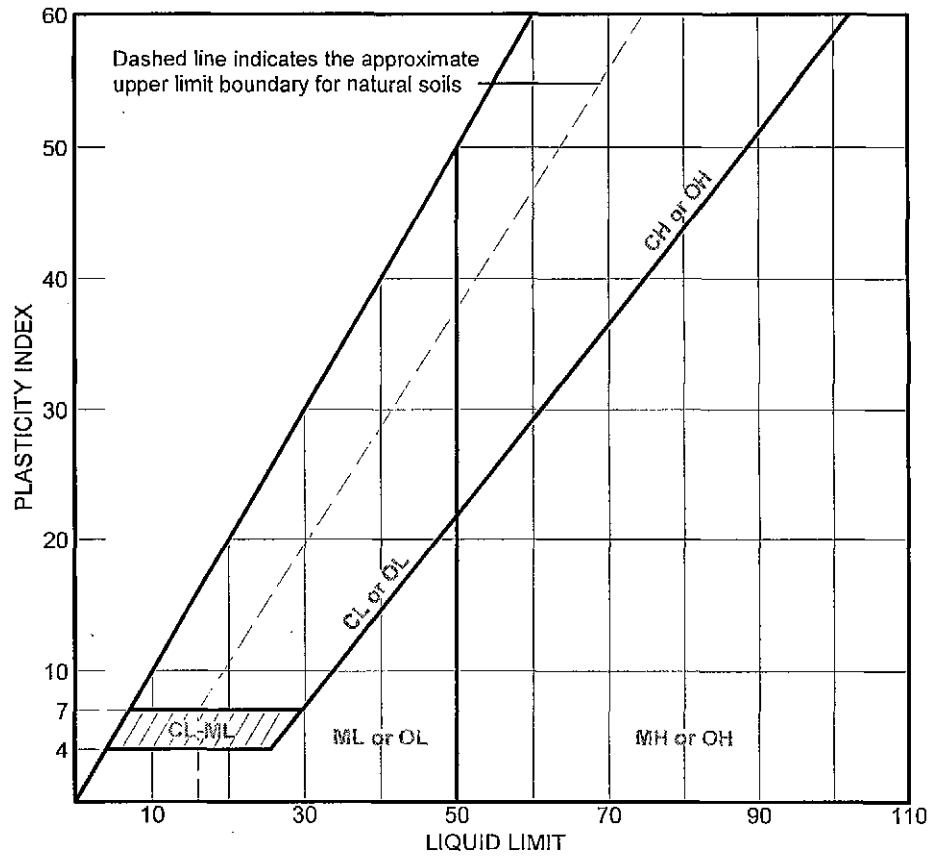
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9791

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	61.5-63 ft	8/28/09	SP-SM	Brown Poorly Graded Sand with Silt	19.5	NV	NP

Client SRNS

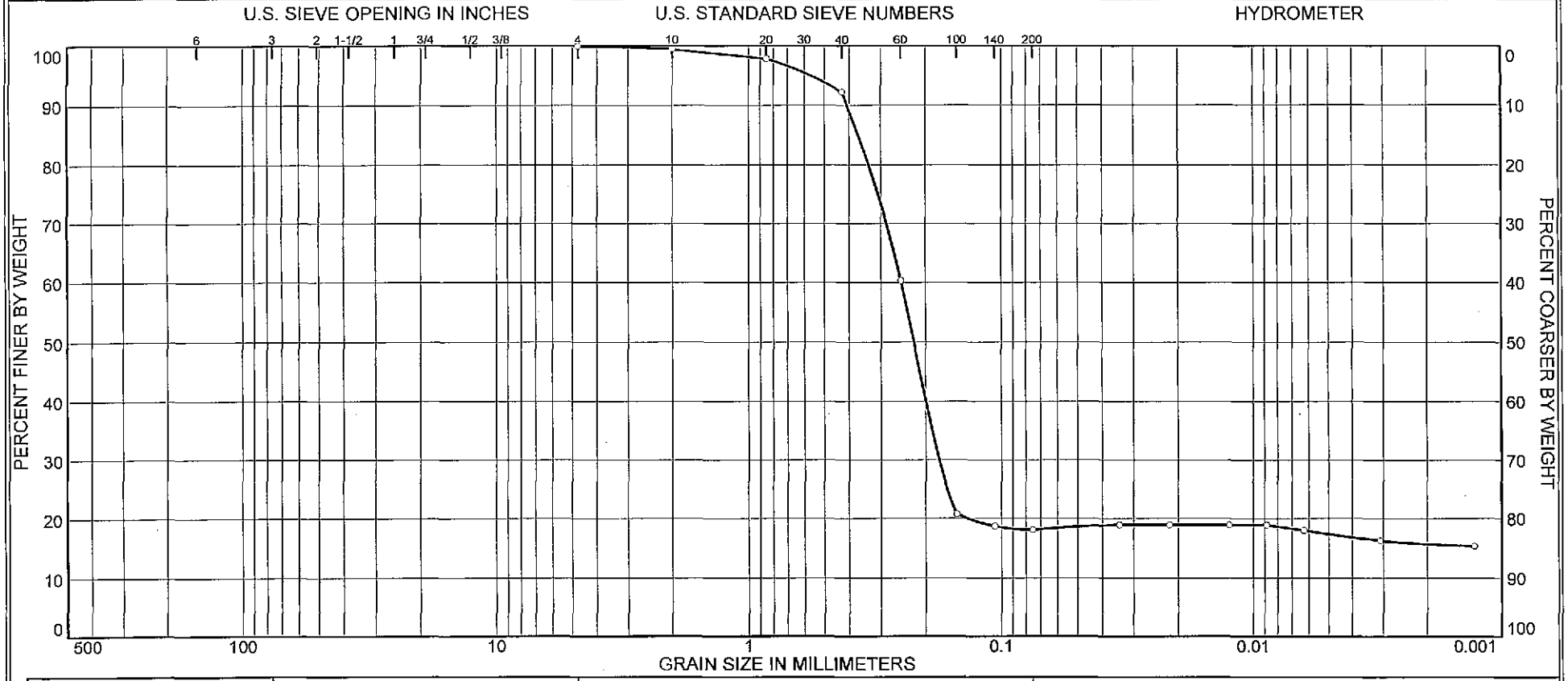
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9791

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.5	7.4	74.0	0.7	17.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	72.5-75 ft	9/3/09	SC	Yellow Clayey Sand	22.9	38	22

Client SRNS

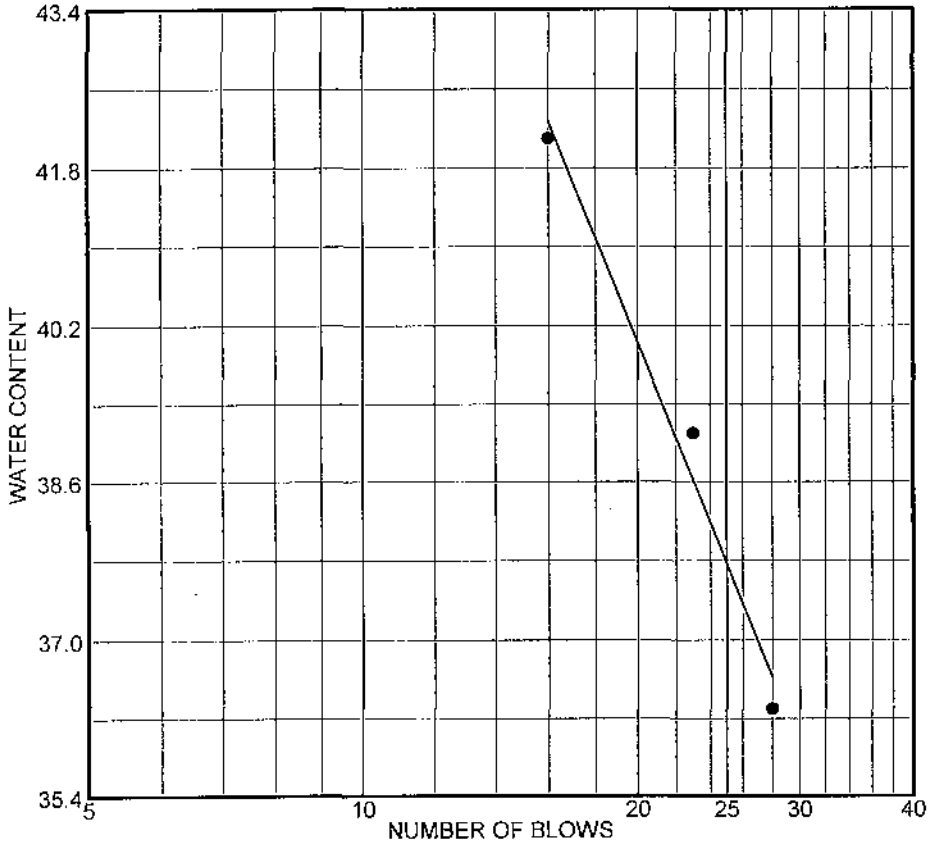
Project ECP Geologic Characterization

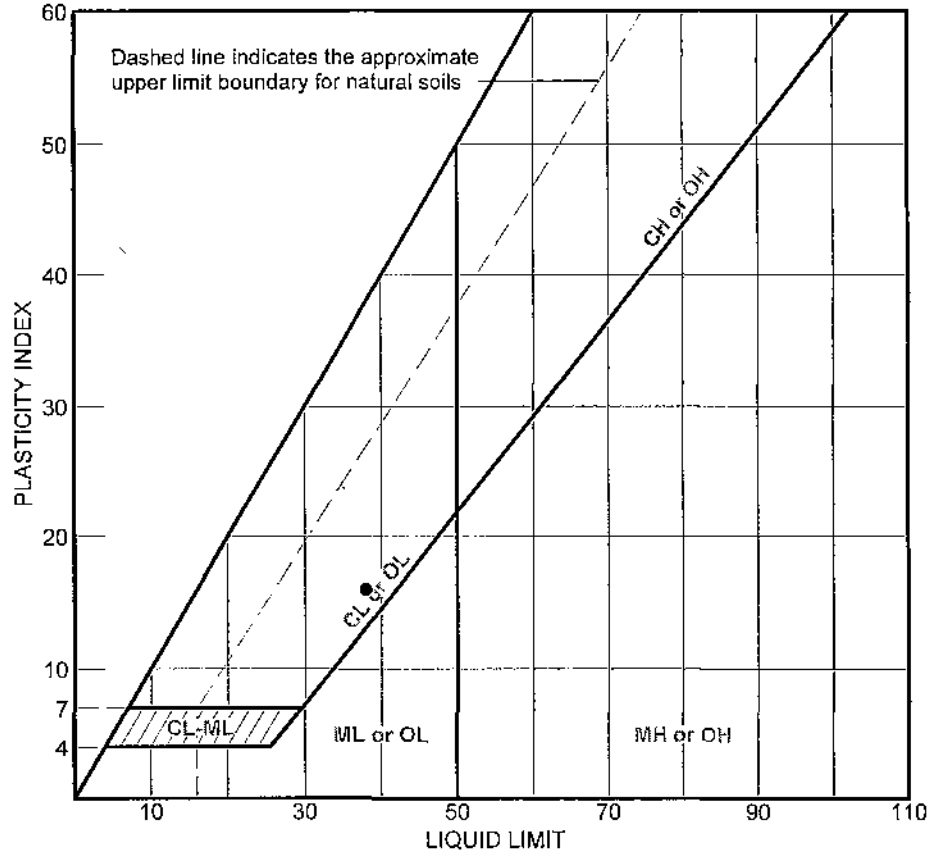
Project No. 6155-08-0031.08 Lab No. 9792

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	72.5-75 ft	9/3/09	SC	Yellow Clayey Sand	22.9	38	16

Client SRNS

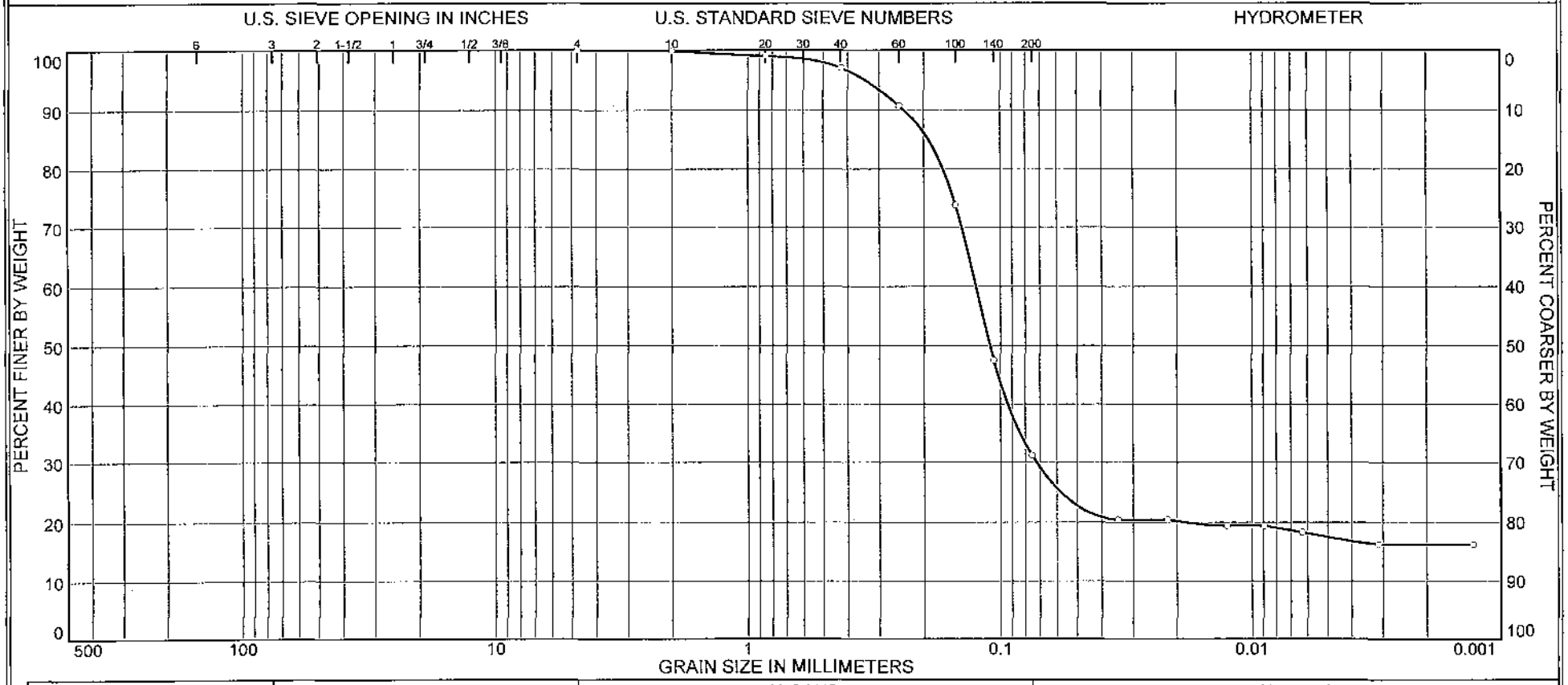
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9792

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed by: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	2.9	65.8	13.7	17.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP8/SB2	UD	83.5-85 ft	9/2/09	SC	Yellow Clayey Sand	31.5	40	24

Client SRNS

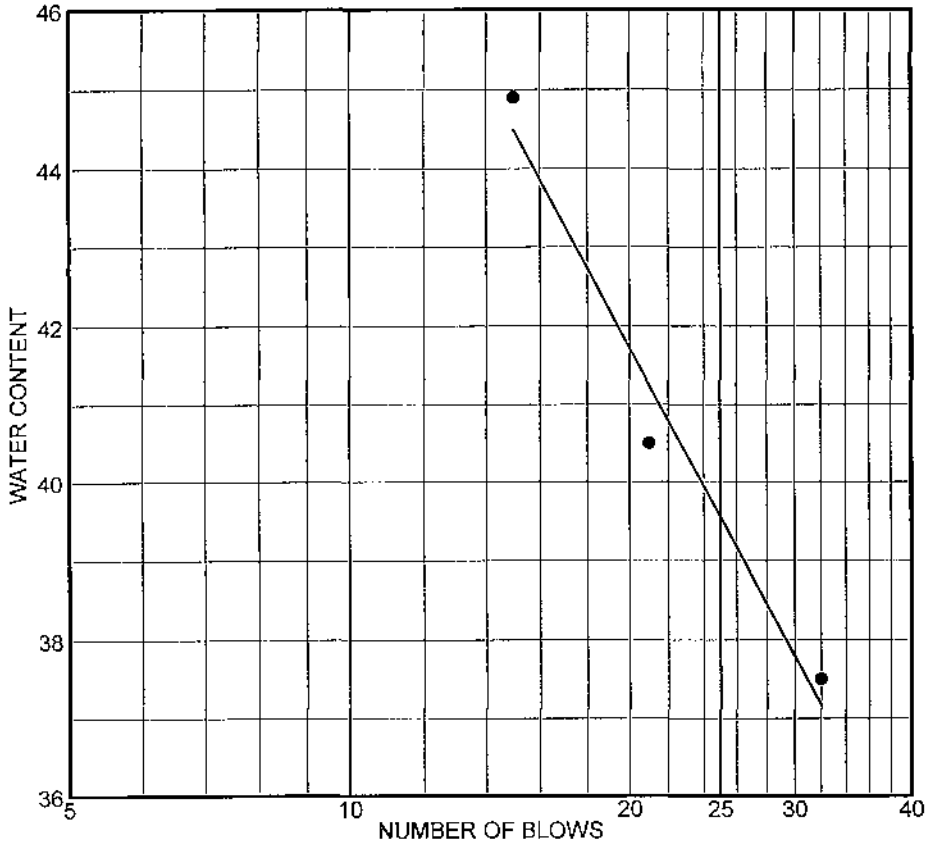
Project ECP Geologic Characterization

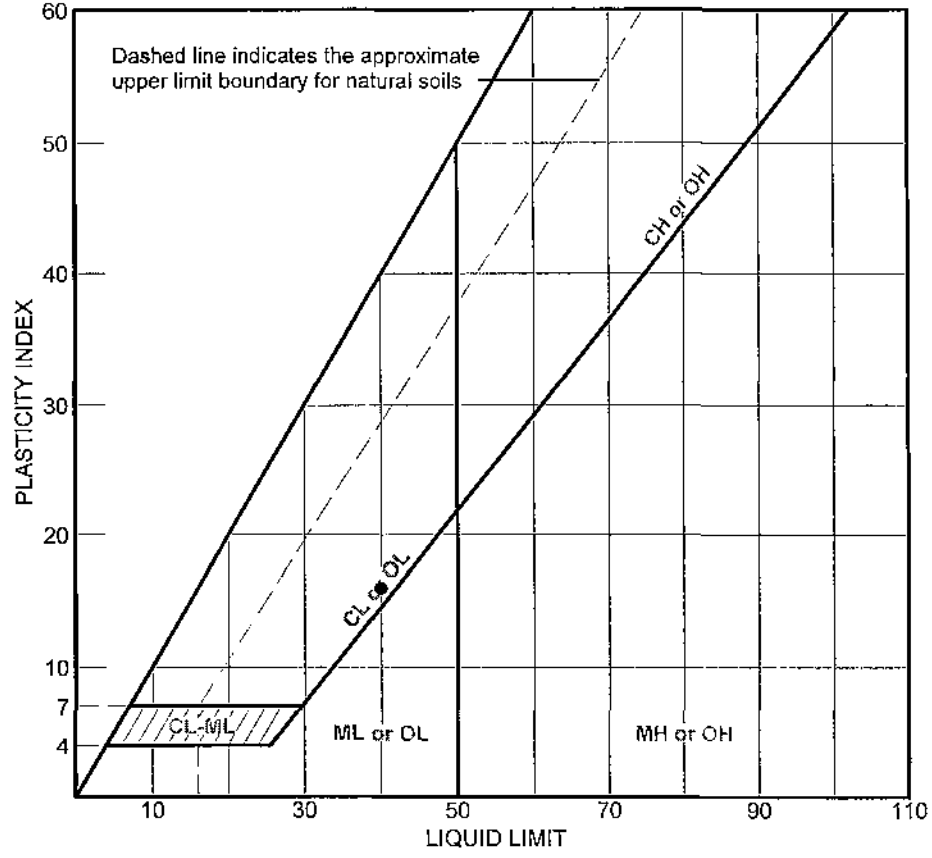
Project No. 6155-08-0031.08 Lab No. 9793

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP8/SB2	UD	83.5-85 ft	9/2/09	SC	Yellow Clayey Sand	31.5	40	16

Client SRNS

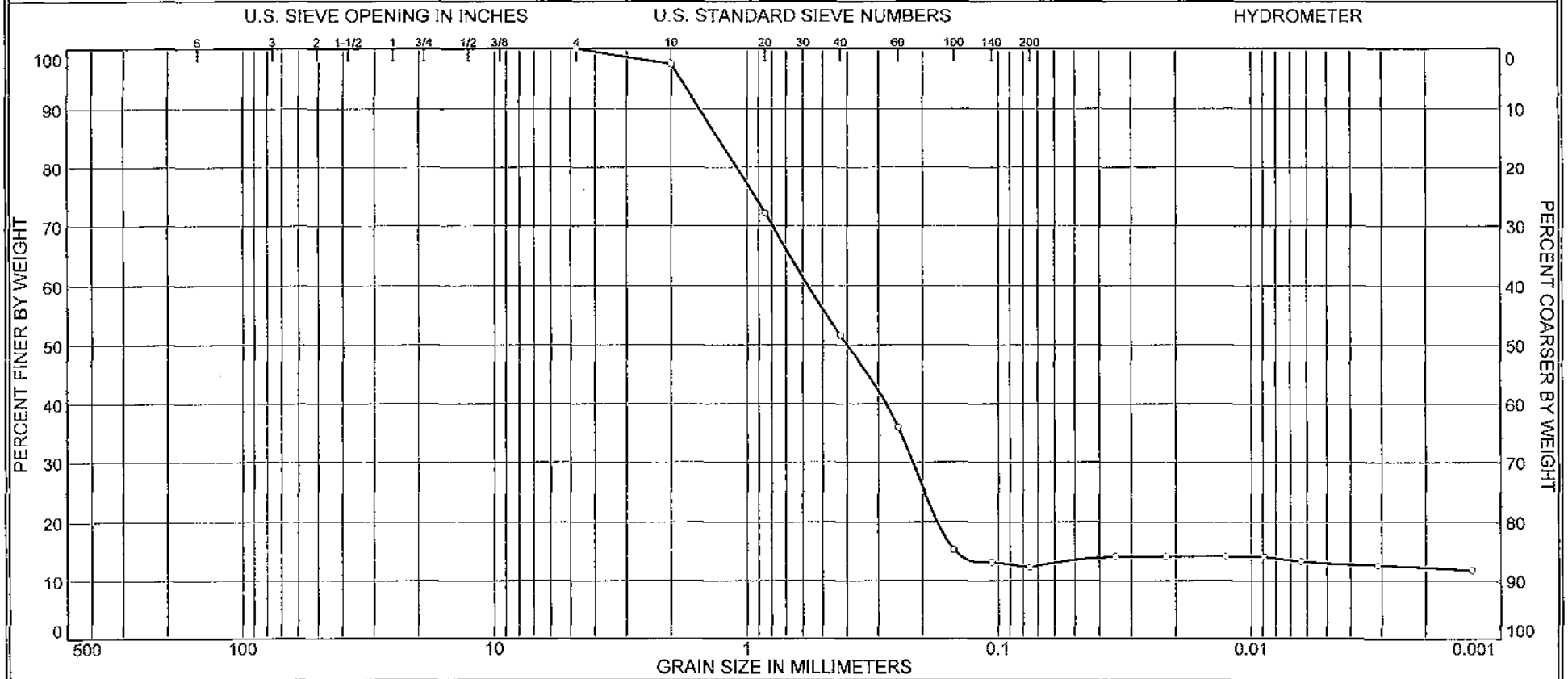
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9793

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: Eh Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	2.6	45.8	39.3		13.0

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	8.5-11 ft	9/3/09	SC	Brown Clayey Sand	12.4	27	19

Client SRNS

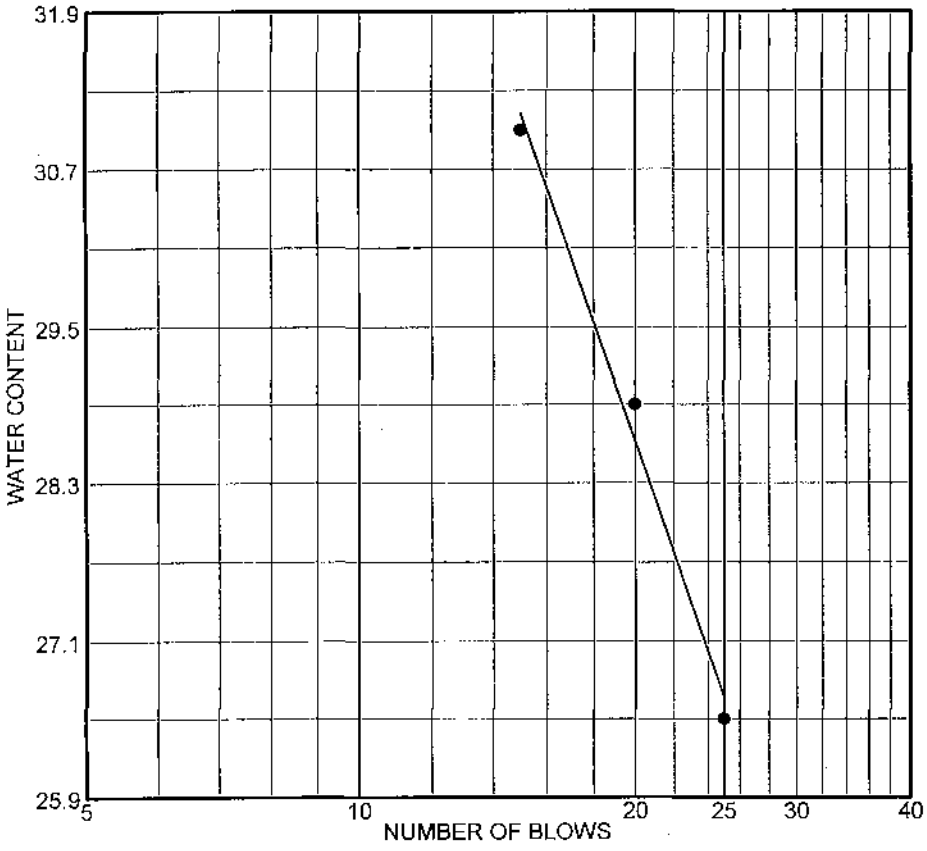
Project ECP Geologic Characterization

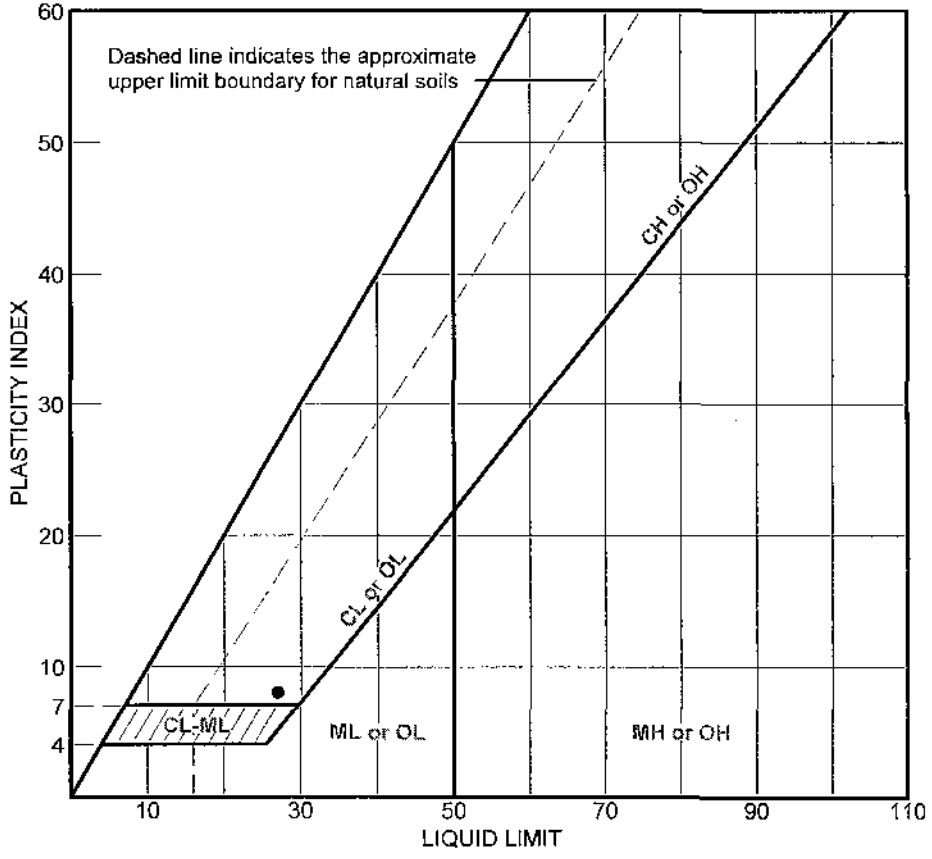
Project No. 6155-08-0031.08 | Lab No. 9794

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP6/SB2	UD	8.5-11 ft	9/3/09	SC	Brown Clayey Sand	12.4	27	8

Client SRNS

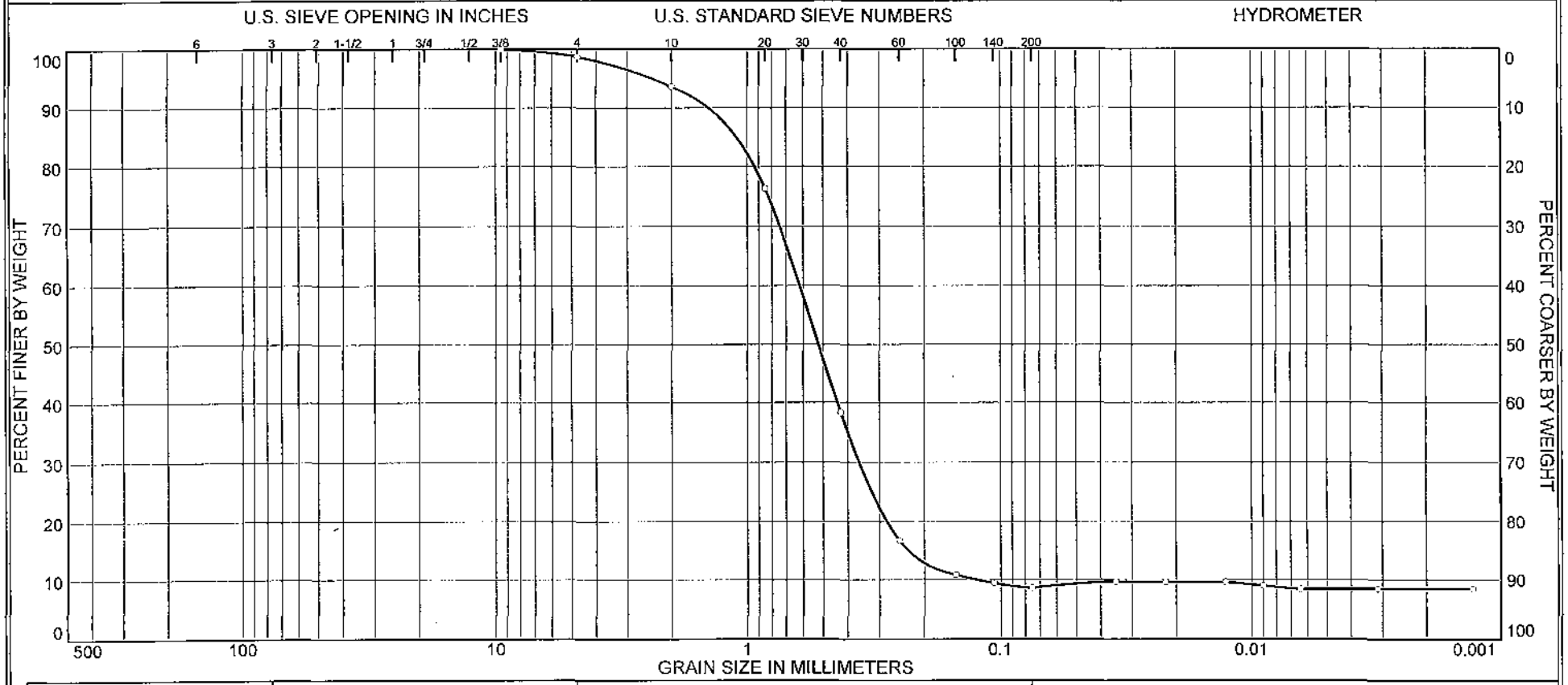
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 | Lab No. 9794

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	1.3	5.1	55.3	29.7	0.2	8.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	19-21 ft	9/3/09	SP-SC	Yellowish Brown Poorly Graded Sand with Clay	12.8	30	18

Client SRNS

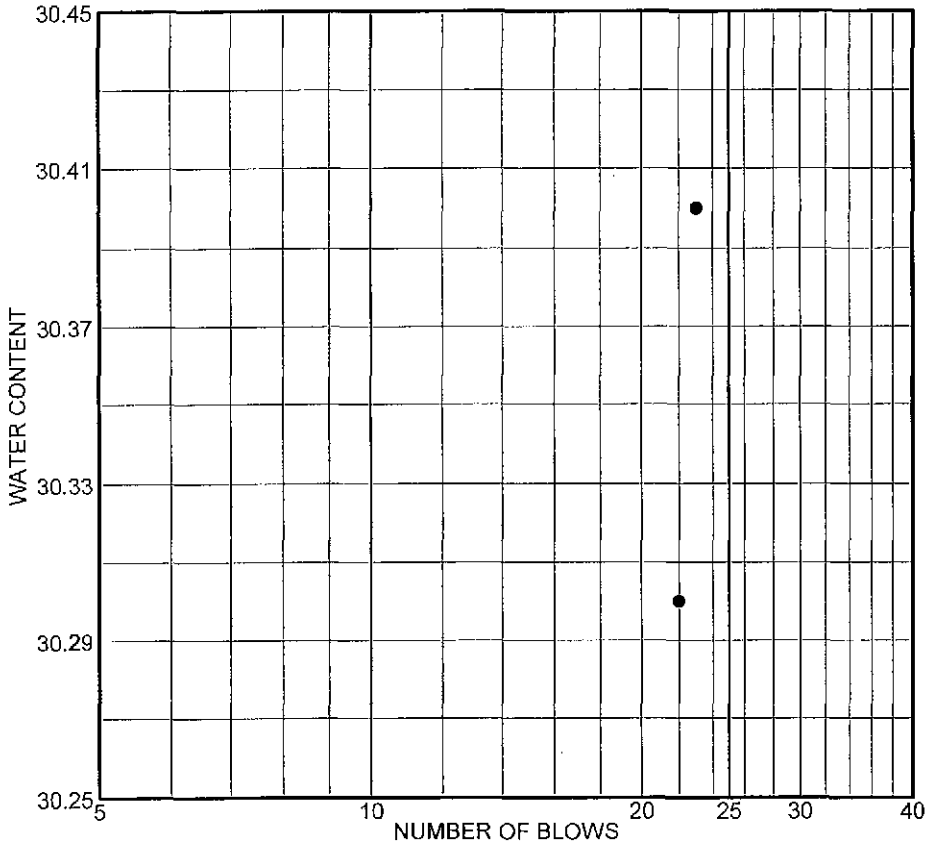
Project ECP Geologic Characterization

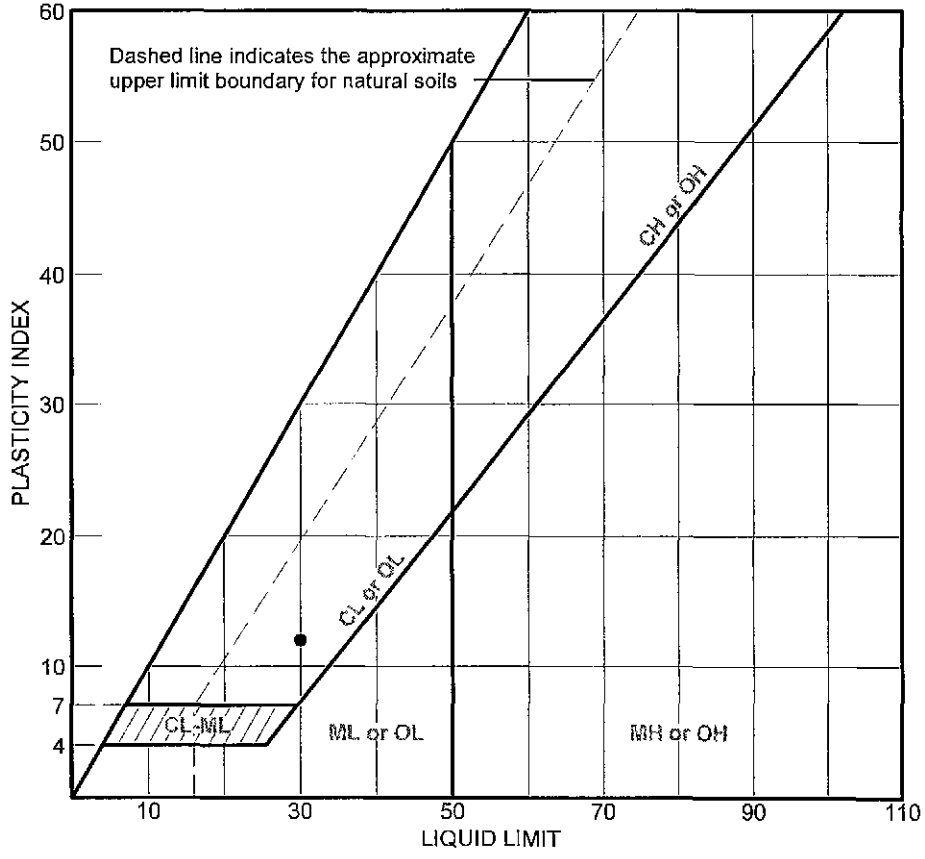
Project No. 6155-08-0031.08 Lab No. 9795

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP6/SB2	UD	19-21 ft	9/3/09	SP-SC	Yellowish Brown Poorly Graded Sand with Clay	12.8	30	12

Client SRNS

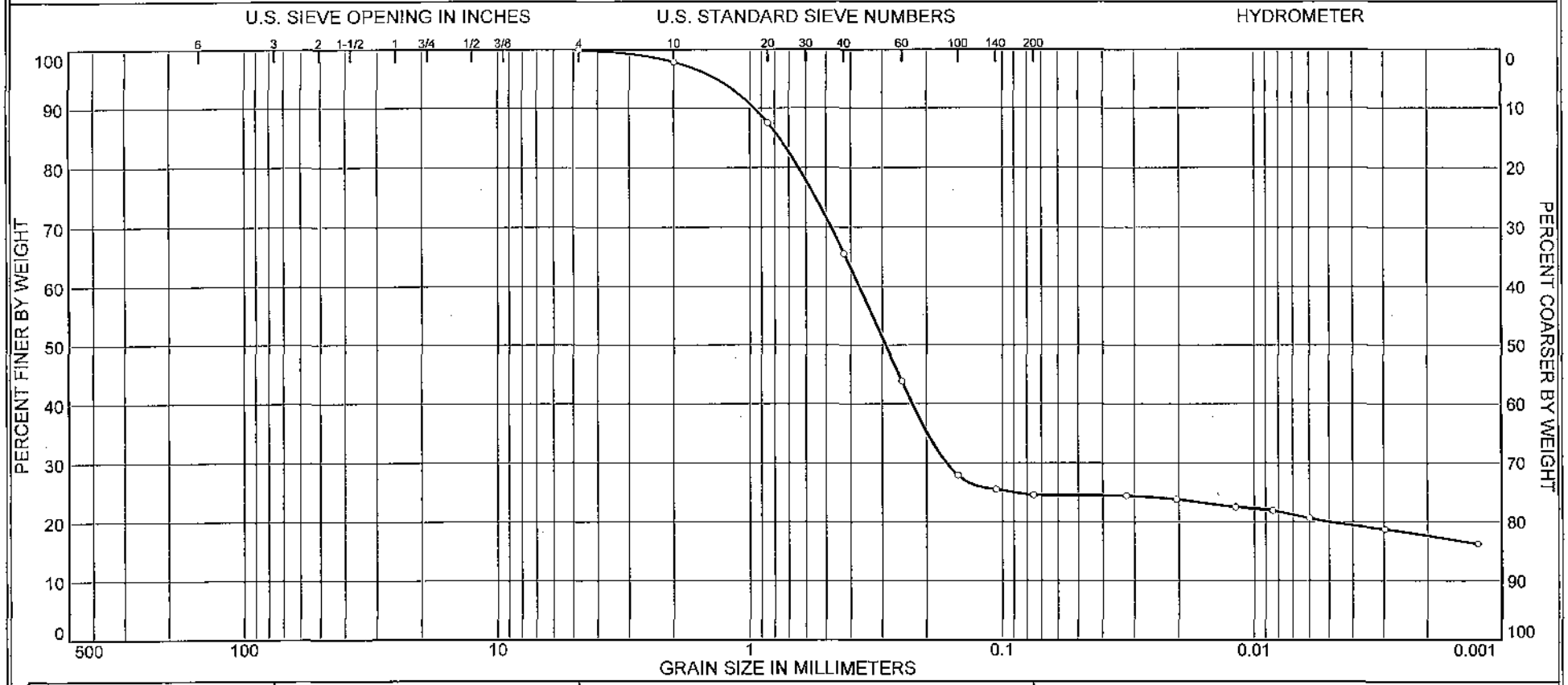
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9795

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	2.1	32.3	41.1	4.5	20.0

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	29.5-31 ft	9/3/09	SC	Brown and Purple Clayey Sand	13.8	49	22

Client SRNS

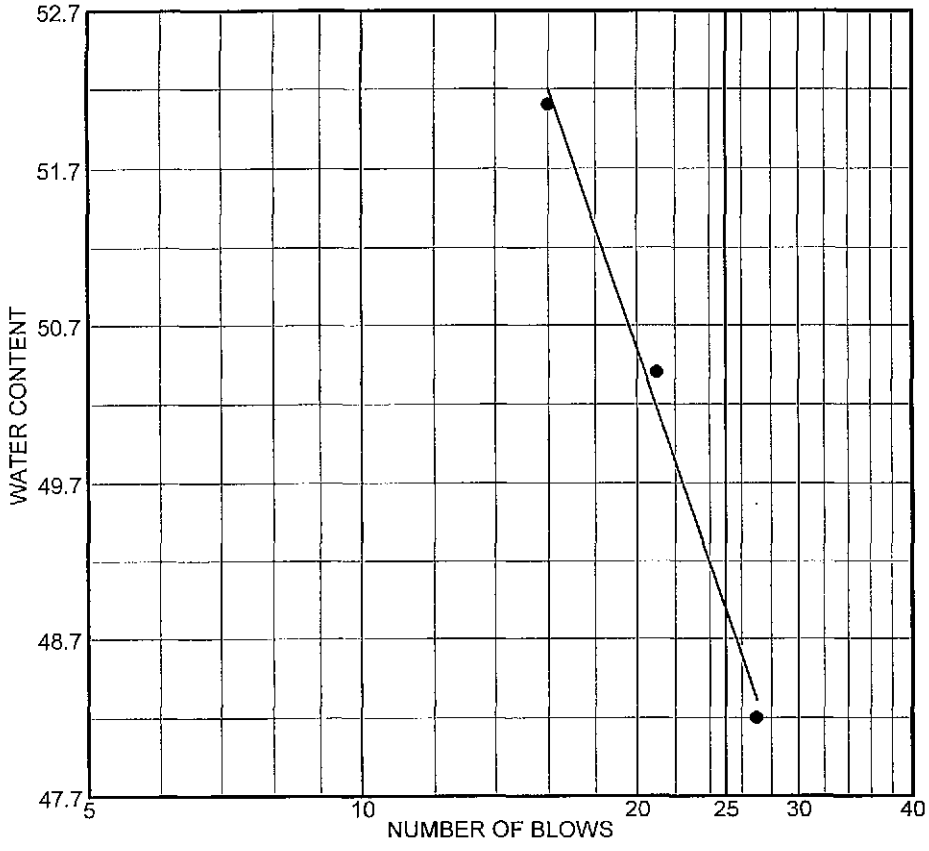
Project ECP Geologic Characterization

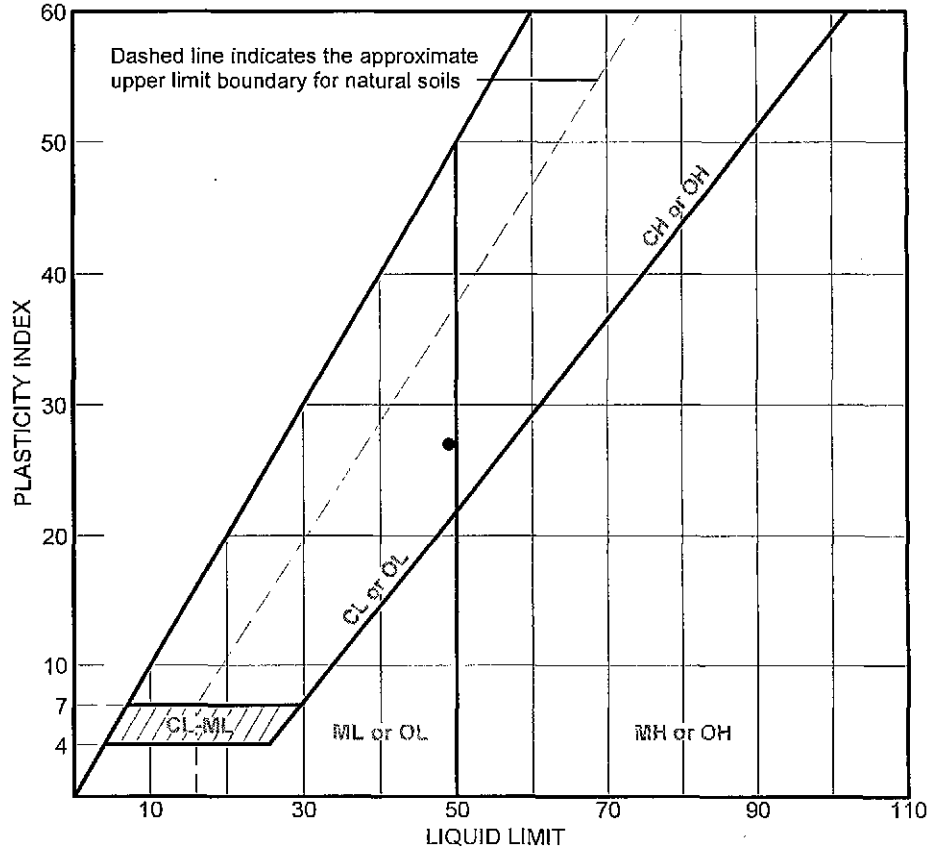
Project No. 6155-08-0031.08 Lab No. 9796

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP6/SB2	UD	29.5-31 ft	9/3/09	SC	Brown and Purple Clayey Sand	13.8	49	27

Client SRNS

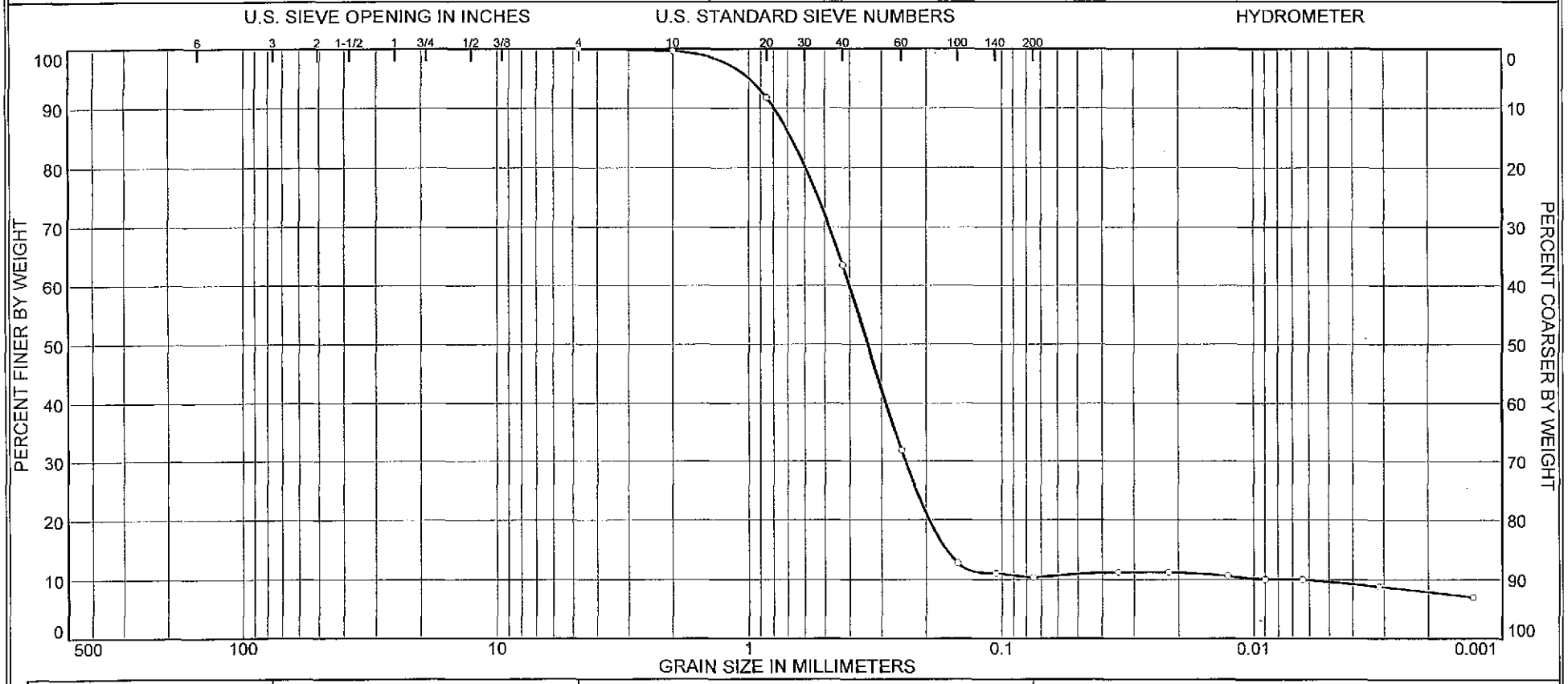
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9796

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.3	36.2	53.2	0.7	9.6

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	41.5-43 ft	9/3/09	SP-SC	Yellowish Brown Poorly Graded Sand with Clay	17.1	29	20

Client SRNS

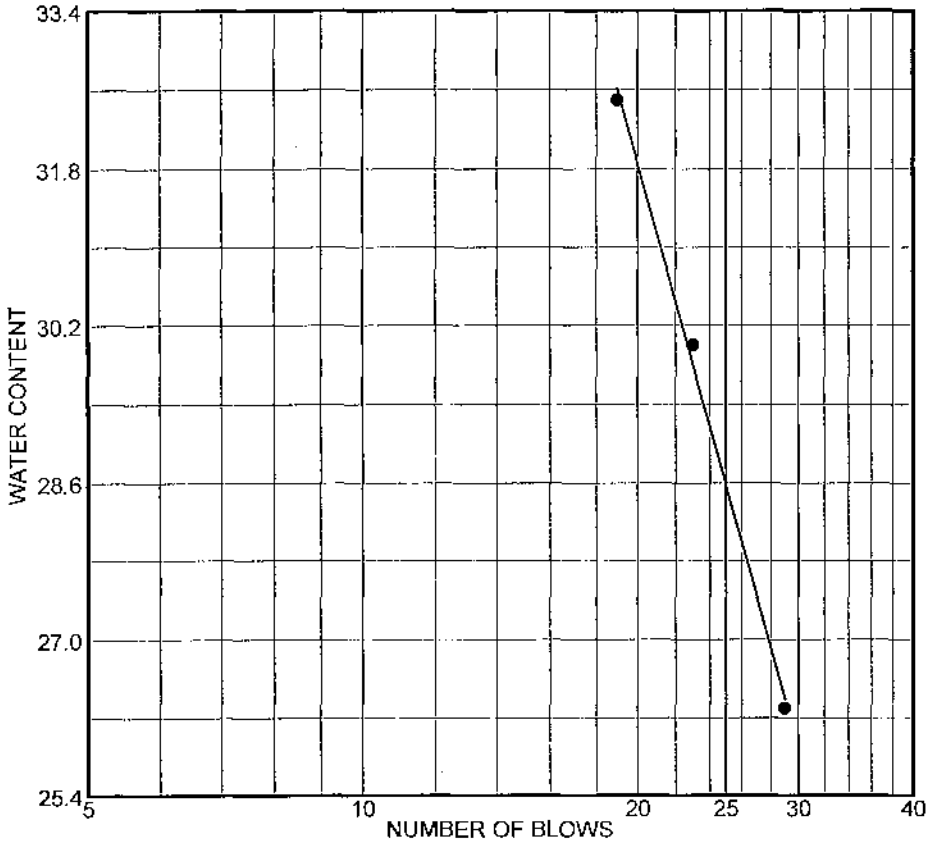
Project ECP Geologic Characterization

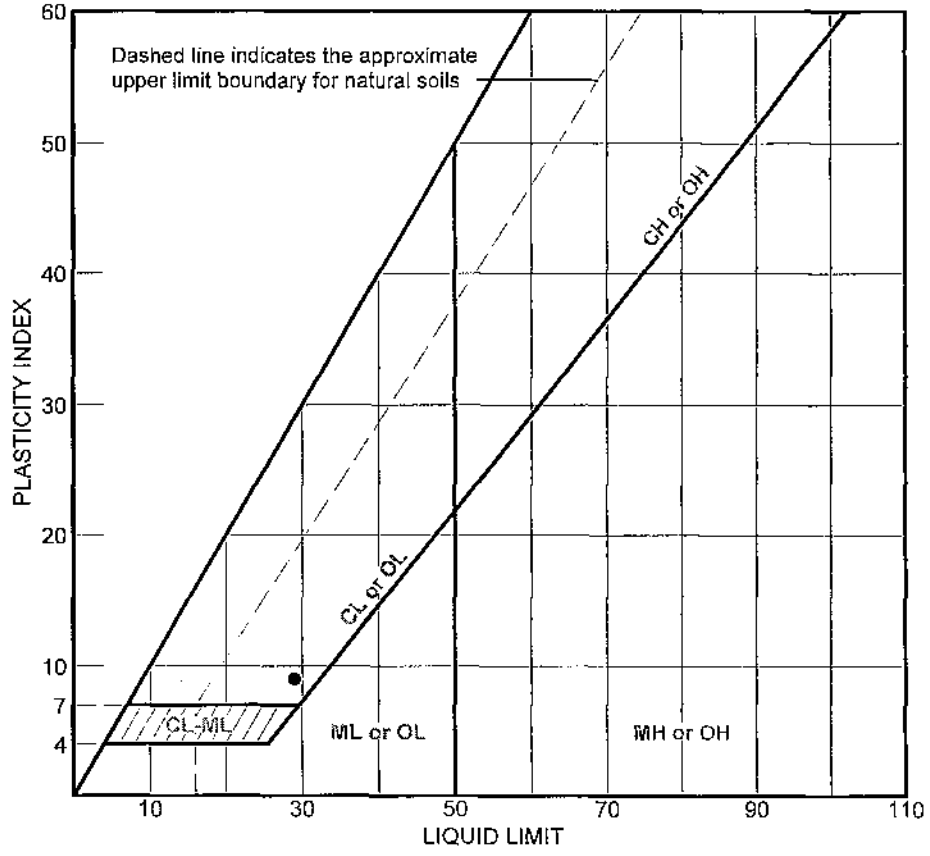
Project No. 6155-08-0031.08 Lab No. 9797

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP6/SB2	UD	41.5-43 ft	9/3/09	SP-SC	Yellowish Brown Poorly Graded Sand with Clay	17.1	29	9

Client SRNS

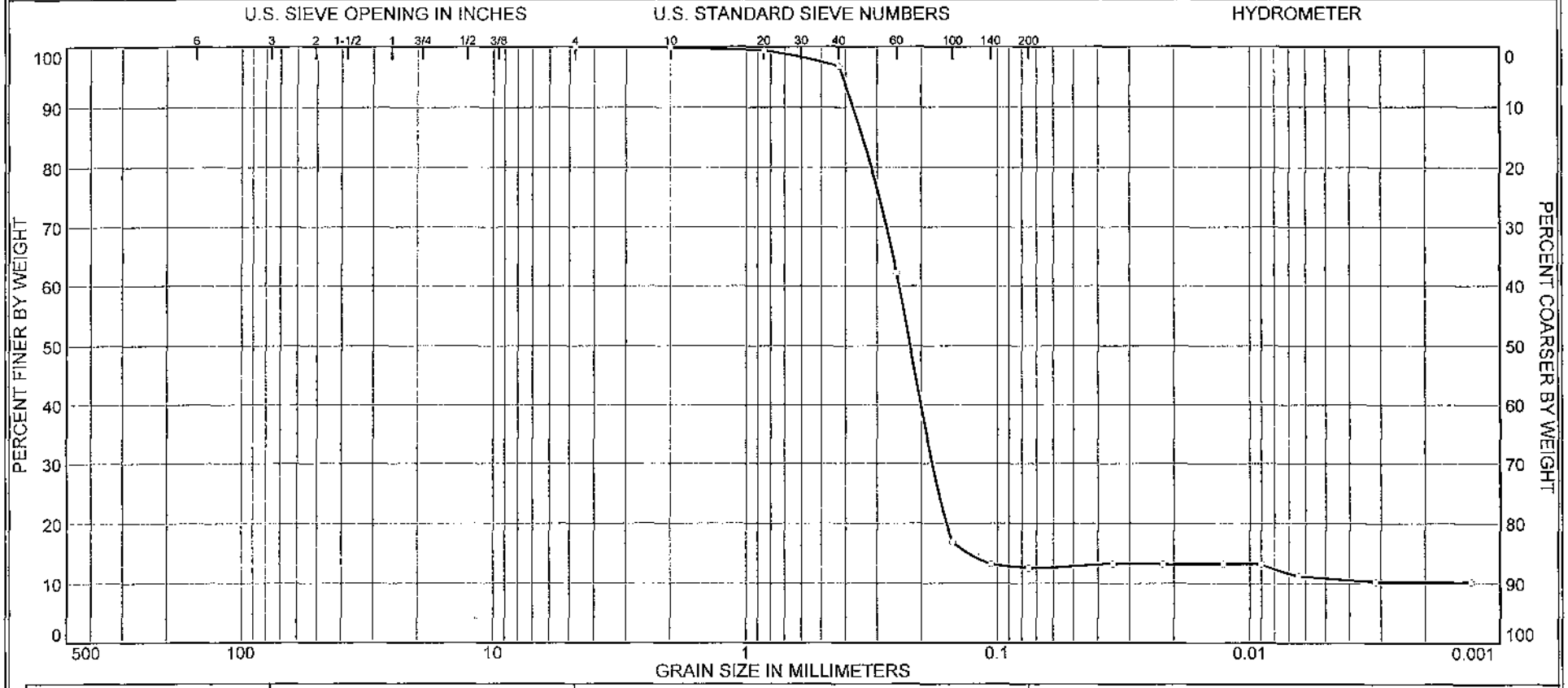
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9797

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	3.2	84.2	1.6	10.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	49-51 ft	9/10/09	SM	Yellow Silty Sand	22.8	NV	NP

Client SRNS

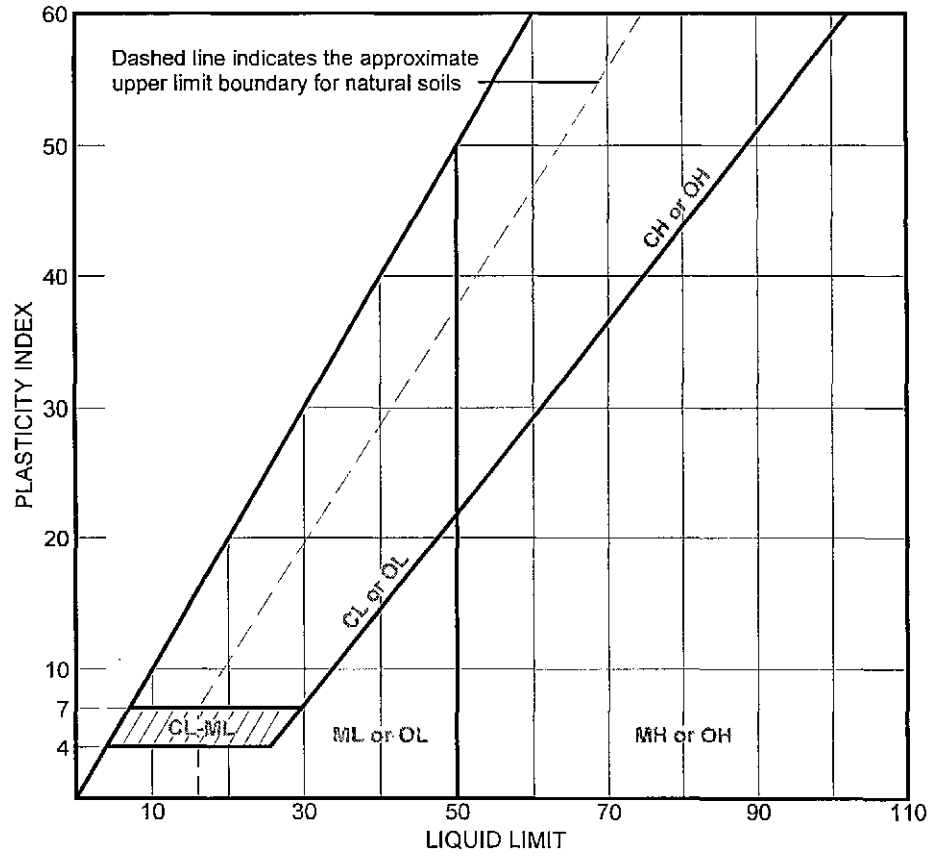
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9798

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP6/SB2	UD	49-51 ft	9/10/09	SM	Yellow Silty Sand	22.8	NV	NP

Client SRNS

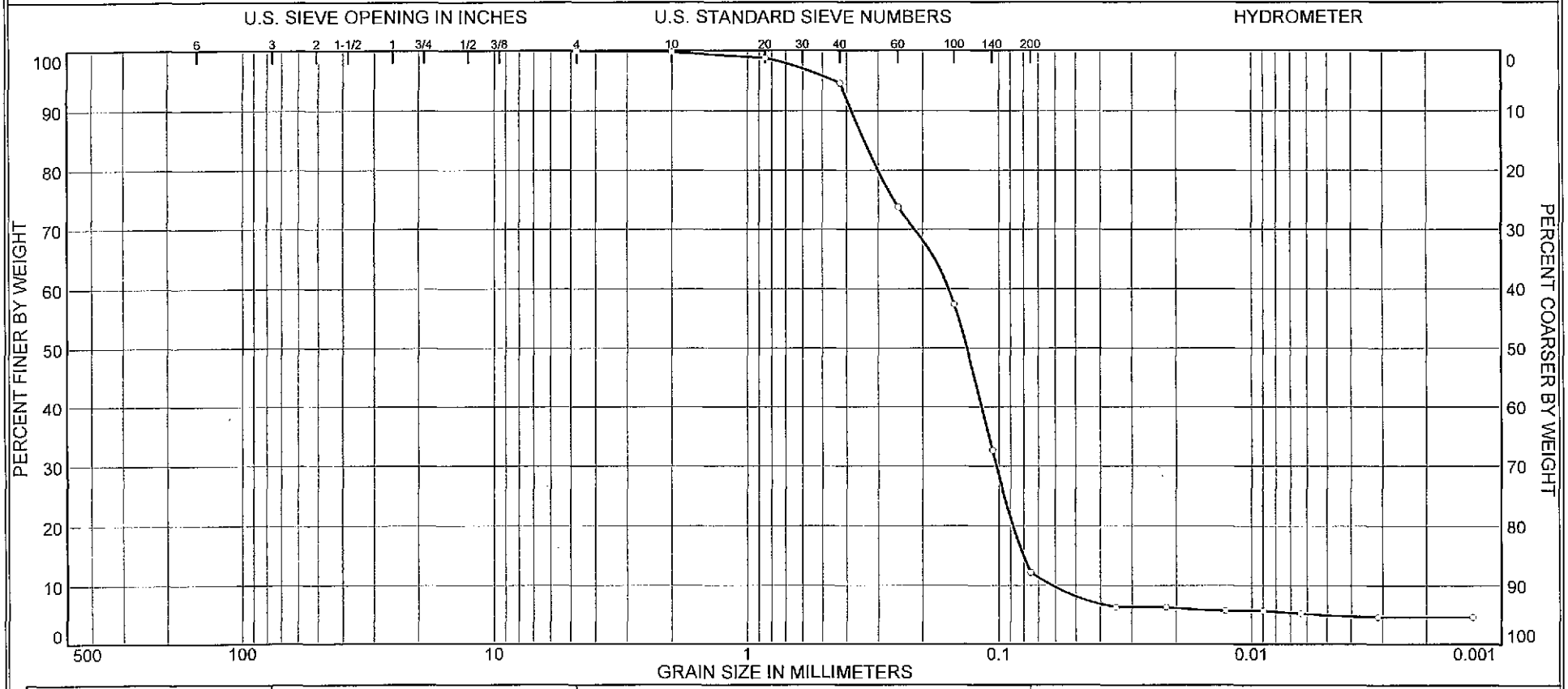
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9798

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.2	5.2	82.4	7.3	4.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	70.5-73 ft	9/10/09	SM	Yellow Silty Sand	22.6	NV	NP

Client SRNS

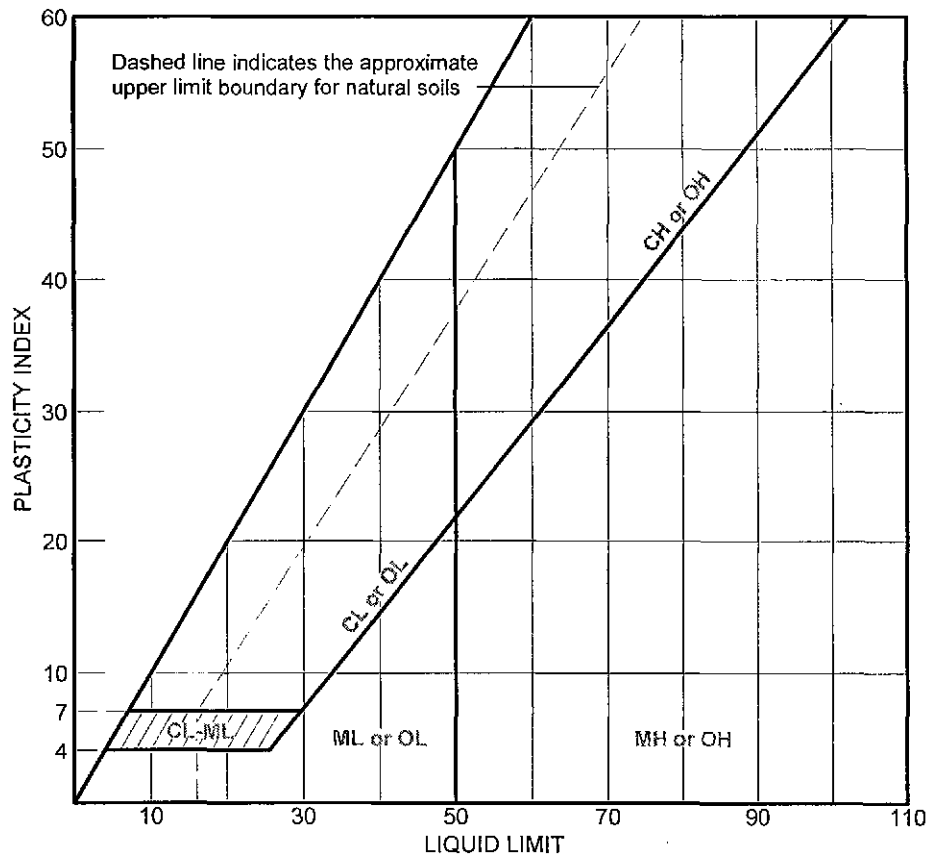
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9799

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP6/SB2	UD	70.5-73 ft	9/10/09	SM	Yellow Silty Sand	22.6	NV	NP

Client SRNS

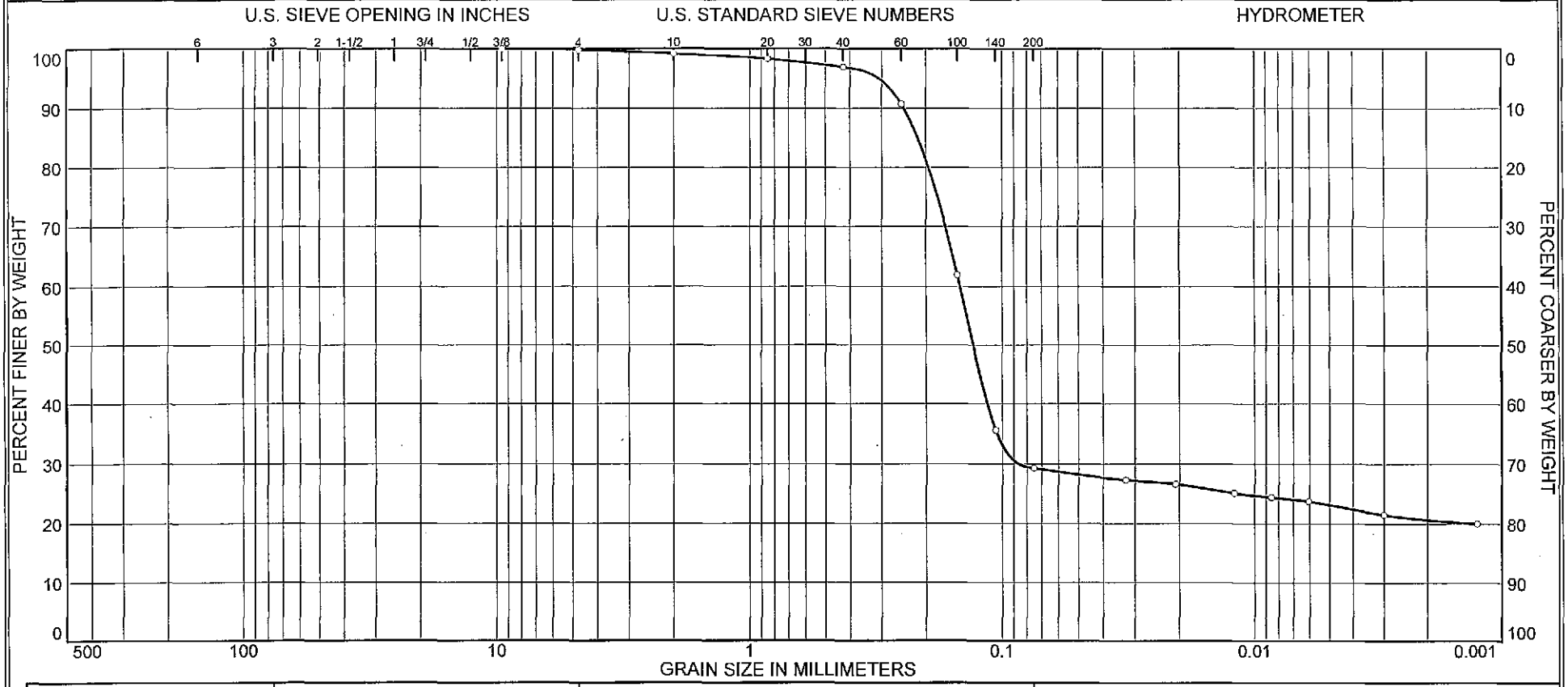
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9799

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.2	0.6	2.3	67.6	6.1	23.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	80.5-83 ft	9/10/09	SC	Tan Clayey Sand	41.0	58	25

Client SRNS

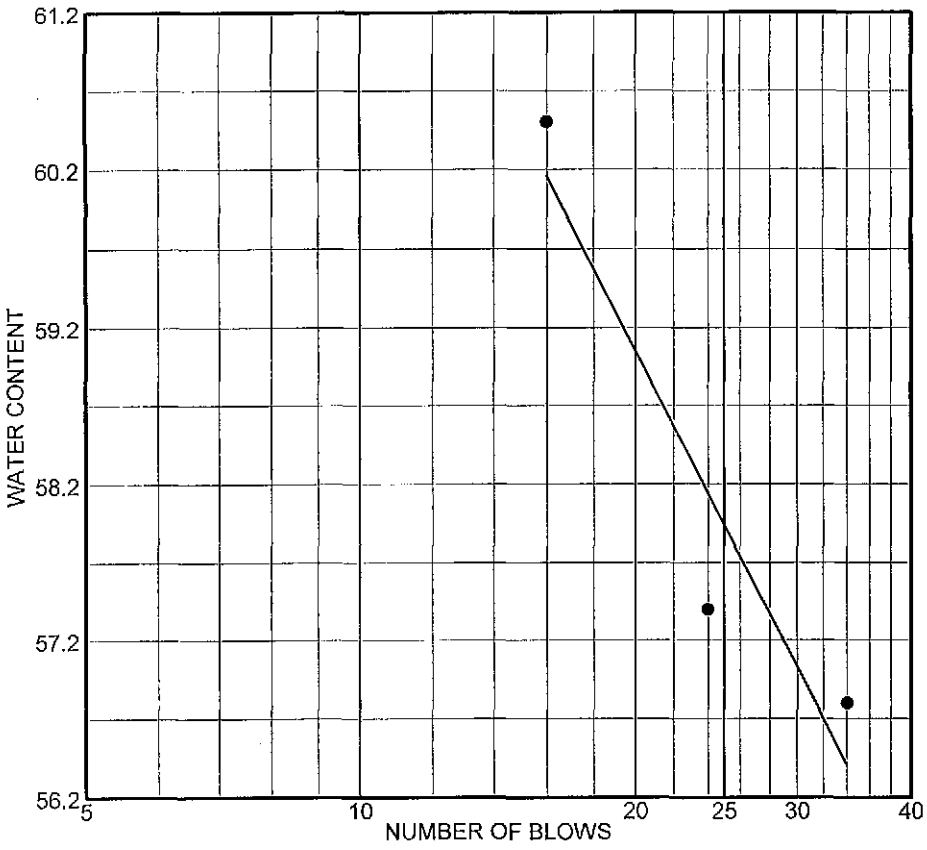
Project ECP Geologic Characterization

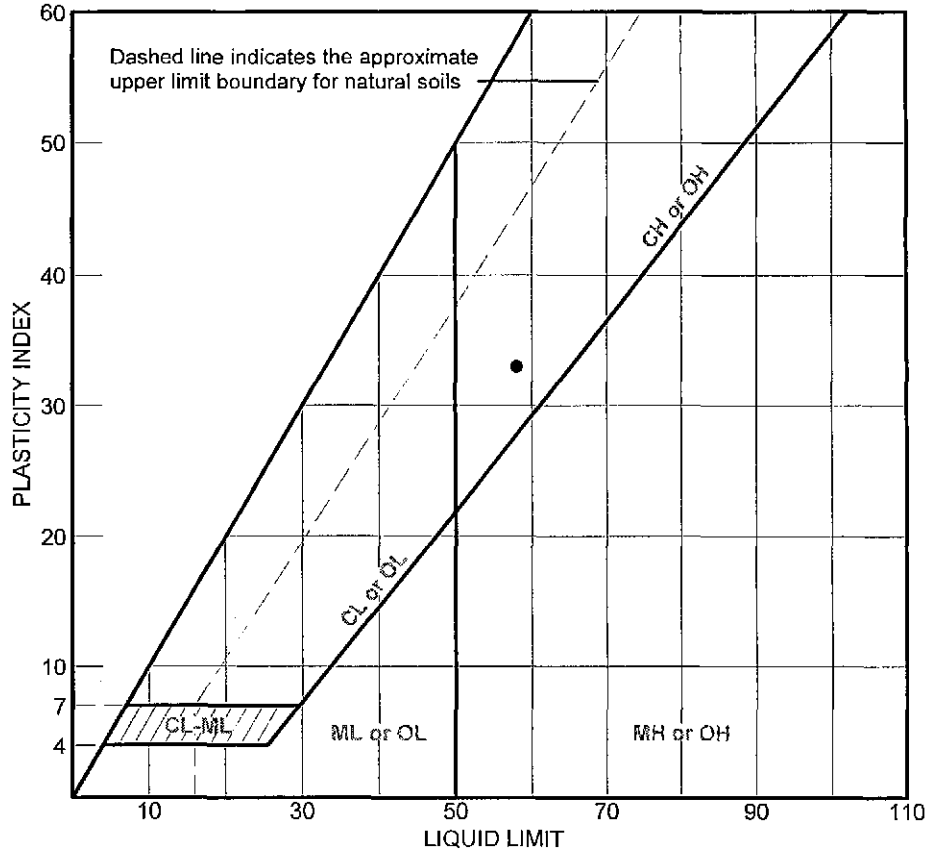
Project No. 6155-08-0031.08 Lab No. 9800

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP6/SB2	UD	80.5-83 ft	9/10/09	SC	Tan Clayey Sand	41.0	58	33

Client SRNS

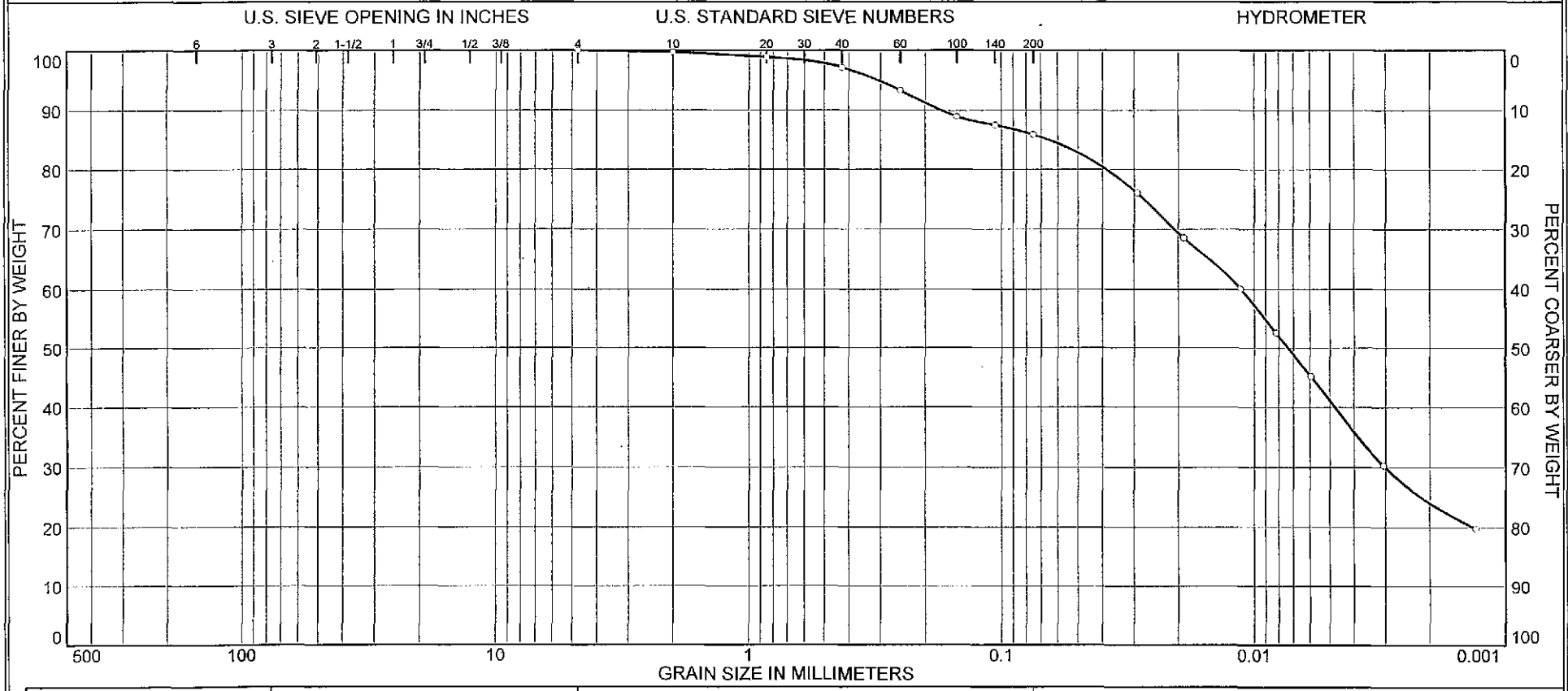
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9800

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.3	2.5	11.3	44.8	41.1

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP6/SB2	UD	109-111 ft	9/10/09	MH	Dark Gray Elastic Silt	44.7	97	44

Client SRNS

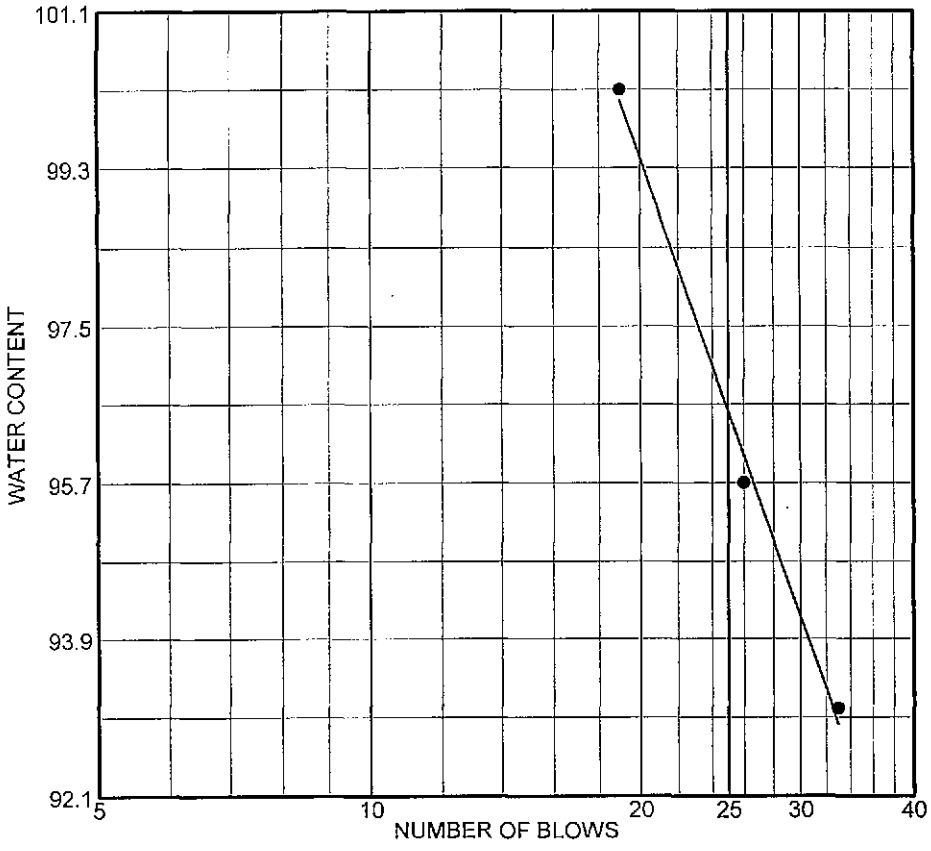
Project ECP Geologic Characterization

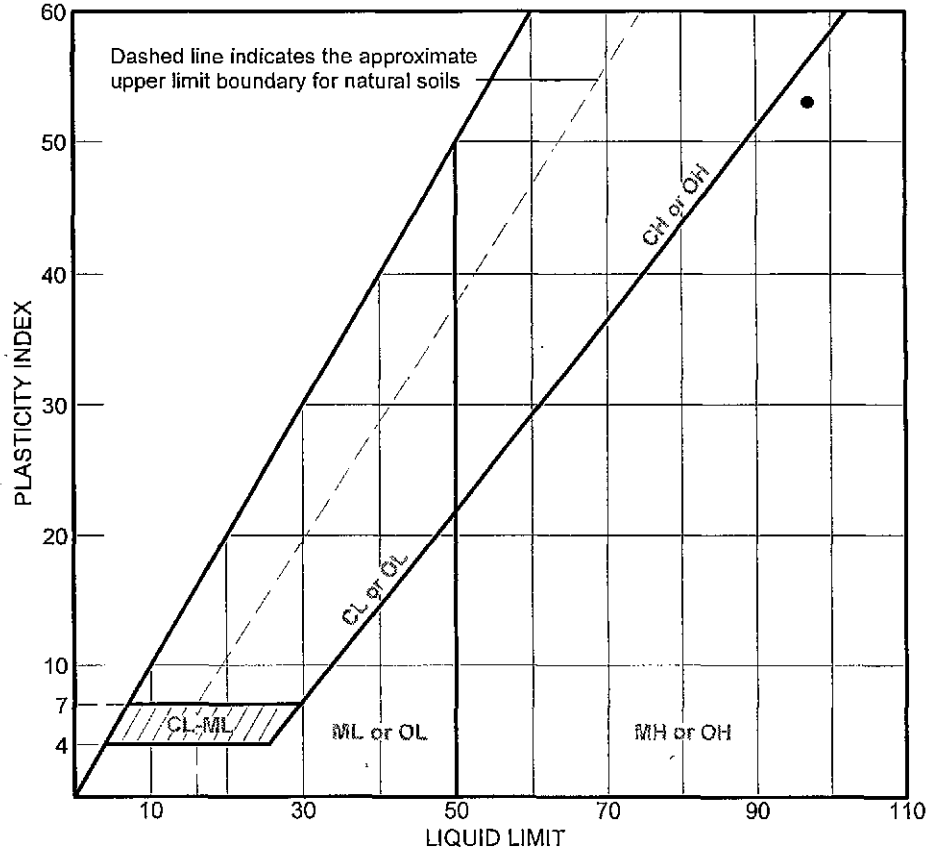
Project No. 6155-08-0031.08 Lab No. 9801

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP6/SB2	UD	109-111 ft	9/10/09	MH	Dark Gray Elastic Silt	44.7	97	53

Client SRNS

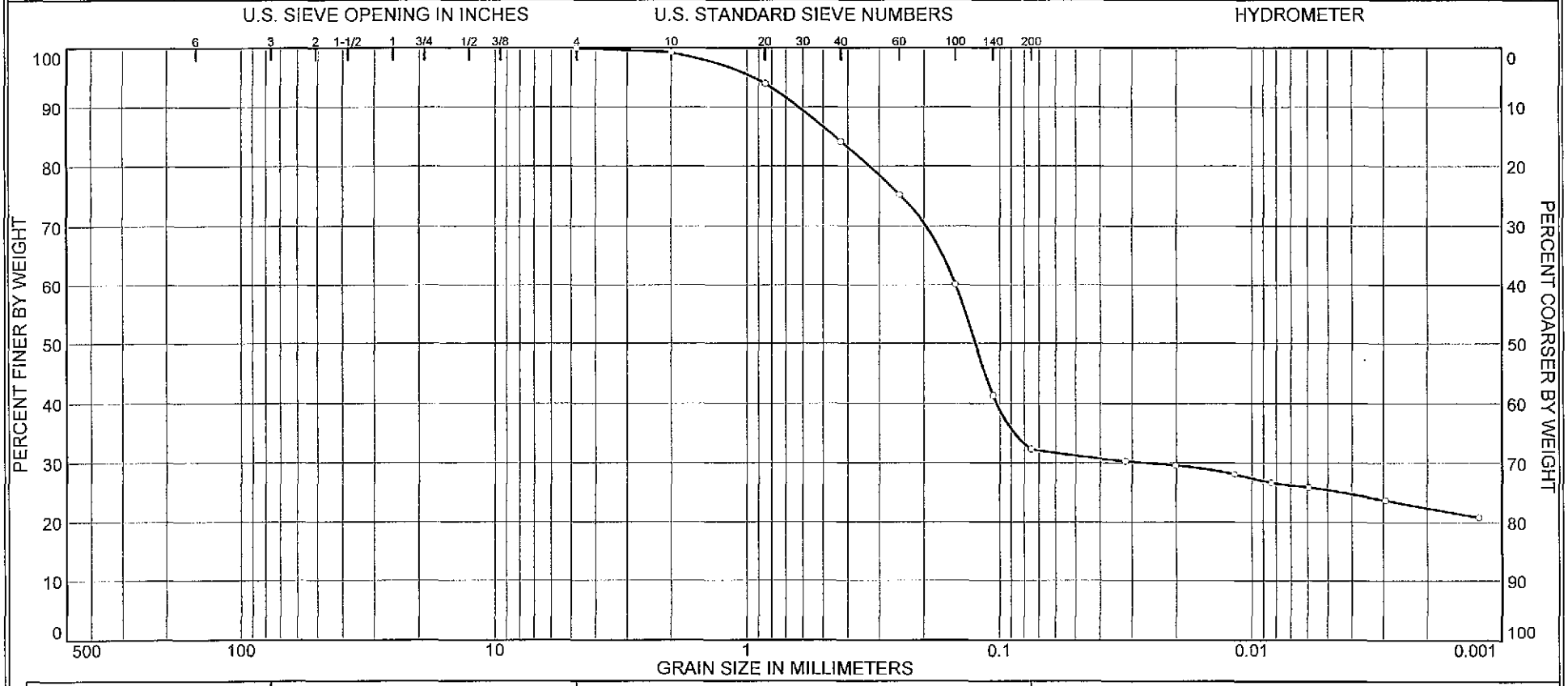
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9801

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.7	15.2	51.8	6.8	25.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	20-22 ft	9/10/09	SC	Brown Clayey Sand	17.3	47	21

Client SRNS

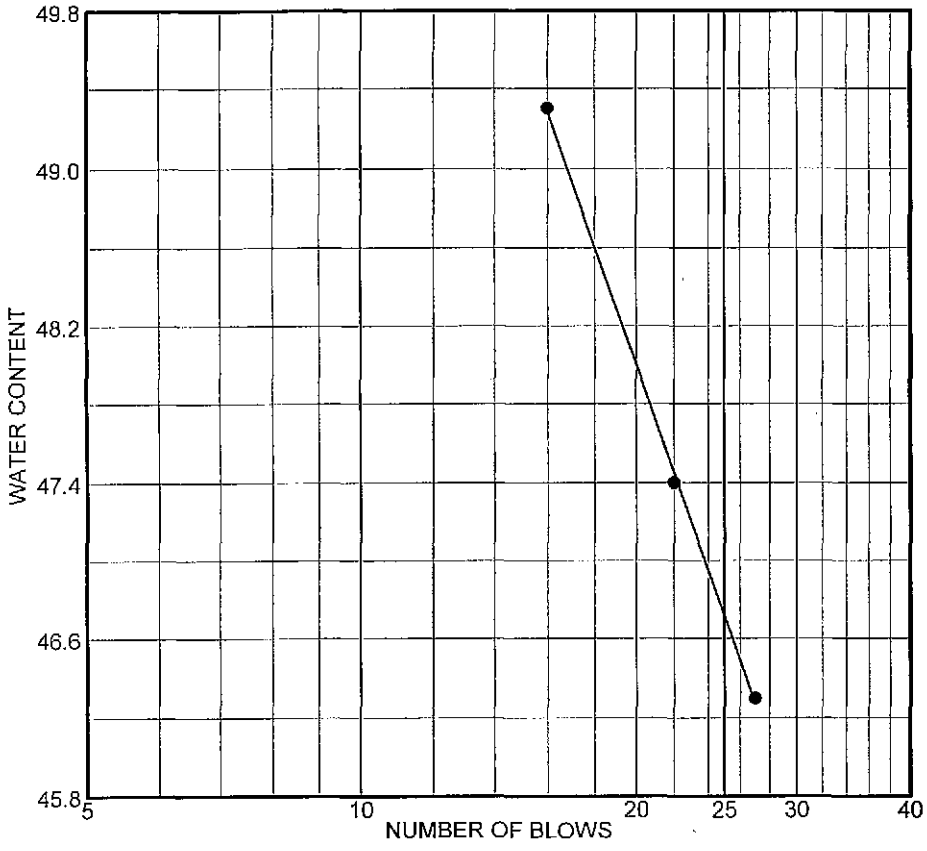
Project ECP Geologic Characterization

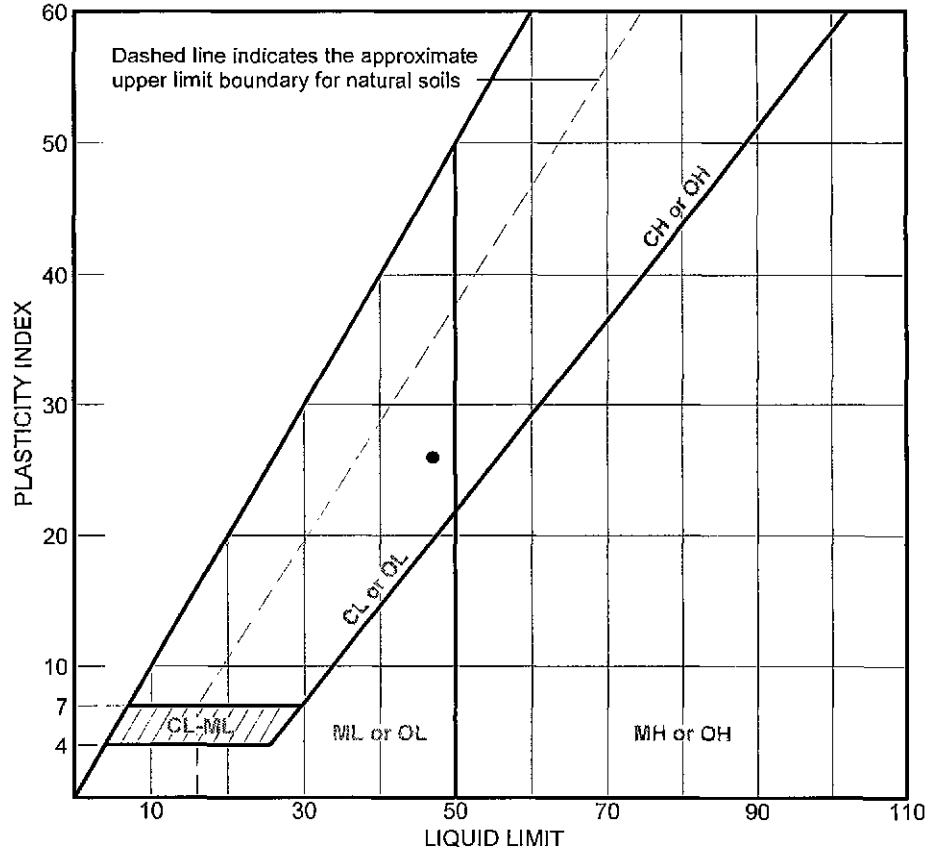
Project No. 6155-08-0031.08 Lab No. 9802

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	20-22 ft	9/10/09	SC	Brown Clayey Sand	17.3	47	26

Client SRNS

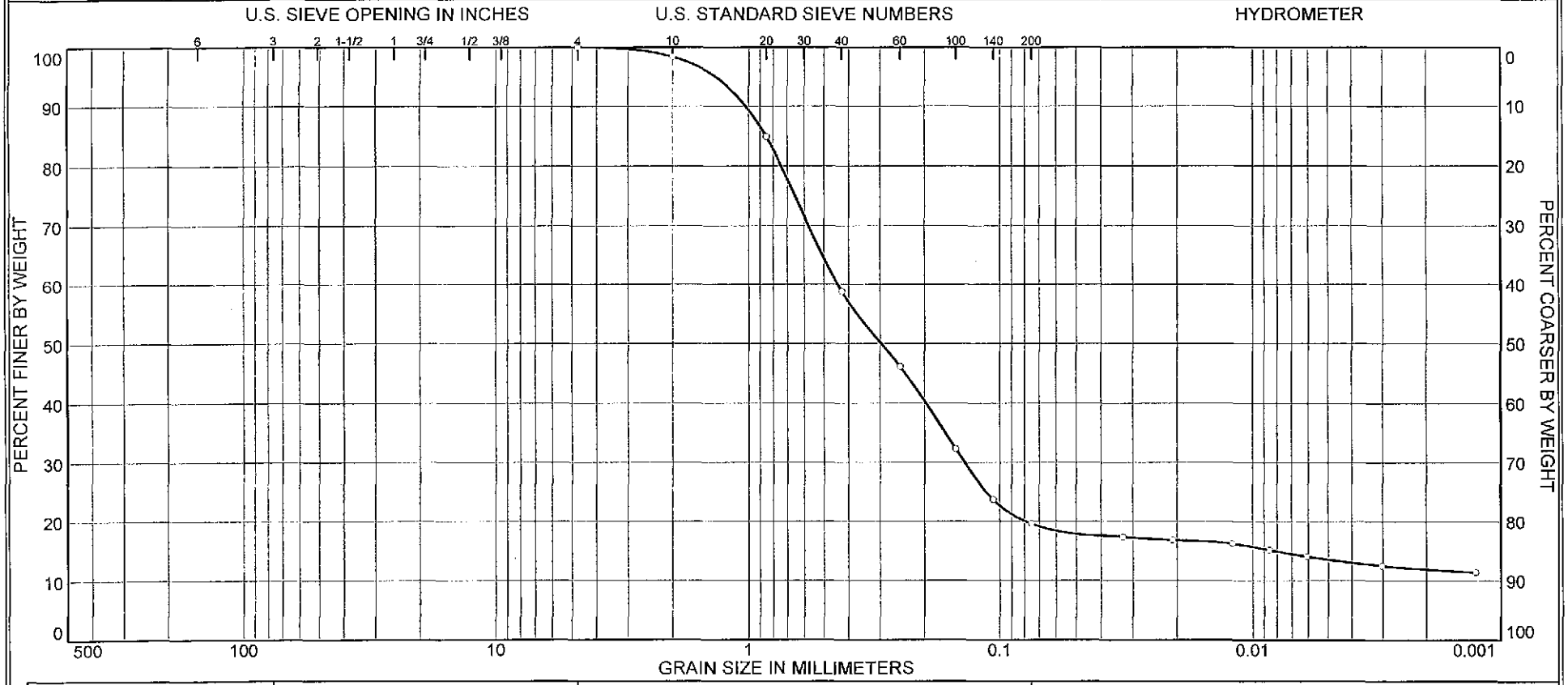
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9802

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.6	39.6	39.2	6.1	13.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	26.5-29 ft	9/10/09	SC	Yellowish Brown Clayey Sand	11.2	45	23

Client SRNS

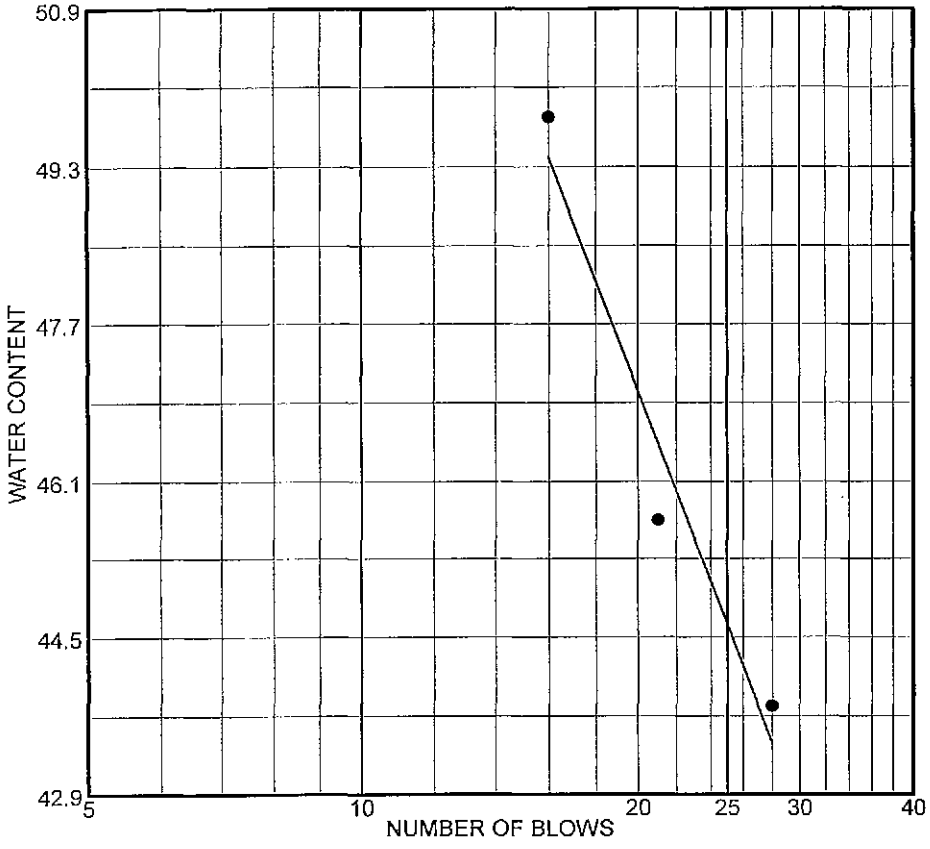
Project ECP Geologic Characterization

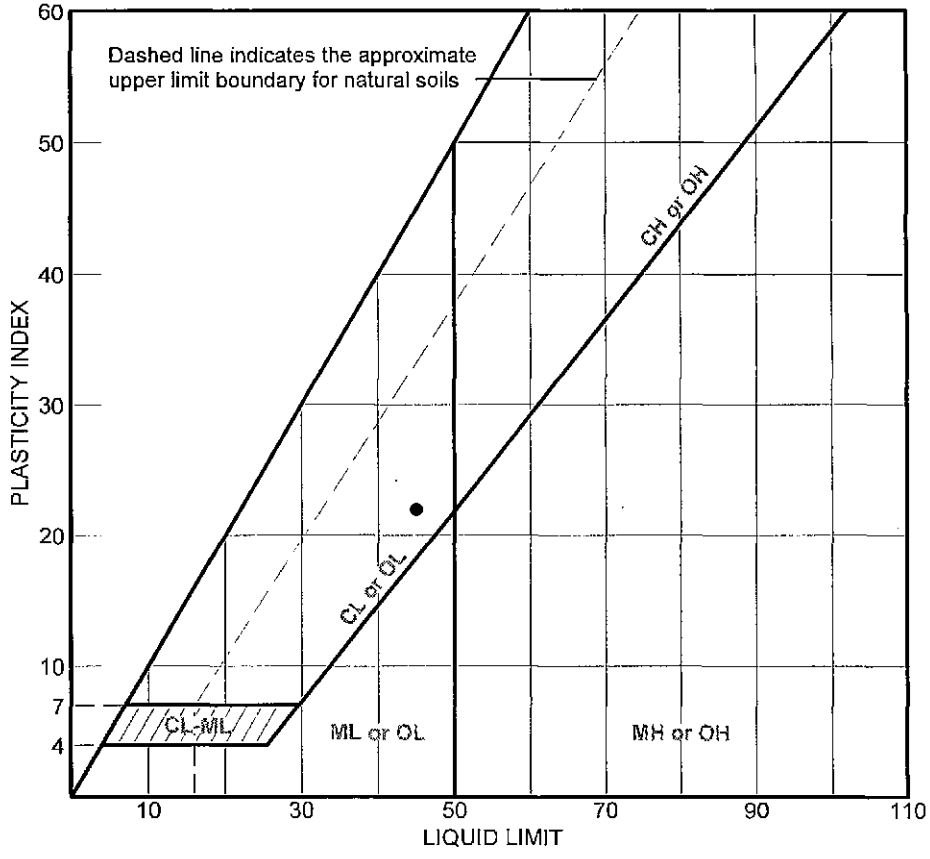
Project No. 6155-08-0031.08 Lab No. 9803

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	26.5-29 ft	9/10/09	SC	Yellowish Brown Clayey Sand	11.2	45	22

Client SRNS

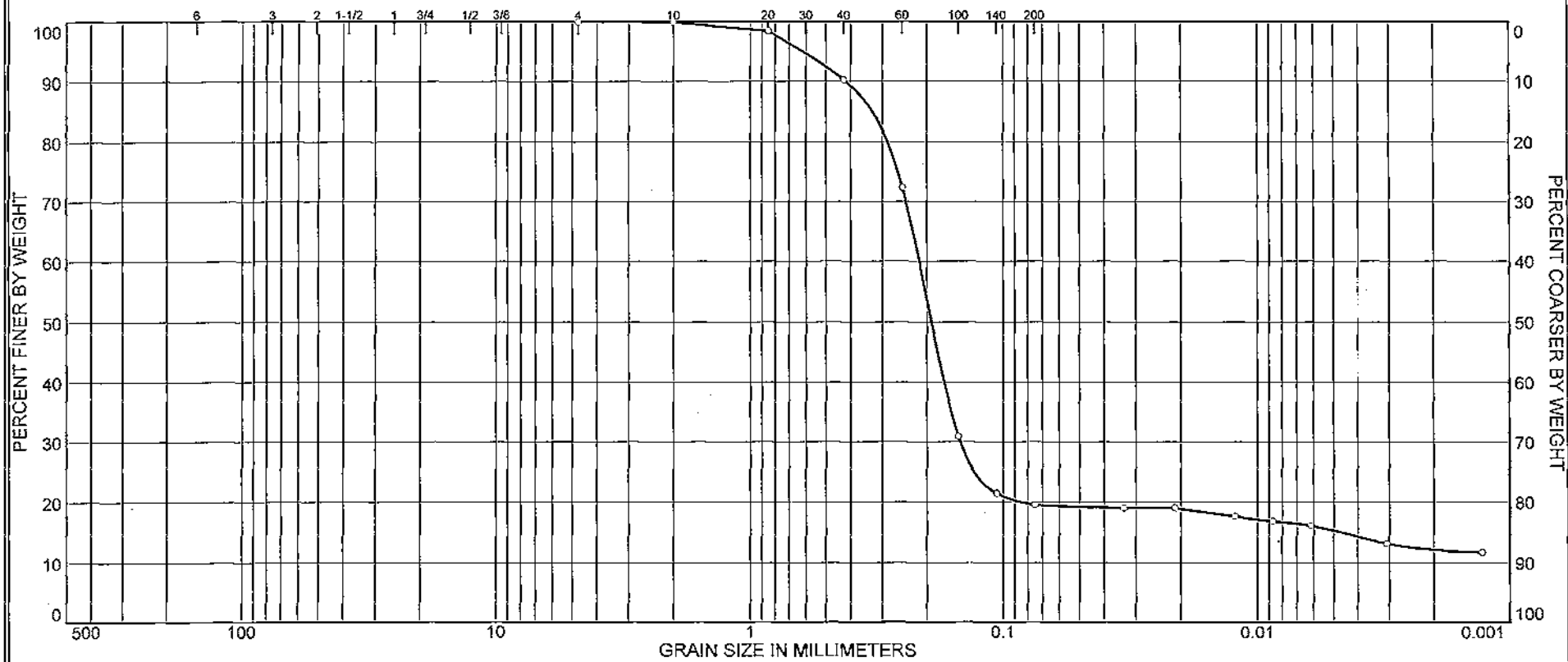
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9803

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed by: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	9.7	70.7	4.2	15.3

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	40.5-42 ft	9/21/09	SC	Reddish Brown Clayey Sand	15.5	33	20

Client SRNS

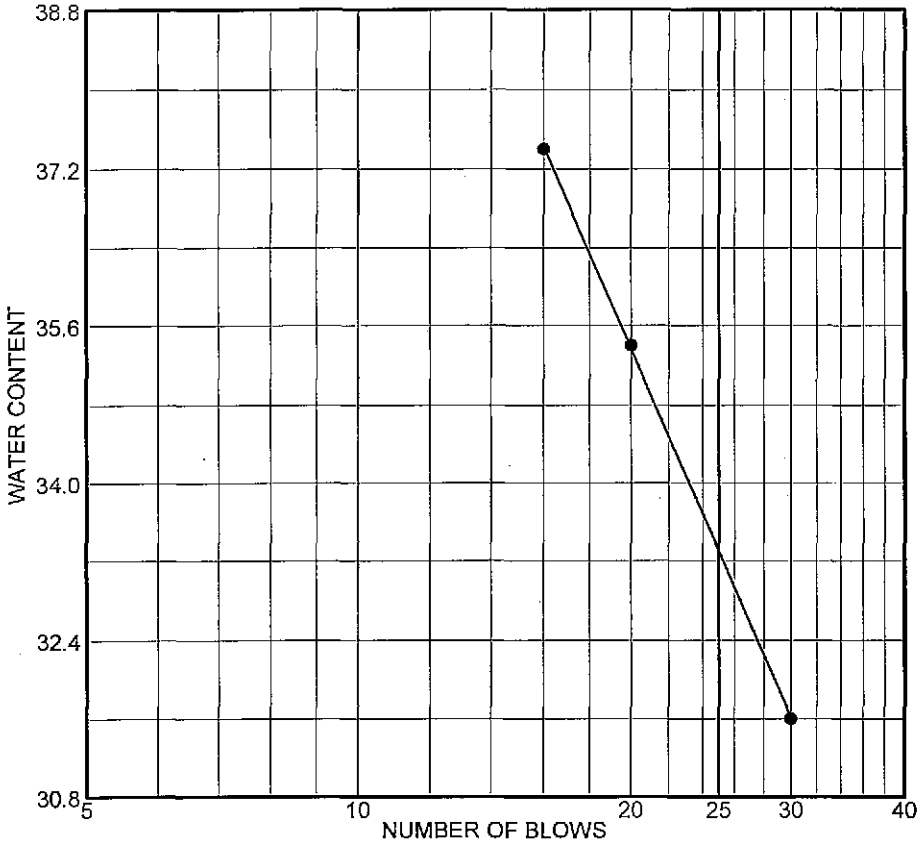
Project ECP Geologic Characterization

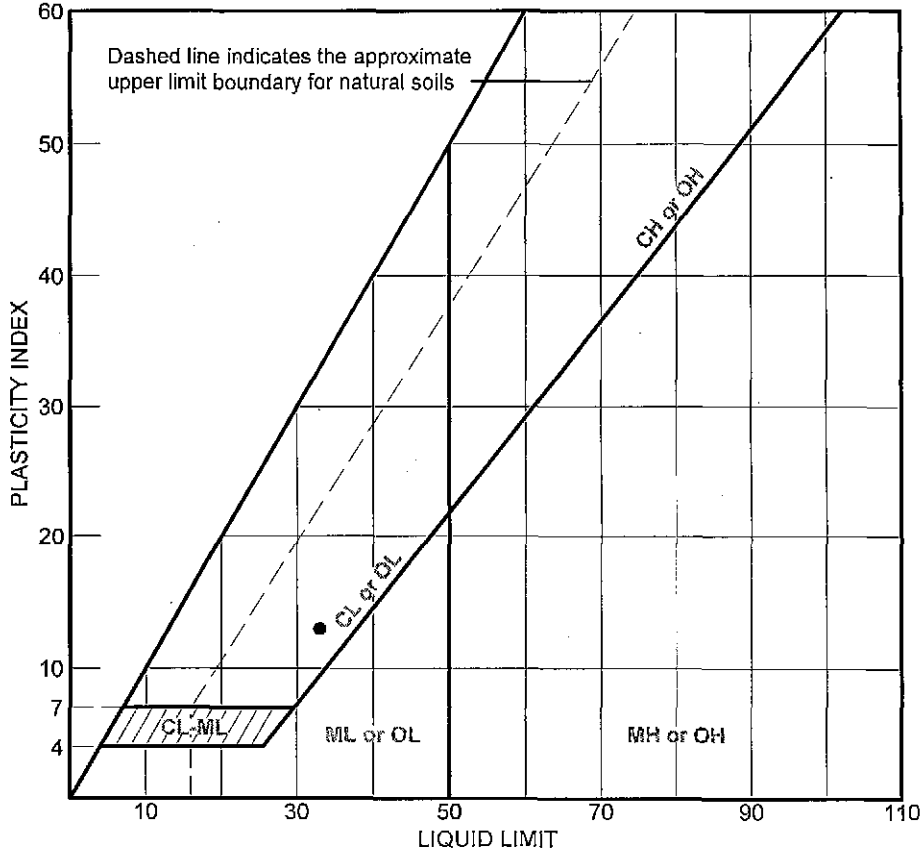
Project No. 6155-08-0031.08 Lab No. 9804

MACTEC ENGINEERING AND CONSULTING, INC.

○ Testd By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	40.5-42 ft	9/21/09	SC	Reddish Brown Clayey Sand	15.5	33	13

Client SRNS

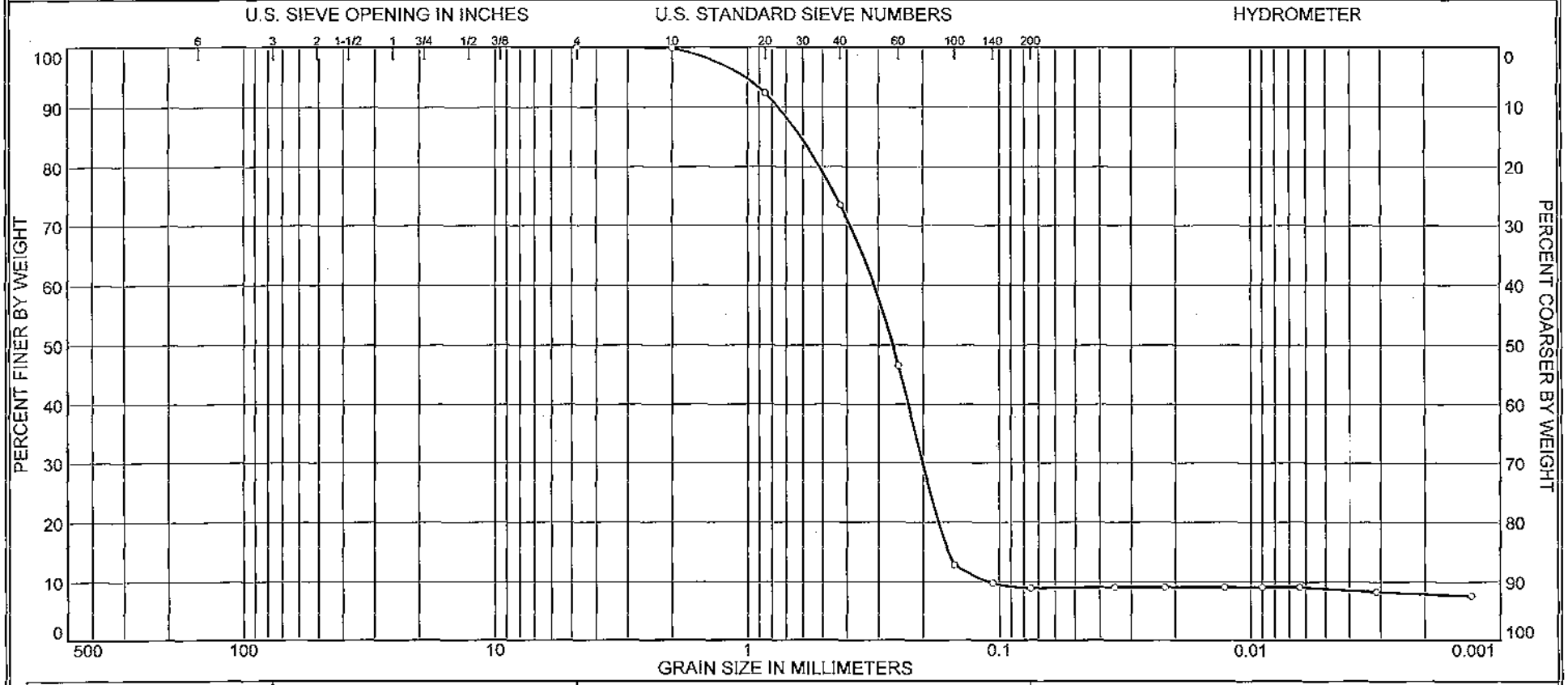
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9804

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	26.4	64.6	0.1	8.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	51.5-53.5 ft	9/21/09	SP-SM	Brown Poorly Graded Sand with Silt	17.1	NV	NP

Client SRNS

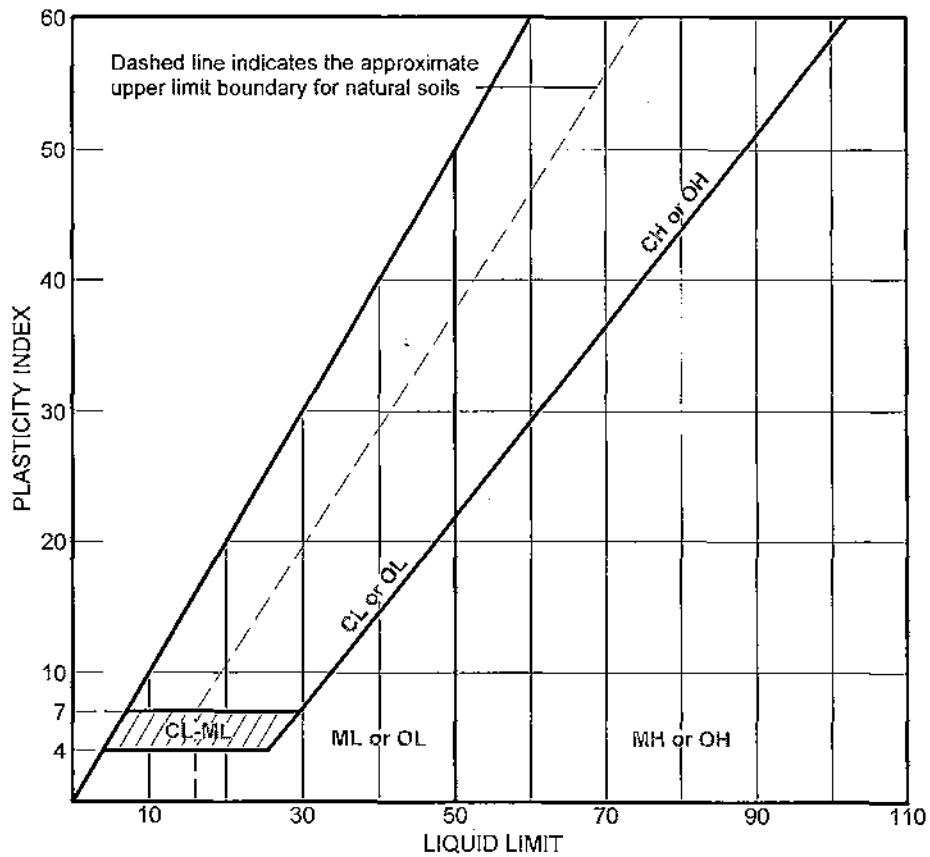
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9805

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed BY: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP9/SB2	UD	51.5-53.5 ft	9/21/09	SP-SM	Brown Poorly Graded Sand with Silt	17.1	NV	NP

Client SRNS

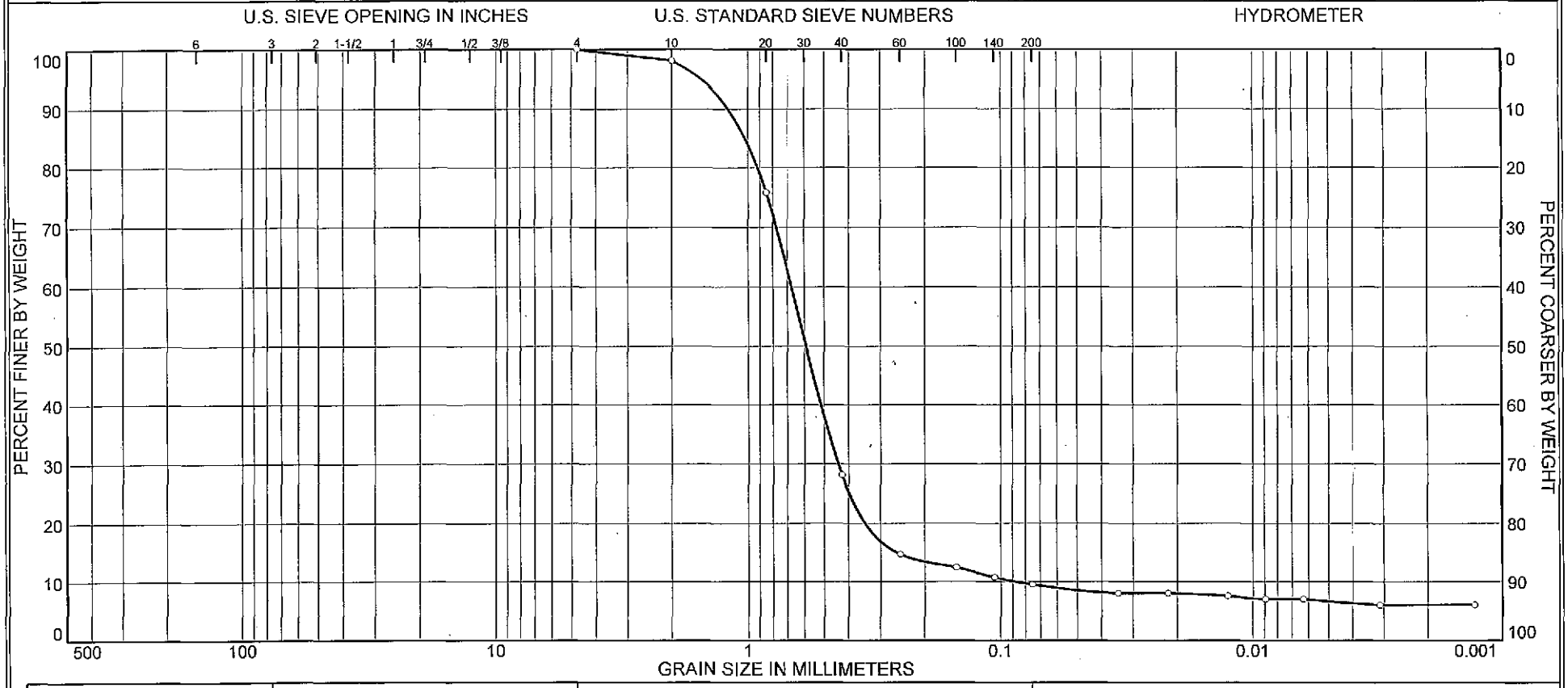
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 | Lab No. 9805

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.8	70.0	18.7	2.9	6.6

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	61.5-64 ft	9/21/09	SP-SC	Tan Poorly Graded Sand with Clay	19.2	52	23

Client SRNS

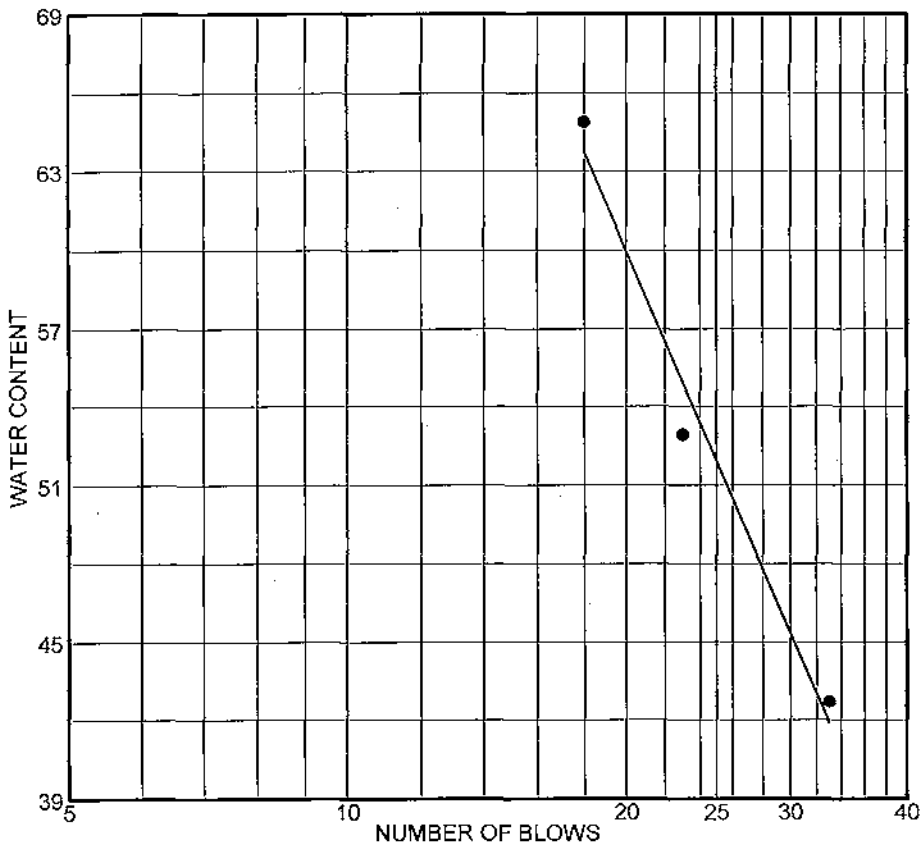
Project ECP Geologic Characterization

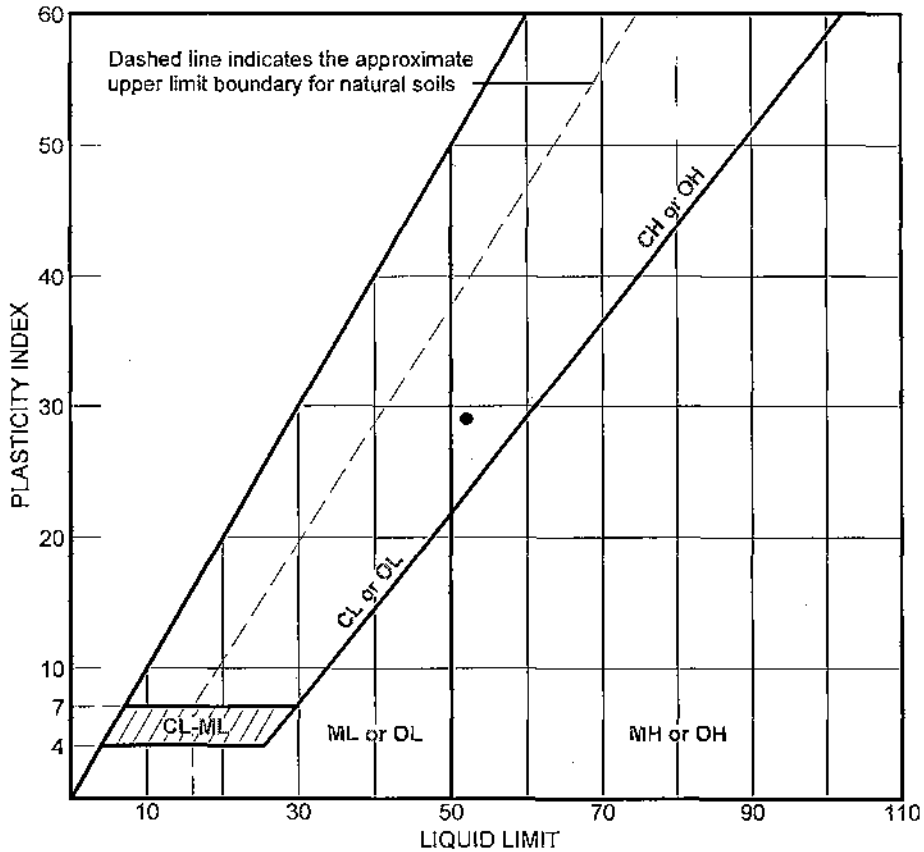
Project No. 6155-08-0031.08 Lab No. 9806

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed by: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP9/SB2	UD	61.5-64 ft	9/21/09	SP-SC	Tan Poorly Graded Sand with Clay	19.2	52	29

Client SRNS

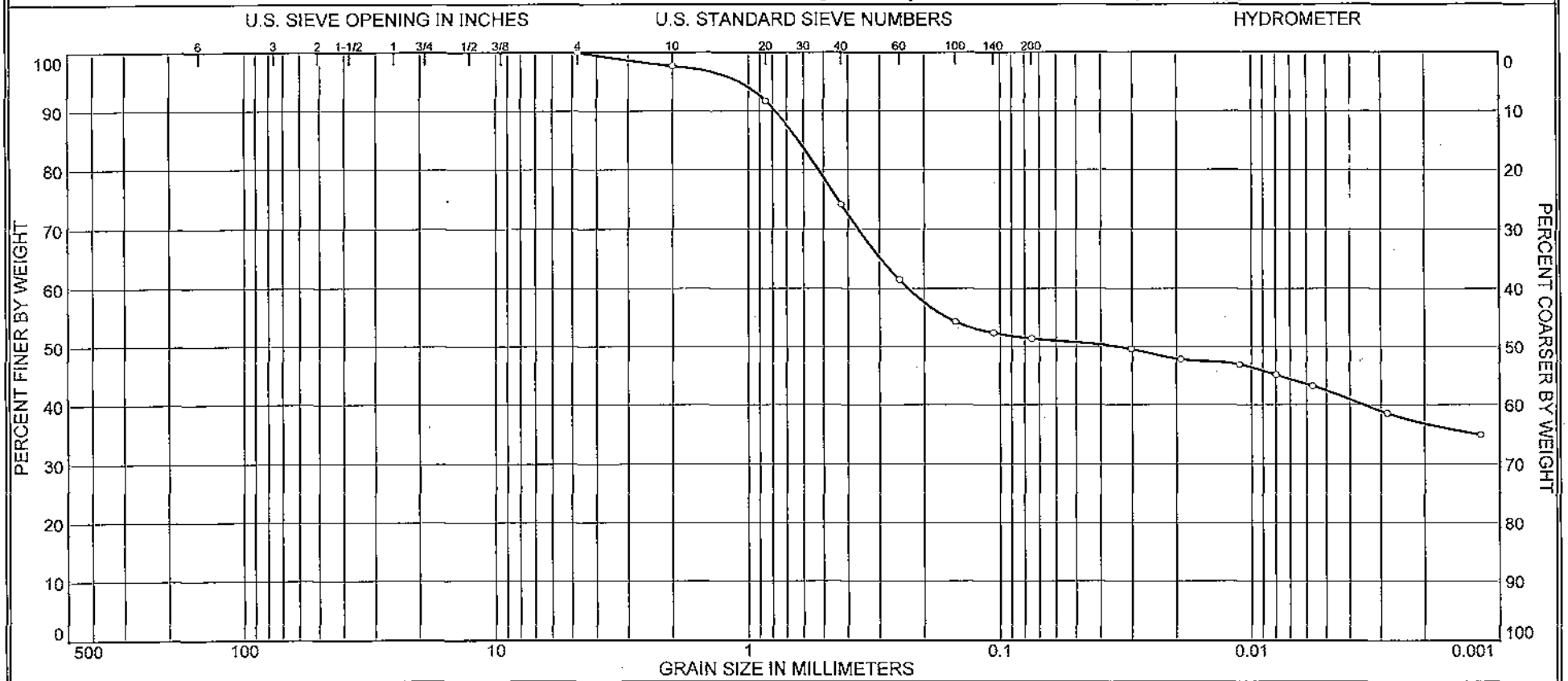
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9806

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed by: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	2.3	23.5	22.8	9.0	42.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	70.5-73 ft	9/21/09	MH	Tan Sandy Elastic Silt	40.0	98	50

Client SRNS

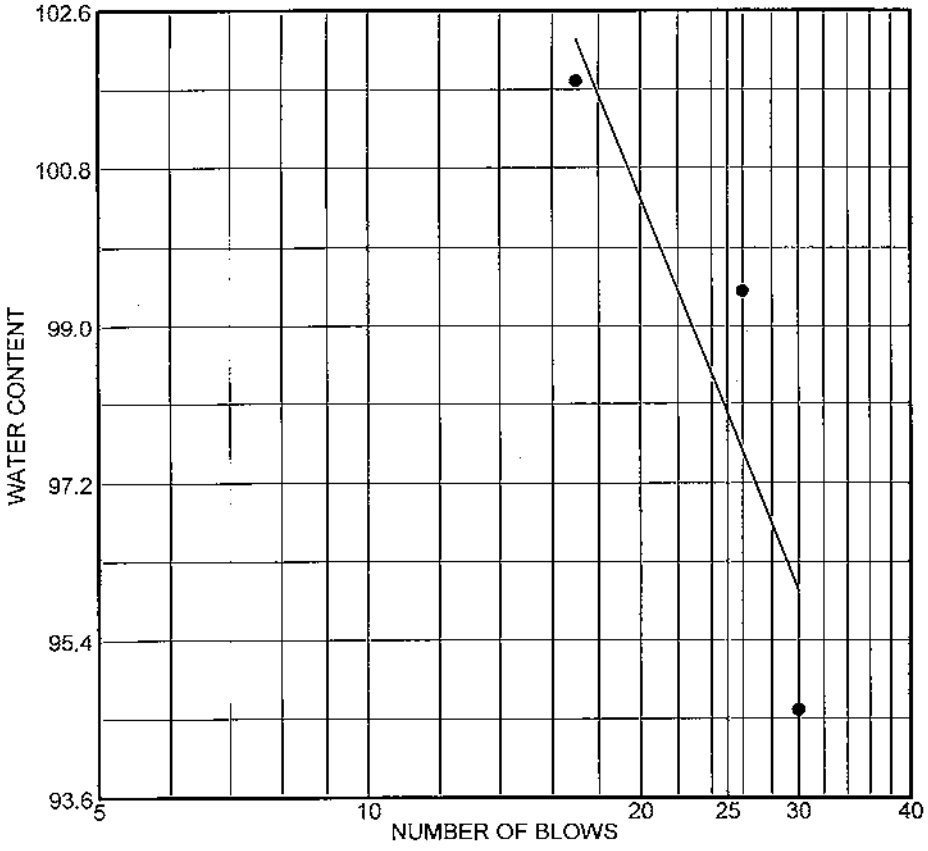
Project ECP Geologic Characterization

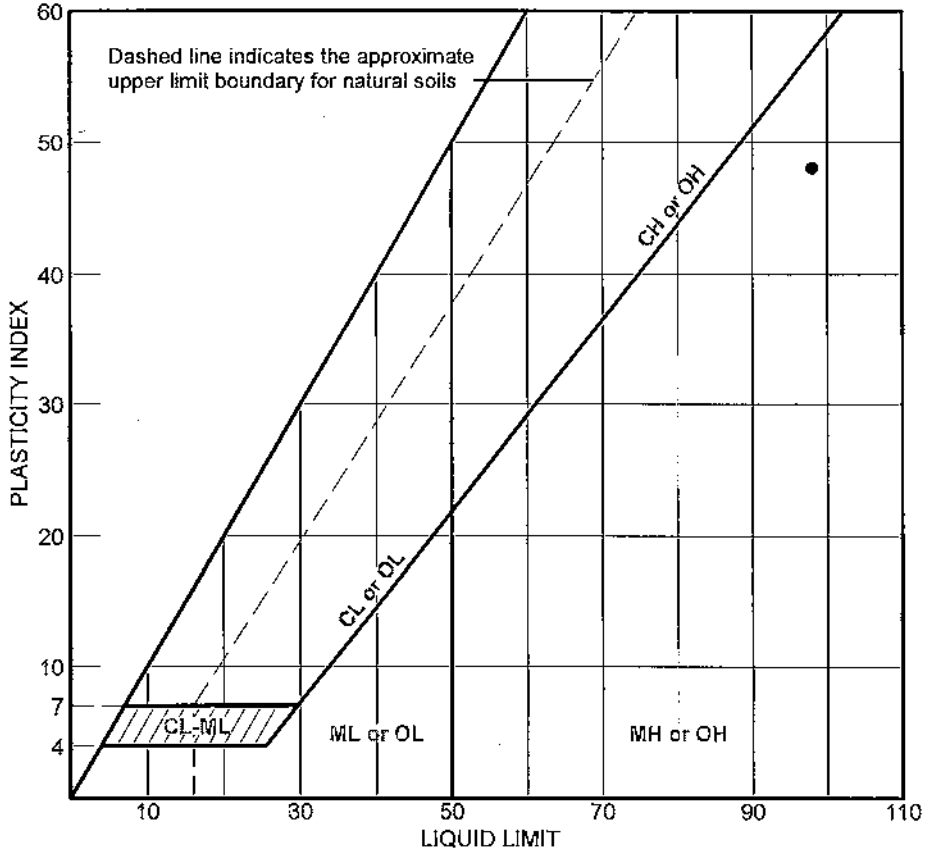
Project No. 6155-08-0031.08 Lab No. 9807

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP9/SB2	UD	70.5-73 ft	9/21/09	MH	Tan Sandy Elastic Silt	40.0	98	48

Client SRNS

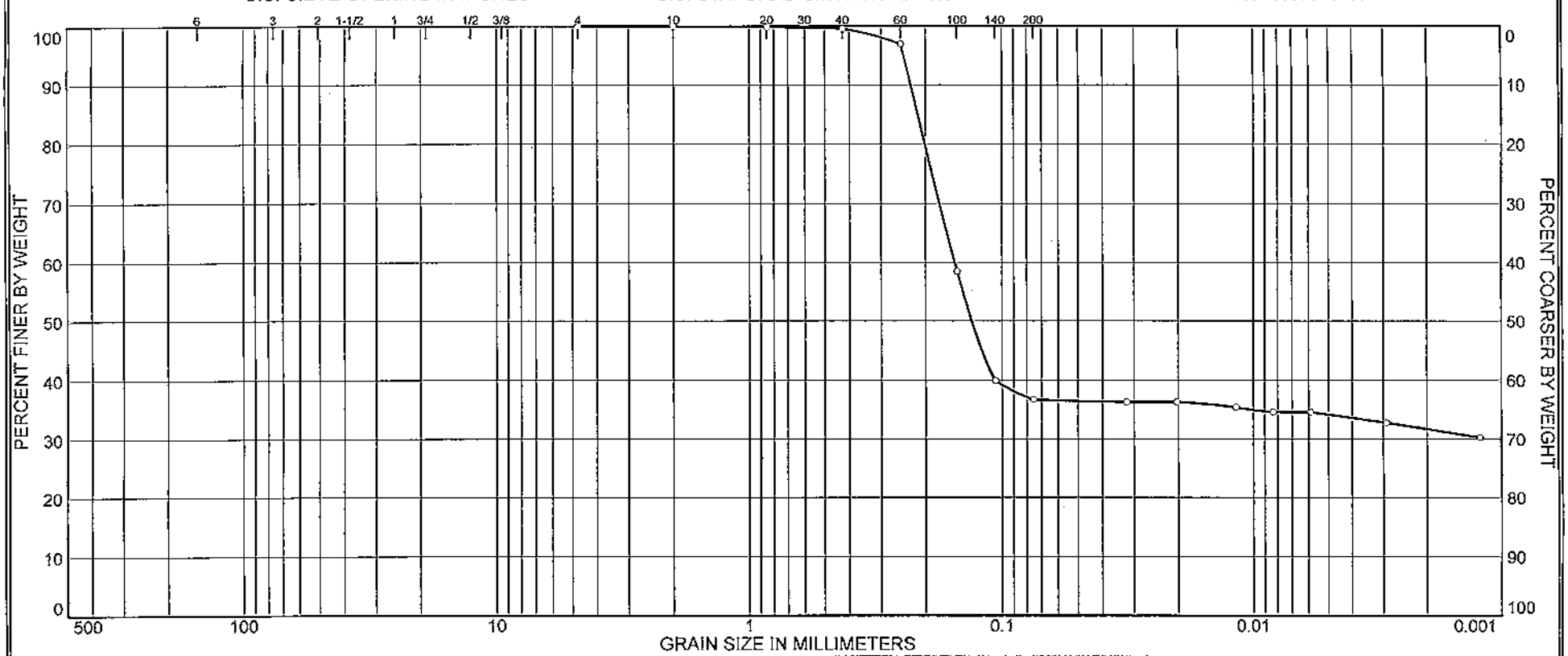
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9807

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.0	0.4	62.9	2.5	34.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	80.5-83 ft	9/21/09	SM	Tan Silty Sand	39.9	65	40

Client SRNS

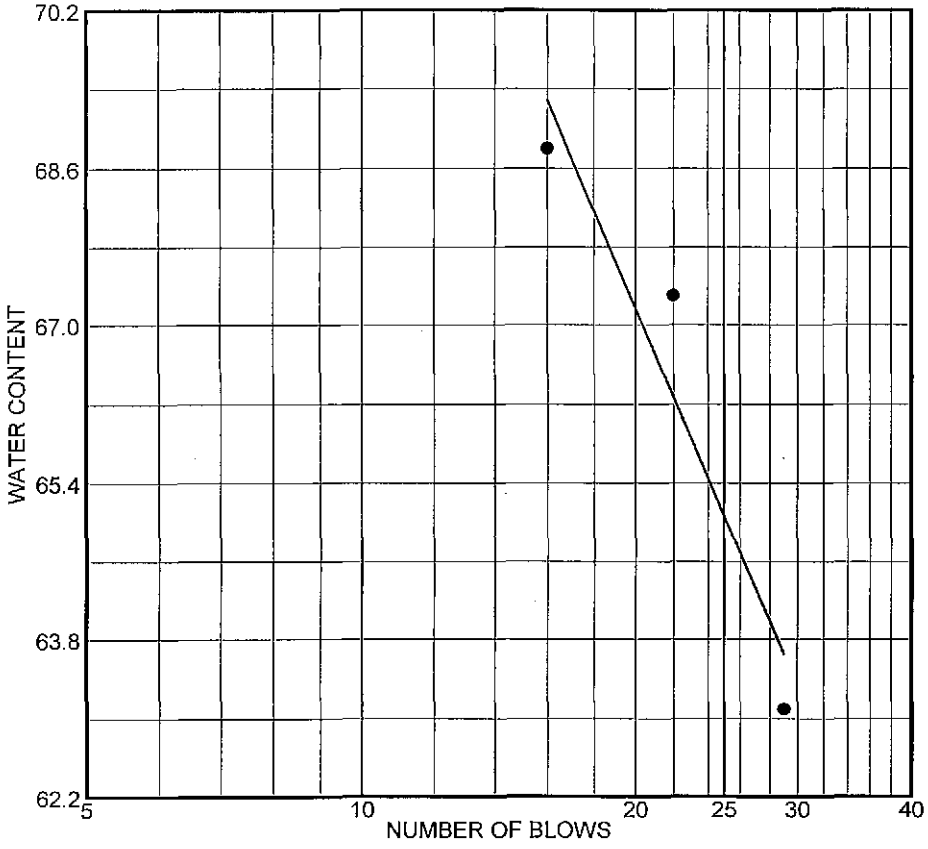
Project ECP Geologic Characterization

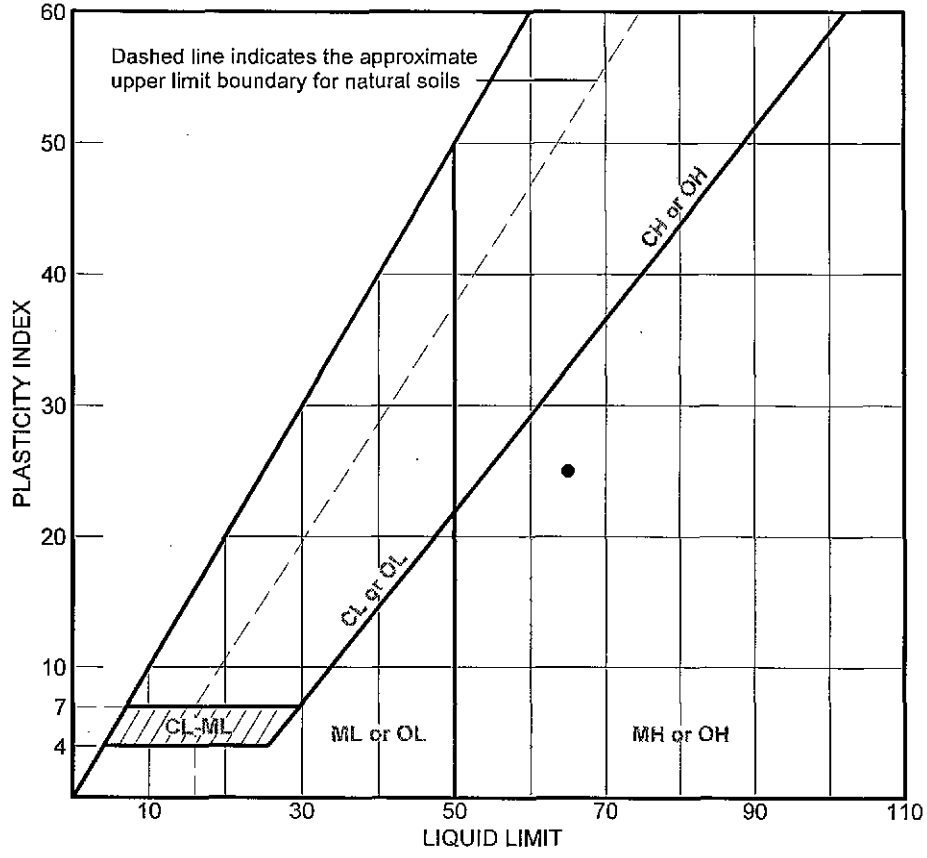
Project No. 6155-08-0031.08 Lab No. 9808

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	80.5-83 ft	9/21/09	SM	Tan Silty Sand	39.9	65	25

Client SRNS

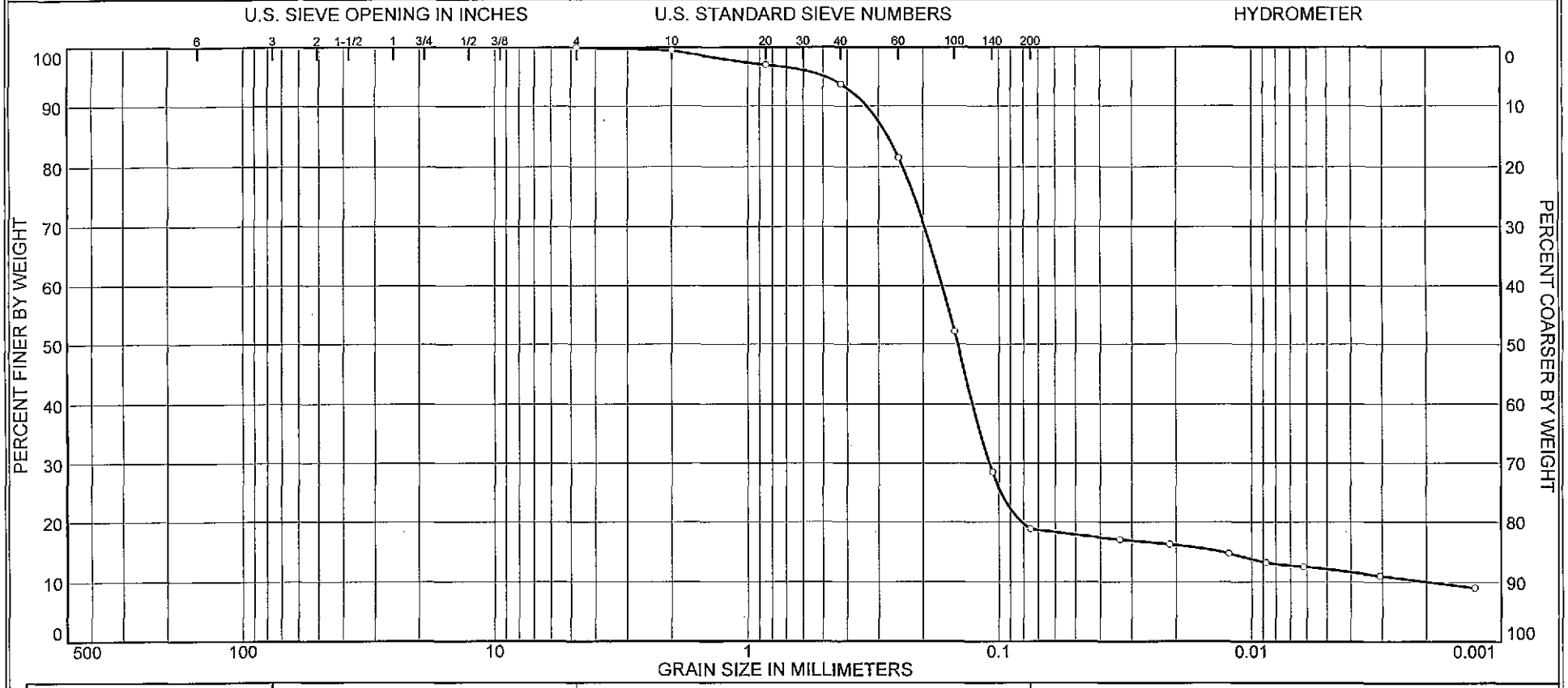
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9808

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.5	5.8	74.9	6.7	12.1

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	115.5-118 ft	9/21/09	SM	Tan Silty Sand	24.1	36	26

Client SRNS

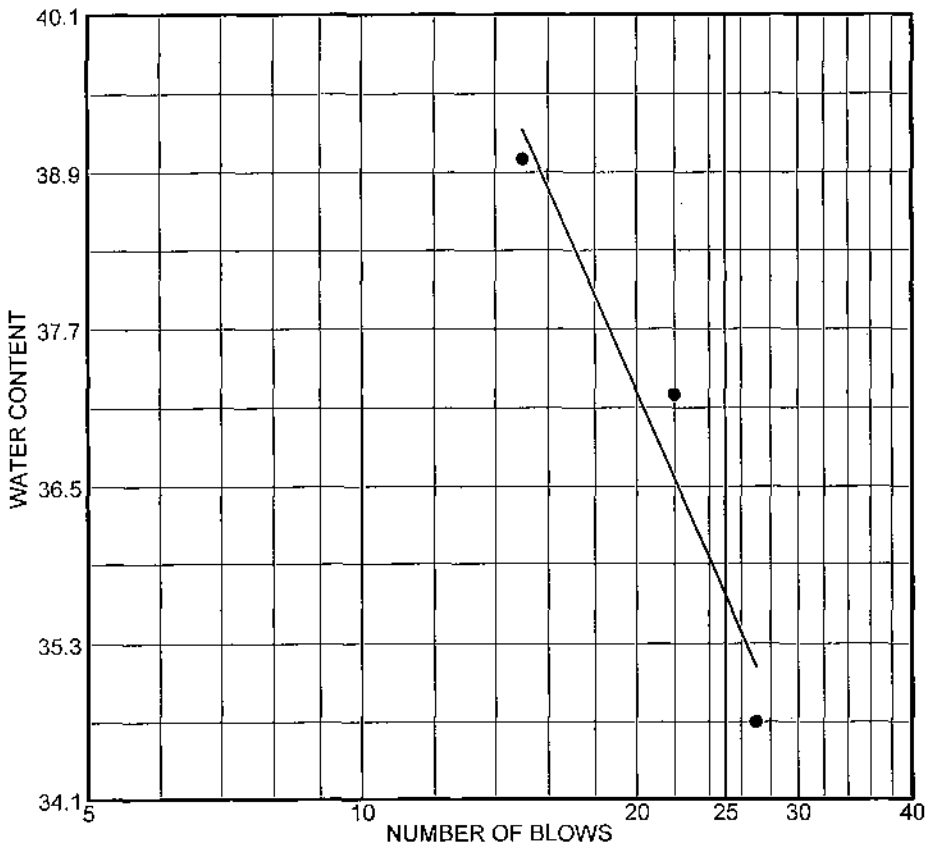
Project ECP Geologic Characterization

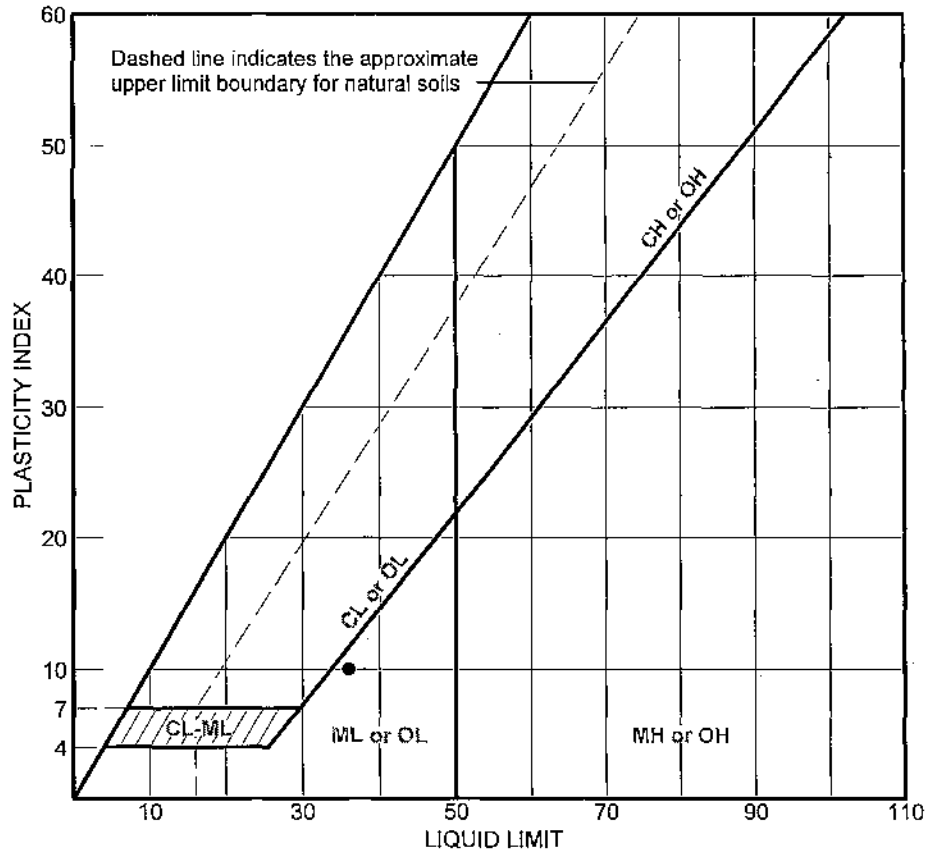
Project No. 6155-08-0031.08 Lab No. 9809

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	115.5-118 ft	9/21/09	SM	Tan Silty Sand	26.5	36	10

Client SRNS

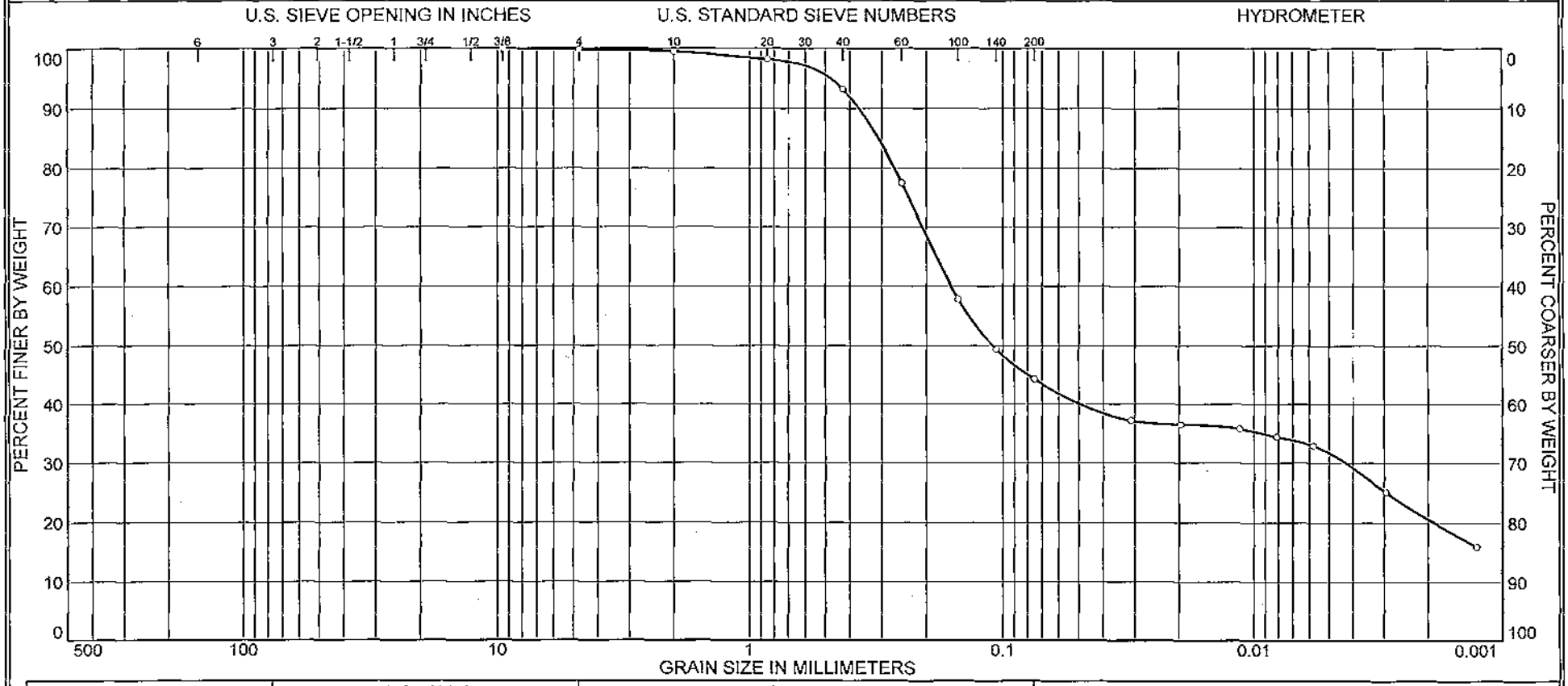
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9809

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.2	0.3	6.3	48.9	12.6	31.7

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP9/SB2	UD	140.5-143 ft	10/5/09	SC	Yellowish Brown Clayey Sand	31.0	44	24

Client SRNS

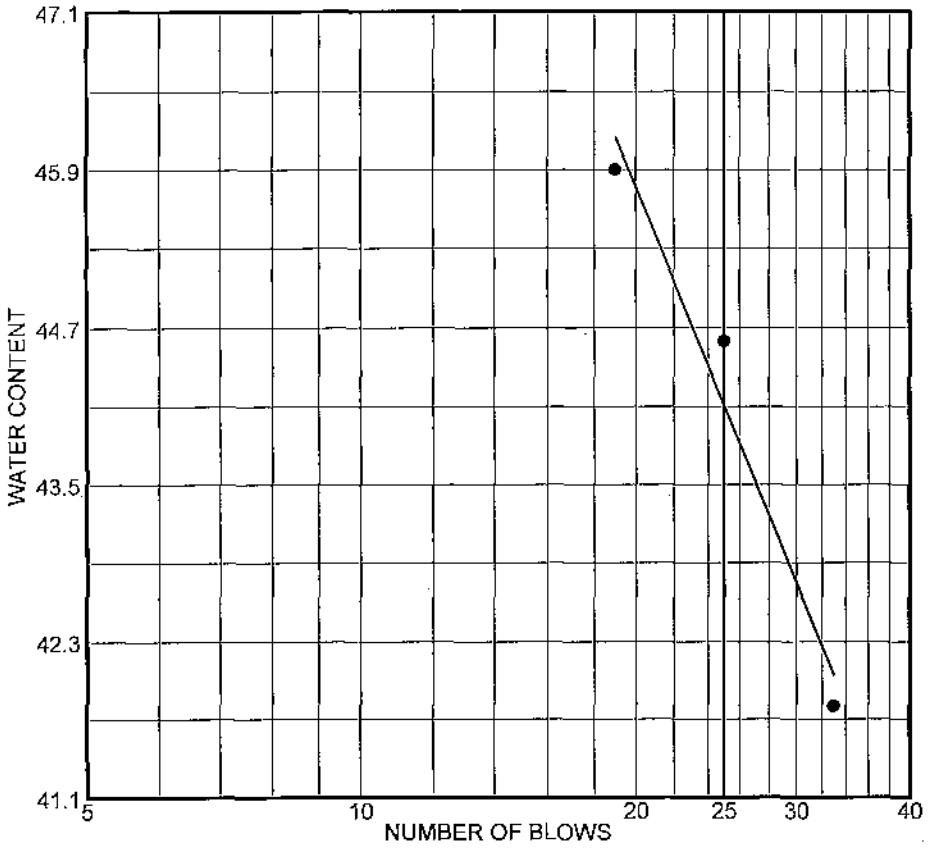
Project ECP Geologic Characterization

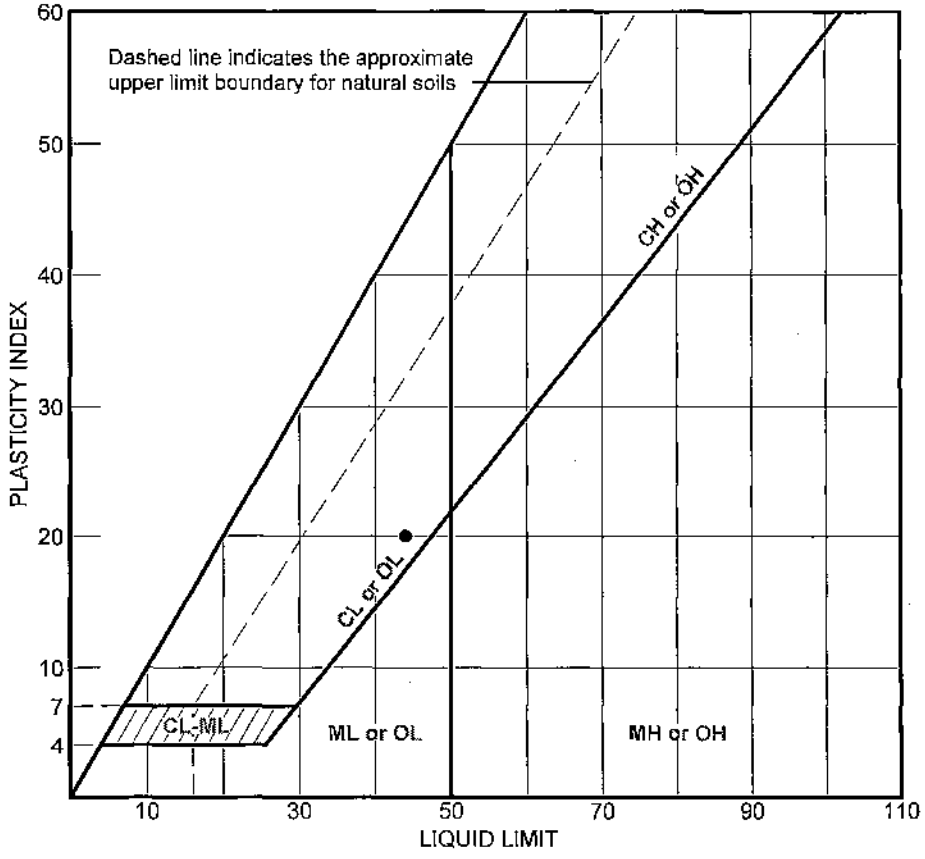
Project No. 6155-08-0031.08 | Lab No. 9810

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP9/SB2	UD	140.5-143 ft	10/5/09	SC	Yellowish Brown Clayey Sand	31.0	44	20

Client SRNS

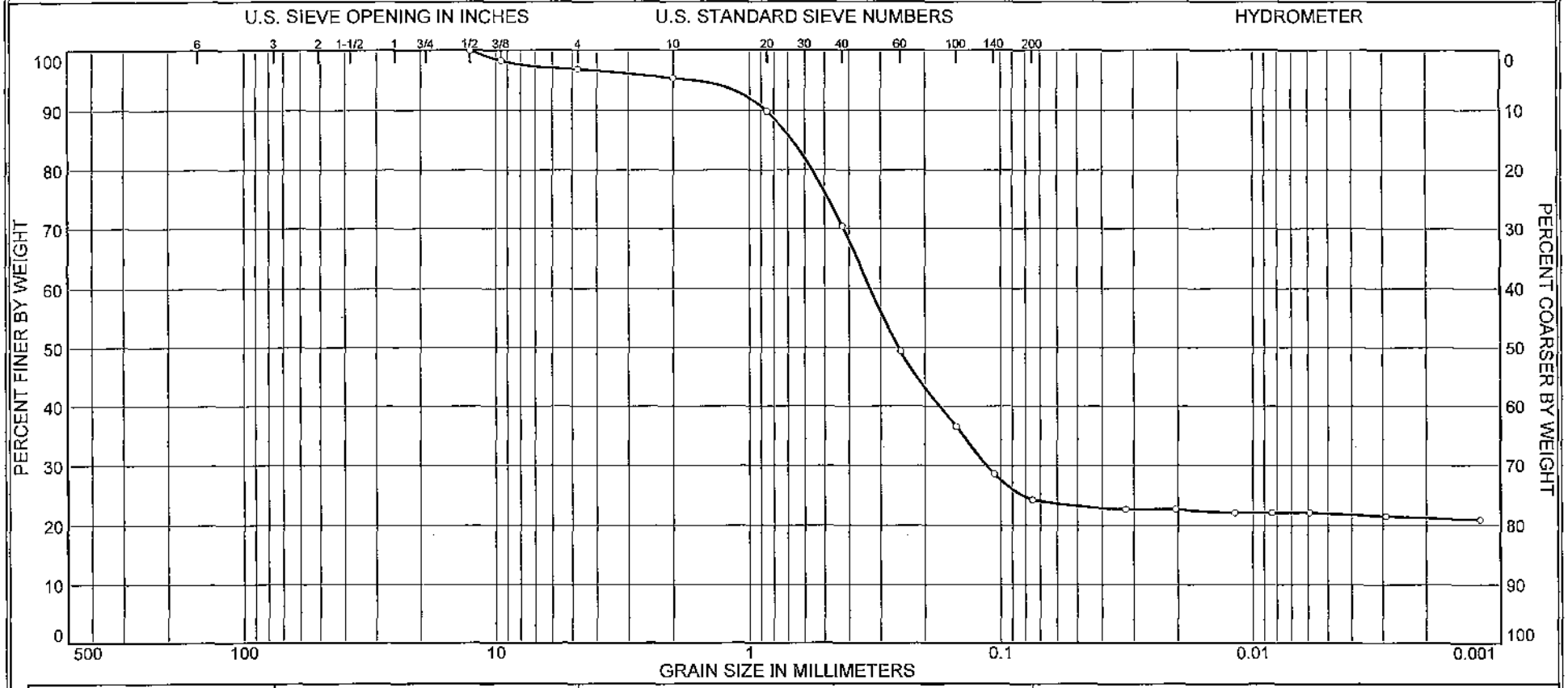
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9810

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	3.1	1.5	25.0	46.1	2.3	22.0

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	17.5-20 ft	10/5/09	SC	Reddish Brown Clayey Sand	14.6	37	17

Client SRNS

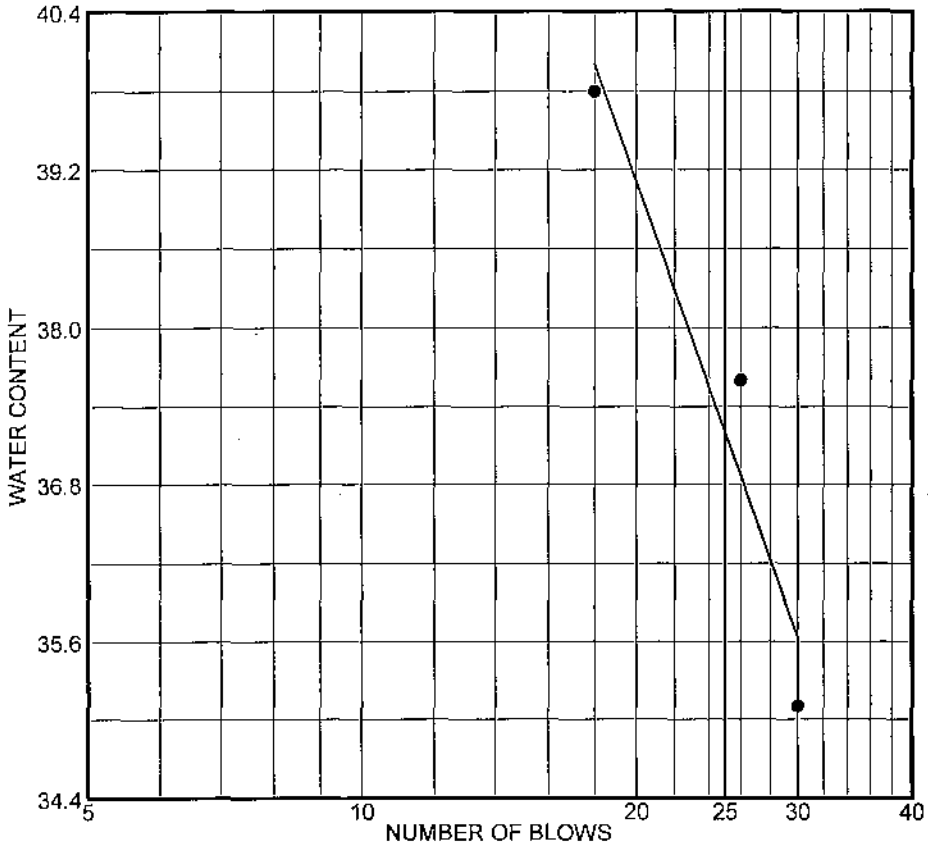
Project ECP Geologic Characterization

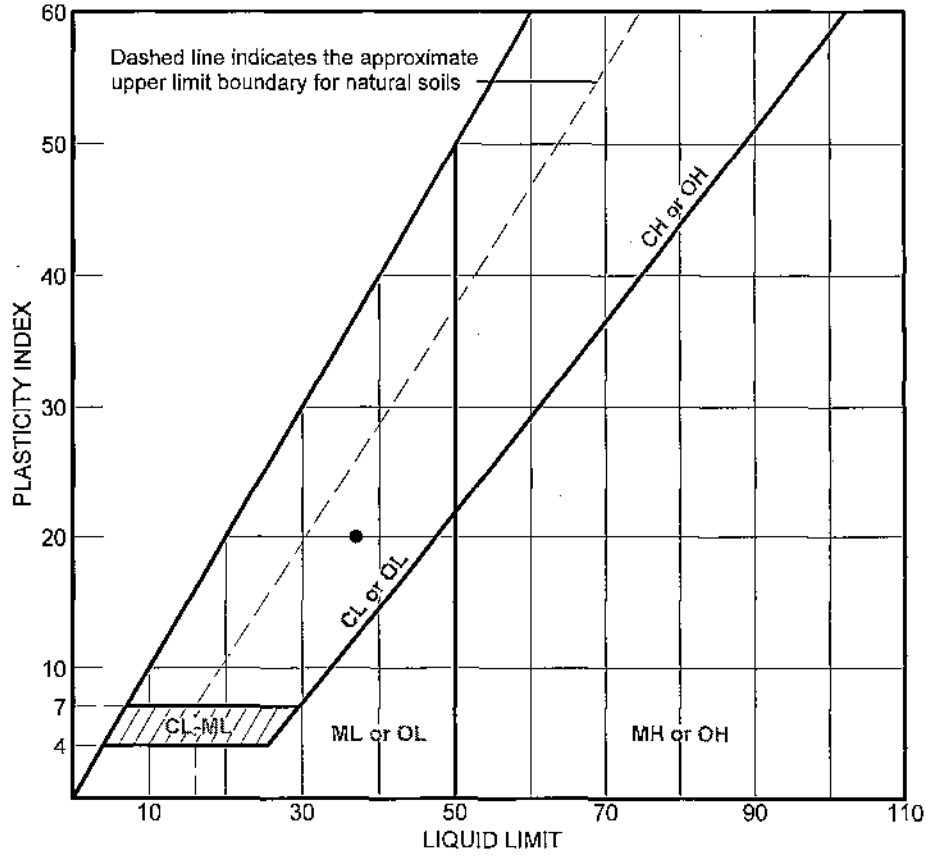
Project No. 6155-08-0031.08 Lab No. 9811

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	17.5-20 ft	10/5/09	SC	Reddish Brown Clayey Sand	14.6	37	20

Client SRNS

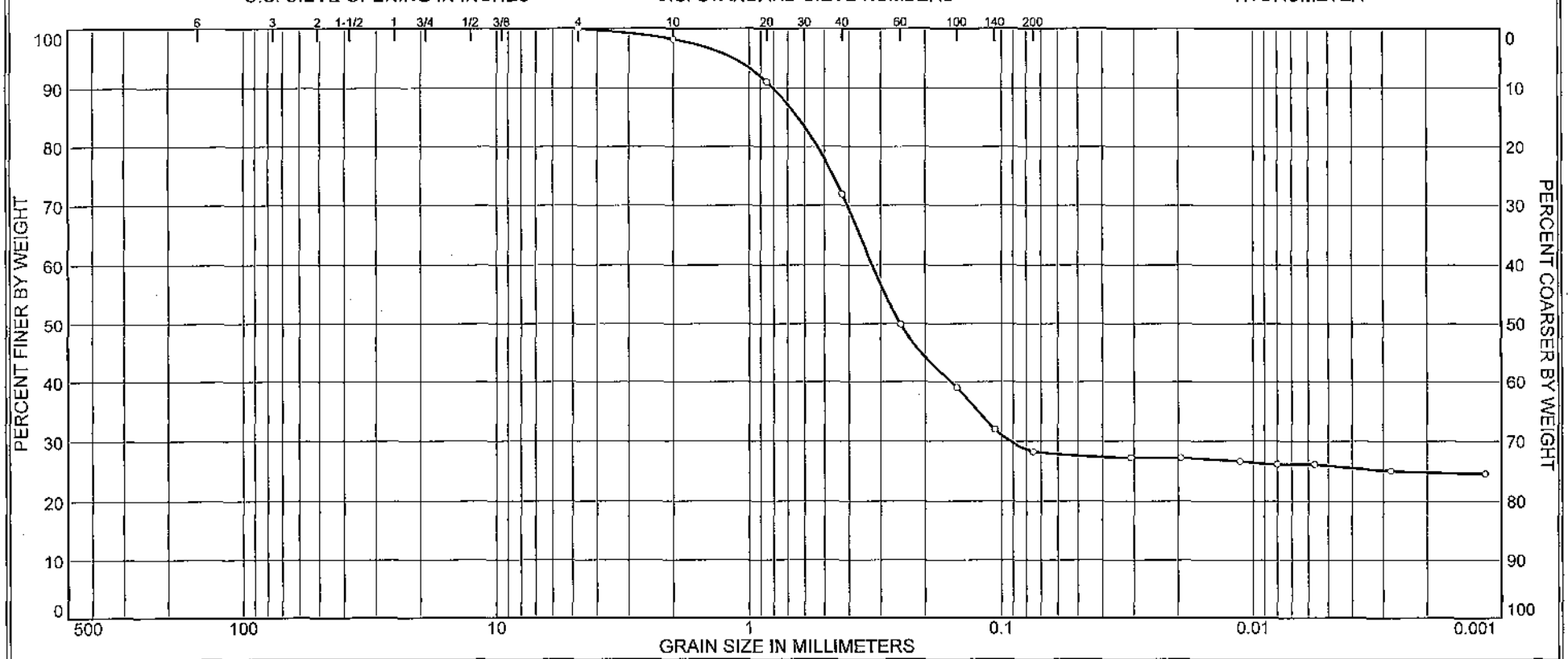
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9811

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.8	26.3	43.7	2.3	25.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	21-23 ft	10/5/09	SC	Red Clayey Sand	24.2	43	20

Client SRNS

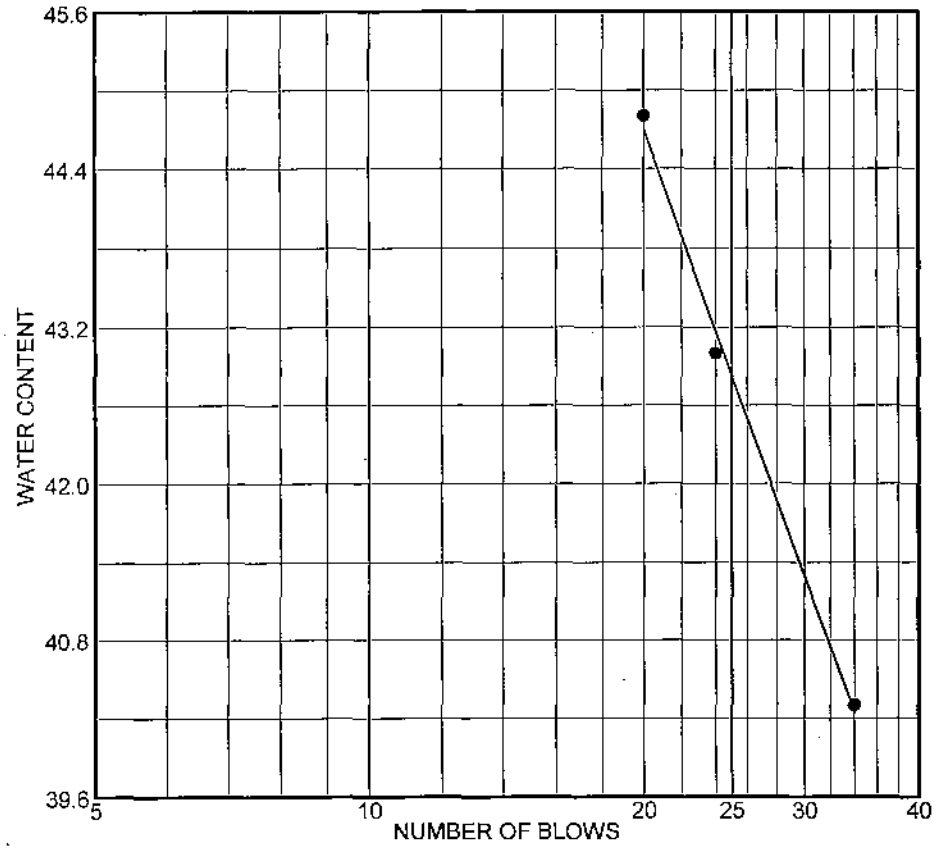
Project ECP Geologic Characterization

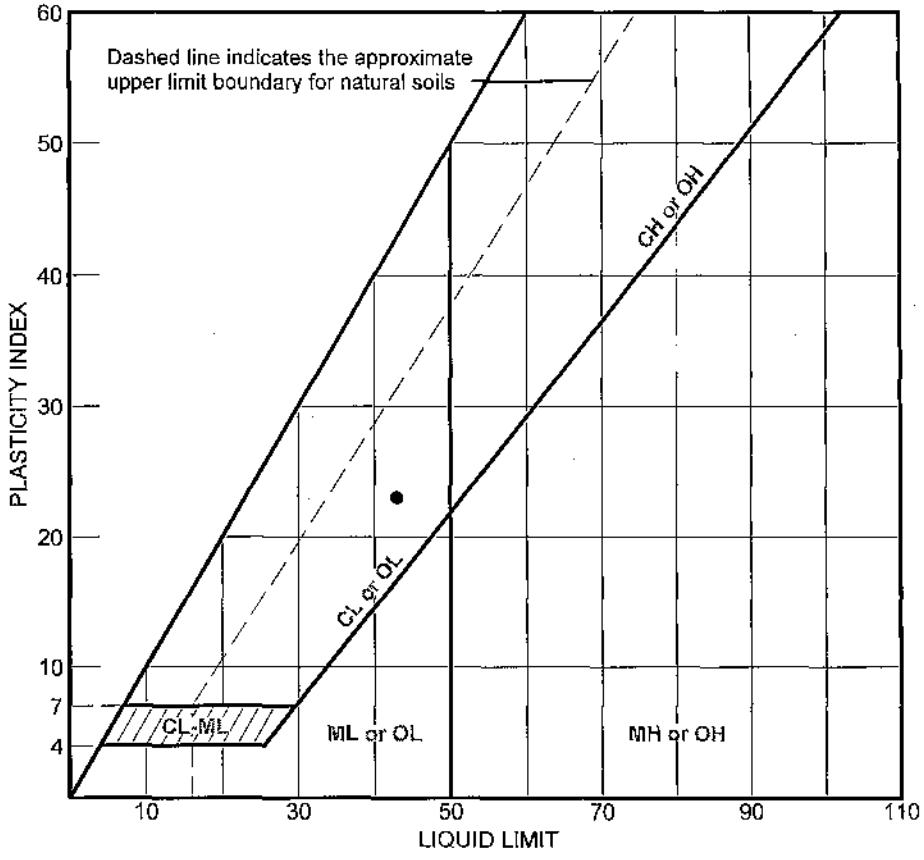
Project No. 6155-08-0031.08 Lab No. 9812

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	21-23 ft	10/5/09	SC	Red Clayey Sand	24.2	43	23

Client SRNS

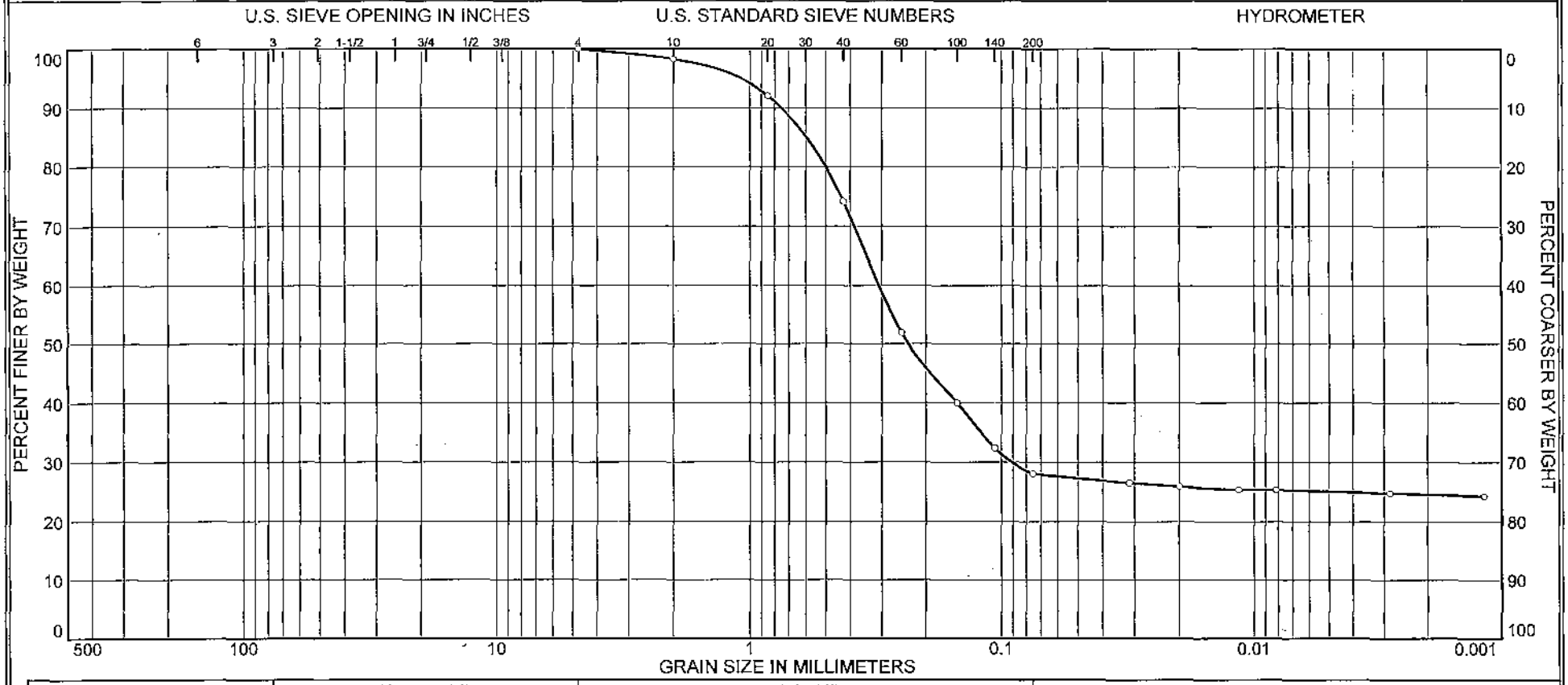
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 | Lab No. 9812

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.7	24.2	46.0	3.0	25.1

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	23.5-26 ft	10/5/09	SC	Reddish Brown Clayey Sand	15.7	40	17

Client SRNS

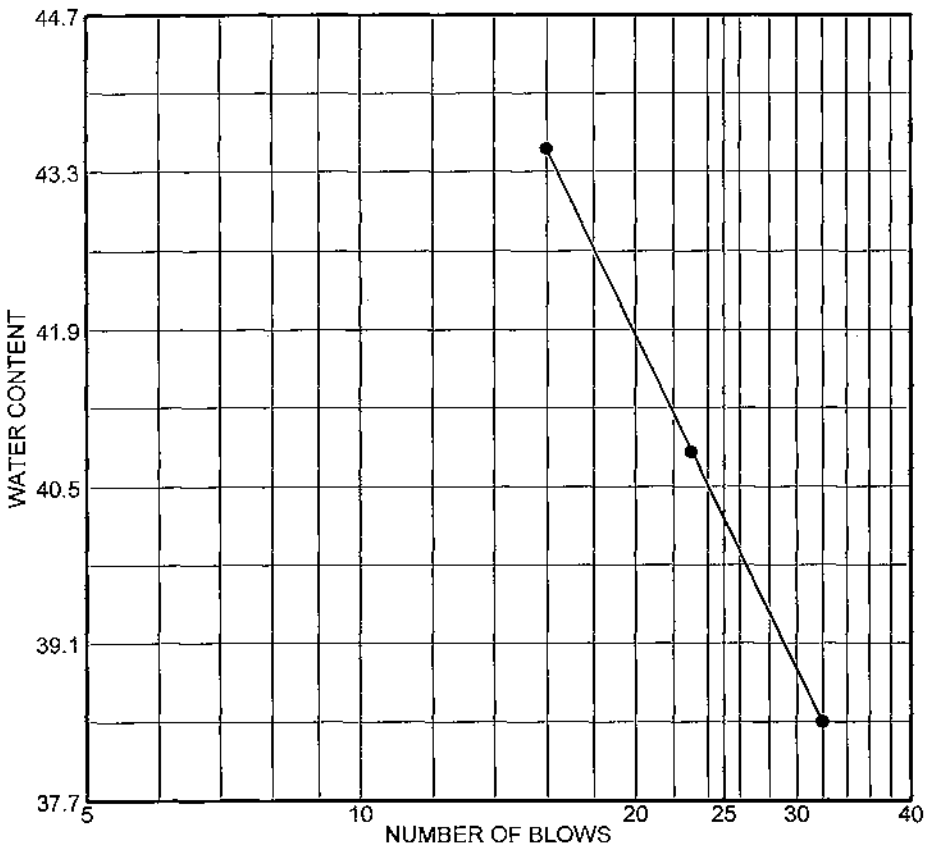
Project ECP Geologic Characterization

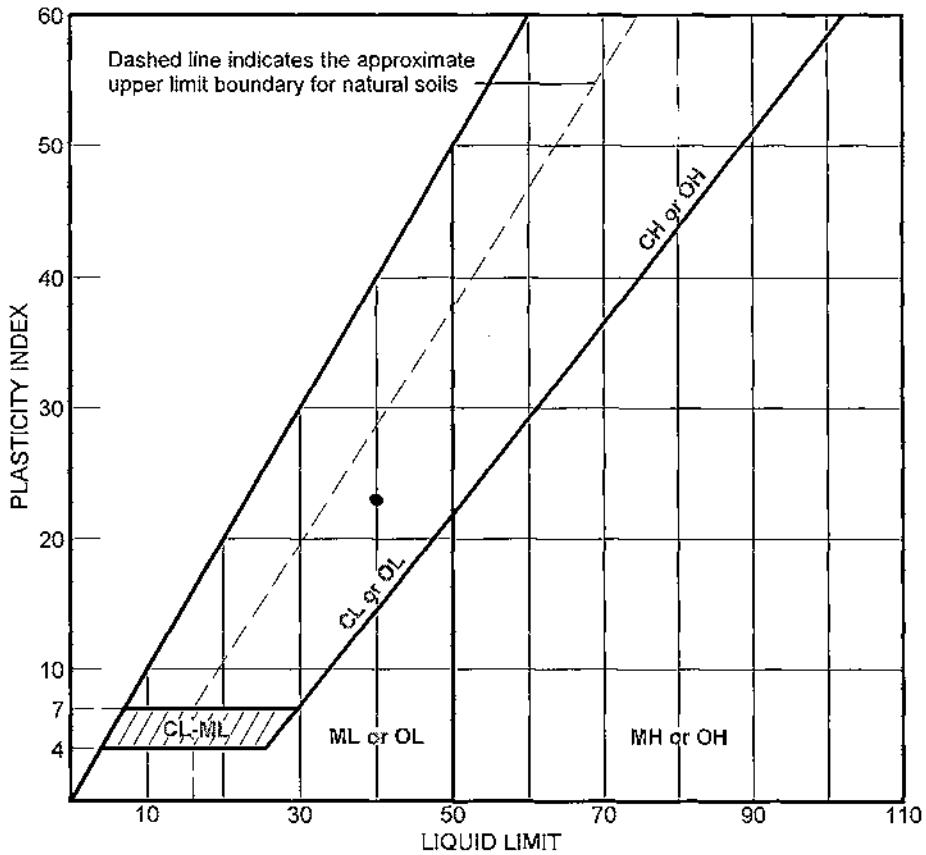
Project No. 6155-08-0031.08 Lab No. 9813

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
•	ECP7/SB2	UD	23.5-26 ft	10/5/09	SC	Reddish Brown Clayey Sand	15.7	40	23

Client SRNS

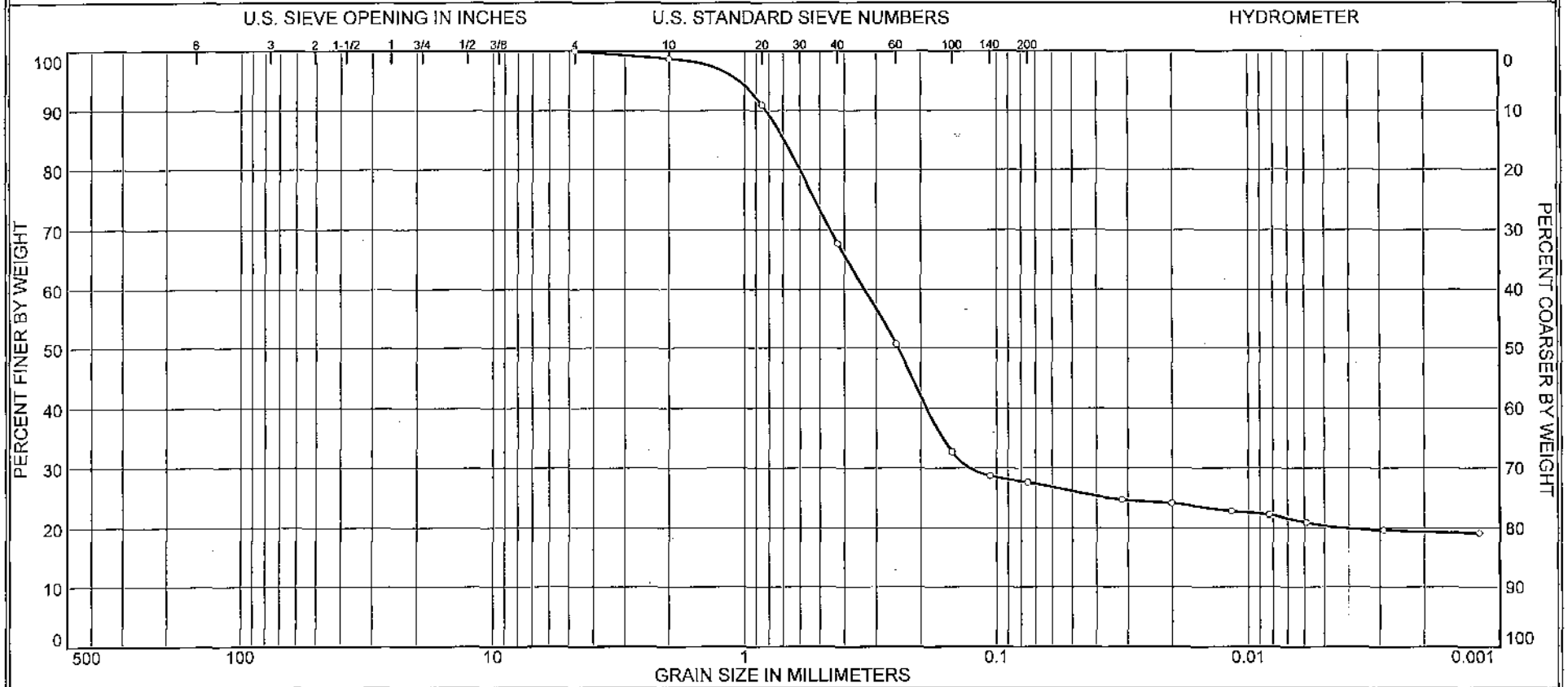
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 | Lab No. 9813

MACTEC ENGINEERING AND CONSULTING, INC.

• Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	1.3	31.0	40.1	7.2	20.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	47.5-50 ft	10/5/09	SC	Yellow Clayey Sand	24.5	70	26

Client SRNS

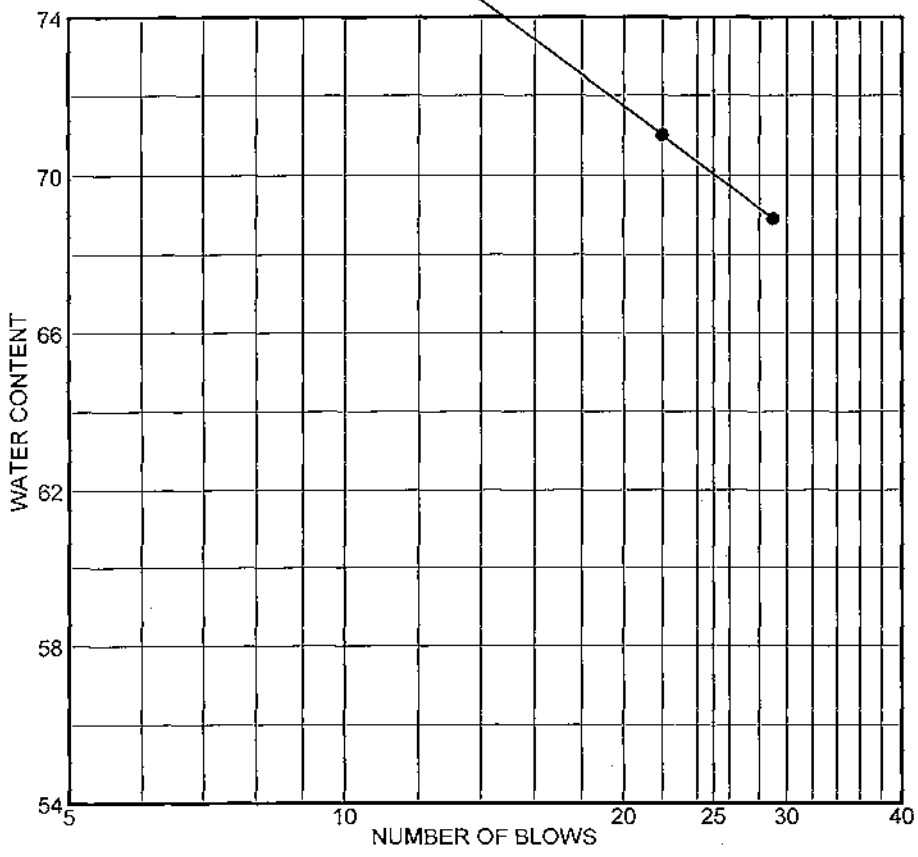
Project ECP Geologic Characterization

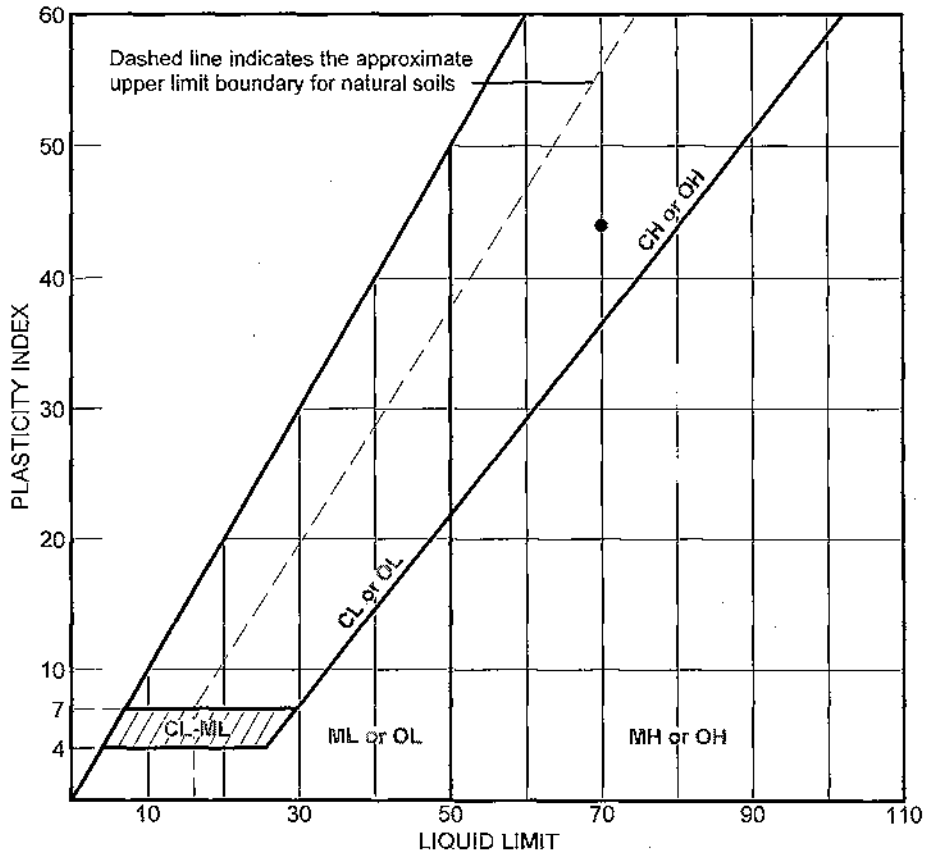
Project No. 6155-08-0031.08 Lab No. 9814

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By :JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	47.5-50 ft	10/5/09	SC	Yellow Clayey Sand	24.5	70	44

Client SRNS

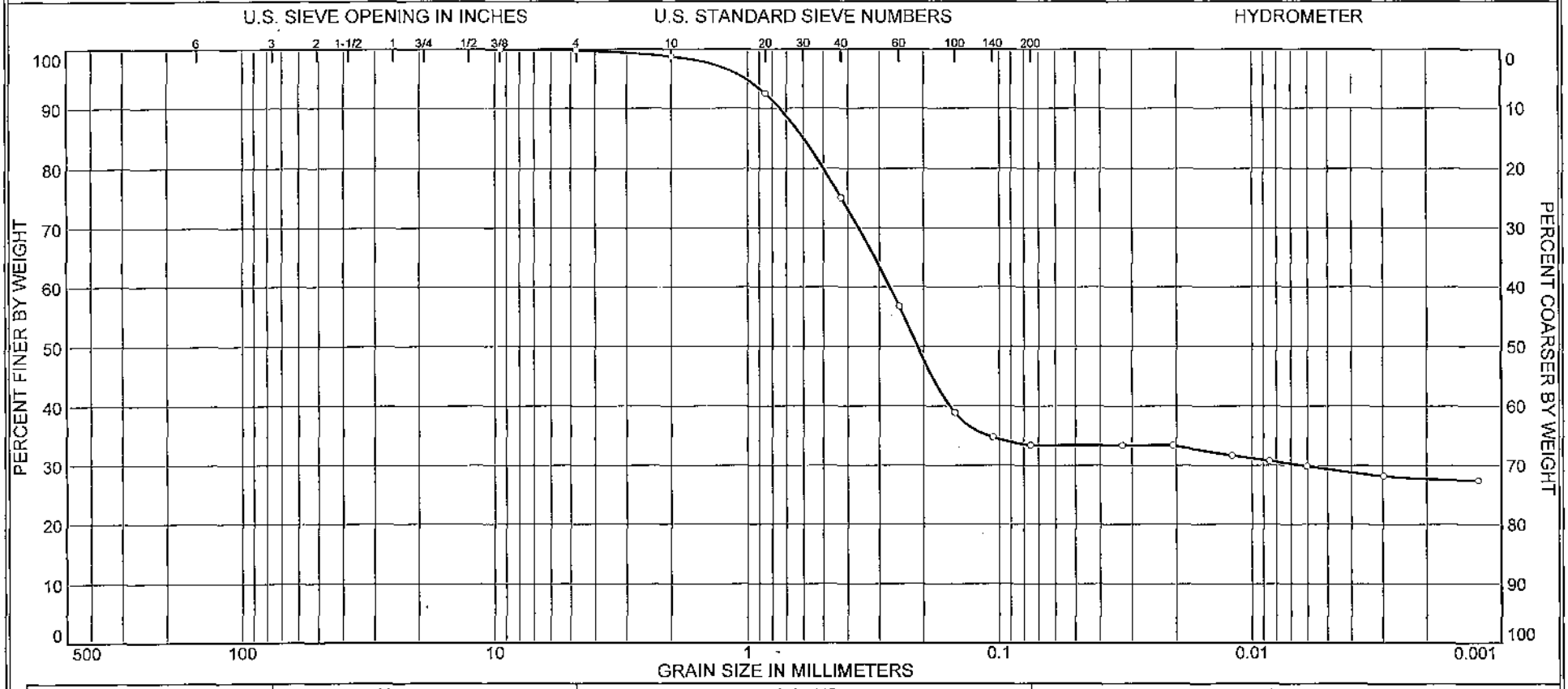
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 | Lab No. 9814

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.2	1.0	23.7	41.7	4.0	29.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	51.5-54 ft	10/5/09	SC	Yellow Clayey Sand	31.9	78	35

Client SRNS

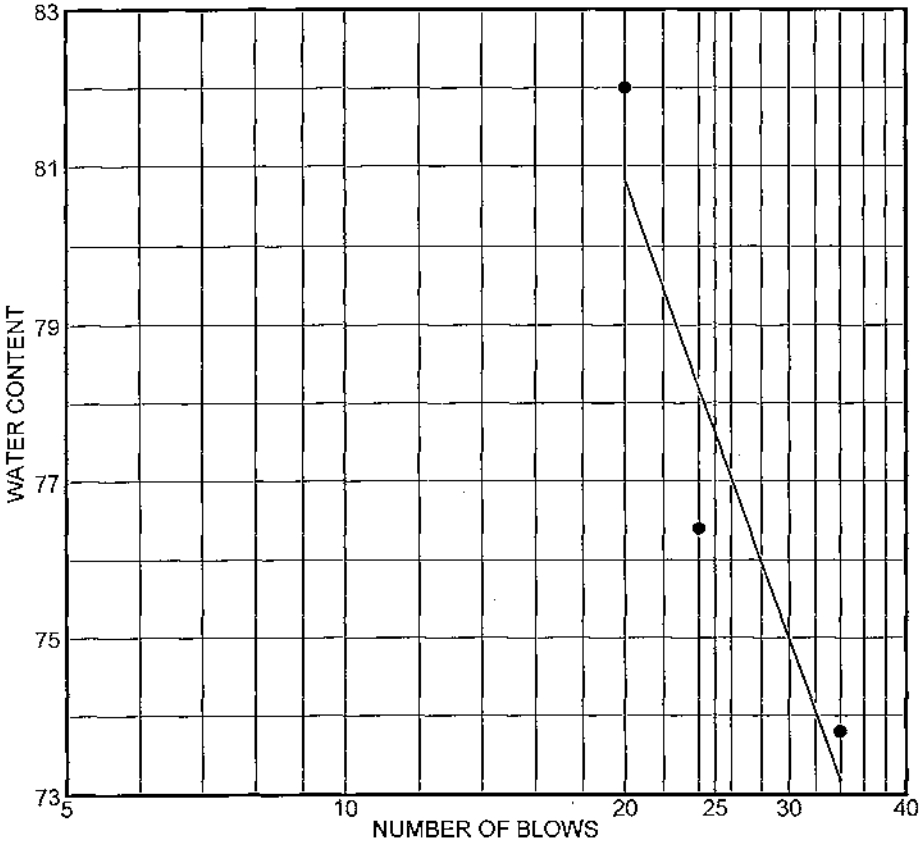
Project ECP Geologic Characterization

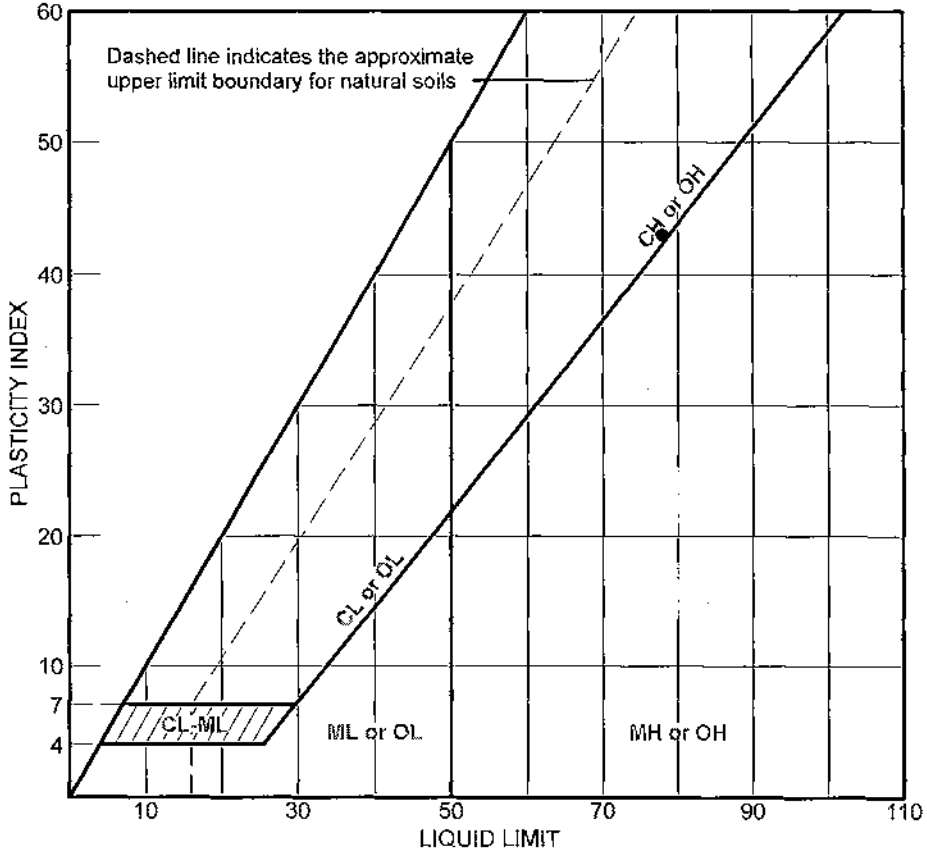
Project No. 6155-08-0031.08 Lab No. 9815

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	51.5-54 ft	10/5/09	SC	Yellow Clayey Sand	31.9	78	43

Client SRNS

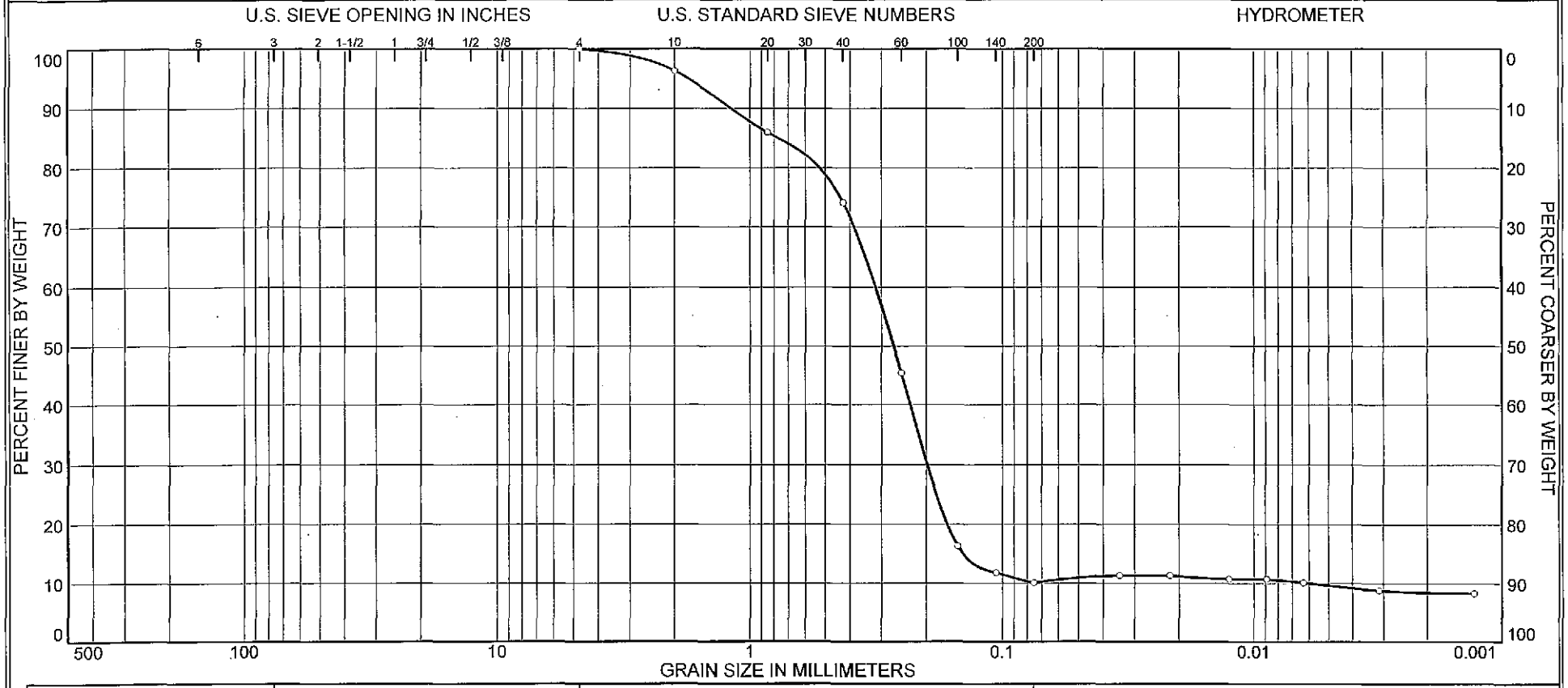
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9815

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	3.7	22.2	64.0	0.5	9.6

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	73.5-76 ft	10/6/09	SP-SM	Yellowish Tan Poorly Graded Sand with Silt	22.4	37	25

Client SRNS

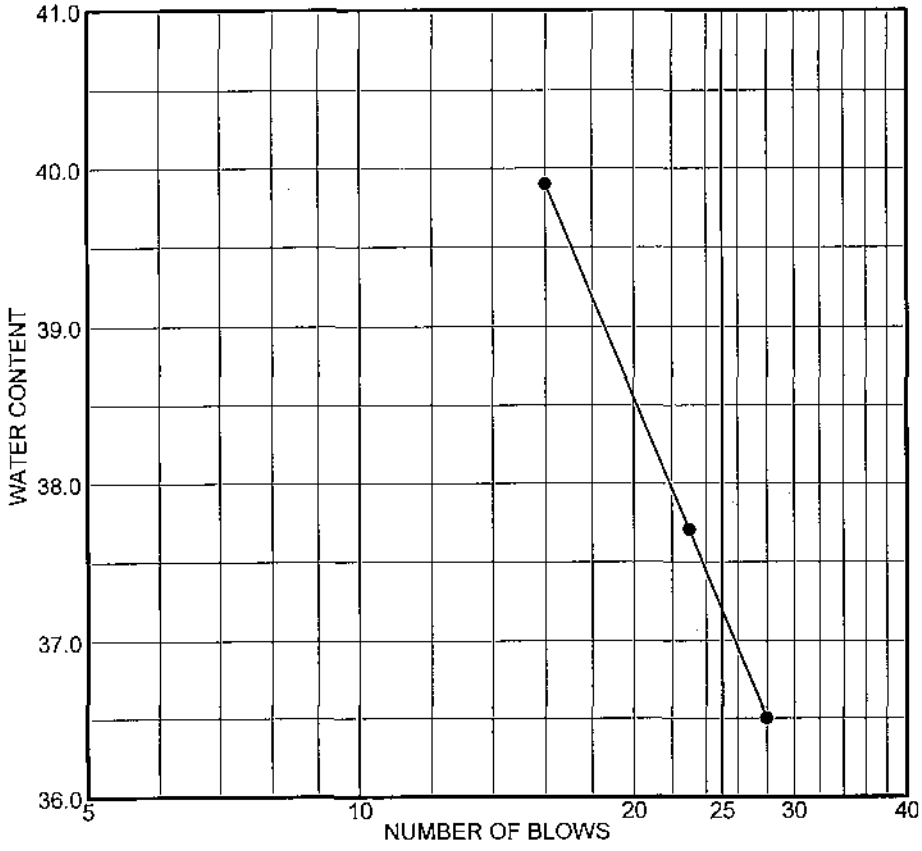
Project ECP Geologic Characterization

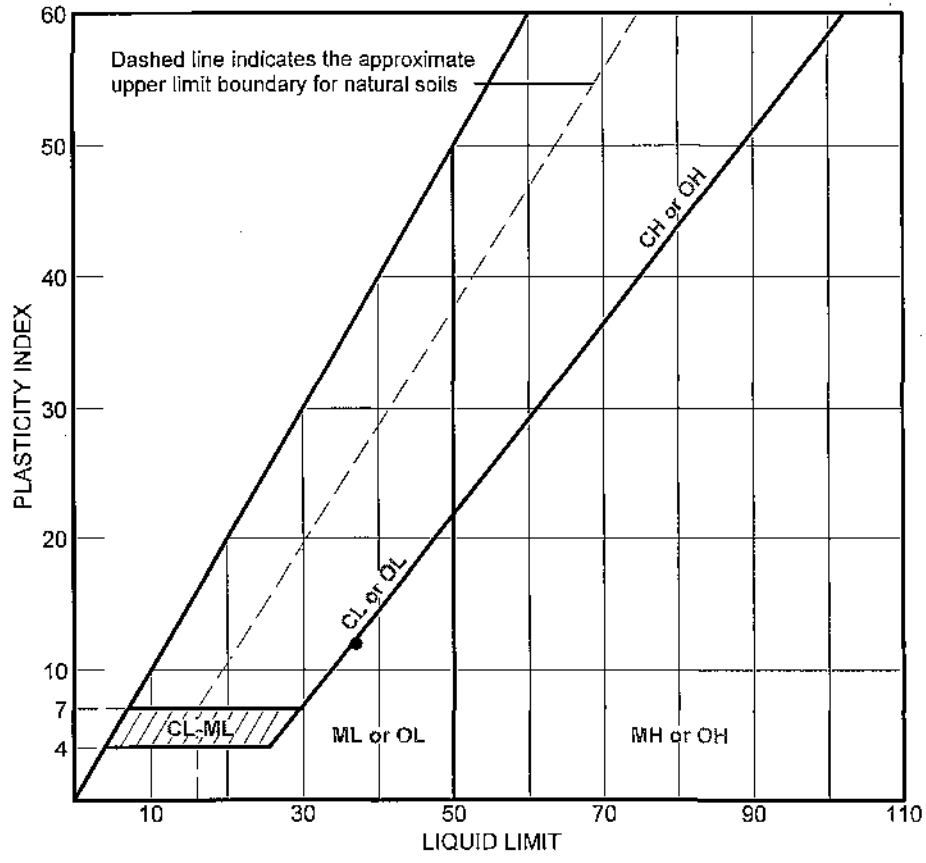
Project No. 6155-08-0031.08 Lab No. 9816

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	73.5-76 ft	10/6/09	SP-SM	Yellowish Tan Poorly Graded Sand with Silt	22.4	37	12

Client SRNS

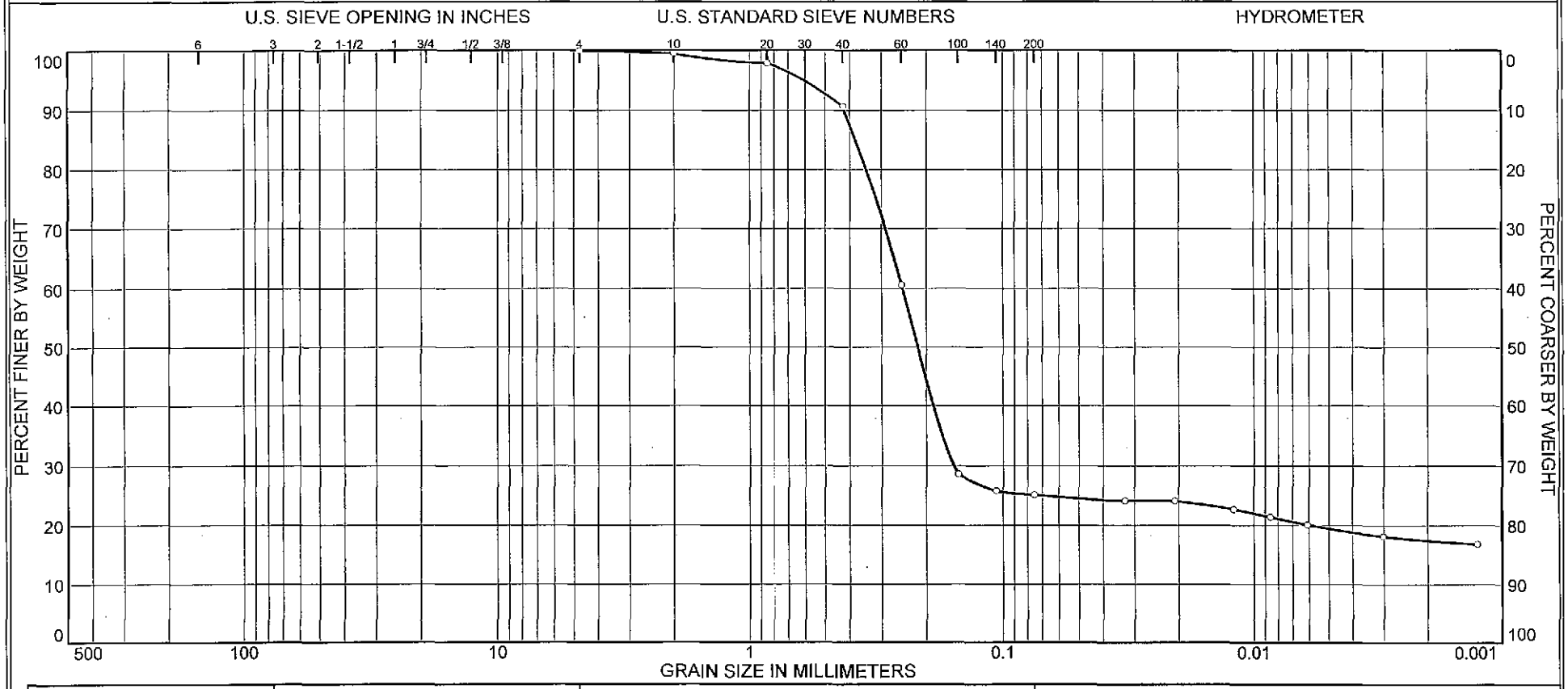
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9816

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.5	9.0	65.4	5.7	19.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	86.5-89 ft	10/6/09	SC	Tan Clayey Sand	25.0	58	21

Client SRNS

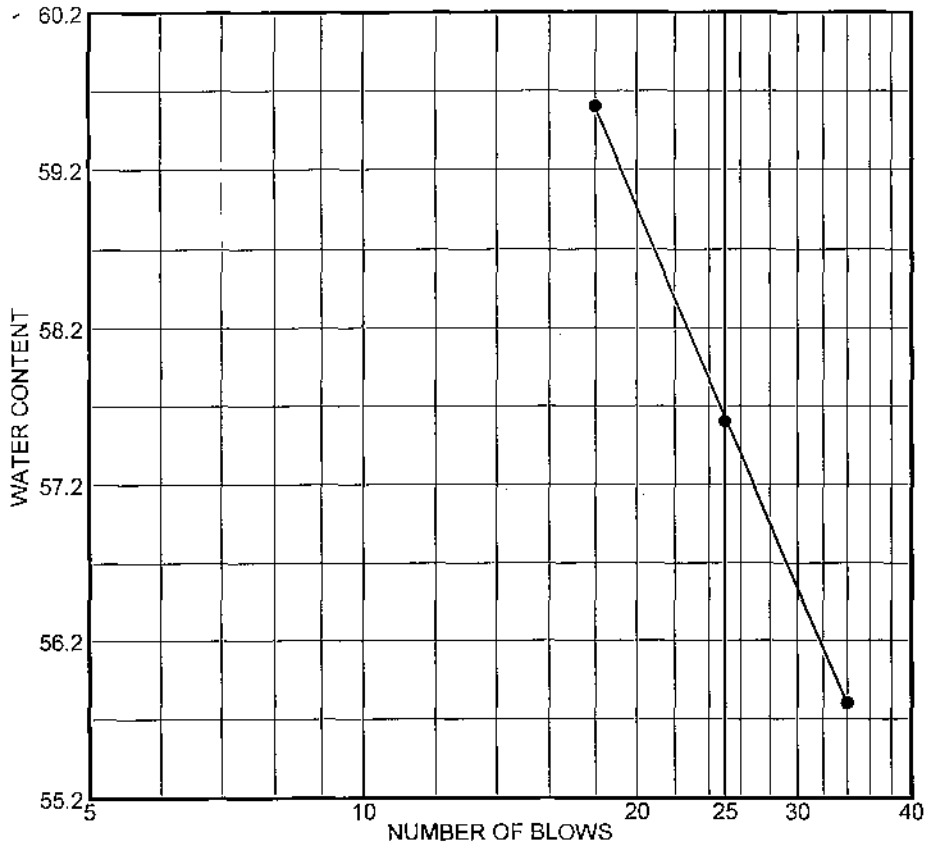
Project ECP Geologic Characterization

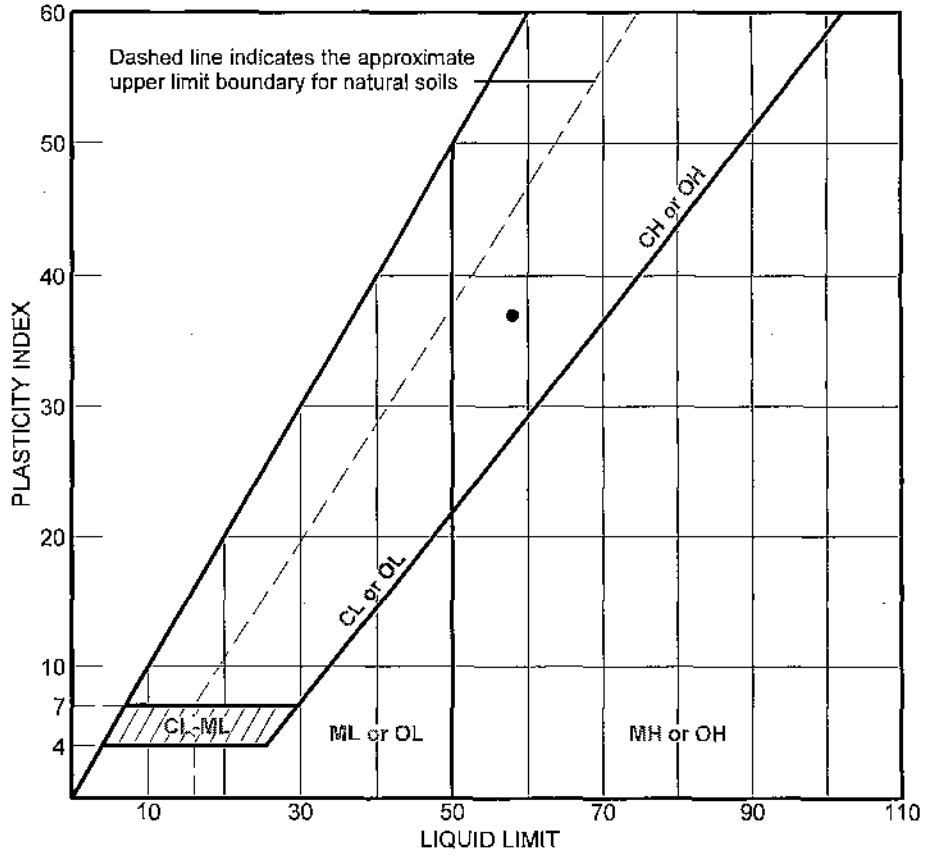
Project No. 6155-08-0031.08 Lab No. 9817

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	86.5-89 ft	10/6/09	SC	Tan Clayey Sand	25.0	58	37

Client SRNS

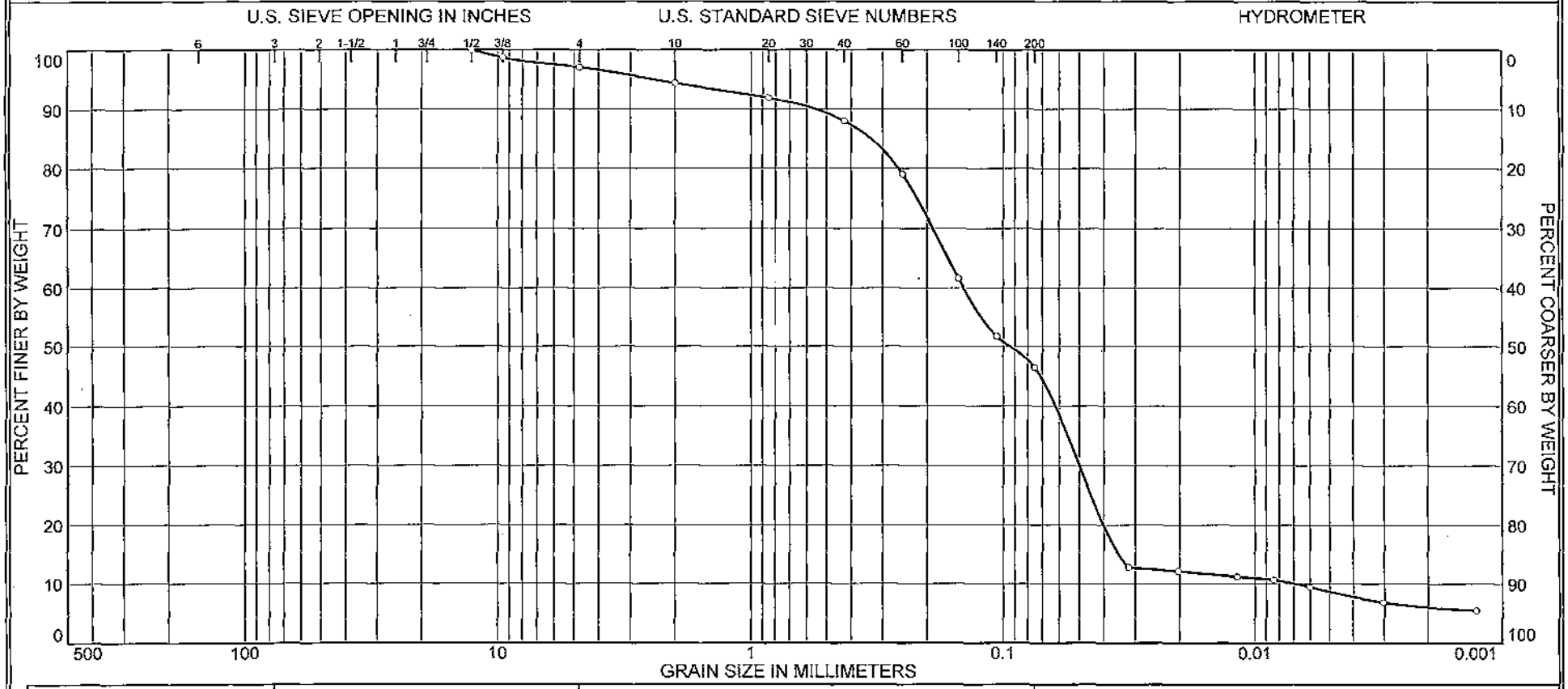
Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9817

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

Particle Size Distribution Report (ASTM D422 (2007))



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	2.9	2.7	6.4	41.6	37.8	8.6

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	ECP7/SB2	UD	123.5-126 ft	10/6/09	SC	Dark Grey Clayey Sand	23.4	47	23

Client SRNS

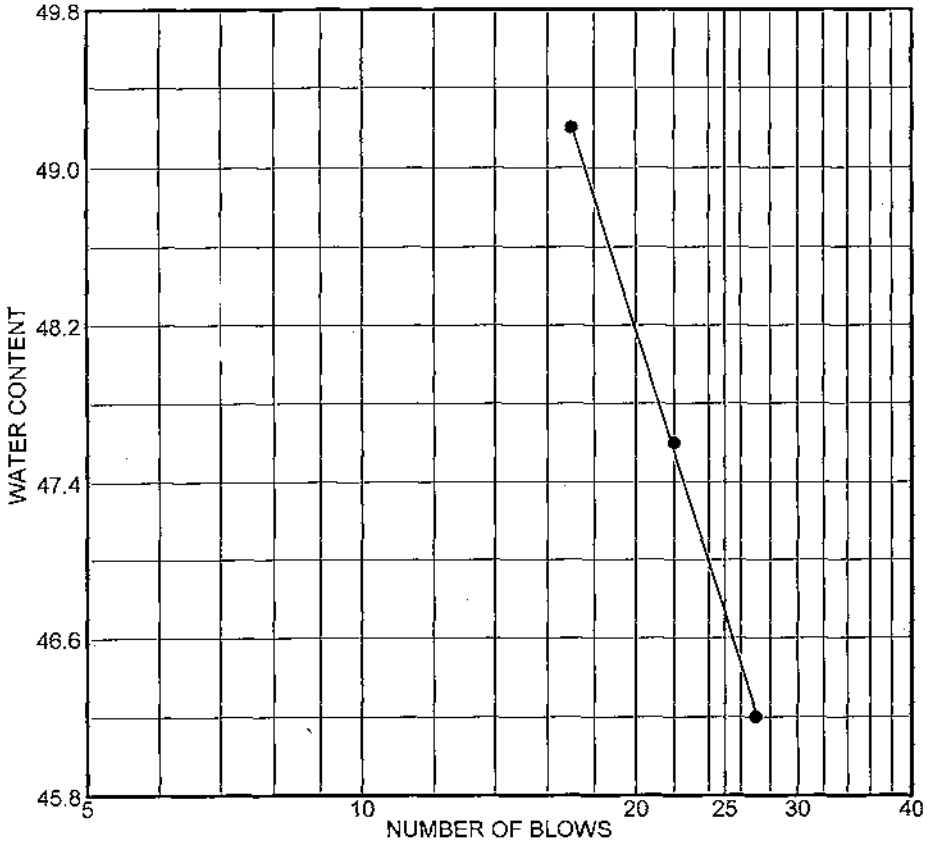
Project ECP Geologic Characterization

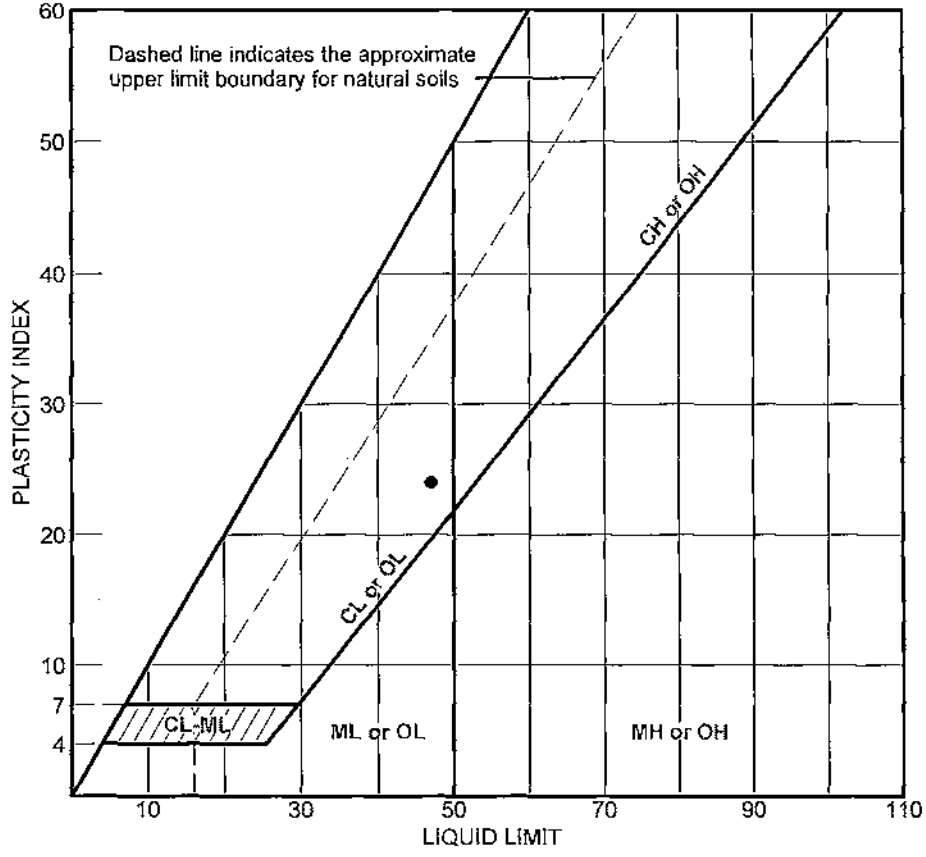
Project No. 6155-08-0031.08 Lab No. 9818

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested By: EH Reviewed By: JW

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	ECP7/SB2	UD	123.5-126 ft	10/6/09	SC	Dark Grey Clayey Sand	23.4	47	24

Client SRNS

Project ECP Geologic Characterization

Project No. 6155-08-0031.08 Lab No. 9818

MACTEC ENGINEERING AND CONSULTING, INC.

● Tested By: EH Reviewed By: JW

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9786	Depth:	14-15 ft
Tested By:	JW	Reviewed By:	JGF
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	2.932			Tare No.	N/A	
2	2.966	Top	2.872	Tare Weight	0.00	*grams*
3	2.97	Bottom	2.872	Wet Weight + Tare	648.84	*grams*
Average	2.956	Average	2.872	Dry Weight + Tare	542.98	*grams*
				Moisture Content	19.5	%

Total Weight of Soil + Tube Section	648.84	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.43	*lbs*
Volume of Sample	0.011	ft^3

RESULT SUMMARY

Moisture Content	**19.5**	%
Wet Density	**129.1**	*pcf*
Dry Density	**108.0**	*pcf*
Specific Gravity	**2.71**	
Porosity	**0.36**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9787	Depth:	22.5-25 ft
Tested By:	JW	Reviewed By:	QEJ
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	3.918			Tare No.	N/A	
2	3.935	Top	2.853	Tare Weight	0.00	*grams*
3	3.912	Bottom	2.853	Wet Weight + Tare	848.34	*grams*
Average	3.922	Average	2.853	Dry Weight + Tare	712.24	*grams*
				Moisture Content	19.1	%

Total Weight of Soil + Tube Section	848.34	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.87	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**19.1**	%
Wet Density	**128.9**	*pcf*
Dry Density	**108.2**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.35**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9788	Depth:	34-35 ft
Tested By:	JW	Reviewed By:	JCT
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	3.441			Tare No.	N/A	
2	3.449	Top	2.826	Tare Weight	0.00	*grams*
3	3.419	Bottom	2.826	Wet Weight + Tare	688.75	*grams*
Average	3.436	Average	2.826	Dry Weight + Tare	559.46	*grams*
				Moisture Content	23.1	%

Total Weight of Soil + Tube Section	688.75	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.52	*lbs*
Volume of Sample	0.012	ft^3

RESULT SUMMARY

Moisture Content	**23.1**	*%*
Wet Density	**121.7**	*pcf*
Dry Density	**98.9**	*pcf*
Specific Gravity	**2.7**	
Porosity	**0.41**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9789	Depth:	42.5-45 ft
Tested By:	JW	Reviewed By:	DGJ
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	3.632			Tare No.	N/A	
2	3.55	Top	2.833	Tare Weight	0.00	*grams*
3	3.522	Bottom	2.833	Wet Weight + Tare	697.42	*grams*
Average	3.568	Average	2.833	Dry Weight + Tare	541.99	*grams*
				Moisture Content	28.7	%

Total Weight of Soil + Tube Section	697.42	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.54	*lbs*
Volume of Sample	0.013	ft^3

RESULT SUMMARY

Moisture Content	**28.7**	%
Wet Density	**118.1**	*pcf*
Dry Density	**91.8**	*pcf*
Specific Gravity	**2.66**	
Porosity	**0.45**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9790	Depth:	54-55 ft
Tested By:	JW	Reviewed By:	RGJ
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	2.434			Tare No.	N/A	
2	2.47	Top	2.852	Tare Weight	0.00	*grams*
3	2.503	Bottom	2.852	Wet Weight + Tare	481.65	*grams*
Average	2.469	Average	2.852	Dry Weight + Tare	371.69	*grams*
				Moisture Content	29.6	%

Total Weight of Soil + Tube Section	481.65	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.06	*lbs*
Volume of Sample	0.009	ft^3

RESULT SUMMARY

Moisture Content	**29.6**	*%*
Wet Density	**116.3**	*pcf*
Dry Density	**89.8**	*pcf*
Specific Gravity	**2.65**	
Porosity	**0.46**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9791	Depth:	61.5-63 ft
Tested By:	JW	Reviewed By:	DGJ
Date:	08/28/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.977			Tare No.	N/A	
2	4.933	Top	2.855	Tare Weight	0.00	*grams*
3	4.886	Bottom	2.855	Wet Weight + Tare	985.94	*grams*
Average	4.932	Average	2.855	Dry Weight + Tare	812.45	*grams*
				Moisture Content	21.4	%

Total Weight of Soil + Tube Section	985.94	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.17	*lbs*
Volume of Sample	0.018	ft^3

RESULT SUMMARY

Moisture Content	**21.4**	%
Wet Density	**119.0**	*pcf*
Dry Density	**98.0**	*pcf*
Specific Gravity	**2.67**	
Porosity	**0.41**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9792	Depth:	72.5-75 ft
Tested By:	JW	Reviewed By:	DGJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.091			Tare No.	N/A	
2	4.105	Top	2.860	Tare Weight	0.00	*grams*
3	4.076	Bottom	2.860	Wet Weight + Tare	829.23	*grams*
Average	4.091	Average	2.860	Dry Weight + Tare	663.84	*grams*
				Moisture Content	24.9	%

Total Weight of Soil + Tube Section	829.23	*grams*
Weight of Clean, Dry Tube Section	663.84	*grams*
Wet Weight of Soil	0.36	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**24.9**	%
Wet Density	**24.0**	*pcf*
Dry Density	**19.2**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.89**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9792	Depth:	72.5-75 ft
Tested By:	JW	Reviewed By:	
Date:	09/03/09	Date:	

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.091			Tare No.	N/A	
2	4.105	Top	2.860	Tare Weight	0.00	*grams*
3	4.076	Bottom	2.860	Wet Weight + Tare	829.23	*grams*
Average	4.091	Average	2.860	Dry Weight + Tare	663.84	*grams*
				Moisture Content	24.9	%

Total Weight of Soil + Tube Section	829.23	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.83	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**24.9**	*%*
Wet Density	**120.2**	***pcf***
Dry Density	**96.2**	***pcf***
Specific Gravity	**2.69**	
Porosity	**0.43**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP8/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9793	Depth:	83.5-85 ft
Tested By:	JW	Reviewed By:	JCJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	3.691			Tare No.	N/A	
2	3.675	Top	2.880	Tare Weight	0.00	*grams*
3	3.695	Bottom	2.880	Wet Weight + Tare	764.42	*grams*
Average	3.687	Average	2.880	Dry Weight + Tare	584.36	*grams*
				Moisture Content	30.8	%

Total Weight of Soil + Tube Section	764.42	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.69	*lbs*
Volume of Sample	0.014	ft^3

RESULT SUMMARY

Moisture Content	**30.8**	%
Wet Density	**121.2**	*pcf*
Dry Density	**92.7**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.45**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9794	Depth:	8.5-11 ft
Tested By:	JW	Reviewed By:	JCJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.052			Tare No.	N/A	
2	5.029	Top	2.860	Tare Weight	0.00	*grams*
3	4.973	Bottom	2.860	Wet Weight + Tare	1093.20	*grams*
Average	5.018	Average	2.860	Dry Weight + Tare	968.90	*grams*
				Moisture Content	12.8	%

Total Weight of Soil + Tube Section	1093.12	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.41	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**12.8**	%
Wet Density	**129.2**	*pcf*
Dry Density	**114.5**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.32**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9795	Depth:	19-21 ft
Tested By:	JW	Reviewed By:	JEJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.042			Tare No.	N/A	
2	5.084	Top	2.840	Tare Weight	0.00	*grams*
3	5.019	Bottom	2.840	Wet Weight + Tare	1005.97	*grams*
Average	5.048	Average	2.840	Dry Weight + Tare	881.28	*grams*
				Moisture Content	14.1	%

Total Weight of Soil + Tube Section	1005.97	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.22	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**14.1**	%
Wet Density	**119.8**	*pcf*
Dry Density	**105.0**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.37**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9796	Depth:	29.5-21 ft
Tested By:	JW	Reviewed By:	JGJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.882			Tare No.	N/A	
2	4.845	Top	2.874	Tare Weight	0.00	*grams*
3	4.854	Bottom	2.874	Wet Weight + Tare	933.83	*grams*
Average	4.860	Average	2.874	Dry Weight + Tare	828.59	*grams*
				Moisture Content	12.7	%

Total Weight of Soil + Tube Section	933.83	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.06	*lbs*
Volume of Sample	0.018	ft^3

RESULT SUMMARY

Moisture Content	**12.7**	%
Wet Density	**112.8**	*pcf*
Dry Density	**100.1**	*pcf*
Specific Gravity	**2.71**	
Porosity	**0.41**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9797	Depth:	41.5-43 ft
Tested By:	JW	Reviewed By:	JEJ
Date:	09/03/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.437			Tare No.	N/A	
2	4.511	Top	2.842	Tare Weight	0.00	*grams*
3	4.429	Bottom	2.842	Wet Weight + Tare	934.21	*grams*
Average	4.459	Average	2.842	Dry Weight + Tare	790.87	*grams*
				Moisture Content	18.1	%

Total Weight of Soil + Tube Section	934.21	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.06	*lbs*
Volume of Sample	0.016	ft^3

RESULT SUMMARY

Moisture Content	**18.1**	%
Wet Density	**125.8**	*pcf*
Dry Density	**106.5**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.36**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9798	Depth:	49-51 ft
Tested By:	JW	Reviewed By:	DEJ
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.508			Tare No.	N/A	
2	5.494	Top	2.863	Tare Weight	0.00	*grams*
3	5.488	Bottom	2.863	Wet Weight + Tare	1135.03	*grams*
Average	5.497	Average	2.863	Dry Weight + Tare	910.35	*grams*
				Moisture Content	24.7	%

Total Weight of Soil + Tube Section	135.03	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	0.30	*lbs*
Volume of Sample	0.020	ft^3

RESULT SUMMARY

Moisture Content	**24.7**	%
Wet Density	**14.5**	*pcf*
Dry Density	**11.7**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.93**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9798	Depth:	49-51 ft
Tested By:	JW	Reviewed By:	
Date:	09/10/09	Date:	

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.508			Tare No.	N/A	
2	5.494	Top	2.863	Tare Weight	0.00	*grams*
3	5.488	Bottom	2.863	Wet Weight + Tare	1135.03	*grams*
Average	5.497	Average	2.863	Dry Weight + Tare	910.35	*grams*
				Moisture Content	24.7	%

Total Weight of Soil + Tube Section	1135.03	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.50	*lbs*
Volume of Sample	0.020	ft^3

RESULT SUMMARY

Moisture Content	**24.7**	*%*
Wet Density	**122.2**	*pcf*
Dry Density	**98.0**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.42**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9799	Depth:	70.5-73 ft
Tested By:	JW	Reviewed By:	[illegible]
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.72			Tare No.	N/A	
2	4.717	Top	2.874	Tare Weight	0.00	*grams*
3	4.724	Bottom	2.874	Wet Weight + Tare	952.96	*grams*
Average	4.720	Average	2.874	Dry Weight + Tare	776.00	*grams*
				Moisture Content	22.8	%

Total Weight of Soil + Tube Section	952.96	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.10	*lbs*
Volume of Sample	0.018	ft^3

RESULT SUMMARY

Moisture Content	**22.8**	%
Wet Density	**118.6**	*pcf*
Dry Density	**96.5**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.42**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9800	Depth:	80.5-83 ft
Tested By:	JW	Reviewed By:	JCF
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.34			Tare No.	N/A	
2	5.333	Top	2.874	Tare Weight	0.00	*grams*
3	5.336	Bottom	2.874	Wet Weight + Tare	980.99	*grams*
Average	5.336	Average	2.874	Dry Weight + Tare	686.47	*grams*
				Moisture Content	42.9	%

Total Weight of Soil + Tube Section	980.99	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.16	*lbs*
Volume of Sample	0.020	ft^3

RESULT SUMMARY

Moisture Content	**42.9**	%
Wet Density	**108.0**	*pcf*
Dry Density	**75.5**	*pcf*
Specific Gravity	**2.67**	
Porosity	**0.55**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP6/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9801	Depth:	109-111 ft
Tested By:	JW	Reviewed By:	QCJ
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	2.021			Tare No.	N/A	
2	2.087	Top	2.866	Tare Weight	0.00	*grams*
3	2.046	Bottom	2.866	Wet Weight + Tare	391.62	*grams*
Average	2.051	Average	2.866	Dry Weight + Tare	291.47	*grams*
				Moisture Content	34.4	%

Total Weight of Soil + Tube Section	391.62	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	0.86	*lbs*
Volume of Sample	0.008	ft^3

RESULT SUMMARY

Moisture Content	**34.4**	%
Wet Density	**112.7**	*pcf*
Dry Density	**83.9**	*pcf*
Specific Gravity	**2.62**	
Porosity	**0.49**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9802	Depth:	20-22 ft
Tested By:	JW	Reviewed By:	DGF
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.044			Tare No.	N/A	
2	5.021	Top	2.874	Tare Weight	0.00	*grams*
3	5.033	Bottom	2.874	Wet Weight + Tare	1096.42	*grams*
Average	5.033	Average	2.874	Dry Weight + Tare	927.58	*grams*
				Moisture Content	18.2	%

Total Weight of Soil + Tube Section	1096.42	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.42	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**18.2**	%
Wet Density	**127.9**	*pcf*
Dry Density	**108.2**	*pcf*
Specific Gravity	**2.71**	
Porosity	**0.36**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9803	Depth:	26.5-29 ft
Tested By:	JW	Reviewed By:	JCJ
Date:	09/10/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.409			Tare No.	N/A	
2	4.42	Top	2.854	Tare Weight	0.00	*grams*
3	4.4	Bottom	2.854	Wet Weight + Tare	910.24	*grams*
Average	4.410	Average	2.854	Dry Weight + Tare	810.21	*grams*
				Moisture Content	12.3	%

Total Weight of Soil + Tube Section	910.24	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.01	*lbs*
Volume of Sample	0.016	ft^3

RESULT SUMMARY

Moisture Content	**12.3**	%
Wet Density	**122.9**	*pcf*
Dry Density	**109.4**	*pcf*
Specific Gravity	**2.72**	
Porosity	**0.36**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9804	Depth:	40.5-42 ft
Tested By:	JW	Reviewed By:	JEJ
Date:	09/21/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.022			Tare No.	N/A	
2	4.991	Top	2.855	Tare Weight	0.00	*grams*
3	5.003	Bottom	2.855	Wet Weight + Tare	1008.76	*grams*
Average	5.005	Average	2.855	Dry Weight + Tare	882.44	*grams*
				Moisture Content	14.3	%

Total Weight of Soil + Tube Section	1008.76	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.22	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**14.3**	%
Wet Density	**119.9**	*pcf*
Dry Density	**104.9**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.37**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9805	Depth:	51.5-53.5 ft
Tested By:	JW	Reviewed By:	QCF
Date:	09/21/09	Date:	12/1/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.992			Tare No.	N/A	
2	4.985	Top	2.882	Tare Weight	0.00	*grams*
3	4.987	Bottom	2.882	Wet Weight + Tare	1018.20	*grams*
Average	4.988	Average	2.882	Dry Weight + Tare	865.80	*grams*
				Moisture Content	17.6	%

Total Weight of Soil + Tube Section	1018.20	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.24	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**17.6**	%
Wet Density	**119.2**	*pcf*
Dry Density	**101.4**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.39**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9806	Depth:	61.5-64 ft
Tested By:	JW	Reviewed By:	DEJ
Date:	09/21/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.466			Tare No.	N/A	
2	4.454	Top	2.873	Tare Weight	0.00	*grams*
3	4.447	Bottom	2.873	Wet Weight + Tare	948.14	*grams*
Average	4.456	Average	2.873	Dry Weight + Tare	784.77	*grams*
				Moisture Content	20.8	%

Total Weight of Soil + Tube Section	948.14	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.09	*lbs*
Volume of Sample	0.017	ft^3

RESULT SUMMARY

Moisture Content	**20.8**	%
Wet Density	**125.0**	*pcf*
Dry Density	**103.5**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.38**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9807	Depth:	70.5-73 ft
Tested By:	JW	Reviewed By:	JET
Date:	09/21/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.13			Tare No.	N/A	
2	4.096	Top	2.875	Tare Weight	0.00	*grams*
3	4.099	Bottom	2.875	Wet Weight + Tare	816.48	*grams*
Average	4.108	Average	2.875	Dry Weight + Tare	623.41	*grams*
				Moisture Content	31.0	%

Total Weight of Soil + Tube Section	816.48	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.80	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**31.0**	%
Wet Density	**116.6**	*pcf*
Dry Density	**89.0**	*pcf*
Specific Gravity	**2.7**	
Porosity	**0.47**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9808	Depth:	80.5-83 ft
Tested By:	JW	Reviewed By:	DEF
Date:	09/21/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.061			Tare No.	N/A	
2	5.055	Top	2.882	Tare Weight	0.00	*grams*
3	5.054	Bottom	2.882	Wet Weight + Tare	948.59	*grams*
Average	5.057	Average	2.882	Dry Weight + Tare	701.28	*grams*
				Moisture Content	35.3	%

Total Weight of Soil + Tube Section	948.59	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.09	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**35.3**	%
Wet Density	**109.5**	*pcf*
Dry Density	**81.0**	*pcf*
Specific Gravity	**2.65**	
Porosity	**0.51**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9809	Depth:	115.5-118 ft
Tested By:	JW	Reviewed By:	DEJ
Date:	09/21/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.068			Tare No.	N/A	
2	5.054	Top	2.859	Tare Weight	0.00	*grams*
3	5.059	Bottom	2.859	Wet Weight + Tare	1007.93	*grams*
Average	5.060	Average	2.859	Dry Weight + Tare	780.00	*grams*
				Moisture Content	29.2	%

Total Weight of Soil + Tube Section	1007.93	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.22	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**29.2**	%
Wet Density	**118.2**	*pcf*
Dry Density	**91.5**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.46**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP9/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9810	Depth:	140.5-143 ft
Tested By:	JW	Reviewed By:	DGF
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	2.522			Tare No.	N/A	
2	2.503	Top	2.826	Tare Weight	0.00	*grams*
3	2.479	Bottom	2.826	Wet Weight + Tare	495.60	*grams*
Average	2.501	Average	2.826	Dry Weight + Tare	363.07	*grams*
				Moisture Content	36.5	%

Total Weight of Soil + Tube Section	495.60	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.09	*lbs*
Volume of Sample	0.009	ft^3

RESULT SUMMARY

Moisture Content	**36.5**	*%*
Wet Density	**120.3**	*pcf*
Dry Density	**88.2**	*pcf*
Specific Gravity	**2.64**	
Porosity	**0.46**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9811	Depth:	17.5-20 ft
Tested By:	JW	Reviewed By:	JGT
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.039			Tare No.	N/A	
2	4.094	Top	2.882	Tare Weight	0.00	*grams*
3	4.087	Bottom	2.882	Wet Weight + Tare	914.51	*grams*
Average	4.073	Average	2.882	Dry Weight + Tare	787.87	*grams*
				Moisture Content	16.1	%

Total Weight of Soil + Tube Section	914.51	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.02	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**16.1**	%
Wet Density	**131.1**	*pcf*
Dry Density	**113.0**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.32**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9812	Depth:	21-23 ft
Tested By:	JW	Reviewed By:	JW
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.71			Tare No.	N/A	
2	4.694	Top	2.858	Tare Weight	0.00	*grams*
3	4.724	Bottom	2.858	Wet Weight + Tare	1059.27	*grams*
Average	4.709	Average	2.858	Dry Weight + Tare	933.65	*grams*
				Moisture Content	13.5	%

Total Weight of Soil + Tube Section	1059.27	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.34	*lbs*
Volume of Sample	0.017	ft^3

RESULT SUMMARY

Moisture Content	**13.5**	%
Wet Density	**133.6**	*pcf*
Dry Density	**117.7**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.30**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9813	Depth:	23.5-26 ft
Tested By:	JW	Reviewed By:	JGT
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.101			Tare No.	N/A	
2	4.097	Top	2.867	Tare Weight	0.00	*grams*
3	4.088	Bottom	2.867	Wet Weight + Tare	937.01	*grams*
Average	4.095	Average	2.867	Dry Weight + Tare	823.57	*grams*
				Moisture Content	13.8	%

Total Weight of Soil + Tube Section	937.01	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.07	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**13.8**	%
Wet Density	**135.0**	*pcf*
Dry Density	**118.7**	*pcf*
Specific Gravity	**2.68**	
Porosity	**0.29**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9814	Depth:	47.5-50 ft
Tested By:	JW	Reviewed By:	DEF
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	5.016			Tare No.	N/A	
2	5.029	Top	2.861	Tare Weight	0.00	*grams*
3	4.972	Bottom	2.861	Wet Weight + Tare	922.76	*grams*
Average	5.006	Average	2.861	Dry Weight + Tare	699.64	*grams*
				Moisture Content	31.9	%

Total Weight of Soil + Tube Section	922.76	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.03	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**31.9**	*%*
Wet Density	**109.2**	*pcf*
Dry Density	**82.8**	*pcf*
Specific Gravity	**2.69**	
Porosity	**0.51**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9815	Depth:	51.5-54 ft
Tested By:	JW	Reviewed By:	QEJ
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.997			Tare No.	N/A	
2	5.004	Top	2.866	Tare Weight	0.00	*grams*
3	5.000	Bottom	2.866	Wet Weight + Tare	944.80	*grams*
Average	5.000	Average	2.866	Dry Weight + Tare	713.70	*grams*
				Moisture Content	32.4	%

Total Weight of Soil + Tube Section	944.80	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.08	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**32.4**	%
Wet Density	**111.6**	*pcf*
Dry Density	**84.3**	*pcf*
Specific Gravity	**2.63**	
Porosity	**0.49**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9816	Depth:	73.5-76 ft
Tested By:	JW	Reviewed By:	DGF
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.967			Tare No.	N/A	
2	4.972	Top	2.866	Tare Weight	0.00	*grams*
3	4.978	Bottom	2.866	Wet Weight + Tare	1007.99	*grams*
Average	4.972	Average	2.866	Dry Weight + Tare	812.13	*grams*
				Moisture Content	24.1	%

Total Weight of Soil + Tube Section	1007.99	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.22	*lbs*
Volume of Sample	0.019	ft^3

RESULT SUMMARY

Moisture Content	**24.1**	%
Wet Density	**119.7**	*pcf*
Dry Density	**96.4**	*pcf*
Specific Gravity	**2.66**	
Porosity	**0.42**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9817	Depth:	86.5-89 ft
Tested By:	JW	Reviewed By:	JCF
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.960			Tare No.	N/A	
2	4.918	Top	2.869	Tare Weight	0.00	*grams*
3	4.945	Bottom	2.869	Wet Weight + Tare	1009.20	*grams*
Average	4.941	Average	2.869	Dry Weight + Tare	795.66	*grams*
				Moisture Content	26.8	%

Total Weight of Soil + Tube Section	1009.20	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	2.22	*lbs*
Volume of Sample	0.018	ft^3

RESULT SUMMARY

Moisture Content	**26.8**	%
Wet Density	**120.4**	*pcf*
Dry Density	**94.9**	*pcf*
Specific Gravity	**2.64**	
Porosity	**0.42**	

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-00013, Rev. 12

Delivery Order No. 8

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TP-4 UNIT WEIGHT OF SAMPLE

Project No.:	6155-08-0031.08	Boring No.:	ECP7/SB2
Project Name:	ECP Geologic Charaterization	Sample No.:	UD
Lab No.	9818	Depth:	123.5-126 ft
Tested By:	JW	Reviewed By:	DGF
Date:	10/05/09	Date:	12/11/09

Total Sample Height, *inches*		Inside Diameter of Cut Tube, *inches*		Moisture Content		
1	4.134			Tare No.	N/A	
2	4.106	Top	2.857	Tare Weight	0.00	*grams*
3	4.136	Bottom	2.857	Wet Weight + Tare	839.01	*grams*
Average	4.125	Average	2.857	Dry Weight + Tare	660.19	*grams*
				Moisture Content	27.1	%

Total Weight of Soil + Tube Section	839.01	*grams*
Weight of Clean, Dry Tube Section	0.00	*grams*
Wet Weight of Soil	1.85	*lbs*
Volume of Sample	0.015	ft^3

RESULT SUMMARY

Moisture Content	**27.1**	%
Wet Density	**120.9**	*pcf*
Dry Density	**95.1**	*pcf*
Specific Gravity	**2.66**	
Porosity	**0.43**	

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-00013, Rev. 12
Delivery Order No. 8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 8/31/2009 **Review Date** 9/7/2009

Boring No.	9786	9787	9788	9789
Sample No.	ECP8/SB2	ECP8/SB2	ECP8/SB2	ECP8/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	14-15 ft	22.5-25 ft	34-35 ft	42.5-45 ft
A) Tare No.	E-2	E-4	E-3	E-1
B) Tare Weight, grams	68.93	73.22	73.71	109.20
C) Wet Soil + Tare, grams	156.43	163.92	100.52	175.93
D) Dry Soil + Tare, grams	145.21	150.40	95.41	160.17
E) Weight of Dry Soil, grams [D - B]	76.28	77.18	21.70	50.97
F) Weight of Moisture, grams [C - D]	11.22	13.52	5.11	15.76
G) Moisture Content, % [F * 100 / E]	14.7	17.5	23.5	30.9
(based on over-dried weight)				
H) Tare No.	E-2	E-4	E-3	E-1
I) Weight of Tare, grams	68.93	73.22	73.71	109.20
J) Weight of Over-Dried Soil + Tare, grams	145.21	150.40	95.41	160.17
K) Weight of Oven- Dried Soil, grams [J - I]	76.28	77.18	21.70	50.97
L) Weight of Ignited Soil + Tare, grams	144.57	149.90	95.08	159.70
M) Ash, grams [L - I]	75.64	76.68	21.37	50.50
N) Ash Content, % [M *100 / K]	99.2	99.4	98.5	99.1
O) Organic Matter, % [100 - N]	**0.8**	**0.6**	**1.5**	**0.9**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 9/1/2009 **Review Date** 9/7/2009

Boring No.	9790	9791	9792	9793
Sample No.	ECP8/SB2	ECP8/SB2	ECP8/SB2	ECP8/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	54-55 ft	61.5-63 ft	72.5-75 ft	83.5-85 ft
A) Tare No.	E-8	L-1	L-1	E-2
B) Tare Weight, grams	102.01	101.33	101.08	69.25
C) Wet Soil + Tare, grams	134.62	158.20	170.14	124.00
D) Dry Soil + Tare, grams	126.33	148.67	157.17	111.15
E) Weight of Dry Soil, grams [D - B]	24.32	47.34	56.09	41.90
F) Weight of Moisture, grams [C - D]	8.29	9.53	12.97	12.85
G) Moisture Content, % [F * 100 / E]	34.1	20.1	23.1	30.7
(based on over-dried weight)				
H) Tare No.	E-8	L-1	L-1	E-2
I) Weight of Tare, grams	102.01	101.33	101.08	69.25
J) Weight of Over-Dried Soil + Tare, grams	126.33	148.67	157.17	111.15
K) Weight of Oven- Dried Soil, grams [J - I]	24.32	47.34	56.09	41.90
L) Weight of Ignited Soil + Tare, grams	125.59	148.46	156.61	110.94
M) Ash, grams [L - I]	23.58	47.13	55.53	41.69
N) Ash Content, % [M *100 / K]	97.0	99.6	99.0	99.5
O) Organic Matter, % [100 - N]	**3.0**	**0.4**	**1.0**	**0.5**

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-0013, Rev. 12
Delivery Order #8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 9/3/2009 **Review Date** 9/7/2009

Boring No.	9794	9795	9796	9797
Sample No.	ECP6/SB2	ECP6/SB2	ECP6/SB2	ECP6/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	8.5-11 ft	19-21 ft	29.5-31 ft	41.5-43 ft
A) Tare No.	E-3	E-4	E-7	E-8
B) Tare Weight, grams	109.03	73.58	104.27	101.90
C) Wet Soil + Tare, grams	166.49	133.57	164.93	159.64
D) Dry Soil + Tare, grams	160.02	126.59	157.45	151.11
E) Weight of Dry Soil, grams [D - B]	50.99	53.01	53.18	49.21
F) Weight of Moisture, grams [C - D]	6.47	6.98	7.48	8.53
G) Moisture Content, % [F * 100 / E]	12.7	13.2	14.1	17.3
(based on over-dried weight)				
H) Tare No.	E-3	E-4	E-7	E-8
I) Weight of Tare, grams	109.03	73.58	104.27	101.90
J) Weight of Over-Dried Soil + Tare, grams	160.02	126.59	157.45	151.11
K) Weight of Oven- Dried Soil, grams [J - I]	50.99	53.01	53.18	49.21
L) Weight of Ignited Soil + Tare, grams	159.67	126.34	157.07	150.59
M) Ash, grams [L - I]	50.64	52.76	52.80	48.69
N) Ash Content, % [M *100 / K]	99.3	99.5	99.3	98.9
O) Organic Matter, % [100 - N]	**0.7**	**0.5**	**0.7**	**1.1**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 9/14/2009 **Review Date** 9/18/2009

Boring No.	9798	9799	9800	9801
Sample No.	ECP6/SB2	ECP6/SB2	ECP6/SB2	ECP6/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	49-51 ft	70.5-73 ft	80.5-83 ft	109-111 ft
A) Tare No.	E-8	E-7	E-4	E-3
B) Tare Weight, grams	101.79	104.17	73.46	108.81
C) Wet Soil + Tare, grams	177.82	184.87	139.73	162.23
D) Dry Soil + Tare, grams	163.62	169.97	120.38	146.08
E) Weight of Dry Soil, grams [D - B]	61.83	65.80	46.92	37.27
F) Weight of Moisture, grams [C - D]	14.20	14.90	19.35	16.15
G) Moisture Content, % [F * 100 / E]	23.0	22.6	41.2	43.3
(based on over-dried weight)				
H) Tare No.	E-8	E-7	E-4	E-3
I) Weight of Tare, grams	101.79	104.17	73.46	108.81
J) Weight of Over-Dried Soil + Tare, grams	163.62	169.97	120.38	146.08
K) Weight of Oven- Dried Soil, grams [J - I]	61.83	65.80	46.92	37.27
L) Weight of Ignited Soil + Tare, grams	162.93	169.85	119.92	144.54
M) Ash, grams [L - I]	61.14	65.68	46.46	35.73
N) Ash Content, % [M *100 / K]	98.9	99.8	99.0	95.9
O) Organic Matter, % [100 - N]	**1.1**	**0.2**	**1.0**	**4.1**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

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ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 9/24/2009 **Review Date** 9/28/2009

Boring No.	9802	9803	9804	9805
Sample No.	ECP9/SB2	ECP9/SB2	ECP9/SB2	ECP9/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	20-22 ft	26.5-29 ft	40.5-42 ft	51.5-53.5 ft
A) Tare No.	L-1	E-2	L-1	E-2
B) Tare Weight, grams	100.94	69.14	100.98	73.38
C) Wet Soil + Tare, grams	159.43	124.15	157.43	125.14
D) Dry Soil + Tare, grams	151.03	118.54	149.73	117.54
E) Weight of Dry Soil, grams [D - B]	50.09	49.40	48.75	44.16
F) Weight of Moisture, grams [C - D]	8.40	5.61	7.70	7.60
G) Moisture Content, % [F * 100 / E]	16.8	11.4	15.8	17.2
(based on over-dried weight)				
H) Tare No.	L-1	E-2	L-1	E-2
I) Weight of Tare, grams	100.94	69.14	100.98	73.38
J) Weight of Over-Dried Soil + Tare, grams	151.03	118.54	149.73	117.31
K) Weight of Oven- Dried Soil, grams [J - I]	50.09	49.40	48.75	43.93
L) Weight of Ignited Soil + Tare, grams	150.58	117.62	149.62	117.03
M) Ash, grams [L - I]	49.64	48.48	48.64	43.65
N) Ash Content, % [M *100 / K]	99.1	98.1	99.8	99.4
O) Organic Matter, % [100 - N]	**0.9**	**1.9**	**0.2**	**0.6**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

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ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 9/24/2009 **Review Date** 9/28/2009

Boring No.	9806	9807	9808	9809
Sample No.	ECP9/SB2	ECP9/SB2	ECP9/SB2	ECP9/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	61.5-64 ft	70.5-73 ft	80.5-83 ft	115.5-118 ft
A) Tare No.	E-3	E-4	E-7	E-8
B) Tare Weight, grams	108.87	69.12	103.89	101.57
C) Wet Soil + Tare, grams	176.70	120.73	161.18	165.25
D) Dry Soil + Tare, grams	165.84	106.90	145.37	152.41
E) Weight of Dry Soil, grams [D - B]	56.97	37.78	41.48	50.84
F) Weight of Moisture, grams [C - D]	10.86	13.83	15.81	12.84
G) Moisture Content, % [F * 100 / E]	19.1	36.6	38.1	25.3
(based on over-dried weight)				
H) Tare No.	E-3	E-4	E-7	E-8
I) Weight of Tare, grams	108.87	69.12	103.89	101.57
J) Weight of Over-Dried Soil + Tare, grams	165.84	106.90	145.37	152.41
K) Weight of Oven- Dried Soil, grams [J - I]	56.97	37.78	41.48	50.84
L) Weight of Ignited Soil + Tare, grams	165.65	106.17	144.93	152.16
M) Ash, grams [L - I]	56.78	37.05	41.04	50.59
N) Ash Content, % [M *100 / K]	99.7	98.1	98.9	99.5
O) Organic Matter, % [100 - N]	**0.3**	**1.9**	**1.1**	**0.5**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

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ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 10/5/2009 **Review Date** 10/9/2009

Boring No.	9810			
Sample No.	ECP9/SB2			
Sample Depth, Ft.	UD			
Lab No.	140.5-143 ft			
A) Tare No.	L-3			
B) Tare Weight, grams	100.47			
C) Wet Soil + Tare, grams	170.76			
D) Dry Soil + Tare, grams	153.89			
E) Weight of Dry Soil, grams [D - B]	53.42			
F) Weight of Moisture, grams [C - D]	16.87			
G) Moisture Content, % [F * 100 / E]	31.6			
(based on over-dried weight)				
H) Tare No.	L-3			
I) Weight of Tare, grams	100.47			
J) Weight of Over-Dried Soil + Tare, grams	153.89			
K) Weight of Oven- Dried Soil, grams [J - I]	53.42			
L) Weight of Ignited Soil + Tare, grams	153.39			
M) Ash, grams [L - I]	52.92			
N) Ash Content, % [M *100 / K]	99.1			
O) Organic Matter, % [100 - N]	**0.9**			

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 10/6/2009 **Review Date** 10/9/2009

Boring No.	9811	9812	9813	9814
Sample No.	ECP7/SB2	ECP7/SB2	ECP7/SB2	ECP7/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	17.5-20 ft	21-23 ft	23.5-26 ft	47.5-50 ft
A) Tare No.	E-1	E-2	E-7	E-4
B) Tare Weight, grams	72.24	105.07	104.19	106.01
C) Wet Soil + Tare, grams	129.81	172.46	178.65	171.71
D) Dry Soil + Tare, grams	122.12	164.62	168.94	157.57
E) Weight of Dry Soil, grams [D - B]	49.88	59.55	64.75	51.56
F) Weight of Moisture, grams [C - D]	7.69	7.84	9.71	14.14
G) Moisture Content, % [F * 100 / E]	15.4	13.2	15.0	27.4
(based on over-dried weight)				
H) Tare No.	E-1	E-2	E-7	E-4
I) Weight of Tare, grams	72.24	105.07	104.19	106.01
J) Weight of Over-Dried Soil + Tare, grams	122.12	164.62	168.94	157.57
K) Weight of Oven- Dried Soil, grams [J - I]	49.88	59.55	64.75	51.56
L) Weight of Ignited Soil + Tare, grams	121.68	164.25	168.31	157.01
M) Ash, grams [L - I]	49.44	59.18	64.12	51.00
N) Ash Content, % [M *100 / K]	99.1	99.4	99.0	98.9
O) Organic Matter, % [100 - N]	**0.9**	**0.6**	**1.0**	**1.1**

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

MACTEC

ORGANIC CONTENT

ASTM D2974-07a

Project No. 6155-08-0031.08 **Project Name** ECP Geologic Charaterization

Tested By EH **Reviewed By** JW

Test Date 10/5/2009 **Review Date** 10/9/2009

Boring No.	9815	9816	9817	9818
Sample No.	ECP7/SB2	ECP7/SB2	ECP7/SB2	ECP7/SB2
Sample Depth, Ft.	UD	UD	UD	UD
Lab No.	51.4-54 ft	73.5-76 ft	86.5-89 ft	123.5-126 ft
A) Tare No.	E-8	L-1	E-3	E-6
B) Tare Weight, grams	101.85	100.82	108.69	73.68
C) Wet Soil + Tare, grams	158.05	163.97	167.87	143.22
D) Dry Soil + Tare, grams	144.30	152.93	155.25	130.04
E) Weight of Dry Soil, grams [D - B]	42.45	52.11	46.56	56.36
F) Weight of Moisture, grams [C - D]	13.75	11.04	12.62	13.18
G) Moisture Content, % [F * 100 / E]	32.4	21.2	27.1	23.4
(based on over-dried weight)				
H) Tare No.	E-8	L-1	E-3	E-6
I) Weight of Tare, grams	101.85	100.82	108.69	73.68
J) Weight of Over-Dried Soil + Tare, grams	144.30	152.93	155.25	130.04
K) Weight of Oven- Dried Soil, grams [J - I]	42.45	52.11	46.56	56.36
L) Weight of Ignited Soil + Tare, grams	143.52	152.84	154.89	129.79
M) Ash, grams [L - I]	41.67	52.02	46.20	56.11
N) Ash Content, % [M *100 / K]	98.2	99.8	99.2	99.6
O) Organic Matter, % [100 - N]	**1.8**	**0.2**	**0.8**	**0.4**

Remarks: Subcontract No. AC54317N

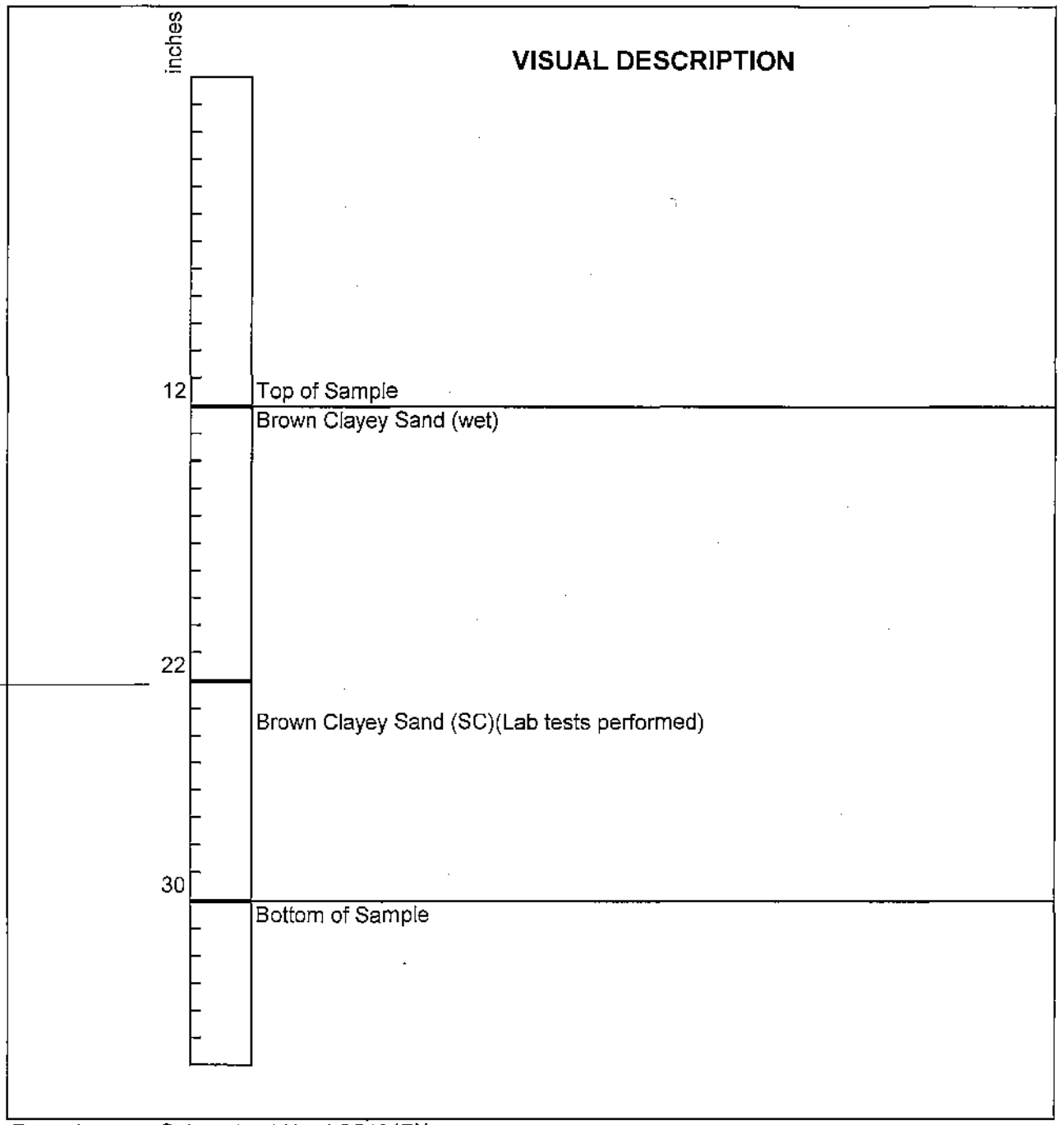
Spe. No. K-SPC-G-0013, Rev. 12

Delivery Order #8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9786 — Checked By: JEB
Boring No: ECP8/SB2 — Sample No: UD — Depth: 14-15 ft
Method of Sample Extrusion: Vertical — By: JW

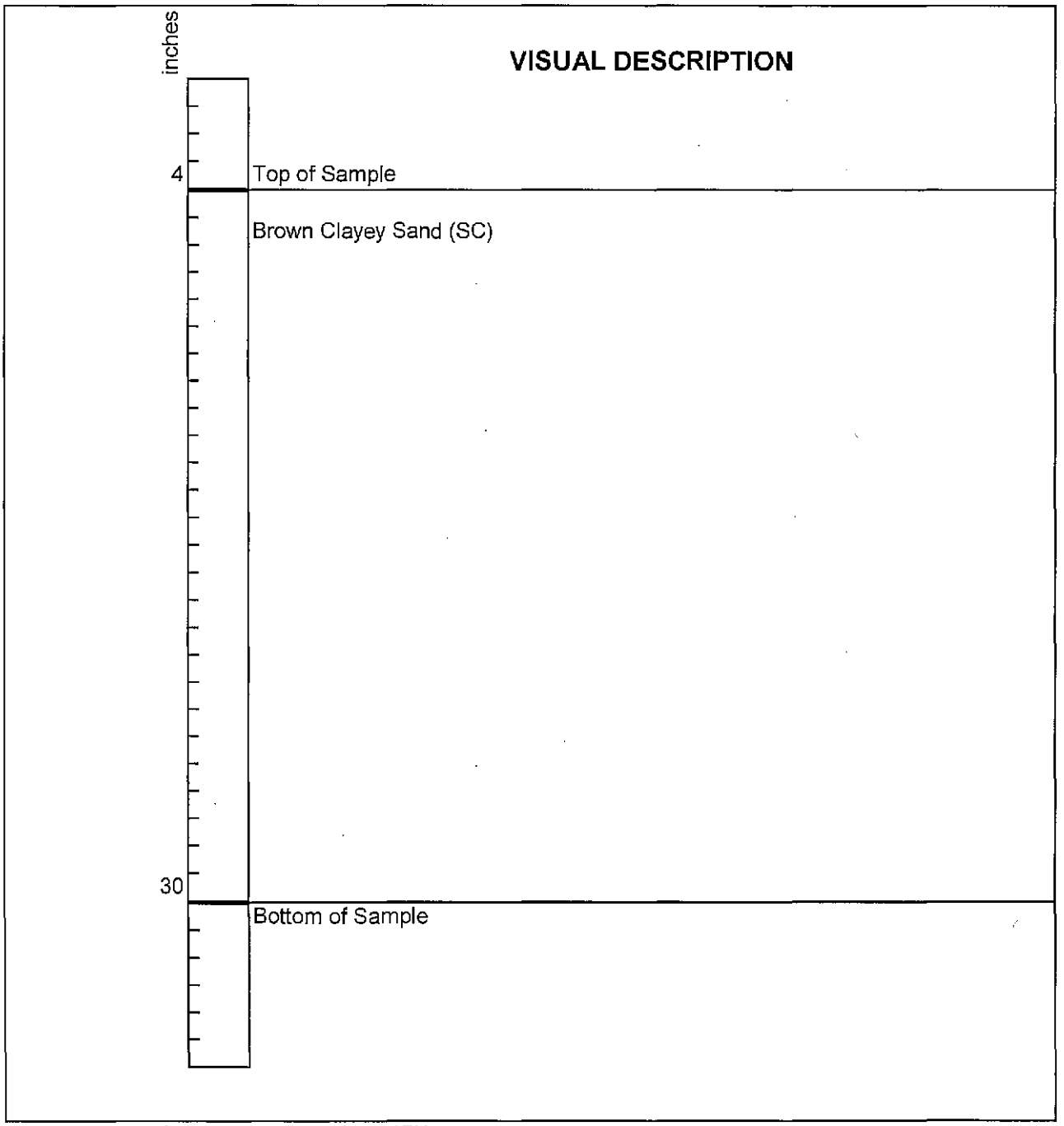


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9787 — Checked By: 9/8
Boring No: ECP8/SB2 — Sample No: UD — Depth: 22.5-25 ft
Method of Sample Extrusion: Vertical — By: JW

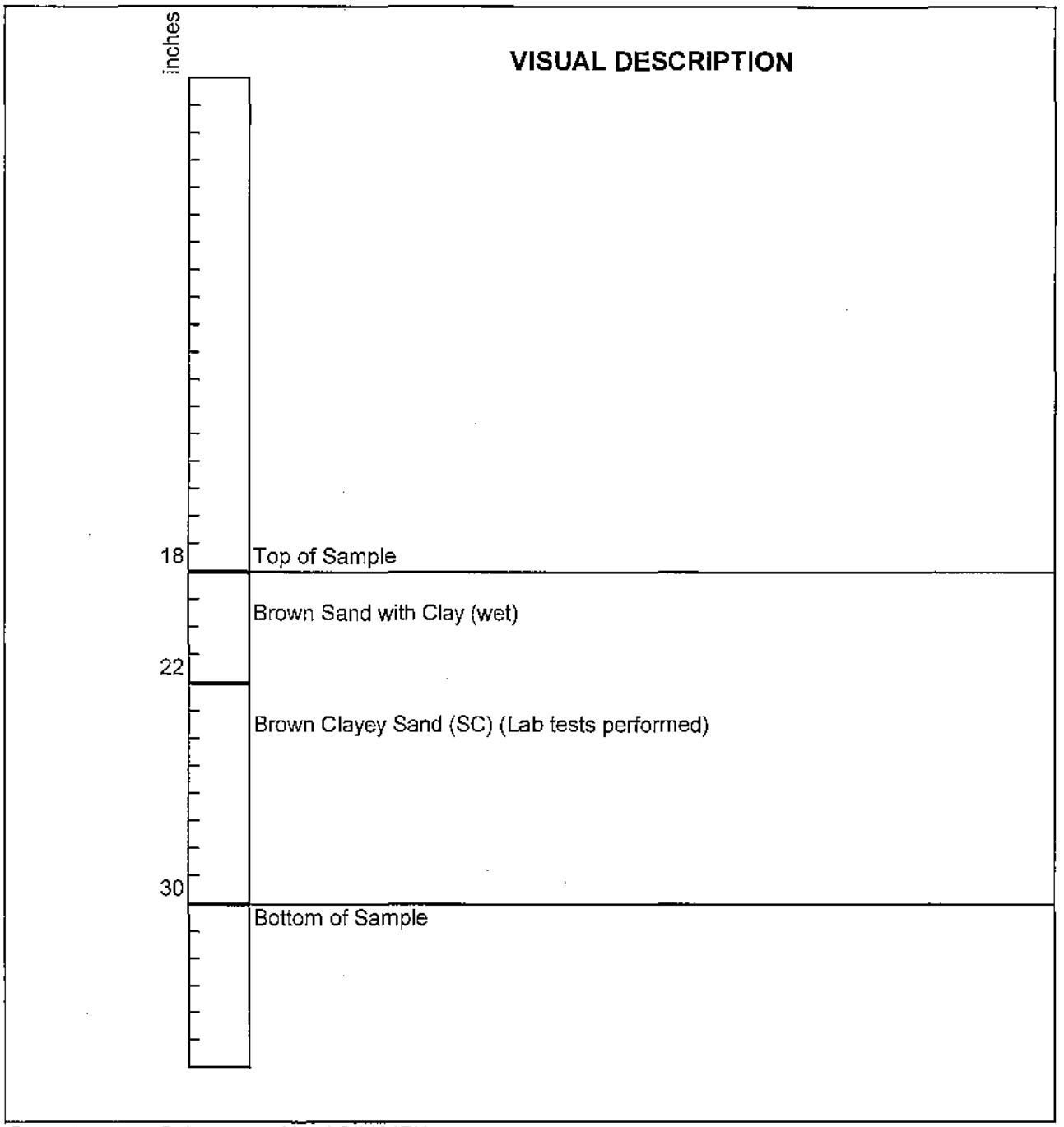


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9788 — Checked By: JAT
Boring No: ECP8/SB2 — Sample No: UD — Depth: 34-35 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9789 — Checked By: JGT
Boring No: ECP8/SB2 — Sample No: UD — Depth: 42.5-45 ft
Method of Sample Extrusion: Vertical — By: JW

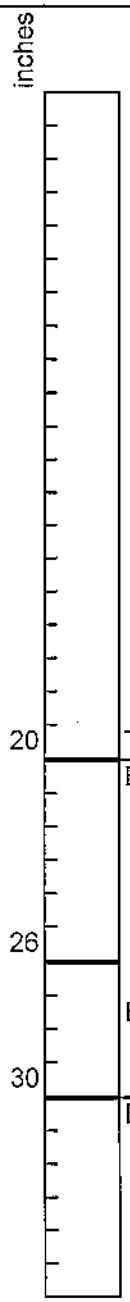
inches	VISUAL DESCRIPTION
3	Top of Sample
	Yellowish Brown Clayey Sand (SC) (Lab tests performed)
16	
	Tan Clayey Sand
30	
	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9790 — Checked By: JEJ
Boring No: ECP8/SB2 — Sample No: UD — Depth: 54-55 ft
Method of Sample Extrusion: Vertical — By: JW



VISUAL DESCRIPTION

Top of Sample

Brownish Tan Clayey Sand (SC) (Lab tests performed)

Brown Sand with Clay

Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

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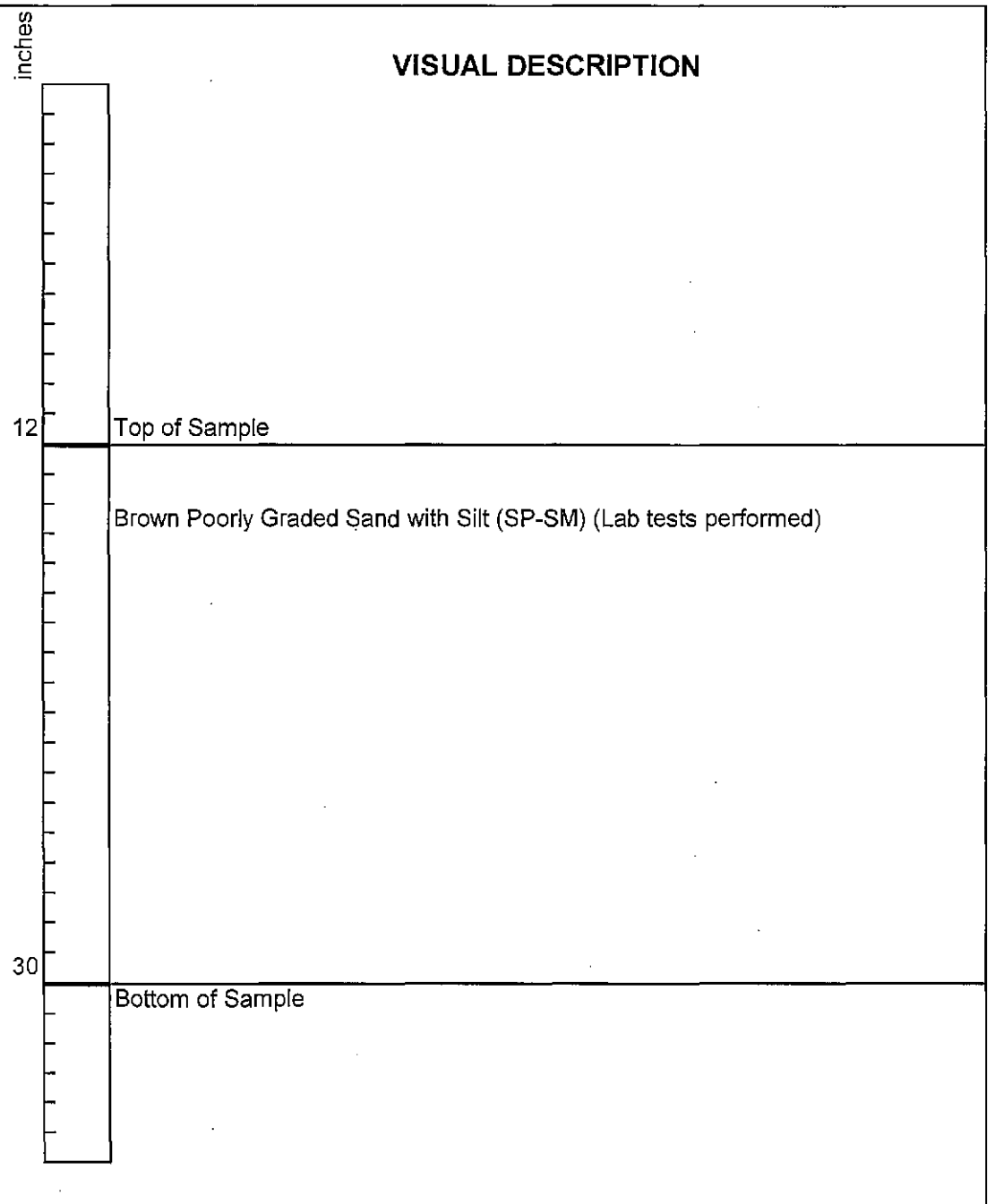
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 8/28/2009
Project No: 6155-08-0031.08 — Lab No. 9791 — Checked By: JGF
Boring No: ECP8/SB2 — Sample No: UD — Depth: 61.5-63 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

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UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/3/2009

Project No: 6155-08-0031.08 — Lab No. 9792 — Checked By: DRT

Boring No: ECP8/SB2 — Sample No: UD — Depth: 72.5-75 ft

Method of Sample Extrusion: Vertical — By: JW

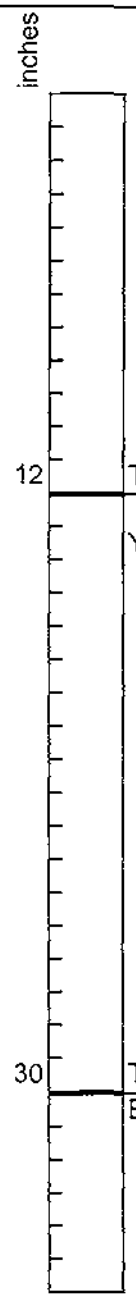
inches	VISUAL DESCRIPTION
2	Top of Sample
	Yellow Clayey Sand (SC)
30	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/3/2009
Project No: 6155-08-0031.08 — Lab No. 9793 — Checked By: JEZ
Boring No: ECP8/SB2 — Sample No: UD — Depth: 83.5-85 ft
Method of Sample Extrusion: Vertical — By: JW



VISUAL DESCRIPTION

12 — Top of Sample

Yellow Clayey Sand (SC) (Top three inches wet)

30 — Tube bent at the bottom

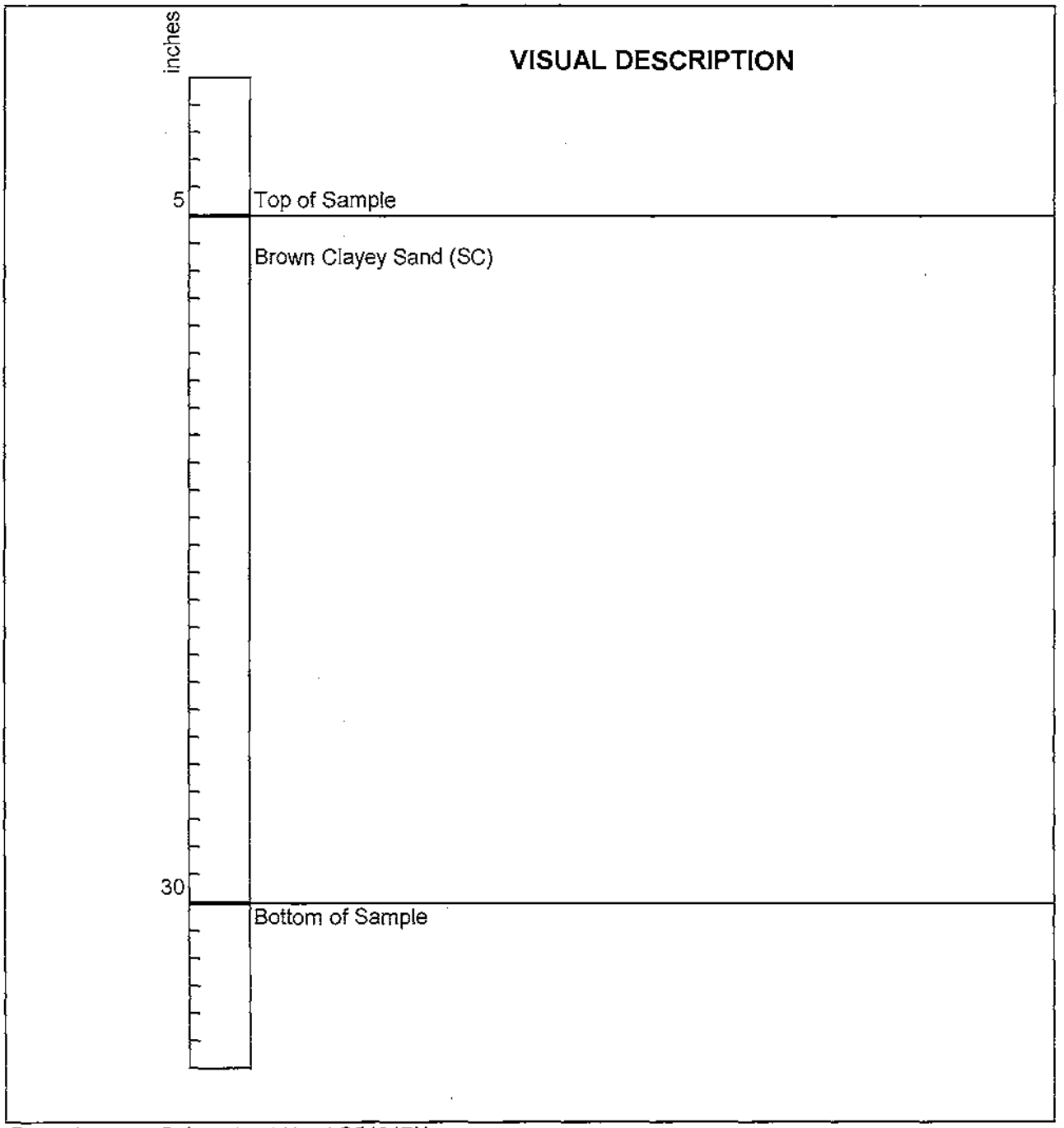
Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/3/2009
Project No: 6155-08-0031.08 — Lab No. 9794 — Checked By: JEY
Boring No: ECP6/SB2 — Sample No: UD — Depth: 8.5-11 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

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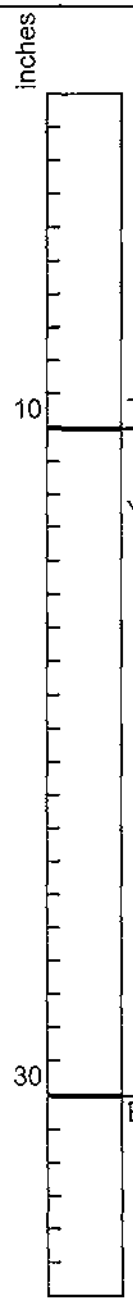
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/3/2009

Project No: 6155-08-0031.08 Lab No. 9795 Checked By: JGS

Boring No: ECP6/SB2 Sample No: UD Depth: 19-21 ft

Method of Sample Extrusion: Vertical By: JW



VISUAL DESCRIPTION

Top of Sample

Yellowish Brown Poorly Graded Sand with Clay (SP-SC)

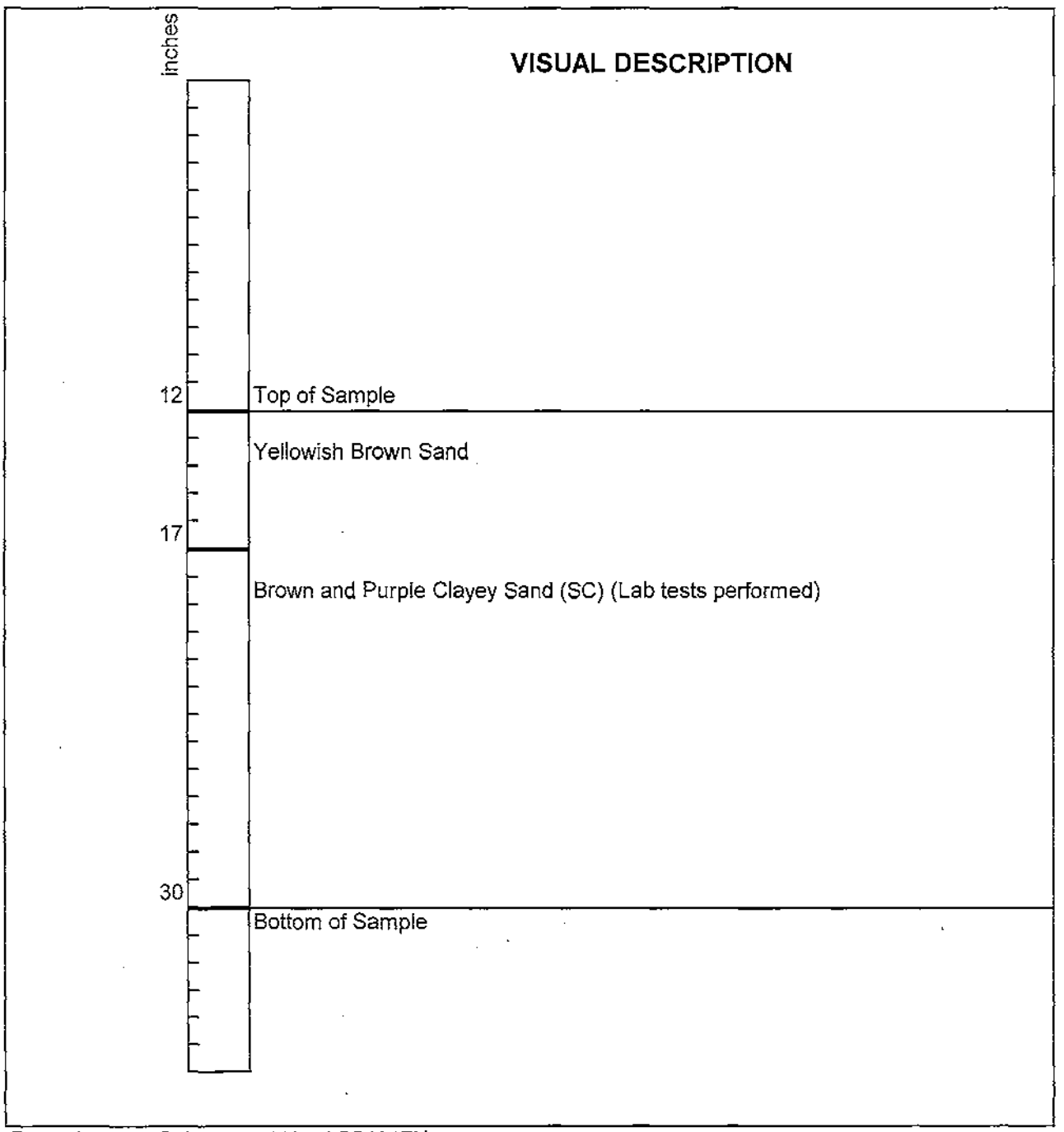
Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/3/2009
Project No: 6155-08-0031.08 — Lab No. 9796 — Checked By: JJ
Boring No: ECP6/SB2 — Sample No: UD — Depth: 29.5-31 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

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UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/3/2009
Project No: 6155-08-0031.08 — Lab No. 9797 — Checked By: DGT
Boring No: ECP6/SB2 — Sample No: UD — Depth: 41.5-43 ft
Method of Sample Extrusion: Vertical — By: JW

inches	VISUAL DESCRIPTION
3	Top of Sample
	Yellowish Brown Clayey Sand (Wet)
10	
	Yellowish Brown Poorly Graded Sand with Clay (SP-SC) (Lab tests performed)
20	
	Yellow Poorly Graded Sand
30	
	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

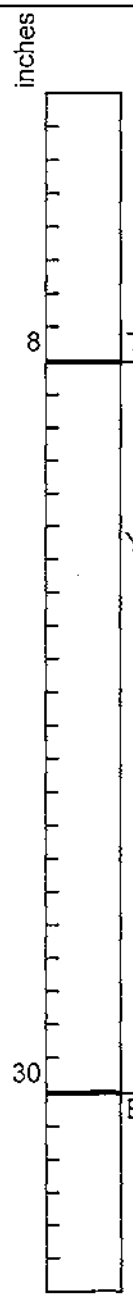
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/10/2009

Project No: 6155-08-0031.08 Lab No. 9798 Checked By: JEJ

Boring No: ECP6/SB2 Sample No: UD Depth: 49-51 ft

Method of Sample Extrusion: Vertical By: JW



VISUAL DESCRIPTION

Top of Sample

Yellow Silty Sand (SC) (Top 6 inches wet)

Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/10/2009
Project No: 6155-08-0031.08 Lab No. 9799 Checked By: DGF
Boring No: ECP6/SB2 Sample No: UD Depth: 70.5-73 ft
Method of Sample Extrusion: Vertical By: JW

inches	VISUAL DESCRIPTION
2	Top of Sample
	Yellow Silty Sand (SM)
30	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

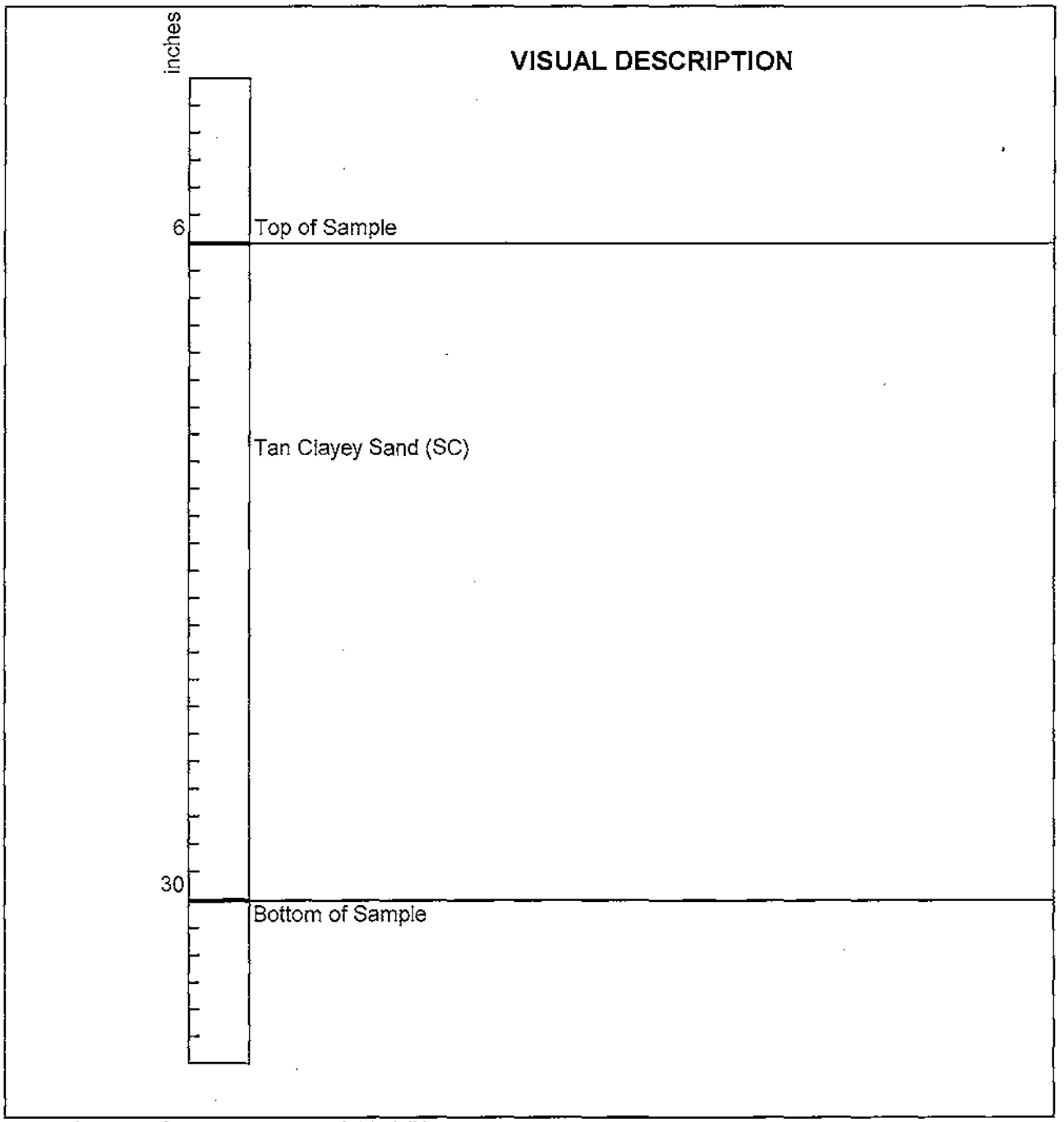
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/10/2009

Project No: 6155-08-0031.08 — Lab No. 9800 — Checked By: DEJ

Boring No: ECP6/SB2 — Sample No: UD — Depth: 80.5-83 ft

Method of Sample Extrusion: Vertical — By: JW

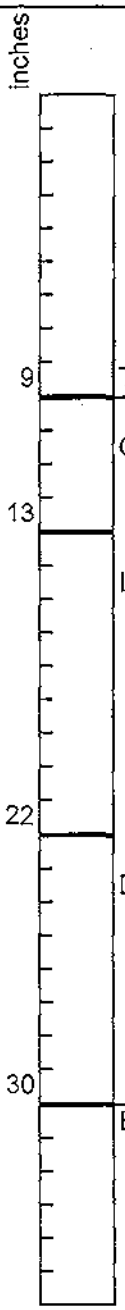


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/10/2009
Project No: 6155-08-0031.08 Lab No. 9801 Checked By: JEJ
Boring No: ECP6/SB2 Sample No: UD Depth: 109-111 ft
Method of Sample Extrusion: Vertical By: JW



VISUAL DESCRIPTION

Top of Sample

Gray Poorly Graded Sand

Light Gray Gravel with Sand (wet)

Dark Gray Elastic Silt (MH) (Lab tests performed)

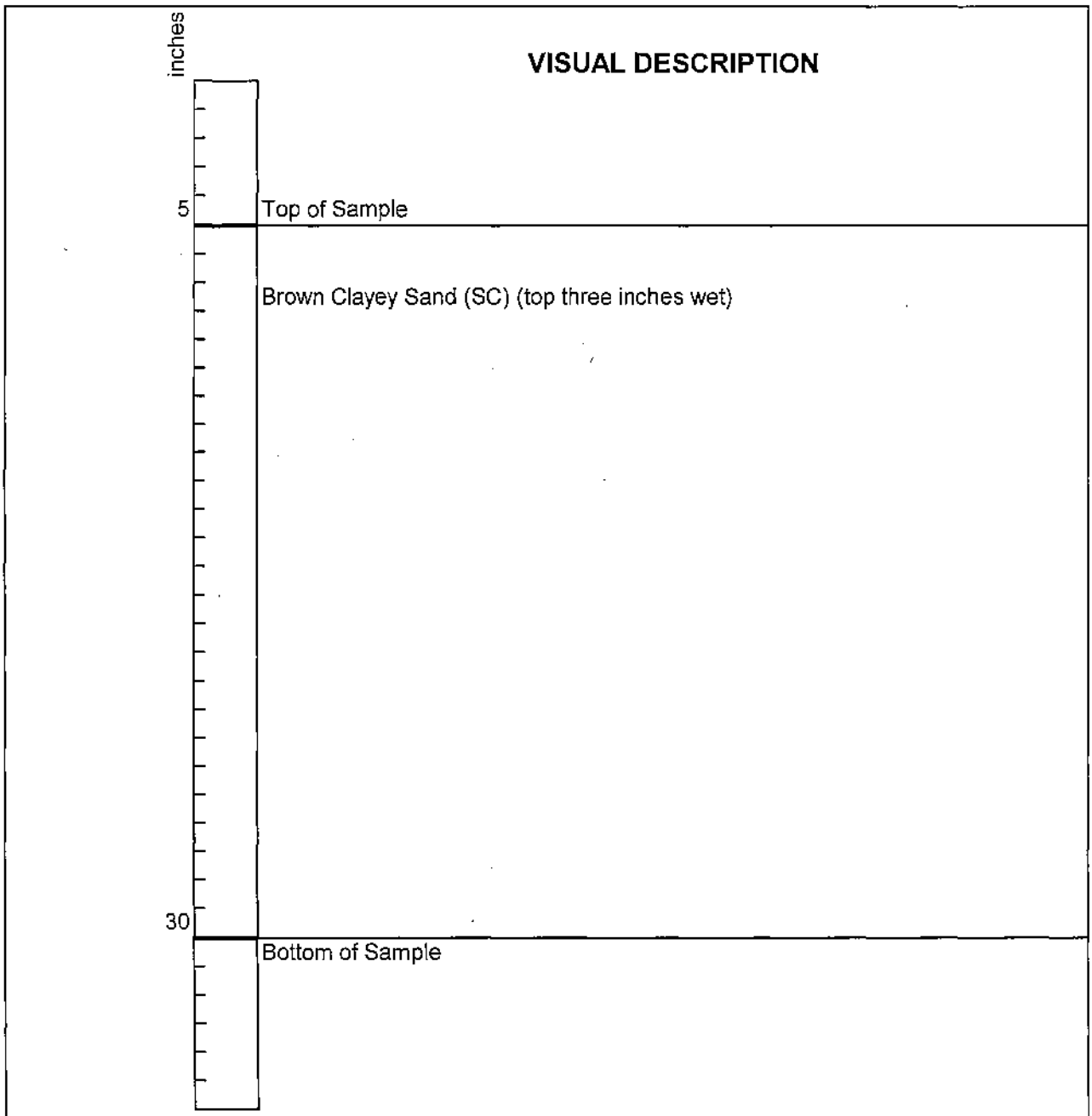
Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/10/2009
Project No: 6155-08-0031.08 — Lab No. 9802 — Checked By: JEF
Boring No: ECP9/SB2 — Sample No: UD — Depth: 20-22 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

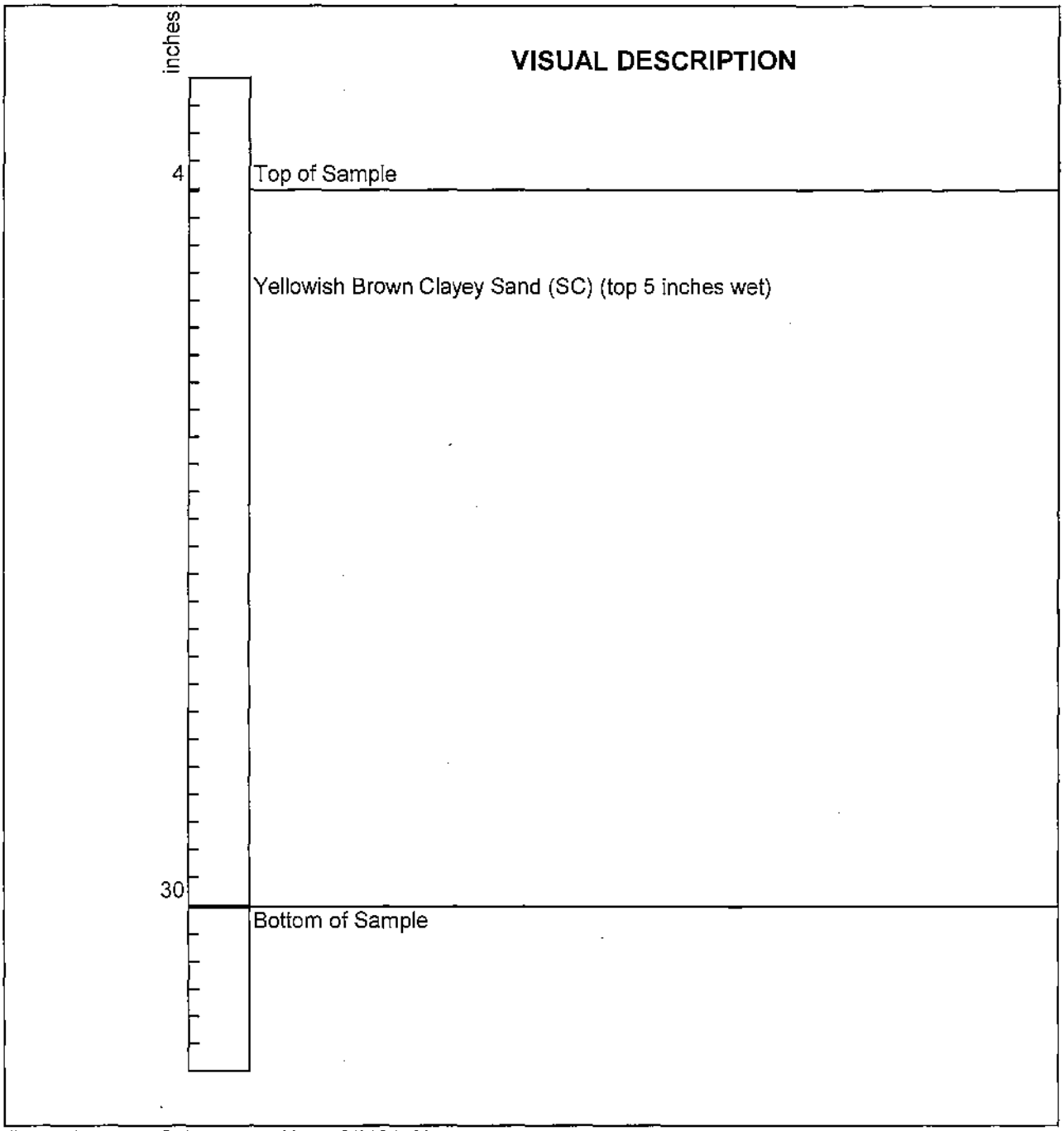
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/10/2009

Project No: 6155-08-0031.08 — Lab No. 9803 — Checked By: JEJ

Boring No: ECP9/SB2 — Sample No: UD — Depth: 26.5-29 ft

Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/21/2009

Project No: 6155-08-0031.08 — Lab No. 9804 — Checked By: DEB

Boring No: ECP9/SB2 — Sample No: UD — Depth: 40.5-42 ft

Method of Sample Extrusion: Vertical — By: JW

inches	VISUAL DESCRIPTION
9	Top of Sample
	Reddish Brown Clayey Sand (SC)
30	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

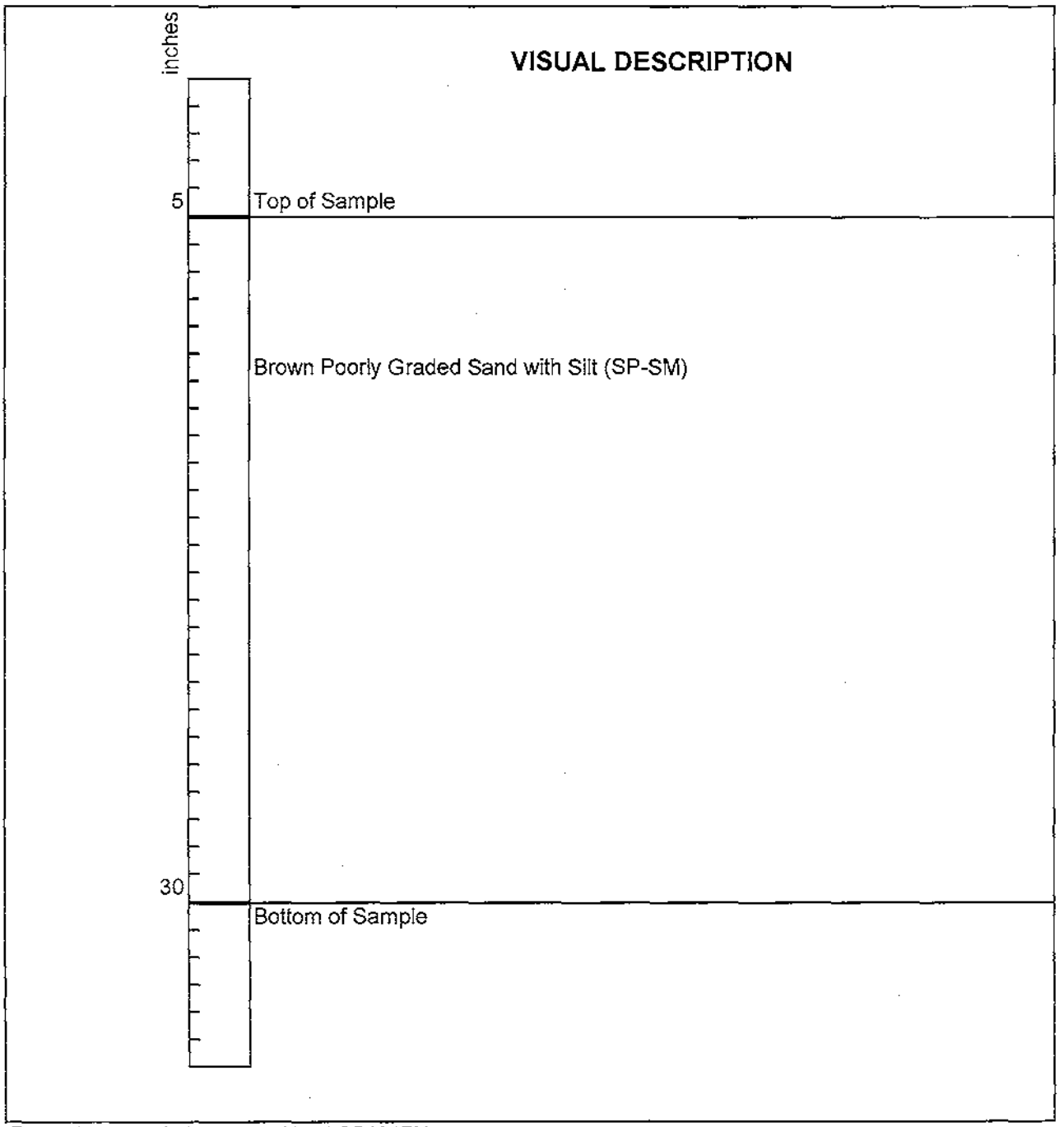
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/21/2009

Project No: 6155-08-0031.08 — Lab No. 9805 — Checked By: JEJ

Boring No: ECP9/SB2 — Sample No: UD — Depth: 51.5-53.5 ft

Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G00013, Rev.12

Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/21/2009
Project No: 6155-08-0031.08 Lab No. 9806 Checked By: DGJ
Boring No: ECP9/SB2 Sample No: UD Depth: 61.5-64 ft
Method of Sample Extrusion: Vertical By: JW

inches	VISUAL DESCRIPTION
3	Top of Sample
	Tan Poorly Graded Sand with Clay (SP-SC)
30	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

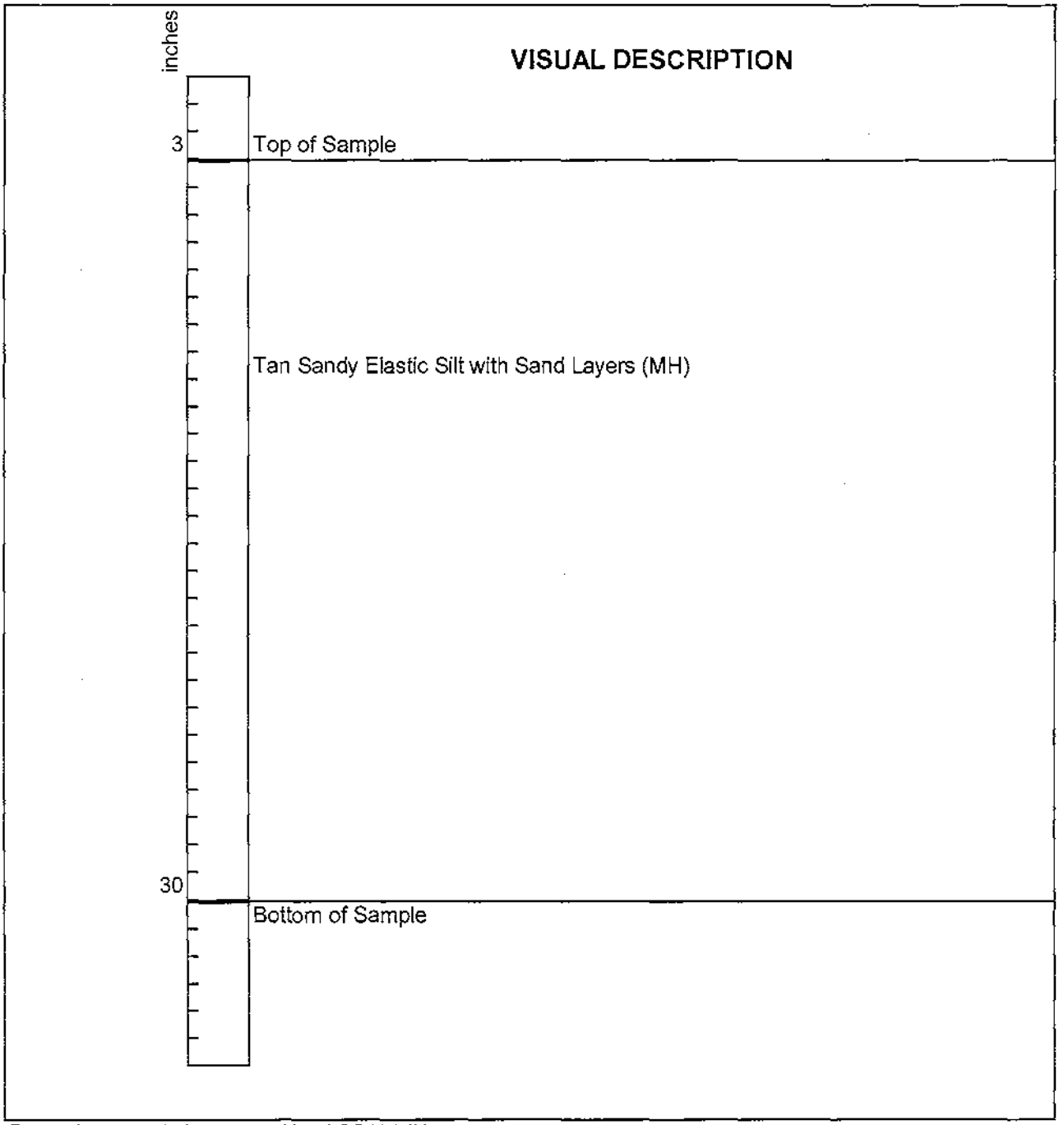
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/21/2009

Project No: 6155-08-0031.08 Lab No. 9807 Checked By: JEJ

Boring No: ECP9/SB2 Sample No: UD Depth: 70.5-73 ft

Method of Sample Extrusion: Vertical By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

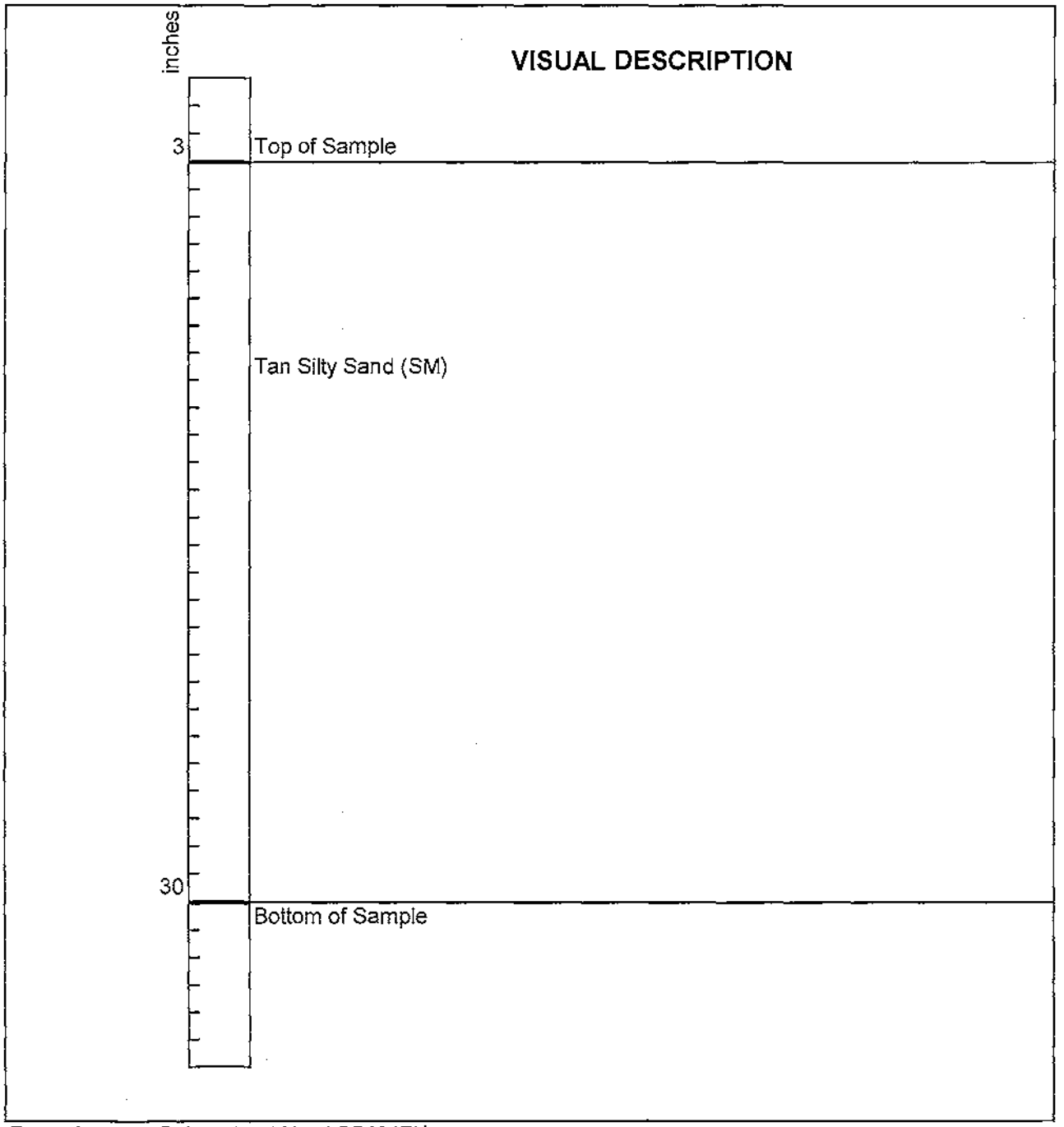
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization Date: 9/21/2009

Project No: 6155-08-0031.08 Lab No. 9808 Checked By: JEJ

Boring No: ECP9/SB2 Sample No: UD Depth: 80.5-83 ft

Method of Sample Extrusion: Vertical By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

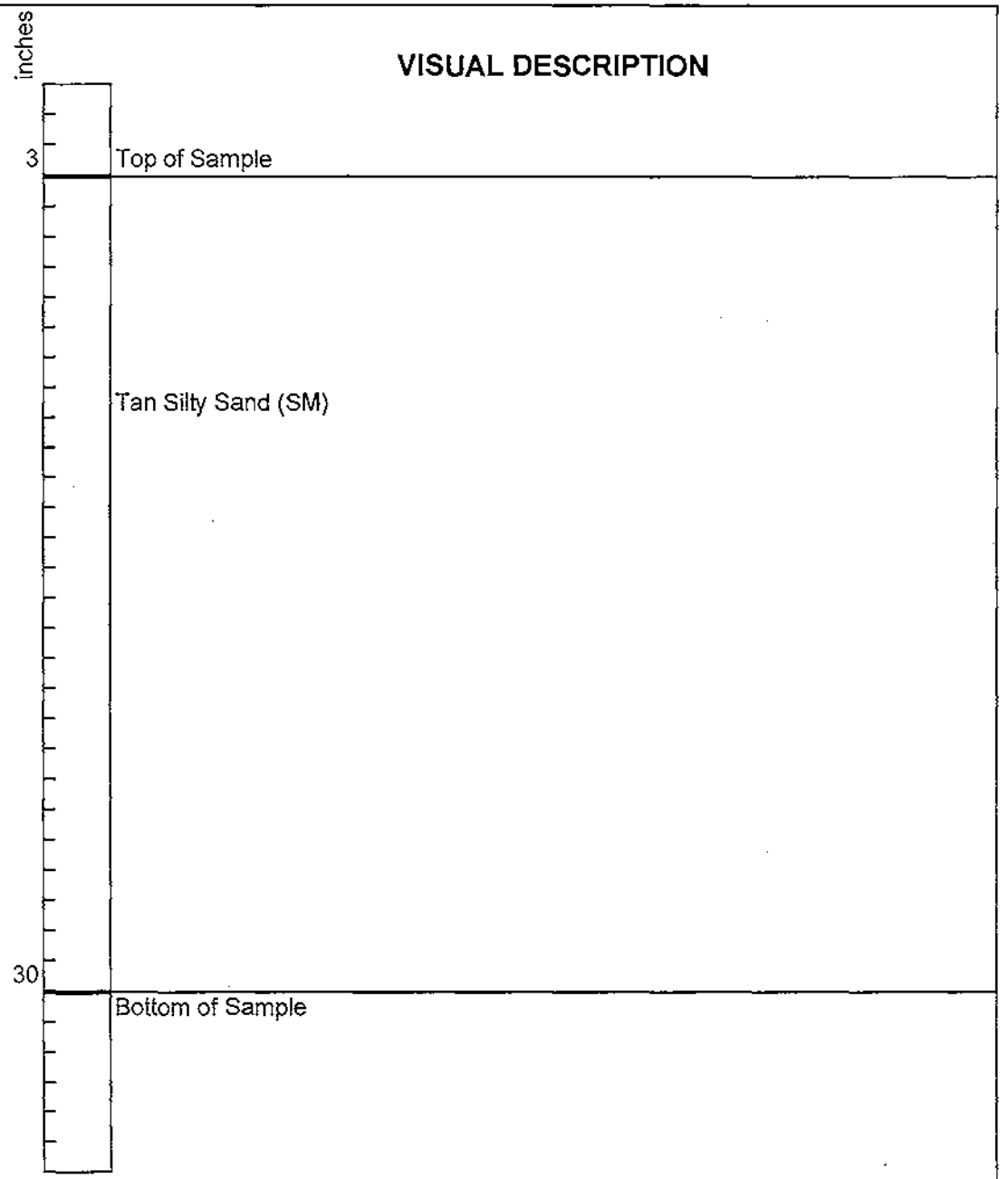
UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009

Project No: 6155-08-0031.08 — Lab No. 9809 — Checked By: JJ2

Boring No: ECP9/SB2 — Sample No: UD — Depth: 115.5-118 ft

Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G00013, Rev.12

Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9810 — Checked By: DGJ
Boring No: ECP9/SB2 — Sample No: UD — Depth: 140.5-143 ft
Method of Sample Extrusion: Vertical — By: JW

inches	VISUAL DESCRIPTION
3	Top of Sample
	Yellowish Brown Clayey Sand (SM)
30	(Tube bent at bottom 20 inches)
	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009

Project No: 6155-08-0031.08 — Lab No. 9811 — Checked By: JEJ

Boring No: ECP7/SB2 — Sample No: UD — Depth: 17.5-20 ft

Method of Sample Extrusion: Vertical — By: JW

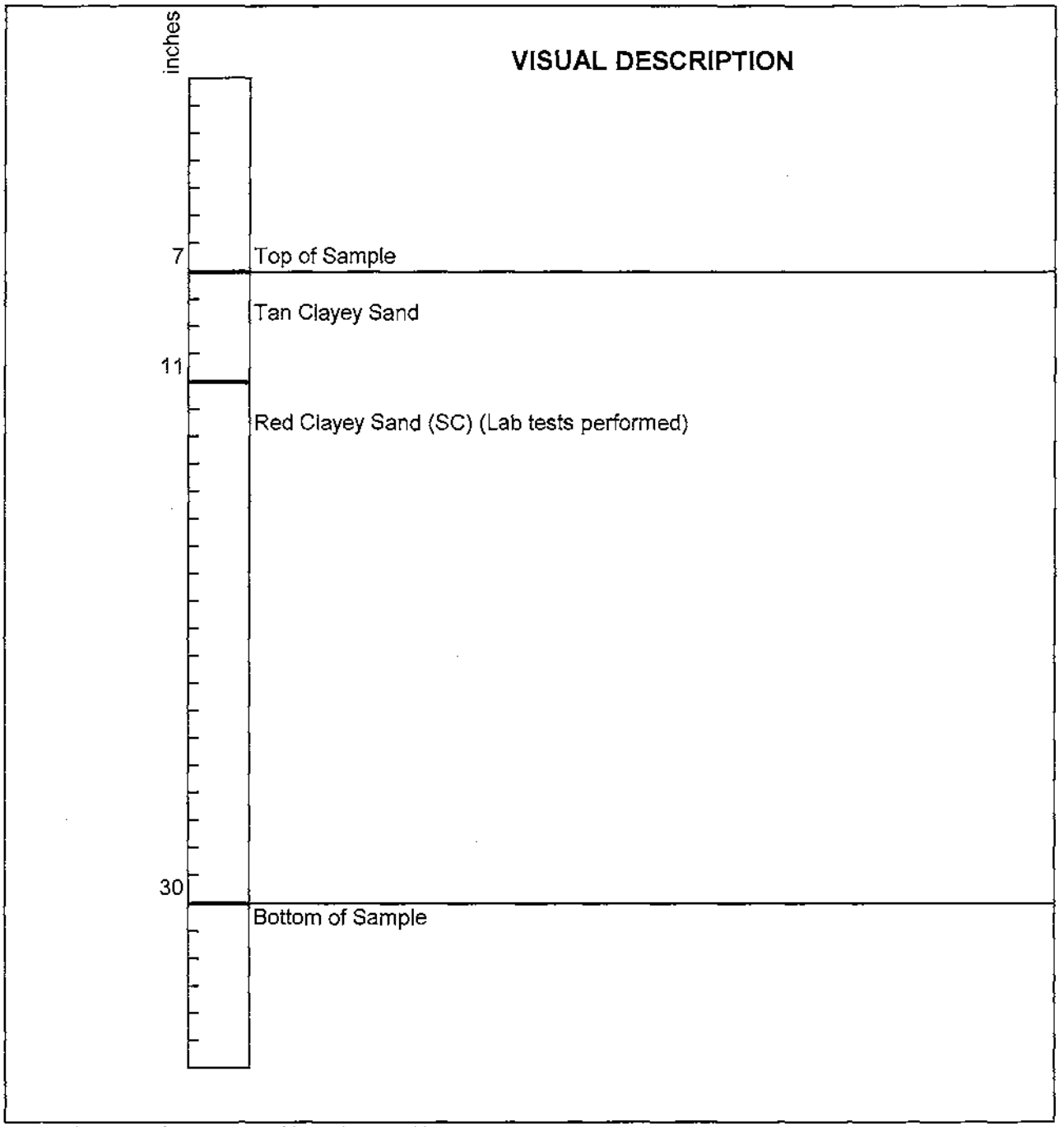
inches	VISUAL DESCRIPTION
3	Top of Sample
	Reddish Brown Clayey Sand (SM)
30	(Tube bent at bottom 9 inches)
	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9812 — Checked By: JEJ
Boring No: ECP7/SB2 — Sample No: UD — Depth: 21-23 ft
Method of Sample Extrusion: Vertical — By: JW

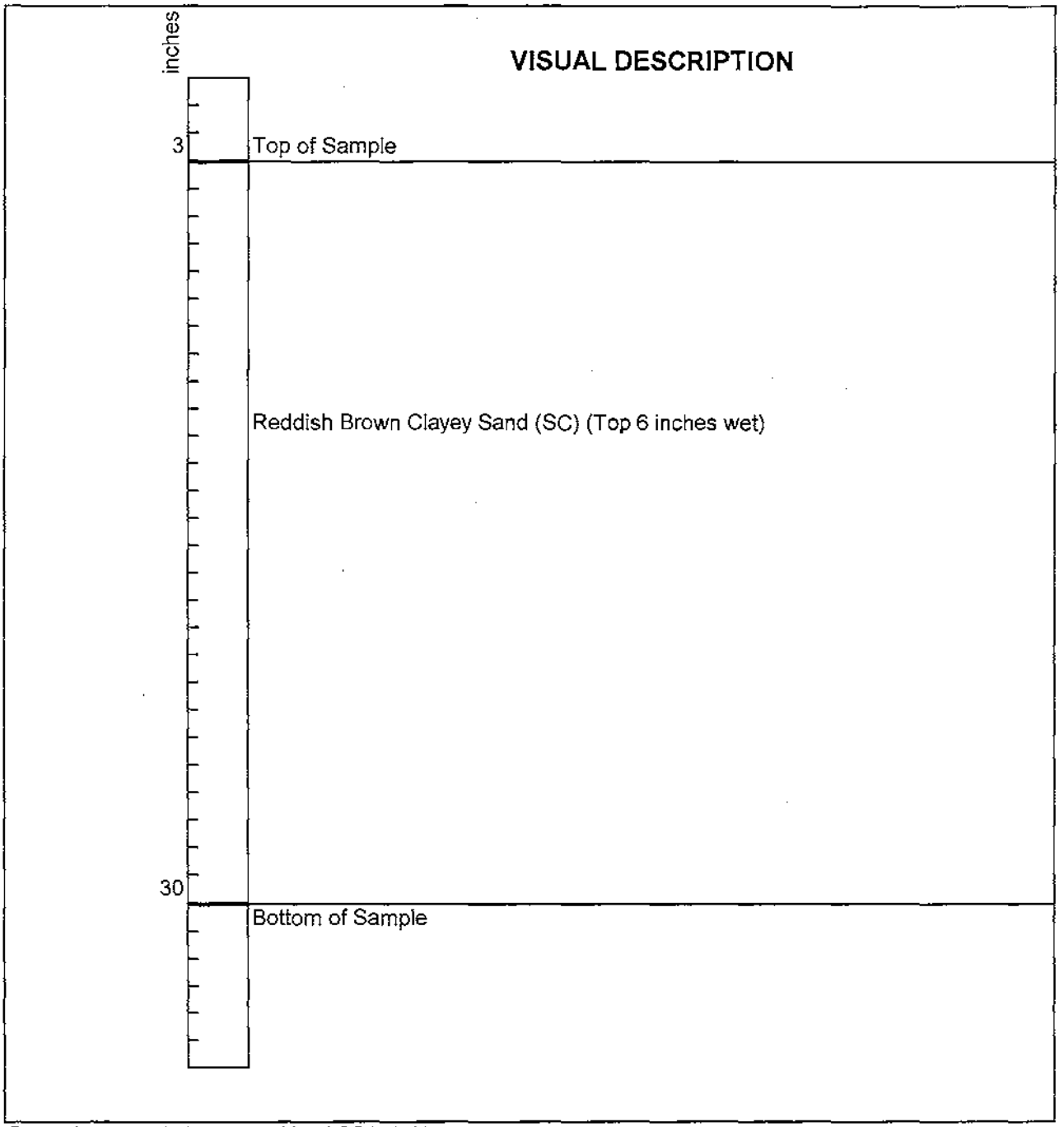


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9813 — Checked By: JGT
Boring No: ECP7/SB2 — Sample No: UD — Depth: 23.5-26 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9814 — Checked By: JGT
Boring No: ECP7/SB2 — Sample No: UD — Depth: 47.5-50 ft
Method of Sample Extrusion: Vertical — By: JW

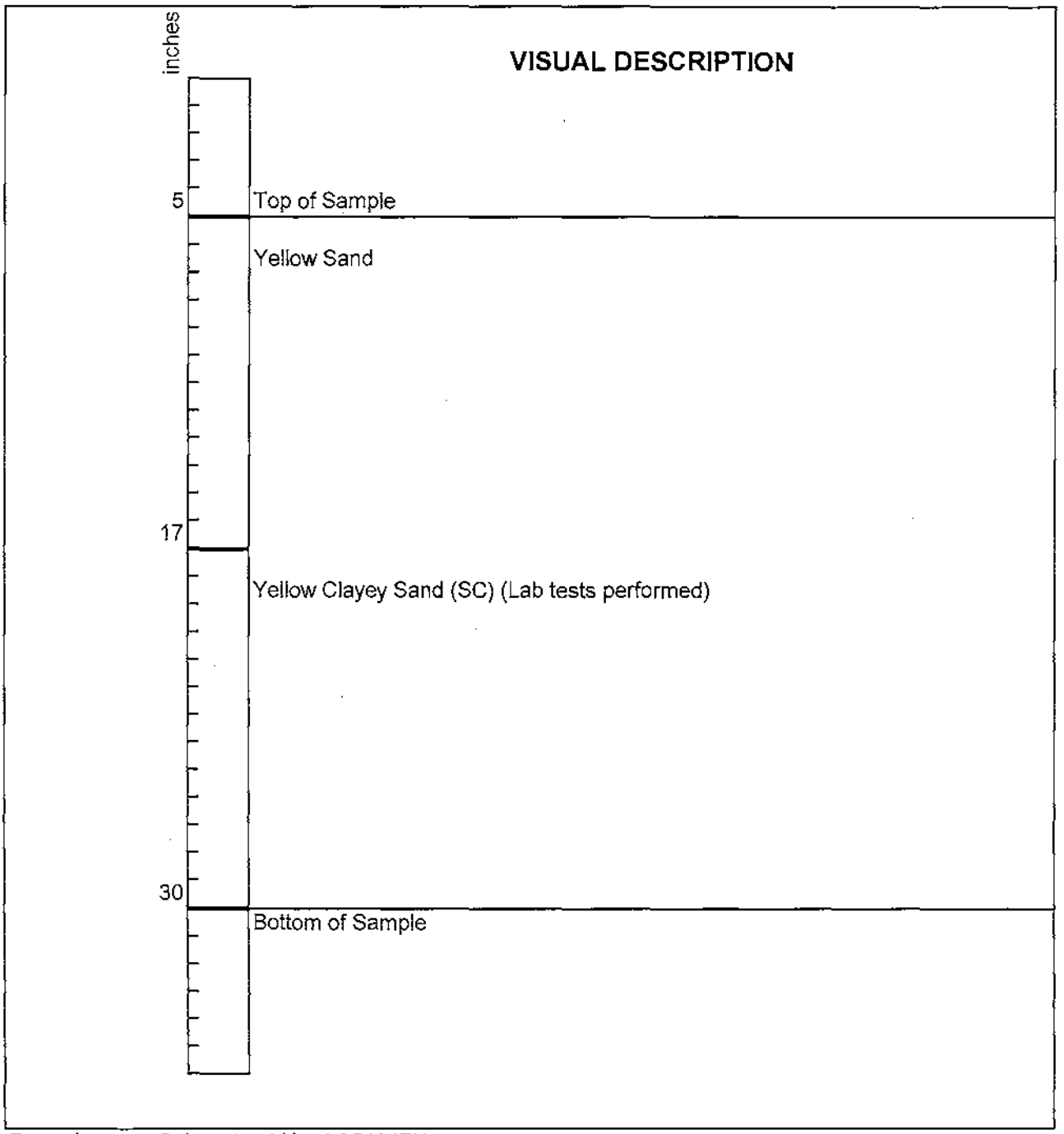
inches	VISUAL DESCRIPTION
3	Top of Sample
	Yellow Sand with Clay
13	
	Yellow Clayey Sand (SC) (Lab tests performed)
30	
	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9815 — Checked By: JGJ
Boring No: ECP7/SB2 — Sample No: UD — Depth: 51.5-54 ft
Method of Sample Extrusion: Vertical — By: JW



Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9816 — Checked By: DGF
Boring No: ECP7/SB2 — Sample No: UD — Depth: 73.5-76 ft
Method of Sample Extrusion: Vertical — By: JW

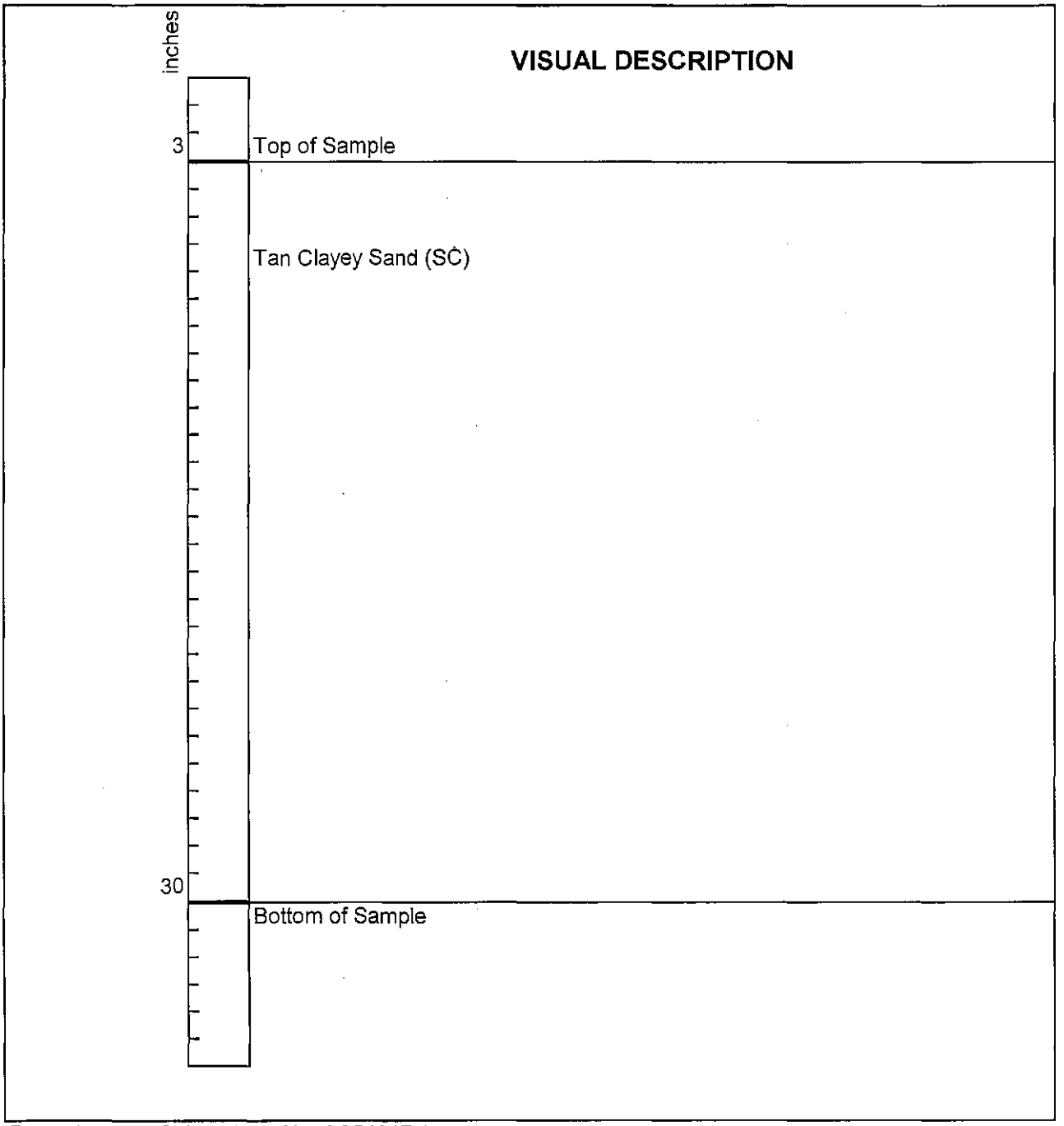
inches	VISUAL DESCRIPTION
3	Top of Sample
	Yellowish Tan Poorly Graded Sand with Silt (SP-SM)
30	Bottom of Sample

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization — Date: 9/30/2009
Project No: 6155-08-0031.08 — Lab No. 9817 — Checked By: JEJ
Boring No: ECP7/SB2 — Sample No: UD — Depth: 86.5-89 ft
Method of Sample Extrusion: Vertical — By: JW

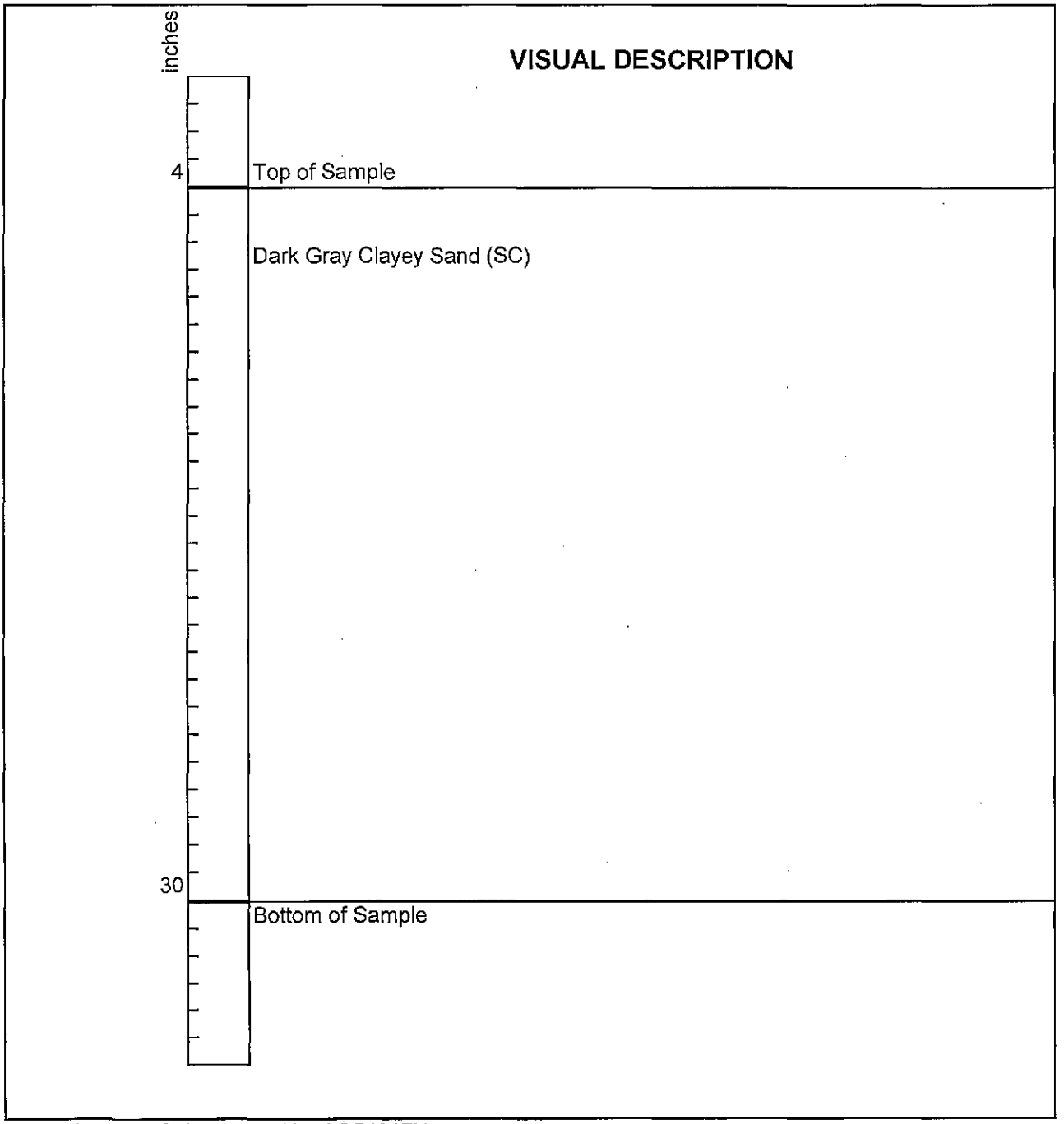


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

UNDISTURBED SAMPLE LOG
TECHNICAL PROCEDURE TP-06

Project Name: ECP Geologic Charaterization | Date: 9/30/2009
Project No: 6155-08-0031.08 | Lab No. 9818 | Checked By: JEJ
Boring No: ECP7/SB2 | Sample No: UD | Depth: 123.5-126 ft
Method of Sample Extrusion: Vertical | By: JW

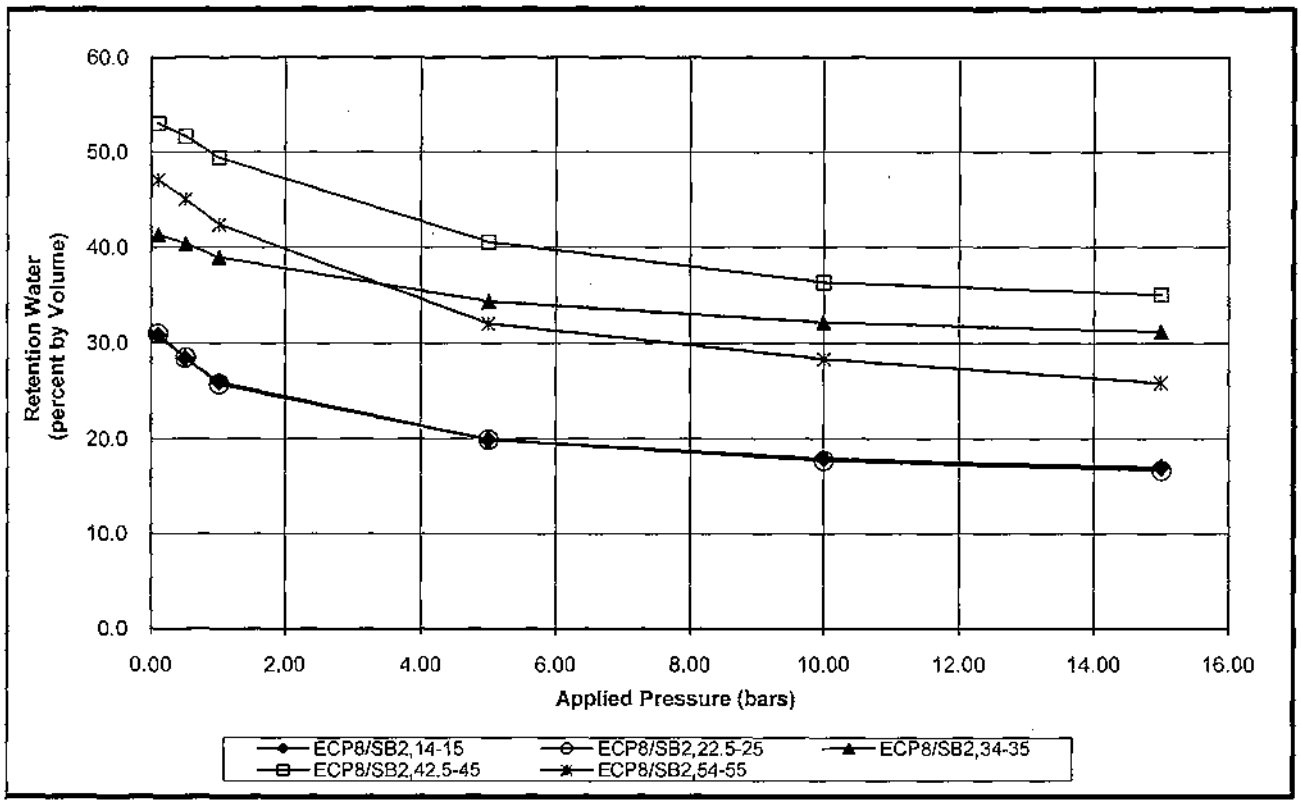


Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G00013, Rev.12
Delivery Order No.8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	GEE	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) Retained Water (percent by volume) 0.10	0.50	1.0	5.0	10.0	15.0
ECP8/SB2,14-15	33.2	112.1	30.8	28.4	26.0	19.9	17.9	17.0
ECP8/SB2,22.5-25	31.7	115.7	31.0	28.5	25.7	19.9	17.7	16.7
ECP8/SB2,34-35	39.8	97.8	41.3	40.4	38.9	34.3	32.2	31.2
ECP8/SB2,42.5-45	51.8	82.8	53.1	51.7	49.5	40.6	36.4	35.1
ECP8/SB2,54-55	46.7	86.2	47.1	45.1	42.4	32.0	28.3	25.8

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	JCS	Review Date	12/11/09

Boring No.	ECP8/SB2	ECP8/SB2	ECP8/SB2	ECP8/SB2	ECP8/SB2
Sample No.	UD	UD	UD	UD	UD
Depth (ft)	14-15	22.5-25	34-35	42.5-45	54-55
Lab No.	9786	9787	9788	9789	9790
Ring No.	WR-2	WR-1	WR-5	WR-6	WR-4
Container Weight. (g)	3.86	3.89	3.51	3.85	3.90
Container Diameter (cm)	5.12	5.10	5.15	5.10	5.09
Container Height, (cm)	1.02	1.03	1.03	1.02	1.03
Container Volume (cm^3)	21.04	20.92	21.31	20.79	20.86
Wt. of Wet Soil + Container (g)	48.56	49.3	45.39	42.22	42.47
Wt. of Dry Soil + Container (g)	41.64	42.67	36.90	31.45	32.72
Moisture Content (%)	18.3	17.1	25.4	39.0	33.8
Dry Unit Weight (pcf)	112.06	115.68	97.77	82.85	86.22
Initial Wt.Wet Soil + Container (g)	48.56	49.30	45.39	42.22	42.47
Initial Wt. Container (g)	3.80	3.89	3.51	3.85	3.90
Initial Moisture, % by Volume	33.2	31.7	39.8	51.8	46.7

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

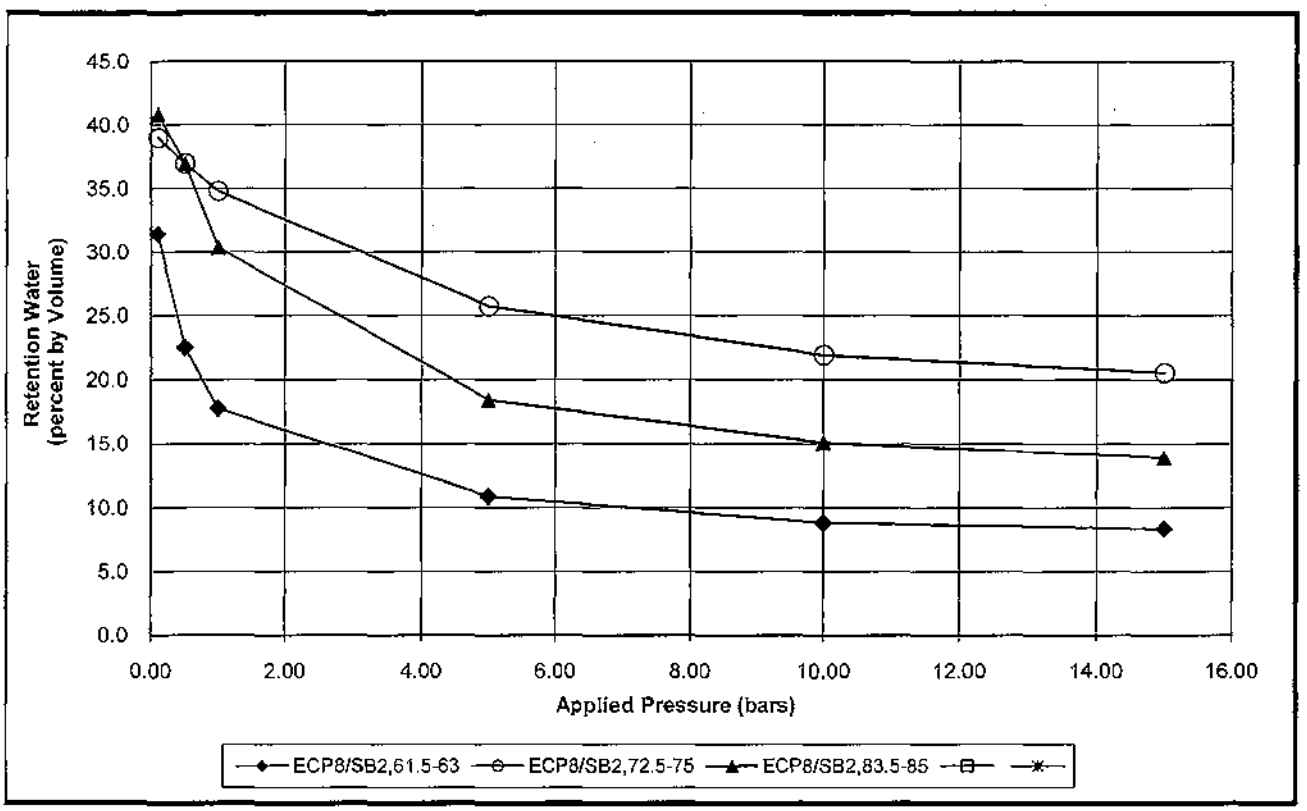
Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65
	Pressure bars	0.1	0.50	1.0	5.0	10.0	15.0
	Date / Read By						
9786	Weight of Soil + Ring	48.13	47.62	47.1	45.82	45.41	45.21
ECP8/SB2	Weight of Ring	3.86	3.86	3.86	3.86	3.86	3.86
14-15	Retained Water (%)	30.8	28.4	26.0	19.9	17.9	17.0
9787	Weight of Soil + Ring	49.15	48.63	48.05	46.84	46.38	46.16
ECP8/SB2	Weight of Ring	3.89	3.89	3.89	3.89	3.89	3.89
22.5-25	Retained Water (%)	31.0	28.5	25.7	19.9	17.7	16.7
9788	Weight of Soil + Ring	45.71	45.5	45.2	44.22	43.76	43.55
ECP8/SB2	Weight of Ring	3.51	3.51	3.51	3.51	3.51	3.51
34-35	Retained Water (%)	41.3	40.4	38.9	34.3	32.2	31.2
9789	Weight of Soil + Ring	42.48	42.19	41.73	39.88	39.01	38.74
ECP8/SB2	Weight of Ring	3.85	3.85	3.85	3.85	3.85	3.85
42.5-45	Retained Water (%)	53.1	51.7	49.5	40.6	36.4	35.1
9790	Weight of Soil + Ring	42.55	42.12	41.56	39.4	38.63	38.11
ECP8/SB2	Weight of Ring	3.9	3.9	3.9	3.9	3.9	3.9
54-55	Retained Water (%)	47.1	45.1	42.4	32.0	28.3	25.8

No. of Samples 5
No. of Tests per Sample 6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	[illegible]	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0				
			Retained Water (percent by volume)									
ECP8/SB2,61.5-63	35.3	100.9	31.4	22.5	17.8	10.9	8.8	8.3				
ECP8/SB2,72.5-75	38.2	95.7	39.0	37.0	34.8	25.7	21.9	20.6				
ECP8/SB2,83.5-85	41.9	99.4	40.8	37.0	30.3	18.4	15.1	13.9				

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	JEJ	Review Date	12/11/09

Boring No.	ECP8/SB2	ECP8/SB2	ECP8/SB2		
Sample No.	UD	UD	UD		
Depth (ft)	61.5-63	72.5-75	83.5-85		
Lab No.	9791	9792	9793		
Ring No.	WR-8	WR-13	WR-3		
Container Weight. (g)	3.71	3.75	3.82		
Container Diameter (cm)	5.14	5.12	5.09		
Container Height, (cm)	1.02	1.02	1.02		
Container Volume (cm^3)	21.20	21.05	20.80		
Wt. of Wet Soil + Container (g)	45.49	44.08	45.66		
Wt. of Dry Soil + Container (g)	38.01	36.04	36.94		
Moisture Content (%)	21.8	24.9	26.3		
Dry Unit Weight (pcf)	100.95	95.70	99.36		
Initial Wt.Wet Soil + Container (g)	45.49	44.08	45.66		
Initial Wt. Container (g)	3.71	3.75	3.82		
Initial Moisture, % by Volume	35.3	38.2	41.9		

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

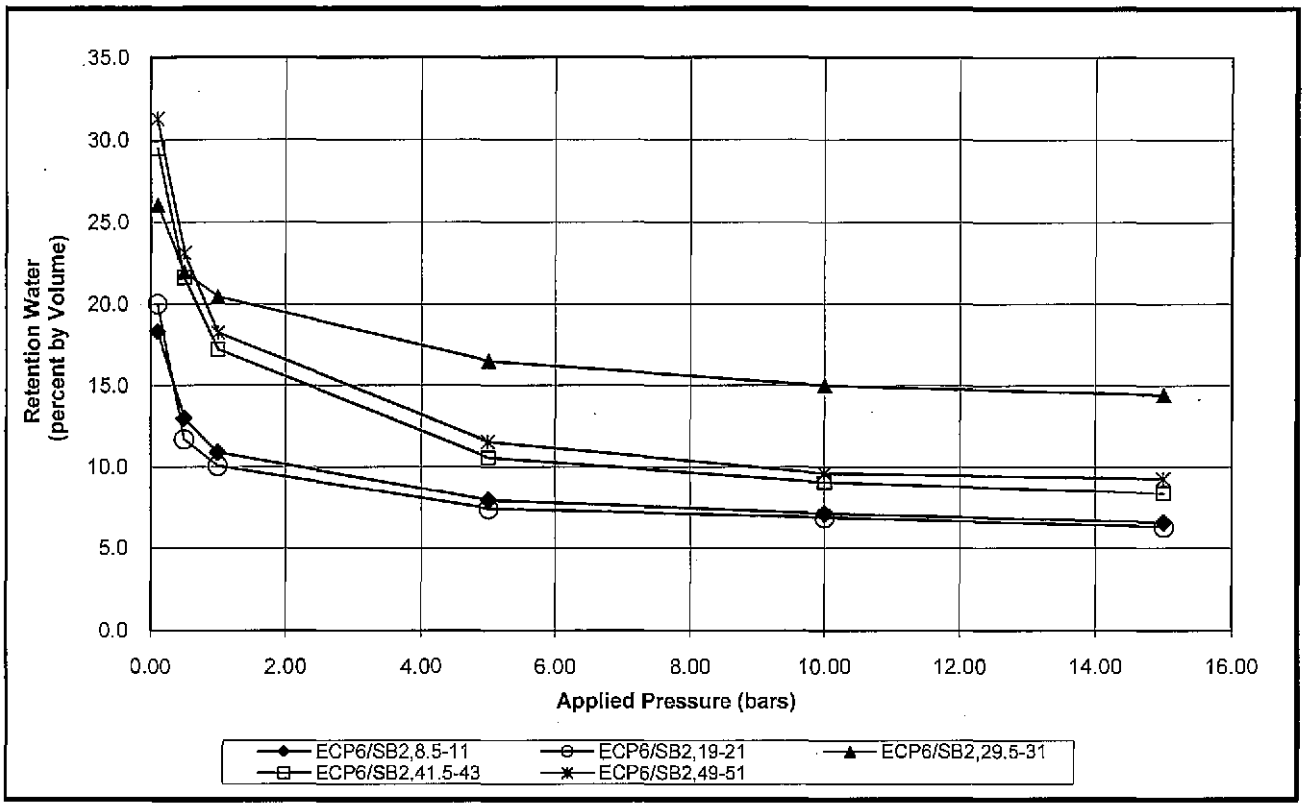
Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65				
	bars	0.1	0.50	1.0	5.0	10.0	15.0				
	Date / Read By										
9791	Weight of Soil + Ring	44.67	42.79	41.78	40.32	39.88	39.78				
ECP8/SB2	Weight of Ring	3.71	3.71	3.71	3.71	3.71	3.71				
61.5-63	Retained Water (%)	31.4	22.5	17.8	10.9	8.8	8.3				
9792	Weight of Soil + Ring	44.25	43.83	43.37	41.46	40.66	40.37				
ECP8/SB2	Weight of Ring	3.75	3.75	3.75	3.75	3.75	3.75				
72.5-75	Retained Water (%)	39.0	37.0	34.8	25.7	21.9	20.6				
9793	Weight of Soil + Ring	45.43	44.63	43.25	40.77	40.08	39.83				
ECP8/SB2	Weight of Ring	3.82	3.82	3.82	3.82	3.82	3.82				
83.5-85	Retained Water (%)	40.8	37.0	30.3	18.4	15.1	13.9				

No. of Samples	3
No. of Tests per Sample	6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	JGZ	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0				
			Retained Water (percent by volume)									
ECP6/SB2,8.5-11	27.1	117.2	18.3	13.0	10.9	7.9	7.1	6.6				
ECP6/SB2,19-21	19.0	111.0	20.0	11.7	10.1	7.4	6.9	6.3				
ECP6/SB2,29.5-31	21.2	110.6	26.1	22.0	20.5	16.5	15.0	14.4				
ECP6/SB2,41.5-43	34.6	110.0	29.5	21.6	17.2	10.6	9.1	8.4				
ECP6/SB2,49-51	32.6	103.2	31.3	23.1	18.3	11.5	9.6	9.3				

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	[illegible]	Review Date	12/11/09

Boring No.	ECP6/SB2	ECP6/SB2	ECP6/SB2	ECP6/SB2	ECP6/SB2
Sample No.	UD	UD	UD	UD	UD
Depth (ft)	8.5-11	19-21	29.5-31	41.5-43	49-51
Lab No.	9794	9795	9796	9797	9798
Ring No.	WR-7	WR-10	WR-18	WR14	WR-9
Container Weight. (g)	3.73	3.50	3.85	3.71	3.70
Container Diameter (cm)	5.11	5.09	5.14	5.06	5.09
Container Height, (cm)	1.02	1.02	1.02	1.02	1.02
Container Volume (cm^3)	21.00	20.84	21.21	20.43	20.70
Wt. of Wet Soil + Container (g)	48.88	44.5	45.96	46.79	44.67
Wt. of Dry Soil + Container (g)	43.18	40.55	41.46	39.73	37.93
Moisture Content (%)	14.4	10.7	12.0	19.6	19.7
Dry Unit Weight (pcf)	117.24	110.96	110.65	110.03	103.18
Initial Wt.Wet Soil + Container (g)	48.88	44.50	45.96	46.79	44.67
Initial Wt. Container (g)	3.73	3.50	3.85	3.71	3.70
Initial Moisture, % by Volume	27.1	19.0	21.2	34.6	32.6

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

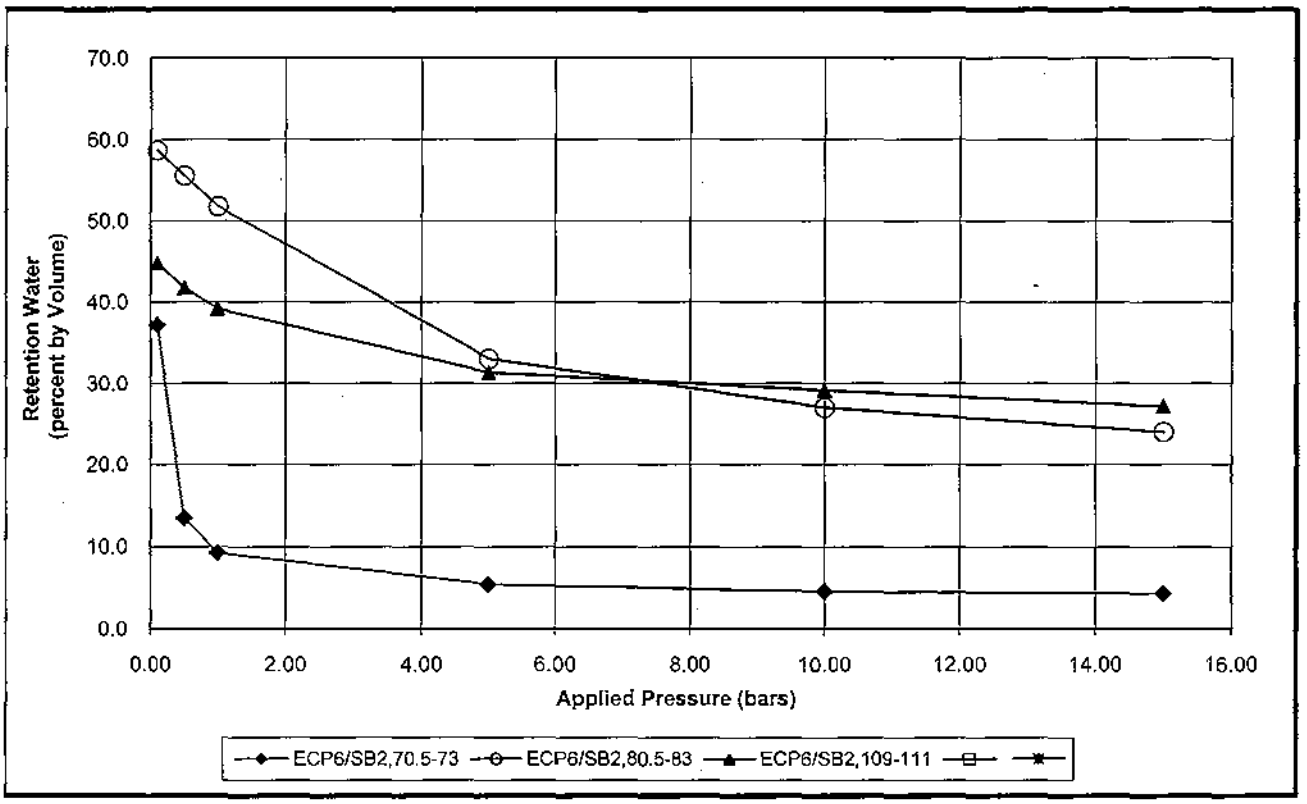
Lab No.	Pressure psi									
	bars	1.45	7.26	14.51	72.55	145.1	217.65			
	Date / Read By	0.1	0.50	1.0	5.0	10.0	15.0			
9794	Weight of Soil + Ring	47.03	45.91	45.47	44.84	44.67	44.56			
ECP6/SB2	Weight of Ring	3.73	3.73	3.73	3.73	3.73	3.73			
8.5-11	Retained Water (%)	18.3	13.0	10.9	7.9	7.1	6.6			
9795	Weight of Soil + Ring	44.72	42.99	42.65	42.09	41.98	41.86			
ECP6/SB2	Weight of Ring	3.5	3.5	3.5	3.5	3.5	3.5			
19-21	Retained Water (%)	20.0	11.7	10.1	7.4	6.9	6.3			
9796	Weight of Soil + Ring	46.99	46.12	45.8	44.96	44.64	44.52			
ECP6/SB2	Weight of Ring	3.85	3.85	3.85	3.85	3.85	3.85			
29.5-31	Retained Water (%)	26.1	22.0	20.5	16.5	15.0	14.4			
9797	Weight of Soil + Ring	45.76	44.15	43.25	41.89	41.58	41.44			
ECP6/SB2	Weight of Ring	3.71	3.71	3.71	3.71	3.71	3.71			
41.5-43	Retained Water (%)	29.5	21.6	17.2	10.6	9.1	8.4			
9798	Weight of Soil + Ring	44.41	42.72	41.71	40.32	39.92	39.85			
ECP6/SB2	Weight of Ring	3.7	3.7	3.7	3.7	3.7	3.7			
49-51	Retained Water (%)	31.3	23.1	18.3	11.5	9.6	9.3			

No. of Samples	5
No. of Tests per Sample	6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	EGJ	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0
			Retained Water (percent by volume)					
ECP6/SB2,70.5-73	44.3	99.4	37.2	13.5	9.3	5.4	4.6	4.3
ECP6/SB2,80.5-83	59.6	77.4	58.7	55.6	51.8	33.0	27.1	24.1
ECP6/SB2,109-111	42.0	94.3	44.8	41.8	39.2	31.4	29.2	27.3

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	9/28/09-10/13/09
Reviewed By	JGZ	Review Date	12/11/09

Boring No.	ECP6/SB2	ECP6/SB2	ECP6/SB2		
Sample No.	UD	UD	UD		
Depth (ft)	70.5-73	80.5-83	109-111		
Lab No.	9799	9800	9801		
Ring No.	WR-15	WR-11	WR-17		
Container Weight. (g)	3.52	3.75	3.91		
Container Diameter (cm)	5.08	5.09	5.15		
Container Height, (cm)	1.03	1.02	1.03		
Container Volume (cm^3)	20.86	20.80	21.36		
Wt. of Wet Soil + Container (g)	45.99	41.94	45.15		
Wt. of Dry Soil + Container (g)	36.75	29.54	36.18		
Moisture Content (%)	27.8	48.1	27.8		
Dry Unit Weight (pcf)	99.40	77.37	94.29		
Initial Wt.Wet Soil + Container (g)	45.99	41.94	45.15		
Initial Wt. Container (g)	3.52	3.75	3.91		
Initial Moisture, % by Volume	44.3	59.6	42.0		

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

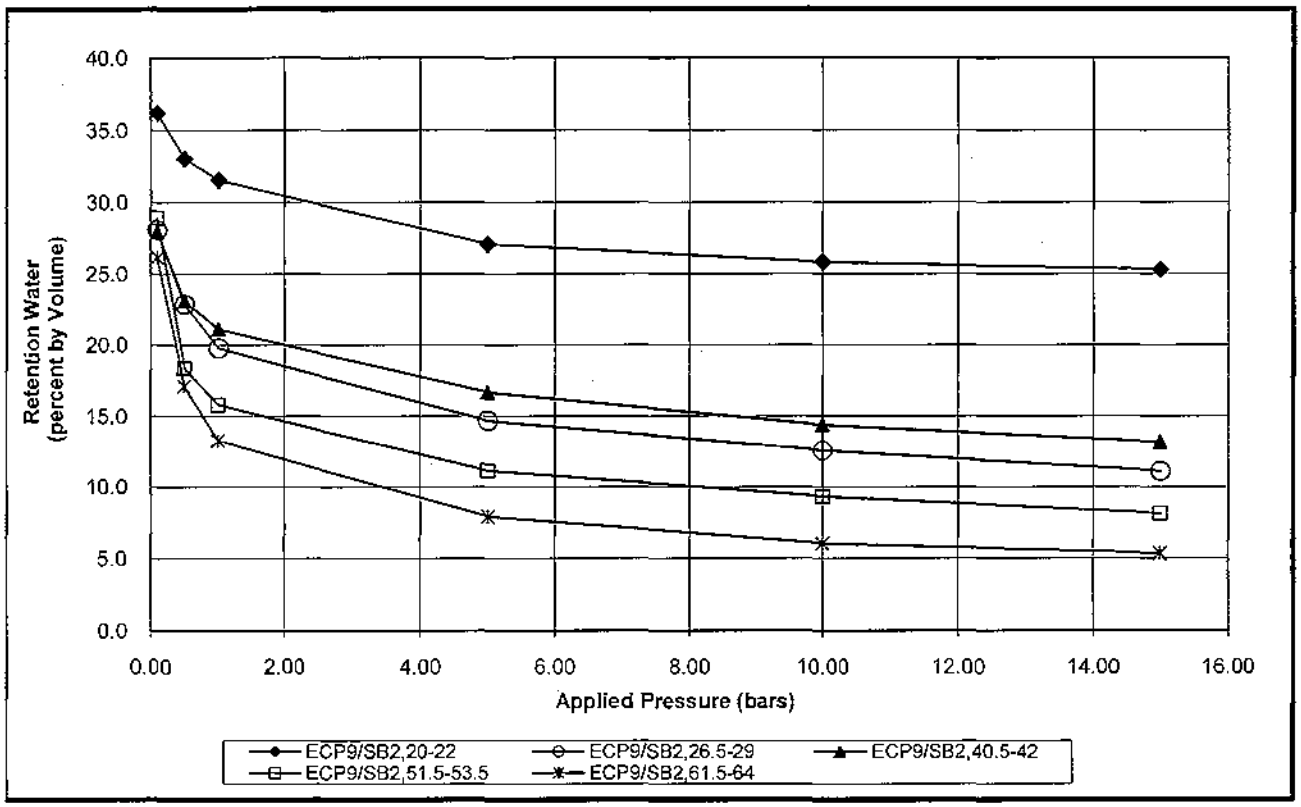
Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65				
	bars	0.1	0.50	1.0	5.0	10.0	15.0				
	Date / Read By										
9799	Weight of Soil + Ring	44.51	39.57	38.69	37.88	37.7	37.65				
ECP6/SB2	Weight of Ring	3.52	3.52	3.52	3.52	3.52	3.52				
70.5-73	Retained Water (%)	37.2	13.5	9.3	5.4	4.6	4.3				
9800	Weight of Soil + Ring	41.75	41.1	40.31	36.41	35.17	34.55				
ECP6/SB2	Weight of Ring	3.75	3.75	3.75	3.75	3.75	3.75				
80.5-83	Retained Water (%)	58.7	55.6	51.8	33.0	27.1	24.1				
9801	Weight of Soil + Ring	45.75	45.1	44.55	42.88	42.41	42				
ECP6/SB2	Weight of Ring	3.91	3.91	3.91	3.91	3.91	3.91				
109-111	Retained Water (%)	44.8	41.8	39.2	31.4	29.2	27.3				

No. of Samples 3
No. of Tests per Sample 6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JGB	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0				
			Retained Water (percent by volume)									
ECP9/SB2,20-22	29.4	106.3	36.2	33.1	31.6	27.1	25.8	25.3				
ECP9/SB2,26.5-29	28.1	109.3	28.1	22.9	19.8	14.7	12.6	11.1				
ECP9/SB2,40.5-42	29.5	102.6	28.0	23.1	21.1	16.7	14.4	13.2				
ECP9/SB2,51.5-53.5	29.0	95.9	29.0	18.4	15.8	11.1	9.3	8.1				
ECP9/SB2,61.5-64	32.8	112.1	26.2	17.1	13.3	7.9	6.0	5.4				

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JE2	Review Date	12/11/09

Boring No.	ECP9/SB2	ECP9/SB2	ECP9/SB2	ECP9/SB2	ECP9/SB2
Sample No.	UD	UD	UD	UD	UD
Depth (ft)	20-22	26.5-29	40.5-42	51.5-53.5	61.5-64
Lab No.	9802	9803	9804	9805	9806
Ring No.	WR-16	WR-14	WR-5	WR-7	WR-4
Container Weight. (g)	3.84	3.68	3.48	3.70	3.89
Container Diameter (cm)	5.10	5.06	5.15	5.11	5.09
Container Height, (cm)	1.02	1.02	1.02	1.02	1.03
Container Volume (cm^3)	20.82	20.43	21.16	21.00	20.86
Wt. of Wet Soil + Container (g)	45.41	45.22	44.53	42.04	48.21
Wt. of Dry Soil + Container (g)	39.29	39.47	38.28	35.96	41.37
Moisture Content (%)	17.3	16.1	18.0	18.8	18.2
Dry Unit Weight (pcf)	106.27	109.33	102.60	95.87	112.13
Initial Wt.Wet Soil + Container (g)	45.41	45.22	44.53	42.04	48.21
Initial Wt. Container (g)	3.84	3.68	3.48	3.70	3.89
Initial Moisture, % by Volume	29.4	28.1	29.5	29.0	32.8

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

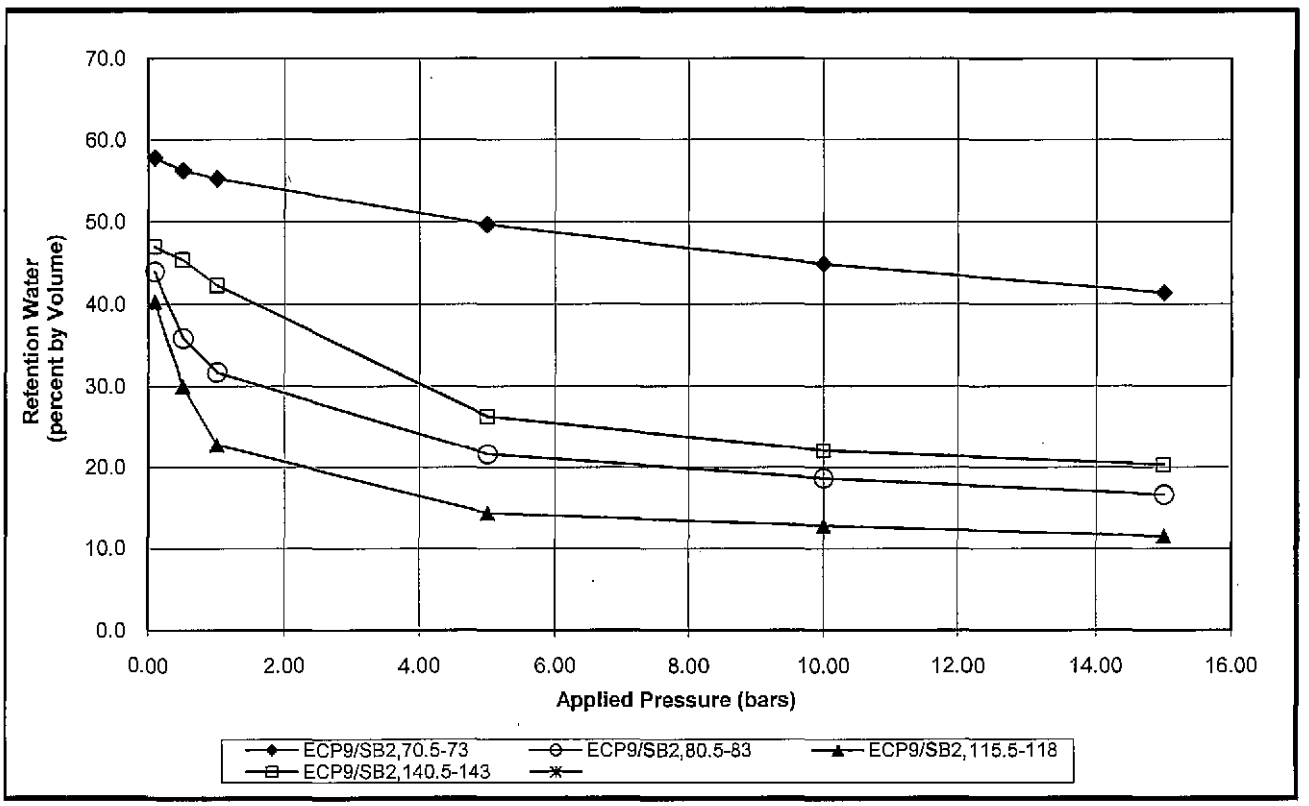
Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65
	bars	0.1	0.50	1.0	5.0	10.0	15.0
	Date / Read By						
9802	Weight of Soil + Ring	46.51	45.85	45.54	44.61	44.35	44.24
ECP9/SB2	Weight of Ring	3.52	3.52	3.52	3.52	3.52	3.52
20-22	Retained Water (%)	36.2	33.1	31.6	27.1	25.8	25.3
9803	Weight of Soil + Ring	45.21	44.14	43.51	42.47	42.04	41.74
ECP9/SB2	Weight of Ring	3.68	3.68	3.68	3.68	3.68	3.68
26.5-29	Retained Water (%)	28.1	22.9	19.8	14.7	12.6	11.1
9804	Weight of Soil + Ring	44.2	43.17	42.75	41.81	41.33	41.07
ECP9/SB2	Weight of Ring	3.48	3.48	3.48	3.48	3.48	3.48
40.5-42	Retained Water (%)	28.0	23.1	21.1	16.7	14.4	13.2
9805	Weight of Soil + Ring	42.04	39.82	39.28	38.3	37.92	37.67
ECP9/SB2	Weight of Ring	3.7	3.7	3.7	3.7	3.7	3.7
51.5-53.5	Retained Water (%)	29.0	18.4	15.8	11.1	9.3	8.1
9806	Weight of Soil + Ring	46.83	44.94	44.14	43.02	42.63	42.49
ECP9/SB2	Weight of Ring	3.89	3.89	3.89	3.89	3.89	3.89
61.5-64	Retained Water (%)	26.2	17.1	13.3	7.9	6.0	5.4

No. of Samples 5
No. of Tests per Sample 6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JEJ	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0
			Retained Water (percent by volume)					
ECP9/SB2,70.5-73	55.0	73.9	57.8	56.3	55.3	49.7	44.9	41.4
ECP9/SB2,80.5-83	47.8	78.8	43.9	35.8	31.7	21.6	18.7	16.6
ECP9/SB2,115.5-118	42.9	85.3	40.3	30.0	22.8	14.3	12.8	11.5
ECP9/SB2,140.5-143	47.7	88.6	47.0	45.3	42.3	26.3	22.1	20.3

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JEJ	Review Date	12/11/09

Boring No.	ECP9/SB2	ECP9/SB2	ECP9/SB2	ECP9/SB2	
Sample No.	UD	UD	UD	UD	
Depth (ft)	70.5-73	80.5-83	115.5-118	140.5-143	
Lab No.	9807	9808	9809	9810	
Ring No.	WR-11	WR-6	WR-10	WR-16	
Container Weight. (g)	3.70	3.86	3.53	3.84	
Container Diameter (cm)	5.09	5.10	5.09	5.10	
Container Height, (cm)	1.02	1.02	1.02	1.02	
Container Volume (cm^3)	20.80	20.79	20.84	20.82	
Wt. of Wet Soil + Container (g)	39.76	40.06	40.93	43.33	
Wt. of Dry Soil + Container (g)	28.32	30.12	32.00	33.41	
Moisture Content (%)	46.5	37.9	31.4	33.5	
Dry Unit Weight (pcf)	73.86	78.83	85.26	88.64	
Initial Wt.Wet Soil + Container (g)	39.76	40.06	40.93	43.33	
Initial Wt. Container (g)	3.70	3.86	3.53	3.84	
Initial Moisture, % by Volume	55.0	47.8	42.9	47.7	

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

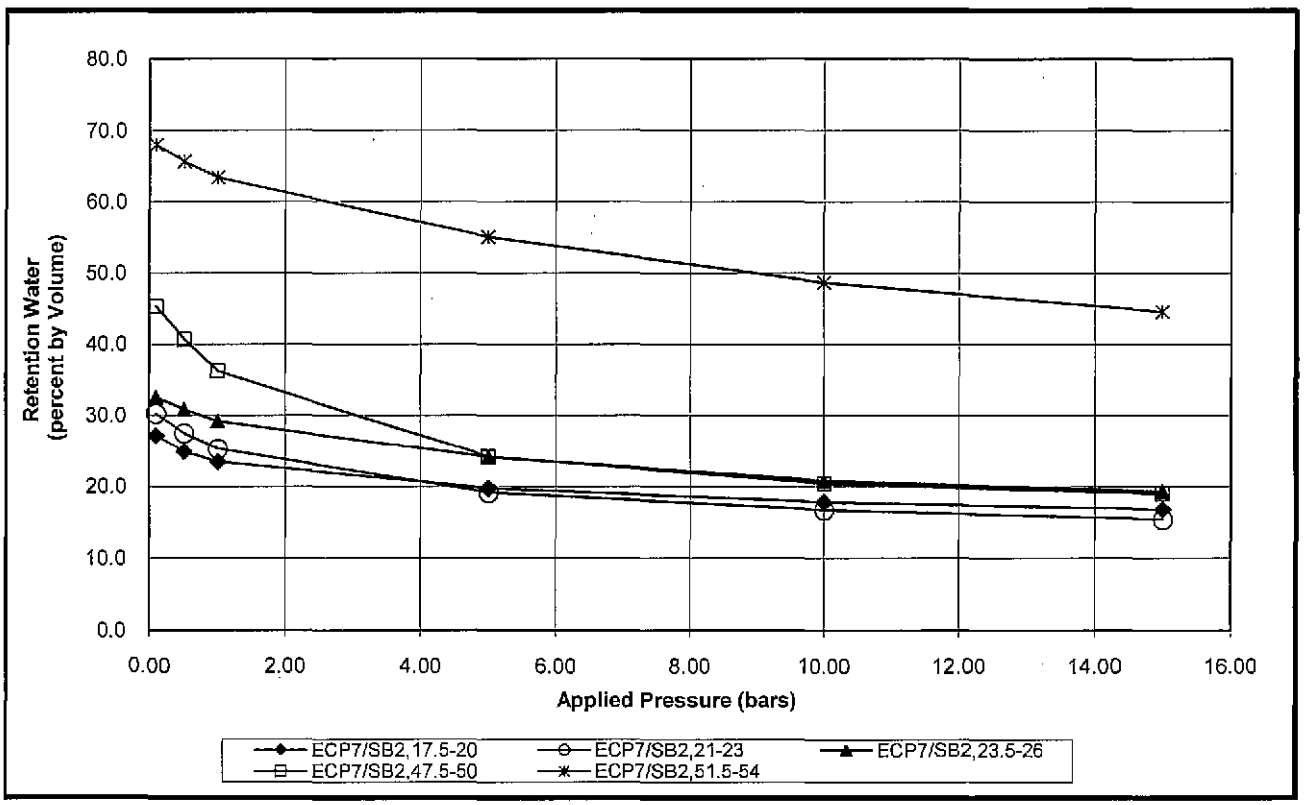
Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65				
	Pressure bars	0.1	0.50	1.0	5.0	10.0	15.0				
	Date / Read By										
9807	Weight of Soil + Ring	40.35	40.02	39.82	38.65	37.65	36.93				
ECP9/SB2	Weight of Ring	3.7	3.7	3.7	3.7	3.7	3.7				
70.5-73	Retained Water (%)	57.8	56.3	55.3	49.7	44.9	41.4				
9808	Weight of Soil + Ring	39.25	37.39	36.53	34.44	33.82	33.4				
ECP9/SB2	Weight of Ring	3.86	3.68	3.68	3.68	3.68	3.68				
80.5-83	Retained Water (%)	43.9	35.8	31.7	21.6	18.7	16.6				
9809	Weight of Soil + Ring	40.39	38.25	36.75	34.99	34.67	34.4				
ECP9/SB2	Weight of Ring	3.53	3.53	3.53	3.53	3.53	3.53				
115.5-118	Retained Water (%)	40.3	30.0	22.8	14.3	12.8	11.5				
9810	Weight of Soil + Ring	43.19	42.85	42.21	38.89	38.01	37.64				
ECP9/SB2	Weight of Ring	3.84	3.84	3.84	3.84	3.84	3.84				
140.5-143	Retained Water (%)	47.0	45.3	42.3	26.3	22.1	20.3				

No. of Samples 4
No. of Tests per Sample 6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JGJ	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) Retained Water (percent by volume)									
			0.10	0.50	1.0	5.0	10.0	15.0				
ECP7/SB2,17.5-20	29.5	117.6	27.2	24.9	23.5	19.8	17.8	16.8				
ECP7/SB2,21-23	34.7	112.7	30.2	27.5	25.3	19.2	16.7	15.4				
ECP7/SB2,23.5-26	34.9	116.4	32.6	30.9	29.2	24.1	20.8	19.3				
ECP7/SB2,47.5-50	44.3	89.0	45.3	40.7	36.3	24.2	20.4	19.0				
ECP7/SB2,51.5-54	64.0	65.2	68.0	65.6	63.4	55.1	48.7	44.6				

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JEZ	Review Date	12/11/09

Boring No.	ECP7/SB2	ECP7/SB2	ECP7/SB2	ECP7/SB2	ECP7/SB2
Sample No.	UD	UD	UD	UD	UD
Depth (ft)	17.5-20	21-23	23.5-26	47.5-50	51.5-54
Lab No.	9811	9812	9813	9814	9815
Ring No.	WR-15	WR-17	WR-13	WR-18	WR-9
Container Weight. (g)	3.51	3.90	3.68	3.83	3.70
Container Diameter (cm)	5.08	5.15	5.12	5.14	5.09
Container Height, (cm)	1.03	1.02	1.02	1.02	1.02
Container Volume (cm^3)	20.86	21.23	21.05	21.21	20.70
Wt. of Wet Soil + Container (g)	48.97	49.6	50.31	43.47	38.57
Wt. of Dry Soil + Container (g)	42.81	42.23	42.97	34.07	25.32
Moisture Content (%)	15.7	19.2	18.7	31.1	61.3
Dry Unit Weight (pcf)	117.56	112.66	116.45	88.96	65.17
Initial Wt.Wet Soil + Container (g)	48.97	49.60	50.31	43.47	38.57
Initial Wt. Container (g)	3.51	3.90	3.68	3.83	3.70
Initial Moisture, % by Volume	29.5	34.7	34.9	44.3	64.0

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

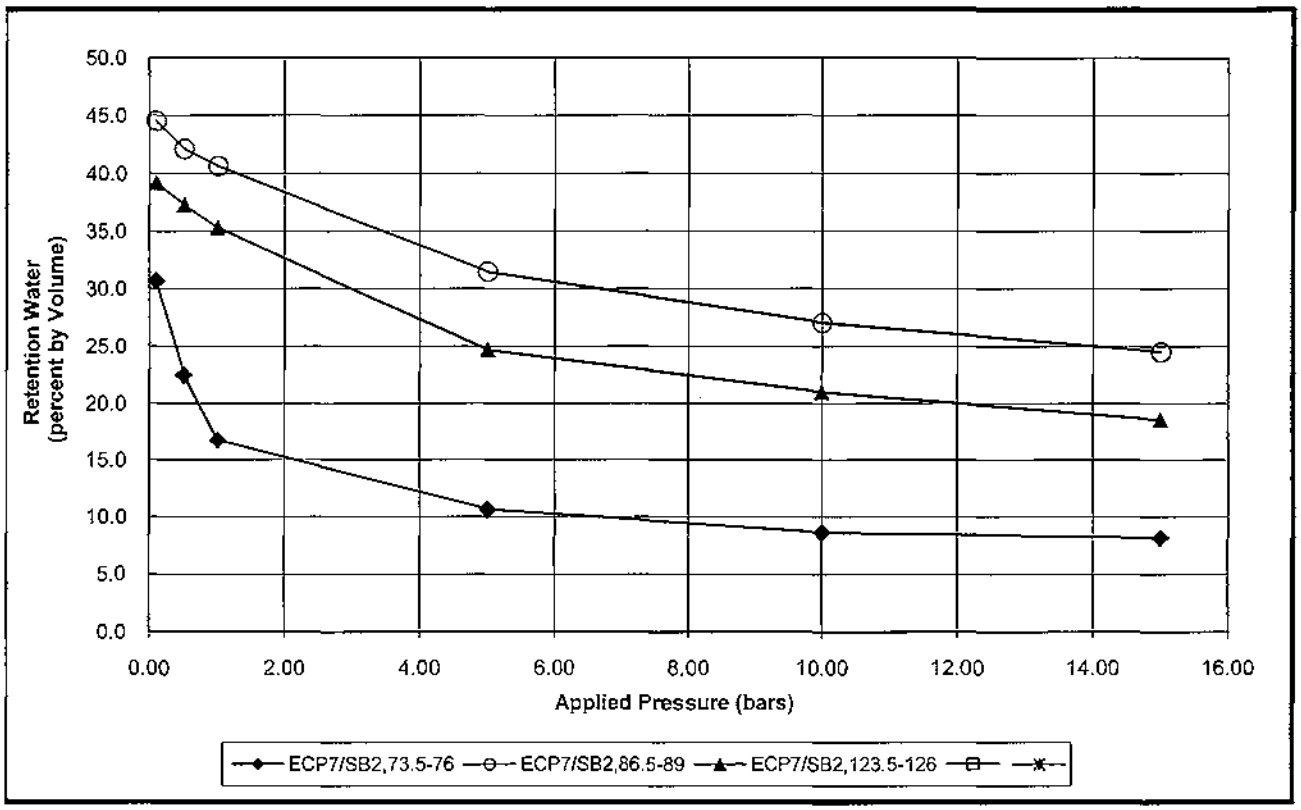
Lab No.	Pressure	psi	1.45	7.26	14.51	72.55	145.1	217.65
		bars	0.1	0.50	1.0	5.0	10.0	15.0
	Date / Read By							
9811	Weight of Soil + Ring		48.48	48.01	47.71	46.93	46.53	46.32
ECP7/SB2	Weight of Ring		3.51	3.51	3.51	3.51	3.51	3.51
17.5-20	Retained Water (%)		27.2	24.9	23.5	19.8	17.8	16.8
9812	Weight of Soil + Ring		48.65	48.07	47.6	46.3	45.78	45.5
ECP7/SB2	Weight of Ring		3.9	3.9	3.9	3.9	3.9	3.9
21-23	Retained Water (%)		30.2	27.5	25.3	19.2	16.7	15.4
9813	Weight of Soil + Ring		49.83	49.47	49.12	48.04	47.34	47.03
ECP7/SB2	Weight of Ring		3.68	3.68	3.68	3.68	3.68	3.68
23.5-26	Retained Water (%)		32.6	30.9	29.2	24.1	20.8	19.3
9814	Weight of Soil + Ring		43.68	42.7	41.76	39.2	38.4	38.1
ECP7/SB2	Weight of Ring		3.83	3.83	3.83	3.83	3.83	3.83
47.5-50	Retained Water (%)		45.3	40.7	36.3	24.2	20.4	19.0
9815	Weight of Soil + Ring		39.4	38.91	38.45	36.73	35.4	34.56
ECP7/SB2	Weight of Ring		3.7	3.7	3.7	3.7	3.7	3.7
51.5-54	Retained Water (%)		68.0	65.6	63.4	55.1	48.7	44.6

No. of Samples 5
No. of Tests per Sample 6

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JEB	Review Date	12/11/09



Sample No. & Depth (ft)	Initial Moisture % by Vol.	Dry Unit Weight (pcf)	Applied Pressure (bars) 0.10	0.50	1.0	5.0	10.0	15.0				
			Retained Water (percent by volume)									
ECP7/SB2,73.5-76	34.2	101.0	30.7	22.5	16.8	10.7	8.7	8.2				
ECP7/SB2,86.5-89	43.2	93.7	44.6	42.1	40.6	31.5	27.1	24.5				
ECP7/SB2,123.5-126	39.3	100.3	39.2	37.3	35.3	24.7	21.0	18.6				

Remarks: The effective porosity (effective drainage porosity as defined by ASTM D653, as a percent, is found for an applied pressure by subtracting the retained percent water (by volume) from the saturation percent water. When testing at pressures higher than one bar, ASTM D2325 using similar equipment designed for the required capacity.

Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

MACTEC

Water Retention Test
(ASTM D3152-72 (2000))

Project No	6155-08-0031.08	Project Name	ECP Geologic Charaterization
Tested By	JW	Test Date	10/15/09-10/30/09
Reviewed By	JCL	Review Date	12/11/09

Boring No.	ECP7/SB2	ECP7/SB2	ECP7/SB2		
Sample No.	UD	UD	UD		
Depth (ft)	73.5-76	86.5-89	123.5-126		
Lab No.	9816	9817	9818		
Ring No.	WR-3	WR-1	WR-2		
Container Weight. (g)	3.89	3.88	3.84		
Container Diameter (cm)	5.09	5.10	5.12		
Container Height, (cm)	1.02	1.03	1.02		
Container Volume (cm^3)	20.80	20.92	21.04		
Wt. of Wet Soil + Container (g)	44.67	44.31	45.93		
Wt. of Dry Soil + Container (g)	37.56	35.28	37.67		
Moisture Content (%)	21.1	28.8	24.4		
Dry Unit Weight (pcf)	101.01	93.67	100.34		
Initial Wt.Wet Soil + Container (g)	44.67	44.31	45.93		
Initial Wt. Container (g)	3.89	3.88	3.84		
Initial Moisture, % by Volume	34.2	43.2	39.3		

Remarks: Subcontract No. AC54317N
Spec. No. K-SPC-G-00013, Rev. 12
Delivery Order #8

Lab No.	Pressure psi	1.45	7.26	14.51	72.55	145.1	217.65				
	Pressure bars	0.1	0.50	1.0	5.0	10.0	15.0				
	Date / Read By										
9816	Weight of Soil + Ring	43.95	42.24	41.05	39.78	39.36	39.26				
ECP7/SB2	Weight of Ring	3.89	3.89	3.89	3.89	3.89	3.89				
73.5-76	Retained Water (%)	30.7	22.5	16.8	10.7	8.7	8.2				
9817	Weight of Soil + Ring	44.6	44.09	43.78	41.87	40.94	40.41				
ECP7/SB2	Weight of Ring	3.88	3.88	3.88	3.88	3.88	3.88				
86.5-89	Retained Water (%)	44.6	42.1	40.6	31.5	27.1	24.5				
9818	Weight of Soil + Ring	45.92	45.52	45.1	42.87	42.09	41.58				
ECP7/SB2	Weight of Ring	3.84	3.84	3.84	3.84	3.84	3.84				
123.5-126	Retained Water (%)	39.2	37.3	35.3	24.7	21.0	18.6				

No. of Samples 3
No. of Tests per Sample 6

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	JGJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*14-15 ft*	Lab No.	*9786*
Sample Description	*Brown Clayey Sand (SC)*		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*19.5*
Wet Unit Weight, pcf:	*129.1*
Dry Unit Weight, pcf:	*108.1*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***9.6E-07***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	BET
Sample No.	UD	Review Date	12/11/09
Sample Depth	14-15 ft	Lab No.	9786
Sample Description	Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	9
Location 1	2.932	Location 1	2.846	Wet Soil+Pan, g	730.14
Location 2	2.966	Location 2	2.881	Dry Soil + Pan, g	626.90
Location3	2.970	Location 3	2.888	Pan Weight, g	83.92
Average	2.956	Average	2.872	Moisture Content, %	19.0
Volume, in^3	19.15	Wet Soil + Tare, g	648.84	Dry Unit Weight, pcf	109.7
SG Measured	2.71	Tare Weight, g	0.00	Saturation, %	95.3
Soil Sample Wt., g	648.84	Dry Soil + Tare, g	542.98	Diameter, in.	N/A
Dry UW, pcf	108.1	Moisture Content, %	19.5	Length, in.	N/A
Saturation, %	93.5			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.7
Back Pressure, psi	28.7
Confining Pressure, psi	10.0
Initial Burette Reading	23.0
Finial Burette Reading	18.2
Volume Change, cc	4.8
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
2040	35.8	70.8	39.2	68.7	25.0	4.7	3.9	1.20E-06	1.07E-06
822	29.4	100.5	31.4	97.9	24.5	9.5	8.9	1.17E-06	1.05E-06
2560	29.4	100.5	35.3	94.1	24.5	9.5	7.8	1.07E-06	9.59E-07
796	35.6	93.7	37.3	92.1	24.5	7.7	7.3	1.06E-06	9.50E-07
1965	35.6	93.7	39.5	90.0	24.5	7.7	6.7	1.03E-06	9.22E-07
3084	35.6	93.7	40.3	88.3	24.5	7.7	6.4	8.90E-07	8.01E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **9.59E-07** **cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.79 cm^2

L = 7.51 cm

Remarks: Subcontract No. AC54317N

Spe. No. K-SPC-G-00013, Rev. 12

Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	*JEJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*22.5-25 ft*	Lab No.	*9787*

Sample Description ***Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*19.1*
Wet Unit Weight, pcf:	*129.0*
Dry Unit Weight, pcf:	*108.3*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.5E-06***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	DEF
Sample No.	UD	Review Date	12/11/09
Sample Depth	22.5-25 ft	Lab No.	9787
Sample Description	Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	10
Location 1	3.918	Location 1	2.820	Wet Soil+Pan, g	947.31
Location 2	3.935	Location 2	2.867	Dry Soil + Pan, g	812.44
Location3	3.912	Location 3	2.871	Pan Weight, g	100.20
Average	3.922	Average	2.853	Moisture Content, %	18.9
Volume, in^3	25.06	Wet Soil + Tare, g	848.34	Dry Unit Weight, pcf	110.0
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	97.6
Soil Sample Wt., g	848.34	Dry Soil + Tare, g	712.24	Diameter, in.	N/A
Dry UW, pcf	108.3	Moisture Content, %	19.1	Length, in.	N/A
Saturation, %	94.0			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.4
Back Pressure, psi	28.4
Confining Pressure, psi	10.0
Initial Burette Reading	25.0
Finial Burette Reading	18.4
Volume Change, cc	6.6
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1200	0.0	24.0	0.2	23.8	23.9	2.4	2.4	1.69E-06	1.54E-06
4620	0.0	24.0	0.7	23.2	23.9	2.4	2.3	1.69E-06	1.54E-06
10800	0.0	24.0	1.6	22.4	23.9	2.4	2.1	1.60E-06	1.46E-06
14820	0.0	24.0	2.1	21.9	24.0	2.4	2.0	1.57E-06	1.43E-06
23580	0.0	24.0	3.2	21.1	24.0	2.4	1.8	1.50E-06	1.37E-06
80758	0.0	24.0	7.9	16.4	23.8	2.4	0.9	1.55E-06	1.42E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.46E-06 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 1.00 cm^2

A = 41.23 cm^2

L = 9.96 cm

Remarks: Subcontract No. AC54317N

Spc. No. K-SPC-G-00013, Rev. 12

Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	JCJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*34-35 ft*	Lab No.	*9788*
Sample Description	***Brown Clayey Sand (SC)***		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*23.1*
Wet Unit Weight, pcf:	*121.7*
Dry Unit Weight, pcf:	*98.9*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.9E-05***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	JEZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	34-35 ft	Lab No.	9788
Sample Description	Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-20
Location 1	3.441	Location 1	2.832	Wet Soil+Pan, g	785.60
Location 2	3.449	Location 2	2.825	Dry Soil + Pan, g	649.37
Location3	3.419	Location 3	2.822	Pan Weight, g	89.91
Average	3.436	Average	2.826	Moisture Content, %	24.4
Volume, in^3	21.56	Wet Soil + Tare, g	688.75	Dry Unit Weight, pcf	102.7
SG Measured	2.7	Tare Weight, g	0.00	Saturation, %	102.5
Soil Sample Wt., g	688.75	Dry Soil + Tare, g	559.46	Diameter, in.	N/A
Dry UW, pcf	98.9	Moisture Content, %	23.1	Length, in.	N/A
Saturation, %	88.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.1
Back Pressure, psi	29.1
Confining Pressure, psi	10.0
Initial Burette Reading	16.2
Finial Burette Reading	3.2
Volume Change, cc	13.0
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
480	19.2	102.1	44.5	76.9	25.0	9.5	3.7	3.38E-05	3.00E-05
840	19.2	102.1	52.3	69.9	25.0	9.5	2.0	3.18E-05	2.83E-05
120	33.5	97.3	40.3	90.8	25.0	7.3	5.8	3.36E-05	2.99E-05
135	40.3	90.1	46.2	84.7	25.0	5.7	4.4	3.29E-05	2.92E-05
120	46.2	84.7	50.2	81.0	25.0	4.4	3.5	3.21E-05	2.85E-05
100	50.2	81.0	52.9	78.4	25.0	3.5	2.9	3.26E-05	2.90E-05

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.92E-05** **cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 40.48 cm^2
L = 8.73 cm

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*42.5-45 ft*	Lab No.	*9789*

Sample Description ***Yellowish Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*28.7*
Wet Unit Weight, pcf:	*118.2*
Dry Unit Weight, pcf:	*91.8*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***5.6E-06***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	42.5-45 ft	Lab No.	9789
Sample Description	Yellowish Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	RL-5
Location 1	3.632	Location 1	2.832	Wet Soil+Pan, g	784.17
Location 2	3.550	Location 2	2.842	Dry Soil + Pan, g	627.60
Location3	3.522	Location 3	2.825	Pan Weight, g	85.61
Average	3.568	Average	2.833	Moisture Content, %	28.9
Volume, in^3	22.49	Wet Soil + Tare, g	697.42	Dry Unit Weight, pcf	95.1
SG Measured	2.66	Tare Weight, g	0.00	Saturation, %	103.1
Soil Sample Wt., g	697.42	Dry Soil + Tare, g	541.99	Diameter, in.	N/A
Dry UW, pcf	91.8	Moisture Content, %	28.7	Length, in.	N/A
Saturation, %	94.4			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.4
Back Pressure, psi	28.4
Confining Pressure, psi	10.0
Initial Burette Reading	25.6
Finial Burette Reading	12.8
Volume Change, cc	12.8
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
420	13.5	93.4	18.9	87.9	25.0	8.8	7.6	6.23E-06	5.54E-06
1050	13.5	93.4	25.8	81.1	25.0	8.8	6.1	6.25E-06	5.56E-06
2716	13.5	93.4	37.4	69.5	25.0	8.8	3.5	5.99E-06	5.32E-06
3280	13.5	93.4	40.5	66.9	25.0	8.8	2.9	6.02E-06	5.35E-06
180	25.3	90.2	27.6	88.2	25.0	7.2	6.7	6.79E-06	6.04E-06
360	25.3	90.2	29.5	86.4	25.0	7.2	6.3	6.51E-06	5.79E-06
660	25.3	90.2	32.4	83.7	25.0	7.2	5.7	6.35E-06	5.65E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **5.61E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 40.67 cm^2
L = 9.06 cm

Remarks: Subcontract No. AC54317N
Spc. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*54-55 ft*	Lab No.	*9790*

Sample Description ***Brownish Tan Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*29.6*
Wet Unit Weight, pcf:	*116.4*
Dry Unit Weight, pcf:	*89.8*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.3E-04***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	JCJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	54-55 ft	Lab No.	9790
Sample Description	Brownish Tan Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-7
Location 1	2.434	Location 1	2.843	Wet Soil+Pan, g	574.44
Location 2	2.470	Location 2	2.837	Dry Soil + Pan, g	462.12
Location3	2.503	Location 3	2.876	Pan Weight, g	90.43
Average	2.469	Average	2.852	Moisture Content, %	30.2
Volume, in^3	15.77	Wet Soil + Tare, g	481.65	Dry Unit Weight, pcf	92.2
SG Measured	2.65	Tare Weight, g	0.00	Saturation, %	101.0
Soil Sample Wt., g	481.65	Dry Soil + Tare, g	371.69	Diameter, in.	N/A
Dry UW, pcf	89.8	Moisture Content, %	29.6	Length, in.	N/A
Saturation, %	93.1			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.5
Back Pressure, psi	29.5
Confining Pressure, psi	10.0
Initial Burette Reading	24.0
Finial Burette Reading	17.2
Volume Change, cc	6.8
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
30	76.9	93.1	79.4	90.7	25.0	2.6	1.8	1.46E-04	1.30E-04
30	79.4	90.7	81.0	89.0	25.0	1.8	1.3	1.40E-04	1.25E-04
30	75.1	95.3	78.2	92.3	25.0	3.2	2.2	1.46E-04	1.30E-04
30	74.9	94.9	77.9	91.9	25.0	3.2	2.2	1.45E-04	1.29E-04
30	77.9	91.9	80.0	89.9	25.0	2.2	1.6	1.41E-04	1.25E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
5	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.28E-04 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.22 cm^2

L = 6.27 cm

Remarks: Subcontract No. AC54317N

Spc. No. K-SPC-G-00013, Rev. 12

Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*8/28/2009*
Boring No.	*ECP8/SB2*	Reviewed By	JCJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*61.5-63 ft*	Lab No.	*9791*

Sample Description ***Brown Poorly Graded Sand with Silt (SP-SM)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*21.4*
Wet Unit Weight, pcf:	*119.0*
Dry Unit Weight, pcf:	*98.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.6E-04***

Remarks: Subcontract No. AC54317N
Spe. No. K-SPC-G-00013, Rev. 12
Delivery Order No. 8

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	08/28/09
Boring No.	ECP8/SB2	Reviewed By	JEJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	61.5-63 ft	Lab No.	9791
Sample Description	Brown Poorly Graded Sand with Silt (SP-SM)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-11
Location 1	4.977	Location 1	2.857	Wet Soil+Pan, g	1104.55
Location 2	4.933	Location 2	2.845	Dry Soil + Pan, g	898.41
Location3	4.886	Location 3	2.864	Pan Weight, g	85.96
Average	4.932	Average	2.855	Moisture Content, %	25.4
Volume, in^3	31.58	Wet Soil + Tare, g	985.94	Dry Unit Weight, pcf	99.3
SG Measured	2.67	Tare Weight, g	0.00	Saturation, %	100.1
Soil Sample Wt., g	985.94	Dry Soil + Tare, g	812.45	Diameter, in.	N/A
Dry UW, pcf	98.0	Moisture Content, %	21.4	Length, in.	N/A
Saturation, %	81.5			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	59.3
Back Pressure, psi	49.3
Confining Pressure, psi	10.0
Initial Burette Reading	16.5
Finial Burette Reading	9.6
Volume Change, cc	6.9
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
60	60.2	103.0	67.6	95.4	24.5	3.4	2.2	1.74E-04	1.57E-04
60	67.6	95.4	72.7	90.9	24.5	2.2	1.5	1.71E-04	1.54E-04
60	72.7	90.9	75.8	87.9	24.5	1.5	1.0	1.65E-04	1.48E-04
60	75.8	97.6	79.9	93.9	24.5	1.7	1.1	1.79E-04	1.61E-04
60	79.9	93.9	82.5	91.5	24.5	1.1	0.7	1.79E-04	1.61E-04
60	69.6	91.5	73.6	87.9	24.5	1.7	1.1	1.72E-04	1.55E-04
60	73.6	87.9	76.1	85.5	24.5	1.1	0.8	1.70E-04	1.53E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.56E-04** **cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.31 cm^2

L = 12.53 cm

Remarks: Subcontract No. AC54317N

Spc. No. K-SPC-G-00013, Rev. 12

Delivery Order No. 8

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP8/SB2*	Reviewed By	*JCJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*72.5-75 ft*	Lab No.	*9792*

Sample Description *Yellow Clayey Sand (SC)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*24.9*
Wet Unit Weight, pcf:	*120.2*
Dry Unit Weight, pcf:	*96.2*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.9E-05***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP8/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	72.5-75 ft	Lab No.	9792
Sample Description	Yellow Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	T-16
Location 1	4.091	Location 1	2.868	Wet Soil+Pan, g	894.83
Location 2	4.105	Location 2	2.851	Dry Soil + Pan, g	715.87
Location3	4.076	Location 3	2.862	Pan Weight, g	52.03
Average	4.091	Average	2.860	Moisture Content, %	27.0
Volume, in^3	26.29	Wet Soil + Tare, g	829.23	Dry Unit Weight, pcf	98.0
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	101.9
Soil Sample Wt., g	829.23	Dry Soil + Tare, g	663.84	Diameter, in.	N/A
Dry UW, pcf	96.2	Moisture Content, %	24.9	Length, in.	N/A
Saturation, %	90.0			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.3
Back Pressure, psi	34.3
Confining Pressure, psi	10.0
Initial Burette Reading	23.0
Finial Burette Reading	15.0
Volume Change, cc	8.0
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1740	2.0	24.0	4.2	21.7	24.0	2.1	1.7	1.65E-05	1.50E-05
1994	4.2	21.7	6.6	19.1	24.0	1.7	1.2	2.11E-05	1.92E-05
4160	1.4	24.0	7.9	17.5	24.0	2.2	0.9	2.58E-05	2.35E-05
2220	0.3	24.2	3.7	21.1	24.1	2.3	1.7	1.79E-05	1.63E-05
1407	0.5	23.9	2.7	21.6	24.1	2.3	1.8	1.90E-05	1.73E-05
3080	2.7	21.6	6.7	17.7	24.0	1.8	1.1	2.20E-05	2.00E-05

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.85E-05 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 1.00 cm^2
A = 41.46 cm^2
L = 10.39 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP8/SB2*	Reviewed By	*JGJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*83.5-85 ft*	Lab No.	*9793*

Sample Description ***Yellow Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*30.8*
Wet Unit Weight, pcf:	*121.3*
Dry Unit Weight, pcf:	*92.7*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***7.6E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP8/SB2	Reviewed By	JGJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	83.5-85 ft	Lab No.	9793
Sample Description	Yellow Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	X-30
Location 1	3.691	Location 1	2.891	Wet Soil+Pan, g	797.16
Location 2	3.675	Location 2	2.874	Dry Soil + Pan, g	633.23
Location3	3.695	Location 3	2.875	Pan Weight, g	48.87
Average	3.687	Average	2.880	Moisture Content, %	28.1
Volume, in^3	24.02	Wet Soil + Tare, g	764.42	Dry Unit Weight, pcf	95.9
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	100.5
Soil Sample Wt., g	764.42	Dry Soil + Tare, g	584.36	Diameter, in.	N/A
Dry UW, pcf	92.7	Moisture Content, %	30.8	Length, in.	N/A
Saturation, %	102.2			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	48.6
Back Pressure, psi	38.6
Confining Pressure, psi	10.0
Initial Burette Reading	34.0
Finial Burette Reading	21.0
Volume Change, cc	13.0
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
540	0.1	24.3	0.6	23.8	24.0	2.6	2.5	8.71E-06	7.92E-06
2100	0.1	24.3	1.6	22.9	24.0	2.6	2.3	6.77E-06	6.16E-06
3794	0.1	24.3	3.1	21.4	24.0	2.6	2.0	8.21E-06	7.47E-06
1250	0.0	24.2	1.2	23.0	24.0	2.6	2.3	9.31E-06	8.47E-06
4229	1.2	23.0	4.2	20.0	24.0	2.3	1.7	8.48E-06	7.72E-06
2204	0.2	24.1	2.0	22.2	24.1	2.6	2.2	8.50E-06	7.72E-06
4006	0.2	24.1	3.4	20.9	24.1	2.6	1.9	8.67E-06	7.87E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **7.62E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 1.00 cm^2
A = 42.03 cm^2
L = 9.36 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP6/SB2*	Reviewed By	*DGZ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*8.5-11 ft*	Lab No.	*9794*

Sample Description *Brown Clayey Sand (SC)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*12.8*
Wet Unit Weight, pcf:	*129.2*
Dry Unit Weight, pcf:	*114.5*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***4.4E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP6/SB2	Reviewed By	DSZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	8.5-11 ft	Lab No.	9794
Sample Description	Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	E-8
Location 1	5.052	Location 1	2.852	Wet Soil+Pan, g	1198.06
Location 2	5.029	Location 2	2.864	Dry Soil + Pan, g	1045.25
Location3	4.973	Location 3	2.864	Pan Weight, g	76.35
Average	5.018	Average	2.860	Moisture Content, %	15.8
Volume, in^3	32.24	Wet Soil + Tare, g	1093.12	Dry Unit Weight, pcf	115.5
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	94.4
Soil Sample Wt., g	1093.12	Dry Soil + Tare, g	968.90	Diameter, in.	N/A
Dry UW, pcf	114.5	Moisture Content, %	12.8	Length, in.	N/A
Saturation, %	74.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	49.4
Back Pressure, psi	39.4
Confining Pressure, psi	10.0
Initial Burette Reading	17.4
Finial Burette Reading	13.0
Volume Change, cc	4.5
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
32	24.5	102.5	44.1	84.5	25.0	6.1	3.2	5.06E-04	4.50E-04
60	24.5	102.5	53.2	75.9	25.0	6.1	1.8	5.06E-04	4.50E-04
31	53.6	75.9	58.4	70.9	25.0	1.7	1.0	4.59E-04	4.09E-04
30	58.4	70.9	61.2	68.3	25.0	1.0	0.6	4.64E-04	4.12E-04
30	61.3	91.3	68.1	84.1	25.0	2.4	1.3	5.15E-04	4.58E-04
30	68.1	84.1	71.8	80.5	25.0	1.3	0.7	5.00E-04	4.44E-04
30	71.8	80.7	73.8	78.5	25.0	0.7	0.4	5.24E-04	4.66E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **4.41E-04 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.45 cm^2
L = 12.75 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP6/SB2*	Reviewed By	*GG*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*19-21 ft*	Lab No.	*9795*

Sample Description ***Yellowish Brown Poorly Graded Sand with Clay (SP-SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*14.1*
Wet Unit Weight, pcf:	*119.9*
Dry Unit Weight, pcf:	*105.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.3E-03***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP6/SB2	Reviewed By	JEF
Sample No.	UD	Review Date	12/11/09
Sample Depth	19-21 ft	Lab No.	9795
Sample Description	Yellowish Brown Poorly Graded Sand with Clay (SP-SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	A
Location 1	5.042	Location 1	2.836	Wet Soil+Pan, g	1138.68
Location 2	5.084	Location 2	2.852	Dry Soil + Pan, g	957.50
Location3	5.019	Location 3	2.832	Pan Weight, g	76.22
Average	5.048	Average	2.840	Moisture Content, %	20.6
Volume, in^3	31.98	Wet Soil + Tare, g	1005.97	Dry Unit Weight, pcf	106.3
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	95.4
Soil Sample Wt., g	1005.97	Dry Soil + Tare, g	881.28	Diameter, in.	N/A
Dry UW, pcf	105.0	Moisture Content, %	14.1	Length, in.	N/A
Saturation, %	63.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	54.3
Back Pressure, psi	44.3
Confining Pressure, psi	10.0
Initial Burette Reading	17.4
Finial Burette Reading	11.2
Volume Change, cc	6.3
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
13	65.0	103.0	75.6	92.5	25.0	3.0	1.3	1.56E-03	1.39E-03
24	75.6	92.5	82.4	86.4	25.0	1.3	0.3	1.51E-03	1.34E-03
21	69.8	86.4	76.1	80.9	25.0	1.3	0.4	1.48E-03	1.32E-03
22	67.4	80.9	72.6	76.3	25.0	1.1	0.3	1.48E-03	1.31E-03
18	64.1	84.4	71.4	77.9	25.0	1.6	0.5	1.59E-03	1.41E-03
20	64.1	77.9	69.2	73.4	25.0	1.1	0.3	1.49E-03	1.33E-03
21	59.4	73.4	64.7	69.1	25.0	1.1	0.3	1.38E-03	1.23E-03

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.33E-03 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 40.87 cm^2
L = 12.82 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP6/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*29.5-31 ft*	Lab No.	*9796*

Sample Description ***Brown and Purple Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*12.7*
Wet Unit Weight, pcf:	*112.8*
Dry Unit Weight, pcf:	*100.1*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***7.5E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP6/SB2	Reviewed By	JEZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	29.5-31 ft	Lab No.	9796
Sample Description	Brown and Purple Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	BC-1
Location 1	4.882	Location 1	2.866	Wet Soil+Pan, g	1115.26
Location 2	4.845	Location 2	2.878	Dry Soil + Pan, g	911.28
Location3	4.854	Location 3	2.879	Pan Weight, g	82.69
Average	4.860	Average	2.874	Moisture Content, %	24.6
Volume, in^3	31.54	Wet Soil + Tare, g	933.83	Dry Unit Weight, pcf	101.2
SG Measured	2.71	Tare Weight, g	0.00	Saturation, %	99.4
Soil Sample Wt., g	933.83	Dry Soil + Tare, g	828.59	Diameter, in.	N/A
Dry UW, pcf	100.1	Moisture Content, %	12.7	Length, in.	N/A
Saturation, %	49.9			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	42.8
Back Pressure, psi	32.8
Confining Pressure, psi	10.0
Initial Burette Reading	16.8
Finial Burette Reading	11.2
Volume Change, cc	5.6
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
300	58.0	88.1	59.6	86.3	25.0	2.4	2.2	9.43E-06	8.38E-06
600	33.3	93.6	39.0	87.4	25.0	4.9	3.9	8.64E-06	7.69E-06
3085	33.3	93.6	52.6	73.6	25.0	4.9	1.7	8.07E-06	7.17E-06
2413	52.6	73.6	58.7	67.9	25.0	1.7	0.7	8.07E-06	7.18E-06
1293	19.2	90.3	32.6	77.4	25.0	5.8	3.6	8.43E-06	7.49E-06
5100	32.6	77.4	51.0	58.7	25.0	3.6	0.6	8.15E-06	7.24E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **7.53E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.86 cm^2
L = 12.35 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/3/2009*
Boring No.	*ECP6/SB2*	Reviewed By	*DGF*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*41.5-43 ft*	Lab No.	*9797*

Sample Description ***Yellowish Brown Poorly Graded Sand with Clay (SP-SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*18.1*
Wet Unit Weight, pcf:	*125.8*
Dry Unit Weight, pcf:	*106.5*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.5E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/03/09
Boring No.	ECP6/SB2	Reviewed By	JGJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	41.5-43 ft	Lab No.	9797
Sample Description	Yellowish Brown Poorly Graded Sand with Clay (SP-SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-23
Location 1	4.437	Location 1	2.836	Wet Soil+Pan, g	1031.92
Location 2	4.511	Location 2	2.847	Dry Soil + Pan, g	874.52
Location3	4.429	Location 3	2.843	Pan Weight, g	83.65
Average	4.459	Average	2.842	Moisture Content, %	19.9
Volume, in^3	28.29	Wet Soil + Tare, g	934.21	Dry Unit Weight, pcf	107.4
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	95.8
Soil Sample Wt., g	934.21	Dry Soil + Tare, g	790.87	Diameter, in.	N/A
Dry UW, pcf	106.5	Moisture Content, %	18.1	Length, in.	N/A
Saturation, %	85.2			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	43.7
Back Pressure, psi	33.7
Confining Pressure, psi	10.0
Initial Burette Reading	24.0
Finial Burette Reading	20.1
Volume Chauge, cc	3.9
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
90	7.0	24.0	8.0	23.1	24.0	1.5	1.3	1.82E-04	1.66E-04
240	7.0	24.0	8.9	22.5	24.0	1.5	1.2	1.29E-04	1.17E-04
120	2.4	23.0	3.9	21.7	24.0	1.8	1.6	1.68E-04	1.53E-04
120	3.9	21.7	4.7	20.8	24.0	1.6	1.4	1.16E-04	1.05E-04
240	0.4	23.0	3.4	20.0	24.0	2.0	1.5	1.78E-04	1.62E-04
240	3.4	20.0	5.6	17.5	24.0	1.5	1.1	1.92E-04	1.75E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.46E-04 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 1.00 cm^2
A = 40.93 cm^2
L = 11.33 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP6/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*49-51 ft*	Lab No.	*9798*

Sample Description *Yellow Silty Sand (SM)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*24.7*
Wet Unit Weight, pcf:	*122.2*
Dry Unit Weight, pcf:	*98.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***3.1E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP6/SB2	Reviewed By	JGJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	49-51 ft	Lab No.	9798
Sample Description	Yellow Silty Sand (SM)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-10
Location 1	5.508	Location 1	2.853	Wet Soil+Pan, g	1227.13
Location 2	5.494	Location 2	2.859	Dry Soil + Pan, g	996.45
Location3	5.488	Location 3	2.877	Pan Weight, g	86.10
Average	5.497	Average	2.863	Moisture Content, %	25.3
Volume, in^3	35.39	Wet Soil + Tare, g	1135.03	Dry Unit Weight, pcf	98.6
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	97.0
Soil Sample Wt., g	1135.03	Dry Soil + Tare, g	910.35	Diameter, in.	N/A
Dry UW, pcf	98.0	Moisture Content, %	24.7	Length, in.	N/A
Saturation, %	93.2			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.8
Back Pressure, psi	28.8
Confining Pressure, psi	10.0
Initial Burette Reading	25.0
Finial Burette Reading	21.6
Volume Change, cc	3.4
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
120	0.0	24.2	2.0	22.0	23.9	1.7	1.4	2.67E-04	2.43E-04
240	0.0	24.2	3.9	20.1	23.9	1.7	1.2	2.81E-04	2.56E-04
120	3.9	20.1	5.6	18.5	23.9	1.2	0.9	3.19E-04	2.91E-04
120	5.6	18.5	7.1	17.0	23.9	0.9	0.7	3.71E-04	3.38E-04
135	7.1	17.0	8.6	15.5	23.9	0.7	0.5	4.49E-04	4.10E-04
120	8.6	23.7	10.3	22.1	24.0	1.1	0.8	3.45E-04	3.14E-04
120	10.3	22.1	11.6	20.6	24.0	0.8	0.6	3.79E-04	3.45E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **3.14E-04 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 1.00 cm^2

A = 41.53 cm^2

L = 13.96 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP6/SB2*	Reviewed By	*DEJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*70.5-73 ft*	Lab No.	*9799*

Sample Description ***Yellow Silty Sand (SM)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*22.8*
Wet Unit Weight, pcf:	*118.6*
Dry Unit Weight, pcf:	*96.6*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.1E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP6/SB2	Reviewed By	[illegible]
Sample No.	UD	Review Date	12/11/09
Sample Depth	70.5-73 ft	Lab No.	9799
Sample Description	Yellow Silty Sand (SM)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	C-33
Location 1	4.720	Location 1	2.872	Wet Soil+Pan, g	1075.03
Location 2	4.717	Location 2	2.877	Dry Soil + Pan, g	877.94
Location3	4.724	Location 3	2.872	Pan Weight, g	101.38
Average	4.720	Average	2.874	Moisture Content, %	25.4
Volume, in^3	30.62	Wet Soil + Tare, g	952.96	Dry Unit Weight, pcf	97.7
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	95.2
Soil Sample Wt., g	952.96	Dry Soil + Tare, g	776.00	Diameter, in.	N/A
Dry UW, pcf	96.6	Moisture Content, %	22.8	Length, in.	N/A
Saturation, %	83.1			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.3
Back Pressure, psi	29.3
Confining Pressure, psi	10.0
Initial Burette Reading	24.5
Finial Burette Reading	18.5
Volume Change, cc	6.0
Permeant used	Water

Time (sec)	H_a (cm)	H_i (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
60	27.3	94.8	38.5	84.6	25.0	5.6	3.8	1.46E-04	1.30E-04
60	38.5	84.6	45.4	78.3	25.0	3.8	2.7	1.29E-04	1.15E-04
60	45.4	78.3	50.2	74.0	25.0	2.7	2.0	1.24E-04	1.10E-04
60	50.2	74.0	53.6	71.0	25.0	2.0	1.5	1.20E-04	1.06E-04
66	53.6	71.0	56.2	68.7	25.0	1.5	1.0	1.15E-04	1.02E-04
60	37.5	71.6	42.6	67.1	25.0	2.8	2.0	1.26E-04	1.12E-04
60	42.6	67.1	46.1	64.0	25.0	2.0	1.5	1.20E-04	1.07E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.12E-04 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_i = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.84 cm^2
L = 11.99 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP6/SB2*	Reviewed By	*DEJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*80.5-83 ft*	Lab No.	*9800*
Sample Description	*Tan Clayey Sand (SC)*		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*42.9*
Wet Unit Weight, pcf:	*108.0*
Dry Unit Weight, pcf:	*75.6*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.3E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP6/SB2	Reviewed By	JCJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	80.5-83 ft	Lab No.	9800
Sample Description	Tan Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	N-11
Location 1	5.340	Location 1	2.873	Wet Soil+Pan, g	1032.75
Location 2	5.333	Location 2	2.876	Dry Soil + Pan, g	735.54
Location3	5.336	Location 3	2.873	Pan Weight, g	49.07
Average	5.336	Average	2.874	Moisture Content, %	43.3
Volume, in^3	34.62	Wet Soil + Tare, g	980.99	Dry Unit Weight, pcf	76.2
SG Measured	2.67	Tare Weight, g	0.00	Saturation, %	97.5
Soil Sample Wt., g	980.99	Dry Soil + Tare, g	686.47	Diameter, in.	N/A
Dry UW, pcf	75.6	Moisture Content, %	42.9	Length, in.	N/A
Saturation, %	95.1			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.0
Back Pressure, psi	29.0
Confining Pressure, psi	10.0
Initial Burette Reading	23.0
Finial Burette Reading	18.0
Volume Change, cc	5.0
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
5400	8.5	102.8	10.4	101.2	25.0	7.0	6.7	1.81E-07	1.61E-07
10800	8.5	102.8	11.6	100.1	25.0	7.0	6.5	1.52E-07	1.35E-07
23220	8.5	102.8	14.6	97.7	25.0	7.0	6.1	1.41E-07	1.25E-07
26760	8.5	102.8	15.3	96.9	25.0	7.0	6.0	1.40E-07	1.25E-07
83640	8.5	102.8	26.0	87.3	24.7	7.0	4.5	1.33E-07	1.19E-07
111525	8.5	102.7	30.2	83.5	25.0	6.9	3.9	1.32E-07	1.18E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.31E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.85 cm^2
L = 13.55 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP6/SB2*	Reviewed By	DGJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*109-111 ft*	Lab No.	*9801*
Sample Description	*Dark Grey Elastic Silt (MH)*		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*34.4*
Wet Unit Weight, pcf:	*112.8*
Dry Unit Weight, pcf:	*83.9*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.6E-08***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP6/SB2	Reviewed By	DEZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	109-111 ft	Lab No.	9801
Sample Description	Dark Grey Elastic Silt (MH)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	K-15
Location 1	2.021	Location 1	2.879	Wet Soil+Pan, g	401.85
Location 2	2.087	Location 2	2.872	Dry Soil + Pan, g	299.89
Location3	2.046	Location 3	2.846	Pan Weight, g	8.42
Average	2.051	Average	2.866	Moisture Content, %	35.0
Volume, in^3	13.23	Wet Soil + Tare, g	391.62	Dry Unit Weight, pcf	85.6
SG Measured	2.62	Tare Weight, g	0.00	Saturation, %	100.7
Soil Sample Wt., g	391.62	Dry Soil + Tare, g	291.47	Diameter, in.	
Dry UW, pcf	83.9	Moisture Content, %	34.4	Length, in.	
Saturation, %	95.0			Volume, in^3	

Consolidation	
Chamber Pressure, psi	43.8
Back Pressure, psi	33.8
Confining Pressure, psi	10.0
Initial Burette Reading	17.4
Finial Burette Reading	13.2
Volume Change, cc	4.2
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradieut	Final Hydraulic Gradient	k cm/see	k cm/sec at 20 °C
8874	40.5	88.8	41.6	88.0	25.0	9.3	8.9	4.53E-08	4.03E-08
10241	10.6	93.4	11.9	92.3	25.0	15.9	15.4	2.88E-08	2.56E-08
15167	10.6	93.4	12.6	91.7	25.0	15.9	15.2	3.02E-08	2.68E-08
20240	10.6	93.4	13.2	91.4	25.0	15.9	15.0	2.83E-08	2.52E-08
78120	10.6	93.4	17.8	87.1	25.0	15.9	13.3	2.28E-08	2.03E-08
93711	10.6	93.4	19.3	86.1	25.0	15.9	12.8	2.30E-08	2.04E-08

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.64E-08 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.61 cm^2
L = 5.21 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP9/SB2*	Reviewed By	*DGJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*20-22 ft*	Lab No.	*9802*

Sample Description ***Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*18.2*
Wet Unit Weight, pcf:	*128.0*
Dry Unit Weight, pcf:	*108.3*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***5.7E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP9/SB2	Reviewed By	JGF
Sample No.	UD	Review Date	12/11/09
Sample Depth	20-22 ft	Lab No.	9802
Sample Description	Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-14
Location 1	5.044	Location 1	2.875	Wet Soil+Pan, g	1203.71
Location 2	5.021	Location 2	2.873	Dry Soil + Pan, g	1009.71
Location3	5.033	Location 3	2.873	Pan Weight, g	82.13
Average	5.033	Average	2.874	Moisture Content, %	20.9
Volume, in^3	32.64	Wet Soil + Tare, g	1096.42	Dry Unit Weight, pcf	111.1
SG Measured	2.71	Tare Weight, g	0.00	Saturation, %	108.4
Soil Sample Wt., g	1096.42	Dry Soil + Tare, g	927.58	Diameter, in.	N/A
Dry UW, pcf	108.3	Moisture Content, %	18.2	Length, in.	N/A
Saturation, %	87.8			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.1
Back Pressure, psi	28.1
Confining Pressure, psi	10.0
Initial Burette Reading	17.4
Finial Burette Reading	4.0
Volume Change, cc	13.4
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1260	24.0	91.0	25.2	89.2	25.0	5.2	5.0	8.89E-07	7.90E-07
3600	24.0	91.0	25.7	88.1	25.0	5.2	4.9	4.83E-07	4.29E-07
6180	24.0	91.0	28.6	85.3	25.0	5.2	4.4	6.60E-07	5.87E-07
9300	24.0	91.0	30.7	83.3	25.0	5.2	4.1	6.36E-07	5.65E-07
14820	24.0	91.0	33.8	80.3	25.0	5.2	3.6	6.02E-07	5.36E-07
19494	24.0	91.0	36.2	78.1	25.0	5.2	3.3	5.88E-07	5.23E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **5.72E-07 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.84 cm^2

L = 12.78 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/10/2009*
Boring No.	*ECP9/SB2*	Reviewed By	*GEA*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*26.5-29 ft*	Lab No.	*9803*

Sample Description ***Yellowish Brown Clayeye Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*12.3*
Wet Unit Weight, pcf:	*122.9*
Dry Unit Weight, pcf:	*109.4*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***6.3E-05***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/10/09
Boring No.	ECP9/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	26.5-29 ft	Lab No.	9803
Sample Description	Yellowish Brown Clayeye Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	L18
Location 1	4.409	Location 1	2.856	Wet Soil+Pan, g	1050.34
Location 2	4.420	Location 2	2.854	Dry Soil + Pan, g	901.10
Location3	4.400	Location 3	2.853	Pan Weight, g	90.89
Average	4.410	Average	2.854	Moisture Content, %	18.4
Volume, in^3	28.22	Wet Soil + Tare, g	910.24	Dry Unit Weight, pcf	112.5
SG Measured	2.72	Tare Weight, g	0.00	Saturation, %	98.5
Soil Sample Wt., g	910.24	Dry Soil + Tare, g	810.21	Diameter, in.	N/A
Dry UW, pcf	109.4	Moisture Content, %	12.3	Length, in.	N/A
Saturation, %	60.9			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.3
Back Pressure, psi	34.3
Confining Pressure, psi	10.0
Initial Burette Reading	17.6
Finial Burette Reading	4.8
Volume Change, cc	12.8
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
180	20.8	101.8	39.2	84.2	25.0	7.2	4.0	7.09E-05	6.30E-05
180	39.2	84.2	49.1	74.1	25.0	4.0	2.2	7.09E-05	6.30E-05
180	49.1	74.1	55.0	69.2	25.0	2.2	1.3	6.82E-05	6.07E-05
120	38.5	70.2	43.9	65.1	25.0	2.8	1.9	7.28E-05	6.47E-05
120	43.9	65.1	47.2	61.6	25.0	1.9	1.3	7.00E-05	6.22E-05
60	47.2	61.6	48.6	60.4	25.0	1.3	1.1	7.20E-05	6.41E-05

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **6.29E-05 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.28 cm^2
L = 11.20 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/21/2009*
Boring No.	*ECP9/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*40.5-42 ft*	Lab No.	*9804*

Sample Description ***Reddish Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*14.3*
Wet Unit Weight, pcf:	*119.9*
Dry Unit Weight, pcf:	*104.9*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.3E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	JGF
Sample No.	UD	Review Date	12/11/09
Sample Depth	40.5-42 ft	Lab No.	9804
Sample Description	Reddish Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	X-31
Location 1	5.022	Location 1	2.853	Wet Soil+Pan, g	1110.37
Location 2	4.991	Location 2	2.859	Dry Soil + Pan, g	930.00
Location3	5.003	Location 3	2.854	Pan Weight, g	47.56
Average	5.005	Average	2.855	Moisture Content, %	20.4
Volume, in^3	32.05	Wet Soil + Tare, g	1008.76	Dry Unit Weight, pcf	108.1
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	100.1
Soil Sample Wt., g	1008.76	Dry Soil + Tare, g	882.44	Diameter, in.	N/A
Dry UW, pcf	104.9	Moisture Content, %	14.3	Length, in.	N/A
Saturation, %	64.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.5
Back Pressure, psi	29.5
Confining Pressure, psi	10.0
Initial Burette Reading	25.0
Finial Burette Reading	9.5
Volume Change, cc	15.5
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
637	16.7	92.9	18.6	91.0	23.3	6.0	5.7	1.98E-06	1.83E-06
1514	16.7	92.9	19.6	90.0	23.3	6.0	5.5	1.29E-06	1.19E-06
1800	16.7	92.9	21.0	88.5	23.3	6.0	5.3	1.66E-06	1.53E-06
3360	16.7	92.9	23.0	86.0	23.3	6.0	5.0	1.39E-06	1.29E-06
2200	15.2	91.0	19.2	87.6	24.0	6.0	5.4	1.15E-06	1.05E-06
5050	15.2	91.0	23.8	84.1	24.0	6.0	4.7	1.12E-06	1.01E-06
11245	15.2	91.0	30.4	75.5	24.0	6.0	3.5	1.14E-06	1.03E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.28E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial ontlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.31 cm^2
L = 12.71 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/21/2009*
Boring No.	*ECP9/SB2*	Reviewed By	*GEJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*51.4-53.5 ft*	Lab No.	*9805*

Sample Description ***Brown Poorly Graded Sand with Silt***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*17.6*
Wet Unit Weight, pcf:	*119.2*
Dry Unit Weight, pcf:	*101.4*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***3.5E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	51.4-53.5 ft	Lab No.	9805
Sample Description	Brown Poorly Graded Sand with Silt		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-17
Location 1	4.992	Location 1	2.883	Wet Soil+Pan, g	1146.73
Location 2	4.985	Location 2	2.881	Dry Soil + Pan, g	956.10
Location3	4.987	Location 3	2.882	Pan Weight, g	90.30
Average	4.988	Average	2.882	Moisture Content, %	22.0
Volume, in^3	32.54	Wet Soil + Tare, g	1018.20	Dry Unit Weight, pcf	102.4
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	93.1
Soil Sample Wt., g	1018.2	Dry Soil + Tare, g	865.80	Diameter, in.	N/A
Dry UW, pcf	101.4	Moisture Content, %	17.6	Length, in.	N/A
Saturation, %	72.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.2
Back Pressure, psi	34.2
Confining Pressure, psi	10.0
Initial Burette Reading	23.0
Finial Burette Reading	17.9
Volume Change, cc	5.1
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
20	38.5	99.0	47.2	90.6	24.0	4.8	3.4	4.00E-04	3.64E-04
20	47.2	90.6	53.4	84.6	24.0	3.4	2.5	3.97E-04	3.62E-04
20	53.4	84.6	57.8	80.3	24.0	2.5	1.8	3.94E-04	3.58E-04
20	57.8	80.3	61.0	77.4	24.0	1.8	1.3	3.81E-04	3.46E-04
20	43.9	77.4	48.7	72.9	24.0	2.6	1.9	3.92E-04	3.56E-04
20	48.7	72.9	52.1	69.7	24.0	1.9	1.4	3.83E-04	3.49E-04
20	52.1	69.7	54.5	67.4	24.0	1.4	1.0	3.74E-04	3.40E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **3.54E-04 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 42.09 cm^2
L = 12.67 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/21/2009*
Boring No.	*ECP9/SB2*	Reviewed By	*JEJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*61.5-64 ft*	Lab No.	*9806*

Sample Description ***Tan Poorly Graded Sand with Clay (SP-SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*20.8*
Wet Unit Weight, pcf:	*125.0*
Dry Unit Weight, pcf:	*103.5*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***3.8E-04***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	JET
Sample No.	UD	Review Date	12/11/09
Sample Depth	61.5-64 ft	Lab No.	9806
Sample Description	Tan Poorly Graded Sand with Clay (SP-SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AO-1
Location 1	4.466	Location 1	2.870	Wet Soil+Pan, g	1064.77
Location 2	4.454	Location 2	2.872	Dry Soil + Pan, g	898.18
Location3	4.447	Location 3	2.878	Pan Weight, g	113.41
Average	4.456	Average	2.873	Moisture Content, %	21.2
Volume, in^3	28.89	Wet Soil + Tare, g	948.14	Dry Unit Weight, pcf	104.3
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	94.2
Soil Sample Wt., g	948.14	Dry Soil + Tare, g	784.77	Diameter, in.	N/A
Dry UW, pcf	103.5	Moisture Content, %	20.8	Length, in.	N/A
Saturation, %	90.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.3
Back Pressure, psi	34.3
Confining Pressure, psi	10.0
Initial Burette Reading	24.0
Finial Burette Reading	20.5
Volume Change, cc	3.5
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
30	9.5	102.1	30.4	81.7	24.0	8.2	4.5	4.26E-04	3.88E-04
20	30.4	81.7	38.8	73.6	24.0	4.5	3.1	4.20E-04	3.82E-04
20	38.8	73.6	44.5	68.4	24.0	3.1	2.1	4.07E-04	3.70E-04
20	38.2	70.2	43.3	65.3	24.0	2.8	1.9	4.05E-04	3.69E-04
20	43.3	65.3	46.7	62.1	24.0	1.9	1.4	3.86E-04	3.51E-04
20	41.9	81.0	48.3	74.8	24.0	3.5	2.3	4.21E-04	3.83E-04
20	48.3	74.8	52.7	70.6	24.0	2.3	1.6	4.25E-04	3.86E-04

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **3.76E-04 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.83 cm^2
L = 11.32 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/21/2009*
Boring No.	*ECP9/SB2*	Reviewed By	JEF
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*70.5-73 ft*	Lab No.	*9807*

Sample Description *Tan Sandy Elastic Silt (MH)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*31.0*
Wet Unit Weight, pcf:	*116.6*
Dry Unit Weight, pcf:	*89.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***4.9E-08***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	JEZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	70.5-73 ft	Lab No.	9807
Sample Description	Tan Sandy Elastic Silt (MH)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-22
Location 1	4.130	Location 1	2.874	Wet Soil+Pan, g	921.77
Location 2	4.096	Location 2	2.874	Dry Soil + Pan, g	708.59
Location3	4.099	Location 3	2.878	Pan Weight, g	85.18
Average	4.108	Average	2.875	Moisture Content, %	34.2
Volume, in^3	26.68	Wet Soil + Tare, g	816.48	Dry Unit Weight, pcf	91.3
SG Measured	2.7	Tare Weight, g	0.00	Saturation, %	109.3
Soil Sample Wt., g	816.48	Dry Soil + Tare, g	623.41	Diameter, in.	N/A
Dry UW, pcf	89.0	Moisture Content, %	31.0	Length, in.	N/A
Saturation, %	93.7			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	49.2
Back Pressure, psi	39.2
Confining Pressnre, psi	10.0
Initial Bnrette Reading	17.1
Finial Burette Reading	6.1
Volume Change, cc	11.0
Permeant used	Water

Time (sec)	H_a (cm)	H_t (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradieut	k cm/sec	k cm/sec at 20 °C
2980	27.0	102.9	27.4	102.5	23.3	7.3	7.2	7.09E-08	6.55E-08
4210	14.3	102.9	15.1	102.3	23.3	8.5	8.4	7.54E-08	6.97E-08
62200	14.3	102.9	20.7	97.6	24.0	8.5	7.4	4.54E-08	4.13E-08
73601	14.3	102.9	21.7	96.9	24.0	8.5	7.2	4.44E-08	4.04E-08
88415	14.3	102.9	22.9	95.9	24.0	8.5	7.0	4.37E-08	3.97E-08
93600	14.3	102.9	23.2	95.6	24.0	8.5	6.9	4.30E-08	3.91E-08

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **4.93E-08 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_t = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.89 cm^2

L = 10.44 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*9/21/2009*
Boring No.	*ECP9/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*80.5-83 ft*	Lab No.	*9808*

Sample Description *Tan Silty Sand (SM)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*35.3*
Wet Unit Weight, pcf:	*109.5*
Dry Unit Weight, pcf:	*81.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***8.9E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	JGS
Sample No.	UD	Review Date	12/11/09
Sample Depth	80.5-83 ft	Lab No.	9808
Sample Description	Tan Silty Sand (SM)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	L-22
Location 1	5.061	Location 1	2.883	Wet Soil+Pan, g	1061.99
Location 2	5.055	Location 2	2.881	Dry Soil + Pan, g	792.85
Location3	5.054	Location 3	2.883	Pan Weight, g	91.57
Average	5.057	Average	2.882	Moisture Content, %	38.4
Volume, in^3	32.99	Wet Soil + Tare, g	948.59	Dry Unit Weight, pcf	82.4
SG Measured	2.65	Tare Weight, g	0.00	Saturation, %	100.9
Soil Sample Wt., g	948.59	Dry Soil + Tare, g	701.28	Diameter, in.	N/A
Dry UW, pcf	81.0	Moisture Content, %	35.3	Length, in.	N/A
Saturation, %	89.7			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.6
Back Pressure, psi	34.6
Confining Pressure, psi	10.0
Initial Burette Reading	17.3
Finial Burette Reading	8.2
Volume Change, cc	9.1
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1700	21.2	102.7	23.9	99.6	23.3	6.3	5.9	1.06E-06	9.80E-07
3180	21.2	102.7	26.0	97.6	23.3	6.3	5.6	9.94E-07	9.19E-07
6312	21.2	102.7	30.2	93.5	23.3	6.3	4.9	9.77E-07	9.04E-07
8160	21.2	102.7	32.3	91.4	23.3	6.3	4.6	9.61E-07	8.89E-07
2185	7.7	101.5	11.7	97.6	24.0	7.3	6.7	9.83E-07	8.94E-07
5040	7.7	101.5	15.9	93.7	24.0	7.3	6.1	9.06E-07	8.24E-07
11235	7.7	101.5	23.7	86.0	24.0	7.3	4.9	8.89E-07	8.09E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **8.88E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 42.10 cm^2
L = 12.84 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	***ECP Geologic Charaterization***	Test Date	*9/21/2009*
Boring No.	***ECP9/SB2***	Reviewed By	JEJ
Sample No.	***UD***	Review Date	12/11/09
Sample Depth	***115.5-118 ft***	Lab No.	*9809*

Sample Description ***Tan Silty Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*29.2*
Wet Unit Weight, pcf:	*118.2*
Dry Unit Weight, pcf:	*91.5*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.3E-05***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	09/21/09
Boring No.	ECP9/SB2	Reviewed By	DEJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	115.5-118 ft	Lab No.	9809
Sample Description	Tan Silty Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-1
Location 1	5.068	Location 1	2.857	Wet Soil+Pan, g	1106.94
Location 2	5.054	Location 2	2.853	Dry Soil + Pan, g	864.84
Location3	5.059	Location 3	2.867	Pan Weight, g	84.82
Average	5.060	Average	2.859	Moisture Content, %	31.0
Volume, in^3	32.49	Wet Soil + Tare, g	1007.93	Dry Unit Weight, pcf	92.7
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	103.0
Soil Sample Wt., g	1007.93	Dry Soil + Tare, g	780.00	Diameter, in.	N/A
Dry UW, pcf	91.5	Moisture Content, %	29.2	Length, in.	N/A
Saturation, %	94.2			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.2
Back Pressure, psi	34.2
Confining Pressure, psi	10.0
Initial Burette Reading	17.0
Finial Burette Reading	9.9
Volume Change, cc	7.1
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1598	21.2	93.3	41.2	73.6	23.3	5.6	2.5	1.24E-05	1.15E-05
120	15.3	92.9	18.0	90.5	23.3	6.0	5.6	1.41E-05	1.30E-05
240	15.3	92.9	20.3	88.0	23.3	6.0	5.3	1.41E-05	1.31E-05
360	15.3	92.9	22.6	85.6	23.3	6.0	4.9	1.44E-05	1.33E-05
480	15.3	92.9	24.7	83.9	23.3	6.0	4.6	1.40E-05	1.29E-05
790	24.7	83.9	33.9	74.2	23.3	4.6	3.1	1.21E-05	1.12E-05
150	33.9	74.2	35.6	72.6	23.3	3.1	2.9	1.41E-05	1.31E-05

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.26E-05 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.42 cm^2
L = 12.85 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP9/SB2*	Reviewed By	*GEA*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*140.5-143 ft*	Lab No.	*9810*

Sample Description ***Yellowish Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*36.5*
Wet Unit Weight, pcf:	*120.4*
Dry Unit Weight, pcf:	*88.2*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***5.1E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP9/SB2	Reviewed By	JGF
Sample No.	UD	Review Date	12/11/09
Sample Depth	140.5-143 ft	Lab No.	9810
Sample Description	Yellowish Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	T-10
Location 1	2.522	Location 1	2.847	Wet Soil+Pan, g	533.61
Location 2	2.503	Location 2	2.771	Dry Soil + Pan, g	414.78
Location3	2.479	Location 3	2.860	Pan Weight, g	51.71
Average	2.501	Average	2.826	Moisture Content, %	32.7
Volume, in^3	15.69	Wet Soil + Tare, g	495.60	Dry Unit Weight, pcf	91.0
SG Measured	2.64	Tare Weight, g	0.00	Saturation, %	106.5
Soil Sample Wt., g	495.6	Dry Soil + Tare, g	363.07	Diameter, in.	N/A
Dry UW, pcf	88.2	Moisture Content, %	36.5	Length, in.	N/A
Saturation, %	111.0			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	39.2
Back Pressure, psi	29.2
Confining Pressure, psi	10.0
Initial Burette Reading	24.0
Finial Burette Reading	16.1
Volume Change, cc	7.9
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1800	15.3	93.9	18.3	90.4	23.3	12.4	11.3	6.02E-07	5.57E-07
4200	15.3	93.9	22.1	86.5	23.3	12.4	10.1	5.96E-07	5.51E-07
7320	15.3	93.9	25.8	82.6	23.3	12.4	8.9	5.57E-07	5.15E-07
9000	15.3	93.9	27.7	80.8	23.3	12.4	8.4	5.47E-07	5.06E-07
4560	16.0	92.6	22.2	86.1	23.1	12.1	10.1	4.99E-07	4.64E-07
7800	16.0	92.6	26.1	82.5	23.1	12.1	8.9	4.93E-07	4.58E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **5.09E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 40.47 cm^2
L = 6.35 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	DEZ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*17.5-20 ft*	Lab No.	*9811*

Sample Description *Reddish Brown Clayey Sand (SC)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*16.1*
Wet Unit Weight, pcf:	*131.1*
Dry Unit Weight, pcf:	*113.0*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***4.5E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	DCJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	17.5-20 ft	Lab No.	9811
Sample Description	Reddish Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-3
Location 1	4.039	Location 1	2.882	Wet Soil+Pan, g	1002.83
Location 2	4.094	Location 2	2.881	Dry Soil + Pan, g	873.15
Location3	4.087	Location 3	2.883	Pan Weight, g	85.28
Average	4.073	Average	2.882	Moisture Content, %	16.5
Volume, in^3	26.57	Wet Soil + Tare, g	914.51	Dry Unit Weight, pcf	114.6
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	96.1
Soil Sample Wt., g	914.51	Dry Soil + Tare, g	787.87	Diameter, in.	N/A
Dry UW, pcf	113.0	Moisture Content, %	16.1	Length, in.	N/A
Saturation, %	89.7			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.2
Back Pressure, psi	34.2
Confining Pressure, psi	10.0
Initial Burette Reading	23.0
Finial Burette Reading	16.7
Volume Change, cc	6.3
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
4560	11.5	101.5	16.6	96.5	23.1	8.7	7.7	5.13E-07	4.77E-07
7920	11.5	101.5	19.8	93.4	23.1	8.7	7.1	5.00E-07	4.64E-07
10500	11.5	101.5	22.2	91.4	23.1	8.7	6.7	4.92E-07	4.57E-07
13200	11.5	101.5	24.3	89.3	23.1	8.7	6.3	4.85E-07	4.50E-07
17820	11.5	101.5	27.8	86.1	23.1	8.7	5.6	4.79E-07	4.45E-07
3279	12.9	102.5	16.3	99.1	23.2	8.7	8.0	4.73E-07	4.39E-07
5550	12.9	102.5	18.6	97.1	23.2	8.7	7.6	4.69E-07	4.34E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **4.52E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 42.09 cm^2
L = 10.35 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*21-23 ft*	Lab No.	*9812*
Sample Description	*Red Clayey Sand (SC)*		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*13.5*
Wet Unit Weight, pcf:	*133.6*
Dry Unit Weight, pcf:	*117.8*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.8E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JCT
Sample No.	UD	Review Date	12/11/09
Sample Depth	21-23 ft	Lab No.	9812
Sample Description	Red Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	S-6
Location 1	4.710	Location 1	2.851	Wet Soil+Pan, g	1117.60
Location 2	4.694	Location 2	2.860	Dry Soil + Pan, g	978.45
Location3	4.724	Location 3	2.863	Pan Weight, g	44.80
Average	4.709	Average	2.858	Moisture Content, %	14.9
Volume, in^3	30.21	Wet Soil + Tare, g	1059.27	Dry Unit Weight, pcf	119.1
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	99.0
Soil Sample Wt., g	1059.27	Dry Soil + Tare, g	933.65	Diameter, in.	N/A
Dry UW, pcf	117.8	Moisture Content, %	13.5	Length, in.	N/A
Saturation, %	85.8			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	49.1
Back Pressure, psi	39.1
Confining Pressure, psi	10.0
Initial Burette Reading	23.5
Finial Burette Reading	17.7
Volume Change, cc	5.8
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
2321	5.0	103.4	18.6	89.8	23.3	8.2	6.0	3.22E-06	2.98E-06
3810	5.0	103.4	25.8	82.7	23.3	8.2	4.8	3.32E-06	3.07E-06
4560	4.7	101.3	25.7	80.2	23.1	8.1	4.6	2.90E-06	2.70E-06
1080	6.5	102.7	12.6	96.6	23.1	8.0	7.0	2.90E-06	2.70E-06
2840	6.5	102.7	20.8	88.5	23.1	8.0	5.7	2.86E-06	2.66E-06
2700	7.7	95.0	20.2	82.9	23.1	7.3	5.2	2.83E-06	2.63E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.79E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.39 cm^2
L = 11.96 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	JCT
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*23.5-26 ft*	Lab No.	*9813*

Sample Description ***Reddish Brown Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*13.8*
Wet Unit Weight, pcf:	*135.1*
Dry Unit Weight, pcf:	*118.7*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***9.1E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JEJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	23.5-26 ft	Lab No.	9813
Sample Description	Reddish Brown Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	L20
Location 1	4.101	Location 1	2.864	Wet Soil+Pan, g	1033.96
Location 2	4.097	Location 2	2.869	Dry Soil + Pan, g	914.52
Location3	4.088	Location 3	2.867	Pan Weight, g	90.95
Average	4.095	Average	2.867	Moisture Content, %	14.5
Volume, in^3	26.43	Wet Soil + Tare, g	937.01	Dry Unit Weight, pcf	120.2
SG Measured	2.68	Tare Weight, g	0.00	Saturation, %	99.4
Soil Sample Wt., g	937.01	Dry Soil + Tare, g	823.57	Diameter, in.	N/A
Dry UW, pcf	118.7	Moisture Content, %	13.8	Length, in.	N/A
Saturation, %	90.3			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	44.2
Back Pressure, psi	34.2
Confining Pressure, psi	10.0
Initial Burette Reading	17.0
Finial Burette Reading	11.6
Volume Change, cc	5.4
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
2183	13.6	102.6	19.6	97.2	23.4	8.6	7.5	1.25E-06	1.16E-06
8400	13.6	102.6	30.7	87.5	23.4	8.6	5.5	1.07E-06	9.86E-07
13680	13.6	102.6	37.2	81.9	23.5	8.6	4.3	1.01E-06	9.26E-07
3120	14.7	94.0	20.4	89.0	23.5	7.6	6.6	9.28E-07	8.55E-07
7680	14.7	94.0	27.0	83.1	23.5	7.6	5.4	9.01E-07	8.29E-07
12480	14.7	94.0	32.5	78.4	23.5	7.6	4.4	8.76E-07	8.06E-07
1980	27.2	92.5	29.6	89.4	23.4	6.3	5.7	8.88E-07	8.19E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **9.11E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.64 cm^2
L = 10.40 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	JGJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*47.5-50 ft*	Lab No.	*9814*

Sample Description ***Yellow Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*31.9*
Wet Unit Weight, pcf:	*109.3*
Dry Unit Weight, pcf:	*82.8*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.5E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JGZ
Sample No.	UD	Review Date	12/11/09
Sample Depth	47.5-50 ft	Lab No.	9814
Sample Description	Yellow Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	L-34
Location 1	5.016	Location 1	2.859	Wet Soil+Pan, g	1051.05
Location 2	5.029	Location 2	2.864	Dry Soil + Pan, g	792.61
Location3	4.972	Location 3	2.860	Pan Weight, g	92.97
Average	5.006	Average	2.861	Moisture Content, %	36.9
Volume, in^3	32.18	Wet Soil + Tare, g	922.76	Dry Unit Weight, pcf	84.2
SG Measured	2.69	Tare Weight, g	0.00	Saturation, %	99.9
Soil Sample Wt., g	922.76	Dry Soil + Tare, g	699.64	Diameter, in.	N/A
Dry UW, pcf	82.8	Moisture Content, %	31.9	Length, in.	N/A
Saturation, %	83.6			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	49.2
Back Pressure, psi	39.2
Confining Pressure, psi	10.0
Initial Burette Reading	17.0
Finial Burette Reading	8.6
Volume Change, cc	8.4
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
8260	14.6	103.7	19.1	99.3	23.4	7.0	6.3	3.12E-07	2.88E-07
13500	14.6	103.7	21.3	97.1	23.5	7.0	6.0	2.94E-07	2.70E-07
16980	14.6	103.7	22.6	95.8	23.5	7.0	5.8	2.84E-07	2.61E-07
21540	14.6	103.7	24.3	94.3	23.5	7.0	5.5	2.75E-07	2.53E-07
26340	14.6	103.7	25.9	92.9	23.5	7.0	5.3	2.65E-07	2.44E-07
5520	9.4	103.7	11.4	101.6	23.4	7.4	7.1	1.97E-07	1.82E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.50E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.48 cm^2
L = 12.71 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	*JCS*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*51.4-54 ft*	Lab No.	*9815*

Sample Description ***Yellow Clayey Sand (SC)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*32.4*
Wet Unit Weight, pcf:	*111.6*
Dry Unit Weight, pcf:	*84.3*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***3.0E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	QEJ
Sample No.	UD	Review Date	12/11/09
Sample Depth	51.4-54 ft	Lab No.	9815
Sample Description	Yellow Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	AB-30
Location 1	4.997	Location 1	2.861	Wet Soil+Pan, g	1047.51
Location 2	5.004	Location 2	2.861	Dry Soil + Pan, g	797.40
Location3	5.000	Location 3	2.877	Pan Weight, g	83.70
Average	5.000	Average	2.866	Moisture Content, %	35.0
Volume, in^3	32.27	Wet Soil + Tare, g	944.80	Dry Unit Weight, pcf	86.4
SG Measured	2.63	Tare Weight, g	0.00	Saturation, %	102.4
Soil Sample Wt., g	944.8	Dry Soil + Tare, g	713.70	Diameter, in.	N/A
Dry UW, pcf	84.3	Moisture Content, %	32.4	Length, in.	N/A
Saturation, %	89.9			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	38.6
Back Pressure, psi	28.6
Confining Pressure, psi	10.0
Initial Burette Reading	17.3
Finial Burette Reading	4.4
Volume Change, cc	12.9
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
1920	15.3	93.6	16.3	92.3	23.4	6.2	6.0	3.79E-07	3.50E-07
8220	15.3	93.6	19.3	89.3	23.4	6.2	5.5	3.33E-07	3.07E-07
13380	15.3	93.6	21.6	87.2	23.5	6.2	5.2	3.23E-07	2.97E-07
16860	15.3	93.6	23.0	85.9	23.5	6.2	5.0	3.17E-07	2.92E-07
21440	15.3	93.6	24.6	84.2	23.5	6.2	4.7	3.11E-07	2.86E-07
26011	15.3	93.6	27.1	82.7	23.5	6.2	4.4	3.21E-07	2.96E-07
5519	14.5	93.0	17.5	90.5	23.4	6.2	5.7	3.21E-07	2.96E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **3.03E-07 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.63 cm^2
L = 12.70 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*73.5-76 ft*	Lab No.	*9816*

Sample Description ***Yellowish Tan Poorly Graded Sand with Silt (SP-SM)***

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*24.1*
Wet Unit Weight, pcf:	*119.7*
Dry Unit Weight, pcf:	*96.4*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.5E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	73.5-76 ft	Lab No.	9816
Sample Description	Yellowish Tan Poorly Graded Sand with Silt (SP-SM)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	X-19
Location 1	4.967	Location 1	2.867	Wet Soil+Pan, g	1070.96
Location 2	4.972	Location 2	2.862	Dry Soil + Pan, g	859.85
Location3	4.978	Location 3	2.870	Pan Weight, g	47.72
Average	4.972	Average	2.866	Moisture Content, %	26.0
Volume, in^3	32.09	Wet Soil + Tare, g	1007.99	Dry Unit Weight, pcf	98.0
SG Measured	2.66	Tare Weight, g	0.00	Saturation, %	99.7
Soil Sample Wt., g	1007.99	Dry Soil + Tare, g	812.13	Diameter, in.	N/A
Dry UW, pcf	96.4	Moisture Content, %	24.1	Length, in.	N/A
Saturation, %	89.0			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	43.2
Back Pressure, psi	33.2
Confining Pressure, psi	10.0
Initial Burette Reading	23.5
Finial Burette Reading	15.0
Volume Change, cc	8.5
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
840	6.3	103.9	9.4	100.6	23.3	7.7	7.2	1.96E-06	1.81E-06
2175	6.3	103.9	13.5	96.7	23.3	7.7	6.6	1.78E-06	1.65E-06
8670	6.3	103.9	27.7	82.7	23.3	7.7	4.4	1.61E-06	1.48E-06
1830	7.8	103.3	13.1	97.8	23.3	7.6	6.7	1.59E-06	1.47E-06
5250	7.8	103.3	20.8	90.4	23.3	7.6	5.5	1.46E-06	1.35E-06
2085	5.0	89.5	9.6	85.0	23.3	6.7	6.0	1.33E-06	1.23E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **1.50E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.63 cm^2
L = 12.63 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	*JGJ*
Sample No.	*UD*	Review Date	*12/11/09*
Sample Depth	*86.5-89 ft*	Lab No.	*9817*

Sample Description *Tan Clayey Sand (SC)*

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*26.8*
Wet Unit Weight, pcf:	*120.4*
Dry Unit Weight, pcf:	*94.9*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.8E-06***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JGF
Sample No.	UD	Review Date	12/11/09
Sample Depth	86.5-89 ft	Lab No.	9817
Sample Description	Tan Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	N-18
Location 1	4.960	Location 1	2.867	Wet Soil+Pan, g	1066.09
Location 2	4.918	Location 2	2.868	Dry Soil + Pan, g	844.56
Location3	4.945	Location 3	2.871	Pan Weight, g	48.90
Average	4.941	Average	2.869	Moisture Content, %	27.8
Volume, in^3	31.93	Wet Soil + Tare, g	1009.20	Dry Unit Weight, pcf	96.3
SG Measured	2.64	Tare Weight, g	0.00	Saturation, %	103.5
Soil Sample Wt., g	1009.2	Dry Soil + Tare, g	795.66	Diameter, in.	N/A
Dry UW, pcf	94.9	Moisture Content, %	26.8	Length, in.	N/A
Saturation, %	96.4			Volume, in^3	N/A

Consolidation	
Chamber Pressure, psi	34.1
Back Pressure, psi	24.1
Confining Pressure, psi	10.0
Initial Burette Reading	25.0
Finial Burette Reading	17.4
Volume Change, cc	7.6
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
870	22.4	93.1	26.0	90.1	23.5	5.6	5.1	2.71E-06	2.50E-06
3379	22.4	93.1	33.5	82.6	23.5	5.6	3.9	2.60E-06	2.39E-06
840	15.1	93.5	19.1	89.0	23.3	6.2	5.6	3.29E-06	3.04E-06
2160	15.1	93.5	24.6	83.6	23.3	6.2	4.7	3.17E-06	2.93E-06
4291	15.4	93.4	31.0	77.0	23.3	6.2	3.7	2.96E-06	2.74E-06
1800	15.0	94.5	23.4	86.5	23.3	6.3	5.0	3.09E-06	2.86E-06
1680	15.0	80.5	21.3	74.3	23.3	5.2	4.2	3.03E-06	2.81E-06

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
7	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.75E-06 cm/sec**

a = area of burette in cm^2
L = length of sample in cm
A = area of sample in cm^2

Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds

H_b = final inlet head in cm
H_2 = final outlet head in cm

a = 0.16 cm^2
A = 41.70 cm^2
L = 12.55 cm

Remarks:

MACTEC

HYDRAULIC CONDUCTIVITY

Project No.	*6155-08-0031.08*	Tested By	*JW*
Project Name	*ECP Geologic Charaterization*	Test Date	*10/5/2009*
Boring No.	*ECP7/SB2*	Reviewed By	JEJ
Sample No.	*UD*	Review Date	12/11/09
Sample Depth	*123.5-126 ft*	Lab No.	*9818*
Sample Description	*Dark Grey Clayey Sand (SC)*		

ASTM D5084-03 - (Method C Falling Head RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*27.1*
Wet Unit Weight, pcf:	*120.9*
Dry Unit Weight, pcf:	*95.1*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.4E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 03) (Method C, Increasing Tailwater Level)

MACTEC

Project Number	6155-08-0031.08	Tested By	JW
Project Name	ECP Geologic Charaterization	Test Date	10/05/09
Boring No.	ECP7/SB2	Reviewed By	JGT
Sample No.	UD	Review Date	12/11/09
Sample Depth	123.5-126 ft	Lab No.	9818
Sample Description	Dark Grey Clayey Sand (SC)		

Initial Sample Data				Final Sample Data	
Length, in		Diameter, in		Pan No.	BC-2
Location 1	4.134	Location 1	2.848	Wet Soil+Pan, g	912.78
Location 2	4.106	Location 2	2.863	Dry Soil + Pan, g	742.36
Location3	4.136	Location 3	2.861	Pan Weight, g	82.17
Average	4.125	Average	2.857	Moisture Content, %	25.8
Volume, in^3	26.45	Wet Soil + Tare, g	839.01	Dry Unit Weight, pcf	97.6
SG Measured	2.66	Tare Weight, g	0.00	Saturation, %	98.1
Soil Sample Wt., g	839.01	Dry Soil + Tare, g	660.19	Diameter, in.	
Dry UW, pcf	95.1	Moisture Content, %	27.1	Length, in.	
Saturation, %	96.6			Volume, in^3	

Consolidation	
Chamber Pressure, psi	39.3
Back Pressure, psi	29.3
Confining Pressure, psi	10.0
Initial Burette Reading	24.0
Finial Burette Reading	12.7
Volume Change, cc	11.3
Permeant used	Water

Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	Temp (°C)	Initial Hydraulic Gradient	Final Hydraulic Gradient	k cm/sec	k cm/sec at 20 °C
846	13.1	102.3	13.8	101.9	23.3	8.5	8.4	2.97E-07	2.75E-07
2160	13.1	102.3	14.5	101.2	23.5	8.5	8.3	2.67E-07	2.45E-07
4290	13.2	100.7	15.5	98.2	23.3	8.4	7.9	2.66E-07	2.46E-07
6750	13.2	100.7	16.6	97.2	23.3	8.4	7.7	2.47E-07	2.28E-07
10200	13.2	100.7	18.1	95.7	23.3	8.4	7.4	2.39E-07	2.21E-07
12705	13.2	100.7	19.2	94.7	23.3	8.4	7.2	2.35E-07	2.18E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
6	UD	N/A	N/A	Vertical

Avg. k at 20 °C **2.39E-07 cm/sec**

a = area of burette in cm^2 Ha = initial inlet head in cm H_b = final inlet head in cm

L = length of sample in cm H_1 = initial outlet head in cm H_2 = final outlet head in cm

A = area of sample in cm^2 t = time in seconds

a = 0.16 cm^2

A = 41.37 cm^2

L = 10.48 cm

Remarks:

ATTACHMENT 2

Equipment List
SRNS Delivery Order No. 8
Subcontract No. AC54317N

Equipment Name	Laboratory ID
Oven	144
Sieve Shaker	529
Liquid Limit Device	101
Sieve 0.375"	445
Sieve #4	1150
Sieve #10	568
Sieve #20	1141
Sieve #40	1187
Sieve #60	1181
Sieve #100	2743
Sieve #140	1917
Sieve #200	2558
Hydrometer	2151
Thermometer	2870
Balance	416
Caliper	2424
Pressure Transducer	2773/2774

Attachment H: Sieve Analysis (SRNL ERTS)

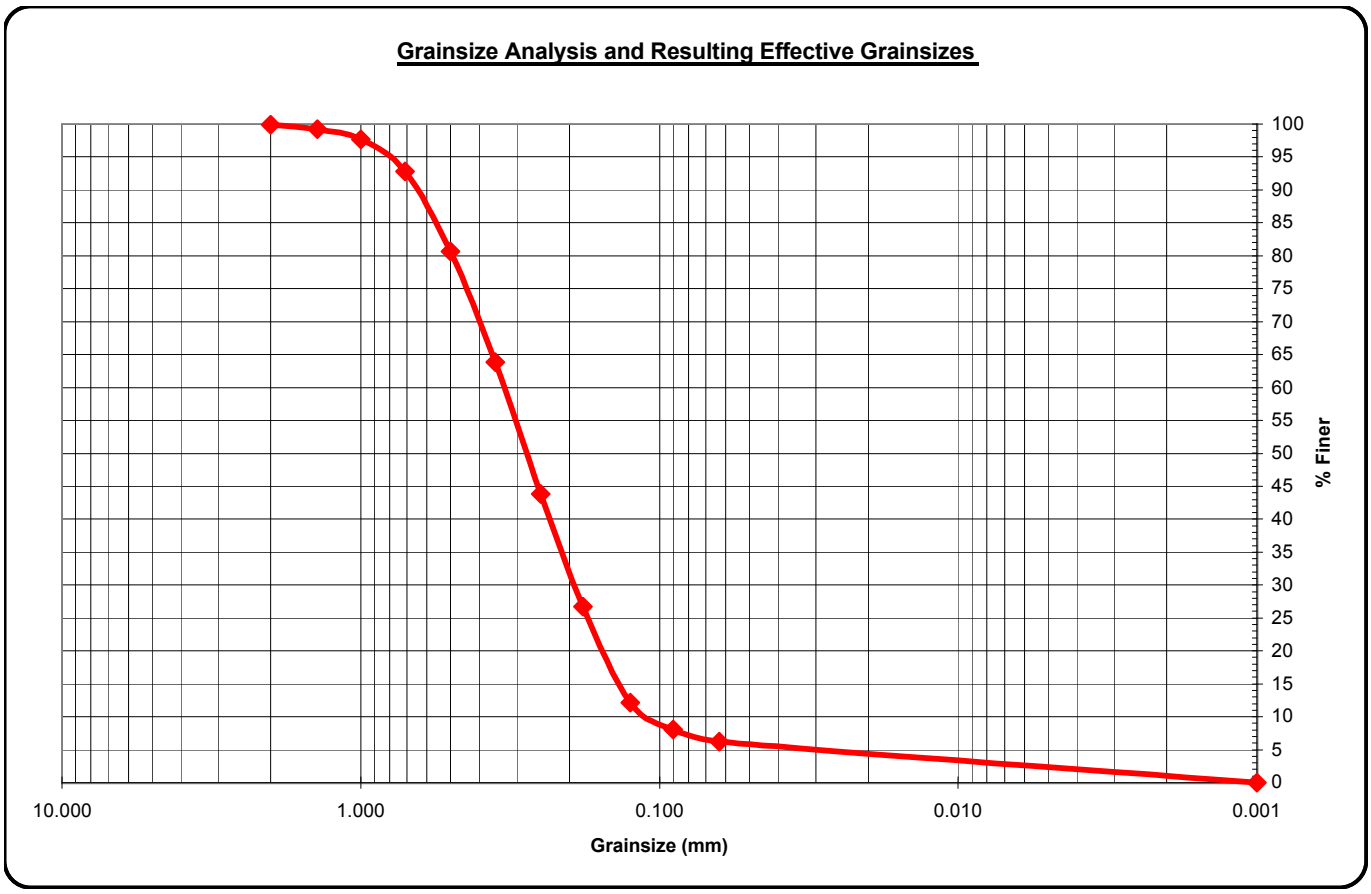
Sample ID:	ECP8-SB1
Sample Depth:	2-3 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.50 g
Total Sieve Weight:	97.40 g
Weight Loss:	1.1 g
Percent Loss:	1.12 %

10.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	19.30%
	14	1.4	0.70	0.72	99.18		
	18	1.0	1.50	1.54	97.64		
	25	0.71	4.70	4.83	92.81		
	35	0.50	11.80	12.11	80.70		
Medium Material	45	0.355	16.40	16.84	63.86	Medium % (0.25 - 0.5 mm)	36.86%
	60	0.250	19.50	20.02	43.84		
Fine Material	80	0.180	16.70	17.15	26.69	Fine % (0.125 - 0.25 mm)	31.72%
	120	0.125	14.20	14.58	12.11		
Silt Material	170	0.090	3.90	4.00	8.11	Silt % (0.125 - 0.063 mm)	5.85%
	230	0.063	1.80	1.85	6.26		
Pan Material	pan	0.001	6.10	6.26	0.00	Pan % (< 0.063 mm)	6.26%
						Total	**100.00%**

Total (g)	97.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



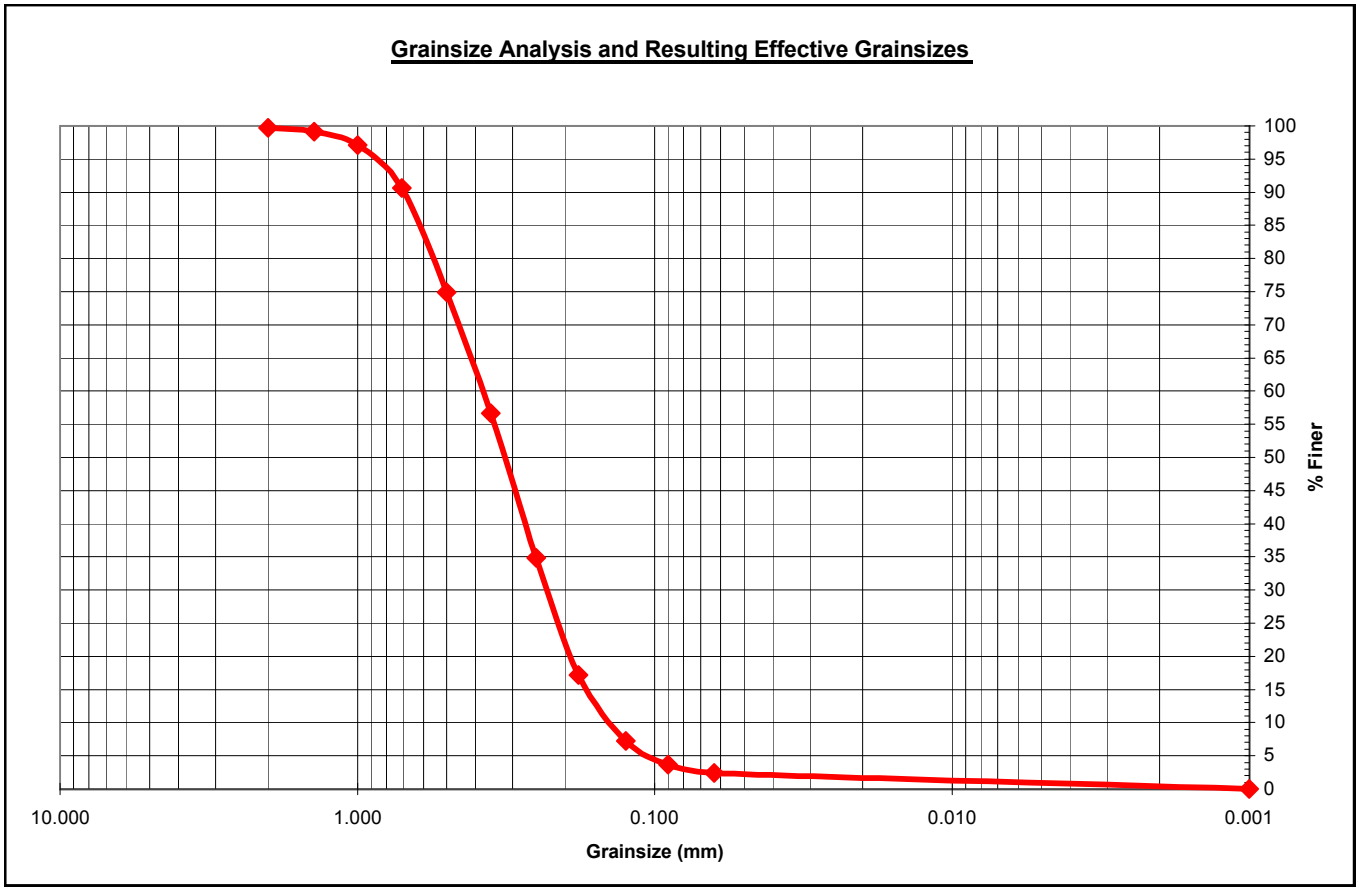
Sample ID:	ECP8-SB1	
Sample Depth:	3-4	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	105.60	g
Total Sieve Weight:	105.70	g
Weight Loss:	-0.1	g
Percent Loss:	-0.09	%

4.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.28	99.72	Coarse % (> 0.5 mm)	25.07%
	14	1.4	0.60	0.57	99.15		
	18	1.0	2.20	2.08	97.07		
	25	0.71	6.80	6.43	90.63		
	35	0.50	16.60	15.70	74.93		
Medium Material	45	0.355	19.30	18.26	56.67	Medium % (0.25 - 0.5 mm)	40.11%
	60	0.250	23.10	21.85	34.82		
Fine Material	80	0.180	18.60	17.60	17.22	Fine % (0.125 - 0.25 mm)	27.53%
	120	0.125	10.50	9.93	7.28		
Silt Material	170	0.090	3.80	3.60	3.69	Silt % (0.125 - 0.063 mm)	4.92%
	230	0.063	1.40	1.32	2.37		
Pan Material	pan	0.001	2.50	2.37	0.00	Pan % (< 0.063 mm)	2.37%
						Total	**100.00%**

Total (g)	105.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



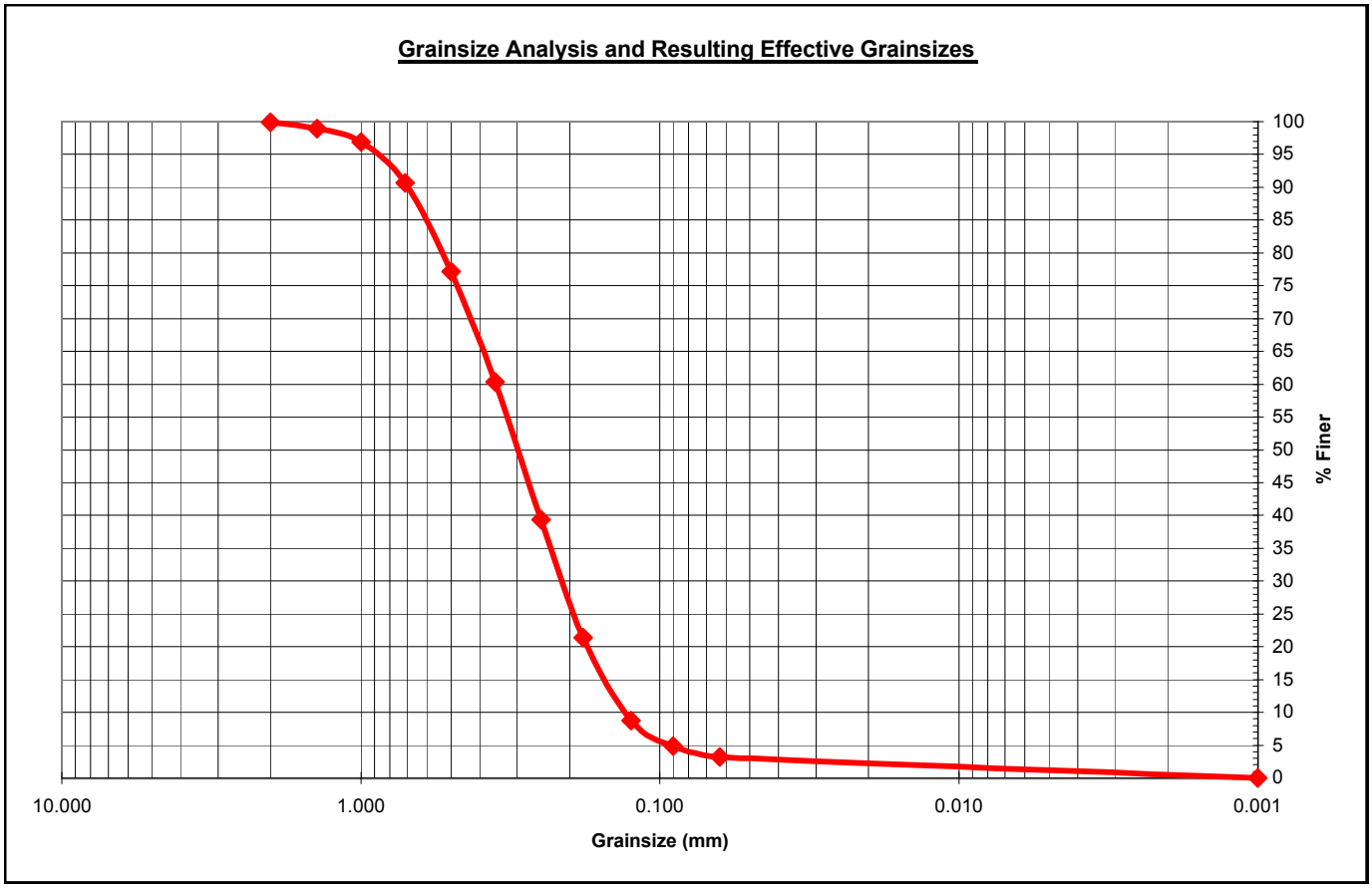
Sample ID:	ECP8-SB1	
Sample Depth:	4-5	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	104.50	g
Total Sieve Weight:	104.60	g
Weight Loss:	-0.1	g
Percent Loss:	-0.10	%

5.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	22.85%
	14	1.4	1.00	0.96	98.95		
	18	1.0	2.20	2.10	96.85		
	25	0.71	6.50	6.21	90.63		
	35	0.50	14.10	13.48	77.15		
Medium Material	45	0.355	17.60	16.83	60.33	Medium % (0.25 - 0.5 mm)	37.76%
	60	0.250	21.90	20.94	39.39		
Fine Material	80	0.180	18.80	17.97	21.41	Fine % (0.125 - 0.25 mm)	30.69%
	120	0.125	13.30	12.72	8.70		
Silt Material	170	0.090	4.00	3.82	4.88	Silt % (0.125 - 0.063 mm)	5.45%
	230	0.063	1.70	1.63	3.25		
Pan Material	pan	0.001	3.40	3.25	0.00	Pan % (< 0.063 mm)	3.25%
						Total	**100.00%**

Total (g)	104.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



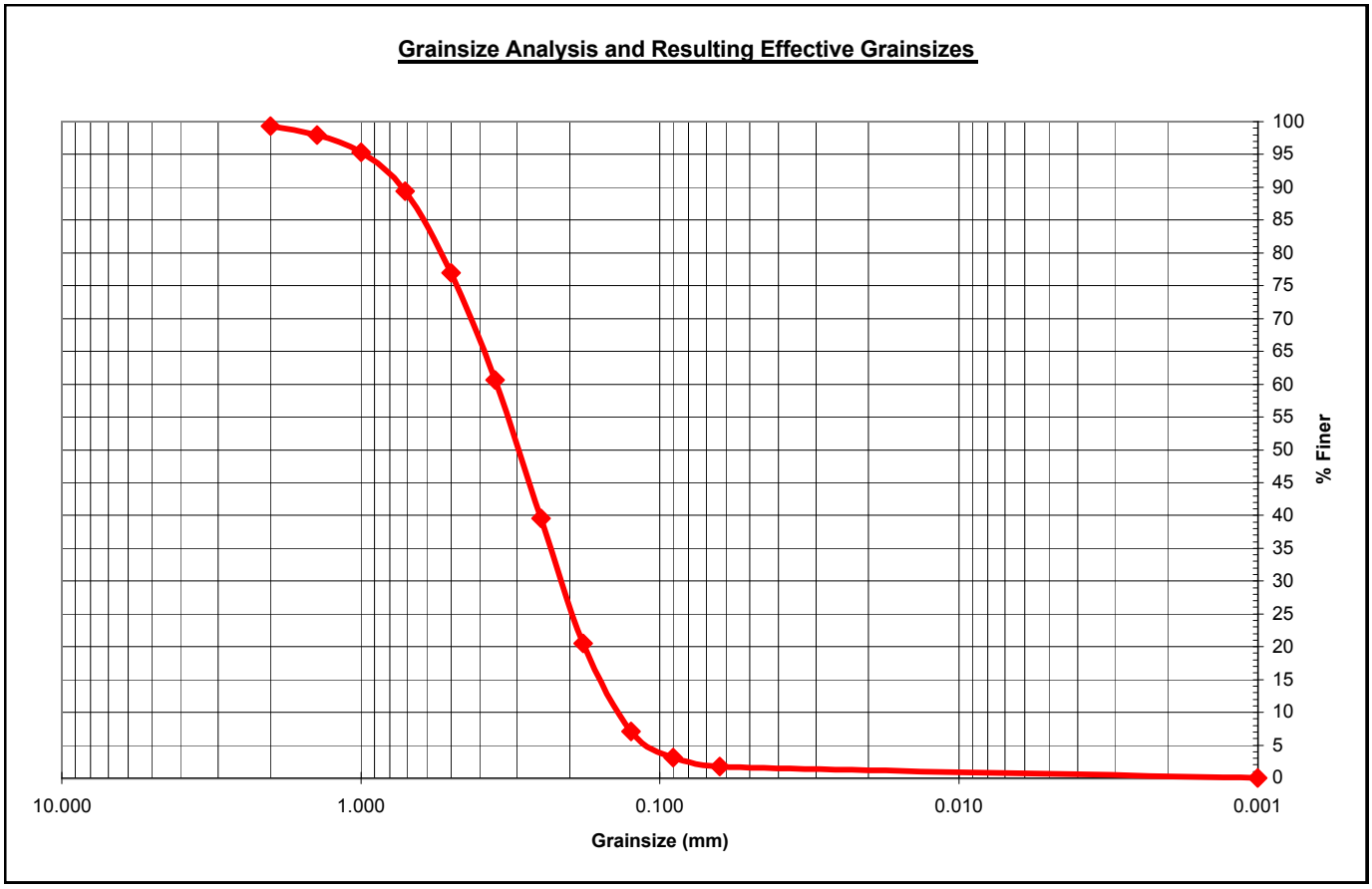
Sample ID:	ECP8-SB1
Sample Depth:	5-6 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	106.30 g
Total Sieve Weight:	106.30 g
Weight Loss:	0 g
Percent Loss:	0.00 %

3.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.70	0.66	99.34	Coarse % (> 0.5 mm)	23.05%
	14	1.4	1.50	1.41	97.93		
	18	1.0	2.80	2.63	95.30		
	25	0.71	6.30	5.93	89.37		
	35	0.50	13.20	12.42	76.95		
Medium Material	45	0.355	17.30	16.27	60.68	Medium % (0.25 - 0.5 mm)	37.44%
	60	0.250	22.50	21.17	39.51		
Fine Material	80	0.180	20.20	19.00	20.51	Fine % (0.125 - 0.25 mm)	32.46%
	120	0.125	14.30	13.45	7.06		
Silt Material	170	0.090	4.20	3.95	3.10	Silt % (0.125 - 0.063 mm)	5.27%
	230	0.063	1.40	1.32	1.79		
Pan Material	pan	0.001	1.90	1.79	0.00	Pan % (< 0.063 mm)	1.79%
						Total	**100.00%**

Total (g)	106.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



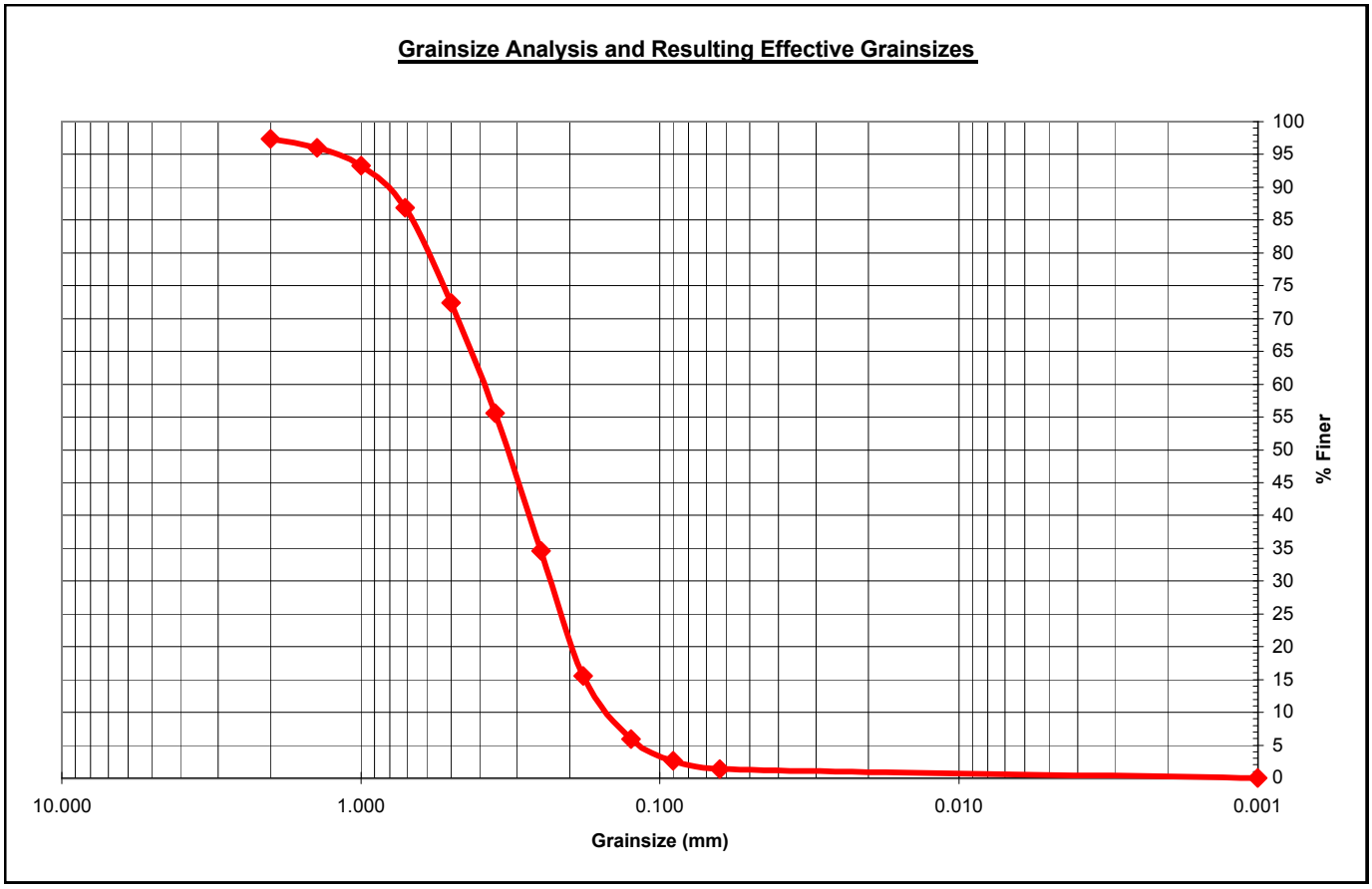
Sample ID:	ECP8-SB1
Sample Depth:	6-7 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	104.30 g
Total Sieve Weight:	104.80 g
Weight Loss:	-0.5 g
Percent Loss:	-0.48 %

5.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.80	2.67	97.33	Coarse % (> 0.5 mm)	27.58%
	14	1.4	1.40	1.34	95.99		
	18	1.0	2.80	2.67	93.32		
	25	0.71	6.70	6.39	86.93		
	35	0.50	15.20	14.50	72.42		
Medium Material	45	0.355	17.60	16.79	55.63	Medium % (0.25 - 0.5 mm)	37.79%
	60	0.250	22.00	20.99	34.64		
Fine Material	80	0.180	20.00	19.08	15.55	Fine % (0.125 - 0.25 mm)	28.72%
	120	0.125	10.10	9.64	5.92		
Silt Material	170	0.090	3.50	3.34	2.58	Silt % (0.125 - 0.063 mm)	4.58%
	230	0.063	1.30	1.24	1.34		
Pan Material	pan	0.001	1.40	1.34	0.00	Pan % (< 0.063 mm)	1.34%
						Total	100.00%

Total (g)	104.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



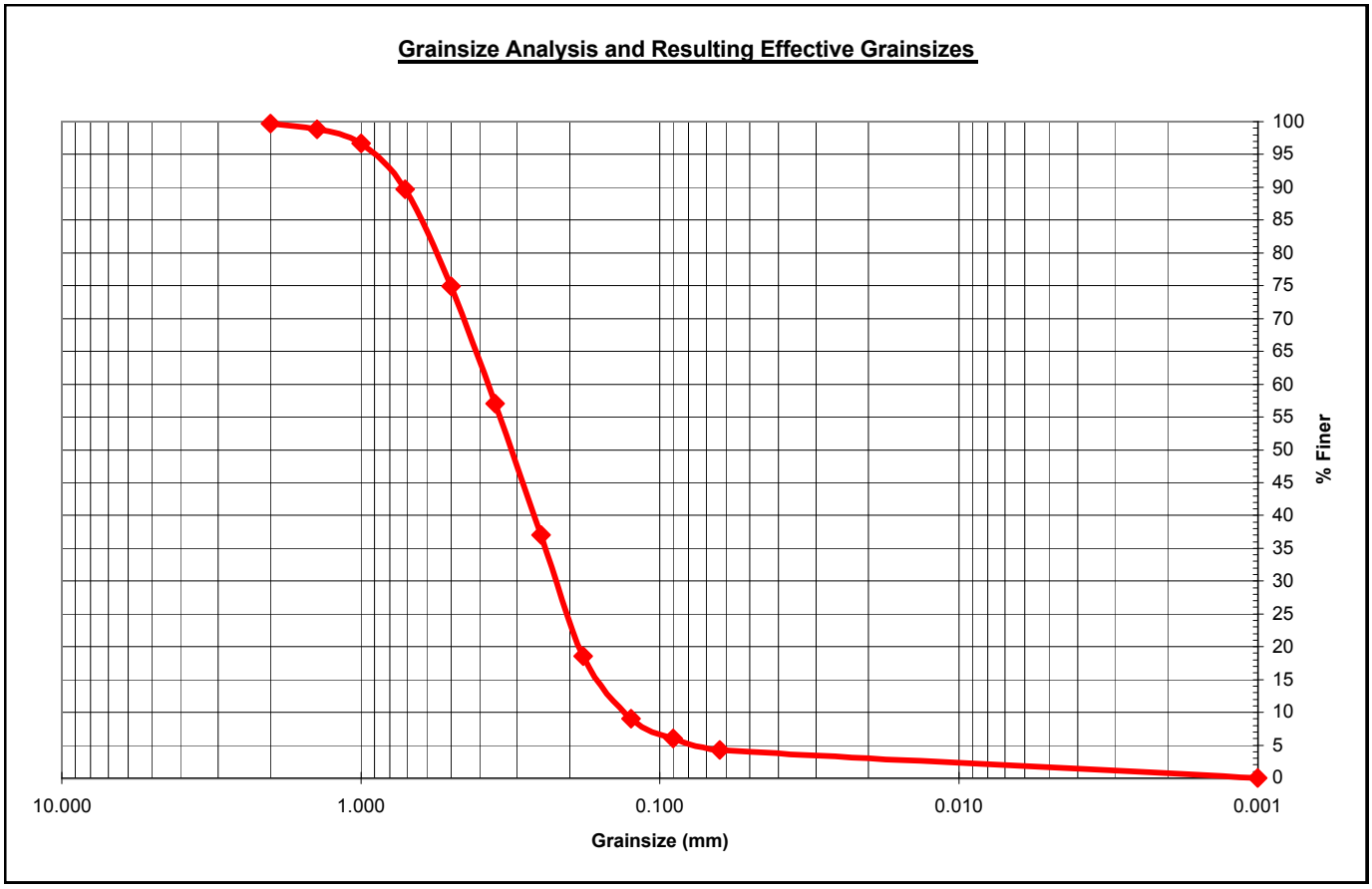
Sample ID:	ECP8-SB1	
Sample Depth:	7-8	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.60	g
Total Sieve Weight:	99.30	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

9.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.30	99.70	Coarse % (> 0.5 mm)	25.08%
	14	1.4	0.90	0.91	98.79		
	18	1.0	2.10	2.11	96.68		
	25	0.71	6.90	6.95	89.73		
	35	0.50	14.70	14.80	74.92		
Medium Material	45	0.355	17.80	17.93	57.00	Medium % (0.25 - 0.5 mm)	37.87%
	60	0.250	19.80	19.94	37.06		
Fine Material	80	0.180	18.40	18.53	18.53	Fine % (0.125 - 0.25 mm)	28.00%
	120	0.125	9.40	9.47	9.06		
Silt Material	170	0.090	3.00	3.02	6.04	Silt % (0.125 - 0.063 mm)	4.83%
	230	0.063	1.80	1.81	4.23		
Pan Material	pan	0.001	4.20	4.23	0.00	Pan % (< 0.063 mm)	4.23%
						Total	100.00%

Total (g)	99.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



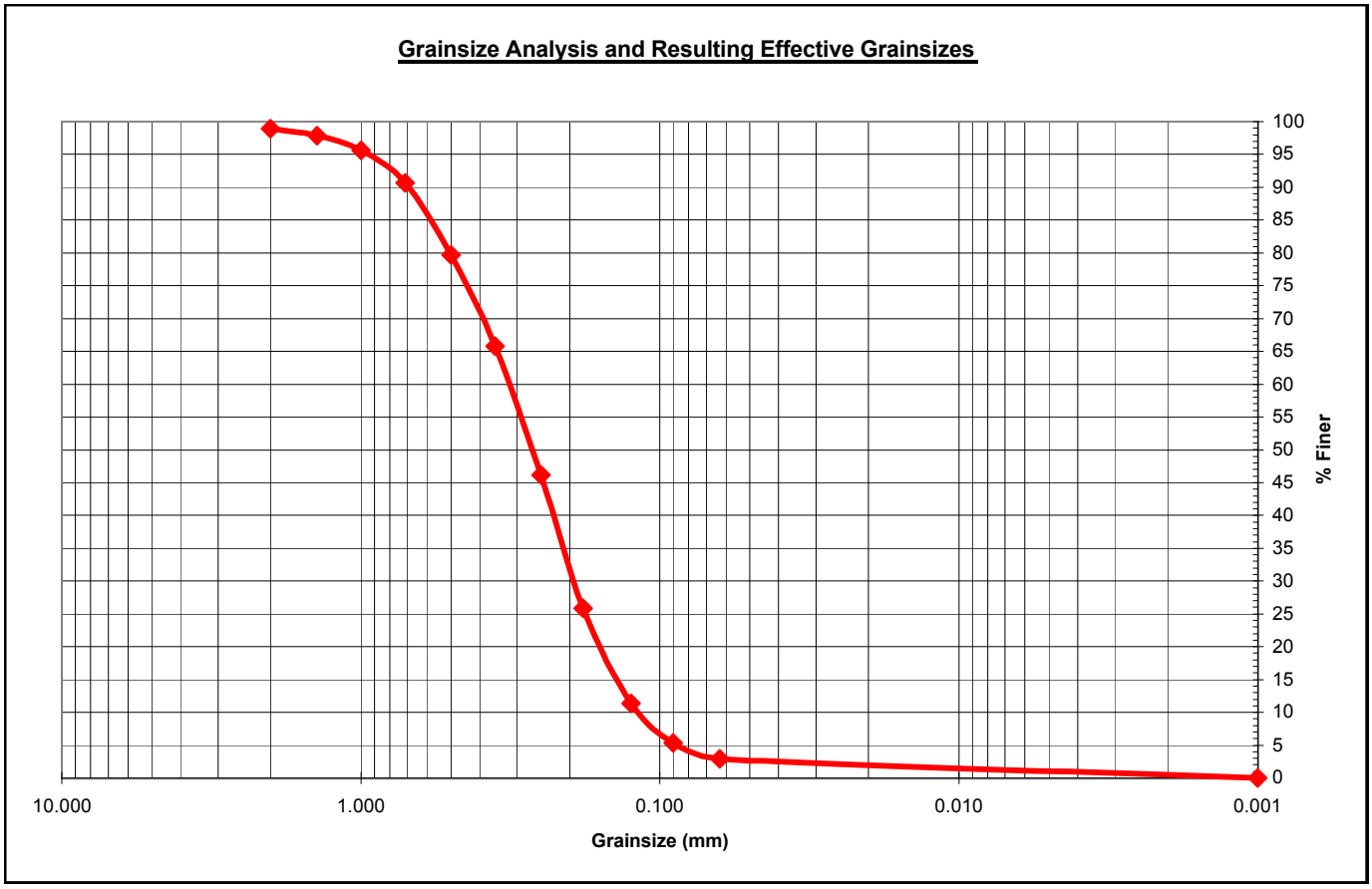
Sample ID:	ECP8-SB1
Sample Depth:	8-9 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.70 g
Total Sieve Weight:	94.60 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

13.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.00	1.06	98.94	Coarse % (> 0.5 mm)	20.30%
	14	1.4	1.00	1.06	97.89		
	18	1.0	2.10	2.22	95.67		
	25	0.71	4.70	4.97	90.70		
	35	0.50	10.40	10.99	79.70		
Medium Material	45	0.355	13.20	13.95	65.75	Medium % (0.25 - 0.5 mm)	33.51%
	60	0.250	18.50	19.56	46.19		
Fine Material	80	0.180	19.20	20.30	25.90	Fine % (0.125 - 0.25 mm)	34.78%
	120	0.125	13.70	14.48	11.42		
Silt Material	170	0.090	5.70	6.03	5.39	Silt % (0.125 - 0.063 mm)	8.46%
	230	0.063	2.30	2.43	2.96		
Pan Material	pan	0.001	2.80	2.96	0.00	Pan % (< 0.063 mm)	2.96%
						Total	100.00%

Total (g)	94.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



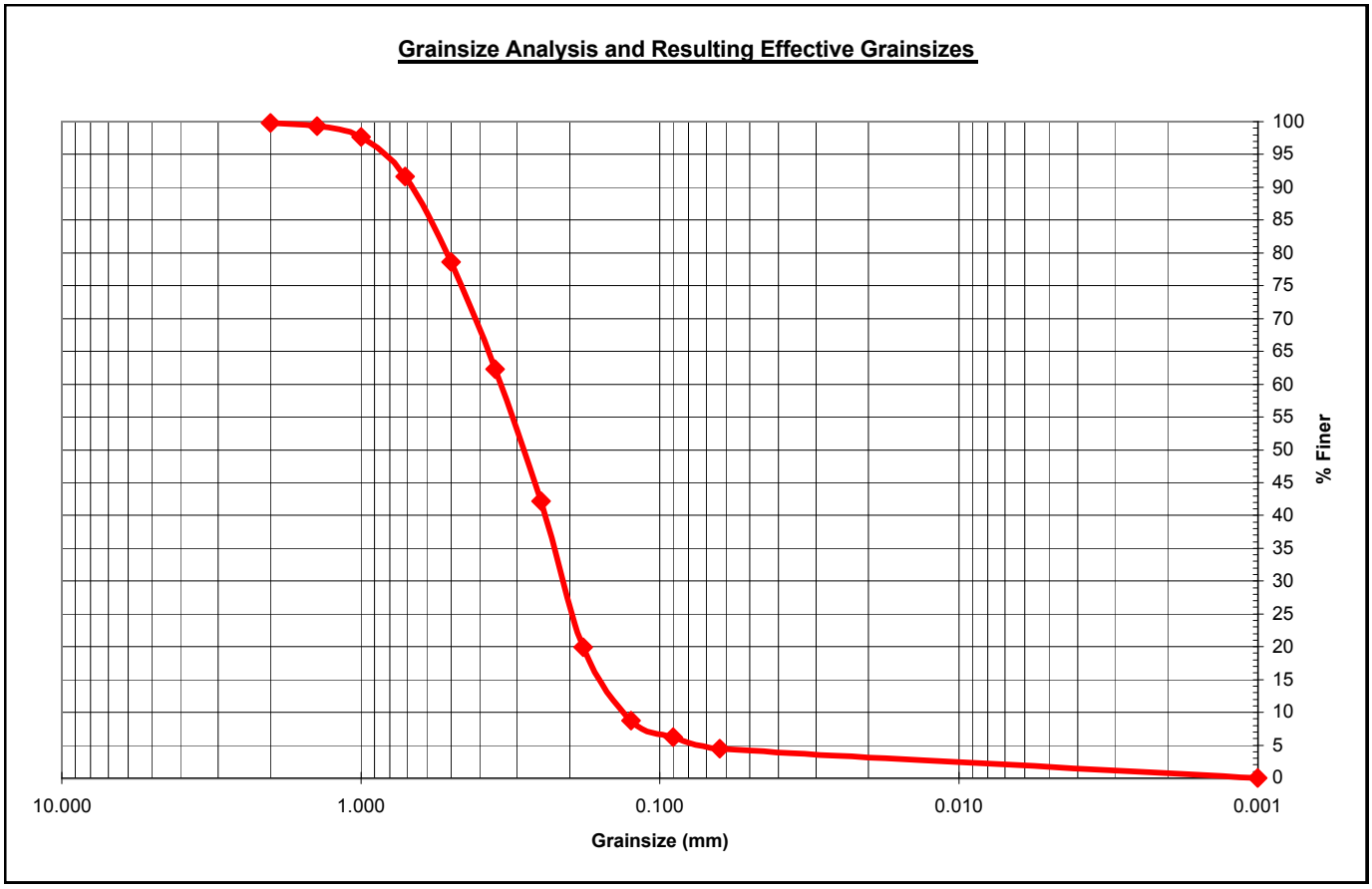
Sample ID:	ECP8-SB1	
Sample Depth:	9-10	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	98.50	g
Total Sieve Weight:	98.00	g
Weight Loss:	0.5	g
Percent Loss:	0.51	%

10.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	21.43%
	14	1.4	0.50	0.51	99.29		
	18	1.0	1.60	1.63	97.65		
	25	0.71	5.90	6.02	91.63		
	35	0.50	12.80	13.06	78.57		
Medium Material	45	0.355	16.00	16.33	62.24	Medium % (0.25 - 0.5 mm)	36.43%
	60	0.250	19.70	20.10	42.14		
Fine Material	80	0.180	21.80	22.24	19.90	Fine % (0.125 - 0.25 mm)	33.37%
	120	0.125	10.90	11.12	8.78		
Silt Material	170	0.090	2.50	2.55	6.22	Silt % (0.125 - 0.063 mm)	4.29%
	230	0.063	1.70	1.73	4.49		
Pan Material	pan	0.001	4.40	4.49	0.00	Pan % (< 0.063 mm)	4.49%
						Total	**100.00%**

Total (g)	98.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



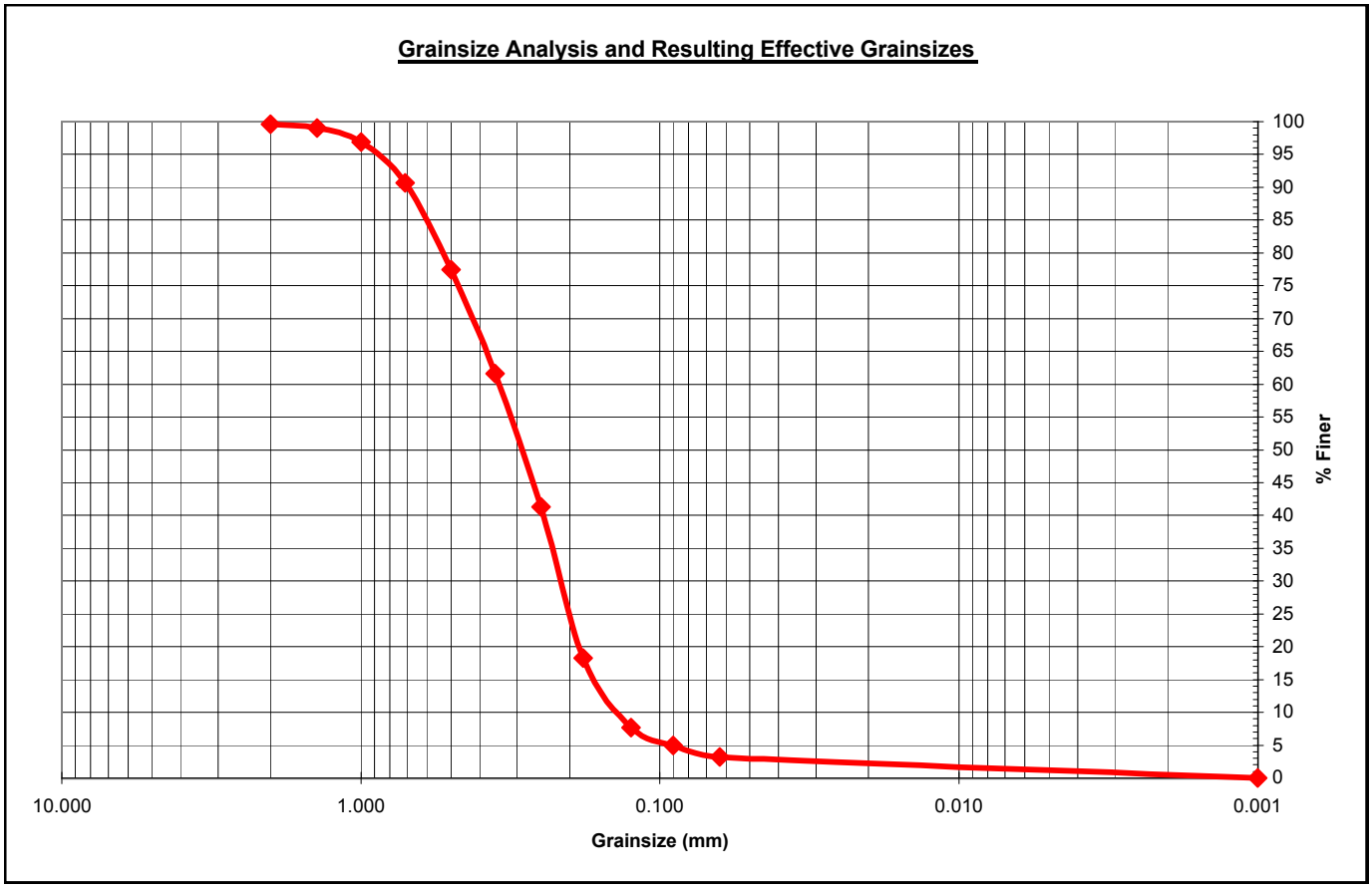
Sample ID:	ECP8-SB1	
Sample Depth:	10-11	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	100.30	g
Total Sieve Weight:	100.50	g
Weight Loss:	-0.2	g
Percent Loss:	-0.20	%

8.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.40	99.60	Coarse % (> 0.5 mm)	22.59%
	14	1.4	0.60	0.60	99.00		
	18	1.0	2.10	2.09	96.92		
	25	0.71	6.30	6.27	90.65		
	35	0.50	13.30	13.23	77.41		
Medium Material	45	0.355	15.90	15.82	61.59	Medium % (0.25 - 0.5 mm)	36.12%
	60	0.250	20.40	20.30	41.29		
Fine Material	80	0.180	23.10	22.99	18.31	Fine % (0.125 - 0.25 mm)	33.63%
	120	0.125	10.70	10.65	7.66		
Silt Material	170	0.090	2.70	2.69	4.98	Silt % (0.125 - 0.063 mm)	4.48%
	230	0.063	1.80	1.79	3.18		
Pan Material	pan	0.001	3.20	3.18	0.00	Pan % (< 0.063 mm)	3.18%
						Total	**100.00%**

Total (g)	100.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



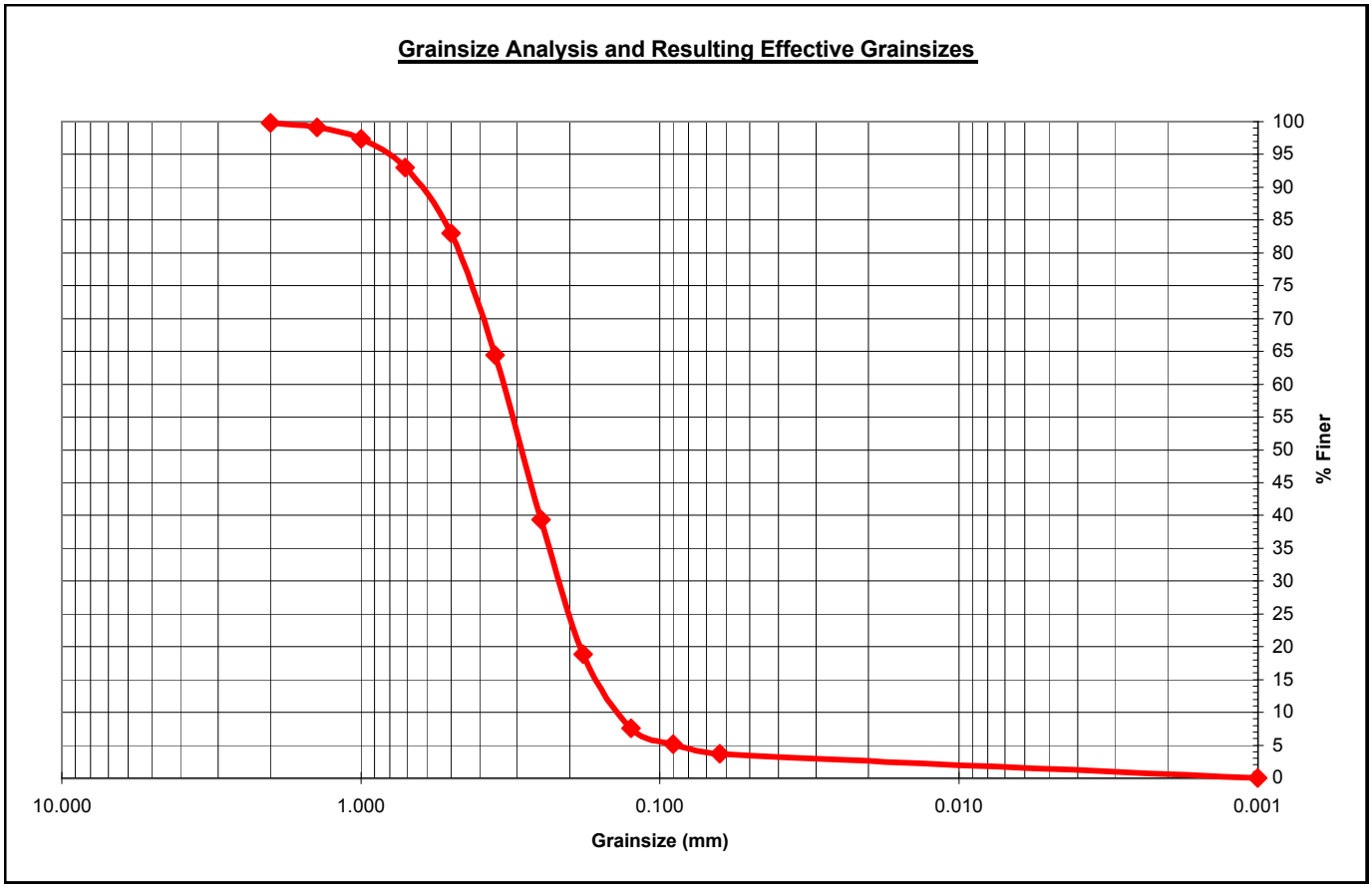
Sample ID:	ECP8-SB1
Sample Depth:	11-12 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.20 g
Total Sieve Weight:	98.60 g
Weight Loss:	0.6 g
Percent Loss:	0.60 %

9.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	17.04%
	14	1.4	0.70	0.71	99.09		
	18	1.0	1.70	1.72	97.36		
	25	0.71	4.30	4.36	93.00		
	35	0.50	9.90	10.04	82.96		
Medium Material	45	0.355	18.30	18.56	64.40	Medium % (0.25 - 0.5 mm)	43.61%
	60	0.250	24.70	25.05	39.35		
Fine Material	80	0.180	20.20	20.49	18.86	Fine % (0.125 - 0.25 mm)	31.74%
	120	0.125	11.10	11.26	7.61		
Silt Material	170	0.090	2.40	2.43	5.17	Silt % (0.125 - 0.063 mm)	3.96%
	230	0.063	1.50	1.52	3.65		
Pan Material	pan	0.001	3.60	3.65	0.00	Pan % (< 0.063 mm)	3.65%
						Total	**100.00%**

Total (g)	98.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



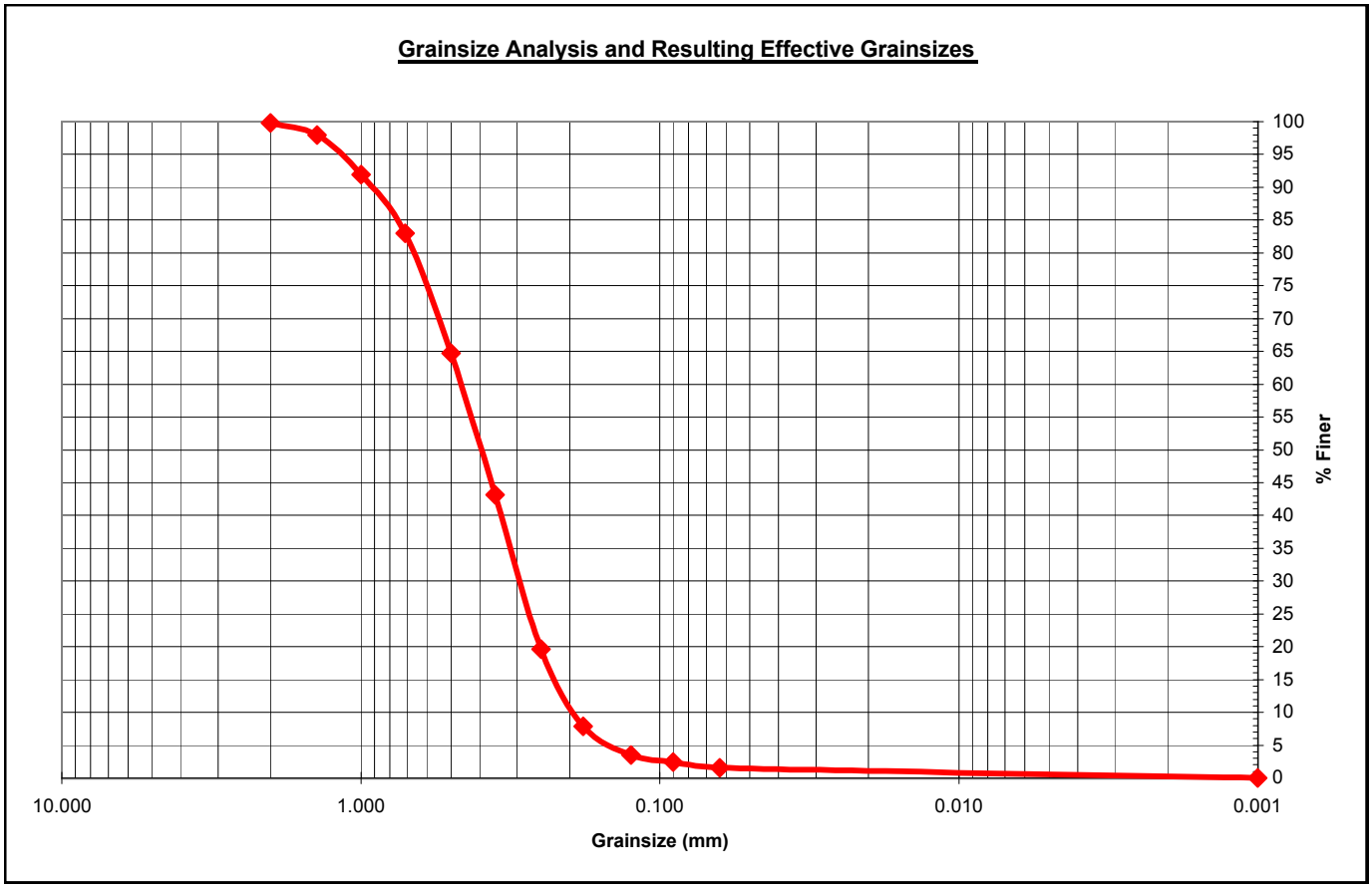
Sample ID:	ECP8-SB1	
Sample Depth:	12-13	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.60	g
Total Sieve Weight:	101.30	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

7.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	35.24%
	14	1.4	1.90	1.88	97.93		
	18	1.0	6.10	6.02	91.91		
	25	0.71	9.00	8.88	83.02		
	35	0.50	18.50	18.26	64.76		
Medium Material	45	0.355	21.90	21.62	43.14	Medium % (0.25 - 0.5 mm)	45.11%
	60	0.250	23.80	23.49	19.64		
Fine Material	80	0.180	11.90	11.75	7.90	Fine % (0.125 - 0.25 mm)	16.19%
	120	0.125	4.50	4.44	3.46		
Silt Material	170	0.090	1.00	0.99	2.47	Silt % (0.125 - 0.063 mm)	1.88%
	230	0.063	0.90	0.89	1.58		
Pan Material	pan	0.001	1.60	1.58	0.00	Pan % (< 0.063 mm)	1.58%
						Total	100.00%

Total (g)	101.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



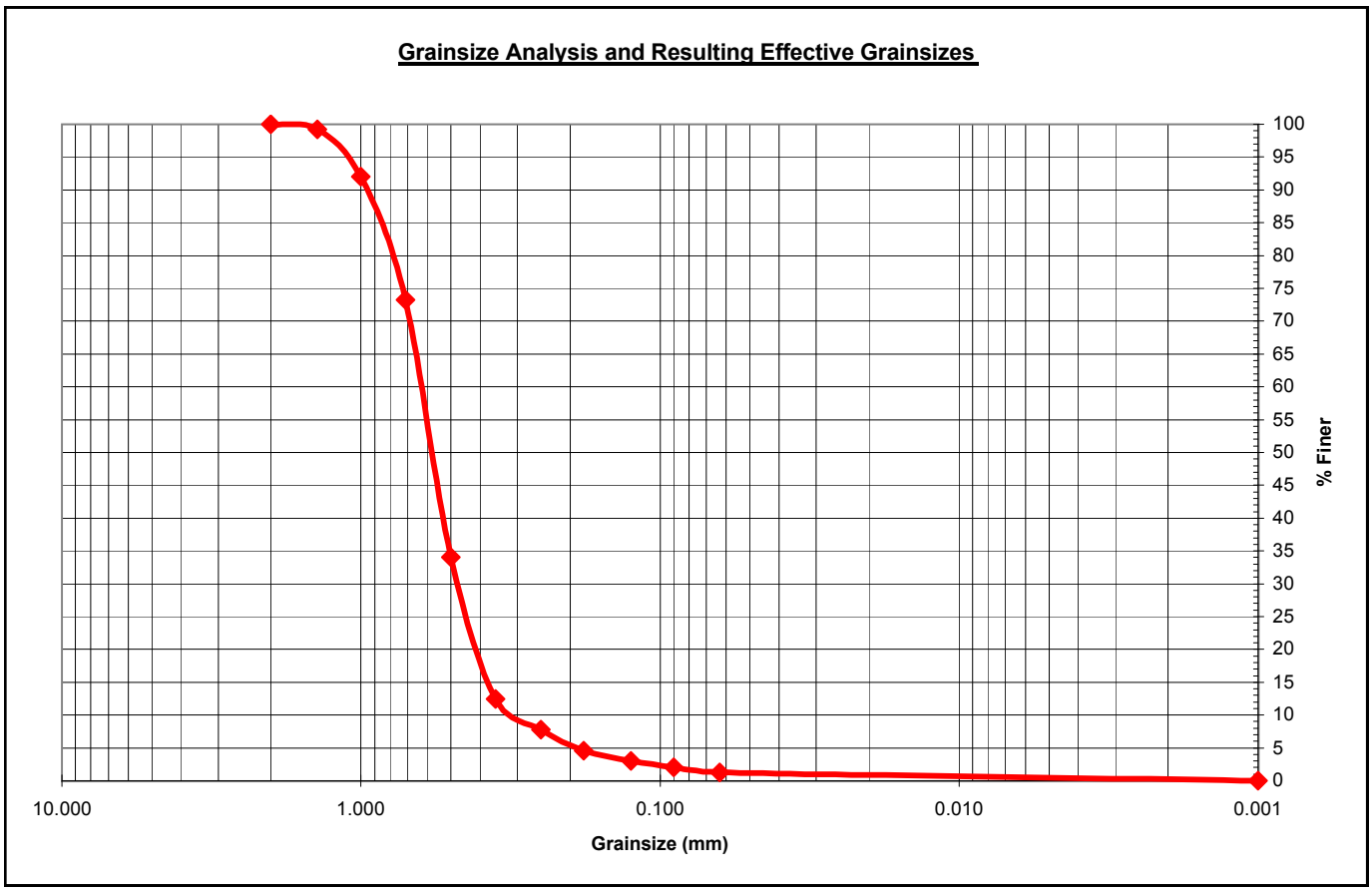
Sample ID:	ECP8-SB1
Sample Depth:	13-14 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	103.10 g
Total Sieve Weight:	103.10 g
Weight Loss:	0 g
Percent Loss:	0.00 %

6.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	65.96%
	14	1.4	0.80	0.78	99.22		
	18	1.0	7.40	7.18	92.05		
	25	0.71	19.40	18.82	73.23		
	35	0.50	40.40	39.19	34.04		
Medium Material	45	0.355	22.30	21.63	12.42	Medium % (0.25 - 0.5 mm)	26.29%
	60	0.250	4.80	4.66	7.76		
Fine Material	80	0.180	3.30	3.20	4.56	Fine % (0.125 - 0.25 mm)	4.75%
	120	0.125	1.60	1.55	3.01		
Silt Material	170	0.090	1.00	0.97	2.04	Silt % (0.125 - 0.063 mm)	1.75%
	230	0.063	0.80	0.78	1.26		
Pan Material	pan	0.001	1.30	1.26	0.00	Pan % (< 0.063 mm)	1.26%
						Total	**100.00%**

Total (g)	103.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



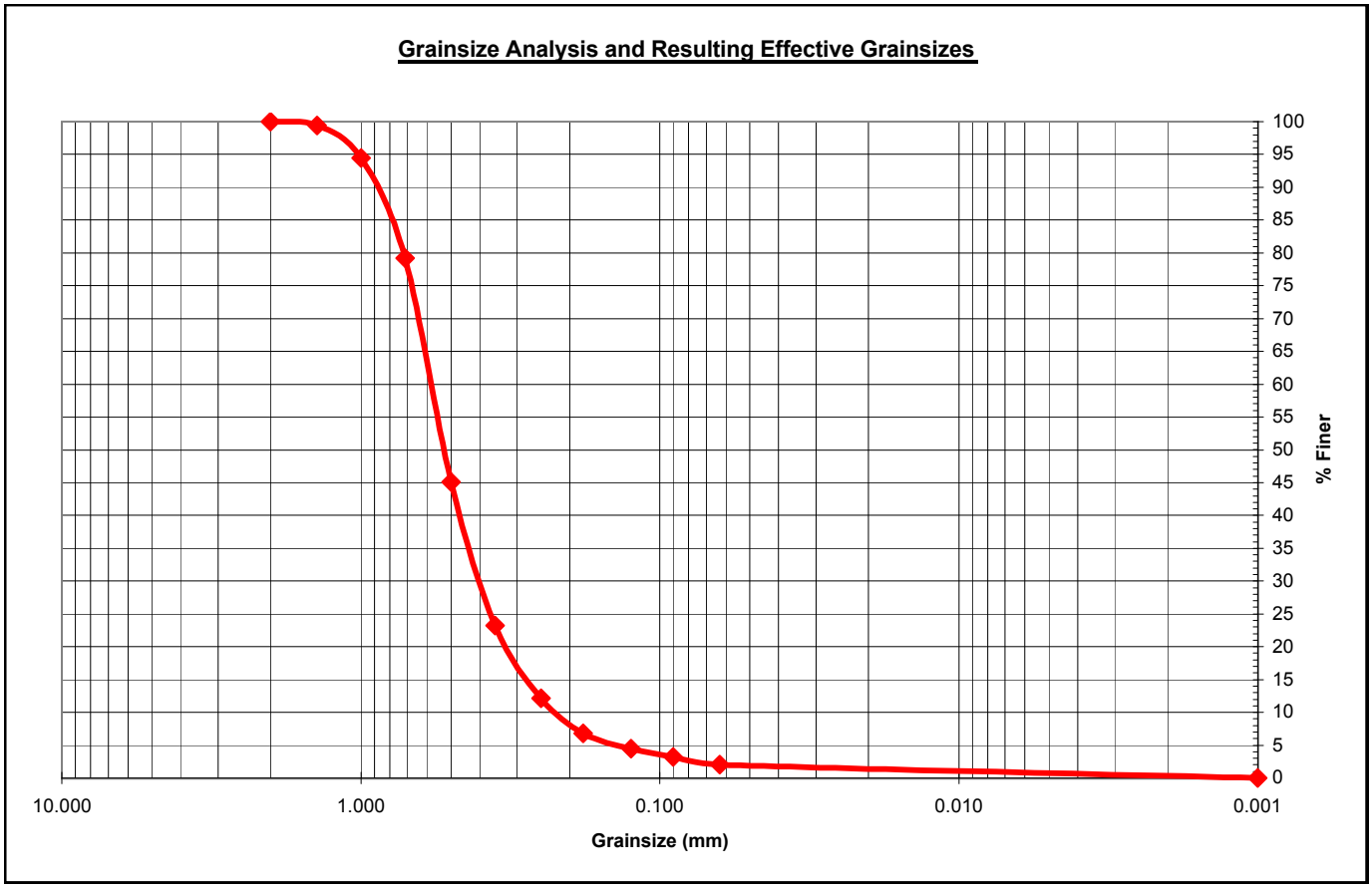
Sample ID:	ECP8-SB1	
Sample Depth:	14-15	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.20	g
Total Sieve Weight:	102.10	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

7.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	54.95%
	14	1.4	0.60	0.59	99.41		
	18	1.0	5.10	5.00	94.42		
	25	0.71	15.50	15.18	79.24		
	35	0.50	34.90	34.18	45.05		
Medium Material	45	0.355	22.30	21.84	23.21	Medium % (0.25 - 0.5 mm)	32.91%
	60	0.250	11.30	11.07	12.14		
Fine Material	80	0.180	5.50	5.39	6.76	Fine % (0.125 - 0.25 mm)	7.64%
	120	0.125	2.30	2.25	4.51		
Silt Material	170	0.090	1.30	1.27	3.23	Silt % (0.125 - 0.063 mm)	2.45%
	230	0.063	1.20	1.18	2.06		
Pan Material	pan	0.001	2.10	2.06	0.00	Pan % (< 0.063 mm)	2.06%
						Total	**100.00%**

Total (g)	102.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



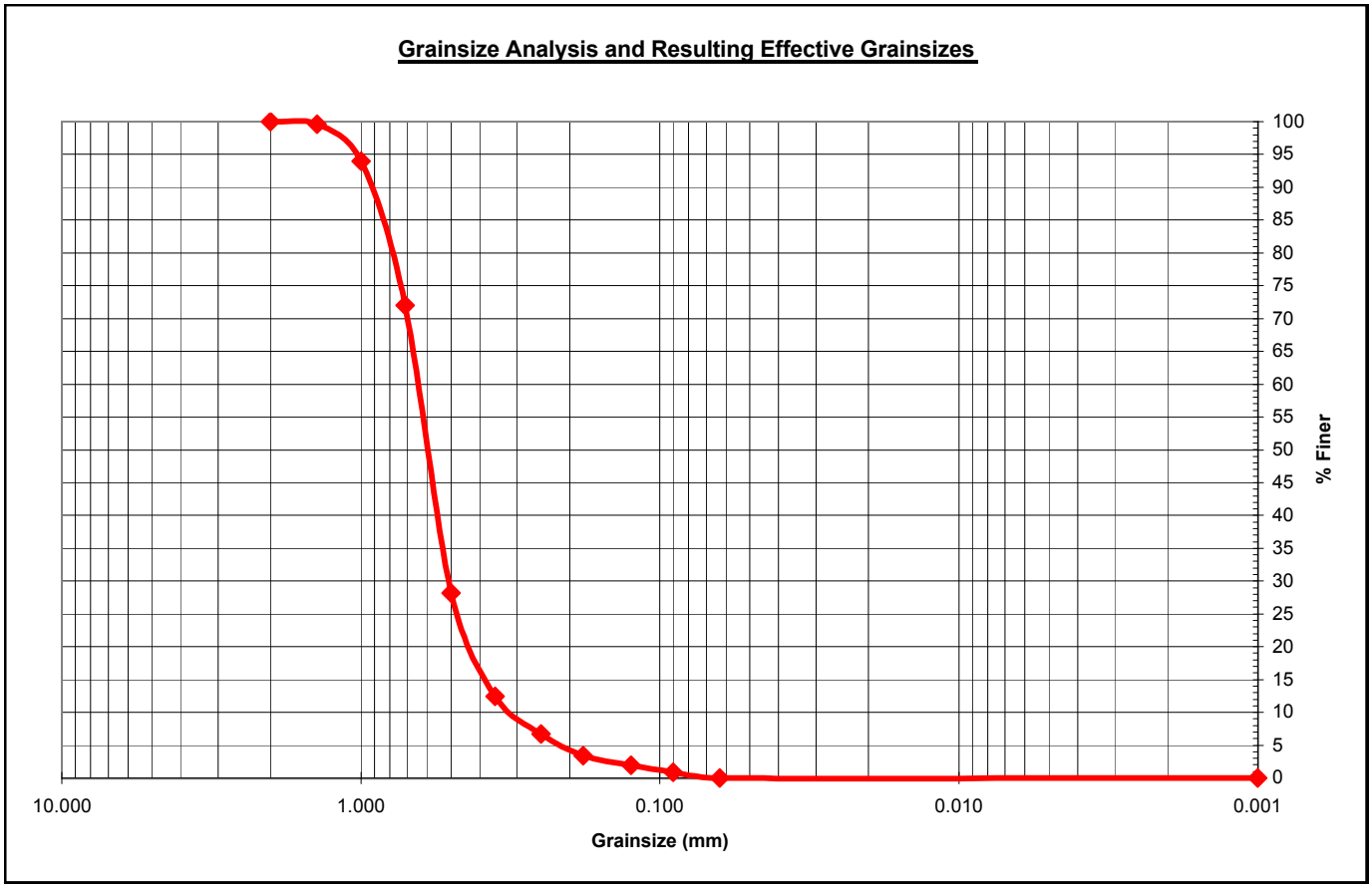
Sample ID:	ECP8-SB1	
Sample Depth:	15-16	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.20	g
Total Sieve Weight:	99.80	g
Weight Loss:	1.4	g
Percent Loss:	1.38	%

8.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	71.84%
	14	1.4	0.40	0.40	99.60		
	18	1.0	5.60	5.61	93.99		
	25	0.71	21.90	21.94	72.04		
	35	0.50	43.80	43.89	28.16		
Medium Material	45	0.355	15.70	15.73	12.42	Medium % (0.25 - 0.5 mm)	21.44%
	60	0.250	5.70	5.71	6.71		
Fine Material	80	0.180	3.30	3.31	3.41	Fine % (0.125 - 0.25 mm)	4.81%
	120	0.125	1.50	1.50	1.90		
Silt Material	170	0.090	1.00	1.00	0.90	Silt % (0.125 - 0.063 mm)	1.90%
	230	0.063	0.90	0.90	0.00		
Pan Material	pan	0.001	0.00	0.00	0.00	Pan % (< 0.063 mm)	0.00%
						Total	**100.00%**

Total (g)	99.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



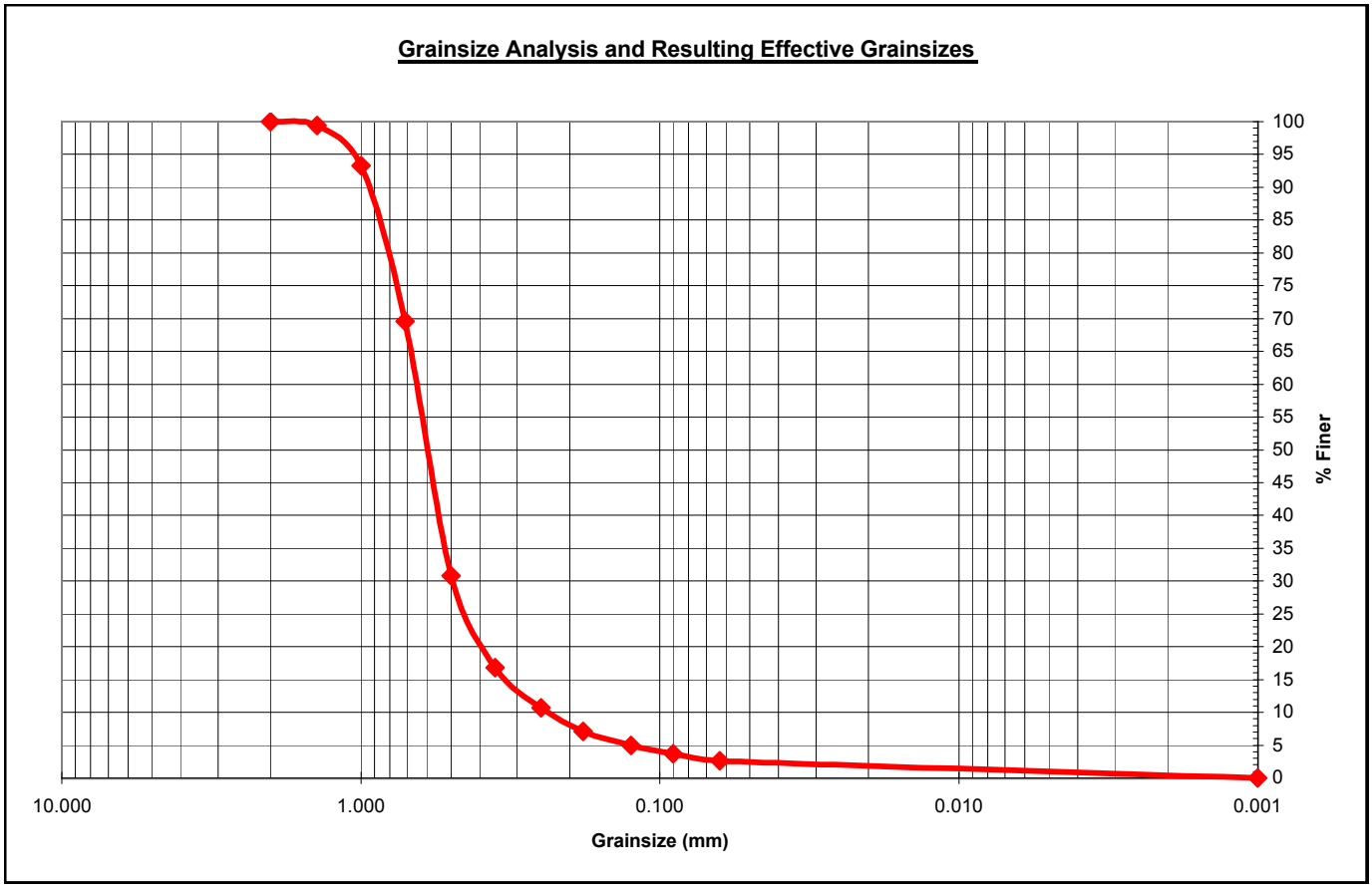
Sample ID:	ECP8-SB1	
Sample Depth:	16-17	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.50	g
Total Sieve Weight:	99.10	g
Weight Loss:	0.4	g
Percent Loss:	0.40	%

9.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	69.22%
	14	1.4	0.60	0.61	99.39		
	18	1.0	6.00	6.05	93.34		
	25	0.71	23.50	23.71	69.63		
	35	0.50	38.50	38.85	30.78		
Medium Material	45	0.355	13.80	13.93	16.85	Medium % (0.25 - 0.5 mm)	20.08%
	60	0.250	6.10	6.16	10.70		
Fine Material	80	0.180	3.60	3.63	7.06	Fine % (0.125 - 0.25 mm)	5.75%
	120	0.125	2.10	2.12	4.94		
Silt Material	170	0.090	1.20	1.21	3.73	Silt % (0.125 - 0.063 mm)	2.32%
	230	0.063	1.10	1.11	2.62		
Pan Material	pan	0.001	2.60	2.62	0.00	Pan % (< 0.063 mm)	2.62%
						Total	**100.00%**

Total (g)	99.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



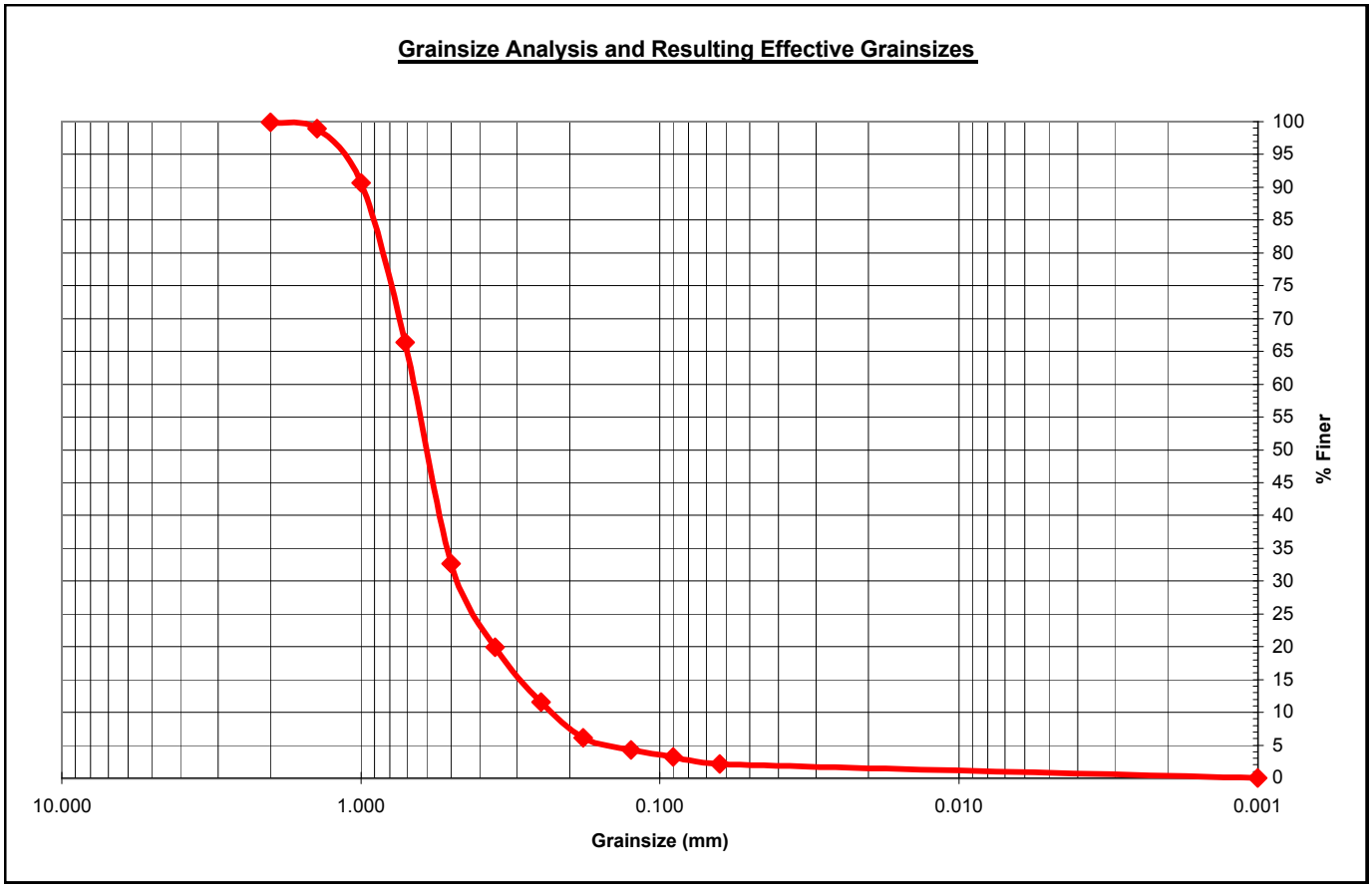
Sample ID:	ECP8-SB1	
Sample Depth:	17-18	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	97.80	g
Total Sieve Weight:	97.50	g
Weight Loss:	0.3	g
Percent Loss:	0.31	%

11.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	67.38%
	14	1.4	0.90	0.92	98.97		
	18	1.0	8.10	8.31	90.67		
	25	0.71	23.70	24.31	66.36		
	35	0.50	32.90	33.74	32.62		
Medium Material	45	0.355	12.40	12.72	19.90	Medium % (0.25 - 0.5 mm)	21.03%
	60	0.250	8.10	8.31	11.59		
Fine Material	80	0.180	5.30	5.44	6.15	Fine % (0.125 - 0.25 mm)	7.28%
	120	0.125	1.80	1.85	4.31		
Silt Material	170	0.090	1.10	1.13	3.18	Silt % (0.125 - 0.063 mm)	2.15%
	230	0.063	1.00	1.03	2.15		
Pan Material	pan	0.001	2.10	2.15	0.00	Pan % (< 0.063 mm)	2.15%
						Total	**100.00%**

Total (g)	97.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



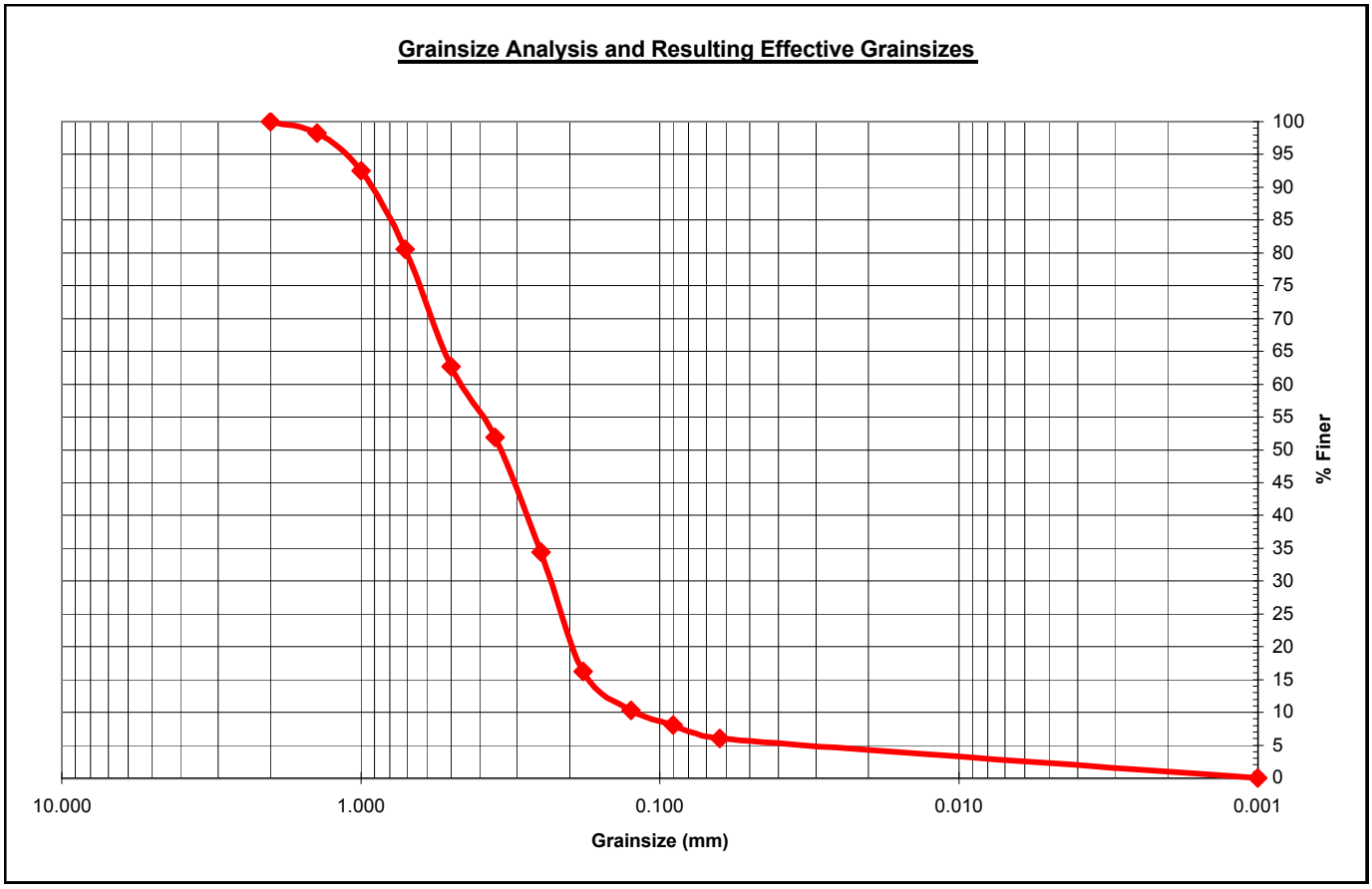
Sample ID:	ECP8-SB1	
Sample Depth:	18-19	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	92.40	g
Total Sieve Weight:	91.40	g
Weight Loss:	1	g
Percent Loss:	1.08	%

16.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	37.31%
	14	1.4	1.60	1.75	98.25		
	18	1.0	5.20	5.69	92.56		
	25	0.71	11.00	12.04	80.53		
	35	0.50	16.30	17.83	62.69		
Medium Material	45	0.355	9.90	10.83	51.86	Medium % (0.25 - 0.5 mm)	28.34%
	60	0.250	16.00	17.51	34.35		
Fine Material	80	0.180	16.60	18.16	16.19	Fine % (0.125 - 0.25 mm)	24.07%
	120	0.125	5.40	5.91	10.28		
Silt Material	170	0.090	2.00	2.19	8.10	Silt % (0.125 - 0.063 mm)	4.27%
	230	0.063	1.90	2.08	6.02		
Pan Material	pan	0.001	5.50	6.02	0.00	Pan % (< 0.063 mm)	6.02%
						Total	**100.00%**

Total (g)	91.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



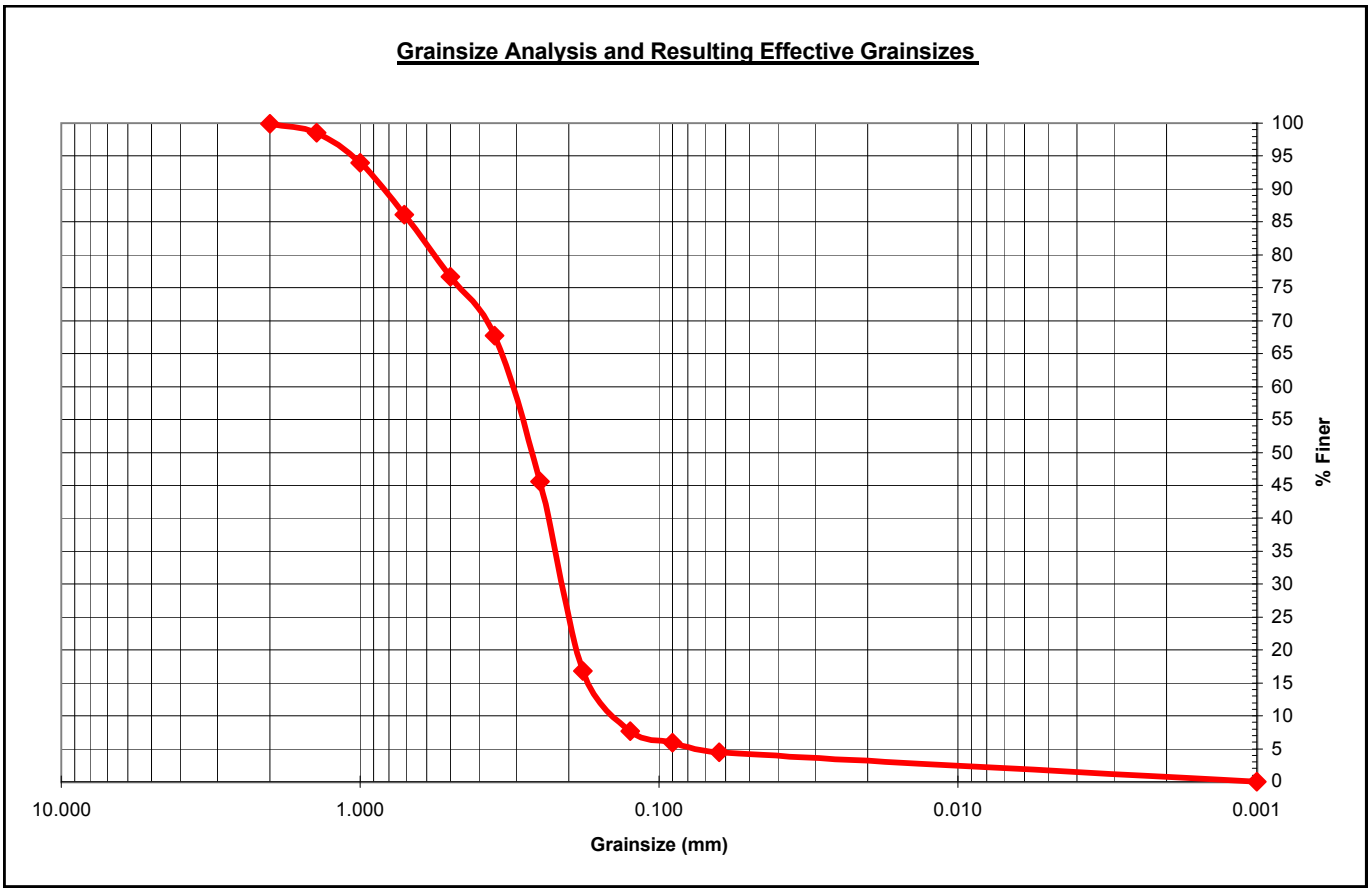
Sample ID:	ECP8-SB1
Sample Depth:	19-20 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	96.80 g
Total Sieve Weight:	95.90 g
Weight Loss:	0.9 g
Percent Loss:	0.93 %

12.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	23.36%
	14	1.4	1.30	1.36	98.54		
	18	1.0	4.40	4.59	93.95		
	25	0.71	7.50	7.82	86.13		
	35	0.50	9.10	9.49	76.64		
Medium Material	45	0.355	8.50	8.86	67.78	Medium % (0.25 - 0.5 mm)	31.07%
	60	0.250	21.30	22.21	45.57		
Fine Material	80	0.180	27.60	28.78	16.79	Fine % (0.125 - 0.25 mm)	37.85%
	120	0.125	8.70	9.07	7.72		
Silt Material	170	0.090	1.70	1.77	5.94	Silt % (0.125 - 0.063 mm)	3.23%
	230	0.063	1.40	1.46	4.48		
Pan Material	pan	0.001	4.30	4.48	0.00	Pan % (< 0.063 mm)	4.48%
						Total	**100.00%**

Total (g)	**95.90**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



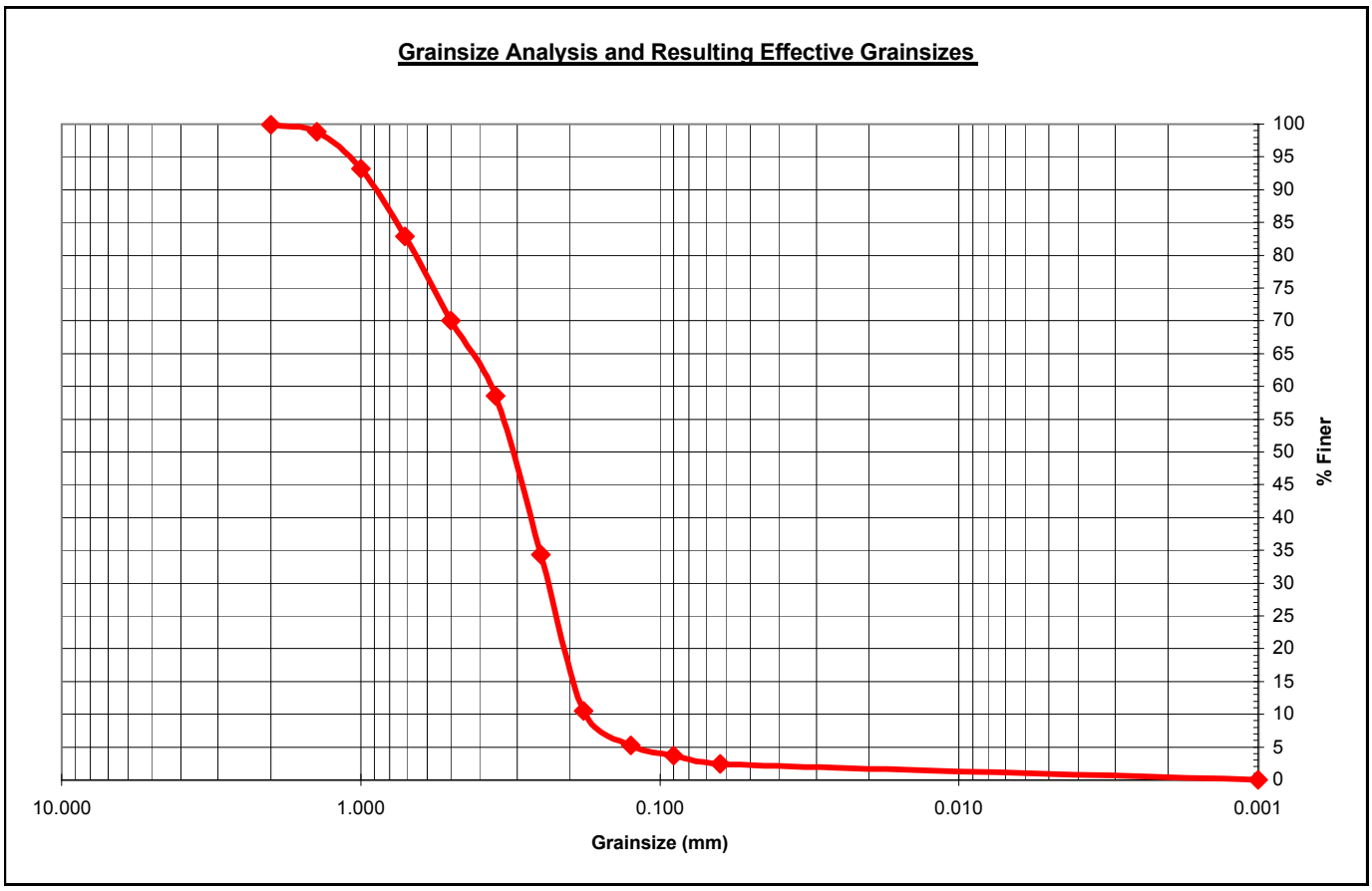
Sample ID:	ECP8-SB1
Sample Depth:	20-21 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	96.50 g
Total Sieve Weight:	95.80 g
Weight Loss:	0.7 g
Percent Loss:	0.73 %

12.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	29.96%
	14	1.4	1.00	1.04	98.85		
	18	1.0	5.40	5.64	93.22		
	25	0.71	9.90	10.33	82.88		
	35	0.50	12.30	12.84	70.04		
Medium Material	45	0.355	11.00	11.48	58.56	Medium % (0.25 - 0.5 mm)	35.70%
	60	0.250	23.20	24.22	34.34		
Fine Material	80	0.180	22.80	23.80	10.54	Fine % (0.125 - 0.25 mm)	29.12%
	120	0.125	5.10	5.32	5.22		
Silt Material	170	0.090	1.50	1.57	3.65	Silt % (0.125 - 0.063 mm)	2.82%
	230	0.063	1.20	1.25	2.40		
Pan Material	pan	0.001	2.30	2.40	0.00	Pan % (< 0.063 mm)	2.40%
						Total	**100.00%**

Total (g)	95.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



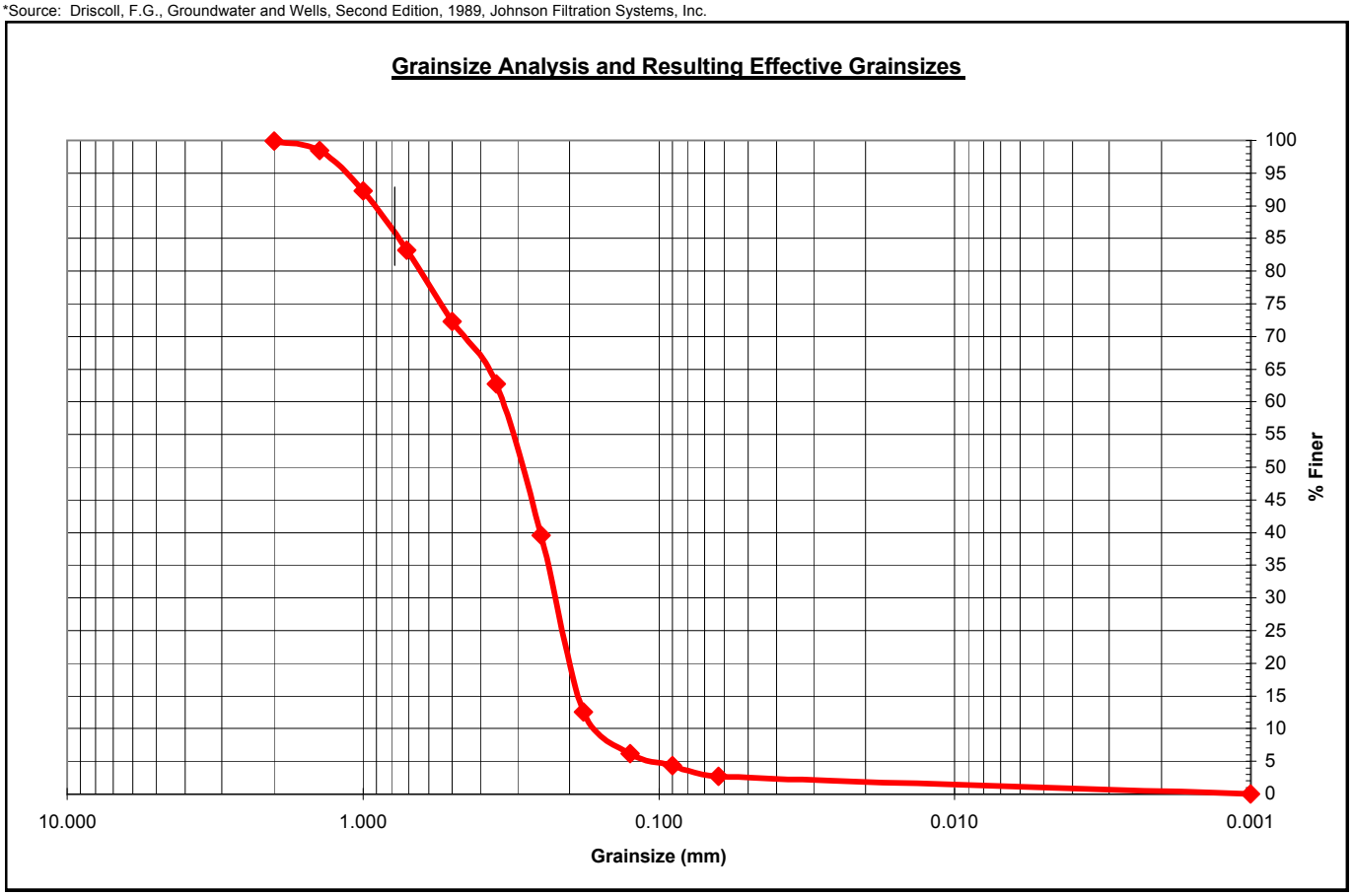
Sample ID:	ECP8-SB1	
Sample Depth:	21-22	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	97.30	g
Total Sieve Weight:	97.20	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

11.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	27.67%
	14	1.4	1.40	1.44	98.46		
	18	1.0	6.00	6.17	92.28		
	25	0.71	8.80	9.05	83.23		
	35	0.50	10.60	10.91	72.33		
Medium Material	45	0.355	9.30	9.57	62.76	Medium % (0.25 - 0.5 mm)	32.72%
	60	0.250	22.50	23.15	39.61		
Fine Material	80	0.180	26.30	27.06	12.55	Fine % (0.125 - 0.25 mm)	33.44%
	120	0.125	6.20	6.38	6.17		
Silt Material	170	0.090	1.80	1.85	4.32	Silt % (0.125 - 0.063 mm)	3.50%
	230	0.063	1.60	1.65	2.67		
Pan Material	pan	0.001	2.60	2.67	0.00	Pan % (< 0.063 mm)	2.67%
						Total	**100.00%**

Total (g)	97.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



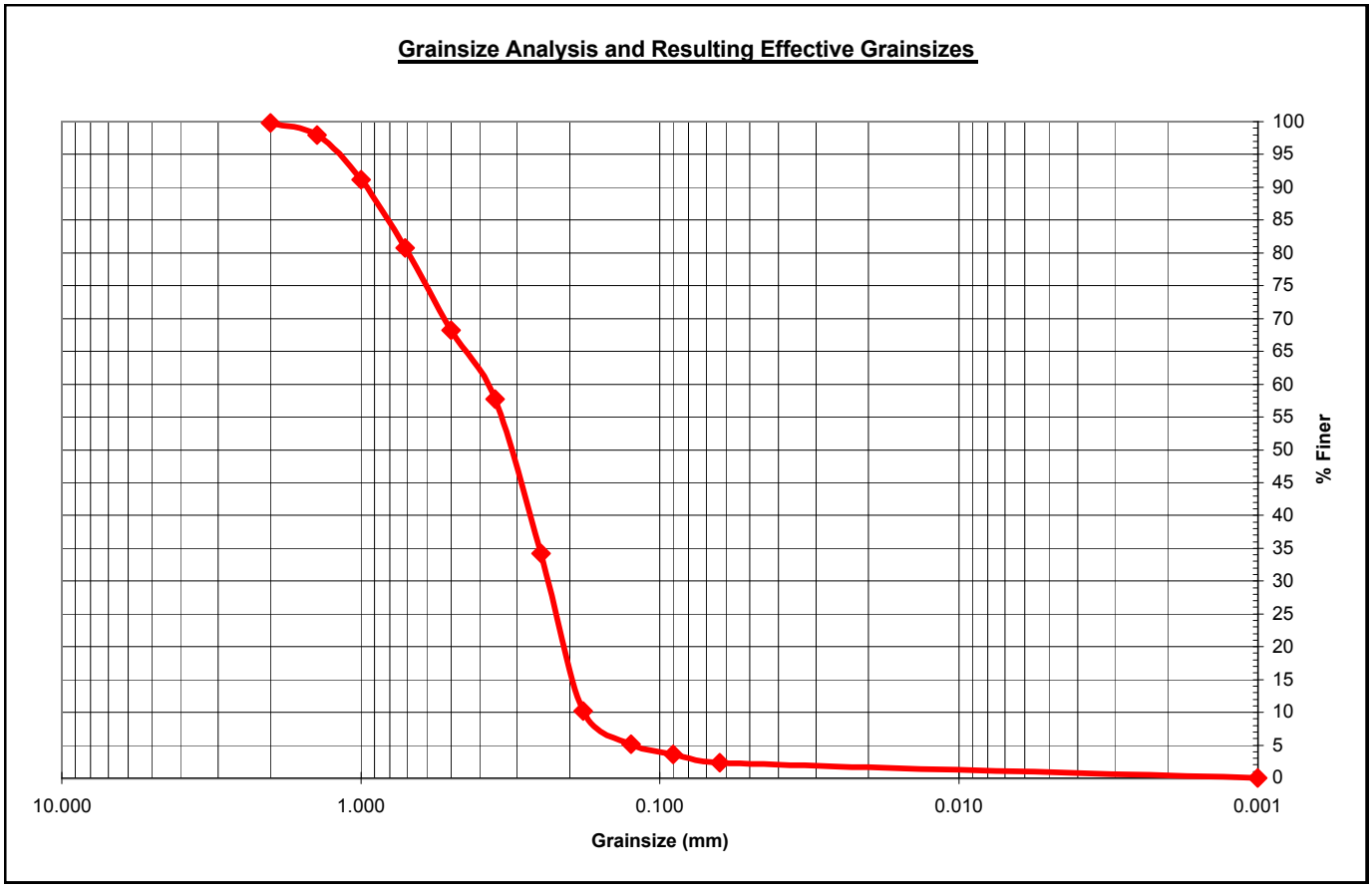
Sample ID:	ECP8-SB1	
Sample Depth:	22-23	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.40	g
Total Sieve Weight:	99.30	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

9.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	31.82%
	14	1.4	1.80	1.81	97.99		
	18	1.0	6.80	6.85	91.14		
	25	0.71	10.30	10.37	80.77		
	35	0.50	12.50	12.59	68.18		
Medium Material	45	0.355	10.40	10.47	57.70	Medium % (0.25 - 0.5 mm)	33.94%
	60	0.250	23.30	23.46	34.24		
Fine Material	80	0.180	23.90	24.07	10.17	Fine % (0.125 - 0.25 mm)	29.10%
	120	0.125	5.00	5.04	5.14		
Silt Material	170	0.090	1.50	1.51	3.63	Silt % (0.125 - 0.063 mm)	2.82%
	230	0.063	1.30	1.31	2.32		
Pan Material	pan	0.001	2.30	2.32	0.00	Pan % (< 0.063 mm)	2.32%
						Total	**100.00%**

Total (g)	99.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



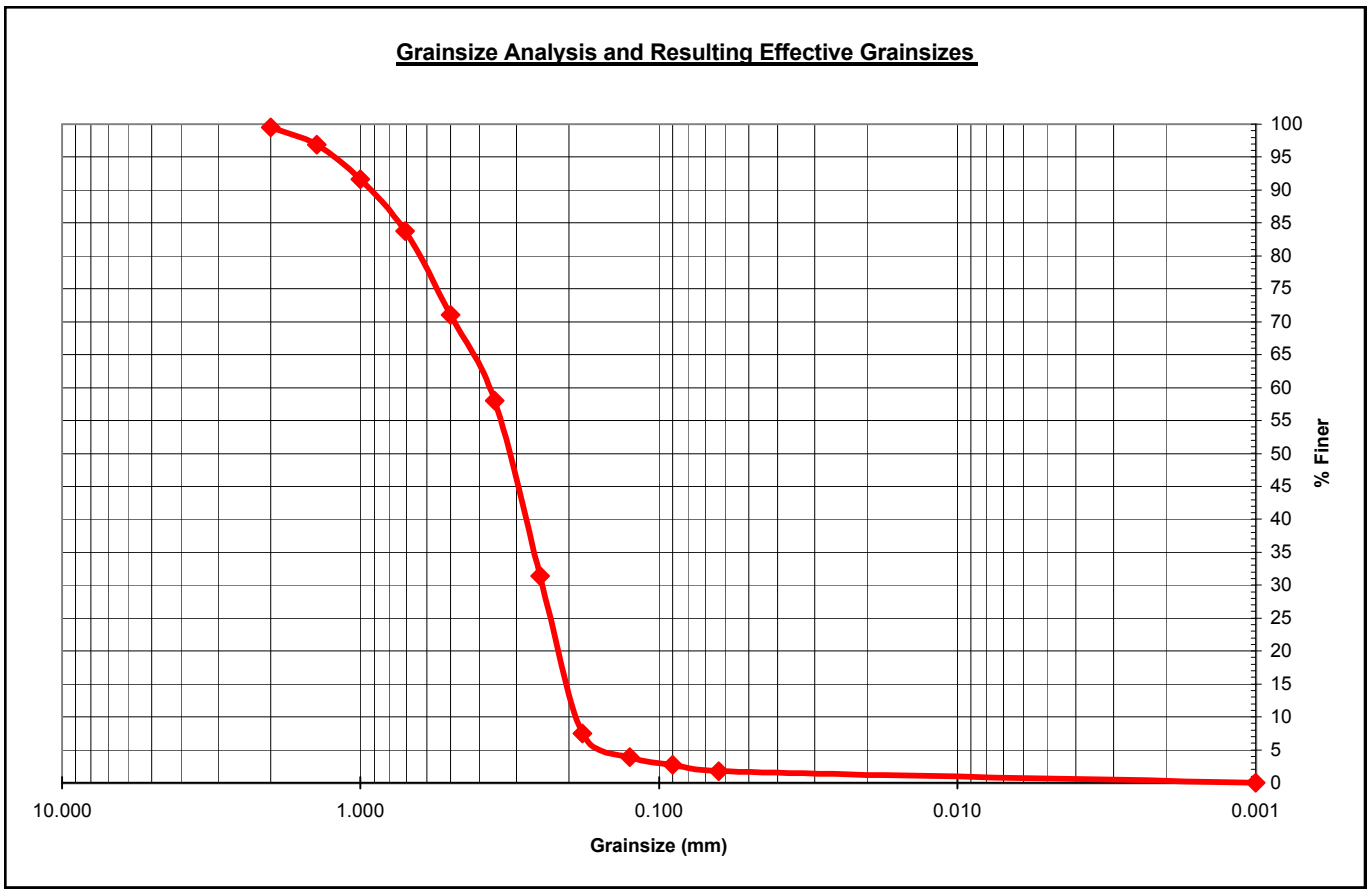
Sample ID:	ECP8-SB1	
Sample Depth:	23-24	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	97.90	g
Total Sieve Weight:	97.70	g
Weight Loss:	0.2	g
Percent Loss:	0.20	%

11.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.50	0.51	99.49	Coarse % (> 0.5 mm)	28.97%
	14	1.4	2.50	2.56	96.93		
	18	1.0	5.20	5.32	91.61		
	25	0.71	7.70	7.88	83.73		
	35	0.50	12.40	12.69	71.03		
Medium Material	45	0.355	12.70	13.00	58.03	Medium % (0.25 - 0.5 mm)	39.61%
	60	0.250	26.00	26.61	31.42		
Fine Material	80	0.180	23.40	23.95	7.47	Fine % (0.125 - 0.25 mm)	27.53%
	120	0.125	3.50	3.58	3.89		
Silt Material	170	0.090	1.10	1.13	2.76	Silt % (0.125 - 0.063 mm)	2.15%
	230	0.063	1.00	1.02	1.74		
Pan Material	pan	0.001	1.70	1.74	0.00	Pan % (< 0.063 mm)	1.74%
						Total	**100.00%**

Total (g)	**97.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



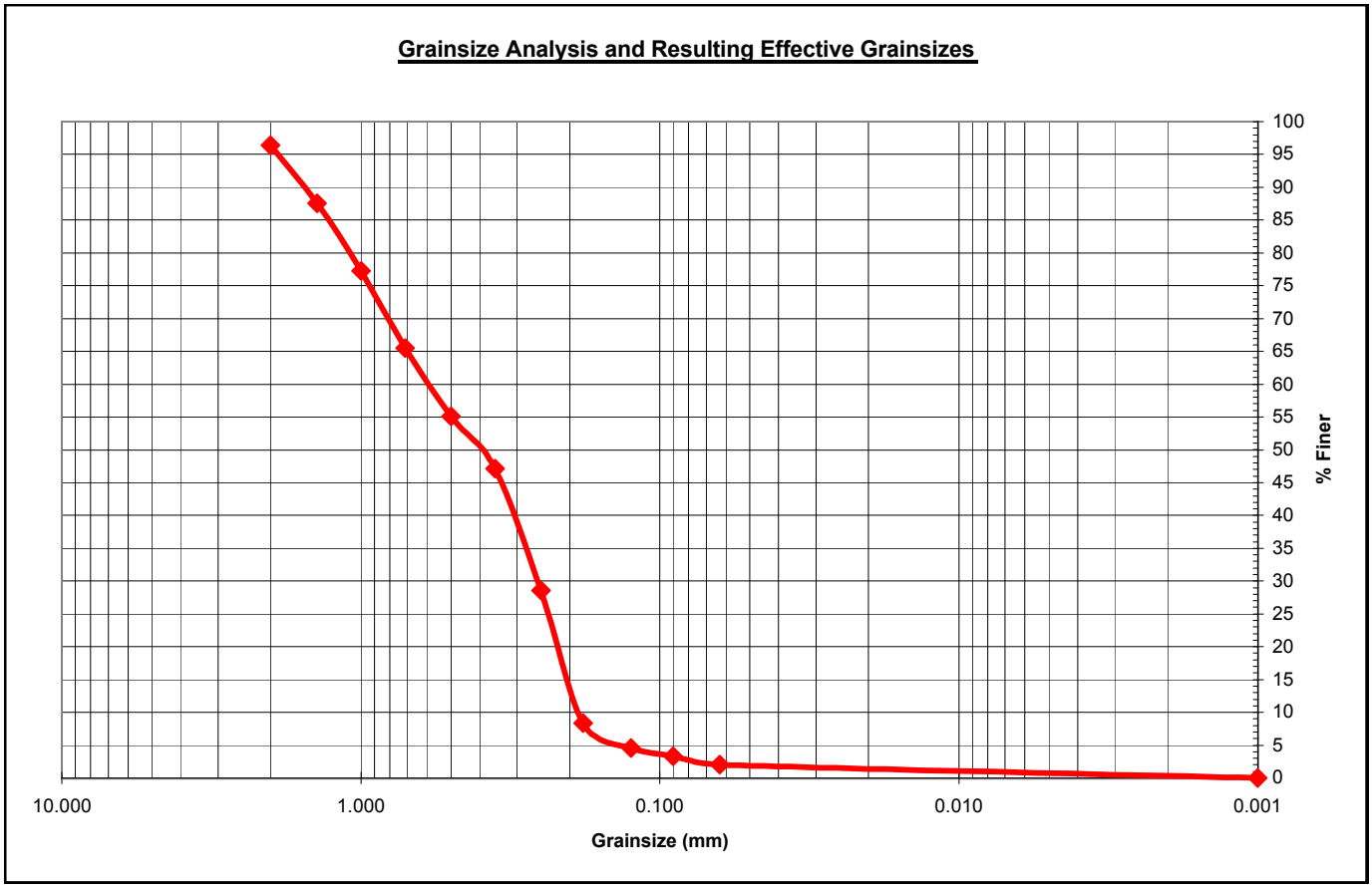
Sample ID:	ECP8-SB1	
Sample Depth:	24-25	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	98.40	g
Total Sieve Weight:	98.20	g
Weight Loss:	0.2	g
Percent Loss:	0.20	%

10.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	3.50	3.56	96.44	Coarse % (> 0.5 mm)	44.91%
	14	1.4	8.70	8.86	87.58		
	18	1.0	10.10	10.29	77.29		
	25	0.71	11.60	11.81	65.48		
	35	0.50	10.20	10.39	55.09		
Medium Material	45	0.355	7.80	7.94	47.15	Medium % (0.25 - 0.5 mm)	26.48%
	60	0.250	18.20	18.53	28.62		
Fine Material	80	0.180	19.90	20.26	8.35	Fine % (0.125 - 0.25 mm)	24.03%
	120	0.125	3.70	3.77	4.58		
Silt Material	170	0.090	1.30	1.32	3.26	Silt % (0.125 - 0.063 mm)	2.55%
	230	0.063	1.20	1.22	2.04		
Pan Material	pan	0.001	2.00	2.04	0.00	Pan % (< 0.063 mm)	2.04%
						Total	**100.00%**

Total (g)	98.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



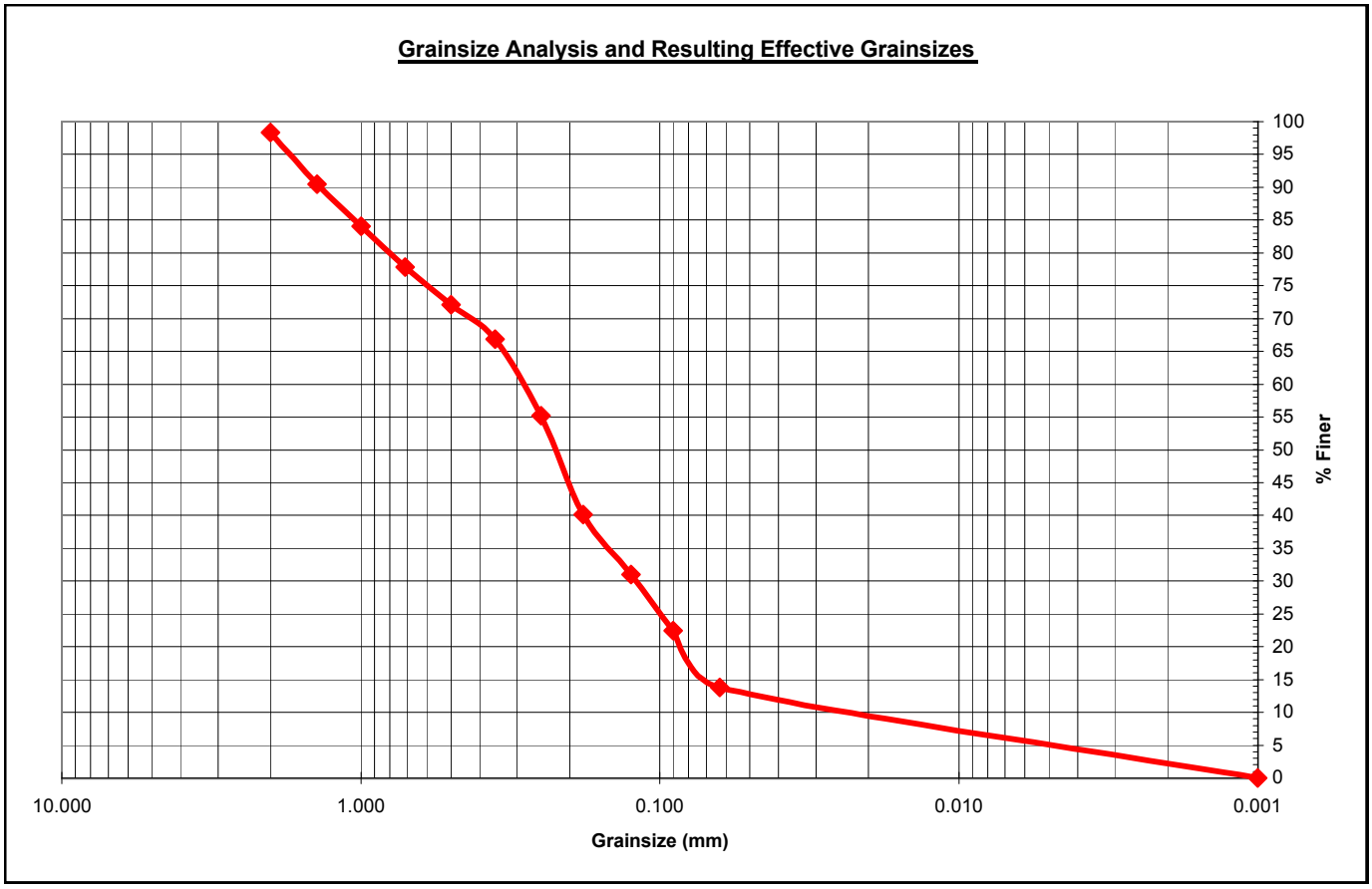
Sample ID:	ECP8-SB1	
Sample Depth:	25-26	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	91.00	g
Total Sieve Weight:	91.00	g
Weight Loss:	0	g
Percent Loss:	0.00	%

17.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.50	1.65	98.35	Coarse % (> 0.5 mm)	27.91%
	14	1.4	7.20	7.91	90.44		
	18	1.0	5.80	6.37	84.07		
	25	0.71	5.70	6.26	77.80		
	35	0.50	5.20	5.71	72.09		
Medium Material	45	0.355	4.80	5.27	66.81	Medium % (0.25 - 0.5 mm)	16.92%
	60	0.250	10.60	11.65	55.16		
Fine Material	80	0.180	13.70	15.05	40.11	Fine % (0.125 - 0.25 mm)	24.18%
	120	0.125	8.30	9.12	30.99		
Silt Material	170	0.090	7.80	8.57	22.42	Silt % (0.125 - 0.063 mm)	17.14%
	230	0.063	7.80	8.57	13.85		
Pan Material	pan	0.001	12.60	13.85	0.00	Pan % (< 0.063 mm)	13.85%
						Total	**100.00%**

Total (g)	91.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



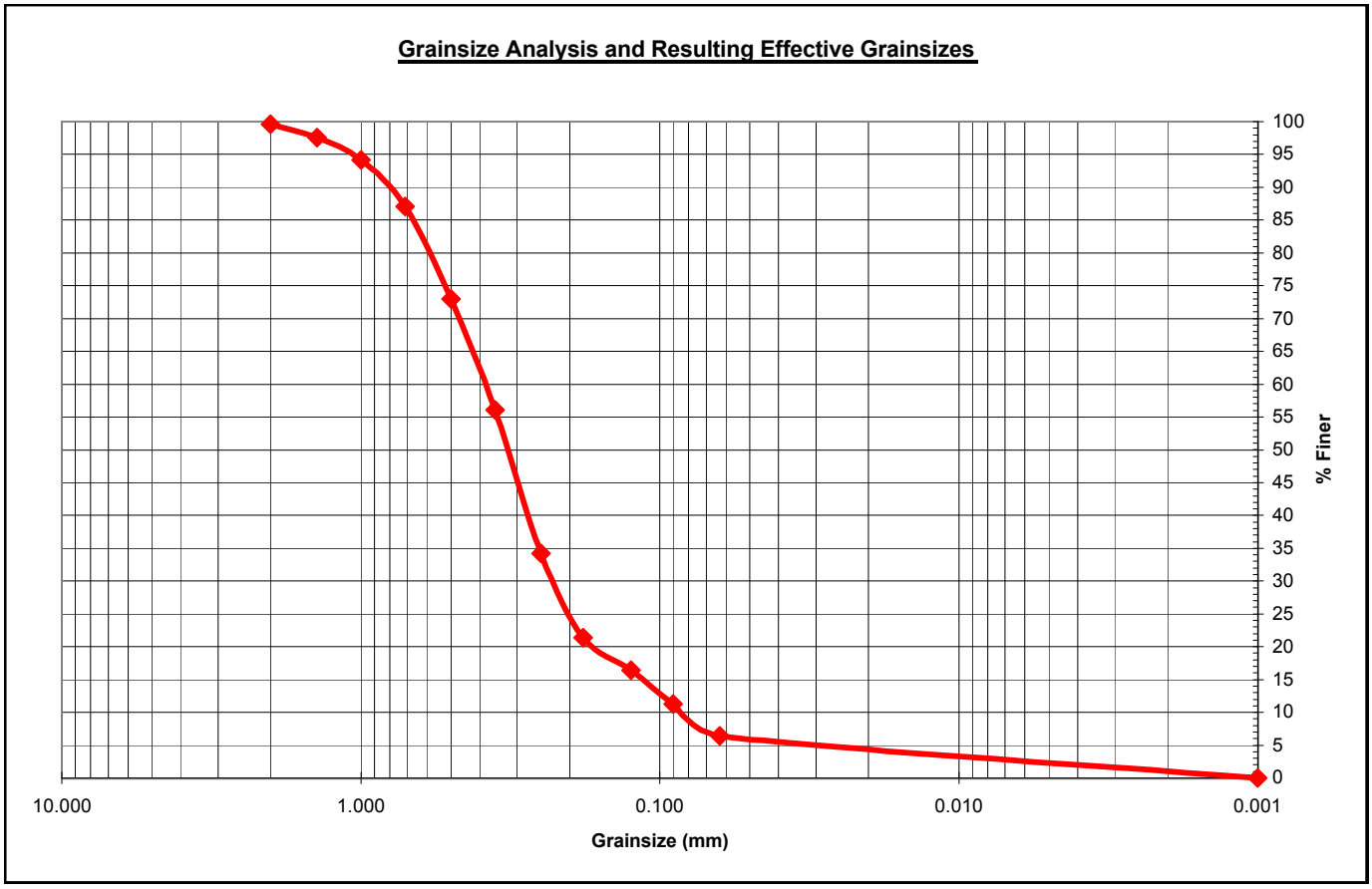
Sample ID:	ECP8-SB1	
Sample Depth:	26-27	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.20	g
Total Sieve Weight:	98.50	g
Weight Loss:	0.7	g
Percent Loss:	0.71	%

9.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.41	99.59	Coarse % (> 0.5 mm)	27.01%
	14	1.4	2.00	2.03	97.56		
	18	1.0	3.30	3.35	94.21		
	25	0.71	7.00	7.11	87.11		
	35	0.50	13.90	14.11	72.99		
Medium Material	45	0.355	16.70	16.95	56.04	Medium % (0.25 - 0.5 mm)	38.78%
	60	0.250	21.50	21.83	34.21		
Fine Material	80	0.180	12.60	12.79	21.42	Fine % (0.125 - 0.25 mm)	17.77%
	120	0.125	4.90	4.97	16.45		
Silt Material	170	0.090	5.10	5.18	11.27	Silt % (0.125 - 0.063 mm)	10.05%
	230	0.063	4.80	4.87	6.40		
Pan Material	pan	0.001	6.30	6.40	0.00	Pan % (< 0.063 mm)	6.40%
						Total	**100.00%**

Total (g)	98.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



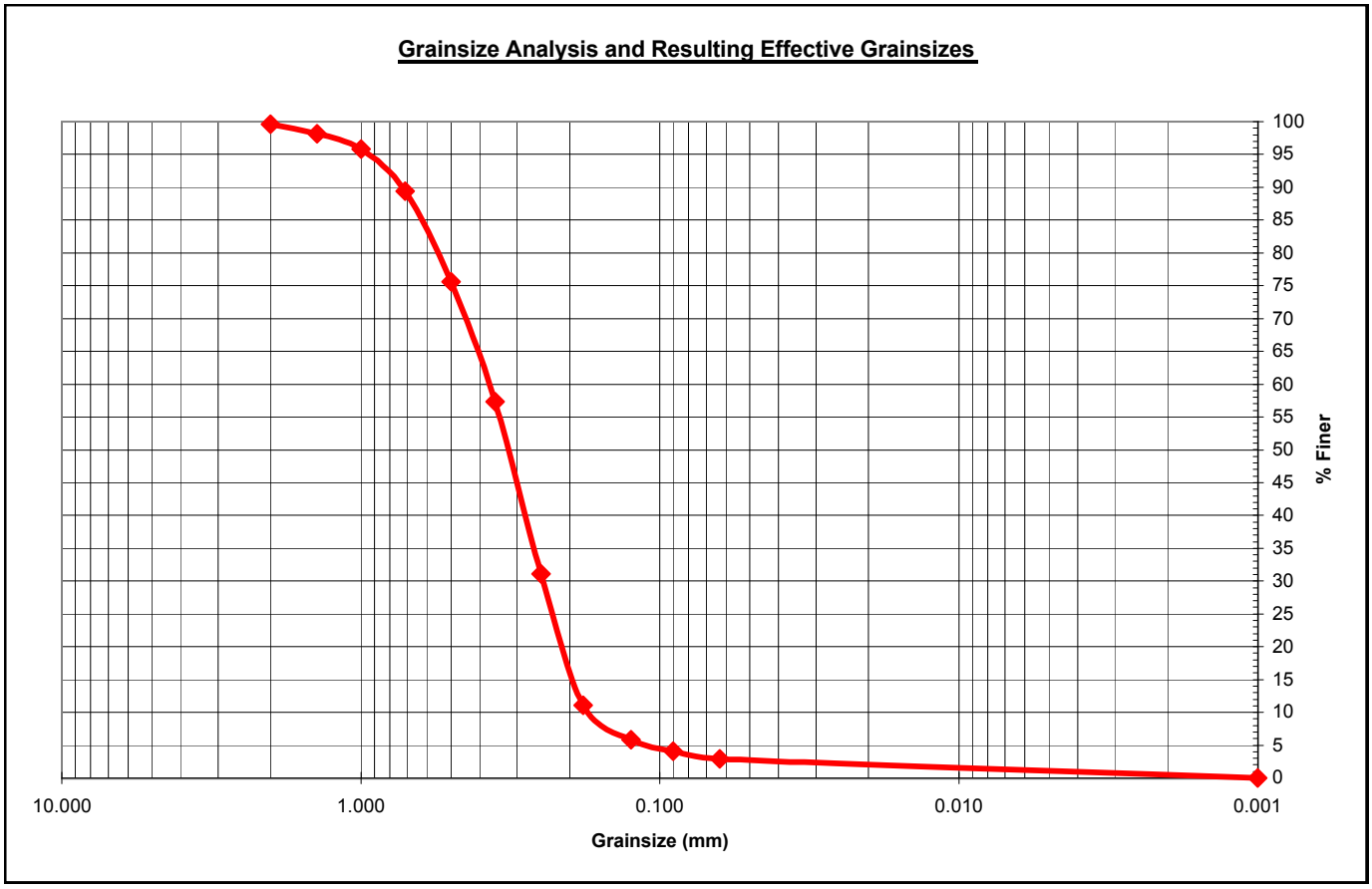
Sample ID:	ECP8-SB1	
Sample Depth:	27-28	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	92.90	g
Total Sieve Weight:	92.80	g
Weight Loss:	0.1	g
Percent Loss:	0.11	%

15.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.43	99.57	Coarse % (> 0.5 mm)	24.35%
	14	1.4	1.30	1.40	98.17		
	18	1.0	2.20	2.37	95.80		
	25	0.71	5.90	6.36	89.44		
	35	0.50	12.80	13.79	75.65		
Medium Material	45	0.355	17.00	18.32	57.33	Medium % (0.25 - 0.5 mm)	44.50%
	60	0.250	24.30	26.19	31.14		
Fine Material	80	0.180	18.60	20.04	11.10	Fine % (0.125 - 0.25 mm)	25.32%
	120	0.125	4.90	5.28	5.82		
Silt Material	170	0.090	1.60	1.72	4.09	Silt % (0.125 - 0.063 mm)	2.91%
	230	0.063	1.10	1.19	2.91		
Pan Material	pan	0.001	2.70	2.91	0.00	Pan % (< 0.063 mm)	2.91%
						Total	100.00%

Total (g)	92.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



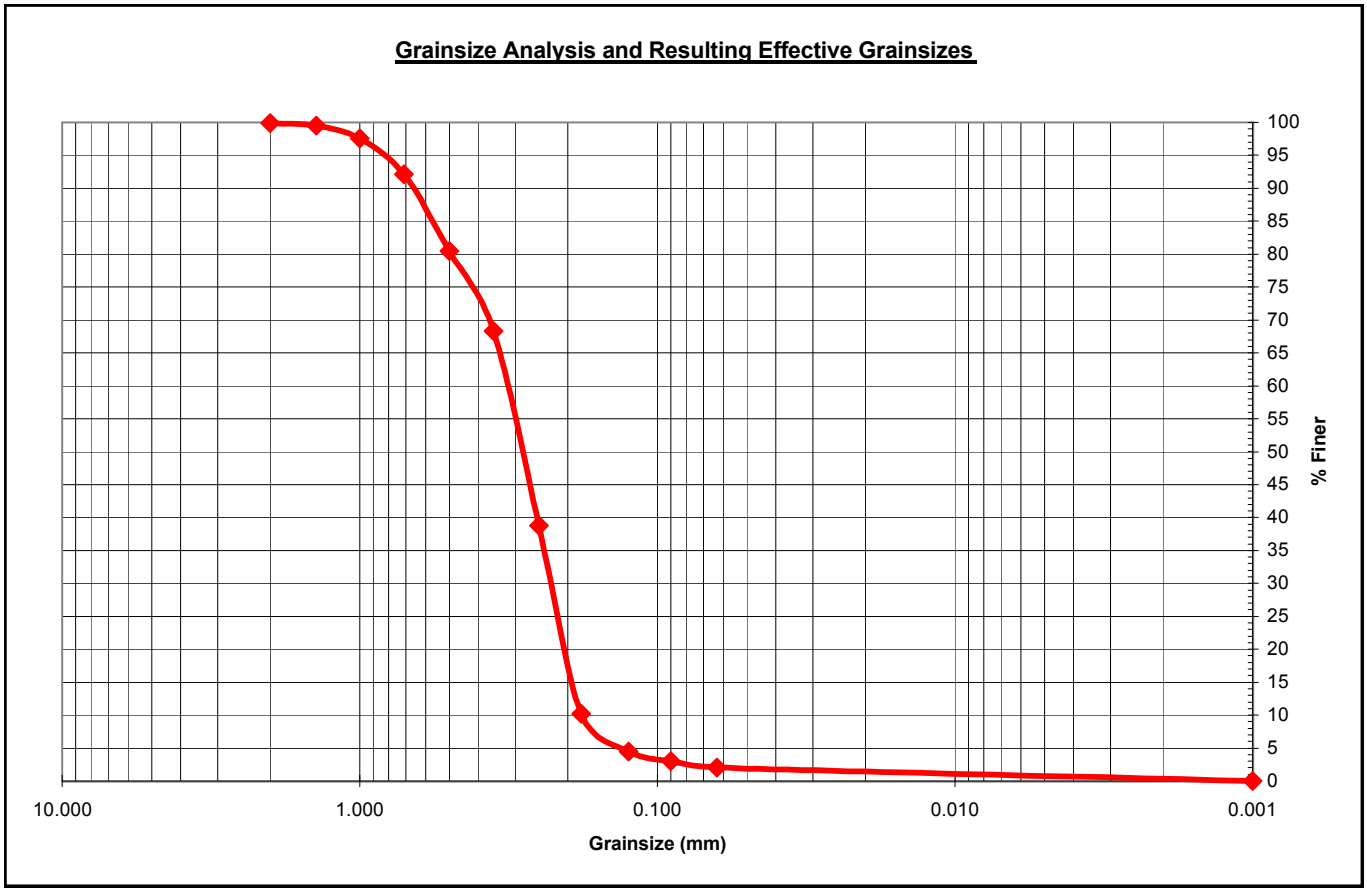
Sample ID:	ECP8-SB1
Sample Depth:	28-29 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.40 g
Total Sieve Weight:	88.90 g
Weight Loss:	0.5 g
Percent Loss:	0.56 %

18.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	19.57%
	14	1.4	0.30	0.34	99.55		
	18	1.0	1.80	2.02	97.53		
	25	0.71	4.80	5.40	92.13		
	35	0.50	10.40	11.70	80.43		
Medium Material	45	0.355	10.80	12.15	68.28	Medium % (0.25 - 0.5 mm)	41.62%
	60	0.250	26.20	29.47	38.81		
Fine Material	80	0.180	25.40	28.57	10.24	Fine % (0.125 - 0.25 mm)	34.31%
	120	0.125	5.10	5.74	4.50		
Silt Material	170	0.090	1.30	1.46	3.04	Silt % (0.125 - 0.063 mm)	2.47%
	230	0.063	0.90	1.01	2.02		
Pan Material	pan	0.001	1.80	2.02	0.00	Pan % (< 0.063 mm)	2.02%
						Total	**100.00%**

Total (g)	88.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



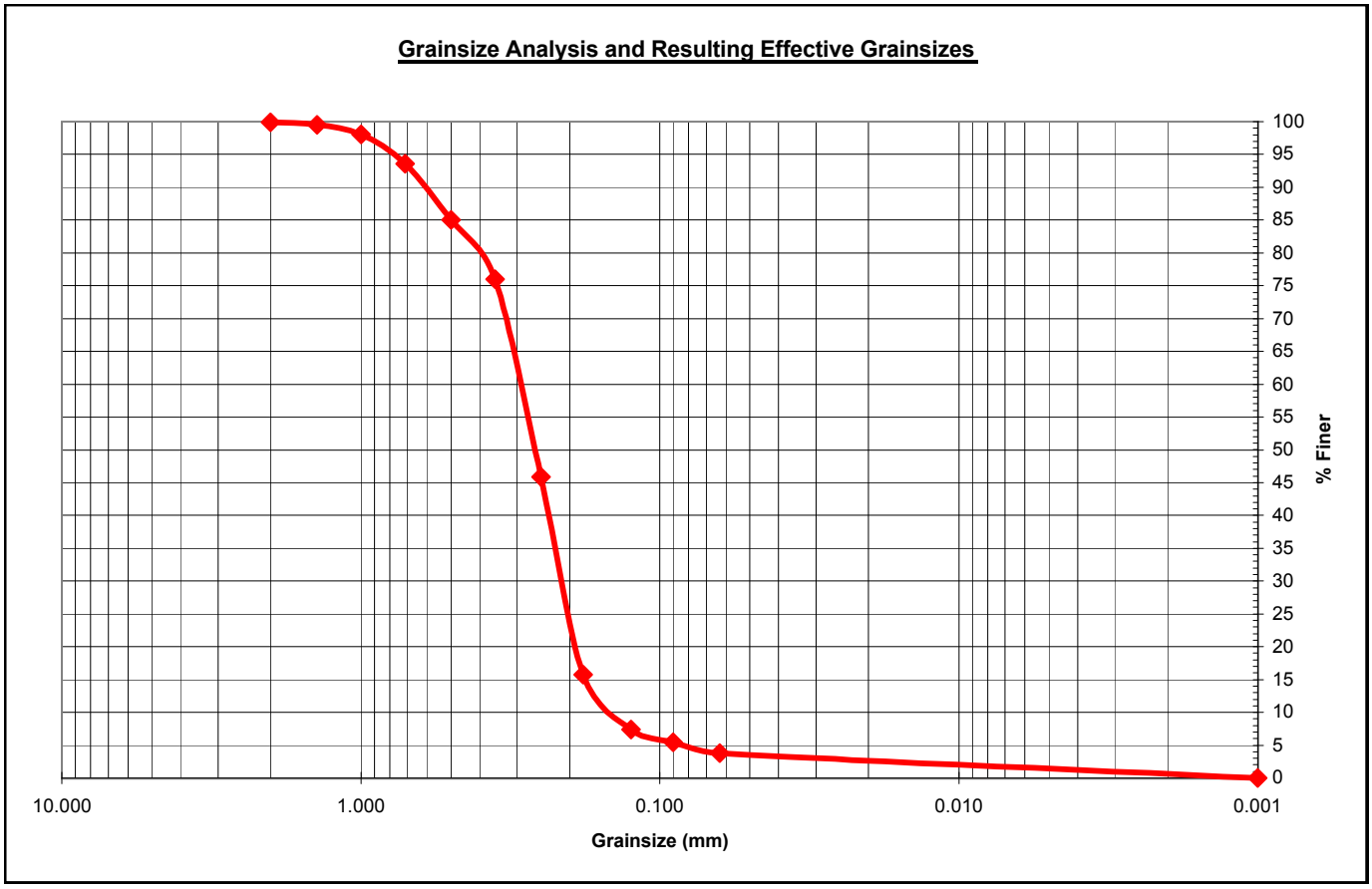
Sample ID:	ECP8-SB1	
Sample Depth:	29-30	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.30	g
Total Sieve Weight:	87.00	g
Weight Loss:	1.3	g
Percent Loss:	1.47	%

19.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	14.94%
	14	1.4	0.30	0.34	99.54		
	18	1.0	1.30	1.49	98.05		
	25	0.71	3.90	4.48	93.56		
	35	0.50	7.40	8.51	85.06		
Medium Material	45	0.355	7.90	9.08	75.98	Medium % (0.25 - 0.5 mm)	39.20%
	60	0.250	26.20	30.11	45.86		
Fine Material	80	0.180	26.20	30.11	15.75	Fine % (0.125 - 0.25 mm)	38.51%
	120	0.125	7.30	8.39	7.36		
Silt Material	170	0.090	1.70	1.95	5.40	Silt % (0.125 - 0.063 mm)	3.56%
	230	0.063	1.40	1.61	3.79		
Pan Material	pan	0.001	3.30	3.79	0.00	Pan % (< 0.063 mm)	3.79%
						Total	100.00%

Total (g)	87.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



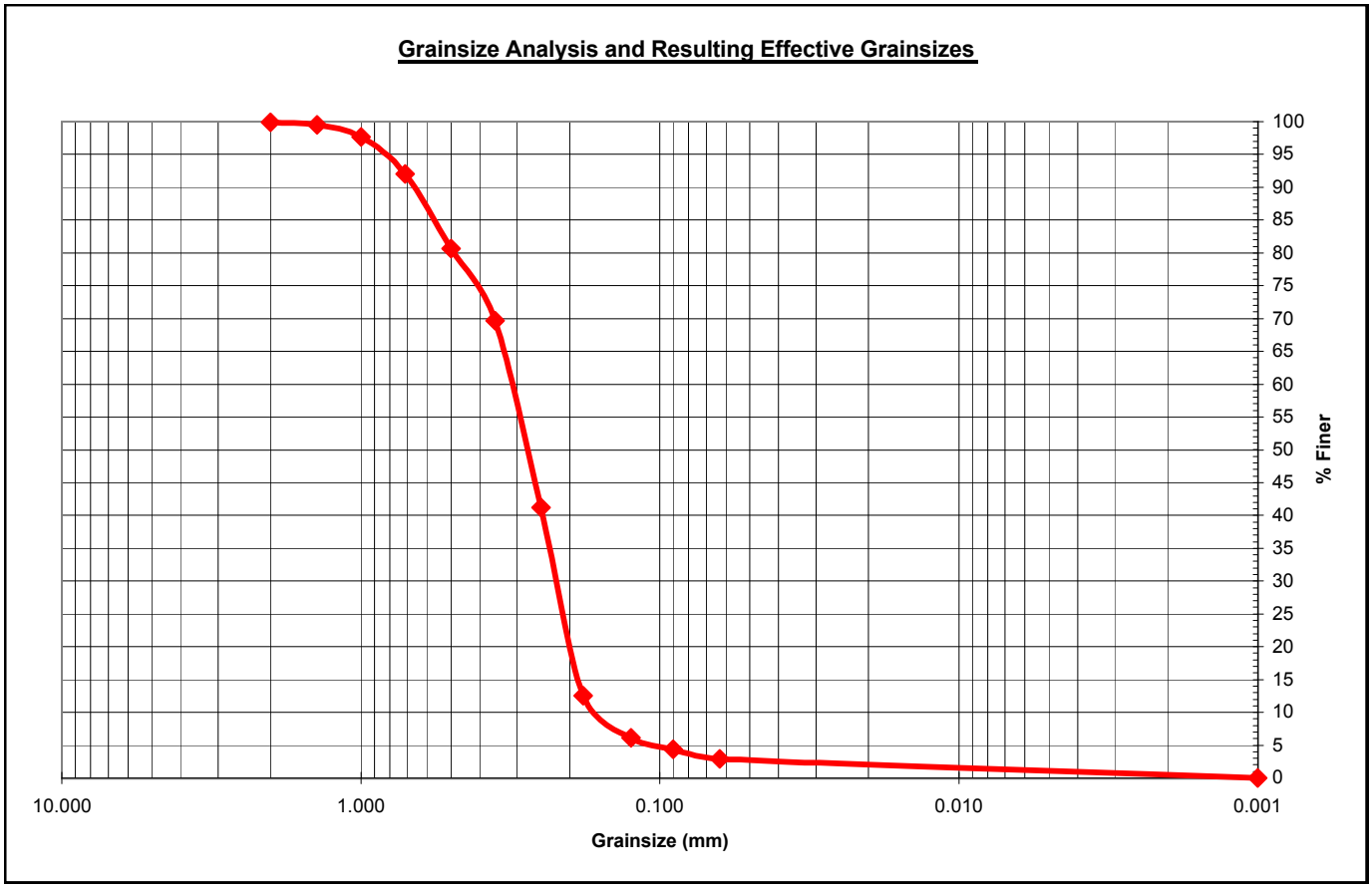
Sample ID:	ECP8-SB1	
Sample Depth:	30-31	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.20	g
Total Sieve Weight:	89.60	g
Weight Loss:	0.6	g
Percent Loss:	0.67	%

18.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	19.31%
	14	1.4	0.30	0.33	99.55		
	18	1.0	1.70	1.90	97.66		
	25	0.71	5.00	5.58	92.08		
	35	0.50	10.20	11.38	80.69		
Medium Material	45	0.355	9.90	11.05	69.64	Medium % (0.25 - 0.5 mm)	39.51%
	60	0.250	25.50	28.46	41.18		
Fine Material	80	0.180	25.70	28.68	12.50	Fine % (0.125 - 0.25 mm)	35.04%
	120	0.125	5.70	6.36	6.14		
Silt Material	170	0.090	1.60	1.79	4.35	Silt % (0.125 - 0.063 mm)	3.24%
	230	0.063	1.30	1.45	2.90		
Pan Material	pan	0.001	2.60	2.90	0.00	Pan % (< 0.063 mm)	2.90%
						Total	**100.00%**

Total (g)	89.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



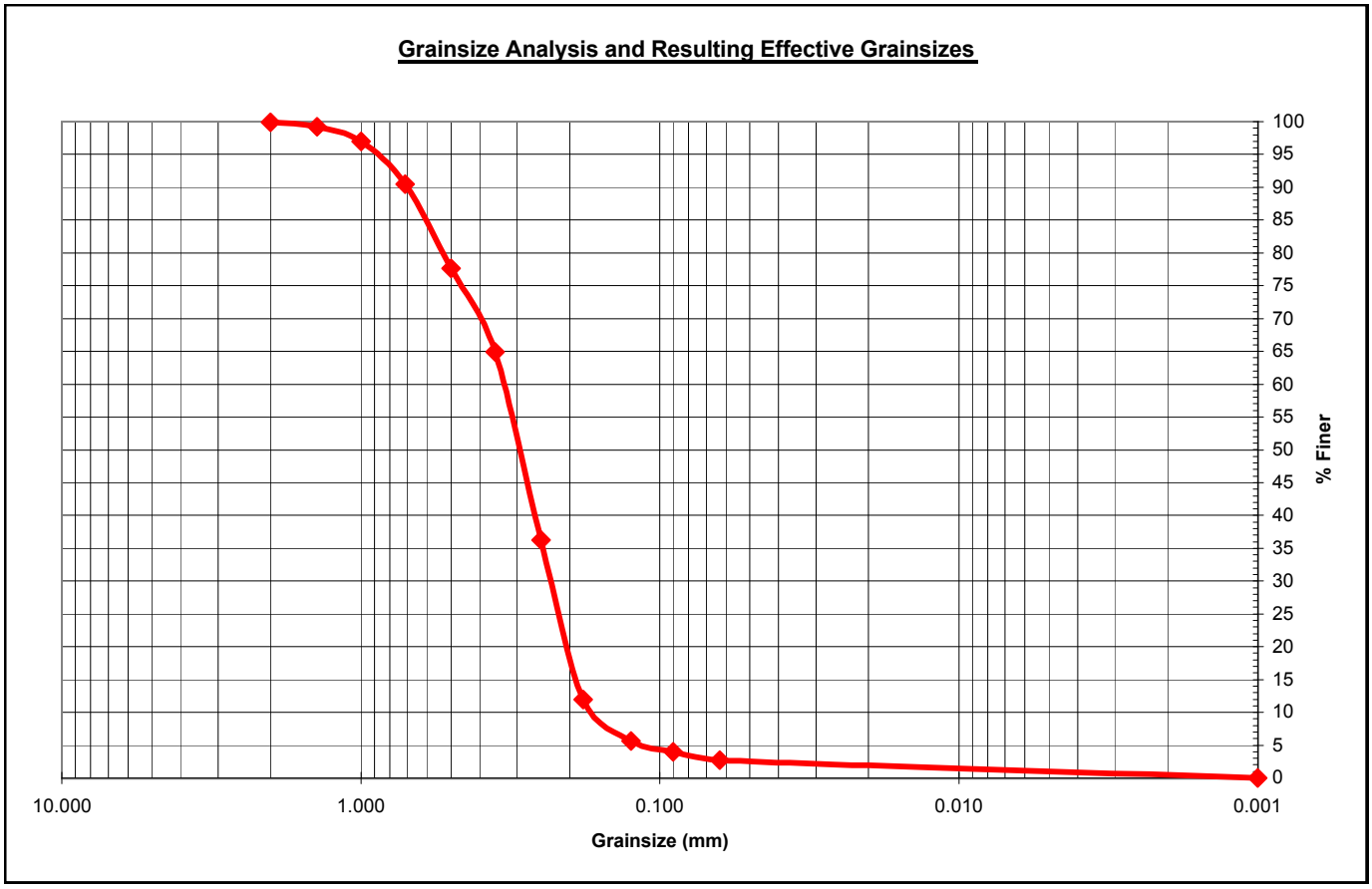
Sample ID:	ECP8-SB1	
Sample Depth:	31-32	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	95.40	g
Total Sieve Weight:	94.80	g
Weight Loss:	0.6	g
Percent Loss:	0.63	%

13.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	22.36%
	14	1.4	0.60	0.63	99.26		
	18	1.0	2.20	2.32	96.94		
	25	0.71	6.10	6.43	90.51		
	35	0.50	12.20	12.87	77.64		
Medium Material	45	0.355	12.10	12.76	64.87	Medium % (0.25 - 0.5 mm)	41.35%
	60	0.250	27.10	28.59	36.29		
Fine Material	80	0.180	23.10	24.37	11.92	Fine % (0.125 - 0.25 mm)	30.70%
	120	0.125	6.00	6.33	5.59		
Silt Material	170	0.090	1.50	1.58	4.01	Silt % (0.125 - 0.063 mm)	2.85%
	230	0.063	1.20	1.27	2.74		
Pan Material	pan	0.001	2.60	2.74	0.00	Pan % (< 0.063 mm)	2.74%
						Total	**100.00%**

Total (g)	94.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



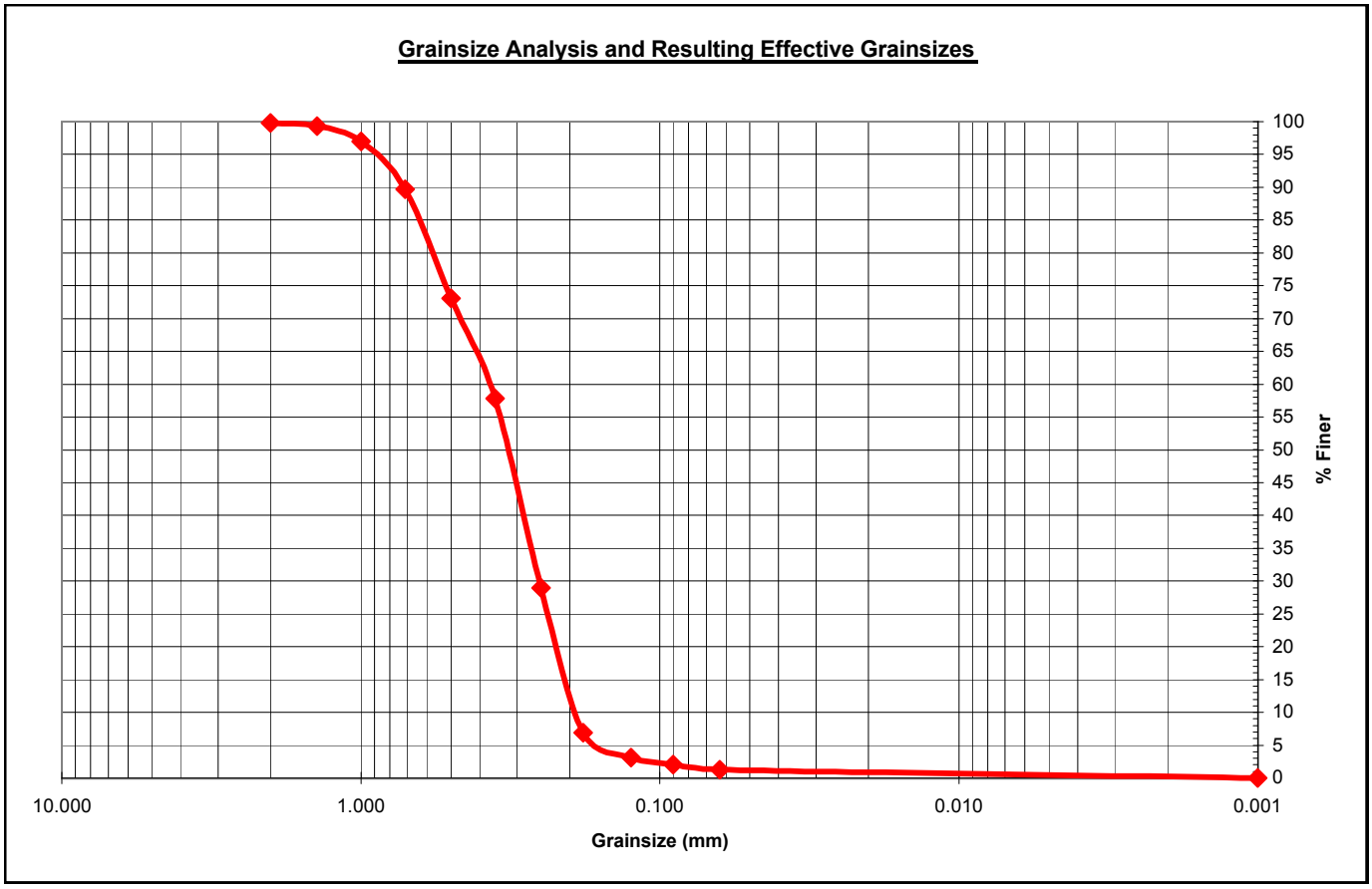
Sample ID:	ECP8-SB1	
Sample Depth:	32-33	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.80	g
Total Sieve Weight:	101.90	g
Weight Loss:	-0.1	g
Percent Loss:	-0.10	%

7.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	26.89%
	14	1.4	0.50	0.49	99.31		
	18	1.0	2.40	2.36	96.96		
	25	0.71	7.40	7.26	89.70		
	35	0.50	16.90	16.58	73.11		
Medium Material	45	0.355	15.60	15.31	57.80	Medium % (0.25 - 0.5 mm)	44.16%
	60	0.250	29.40	28.85	28.95		
Fine Material	80	0.180	22.50	22.08	6.87	Fine % (0.125 - 0.25 mm)	25.81%
	120	0.125	3.80	3.73	3.14		
Silt Material	170	0.090	1.10	1.08	2.06	Silt % (0.125 - 0.063 mm)	1.86%
	230	0.063	0.80	0.79	1.28		
Pan Material	pan	0.001	1.30	1.28	0.00	Pan % (< 0.063 mm)	1.28%
						Total	100.00%

Total (g)	101.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



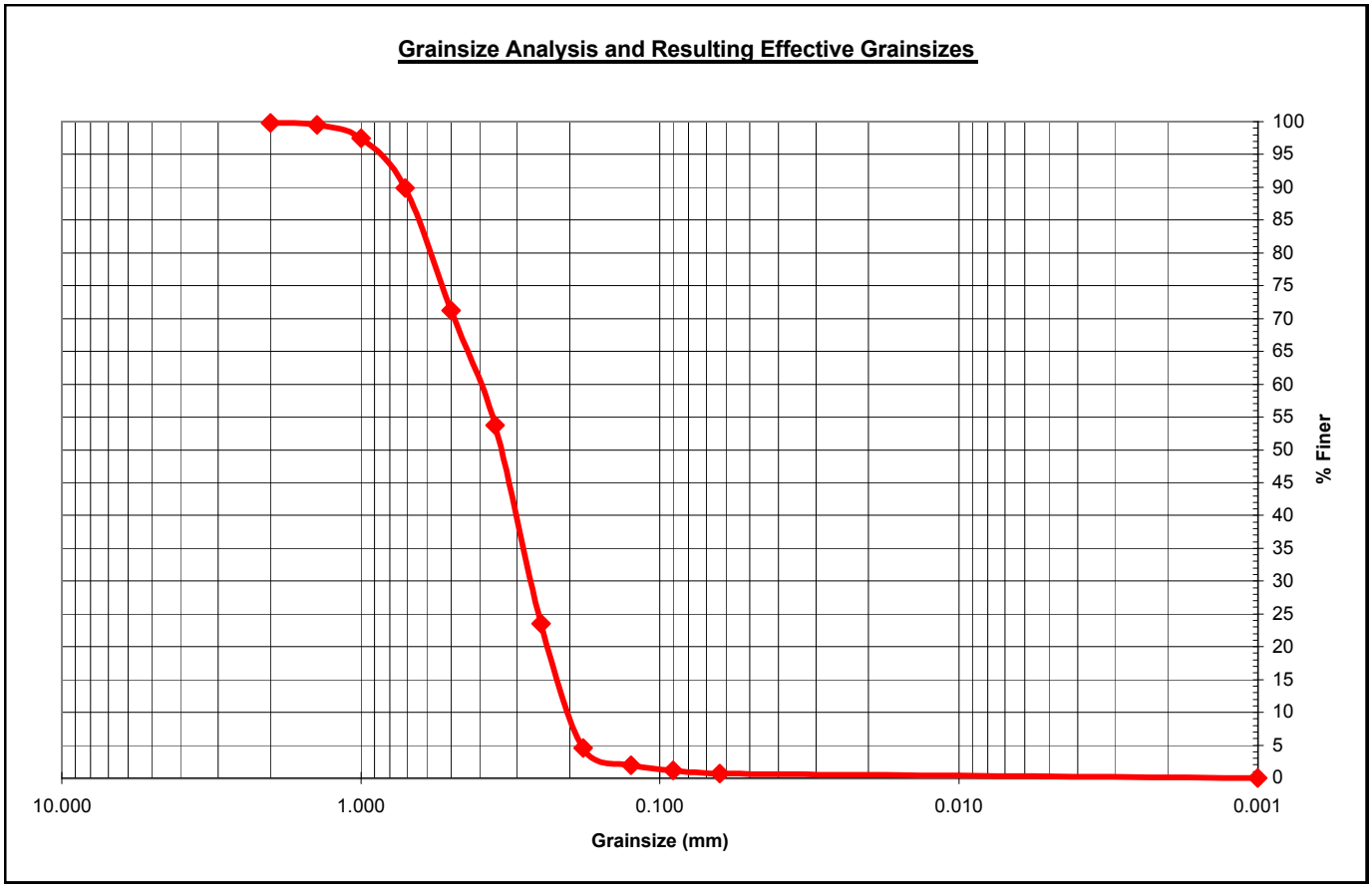
Sample ID:	ECP8-SB1	
Sample Depth:	33-34	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.20	g
Total Sieve Weight:	102.50	g
Weight Loss:	-0.3	g
Percent Loss:	-0.29	%

7.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.20	99.80	Coarse % (> 0.5 mm)	28.78%
	14	1.4	0.30	0.29	99.51		
	18	1.0	2.10	2.05	97.46		
	25	0.71	7.80	7.61	89.85		
	35	0.50	19.10	18.63	71.22		
Medium Material	45	0.355	17.90	17.46	53.76	Medium % (0.25 - 0.5 mm)	47.71%
	60	0.250	31.00	30.24	23.51		
Fine Material	80	0.180	19.40	18.93	4.59	Fine % (0.125 - 0.25 mm)	21.56%
	120	0.125	2.70	2.63	1.95		
Silt Material	170	0.090	0.80	0.78	1.17	Silt % (0.125 - 0.063 mm)	1.27%
	230	0.063	0.50	0.49	0.68		
Pan Material	pan	0.001	0.70	0.68	0.00	Pan % (< 0.063 mm)	0.68%
						Total	**100.00%**

Total (g)	102.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



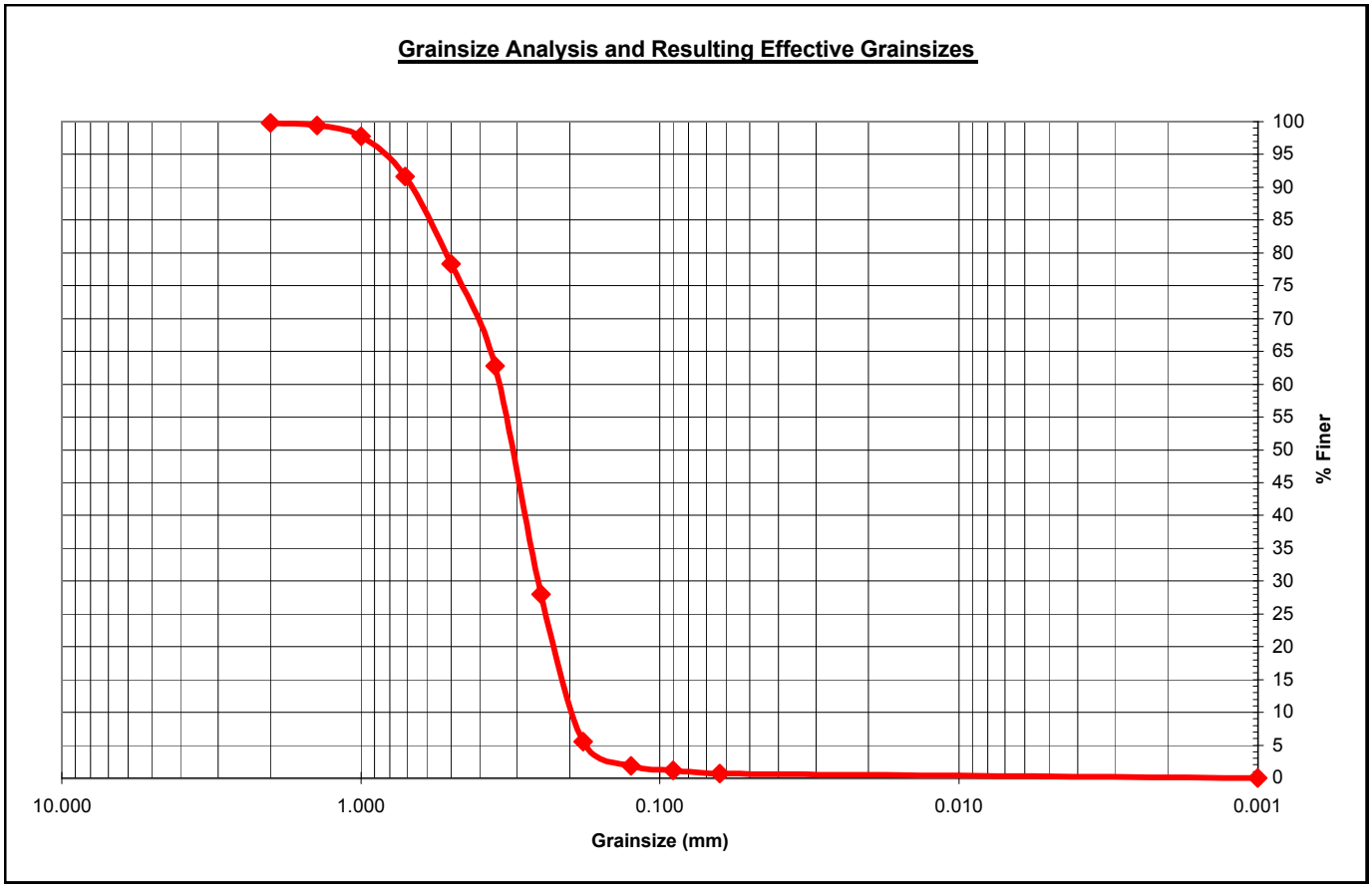
Sample ID:	ECP8-SB1	
Sample Depth:	34-35	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	103.00	g
Total Sieve Weight:	102.60	g
Weight Loss:	0.4	g
Percent Loss:	0.39	%

6.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.19	99.81	Coarse % (> 0.5 mm)	21.64%
	14	1.4	0.40	0.39	99.42		
	18	1.0	1.70	1.66	97.76		
	25	0.71	6.30	6.14	91.62		
	35	0.50	13.60	13.26	78.36		
Medium Material	45	0.355	16.00	15.59	62.77	Medium % (0.25 - 0.5 mm)	50.39%
	60	0.250	35.70	34.80	27.97		
Fine Material	80	0.180	23.00	22.42	5.56	Fine % (0.125 - 0.25 mm)	26.12%
	120	0.125	3.80	3.70	1.85		
Silt Material	170	0.090	0.70	0.68	1.17	Silt % (0.125 - 0.063 mm)	1.17%
	230	0.063	0.50	0.49	0.68		
Pan Material	pan	0.001	0.70	0.68	0.00	Pan % (< 0.063 mm)	0.68%
						Total	100.00%

Total (g)	102.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



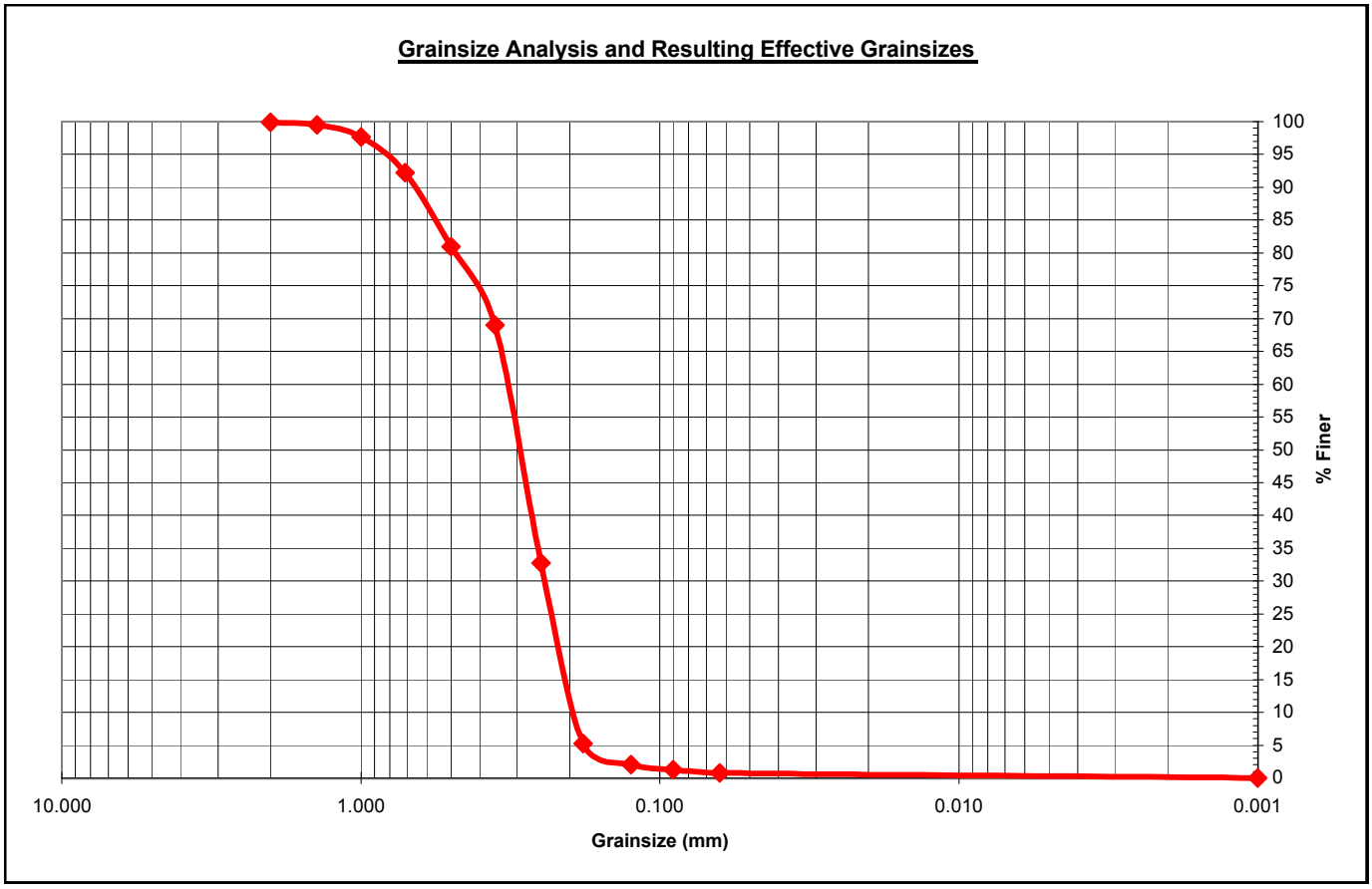
Sample ID:	ECP8-SB1
Sample Depth:	35-36 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	102.90 g
Total Sieve Weight:	102.90 g
Weight Loss:	0 g
Percent Loss:	0.00 %

6.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	19.05%
	14	1.4	0.40	0.39	99.51		
	18	1.0	1.90	1.85	97.67		
	25	0.71	5.60	5.44	92.23		
	35	0.50	11.60	11.27	80.95		
Medium Material	45	0.355	12.30	11.95	69.00	Medium % (0.25 - 0.5 mm)	48.20%
	60	0.250	37.30	36.25	32.75		
Fine Material	80	0.180	28.30	27.50	5.25	Fine % (0.125 - 0.25 mm)	30.71%
	120	0.125	3.30	3.21	2.04		
Silt Material	170	0.090	0.80	0.78	1.26	Silt % (0.125 - 0.063 mm)	1.26%
	230	0.063	0.50	0.49	0.78		
Pan Material	pan	0.001	0.80	0.78	0.00	Pan % (< 0.063 mm)	0.78%
						Total	100.00%

Total (g)	102.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



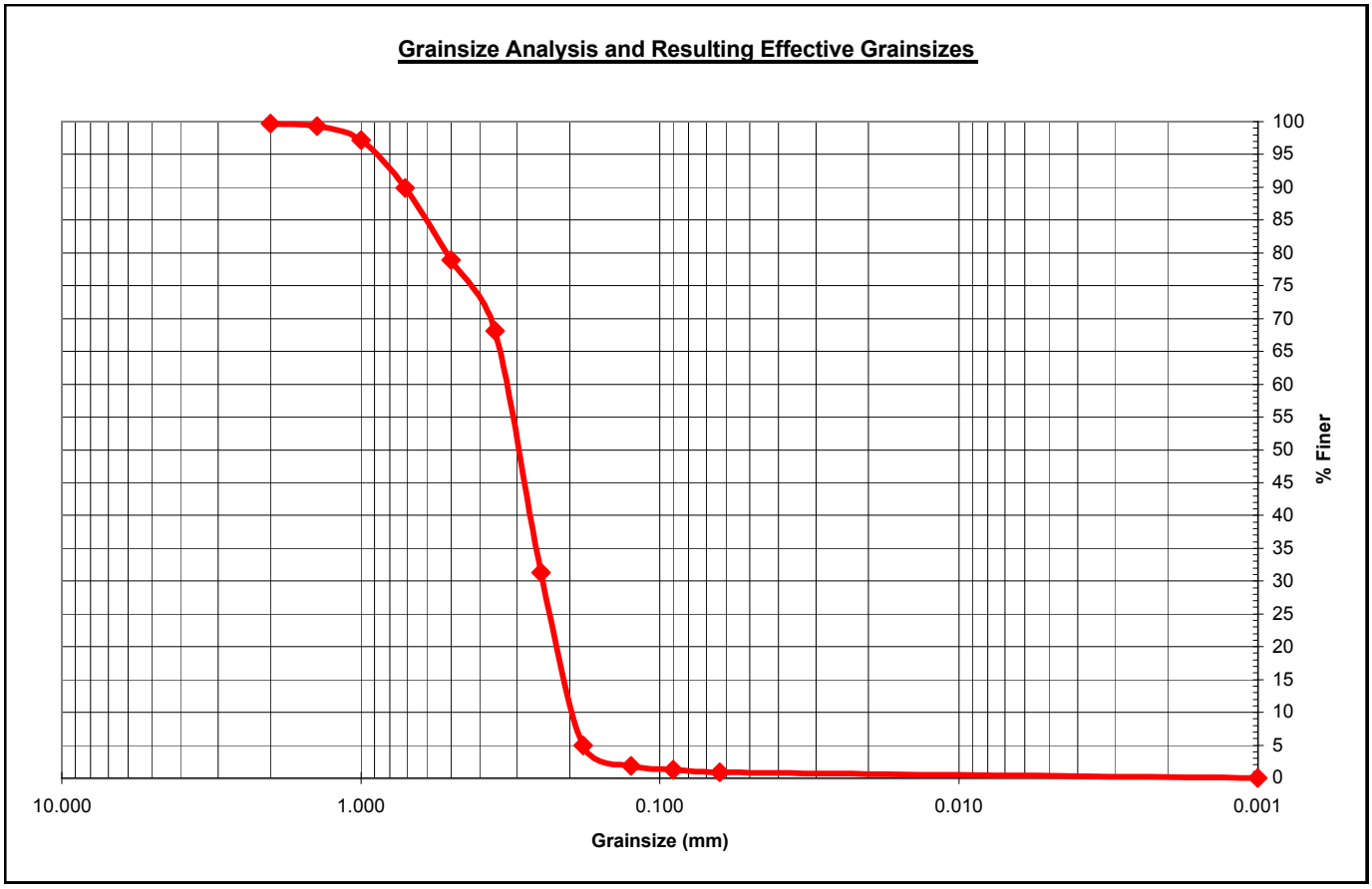
Sample ID:	ECP8-SB1	
Sample Depth:	36-37	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.50	g
Total Sieve Weight:	102.40	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

6.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.29	99.71	Coarse % (> 0.5 mm)	21.09%
	14	1.4	0.40	0.39	99.32		
	18	1.0	2.20	2.15	97.17		
	25	0.71	7.40	7.23	89.94		
	35	0.50	11.30	11.04	78.91		
Medium Material	45	0.355	11.00	10.74	68.16	Medium % (0.25 - 0.5 mm)	47.66%
	60	0.250	37.80	36.91	31.25		
Fine Material	80	0.180	26.90	26.27	4.98	Fine % (0.125 - 0.25 mm)	29.39%
	120	0.125	3.20	3.13	1.86		
Silt Material	170	0.090	0.60	0.59	1.27	Silt % (0.125 - 0.063 mm)	0.98%
	230	0.063	0.40	0.39	0.88		
Pan Material	pan	0.001	0.90	0.88	0.00	Pan % (< 0.063 mm)	0.88%
						Total	100.00%

Total (g)	102.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



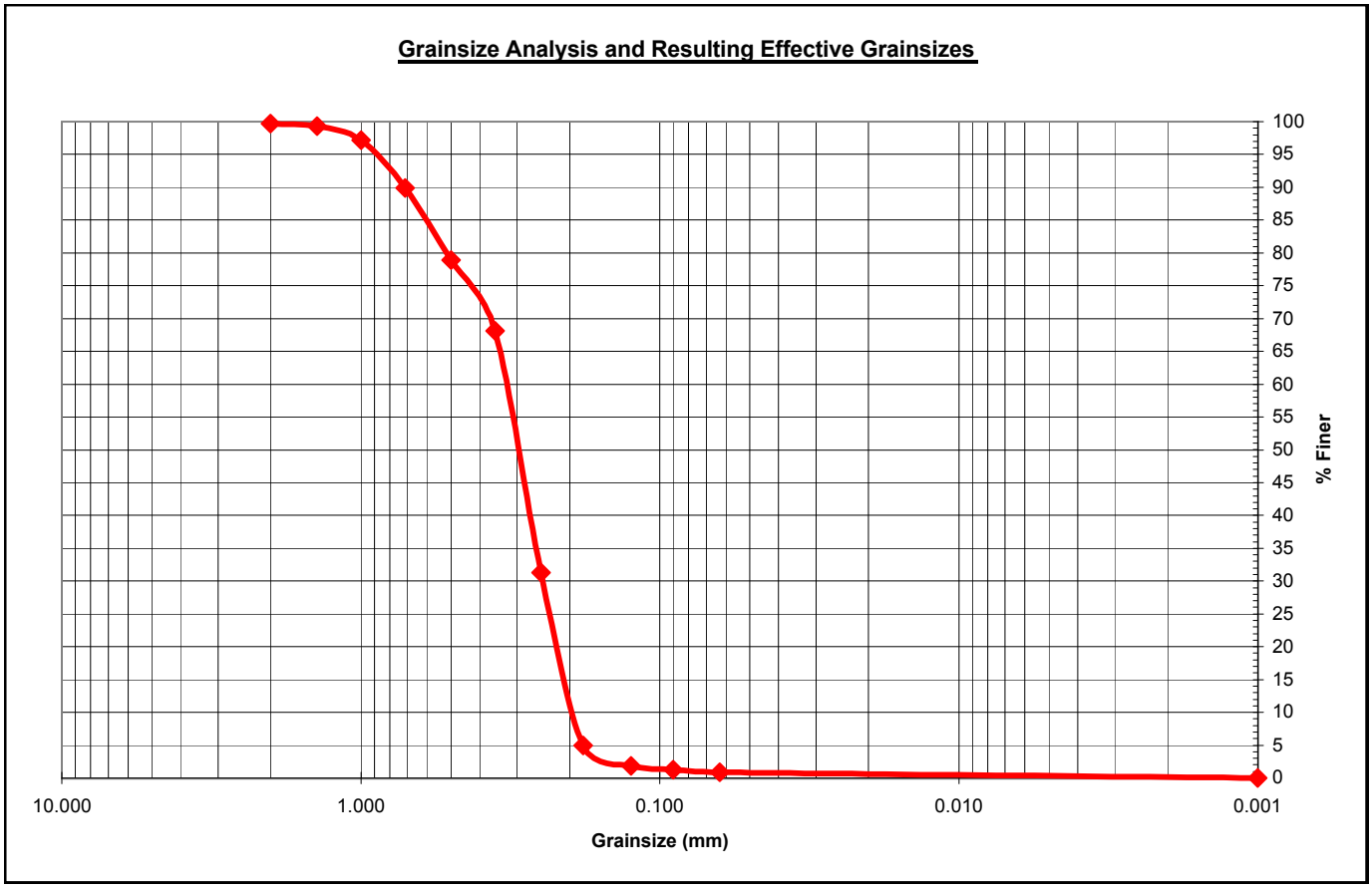
Sample ID:	ECP8-SB1	
Sample Depth:	37-38	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.40	g
Total Sieve Weight:	102.00	g
Weight Loss:	0.4	g
Percent Loss:	0.39	%

6.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.29	99.71	Coarse % (> 0.5 mm)	17.55%
	14	1.4	0.60	0.59	99.12		
	18	1.0	1.90	1.86	97.25		
	25	0.71	5.90	5.78	91.47		
	35	0.50	9.20	9.02	82.45		
Medium Material	45	0.355	8.60	8.43	74.02	Medium % (0.25 - 0.5 mm)	48.14%
	60	0.250	40.50	39.71	34.31		
Fine Material	80	0.180	29.50	28.92	5.39	Fine % (0.125 - 0.25 mm)	32.16%
	120	0.125	3.30	3.24	2.16		
Silt Material	170	0.090	0.70	0.69	1.47	Silt % (0.125 - 0.063 mm)	1.18%
	230	0.063	0.50	0.49	0.98		
Pan Material	pan	0.001	1.00	0.98	0.00	Pan % (< 0.063 mm)	0.98%
						Total	**100.00%**

Total (g)	102.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



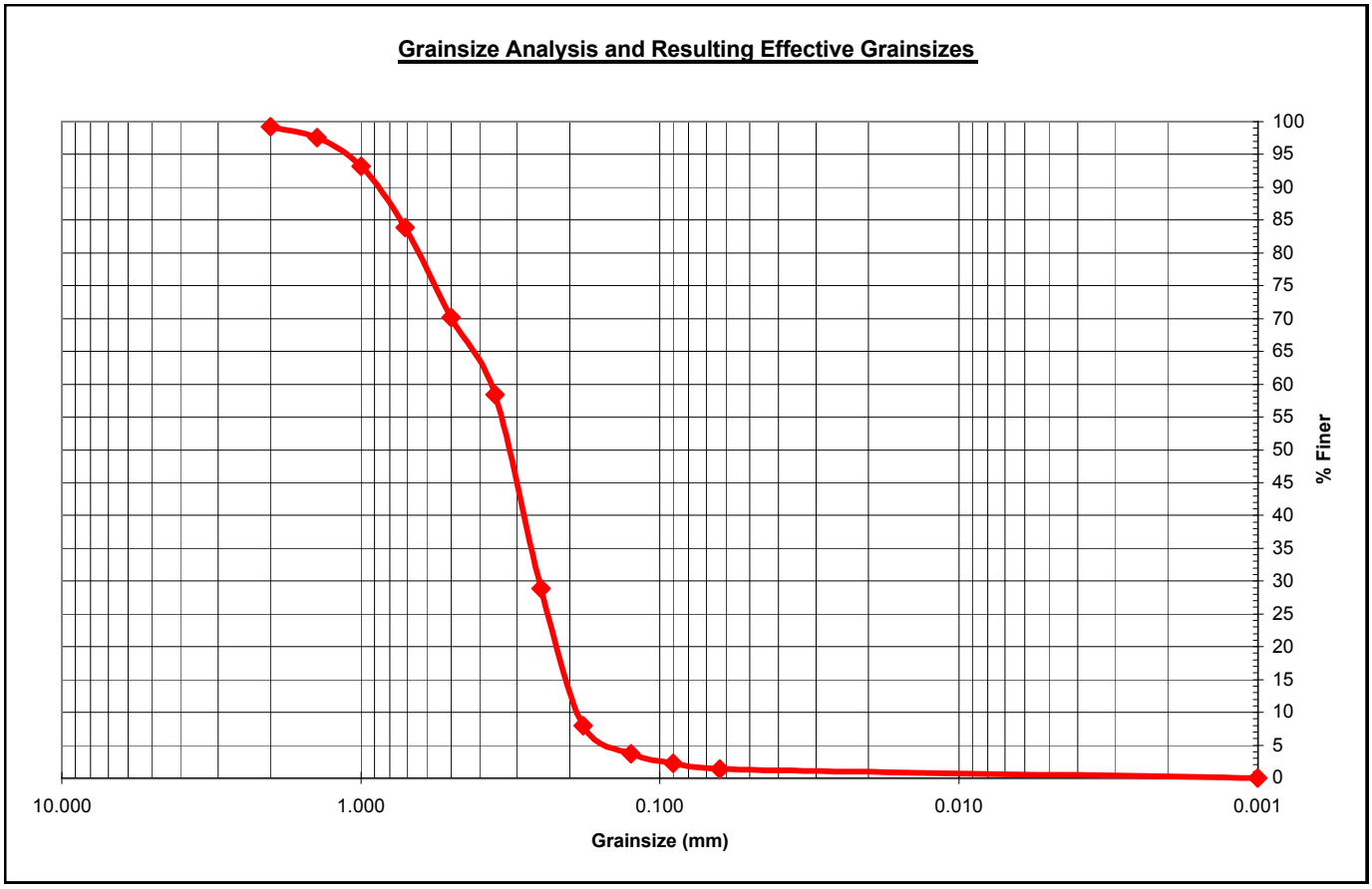
Sample ID:	ECP8-SB1	
Sample Depth:	38-39	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	89.80	g
Total Sieve Weight:	89.50	g
Weight Loss:	0.3	g
Percent Loss:	0.33	%

18.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.70	0.78	99.22	Coarse % (> 0.5 mm)	29.83%
	14	1.4	1.50	1.68	97.54		
	18	1.0	3.90	4.36	93.18		
	25	0.71	8.30	9.27	83.91		
	35	0.50	12.30	13.74	70.17		
Medium Material	45	0.355	10.50	11.73	58.44	Medium % (0.25 - 0.5 mm)	41.34%
	60	0.250	26.50	29.61	28.83		
Fine Material	80	0.180	18.70	20.89	7.93	Fine % (0.125 - 0.25 mm)	25.14%
	120	0.125	3.80	4.25	3.69		
Silt Material	170	0.090	1.30	1.45	2.23	Silt % (0.125 - 0.063 mm)	2.35%
	230	0.063	0.80	0.89	1.34		
Pan Material	pan	0.001	1.20	1.34	0.00	Pan % (< 0.063 mm)	1.34%
						Total	**100.00%**

Total (g)	89.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



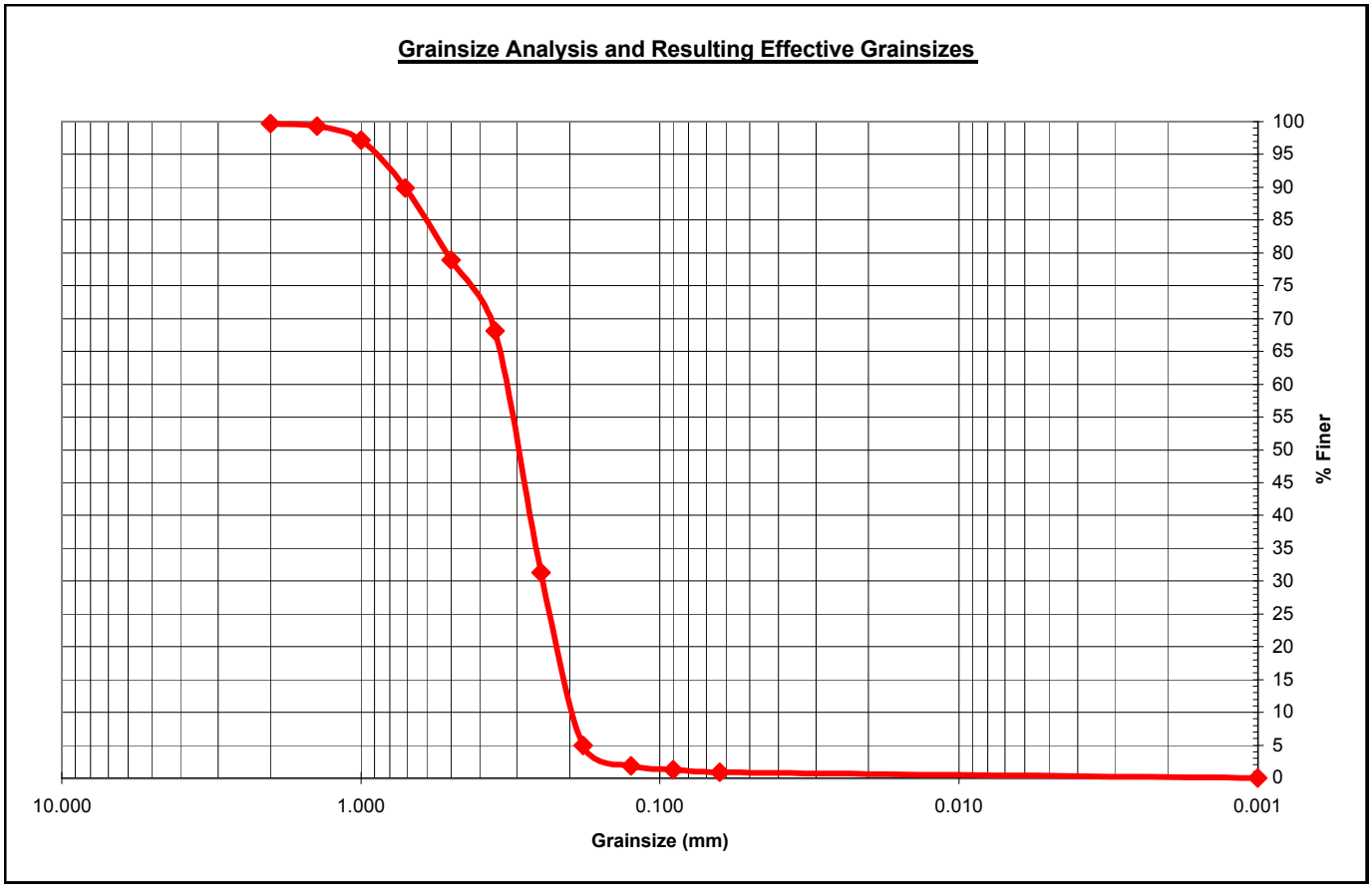
Sample ID:	ECP8-SB1
Sample Depth:	39-40 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.20 g
Total Sieve Weight:	93.70 g
Weight Loss:	0.5 g
Percent Loss:	0.53 %

14.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.00	2.13	97.87	Coarse % (> 0.5 mm)	47.49%
	14	1.4	2.70	2.88	94.98		
	18	1.0	7.80	8.32	86.66		
	25	0.71	14.80	15.80	70.86		
	35	0.50	17.20	18.36	52.51		
Medium Material	45	0.355	11.00	11.74	40.77	Medium % (0.25 - 0.5 mm)	21.66%
	60	0.250	9.30	9.93	30.84		
Fine Material	80	0.180	12.60	13.45	17.40	Fine % (0.125 - 0.25 mm)	22.52%
	120	0.125	8.50	9.07	8.32		
Silt Material	170	0.090	2.00	2.13	6.19	Silt % (0.125 - 0.063 mm)	3.84%
	230	0.063	1.60	1.71	4.48		
Pan Material	pan	0.001	4.20	4.48	0.00	Pan % (< 0.063 mm)	4.48%
						Total	**100.00%**

Total (g)	93.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



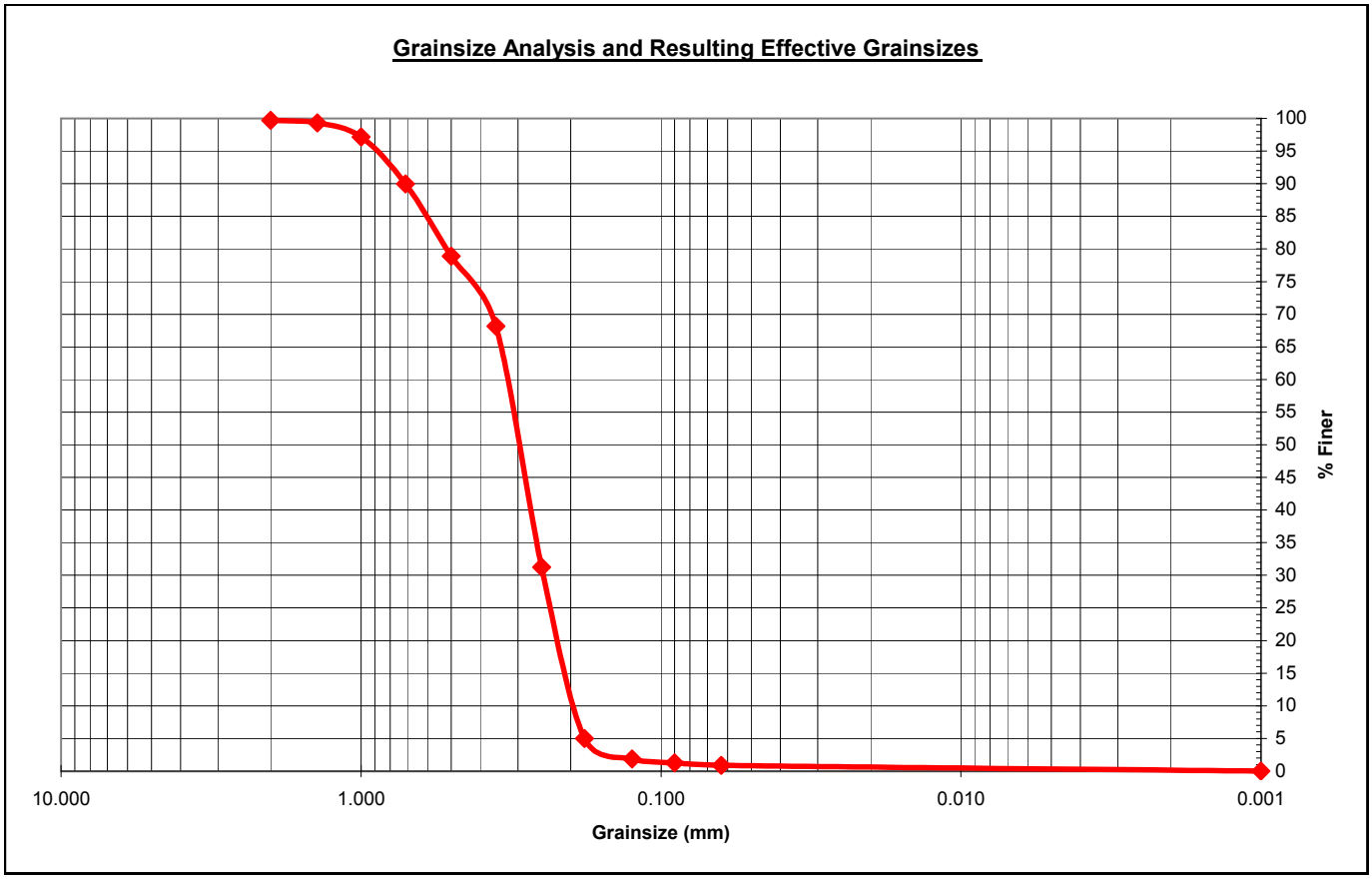
Sample ID:	ECP8-SB1	
Sample Depth:	40-41	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.10	g
Total Sieve Weight:	93.20	g
Weight Loss:	-0.1	g
Percent Loss:	-0.11	%

15.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	16.74%
	14	1.4	1.90	2.04	97.85		
	18	1.0	3.10	3.33	94.53		
	25	0.71	4.90	5.26	89.27		
	35	0.50	5.60	6.01	83.26		
Medium Material	45	0.355	4.60	4.94	78.33	Medium % (0.25 - 0.5 mm)	13.84%
	60	0.250	8.30	8.91	69.42		
Fine Material	80	0.180	28.30	30.36	39.06	Fine % (0.125 - 0.25 mm)	57.94%
	120	0.125	25.70	27.58	11.48		
Silt Material	170	0.090	2.60	2.79	8.69	Silt % (0.125 - 0.063 mm)	4.61%
	230	0.063	1.70	1.82	6.87		
Pan Material	pan	0.001	6.40	6.87	0.00	Pan % (< 0.063 mm)	6.87%
						Total	**100.00%**

Total (g)	93.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



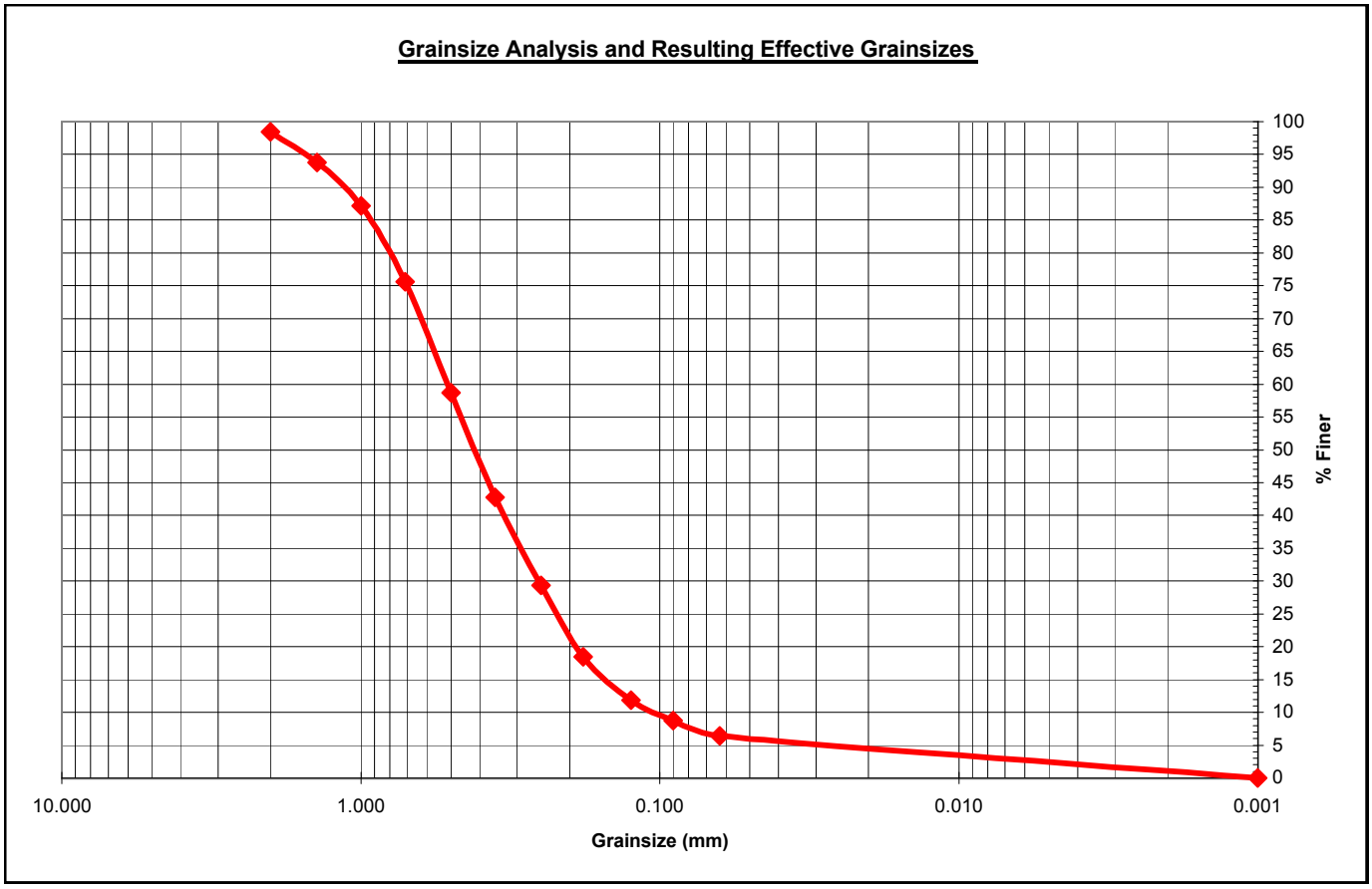
Sample ID:	ECP8-SB1
Sample Depth:	42-43 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.50 g
Total Sieve Weight:	88.80 g
Weight Loss:	0.7 g
Percent Loss:	0.78 %

18.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.40	1.58	98.42	Coarse % (> 0.5 mm)	41.33%
	14	1.4	4.10	4.62	93.81		
	18	1.0	5.90	6.64	87.16		
	25	0.71	10.30	11.60	75.56		
	35	0.50	15.00	16.89	58.67		
Medium Material	45	0.355	14.10	15.88	42.79	Medium % (0.25 - 0.5 mm)	29.28%
	60	0.250	11.90	13.40	29.39		
Fine Material	80	0.180	9.70	10.92	18.47	Fine % (0.125 - 0.25 mm)	17.57%
	120	0.125	5.90	6.64	11.82		
Silt Material	170	0.090	2.70	3.04	8.78	Silt % (0.125 - 0.063 mm)	5.41%
	230	0.063	2.10	2.36	6.42		
Pan Material	pan	0.001	5.70	6.42	0.00	Pan % (< 0.063 mm)	6.42%
						Total	**100.00%**

Total (g)	88.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



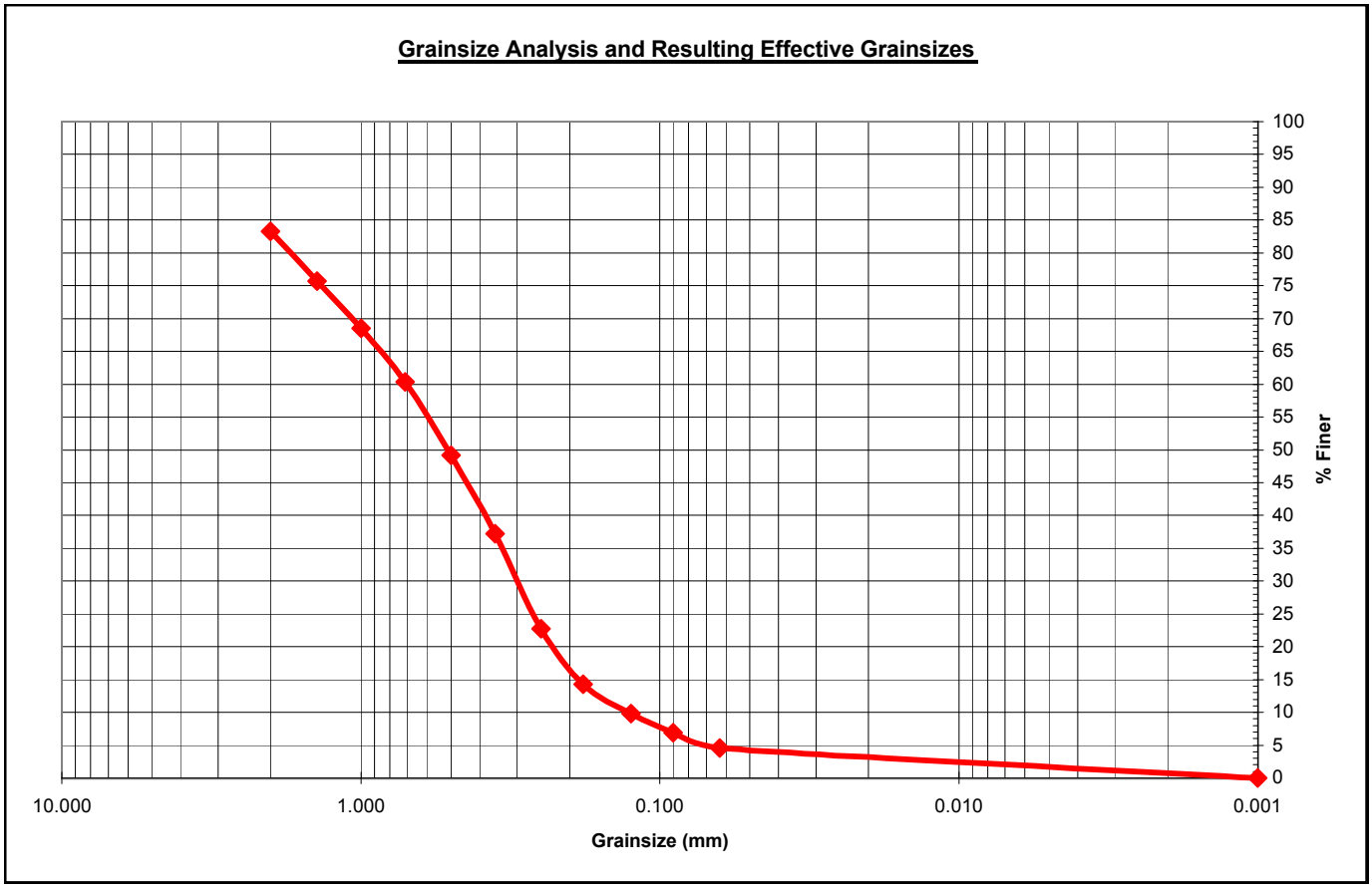
Sample ID:	ECP8-SB1	
Sample Depth:	43-44	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	85.00	g
Total Sieve Weight:	85.20	g
Weight Loss:	-0.2	g
Percent Loss:	-0.24	%

22.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	14.20	16.67	83.33	Coarse % (> 0.5 mm)	50.82%
	14	1.4	6.50	7.63	75.70		
	18	1.0	6.10	7.16	68.54		
	25	0.71	7.00	8.22	60.33		
	35	0.50	9.50	11.15	49.18		
Medium Material	45	0.355	10.20	11.97	37.21	Medium % (0.25 - 0.5 mm)	26.41%
	60	0.250	12.30	14.44	22.77		
Fine Material	80	0.180	7.20	8.45	14.32	Fine % (0.125 - 0.25 mm)	12.91%
	120	0.125	3.80	4.46	9.86		
Silt Material	170	0.090	2.50	2.93	6.92	Silt % (0.125 - 0.063 mm)	5.28%
	230	0.063	2.00	2.35	4.58		
Pan Material	pan	0.001	3.90	4.58	0.00	Pan % (< 0.063 mm)	4.58%
						Total	100.00%

Total (g)	85.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



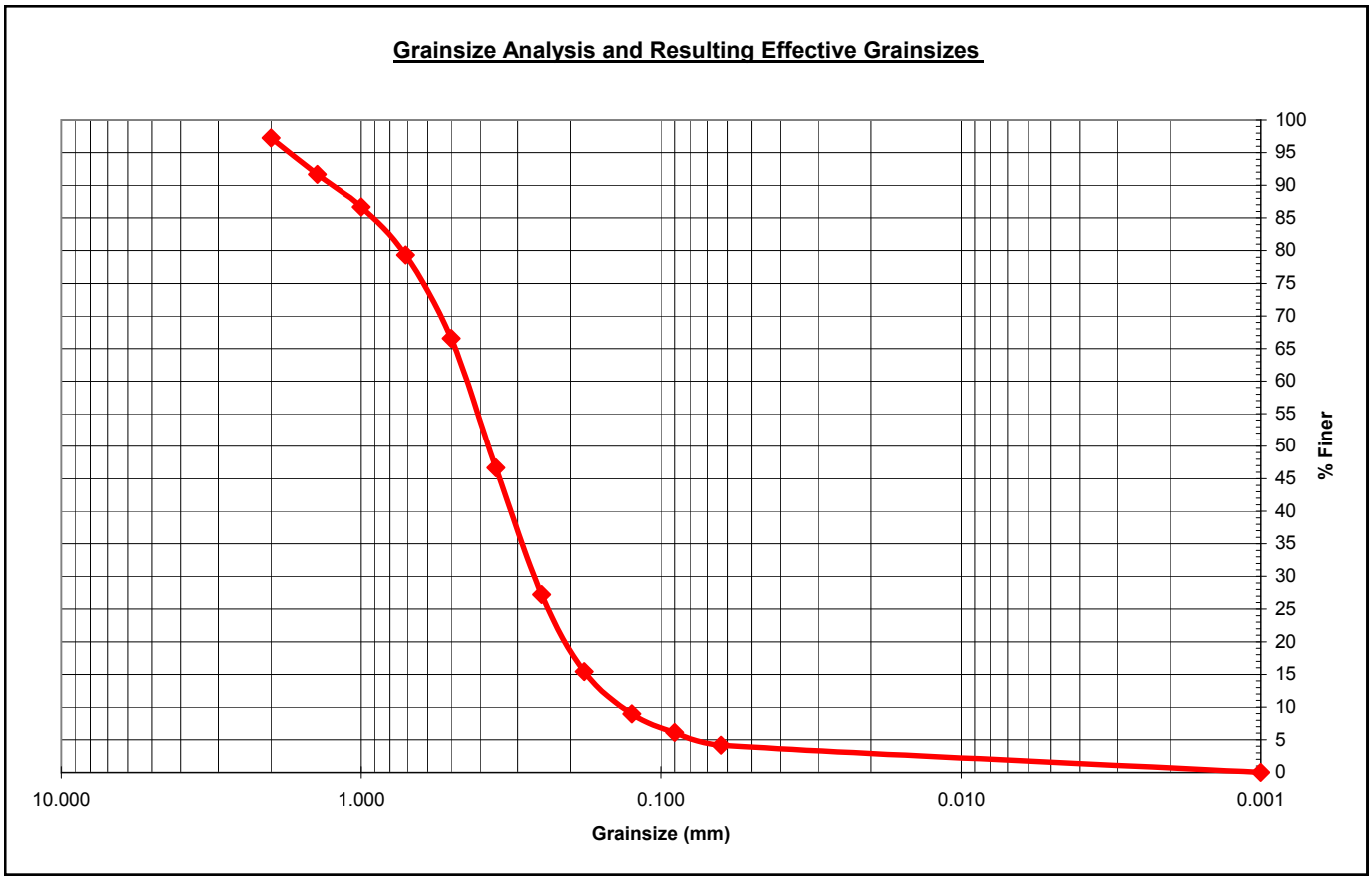
Sample ID:	ECP8-SB1	
Sample Depth:	44-45	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	91.60	g
Total Sieve Weight:	91.50	g
Weight Loss:	0.1	g
Percent Loss:	0.11	%

16.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.50	2.73	97.27	Coarse % (> 0.5 mm)	33.44%
	14	1.4	5.10	5.57	91.69		
	18	1.0	4.60	5.03	86.67		
	25	0.71	6.70	7.32	79.34		
	35	0.50	11.70	12.79	66.56		
Medium Material	45	0.355	18.20	19.89	46.67	Medium % (0.25 - 0.5 mm)	39.34%
	60	0.250	17.80	19.45	27.21		
Fine Material	80	0.180	10.80	11.80	15.41	Fine % (0.125 - 0.25 mm)	18.25%
	120	0.125	5.90	6.45	8.96		
Silt Material	170	0.090	2.60	2.84	6.12	Silt % (0.125 - 0.063 mm)	4.81%
	230	0.063	1.80	1.97	4.15		
Pan Material	pan	0.001	3.80	4.15	0.00	Pan % (< 0.063 mm)	4.15%
						Total	100.00%

Total (g)	91.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



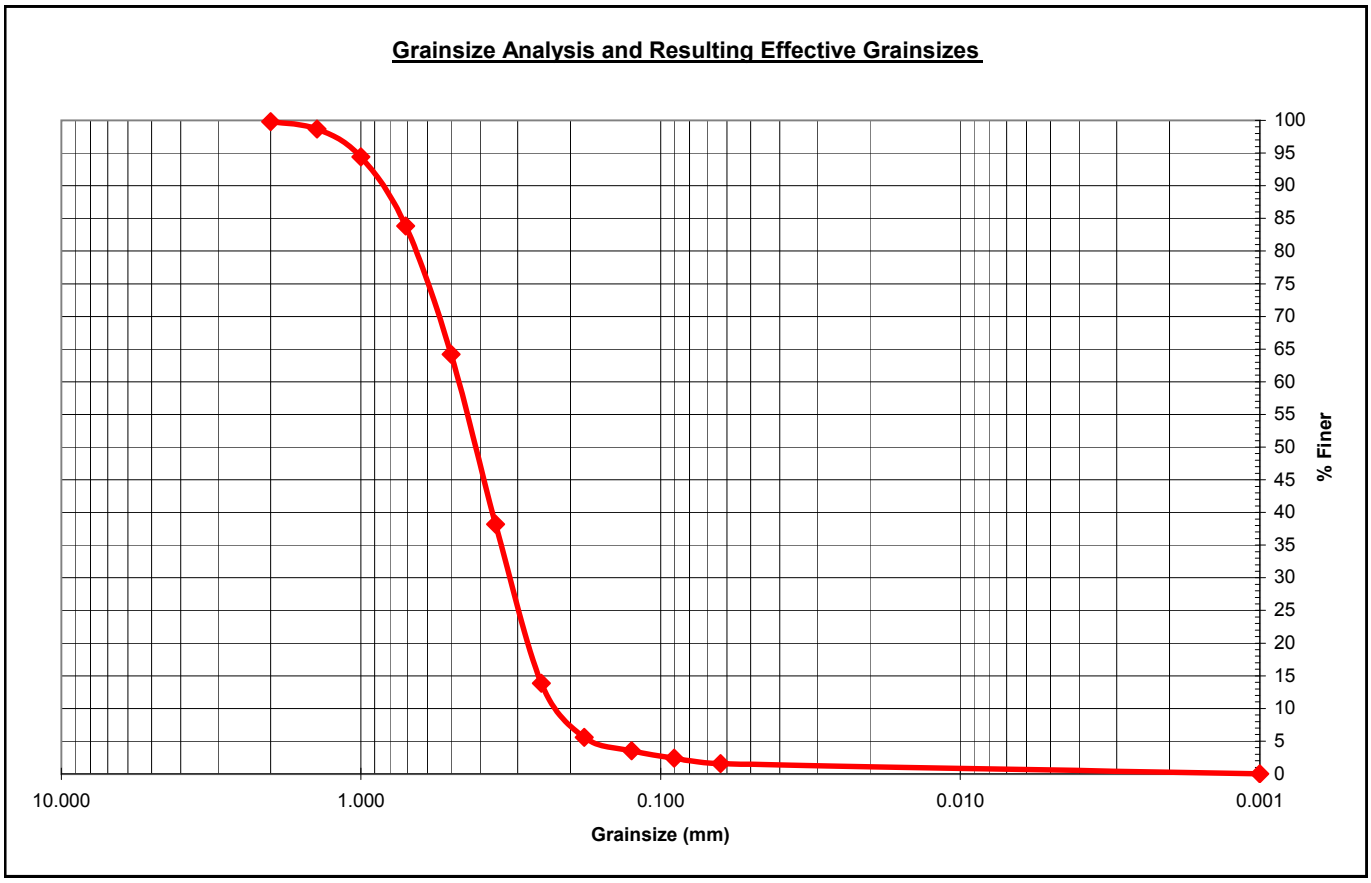
Sample ID:	ECP8-SB1
Sample Depth:	45-46 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	96.90 g
Total Sieve Weight:	96.60 g
Weight Loss:	0.3 g
Percent Loss:	0.31 %

11.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.21	99.79	Coarse % (> 0.5 mm)	35.82%
	14	1.4	1.10	1.14	98.65		
	18	1.0	4.10	4.24	94.41		
	25	0.71	10.20	10.56	83.85		
	35	0.50	19.00	19.67	64.18		
Medium Material	45	0.355	25.10	25.98	38.20	Medium % (0.25 - 0.5 mm)	50.31%
	60	0.250	23.50	24.33	13.87		
Fine Material	80	0.180	8.00	8.28	5.59	Fine % (0.125 - 0.25 mm)	10.35%
	120	0.125	2.00	2.07	3.52		
Silt Material	170	0.090	1.10	1.14	2.38	Silt % (0.125 - 0.063 mm)	1.97%
	230	0.063	0.80	0.83	1.55		
Pan Material	pan	0.001	1.50	1.55	0.00	Pan % (< 0.063 mm)	1.55%
						Total	**100.00%**

Total (g)	96.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



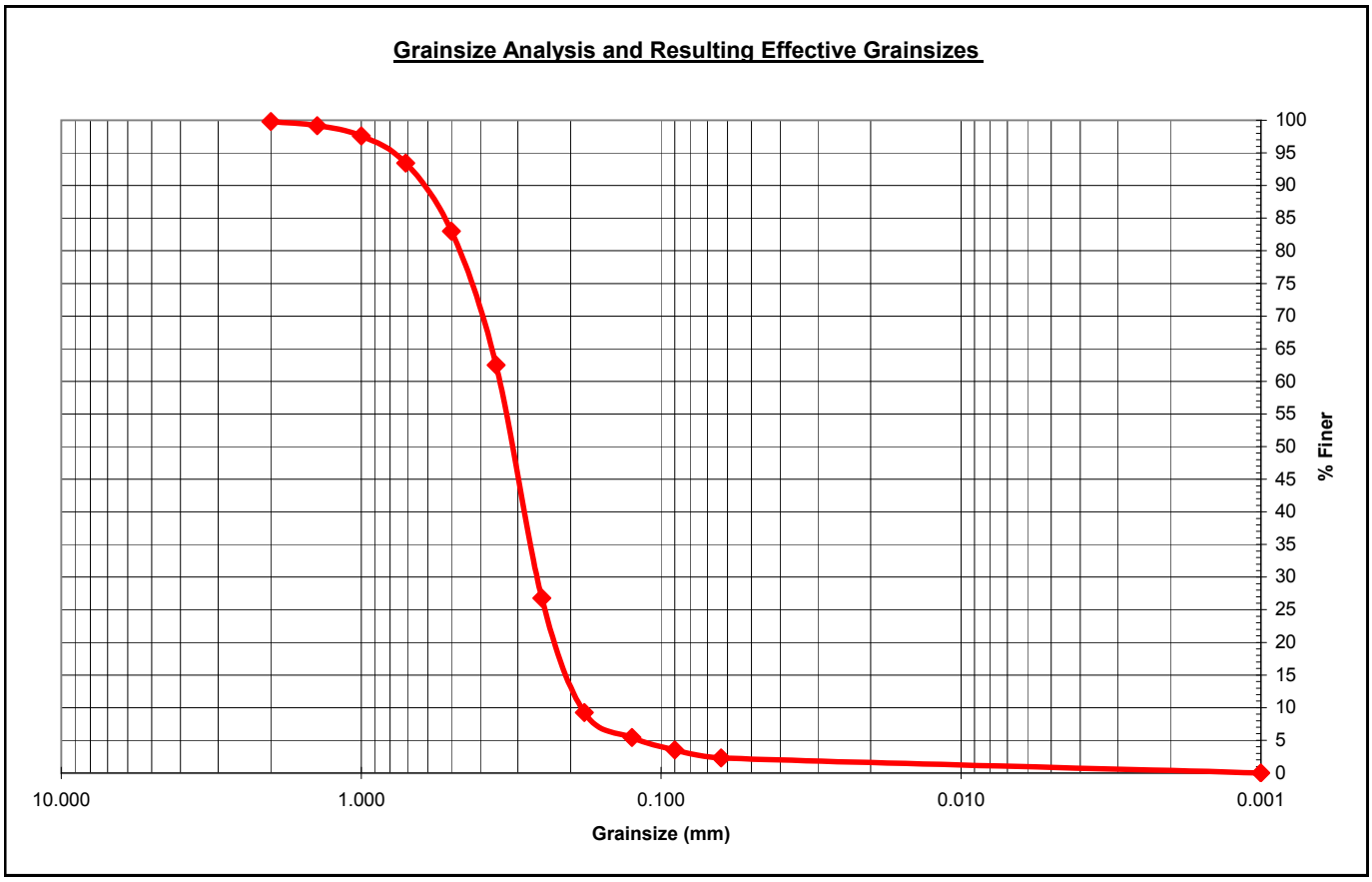
Sample ID:	ECP8-SB1	
Sample Depth:	46-47	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	96.30	g
Total Sieve Weight:	96.00	g
Weight Loss:	0.3	g
Percent Loss:	0.31	%

12.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.21	99.79	Coarse % (> 0.5 mm)	16.98%
	14	1.4	0.60	0.63	99.17		
	18	1.0	1.50	1.56	97.60		
	25	0.71	4.00	4.17	93.44		
	35	0.50	10.00	10.42	83.02		
Medium Material	45	0.355	19.70	20.52	62.50	Medium % (0.25 - 0.5 mm)	56.25%
	60	0.250	34.30	35.73	26.77		
Fine Material	80	0.180	16.80	17.50	9.27	Fine % (0.125 - 0.25 mm)	21.35%
	120	0.125	3.70	3.85	5.42		
Silt Material	170	0.090	1.80	1.88	3.54	Silt % (0.125 - 0.063 mm)	3.13%
	230	0.063	1.20	1.25	2.29		
Pan Material	pan	0.001	2.20	2.29	0.00	Pan % (< 0.063 mm)	2.29%
						Total	**100.00%**

Total (g)	96.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



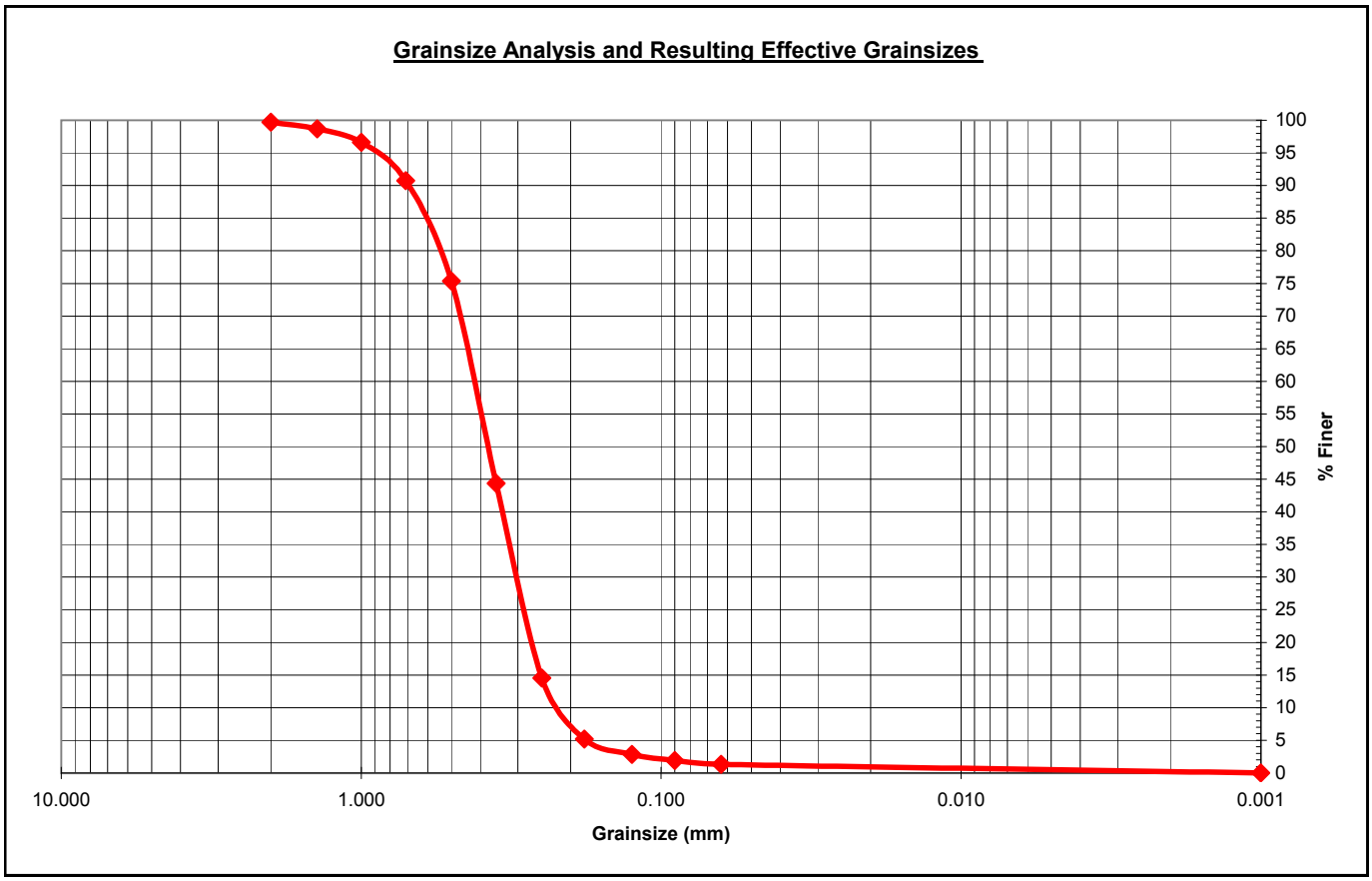
Sample ID:	ECP8-SB1	
Sample Depth:	47-48	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	98.80	g
Total Sieve Weight:	98.30	g
Weight Loss:	0.5	g
Percent Loss:	0.51	%

10.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.31	99.69	Coarse % (> 0.5 mm)	24.62%
	14	1.4	1.00	1.02	98.68		
	18	1.0	2.00	2.03	96.64		
	25	0.71	5.80	5.90	90.74		
	35	0.50	15.10	15.36	75.38		
Medium Material	45	0.355	30.50	31.03	44.35	Medium % (0.25 - 0.5 mm)	60.83%
	60	0.250	29.30	29.81	14.55		
Fine Material	80	0.180	9.20	9.36	5.19	Fine % (0.125 - 0.25 mm)	11.70%
	120	0.125	2.30	2.34	2.85		
Silt Material	170	0.090	0.90	0.92	1.93	Silt % (0.125 - 0.063 mm)	1.53%
	230	0.063	0.60	0.61	1.32		
Pan Material	pan	0.001	1.30	1.32	0.00	Pan % (< 0.063 mm)	1.32%
						Total	**100.00%**

Total (g)	98.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



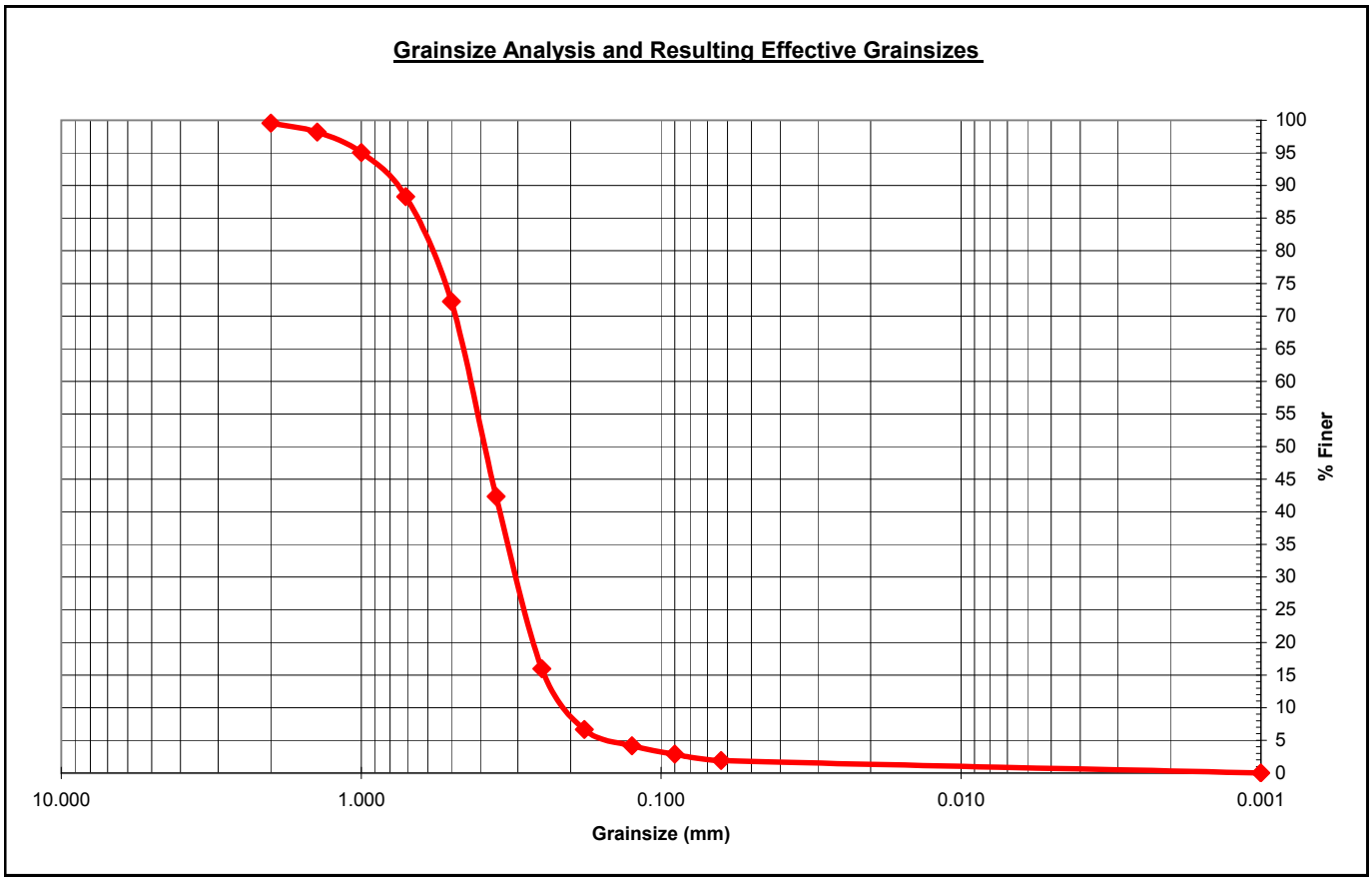
Sample ID:	ECP8-SB1	
Sample Depth:	48-49	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.50	g
Total Sieve Weight:	93.30	g
Weight Loss:	0.2	g
Percent Loss:	0.21	%

15.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.43	99.57	Coarse % (> 0.5 mm)	27.76%
	14	1.4	1.30	1.39	98.18		
	18	1.0	2.90	3.11	95.07		
	25	0.71	6.30	6.75	88.32		
	35	0.50	15.00	16.08	72.24		
Medium Material	45	0.355	27.90	29.90	42.34	Medium % (0.25 - 0.5 mm)	56.27%
	60	0.250	24.60	26.37	15.97		
Fine Material	80	0.180	8.70	9.32	6.65	Fine % (0.125 - 0.25 mm)	11.79%
	120	0.125	2.30	2.47	4.18		
Silt Material	170	0.090	1.20	1.29	2.89	Silt % (0.125 - 0.063 mm)	2.25%
	230	0.063	0.90	0.96	1.93		
Pan Material	pan	0.001	1.80	1.93	0.00	Pan % (< 0.063 mm)	1.93%
						Total	**100.00%**

Total (g)	93.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



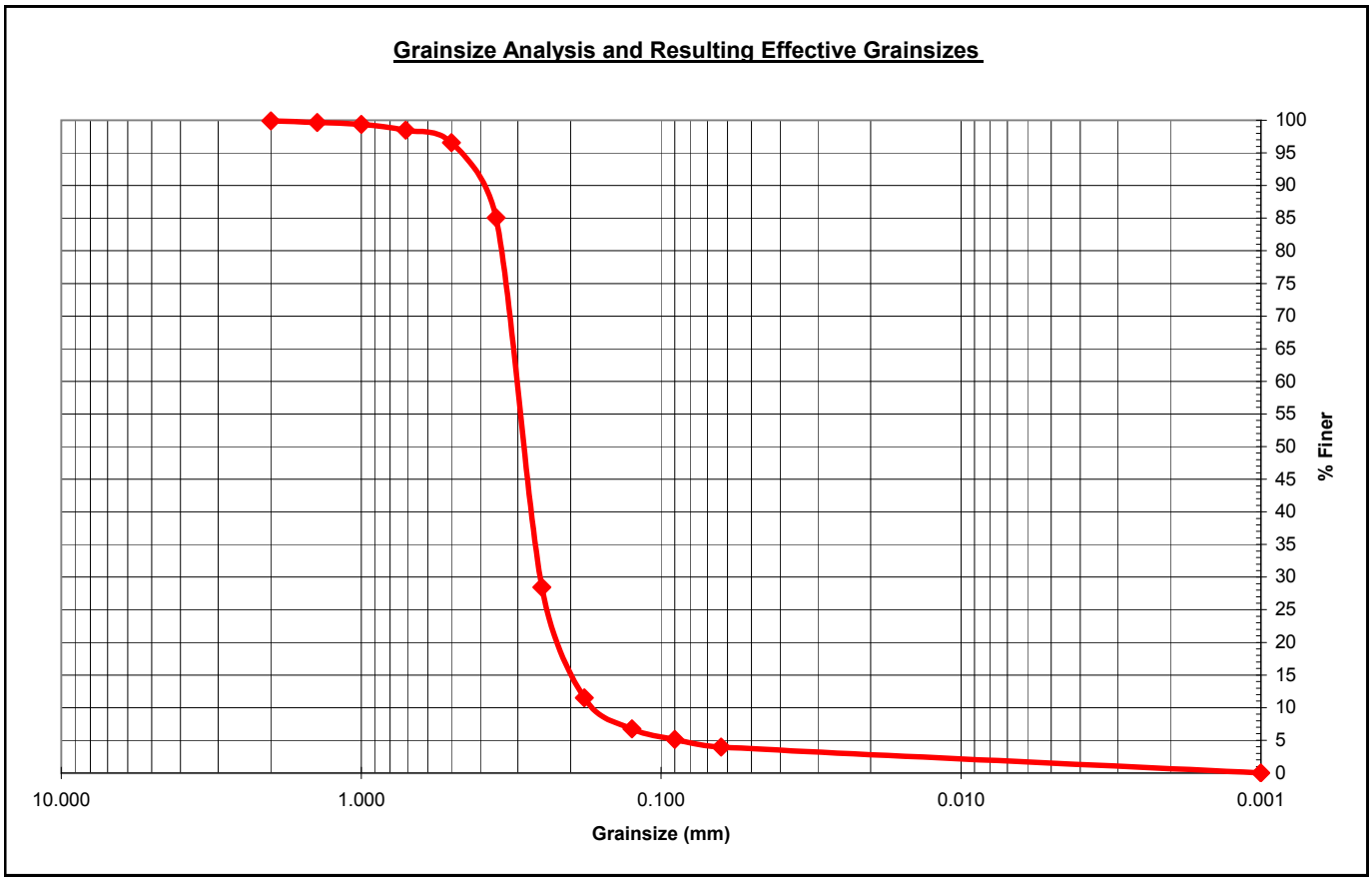
Sample ID:	ECP8-SB1
Sample Depth:	49-50 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.40 g
Total Sieve Weight:	93.10 g
Weight Loss:	0.3 g
Percent Loss:	0.32 %

15.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	3.44%
	14	1.4	0.20	0.21	99.68		
	18	1.0	0.30	0.32	99.36		
	25	0.71	0.80	0.86	98.50		
	35	0.50	1.80	1.93	96.56		
Medium Material	45	0.355	10.70	11.49	85.07	Medium % (0.25 - 0.5 mm)	68.10%
	60	0.250	52.70	56.61	28.46		
Fine Material	80	0.180	15.80	16.97	11.49	Fine % (0.125 - 0.25 mm)	21.70%
	120	0.125	4.40	4.73	6.77		
Silt Material	170	0.090	1.50	1.61	5.16	Silt % (0.125 - 0.063 mm)	2.79%
	230	0.063	1.10	1.18	3.97		
Pan Material	pan	0.001	3.70	3.97	0.00	Pan % (< 0.063 mm)	3.97%
						Total	100.00%

Total (g)	93.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



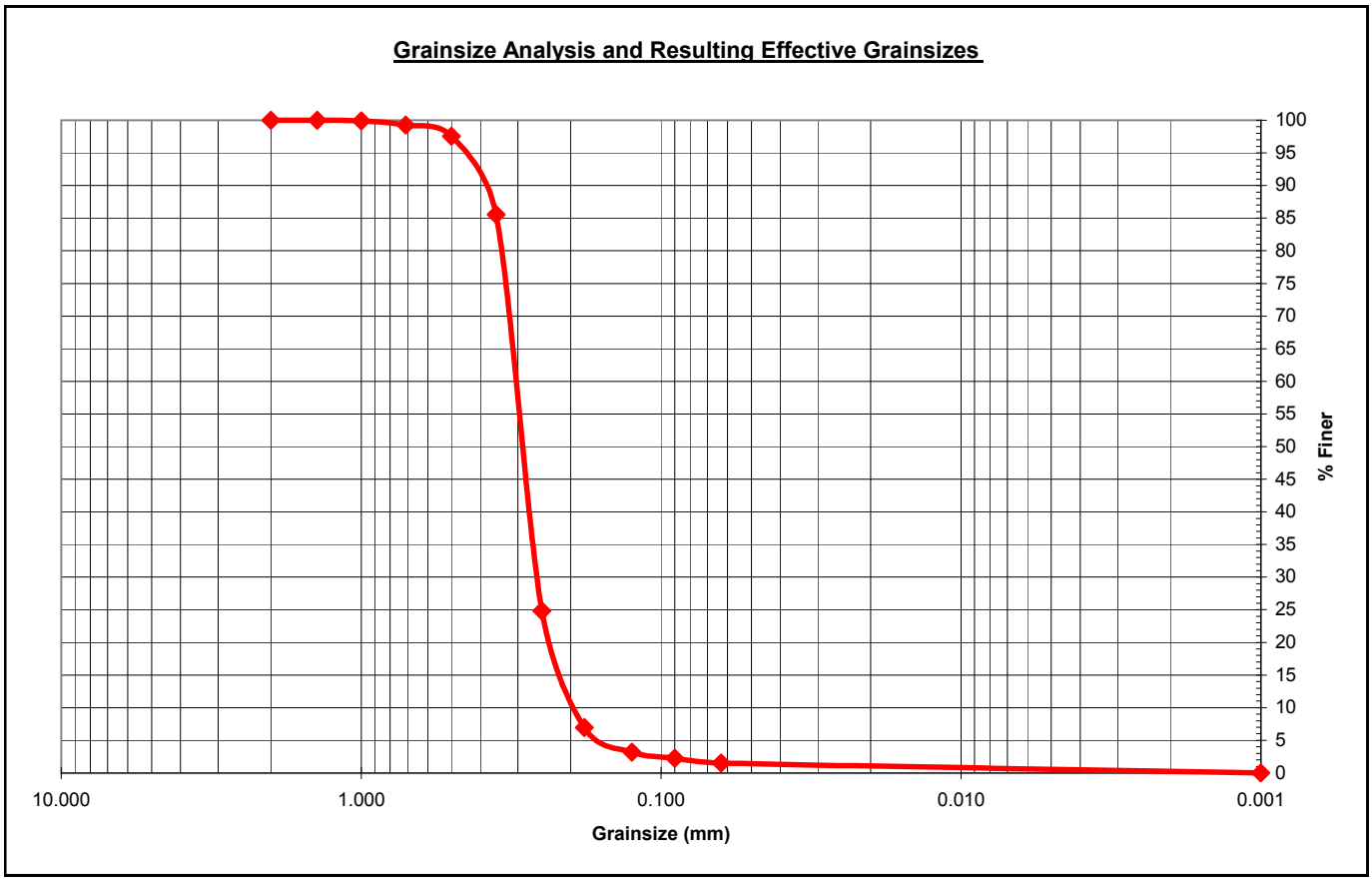
Sample ID:	ECP8-SB1
Sample Depth:	50-51 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.10 g
Total Sieve Weight:	97.50 g
Weight Loss:	0.6 g
Percent Loss:	0.61 %

10.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	2.46%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.10	0.10	99.90		
	25	0.71	0.60	0.62	99.28		
	35	0.50	1.70	1.74	97.54		
Medium Material	45	0.355	11.70	12.00	85.54	Medium % (0.25 - 0.5 mm)	72.72%
	60	0.250	59.20	60.72	24.82		
Fine Material	80	0.180	17.40	17.85	6.97	Fine % (0.125 - 0.25 mm)	21.64%
	120	0.125	3.70	3.79	3.18		
Silt Material	170	0.090	0.90	0.92	2.26	Silt % (0.125 - 0.063 mm)	1.64%
	230	0.063	0.70	0.72	1.54		
Pan Material	pan	0.001	1.50	1.54	0.00	Pan % (< 0.063 mm)	1.54%
						Total	**100.00%**

Total (g)	97.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



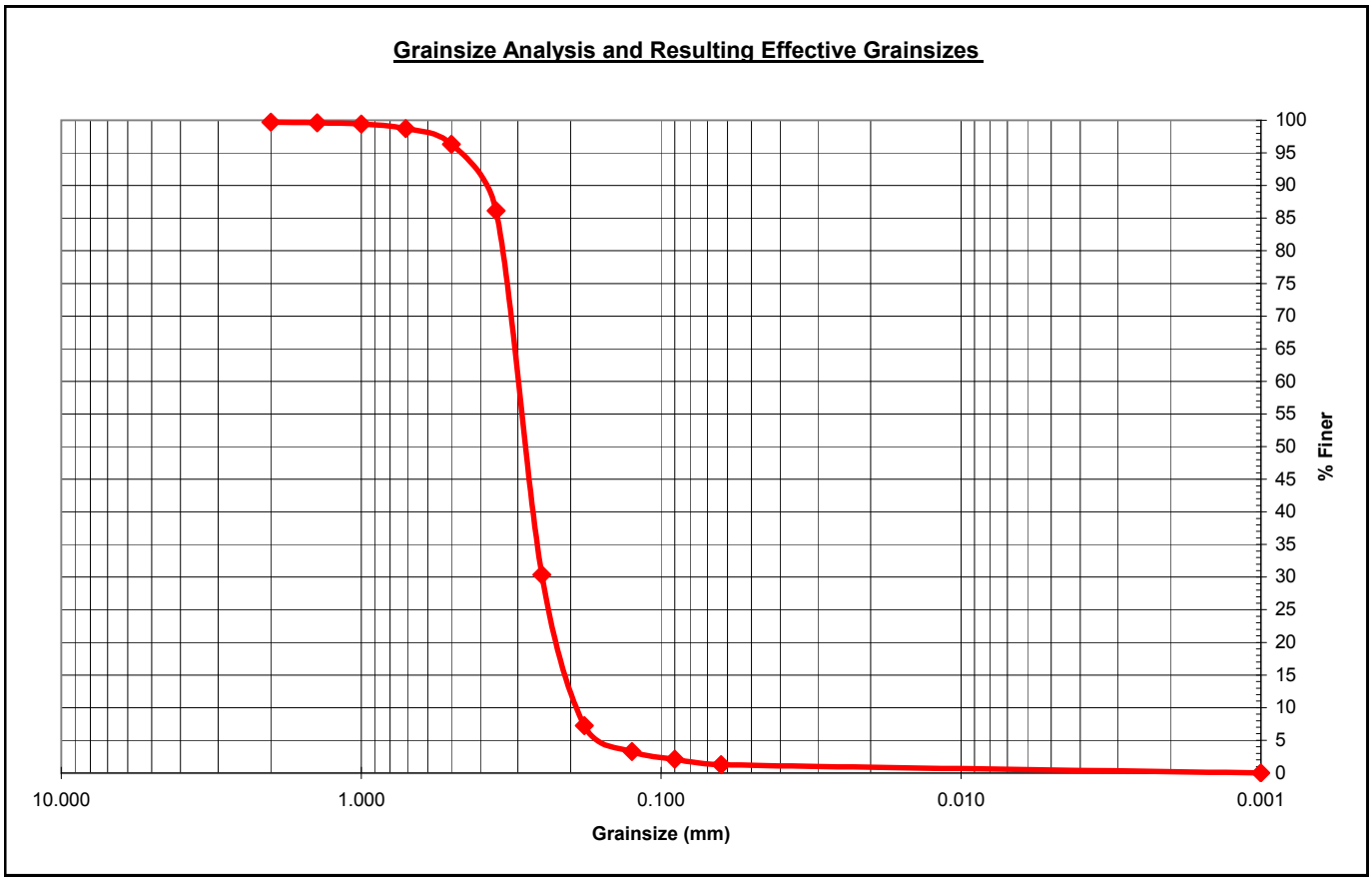
Sample ID:	ECP8-SB1	
Sample Depth:	51-52	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	100.70	g
Total Sieve Weight:	100.40	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

8.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.30	99.70	Coarse % (> 0.5 mm)	3.69%
	14	1.4	0.10	0.10	99.60		
	18	1.0	0.20	0.20	99.40		
	25	0.71	0.70	0.70	98.71		
	35	0.50	2.40	2.39	96.31		
Medium Material	45	0.355	10.20	10.16	86.16	Medium % (0.25 - 0.5 mm)	65.94%
	60	0.250	56.00	55.78	30.38		
Fine Material	80	0.180	23.20	23.11	7.27	Fine % (0.125 - 0.25 mm)	27.09%
	120	0.125	4.00	3.98	3.29		
Silt Material	170	0.090	1.20	1.20	2.09	Silt % (0.125 - 0.063 mm)	1.99%
	230	0.063	0.80	0.80	1.29		
Pan Material	pan	0.001	1.30	1.29	0.00	Pan % (< 0.063 mm)	1.29%
						Total	100.00%

Total (g)	100.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



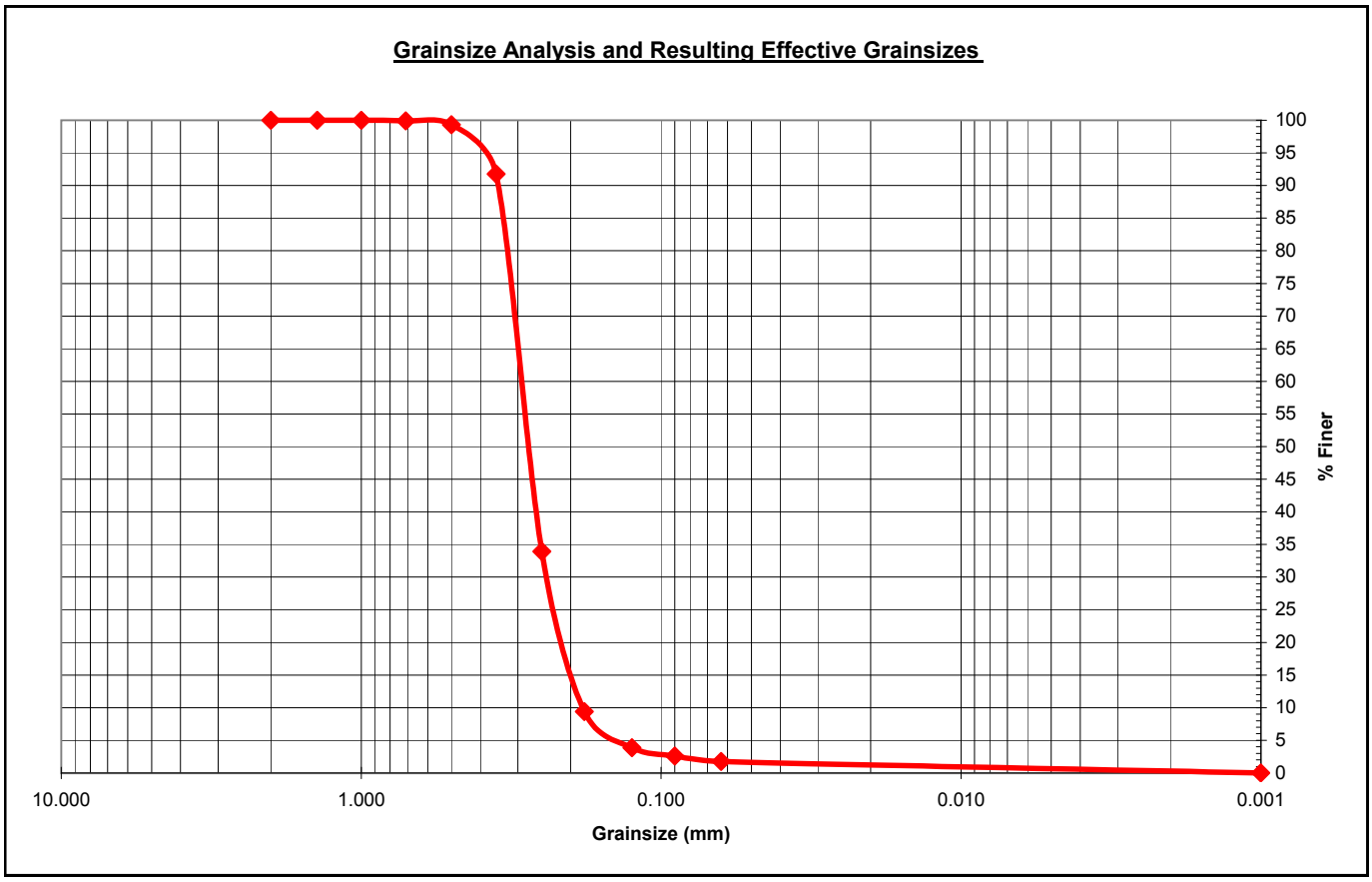
Sample ID:	ECP8-SB1
Sample Depth:	52-53 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	103.50 g
Total Sieve Weight:	103.10 g
Weight Loss:	0.4 g
Percent Loss:	0.39 %

5.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.68%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.00	0.00	100.00		
	25	0.71	0.10	0.10	99.90		
	35	0.50	0.60	0.58	99.32		
Medium Material	45	0.355	7.80	7.57	91.76	Medium % (0.25 - 0.5 mm)	65.37%
	60	0.250	59.60	57.81	33.95		
Fine Material	80	0.180	25.30	24.54	9.41	Fine % (0.125 - 0.25 mm)	30.07%
	120	0.125	5.70	5.53	3.88		
Silt Material	170	0.090	1.30	1.26	2.62	Silt % (0.125 - 0.063 mm)	2.13%
	230	0.063	0.90	0.87	1.75		
Pan Material	pan	0.001	1.80	1.75	0.00	Pan % (< 0.063 mm)	1.75%
						Total	100.00%

Total (g)	103.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



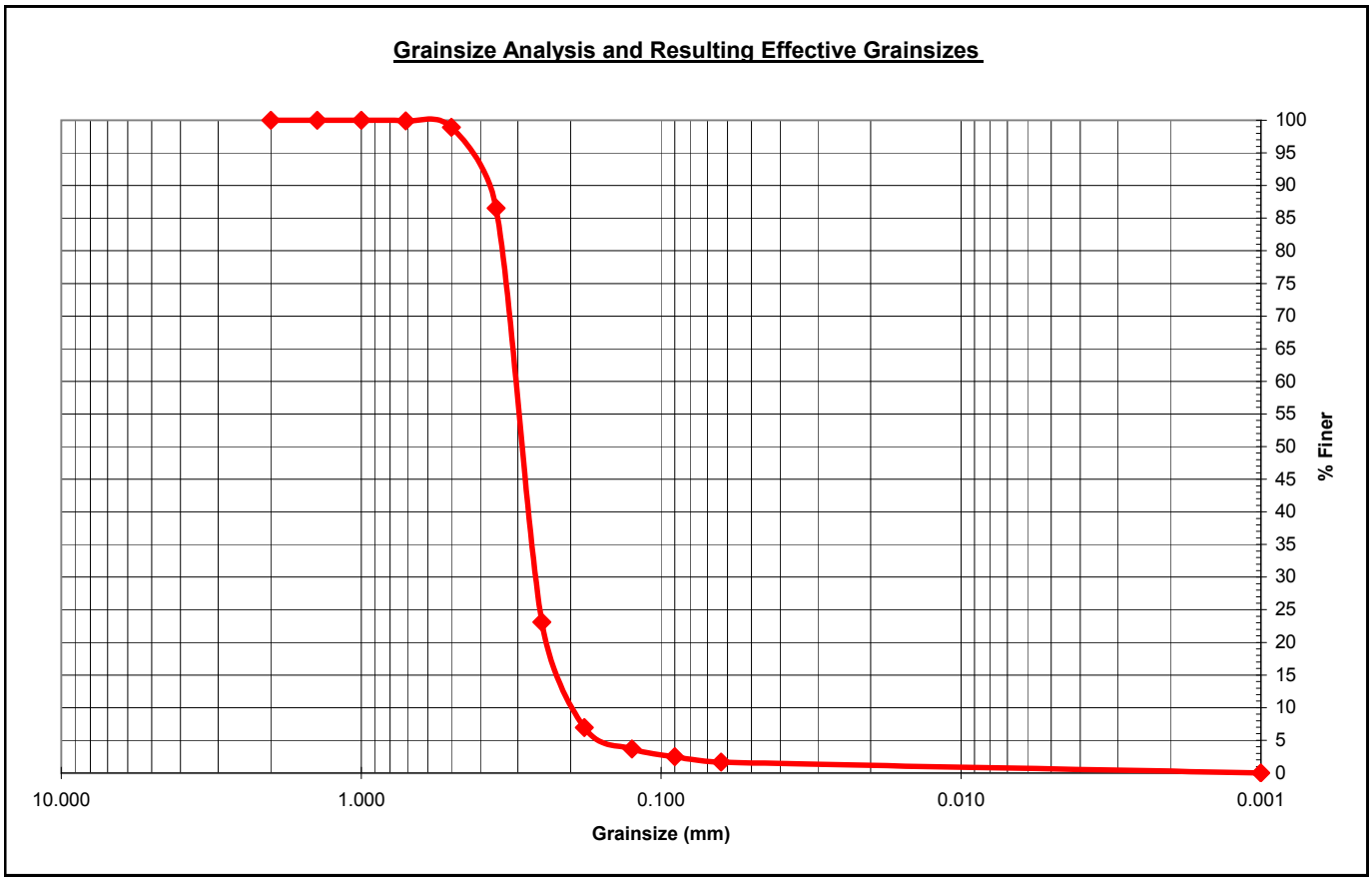
Sample ID:	ECP8-SB1	
Sample Depth:	53-54	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	103.80	g
Total Sieve Weight:	103.30	g
Weight Loss:	0.5	g
Percent Loss:	0.48	%

5.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	1.06%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.00	0.00	100.00		
	25	0.71	0.10	0.10	99.90		
	35	0.50	1.00	0.97	98.94		
Medium Material	45	0.355	12.80	12.39	86.54	Medium % (0.25 - 0.5 mm)	75.80%
	60	0.250	65.50	63.41	23.14		
Fine Material	80	0.180	16.70	16.17	6.97	Fine % (0.125 - 0.25 mm)	19.46%
	120	0.125	3.40	3.29	3.68		
Silt Material	170	0.090	1.20	1.16	2.52	Silt % (0.125 - 0.063 mm)	2.03%
	230	0.063	0.90	0.87	1.65		
Pan Material	pan	0.001	1.70	1.65	0.00	Pan % (< 0.063 mm)	1.65%
						Total	100.00%

Total (g)	103.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



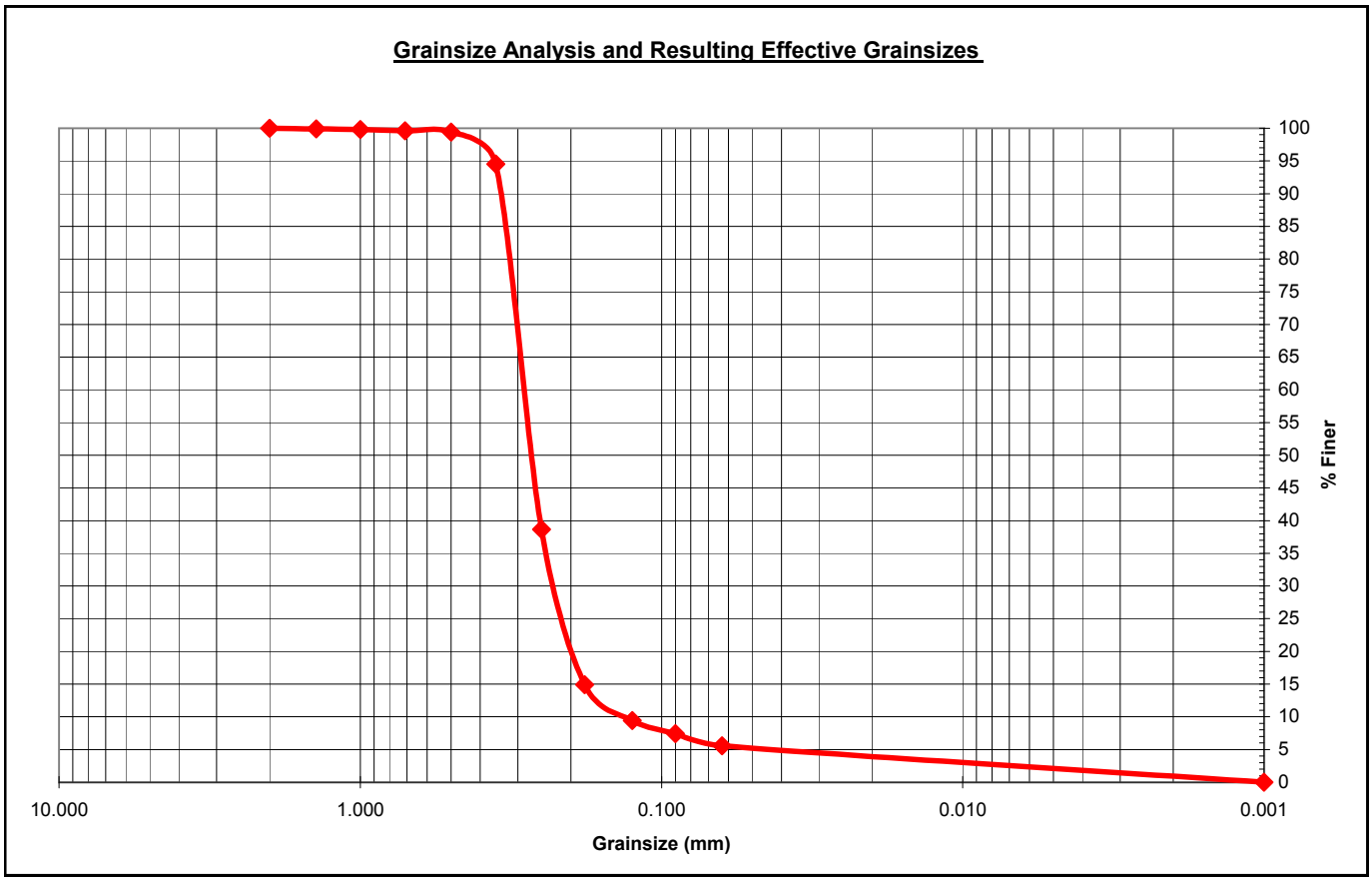
Sample ID:	ECP8-SB1	
Sample Depth:	54-55	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.50	g
Total Sieve Weight:	98.50	g
Weight Loss:	1	g
Percent Loss:	1.01	%

9.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.61%
	14	1.4	0.10	0.10	99.90		
	18	1.0	0.10	0.10	99.80		
	25	0.71	0.20	0.20	99.59		
	35	0.50	0.20	0.20	99.39		
Medium Material	45	0.355	4.80	4.87	94.52	Medium % (0.25 - 0.5 mm)	60.71%
	60	0.250	55.00	55.84	38.68		
Fine Material	80	0.180	23.40	23.76	14.92	Fine % (0.125 - 0.25 mm)	29.24%
	120	0.125	5.40	5.48	9.44		
Silt Material	170	0.090	2.00	2.03	7.41	Silt % (0.125 - 0.063 mm)	3.86%
	230	0.063	1.80	1.83	5.58		
Pan Material	pan	0.001	5.50	5.58	0.00	Pan % (< 0.063 mm)	5.58%
						Total	**100.00%**

Total (g)	98.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



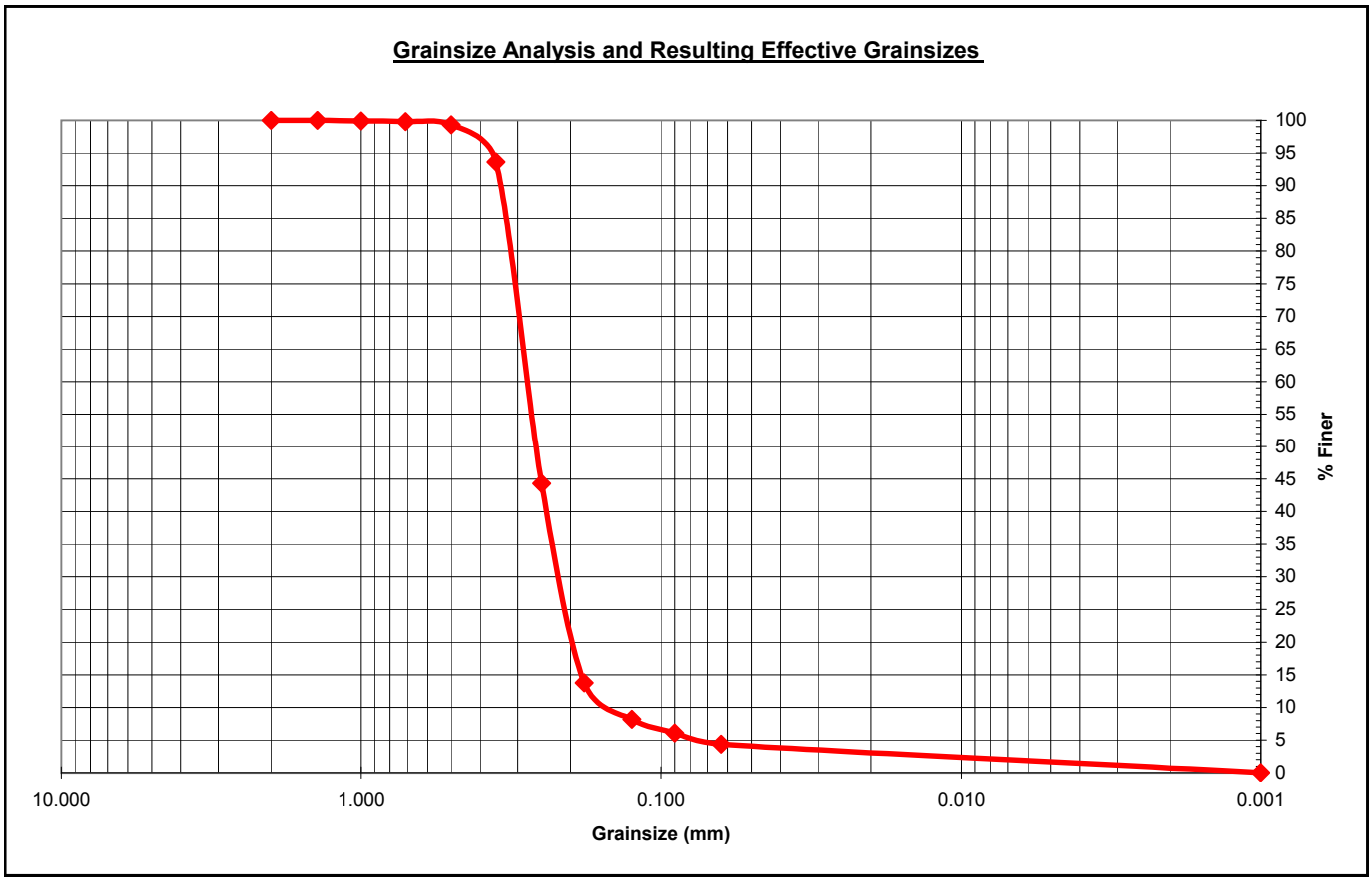
Sample ID:	ECP8-SB1	
Sample Depth:	55-56	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	98.90	g
Total Sieve Weight:	98.80	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

10.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.71%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.10	0.10	99.90		
	25	0.71	0.10	0.10	99.80		
	35	0.50	0.50	0.51	99.29		
Medium Material	45	0.355	5.60	5.67	93.62	Medium % (0.25 - 0.5 mm)	54.96%
	60	0.250	48.70	49.29	44.33		
Fine Material	80	0.180	30.20	30.57	13.77	Fine % (0.125 - 0.25 mm)	36.13%
	120	0.125	5.50	5.57	8.20		
Silt Material	170	0.090	2.10	2.13	6.07	Silt % (0.125 - 0.063 mm)	3.85%
	230	0.063	1.70	1.72	4.35		
Pan Material	pan	0.001	4.30	4.35	0.00	Pan % (< 0.063 mm)	4.35%
						Total	**100.00%**

Total (g)	98.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



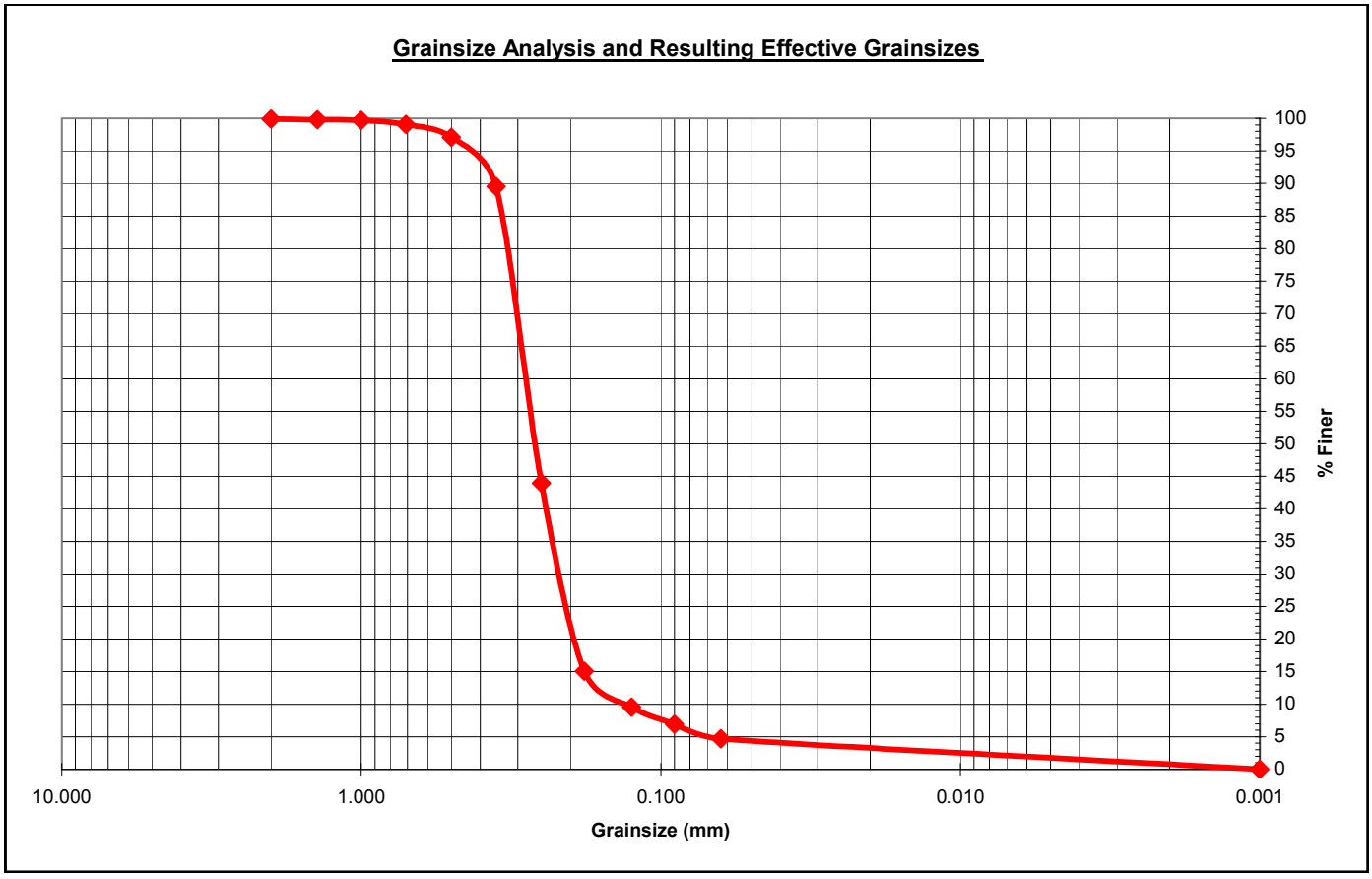
Sample ID:	ECP8-SB1	
Sample Depth:	56-57	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	99.50	g
Total Sieve Weight:	99.50	g
Weight Loss:	0	g
Percent Loss:	0.00	%

9.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.10	99.90	Coarse % (> 0.5 mm)	2.91%
	14	1.4	0.10	0.10	99.80		
	18	1.0	0.10	0.10	99.70		
	25	0.71	0.60	0.60	99.10		
	35	0.50	2.00	2.01	97.09		
Medium Material	45	0.355	7.50	7.54	89.55	Medium % (0.25 - 0.5 mm)	53.17%
	60	0.250	45.40	45.63	43.92		
Fine Material	80	0.180	28.70	28.84	15.08	Fine % (0.125 - 0.25 mm)	34.37%
	120	0.125	5.50	5.53	9.55		
Silt Material	170	0.090	2.60	2.61	6.93	Silt % (0.125 - 0.063 mm)	4.82%
	230	0.063	2.20	2.21	4.72		
Pan Material	pan	0.001	4.70	4.72	0.00	Pan % (< 0.063 mm)	4.72%
						Total	**100.00%**

Total (g)	99.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



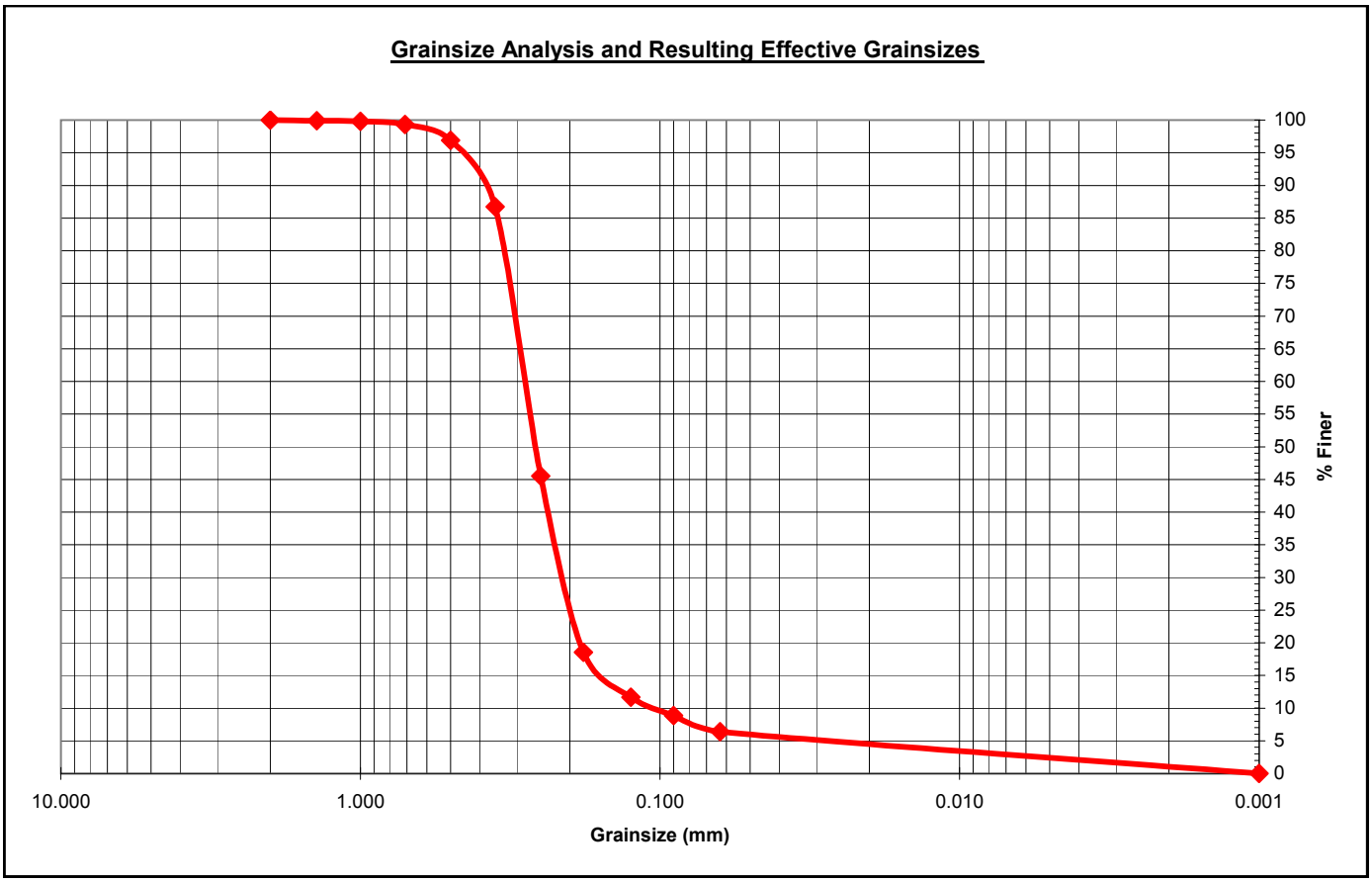
Sample ID:	ECP8-SB1	
Sample Depth:	57-58	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	100.70	g
Total Sieve Weight:	100.40	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

8.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	3.09%
	14	1.4	0.10	0.10	99.90		
	18	1.0	0.10	0.10	99.80		
	25	0.71	0.50	0.50	99.30		
	35	0.50	2.40	2.39	96.91		
Medium Material	45	0.355	10.20	10.16	86.75	Medium % (0.25 - 0.5 mm)	51.39%
	60	0.250	41.40	41.24	45.52		
Fine Material	80	0.180	27.10	26.99	18.53	Fine % (0.125 - 0.25 mm)	33.86%
	120	0.125	6.90	6.87	11.65		
Silt Material	170	0.090	2.80	2.79	8.86	Silt % (0.125 - 0.063 mm)	5.28%
	230	0.063	2.50	2.49	6.37		
Pan Material	pan	0.001	6.40	6.37	0.00	Pan % (< 0.063 mm)	6.37%
						Total	**100.00%**

Total (g)	100.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



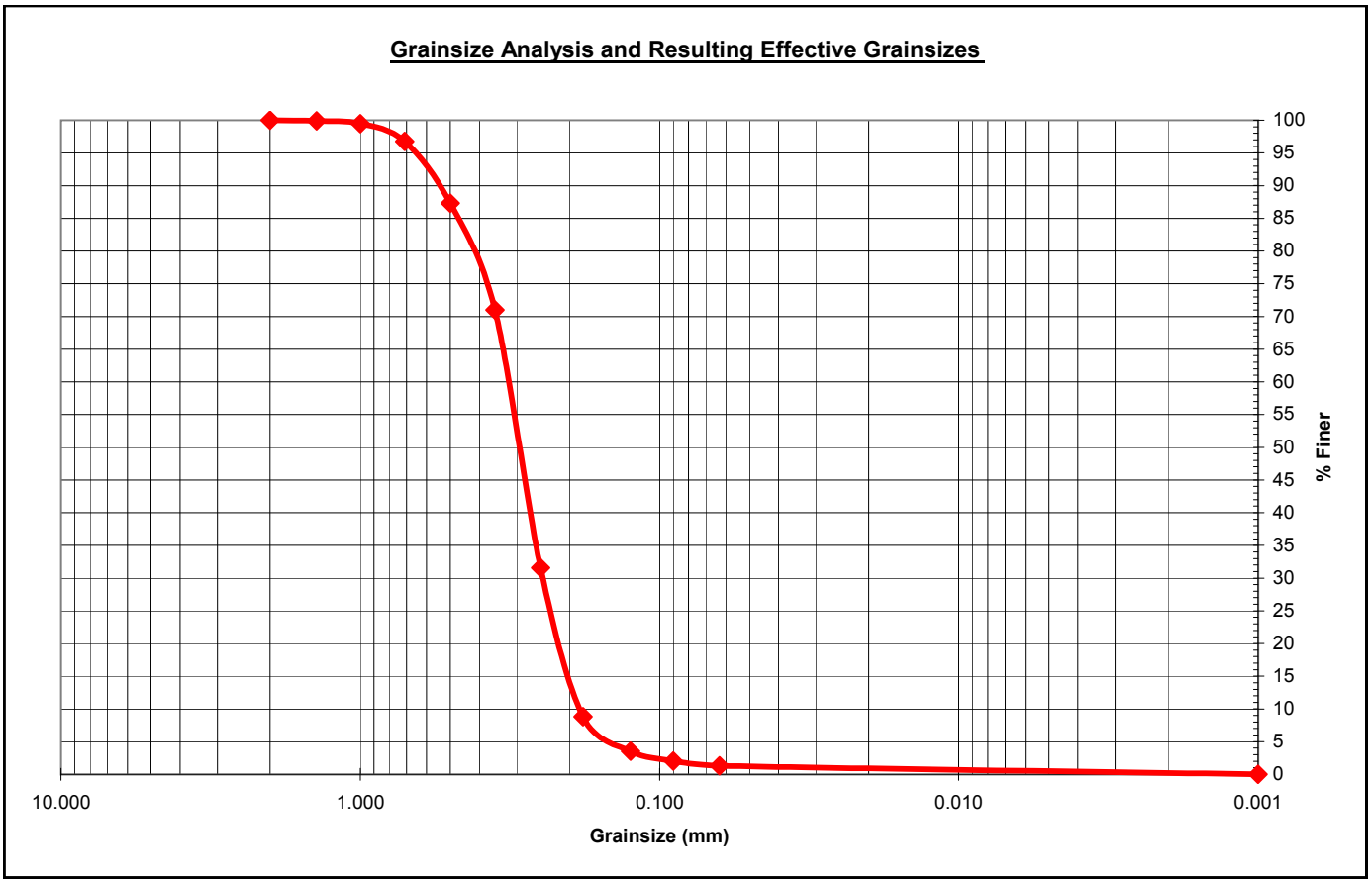
Sample ID:	ECP8-SB1	
Sample Depth:	58-59	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.30	g
Total Sieve Weight:	93.10	g
Weight Loss:	0.2	g
Percent Loss:	0.21	%

15.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	12.67%
	14	1.4	0.10	0.11	99.89		
	18	1.0	0.40	0.43	99.46		
	25	0.71	2.50	2.69	96.78		
	35	0.50	8.80	9.45	87.33		
Medium Material	45	0.355	15.20	16.33	71.00	Medium % (0.25 - 0.5 mm)	55.75%
	60	0.250	36.70	39.42	31.58		
Fine Material	80	0.180	21.20	22.77	8.81	Fine % (0.125 - 0.25 mm)	28.03%
	120	0.125	4.90	5.26	3.54		
Silt Material	170	0.090	1.40	1.50	2.04	Silt % (0.125 - 0.063 mm)	2.26%
	230	0.063	0.70	0.75	1.29		
Pan Material	pan	0.001	1.20	1.29	0.00	Pan % (< 0.063 mm)	1.29%
						Total	100.00%

Total (g)	93.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



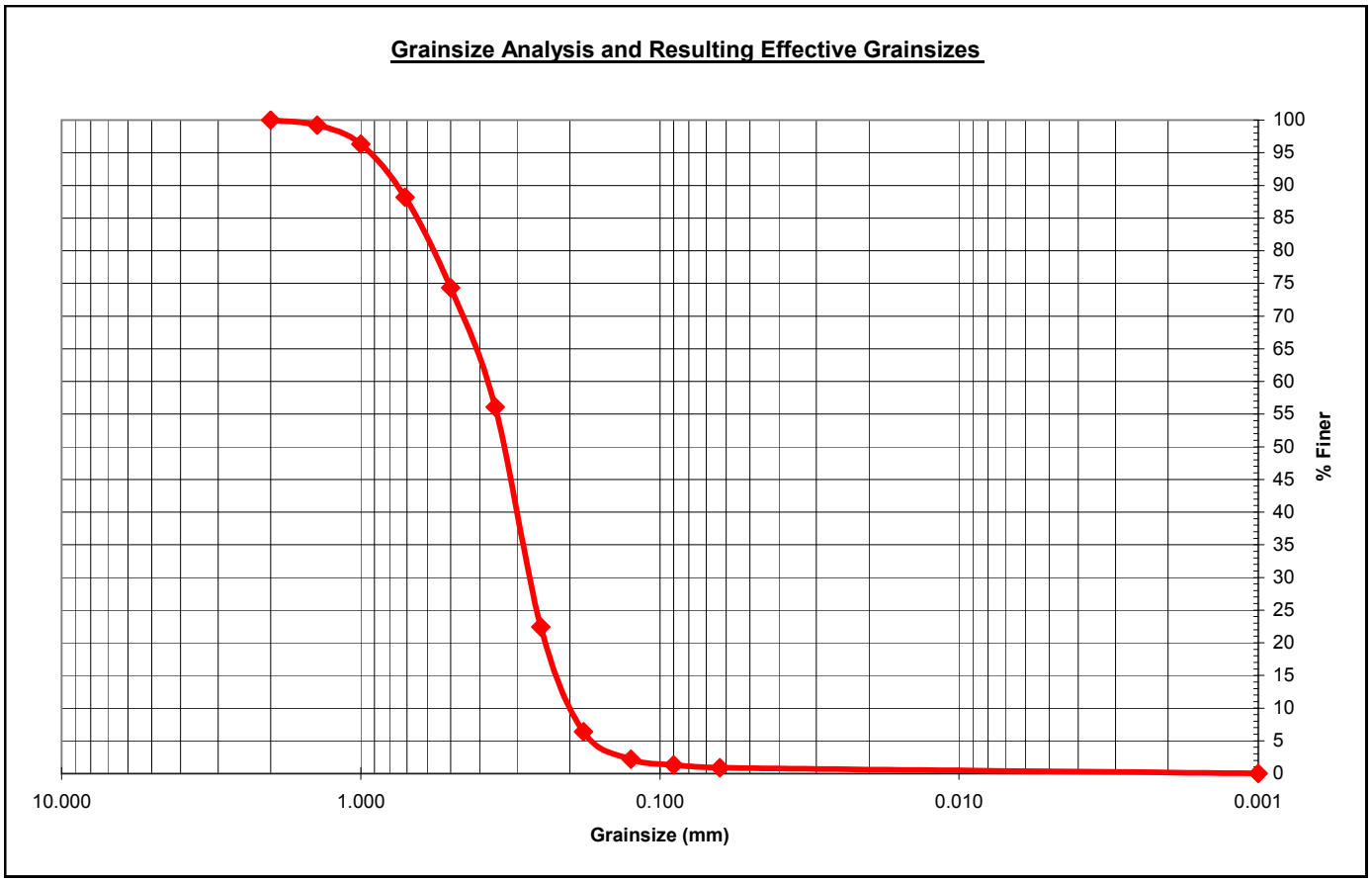
Sample ID:	ECP8-SB1	
Sample Depth:	59-60	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.30	g
Total Sieve Weight:	92.40	g
Weight Loss:	0.9	g
Percent Loss:	0.96	%

15.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	25.65%
	14	1.4	0.70	0.76	99.24		
	18	1.0	2.70	2.92	96.32		
	25	0.71	7.50	8.12	88.20		
	35	0.50	12.80	13.85	74.35		
Medium Material	45	0.355	16.90	18.29	56.06	Medium % (0.25 - 0.5 mm)	51.95%
	60	0.250	31.10	33.66	22.40		
Fine Material	80	0.180	14.80	16.02	6.39	Fine % (0.125 - 0.25 mm)	20.24%
	120	0.125	3.90	4.22	2.16		
Silt Material	170	0.090	0.80	0.87	1.30	Silt % (0.125 - 0.063 mm)	1.30%
	230	0.063	0.40	0.43	0.87		
Pan Material	pan	0.001	0.80	0.87	0.00	Pan % (< 0.063 mm)	0.87%
						Total	**100.00%**

Total (g)	92.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



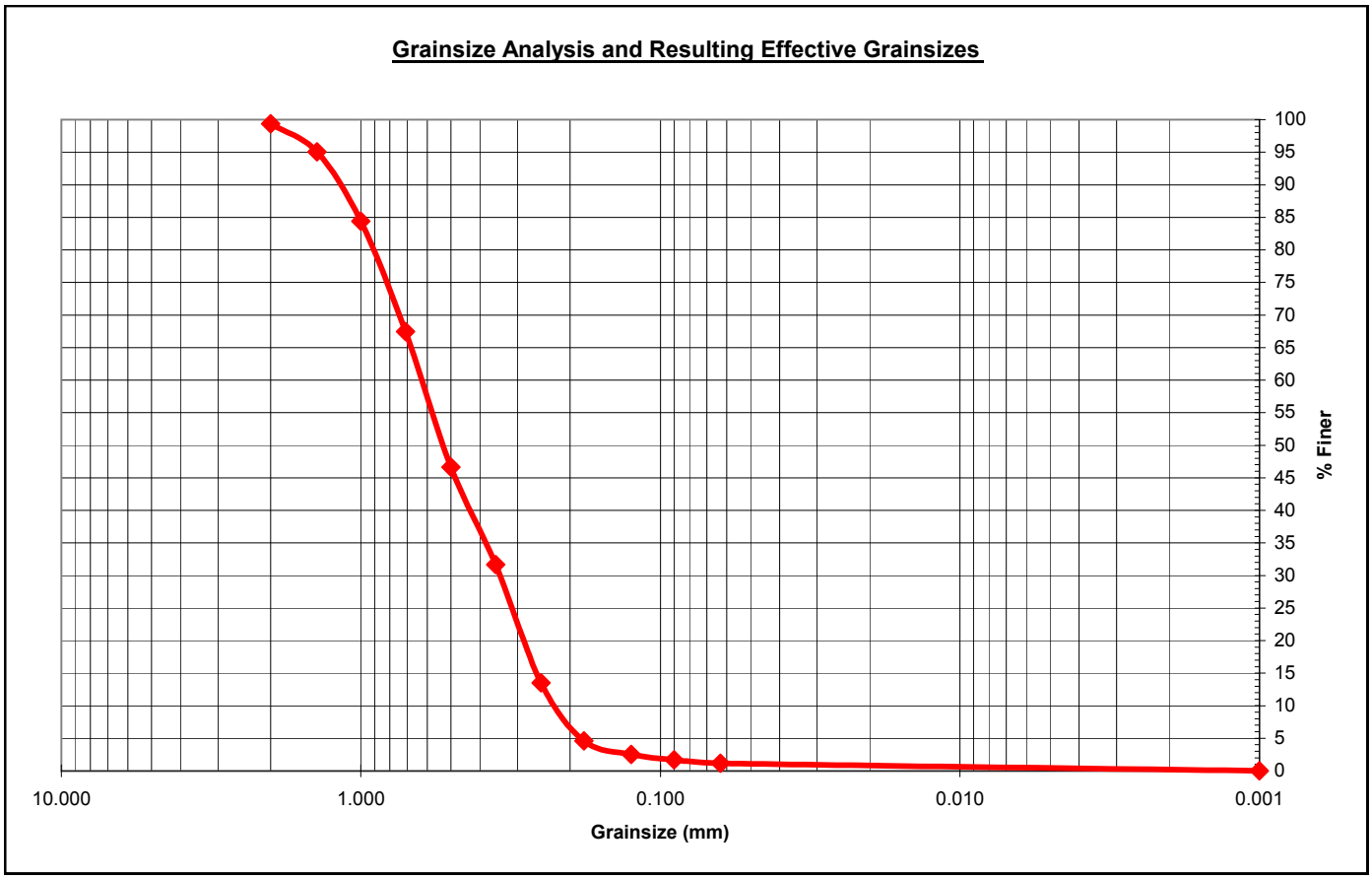
Sample ID:	ECP8-SB1	
Sample Depth:	60-61	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	95.90	g
Total Sieve Weight:	95.60	g
Weight Loss:	0.3	g
Percent Loss:	0.31	%

12.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.60	0.63	99.37	Coarse % (> 0.5 mm)	53.35%
	14	1.4	4.10	4.29	95.08		
	18	1.0	10.20	10.67	84.41		
	25	0.71	16.20	16.95	67.47		
	35	0.50	19.90	20.82	46.65		
Medium Material	45	0.355	14.30	14.96	31.69	Medium % (0.25 - 0.5 mm)	33.16%
	60	0.250	17.40	18.20	13.49		
Fine Material	80	0.180	8.50	8.89	4.60	Fine % (0.125 - 0.25 mm)	10.98%
	120	0.125	2.00	2.09	2.51		
Silt Material	170	0.090	0.80	0.84	1.67	Silt % (0.125 - 0.063 mm)	1.36%
	230	0.063	0.50	0.52	1.15		
Pan Material	pan	0.001	1.10	1.15	0.00	Pan % (< 0.063 mm)	1.15%
						Total	**100.00%**

Total (g)	95.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



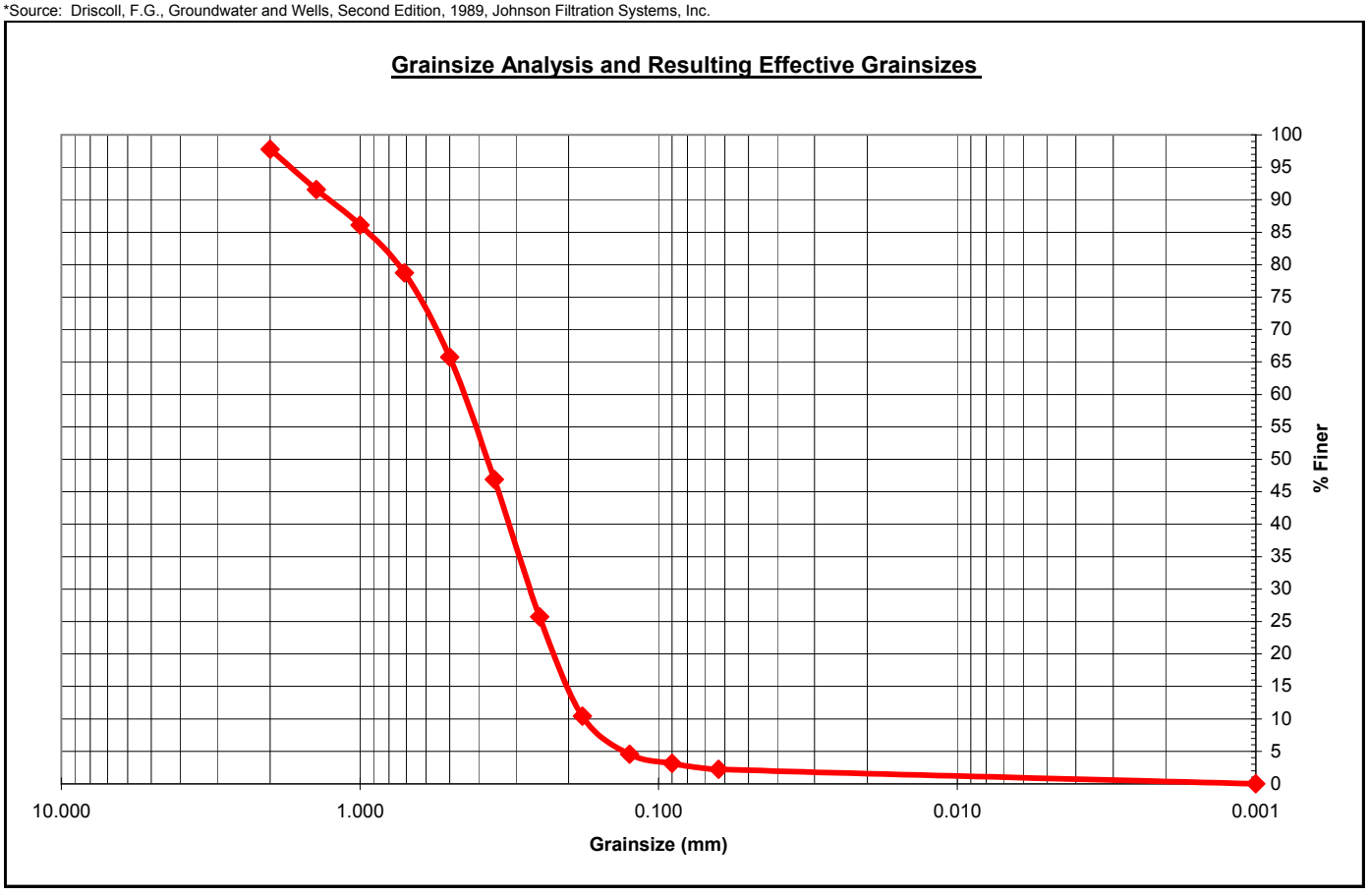
Sample ID:	ECP8-SB1
Sample Depth:	61-62 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.40 g
Total Sieve Weight:	94.90 g
Weight Loss:	0.5 g
Percent Loss:	0.52 %

13.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.10	2.21	97.79	Coarse % (> 0.5 mm)	34.25%
	14	1.4	5.90	6.22	91.57		
	18	1.0	5.20	5.48	86.09		
	25	0.71	7.00	7.38	78.71		
	35	0.50	12.30	12.96	65.75		
Medium Material	45	0.355	17.90	18.86	46.89	Medium % (0.25 - 0.5 mm)	40.04%
	60	0.250	20.10	21.18	25.71		
Fine Material	80	0.180	14.50	15.28	10.43	Fine % (0.125 - 0.25 mm)	21.18%
	120	0.125	5.60	5.90	4.53		
Silt Material	170	0.090	1.30	1.37	3.16	Silt % (0.125 - 0.063 mm)	2.32%
	230	0.063	0.90	0.95	2.21		
Pan Material	pan	0.001	2.10	2.21	0.00	Pan % (< 0.063 mm)	2.21%
						Total	**100.00%**

Total (g)	94.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



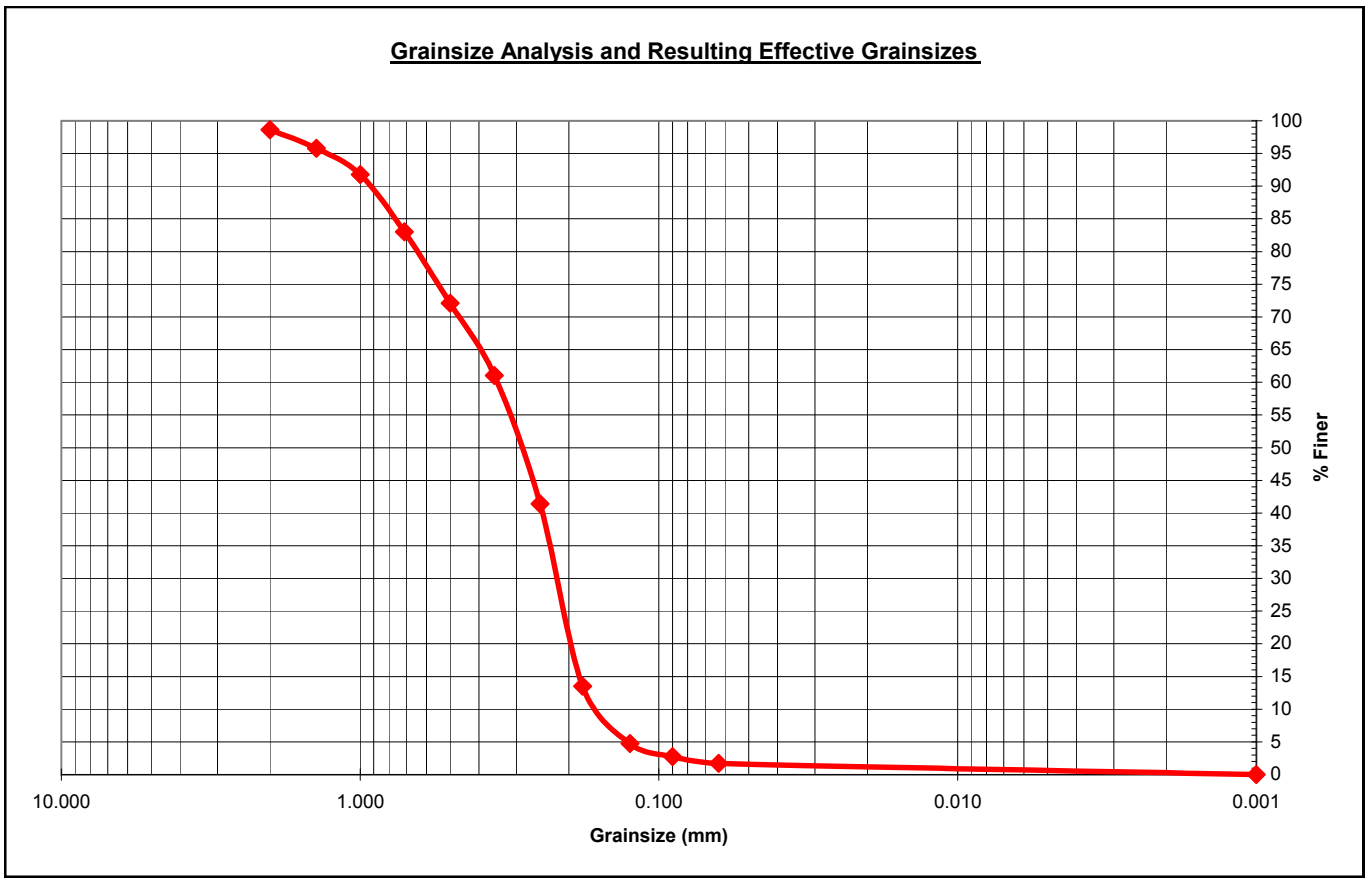
Sample ID:	ECP8-SB1
Sample Depth:	62-63 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.10 g
Total Sieve Weight:	94.70 g
Weight Loss:	0.4 g
Percent Loss:	0.42 %

13.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.30	1.37	98.63	Coarse % (> 0.5 mm)	27.88%
	14	1.4	2.70	2.85	95.78		
	18	1.0	3.80	4.01	91.76		
	25	0.71	8.30	8.76	83.00		
	35	0.50	10.30	10.88	72.12		
Medium Material	45	0.355	10.50	11.09	61.03	Medium % (0.25 - 0.5 mm)	30.73%
	60	0.250	18.60	19.64	41.39		
Fine Material	80	0.180	26.40	27.88	13.52	Fine % (0.125 - 0.25 mm)	36.64%
	120	0.125	8.30	8.76	4.75		
Silt Material	170	0.090	1.90	2.01	2.75	Silt % (0.125 - 0.063 mm)	3.06%
	230	0.063	1.00	1.06	1.69		
Pan Material	pan	0.001	1.60	1.69	0.00	Pan % (< 0.063 mm)	1.69%
						Total	**100.00%**

Total (g)	94.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



Sample ID:	ECP8-SB1
Sample Depth:	63-64 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.90 g
Total Sieve Weight:	86.90 g
Weight Loss:	2 g
Percent Loss:	2.25 %

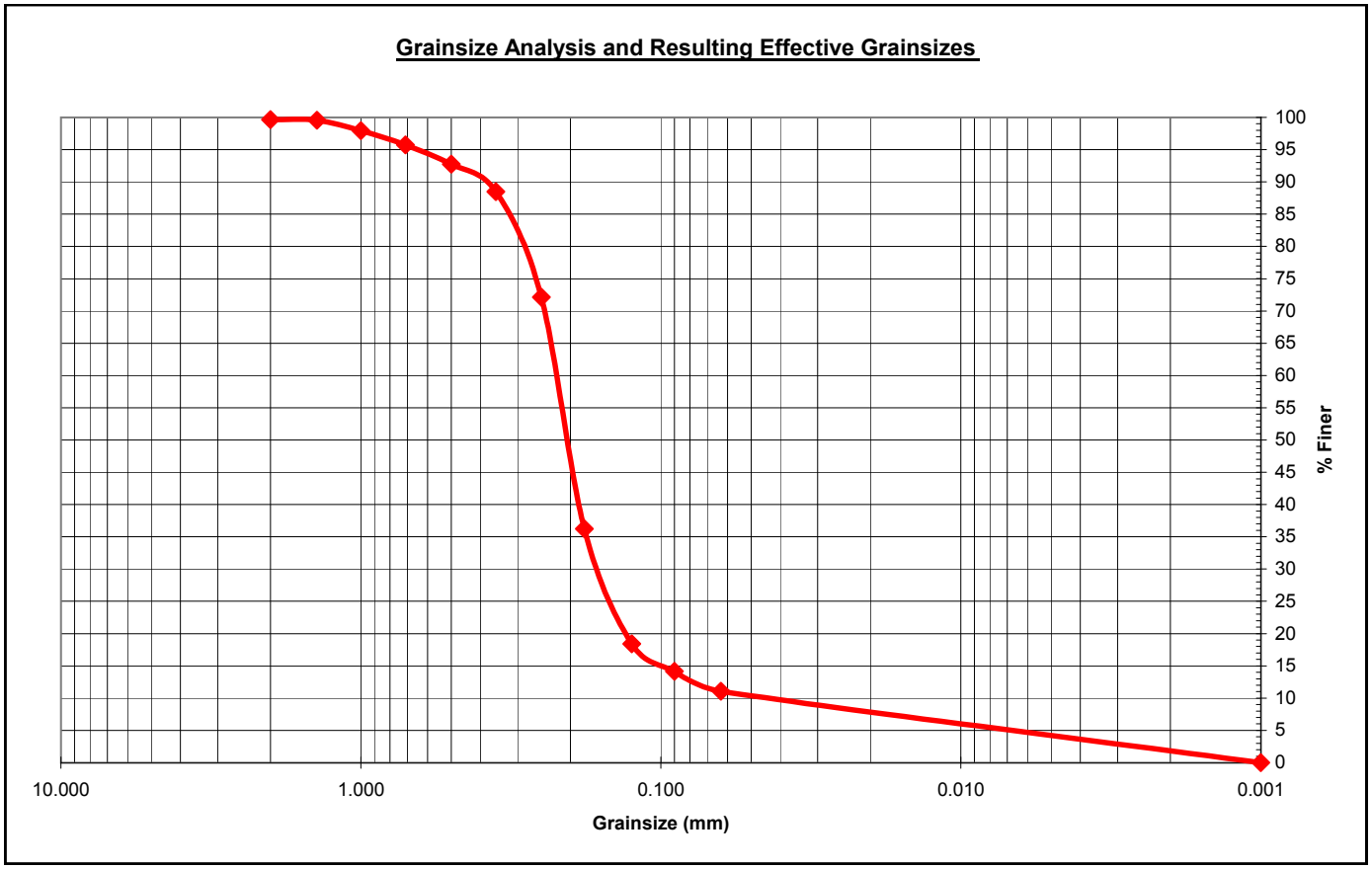
19.18 % Moisture

This sample was predominantly clay. The larger sieves had clay aggregates.

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*		Comment
Coarse Material	10	2.0	0.30	0.35	99.65	Coarse % (> 0.5 mm)	7.25%	CLAY
	14	1.4	0.10	0.12	99.54			CLAY
	18	1.0	1.40	1.61	97.93			
	25	0.71	1.90	2.19	95.74			
	35	0.50	2.60	2.99	92.75			
Medium Material	45	0.355	3.70	4.26	88.49	Medium % (0.25 - 0.5 mm)	20.60%	
	60	0.250	14.20	16.34	72.15			
Fine Material	80	0.180	31.20	35.90	36.25	Fine % (0.125 - 0.25 mm)	53.74%	
	120	0.125	15.50	17.84	18.41			
Silt Material	170	0.090	3.70	4.26	14.15	Silt % (0.125 - 0.063 mm)	7.36%	
	230	0.063	2.70	3.11	11.05			
Pan Material	pan	0.001	9.60	11.05	0.00	Pan % (< 0.063 mm)	11.05%	
						Total	100.00%	

Total (g)	86.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



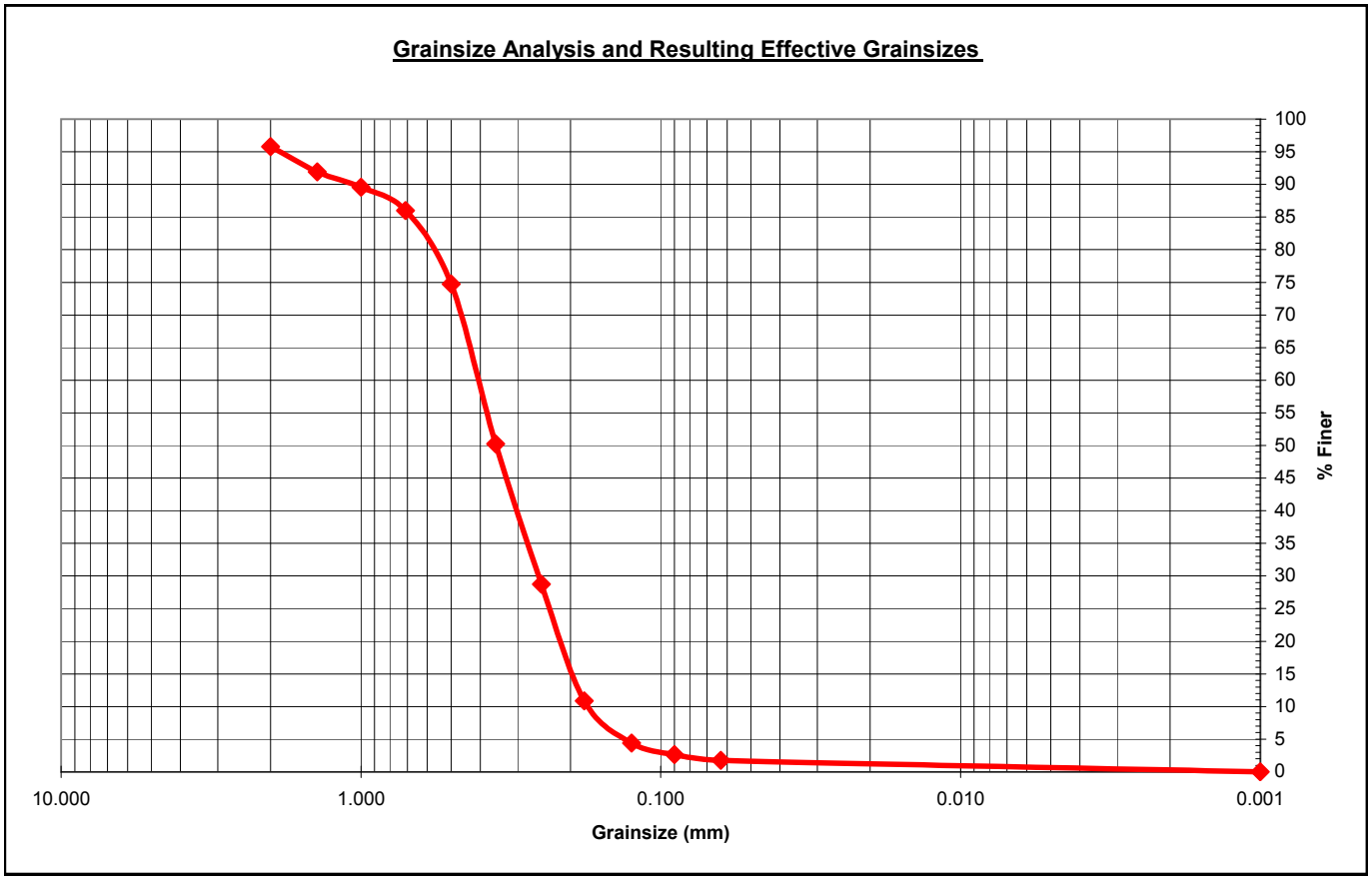
Sample ID:	ECP8-SB1
Sample Depth:	64-65 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.20 g
Total Sieve Weight:	97.70 g
Weight Loss:	0.5 g
Percent Loss:	0.51 %

10.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.10	4.20	95.80	Coarse % (> 0.5 mm)	25.28%
	14	1.4	3.80	3.89	91.91		
	18	1.0	2.30	2.35	89.56		
	25	0.71	3.50	3.58	85.98		
	35	0.50	11.00	11.26	74.72		
Medium Material	45	0.355	23.90	24.46	50.26	Medium % (0.25 - 0.5 mm)	45.96%
	60	0.250	21.00	21.49	28.76		
Fine Material	80	0.180	17.50	17.91	10.85	Fine % (0.125 - 0.25 mm)	24.36%
	120	0.125	6.30	6.45	4.40		
Silt Material	170	0.090	1.70	1.74	2.66	Silt % (0.125 - 0.063 mm)	2.66%
	230	0.063	0.90	0.92	1.74		
Pan Material	pan	0.001	1.70	1.74	0.00	Pan % (< 0.063 mm)	1.74%
						Total	**100.00%**

Total (g)	97.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



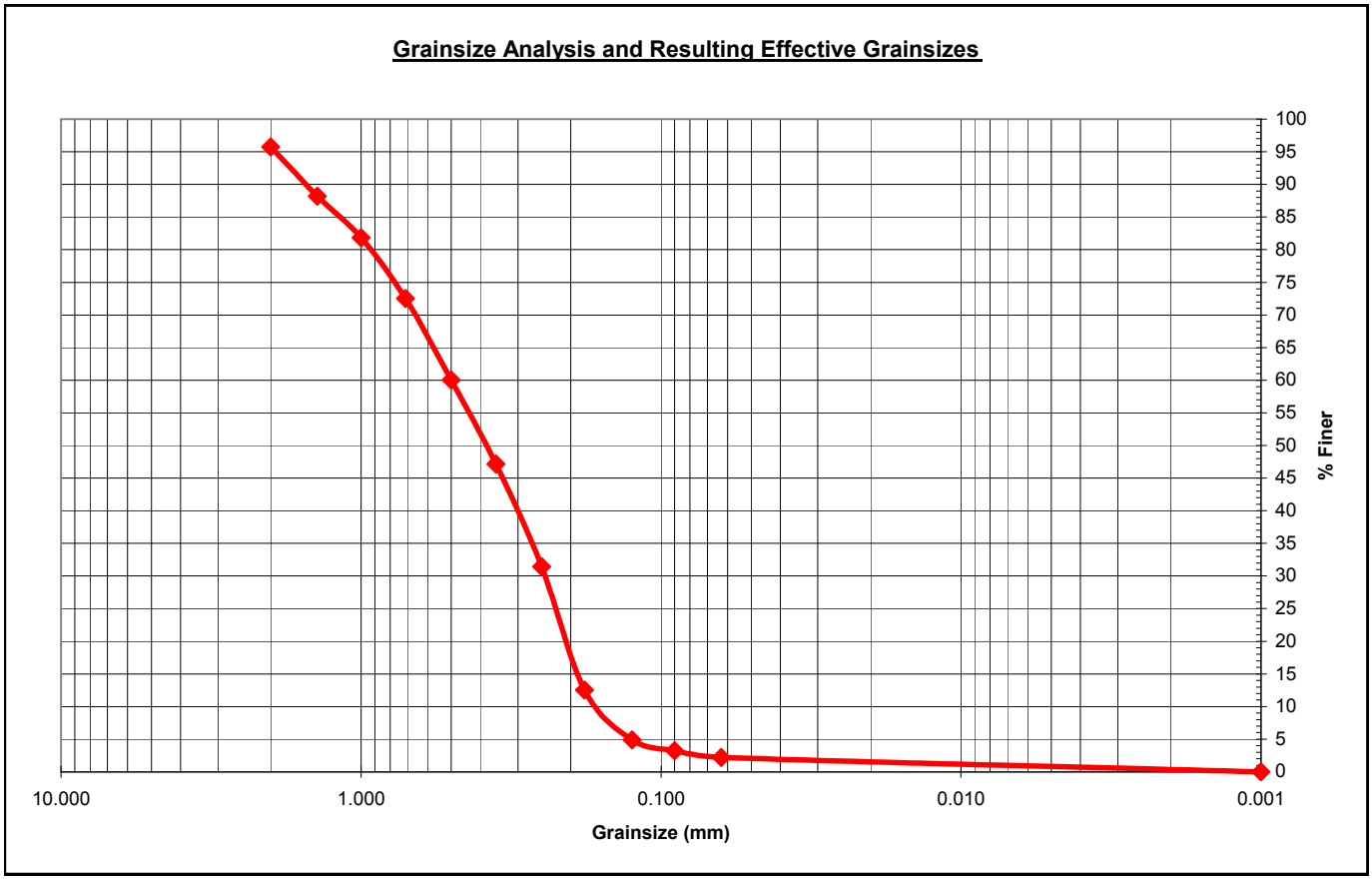
Sample ID:	ECP8-SB1
Sample Depth:	65-66 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	96.20 g
Total Sieve Weight:	95.80 g
Weight Loss:	0.4 g
Percent Loss:	0.42 %

12.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.10	4.28	95.72	Coarse % (> 0.5 mm)	39.98%
	14	1.4	7.20	7.52	88.20		
	18	1.0	6.10	6.37	81.84		
	25	0.71	8.90	9.29	72.55		
	35	0.50	12.00	12.53	60.02		
Medium Material	45	0.355	12.30	12.84	47.18	Medium % (0.25 - 0.5 mm)	28.60%
	60	0.250	15.10	15.76	31.42		
Fine Material	80	0.180	18.10	18.89	12.53	Fine % (0.125 - 0.25 mm)	26.51%
	120	0.125	7.30	7.62	4.91		
Silt Material	170	0.090	1.60	1.67	3.24	Silt % (0.125 - 0.063 mm)	2.71%
	230	0.063	1.00	1.04	2.19		
Pan Material	pan	0.001	2.10	2.19	0.00	Pan % (< 0.063 mm)	2.19%
						Total	100.00%

Total (g)	95.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



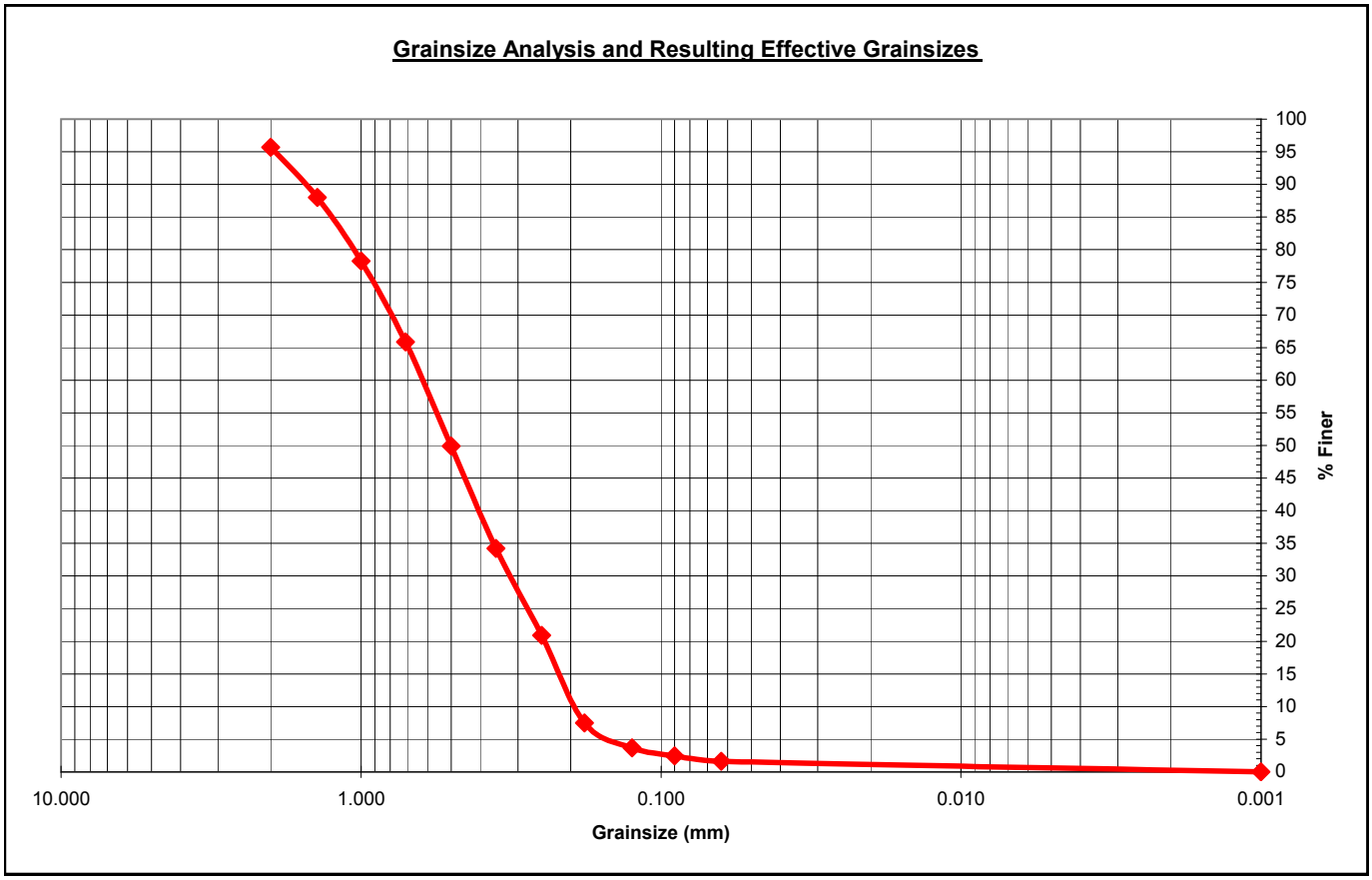
Sample ID:	ECP8-SB1	
Sample Depth:	66-67	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	97.80	g
Total Sieve Weight:	97.60	g
Weight Loss:	0.2	g
Percent Loss:	0.20	%

11.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.20	4.30	95.70	Coarse % (> 0.5 mm)	50.10%
	14	1.4	7.50	7.68	88.01		
	18	1.0	9.50	9.73	78.28		
	25	0.71	12.10	12.40	65.88		
	35	0.50	15.60	15.98	49.90		
Medium Material	45	0.355	15.30	15.68	34.22	Medium % (0.25 - 0.5 mm)	29.00%
	60	0.250	13.00	13.32	20.90		
Fine Material	80	0.180	13.10	13.42	7.48	Fine % (0.125 - 0.25 mm)	17.21%
	120	0.125	3.70	3.79	3.69		
Silt Material	170	0.090	1.20	1.23	2.46	Silt % (0.125 - 0.063 mm)	2.05%
	230	0.063	0.80	0.82	1.64		
Pan Material	pan	0.001	1.60	1.64	0.00	Pan % (< 0.063 mm)	1.64%
						Total	**100.00%**

Total (g)	97.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



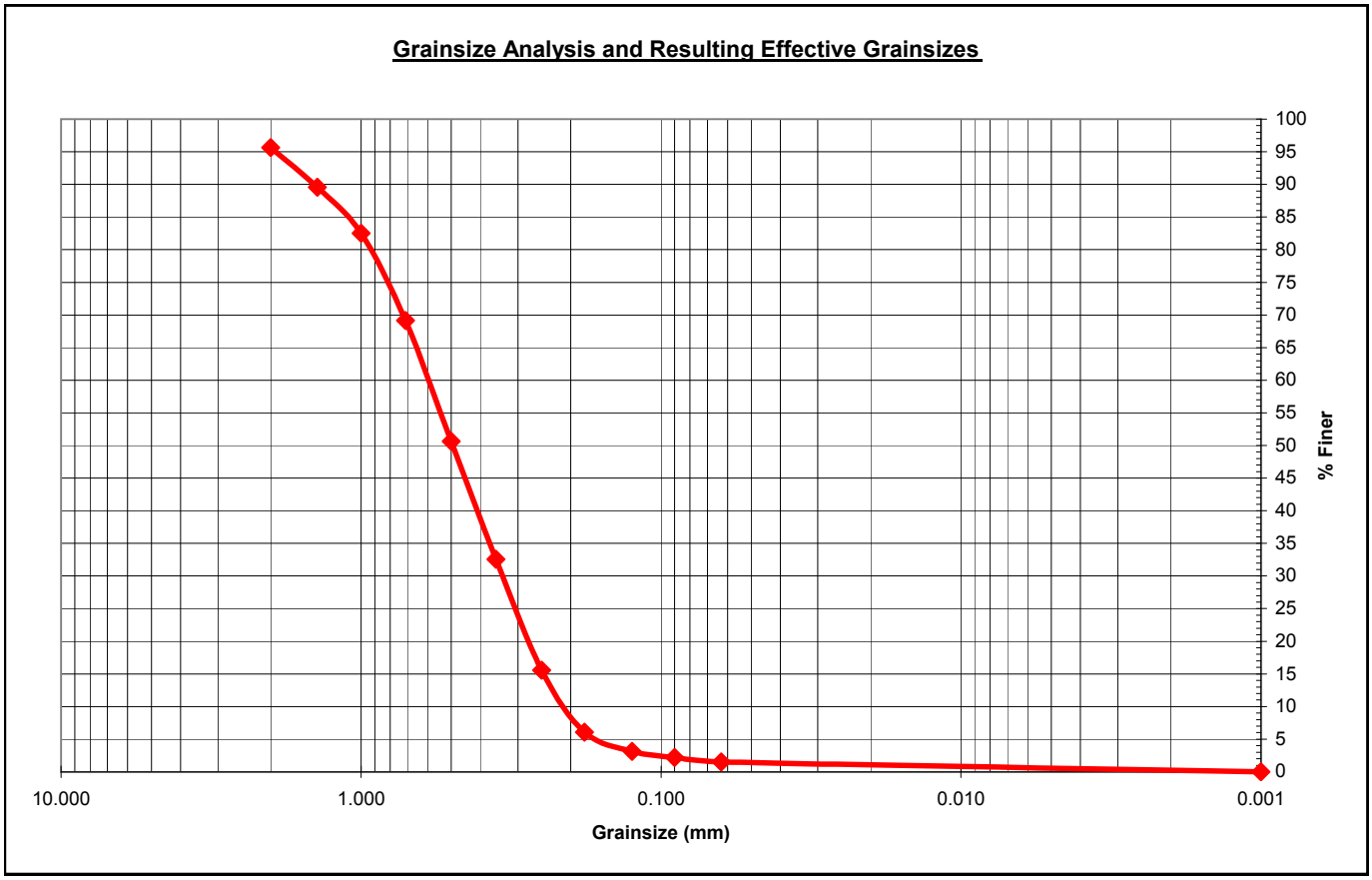
Sample ID:	ECP8-SB1
Sample Depth:	67-68 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.10 g
Total Sieve Weight:	98.90 g
Weight Loss:	0.2 g
Percent Loss:	0.20 %

9.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.30	4.35	95.65	Coarse % (> 0.5 mm)	49.34%
	14	1.4	6.00	6.07	89.59		
	18	1.0	7.00	7.08	82.51		
	25	0.71	13.20	13.35	69.16		
	35	0.50	18.30	18.50	50.66		
Medium Material	45	0.355	17.90	18.10	32.56	Medium % (0.25 - 0.5 mm)	35.09%
	60	0.250	16.80	16.99	15.57		
Fine Material	80	0.180	9.40	9.50	6.07	Fine % (0.125 - 0.25 mm)	12.44%
	120	0.125	2.90	2.93	3.13		
Silt Material	170	0.090	0.90	0.91	2.22	Silt % (0.125 - 0.063 mm)	1.62%
	230	0.063	0.70	0.71	1.52		
Pan Material	pan	0.001	1.50	1.52	0.00	Pan % (< 0.063 mm)	1.52%
						Total	**100.00%**

Total (g)	98.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



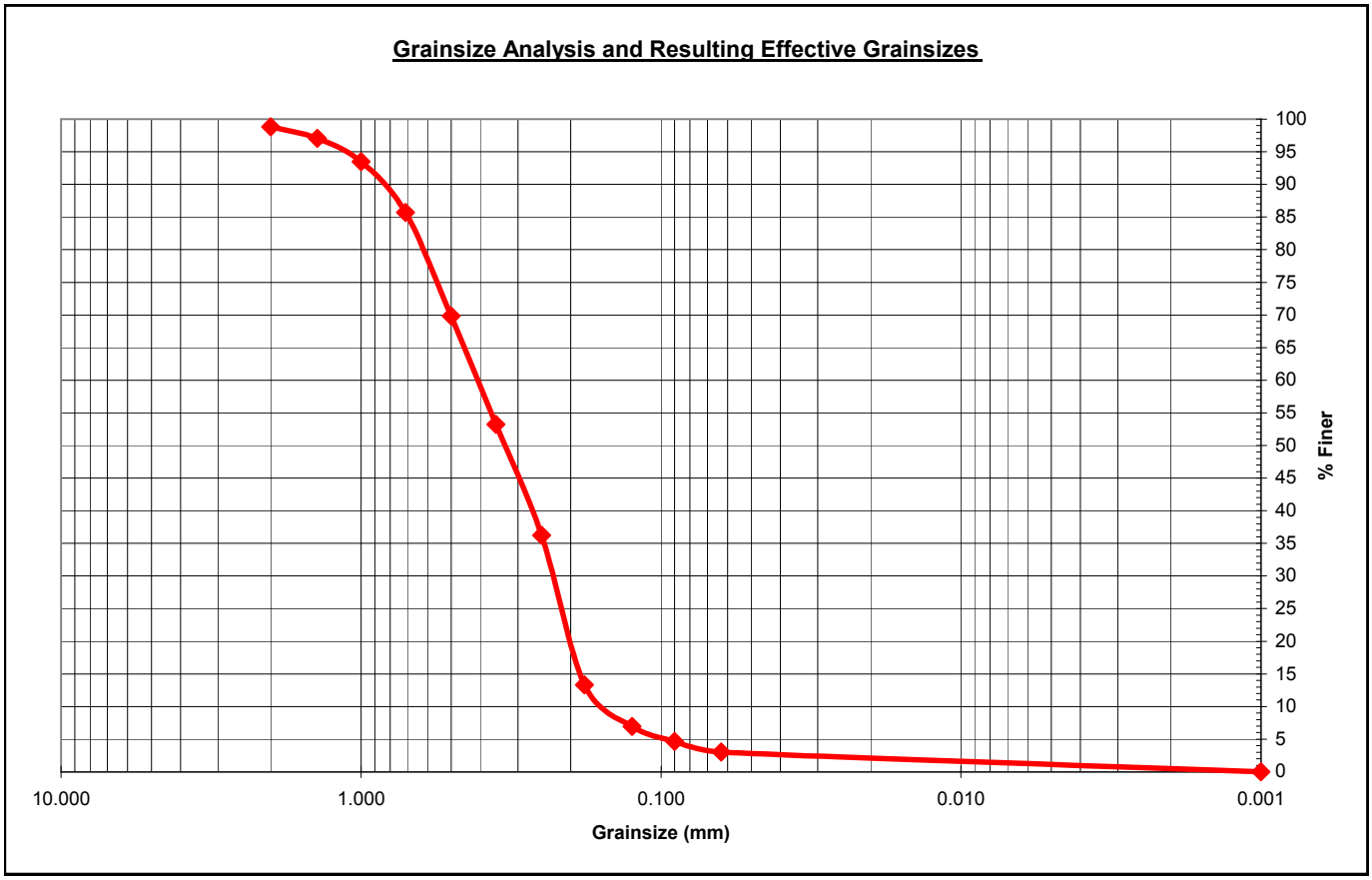
Sample ID:	ECP8-SB1
Sample Depth:	68-69 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	92.60 g
Total Sieve Weight:	92.20 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

15.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.10	1.19	98.81	Coarse % (> 0.5 mm)	30.15%
	14	1.4	1.60	1.74	97.07		
	18	1.0	3.30	3.58	93.49		
	25	0.71	7.20	7.81	85.68		
	35	0.50	14.60	15.84	69.85		
Medium Material	45	0.355	15.30	16.59	53.25	Medium % (0.25 - 0.5 mm)	33.62%
	60	0.250	15.70	17.03	36.23		
Fine Material	80	0.180	21.10	22.89	13.34	Fine % (0.125 - 0.25 mm)	29.28%
	120	0.125	5.90	6.40	6.94		
Silt Material	170	0.090	2.10	2.28	4.66	Silt % (0.125 - 0.063 mm)	3.90%
	230	0.063	1.50	1.63	3.04		
Pan Material	pan	0.001	2.80	3.04	0.00	Pan % (< 0.063 mm)	3.04%
						Total	**100.00%**

Total (g)	92.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



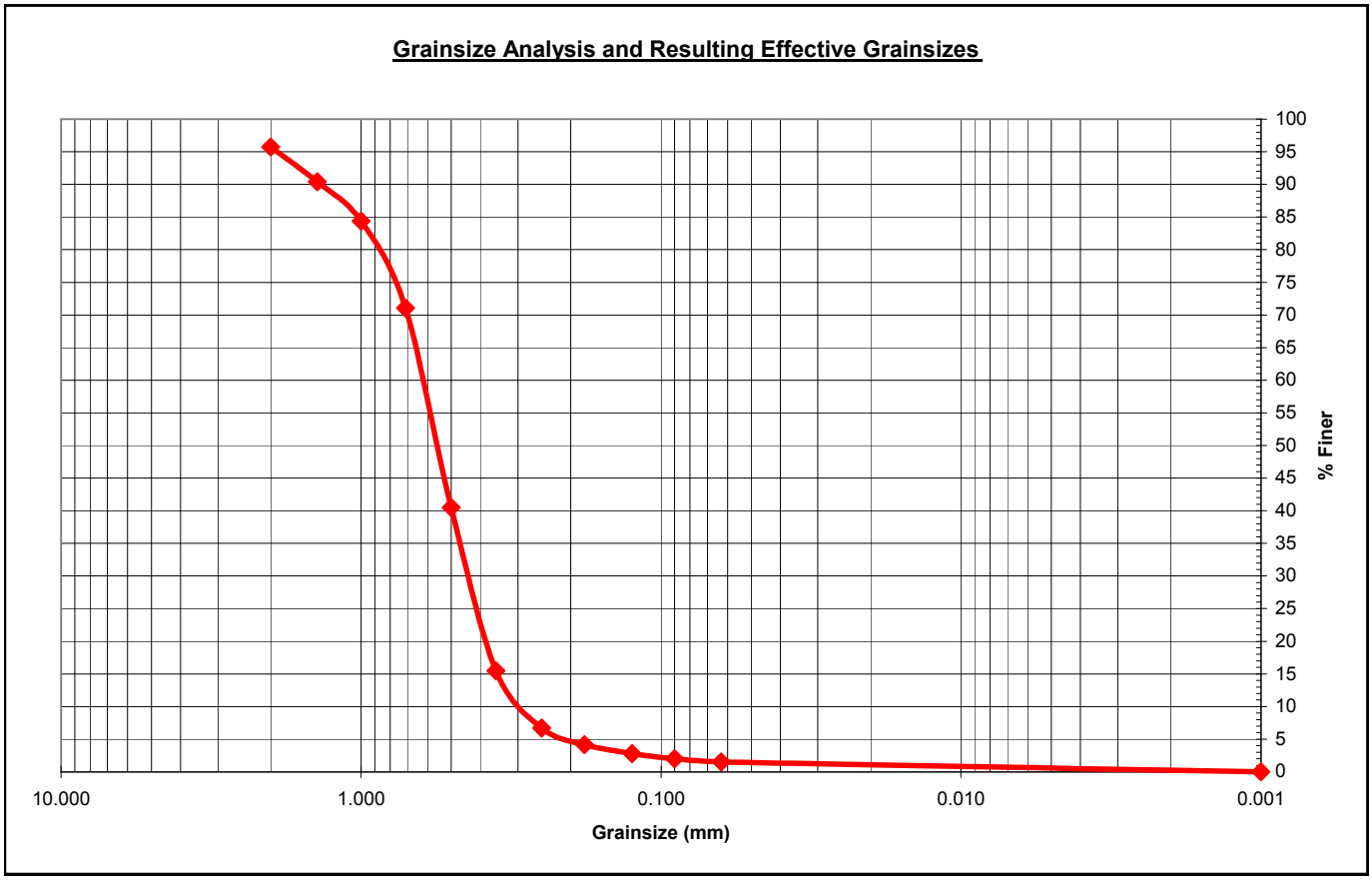
Sample ID:	ECP8-SB1
Sample Depth:	69-70 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.90 g
Total Sieve Weight:	93.60 g
Weight Loss:	0.3 g
Percent Loss:	0.32 %

14.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.00	4.27	95.73	Coarse % (> 0.5 mm)	59.51%
	14	1.4	5.00	5.34	90.38		
	18	1.0	5.60	5.98	84.40		
	25	0.71	12.50	13.35	71.05		
	35	0.50	28.60	30.56	40.49		
Medium Material	45	0.355	23.40	25.00	15.49	Medium % (0.25 - 0.5 mm)	33.76%
	60	0.250	8.20	8.76	6.73		
Fine Material	80	0.180	2.40	2.56	4.17	Fine % (0.125 - 0.25 mm)	3.95%
	120	0.125	1.30	1.39	2.78		
Silt Material	170	0.090	0.70	0.75	2.03	Silt % (0.125 - 0.063 mm)	1.28%
	230	0.063	0.50	0.53	1.50		
Pan Material	pan	0.001	1.40	1.50	0.00	Pan % (< 0.063 mm)	1.50%
						Total	100.00%

Total (g)	93.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



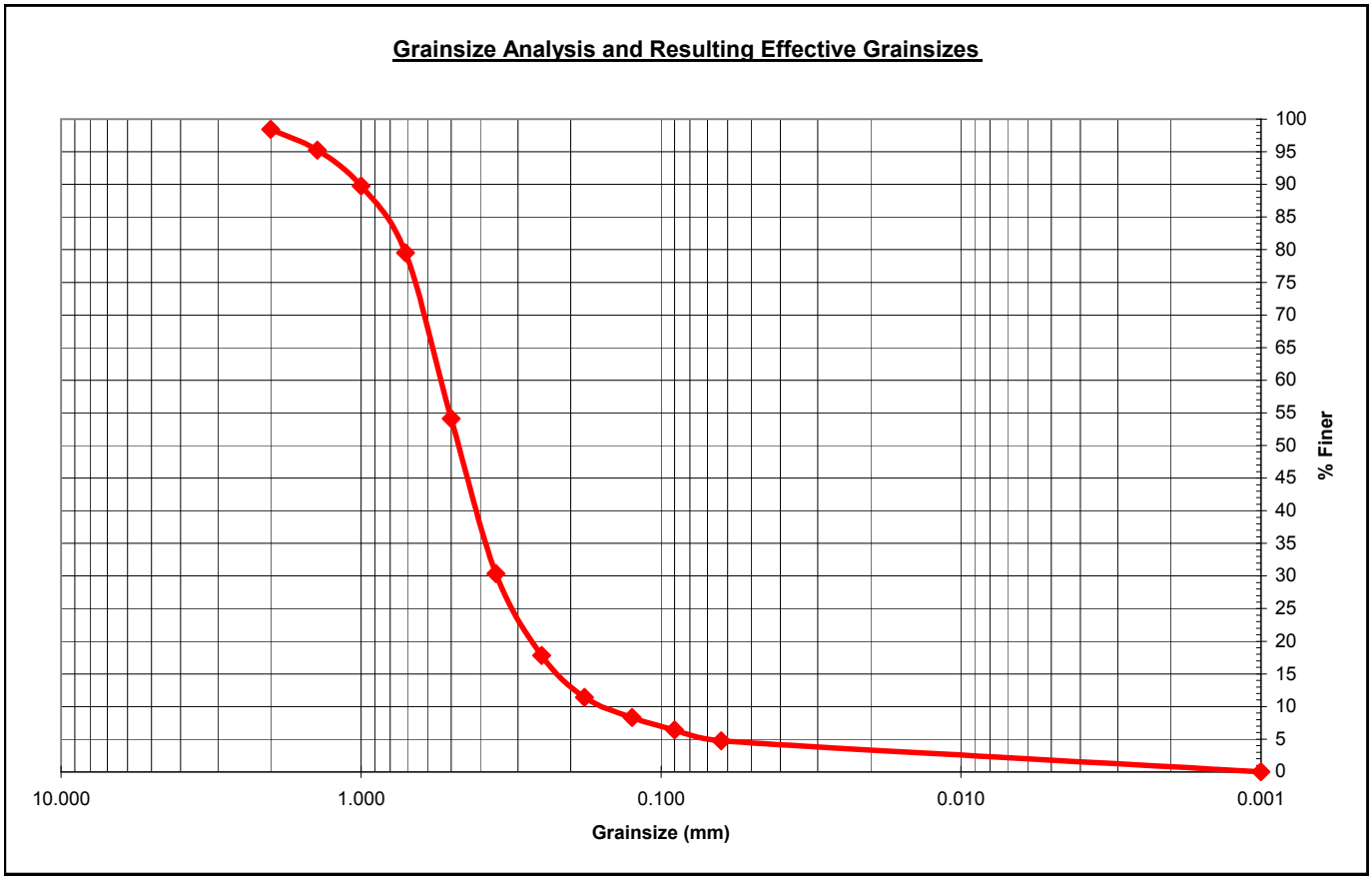
Sample ID:	ECP8-SB1	
Sample Depth:	70-71	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	95.00	g
Total Sieve Weight:	94.80	g
Weight Loss:	0.2	g
Percent Loss:	0.21	%

13.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.50	1.58	98.42	Coarse % (> 0.5 mm)	45.89%
	14	1.4	3.00	3.16	95.25		
	18	1.0	5.20	5.49	89.77		
	25	0.71	9.70	10.23	79.54		
	35	0.50	24.10	25.42	54.11		
Medium Material	45	0.355	22.50	23.73	30.38	Medium % (0.25 - 0.5 mm)	36.29%
	60	0.250	11.90	12.55	17.83		
Fine Material	80	0.180	6.10	6.43	11.39	Fine % (0.125 - 0.25 mm)	9.49%
	120	0.125	2.90	3.06	8.33		
Silt Material	170	0.090	1.80	1.90	6.43	Silt % (0.125 - 0.063 mm)	3.59%
	230	0.063	1.60	1.69	4.75		
Pan Material	pan	0.001	4.50	4.75	0.00	Pan % (< 0.063 mm)	4.75%
						Total	**100.00%**

Total (g)	94.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



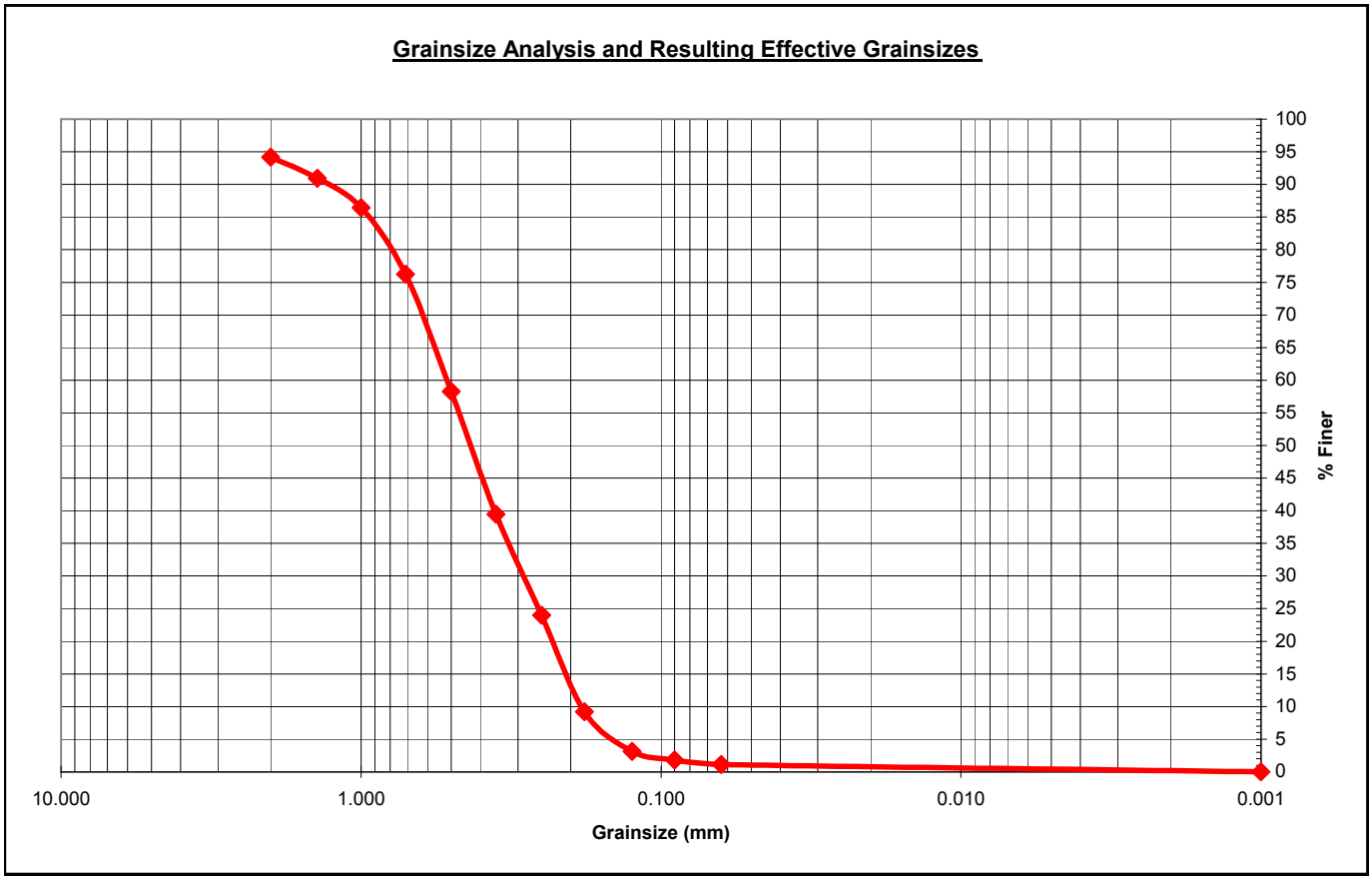
Sample ID:	ECP8-SB1
Sample Depth:	71-72 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.00 g
Total Sieve Weight:	89.20 g
Weight Loss:	0.8 g
Percent Loss:	0.89 %

18.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	5.20	5.83	94.17	Coarse % (> 0.5 mm)	41.70%
	14	1.4	2.90	3.25	90.92		
	18	1.0	4.00	4.48	86.43		
	25	0.71	9.10	10.20	76.23		
	35	0.50	16.00	17.94	58.30		
Medium Material	45	0.355	16.80	18.83	39.46	Medium % (0.25 - 0.5 mm)	34.30%
	60	0.250	13.80	15.47	23.99		
Fine Material	80	0.180	13.20	14.80	9.19	Fine % (0.125 - 0.25 mm)	20.85%
	120	0.125	5.40	6.05	3.14		
Silt Material	170	0.090	1.20	1.35	1.79	Silt % (0.125 - 0.063 mm)	2.02%
	230	0.063	0.60	0.67	1.12		
Pan Material	pan	0.001	1.00	1.12	0.00	Pan % (< 0.063 mm)	1.12%
						Total	**100.00%**

Total (g)	89.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



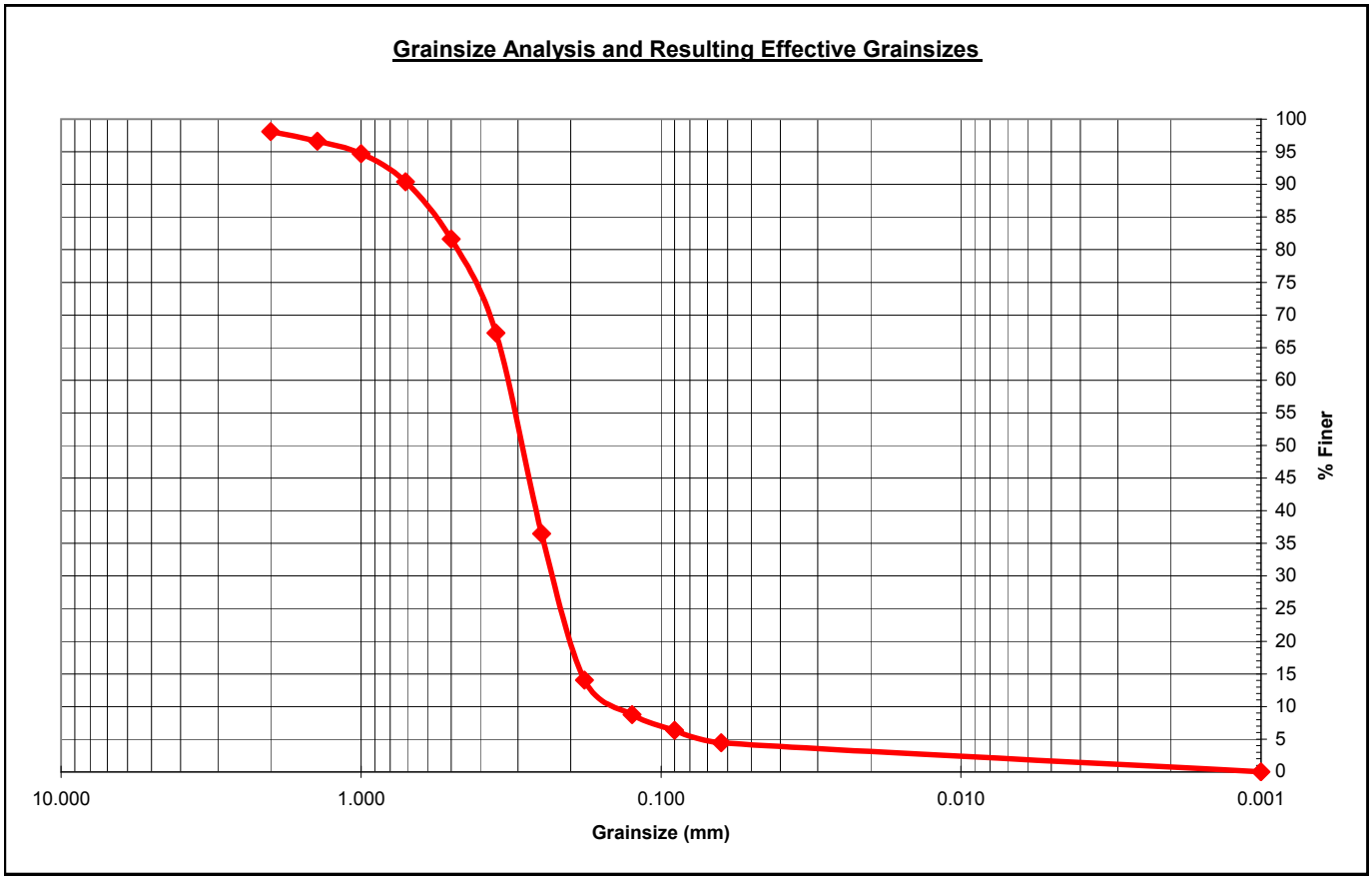
Sample ID:	ECP8-SB1
Sample Depth:	72-73 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.30 g
Total Sieve Weight:	83.30 g
Weight Loss:	1 g
Percent Loss:	1.19 %

23.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.60	1.92	98.08	Coarse % (> 0.5 mm)	18.37%
	14	1.4	1.20	1.44	96.64		
	18	1.0	1.60	1.92	94.72		
	25	0.71	3.60	4.32	90.40		
	35	0.50	7.30	8.76	81.63		
Medium Material	45	0.355	12.00	14.41	67.23	Medium % (0.25 - 0.5 mm)	45.14%
	60	0.250	25.60	30.73	36.49		
Fine Material	80	0.180	18.70	22.45	14.05	Fine % (0.125 - 0.25 mm)	27.73%
	120	0.125	4.40	5.28	8.76		
Silt Material	170	0.090	2.00	2.40	6.36	Silt % (0.125 - 0.063 mm)	4.32%
	230	0.063	1.60	1.92	4.44		
Pan Material	pan	0.001	3.70	4.44	0.00	Pan % (< 0.063 mm)	4.44%
						Total	**100.00%**

Total (g)	83.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



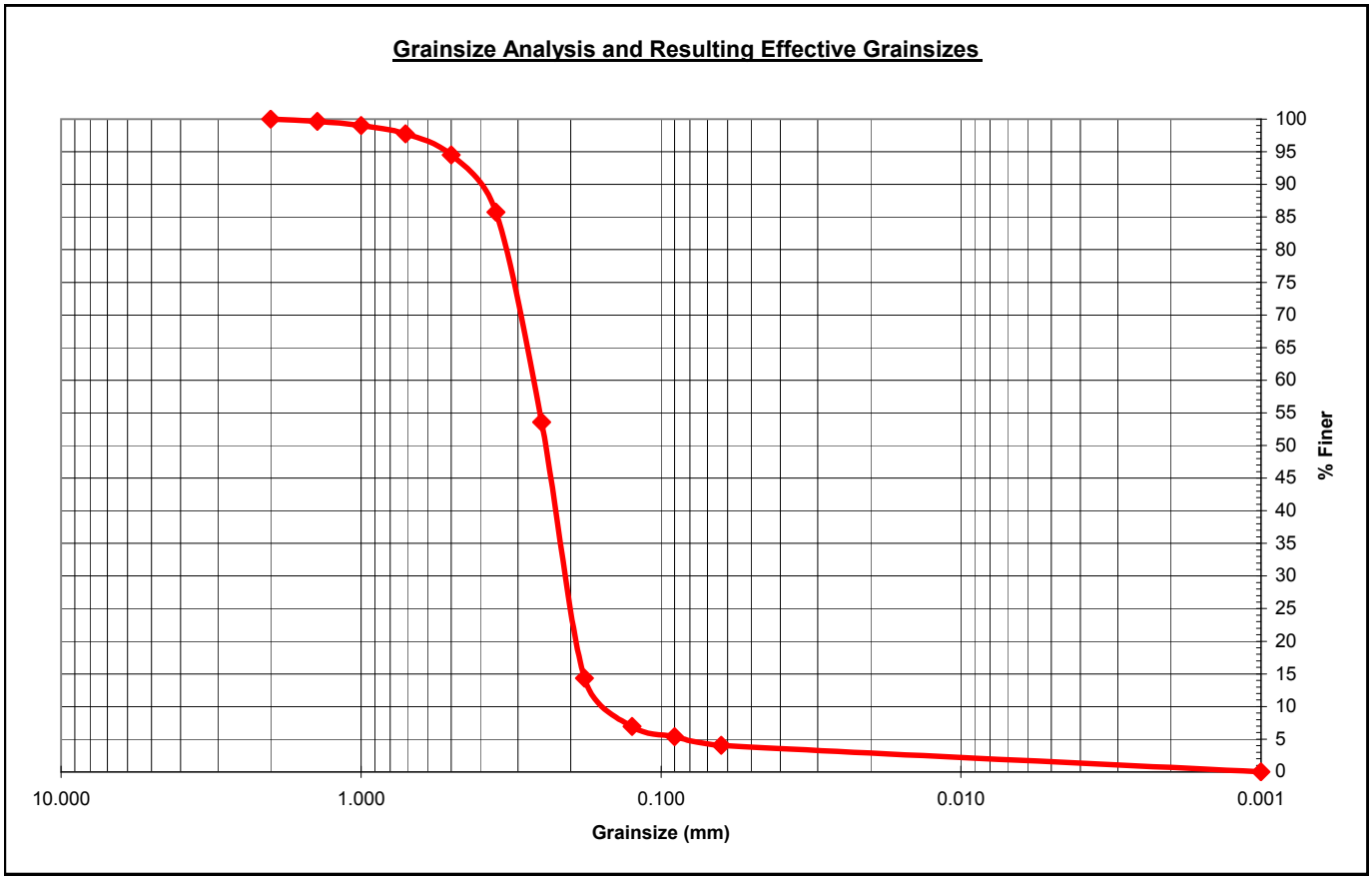
Sample ID:	ECP8-SB1
Sample Depth:	73-74 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.80 g
Total Sieve Weight:	83.60 g
Weight Loss:	1.2 g
Percent Loss:	1.42 %

22.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	5.50%
	14	1.4	0.30	0.36	99.64		
	18	1.0	0.50	0.60	99.04		
	25	0.71	1.10	1.32	97.73		
	35	0.50	2.70	3.23	94.50		
Medium Material	45	0.355	7.30	8.73	85.77	Medium % (0.25 - 0.5 mm)	40.91%
	60	0.250	26.90	32.18	53.59		
Fine Material	80	0.180	32.80	39.23	14.35	Fine % (0.125 - 0.25 mm)	46.65%
	120	0.125	6.20	7.42	6.94		
Silt Material	170	0.090	1.30	1.56	5.38	Silt % (0.125 - 0.063 mm)	2.87%
	230	0.063	1.10	1.32	4.07		
Pan Material	pan	0.001	3.40	4.07	0.00	Pan % (< 0.063 mm)	4.07%
						Total	**100.00%**

Total (g)	83.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



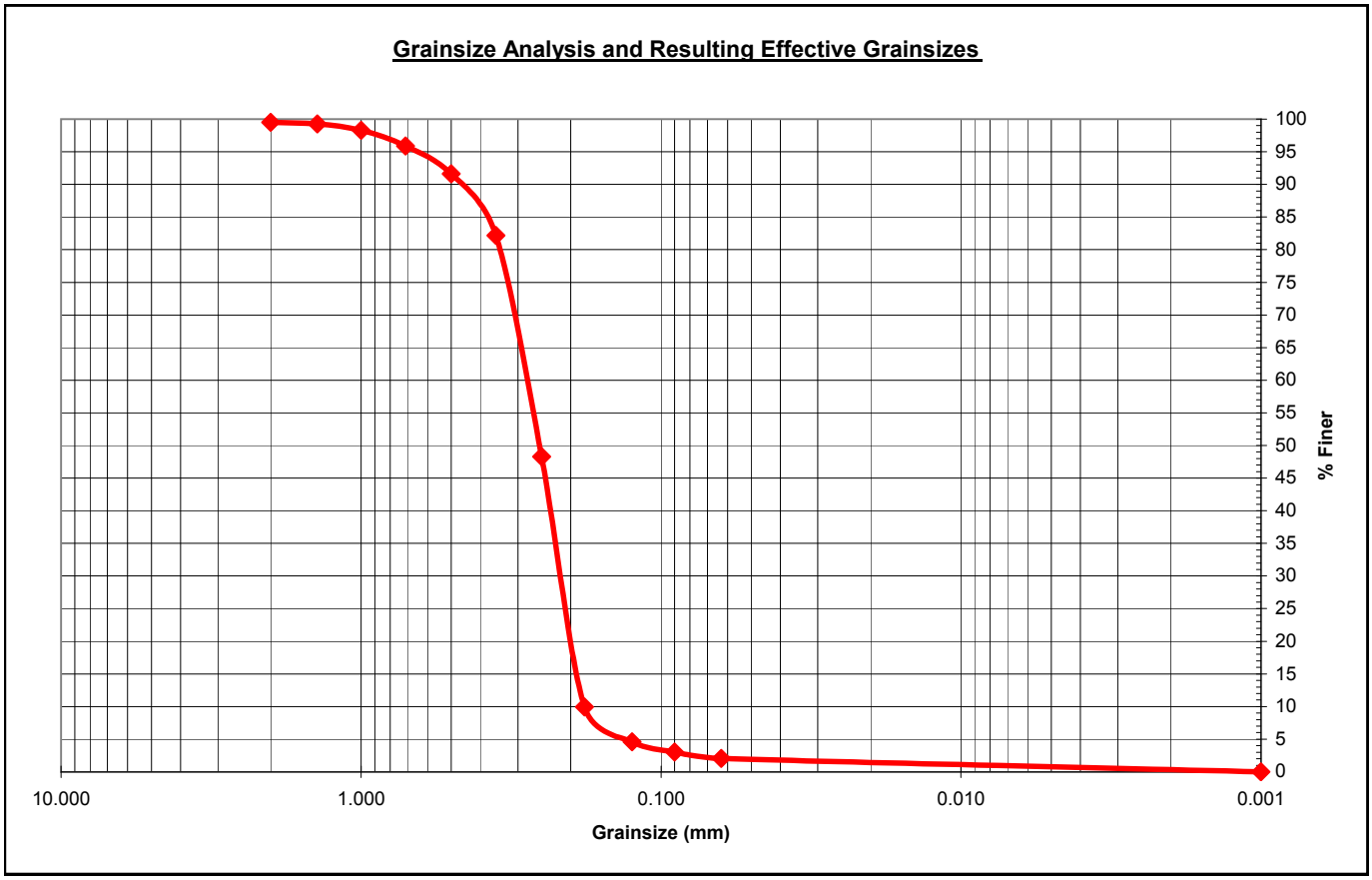
Sample ID:	ECP8-SB1
Sample Depth:	74-75 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	82.90 g
Total Sieve Weight:	82.40 g
Weight Loss:	0.5 g
Percent Loss:	0.60 %

24.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.49	99.51	Coarse % (> 0.5 mm)	8.37%
	14	1.4	0.20	0.24	99.27		
	18	1.0	0.80	0.97	98.30		
	25	0.71	2.00	2.43	95.87		
	35	0.50	3.50	4.25	91.63		
Medium Material	45	0.355	7.80	9.47	82.16	Medium % (0.25 - 0.5 mm)	43.33%
	60	0.250	27.90	33.86	48.30		
Fine Material	80	0.180	31.60	38.35	9.95	Fine % (0.125 - 0.25 mm)	43.69%
	120	0.125	4.40	5.34	4.61		
Silt Material	170	0.090	1.30	1.58	3.03	Silt % (0.125 - 0.063 mm)	2.55%
	230	0.063	0.80	0.97	2.06		
Pan Material	pan	0.001	1.70	2.06	0.00	Pan % (< 0.063 mm)	2.06%
						Total	100.00%

Total (g)	82.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



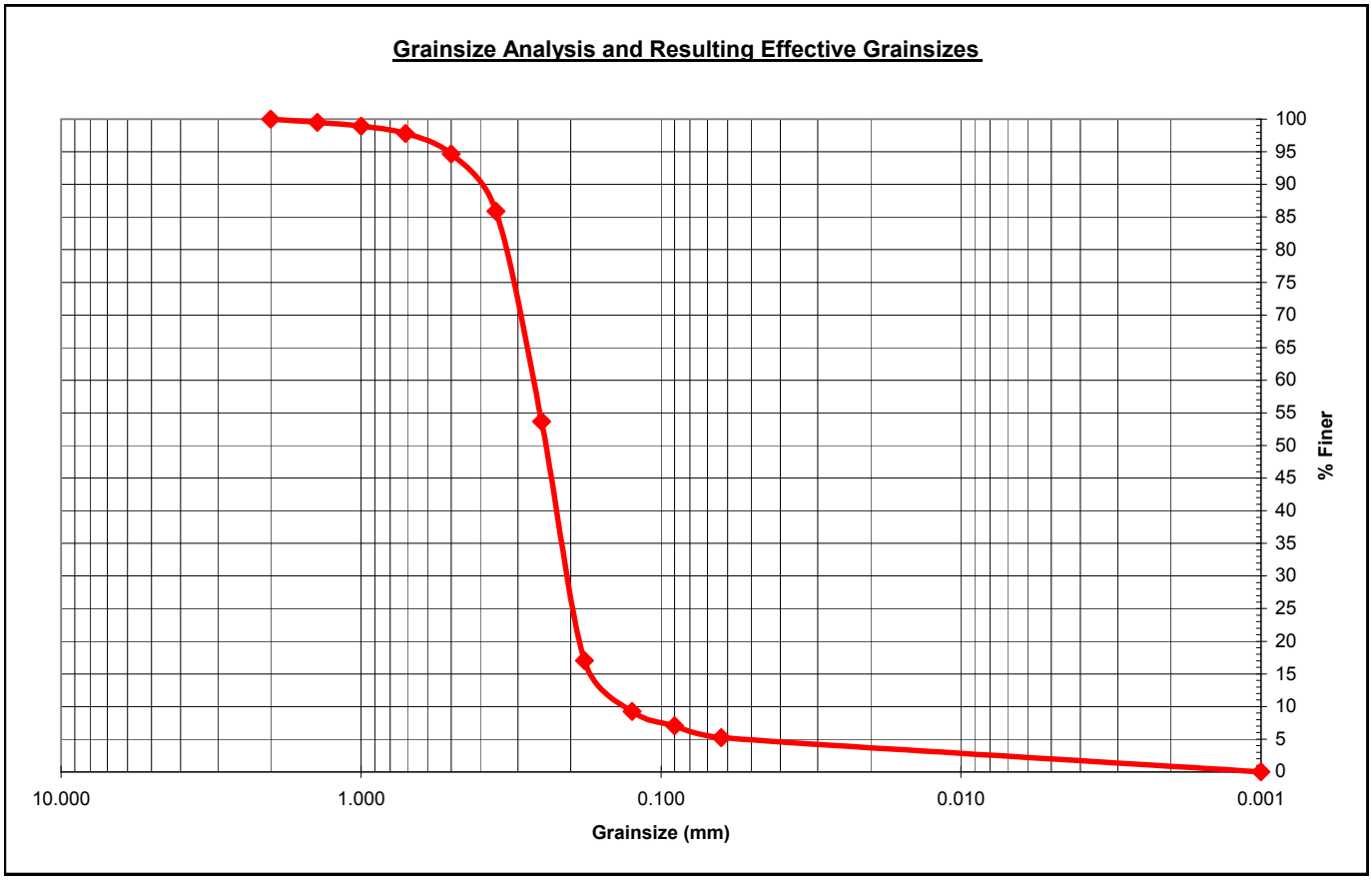
Sample ID:	ECP8-SB1
Sample Depth:	75-76 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.40 g
Total Sieve Weight:	82.20 g
Weight Loss:	1.2 g
Percent Loss:	1.44 %

24.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	5.35%
	14	1.4	0.40	0.49	99.51		
	18	1.0	0.50	0.61	98.91		
	25	0.71	0.90	1.09	97.81		
	35	0.50	2.60	3.16	94.65		
Medium Material	45	0.355	7.20	8.76	85.89	Medium % (0.25 - 0.5 mm)	41.00%
	60	0.250	26.50	32.24	53.65		
Fine Material	80	0.180	30.10	36.62	17.03	Fine % (0.125 - 0.25 mm)	44.40%
	120	0.125	6.40	7.79	9.25		
Silt Material	170	0.090	1.80	2.19	7.06	Silt % (0.125 - 0.063 mm)	4.01%
	230	0.063	1.50	1.82	5.23		
Pan Material	pan	0.001	4.30	5.23	0.00	Pan % (< 0.063 mm)	5.23%
						Total	100.00%

Total (g)	82.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



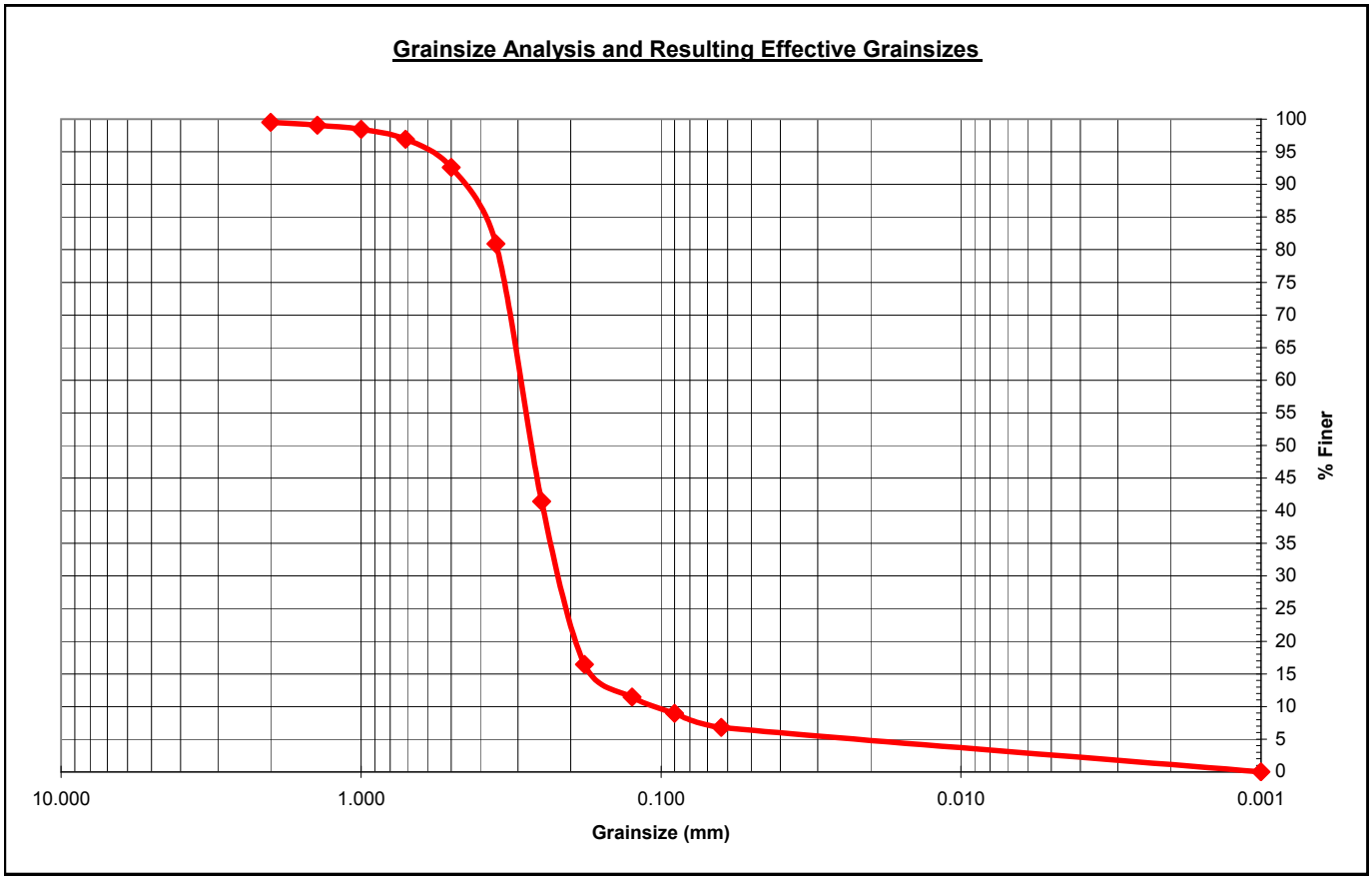
Sample ID:	ECP8-SB1
Sample Depth:	76-77 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.60 g
Total Sieve Weight:	83.80 g
Weight Loss:	-0.2 g
Percent Loss:	-0.24 %

24.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.48	99.52	Coarse % (> 0.5 mm)	7.40%
	14	1.4	0.40	0.48	99.05		
	18	1.0	0.50	0.60	98.45		
	25	0.71	1.30	1.55	96.90		
	35	0.50	3.60	4.30	92.60		
Medium Material	45	0.355	9.80	11.69	80.91	Medium % (0.25 - 0.5 mm)	51.19%
	60	0.250	33.10	39.50	41.41		
Fine Material	80	0.180	20.90	24.94	16.47	Fine % (0.125 - 0.25 mm)	29.95%
	120	0.125	4.20	5.01	11.46		
Silt Material	170	0.090	2.10	2.51	8.95	Silt % (0.125 - 0.063 mm)	4.65%
	230	0.063	1.80	2.15	6.80		
Pan Material	pan	0.001	5.70	6.80	0.00	Pan % (< 0.063 mm)	6.80%
						Total	**100.00%**

Total (g)	83.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



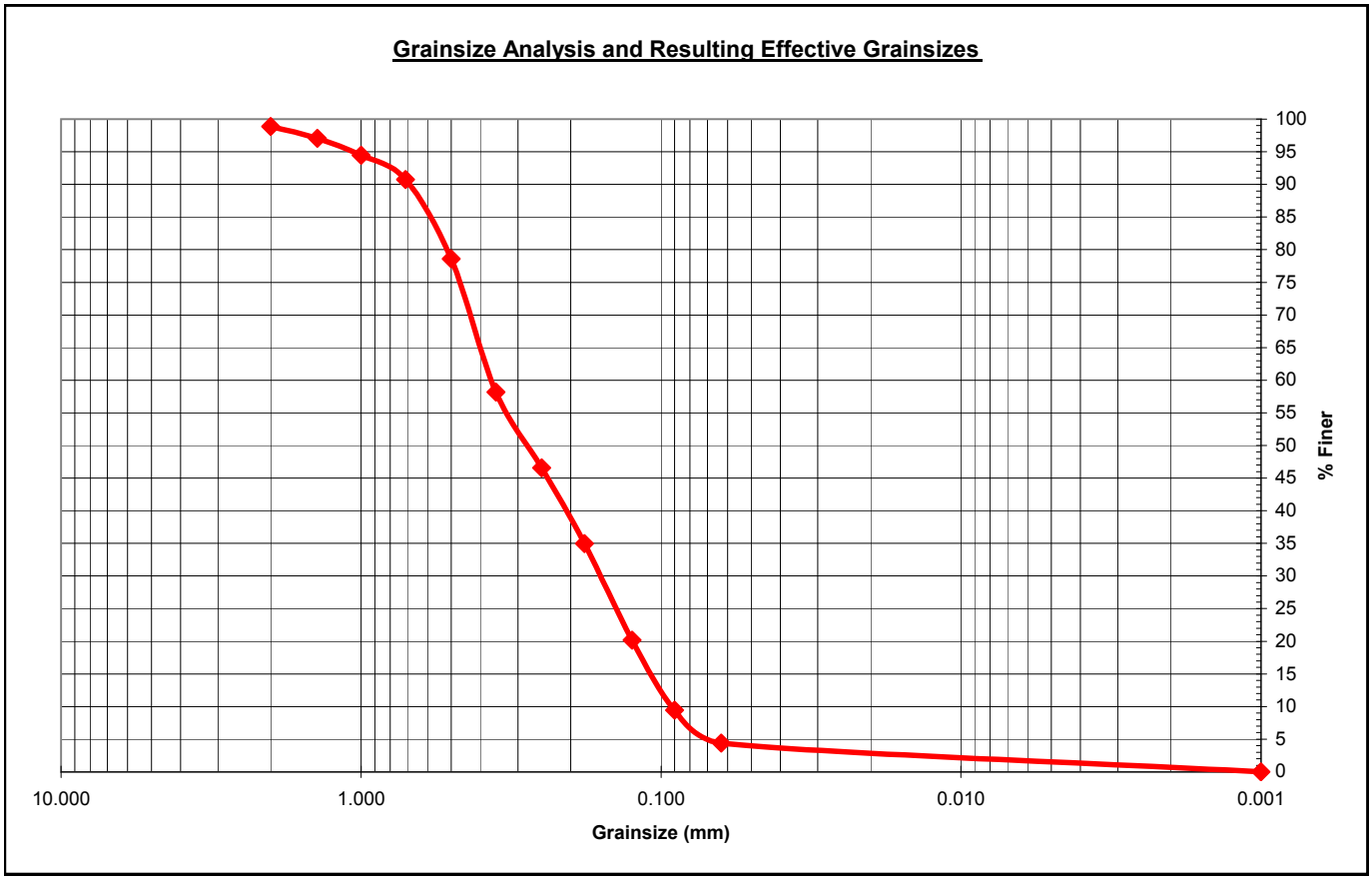
Sample ID:	ECP8-SB1
Sample Depth:	77-78 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.70 g
Total Sieve Weight:	88.70 g
Weight Loss:	0 g
Percent Loss:	0.00 %

19.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.00	1.13	98.87	Coarse % (> 0.5 mm)	21.42%
	14	1.4	1.60	1.80	97.07		
	18	1.0	2.30	2.59	94.48		
	25	0.71	3.30	3.72	90.76		
	35	0.50	10.80	12.18	78.58		
Medium Material	45	0.355	18.10	20.41	58.17	Medium % (0.25 - 0.5 mm)	32.02%
	60	0.250	10.30	11.61	46.56		
Fine Material	80	0.180	10.30	11.61	34.95	Fine % (0.125 - 0.25 mm)	26.38%
	120	0.125	13.10	14.77	20.18		
Silt Material	170	0.090	9.50	10.71	9.47	Silt % (0.125 - 0.063 mm)	15.78%
	230	0.063	4.50	5.07	4.40		
Pan Material	pan	0.001	3.90	4.40	0.00	Pan % (< 0.063 mm)	4.40%
						Total	**100.00%**

Total (g)	88.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



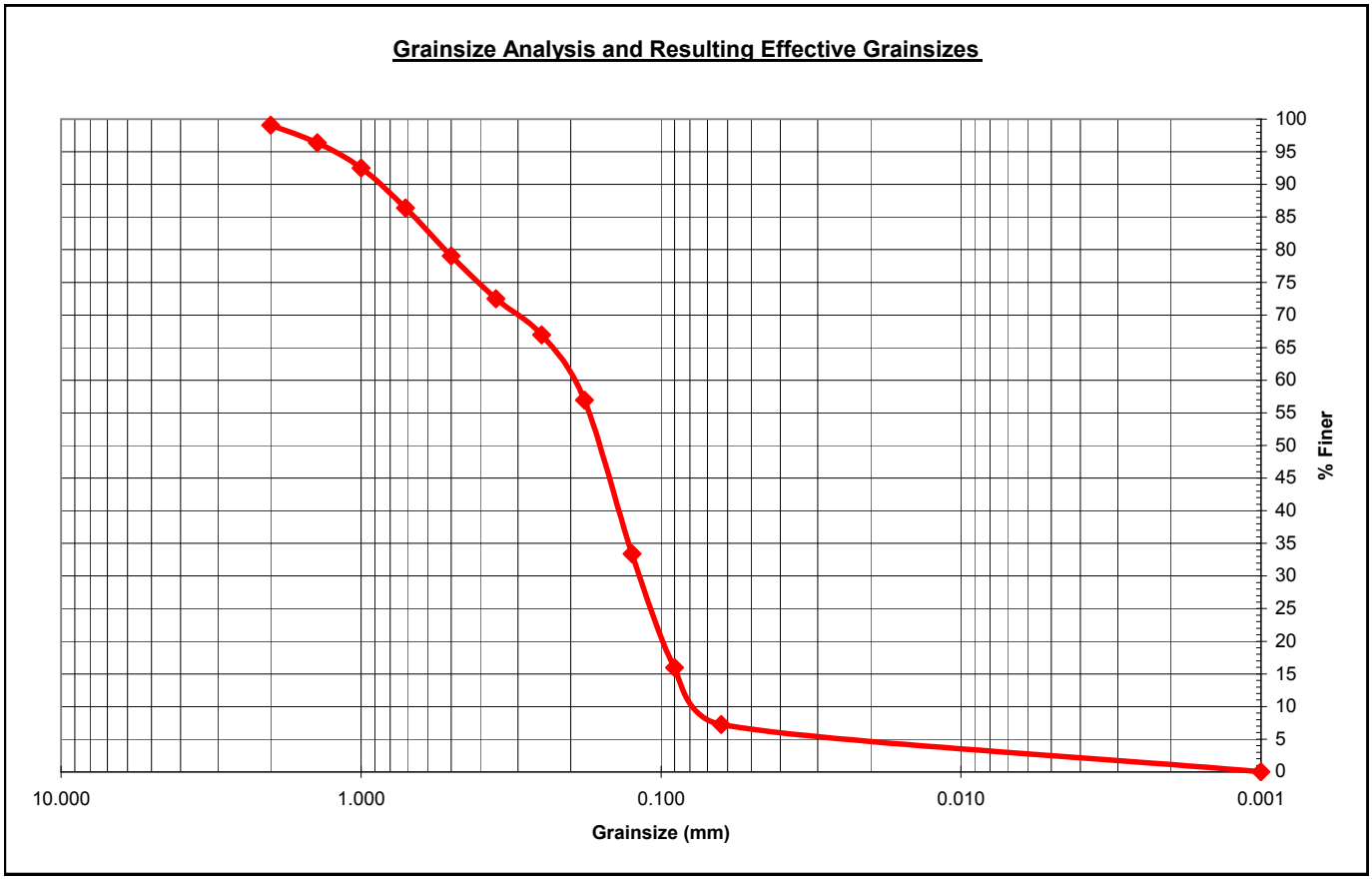
Sample ID:	ECP8-SB1	
Sample Depth:	78-79	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.60	g
Total Sieve Weight:	88.30	g
Weight Loss:	0.3	g
Percent Loss:	0.34	%

19.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.80	0.91	99.09	Coarse % (> 0.5 mm)	20.95%
	14	1.4	2.40	2.72	96.38		
	18	1.0	3.40	3.85	92.53		
	25	0.71	5.40	6.12	86.41		
	35	0.50	6.50	7.36	79.05		
Medium Material	45	0.355	5.80	6.57	72.48	Medium % (0.25 - 0.5 mm)	12.12%
	60	0.250	4.90	5.55	66.93		
Fine Material	80	0.180	8.80	9.97	56.96	Fine % (0.125 - 0.25 mm)	33.52%
	120	0.125	20.80	23.56	33.41		
Silt Material	170	0.090	15.40	17.44	15.97	Silt % (0.125 - 0.063 mm)	26.16%
	230	0.063	7.70	8.72	7.25		
Pan Material	pan	0.001	6.40	7.25	0.00	Pan % (< 0.063 mm)	7.25%
						Total	100.00%

Total (g)	88.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



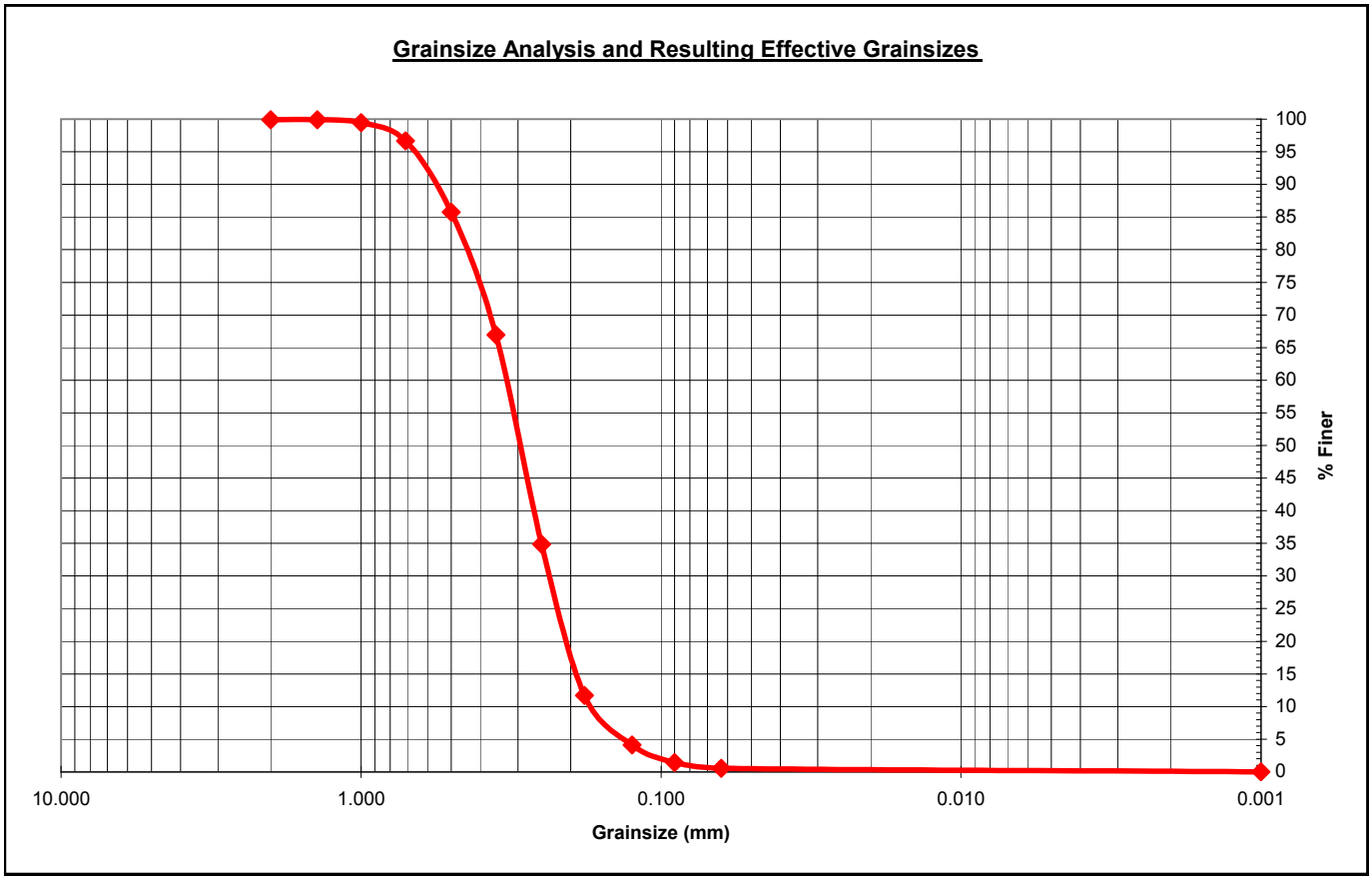
Sample ID:	ECP8-SB1
Sample Depth:	79-80 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.60 g
Total Sieve Weight:	90.40 g
Weight Loss:	0.2 g
Percent Loss:	0.22 %

17.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	14.27%
	14	1.4	0.00	0.00	99.89		
	18	1.0	0.40	0.44	99.45		
	25	0.71	2.50	2.77	96.68		
	35	0.50	9.90	10.95	85.73		
Medium Material	45	0.355	17.00	18.81	66.92	Medium % (0.25 - 0.5 mm)	50.88%
	60	0.250	29.00	32.08	34.85		
Fine Material	80	0.180	20.90	23.12	11.73	Fine % (0.125 - 0.25 mm)	30.75%
	120	0.125	6.90	7.63	4.09		
Silt Material	170	0.090	2.40	2.65	1.44	Silt % (0.125 - 0.063 mm)	3.54%
	230	0.063	0.80	0.88	0.55		
Pan Material	pan	0.001	0.50	0.55	0.00	Pan % (< 0.063 mm)	0.55%
						Total	100.00%

Total (g)	90.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



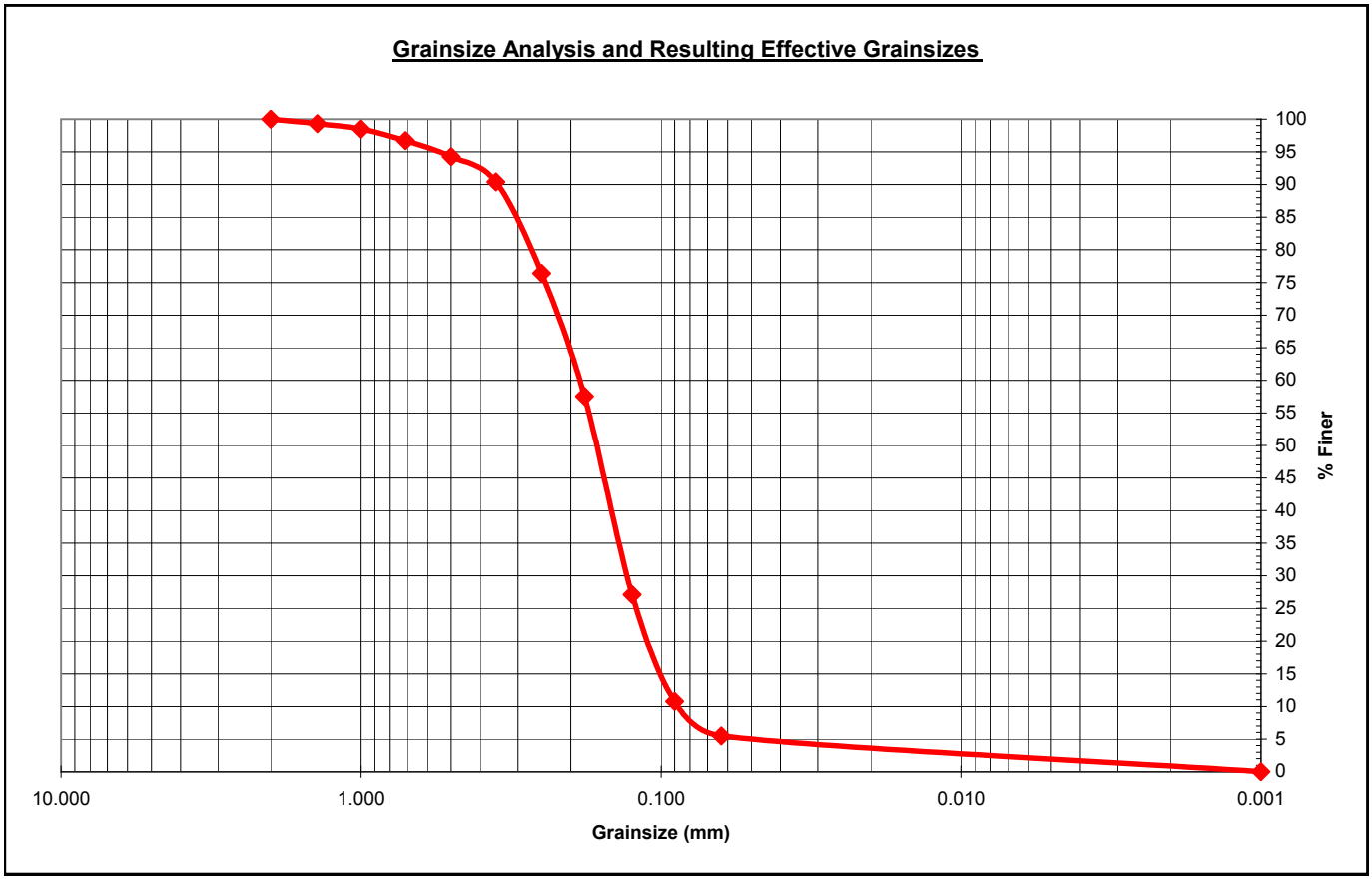
Sample ID:	ECP8-SB1
Sample Depth:	80-81 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.80 g
Total Sieve Weight:	85.50 g
Weight Loss:	0.3 g
Percent Loss:	0.35 %

22.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	5.73%
	14	1.4	0.60	0.70	99.30		
	18	1.0	0.70	0.82	98.48		
	25	0.71	1.50	1.75	96.73		
	35	0.50	2.10	2.46	94.27		
Medium Material	45	0.355	3.30	3.86	90.41	Medium % (0.25 - 0.5 mm)	17.89%
	60	0.250	12.00	14.04	76.37		
Fine Material	80	0.180	16.10	18.83	57.54	Fine % (0.125 - 0.25 mm)	49.24%
	120	0.125	26.00	30.41	27.13		
Silt Material	170	0.090	14.00	16.37	10.76	Silt % (0.125 - 0.063 mm)	21.64%
	230	0.063	4.50	5.26	5.50		
Pan Material	pan	0.001	4.70	5.50	0.00	Pan % (< 0.063 mm)	5.50%
						Total	100.00%

Total (g)	85.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



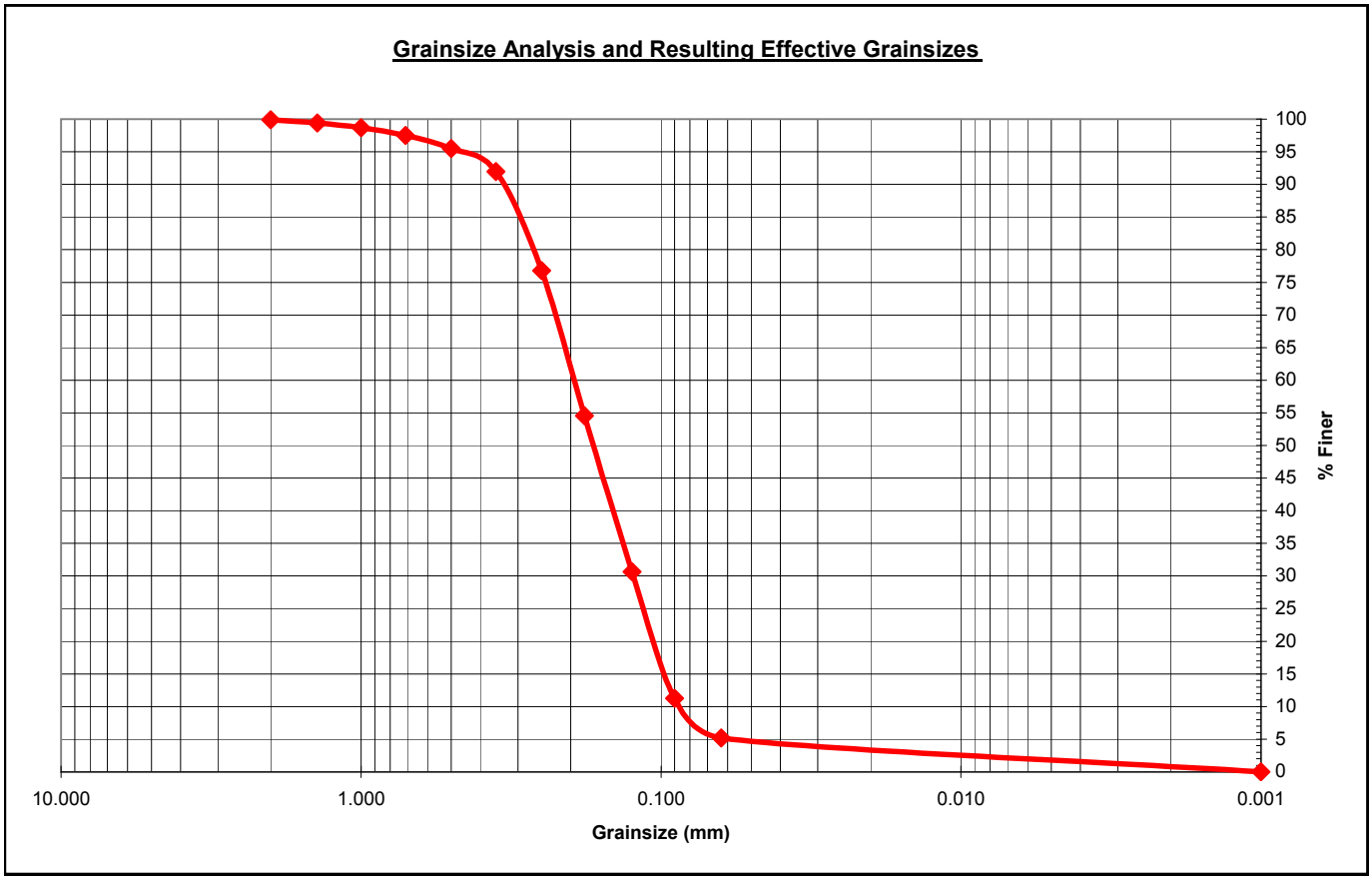
Sample ID:	ECP8-SB1
Sample Depth:	81-82 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.10 g
Total Sieve Weight:	84.50 g
Weight Loss:	0.6 g
Percent Loss:	0.71 %

22.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.12	99.88	Coarse % (> 0.5 mm)	4.50%
	14	1.4	0.40	0.47	99.41		
	18	1.0	0.60	0.71	98.70		
	25	0.71	1.00	1.18	97.51		
	35	0.50	1.70	2.01	95.50		
Medium Material	45	0.355	3.00	3.55	91.95	Medium % (0.25 - 0.5 mm)	18.70%
	60	0.250	12.80	15.15	76.80		
Fine Material	80	0.180	18.80	22.25	54.56	Fine % (0.125 - 0.25 mm)	46.15%
	120	0.125	20.20	23.91	30.65		
Silt Material	170	0.090	16.40	19.41	11.24	Silt % (0.125 - 0.063 mm)	25.44%
	230	0.063	5.10	6.04	5.21		
Pan Material	pan	0.001	4.40	5.21	0.00	Pan % (< 0.063 mm)	5.21%
						Total	**100.00%**

Total (g)	84.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



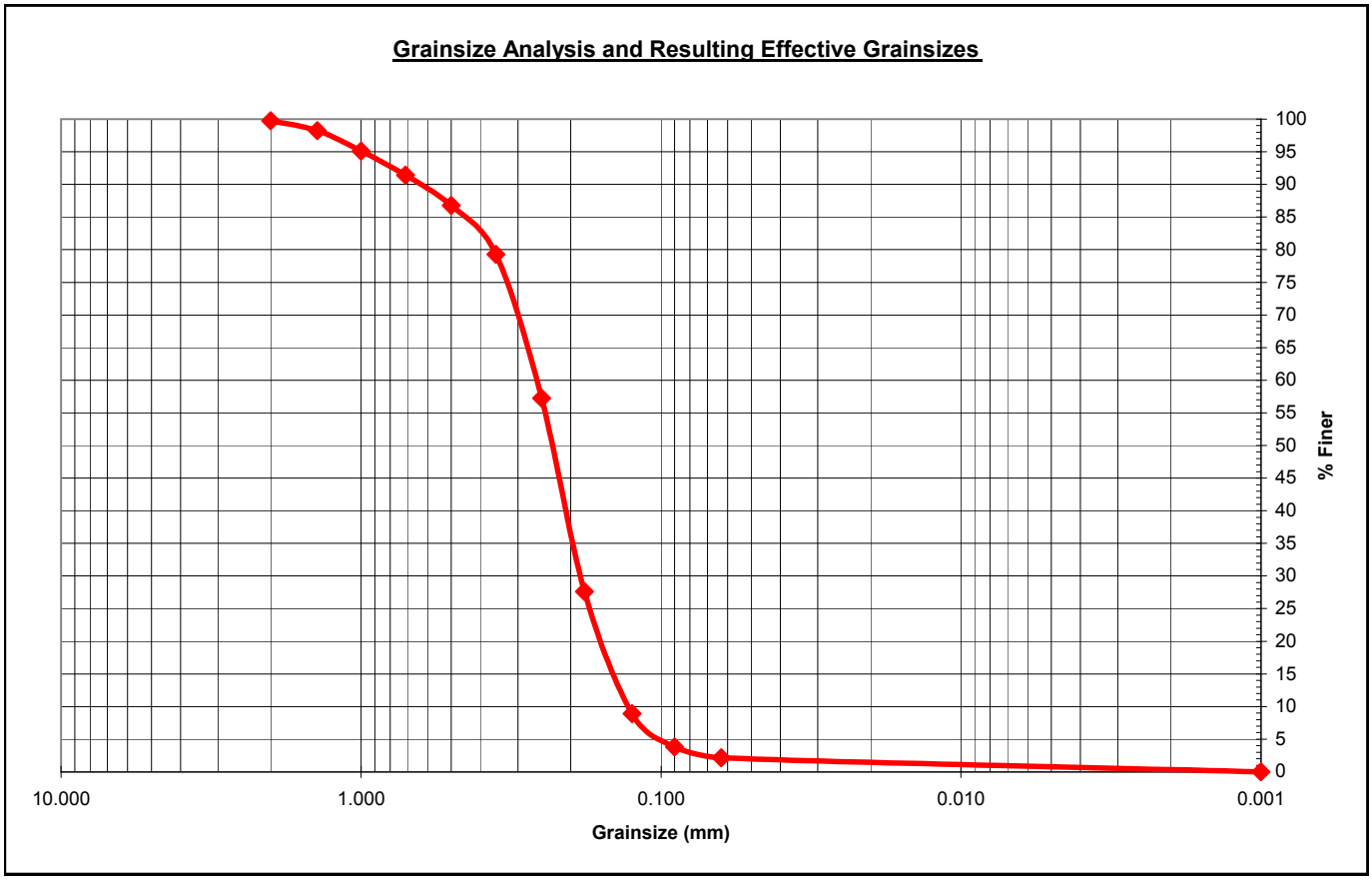
Sample ID:	ECP8-SB1	
Sample Depth:	82-83	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	84.40	g
Total Sieve Weight:	84.00	g
Weight Loss:	0.4	g
Percent Loss:	0.47	%

23.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.24	99.76	Coarse % (> 0.5 mm)	13.21%
	14	1.4	1.30	1.55	98.21		
	18	1.0	2.60	3.10	95.12		
	25	0.71	3.10	3.69	91.43		
	35	0.50	3.90	4.64	86.79		
Medium Material	45	0.355	6.30	7.50	79.29	Medium % (0.25 - 0.5 mm)	29.52%
	60	0.250	18.50	22.02	57.26		
Fine Material	80	0.180	24.90	29.64	27.62	Fine % (0.125 - 0.25 mm)	48.33%
	120	0.125	15.70	18.69	8.93		
Silt Material	170	0.090	4.30	5.12	3.81	Silt % (0.125 - 0.063 mm)	6.79%
	230	0.063	1.40	1.67	2.14		
Pan Material	pan	0.001	1.80	2.14	0.00	Pan % (< 0.063 mm)	2.14%
						Total	100.00%

Total (g)	84.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



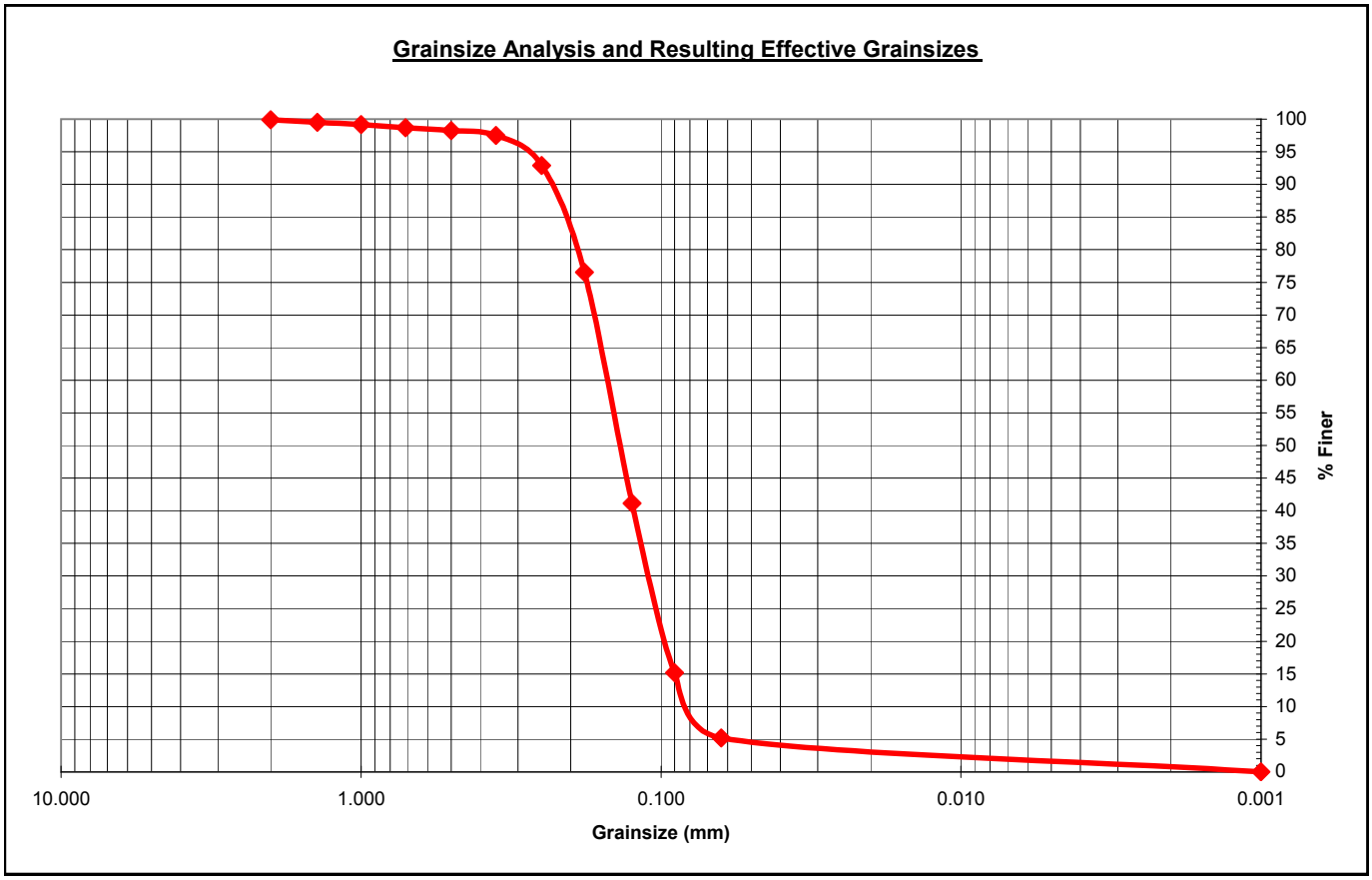
Sample ID:	ECP8-SB1
Sample Depth:	83-84 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.50 g
Total Sieve Weight:	84.40 g
Weight Loss:	1.1 g
Percent Loss:	1.29 %

22.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.12	99.88	Coarse % (> 0.5 mm)	1.78%
	14	1.4	0.30	0.36	99.53		
	18	1.0	0.30	0.36	99.17		
	25	0.71	0.40	0.47	98.70		
	35	0.50	0.40	0.47	98.22		
Medium Material	45	0.355	0.60	0.71	97.51	Medium % (0.25 - 0.5 mm)	5.33%
	60	0.250	3.90	4.62	92.89		
Fine Material	80	0.180	13.80	16.35	76.54	Fine % (0.125 - 0.25 mm)	51.78%
	120	0.125	29.90	35.43	41.11		
Silt Material	170	0.090	21.90	25.95	15.17	Silt % (0.125 - 0.063 mm)	35.90%
	230	0.063	8.40	9.95	5.21		
Pan Material	pan	0.001	4.40	5.21	0.00	Pan % (< 0.063 mm)	5.21%
						Total	100.00%

Total (g)	84.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



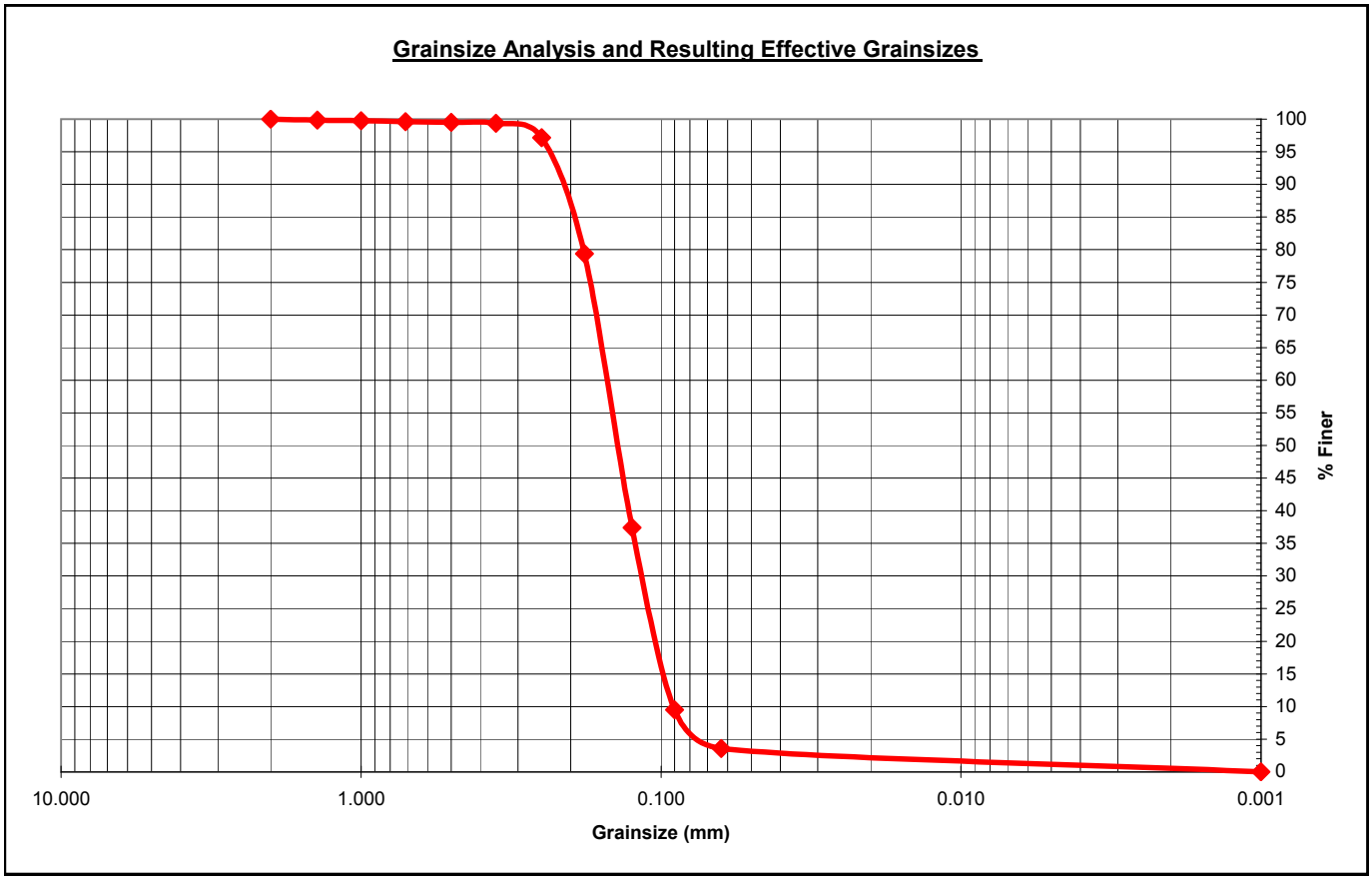
Sample ID:	ECP8-SB1
Sample Depth:	84-85 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	81.20 g
Total Sieve Weight:	81.00 g
Weight Loss:	0.2 g
Percent Loss:	0.25 %

26.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.49%
	14	1.4	0.10	0.12	99.88		
	18	1.0	0.10	0.12	99.75		
	25	0.71	0.10	0.12	99.63		
	35	0.50	0.10	0.12	99.51		
Medium Material	45	0.355	0.10	0.12	99.38	Medium % (0.25 - 0.5 mm)	2.35%
	60	0.250	1.80	2.22	97.16		
Fine Material	80	0.180	14.40	17.78	79.38	Fine % (0.125 - 0.25 mm)	59.75%
	120	0.125	34.00	41.98	37.41		
Silt Material	170	0.090	22.60	27.90	9.51	Silt % (0.125 - 0.063 mm)	33.83%
	230	0.063	4.80	5.93	3.58		
Pan Material	pan	0.001	2.90	3.58	0.00	Pan % (< 0.063 mm)	3.58%
						Total	**100.00%**

Total (g)	81.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



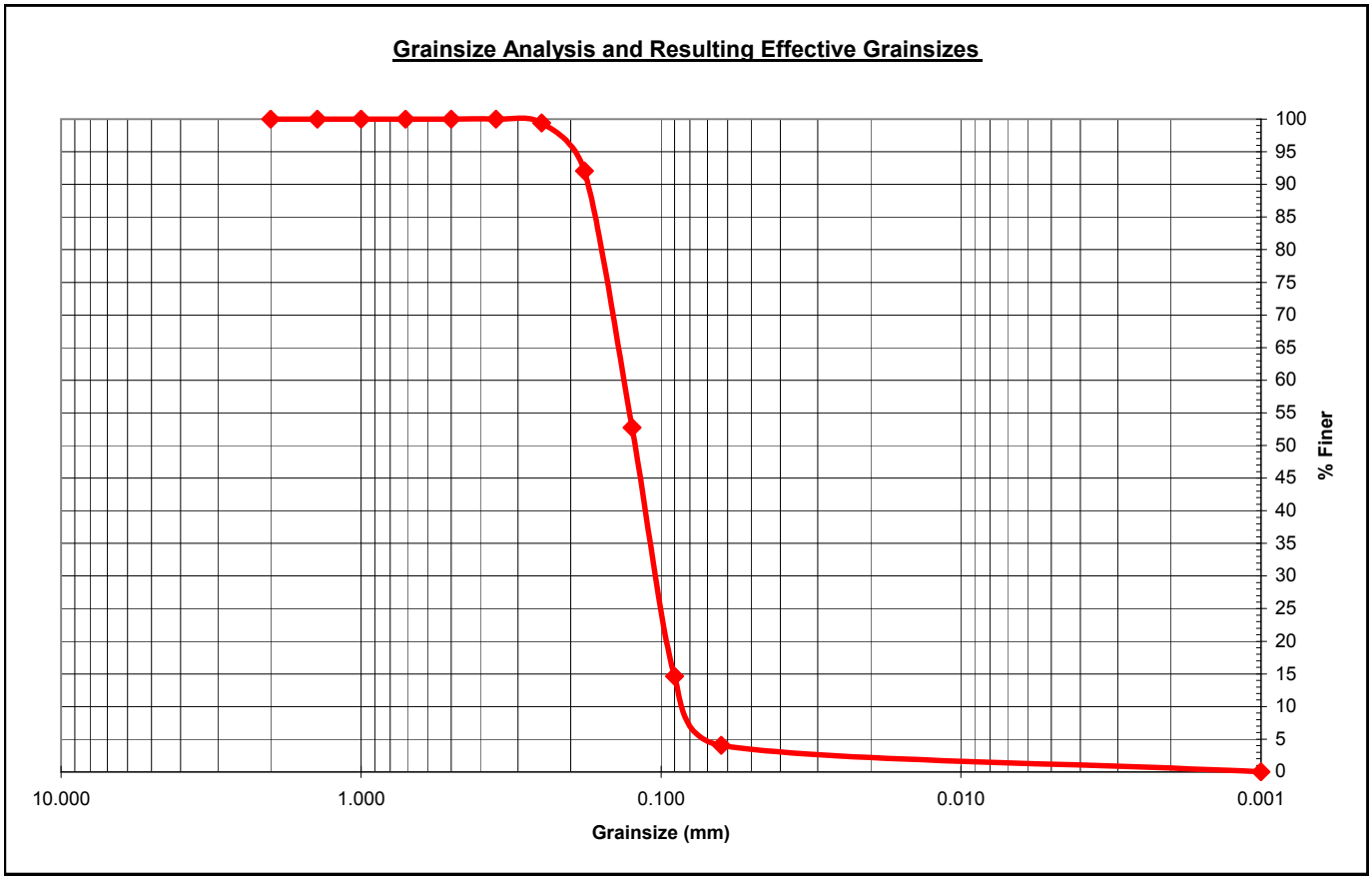
Sample ID:	ECP8-SB1
Sample Depth:	85-86 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.70 g
Total Sieve Weight:	83.40 g
Weight Loss:	0.3 g
Percent Loss:	0.36 %

23.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.00%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.00	0.00	100.00		
	25	0.71	0.00	0.00	100.00		
	35	0.50	0.00	0.00	100.00		
Medium Material	45	0.355	0.00	0.00	100.00	Medium % (0.25 - 0.5 mm)	0.60%
	60	0.250	0.50	0.60	99.40		
Fine Material	80	0.180	6.10	7.31	92.09	Fine % (0.125 - 0.25 mm)	46.64%
	120	0.125	32.80	39.33	52.76		
Silt Material	170	0.090	31.80	38.13	14.63	Silt % (0.125 - 0.063 mm)	48.68%
	230	0.063	8.80	10.55	4.08		
Pan Material	pan	0.001	3.40	4.08	0.00	Pan % (< 0.063 mm)	4.08%
						Total	100.00%

Total (g)	83.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



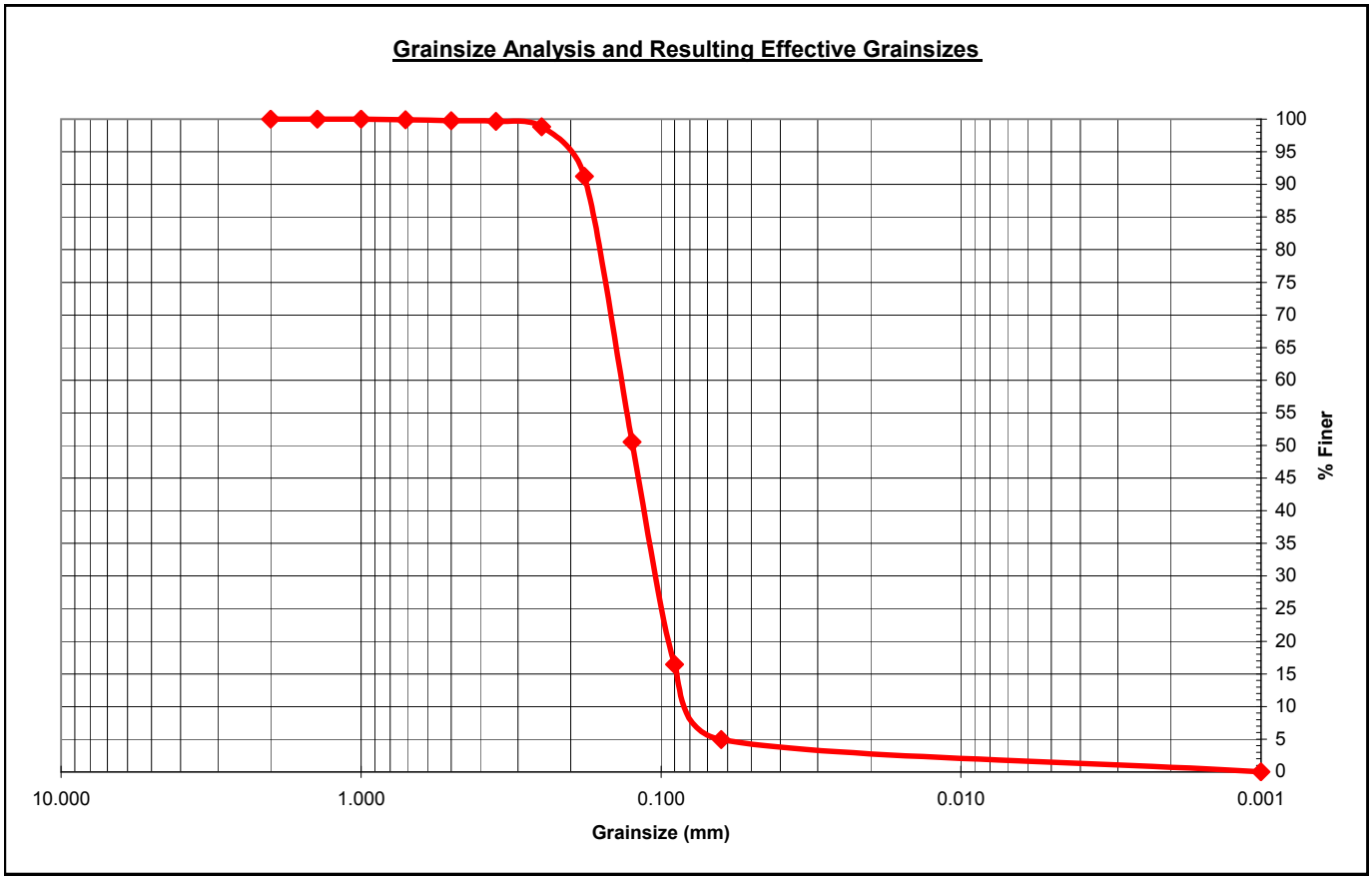
Sample ID:	ECP8-SB1
Sample Depth:	86-87 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.80 g
Total Sieve Weight:	84.50 g
Weight Loss:	0.3 g
Percent Loss:	0.35 %

22.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.24%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.00	0.00	100.00		
	25	0.71	0.10	0.12	99.88		
	35	0.50	0.10	0.12	99.76		
Medium Material	45	0.355	0.10	0.12	99.64	Medium % (0.25 - 0.5 mm)	0.95%
	60	0.250	0.70	0.83	98.82		
Fine Material	80	0.180	6.40	7.57	91.24	Fine % (0.125 - 0.25 mm)	48.28%
	120	0.125	34.40	40.71	50.53		
Silt Material	170	0.090	28.80	34.08	16.45	Silt % (0.125 - 0.063 mm)	45.56%
	230	0.063	9.70	11.48	4.97		
Pan Material	pan	0.001	4.20	4.97	0.00	Pan % (< 0.063 mm)	4.97%
						Total	100.00%

Total (g)	84.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



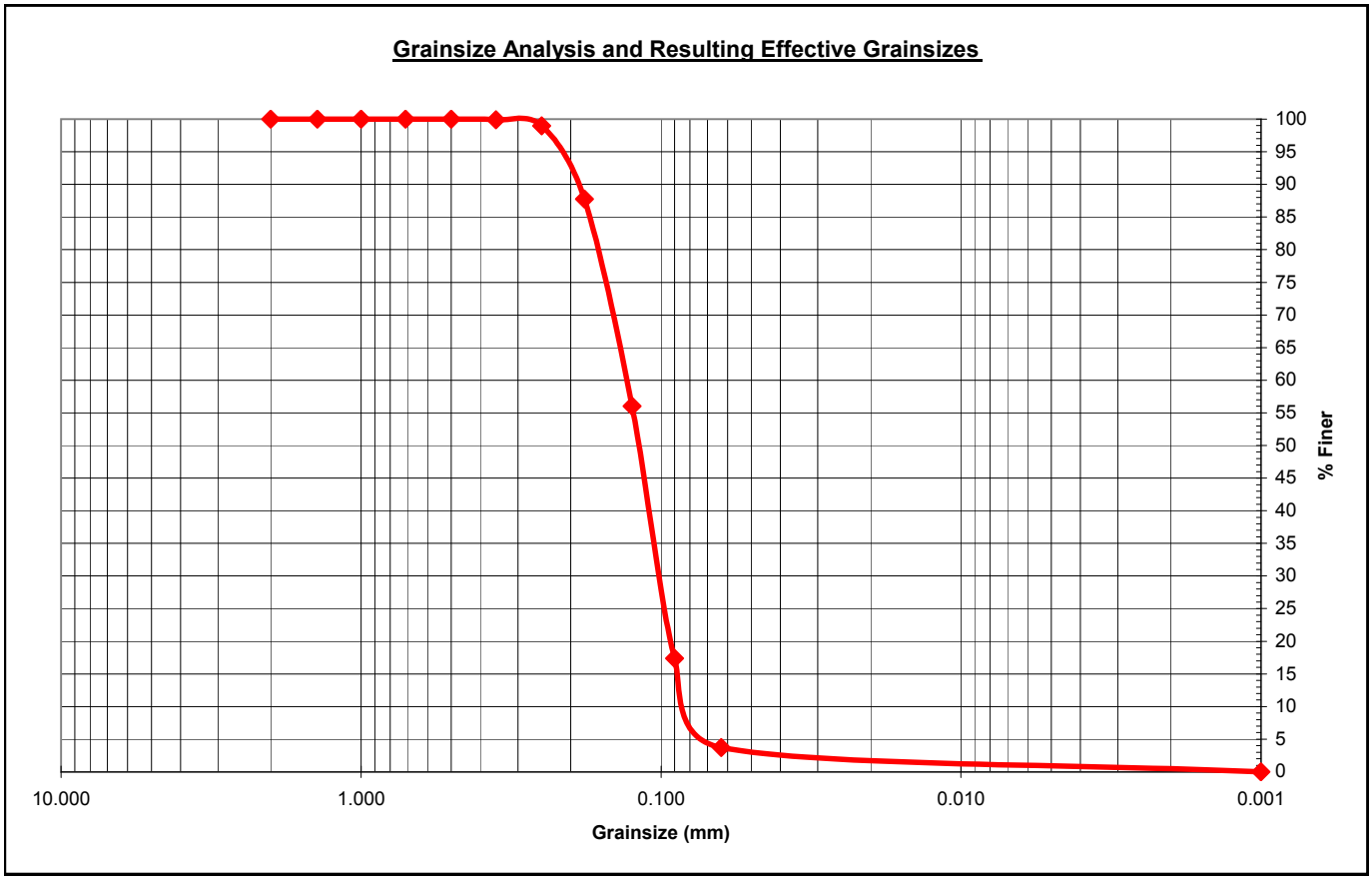
Sample ID:	ECP8-SB1
Sample Depth:	87-88 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.20 g
Total Sieve Weight:	85.70 g
Weight Loss:	0.5 g
Percent Loss:	0.58 %

21.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.00	0.00	100.00	Coarse % (> 0.5 mm)	0.00%
	14	1.4	0.00	0.00	100.00		
	18	1.0	0.00	0.00	100.00		
	25	0.71	0.00	0.00	100.00		
	35	0.50	0.00	0.00	100.00		
Medium Material	45	0.355	0.10	0.12	99.88	Medium % (0.25 - 0.5 mm)	1.05%
	60	0.250	0.80	0.93	98.95		
Fine Material	80	0.180	9.60	11.20	87.75	Fine % (0.125 - 0.25 mm)	42.94%
	120	0.125	27.20	31.74	56.01		
Silt Material	170	0.090	33.10	38.62	17.39	Silt % (0.125 - 0.063 mm)	52.28%
	230	0.063	11.70	13.65	3.73		
Pan Material	pan	0.001	3.20	3.73	0.00	Pan % (< 0.063 mm)	3.73%
						Total	**100.00%**

Total (g)	85.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



Sample ID:	ECP8-SB1
Sample Depth:	88-89 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.10 g
Total Sieve Weight:	85.40 g
Weight Loss:	-0.3 g
Percent Loss:	-0.35 %

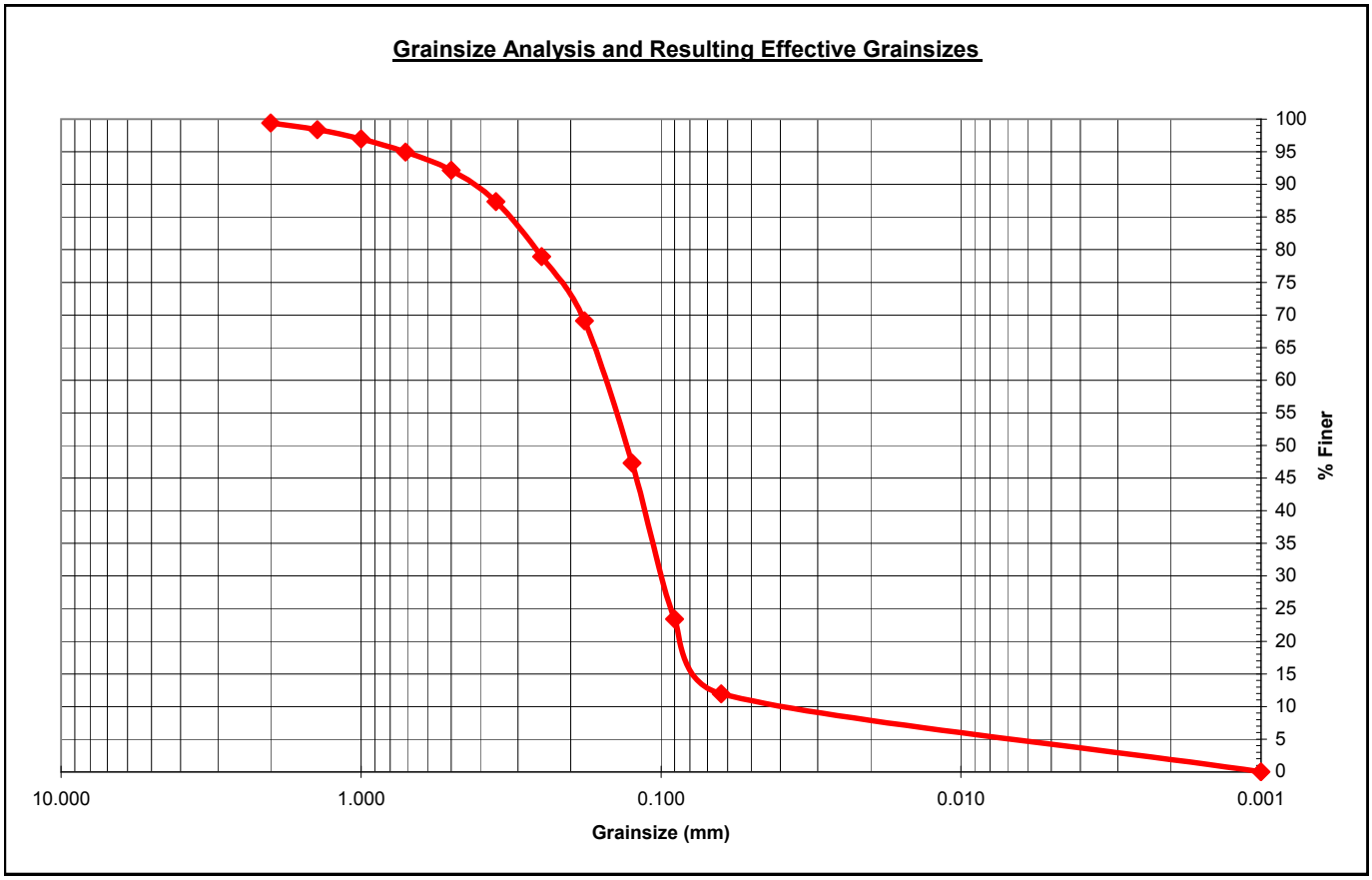
22.64 % Moisture

50% of coarse weight is clay nodules.

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.50	0.59	99.41	Coarse % (> 0.5 mm)	7.85%
	14	1.4	0.90	1.05	98.36		
	18	1.0	1.20	1.41	96.96		
	25	0.71	1.70	1.99	94.96		
	35	0.50	2.40	2.81	92.15		
Medium Material	45	0.355	4.10	4.80	87.35	Medium % (0.25 - 0.5 mm)	13.23%
	60	0.250	7.20	8.43	78.92		
Fine Material	80	0.180	8.40	9.84	69.09	Fine % (0.125 - 0.25 mm)	31.62%
	120	0.125	18.60	21.78	47.31		
Silt Material	170	0.090	20.40	23.89	23.42	Silt % (0.125 - 0.063 mm)	35.36%
	230	0.063	9.80	11.48	11.94		
Pan Material	pan	0.001	10.20	11.94	0.00	Pan % (< 0.063 mm)	11.94%
						Total	**100.00%**

Total (g)	85.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



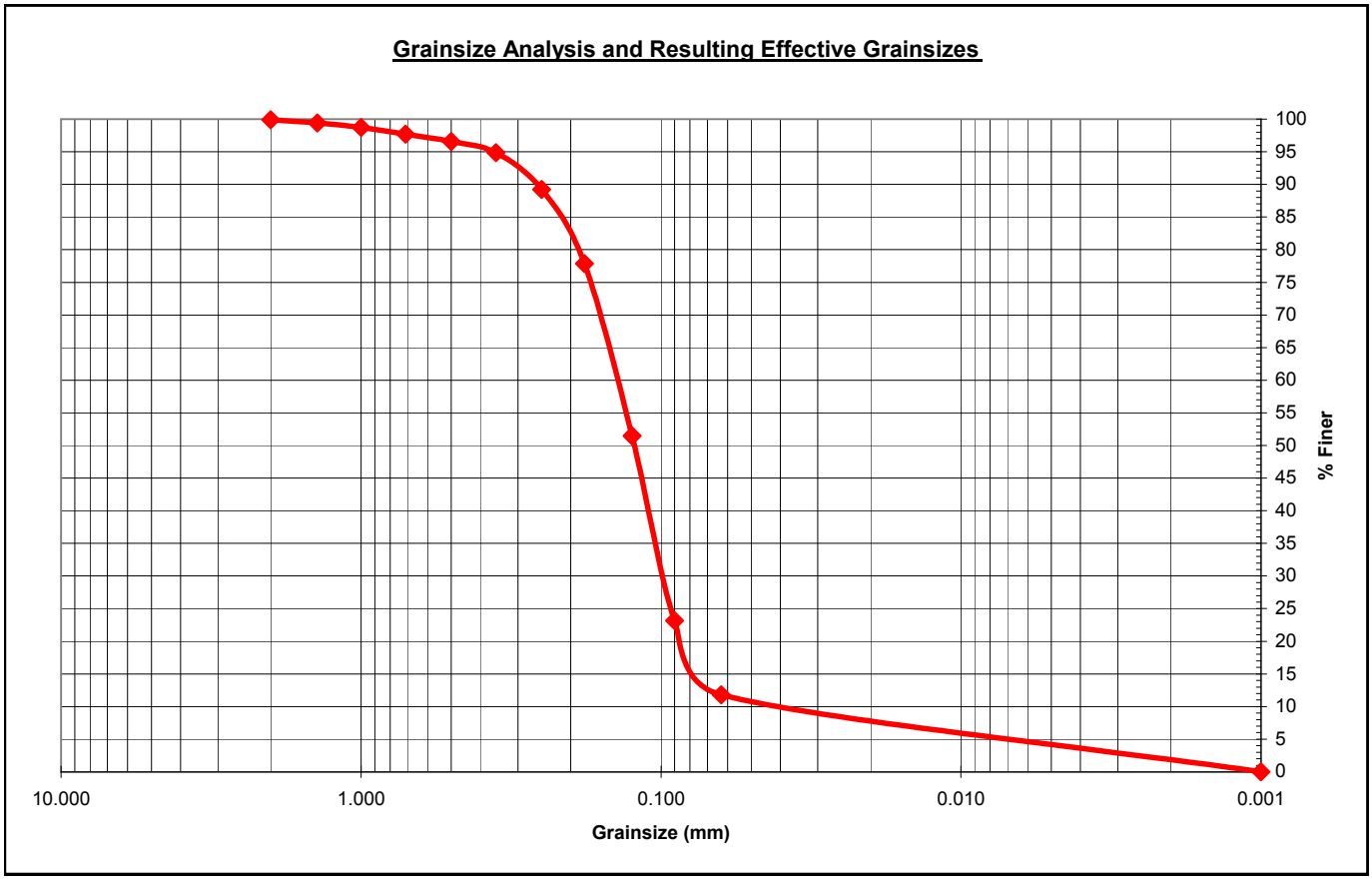
Sample ID:	ECP8-SB1
Sample Depth:	89-90 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.10 g
Total Sieve Weight:	87.20 g
Weight Loss:	-0.1 g
Percent Loss:	-0.11 %

20.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.10	0.11	99.89	Coarse % (> 0.5 mm)	3.44%
	14	1.4	0.40	0.46	99.43		
	18	1.0	0.60	0.69	98.74		
	25	0.71	0.90	1.03	97.71		
	35	0.50	1.00	1.15	96.56		
Medium Material	45	0.355	1.50	1.72	94.84	Medium % (0.25 - 0.5 mm)	7.34%
	60	0.250	4.90	5.62	89.22		
Fine Material	80	0.180	9.90	11.35	77.87	Fine % (0.125 - 0.25 mm)	37.73%
	120	0.125	23.00	26.38	51.49		
Silt Material	170	0.090	24.70	28.33	23.17	Silt % (0.125 - 0.063 mm)	39.68%
	230	0.063	9.90	11.35	11.81		
Pan Material	pan	0.001	10.30	11.81	0.00	Pan % (< 0.063 mm)	11.81%
						Total	**100.00%**

Total (g)	87.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



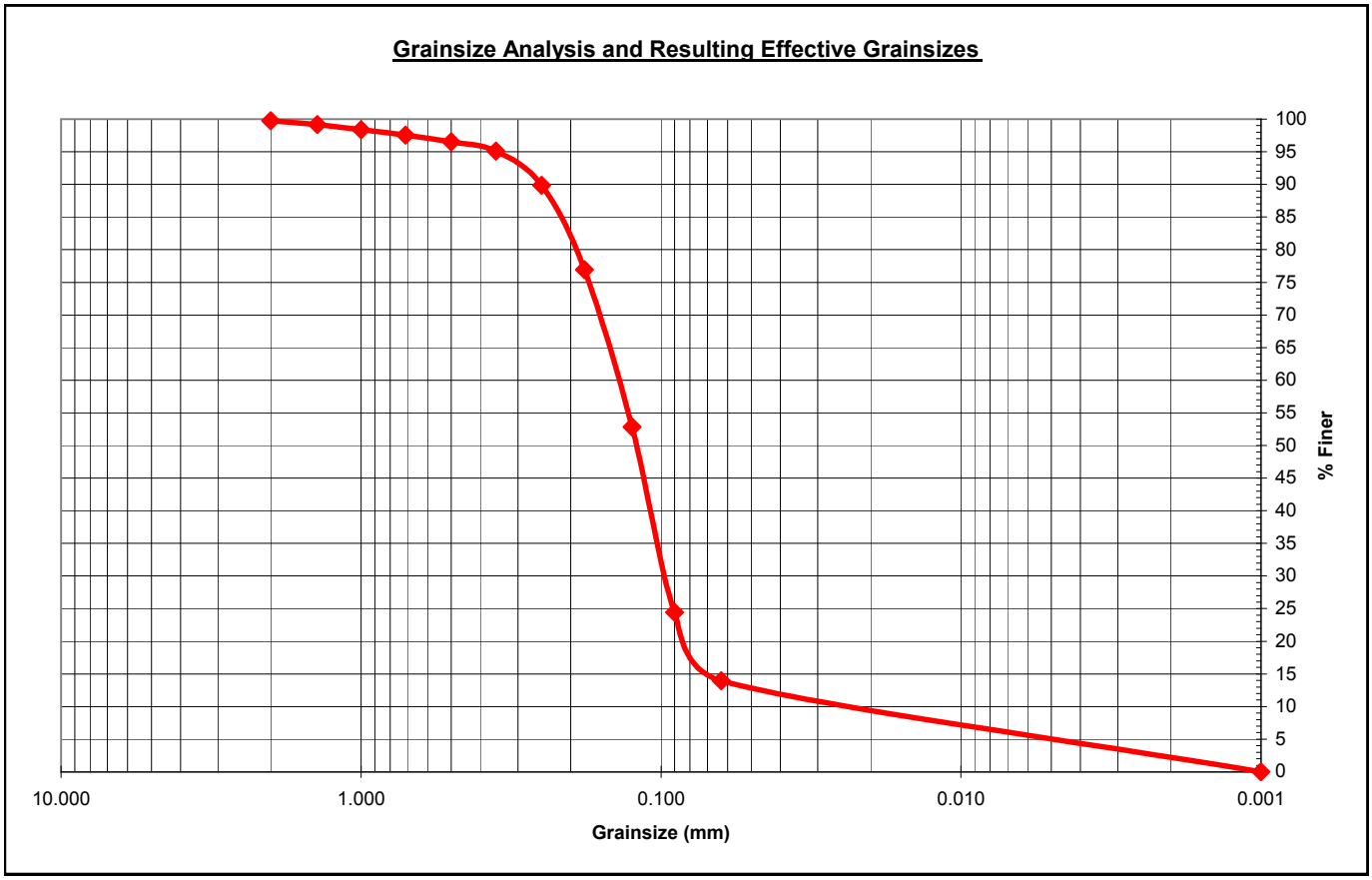
Sample ID:	ECP8-SB1	
Sample Depth:	90-91	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	86.90	g
Total Sieve Weight:	85.90	g
Weight Loss:	1	g
Percent Loss:	1.15	%

21.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.23	99.77	Coarse % (> 0.5 mm)	3.49%
	14	1.4	0.50	0.58	99.19		
	18	1.0	0.70	0.81	98.37		
	25	0.71	0.70	0.81	97.56		
	35	0.50	0.90	1.05	96.51		
Medium Material	45	0.355	1.20	1.40	95.11	Medium % (0.25 - 0.5 mm)	6.64%
	60	0.250	4.50	5.24	89.87		
Fine Material	80	0.180	11.10	12.92	76.95	Fine % (0.125 - 0.25 mm)	37.02%
	120	0.125	20.70	24.10	52.85		
Silt Material	170	0.090	24.40	28.41	24.45	Silt % (0.125 - 0.063 mm)	38.88%
	230	0.063	9.00	10.48	13.97		
Pan Material	pan	0.001	12.00	13.97	0.00	Pan % (< 0.063 mm)	13.97%
						Total	100.00%

Total (g)	85.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



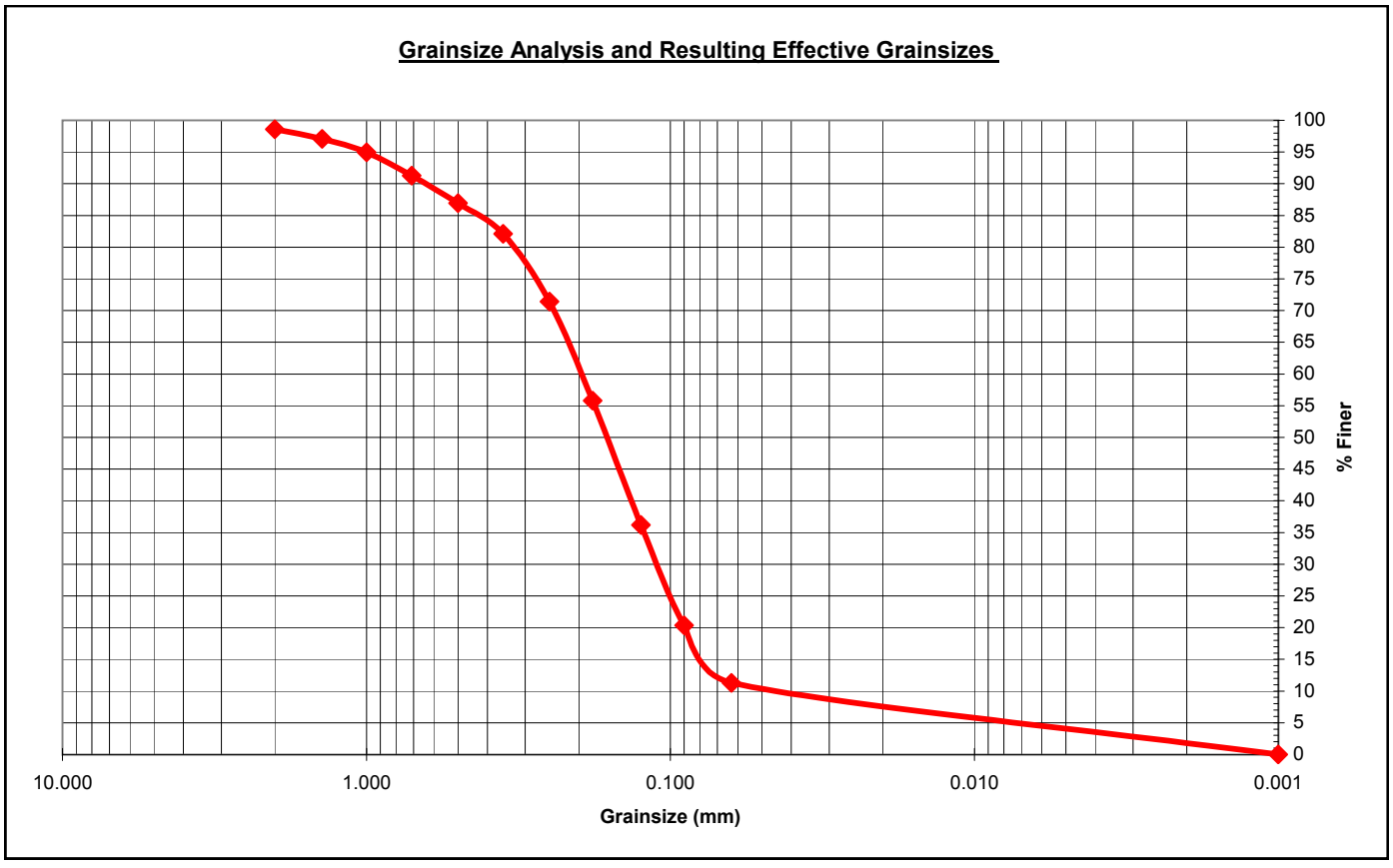
Sample ID:	ECP8-SB1
Sample Depth:	91-92 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.20 g
Total Sieve Weight:	92.80 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

15.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.30	1.40	98.60	Coarse % (> 0.5 mm)	13.04%
	14	1.4	1.40	1.51	97.09		
	18	1.0	2.00	2.16	94.94		
	25	0.71	3.40	3.66	91.27		
	35	0.50	4.00	4.31	86.96		
Medium Material	45	0.355	4.50	4.85	82.11	Medium % (0.25 - 0.5 mm)	15.52%
	60	0.250	9.90	10.67	71.44		
Fine Material	80	0.180	14.50	15.63	55.82	Fine % (0.125 - 0.25 mm)	35.24%
	120	0.125	18.20	19.61	36.21		
Silt Material	170	0.090	14.70	15.84	20.37	Silt % (0.125 - 0.063 mm)	24.89%
	230	0.063	8.40	9.05	11.31		
Pan Material	pan	0.001	10.50	11.31	0.00	Pan % (< 0.063 mm)	11.31%
						Total	**100.00%**

Total (g)	92.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



Sample ID:	ECP8-SB1	
Sample Depth:	92-93	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	92.20	g
Total Sieve Weight:	91.30	g
Weight Loss:	0.9	g
Percent Loss:	0.98	%

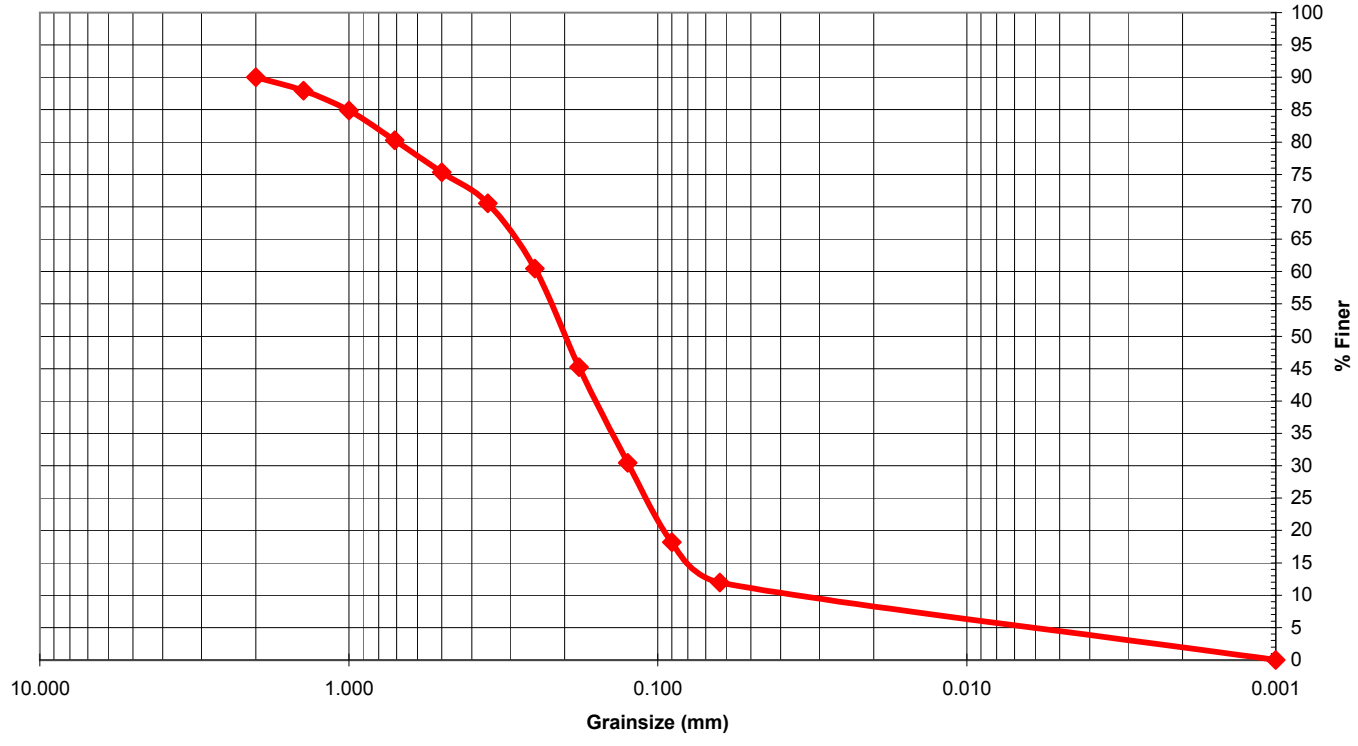
16.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	9.10	9.97	90.03	Coarse % (> 0.5 mm)	24.64%
	14	1.4	1.90	2.08	87.95		
	18	1.0	2.80	3.07	84.88		
	25	0.71	4.20	4.60	80.28		
	35	0.50	4.50	4.93	75.36		
Medium Material	45	0.355	4.40	4.82	70.54	Medium % (0.25 - 0.5 mm)	14.90%
	60	0.250	9.20	10.08	60.46		
Fine Material	80	0.180	13.90	15.22	45.24	Fine % (0.125 - 0.25 mm)	30.01%
	120	0.125	13.50	14.79	30.45		
Silt Material	170	0.090	11.20	12.27	18.18	Silt % (0.125 - 0.063 mm)	18.51%
	230	0.063	5.70	6.24	11.94		
Pan Material	pan	0.001	10.90	11.94	0.00	Pan % (< 0.063 mm)	11.94%
						Total	100.00%

Total (g)	91.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.

Grainsize Analysis and Resulting Effective Grainsizes



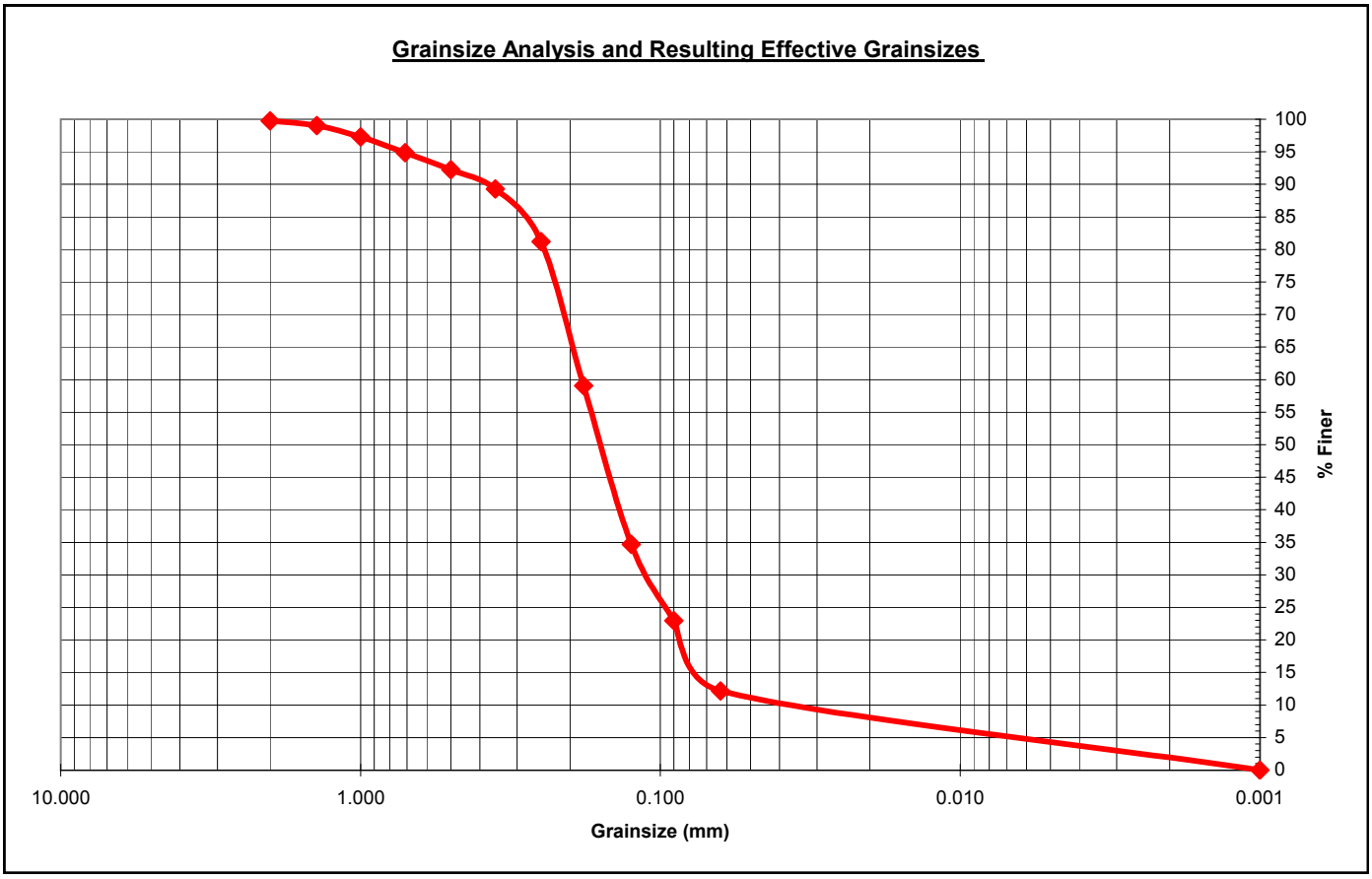
Sample ID:	ECP8-SB1	
Sample Depth:	93-94	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	91.20	g
Total Sieve Weight:	91.40	g
Weight Loss:	-0.2	g
Percent Loss:	-0.22	%

17.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.20	0.22	99.78	Coarse % (> 0.5 mm)	7.77%
	14	1.4	0.70	0.77	99.02		
	18	1.0	1.60	1.75	97.26		
	25	0.71	2.20	2.41	94.86		
	35	0.50	2.40	2.63	92.23		
Medium Material	45	0.355	2.70	2.95	89.28	Medium % (0.25 - 0.5 mm)	11.05%
	60	0.250	7.40	8.10	81.18		
Fine Material	80	0.180	20.20	22.10	59.08	Fine % (0.125 - 0.25 mm)	46.50%
	120	0.125	22.30	24.40	34.68		
Silt Material	170	0.090	10.70	11.71	22.98	Silt % (0.125 - 0.063 mm)	22.54%
	230	0.063	9.90	10.83	12.14		
Pan Material	pan	0.001	11.10	12.14	0.00	Pan % (< 0.063 mm)	12.14%
						Total	**100.00%**

Total (g)	91.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



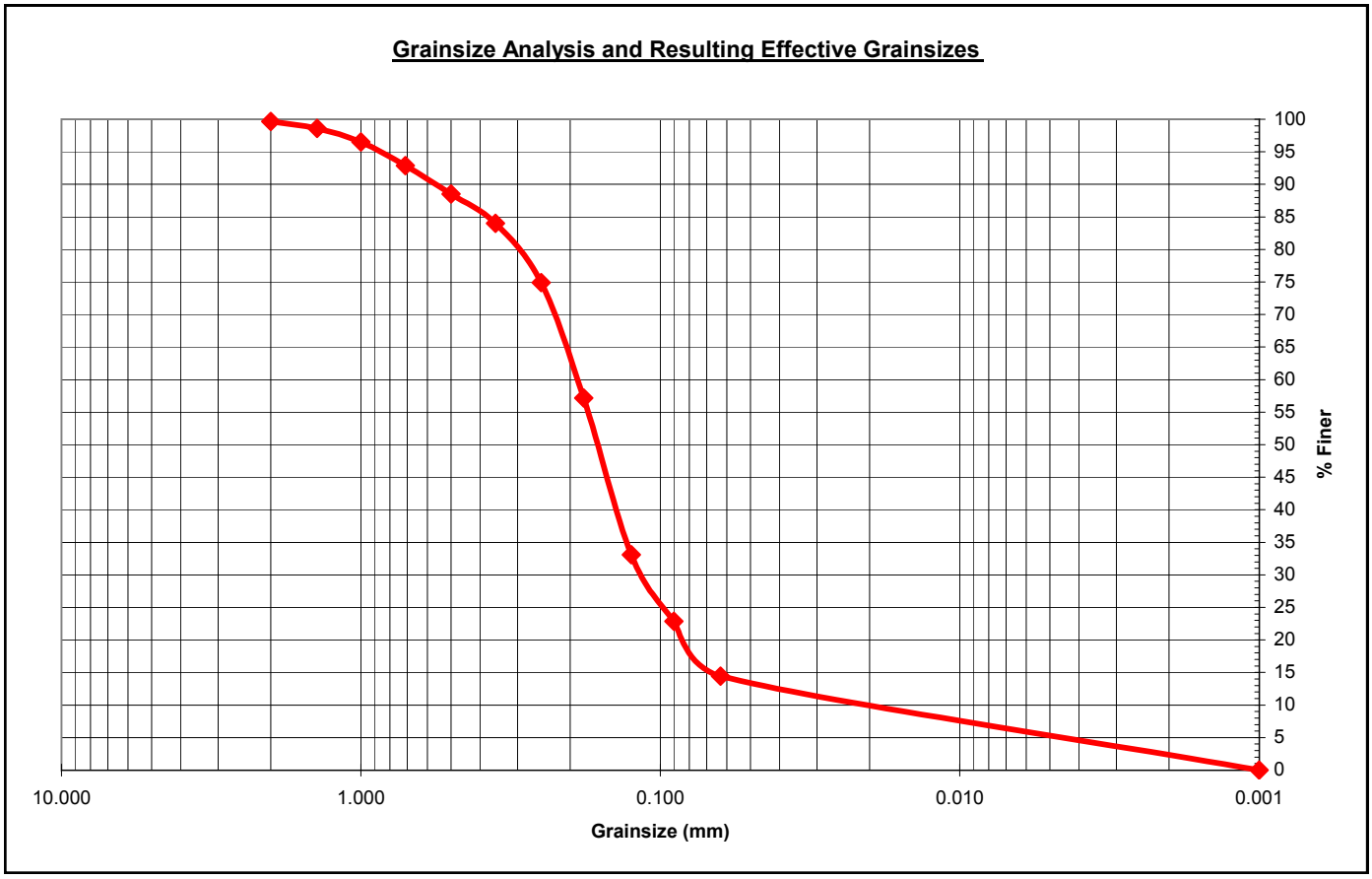
Sample ID:	ECP8-SB1
Sample Depth:	94-95 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.60 g
Total Sieve Weight:	91.30 g
Weight Loss:	0.3 g
Percent Loss:	0.33 %

16.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.30	0.33	99.67	Coarse % (> 0.5 mm)	11.50%
	14	1.4	1.00	1.10	98.58		
	18	1.0	1.90	2.08	96.50		
	25	0.71	3.30	3.61	92.88		
	35	0.50	4.00	4.38	88.50		
Medium Material	45	0.355	4.10	4.49	84.01	Medium % (0.25 - 0.5 mm)	13.58%
	60	0.250	8.30	9.09	74.92		
Fine Material	80	0.180	16.20	17.74	57.17	Fine % (0.125 - 0.25 mm)	41.84%
	120	0.125	22.00	24.10	33.08		
Silt Material	170	0.090	9.30	10.19	22.89	Silt % (0.125 - 0.063 mm)	18.62%
	230	0.063	7.70	8.43	14.46		
Pan Material	pan	0.001	13.20	14.46	0.00	Pan % (< 0.063 mm)	14.46%
						Total	**100.00%**

Total (g)	91.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



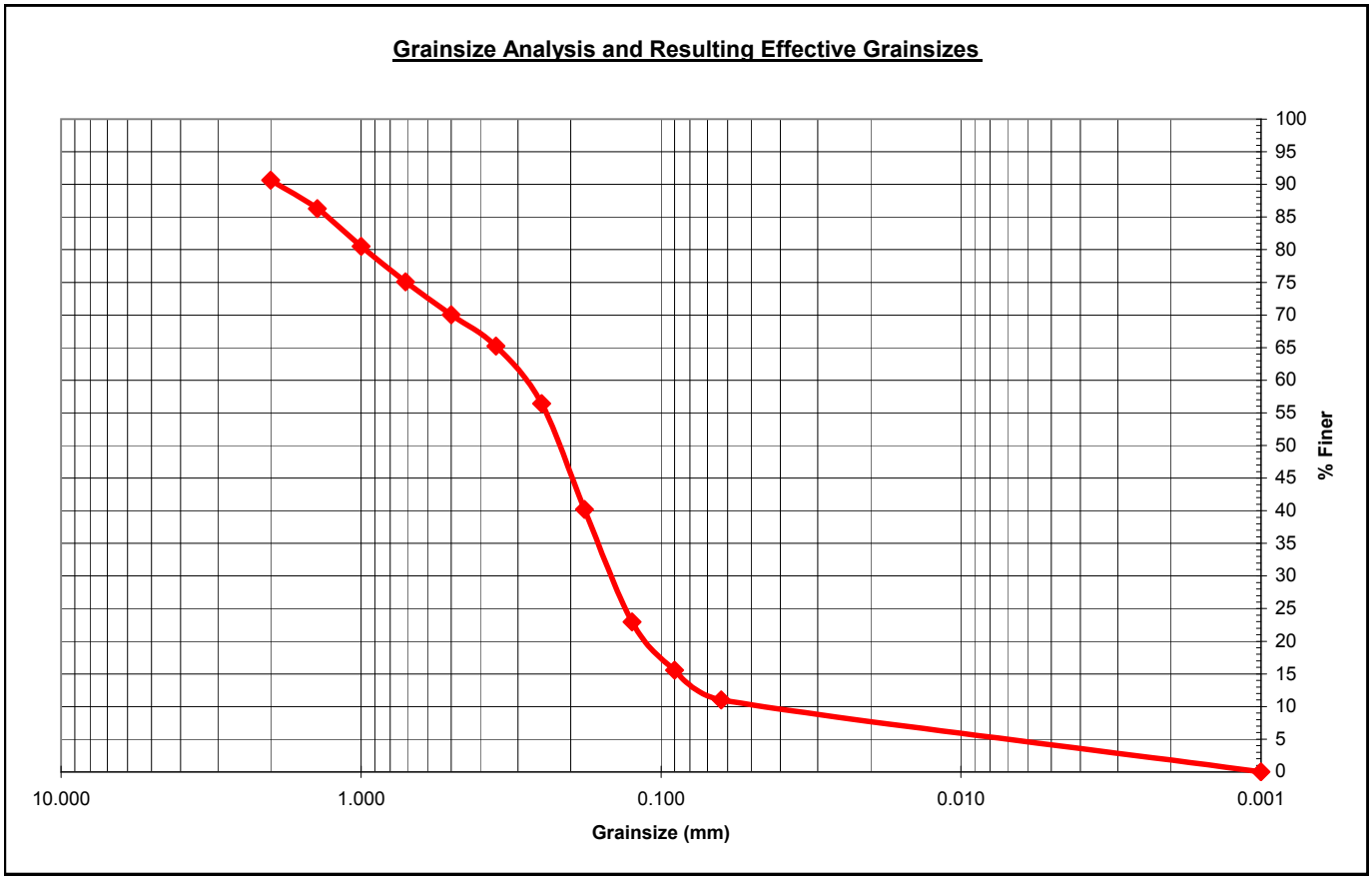
Sample ID:	ECP8-SB1
Sample Depth:	95-96 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	92.20 g
Total Sieve Weight:	91.80 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

16.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	8.60	9.37	90.63	Coarse % (> 0.5 mm)	29.96%
	14	1.4	4.00	4.36	86.27		
	18	1.0	5.30	5.77	80.50		
	25	0.71	5.00	5.45	75.05		
	35	0.50	4.60	5.01	70.04		
Medium Material	45	0.355	4.40	4.79	65.25	Medium % (0.25 - 0.5 mm)	13.62%
	60	0.250	8.10	8.82	56.43		
Fine Material	80	0.180	14.90	16.23	40.20	Fine % (0.125 - 0.25 mm)	33.44%
	120	0.125	15.80	17.21	22.98		
Silt Material	170	0.090	6.80	7.41	15.58	Silt % (0.125 - 0.063 mm)	11.98%
	230	0.063	4.20	4.58	11.00		
Pan Material	pan	0.001	10.10	11.00	0.00	Pan % (< 0.063 mm)	11.00%
						Total	**100.00%**

Total (g)	91.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



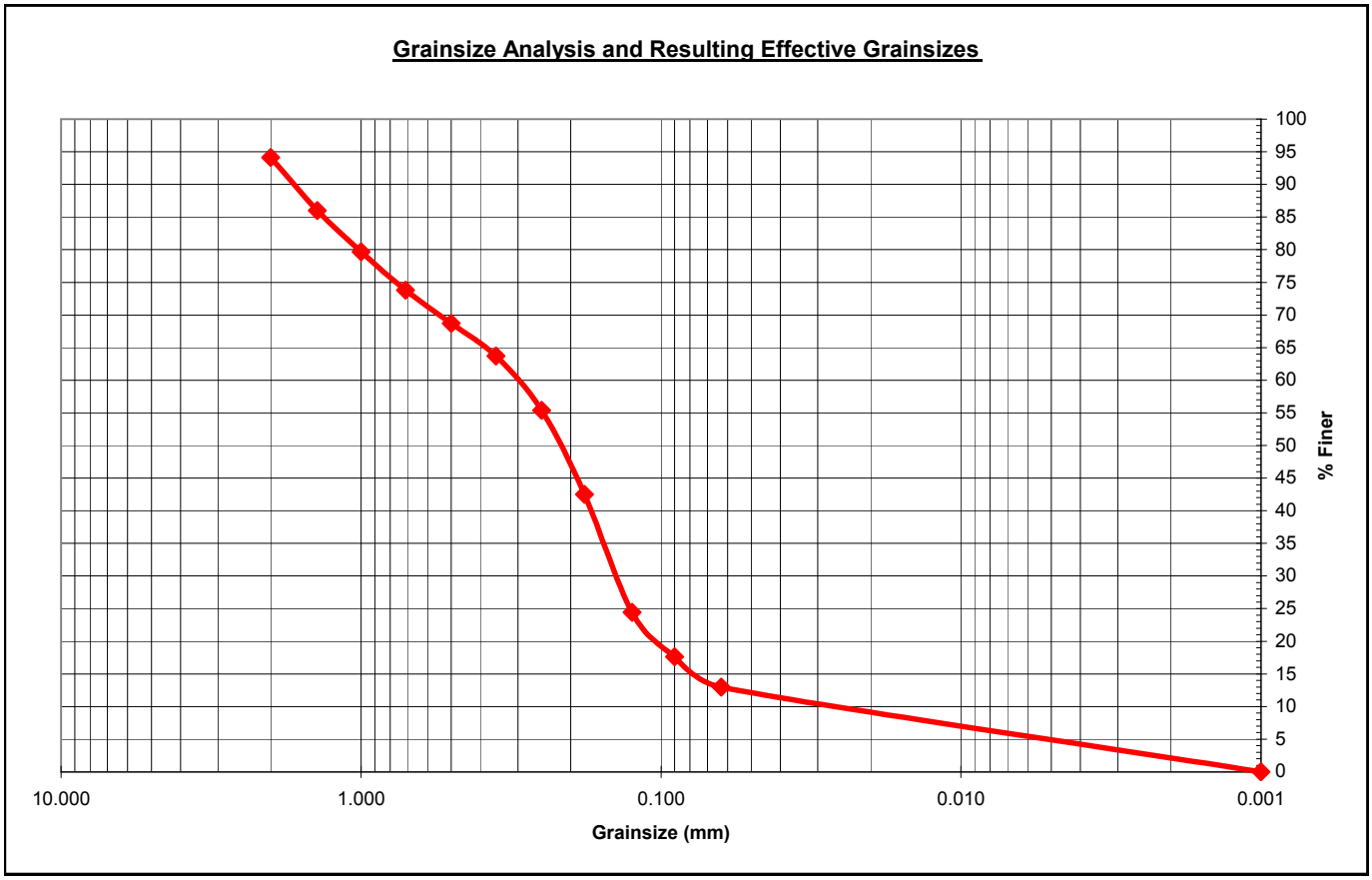
Sample ID:	ECP8-SB1	
Sample Depth:	96-97	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.70	g
Total Sieve Weight:	90.10	g
Weight Loss:	0.6	g
Percent Loss:	0.66	%

17.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	5.30	5.88	94.12	Coarse % (> 0.5 mm)	31.30%
	14	1.4	7.30	8.10	86.02		
	18	1.0	5.70	6.33	79.69		
	25	0.71	5.30	5.88	73.81		
	35	0.50	4.60	5.11	68.70		
Medium Material	45	0.355	4.50	4.99	63.71	Medium % (0.25 - 0.5 mm)	13.32%
	60	0.250	7.50	8.32	55.38		
Fine Material	80	0.180	11.60	12.87	42.51	Fine % (0.125 - 0.25 mm)	30.97%
	120	0.125	16.30	18.09	24.42		
Silt Material	170	0.090	6.10	6.77	17.65	Silt % (0.125 - 0.063 mm)	11.43%
	230	0.063	4.20	4.66	12.99		
Pan Material	pan	0.001	11.70	12.99	0.00	Pan % (< 0.063 mm)	12.99%
						Total	**100.00%**

Total (g)	90.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



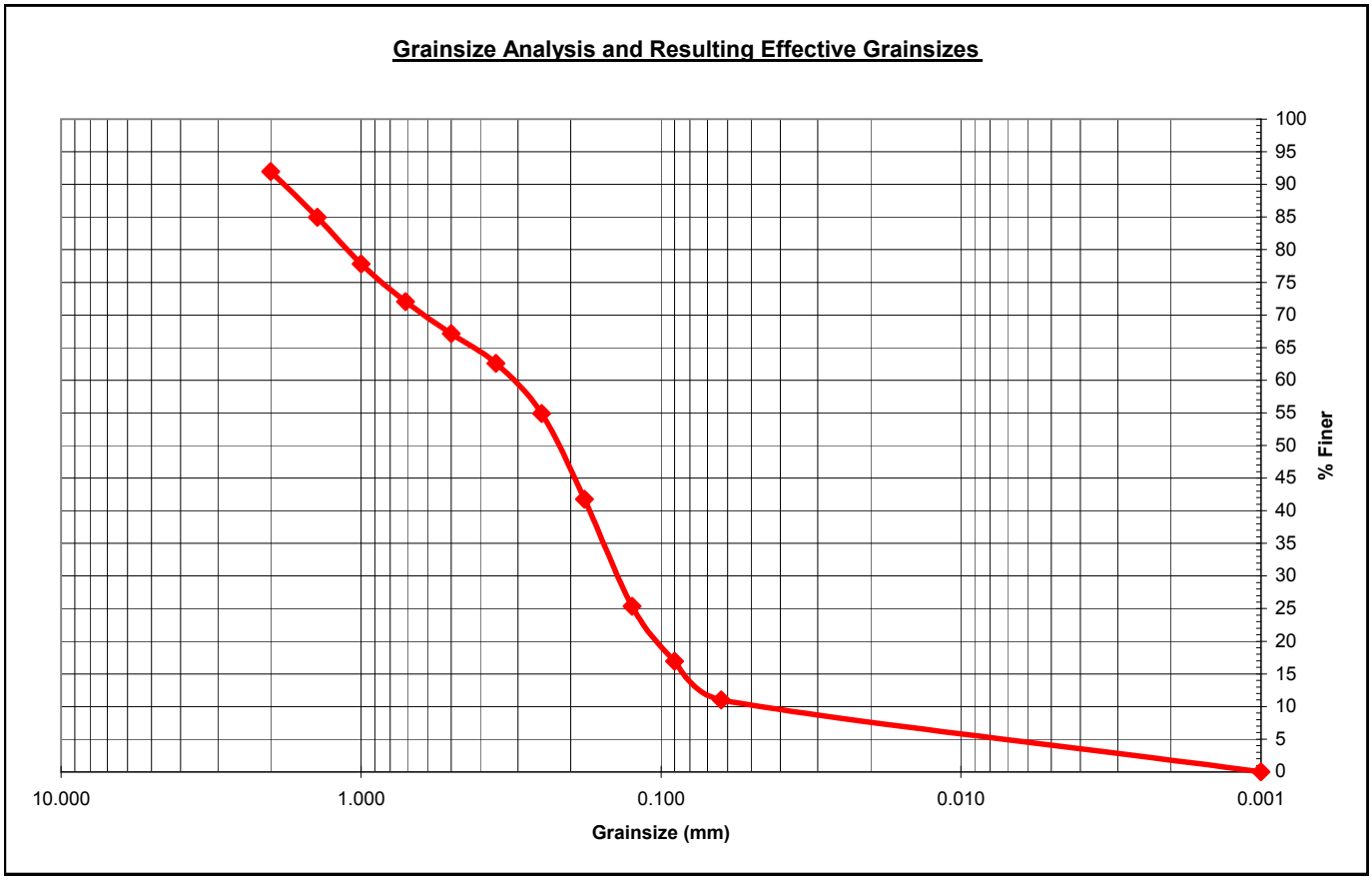
Sample ID:	ECP8-SB1	
Sample Depth:	97-98	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.40	g
Total Sieve Weight:	89.80	g
Weight Loss:	0.6	g
Percent Loss:	0.66	%

17.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	7.20	8.02	91.98	Coarse % (> 0.5 mm)	32.85%
	14	1.4	6.30	7.02	84.97		
	18	1.0	6.40	7.13	77.84		
	25	0.71	5.20	5.79	72.05		
	35	0.50	4.40	4.90	67.15		
Medium Material	45	0.355	4.10	4.57	62.58	Medium % (0.25 - 0.5 mm)	12.25%
	60	0.250	6.90	7.68	54.90		
Fine Material	80	0.180	11.80	13.14	41.76	Fine % (0.125 - 0.25 mm)	29.51%
	120	0.125	14.70	16.37	25.39		
Silt Material	170	0.090	7.60	8.46	16.93	Silt % (0.125 - 0.063 mm)	14.37%
	230	0.063	5.30	5.90	11.02		
Pan Material	pan	0.001	9.90	11.02	0.00	Pan % (< 0.063 mm)	11.02%
						Total	**100.00%**

Total (g)	89.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



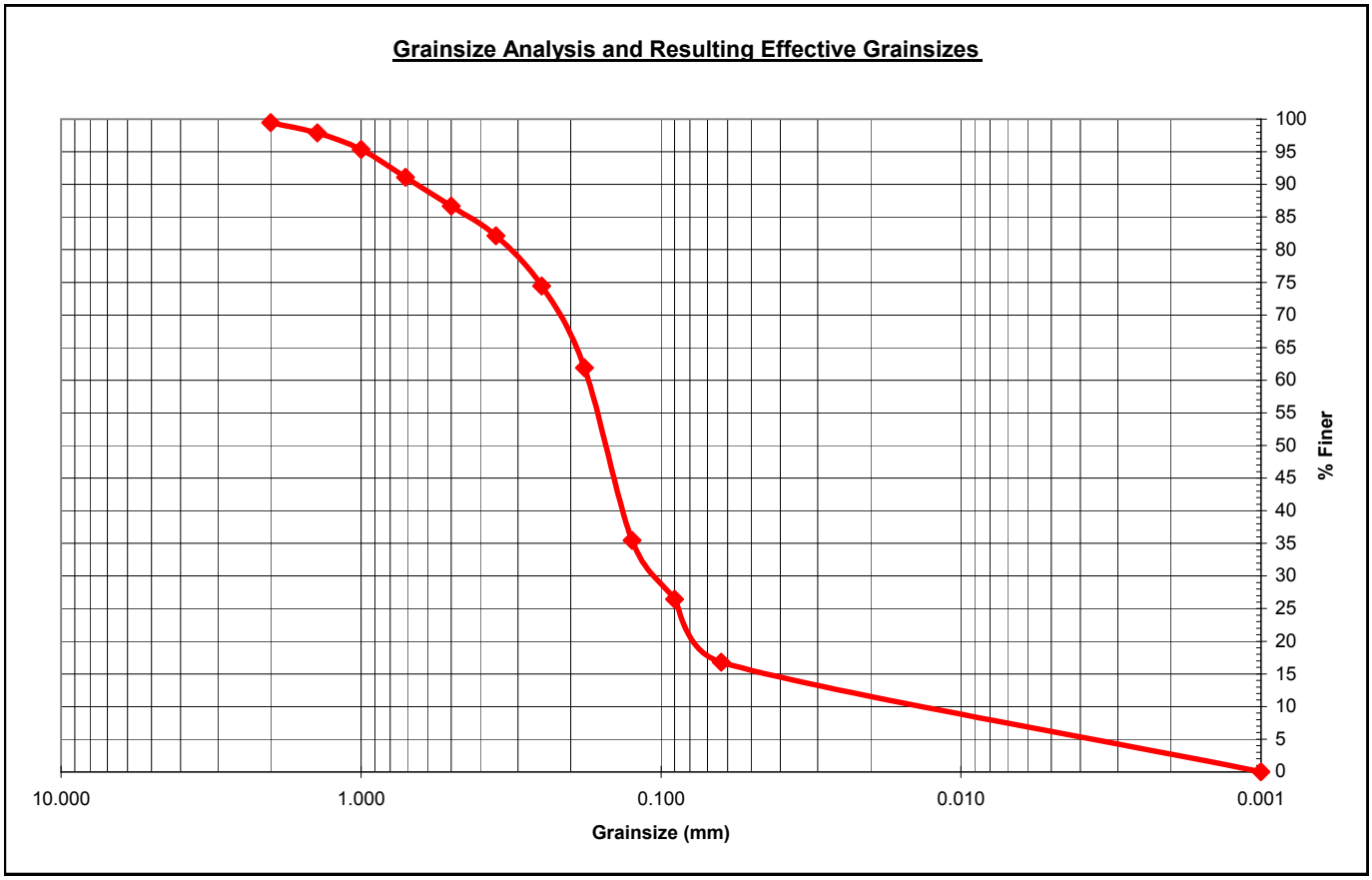
Sample ID:	ECP8-SB1
Sample Depth:	98-99 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.60 g
Total Sieve Weight:	90.00 g
Weight Loss:	0.6 g
Percent Loss:	0.66 %

17.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.50	0.56	99.44	Coarse % (> 0.5 mm)	13.33%
	14	1.4	1.40	1.56	97.89		
	18	1.0	2.30	2.56	95.33		
	25	0.71	3.80	4.22	91.11		
	35	0.50	4.00	4.44	86.67		
Medium Material	45	0.355	4.10	4.56	82.11	Medium % (0.25 - 0.5 mm)	12.22%
	60	0.250	6.90	7.67	74.44		
Fine Material	80	0.180	11.30	12.56	61.89	Fine % (0.125 - 0.25 mm)	39.00%
	120	0.125	23.80	26.44	35.44		
Silt Material	170	0.090	8.10	9.00	26.44	Silt % (0.125 - 0.063 mm)	18.67%
	230	0.063	8.70	9.67	16.78		
Pan Material	pan	0.001	15.10	16.78	0.00	Pan % (< 0.063 mm)	16.78%
						Total	**100.00%**

Total (g)	90.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



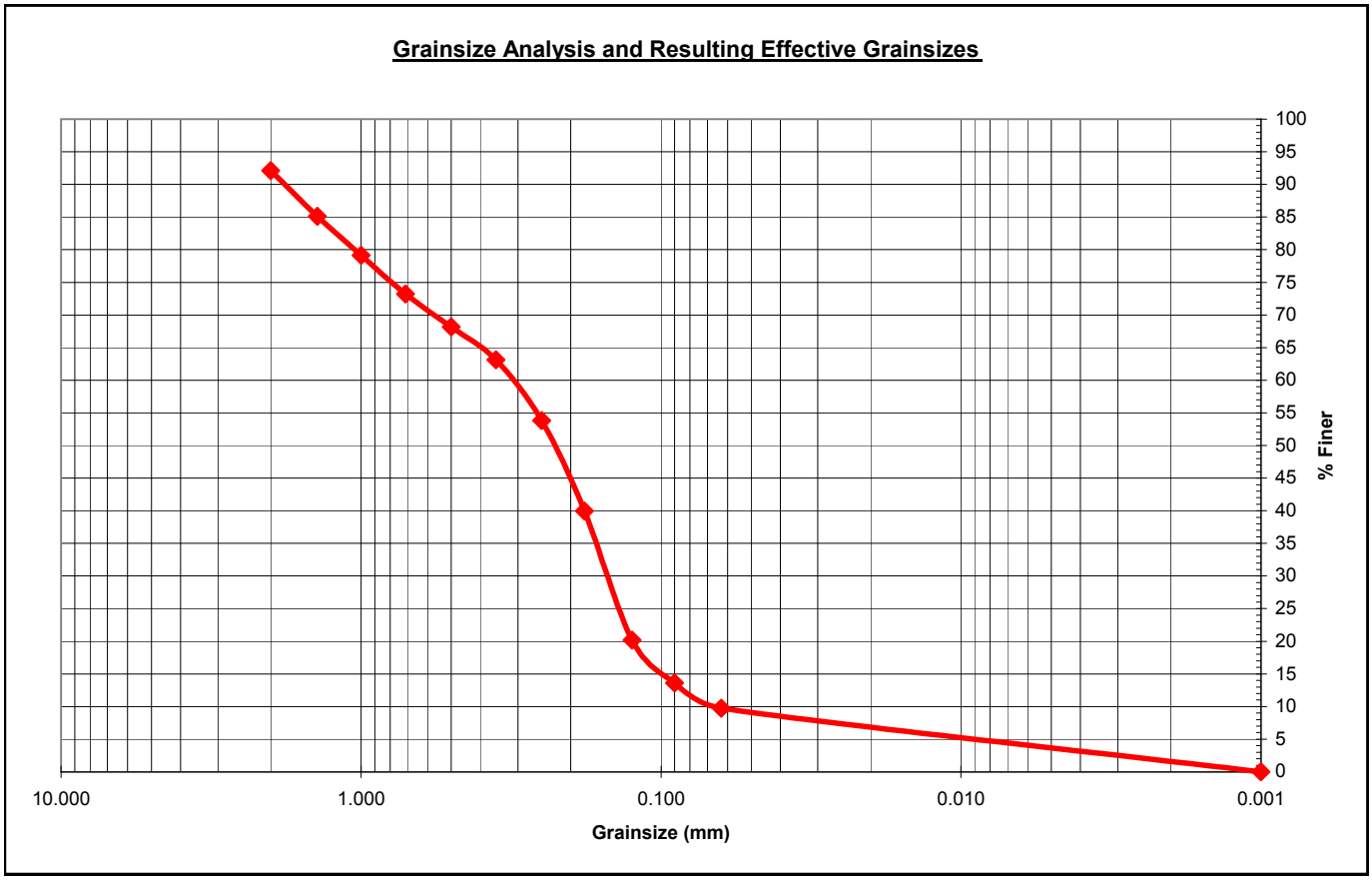
Sample ID:	ECP8-SB1
Sample Depth:	99-100 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.40 g
Total Sieve Weight:	87.30 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

20.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	6.90	7.90	92.10	Coarse % (> 0.5 mm)	31.84%
	14	1.4	6.10	6.99	85.11		
	18	1.0	5.20	5.96	79.15		
	25	0.71	5.20	5.96	73.20		
	35	0.50	4.40	5.04	68.16		
Medium Material	45	0.355	4.40	5.04	63.12	Medium % (0.25 - 0.5 mm)	14.32%
	60	0.250	8.10	9.28	53.84		
Fine Material	80	0.180	12.10	13.86	39.98	Fine % (0.125 - 0.25 mm)	33.68%
	120	0.125	17.30	19.82	20.16		
Silt Material	170	0.090	5.70	6.53	13.63	Silt % (0.125 - 0.063 mm)	10.42%
	230	0.063	3.40	3.89	9.74		
Pan Material	pan	0.001	8.50	9.74	0.00	Pan % (< 0.063 mm)	9.74%
						Total	**100.00%**

Total (g)	87.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



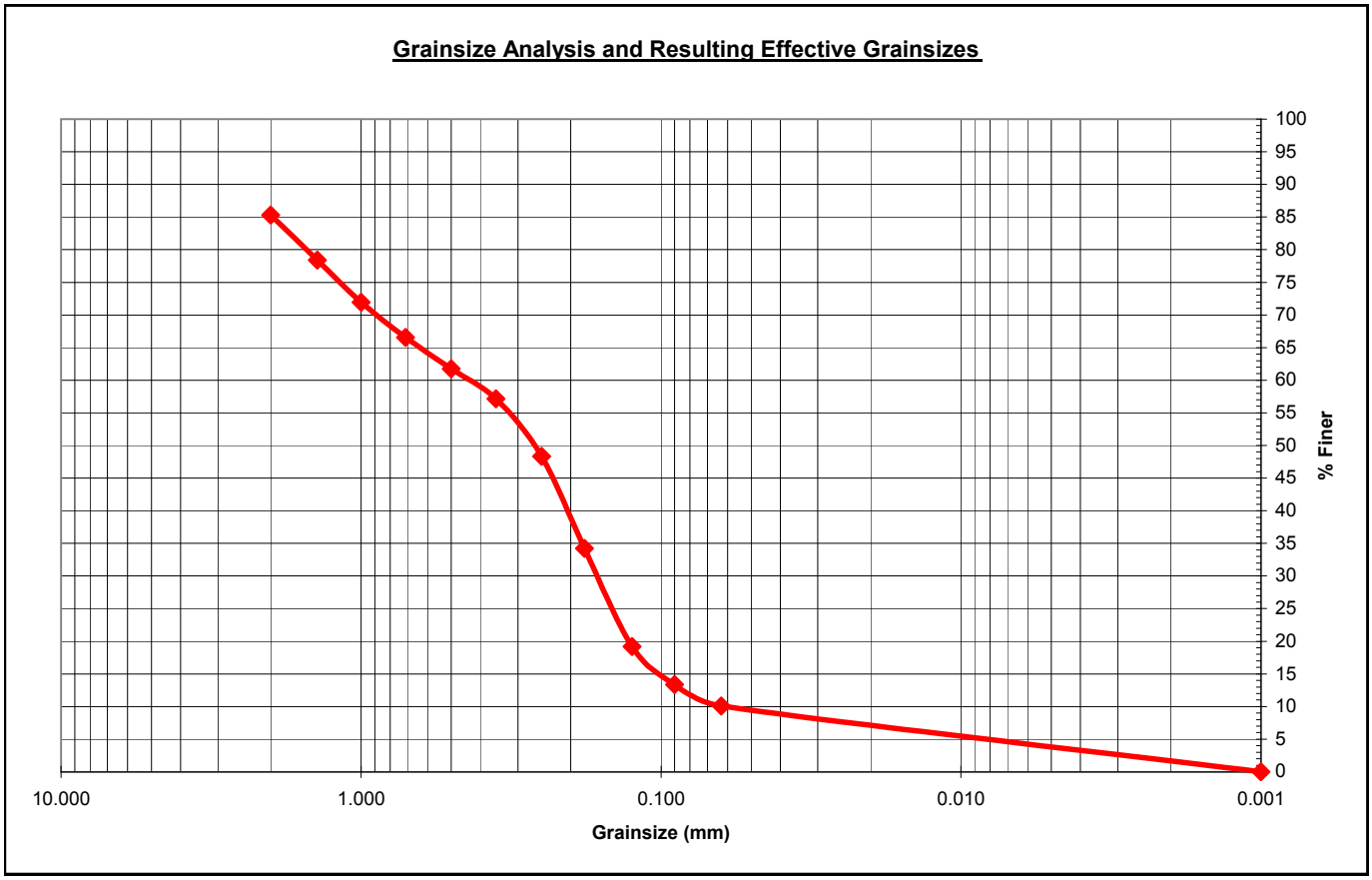
Sample ID:	ECP8-SB1
Sample Depth:	100-101 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.40 g
Total Sieve Weight:	91.20 g
Weight Loss:	0.2 g
Percent Loss:	0.22 %

16.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	13.40	14.69	85.31	Coarse % (> 0.5 mm)	38.27%
	14	1.4	6.30	6.91	78.40		
	18	1.0	5.90	6.47	71.93		
	25	0.71	4.90	5.37	66.56		
	35	0.50	4.40	4.82	61.73		
Medium Material	45	0.355	4.20	4.61	57.13	Medium % (0.25 - 0.5 mm)	13.38%
	60	0.250	8.00	8.77	48.36		
Fine Material	80	0.180	12.90	14.14	34.21	Fine % (0.125 - 0.25 mm)	29.17%
	120	0.125	13.70	15.02	19.19		
Silt Material	170	0.090	5.30	5.81	13.38	Silt % (0.125 - 0.063 mm)	9.10%
	230	0.063	3.00	3.29	10.09		
Pan Material	pan	0.001	9.20	10.09	0.00	Pan % (< 0.063 mm)	10.09%
						Total	100.00%

Total (g)	91.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



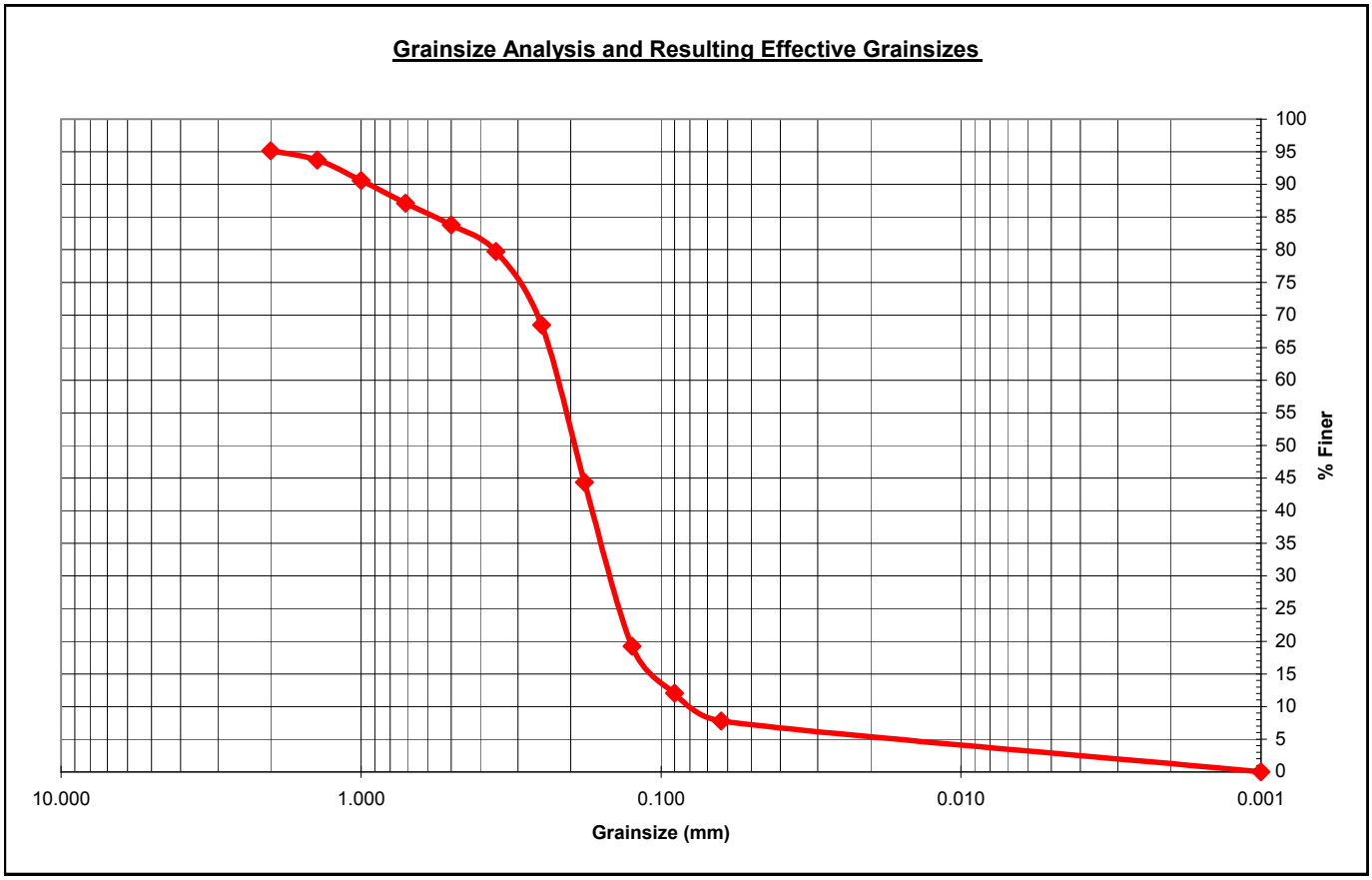
Sample ID:	ECP8-SB1
Sample Depth:	101-102 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.40 g
Total Sieve Weight:	86.30 g
Weight Loss:	0.1 g
Percent Loss:	0.12 %

21.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.20	4.87	95.13	Coarse % (> 0.5 mm)	16.22%
	14	1.4	1.20	1.39	93.74		
	18	1.0	2.70	3.13	90.61		
	25	0.71	3.00	3.48	87.14		
	35	0.50	2.90	3.36	83.78		
Medium Material	45	0.355	3.50	4.06	79.72	Medium % (0.25 - 0.5 mm)	15.30%
	60	0.250	9.70	11.24	68.48		
Fine Material	80	0.180	20.80	24.10	44.38	Fine % (0.125 - 0.25 mm)	49.25%
	120	0.125	21.70	25.14	19.24		
Silt Material	170	0.090	6.20	7.18	12.05	Silt % (0.125 - 0.063 mm)	11.47%
	230	0.063	3.70	4.29	7.76		
Pan Material	pan	0.001	6.70	7.76	0.00	Pan % (< 0.063 mm)	7.76%
						Total	**100.00%**

Total (g)	86.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



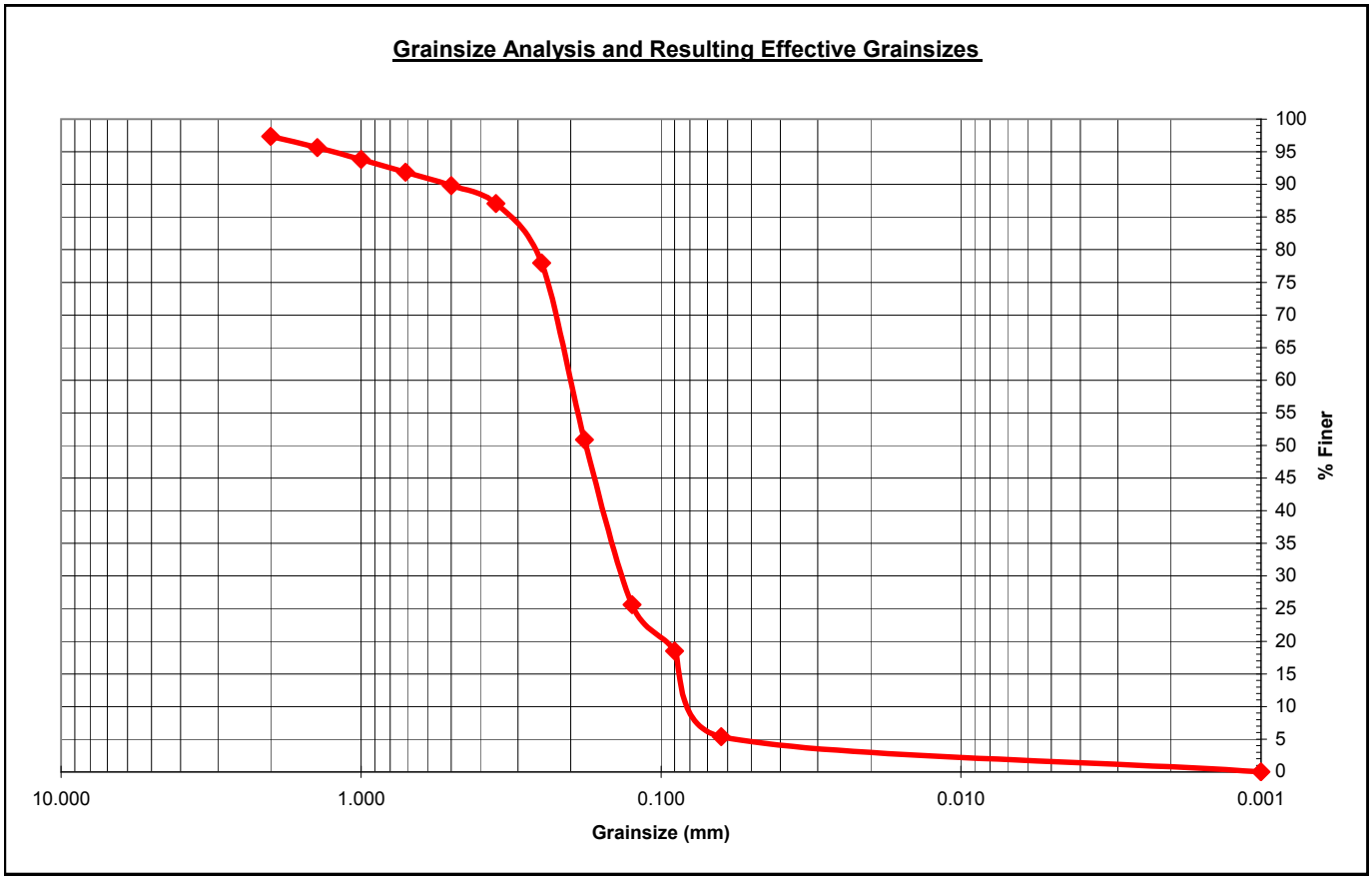
Sample ID:	ECP8-SB1
Sample Depth:	102-103 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.60 g
Total Sieve Weight:	87.50 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

20.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.30	2.63	97.37	Coarse % (> 0.5 mm)	10.17%
	14	1.4	1.50	1.71	95.66		
	18	1.0	1.60	1.83	93.83		
	25	0.71	1.70	1.94	91.89		
	35	0.50	1.80	2.06	89.83		
Medium Material	45	0.355	2.40	2.74	87.09	Medium % (0.25 - 0.5 mm)	11.89%
	60	0.250	8.00	9.14	77.94		
Fine Material	80	0.180	23.70	27.09	50.86	Fine % (0.125 - 0.25 mm)	52.34%
	120	0.125	22.10	25.26	25.60		
Silt Material	170	0.090	6.20	7.09	18.51	Silt % (0.125 - 0.063 mm)	20.23%
	230	0.063	11.50	13.14	5.37		
Pan Material	pan	0.001	4.70	5.37	0.00	Pan % (< 0.063 mm)	5.37%
						Total	100.00%

Total (g)	87.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



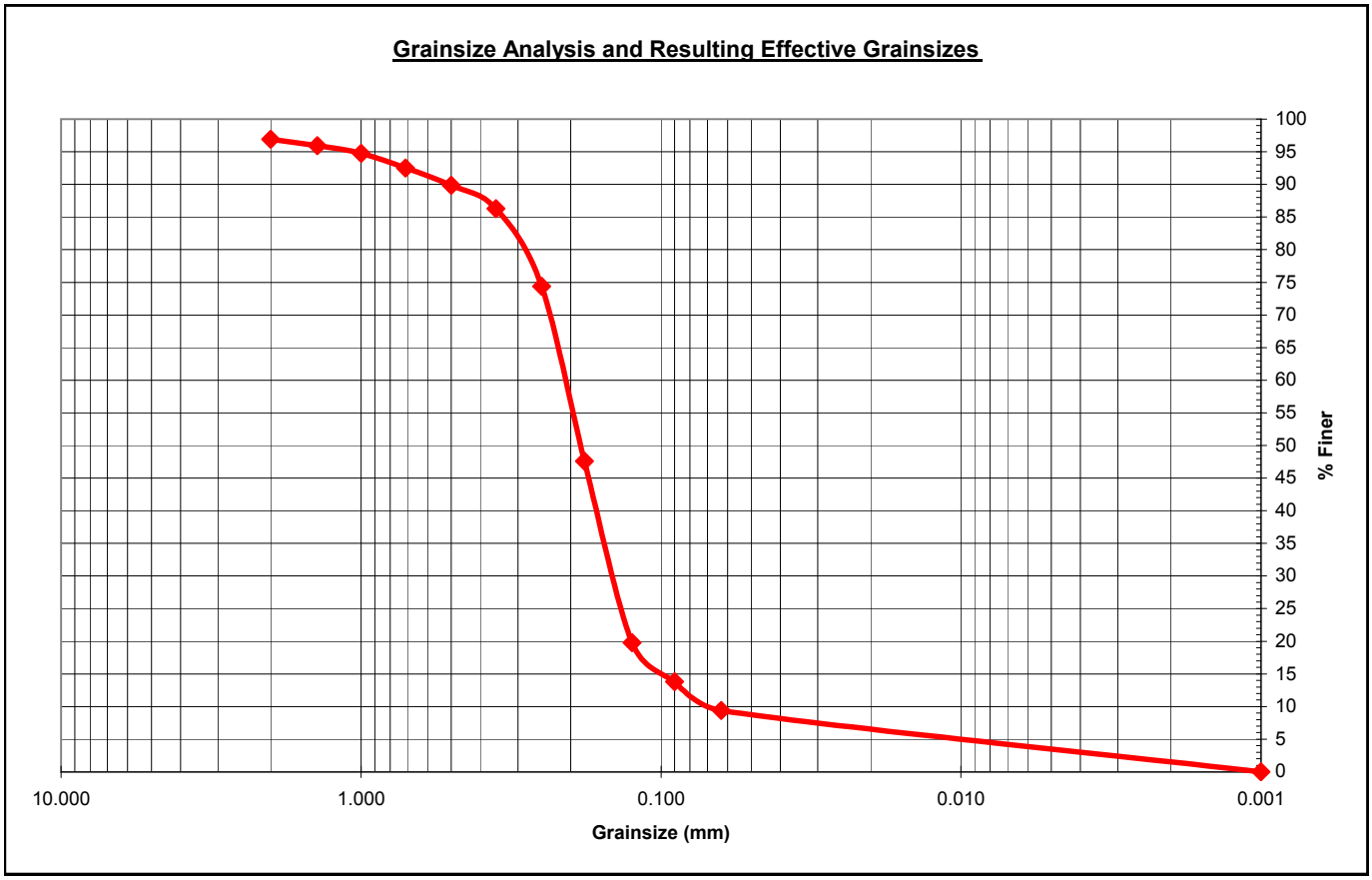
Sample ID:	ECP8-SB1
Sample Depth:	103-104 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.10 g
Total Sieve Weight:	84.00 g
Weight Loss:	1.1 g
Percent Loss:	1.29 %

22.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.60	3.10	96.90	Coarse % (> 0.5 mm)	10.12%
	14	1.4	0.80	0.95	95.95		
	18	1.0	1.00	1.19	94.76		
	25	0.71	1.90	2.26	92.50		
	35	0.50	2.20	2.62	89.88		
Medium Material	45	0.355	3.00	3.57	86.31	Medium % (0.25 - 0.5 mm)	15.48%
	60	0.250	10.00	11.90	74.40		
Fine Material	80	0.180	22.50	26.79	47.62	Fine % (0.125 - 0.25 mm)	54.64%
	120	0.125	23.40	27.86	19.76		
Silt Material	170	0.090	5.00	5.95	13.81	Silt % (0.125 - 0.063 mm)	10.36%
	230	0.063	3.70	4.40	9.40		
Pan Material	pan	0.001	7.90	9.40	0.00	Pan % (< 0.063 mm)	9.40%
						Total	**100.00%**

Total (g)	84.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



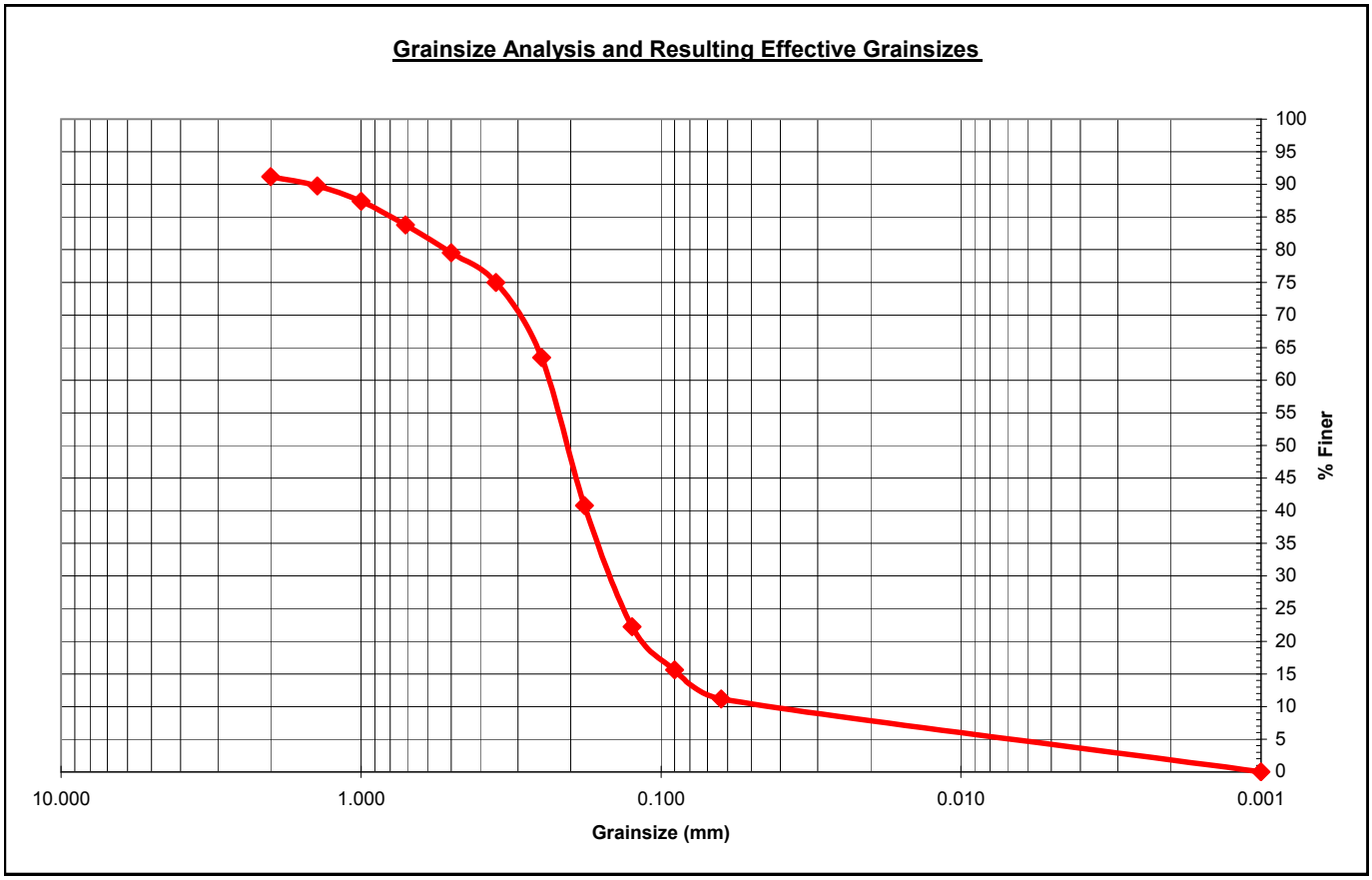
Sample ID:	ECP8-SB1
Sample Depth:	104-105 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.60 g
Total Sieve Weight:	85.10 g
Weight Loss:	0.5 g
Percent Loss:	0.58 %

22.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	7.50	8.81	91.19	Coarse % (> 0.5 mm)	20.45%
	14	1.4	1.20	1.41	89.78		
	18	1.0	2.00	2.35	87.43		
	25	0.71	3.10	3.64	83.78		
	35	0.50	3.60	4.23	79.55		
Medium Material	45	0.355	3.90	4.58	74.97	Medium % (0.25 - 0.5 mm)	16.10%
	60	0.250	9.80	11.52	63.45		
Fine Material	80	0.180	19.30	22.68	40.78	Fine % (0.125 - 0.25 mm)	41.25%
	120	0.125	15.80	18.57	22.21		
Silt Material	170	0.090	5.60	6.58	15.63	Silt % (0.125 - 0.063 mm)	11.05%
	230	0.063	3.80	4.47	11.16		
Pan Material	pan	0.001	9.50	11.16	0.00	Pan % (< 0.063 mm)	11.16%
						Total	**100.00%**

Total (g)	85.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



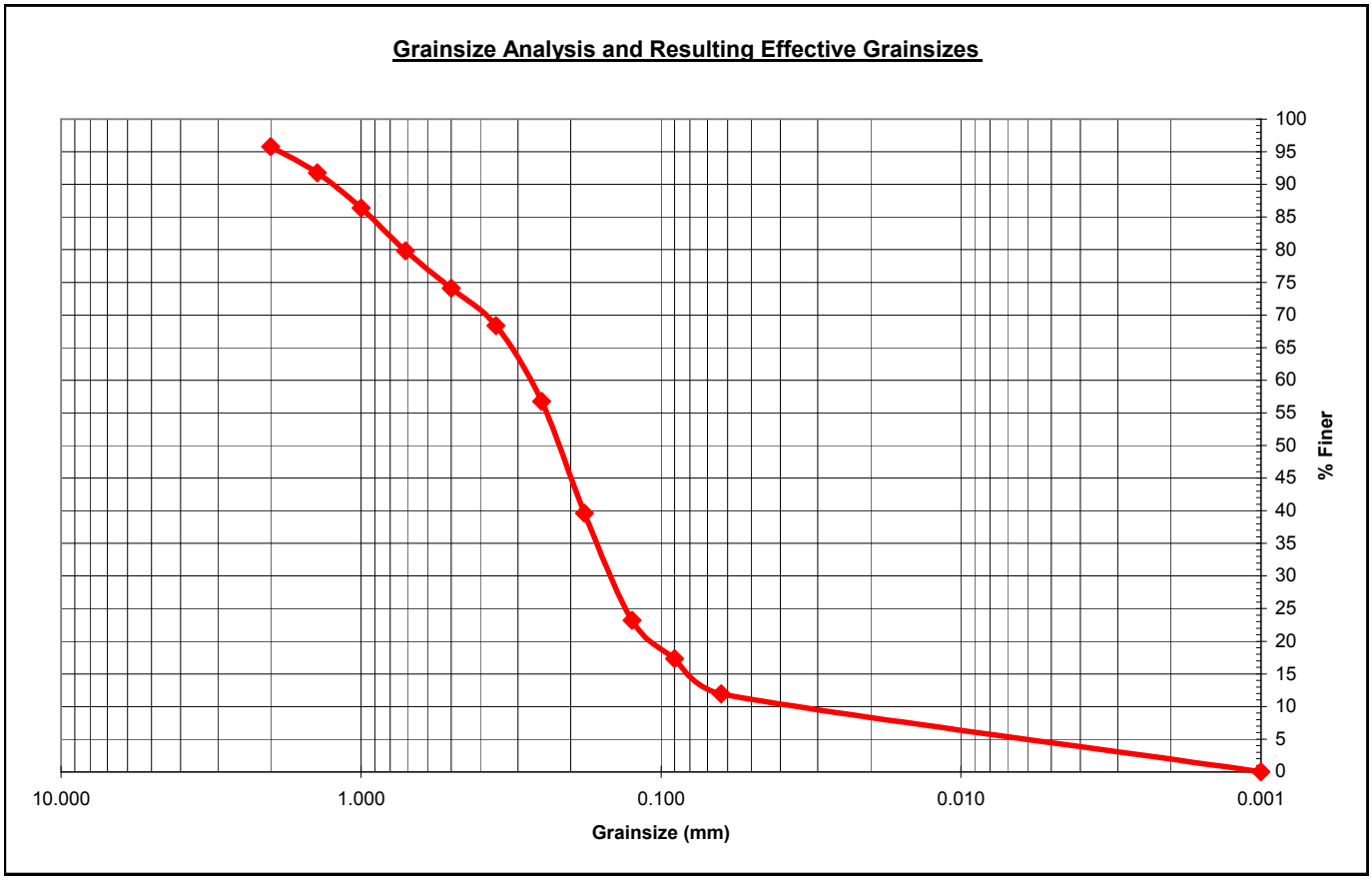
Sample ID:	ECP8-SB1	
Sample Depth:	105-106	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	86.60	g
Total Sieve Weight:	85.30	g
Weight Loss:	1.3	g
Percent Loss:	1.50	%

21.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	3.60	4.22	95.78	Coarse % (> 0.5 mm)	25.91%
	14	1.4	3.40	3.99	91.79		
	18	1.0	4.60	5.39	86.40		
	25	0.71	5.60	6.57	79.84		
	35	0.50	4.90	5.74	74.09		
Medium Material	45	0.355	4.90	5.74	68.35	Medium % (0.25 - 0.5 mm)	17.35%
	60	0.250	9.90	11.61	56.74		
Fine Material	80	0.180	14.60	17.12	39.62	Fine % (0.125 - 0.25 mm)	33.53%
	120	0.125	14.00	16.41	23.21		
Silt Material	170	0.090	5.00	5.86	17.35	Silt % (0.125 - 0.063 mm)	11.25%
	230	0.063	4.60	5.39	11.96		
Pan Material	pan	0.001	10.20	11.96	0.00	Pan % (< 0.063 mm)	11.96%
						Total	**100.00%**

Total (g)	85.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



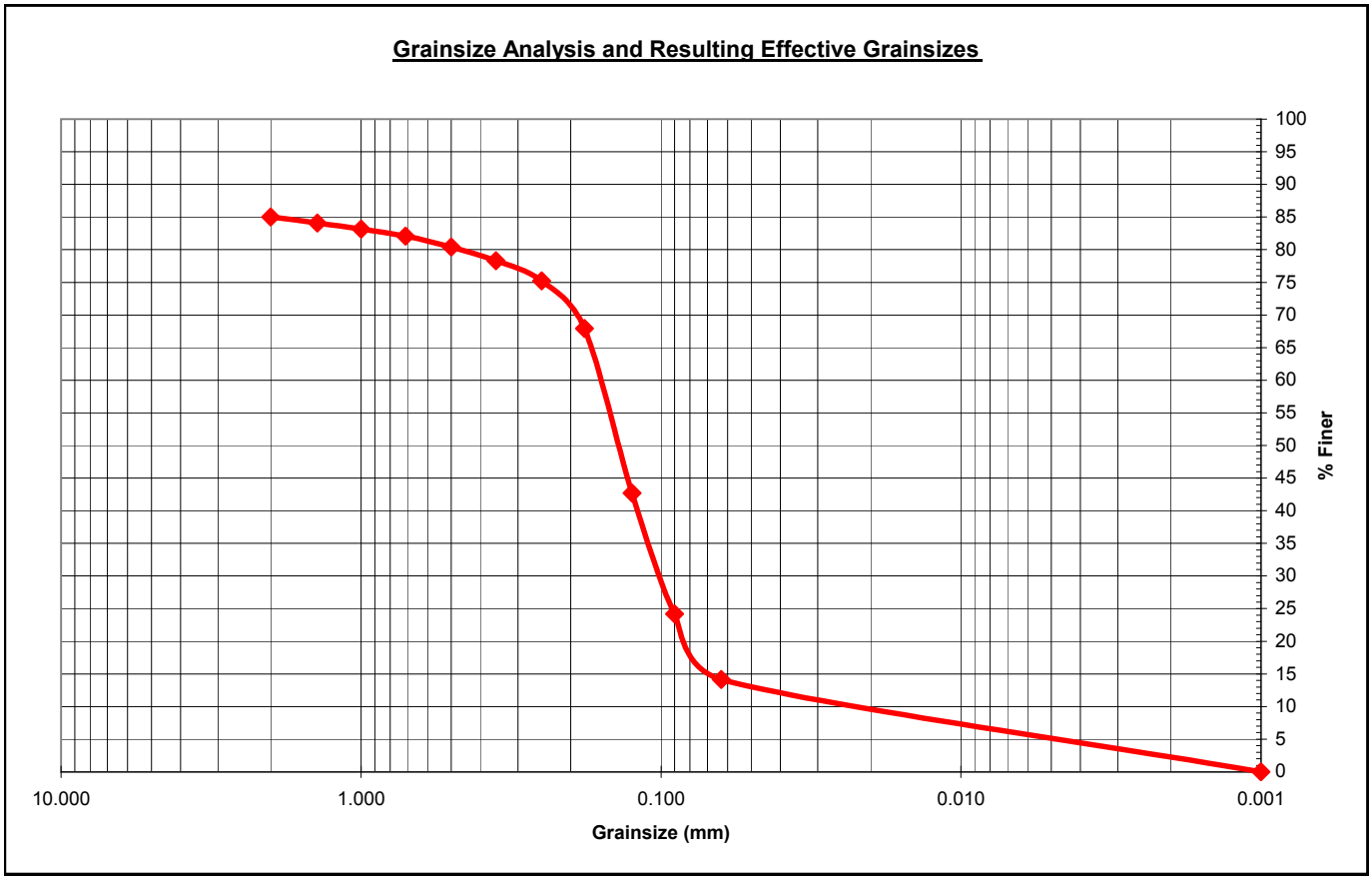
Sample ID:	ECP8-SB1
Sample Depth:	106-107 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.80 g
Total Sieve Weight:	84.80 g
Weight Loss:	1 g
Percent Loss:	1.17 %

22.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	12.70	14.98	85.02	Coarse % (> 0.5 mm)	19.58%
	14	1.4	0.80	0.94	84.08		
	18	1.0	0.80	0.94	83.14		
	25	0.71	0.90	1.06	82.08		
	35	0.50	1.40	1.65	80.42		
Medium Material	45	0.355	1.80	2.12	78.30	Medium % (0.25 - 0.5 mm)	5.19%
	60	0.250	2.60	3.07	75.24		
Fine Material	80	0.180	6.20	7.31	67.92	Fine % (0.125 - 0.25 mm)	32.55%
	120	0.125	21.40	25.24	42.69		
Silt Material	170	0.090	15.70	18.51	24.17	Silt % (0.125 - 0.063 mm)	28.54%
	230	0.063	8.50	10.02	14.15		
Pan Material	pan	0.001	12.00	14.15	0.00	Pan % (< 0.063 mm)	14.15%
						Total	100.00%

Total (g)	84.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



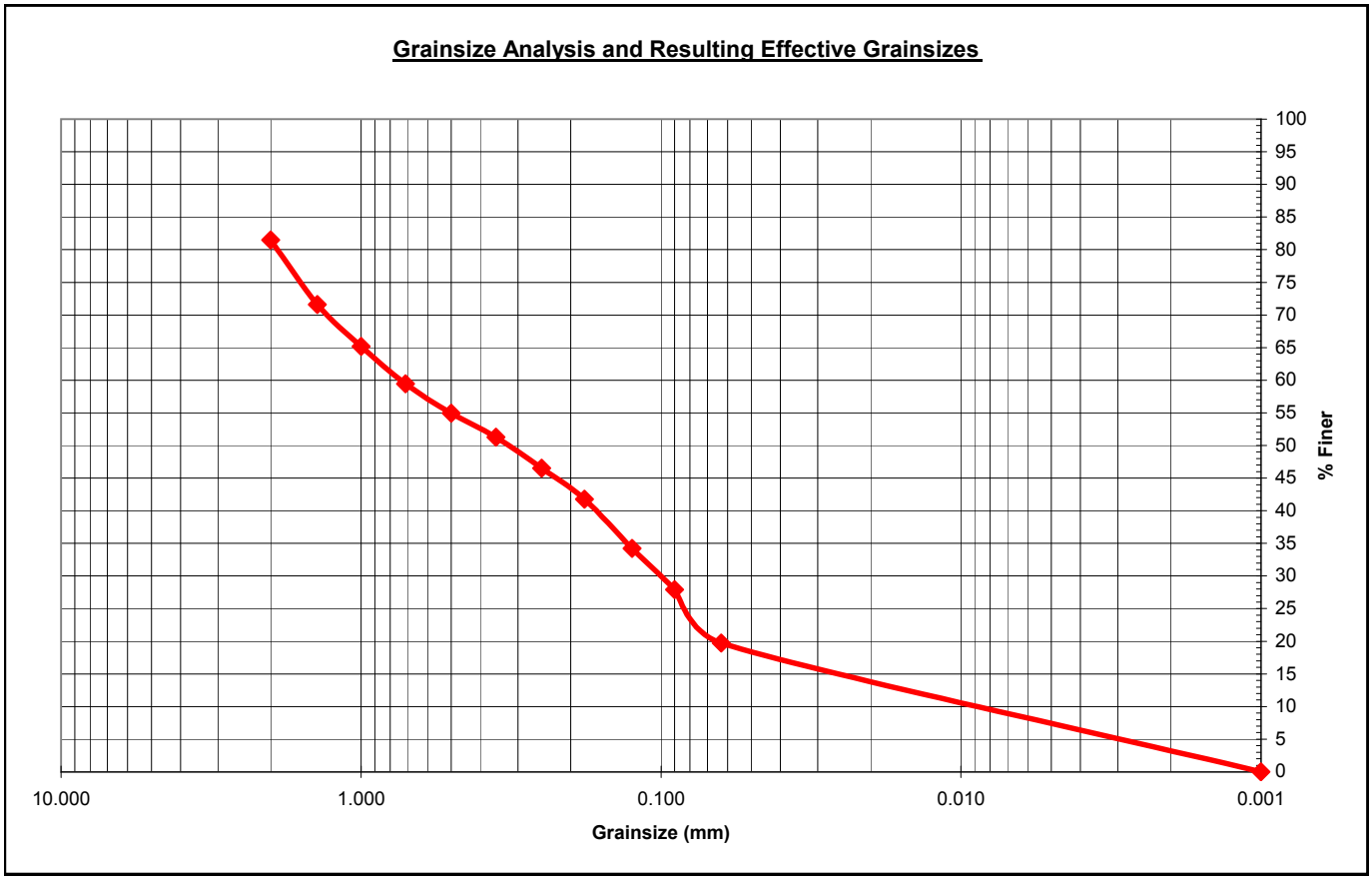
Sample ID:	ECP8-SB1
Sample Depth:	107-108 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.50 g
Total Sieve Weight:	82.10 g
Weight Loss:	1.4 g
Percent Loss:	1.68 %

24.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	15.20	18.51	81.49	Coarse % (> 0.5 mm)	45.07%
	14	1.4	8.10	9.87	71.62		
	18	1.0	5.30	6.46	65.16		
	25	0.71	4.70	5.72	59.44		
	35	0.50	3.70	4.51	54.93		
Medium Material	45	0.355	3.00	3.65	51.28	Medium % (0.25 - 0.5 mm)	8.40%
	60	0.250	3.90	4.75	46.53		
Fine Material	80	0.180	3.90	4.75	41.78	Fine % (0.125 - 0.25 mm)	12.30%
	120	0.125	6.20	7.55	34.23		
Silt Material	170	0.090	5.20	6.33	27.89	Silt % (0.125 - 0.063 mm)	14.49%
	230	0.063	6.70	8.16	19.73		
Pan Material	pan	0.001	16.20	19.73	0.00	Pan % (< 0.063 mm)	19.73%
						Total	**100.00%**

Total (g)	82.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



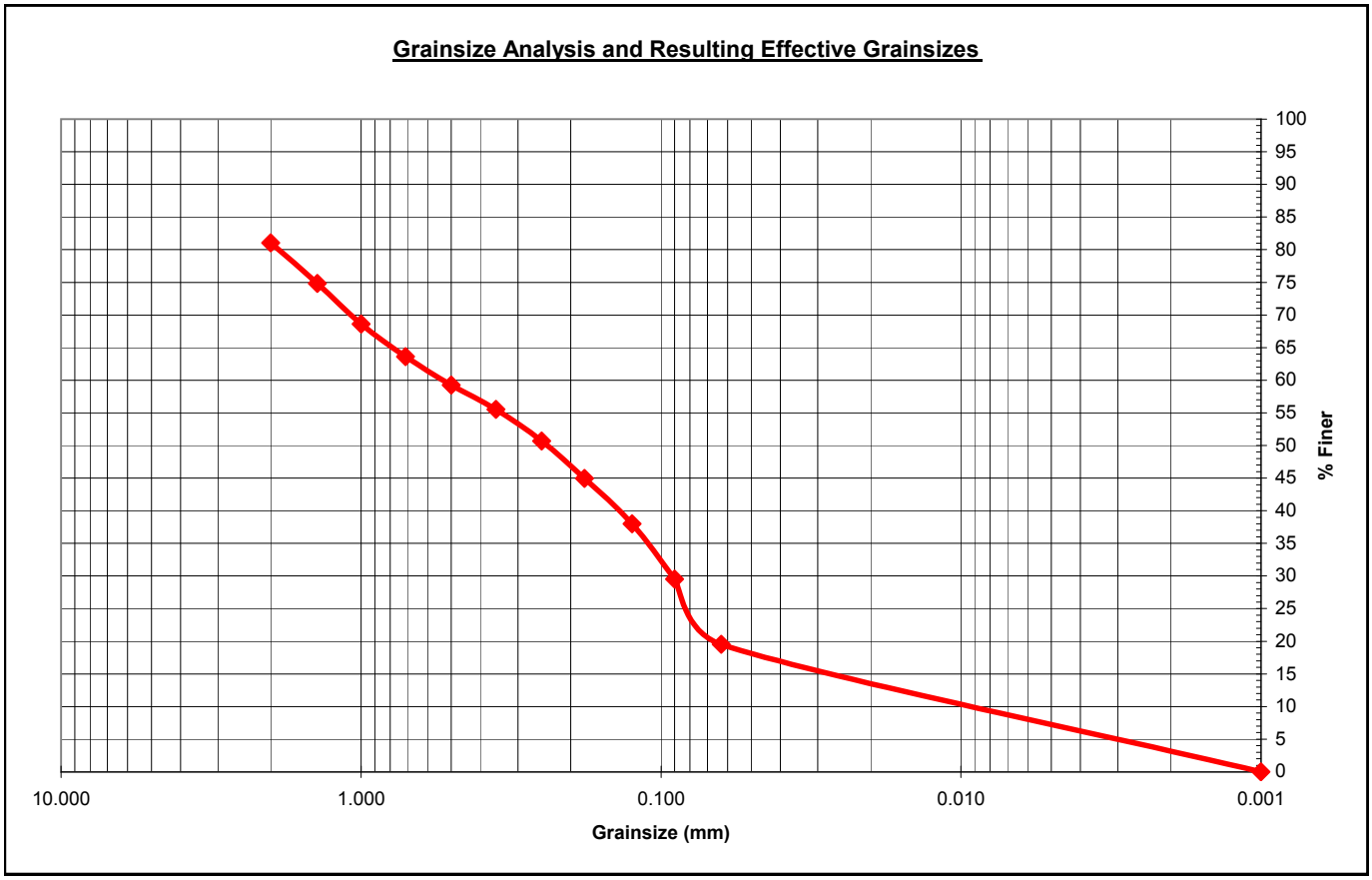
Sample ID:	ECP8-SB1	
Sample Depth:	108-109	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	80.70	g
Total Sieve Weight:	80.30	g
Weight Loss:	0.4	g
Percent Loss:	0.50	%

26.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	15.20	18.93	81.07	Coarse % (> 0.5 mm)	40.72%
	14	1.4	5.00	6.23	74.84		
	18	1.0	5.00	6.23	68.62		
	25	0.71	4.00	4.98	63.64		
	35	0.50	3.50	4.36	59.28		
Medium Material	45	0.355	3.00	3.74	55.54	Medium % (0.25 - 0.5 mm)	8.59%
	60	0.250	3.90	4.86	50.68		
Fine Material	80	0.180	4.60	5.73	44.96	Fine % (0.125 - 0.25 mm)	12.70%
	120	0.125	5.60	6.97	37.98		
Silt Material	170	0.090	6.80	8.47	29.51	Silt % (0.125 - 0.063 mm)	18.43%
	230	0.063	8.00	9.96	19.55		
Pan Material	pan	0.001	15.70	19.55	0.00	Pan % (< 0.063 mm)	19.55%
						Total	**100.00%**

Total (g)	80.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



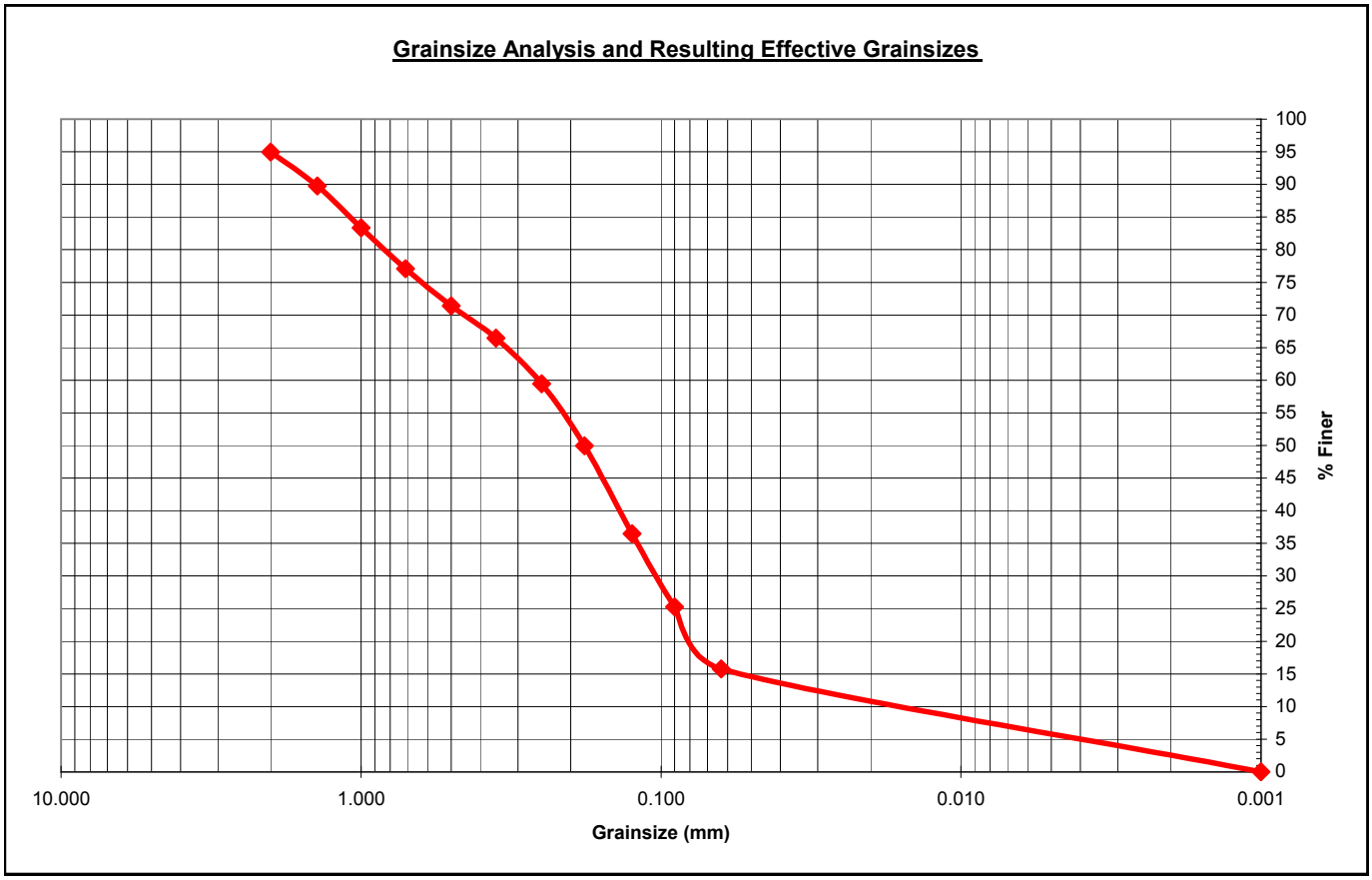
Sample ID:	ECP8-SB1	
Sample Depth:	109-110	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	81.40	g
Total Sieve Weight:	81.10	g
Weight Loss:	0.3	g
Percent Loss:	0.37	%

26.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.10	5.06	94.94	Coarse % (> 0.5 mm)	28.61%
	14	1.4	4.20	5.18	89.77		
	18	1.0	5.20	6.41	83.35		
	25	0.71	5.10	6.29	77.07		
	35	0.50	4.60	5.67	71.39		
Medium Material	45	0.355	4.00	4.93	66.46	Medium % (0.25 - 0.5 mm)	11.96%
	60	0.250	5.70	7.03	59.43		
Fine Material	80	0.180	7.70	9.49	49.94	Fine % (0.125 - 0.25 mm)	22.93%
	120	0.125	10.90	13.44	36.50		
Silt Material	170	0.090	9.10	11.22	25.28	Silt % (0.125 - 0.063 mm)	20.72%
	230	0.063	7.70	9.49	15.78		
Pan Material	pan	0.001	12.80	15.78	0.00	Pan % (< 0.063 mm)	15.78%
						Total	**100.00%**

Total (g)	81.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



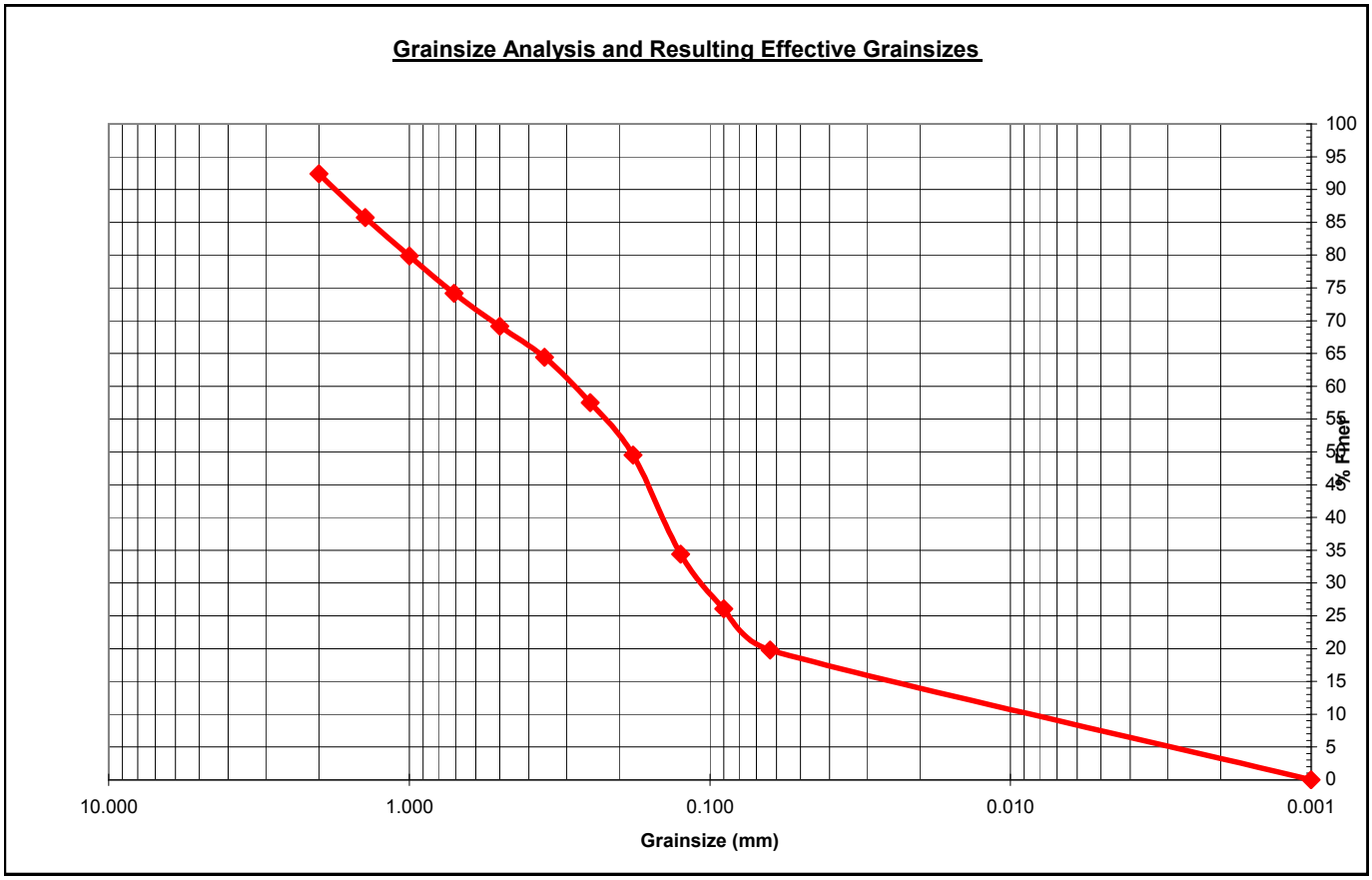
Sample ID:	ECP8-SB1	
Sample Depth:	110-111	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	83.70	g
Total Sieve Weight:	84.00	g
Weight Loss:	-0.3	g
Percent Loss:	-0.36	%

23.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	6.40	7.62	92.38	Coarse % (> 0.5 mm)	30.83%
	14	1.4	5.60	6.67	85.71		
	18	1.0	4.90	5.83	79.88		
	25	0.71	4.80	5.71	74.17		
	35	0.50	4.20	5.00	69.17		
Medium Material	45	0.355	4.00	4.76	64.40	Medium % (0.25 - 0.5 mm)	11.67%
	60	0.250	5.80	6.90	57.50		
Fine Material	80	0.180	6.70	7.98	49.52	Fine % (0.125 - 0.25 mm)	23.10%
	120	0.125	12.70	15.12	34.40		
Silt Material	170	0.090	7.00	8.33	26.07	Silt % (0.125 - 0.063 mm)	14.64%
	230	0.063	5.30	6.31	19.76		
Pan Material	pan	0.001	16.60	19.76	0.00	Pan % (< 0.063 mm)	19.76%
						Total	**100.00%**

Total (g)	84.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



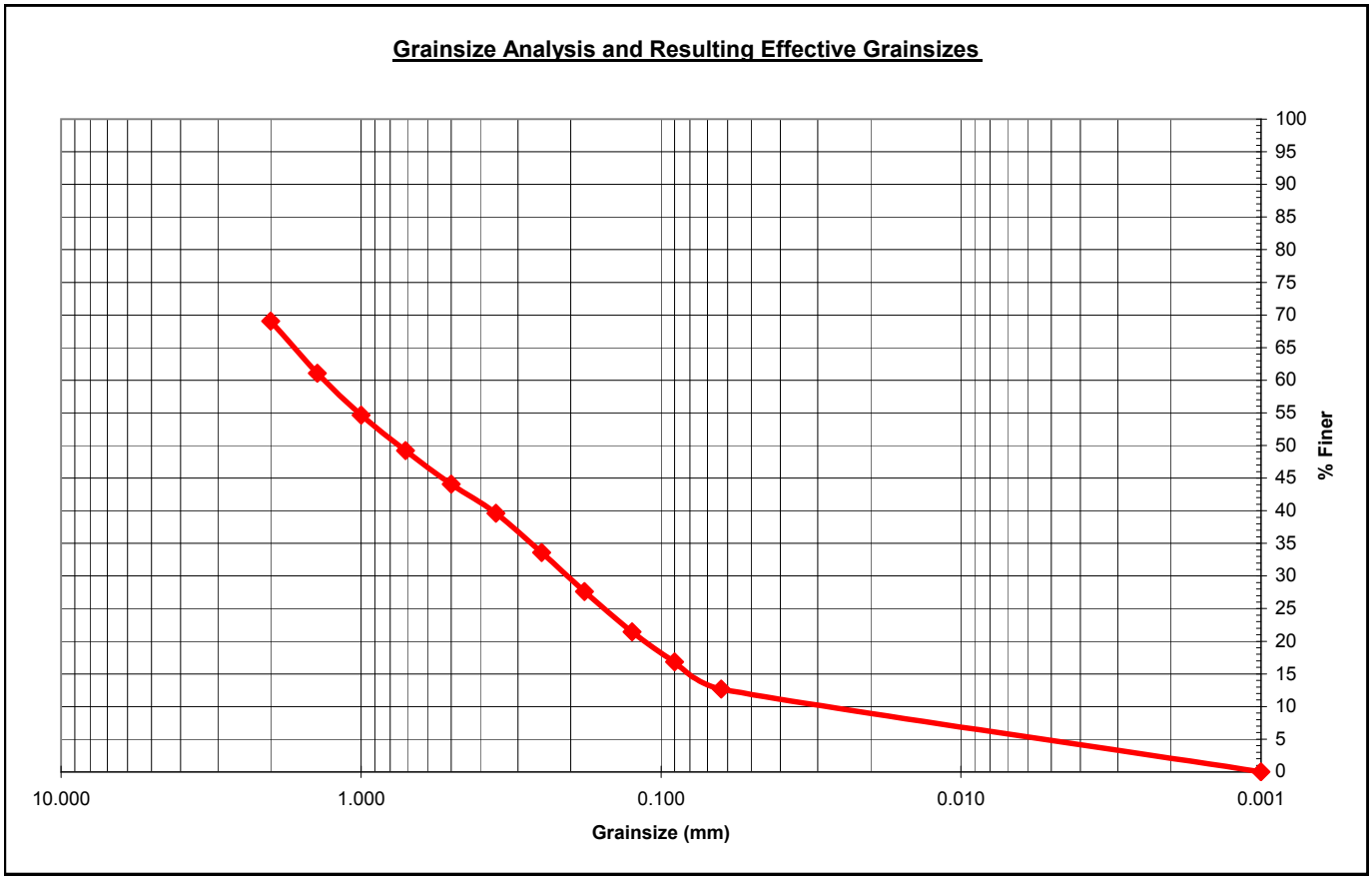
Sample ID:	ECP8-SB1
Sample Depth:	111-112 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.70 g
Total Sieve Weight:	93.70 g
Weight Loss:	0 g
Percent Loss:	0.00 %

14.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	29.00	30.95	69.05	Coarse % (> 0.5 mm)	55.92%
	14	1.4	7.50	8.00	61.05		
	18	1.0	6.00	6.40	54.64		
	25	0.71	5.10	5.44	49.20		
	35	0.50	4.80	5.12	44.08		
Medium Material	45	0.355	4.20	4.48	39.59	Medium % (0.25 - 0.5 mm)	10.46%
	60	0.250	5.60	5.98	33.62		
Fine Material	80	0.180	5.60	5.98	27.64	Fine % (0.125 - 0.25 mm)	12.17%
	120	0.125	5.80	6.19	21.45		
Silt Material	170	0.090	4.30	4.59	16.86	Silt % (0.125 - 0.063 mm)	8.75%
	230	0.063	3.90	4.16	12.70		
Pan Material	pan	0.001	11.90	12.70	0.00	Pan % (< 0.063 mm)	12.70%
						Total	100.00%

Total (g)	93.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



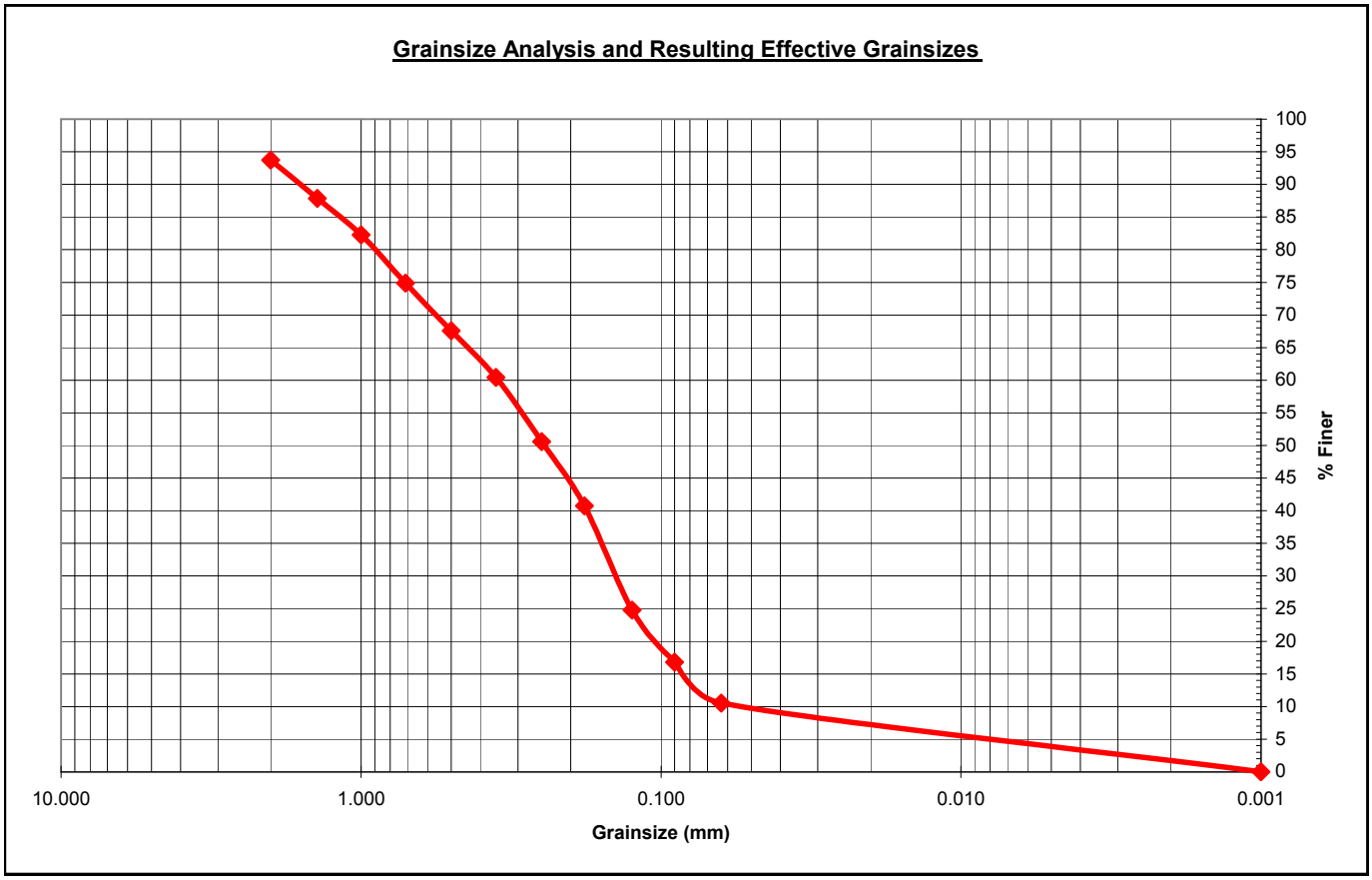
Sample ID:	ECP8-SB1	
Sample Depth:	112-113	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	86.90	g
Total Sieve Weight:	86.40	g
Weight Loss:	0.5	g
Percent Loss:	0.58	%

21.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	5.40	6.25	93.75	Coarse % (> 0.5 mm)	32.41%
	14	1.4	5.10	5.90	87.85		
	18	1.0	4.80	5.56	82.29		
	25	0.71	6.40	7.41	74.88		
	35	0.50	6.30	7.29	67.59		
Medium Material	45	0.355	6.20	7.18	60.42	Medium % (0.25 - 0.5 mm)	17.01%
	60	0.250	8.50	9.84	50.58		
Fine Material	80	0.180	8.50	9.84	40.74	Fine % (0.125 - 0.25 mm)	25.81%
	120	0.125	13.80	15.97	24.77		
Silt Material	170	0.090	6.90	7.99	16.78	Silt % (0.125 - 0.063 mm)	14.24%
	230	0.063	5.40	6.25	10.53		
Pan Material	pan	0.001	9.10	10.53	0.00	Pan % (< 0.063 mm)	10.53%
						Total	**100.00%**

Total (g)	86.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



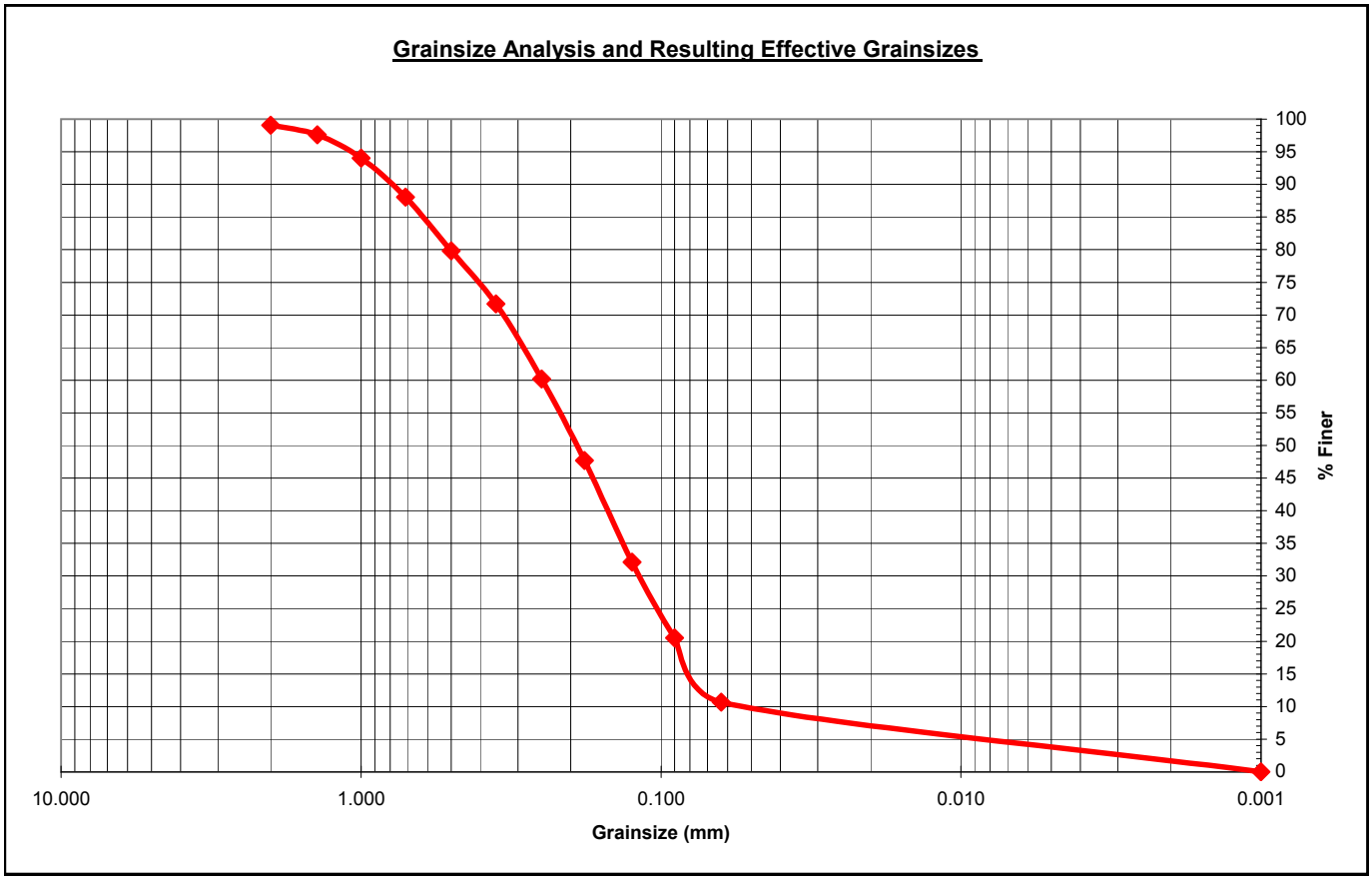
Sample ID:	ECP8-SB1
Sample Depth:	113-114 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.70 g
Total Sieve Weight:	87.20 g
Weight Loss:	0.5 g
Percent Loss:	0.57 %

20.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.80	0.92	99.08	Coarse % (> 0.5 mm)	20.18%
	14	1.4	1.30	1.49	97.59		
	18	1.0	3.10	3.56	94.04		
	25	0.71	5.20	5.96	88.07		
	35	0.50	7.20	8.26	79.82		
Medium Material	45	0.355	7.10	8.14	71.67	Medium % (0.25 - 0.5 mm)	19.61%
	60	0.250	10.00	11.47	60.21		
Fine Material	80	0.180	10.90	12.50	47.71	Fine % (0.125 - 0.25 mm)	28.10%
	120	0.125	13.60	15.60	32.11		
Silt Material	170	0.090	10.10	11.58	20.53	Silt % (0.125 - 0.063 mm)	21.44%
	230	0.063	8.60	9.86	10.67		
Pan Material	pan	0.001	9.30	10.67	0.00	Pan % (< 0.063 mm)	10.67%
						Total	**100.00%**

Total (g)	87.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



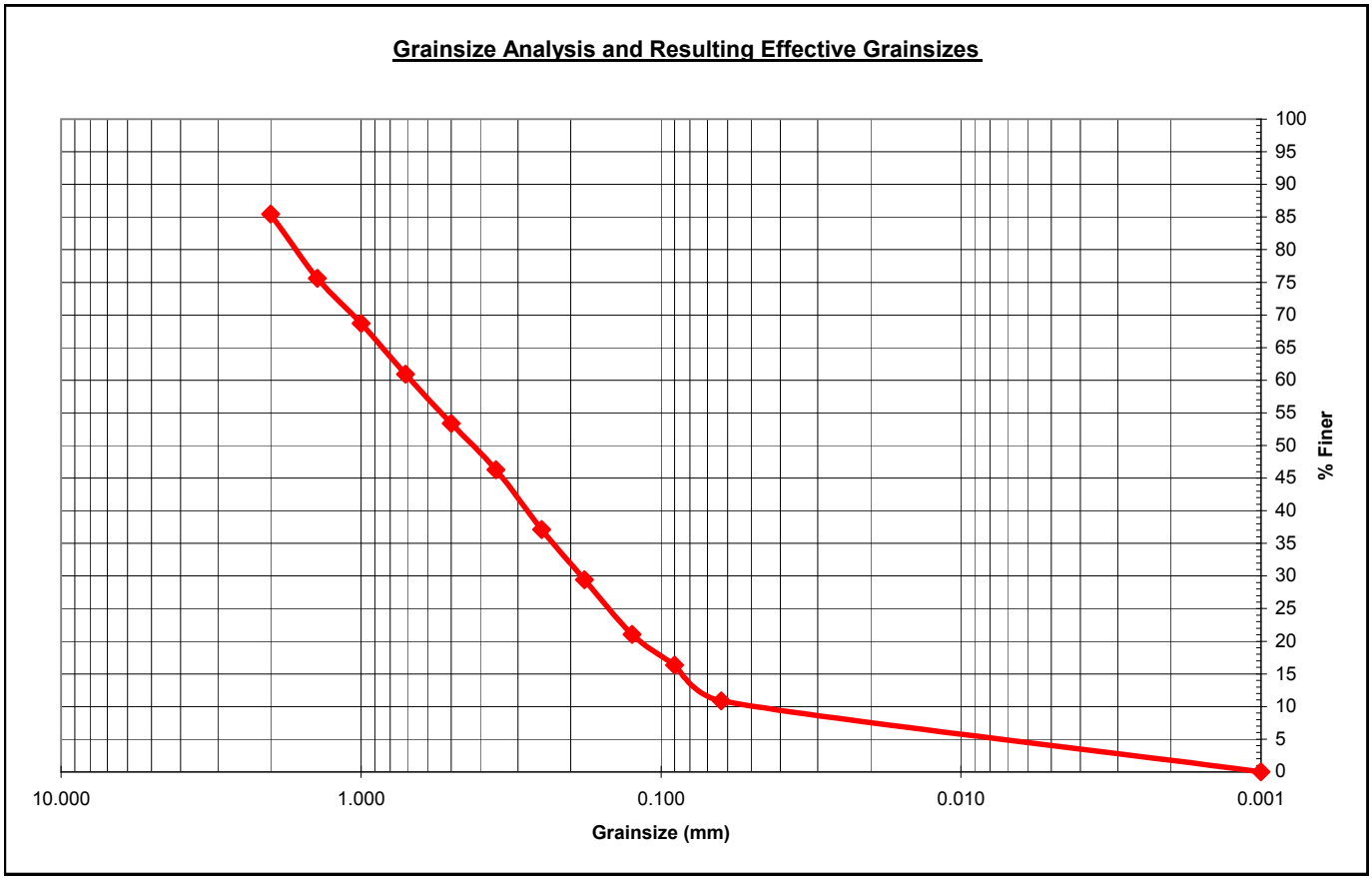
Sample ID:	ECP8-SB1
Sample Depth:	114-115 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.10 g
Total Sieve Weight:	87.30 g
Weight Loss:	0.8 g
Percent Loss:	0.91 %

19.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	12.70	14.55	85.45	Coarse % (> 0.5 mm)	46.62%
	14	1.4	8.60	9.85	75.60		
	18	1.0	6.00	6.87	68.73		
	25	0.71	6.80	7.79	60.94		
	35	0.50	6.60	7.56	53.38		
Medium Material	45	0.355	6.20	7.10	46.28	Medium % (0.25 - 0.5 mm)	16.27%
	60	0.250	8.00	9.16	37.11		
Fine Material	80	0.180	6.70	7.67	29.44	Fine % (0.125 - 0.25 mm)	16.04%
	120	0.125	7.30	8.36	21.08		
Silt Material	170	0.090	4.10	4.70	16.38	Silt % (0.125 - 0.063 mm)	10.19%
	230	0.063	4.80	5.50	10.88		
Pan Material	pan	0.001	9.50	10.88	0.00	Pan % (< 0.063 mm)	10.88%
						Total	100.00%

Total (g)	87.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



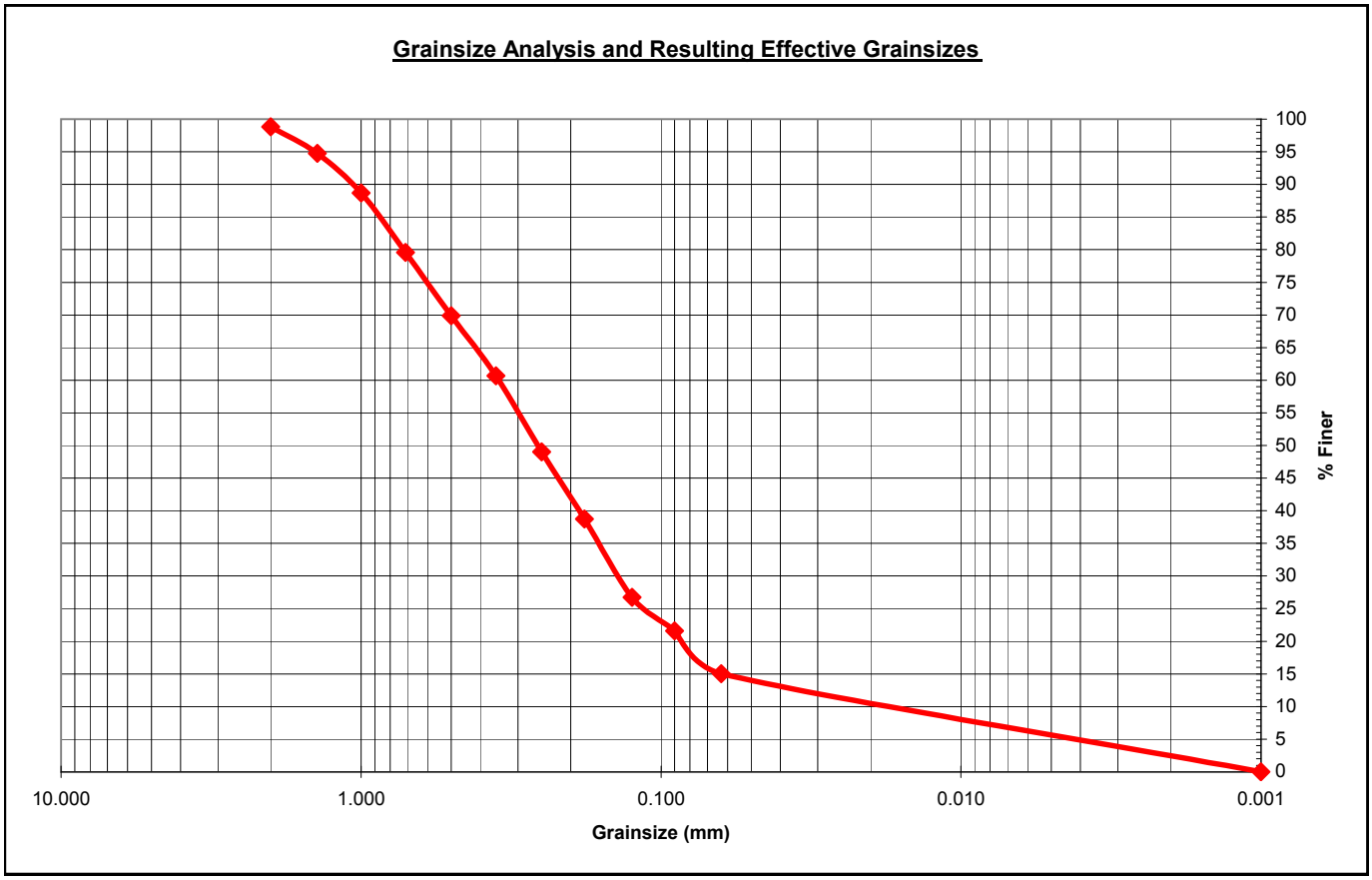
Sample ID:	ECP8-SB1
Sample Depth:	115-116 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.70 g
Total Sieve Weight:	85.70 g
Weight Loss:	1 g
Percent Loss:	1.15 %

21.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.00	1.17	98.83	Coarse % (> 0.5 mm)	30.11%
	14	1.4	3.50	4.08	94.75		
	18	1.0	5.20	6.07	88.68		
	25	0.71	7.80	9.10	79.58		
	35	0.50	8.30	9.68	69.89		
Medium Material	45	0.355	7.90	9.22	60.68	Medium % (0.25 - 0.5 mm)	20.89%
	60	0.250	10.00	11.67	49.01		
Fine Material	80	0.180	8.80	10.27	38.74	Fine % (0.125 - 0.25 mm)	22.29%
	120	0.125	10.30	12.02	26.72		
Silt Material	170	0.090	4.40	5.13	21.59	Silt % (0.125 - 0.063 mm)	11.67%
	230	0.063	5.60	6.53	15.05		
Pan Material	pan	0.001	12.90	15.05	0.00	Pan % (< 0.063 mm)	15.05%
						Total	**100.00%**

Total (g)	85.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



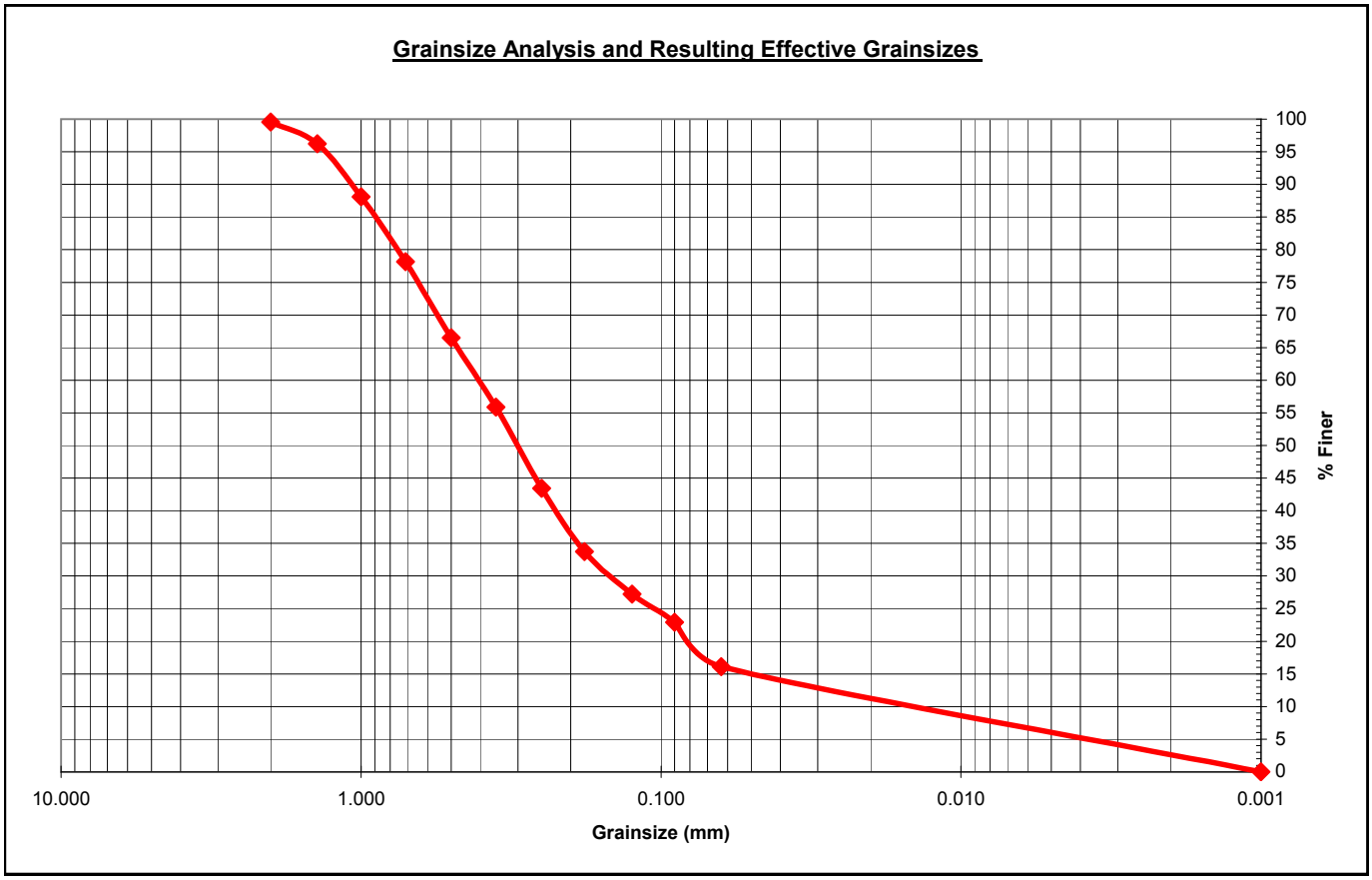
Sample ID:	ECP8-SB1	
Sample Depth:	116-117	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.10	g
Total Sieve Weight:	92.50	g
Weight Loss:	0.6	g
Percent Loss:	0.64	%

15.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.40	0.43	99.57	Coarse % (> 0.5 mm)	33.51%
	14	1.4	3.10	3.35	96.22		
	18	1.0	7.50	8.11	88.11		
	25	0.71	9.20	9.95	78.16		
	35	0.50	10.80	11.68	66.49		
Medium Material	45	0.355	9.80	10.59	55.89	Medium % (0.25 - 0.5 mm)	23.03%
	60	0.250	11.50	12.43	43.46		
Fine Material	80	0.180	9.00	9.73	33.73	Fine % (0.125 - 0.25 mm)	16.22%
	120	0.125	6.00	6.49	27.24		
Silt Material	170	0.090	4.00	4.32	22.92	Silt % (0.125 - 0.063 mm)	11.14%
	230	0.063	6.30	6.81	16.11		
Pan Material	pan	0.001	14.90	16.11	0.00	Pan % (< 0.063 mm)	16.11%
						Total	**100.00%**

Total (g)	92.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



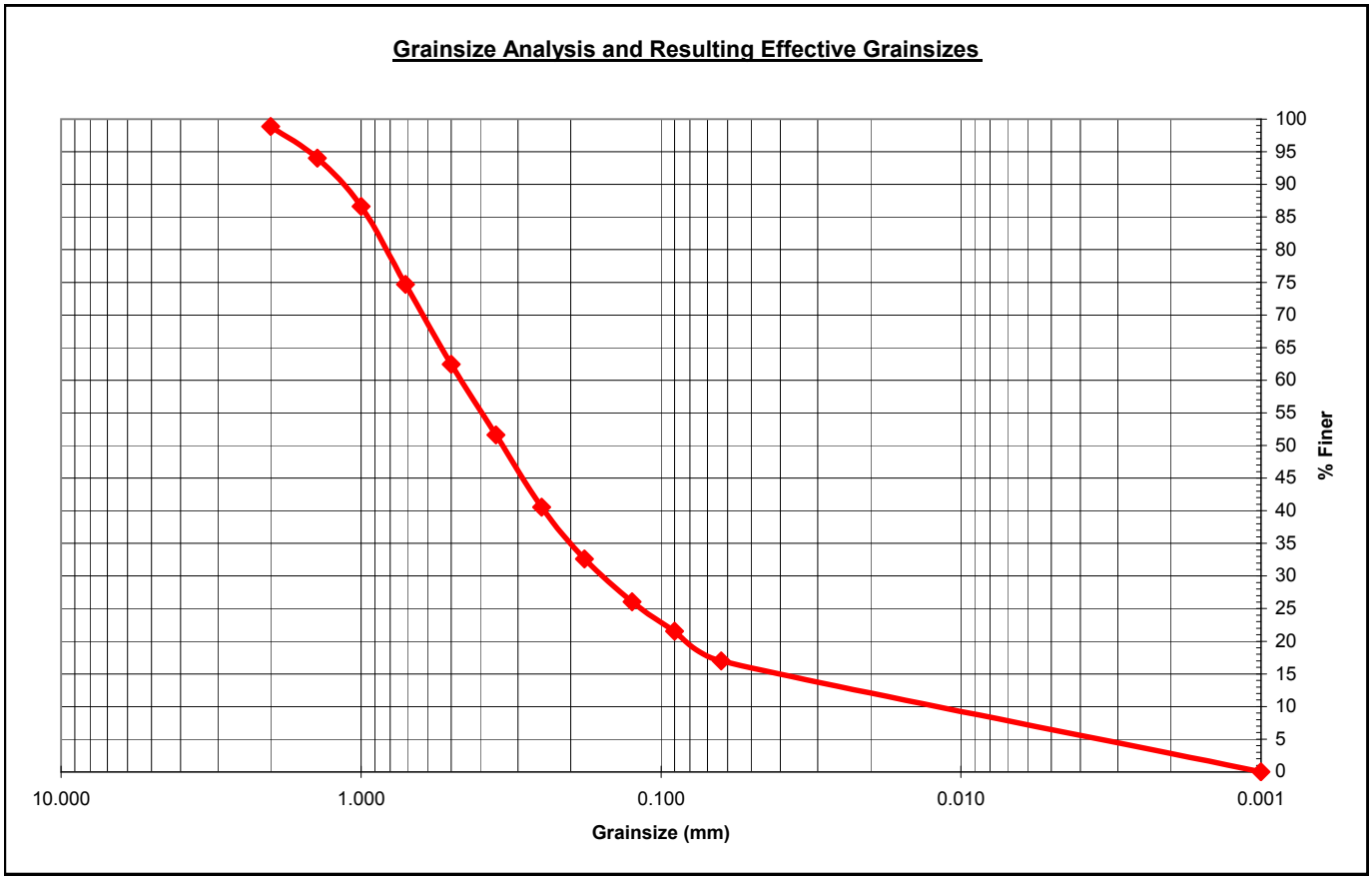
Sample ID:	ECP8-SB1
Sample Depth:	117-118 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.10 g
Total Sieve Weight:	90.50 g
Weight Loss:	0.6 g
Percent Loss:	0.66 %

17.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.00	1.10	98.90	Coarse % (> 0.5 mm)	37.57%
	14	1.4	4.40	4.86	94.03		
	18	1.0	6.70	7.40	86.63		
	25	0.71	10.80	11.93	74.70		
	35	0.50	11.10	12.27	62.43		
Medium Material	45	0.355	9.80	10.83	51.60	Medium % (0.25 - 0.5 mm)	21.88%
	60	0.250	10.00	11.05	40.55		
Fine Material	80	0.180	7.20	7.96	32.60	Fine % (0.125 - 0.25 mm)	14.48%
	120	0.125	5.90	6.52	26.08		
Silt Material	170	0.090	4.10	4.53	21.55	Silt % (0.125 - 0.063 mm)	9.06%
	230	0.063	4.10	4.53	17.02		
Pan Material	pan	0.001	15.40	17.02	0.00	Pan % (< 0.063 mm)	17.02%
						Total	**100.00%**

Total (g)	90.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



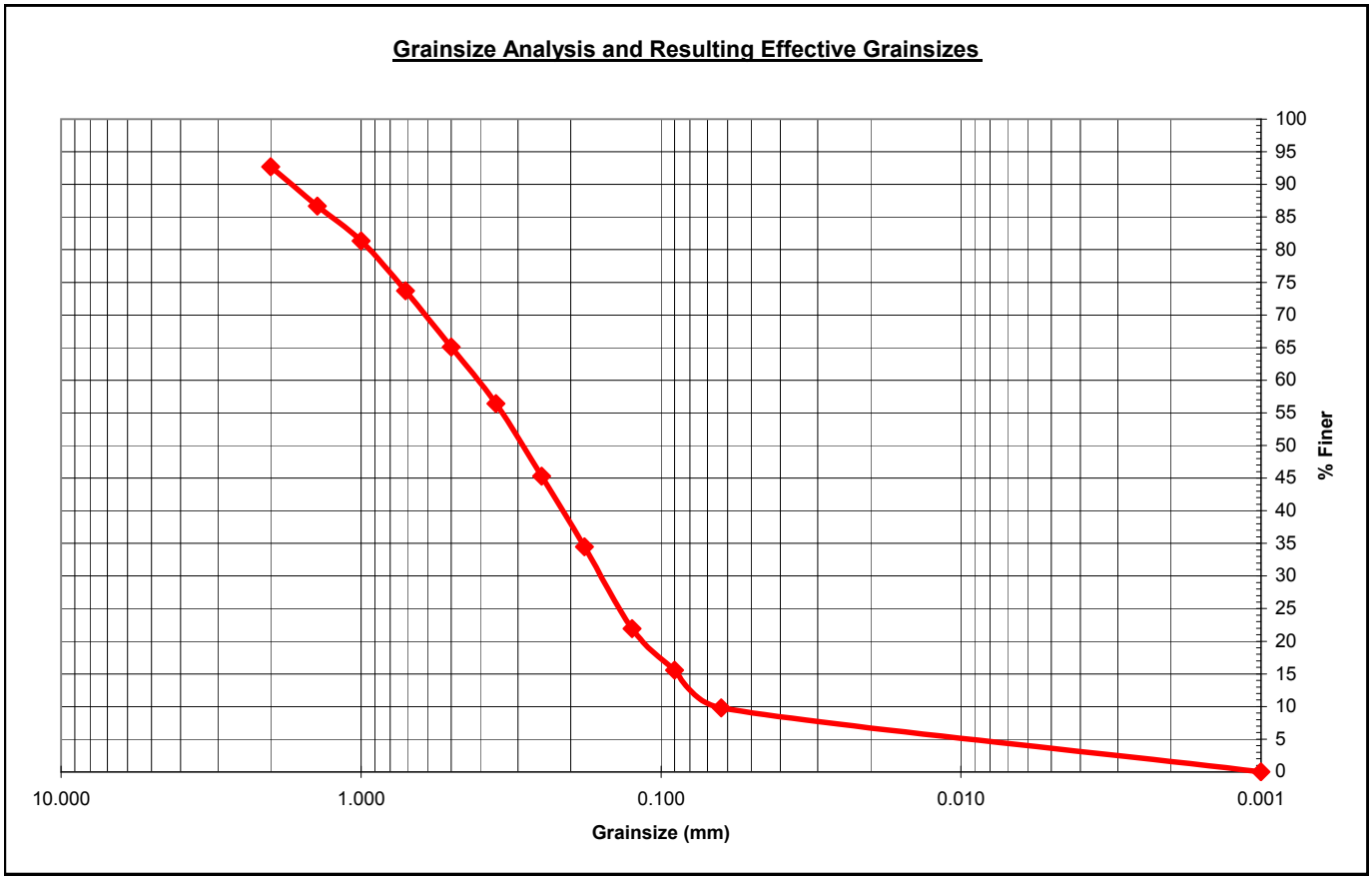
Sample ID:	ECP8-SB1	
Sample Depth:	119-120	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.00	g
Total Sieve Weight:	87.90	g
Weight Loss:	0.1	g
Percent Loss:	0.11	%

20.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	6.40	7.28	92.72	Coarse % (> 0.5 mm)	34.93%
	14	1.4	5.30	6.03	86.69		
	18	1.0	4.70	5.35	81.34		
	25	0.71	6.70	7.62	73.72		
	35	0.50	7.60	8.65	65.07		
Medium Material	45	0.355	7.60	8.65	56.43	Medium % (0.25 - 0.5 mm)	19.80%
	60	0.250	9.80	11.15	45.28		
Fine Material	80	0.180	9.50	10.81	34.47	Fine % (0.125 - 0.25 mm)	23.32%
	120	0.125	11.00	12.51	21.96		
Silt Material	170	0.090	5.60	6.37	15.59	Silt % (0.125 - 0.063 mm)	12.17%
	230	0.063	5.10	5.80	9.78		
Pan Material	pan	0.001	8.60	9.78	0.00	Pan % (< 0.063 mm)	9.78%
						Total	**100.00%**

Total (g)	87.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



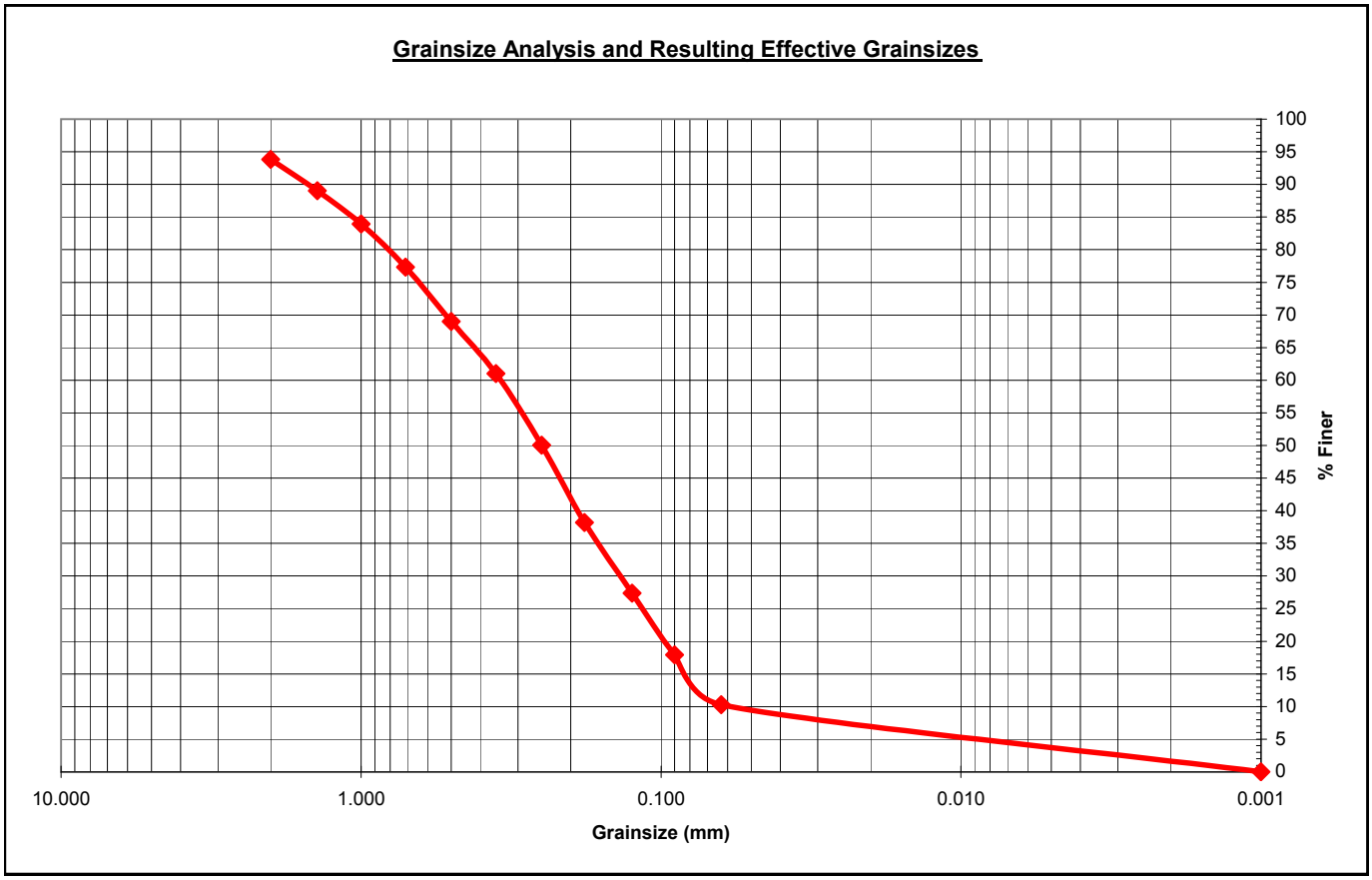
Sample ID:	ECP8-SB1	
Sample Depth:	120-121	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.10	g
Total Sieve Weight:	87.70	g
Weight Loss:	0.4	g
Percent Loss:	0.45	%

19.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	5.40	6.16	93.84	Coarse % (> 0.5 mm)	31.01%
	14	1.4	4.20	4.79	89.05		
	18	1.0	4.50	5.13	83.92		
	25	0.71	5.80	6.61	77.31		
	35	0.50	7.30	8.32	68.99		
Medium Material	45	0.355	7.00	7.98	61.00	Medium % (0.25 - 0.5 mm)	18.93%
	60	0.250	9.60	10.95	50.06		
Fine Material	80	0.180	10.40	11.86	38.20	Fine % (0.125 - 0.25 mm)	22.69%
	120	0.125	9.50	10.83	27.37		
Silt Material	170	0.090	8.30	9.46	17.90	Silt % (0.125 - 0.063 mm)	17.10%
	230	0.063	6.70	7.64	10.26		
Pan Material	pan	0.001	9.00	10.26	0.00	Pan % (< 0.063 mm)	10.26%
						Total	**100.00%**

Total (g)	87.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



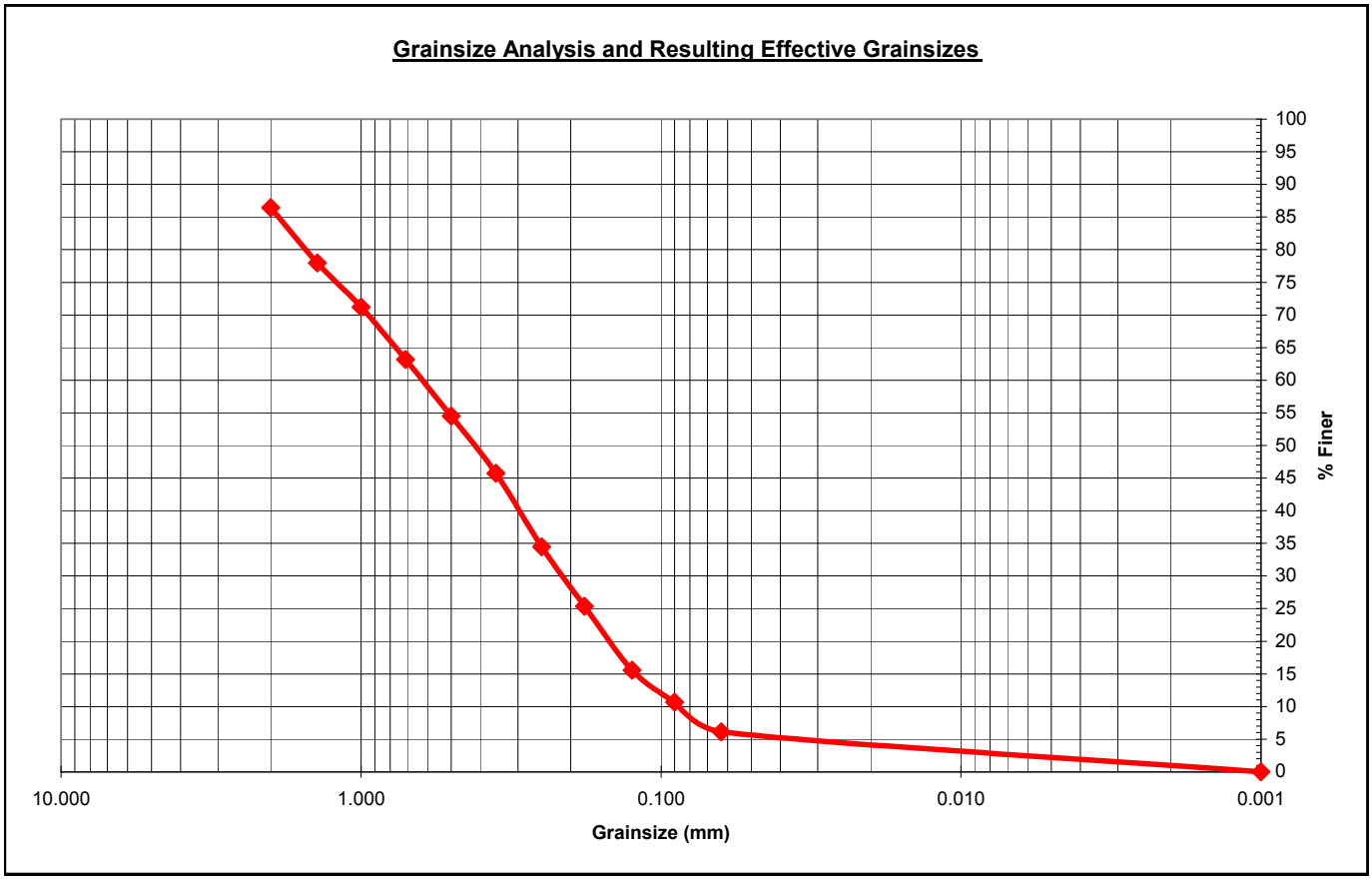
Sample ID:	ECP8-SB1	
Sample Depth:	121-122	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.10	g
Total Sieve Weight:	89.90	g
Weight Loss:	0.2	g
Percent Loss:	0.22	%

18.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	12.20	13.57	86.43	Coarse % (> 0.5 mm)	45.49%
	14	1.4	7.60	8.45	77.98		
	18	1.0	6.10	6.79	71.19		
	25	0.71	7.20	8.01	63.18		
	35	0.50	7.80	8.68	54.51		
Medium Material	45	0.355	7.90	8.79	45.72	Medium % (0.25 - 0.5 mm)	20.02%
	60	0.250	10.10	11.23	34.48		
Fine Material	80	0.180	8.20	9.12	25.36	Fine % (0.125 - 0.25 mm)	18.91%
	120	0.125	8.80	9.79	15.57		
Silt Material	170	0.090	4.40	4.89	10.68	Silt % (0.125 - 0.063 mm)	9.45%
	230	0.063	4.10	4.56	6.12		
Pan Material	pan	0.001	5.50	6.12	0.00	Pan % (< 0.063 mm)	6.12%
						Total	100.00%

Total (g)	89.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



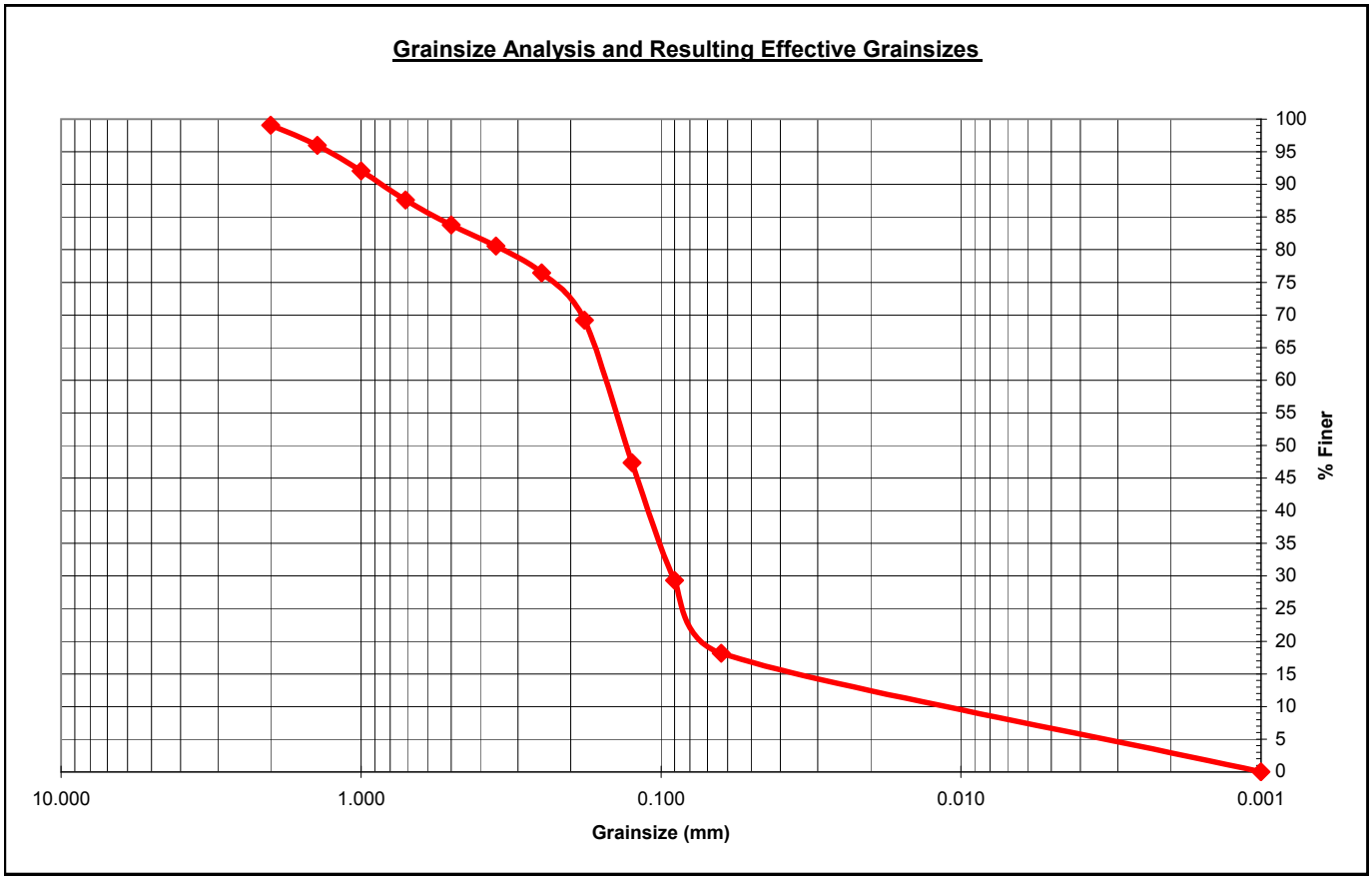
Sample ID:	ECP8-SB1	
Sample Depth:	122-123	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	87.00	g
Total Sieve Weight:	87.00	g
Weight Loss:	0	g
Percent Loss:	0.00	%

20.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	0.80	0.92	99.08	Coarse % (> 0.5 mm)	16.21%
	14	1.4	2.70	3.10	95.98		
	18	1.0	3.40	3.91	92.07		
	25	0.71	3.90	4.48	87.59		
	35	0.50	3.30	3.79	83.79		
Medium Material	45	0.355	2.80	3.22	80.57	Medium % (0.25 - 0.5 mm)	7.36%
	60	0.250	3.60	4.14	76.44		
Fine Material	80	0.180	6.30	7.24	69.20	Fine % (0.125 - 0.25 mm)	29.08%
	120	0.125	19.00	21.84	47.36		
Silt Material	170	0.090	15.70	18.05	29.31	Silt % (0.125 - 0.063 mm)	29.20%
	230	0.063	9.70	11.15	18.16		
Pan Material	pan	0.001	15.80	18.16	0.00	Pan % (< 0.063 mm)	18.16%
						Total	100.00%

Total (g)	87.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



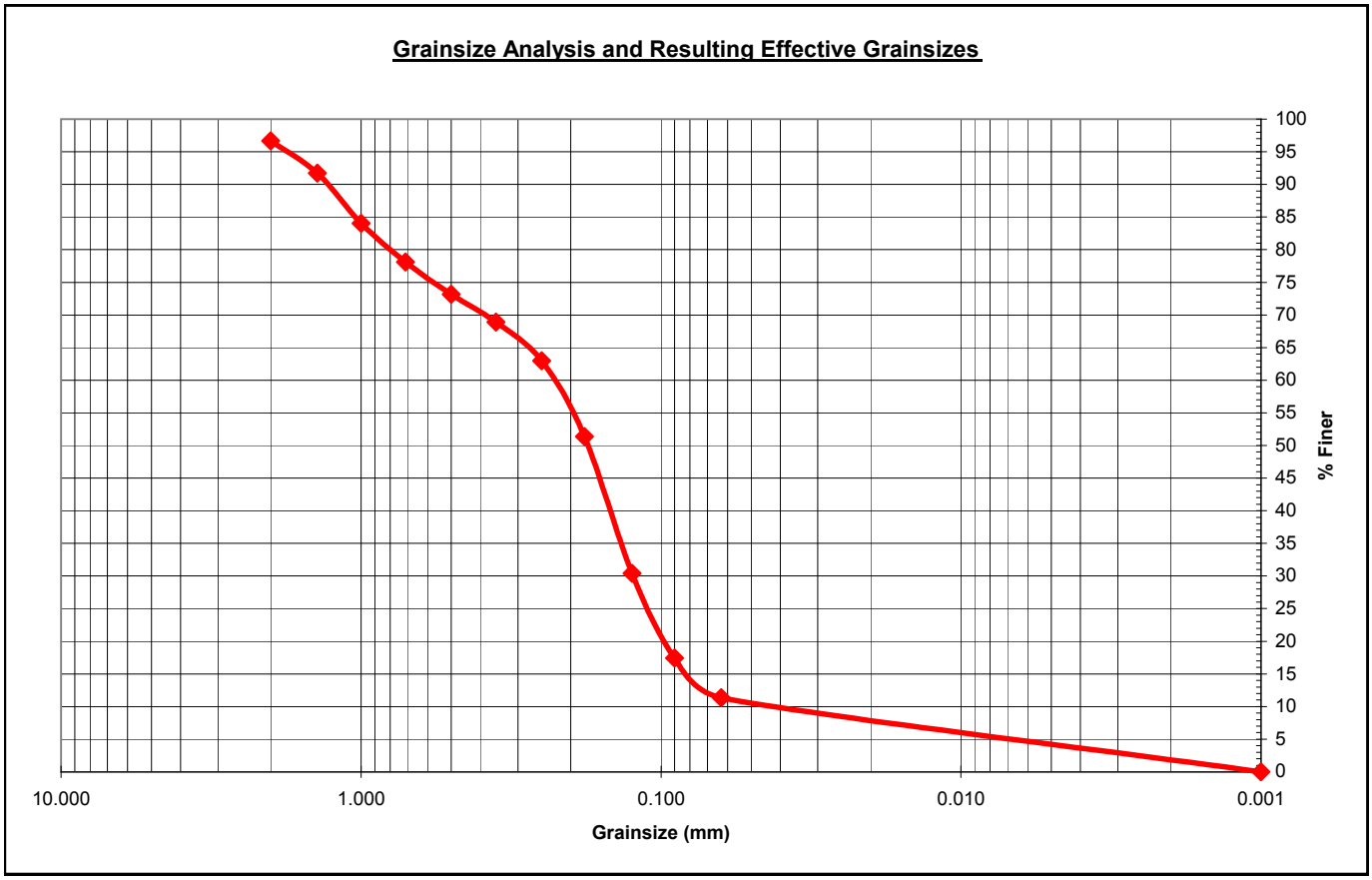
Sample ID:	ECP8-SB1
Sample Depth:	123-124 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.10 g
Total Sieve Weight:	87.20 g
Weight Loss:	0.9 g
Percent Loss:	1.02 %

19.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.90	3.33	96.67	Coarse % (> 0.5 mm)	26.83%
	14	1.4	4.30	4.93	91.74		
	18	1.0	6.70	7.68	84.06		
	25	0.71	5.20	5.96	78.10		
	35	0.50	4.30	4.93	73.17		
Medium Material	45	0.355	3.70	4.24	68.92	Medium % (0.25 - 0.5 mm)	10.21%
	60	0.250	5.20	5.96	62.96		
Fine Material	80	0.180	10.10	11.58	51.38	Fine % (0.125 - 0.25 mm)	32.57%
	120	0.125	18.30	20.99	30.39		
Silt Material	170	0.090	11.30	12.96	17.43	Silt % (0.125 - 0.063 mm)	19.04%
	230	0.063	5.30	6.08	11.35		
Pan Material	pan	0.001	9.90	11.35	0.00	Pan % (< 0.063 mm)	11.35%
						Total	100.00%

Total (g)	87.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



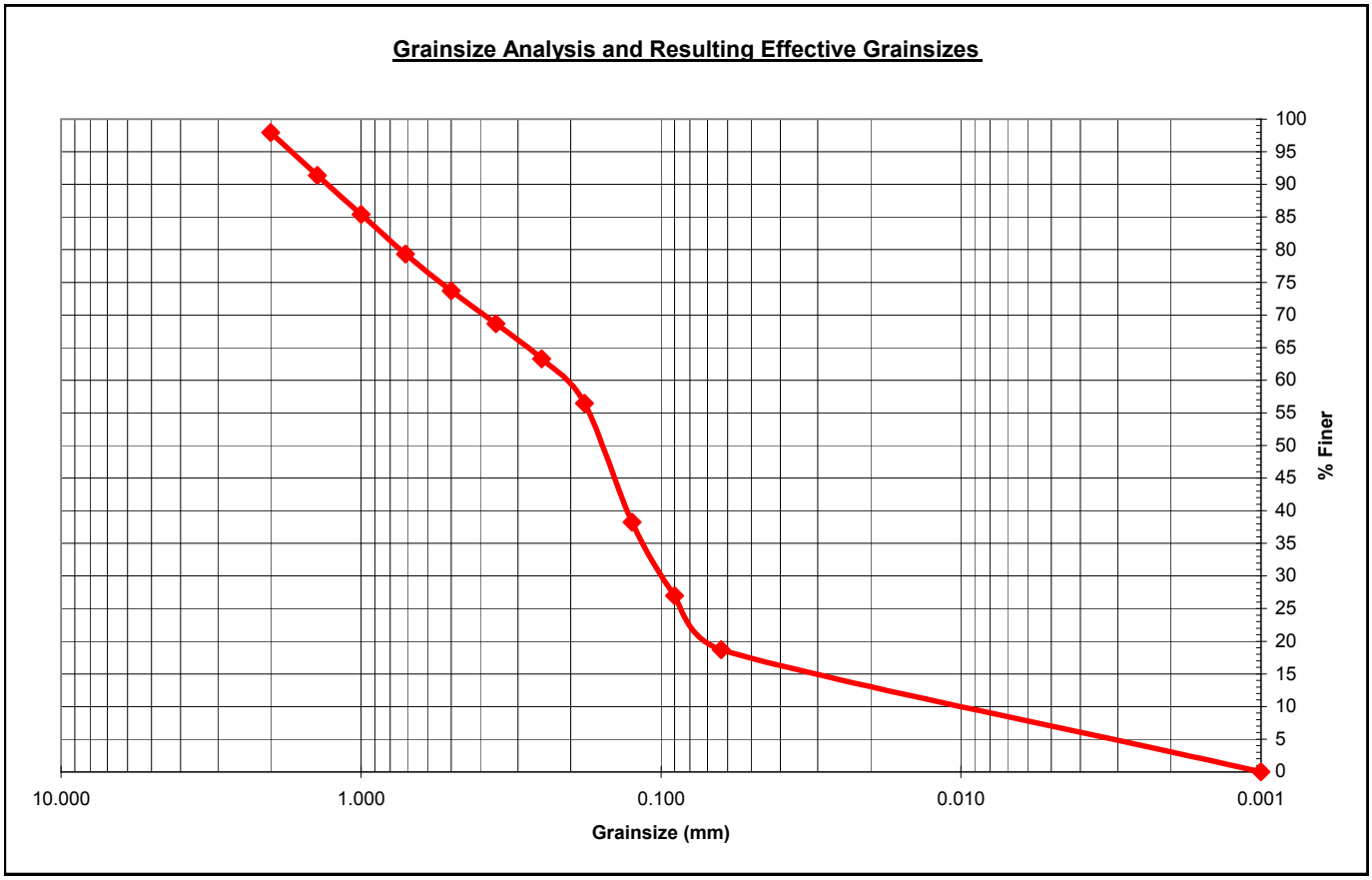
Sample ID:	ECP8-SB1	
Sample Depth:	124-125	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	87.50	g
Total Sieve Weight:	87.10	g
Weight Loss:	0.4	g
Percent Loss:	0.46	%

20.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	1.80	2.07	97.93	Coarse % (> 0.5 mm)	26.29%
	14	1.4	5.70	6.54	91.39		
	18	1.0	5.20	5.97	85.42		
	25	0.71	5.30	6.08	79.33		
	35	0.50	4.90	5.63	73.71		
Medium Material	45	0.355	4.40	5.05	68.66	Medium % (0.25 - 0.5 mm)	10.45%
	60	0.250	4.70	5.40	63.26		
Fine Material	80	0.180	5.90	6.77	56.49	Fine % (0.125 - 0.25 mm)	25.03%
	120	0.125	15.90	18.25	38.23		
Silt Material	170	0.090	9.80	11.25	26.98	Silt % (0.125 - 0.063 mm)	19.52%
	230	0.063	7.20	8.27	18.71		
Pan Material	pan	0.001	16.30	18.71	0.00	Pan % (< 0.063 mm)	18.71%
						Total	100.00%

Total (g)	87.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



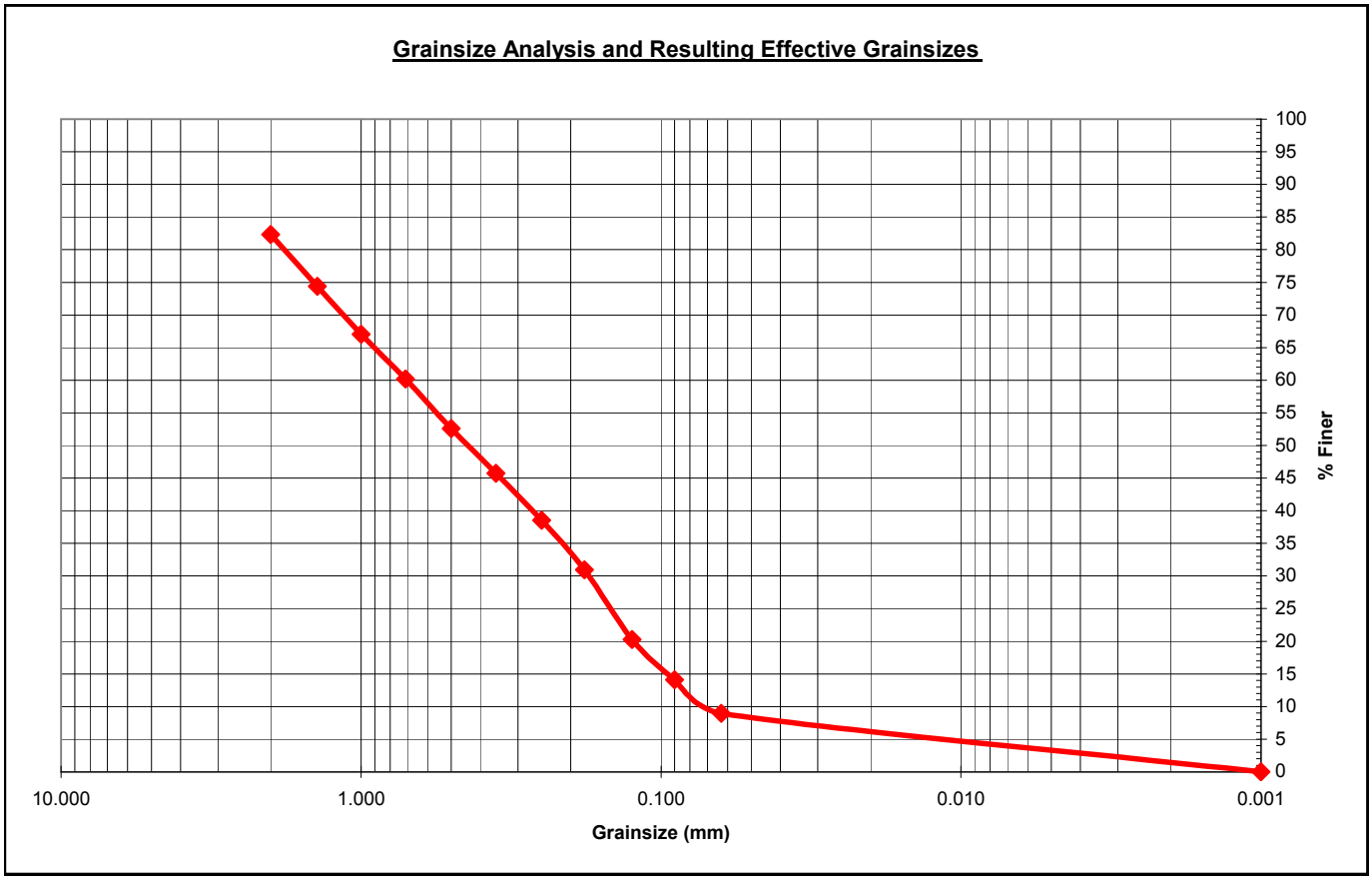
Sample ID:	ECP8-SB1
Sample Depth:	125-126 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.60 g
Total Sieve Weight:	85.90 g
Weight Loss:	-0.3 g
Percent Loss:	-0.35 %

22.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	15.20	17.69	82.31	Coarse % (> 0.5 mm)	47.38%
	14	1.4	6.80	7.92	74.39		
	18	1.0	6.30	7.33	67.05		
	25	0.71	5.90	6.87	60.19		
	35	0.50	6.50	7.57	52.62		
Medium Material	45	0.355	5.90	6.87	45.75	Medium % (0.25 - 0.5 mm)	14.09%
	60	0.250	6.20	7.22	38.53		
Fine Material	80	0.180	6.50	7.57	30.97	Fine % (0.125 - 0.25 mm)	18.28%
	120	0.125	9.20	10.71	20.26		
Silt Material	170	0.090	5.30	6.17	14.09	Silt % (0.125 - 0.063 mm)	11.29%
	230	0.063	4.40	5.12	8.96		
Pan Material	pan	0.001	7.70	8.96	0.00	Pan % (< 0.063 mm)	8.96%
						Total	**100.00%**

Total (g)	85.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



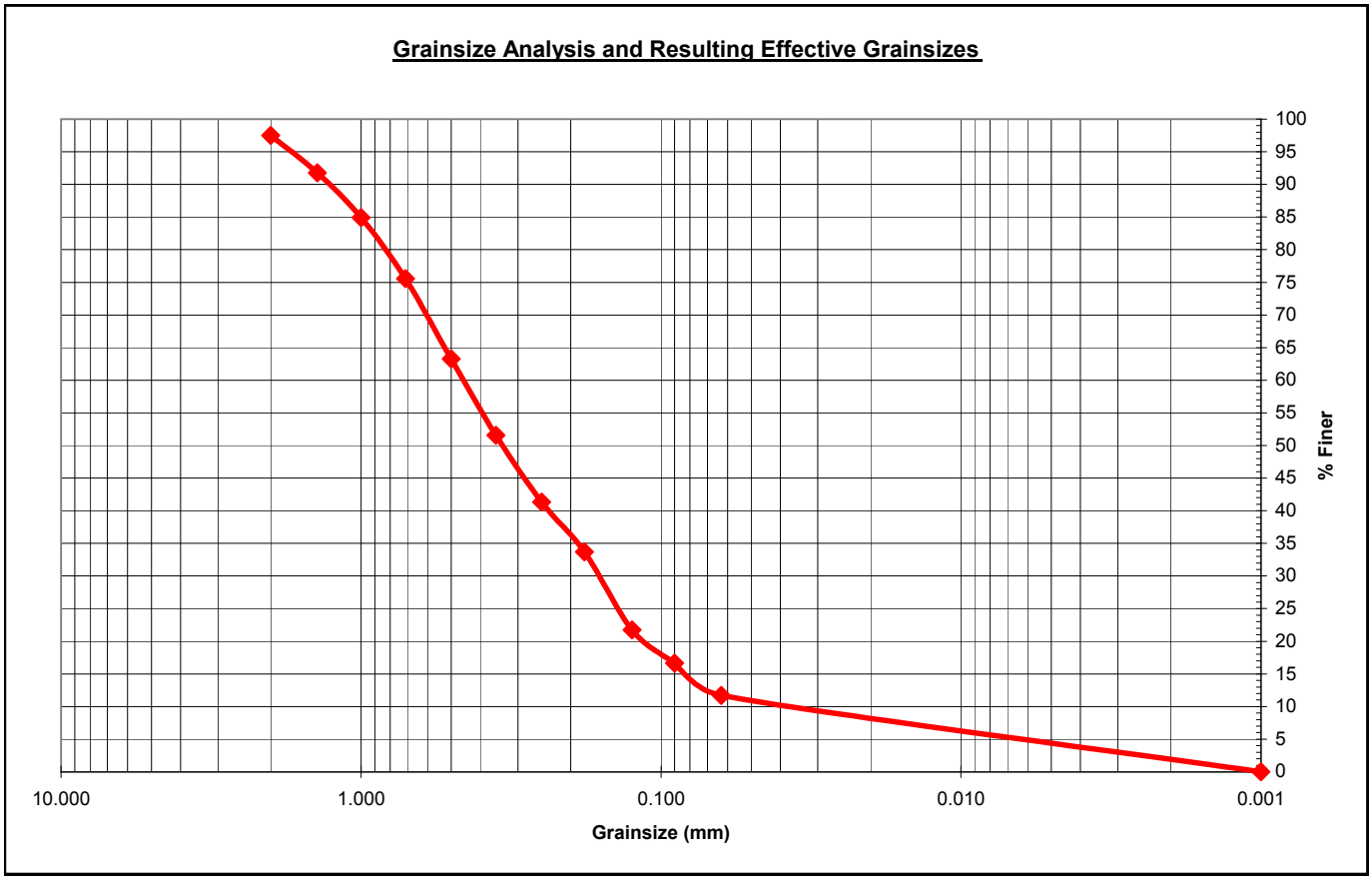
Sample ID:	ECP8-SB1	
Sample Depth:	126-127	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.50	g
Total Sieve Weight:	88.80	g
Weight Loss:	-0.3	g
Percent Loss:	-0.34	%

19.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	2.20	2.48	97.52	Coarse % (> 0.5 mm)	36.71%
	14	1.4	5.10	5.74	91.78		
	18	1.0	6.10	6.87	84.91		
	25	0.71	8.30	9.35	75.56		
	35	0.50	10.90	12.27	63.29		
Medium Material	45	0.355	10.40	11.71	51.58	Medium % (0.25 - 0.5 mm)	21.96%
	60	0.250	9.10	10.25	41.33		
Fine Material	80	0.180	6.80	7.66	33.67	Fine % (0.125 - 0.25 mm)	19.59%
	120	0.125	10.60	11.94	21.73		
Silt Material	170	0.090	4.50	5.07	16.67	Silt % (0.125 - 0.063 mm)	10.02%
	230	0.063	4.40	4.95	11.71		
Pan Material	pan	0.001	10.40	11.71	0.00	Pan % (< 0.063 mm)	11.71%
						Total	**100.00%**

Total (g)	88.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



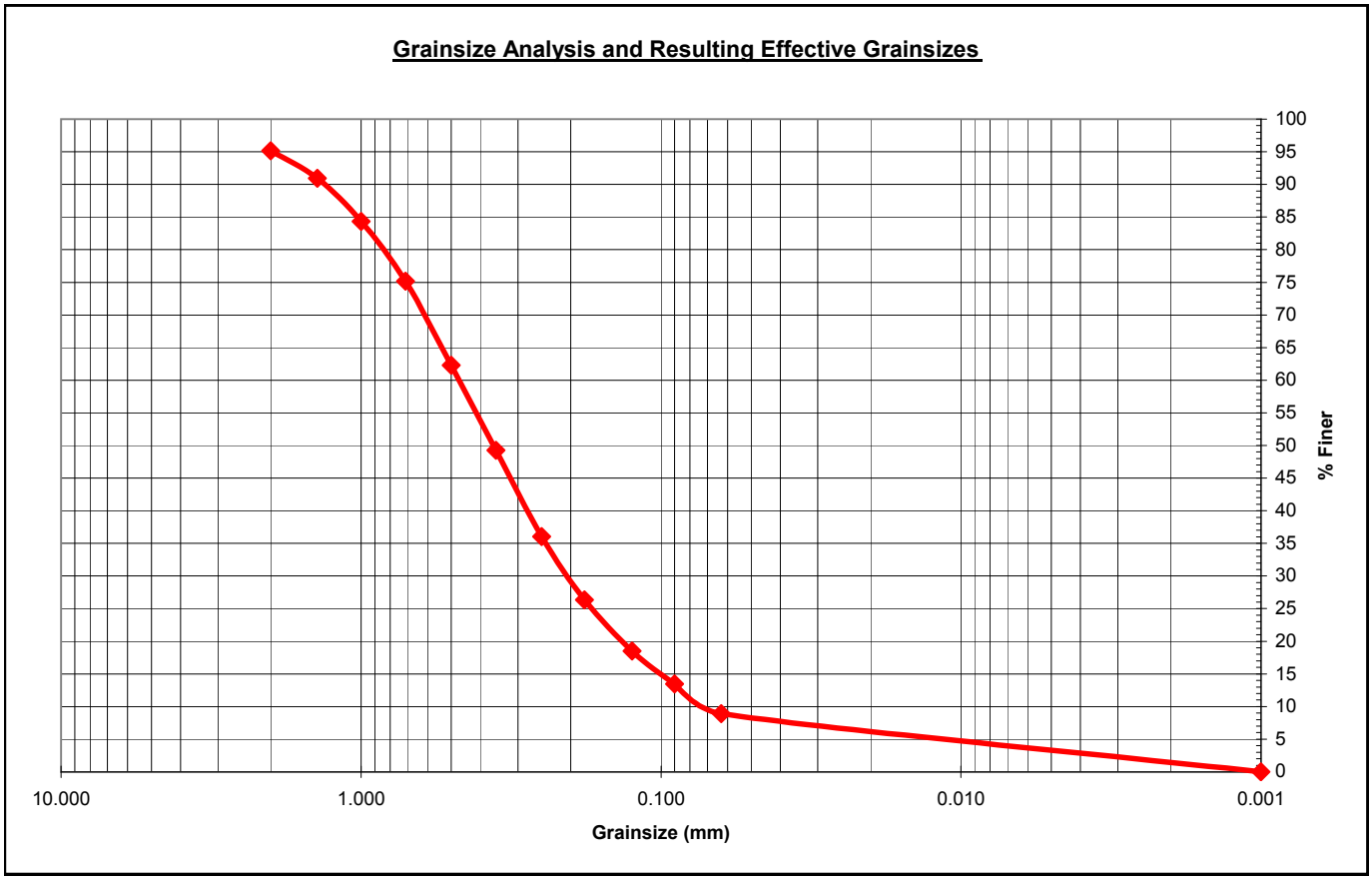
Sample ID:	ECP8-SB1
Sample Depth:	127-128 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.30 g
Total Sieve Weight:	90.70 g
Weight Loss:	0.6 g
Percent Loss:	0.66 %

17.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
Coarse Material	10	2.0	4.40	4.85	95.15	Coarse % (> 0.5 mm)	37.71%
	14	1.4	3.80	4.19	90.96		
	18	1.0	6.00	6.62	84.34		
	25	0.71	8.30	9.15	75.19		
	35	0.50	11.70	12.90	62.29		
Medium Material	45	0.355	11.80	13.01	49.28	Medium % (0.25 - 0.5 mm)	26.24%
	60	0.250	12.00	13.23	36.05		
Fine Material	80	0.180	8.80	9.70	26.35	Fine % (0.125 - 0.25 mm)	17.53%
	120	0.125	7.10	7.83	18.52		
Silt Material	170	0.090	4.60	5.07	13.45	Silt % (0.125 - 0.063 mm)	9.59%
	230	0.063	4.10	4.52	8.93		
Pan Material	pan	0.001	8.10	8.93	0.00	Pan % (< 0.063 mm)	8.93%
						Total	**100.00%**

Total (g)	90.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



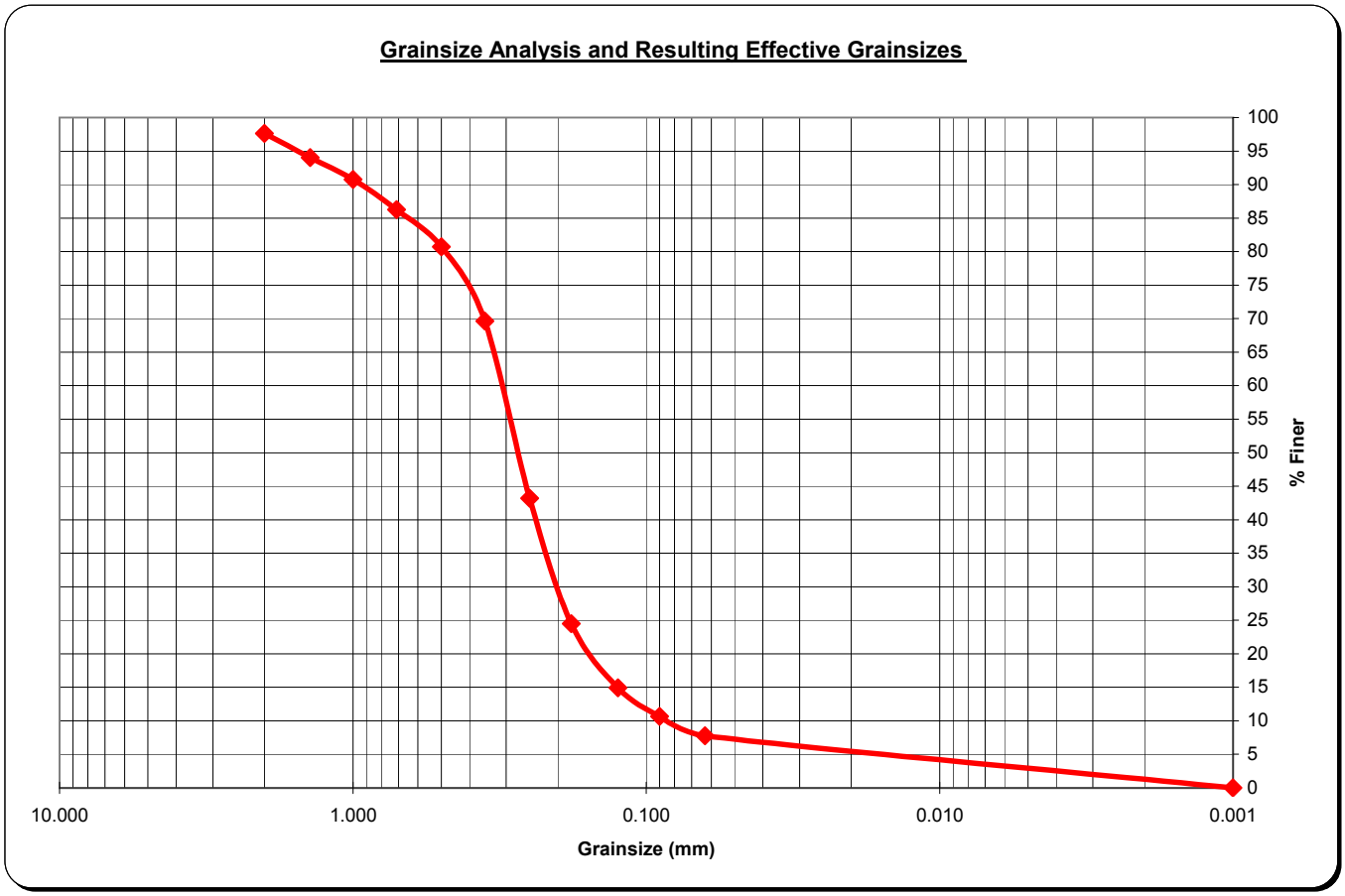
Sample ID:	ECP9-SB1
Sample Depth:	1-2 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	101.20 g
Total Sieve Weight:	100.50 g
Weight Loss:	0.7 g
Percent Loss:	0.69 %

8.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.40	2.39	97.61	coarse % > 0.5 mm	19.30%
	14	1.4	3.60	3.58	94.03		
	18	1.0	3.30	3.28	90.75		
	25	0.71	4.50	4.48	86.27		
	35	0.50	5.60	5.57	80.70		
medium	45	0.355	11.10	11.04	69.65	medium % 0.25 - 0.5 mm	37.51%
	60	0.250	26.60	26.47	43.18		
fine	80	0.180	18.80	18.71	24.48	Fine % 0.125 - 0.25	28.26%
	120	0.125	9.60	9.55	14.93		
silt	170	0.090	4.30	4.28	10.65	Silt % < 0.125	7.16%
	230	0.063	2.90	2.89	7.76		
pan	pan	0.001	7.80	7.76	0.00	Pan % < 0.063	7.76%
						Total	**100.00%**

Total (g)	**100.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



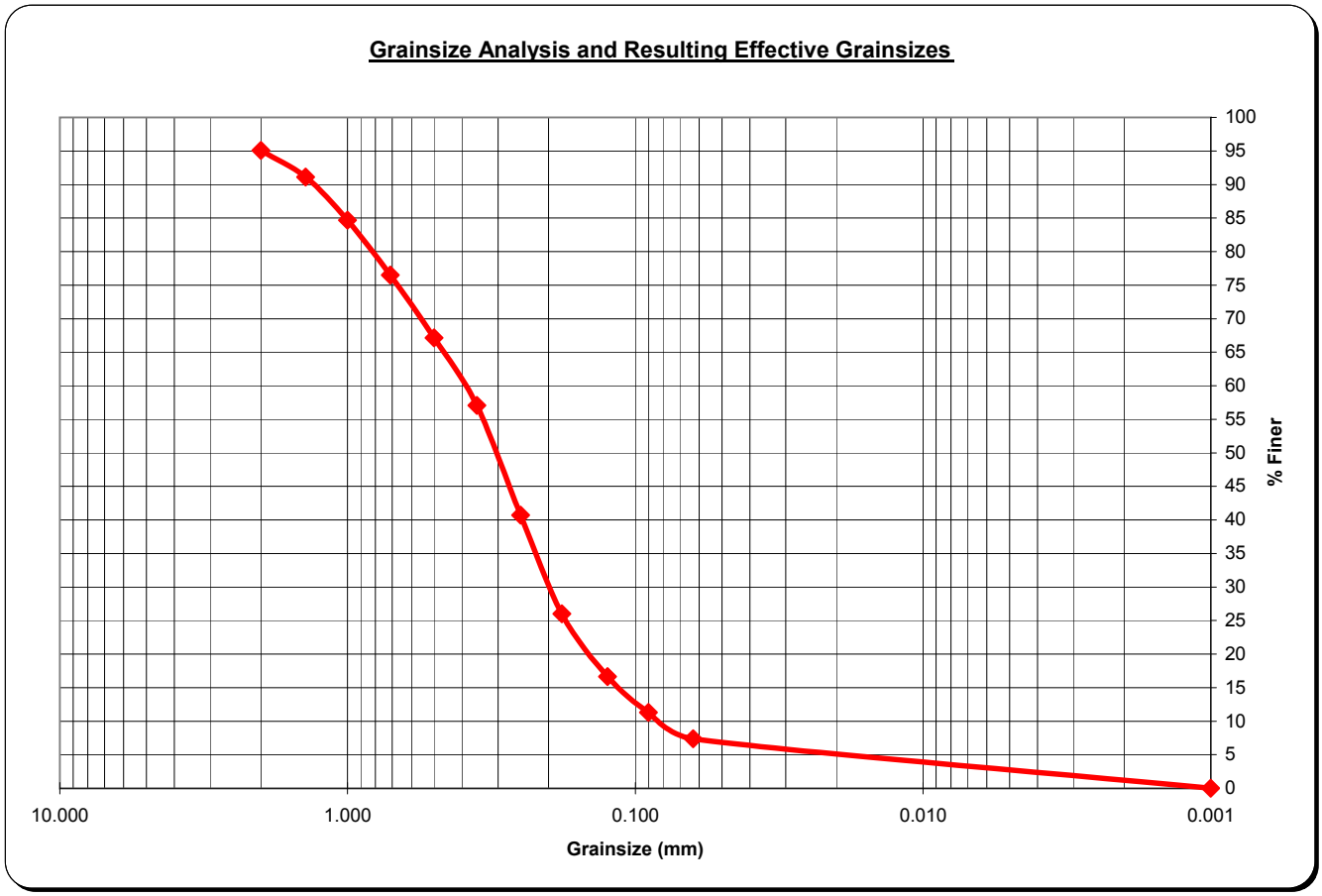
Sample ID:	ECP9-SB1
Sample Depth:	2-3 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.60 g
Total Sieve Weight:	99.20 g
Weight Loss:	0.4 g
Percent Loss:	0.40 %

9.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	4.90	4.94	95.06	coarse % > 0.5 mm	32.86%
	14	1.4	3.90	3.93	91.13		
	18	1.0	6.40	6.45	84.68		
	25	0.71	8.10	8.17	76.51		
	35	0.50	9.30	9.38	67.14		
medium	45	0.355	10.00	10.08	57.06	medium % 0.25 - 0.5 mm	26.41%
	60	0.250	16.20	16.33	40.73		
fine	80	0.180	14.60	14.72	26.01	Fine % 0.125 - 0.25	24.09%
	120	0.125	9.30	9.38	16.63		
silt	170	0.090	5.30	5.34	11.29	Silt % < 0.125	9.27%
	230	0.063	3.90	3.93	7.36		
pan	pan	0.001	7.30	7.36	0.00	Pan % < 0.063	7.36%
						Total	**100.00%**

Total (g)	**99.20**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



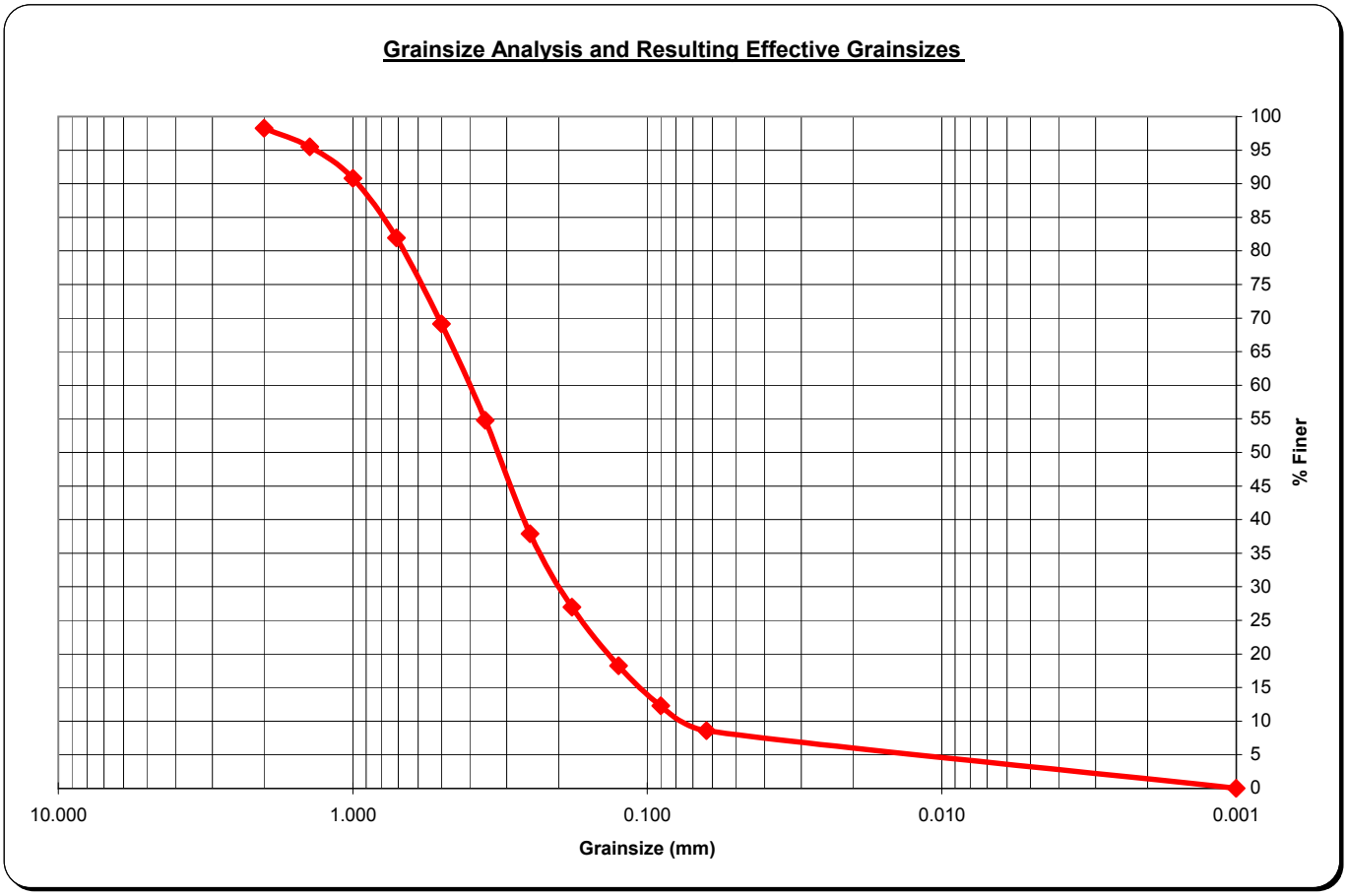
Sample ID:	ECP9-SB1
Sample Depth:	3-4 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	103.30 g
Total Sieve Weight:	102.40 g
Weight Loss:	0.9 g
Percent Loss:	0.87 %

6.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.80	1.76	98.24	coarse % > 0.5 mm	30.86%
	14	1.4	2.80	2.73	95.51		
	18	1.0	4.80	4.69	90.82		
	25	0.71	9.10	8.89	81.93		
	35	0.50	13.10	12.79	69.14		
medium	45	0.355	14.70	14.36	54.79	medium % 0.25 - 0.5 mm	31.25%
	60	0.250	17.30	16.89	37.89		
fine	80	0.180	11.20	10.94	26.95	Fine % 0.125 - 0.25	19.63%
	120	0.125	8.90	8.69	18.26		
silt	170	0.090	6.10	5.96	12.30	Silt % < 0.125	9.67%
	230	0.063	3.80	3.71	8.59		
pan	pan	0.001	8.80	8.59	0.00	Pan % < 0.063	8.59%
						Total	**100.00%**

Total (g)	102.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



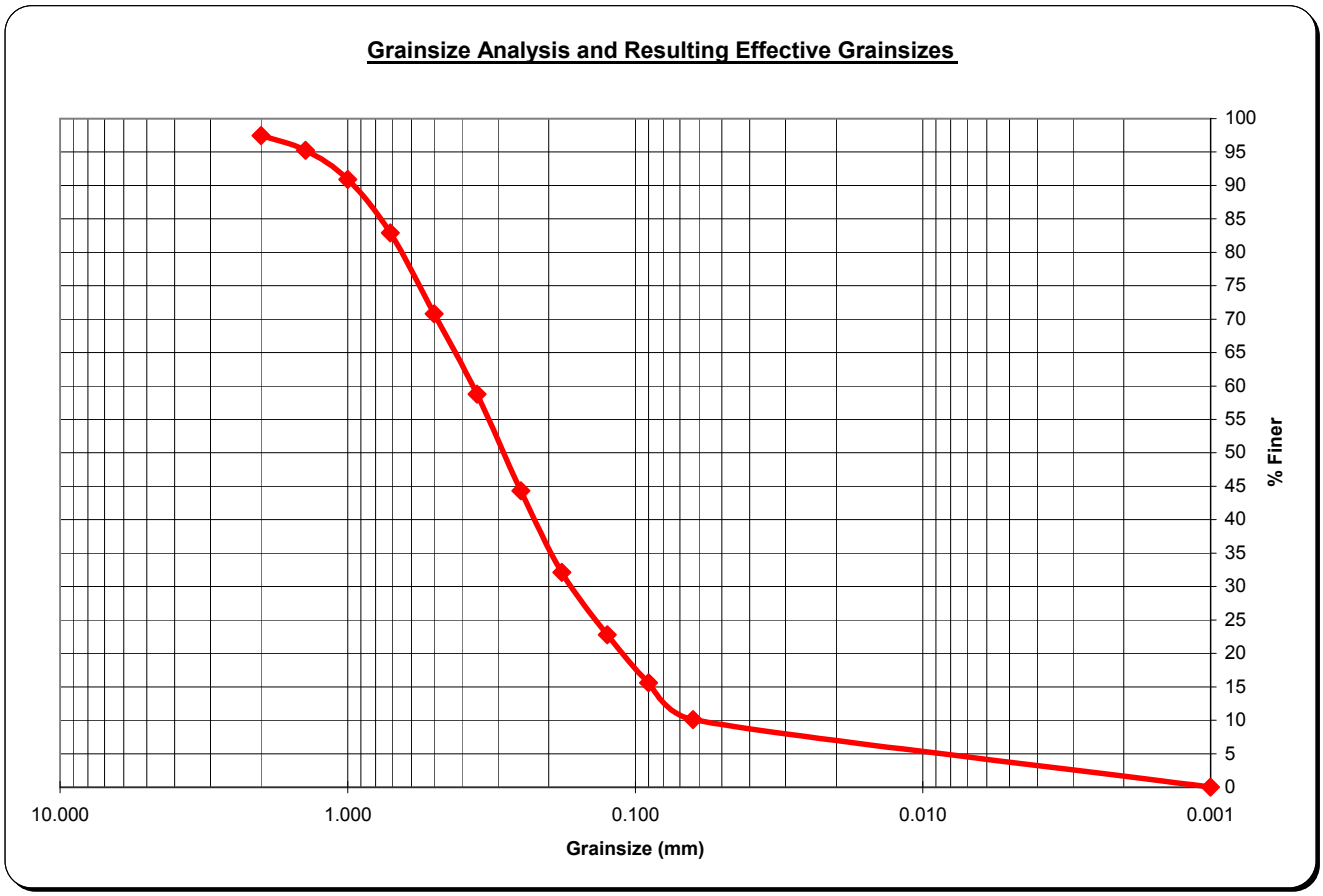
Sample ID:	ECP9-SB1	
Sample Depth:	4-5	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	103.30	g
Total Sieve Weight:	103.10	g
Weight Loss:	0.2	g
Percent Loss:	0.19	%

6.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.60	2.52	97.48	coarse % > 0.5 mm	29.19%
	14	1.4	2.30	2.23	95.25		
	18	1.0	4.50	4.36	90.88		
	25	0.71	8.20	7.95	82.93		
	35	0.50	12.50	12.12	70.81		
medium	45	0.355	12.40	12.03	58.78	medium % 0.25 - 0.5 mm	26.48%
	60	0.250	14.90	14.45	44.33		
fine	80	0.180	12.60	12.22	32.10	Fine % 0.125 - 0.25	21.53%
	120	0.125	9.60	9.31	22.79		
silt	170	0.090	7.40	7.18	15.62	Silt % < 0.125	12.71%
	230	0.063	5.70	5.53	10.09		
pan	pan	0.001	10.40	10.09	0.00	Pan % < 0.063	10.09%
						Total	**100.00%**

Total (g)	103.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



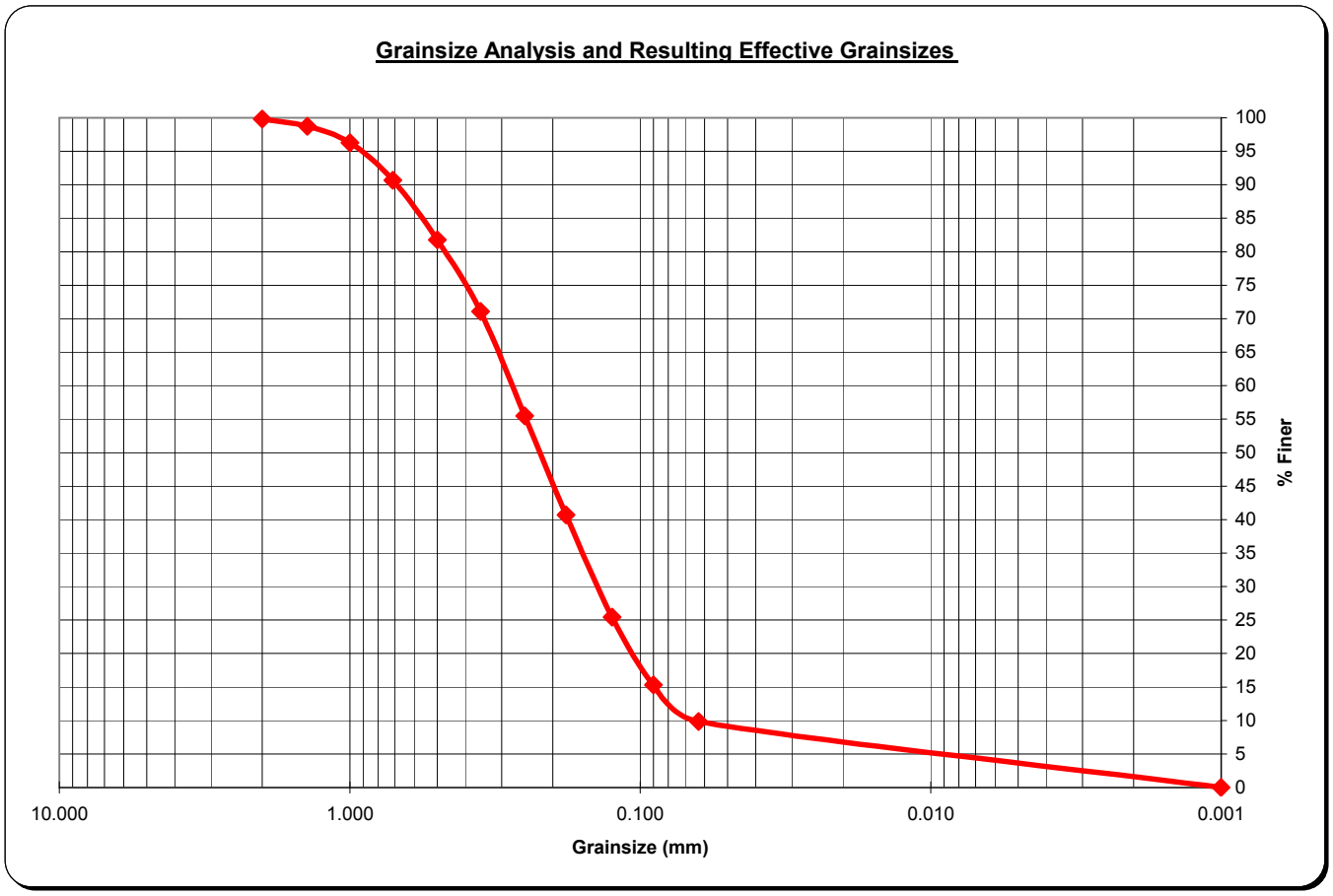
Sample ID:	ECP9-SB1
Sample Depth:	6-7 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	102.50 g
Total Sieve Weight:	102.70 g
Weight Loss:	-0.2 g
Percent Loss:	-0.20 %

6.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.19	99.81	coarse % > 0.5 mm	18.21%
	14	1.4	1.10	1.07	98.73		
	18	1.0	2.50	2.43	96.30		
	25	0.71	5.80	5.65	90.65		
	35	0.50	9.10	8.86	81.79		
medium	45	0.355	11.00	10.71	71.08	medium % 0.25 - 0.5 mm	26.29%
	60	0.250	16.00	15.58	55.50		
fine	80	0.180	15.20	14.80	40.70	Fine % 0.125 - 0.25	30.09%
	120	0.125	15.70	15.29	25.41		
silt	170	0.090	10.40	10.13	15.29	Silt % < 0.125	15.58%
	230	0.063	5.60	5.45	9.83		
pan	pan	0.001	10.10	9.83	0.00	Pan % < 0.063	9.83%
						Total	**100.00%**

Total (g)	**102.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



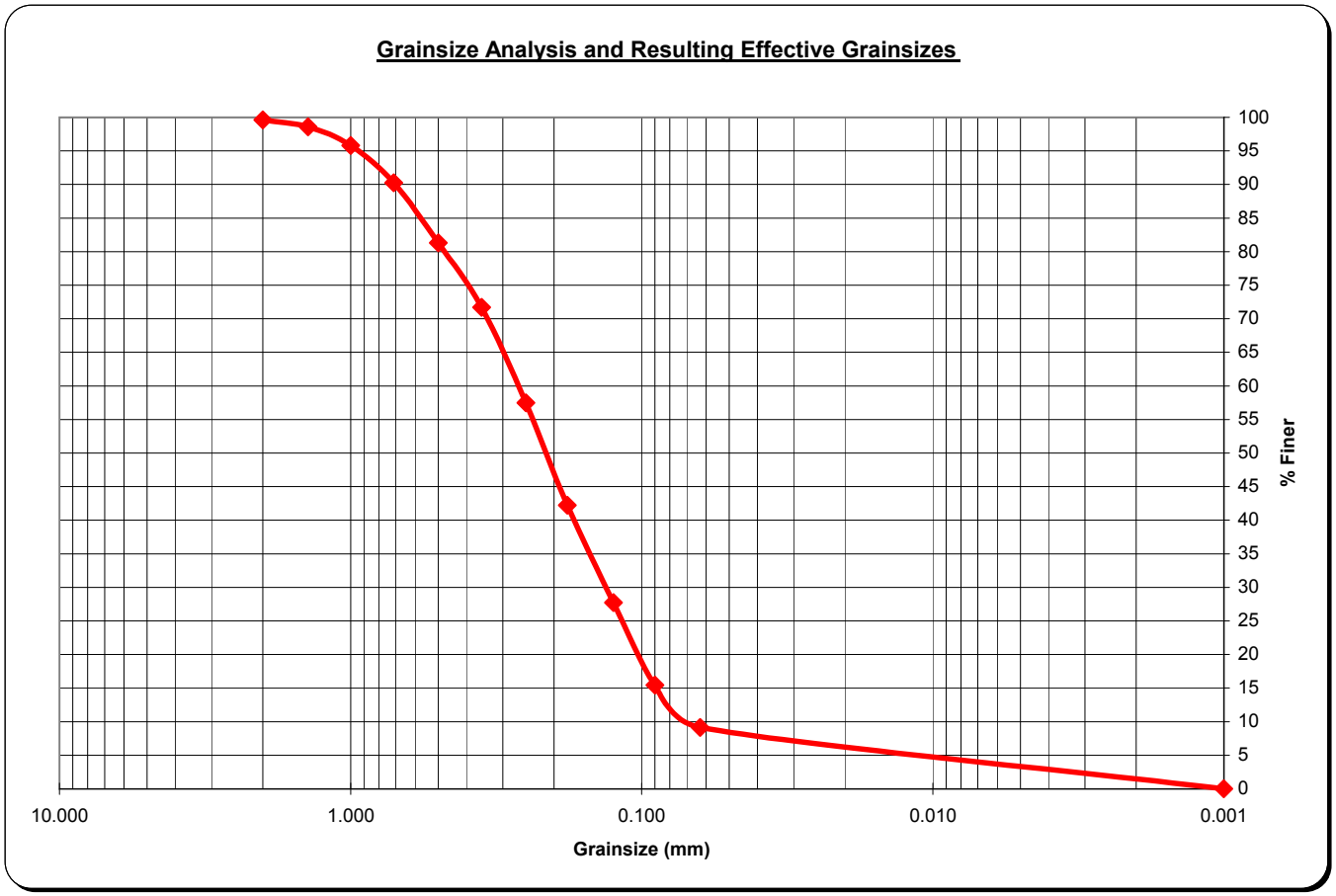
Sample ID:	ECP9-SB1
Sample Depth:	7-8 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	105.20 g
Total Sieve Weight:	104.90 g
Weight Loss:	0.3 g
Percent Loss:	0.29 %

4.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.38	99.62	coarse % > 0.5 mm	18.68%
	14	1.4	1.10	1.05	98.57		
	18	1.0	2.90	2.76	95.81		
	25	0.71	5.80	5.53	90.28		
	35	0.50	9.40	8.96	81.32		
medium	45	0.355	10.10	9.63	71.69	medium % 0.25 - 0.5 mm	23.83%
	60	0.250	14.90	14.20	57.48		
fine	80	0.180	16.00	15.25	42.23	Fine % 0.125 - 0.25	29.74%
	120	0.125	15.20	14.49	27.74		
silt	170	0.090	12.90	12.30	15.44	Silt % < 0.125	18.59%
	230	0.063	6.60	6.29	9.15		
pan	pan	0.001	9.60	9.15	0.00	Pan % < 0.063	9.15%
						Total	**100.00%**

Total (g)	104.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



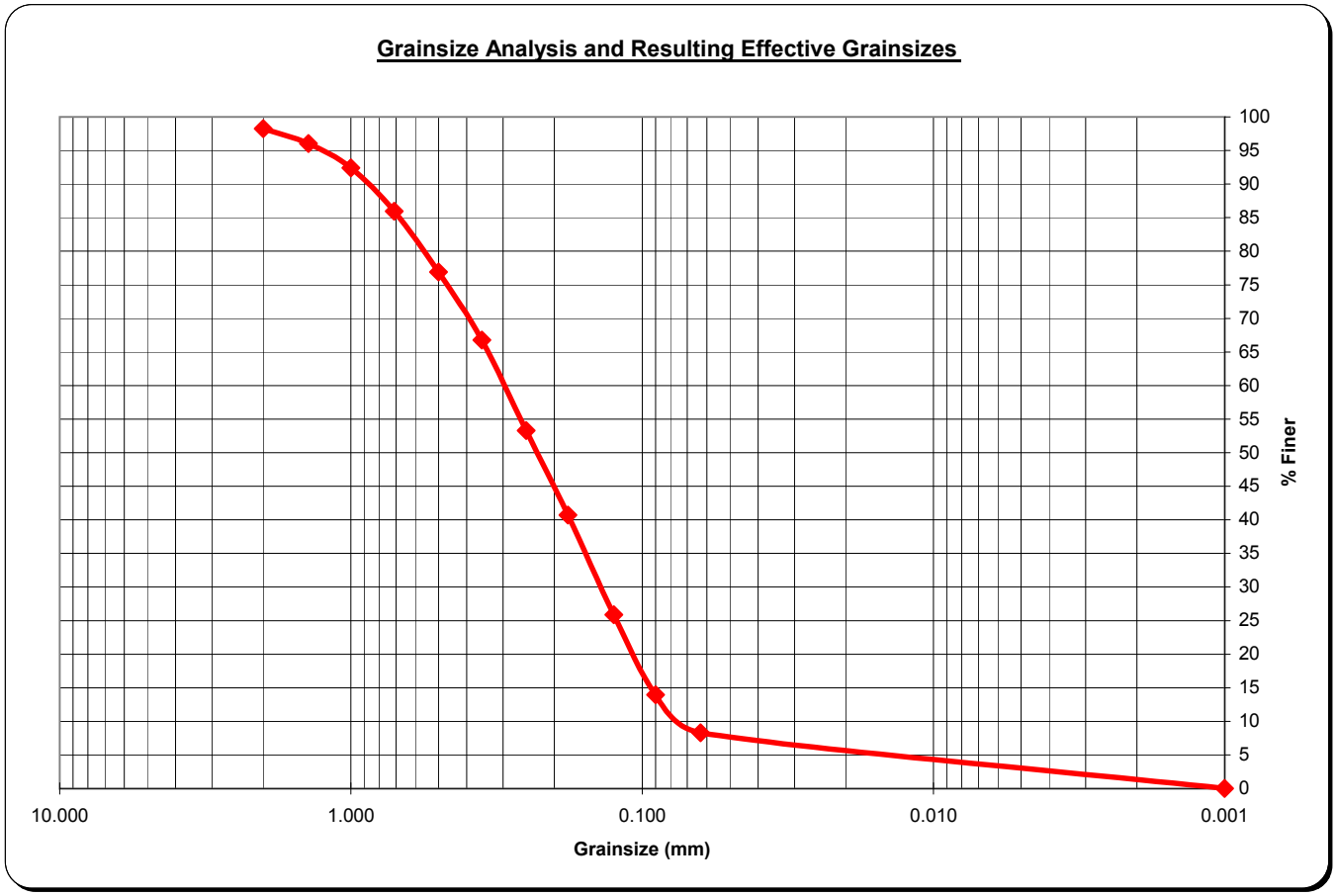
Sample ID:	ECP9-SB1	
Sample Depth:	8-9	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	104.00	g
Total Sieve Weight:	103.90	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

5.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.80	1.73	98.27	coarse % > 0.5 mm	23.10%
	14	1.4	2.30	2.21	96.05		
	18	1.0	3.80	3.66	92.40		
	25	0.71	6.70	6.45	85.95		
	35	0.50	9.40	9.05	76.90		
medium	45	0.355	10.50	10.11	66.79	medium % 0.25 - 0.5 mm	23.58%
	60	0.250	14.00	13.47	53.32		
fine	80	0.180	13.10	12.61	40.71	Fine % 0.125 - 0.25	27.43%
	120	0.125	15.40	14.82	25.89		
silt	170	0.090	12.40	11.93	13.96	Silt % < 0.125	17.61%
	230	0.063	5.90	5.68	8.28		
pan	pan	0.001	8.60	8.28	0.00	Pan % < 0.063	8.28%
						Total	**100.00%**

Total (g)	103.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



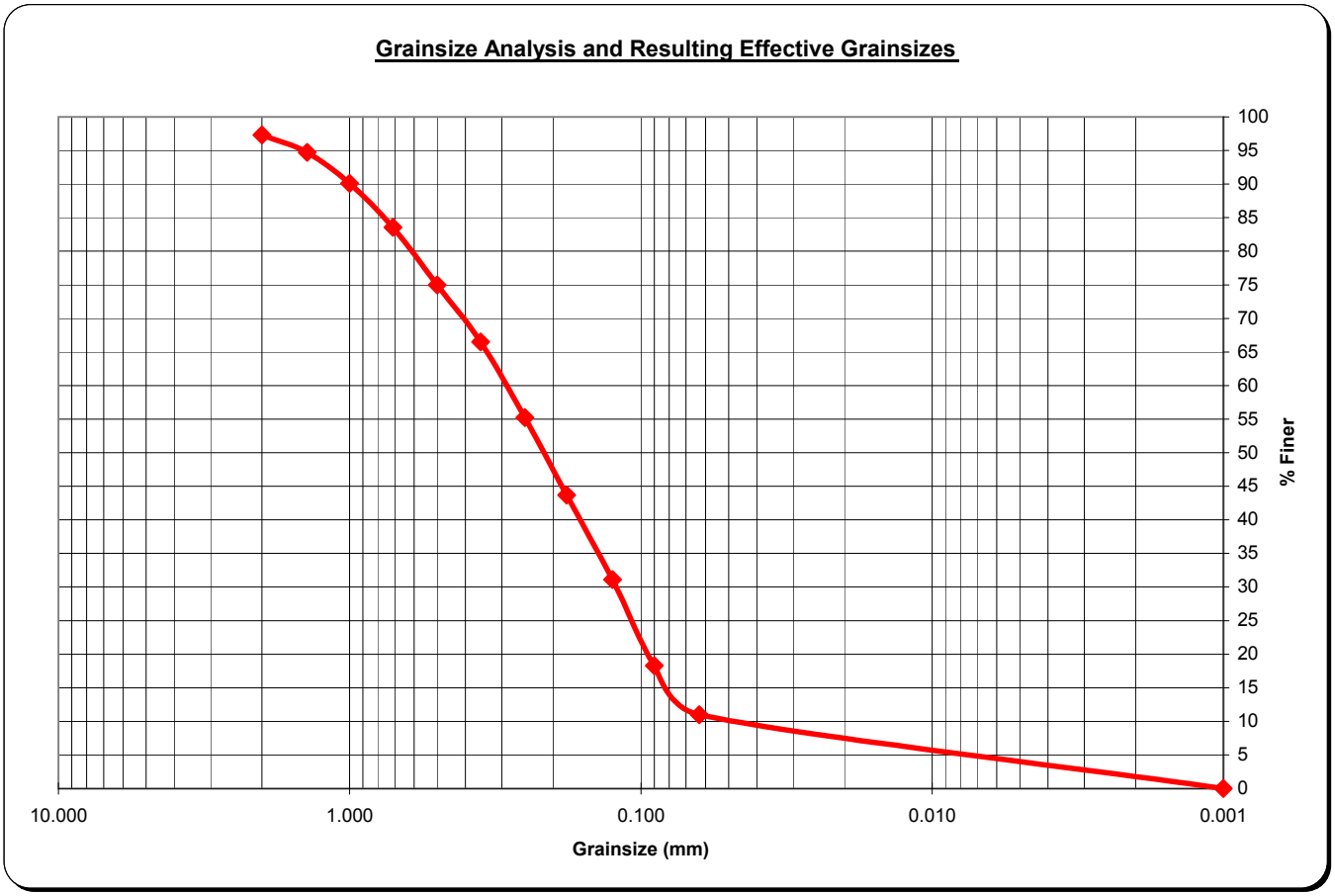
Sample ID:	ECP9-SB1
Sample Depth:	9-10 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	104.30 g
Total Sieve Weight:	103.90 g
Weight Loss:	0.4 g
Percent Loss:	0.38 %

5.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.80	2.69	97.31	coarse % > 0.5 mm	25.02%
	14	1.4	2.70	2.60	94.71		
	18	1.0	4.80	4.62	90.09		
	25	0.71	6.80	6.54	83.54		
	35	0.50	8.90	8.57	74.98		
medium	45	0.355	8.80	8.47	66.51	medium % 0.25 - 0.5 mm	19.73%
	60	0.250	11.70	11.26	55.25		
fine	80	0.180	12.00	11.55	43.70	Fine % 0.125 - 0.25	24.16%
	120	0.125	13.10	12.61	31.09		
silt	170	0.090	13.30	12.80	18.29	Silt % < 0.125	20.12%
	230	0.063	7.60	7.31	10.97		
pan	pan	0.001	11.40	10.97	0.00	Pan % < 0.063	10.97%
						Total	**100.00%**

Total (g)	103.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



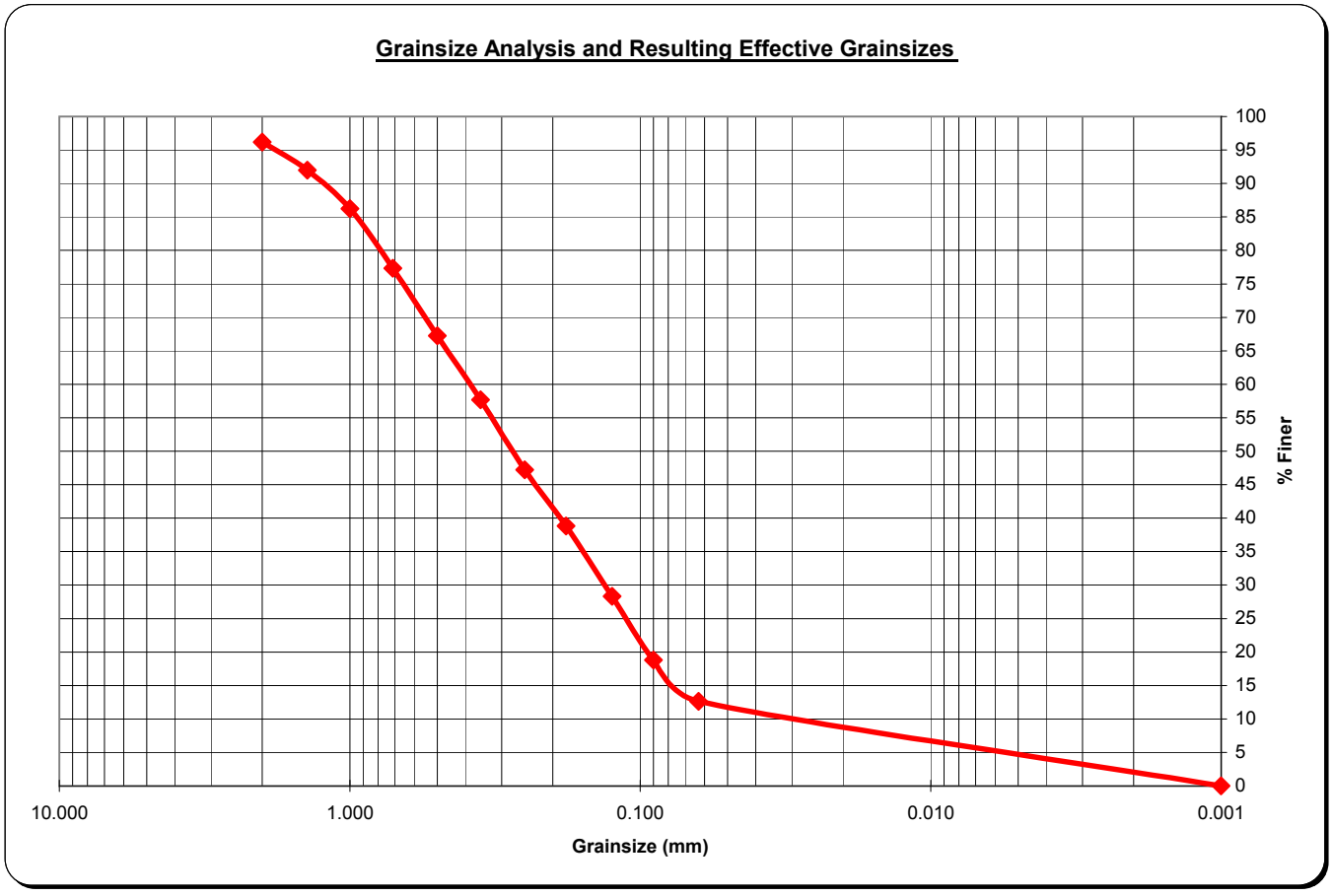
Sample ID:	ECP9-SB1
Sample Depth:	10-11 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	97.80 g
Total Sieve Weight:	97.40 g
Weight Loss:	0.4 g
Percent Loss:	0.41 %

11.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	3.70	3.80	96.20	coarse % > 0.5 mm	32.75%
	14	1.4	4.10	4.21	91.99		
	18	1.0	5.60	5.75	86.24		
	25	0.71	8.70	8.93	77.31		
	35	0.50	9.80	10.06	67.25		
medium	45	0.355	9.30	9.55	57.70	medium % 0.25 - 0.5 mm	20.02%
	60	0.250	10.20	10.47	47.23		
fine	80	0.180	8.20	8.42	38.81	Fine % 0.125 - 0.25	18.89%
	120	0.125	10.20	10.47	28.34		
silt	170	0.090	9.30	9.55	18.79	Silt % < 0.125	15.71%
	230	0.063	6.00	6.16	12.63		
pan	pan	0.001	12.30	12.63	0.00	Pan % < 0.063	12.63%
						Total	100.00%

Total (g)	97.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



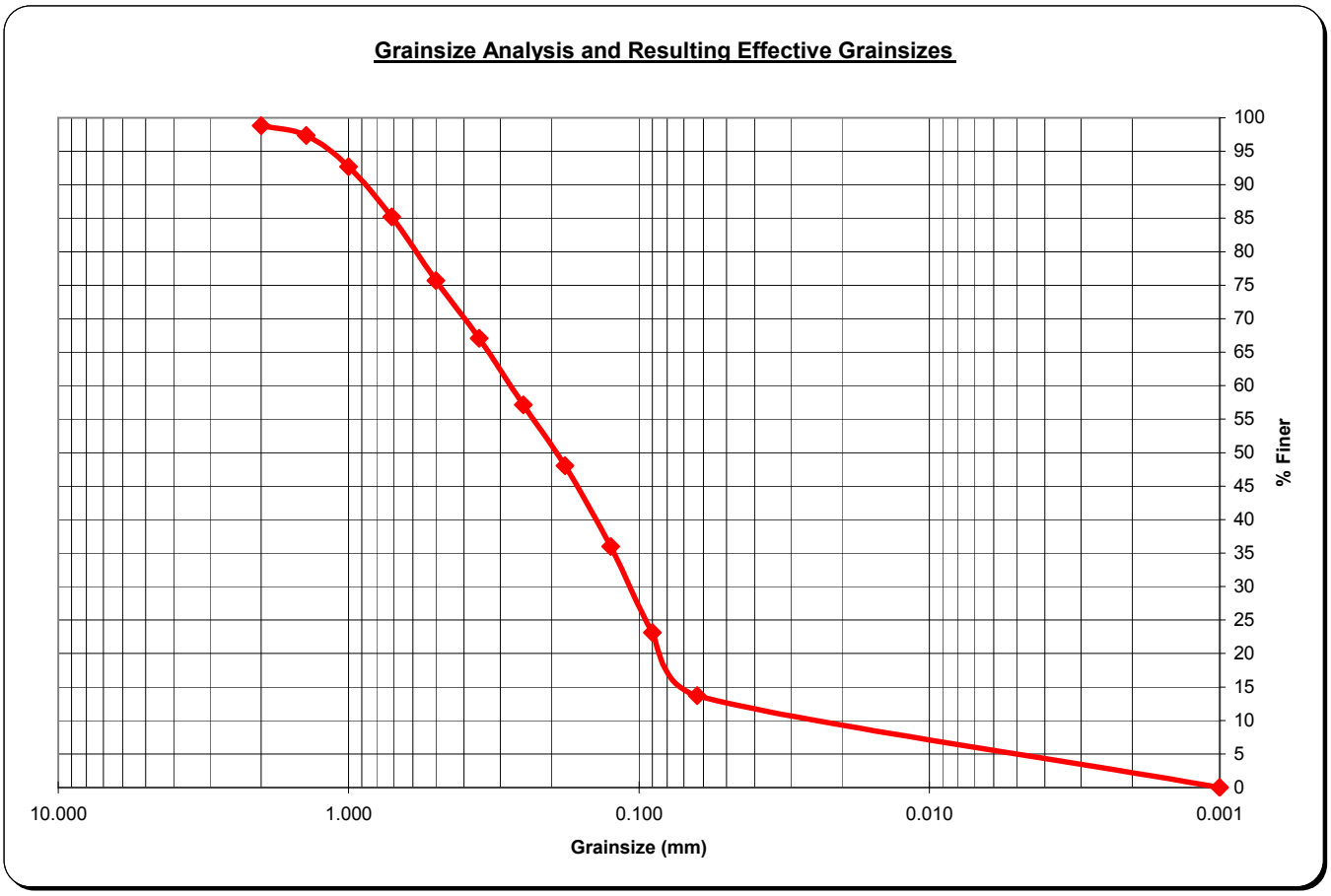
Sample ID:	ECP9-SB1	
Sample Depth:	11-12	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	95.50	g
Total Sieve Weight:	94.70	g
Weight Loss:	0.8	g
Percent Loss:	0.84	%

13.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.10	1.16	98.84	coarse % > 0.5 mm	24.29%
	14	1.4	1.40	1.48	97.36		
	18	1.0	4.40	4.65	92.71		
	25	0.71	7.10	7.50	85.22		
	35	0.50	9.00	9.50	75.71		
medium	45	0.355	8.20	8.66	67.05	medium % 0.25 - 0.5 mm	18.59%
	60	0.250	9.40	9.93	57.13		
fine	80	0.180	8.60	9.08	48.05	Fine % 0.125 - 0.25	21.12%
	120	0.125	11.40	12.04	36.01		
silt	170	0.090	12.20	12.88	23.13	Silt % < 0.125	22.28%
	230	0.063	8.90	9.40	13.73		
pan	pan	0.001	13.00	13.73	0.00	Pan % < 0.063	13.73%
						Total	**100.00%**

Total (g)	94.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



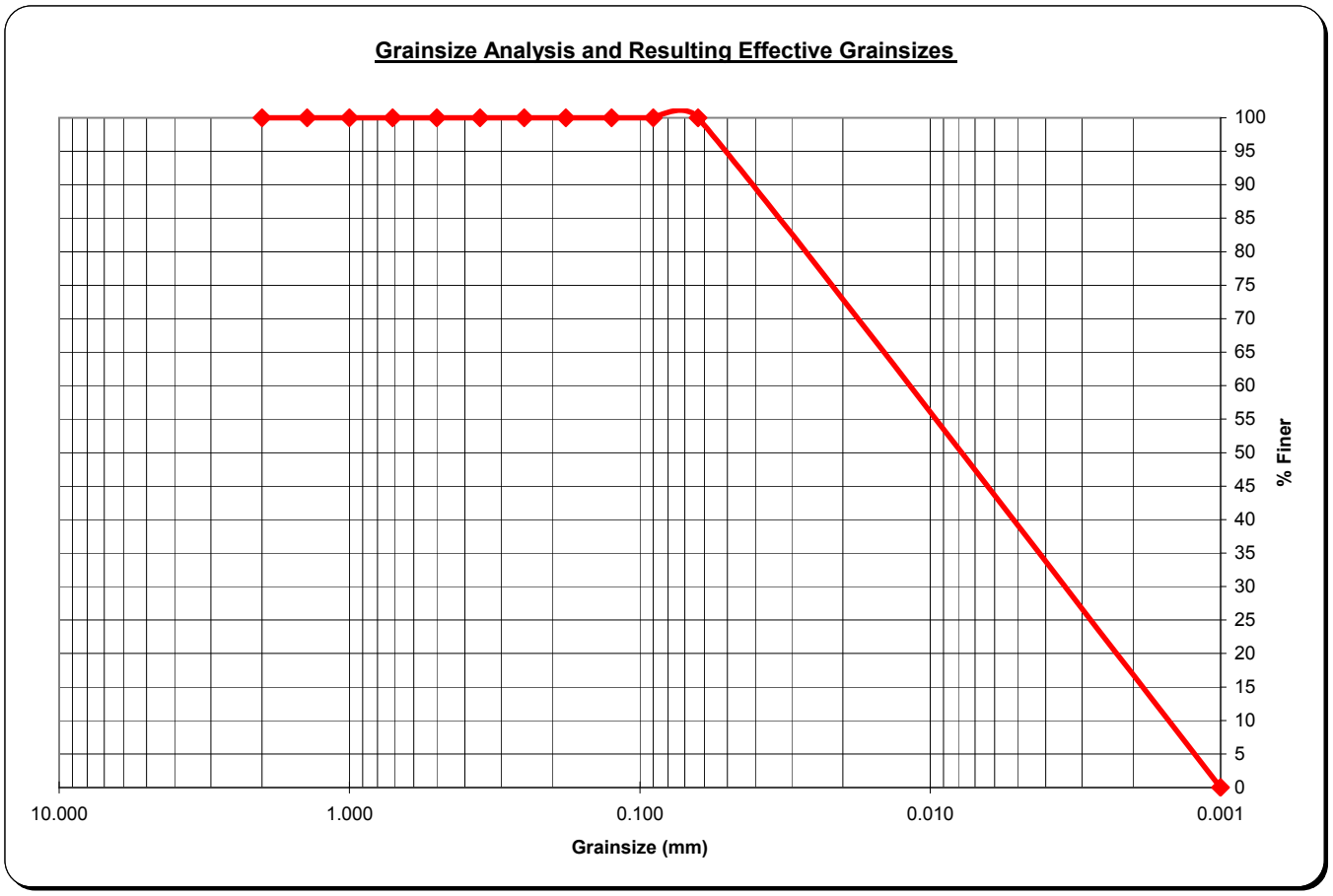
Sample ID:	ECP9-SB1
Sample Depth:	12-13 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	CLAY g
Total Sieve Weight:	110.00 g
Weight Loss:	g
Percent Loss:	%

% Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0		0.00	100.00	coarse % > 0.5 mm	0.00%
	14	1.4		0.00	100.00		
	18	1.0		0.00	100.00		
	25	0.71		0.00	100.00		
	35	0.50		0.00	100.00		
medium	45	0.355		0.00	100.00	medium % 0.25 - 0.5 mm	0.00%
	60	0.250		0.00	100.00		
fine	80	0.180		0.00	100.00	Fine % 0.125 - 0.25	0.00%
	120	0.125		0.00	100.00		
silt	170	0.090		0.00	100.00	Silt % < 0.125	0.00%
	230	0.063		0.00	100.00		
pan	pan	0.001	110.00	100.00	0.00	Pan % < 0.063	100.00%
						Total	**100.00%**

Total (g)	**110.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



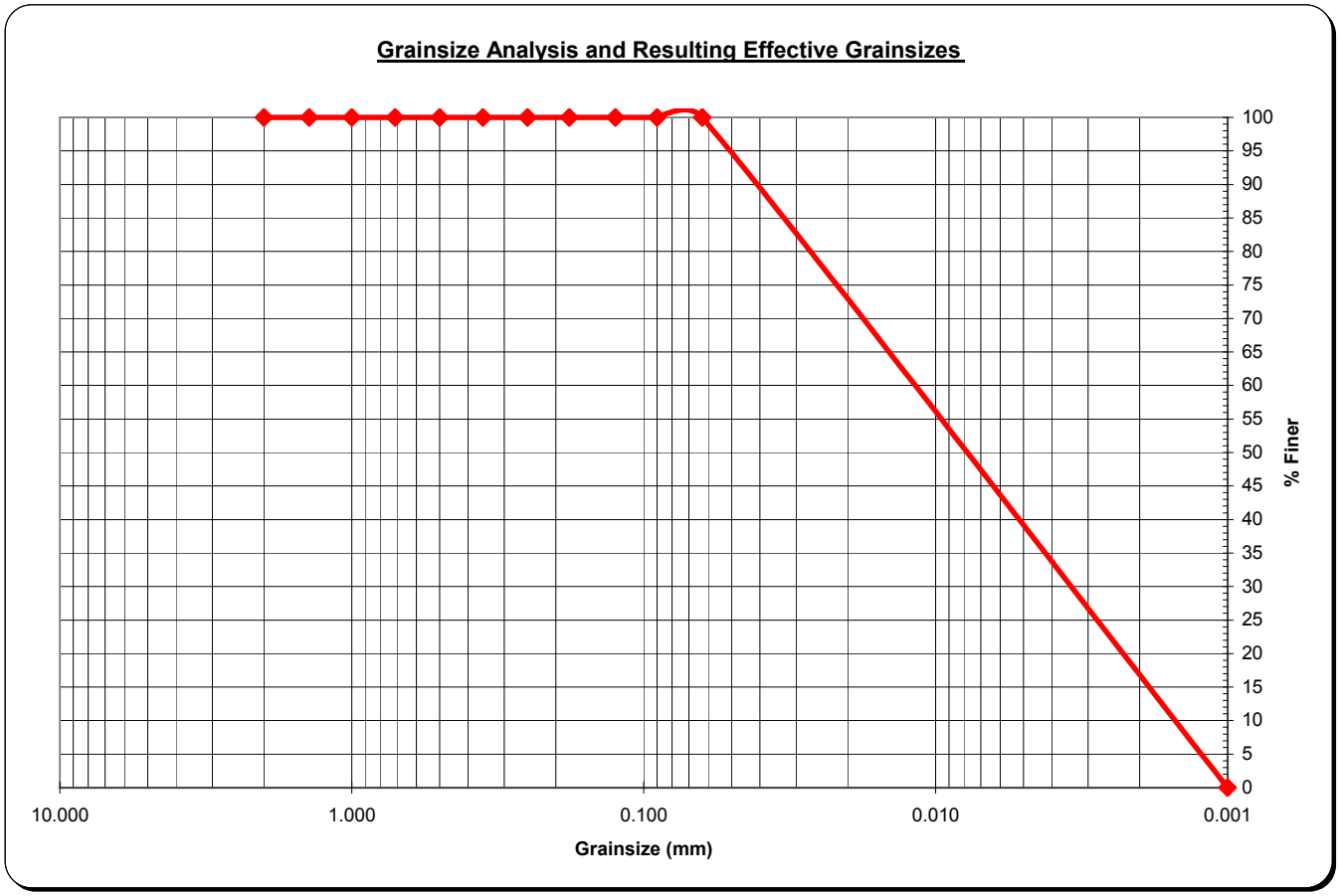
Sample ID:	ECP9-SB1	
Sample Depth:	13-14	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	CLAY	g
Total Sieve Weight:	110.00	g
Weight Loss:	#VALUE!	g
Percent Loss:	#VALUE!	%

#VALUE! % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0		0.00	100.00	coarse % > 0.5 mm	0.00%
	14	1.4		0.00	100.00		
	18	1.0		0.00	100.00		
	25	0.71		0.00	100.00		
	35	0.50		0.00	100.00		
medium	45	0.355		0.00	100.00	medium % 0.25 - 0.5 mm	0.00%
	60	0.250		0.00	100.00		
fine	80	0.180		0.00	100.00	Fine % 0.125 - 0.25	0.00%
	120	0.125		0.00	100.00		
silt	170	0.090		0.00	100.00	Silt % < 0.125	0.00%
	230	0.063		0.00	100.00		
pan	pan	0.001	110.00	100.00	0.00	Pan % < 0.063	100.00%
						Total	**100.00%**

Total (g)	**110.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



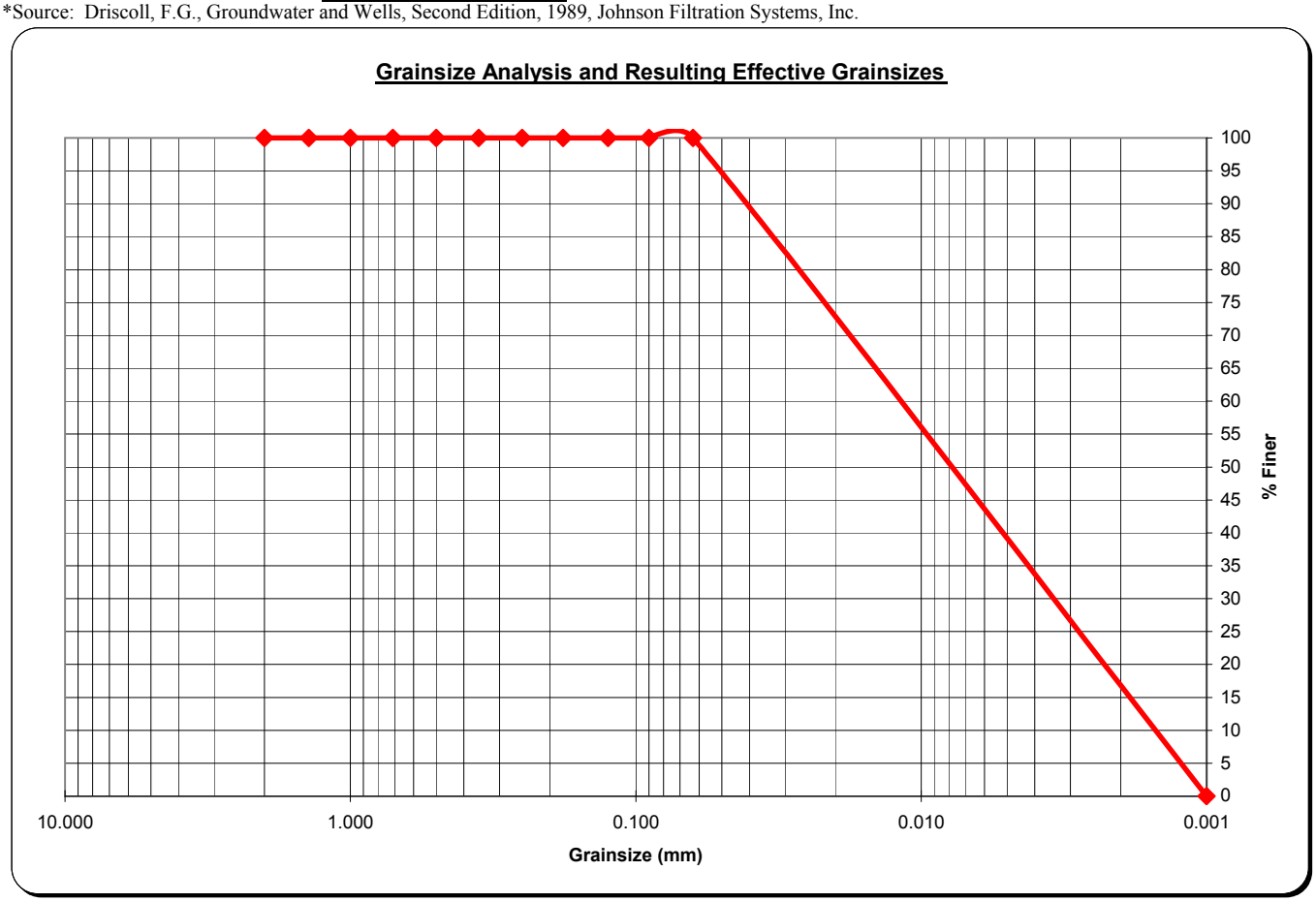
Sample ID:	ECP9-SB1
Sample Depth:	14-15 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	CLAY g
Total Sieve Weight:	110.00 g
Weight Loss:	#VALUE! g
Percent Loss:	#VALUE! %

#VALUE! % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0		0.00	100.00	coarse % > 0.5 mm	0.00%
	14	1.4		0.00	100.00		
	18	1.0		0.00	100.00		
	25	0.71		0.00	100.00		
	35	0.50		0.00	100.00		
medium	45	0.355		0.00	100.00	medium % 0.25 - 0.5 mm	0.00%
	60	0.250		0.00	100.00		
fine	80	0.180		0.00	100.00	Fine % 0.125 - 0.25	0.00%
	120	0.125		0.00	100.00		
silt	170	0.090		0.00	100.00	Silt % < 0.125	0.00%
	230	0.063		0.00	100.00		
pan	pan	0.001	110.00	100.00	0.00	Pan % < 0.063	100.00%
						Total	**100.00%**

Total (g)	**110.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



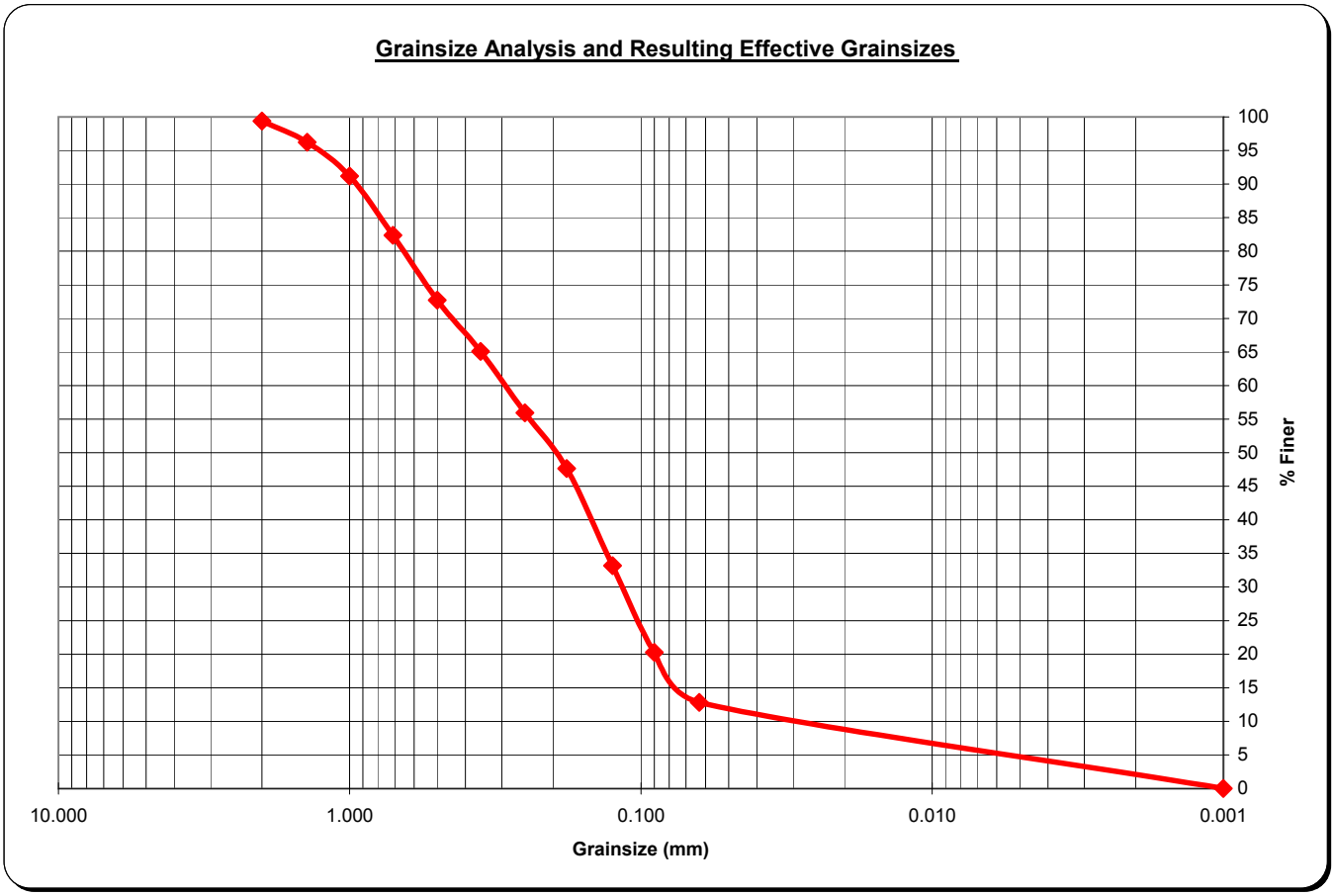
Sample ID:	ECP9-SB1
Sample Depth:	15-16 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.80 g
Total Sieve Weight:	95.30 g
Weight Loss:	0.5 g
Percent Loss:	0.52 %

12.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.63	99.37	coarse % > 0.5 mm	27.28%
	14	1.4	3.00	3.15	96.22		
	18	1.0	4.80	5.04	91.19		
	25	0.71	8.40	8.81	82.37		
	35	0.50	9.20	9.65	72.72		
medium	45	0.355	7.30	7.66	65.06	medium % 0.25 - 0.5 mm	16.79%
	60	0.250	8.70	9.13	55.93		
fine	80	0.180	7.90	8.29	47.64	Fine % 0.125 - 0.25	22.77%
	120	0.125	13.80	14.48	33.16		
silt	170	0.090	12.30	12.91	20.25	Silt % < 0.125	20.36%
	230	0.063	7.10	7.45	12.80		
pan	pan	0.001	12.20	12.80	0.00	Pan % < 0.063	12.80%
						Total	**100.00%**

Total (g)	95.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



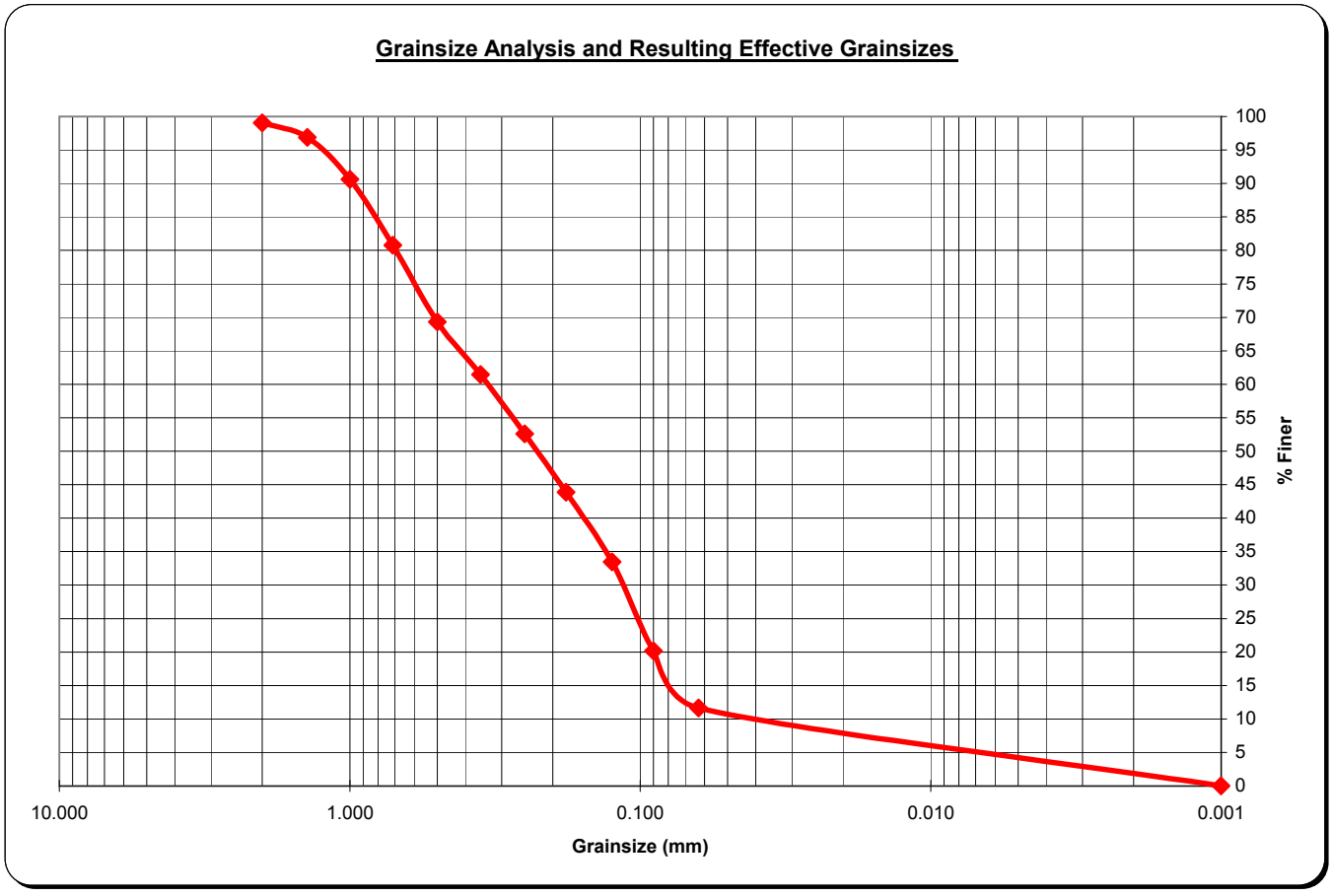
Sample ID:	ECP9-SB1
Sample Depth:	16-17 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	97.10 g
Total Sieve Weight:	96.20 g
Weight Loss:	0.9 g
Percent Loss:	0.93 %

11.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.90	0.94	99.06	coarse % > 0.5 mm	30.67%
	14	1.4	2.10	2.18	96.88		
	18	1.0	6.00	6.24	90.64		
	25	0.71	9.50	9.88	80.77		
	35	0.50	11.00	11.43	69.33		
medium	45	0.355	7.60	7.90	61.43	medium % 0.25 - 0.5 mm	16.74%
	60	0.250	8.50	8.84	52.60		
fine	80	0.180	8.40	8.73	43.87	Fine % 0.125 - 0.25	19.13%
	120	0.125	10.00	10.40	33.47		
silt	170	0.090	12.80	13.31	20.17	Silt % < 0.125	21.83%
	230	0.063	8.20	8.52	11.64		
pan	pan	0.001	11.20	11.64	0.00	Pan % < 0.063	11.64%
						Total	**100.00%**

Total (g)	**96.20**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



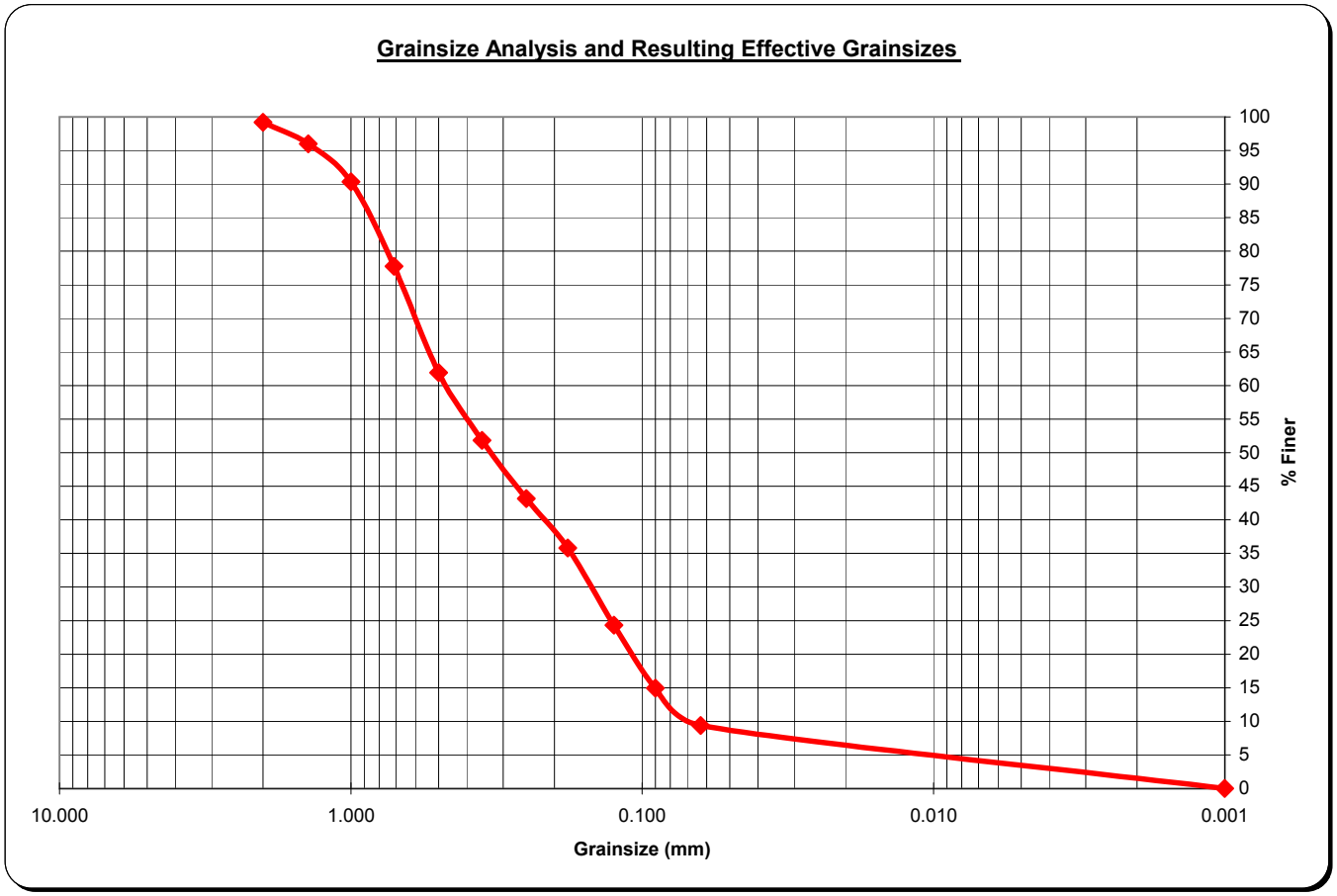
Sample ID:	ECP9-SB1
Sample Depth:	17-18 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	100.30 g
Total Sieve Weight:	100.30 g
Weight Loss:	0 g
Percent Loss:	0.00 %

8.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.80	0.80	99.20	coarse % > 0.5 mm	38.09%
	14	1.4	3.20	3.19	96.01		
	18	1.0	5.70	5.68	90.33		
	25	0.71	12.60	12.56	77.77		
	35	0.50	15.90	15.85	61.91		
medium	45	0.355	10.10	10.07	51.84	medium % 0.25 - 0.5 mm	18.74%
	60	0.250	8.70	8.67	43.17		
fine	80	0.180	7.40	7.38	35.79	Fine % 0.125 - 0.25	18.84%
	120	0.125	11.50	11.47	24.33		
silt	170	0.090	9.40	9.37	14.96	Silt % < 0.125	14.96%
	230	0.063	5.60	5.58	9.37		
pan	pan	0.001	9.40	9.37	0.00	Pan % < 0.063	9.37%
						Total	100.00%

Total (g)	100.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



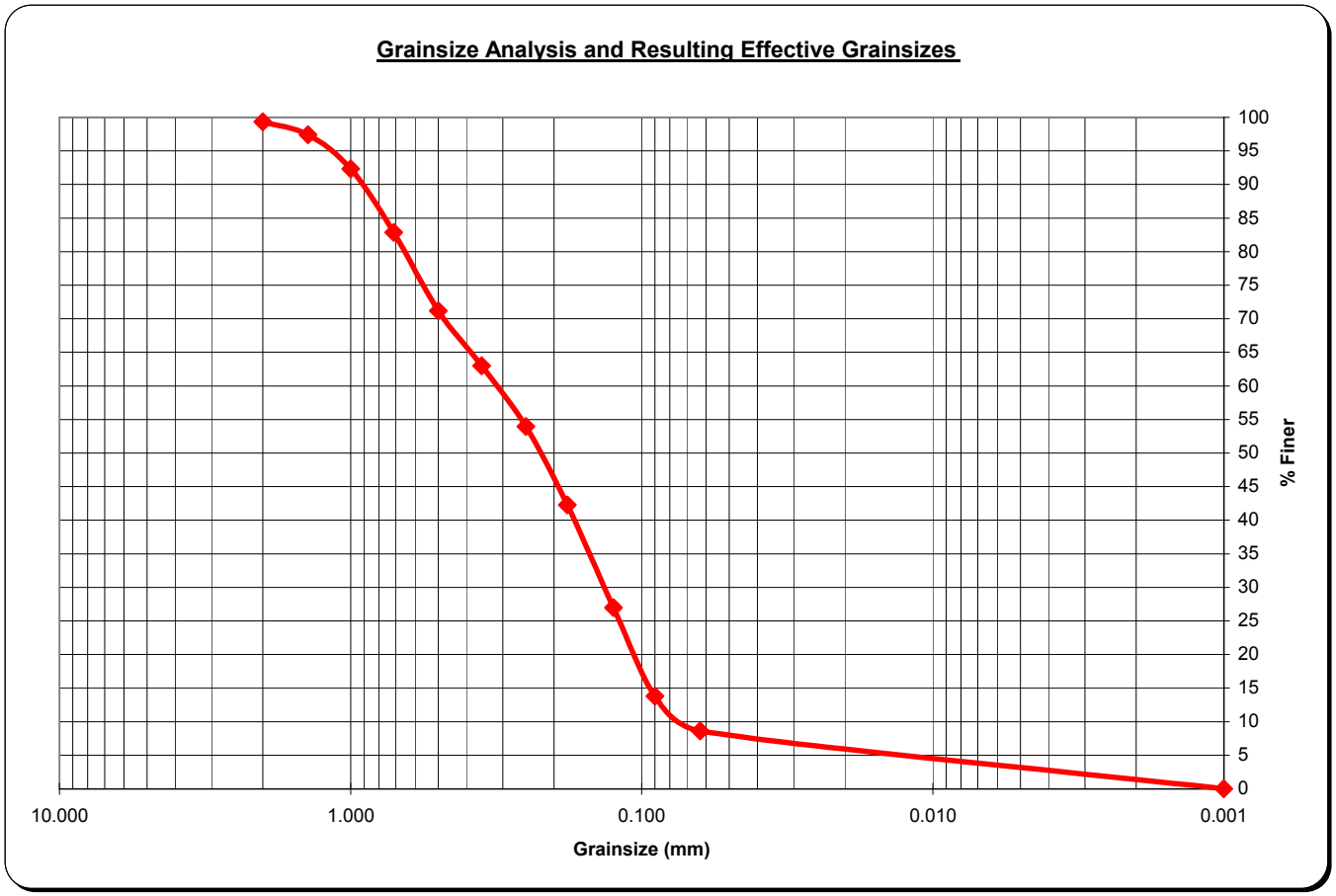
Sample ID:	ECP9-SB1
Sample Depth:	18-19 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.50 g
Total Sieve Weight:	92.70 g
Weight Loss:	0.8 g
Percent Loss:	0.86 %

15.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.65	99.35	coarse % > 0.5 mm	28.80%
	14	1.4	1.80	1.94	97.41		
	18	1.0	4.70	5.07	92.34		
	25	0.71	8.80	9.49	82.85		
	35	0.50	10.80	11.65	71.20		
medium	45	0.355	7.60	8.20	63.00	medium % 0.25 - 0.5 mm	17.26%
	60	0.250	8.40	9.06	53.94		
fine	80	0.180	10.80	11.65	42.29	Fine % 0.125 - 0.25	26.97%
	120	0.125	14.20	15.32	26.97		
silt	170	0.090	12.20	13.16	13.81	Silt % < 0.125	18.34%
	230	0.063	4.80	5.18	8.63		
pan	pan	0.001	8.00	8.63	0.00	Pan % < 0.063	8.63%
						Total	**100.00%**

Total (g)	**92.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



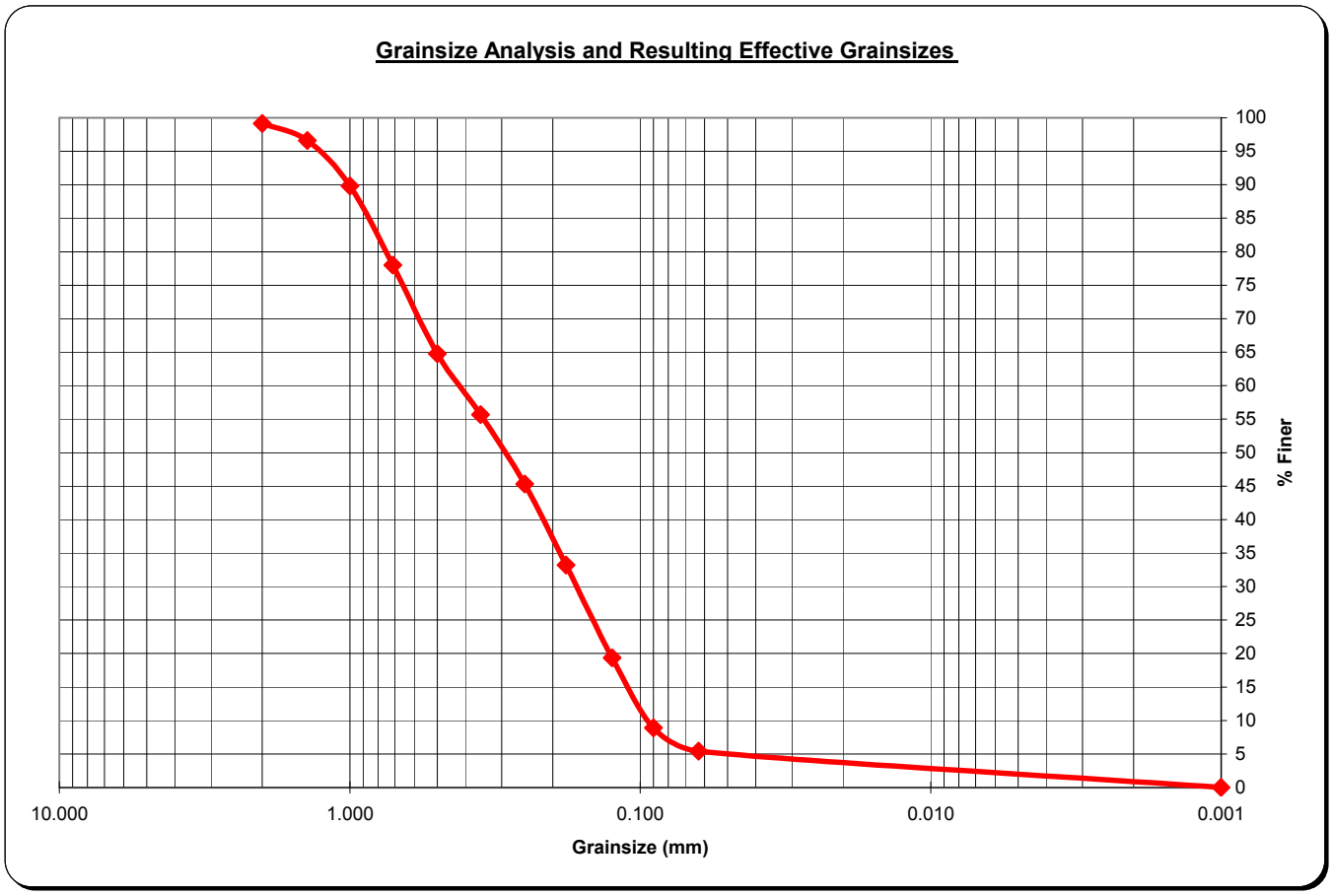
Sample ID:	ECP9-SB1
Sample Depth:	19-20 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.10 g
Total Sieve Weight:	94.50 g
Weight Loss:	0.6 g
Percent Loss:	0.63 %

13.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.80	0.85	99.15	coarse % > 0.5 mm	35.24%
	14	1.4	2.40	2.54	96.61		
	18	1.0	6.40	6.77	89.84		
	25	0.71	11.20	11.85	77.99		
	35	0.50	12.50	13.23	64.76		
medium	45	0.355	8.60	9.10	55.66	medium % 0.25 - 0.5 mm	19.47%
	60	0.250	9.80	10.37	45.29		
fine	80	0.180	11.40	12.06	33.23	Fine % 0.125 - 0.25	25.93%
	120	0.125	13.10	13.86	19.37		
silt	170	0.090	9.90	10.48	8.89	Silt % < 0.125	13.97%
	230	0.063	3.30	3.49	5.40		
pan	pan	0.001	5.10	5.40	0.00	Pan % < 0.063	5.40%
						Total	**100.00%**

Total (g)	**94.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



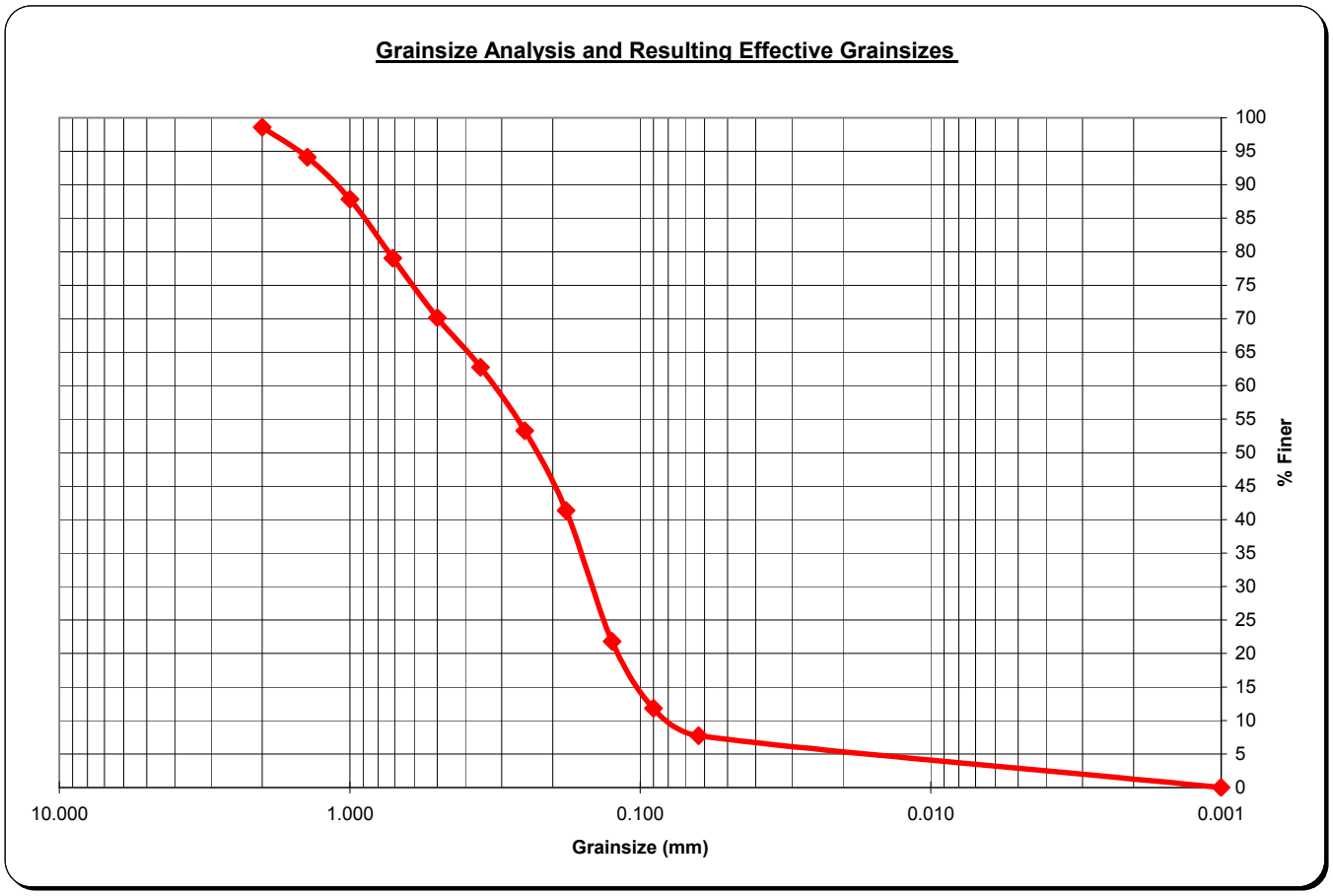
Sample ID:	ECP9-SB1
Sample Depth:	20-21 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.40 g
Total Sieve Weight:	93.10 g
Weight Loss:	1.3 g
Percent Loss:	1.38 %

14.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.30	1.40	98.60	coarse % > 0.5 mm	29.86%
	14	1.4	4.20	4.51	94.09		
	18	1.0	5.80	6.23	87.86		
	25	0.71	8.20	8.81	79.05		
	35	0.50	8.30	8.92	70.14		
medium	45	0.355	6.90	7.41	62.73	medium % 0.25 - 0.5 mm	16.86%
	60	0.250	8.80	9.45	53.28		
fine	80	0.180	11.10	11.92	41.35	Fine % 0.125 - 0.25	31.47%
	120	0.125	18.20	19.55	21.80		
silt	170	0.090	9.30	9.99	11.82	Silt % < 0.125	14.07%
	230	0.063	3.80	4.08	7.73		
pan	pan	0.001	7.20	7.73	0.00	Pan % < 0.063	7.73%
						Total	**100.00%**

Total (g)	**93.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



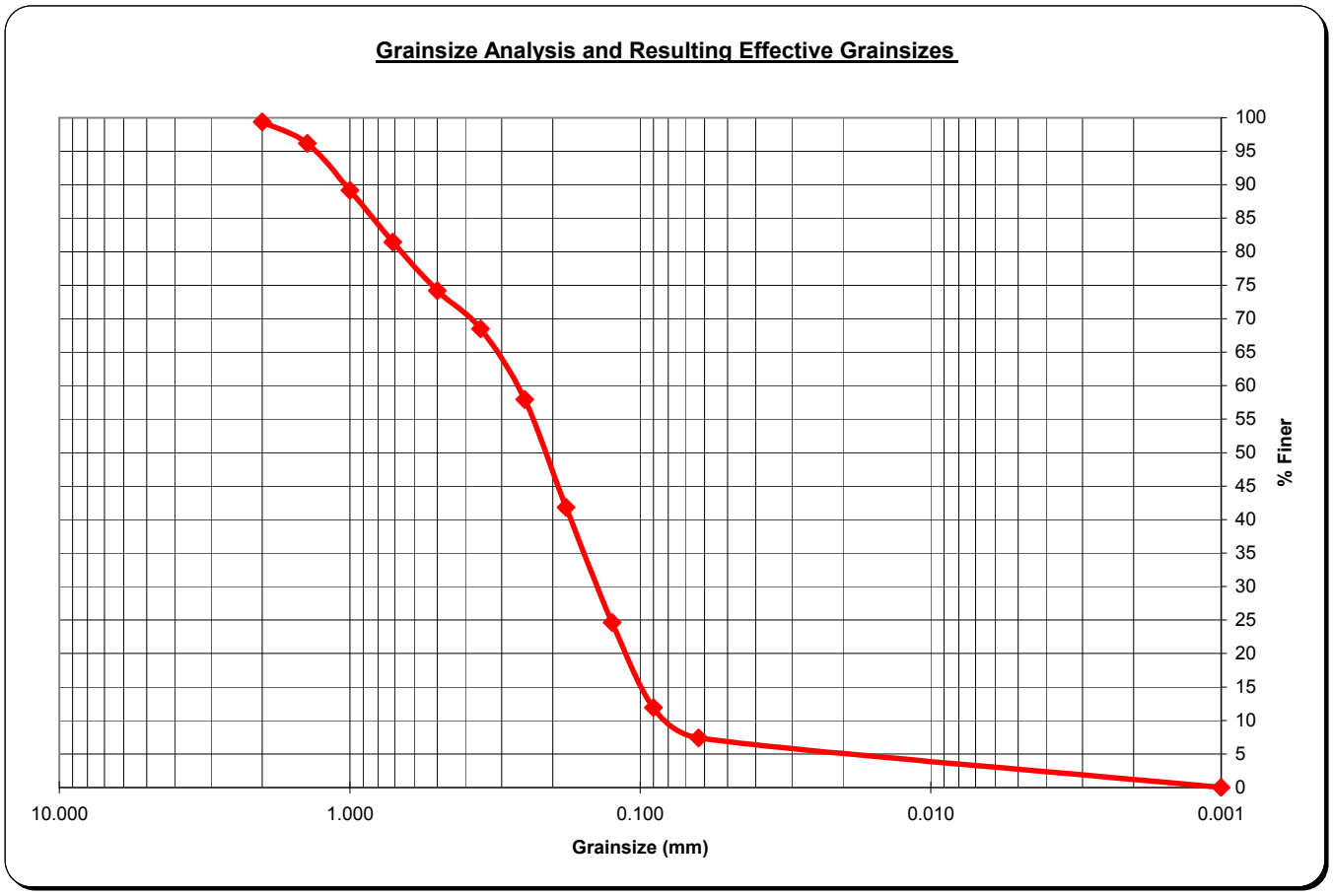
Sample ID:	ECP9-SB1
Sample Depth:	21-22 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.00 g
Total Sieve Weight:	94.90 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

13.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.63	99.37	coarse % > 0.5 mm	25.82%
	14	1.4	3.00	3.16	96.21		
	18	1.0	6.70	7.06	89.15		
	25	0.71	7.30	7.69	81.45		
	35	0.50	6.90	7.27	74.18		
medium	45	0.355	5.40	5.69	68.49	medium % 0.25 - 0.5 mm	16.23%
	60	0.250	10.00	10.54	57.96		
fine	80	0.180	15.30	16.12	41.83	Fine % 0.125 - 0.25	33.30%
	120	0.125	16.30	17.18	24.66		
silt	170	0.090	12.10	12.75	11.91	Silt % < 0.125	17.28%
	230	0.063	4.30	4.53	7.38		
pan	pan	0.001	7.00	7.38	0.00	Pan % < 0.063	7.38%
						Total	**100.00%**

Total (g)	94.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



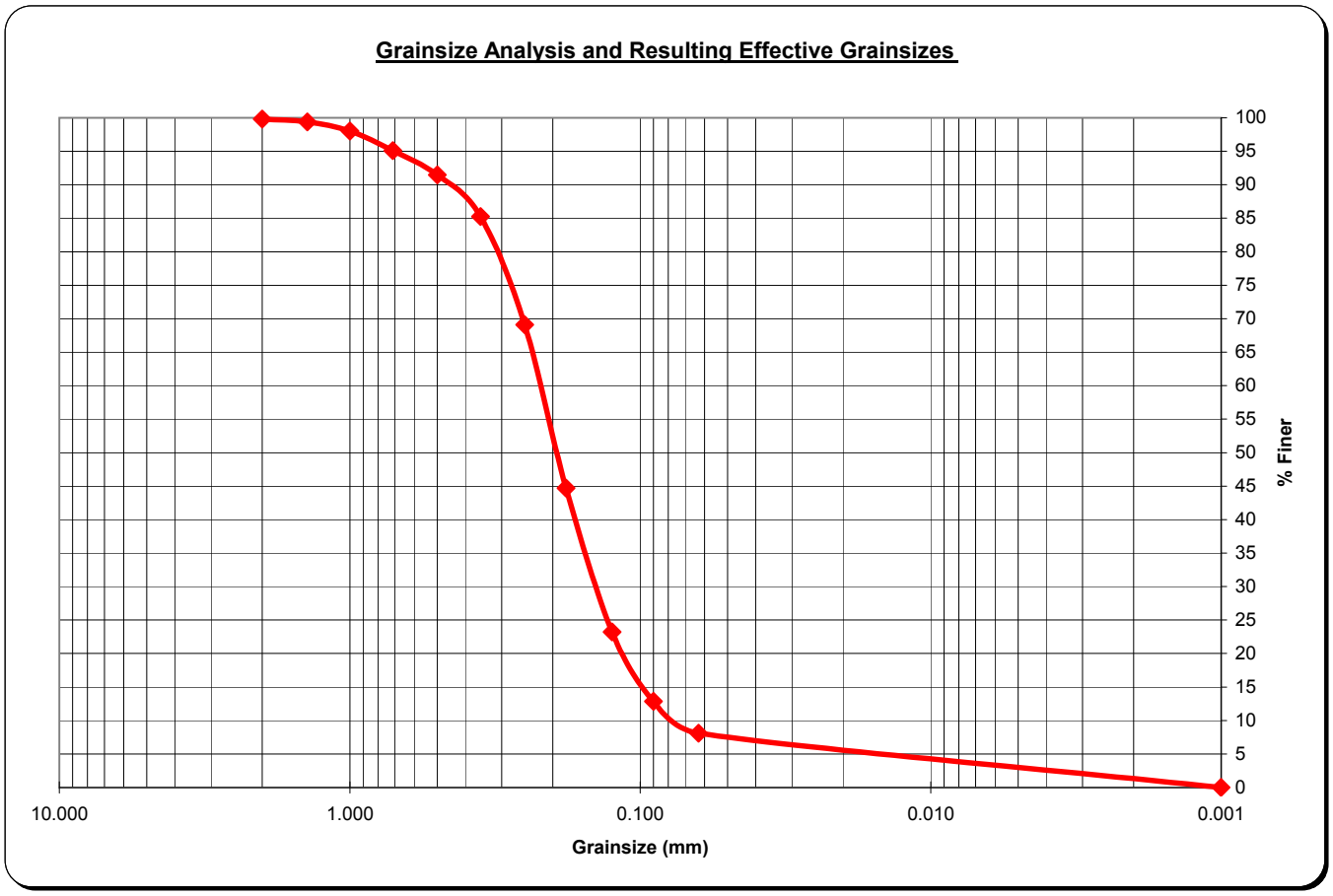
Sample ID:	ECP9-SB1
Sample Depth:	22-23 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	97.10 g
Total Sieve Weight:	96.40 g
Weight Loss:	0.7 g
Percent Loss:	0.72 %

11.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.21	99.79	coarse % > 0.5 mm	8.51%
	14	1.4	0.40	0.41	99.38		
	18	1.0	1.30	1.35	98.03		
	25	0.71	2.80	2.90	95.12		
	35	0.50	3.50	3.63	91.49		
medium	45	0.355	6.00	6.22	85.27	medium % 0.25 - 0.5 mm	22.41%
	60	0.250	15.60	16.18	69.09		
fine	80	0.180	23.50	24.38	44.71	Fine % 0.125 - 0.25	45.85%
	120	0.125	20.70	21.47	23.24		
silt	170	0.090	10.00	10.37	12.86	Silt % < 0.125	15.15%
	230	0.063	4.60	4.77	8.09		
pan	pan	0.001	7.80	8.09	0.00	Pan % < 0.063	8.09%
						Total	**100.00%**

Total (g)	**96.40**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



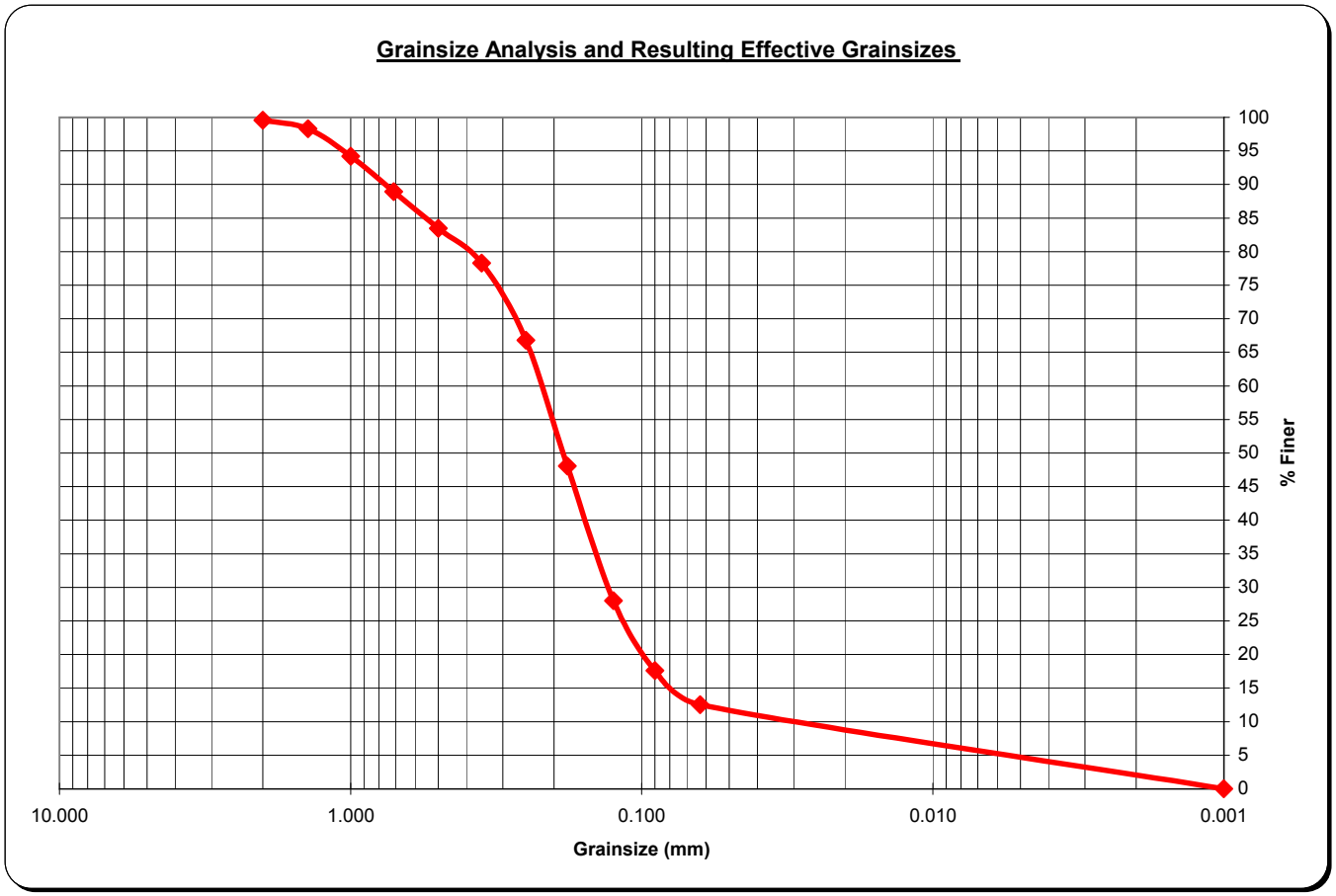
Sample ID:	ECP9-SB1
Sample Depth:	23-24 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	96.00 g
Total Sieve Weight:	94.90 g
Weight Loss:	1.1 g
Percent Loss:	1.15 %

12.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.42	99.58	coarse % > 0.5 mm	16.54%
	14	1.4	1.20	1.26	98.31		
	18	1.0	3.90	4.11	94.20		
	25	0.71	5.00	5.27	88.94		
	35	0.50	5.20	5.48	83.46		
medium	45	0.355	4.90	5.16	78.29	medium % 0.25 - 0.5 mm	16.65%
	60	0.250	10.90	11.49	66.81		
fine	80	0.180	17.80	18.76	48.05	Fine % 0.125 - 0.25	38.78%
	120	0.125	19.00	20.02	28.03		
silt	170	0.090	9.90	10.43	17.60	Silt % < 0.125	15.49%
	230	0.063	4.80	5.06	12.54		
pan	pan	0.001	11.90	12.54	0.00	Pan % < 0.063	12.54%
						Total	**100.00%**

Total (g)	94.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



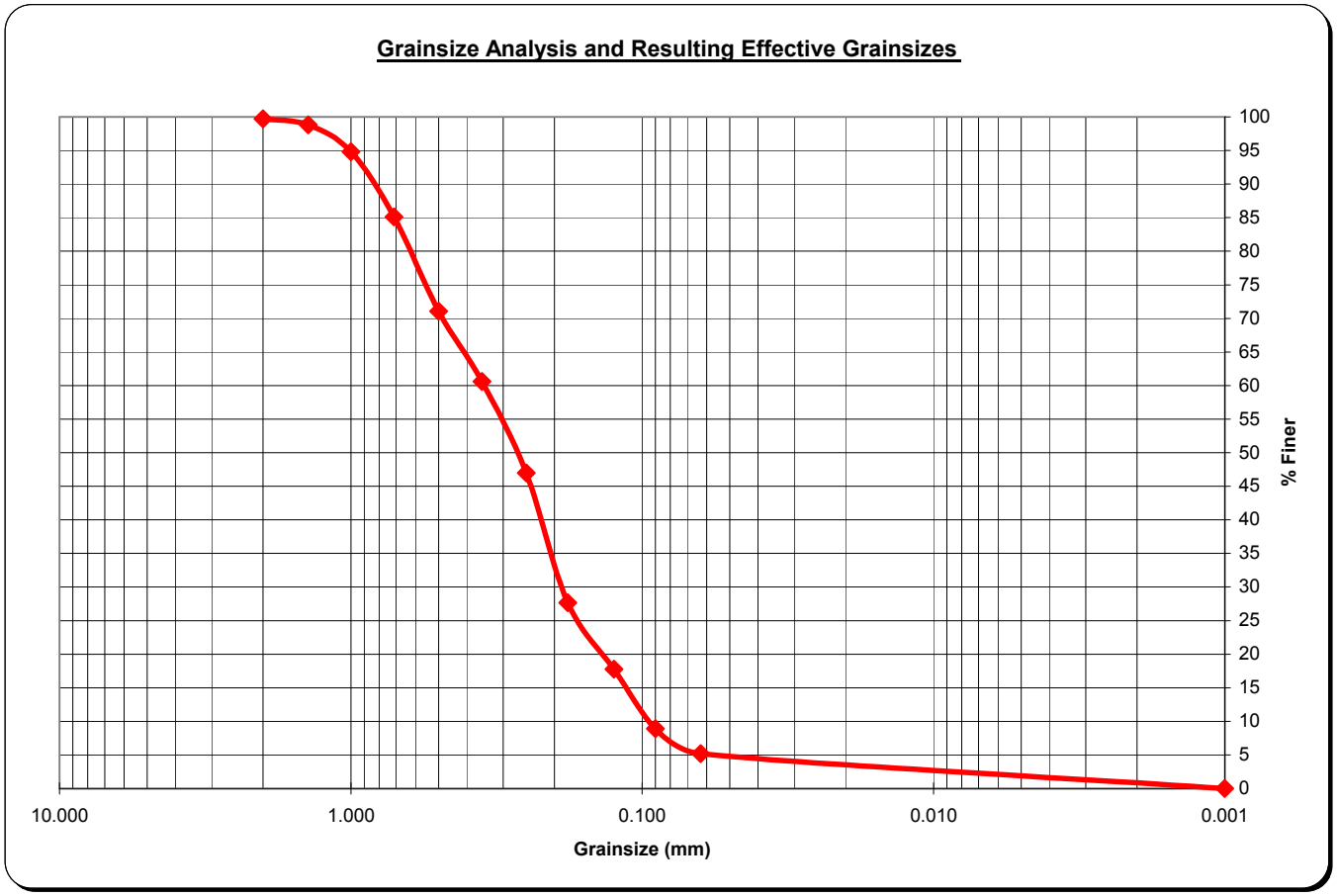
Sample ID:	ECP9-SB1
Sample Depth:	24-25 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	102.00 g
Total Sieve Weight:	102.00 g
Weight Loss:	0 g
Percent Loss:	0.00 %

7.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.29	99.71	coarse % > 0.5 mm	28.92%
	14	1.4	0.90	0.88	98.82		
	18	1.0	4.10	4.02	94.80		
	25	0.71	9.90	9.71	85.10		
	35	0.50	14.30	14.02	71.08		
medium	45	0.355	10.70	10.49	60.59	medium % 0.25 - 0.5 mm	24.12%
	60	0.250	13.90	13.63	46.96		
fine	80	0.180	19.70	19.31	27.65	Fine % 0.125 - 0.25	29.22%
	120	0.125	10.10	9.90	17.75		
silt	170	0.090	9.00	8.82	8.92	Silt % < 0.125	12.55%
	230	0.063	3.80	3.73	5.20		
pan	pan	0.001	5.30	5.20	0.00	Pan % < 0.063	5.20%
						Total	**100.00%**

Total (g)	102.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



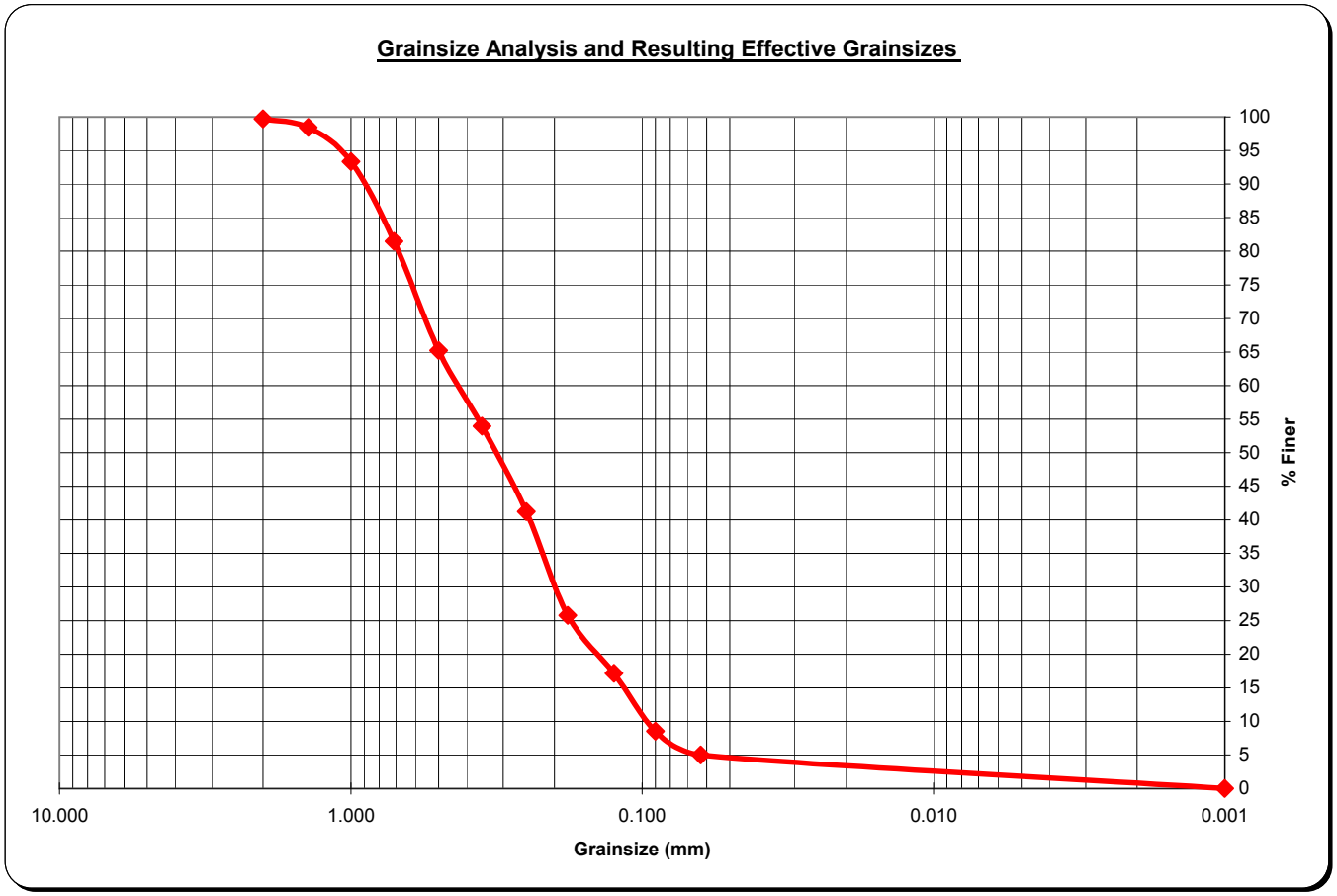
Sample ID:	ECP9-SB1
Sample Depth:	25-26 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	102.40 g
Total Sieve Weight:	102.10 g
Weight Loss:	0.3 g
Percent Loss:	0.29 %

6.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.29	99.71	coarse % > 0.5 mm	34.77%
	14	1.4	1.30	1.27	98.43		
	18	1.0	5.20	5.09	93.34		
	25	0.71	12.10	11.85	81.49		
	35	0.50	16.60	16.26	65.23		
medium	45	0.355	11.50	11.26	53.97	medium % 0.25 - 0.5 mm	24.00%
	60	0.250	13.00	12.73	41.23		
fine	80	0.180	15.80	15.48	25.76	Fine % 0.125 - 0.25	24.09%
	120	0.125	8.80	8.62	17.14		
silt	170	0.090	8.80	8.62	8.52	Silt % < 0.125	12.14%
	230	0.063	3.60	3.53	5.00		
pan	pan	0.001	5.10	5.00	0.00	Pan % < 0.063	5.00%
						Total	**100.00%**

Total (g)	**102.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



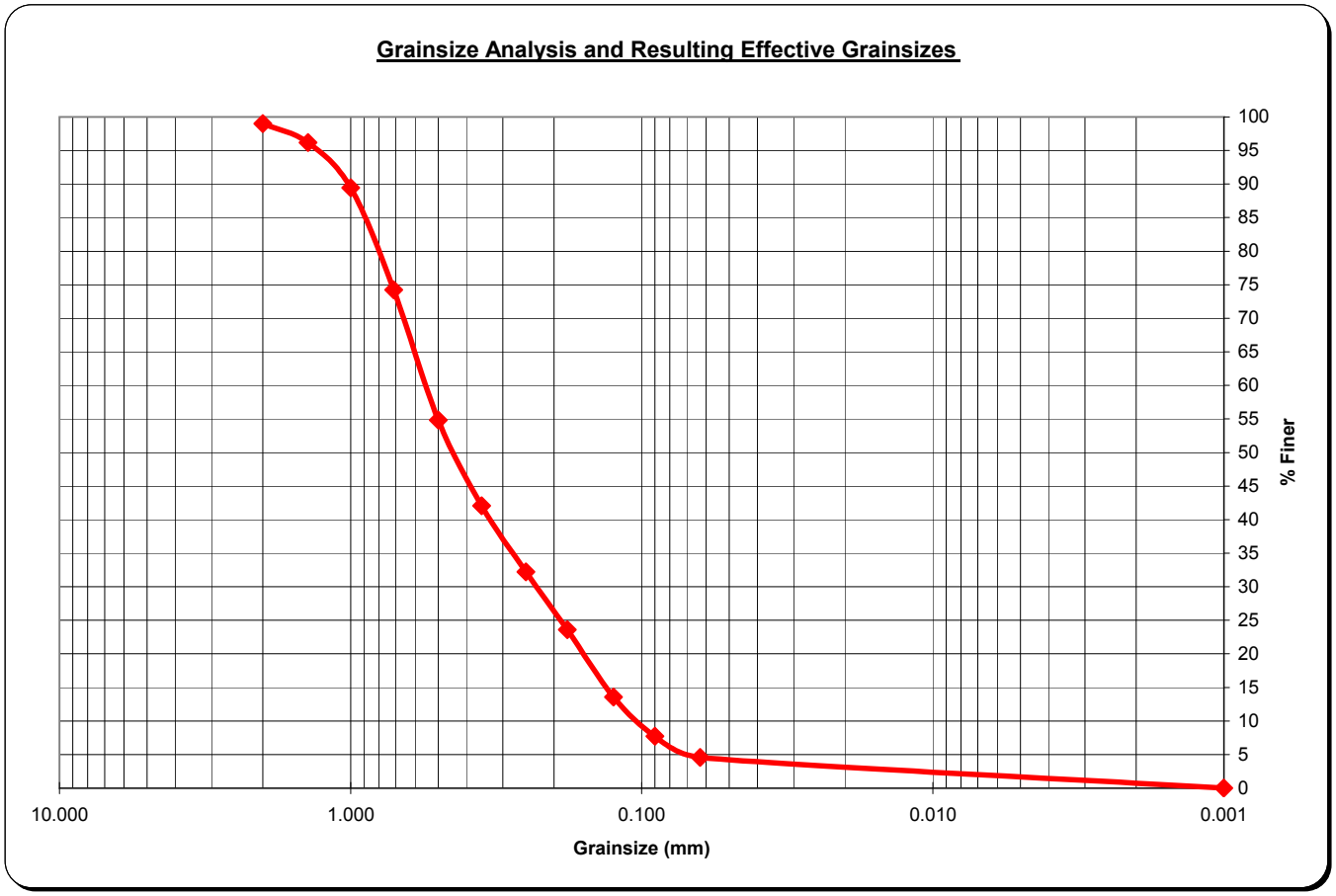
Sample ID:	ECP9-SB1
Sample Depth:	26-27 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	102.90 g
Total Sieve Weight:	102.50 g
Weight Loss:	0.4 g
Percent Loss:	0.39 %

6.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.00	0.98	99.02	coarse % > 0.5 mm	45.17%
	14	1.4	2.90	2.83	96.20		
	18	1.0	6.90	6.73	89.46		
	25	0.71	15.60	15.22	74.24		
	35	0.50	19.90	19.41	54.83		
medium	45	0.355	13.10	12.78	42.05	medium % 0.25 - 0.5 mm	22.63%
	60	0.250	10.10	9.85	32.20		
fine	80	0.180	8.80	8.59	23.61	Fine % 0.125 - 0.25	18.63%
	120	0.125	10.30	10.05	13.56		
silt	170	0.090	6.00	5.85	7.71	Silt % < 0.125	8.98%
	230	0.063	3.20	3.12	4.59		
pan	pan	0.001	4.70	4.59	0.00	Pan % < 0.063	4.59%
						Total	**100.00%**

Total (g)	**102.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



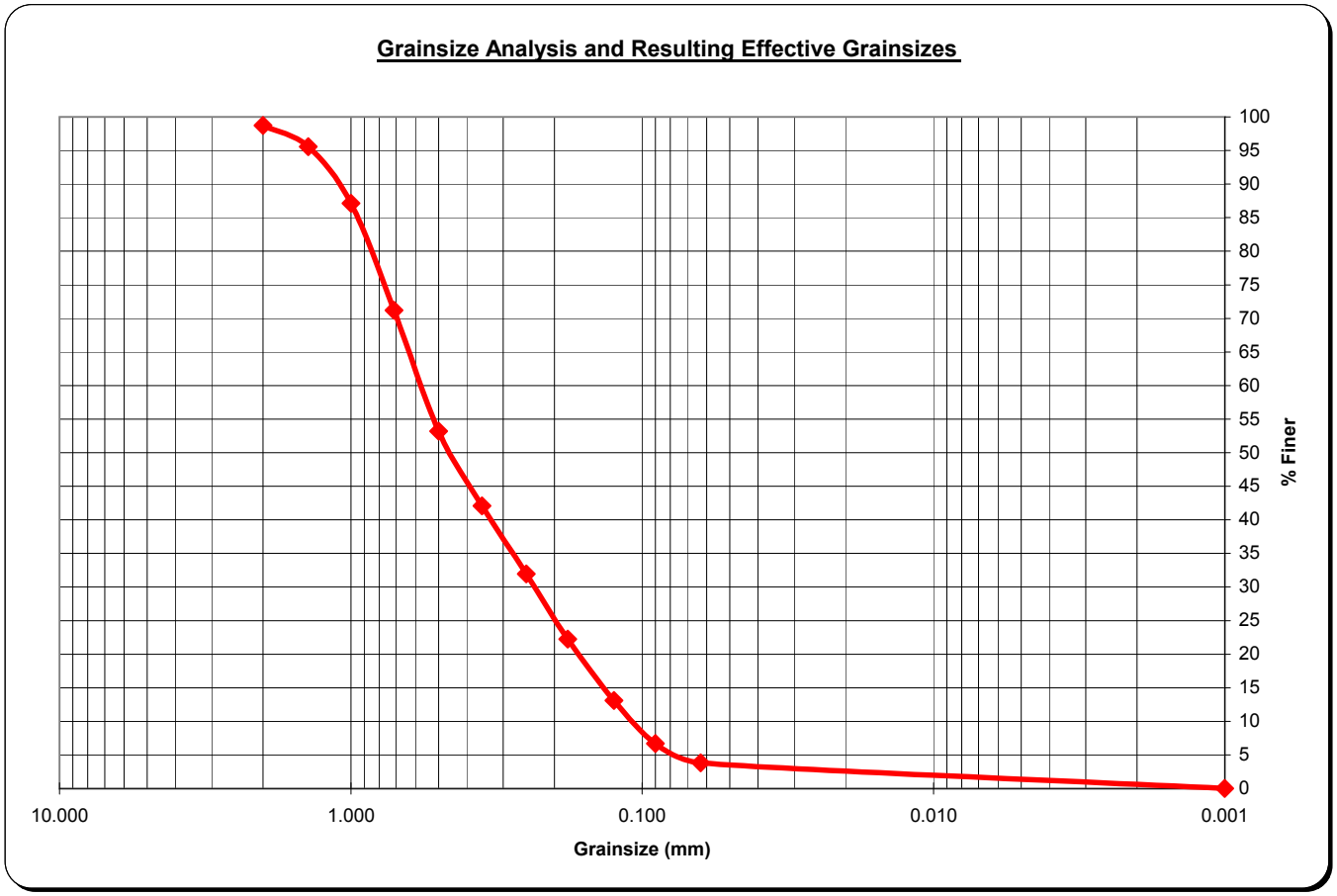
Sample ID:	ECP9-SB1	
Sample Depth:	27-28	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.20	g
Total Sieve Weight:	101.70	g
Weight Loss:	0.5	g
Percent Loss:	0.49	%

7.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.30	1.28	98.72	coarse % > 0.5 mm	46.80%
	14	1.4	3.20	3.15	95.58		
	18	1.0	8.60	8.46	87.12		
	25	0.71	16.20	15.93	71.19		
	35	0.50	18.30	17.99	53.20		
medium	45	0.355	11.30	11.11	42.08	medium % 0.25 - 0.5 mm	21.24%
	60	0.250	10.30	10.13	31.96		
fine	80	0.180	9.90	9.73	22.22	Fine % 0.125 - 0.25	18.88%
	120	0.125	9.30	9.14	13.08		
silt	170	0.090	6.50	6.39	6.69	Silt % < 0.125	9.24%
	230	0.063	2.90	2.85	3.83		
pan	pan	0.001	3.90	3.83	0.00	Pan % < 0.063	3.83%
						Total	**100.00%**

Total (g)	101.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



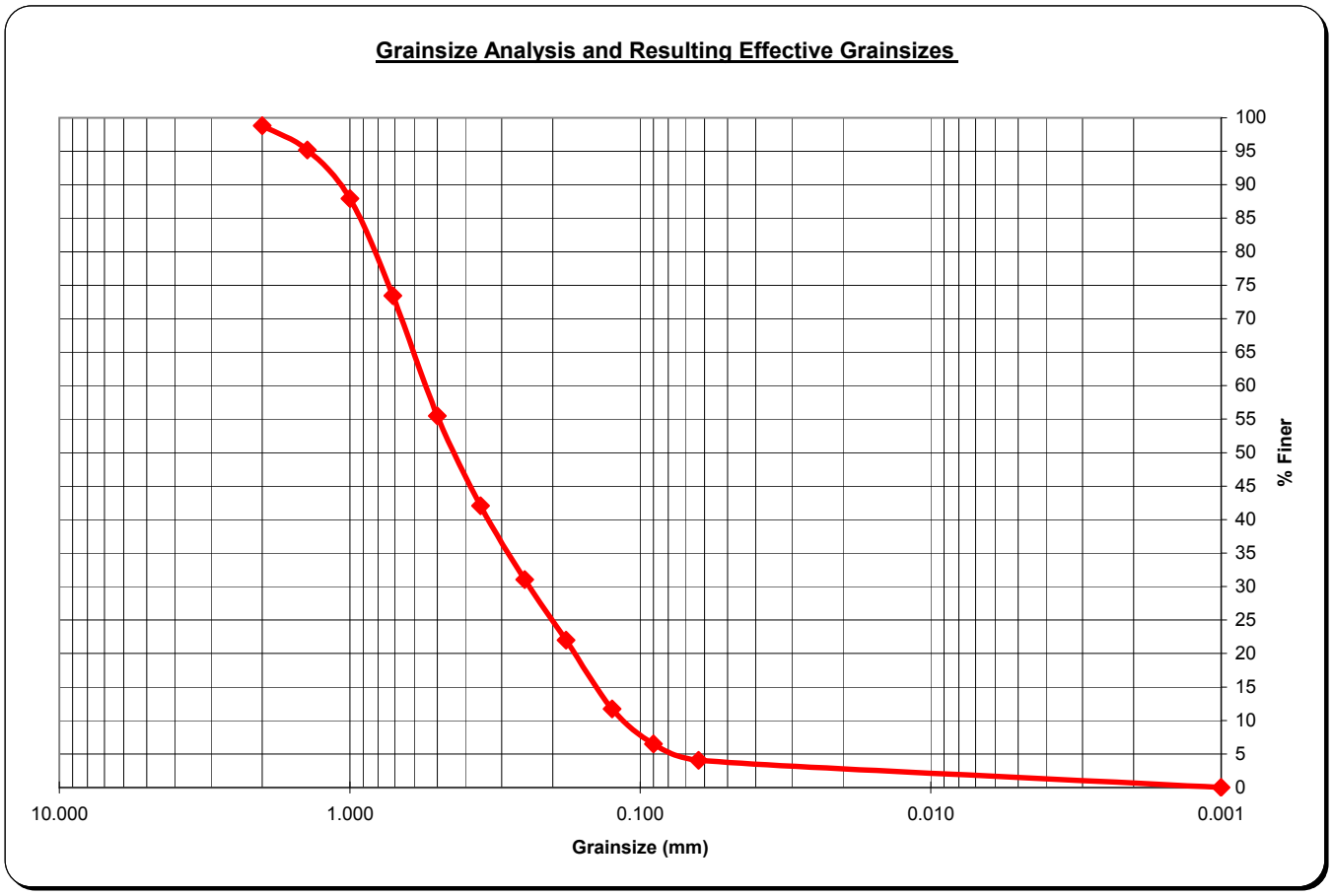
Sample ID:	ECP9-SB1	
Sample Depth:	28-29	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	94.00	g
Total Sieve Weight:	93.70	g
Weight Loss:	0.3	g
Percent Loss:	0.32	%

14.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.10	1.17	98.83	coarse % > 0.5 mm	44.50%
	14	1.4	3.40	3.63	95.20		
	18	1.0	6.80	7.26	87.94		
	25	0.71	13.60	14.51	73.43		
	35	0.50	16.80	17.93	55.50		
medium	45	0.355	12.60	13.45	42.05	medium % 0.25 - 0.5 mm	24.44%
	60	0.250	10.30	10.99	31.06		
fine	80	0.180	8.50	9.07	21.99	Fine % 0.125 - 0.25	19.32%
	120	0.125	9.60	10.25	11.74		
silt	170	0.090	4.90	5.23	6.51	Silt % < 0.125	7.68%
	230	0.063	2.30	2.45	4.06		
pan	pan	0.001	3.80	4.06	0.00	Pan % < 0.063	4.06%
						Total	**100.00%**

Total (g)	93.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



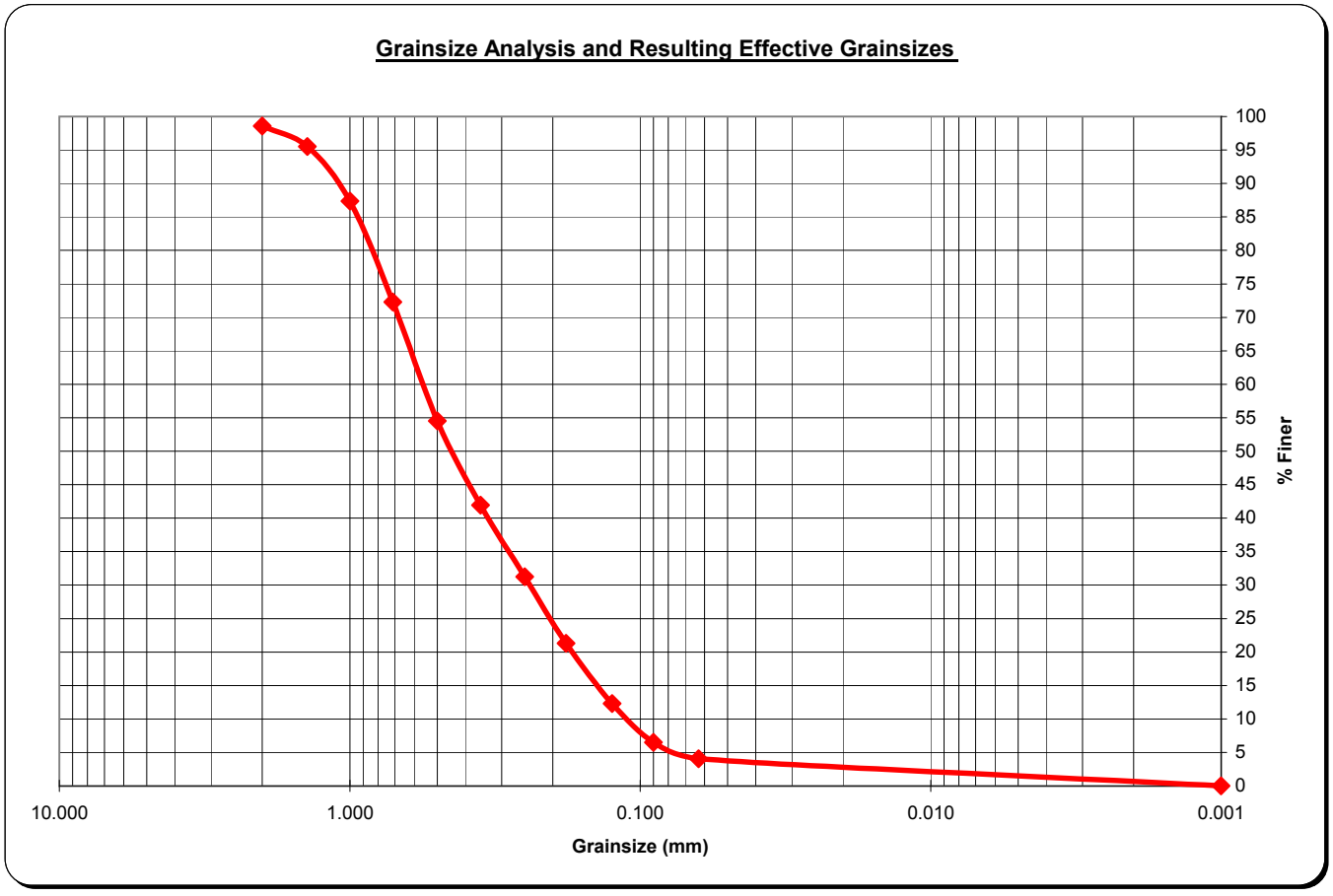
Sample ID:	ECP9-SB1
Sample Depth:	29-30 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.90 g
Total Sieve Weight:	93.50 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

14.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.30	1.39	98.61	coarse % > 0.5 mm	45.45%
	14	1.4	2.90	3.10	95.51		
	18	1.0	7.60	8.13	87.38		
	25	0.71	14.10	15.08	72.30		
	35	0.50	16.60	17.75	54.55		
medium	45	0.355	11.80	12.62	41.93	medium % 0.25 - 0.5 mm	23.32%
	60	0.250	10.00	10.70	31.23		
fine	80	0.180	9.30	9.95	21.28	Fine % 0.125 - 0.25	18.93%
	120	0.125	8.40	8.98	12.30		
silt	170	0.090	5.40	5.78	6.52	Silt % < 0.125	8.24%
	230	0.063	2.30	2.46	4.06		
pan	pan	0.001	3.80	4.06	0.00	Pan % < 0.063	4.06%
						Total	**100.00%**

Total (g)	**93.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



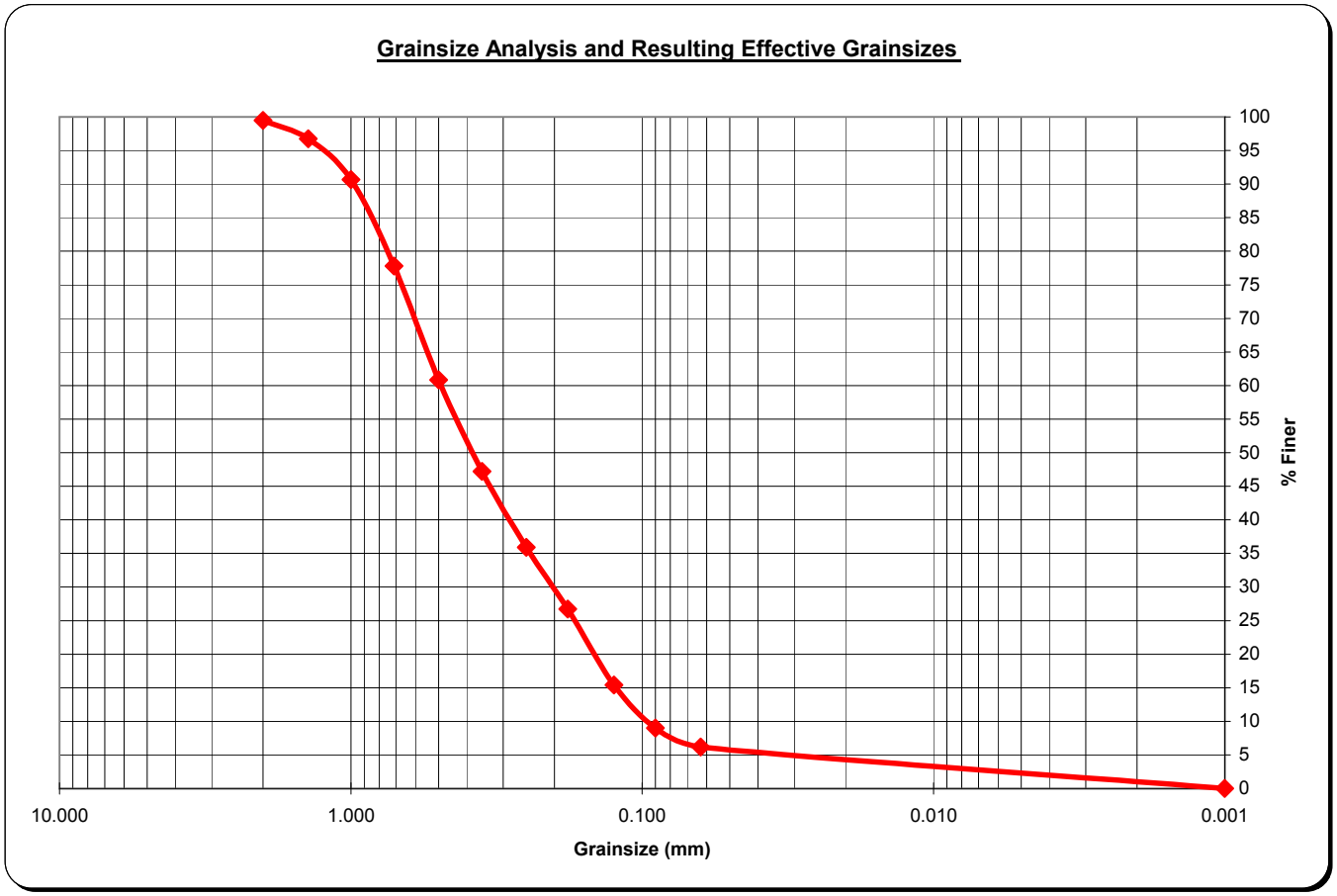
Sample ID:	ECP9-SB1
Sample Depth:	30-31 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.30 g
Total Sieve Weight:	95.50 g
Weight Loss:	-0.2 g
Percent Loss:	-0.21 %

13.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.50	0.52	99.48	coarse % > 0.5 mm	39.16%
	14	1.4	2.60	2.72	96.75		
	18	1.0	5.80	6.07	90.68		
	25	0.71	12.30	12.88	77.80		
	35	0.50	16.20	16.96	60.84		
medium	45	0.355	13.00	13.61	47.23	medium % 0.25 - 0.5 mm	24.92%
	60	0.250	10.80	11.31	35.92		
fine	80	0.180	8.80	9.21	26.70	Fine % 0.125 - 0.25	20.52%
	120	0.125	10.80	11.31	15.39		
silt	170	0.090	6.10	6.39	9.01	Silt % < 0.125	9.21%
	230	0.063	2.70	2.83	6.18		
pan	pan	0.001	5.90	6.18	0.00	Pan % < 0.063	6.18%
						Total	**100.00%**

Total (g)	95.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



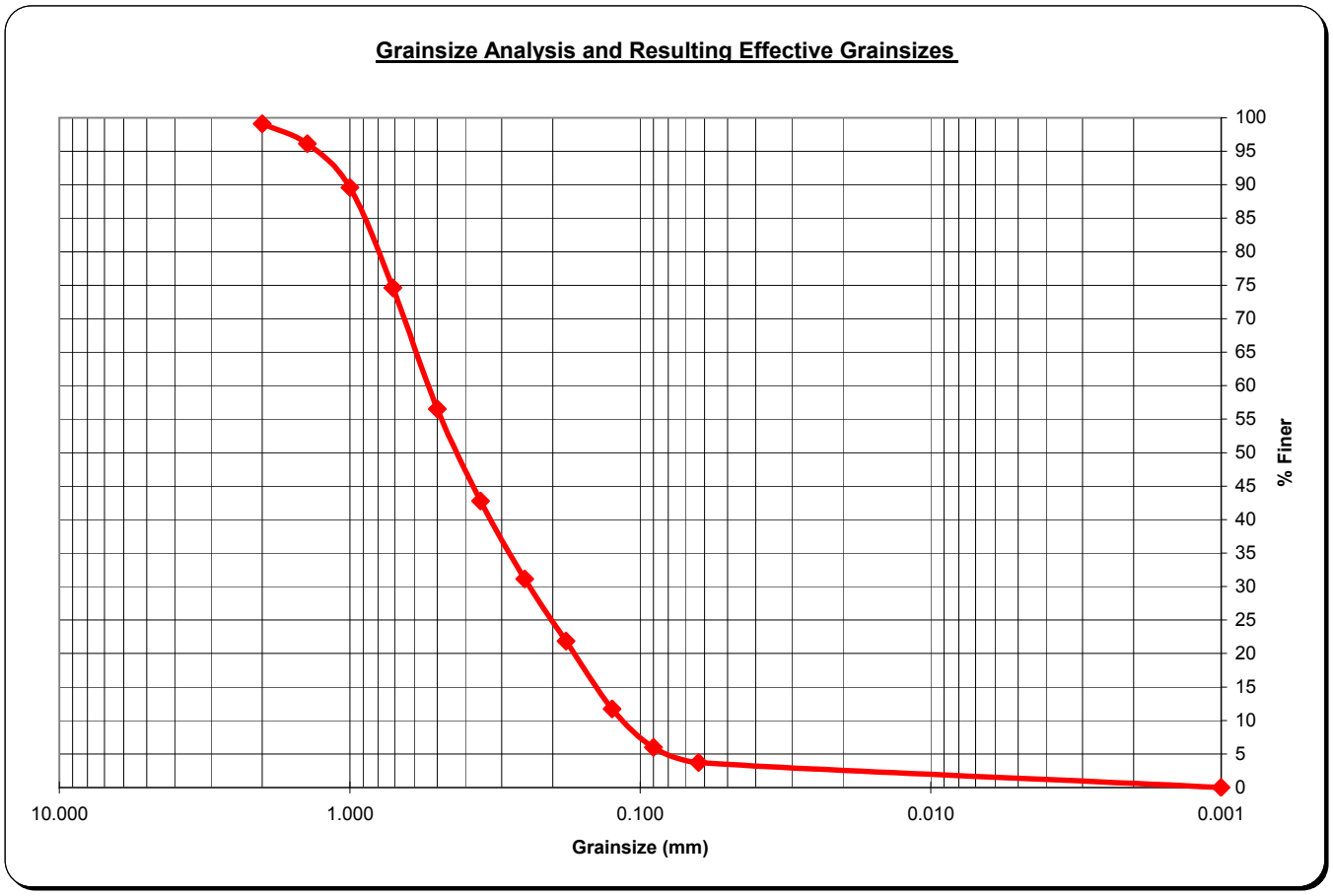
Sample ID:	ECP9-SB1
Sample Depth:	31-32 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.00 g
Total Sieve Weight:	98.90 g
Weight Loss:	0.1 g
Percent Loss:	0.10 %

10.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.90	0.91	99.09	coarse % > 0.5 mm	43.48%
	14	1.4	2.90	2.93	96.16		
	18	1.0	6.50	6.57	89.59		
	25	0.71	14.80	14.96	74.62		
	35	0.50	17.90	18.10	56.52		
medium	45	0.355	13.60	13.75	42.77	medium % 0.25 - 0.5 mm	25.38%
	60	0.250	11.50	11.63	31.14		
fine	80	0.180	9.20	9.30	21.84	Fine % 0.125 - 0.25	19.41%
	120	0.125	10.00	10.11	11.73		
silt	170	0.090	5.70	5.76	5.97	Silt % < 0.125	7.99%
	230	0.063	2.20	2.22	3.74		
pan	pan	0.001	3.70	3.74	0.00	Pan % < 0.063	3.74%
						Total	100.00%

Total (g)	98.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



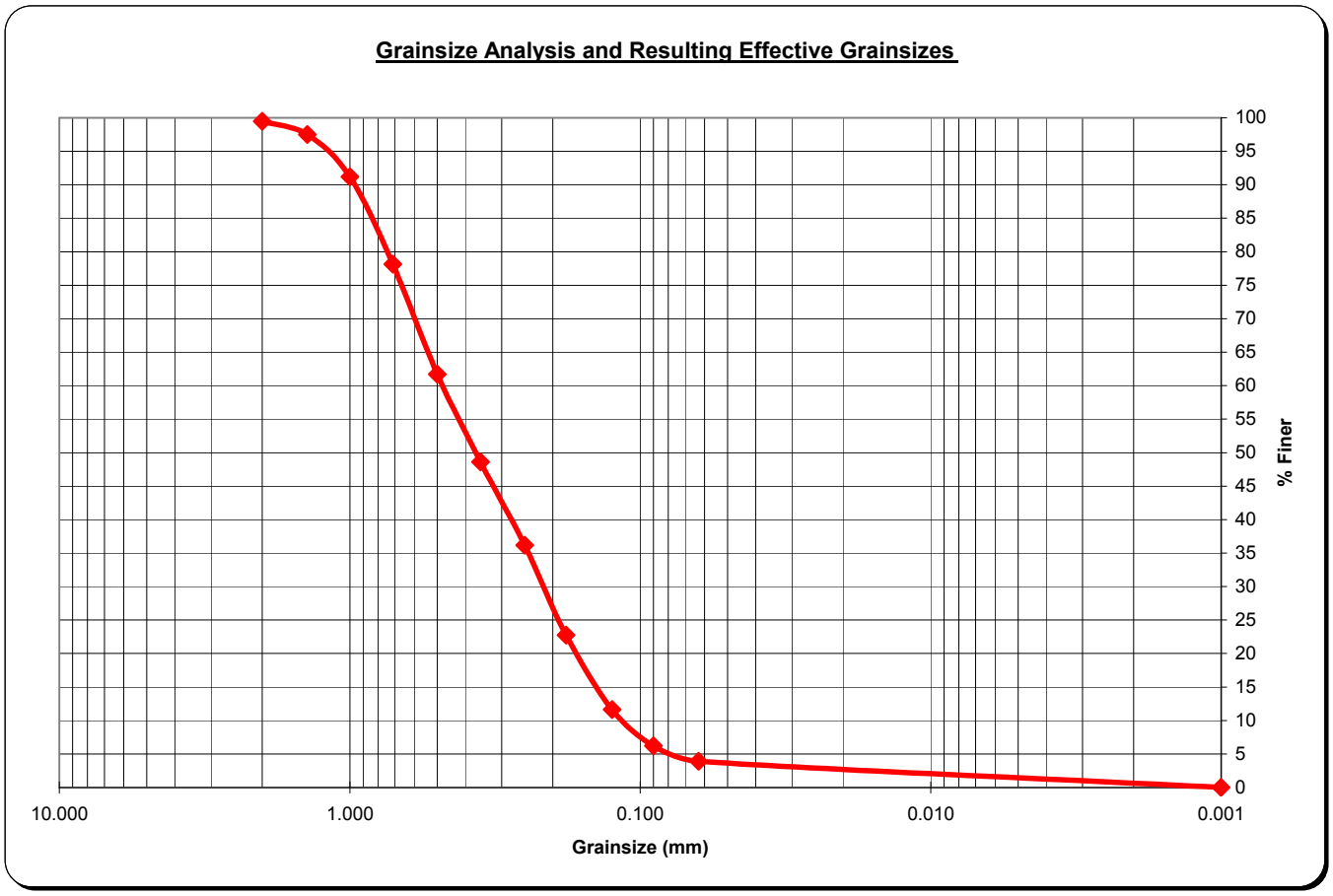
Sample ID:	ECP9-SB1
Sample Depth:	32-33 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	100.40 g
Total Sieve Weight:	99.80 g
Weight Loss:	0.6 g
Percent Loss:	0.60 %

8.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.50	0.50	99.50	coarse % > 0.5 mm	38.28%
	14	1.4	2.00	2.00	97.49		
	18	1.0	6.30	6.31	91.18		
	25	0.71	13.00	13.03	78.16		
	35	0.50	16.40	16.43	61.72		
medium	45	0.355	13.10	13.13	48.60	medium % 0.25 - 0.5 mm	25.55%
	60	0.250	12.40	12.42	36.17		
fine	80	0.180	13.40	13.43	22.75	Fine % 0.125 - 0.25	24.55%
	120	0.125	11.10	11.12	11.62		
silt	170	0.090	5.40	5.41	6.21	Silt % < 0.125	7.72%
	230	0.063	2.30	2.30	3.91		
pan	pan	0.001	3.90	3.91	0.00	Pan % < 0.063	3.91%
						Total	**100.00%**

Total (g)	99.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



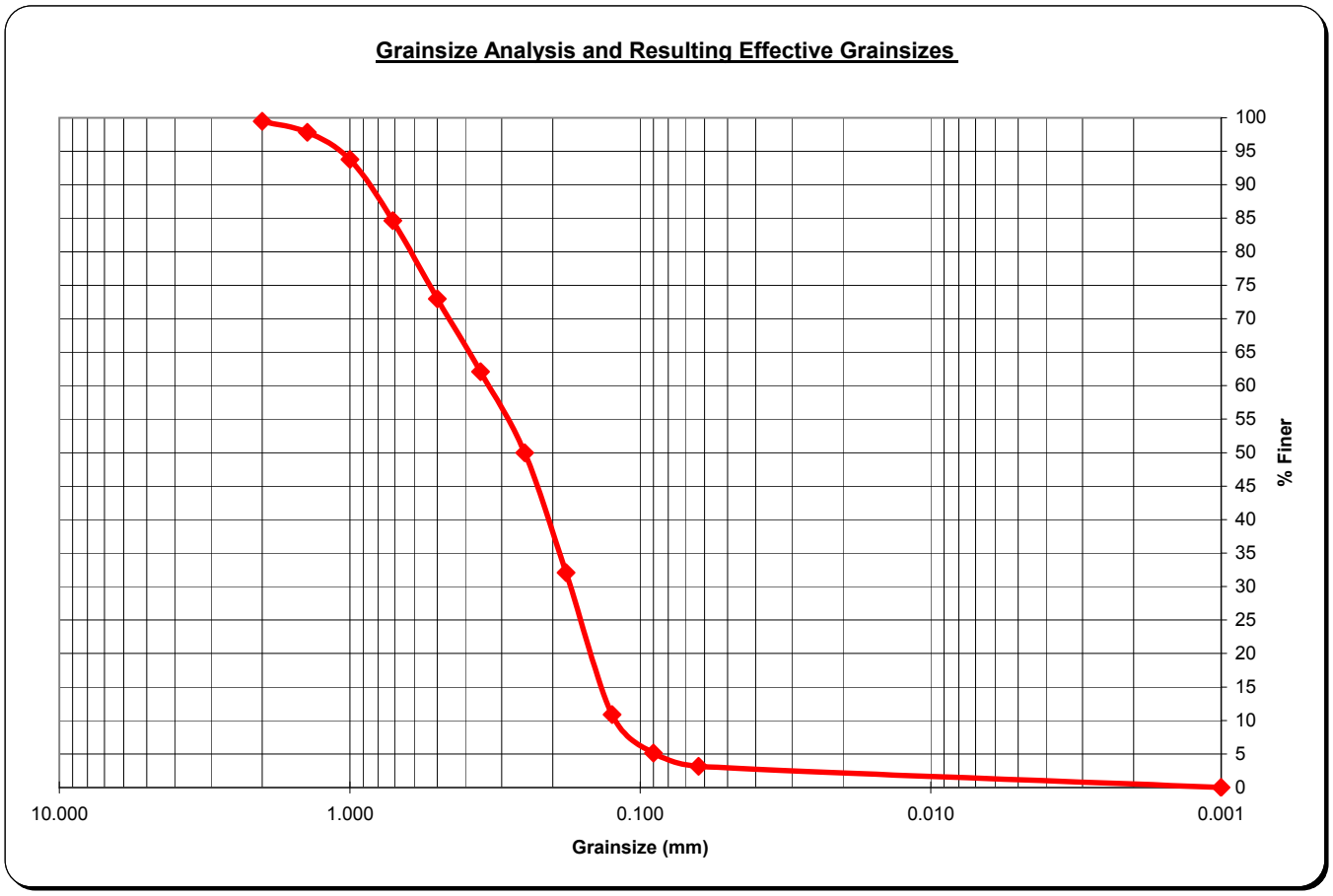
Sample ID:	ECP9-SB1	
Sample Depth:	33-34	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.10	g
Total Sieve Weight:	101.00	g
Weight Loss:	0.1	g
Percent Loss:	0.10	%

8.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.50	0.50	99.50	coarse % > 0.5 mm	27.03%
	14	1.4	1.70	1.68	97.82		
	18	1.0	4.10	4.06	93.76		
	25	0.71	9.20	9.11	84.65		
	35	0.50	11.80	11.68	72.97		
medium	45	0.355	11.00	10.89	62.08	medium % 0.25 - 0.5 mm	22.97%
	60	0.250	12.20	12.08	50.00		
fine	80	0.180	18.10	17.92	32.08	Fine % 0.125 - 0.25	39.11%
	120	0.125	21.40	21.19	10.89		
silt	170	0.090	5.80	5.74	5.15	Silt % < 0.125	7.72%
	230	0.063	2.00	1.98	3.17		
pan	pan	0.001	3.20	3.17	0.00	Pan % < 0.063	3.17%
						Total	100.00%

Total (g)	101.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



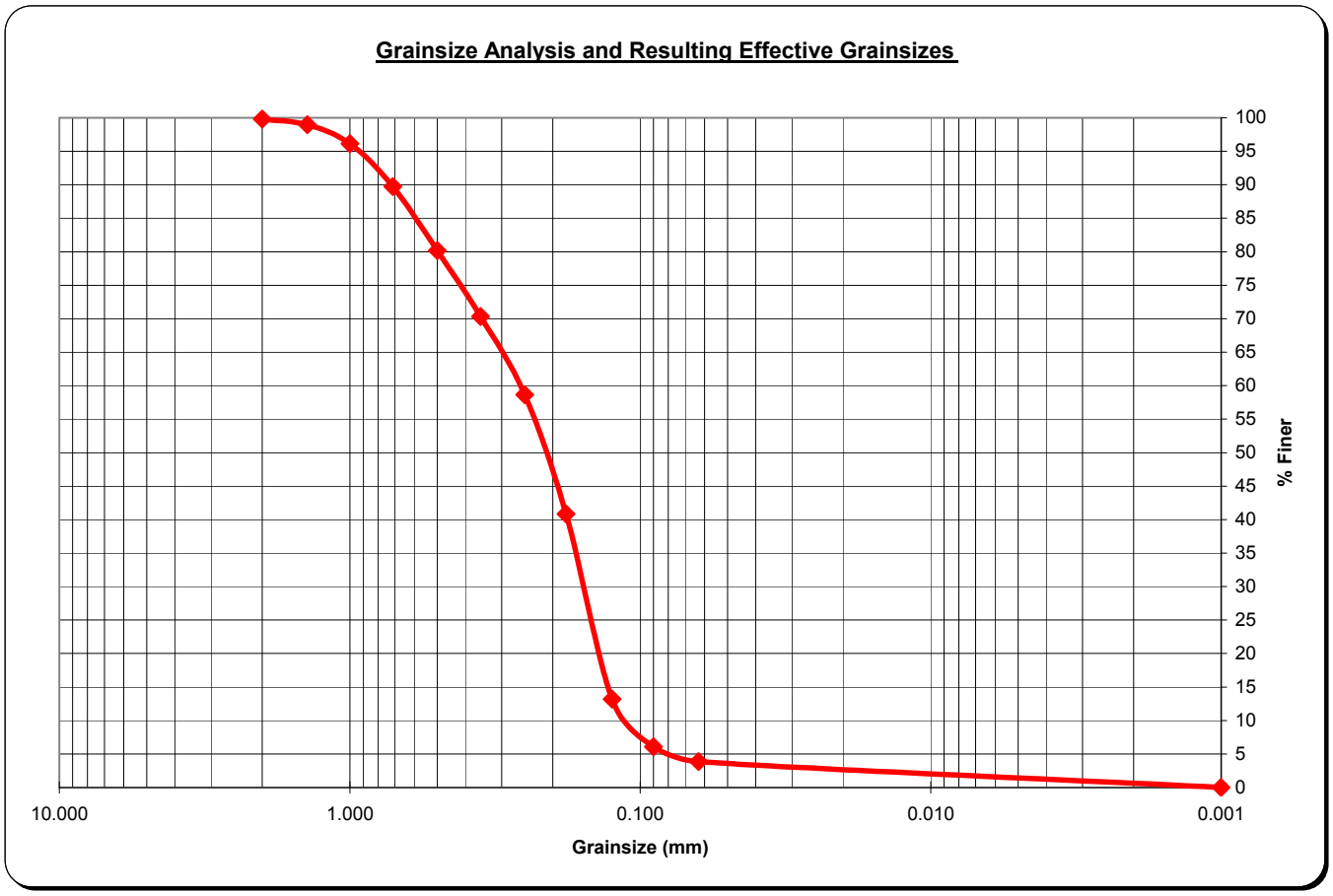
Sample ID:	ECP9-SB1
Sample Depth:	34-35 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.70 g
Total Sieve Weight:	98.40 g
Weight Loss:	1.3 g
Percent Loss:	1.30 %

9.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.20	99.80	coarse % > 0.5 mm	19.82%
	14	1.4	0.80	0.81	98.98		
	18	1.0	2.80	2.85	96.14		
	25	0.71	6.30	6.40	89.74		
	35	0.50	9.40	9.55	80.18		
medium	45	0.355	9.70	9.86	70.33	medium % 0.25 - 0.5 mm	21.54%
	60	0.250	11.50	11.69	58.64		
fine	80	0.180	17.50	17.78	40.85	Fine % 0.125 - 0.25	45.43%
	120	0.125	27.20	27.64	13.21		
silt	170	0.090	7.00	7.11	6.10	Silt % < 0.125	9.35%
	230	0.063	2.20	2.24	3.86		
pan	pan	0.001	3.80	3.86	0.00	Pan % < 0.063	3.86%
						Total	**100.00%**

Total (g)	98.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



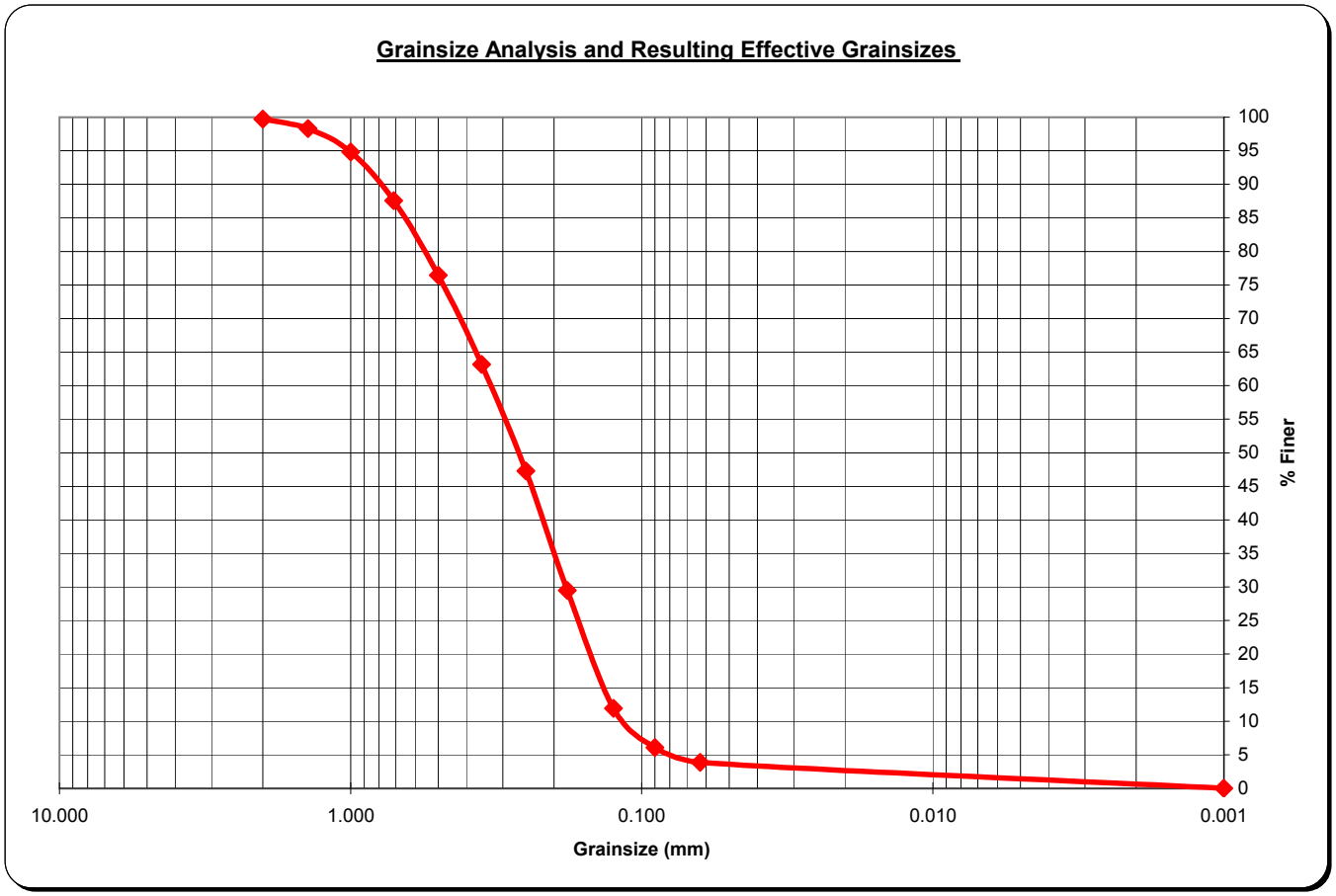
Sample ID:	ECP9-SB1	
Sample Depth:	35-36	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.00	g
Total Sieve Weight:	100.70	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

8.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.30	99.70	coarse % > 0.5 mm	23.54%
	14	1.4	1.40	1.39	98.31		
	18	1.0	3.50	3.48	94.84		
	25	0.71	7.30	7.25	87.59		
	35	0.50	11.20	11.12	76.46		
medium	45	0.355	13.40	13.31	63.16	medium % 0.25 - 0.5 mm	29.20%
	60	0.250	16.00	15.89	47.27		
fine	80	0.180	17.90	17.78	29.49	Fine % 0.125 - 0.25	35.35%
	120	0.125	17.70	17.58	11.92		
silt	170	0.090	5.90	5.86	6.06	Silt % < 0.125	8.04%
	230	0.063	2.20	2.18	3.87		
pan	pan	0.001	3.90	3.87	0.00	Pan % < 0.063	3.87%
						Total	100.00%

Total (g)	100.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



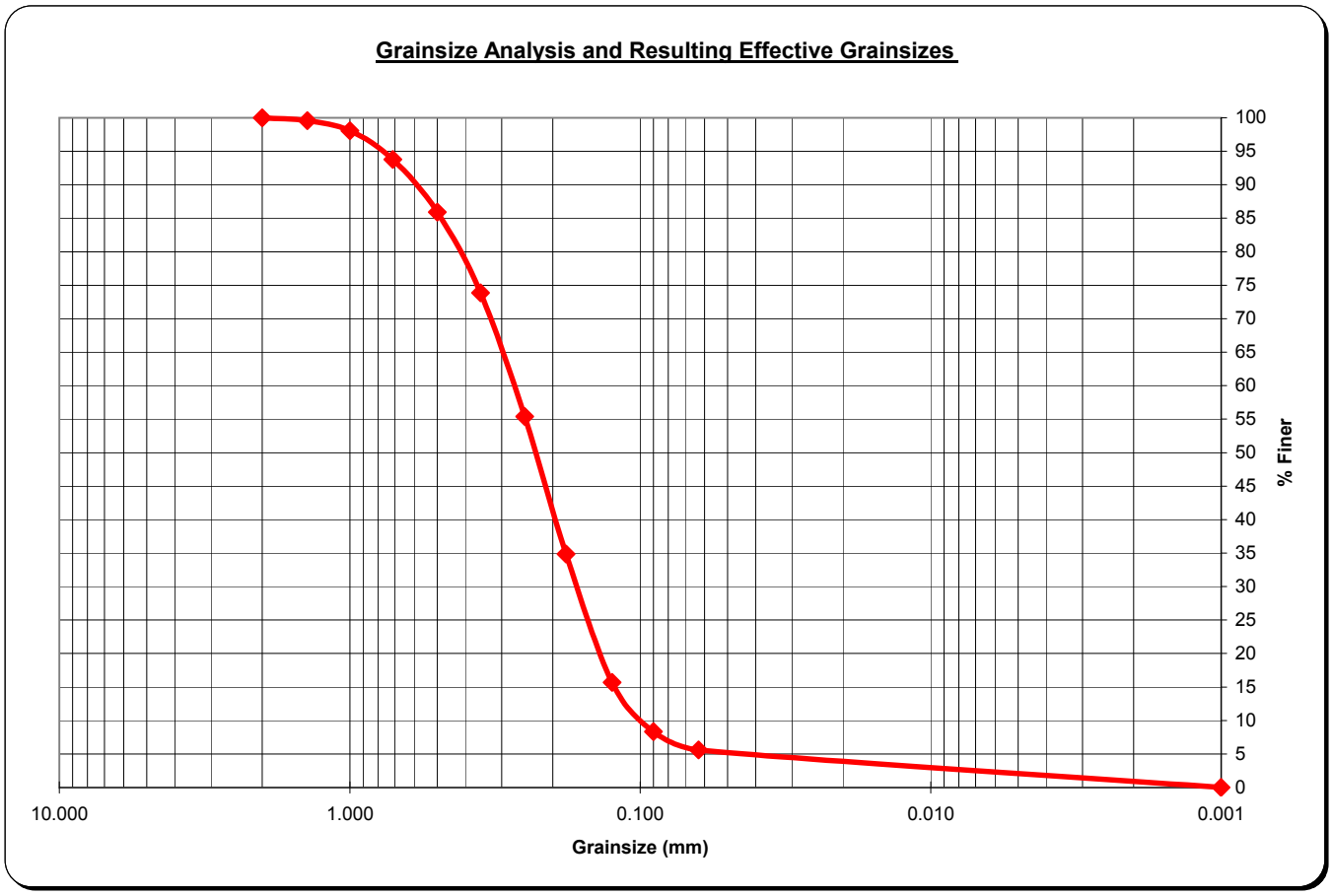
Sample ID:	ECP9-SB1
Sample Depth:	36-37 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.90 g
Total Sieve Weight:	99.50 g
Weight Loss:	0.4 g
Percent Loss:	0.40 %

9.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	14.07%
	14	1.4	0.40	0.40	99.60		
	18	1.0	1.50	1.51	98.09		
	25	0.71	4.30	4.32	93.77		
	35	0.50	7.80	7.84	85.93		
medium	45	0.355	12.00	12.06	73.87	medium % 0.25 - 0.5 mm	30.55%
	60	0.250	18.40	18.49	55.38		
fine	80	0.180	20.40	20.50	34.87	Fine % 0.125 - 0.25	39.70%
	120	0.125	19.10	19.20	15.68		
silt	170	0.090	7.30	7.34	8.34	Silt % < 0.125	10.05%
	230	0.063	2.70	2.71	5.63		
pan	pan	0.001	5.60	5.63	0.00	Pan % < 0.063	5.63%
						Total	**100.00%**

Total (g)	**99.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



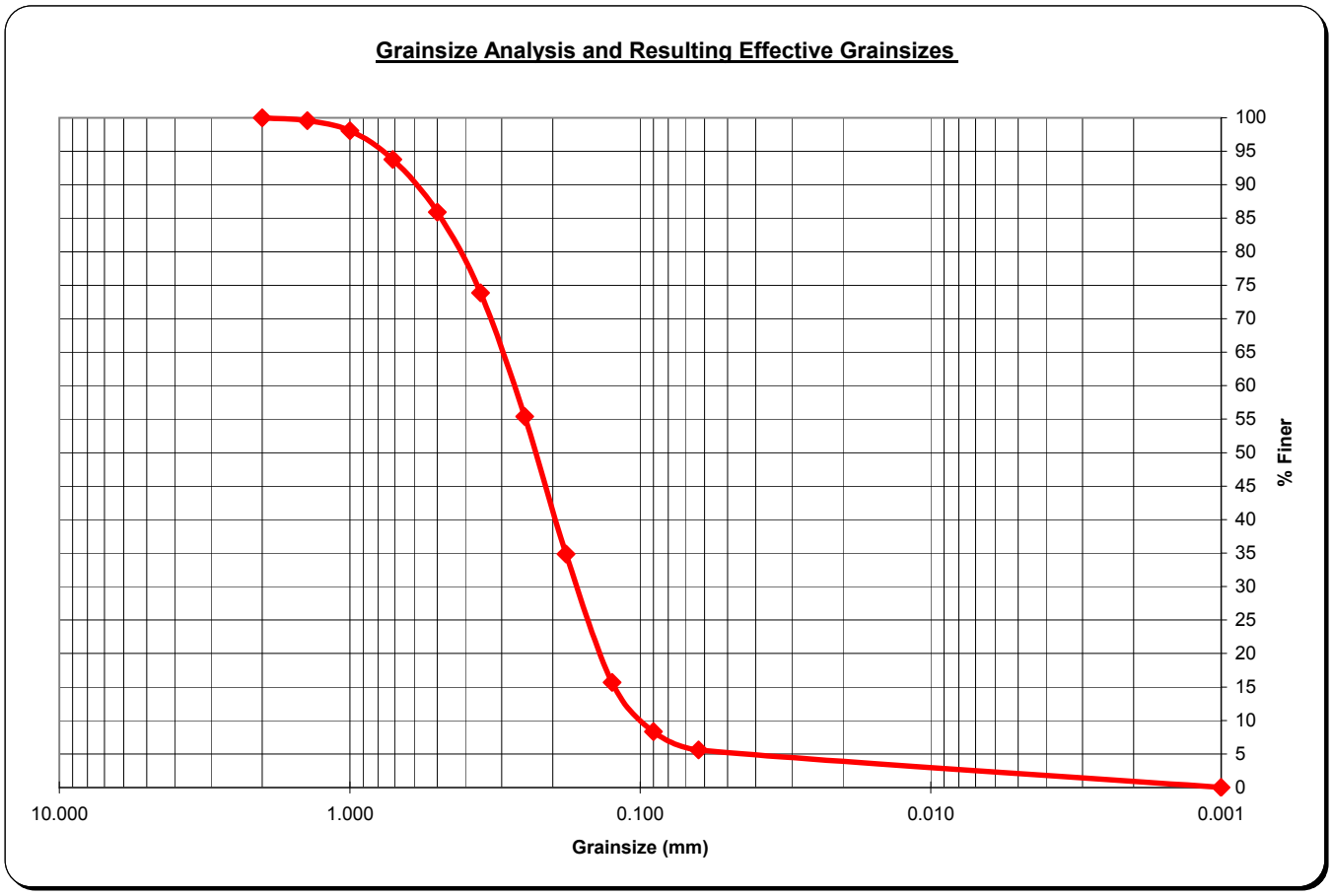
Sample ID:	ECP9-SB1
Sample Depth:	37-38 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	100.40 g
Total Sieve Weight:	99.50 g
Weight Loss:	0.9 g
Percent Loss:	0.90 %

8.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	15.98%
	14	1.4	0.30	0.30	99.60		
	18	1.0	1.50	1.51	98.09		
	25	0.71	4.70	4.72	93.37		
	35	0.50	9.30	9.35	84.02		
medium	45	0.355	13.10	13.17	70.85	medium % 0.25 - 0.5 mm	34.97%
	60	0.250	21.70	21.81	49.05		
fine	80	0.180	17.30	17.39	31.66	Fine % 0.125 - 0.25	29.75%
	120	0.125	12.30	12.36	19.30		
silt	170	0.090	7.10	7.14	12.16	Silt % < 0.125	11.36%
	230	0.063	4.20	4.22	7.94		
pan	pan	0.001	7.90	7.94	0.00	Pan % < 0.063	7.94%
						Total	**100.00%**

Total (g)	99.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



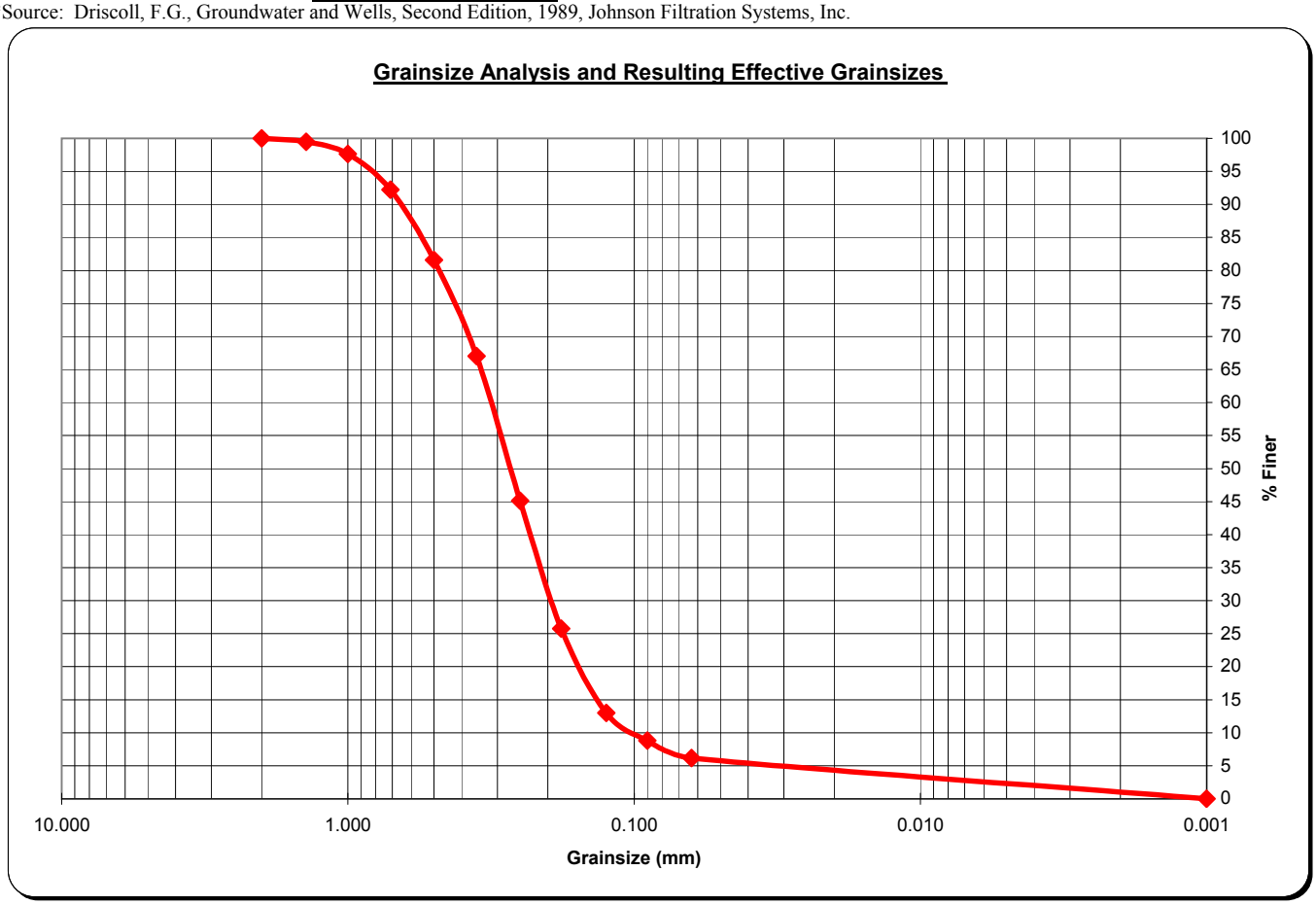
Sample ID:	ECP9-SB1
Sample Depth:	38-39 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.40 g
Total Sieve Weight:	94.00 g
Weight Loss:	0.4 g
Percent Loss:	0.42 %

14.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	18.40%
	14	1.4	0.50	0.53	99.47		
	18	1.0	1.70	1.81	97.66		
	25	0.71	5.10	5.43	92.23		
	35	0.50	10.00	10.64	81.60		
medium	45	0.355	13.70	14.57	67.02	medium % 0.25 - 0.5 mm	36.49%
	60	0.250	20.60	21.91	45.11		
fine	80	0.180	18.20	19.36	25.74	Fine % 0.125 - 0.25	32.13%
	120	0.125	12.00	12.77	12.98		
silt	170	0.090	3.90	4.15	8.83	Silt % < 0.125	6.81%
	230	0.063	2.50	2.66	6.17		
pan	pan	0.001	5.80	6.17	0.00	Pan % < 0.063	6.17%
						Total	**100.00%**

Total (g)	**94.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



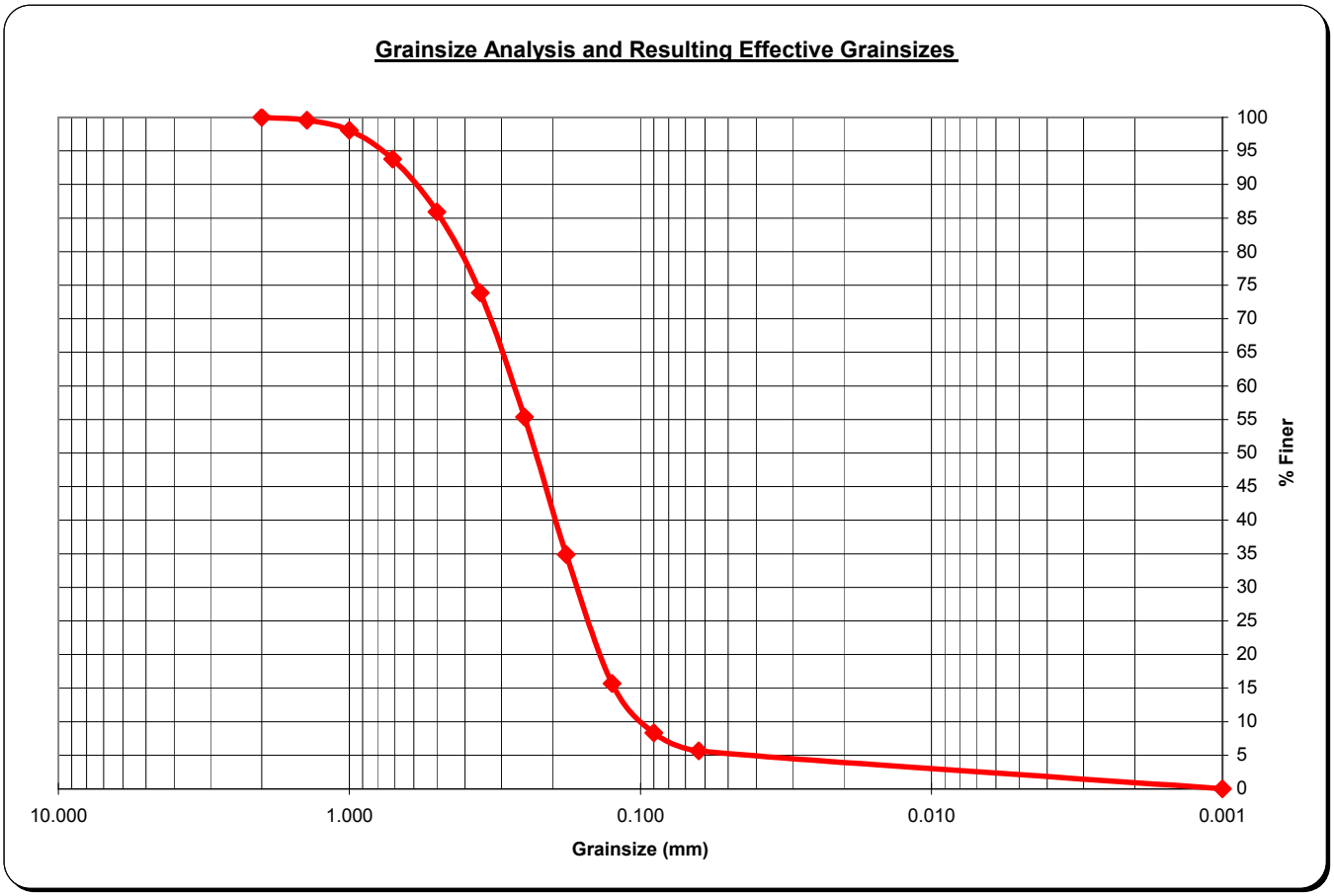
Sample ID:	ECP9-SB1	
Sample Depth:	39-40	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	94.80	g
Total Sieve Weight:	94.10	g
Weight Loss:	0.7	g
Percent Loss:	0.74	%

13.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	19.34%
	14	1.4	0.50	0.53	99.36		
	18	1.0	1.60	1.70	97.66		
	25	0.71	5.20	5.53	92.14		
	35	0.50	10.80	11.48	80.66		
medium	45	0.355	13.60	14.45	66.21	medium % 0.25 - 0.5 mm	37.19%
	60	0.250	21.40	22.74	43.46		
fine	80	0.180	23.50	24.97	18.49	Fine % 0.125 - 0.25	36.34%
	120	0.125	10.70	11.37	7.12		
silt	170	0.090	2.20	2.34	4.78	Silt % < 0.125	3.83%
	230	0.063	1.40	1.49	3.29		
pan	pan	0.001	3.10	3.29	0.00	Pan % < 0.063	3.29%
						Total	**100.00%**

Total (g)	94.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



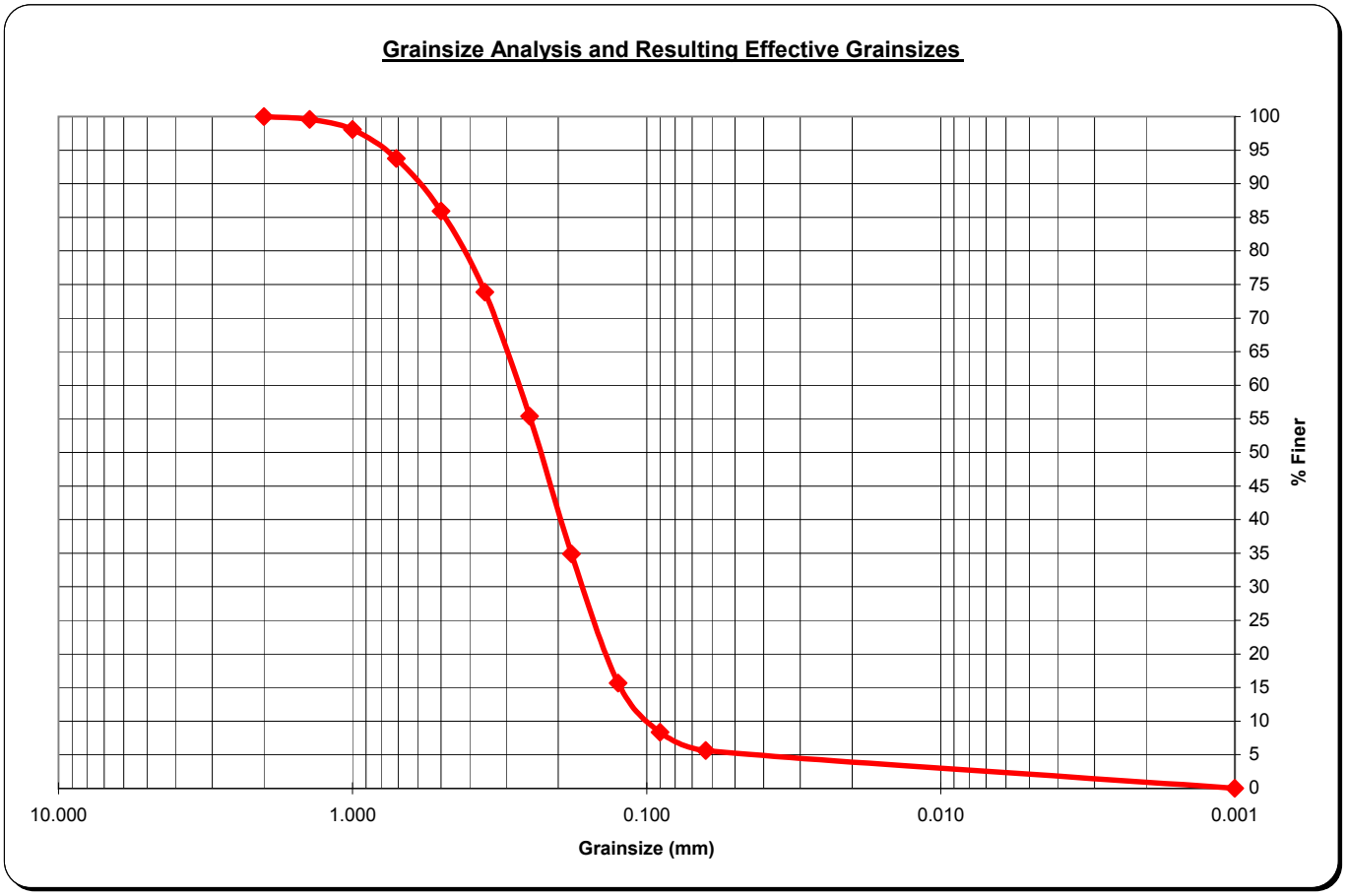
Sample ID:	ECP9-SB1
Sample Depth:	40-41 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	97.40 g
Total Sieve Weight:	97.00 g
Weight Loss:	0.4 g
Percent Loss:	0.41 %

11.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	16.19%
	14	1.4	0.40	0.41	99.48		
	18	1.0	1.60	1.65	97.84		
	25	0.71	4.50	4.64	93.20		
	35	0.50	9.10	9.38	83.81		
medium	45	0.355	11.40	11.75	72.06	medium % 0.25 - 0.5 mm	32.68%
	60	0.250	20.30	20.93	51.13		
fine	80	0.180	27.80	28.66	22.47	Fine % 0.125 - 0.25	41.86%
	120	0.125	12.80	13.20	9.28		
silt	170	0.090	3.30	3.40	5.88	Silt % < 0.125	5.36%
	230	0.063	1.90	1.96	3.92		
pan	pan	0.001	3.80	3.92	0.00	Pan % < 0.063	3.92%
						Total	**100.00%**

Total (g)	**97.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



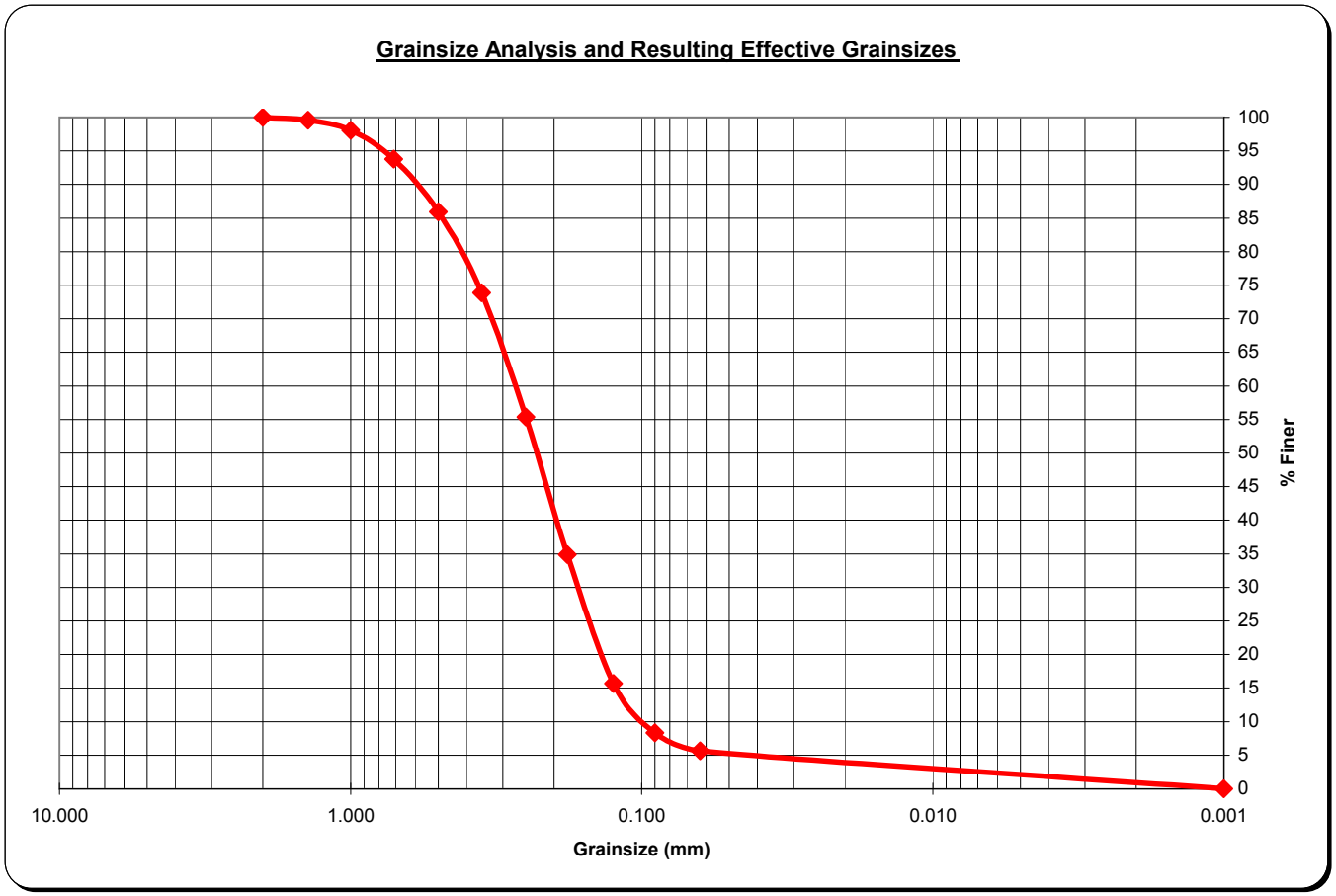
Sample ID:	ECP9-SB1
Sample Depth:	41-42 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.70 g
Total Sieve Weight:	97.90 g
Weight Loss:	0.8 g
Percent Loss:	0.81 %

10.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	13.79%
	14	1.4	0.50	0.51	99.39		
	18	1.0	1.30	1.33	98.06		
	25	0.71	3.90	3.98	94.08		
	35	0.50	7.70	7.87	86.21		
medium	45	0.355	10.00	10.21	76.00	medium % 0.25 - 0.5 mm	28.29%
	60	0.250	17.70	18.08	57.92		
fine	80	0.180	26.90	27.48	30.44	Fine % 0.125 - 0.25	47.29%
	120	0.125	19.40	19.82	10.62		
silt	170	0.090	3.80	3.88	6.74	Silt % < 0.125	5.92%
	230	0.063	2.00	2.04	4.70		
pan	pan	0.001	4.60	4.70	0.00	Pan % < 0.063	4.70%
						Total	**100.00%**

Total (g)	**97.90**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



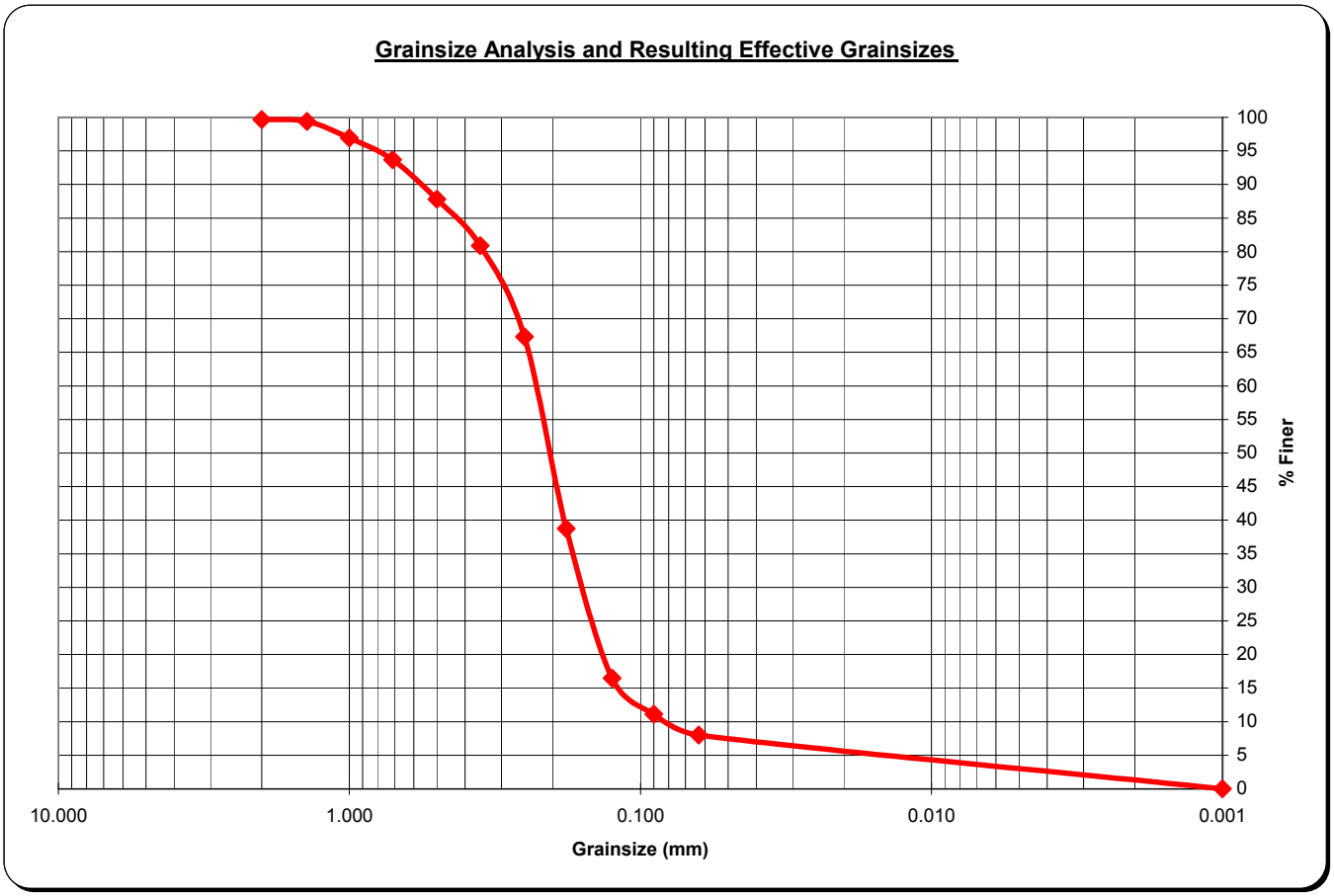
Sample ID:	ECP9-SB1	
Sample Depth:	42-43	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	96.30	g
Total Sieve Weight:	95.20	g
Weight Loss:	1.1	g
Percent Loss:	1.14	%

12.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.32	99.68	coarse % > 0.5 mm	12.18%
	14	1.4	0.30	0.32	99.37		
	18	1.0	2.30	2.42	96.95		
	25	0.71	3.10	3.26	93.70		
	35	0.50	5.60	5.88	87.82		
medium	45	0.355	6.60	6.93	80.88	medium % 0.25 - 0.5 mm	20.48%
	60	0.250	12.90	13.55	67.33		
fine	80	0.180	27.20	28.57	38.76	Fine % 0.125 - 0.25	50.84%
	120	0.125	21.20	22.27	16.49		
silt	170	0.090	5.10	5.36	11.13	Silt % < 0.125	8.51%
	230	0.063	3.00	3.15	7.98		
pan	pan	0.001	7.60	7.98	0.00	Pan % < 0.063	7.98%
						Total	100.00%

Total (g)	95.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



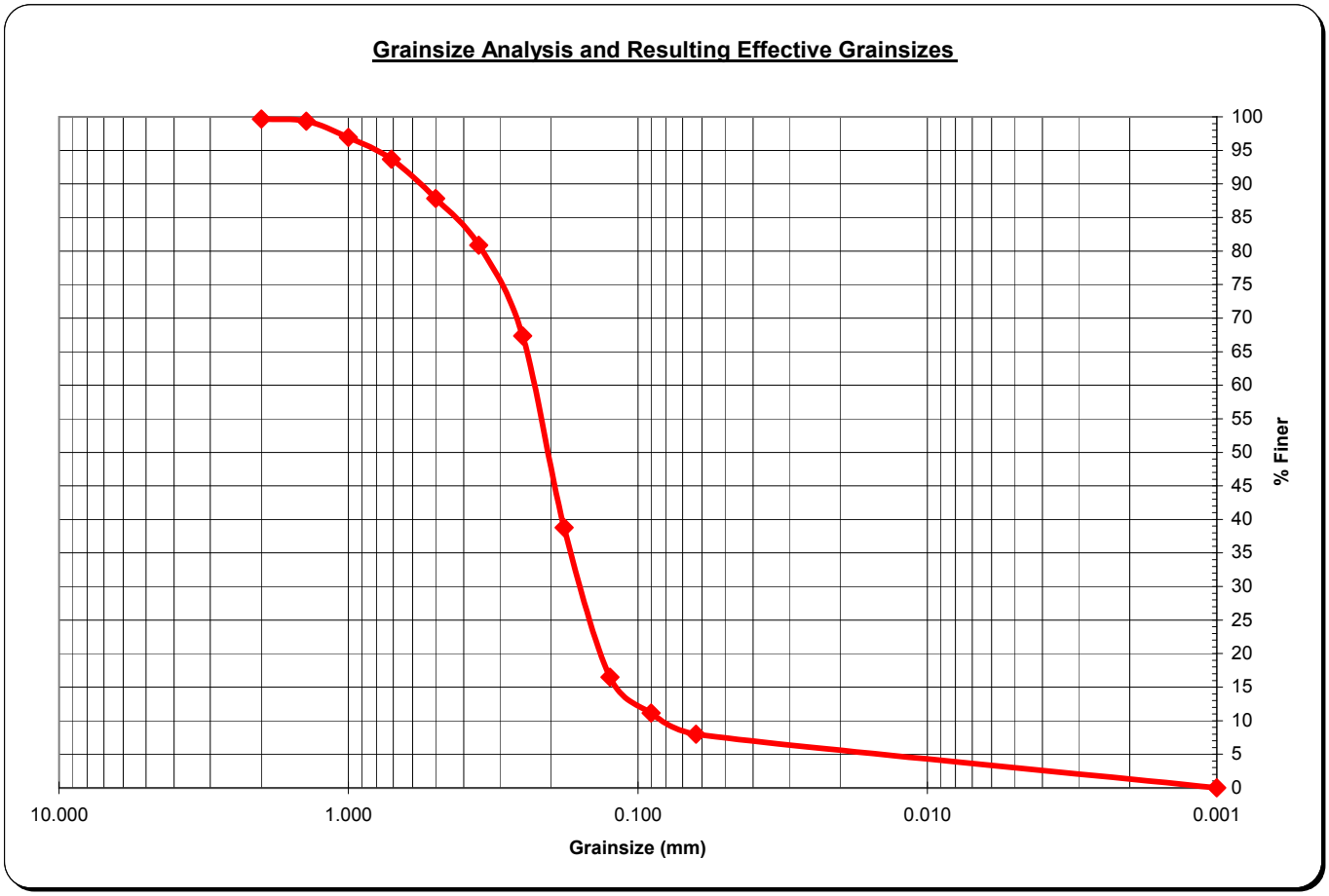
Sample ID:	ECP9-SB1	
Sample Depth:	43-44	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	97.40	g
Total Sieve Weight:	96.70	g
Weight Loss:	0.7	g
Percent Loss:	0.72	%

11.45 % Moisture

	Sieve number	2.36	Weight (g)	Weight %	100	Grain-Size	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	5.38%
	14	1.4	0.20	0.21	99.69		
	18	1.0	0.60	0.62	99.07		
	25	0.71	1.40	1.45	97.62		
	35	0.50	2.90	3.00	94.62		
medium	45	0.355	5.20	5.38	89.25	medium % 0.25 - 0.5 mm	24.51%
	60	0.250	18.50	19.13	70.11		
fine	80	0.180	34.40	35.57	34.54	Fine % 0.125 - 0.25	55.84%
	120	0.125	19.60	20.27	14.27		
silt	170	0.090	3.70	3.83	10.44	Silt % < 0.125	6.51%
	230	0.063	2.60	2.69	7.76		
pan	pan	0.001	7.50	7.76	0.00	Pan % < 0.063	7.76%
						Total	**100.00%**

Total (g)	96.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



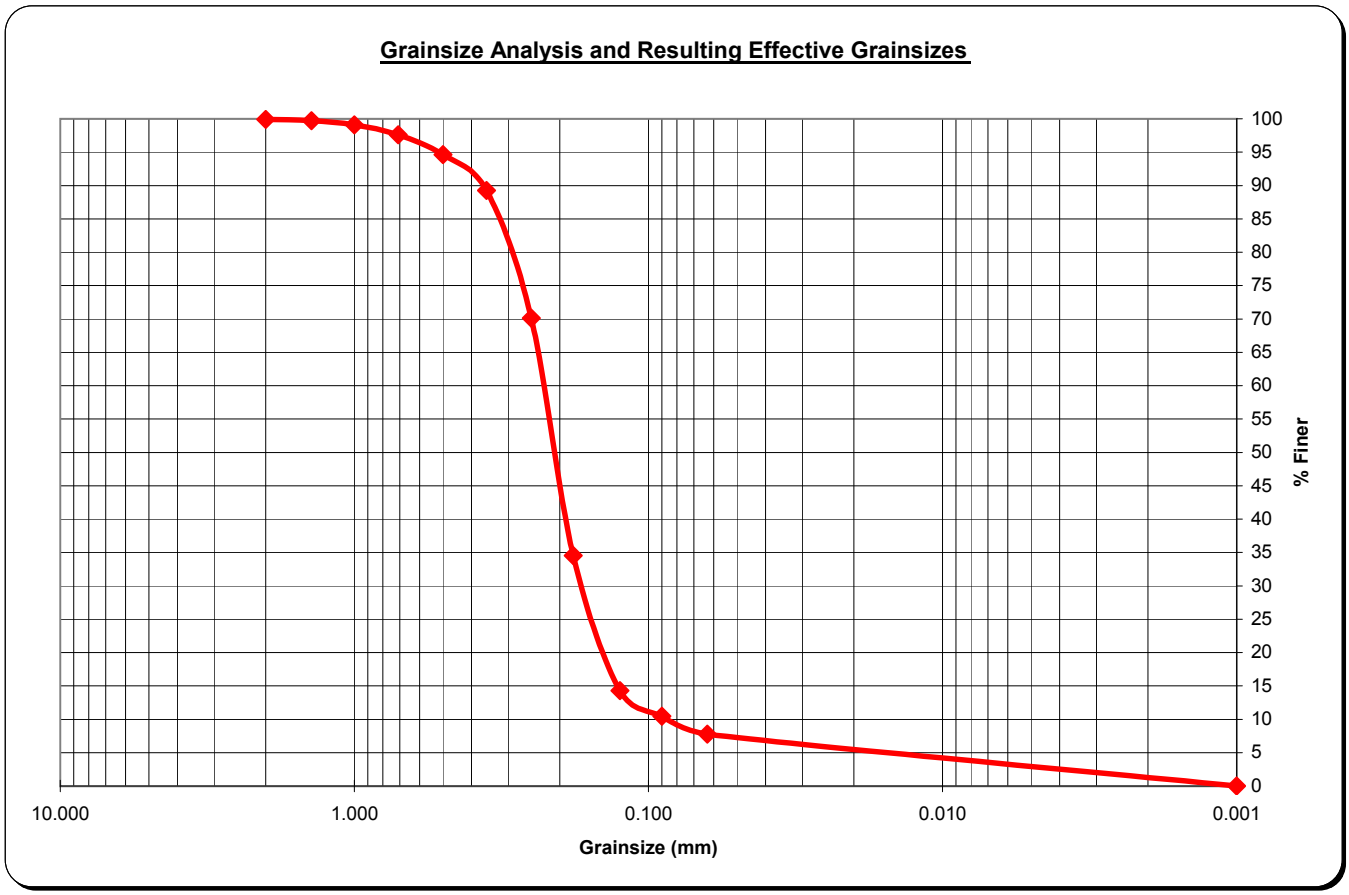
Sample ID:	ECP9-SB1
Sample Depth:	44-45 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.50 g
Total Sieve Weight:	98.10 g
Weight Loss:	0.4 g
Percent Loss:	0.41 %

10.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.20	99.80	coarse % > 0.5 mm	4.79%
	14	1.4	0.20	0.20	99.59		
	18	1.0	0.50	0.51	99.08		
	25	0.71	1.30	1.33	97.76		
	35	0.50	2.50	2.55	95.21		
medium	45	0.355	6.40	6.52	88.69	medium % 0.25 - 0.5 mm	33.03%
	60	0.250	26.00	26.50	62.18		
fine	80	0.180	33.60	34.25	27.93	Fine % 0.125 - 0.25	52.19%
	120	0.125	17.60	17.94	9.99		
silt	170	0.090	2.30	2.34	7.65	Silt % < 0.125	4.28%
	230	0.063	1.90	1.94	5.71		
pan	pan	0.001	5.60	5.71	0.00	Pan % < 0.063	5.71%
						Total	**100.00%**

Total (g)	98.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



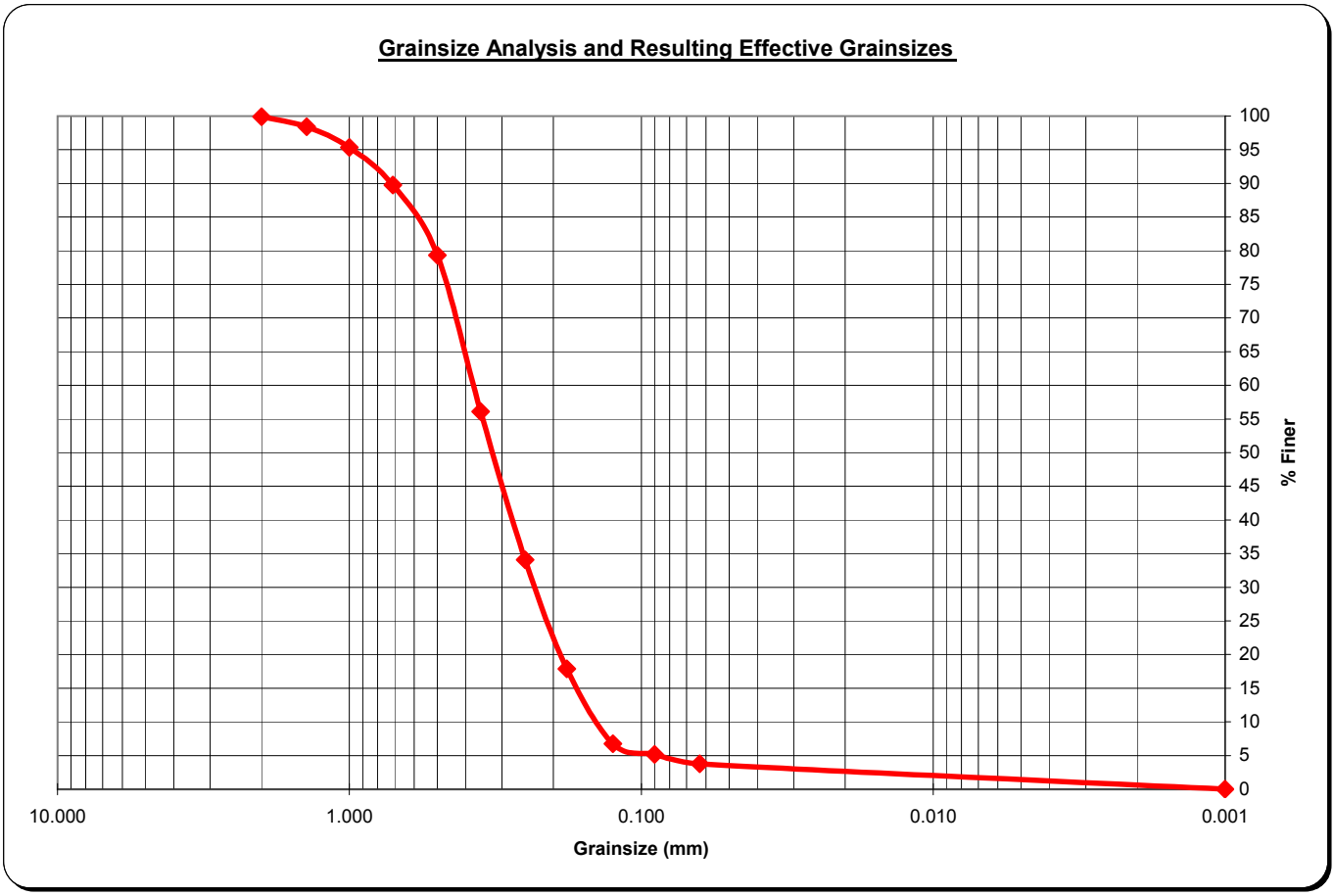
Sample ID:	ECP9-SB1	
Sample Depth:	45-46	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	101.00	g
Total Sieve Weight:	100.70	g
Weight Loss:	0.3	g
Percent Loss:	0.30	%

8.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	20.66%
	14	1.4	1.50	1.49	98.41		
	18	1.0	3.10	3.08	95.33		
	25	0.71	5.60	5.56	89.77		
	35	0.50	10.50	10.43	79.34		
medium	45	0.355	23.40	23.24	56.11	medium % 0.25 - 0.5 mm	45.28%
	60	0.250	22.20	22.05	34.06		
fine	80	0.180	16.30	16.19	17.87	Fine % 0.125 - 0.25	27.31%
	120	0.125	11.20	11.12	6.75		
silt	170	0.090	1.60	1.59	5.16	Silt % < 0.125	2.98%
	230	0.063	1.40	1.39	3.77		
pan	pan	0.001	3.80	3.77	0.00	Pan % < 0.063	3.77%
						Total	**100.00%**

Total (g)	**100.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



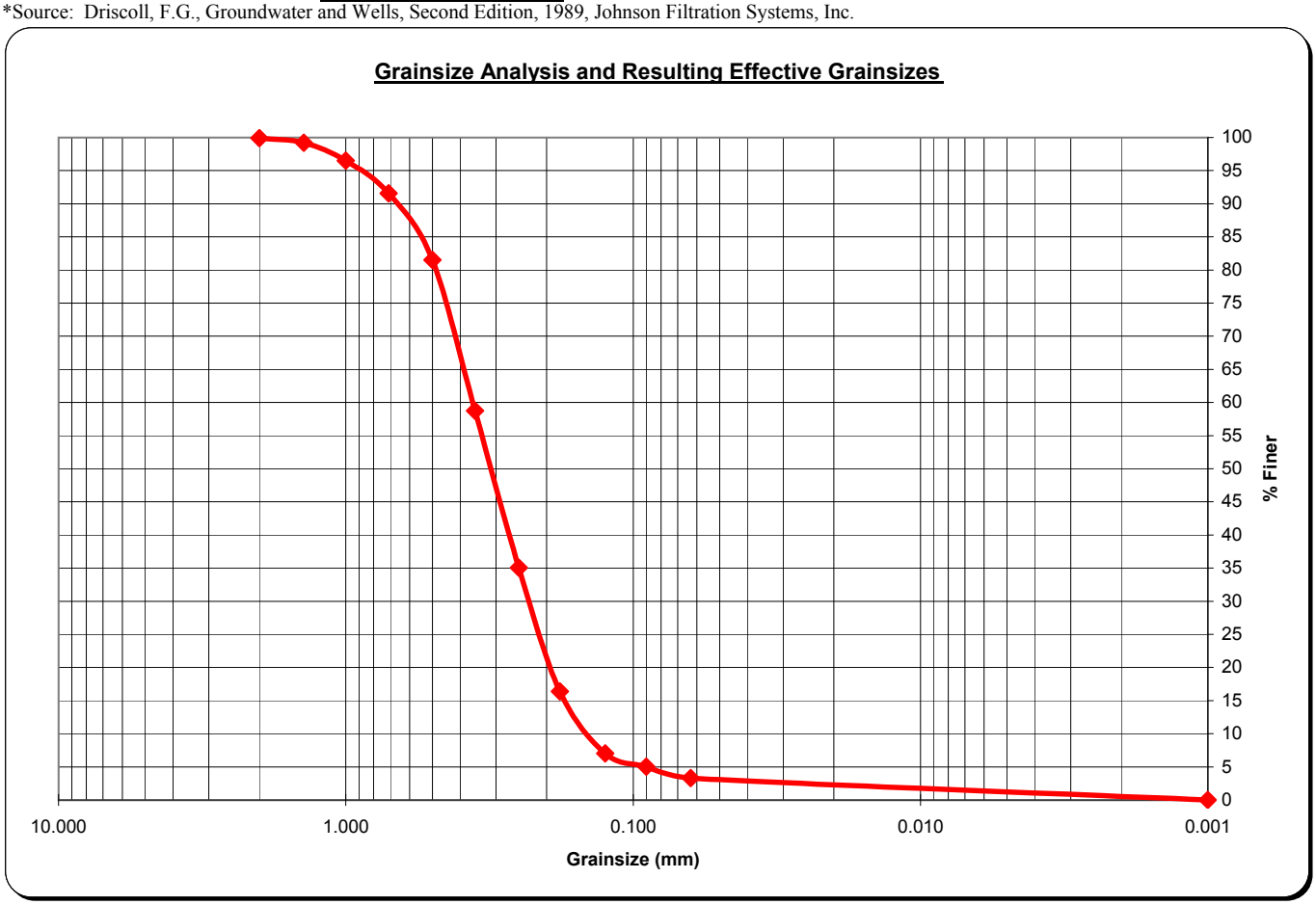
Sample ID:	ECP9-SB1	
Sample Depth:	46-47	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	100.30	g
Total Sieve Weight:	99.60	g
Weight Loss:	0.7	g
Percent Loss:	0.70	%

8.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	18.47%
	14	1.4	0.70	0.70	99.20		
	18	1.0	2.70	2.71	96.49		
	25	0.71	4.90	4.92	91.57		
	35	0.50	10.00	10.04	81.53		
medium	45	0.355	22.70	22.79	58.73	medium % 0.25 - 0.5 mm	46.49%
	60	0.250	23.60	23.69	35.04		
fine	80	0.180	18.60	18.67	16.37	Fine % 0.125 - 0.25	28.01%
	120	0.125	9.30	9.34	7.03		
silt	170	0.090	2.00	2.01	5.02	Silt % < 0.125	3.71%
	230	0.063	1.70	1.71	3.31		
pan	pan	0.001	3.30	3.31	0.00	Pan % < 0.063	3.31%
						Total	**100.00%**

Total (g)	99.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



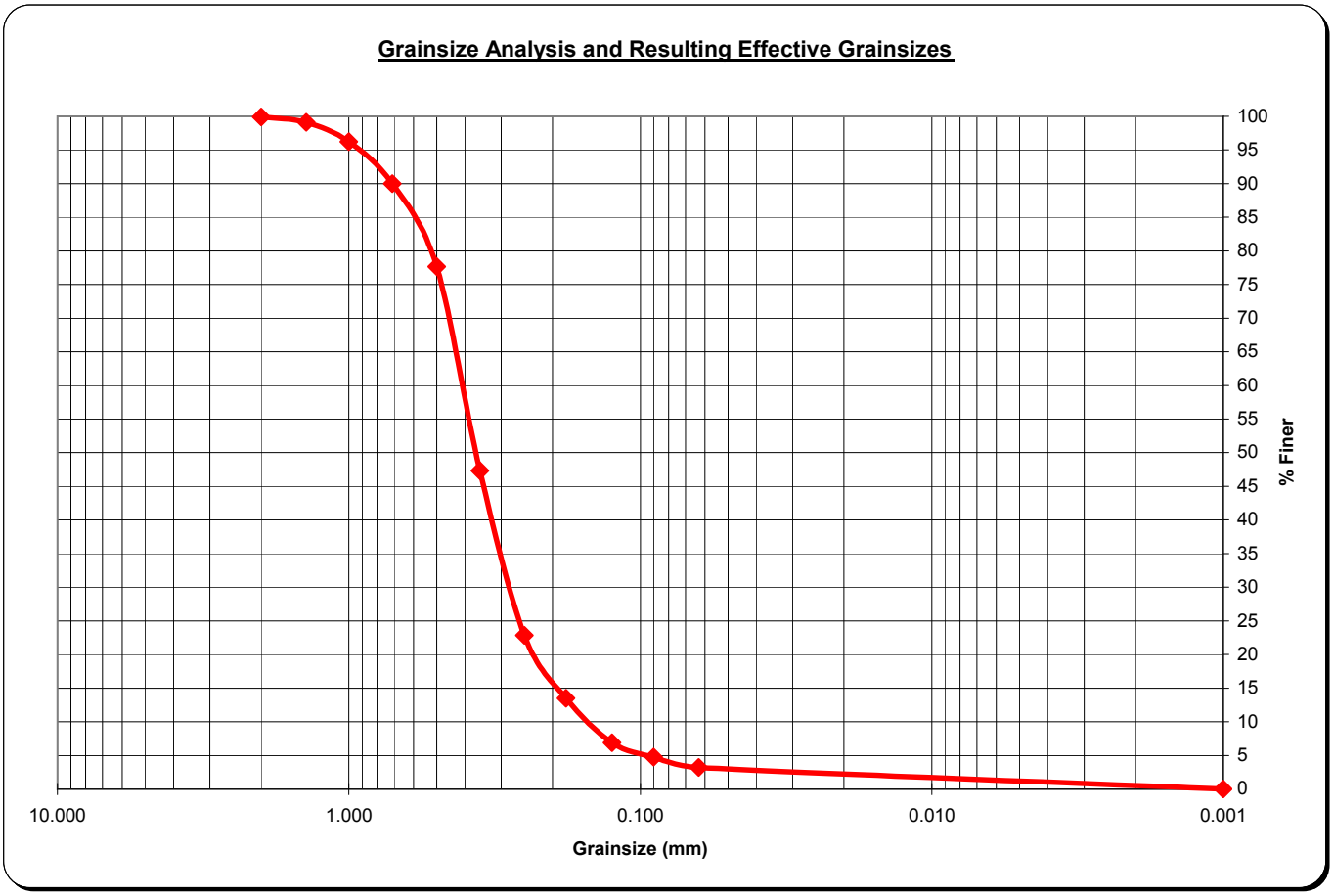
Sample ID:	ECP9-SB1
Sample Depth:	47-48 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	103.00 g
Total Sieve Weight:	102.90 g
Weight Loss:	0.1 g
Percent Loss:	0.10 %

6.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	22.35%
	14	1.4	0.80	0.78	99.13		
	18	1.0	3.00	2.92	96.21		
	25	0.71	6.40	6.22	89.99		
	35	0.50	12.70	12.34	77.65		
medium	45	0.355	31.20	30.32	47.33	medium % 0.25 - 0.5 mm	54.81%
	60	0.250	25.20	24.49	22.84		
fine	80	0.180	9.60	9.33	13.51	Fine % 0.125 - 0.25	15.94%
	120	0.125	6.80	6.61	6.90		
silt	170	0.090	2.20	2.14	4.76	Silt % < 0.125	3.69%
	230	0.063	1.60	1.55	3.21		
pan	pan	0.001	3.30	3.21	0.00	Pan % < 0.063	3.21%
						Total	**100.00%**

Total (g)	**102.90**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



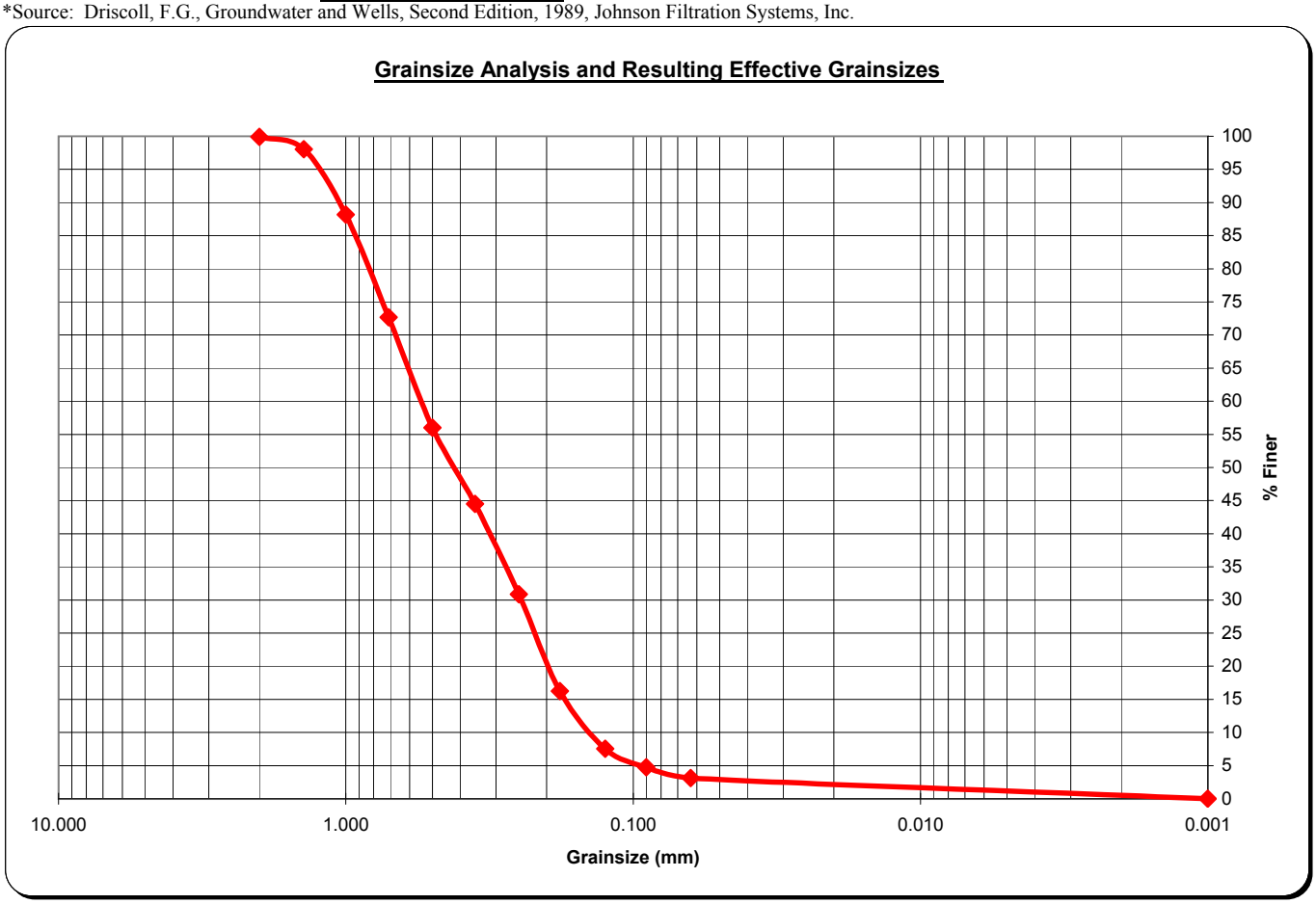
Sample ID:	ECP9-SB1	
Sample Depth:	48-49	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	93.40	g
Total Sieve Weight:	93.00	g
Weight Loss:	0.4	g
Percent Loss:	0.43	%

15.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	43.98%
	14	1.4	1.70	1.83	98.06		
	18	1.0	9.20	9.89	88.17		
	25	0.71	14.40	15.48	72.69		
	35	0.50	15.50	16.67	56.02		
medium	45	0.355	10.70	11.51	44.52	medium % 0.25 - 0.5 mm	25.16%
	60	0.250	12.70	13.66	30.86		
fine	80	0.180	13.60	14.62	16.24	Fine % 0.125 - 0.25	23.33%
	120	0.125	8.10	8.71	7.53		
silt	170	0.090	2.60	2.80	4.73	Silt % < 0.125	4.41%
	230	0.063	1.50	1.61	3.12		
pan	pan	0.001	2.90	3.12	0.00	Pan % < 0.063	3.12%
						Total	**100.00%**

Total (g)	93.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



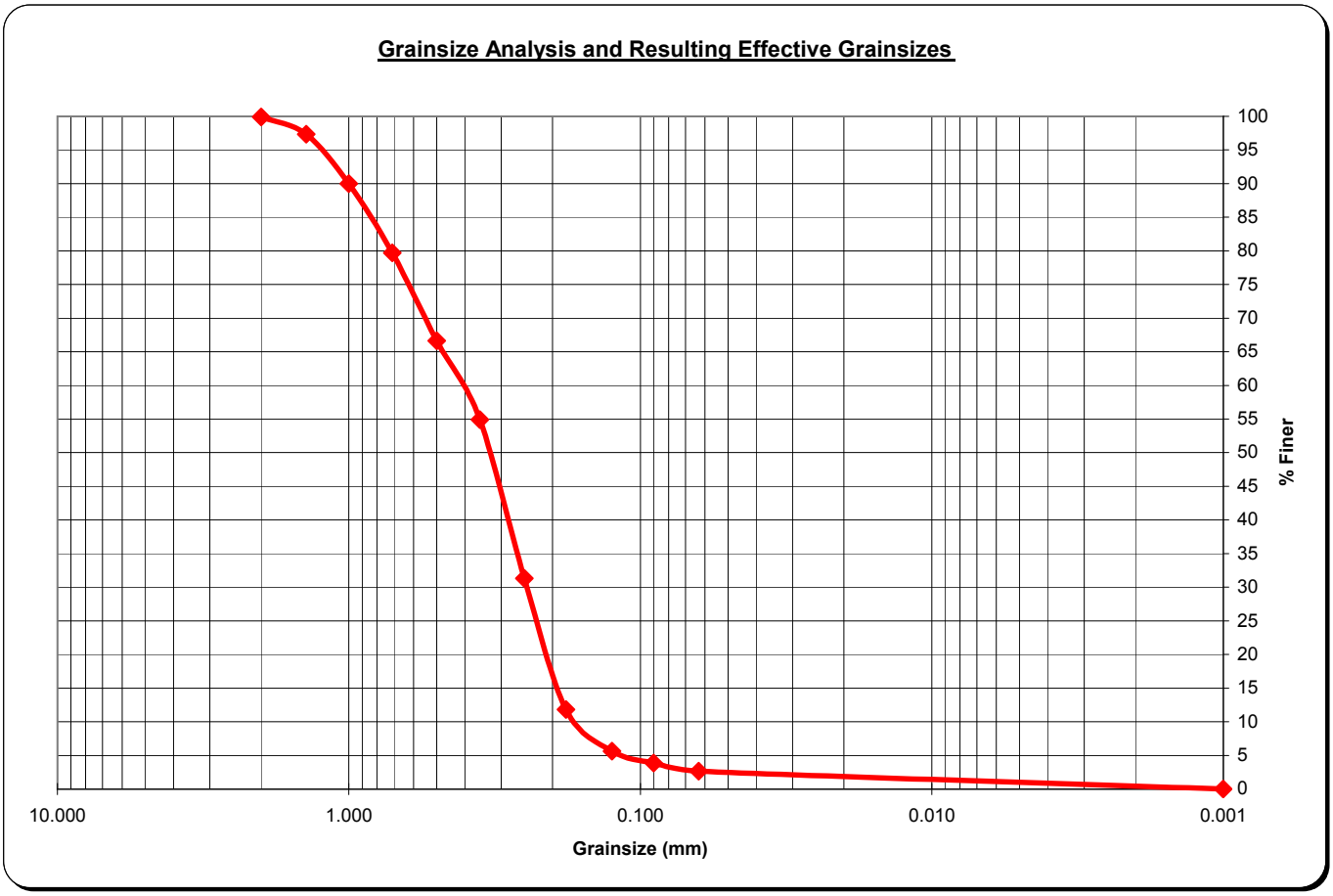
Sample ID:	ECP9-SB1
Sample Depth:	49-50 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.00 g
Total Sieve Weight:	98.00 g
Weight Loss:	0 g
Percent Loss:	0.00 %

10.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	33.37%
	14	1.4	2.50	2.55	97.35		
	18	1.0	7.20	7.35	90.00		
	25	0.71	10.10	10.31	79.69		
	35	0.50	12.80	13.06	66.63		
medium	45	0.355	11.50	11.73	54.90	medium % 0.25 - 0.5 mm	35.31%
	60	0.250	23.10	23.57	31.33		
fine	80	0.180	19.10	19.49	11.84	Fine % 0.125 - 0.25	25.71%
	120	0.125	6.10	6.22	5.61		
silt	170	0.090	1.70	1.73	3.88	Silt % < 0.125	2.96%
	230	0.063	1.20	1.22	2.65		
pan	pan	0.001	2.60	2.65	0.00	Pan % < 0.063	2.65%
						Total	100.00%

Total (g)	98.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



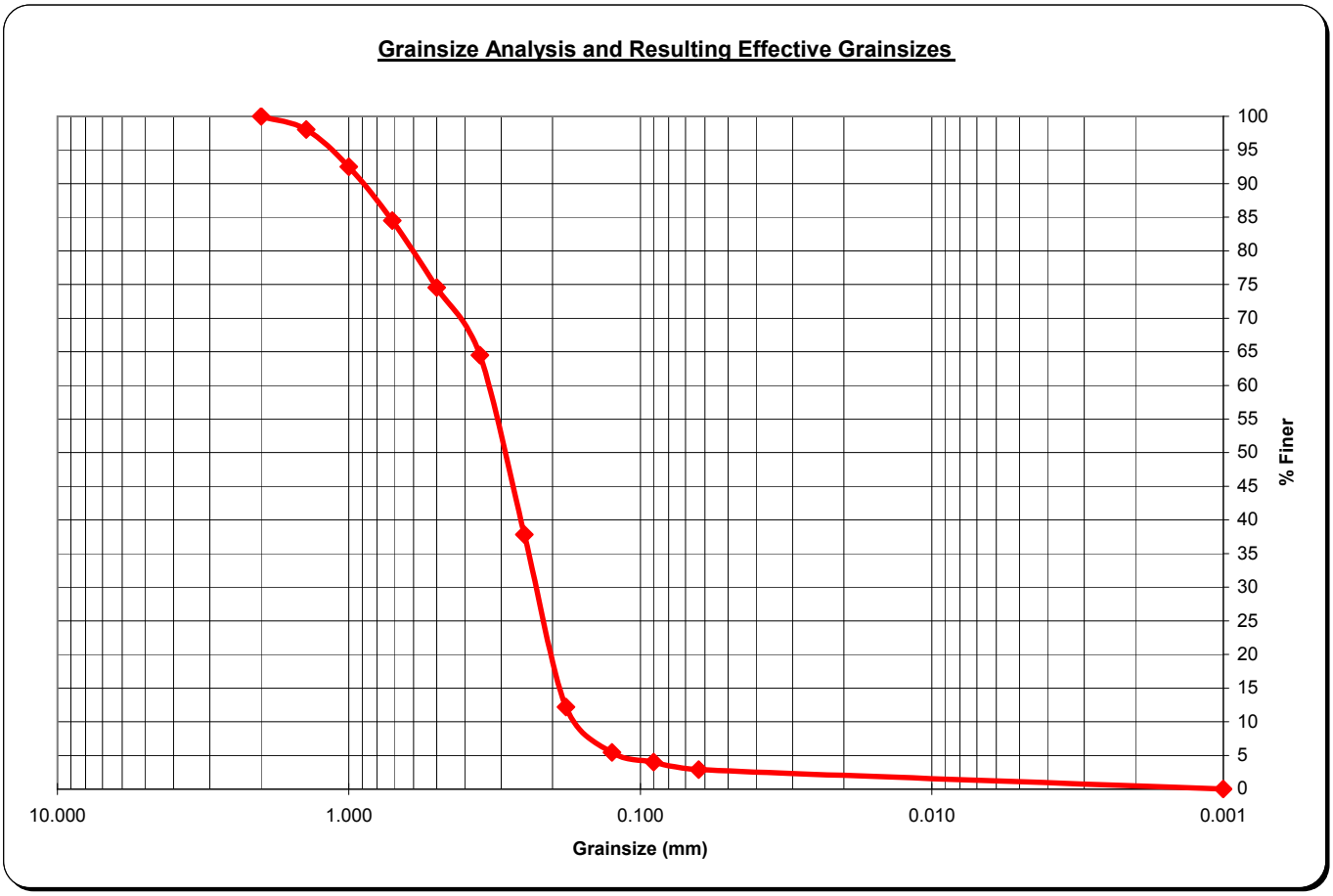
Sample ID:	ECP9-SB1
Sample Depth:	50-51 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.40 g
Total Sieve Weight:	97.50 g
Weight Loss:	0.9 g
Percent Loss:	0.91 %

10.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	25.44%
	14	1.4	1.90	1.95	98.05		
	18	1.0	5.40	5.54	92.51		
	25	0.71	7.80	8.00	84.51		
	35	0.50	9.70	9.95	74.56		
medium	45	0.355	9.80	10.05	64.51	medium % 0.25 - 0.5 mm	36.72%
	60	0.250	26.00	26.67	37.85		
fine	80	0.180	25.00	25.64	12.21	Fine % 0.125 - 0.25	32.41%
	120	0.125	6.60	6.77	5.44		
silt	170	0.090	1.40	1.44	4.00	Silt % < 0.125	2.56%
	230	0.063	1.10	1.13	2.87		
pan	pan	0.001	2.80	2.87	0.00	Pan % < 0.063	2.87%
						Total	100.00%

Total (g)	97.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



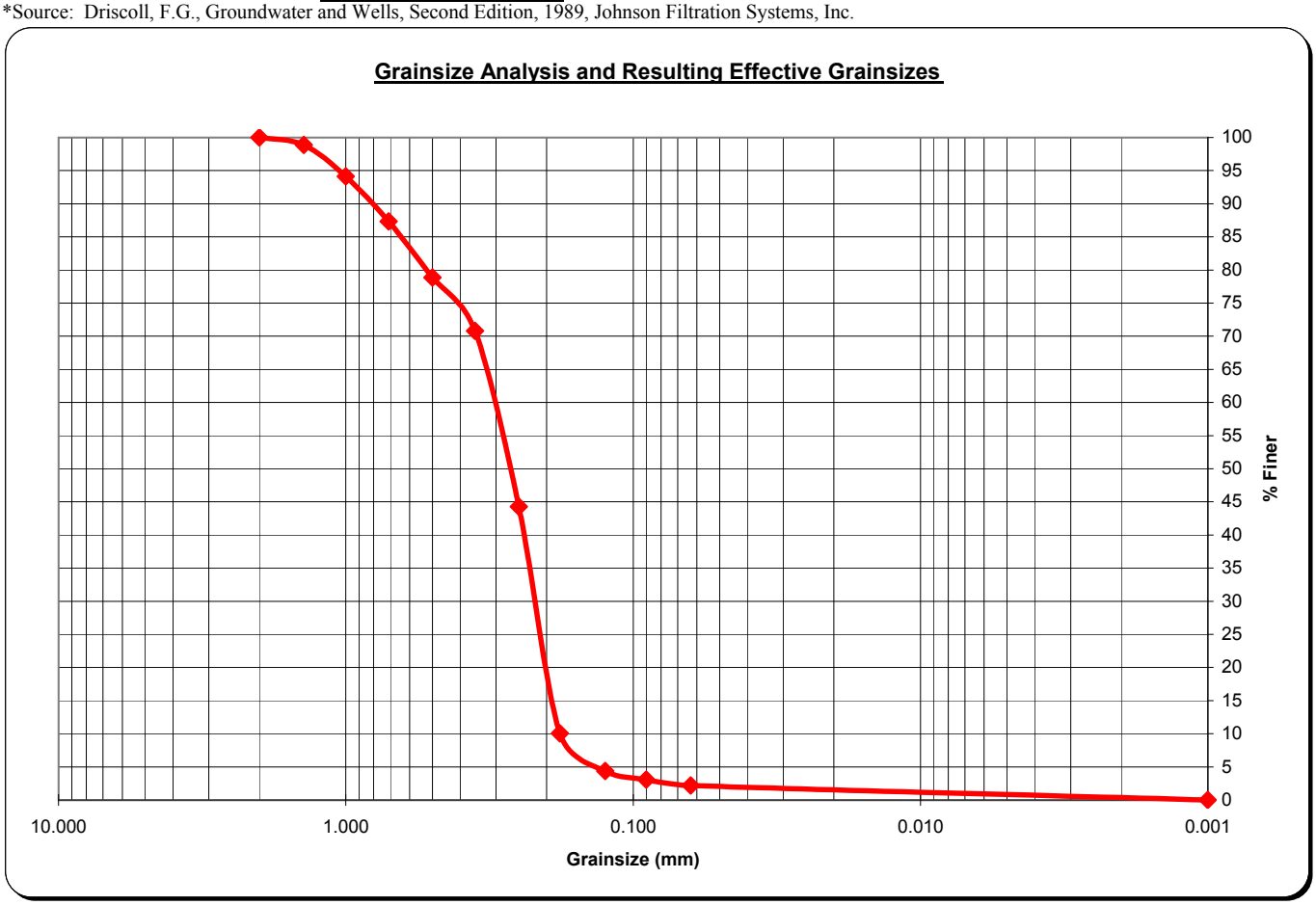
Sample ID:	ECP9-SB1
Sample Depth:	51-52 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	100.60 g
Total Sieve Weight:	100.30 g
Weight Loss:	0.3 g
Percent Loss:	0.30 %

8.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	21.14%
	14	1.4	1.10	1.10	98.90		
	18	1.0	4.80	4.79	94.12		
	25	0.71	6.80	6.78	87.34		
	35	0.50	8.50	8.47	78.86		
medium	45	0.355	8.10	8.08	70.79	medium % 0.25 - 0.5 mm	34.60%
	60	0.250	26.60	26.52	44.27		
fine	80	0.180	34.30	34.20	10.07	Fine % 0.125 - 0.25	39.88%
	120	0.125	5.70	5.68	4.39		
silt	170	0.090	1.30	1.30	3.09	Silt % < 0.125	2.19%
	230	0.063	0.90	0.90	2.19		
pan	pan	0.001	2.20	2.19	0.00	Pan % < 0.063	2.19%
						Total	**100.00%**

Total (g)	100.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



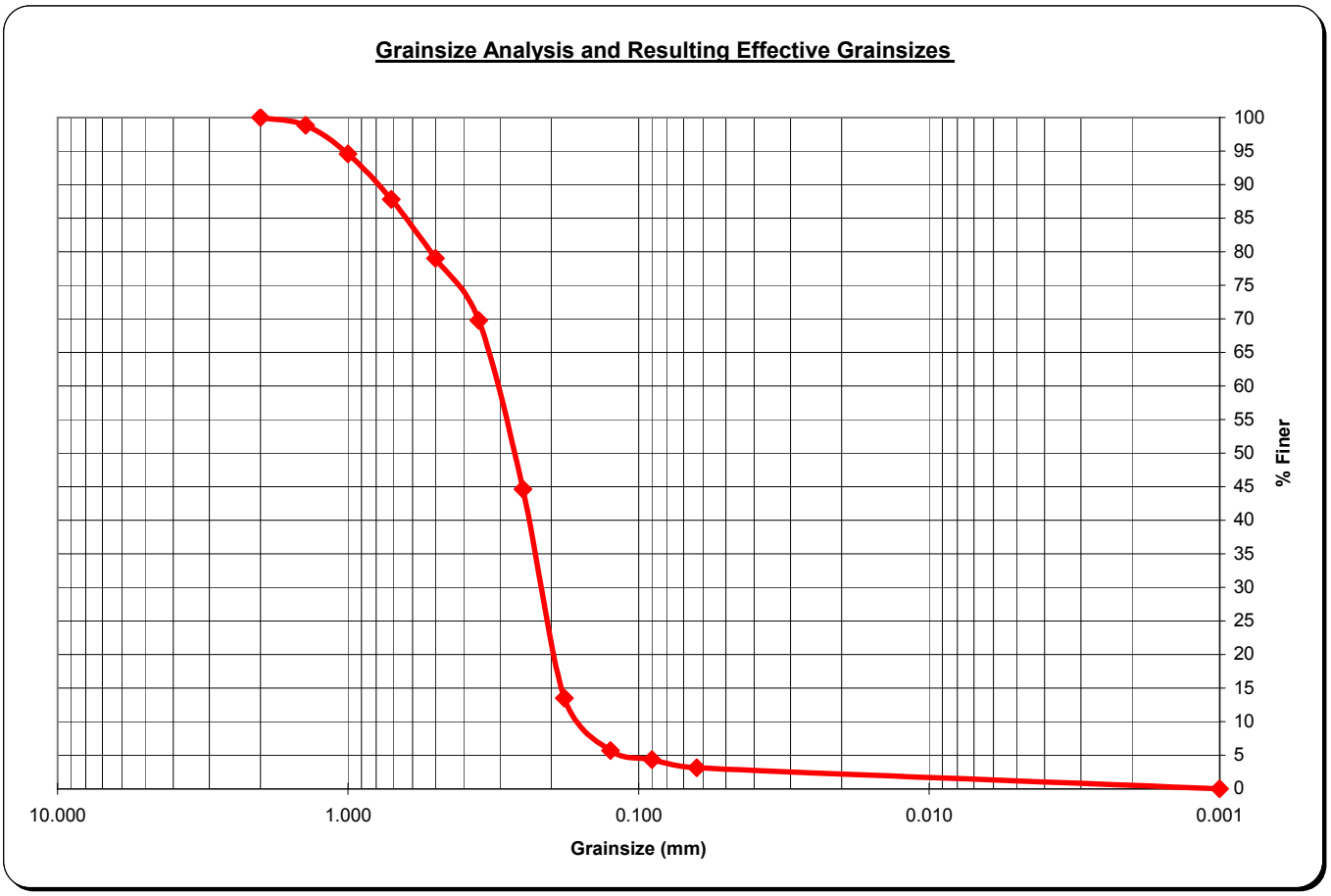
Sample ID:	ECP9-SB1	
Sample Depth:	52-53	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.20	g
Total Sieve Weight:	101.50	g
Weight Loss:	0.7	g
Percent Loss:	0.68	%

7.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	20.99%
	14	1.4	1.20	1.18	98.82		
	18	1.0	4.30	4.24	94.58		
	25	0.71	6.90	6.80	87.78		
	35	0.50	8.90	8.77	79.01		
medium	45	0.355	9.40	9.26	69.75	medium % 0.25 - 0.5 mm	34.38%
	60	0.250	25.50	25.12	44.63		
fine	80	0.180	31.60	31.13	13.50	Fine % 0.125 - 0.25	38.92%
	120	0.125	7.90	7.78	5.71		
silt	170	0.090	1.40	1.38	4.33	Silt % < 0.125	2.56%
	230	0.063	1.20	1.18	3.15		
pan	pan	0.001	3.20	3.15	0.00	Pan % < 0.063	3.15%
						Total	**100.00%**

Total (g)	101.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



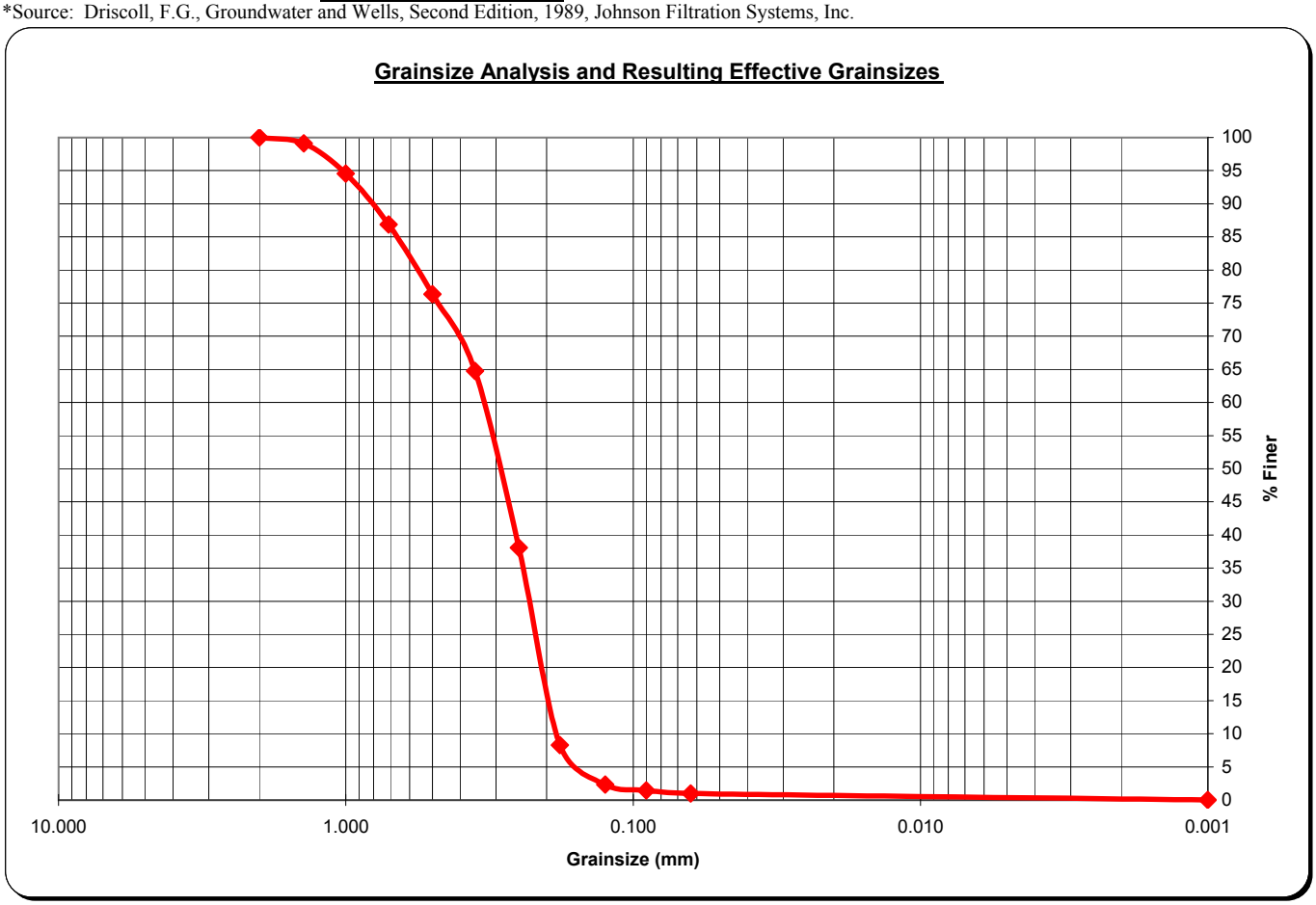
Sample ID:	ECP9-SB1
Sample Depth:	53-54 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	103.20 g
Total Sieve Weight:	102.70 g
Weight Loss:	0.5 g
Percent Loss:	0.48 %

6.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	23.66%
	14	1.4	0.90	0.88	99.12		
	18	1.0	4.70	4.58	94.55		
	25	0.71	7.90	7.69	86.85		
	35	0.50	10.80	10.52	76.34		
medium	45	0.355	11.90	11.59	64.75	medium % 0.25 - 0.5 mm	38.27%
	60	0.250	27.40	26.68	38.07		
fine	80	0.180	30.60	29.80	8.28	Fine % 0.125 - 0.25	35.74%
	120	0.125	6.10	5.94	2.34		
silt	170	0.090	0.90	0.88	1.46	Silt % < 0.125	1.36%
	230	0.063	0.50	0.49	0.97		
pan	pan	0.001	1.00	0.97	0.00	Pan % < 0.063	0.97%
						Total	**100.00%**

Total (g)	102.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



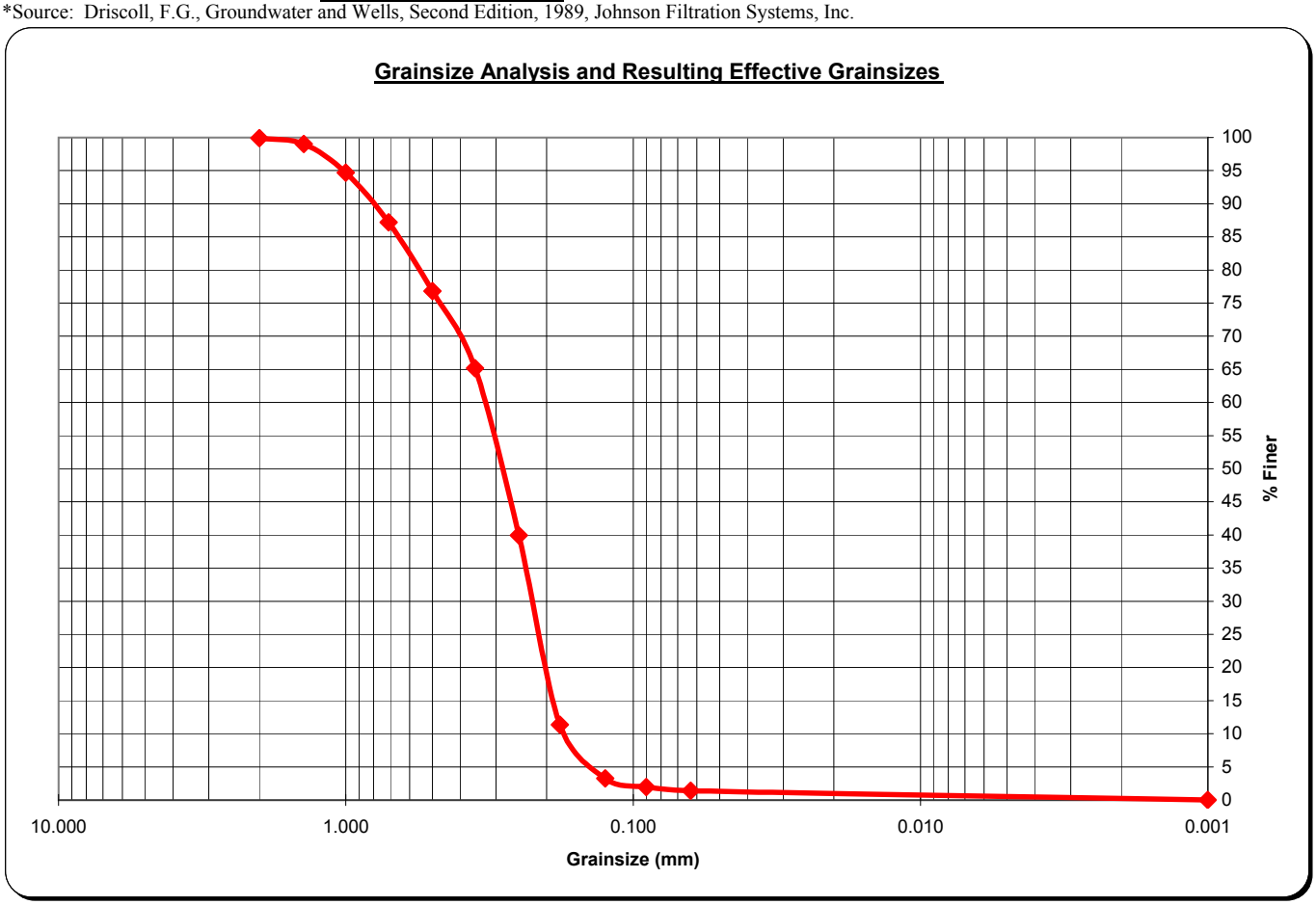
Sample ID:	ECP9-SB1	
Sample Depth:	54-55	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	102.10	g
Total Sieve Weight:	101.40	g
Weight Loss:	0.7	g
Percent Loss:	0.69	%

7.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	23.18%
	14	1.4	0.90	0.89	99.01		
	18	1.0	4.40	4.34	94.67		
	25	0.71	7.60	7.50	87.18		
	35	0.50	10.50	10.36	76.82		
medium	45	0.355	11.80	11.64	65.19	medium % 0.25 - 0.5 mm	36.88%
	60	0.250	25.60	25.25	39.94		
fine	80	0.180	29.00	28.60	11.34	Fine % 0.125 - 0.25	36.69%
	120	0.125	8.20	8.09	3.25		
silt	170	0.090	1.30	1.28	1.97	Silt % < 0.125	1.87%
	230	0.063	0.60	0.59	1.38		
pan	pan	0.001	1.40	1.38	0.00	Pan % < 0.063	1.38%
						Total	**100.00%**

Total (g)	101.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



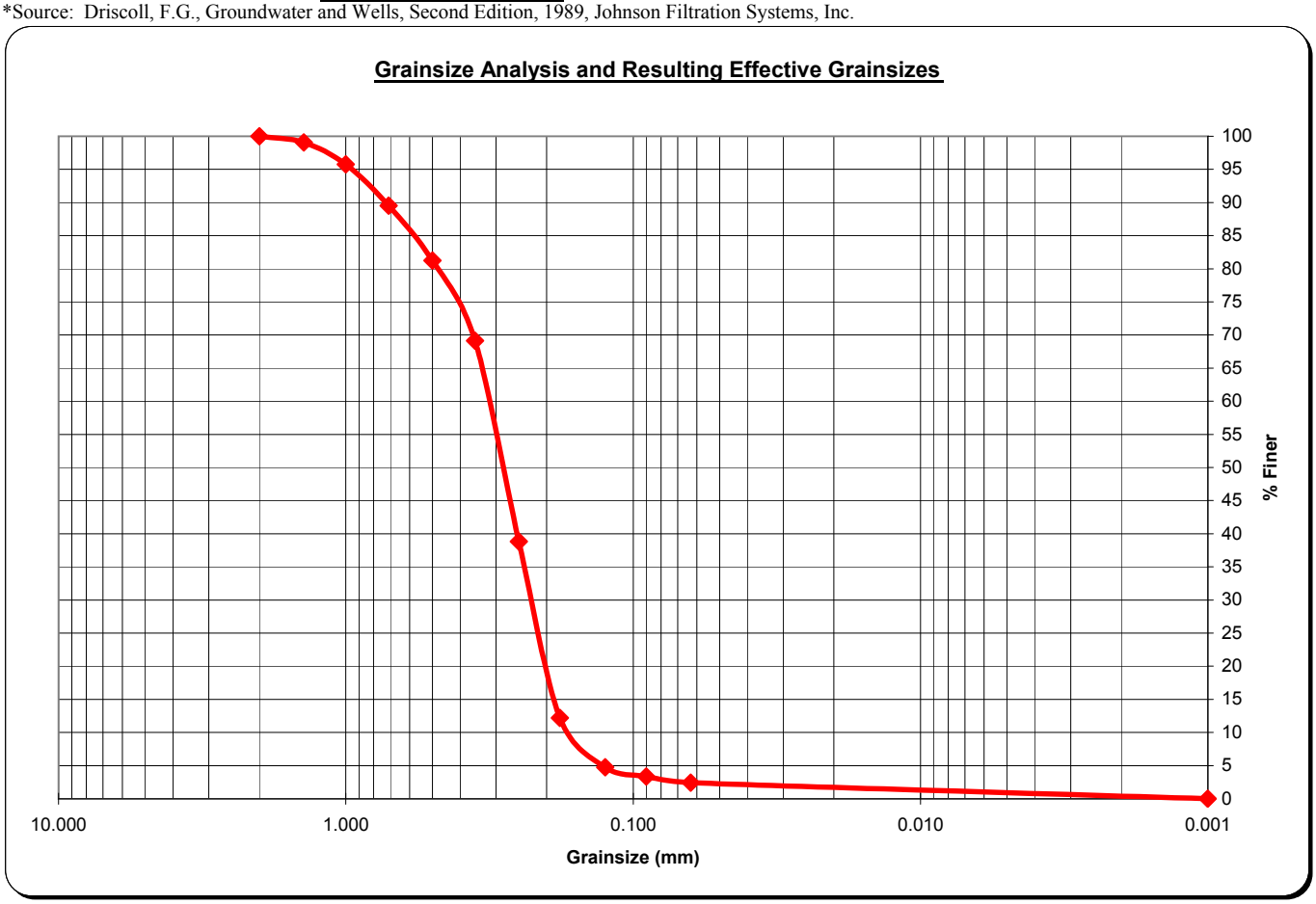
Sample ID:	ECP9-SB1
Sample Depth:	55-56 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.30 g
Total Sieve Weight:	99.10 g
Weight Loss:	0.2 g
Percent Loss:	0.20 %

9.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	18.77%
	14	1.4	0.90	0.91	99.09		
	18	1.0	3.30	3.33	95.76		
	25	0.71	6.20	6.26	89.51		
	35	0.50	8.20	8.27	81.23		
medium	45	0.355	12.00	12.11	69.12	medium % 0.25 - 0.5 mm	42.38%
	60	0.250	30.00	30.27	38.85		
fine	80	0.180	26.40	26.64	12.21	Fine % 0.125 - 0.25	34.11%
	120	0.125	7.40	7.47	4.74		
silt	170	0.090	1.40	1.41	3.33	Silt % < 0.125	2.32%
	230	0.063	0.90	0.91	2.42		
pan	pan	0.001	2.40	2.42	0.00	Pan % < 0.063	2.42%
						Total	**100.00%**

Total (g)	99.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



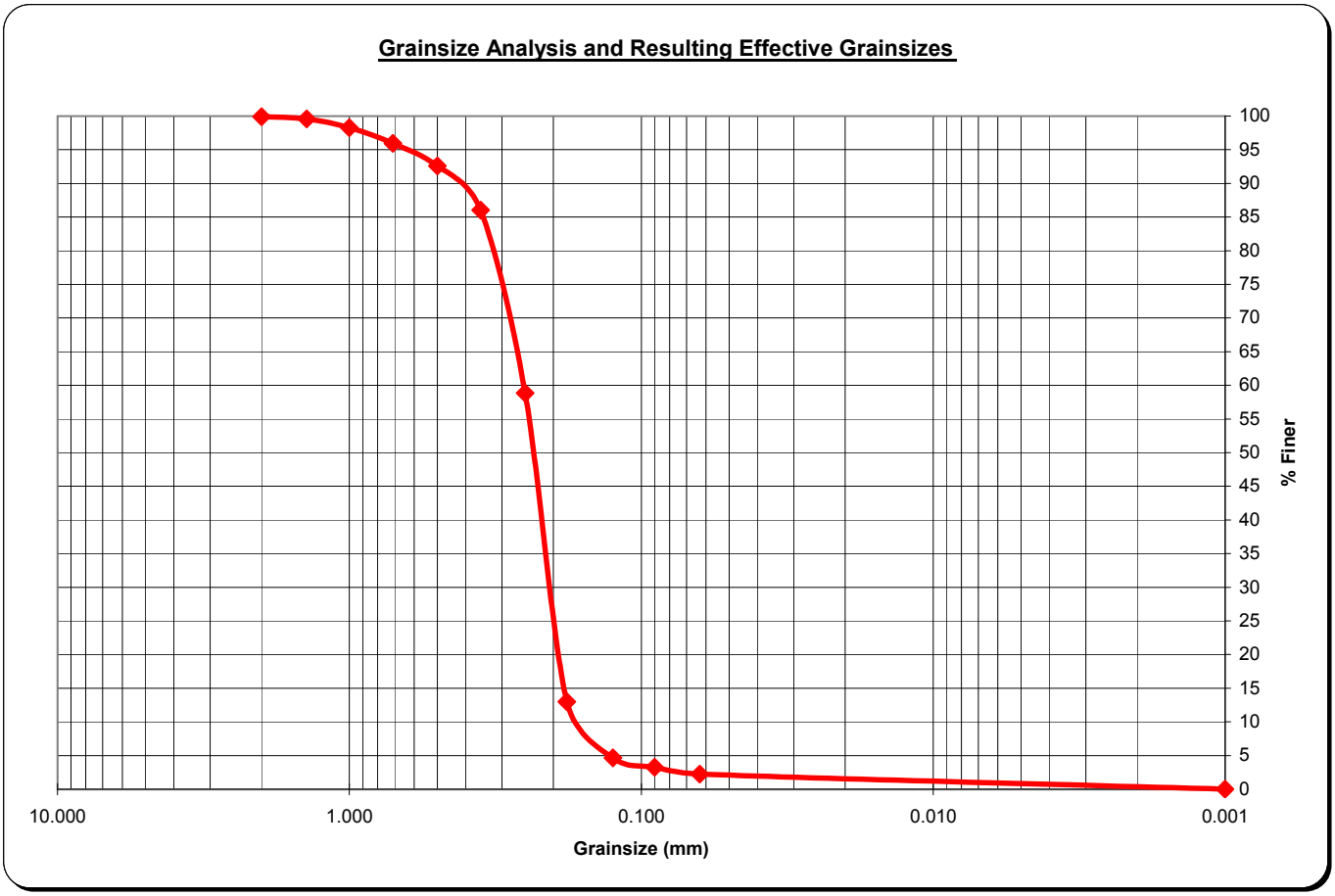
Sample ID:	ECP9-SB1
Sample Depth:	56-57 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	99.40 g
Total Sieve Weight:	98.70 g
Weight Loss:	0.7 g
Percent Loss:	0.70 %

9.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.10	99.90	coarse % > 0.5 mm	7.40%
	14	1.4	0.30	0.30	99.59		
	18	1.0	1.30	1.32	98.28		
	25	0.71	2.30	2.33	95.95		
	35	0.50	3.30	3.34	92.60		
medium	45	0.355	6.50	6.59	86.02	medium % 0.25 - 0.5 mm	33.74%
	60	0.250	26.80	27.15	58.87		
fine	80	0.180	45.30	45.90	12.97	Fine % 0.125 - 0.25	54.20%
	120	0.125	8.20	8.31	4.66		
silt	170	0.090	1.40	1.42	3.24	Silt % < 0.125	2.43%
	230	0.063	1.00	1.01	2.23		
pan	pan	0.001	2.20	2.23	0.00	Pan % < 0.063	2.23%
						Total	**100.00%**

Total (g)	98.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



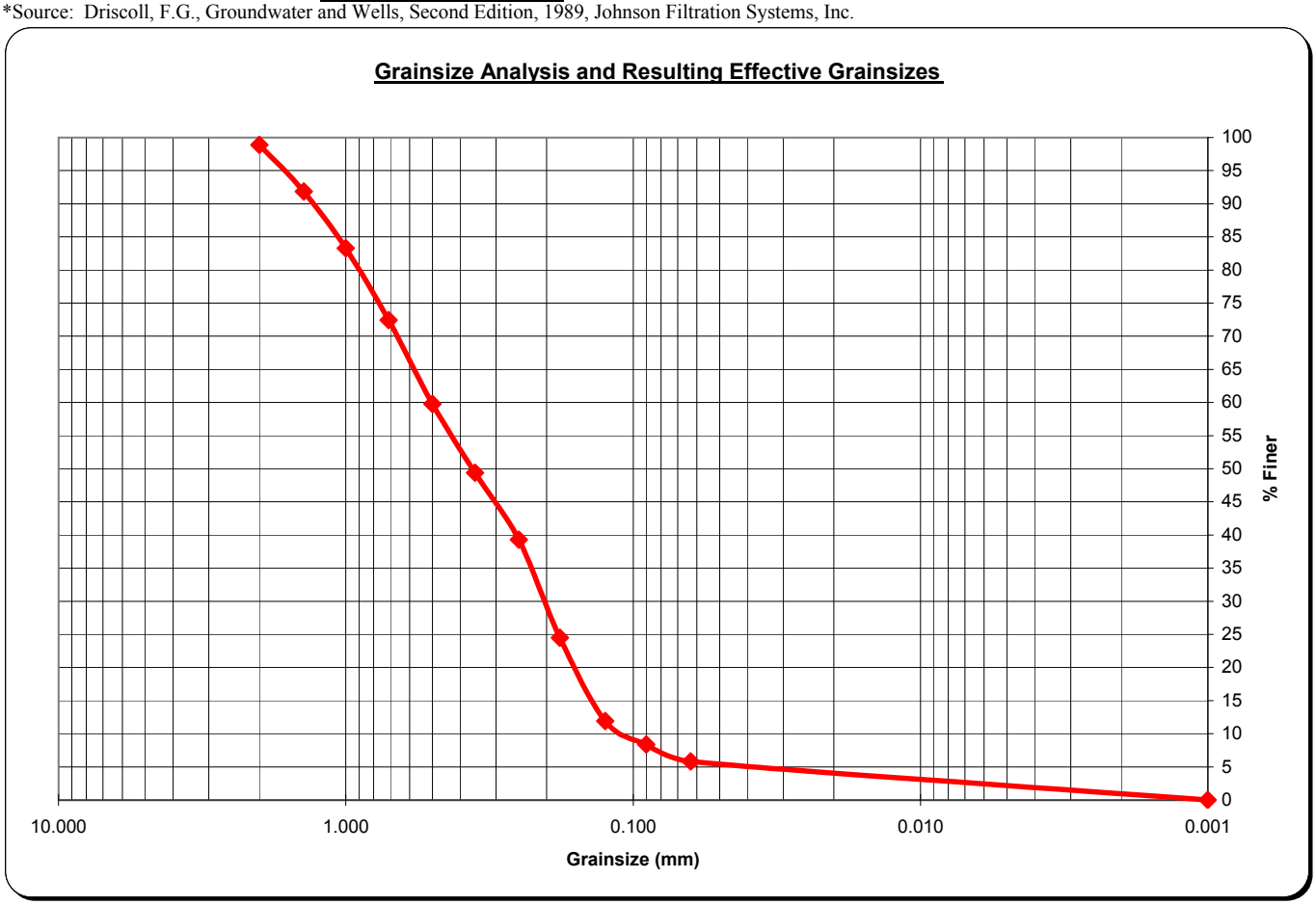
Sample ID:	ECP9-SB1
Sample Depth:	57-58 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	98.30 g
Total Sieve Weight:	98.00 g
Weight Loss:	0.3 g
Percent Loss:	0.31 %

10.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.10	1.12	98.88	coarse % > 0.5 mm	40.20%
	14	1.4	6.90	7.04	91.84		
	18	1.0	8.40	8.57	83.27		
	25	0.71	10.60	10.82	72.45		
	35	0.50	12.40	12.65	59.80		
medium	45	0.355	10.20	10.41	49.39	medium % 0.25 - 0.5 mm	20.51%
	60	0.250	9.90	10.10	39.29		
fine	80	0.180	14.50	14.80	24.49	Fine % 0.125 - 0.25	27.35%
	120	0.125	12.30	12.55	11.94		
silt	170	0.090	3.50	3.57	8.37	Silt % < 0.125	6.12%
	230	0.063	2.50	2.55	5.82		
pan	pan	0.001	5.70	5.82	0.00	Pan % < 0.063	5.82%
						Total	**100.00%**

Total (g)	98.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



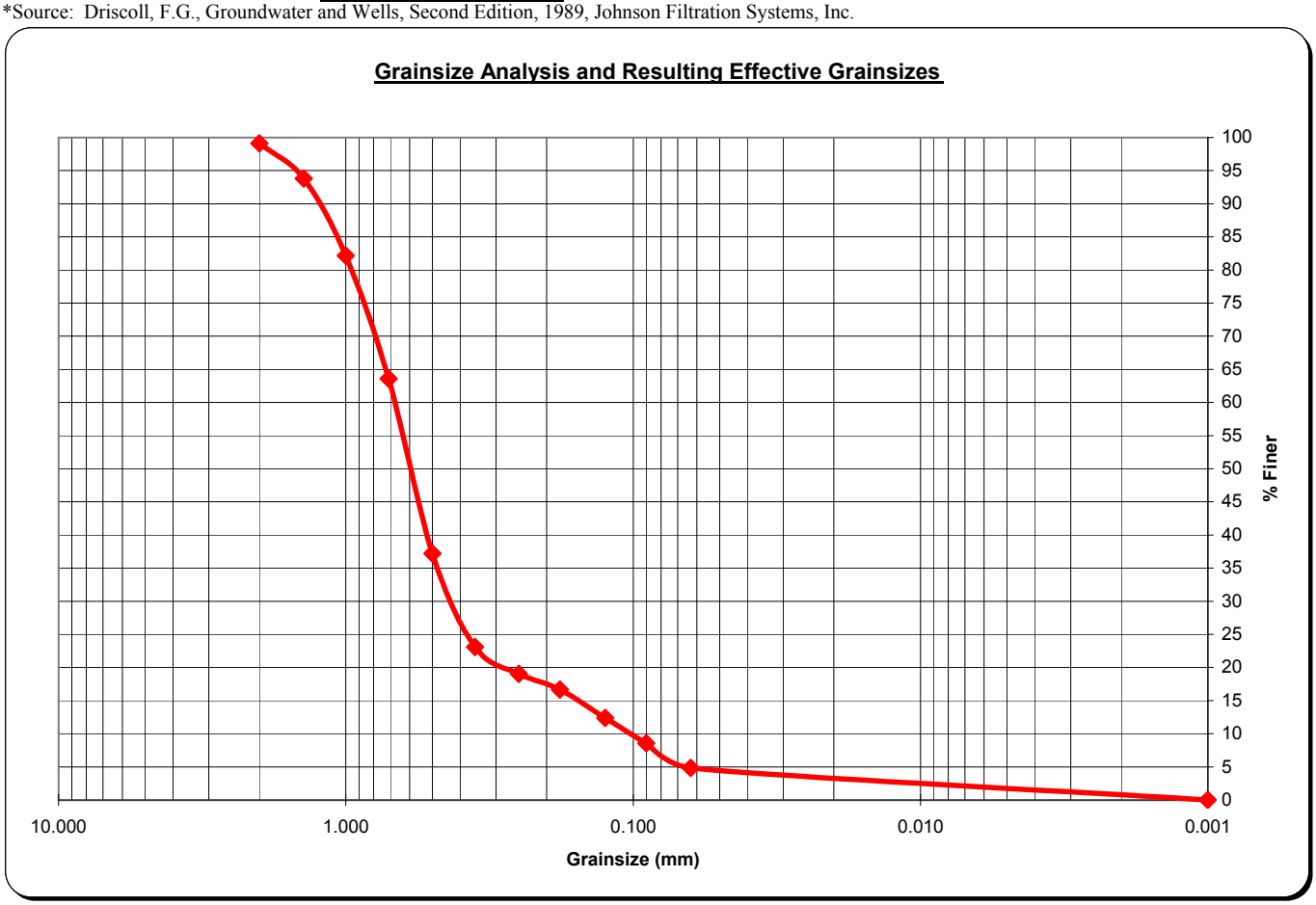
Sample ID:	ECP9-SB1
Sample Depth:	58-59 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.20 g
Total Sieve Weight:	88.70 g
Weight Loss:	0.5 g
Percent Loss:	0.56 %

18.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.80	0.90	99.10	coarse % > 0.5 mm	62.80%
	14	1.4	4.70	5.30	93.80		
	18	1.0	10.30	11.61	82.19		
	25	0.71	16.50	18.60	63.59		
	35	0.50	23.40	26.38	37.20		
medium	45	0.355	12.50	14.09	23.11	medium % 0.25 - 0.5 mm	18.15%
	60	0.250	3.60	4.06	19.05		
fine	80	0.180	2.10	2.37	16.69	Fine % 0.125 - 0.25	6.65%
	120	0.125	3.80	4.28	12.40		
silt	170	0.090	3.40	3.83	8.57	Silt % < 0.125	7.55%
	230	0.063	3.30	3.72	4.85		
pan	pan	0.001	4.30	4.85	0.00	Pan % < 0.063	4.85%
						Total	**100.00%**

Total (g)	88.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



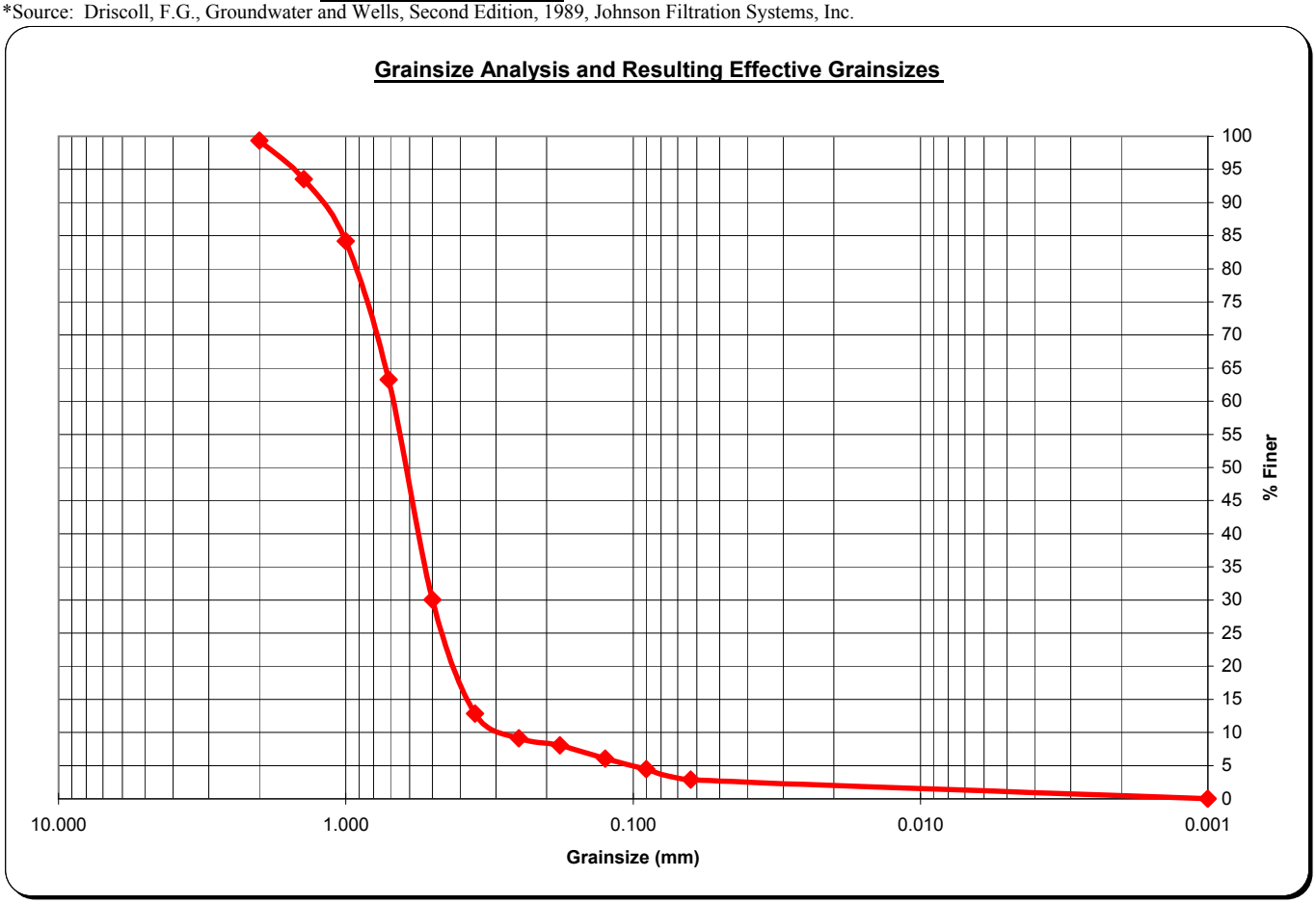
Sample ID:	ECP9-SB1
Sample Depth:	59-60 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.50 g
Total Sieve Weight:	94.20 g
Weight Loss:	0.3 g
Percent Loss:	0.32 %

14.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.64	99.36	coarse % > 0.5 mm	69.96%
	14	1.4	5.50	5.84	93.52		
	18	1.0	8.80	9.34	84.18		
	25	0.71	19.70	20.91	63.27		
	35	0.50	31.30	33.23	30.04		
medium	45	0.355	16.20	17.20	12.85	medium % 0.25 - 0.5 mm	20.91%
	60	0.250	3.50	3.72	9.13		
fine	80	0.180	1.00	1.06	8.07	Fine % 0.125 - 0.25	3.08%
	120	0.125	1.90	2.02	6.05		
silt	170	0.090	1.50	1.59	4.46	Silt % < 0.125	3.18%
	230	0.063	1.50	1.59	2.87		
pan	pan	0.001	2.70	2.87	0.00	Pan % < 0.063	2.87%
						Total	**100.00%**

Total (g)	94.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



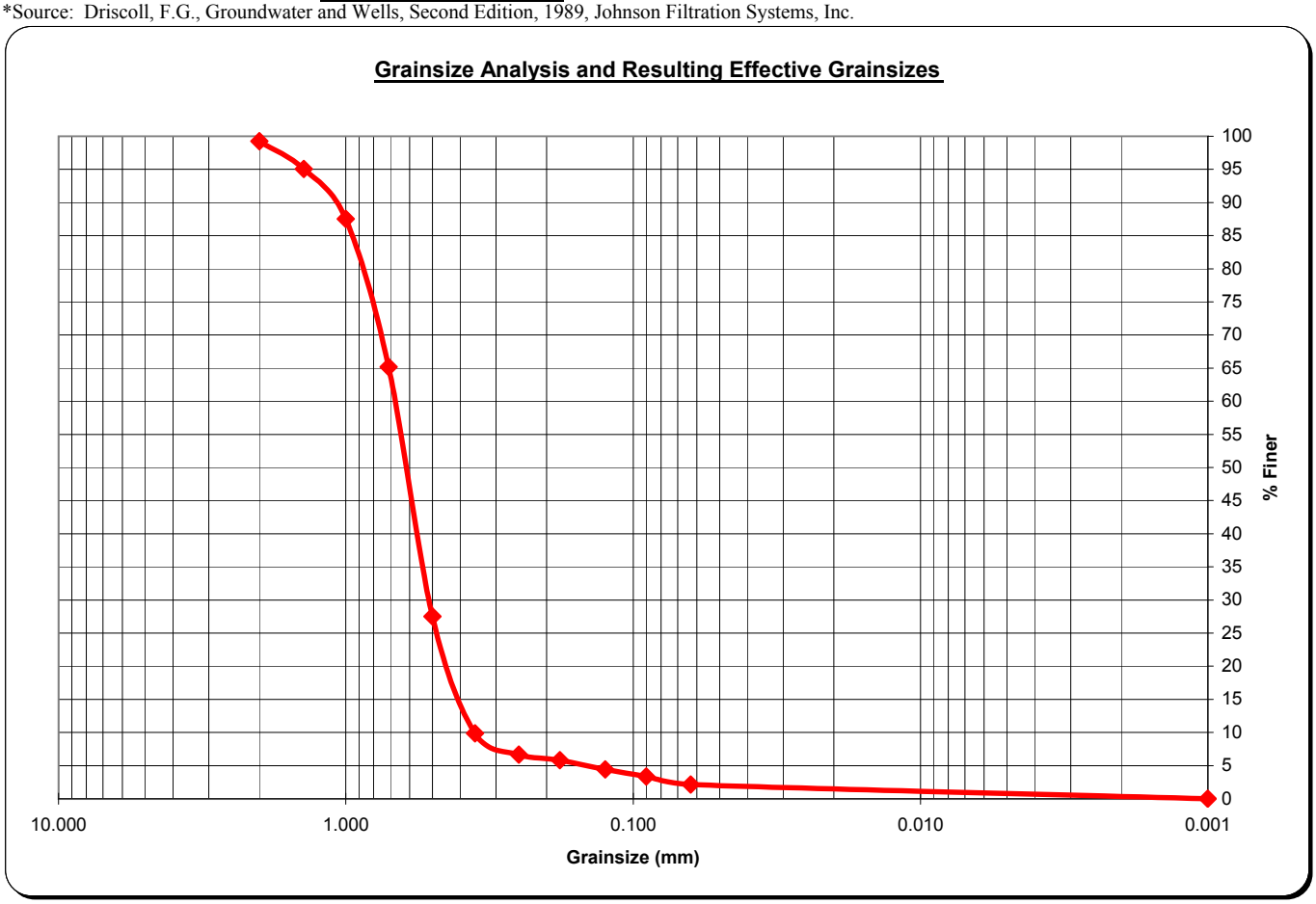
Sample ID:	ECP9-SB1
Sample Depth:	60-61 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.50 g
Total Sieve Weight:	93.10 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

15.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.70	0.75	99.25	coarse % > 0.5 mm	72.50%
	14	1.4	3.90	4.19	95.06		
	18	1.0	7.00	7.52	87.54		
	25	0.71	20.80	22.34	65.20		
	35	0.50	35.10	37.70	27.50		
medium	45	0.355	16.40	17.62	9.88	medium % 0.25 - 0.5 mm	20.84%
	60	0.250	3.00	3.22	6.66		
fine	80	0.180	0.80	0.86	5.80	Fine % 0.125 - 0.25	2.26%
	120	0.125	1.30	1.40	4.40		
silt	170	0.090	1.00	1.07	3.33	Silt % < 0.125	2.26%
	230	0.063	1.10	1.18	2.15		
pan	pan	0.001	2.00	2.15	0.00	Pan % < 0.063	2.15%
						Total	100.00%

Total (g)	93.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



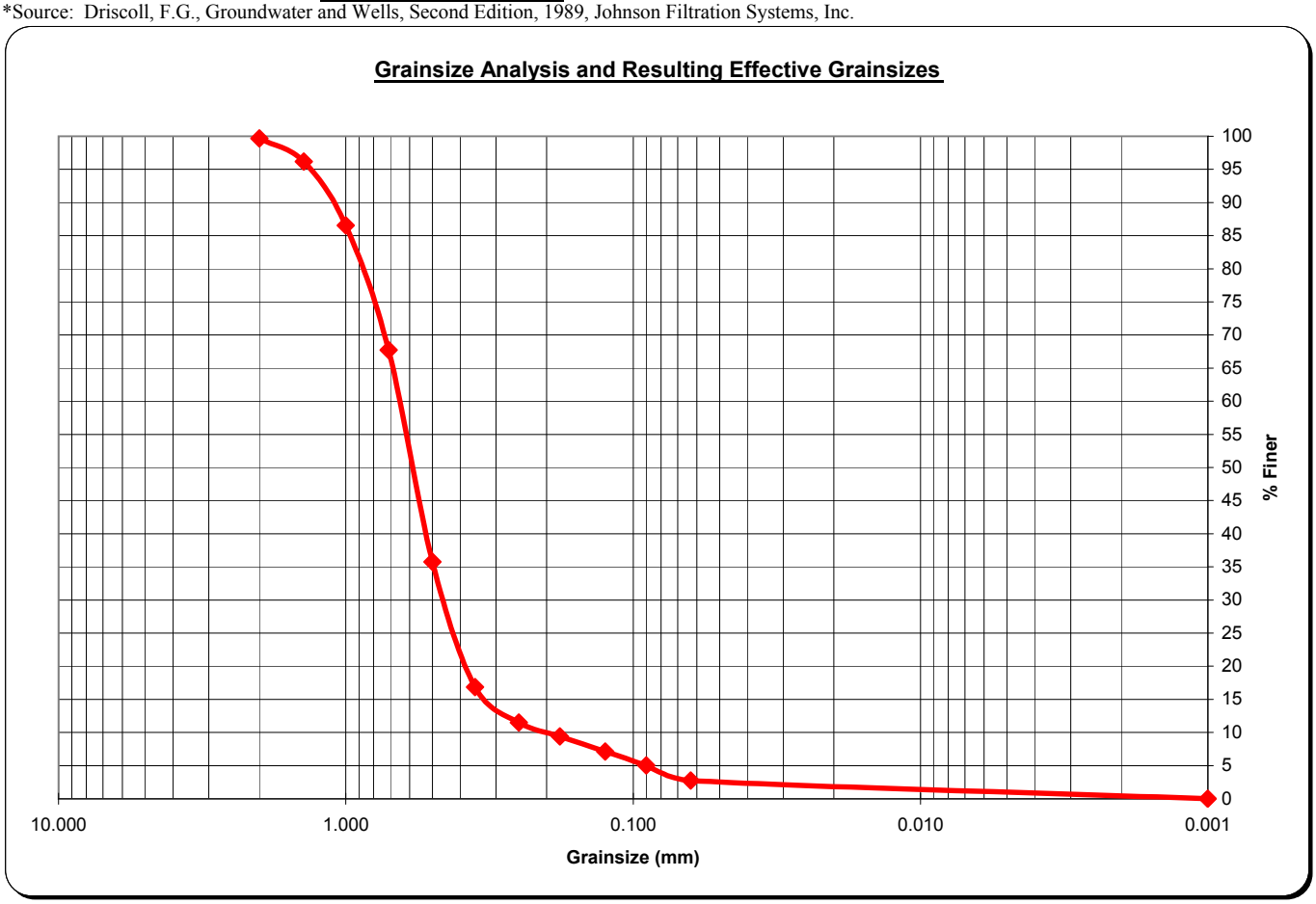
Sample ID:	ECP9-SB1	
Sample Depth:	61-62	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	91.90	g
Total Sieve Weight:	91.40	g
Weight Loss:	0.5	g
Percent Loss:	0.54	%

16.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.33	99.67	coarse % > 0.5 mm	64.22%
	14	1.4	3.20	3.50	96.17		
	18	1.0	8.80	9.63	86.54		
	25	0.71	17.20	18.82	67.72		
	35	0.50	29.20	31.95	35.78		
medium	45	0.355	17.30	18.93	16.85	medium % 0.25 - 0.5 mm	24.29%
	60	0.250	4.90	5.36	11.49		
fine	80	0.180	1.90	2.08	9.41	Fine % 0.125 - 0.25	4.38%
	120	0.125	2.10	2.30	7.11		
silt	170	0.090	1.90	2.08	5.03	Silt % < 0.125	4.38%
	230	0.063	2.10	2.30	2.74		
pan	pan	0.001	2.50	2.74	0.00	Pan % < 0.063	2.74%
						Total	**100.00%**

Total (g)	91.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



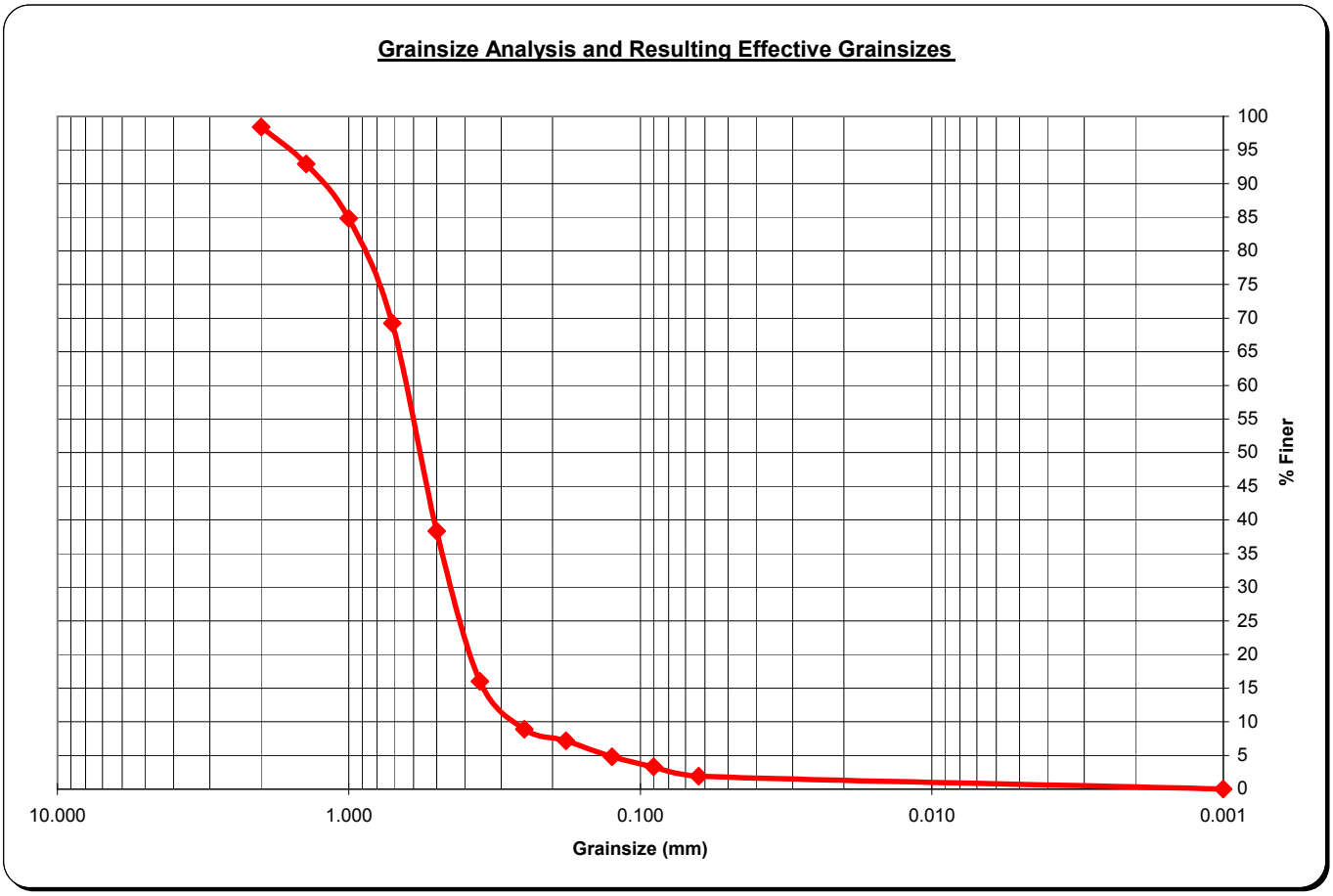
Sample ID:	ECP9-SB1
Sample Depth:	62-63 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.90 g
Total Sieve Weight:	93.60 g
Weight Loss:	0.3 g
Percent Loss:	0.32 %

14.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.50	1.60	98.40	coarse % > 0.5 mm	61.65%
	14	1.4	5.10	5.45	92.95		
	18	1.0	7.60	8.12	84.83		
	25	0.71	14.60	15.60	69.23		
	35	0.50	28.90	30.88	38.35		
medium	45	0.355	20.90	22.33	16.03	medium % 0.25 - 0.5 mm	29.49%
	60	0.250	6.70	7.16	8.87		
fine	80	0.180	1.60	1.71	7.16	Fine % 0.125 - 0.25	4.06%
	120	0.125	2.20	2.35	4.81		
silt	170	0.090	1.40	1.50	3.31	Silt % < 0.125	2.88%
	230	0.063	1.30	1.39	1.92		
pan	pan	0.001	1.80	1.92	0.00	Pan % < 0.063	1.92%
						Total	**100.00%**

Total (g)	93.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



Sample ID:	ECP9-SB1
Sample Depth:	63-64 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	92.40 g
Total Sieve Weight:	92.00 g
Weight Loss:	0.4 g
Percent Loss:	0.43 %

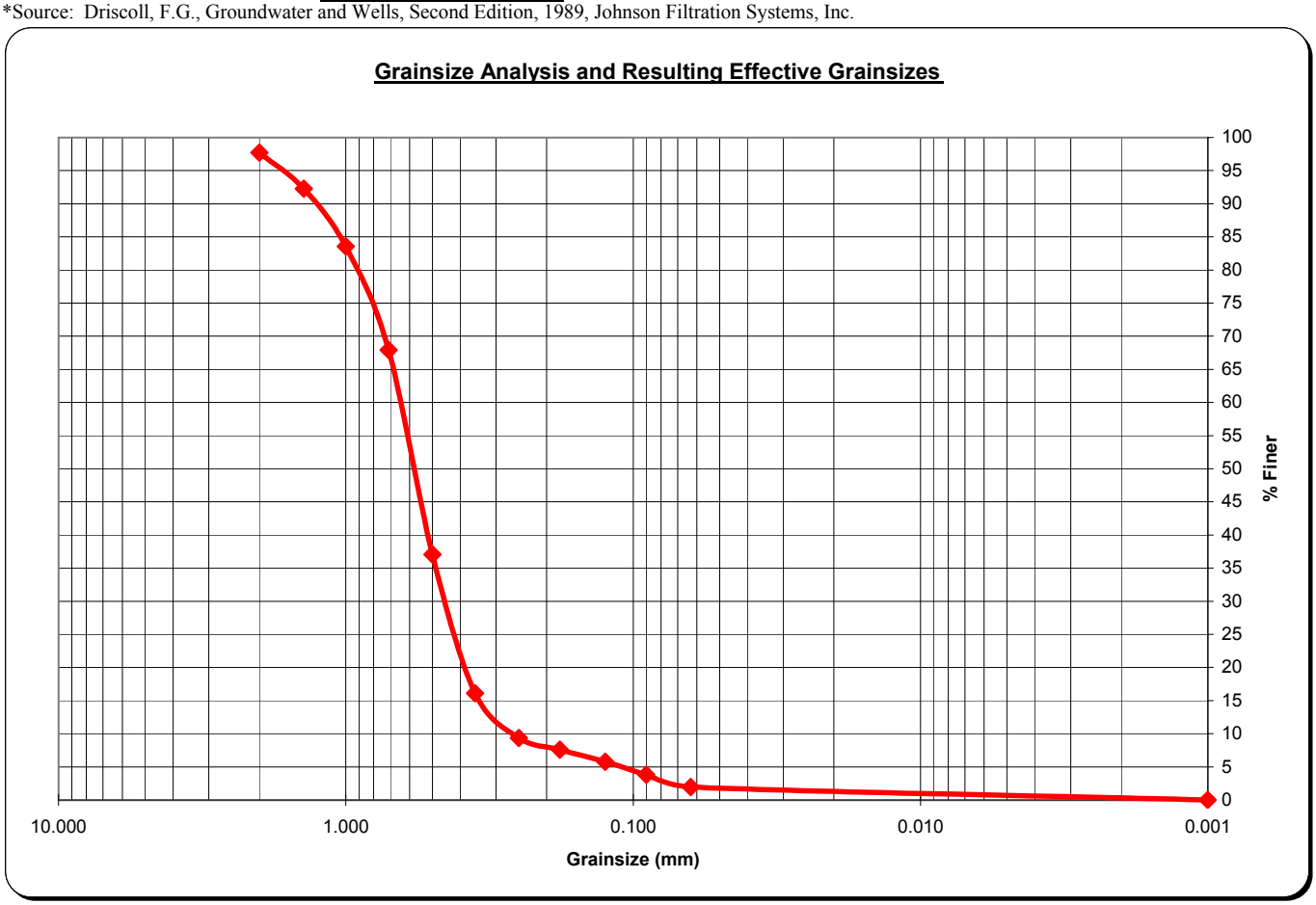
16.00 % Moisture

This sample was predominantly clay. The larger sieves had clay aggregates.

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*		Comment
coarse	10	2.0	2.10	2.28	97.72	coarse % > 0.5 mm	62.93%	CLAY
	14	1.4	5.00	5.43	92.28			CLAY
	18	1.0	8.00	8.70	83.59			
	25	0.71	14.40	15.65	67.93			
	35	0.50	28.40	30.87	37.07			
medium	45	0.355	19.30	20.98	16.09	medium % 0.25 - 0.5 mm	27.72%	
	60	0.250	6.20	6.74	9.35			
fine	80	0.180	1.60	1.74	7.61	Fine % 0.125 - 0.25	3.59%	
	120	0.125	1.70	1.85	5.76			
silt	170	0.090	1.80	1.96	3.80	Silt % < 0.125	3.80%	
	230	0.063	1.70	1.85	1.96			
pan	pan	0.001	1.80	1.96	0.00	Pan % < 0.063	1.96%	
						Total	100.00%	

Total (g)	92.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



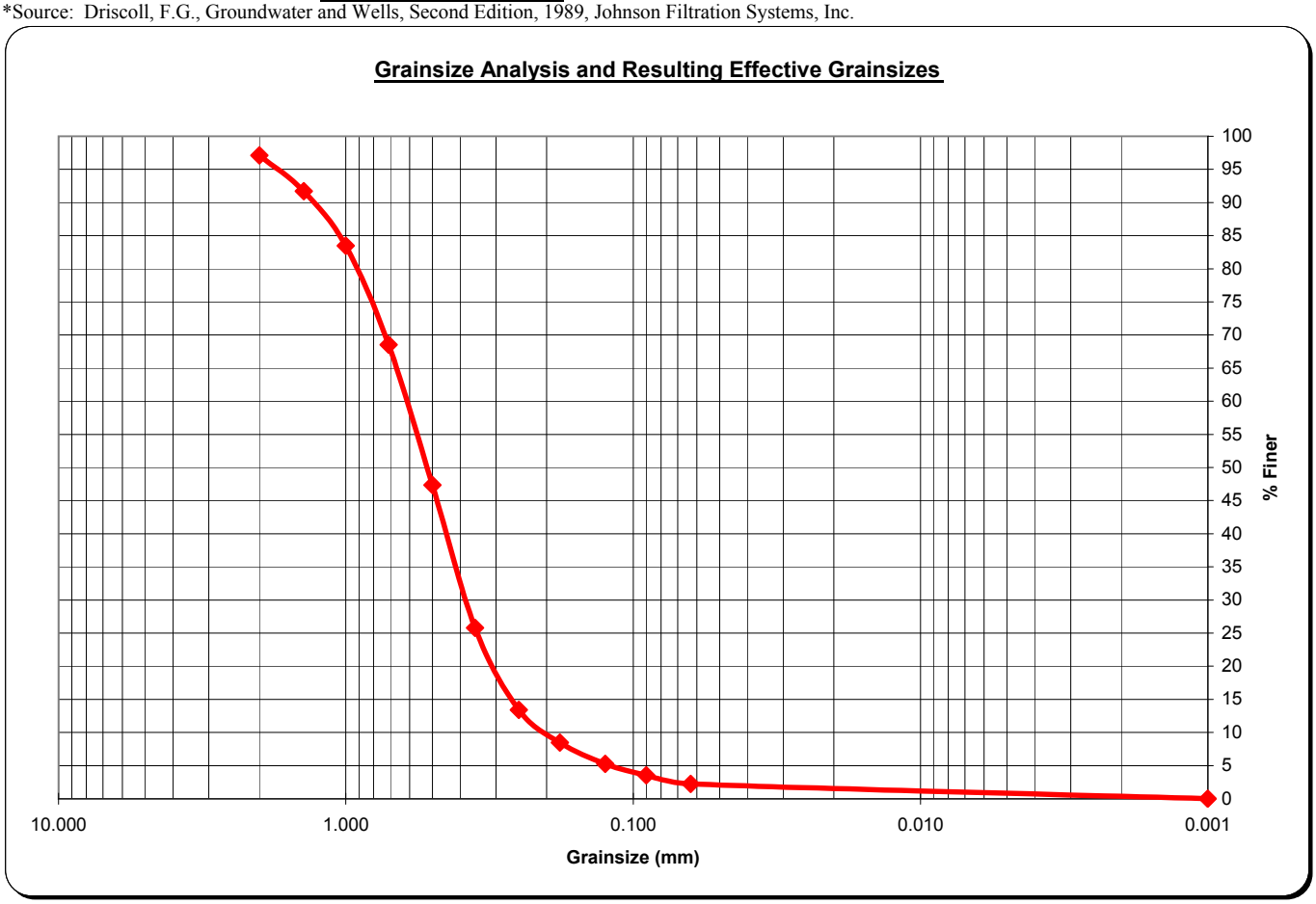
Sample ID:	ECP9-SB1
Sample Depth:	65-66 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.70 g
Total Sieve Weight:	93.10 g
Weight Loss:	0.6 g
Percent Loss:	0.64 %

14.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.70	2.90	97.10	coarse % > 0.5 mm	52.63%
	14	1.4	5.00	5.37	91.73		
	18	1.0	7.70	8.27	83.46		
	25	0.71	13.90	14.93	68.53		
	35	0.50	19.70	21.16	47.37		
medium	45	0.355	20.10	21.59	25.78	medium % 0.25 - 0.5 mm	33.94%
	60	0.250	11.50	12.35	13.43		
fine	80	0.180	4.60	4.94	8.49	Fine % 0.125 - 0.25	8.16%
	120	0.125	3.00	3.22	5.26		
silt	170	0.090	1.60	1.72	3.54	Silt % < 0.125	3.01%
	230	0.063	1.20	1.29	2.26		
pan	pan	0.001	2.10	2.26	0.00	Pan % < 0.063	2.26%
						Total	**100.00%**

Total (g)	**93.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



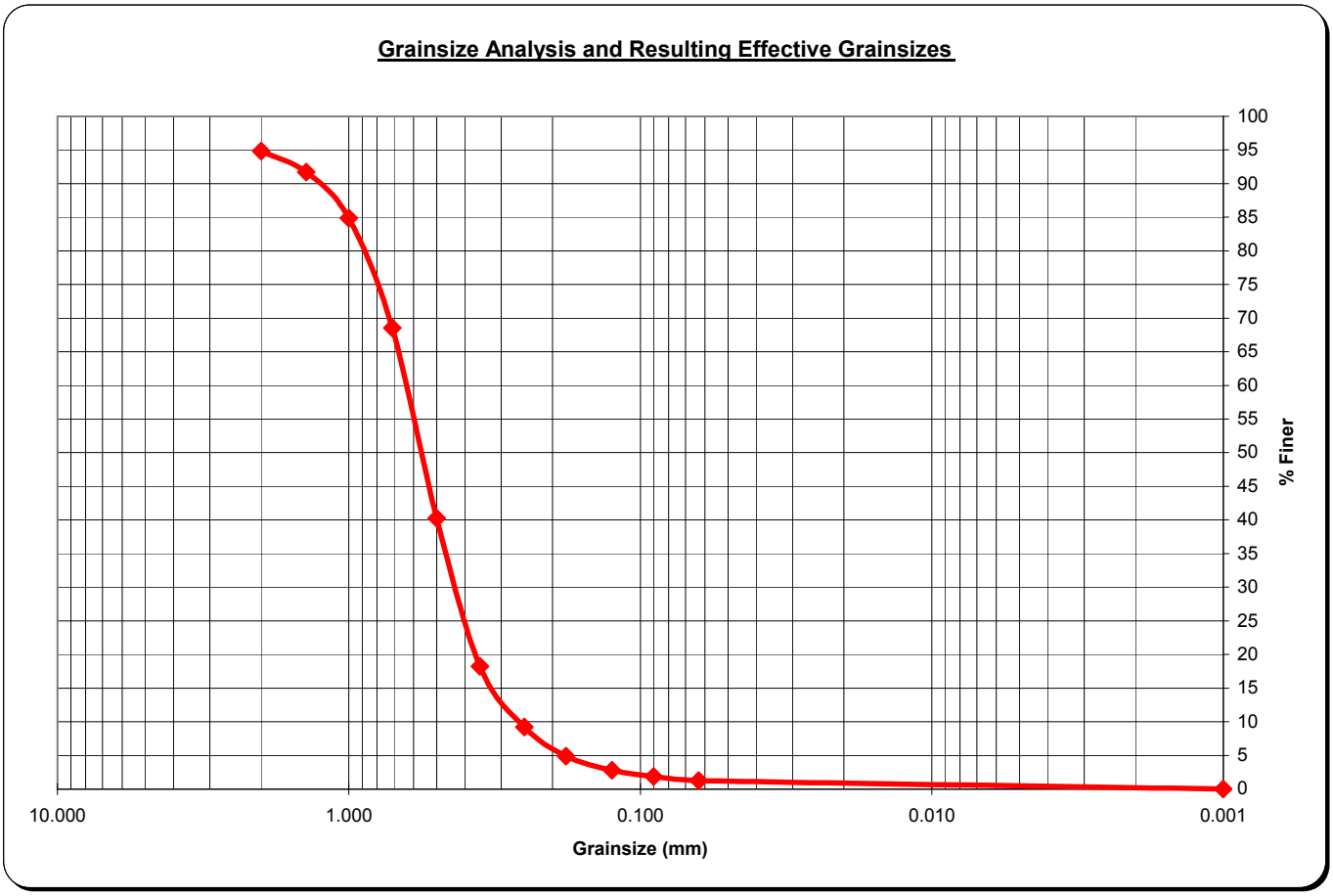
Sample ID:	ECP9-SB1
Sample Depth:	66-67 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	97.10 g
Total Sieve Weight:	96.60 g
Weight Loss:	0.5 g
Percent Loss:	0.51 %

11.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	5.00	5.18	94.82	coarse % > 0.5 mm	59.73%
	14	1.4	3.00	3.11	91.72		
	18	1.0	6.60	6.83	84.89		
	25	0.71	15.80	16.36	68.53		
	35	0.50	27.30	28.26	40.27		
medium	45	0.355	21.30	22.05	18.22	medium % 0.25 - 0.5 mm	31.06%
	60	0.250	8.70	9.01	9.21		
fine	80	0.180	4.20	4.35	4.87	Fine % 0.125 - 0.25	6.42%
	120	0.125	2.00	2.07	2.80		
silt	170	0.090	0.90	0.93	1.86	Silt % < 0.125	1.55%
	230	0.063	0.60	0.62	1.24		
pan	pan	0.001	1.20	1.24	0.00	Pan % < 0.063	1.24%
						Total	**100.00%**

Total (g)	96.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



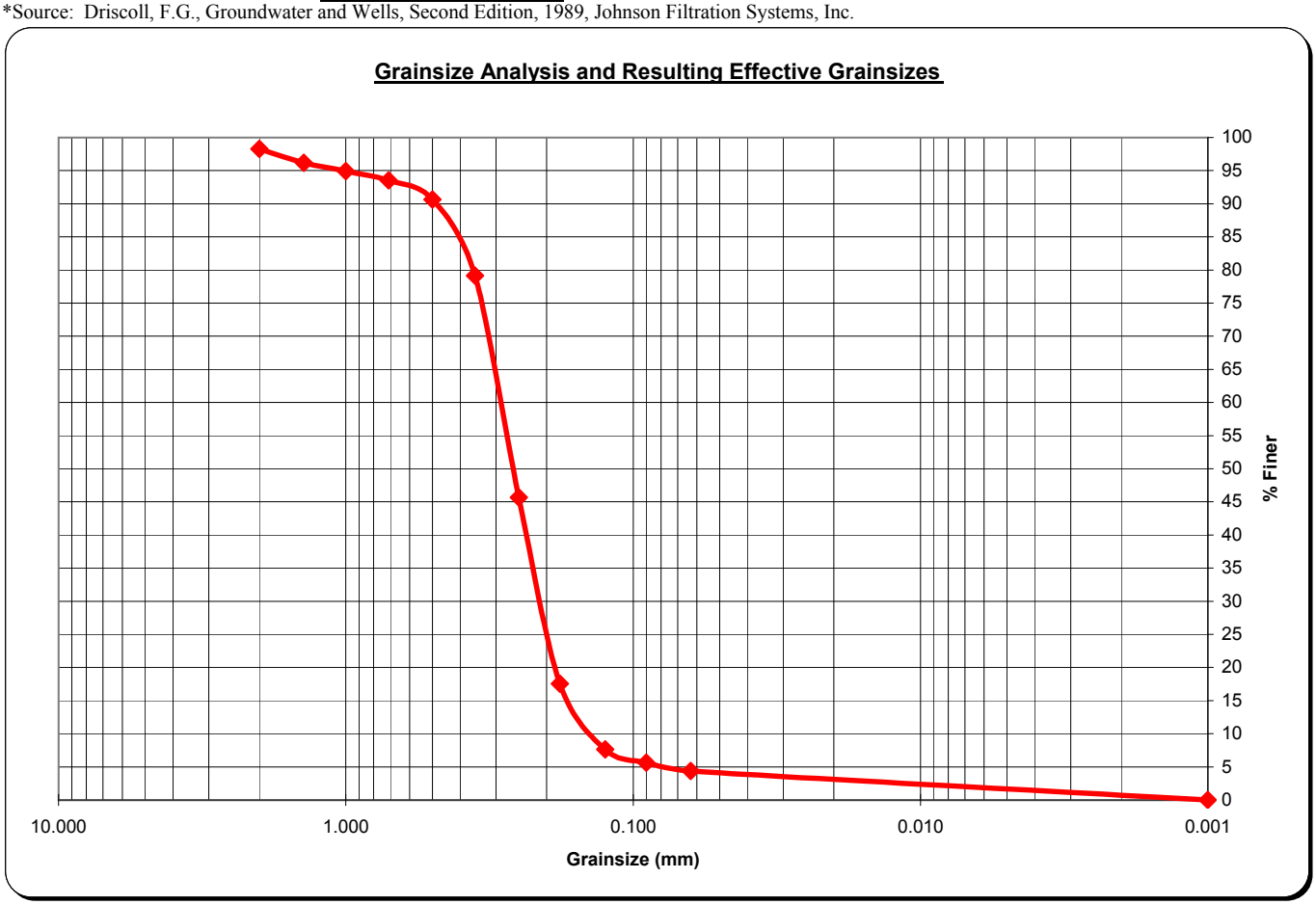
Sample ID:	ECP9-SB1
Sample Depth:	67-68 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.20 g
Total Sieve Weight:	86.70 g
Weight Loss:	0.5 g
Percent Loss:	0.57 %

20.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.50	1.73	98.27	coarse % > 0.5 mm	9.34%
	14	1.4	1.80	2.08	96.19		
	18	1.0	1.10	1.27	94.93		
	25	0.71	1.20	1.38	93.54		
	35	0.50	2.50	2.88	90.66		
medium	45	0.355	10.00	11.53	79.12	medium % 0.25 - 0.5 mm	44.98%
	60	0.250	29.00	33.45	45.67		
fine	80	0.180	24.40	28.14	17.53	Fine % 0.125 - 0.25	38.06%
	120	0.125	8.60	9.92	7.61		
silt	170	0.090	1.70	1.96	5.65	Silt % < 0.125	3.23%
	230	0.063	1.10	1.27	4.38		
pan	pan	0.001	3.80	4.38	0.00	Pan % < 0.063	4.38%
						Total	100.00%

Total (g)	86.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



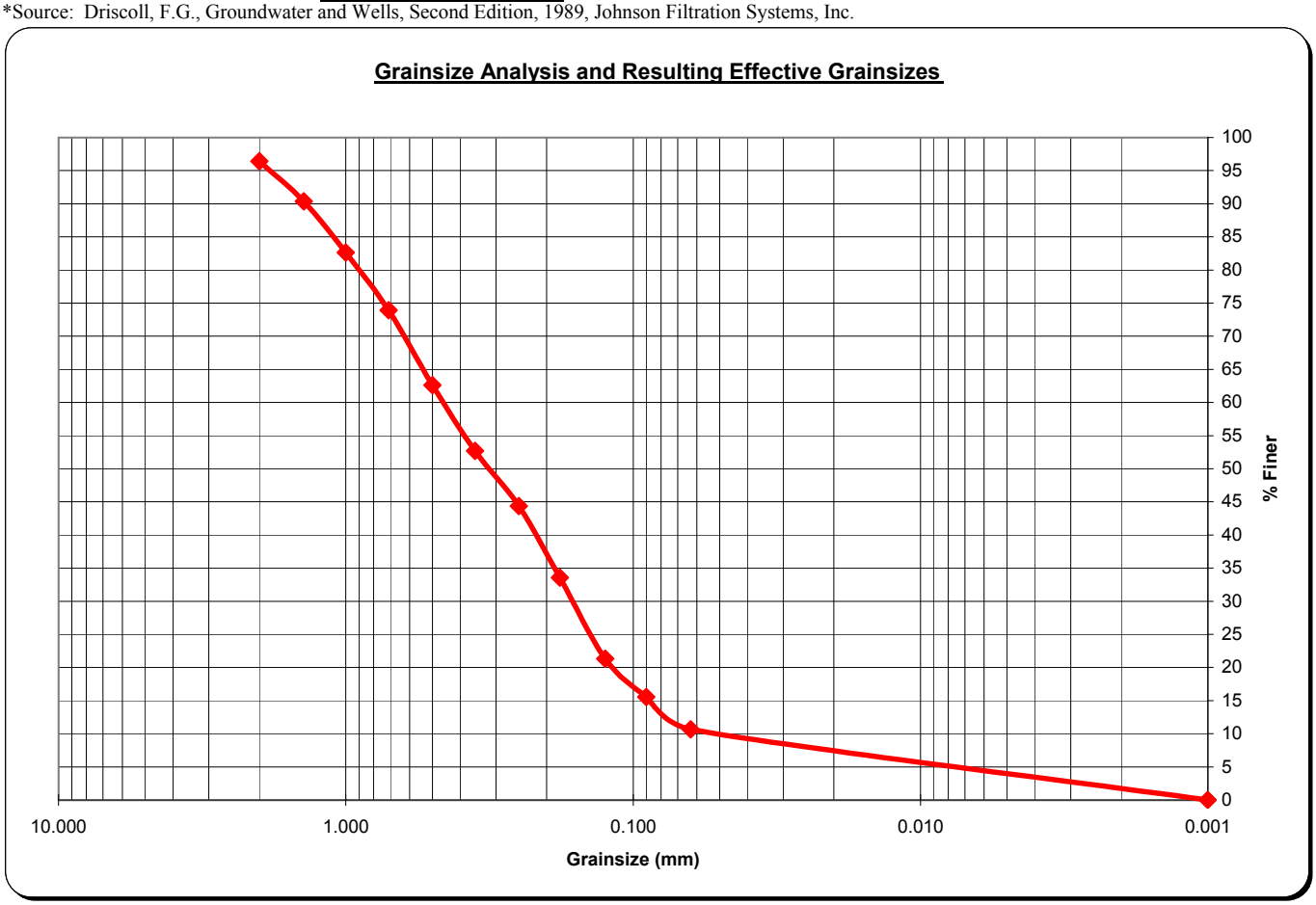
Sample ID:	ECP9-SB1
Sample Depth:	68-69 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	78.80 g
Total Sieve Weight:	77.80 g
Weight Loss:	1 g
Percent Loss:	1.27 %

28.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.80	3.60	96.40	coarse % > 0.5 mm	37.40%
	14	1.4	4.70	6.04	90.36		
	18	1.0	6.00	7.71	82.65		
	25	0.71	6.80	8.74	73.91		
	35	0.50	8.80	11.31	62.60		
medium	45	0.355	7.70	9.90	52.70	medium % 0.25 - 0.5 mm	18.25%
	60	0.250	6.50	8.35	44.34		
fine	80	0.180	8.40	10.80	33.55	Fine % 0.125 - 0.25	23.01%
	120	0.125	9.50	12.21	21.34		
silt	170	0.090	4.50	5.78	15.55	Silt % < 0.125	10.67%
	230	0.063	3.80	4.88	10.67		
pan	pan	0.001	8.30	10.67	0.00	Pan % < 0.063	10.67%
						Total	**100.00%**

Total (g)	77.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



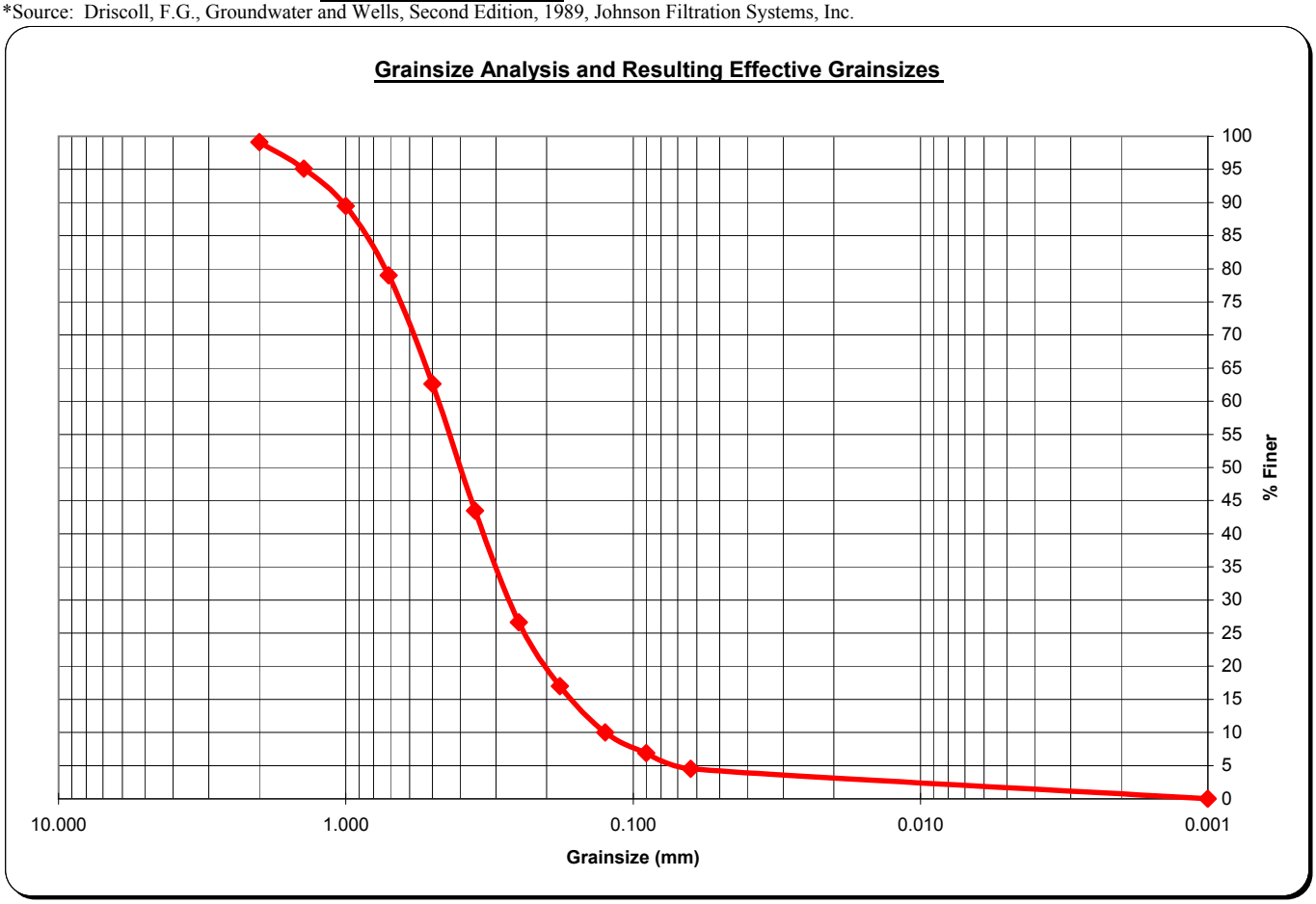
Sample ID:	ECP9-SB1
Sample Depth:	73-74 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	81.00 g
Total Sieve Weight:	80.00 g
Weight Loss:	1 g
Percent Loss:	1.23 %

26.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.70	0.88	99.13	coarse % > 0.5 mm	37.38%
	14	1.4	3.20	4.00	95.13		
	18	1.0	4.50	5.63	89.50		
	25	0.71	8.40	10.50	79.00		
	35	0.50	13.10	16.38	62.63		
medium	45	0.355	15.30	19.13	43.50	medium % 0.25 - 0.5 mm	36.00%
	60	0.250	13.50	16.88	26.63		
fine	80	0.180	7.70	9.63	17.00	Fine % 0.125 - 0.25	16.63%
	120	0.125	5.60	7.00	10.00		
silt	170	0.090	2.50	3.13	6.88	Silt % < 0.125	5.50%
	230	0.063	1.90	2.38	4.50		
pan	pan	0.001	3.60	4.50	0.00	Pan % < 0.063	4.50%
						Total	**100.00%**

Total (g)	80.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



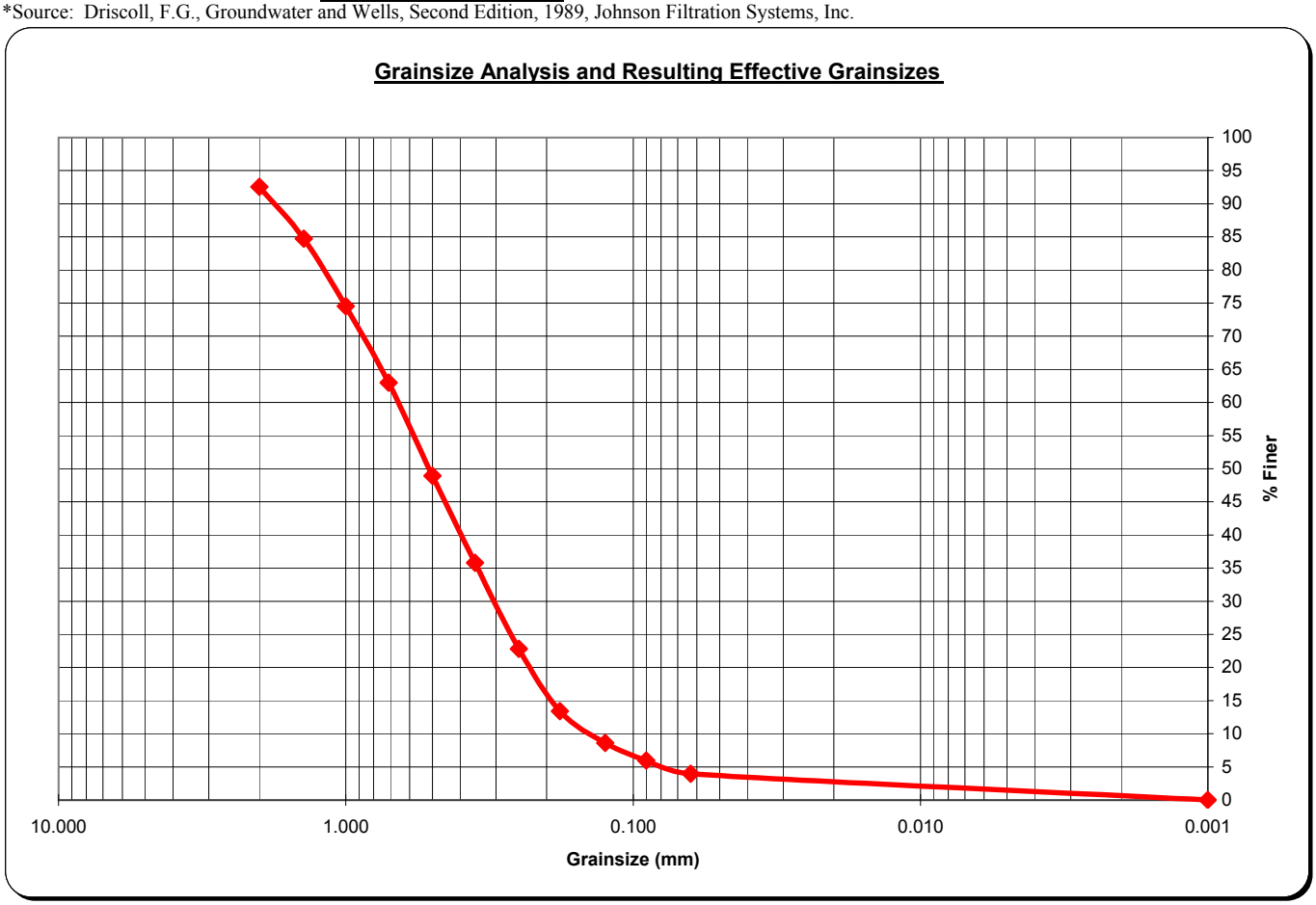
Sample ID:	ECP9-SB1
Sample Depth:	74-75 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	74.00 g
Total Sieve Weight:	75.40 g
Weight Loss:	-1.4 g
Percent Loss:	-1.89 %

32.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	5.60	7.43	92.57	coarse % > 0.5 mm	51.06%
	14	1.4	5.90	7.82	84.75		
	18	1.0	7.70	10.21	74.54		
	25	0.71	8.70	11.54	63.00		
	35	0.50	10.60	14.06	48.94		
medium	45	0.355	9.90	13.13	35.81	medium % 0.25 - 0.5 mm	26.13%
	60	0.250	9.80	13.00	22.81		
fine	80	0.180	7.10	9.42	13.40	Fine % 0.125 - 0.25	14.19%
	120	0.125	3.60	4.77	8.62		
silt	170	0.090	2.00	2.65	5.97	Silt % < 0.125	4.64%
	230	0.063	1.50	1.99	3.98		
pan	pan	0.001	3.00	3.98	0.00	Pan % < 0.063	3.98%
						Total	**100.00%**

Total (g)	75.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



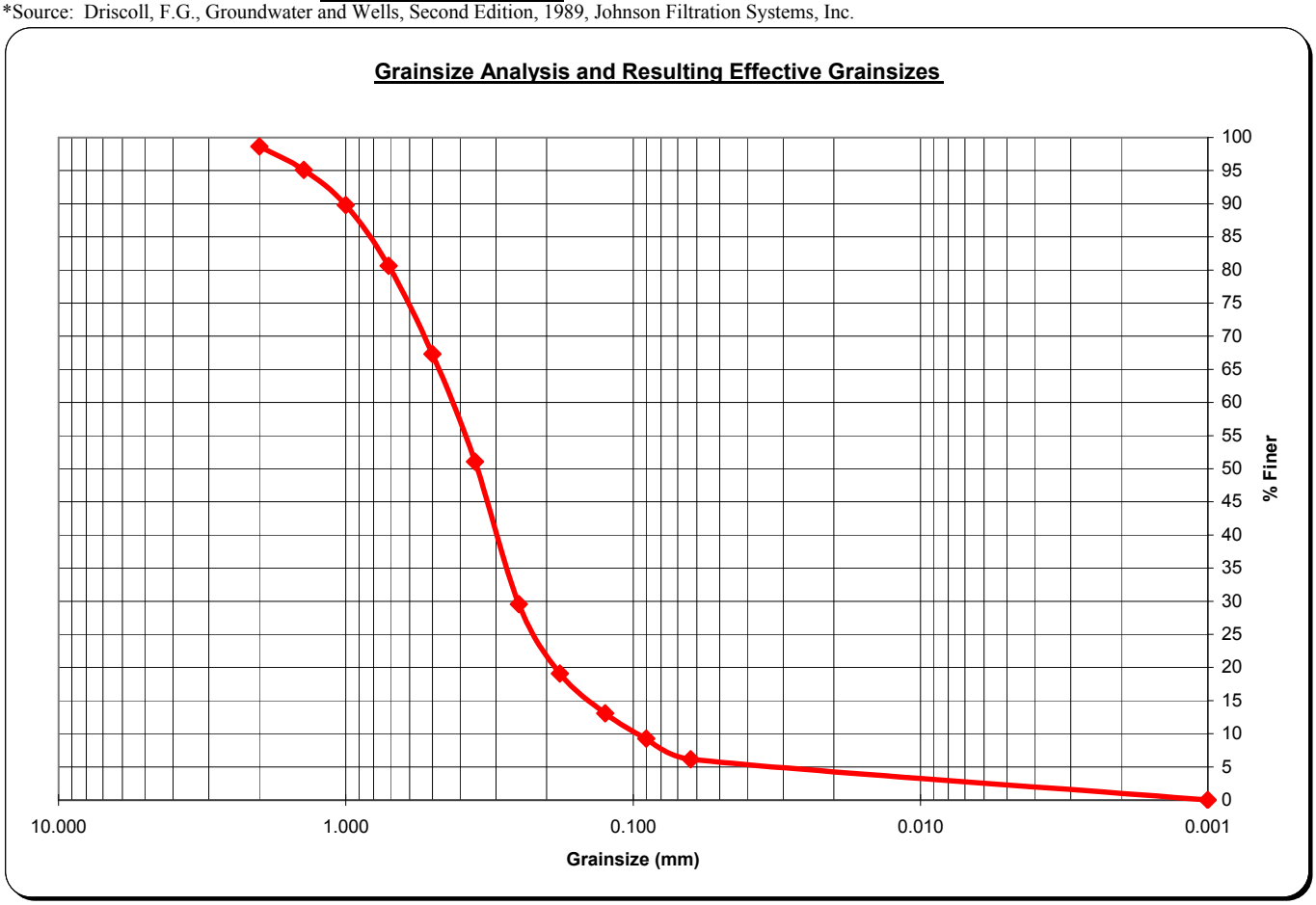
Sample ID:	ECP9-SB1
Sample Depth:	75-76 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	73.30 g
Total Sieve Weight:	73.40 g
Weight Loss:	-0.1 g
Percent Loss:	-0.14 %

33.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.00	1.36	98.64	coarse % > 0.5 mm	32.70%
	14	1.4	2.60	3.54	95.10		
	18	1.0	3.90	5.31	89.78		
	25	0.71	6.70	9.13	80.65		
	35	0.50	9.80	13.35	67.30		
medium	45	0.355	11.90	16.21	51.09	medium % 0.25 - 0.5 mm	37.74%
	60	0.250	15.80	21.53	29.56		
fine	80	0.180	7.70	10.49	19.07	Fine % 0.125 - 0.25	16.49%
	120	0.125	4.40	5.99	13.08		
silt	170	0.090	2.80	3.81	9.26	Silt % < 0.125	6.95%
	230	0.063	2.30	3.13	6.13		
pan	pan	0.001	4.50	6.13	0.00	Pan % < 0.063	6.13%
						Total	**100.00%**

Total (g)	73.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



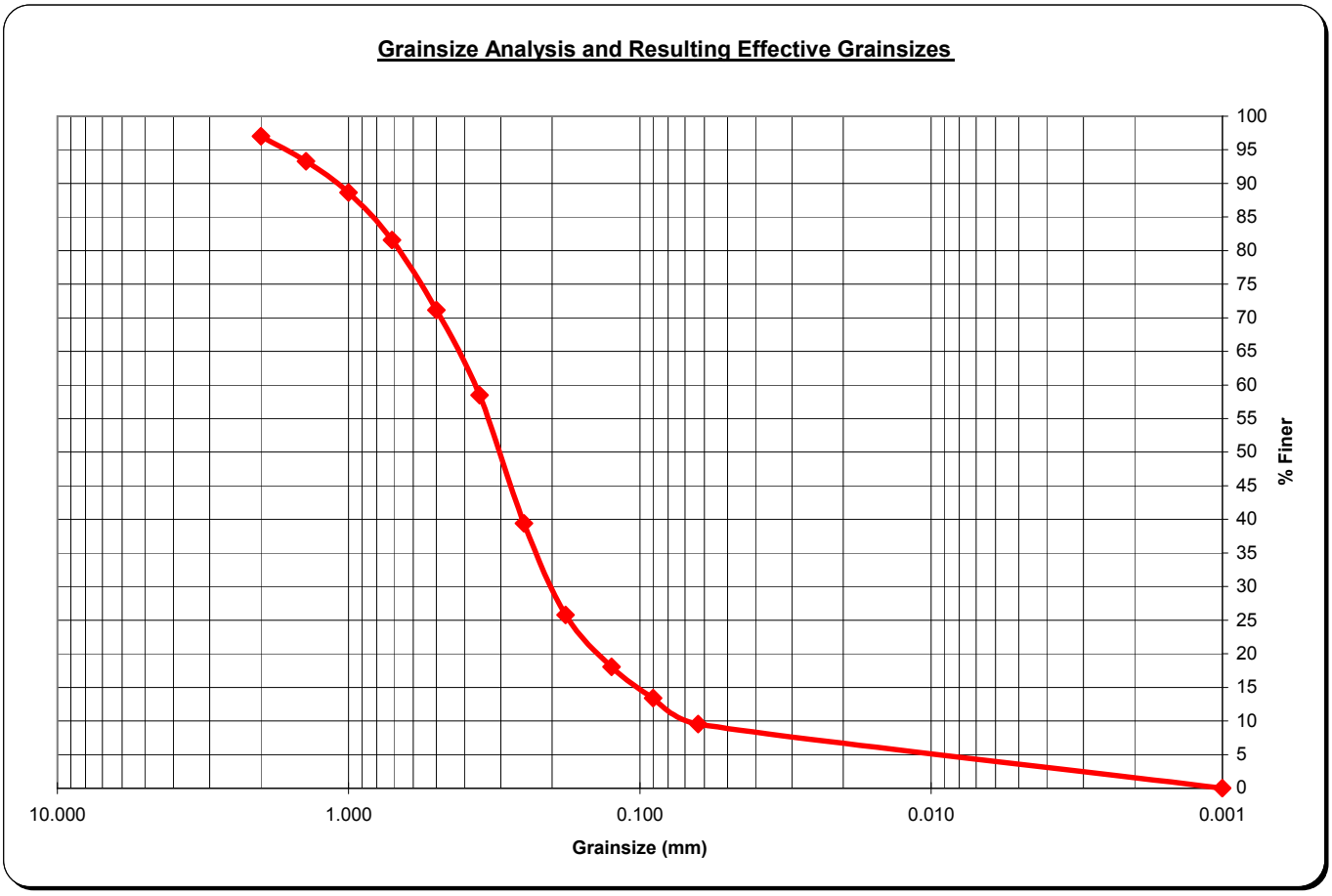
Sample ID:	ECP9-SB1
Sample Depth:	76-77 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	77.90 g
Total Sieve Weight:	77.60 g
Weight Loss:	0.3 g
Percent Loss:	0.39 %

29.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.30	2.96	97.04	coarse % > 0.5 mm	28.87%
	14	1.4	2.90	3.74	93.30		
	18	1.0	3.60	4.64	88.66		
	25	0.71	5.50	7.09	81.57		
	35	0.50	8.10	10.44	71.13		
medium	45	0.355	9.80	12.63	58.51	medium % 0.25 - 0.5 mm	31.70%
	60	0.250	14.80	19.07	39.43		
fine	80	0.180	10.60	13.66	25.77	Fine % 0.125 - 0.25	21.39%
	120	0.125	6.00	7.73	18.04		
silt	170	0.090	3.60	4.64	13.40	Silt % < 0.125	8.51%
	230	0.063	3.00	3.87	9.54		
pan	pan	0.001	7.40	9.54	0.00	Pan % < 0.063	9.54%
						Total	**100.00%**

Total (g)	77.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



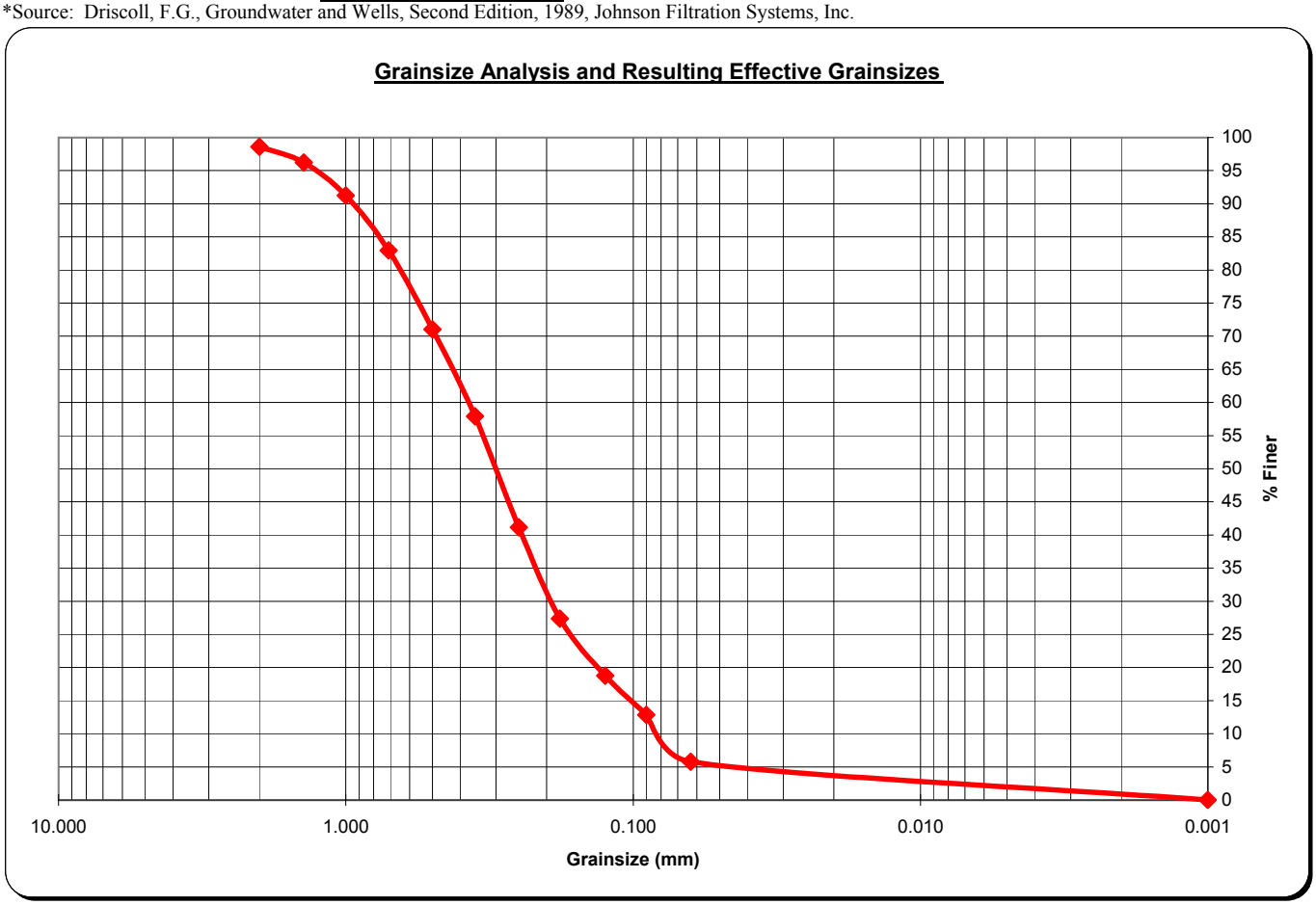
Sample ID:	ECP9-SB1
Sample Depth:	77-78 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	65.10 g
Total Sieve Weight:	63.90 g
Weight Loss:	1.2 g
Percent Loss:	1.84 %

40.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.90	1.41	98.59	coarse % > 0.5 mm	28.95%
	14	1.4	1.50	2.35	96.24		
	18	1.0	3.20	5.01	91.24		
	25	0.71	5.30	8.29	82.94		
	35	0.50	7.60	11.89	71.05		
medium	45	0.355	8.40	13.15	57.90	medium % 0.25 - 0.5 mm	29.89%
	60	0.250	10.70	16.74	41.16		
fine	80	0.180	8.80	13.77	27.39	Fine % 0.125 - 0.25	22.38%
	120	0.125	5.50	8.61	18.78		
silt	170	0.090	3.80	5.95	12.83	Silt % < 0.125	12.99%
	230	0.063	4.50	7.04	5.79		
pan	pan	0.001	3.70	5.79	0.00	Pan % < 0.063	5.79%
						Total	**100.00%**

Total (g)	63.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



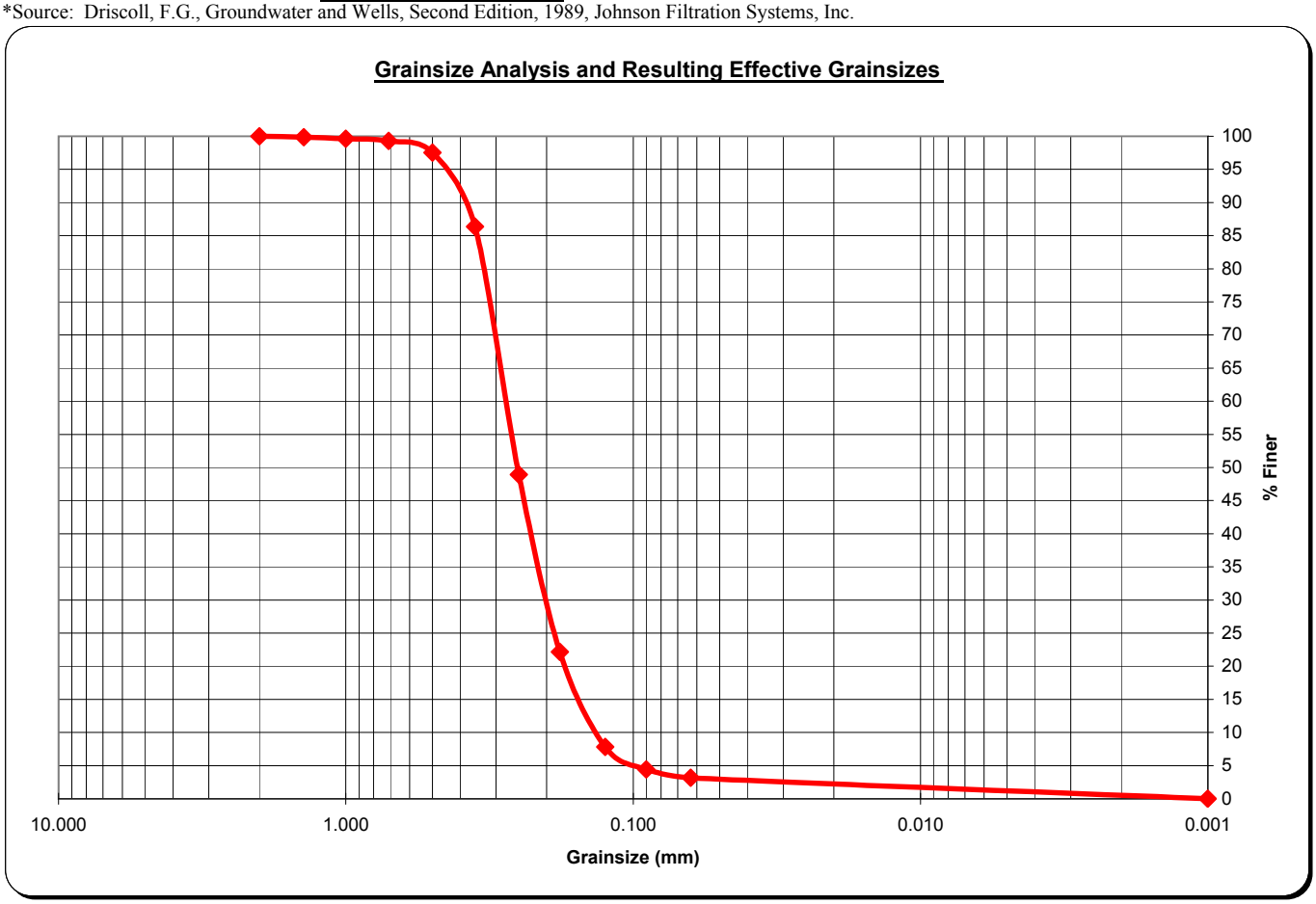
Sample ID:	ECP9-SB1
Sample Depth:	78-79 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.30 g
Total Sieve Weight:	85.80 g
Weight Loss:	0.5 g
Percent Loss:	0.58 %

21.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	2.45%
	14	1.4	0.10	0.12	99.88		
	18	1.0	0.20	0.23	99.65		
	25	0.71	0.30	0.35	99.30		
	35	0.50	1.50	1.75	97.55		
medium	45	0.355	9.60	11.19	86.36	medium % 0.25 - 0.5 mm	48.60%
	60	0.250	32.10	37.41	48.95		
fine	80	0.180	23.00	26.81	22.14	Fine % 0.125 - 0.25	41.14%
	120	0.125	12.30	14.34	7.81		
silt	170	0.090	2.90	3.38	4.43	Silt % < 0.125	4.66%
	230	0.063	1.10	1.28	3.15		
pan	pan	0.001	2.70	3.15	0.00	Pan % < 0.063	3.15%
						Total	**100.00%**

Total (g)	85.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



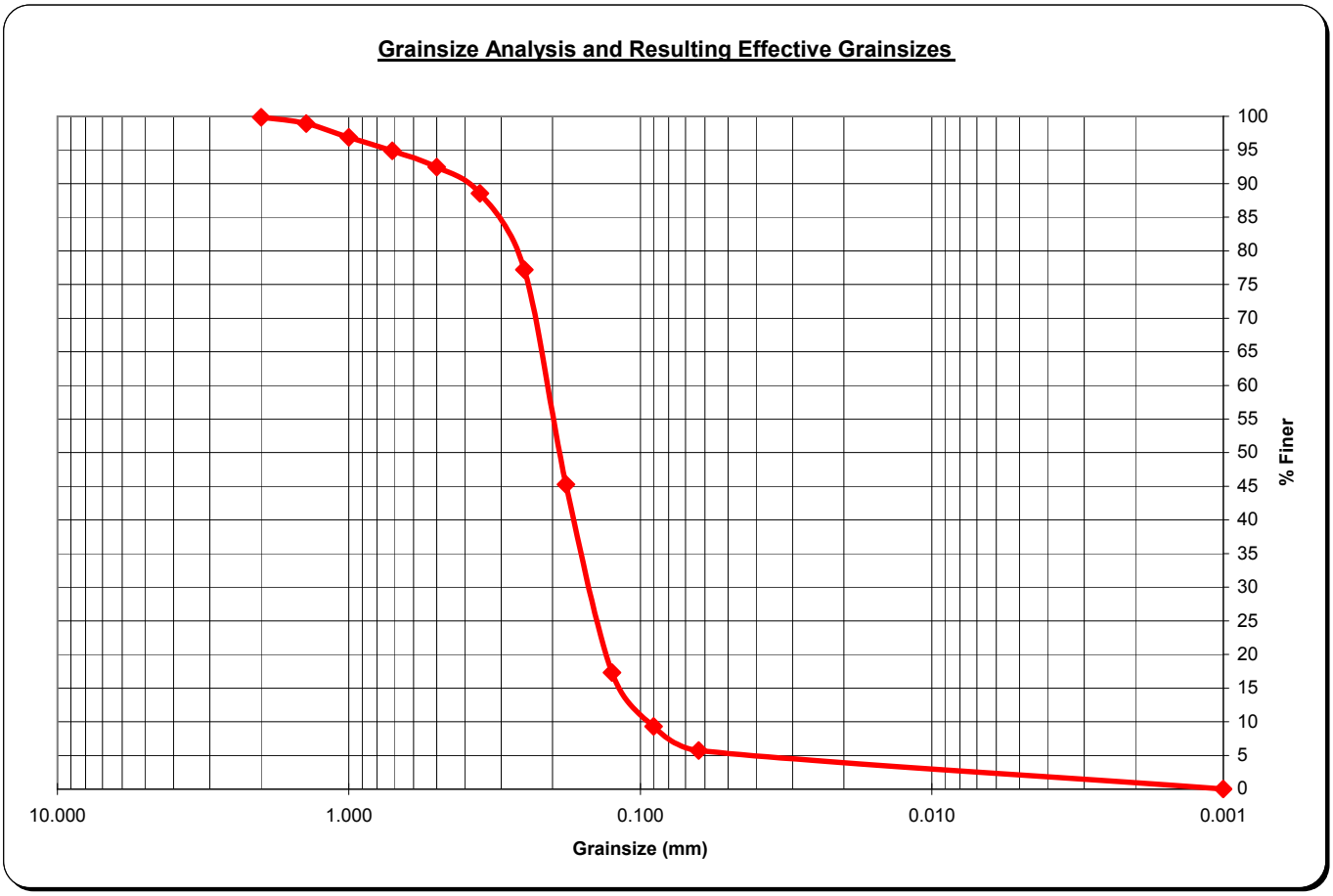
Sample ID:	ECP9-SB1
Sample Depth:	79-80 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.30 g
Total Sieve Weight:	83.70 g
Weight Loss:	0.6 g
Percent Loss:	0.71 %

23.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	7.53%
	14	1.4	0.80	0.96	98.92		
	18	1.0	1.70	2.03	96.89		
	25	0.71	1.70	2.03	94.86		
	35	0.50	2.00	2.39	92.47		
medium	45	0.355	3.30	3.94	88.53	medium % 0.25 - 0.5 mm	15.29%
	60	0.250	9.50	11.35	77.18		
fine	80	0.180	26.70	31.90	45.28	Fine % 0.125 - 0.25	59.86%
	120	0.125	23.40	27.96	17.32		
silt	170	0.090	6.70	8.00	9.32	Silt % < 0.125	11.59%
	230	0.063	3.00	3.58	5.73		
pan	pan	0.001	4.80	5.73	0.00	Pan % < 0.063	5.73%
						Total	**100.00%**

Total (g)	83.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



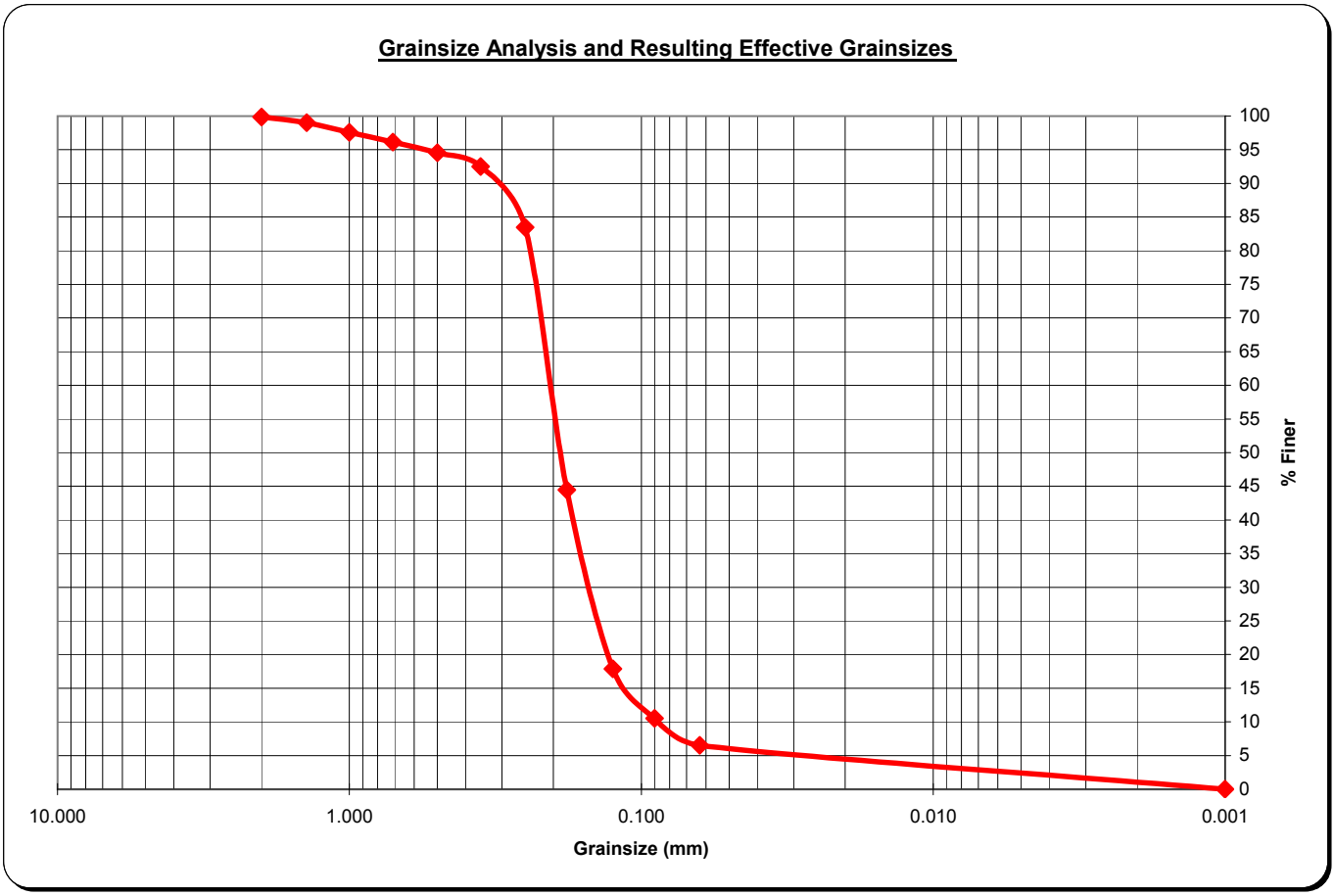
Sample ID:	ECP9-SB1
Sample Depth:	80-81 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.60 g
Total Sieve Weight:	82.80 g
Weight Loss:	0.8 g
Percent Loss:	0.96 %

24.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	5.43%
	14	1.4	0.70	0.85	99.03		
	18	1.0	1.20	1.45	97.58		
	25	0.71	1.20	1.45	96.14		
	35	0.50	1.30	1.57	94.57		
medium	45	0.355	1.70	2.05	92.51	medium % 0.25 - 0.5 mm	11.11%
	60	0.250	7.50	9.06	83.45		
fine	80	0.180	32.30	39.01	44.44	Fine % 0.125 - 0.25	65.58%
	120	0.125	22.00	26.57	17.87		
silt	170	0.090	6.10	7.37	10.51	Silt % < 0.125	11.35%
	230	0.063	3.30	3.99	6.52		
pan	pan	0.001	5.40	6.52	0.00	Pan % < 0.063	6.52%
						Total	**100.00%**

Total (g)	**82.80**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



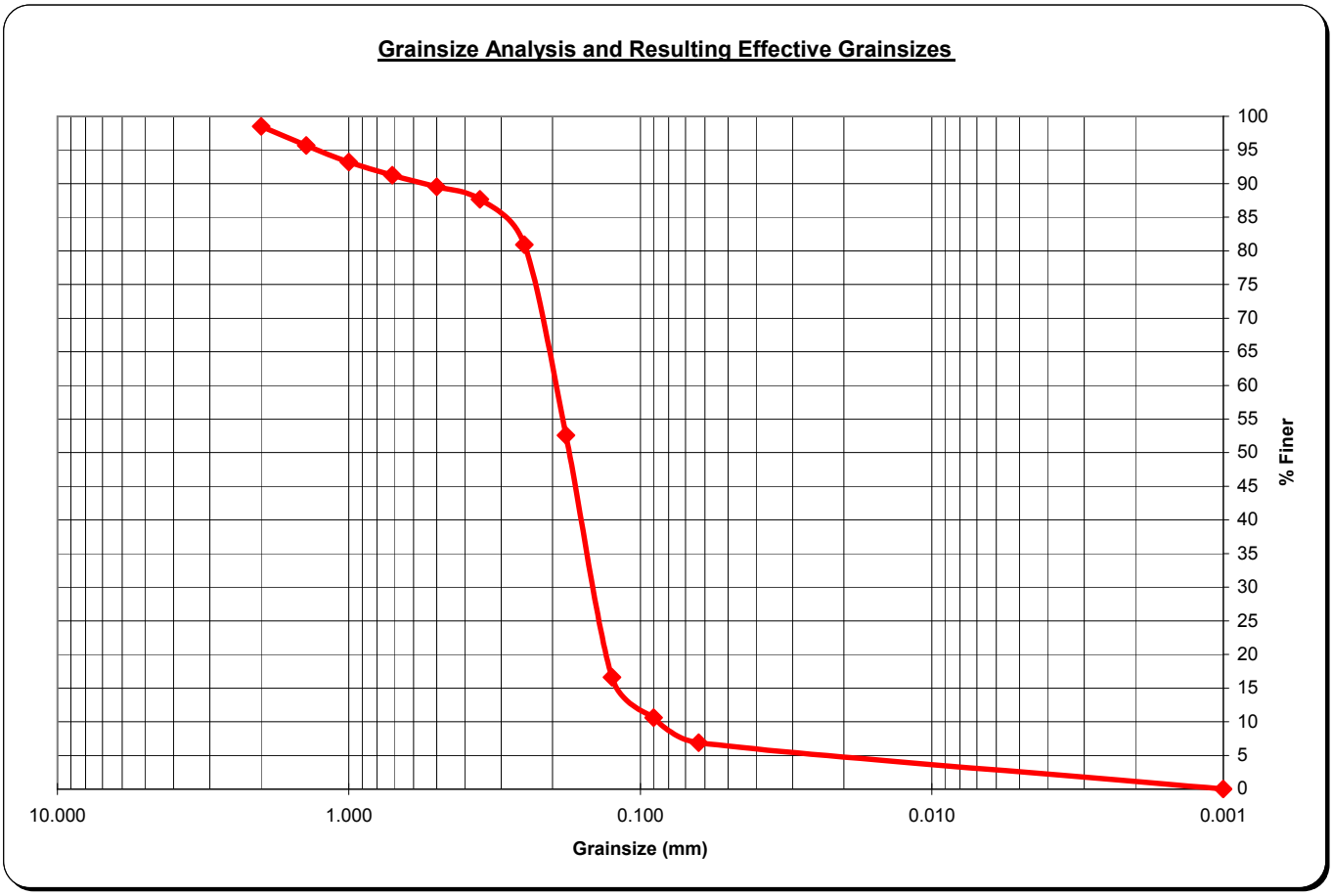
Sample ID:	ECP9-SB1
Sample Depth:	81-82 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	82.10 g
Total Sieve Weight:	81.20 g
Weight Loss:	0.9 g
Percent Loss:	1.10 %

25.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.20	1.48	98.52	coarse % > 0.5 mm	10.47%
	14	1.4	2.30	2.83	95.69		
	18	1.0	2.00	2.46	93.23		
	25	0.71	1.60	1.97	91.26		
	35	0.50	1.40	1.72	89.53		
medium	45	0.355	1.50	1.85	87.68	medium % 0.25 - 0.5 mm	8.62%
	60	0.250	5.50	6.77	80.91		
fine	80	0.180	23.00	28.33	52.59	Fine % 0.125 - 0.25	64.29%
	120	0.125	29.20	35.96	16.63		
silt	170	0.090	4.90	6.03	10.59	Silt % < 0.125	9.73%
	230	0.063	3.00	3.69	6.90		
pan	pan	0.001	5.60	6.90	0.00	Pan % < 0.063	6.90%
						Total	100.00%

Total (g)	81.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



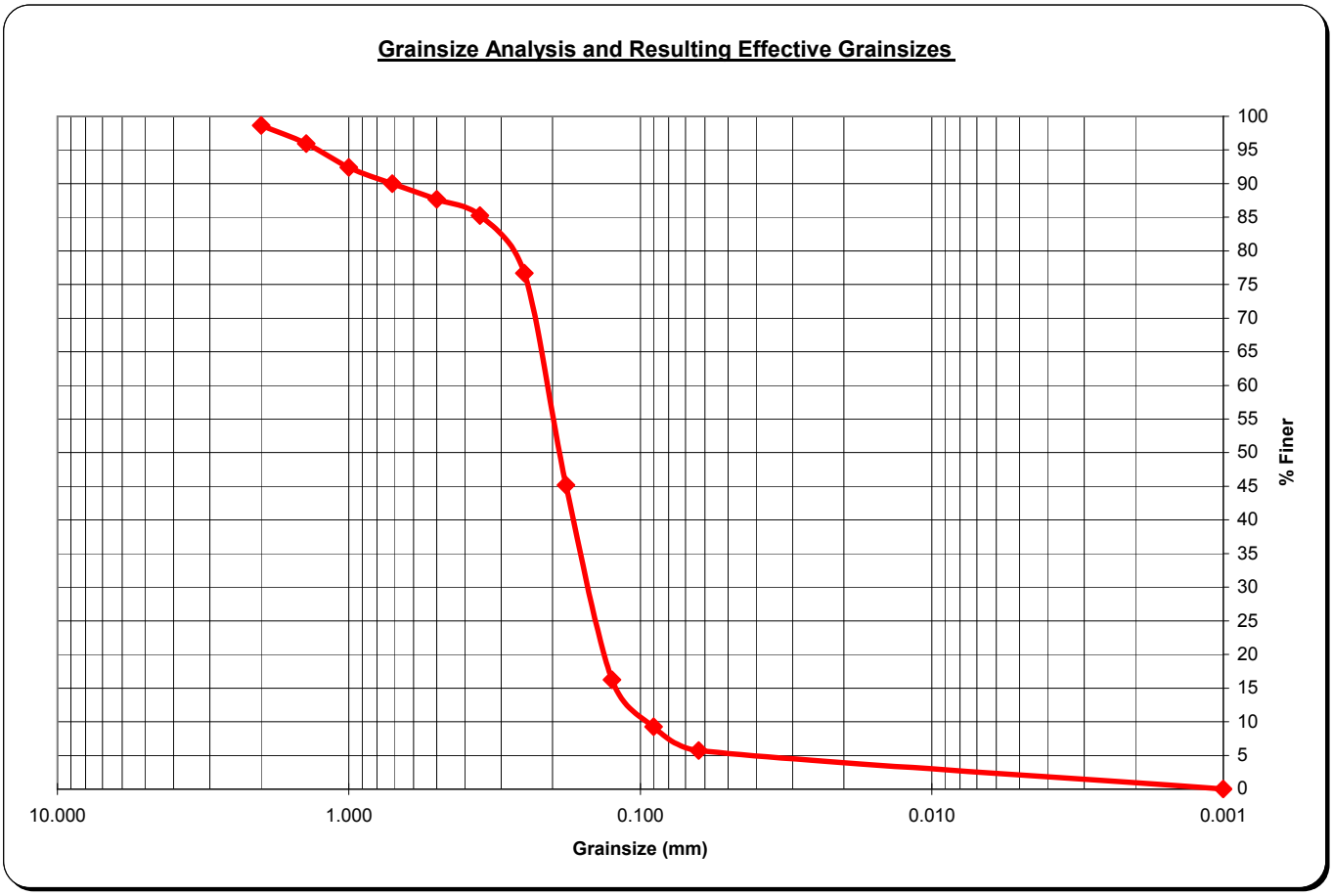
Sample ID:	ECP9-SB1
Sample Depth:	82-83 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	82.70 g
Total Sieve Weight:	81.90 g
Weight Loss:	0.8 g
Percent Loss:	0.97 %

24.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.10	1.34	98.66	coarse % > 0.5 mm	12.33%
	14	1.4	2.20	2.69	95.97		
	18	1.0	2.90	3.54	92.43		
	25	0.71	2.00	2.44	89.99		
	35	0.50	1.90	2.32	87.67		
medium	45	0.355	2.00	2.44	85.23	medium % 0.25 - 0.5 mm	10.99%
	60	0.250	7.00	8.55	76.68		
fine	80	0.180	25.80	31.50	45.18	Fine % 0.125 - 0.25	60.44%
	120	0.125	23.70	28.94	16.24		
silt	170	0.090	5.70	6.96	9.28	Silt % < 0.125	10.50%
	230	0.063	2.90	3.54	5.74		
pan	pan	0.001	4.70	5.74	0.00	Pan % < 0.063	5.74%
						Total	**100.00%**

Total (g)	81.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



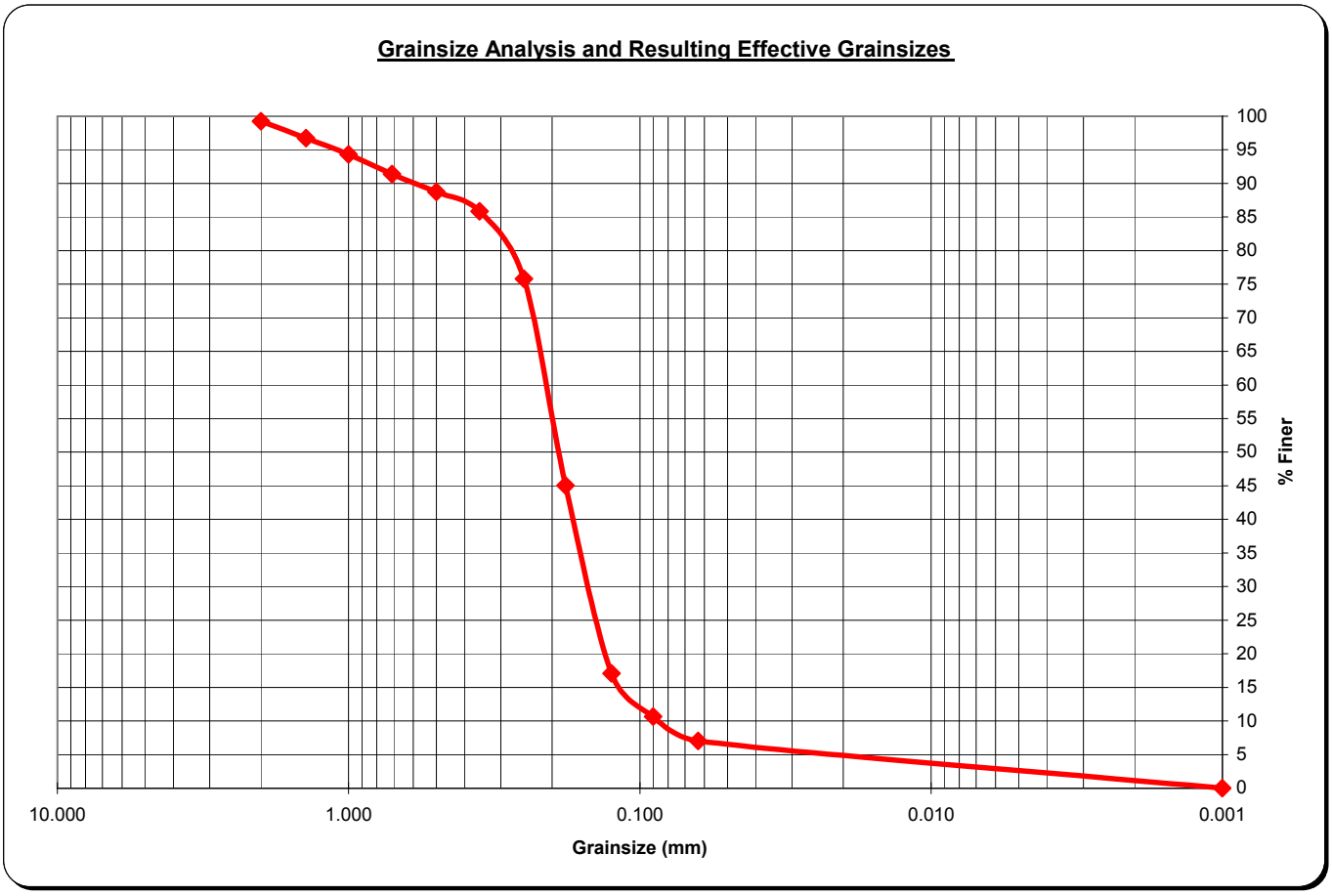
Sample ID:	ECP9-SB1
Sample Depth:	83-84 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.40 g
Total Sieve Weight:	82.60 g
Weight Loss:	0.8 g
Percent Loss:	0.96 %

24.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.73	99.27	coarse % > 0.5 mm	11.26%
	14	1.4	2.10	2.54	96.73		
	18	1.0	2.00	2.42	94.31		
	25	0.71	2.40	2.91	91.40		
	35	0.50	2.20	2.66	88.74		
medium	45	0.355	2.40	2.91	85.84	medium % 0.25 - 0.5 mm	12.95%
	60	0.250	8.30	10.05	75.79		
fine	80	0.180	25.40	30.75	45.04	Fine % 0.125 - 0.25	58.72%
	120	0.125	23.10	27.97	17.07		
silt	170	0.090	5.30	6.42	10.65	Silt % < 0.125	10.05%
	230	0.063	3.00	3.63	7.02		
pan	pan	0.001	5.80	7.02	0.00	Pan % < 0.063	7.02%
						Total	100.00%

Total (g)	82.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



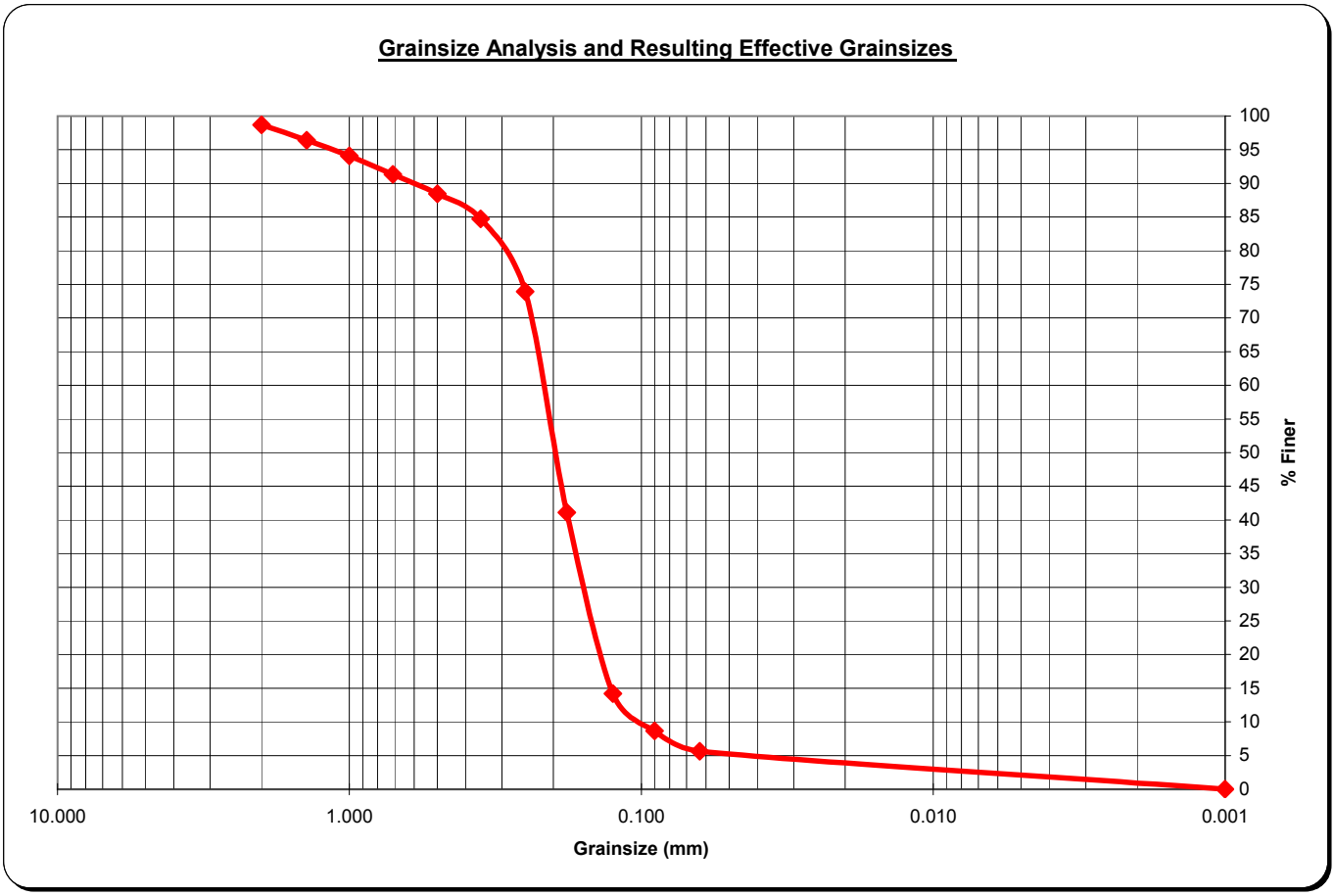
Sample ID:	ECP9-SB1
Sample Depth:	84-85 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.90 g
Total Sieve Weight:	83.20 g
Weight Loss:	0.7 g
Percent Loss:	0.83 %

23.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.10	1.32	98.68	coarse % > 0.5 mm	11.54%
	14	1.4	1.90	2.28	96.39		
	18	1.0	1.90	2.28	94.11		
	25	0.71	2.30	2.76	91.35		
	35	0.50	2.40	2.88	88.46		
medium	45	0.355	3.10	3.73	84.74	medium % 0.25 - 0.5 mm	14.54%
	60	0.250	9.00	10.82	73.92		
fine	80	0.180	27.30	32.81	41.11	Fine % 0.125 - 0.25	59.74%
	120	0.125	22.40	26.92	14.18		
silt	170	0.090	4.60	5.53	8.65	Silt % < 0.125	8.53%
	230	0.063	2.50	3.00	5.65		
pan	pan	0.001	4.70	5.65	0.00	Pan % < 0.063	5.65%
						Total	**100.00%**

Total (g)	**83.20**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



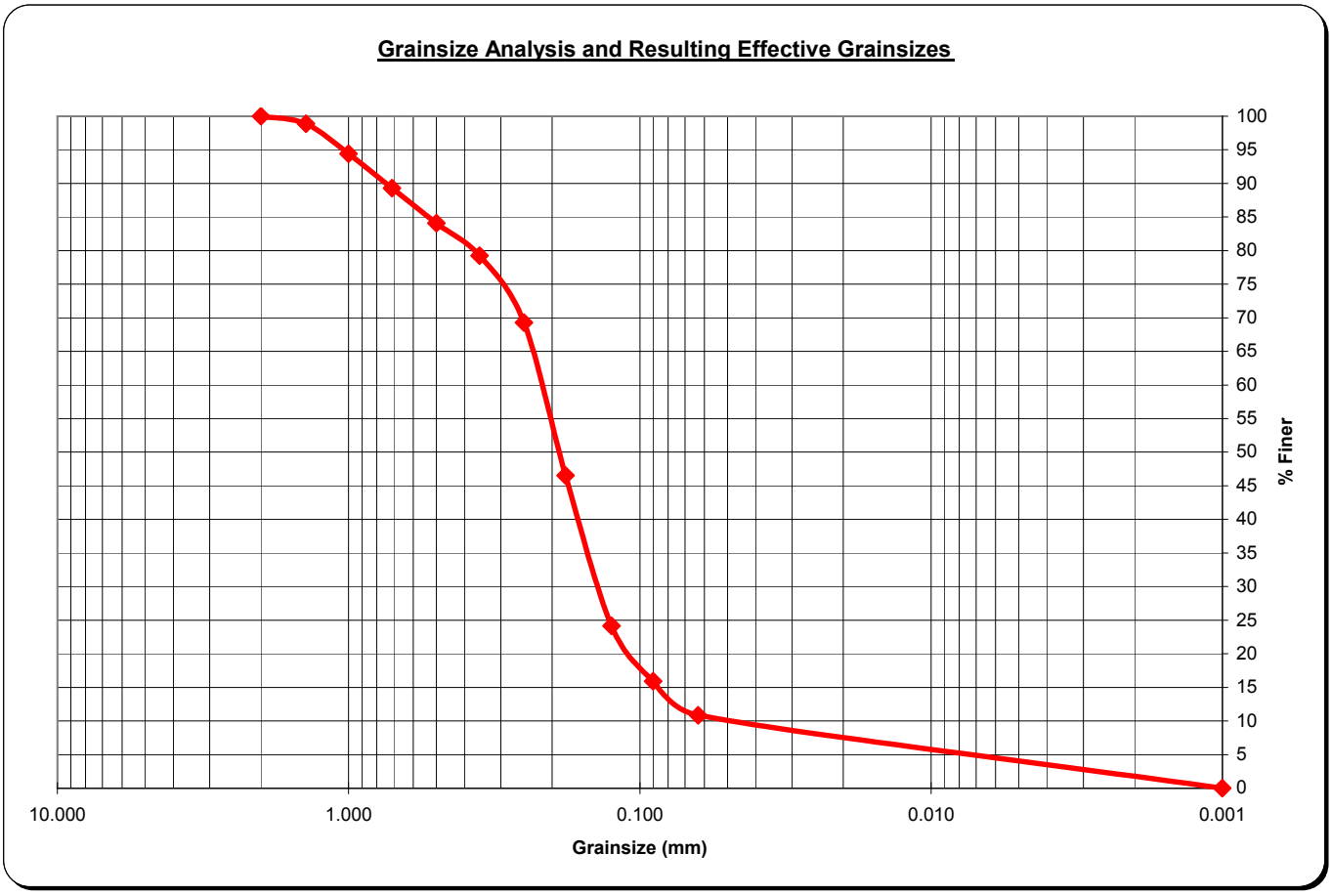
Sample ID:	ECP9-SB1
Sample Depth:	85-86 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	81.00 g
Total Sieve Weight:	80.40 g
Weight Loss:	0.6 g
Percent Loss:	0.74 %

26.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	15.92%
	14	1.4	0.90	1.12	98.88		
	18	1.0	3.60	4.48	94.40		
	25	0.71	4.10	5.10	89.30		
	35	0.50	4.20	5.22	84.08		
medium	45	0.355	3.90	4.85	79.23	medium % 0.25 - 0.5 mm	14.80%
	60	0.250	8.00	9.95	69.28		
fine	80	0.180	18.30	22.76	46.52	Fine % 0.125 - 0.25	45.15%
	120	0.125	18.00	22.39	24.13		
silt	170	0.090	6.60	8.21	15.92	Silt % < 0.125	13.31%
	230	0.063	4.10	5.10	10.82		
pan	pan	0.001	8.70	10.82	0.00	Pan % < 0.063	10.82%
						Total	**100.00%**

Total (g)	80.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



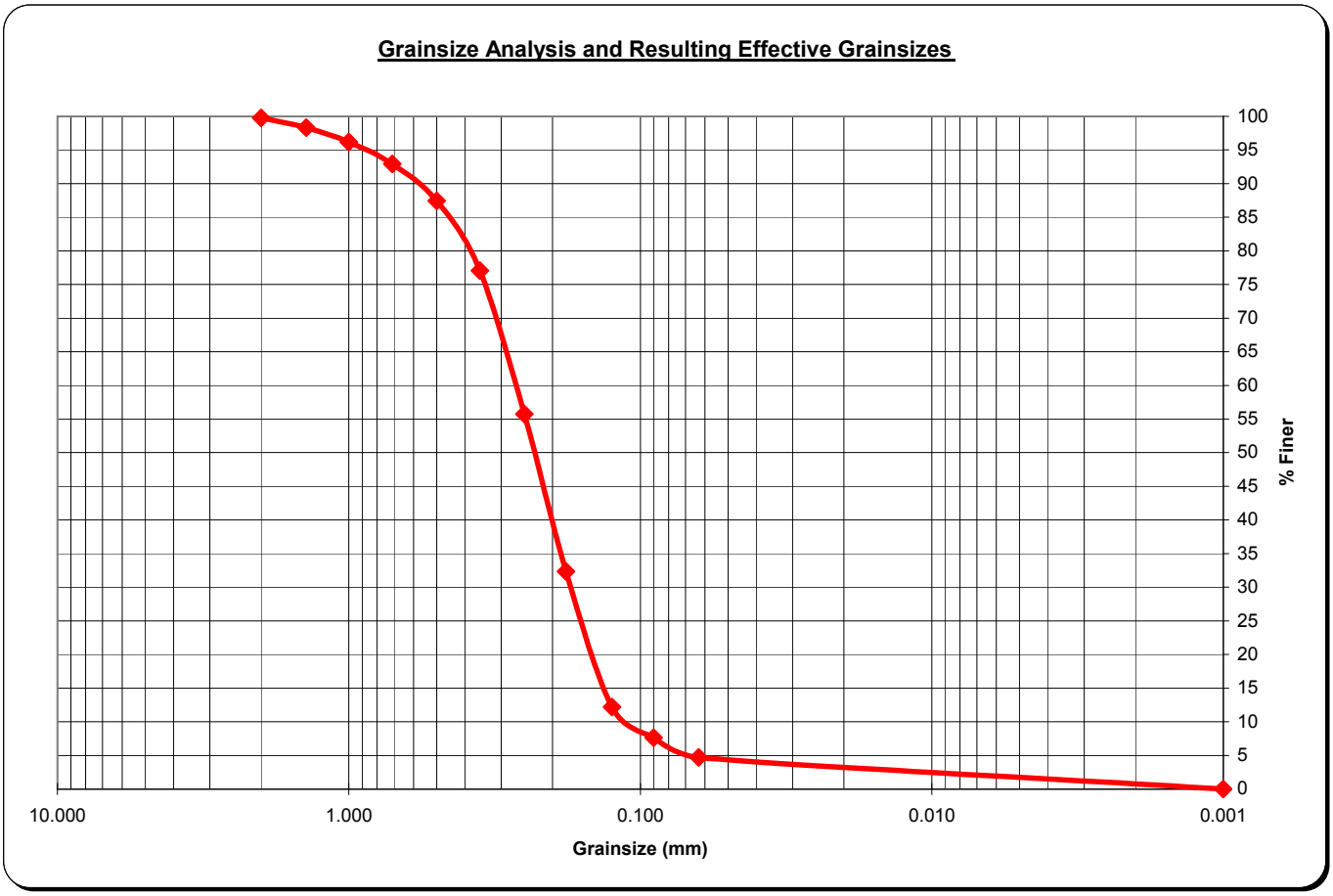
Sample ID:	ECP9-SB1
Sample Depth:	86-87 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.70 g
Total Sieve Weight:	89.30 g
Weight Loss:	0.4 g
Percent Loss:	0.45 %

18.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.22	99.78	coarse % > 0.5 mm	12.54%
	14	1.4	1.30	1.46	98.32		
	18	1.0	1.90	2.13	96.19		
	25	0.71	2.90	3.25	92.95		
	35	0.50	4.90	5.49	87.46		
medium	45	0.355	9.30	10.41	77.04	medium % 0.25 - 0.5 mm	31.69%
	60	0.250	19.00	21.28	55.77		
fine	80	0.180	20.90	23.40	32.36	Fine % 0.125 - 0.25	43.56%
	120	0.125	18.00	20.16	12.21		
silt	170	0.090	4.10	4.59	7.61	Silt % < 0.125	7.50%
	230	0.063	2.60	2.91	4.70		
pan	pan	0.001	4.20	4.70	0.00	Pan % < 0.063	4.70%
						Total	**100.00%**

Total (g)	89.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



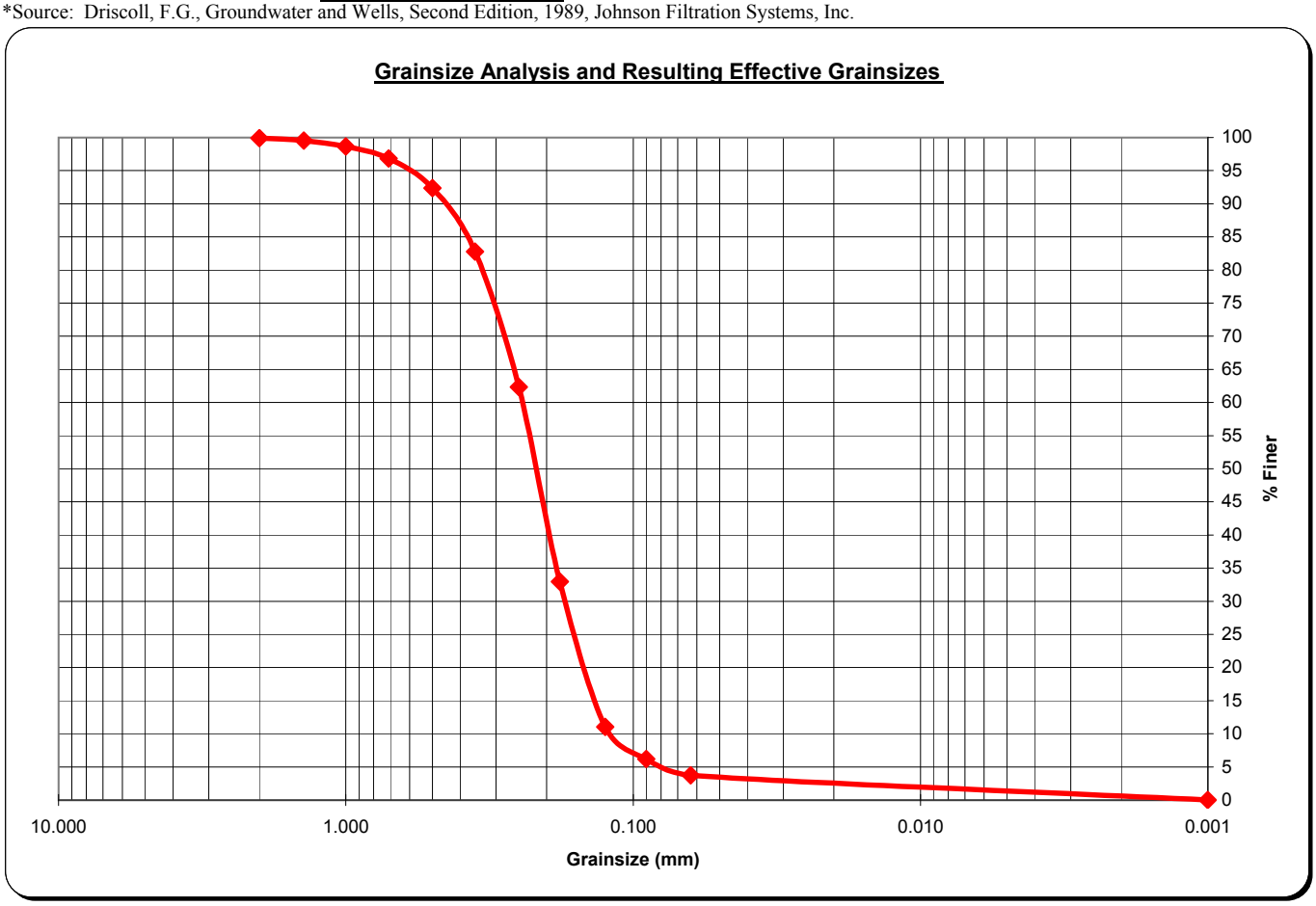
Sample ID:	ECP9-SB1
Sample Depth:	87-88 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.60 g
Total Sieve Weight:	88.90 g
Weight Loss:	0.7 g
Percent Loss:	0.78 %

18.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	7.65%
	14	1.4	0.30	0.34	99.55		
	18	1.0	0.80	0.90	98.65		
	25	0.71	1.60	1.80	96.85		
	35	0.50	4.00	4.50	92.35		
medium	45	0.355	8.50	9.56	82.79	medium % 0.25 - 0.5 mm	30.03%
	60	0.250	18.20	20.47	62.32		
fine	80	0.180	26.10	29.36	32.96	Fine % 0.125 - 0.25	51.29%
	120	0.125	19.50	21.93	11.02		
silt	170	0.090	4.30	4.84	6.19	Silt % < 0.125	7.31%
	230	0.063	2.20	2.47	3.71		
pan	pan	0.001	3.30	3.71	0.00	Pan % < 0.063	3.71%
						Total	100.00%

Total (g)	88.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



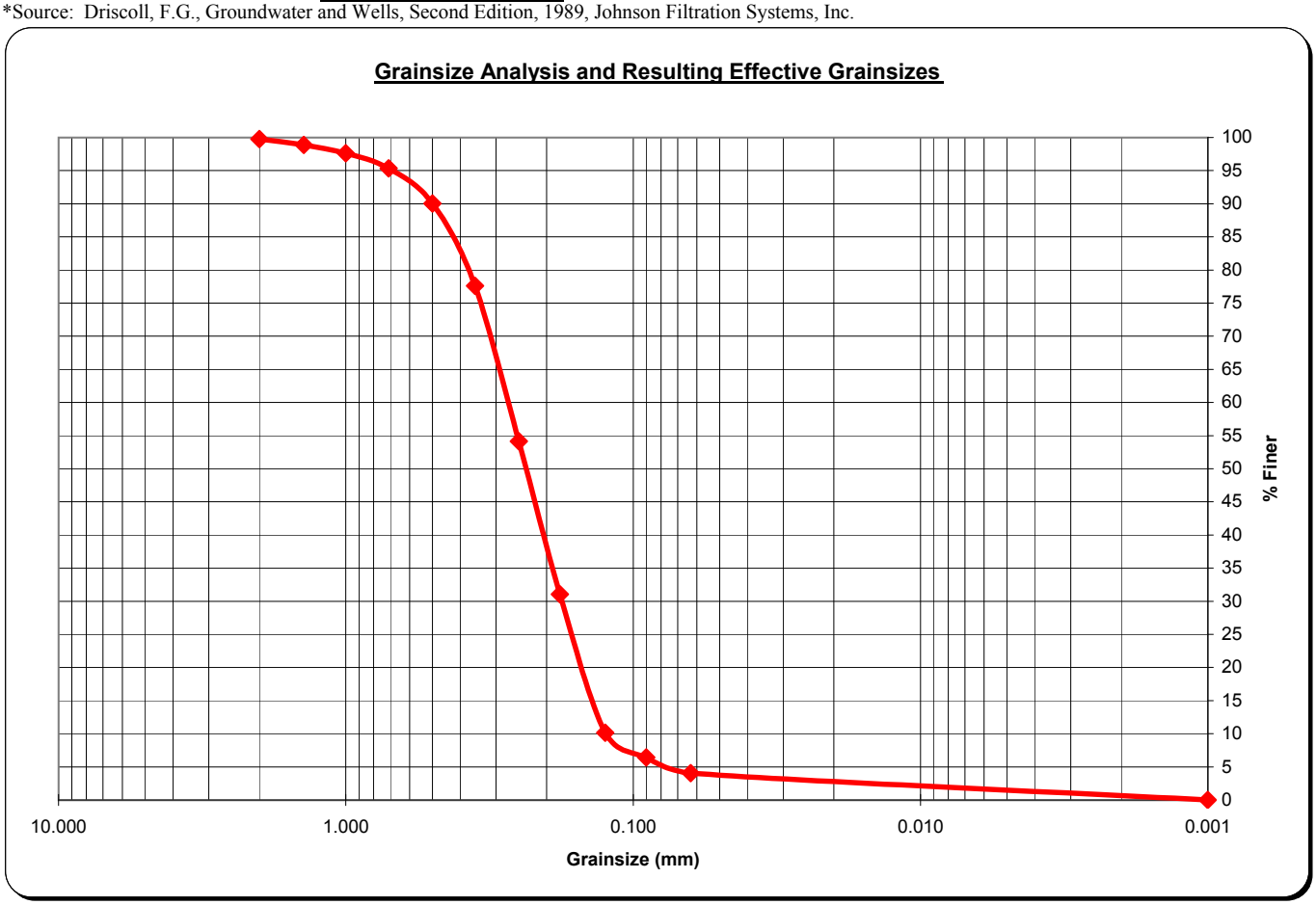
Sample ID:	ECP9-SB1
Sample Depth:	88-89 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.00 g
Total Sieve Weight:	88.50 g
Weight Loss:	0.5 g
Percent Loss:	0.56 %

19.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.23	99.77	coarse % > 0.5 mm	9.94%
	14	1.4	0.80	0.90	98.87		
	18	1.0	1.10	1.24	97.63		
	25	0.71	2.00	2.26	95.37		
	35	0.50	4.70	5.31	90.06		
medium	45	0.355	11.00	12.43	77.63	medium % 0.25 - 0.5 mm	35.93%
	60	0.250	20.80	23.50	54.12		
fine	80	0.180	20.40	23.05	31.07	Fine % 0.125 - 0.25	43.95%
	120	0.125	18.50	20.90	10.17		
silt	170	0.090	3.30	3.73	6.44	Silt % < 0.125	6.10%
	230	0.063	2.10	2.37	4.07		
pan	pan	0.001	3.60	4.07	0.00	Pan % < 0.063	4.07%
						Total	**100.00%**

Total (g)	88.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



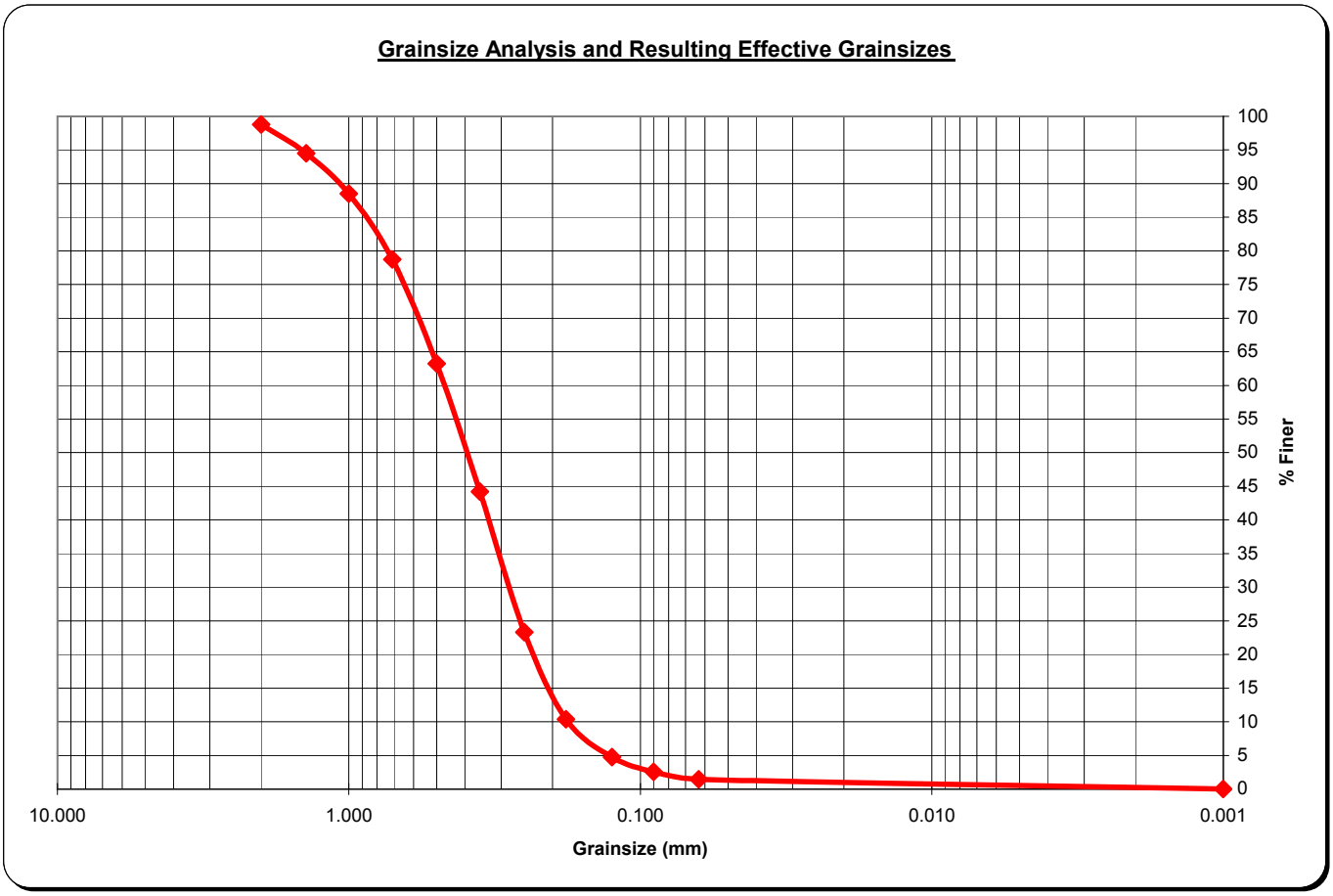
Sample ID:	ECP9-SB1
Sample Depth:	89-90 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	82.30 g
Total Sieve Weight:	81.90 g
Weight Loss:	0.4 g
Percent Loss:	0.49 %

25.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.00	1.22	98.78	coarse % > 0.5 mm	36.75%
	14	1.4	3.50	4.27	94.51		
	18	1.0	4.90	5.98	88.52		
	25	0.71	8.00	9.77	78.75		
	35	0.50	12.70	15.51	63.25		
medium	45	0.355	15.60	19.05	44.20	medium % 0.25 - 0.5 mm	39.93%
	60	0.250	17.10	20.88	23.32		
fine	80	0.180	10.60	12.94	10.38	Fine % 0.125 - 0.25	18.56%
	120	0.125	4.60	5.62	4.76		
silt	170	0.090	1.80	2.20	2.56	Silt % < 0.125	3.30%
	230	0.063	0.90	1.10	1.47		
pan	pan	0.001	1.20	1.47	0.00	Pan % < 0.063	1.47%
						Total	**100.00%**

Total (g)	**81.90**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



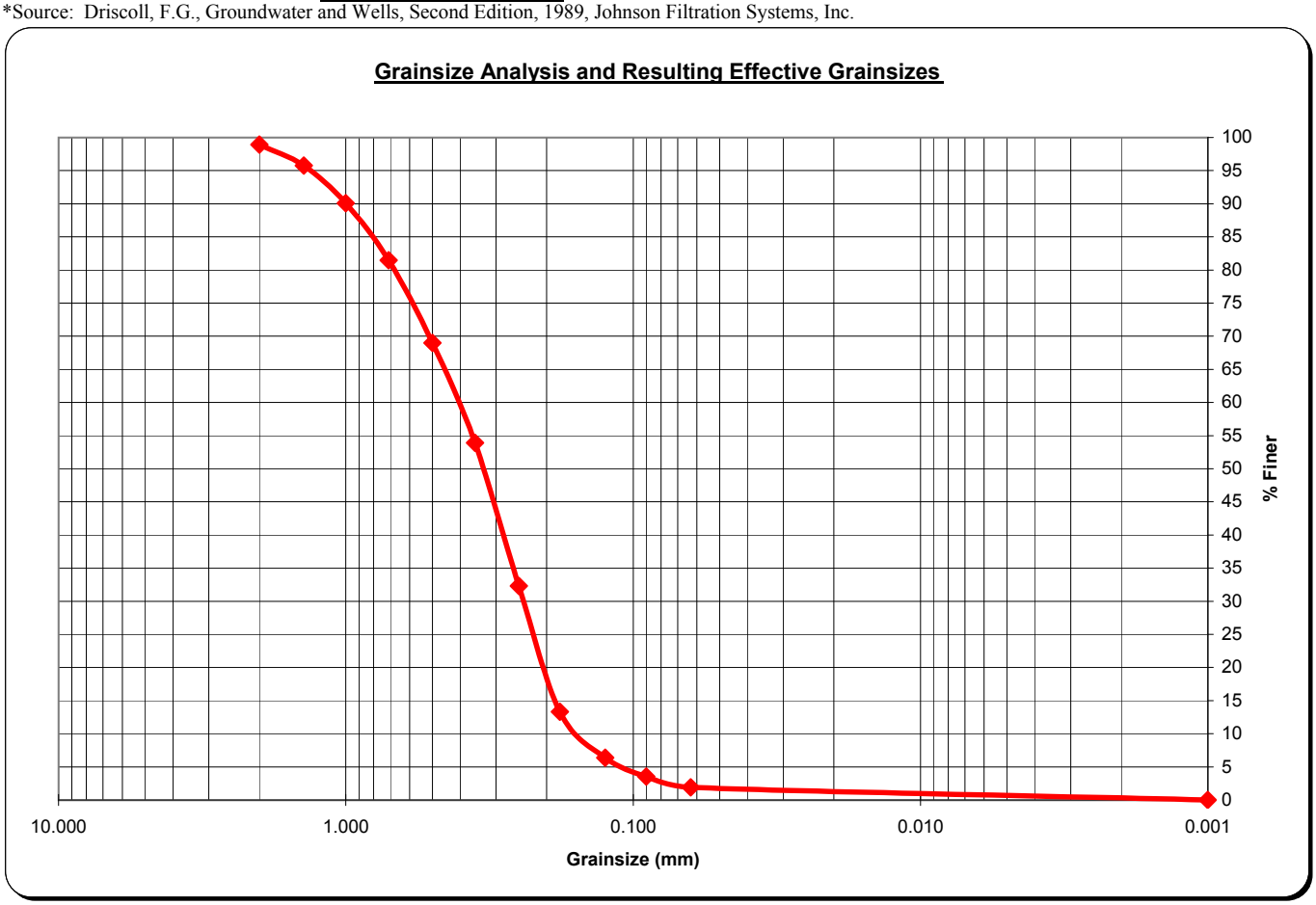
Sample ID:	ECP9-SB1
Sample Depth:	90-91 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.30 g
Total Sieve Weight:	84.80 g
Weight Loss:	-0.5 g
Percent Loss:	-0.59 %

23.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.90	1.06	98.94	coarse % > 0.5 mm	31.01%
	14	1.4	2.70	3.18	95.75		
	18	1.0	4.80	5.66	90.09		
	25	0.71	7.30	8.61	81.49		
	35	0.50	10.60	12.50	68.99		
medium	45	0.355	12.80	15.09	53.89	medium % 0.25 - 0.5 mm	36.67%
	60	0.250	18.30	21.58	32.31		
fine	80	0.180	16.10	18.99	13.33	Fine % 0.125 - 0.25	25.94%
	120	0.125	5.90	6.96	6.37		
silt	170	0.090	2.40	2.83	3.54	Silt % < 0.125	4.48%
	230	0.063	1.40	1.65	1.89		
pan	pan	0.001	1.60	1.89	0.00	Pan % < 0.063	1.89%
						Total	**100.00%**

Total (g)	84.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



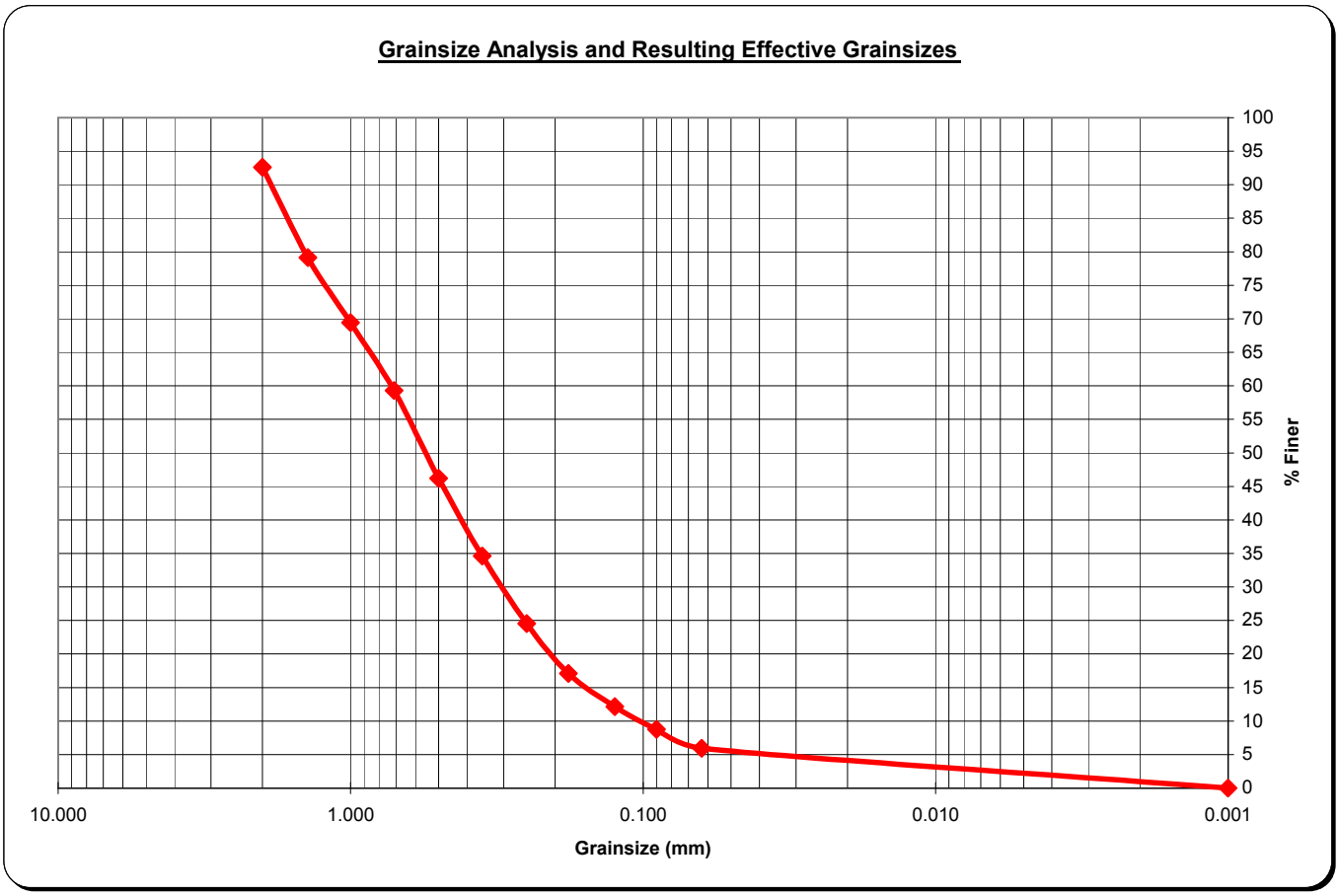
Sample ID:	ECP9-SB1
Sample Depth:	91-92 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	74.60 g
Total Sieve Weight:	74.20 g
Weight Loss:	0.4 g
Percent Loss:	0.54 %

32.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	5.50	7.41	92.59	coarse % > 0.5 mm	53.77%
	14	1.4	10.00	13.48	79.11		
	18	1.0	7.20	9.70	69.41		
	25	0.71	7.50	10.11	59.30		
	35	0.50	9.70	13.07	46.23		
medium	45	0.355	8.60	11.59	34.64	medium % 0.25 - 0.5 mm	21.70%
	60	0.250	7.50	10.11	24.53		
fine	80	0.180	5.50	7.41	17.12	Fine % 0.125 - 0.25	12.40%
	120	0.125	3.70	4.99	12.13		
silt	170	0.090	2.50	3.37	8.76	Silt % < 0.125	6.20%
	230	0.063	2.10	2.83	5.93		
pan	pan	0.001	4.40	5.93	0.00	Pan % < 0.063	5.93%
						Total	**100.00%**

Total (g)	74.20

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



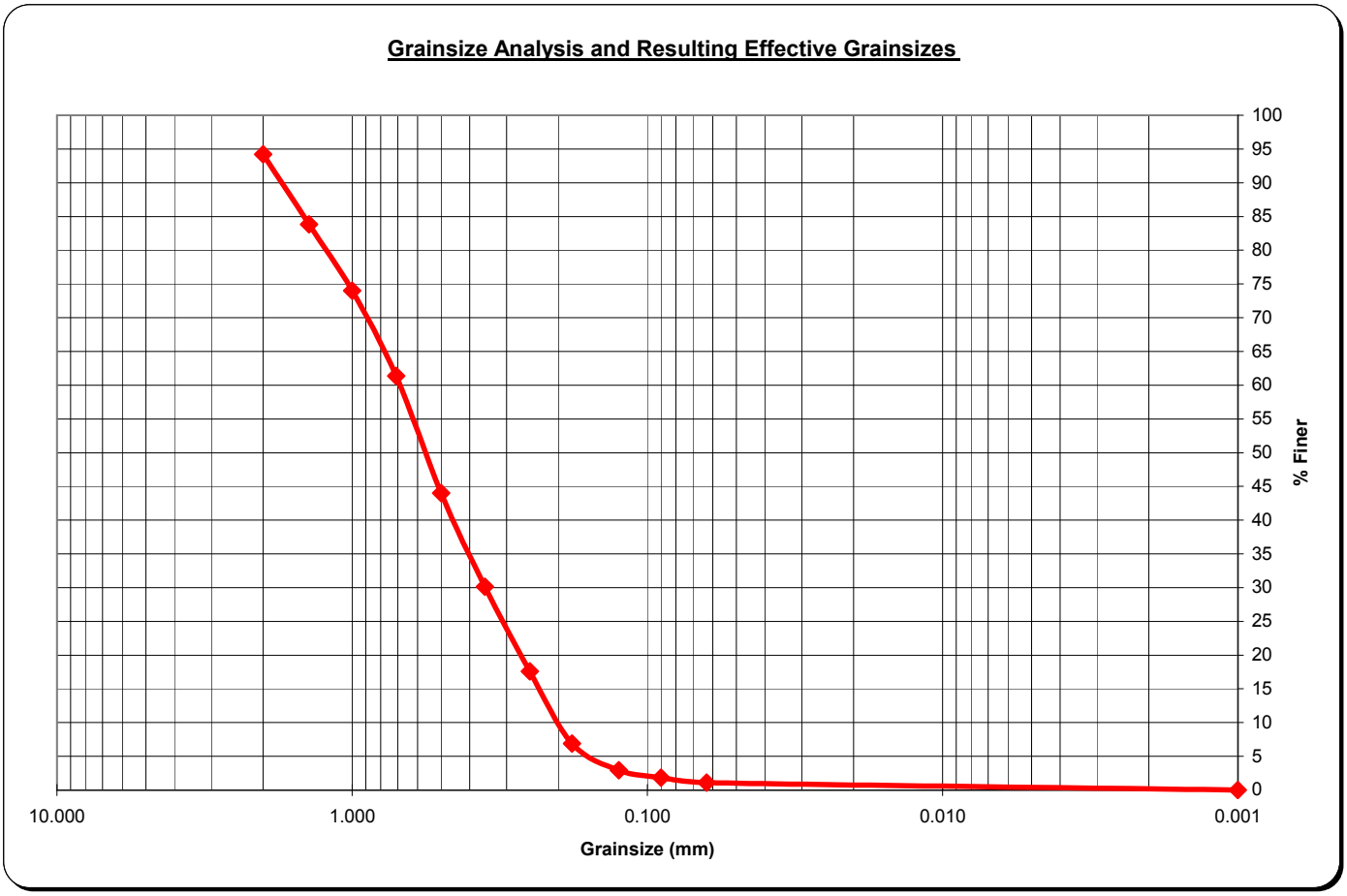
Sample ID:	ECP9-SB1
Sample Depth:	92-93 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.10 g
Total Sieve Weight:	87.40 g
Weight Loss:	-0.3 g
Percent Loss:	-0.34 %

20.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	8.80	10.07	89.93	coarse % > 0.5 mm	62.01%
	14	1.4	9.90	11.33	78.60		
	18	1.0	9.80	11.21	67.39		
	25	0.71	11.00	12.59	54.81		
	35	0.50	14.70	16.82	37.99		
medium	45	0.355	11.90	13.62	24.37	medium % 0.25 - 0.5 mm	25.06%
	60	0.250	10.00	11.44	12.93		
fine	80	0.180	6.70	7.67	5.26	Fine % 0.125 - 0.25	10.07%
	120	0.125	2.10	2.40	2.86		
silt	170	0.090	1.00	1.14	1.72	Silt % < 0.125	1.83%
	230	0.063	0.60	0.69	1.03		
pan	pan	0.001	0.90	1.03	0.00	Pan % < 0.063	1.03%
						Total	**100.00%**

Total (g)	**87.40**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



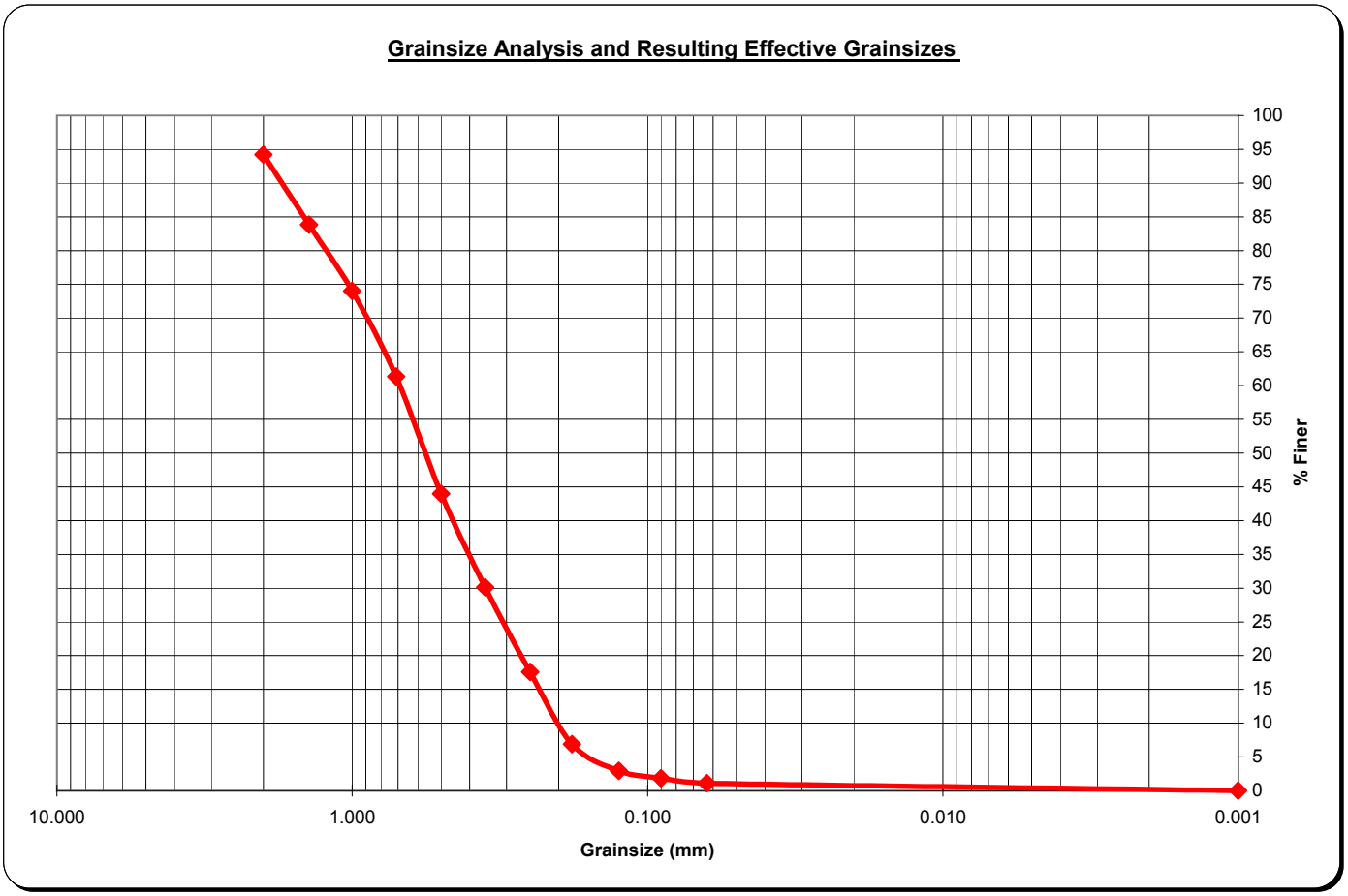
Sample ID:	ECP9-SB1
Sample Depth:	93-94 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.70 g
Total Sieve Weight:	91.60 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

16.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	5.30	5.79	94.21	coarse % > 0.5 mm	56.00%
	14	1.4	9.50	10.37	83.84		
	18	1.0	9.00	9.83	74.02		
	25	0.71	11.60	12.66	61.35		
	35	0.50	15.90	17.36	44.00		
medium	45	0.355	12.70	13.86	30.13	medium % 0.25 - 0.5 mm	26.42%
	60	0.250	11.50	12.55	17.58		
fine	80	0.180	9.80	10.70	6.88	Fine % 0.125 - 0.25	14.63%
	120	0.125	3.60	3.93	2.95		
silt	170	0.090	1.00	1.09	1.86	Silt % < 0.125	1.86%
	230	0.063	0.70	0.76	1.09		
pan	pan	0.001	1.00	1.09	0.00	Pan % < 0.063	1.09%
						Total	**100.00%**

Total (g)	91.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



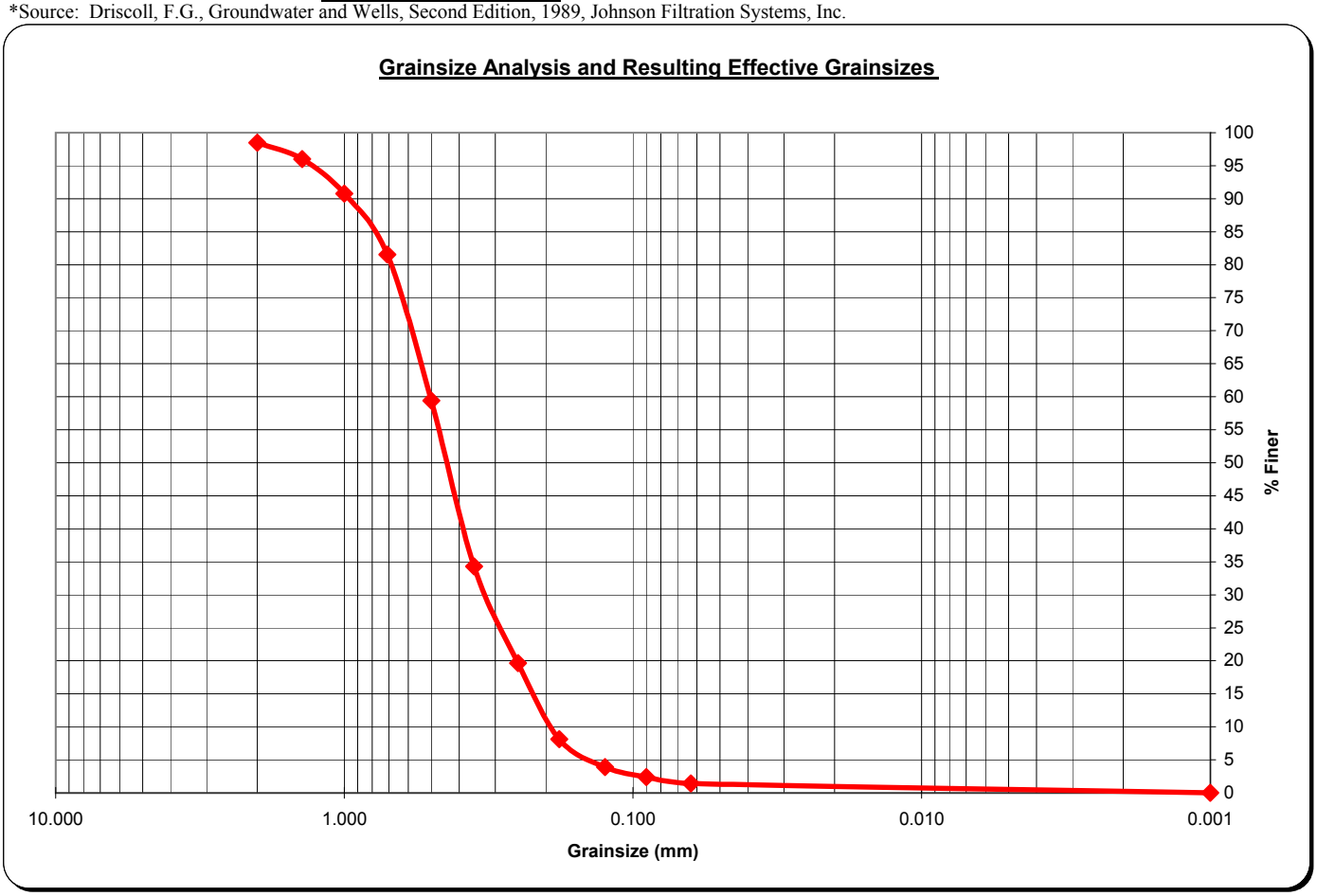
Sample ID:	ECP9-SB1
Sample Depth:	94-95 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	92.00 g
Total Sieve Weight:	92.10 g
Weight Loss:	-0.1 g
Percent Loss:	-0.11 %

16.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.40	1.52	98.48	coarse % > 0.5 mm	40.61%
	14	1.4	2.30	2.50	95.98		
	18	1.0	4.80	5.21	90.77		
	25	0.71	8.50	9.23	81.54		
	35	0.50	20.40	22.15	59.39		
medium	45	0.355	23.10	25.08	34.31	medium % 0.25 - 0.5 mm	39.74%
	60	0.250	13.50	14.66	19.65		
fine	80	0.180	10.60	11.51	8.14	Fine % 0.125 - 0.25	15.74%
	120	0.125	3.90	4.23	3.91		
silt	170	0.090	1.40	1.52	2.39	Silt % < 0.125	2.50%
	230	0.063	0.90	0.98	1.41		
pan	pan	0.001	1.30	1.41	0.00	Pan % < 0.063	1.41%
						Total	**100.00%**

Total (g)	**92.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



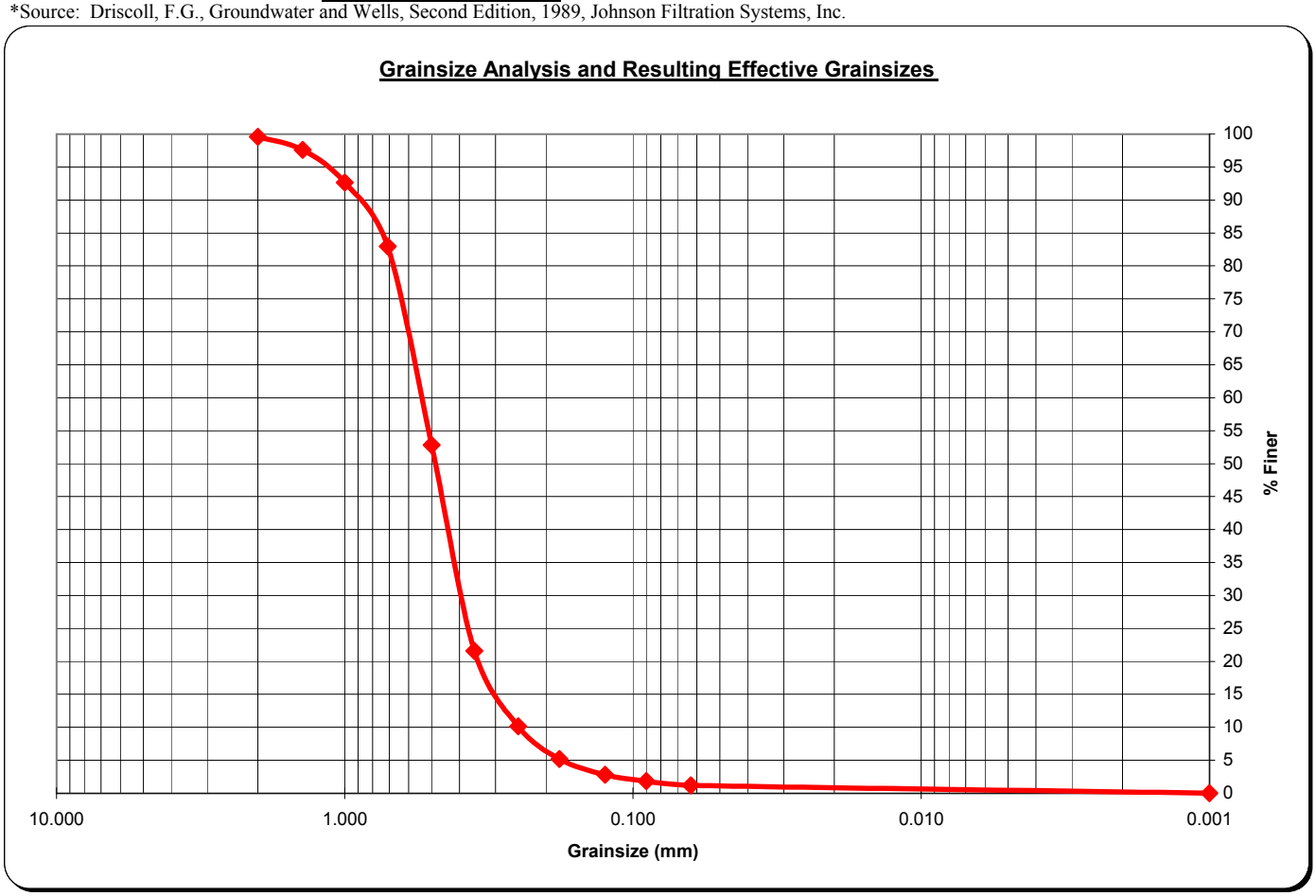
Sample ID:	ECP9-SB1	
Sample Depth:	95-96	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	92.80	g
Total Sieve Weight:	92.60	g
Weight Loss:	0.2	g
Percent Loss:	0.22	%

15.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.43	99.57	coarse % > 0.5 mm	47.19%
	14	1.4	1.80	1.94	97.62		
	18	1.0	4.60	4.97	92.66		
	25	0.71	9.00	9.72	82.94		
	35	0.50	27.90	30.13	52.81		
medium	45	0.355	28.90	31.21	21.60	medium % 0.25 - 0.5 mm	42.66%
	60	0.250	10.60	11.45	10.15		
fine	80	0.180	4.60	4.97	5.18	Fine % 0.125 - 0.25	7.34%
	120	0.125	2.20	2.38	2.81		
silt	170	0.090	0.90	0.97	1.84	Silt % < 0.125	1.62%
	230	0.063	0.60	0.65	1.19		
pan	pan	0.001	1.10	1.19	0.00	Pan % < 0.063	1.19%
						Total	**100.00%**

Total (g)	92.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



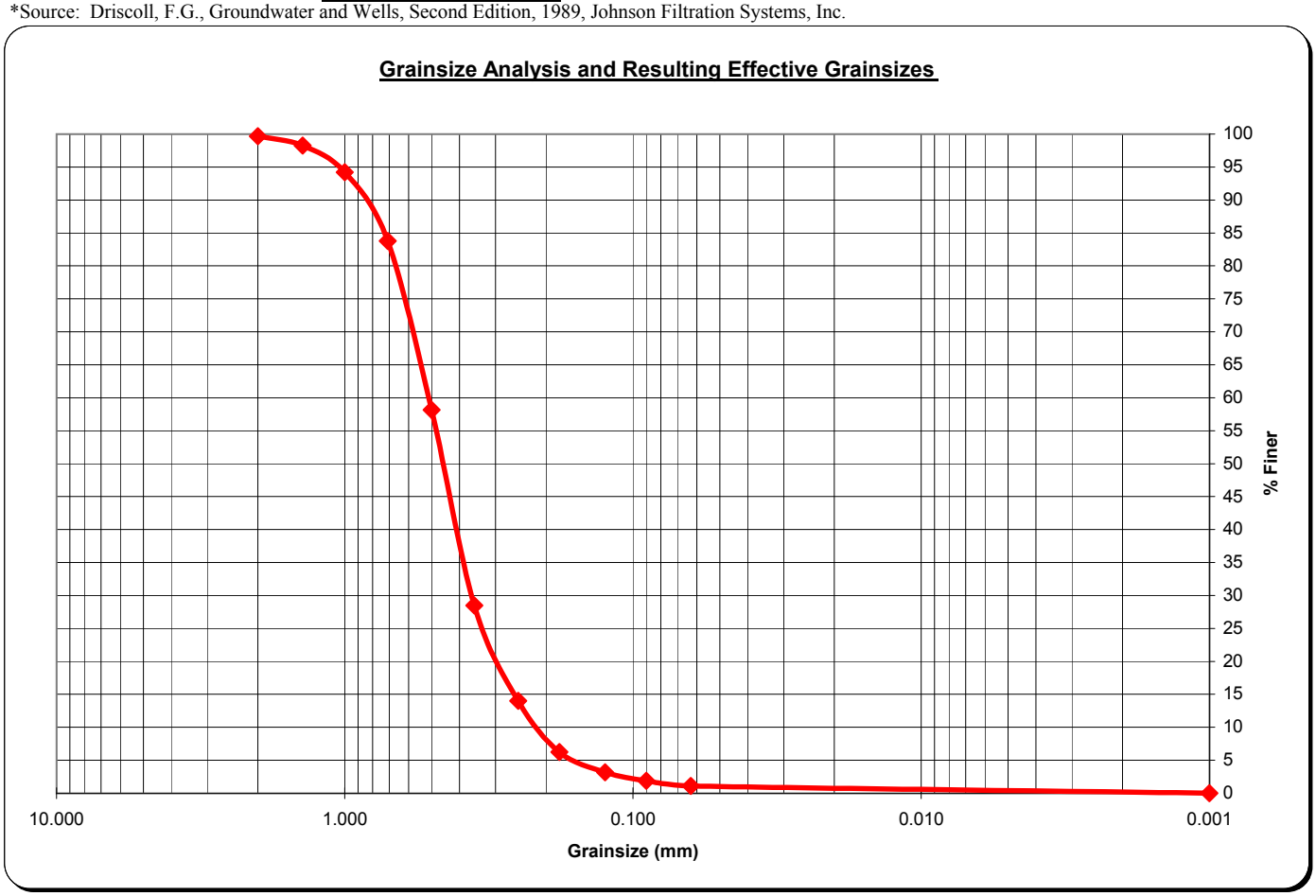
Sample ID:	ECP9-SB1
Sample Depth:	96-97 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	91.30 g
Total Sieve Weight:	91.30 g
Weight Loss:	0 g
Percent Loss:	0.00 %

17.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.33	99.67	coarse % > 0.5 mm	41.84%
	14	1.4	1.30	1.42	98.25		
	18	1.0	3.70	4.05	94.19		
	25	0.71	9.50	10.41	83.79		
	35	0.50	23.40	25.63	58.16		
medium	45	0.355	27.10	29.68	28.48	medium % 0.25 - 0.5 mm	44.14%
	60	0.250	13.20	14.46	14.02		
fine	80	0.180	7.10	7.78	6.24	Fine % 0.125 - 0.25	10.84%
	120	0.125	2.80	3.07	3.18		
silt	170	0.090	1.20	1.31	1.86	Silt % < 0.125	2.08%
	230	0.063	0.70	0.77	1.10		
pan	pan	0.001	1.00	1.10	0.00	Pan % < 0.063	1.10%
						Total	**100.00%**

Total (g)	**91.30**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



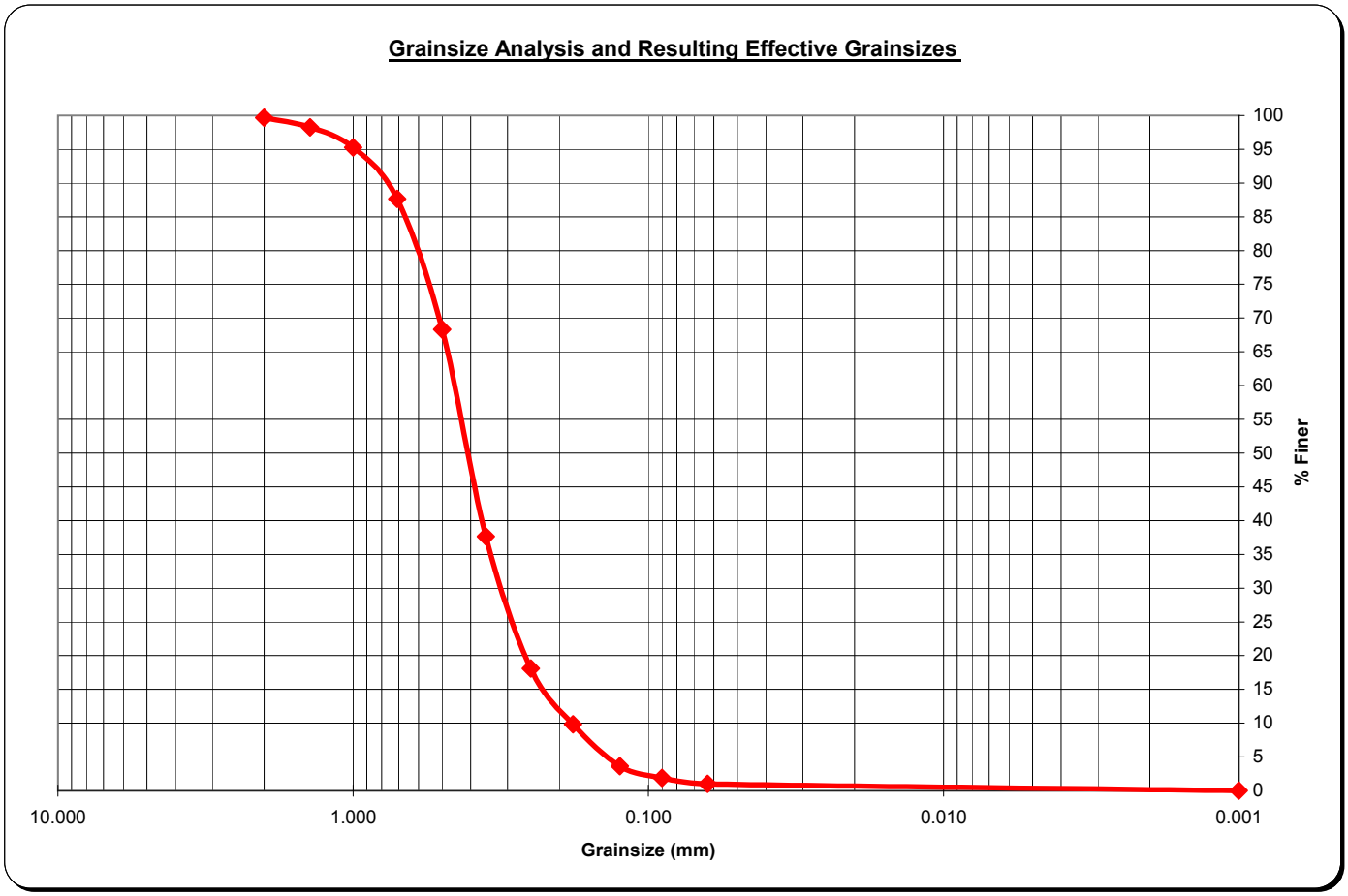
Sample ID:	ECP9-SB1	
Sample Depth:	97-98	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.80	g
Total Sieve Weight:	90.60	g
Weight Loss:	0.2	g
Percent Loss:	0.22	%

17.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.33	99.67	coarse % > 0.5 mm	31.68%
	14	1.4	1.30	1.43	98.23		
	18	1.0	2.70	2.98	95.25		
	25	0.71	6.90	7.62	87.64		
	35	0.50	17.50	19.32	68.32		
medium	45	0.355	27.80	30.68	37.64	medium % 0.25 - 0.5 mm	50.22%
	60	0.250	17.70	19.54	18.10		
fine	80	0.180	7.50	8.28	9.82	Fine % 0.125 - 0.25	14.46%
	120	0.125	5.60	6.18	3.64		
silt	170	0.090	1.60	1.77	1.88	Silt % < 0.125	2.65%
	230	0.063	0.80	0.88	0.99		
pan	pan	0.001	0.90	0.99	0.00	Pan % < 0.063	0.99%
						Total	**100.00%**

Total (g)	90.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



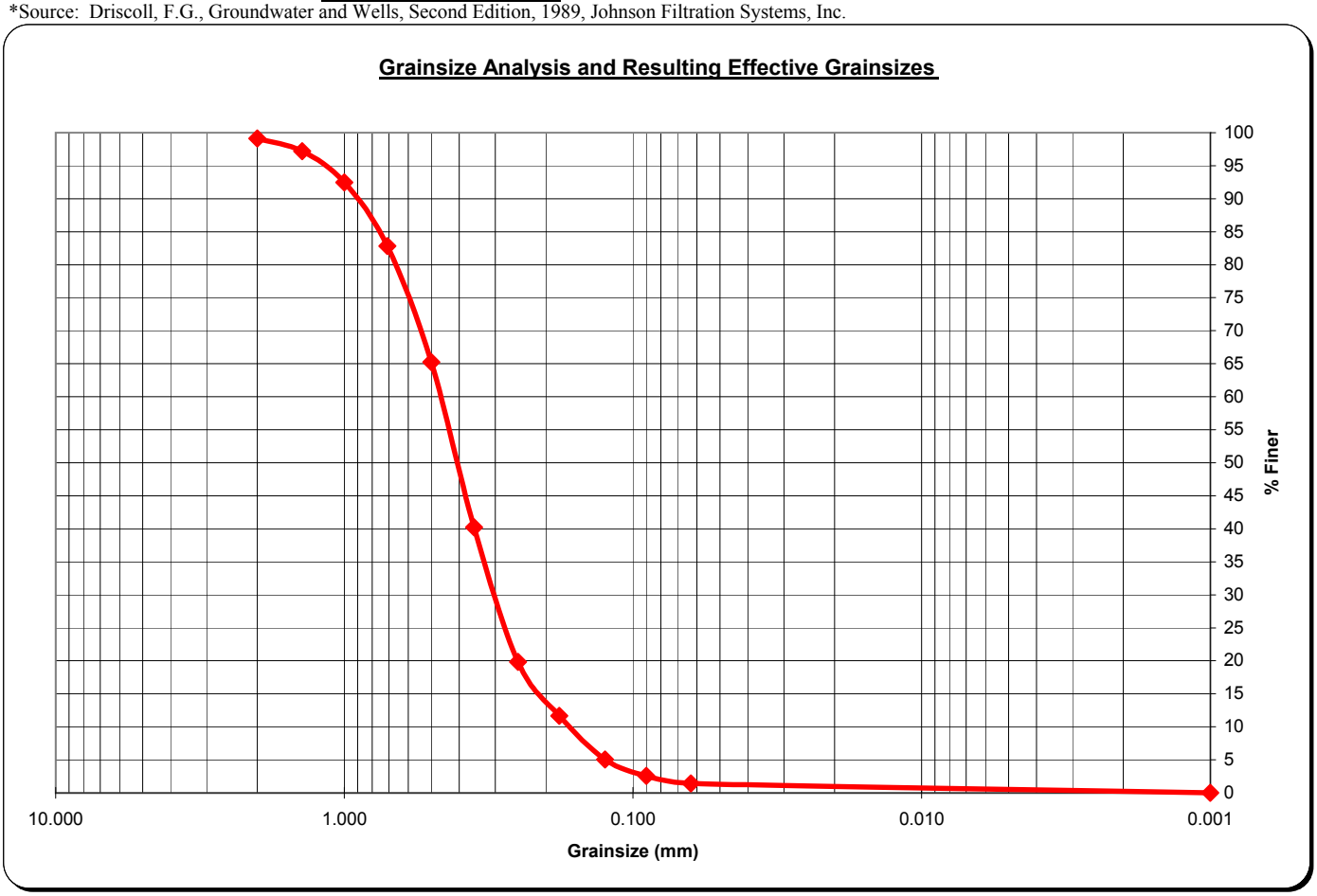
Sample ID:	ECP9-SB1
Sample Depth:	98-99 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	92.80 g
Total Sieve Weight:	92.70 g
Weight Loss:	0.1 g
Percent Loss:	0.11 %

15.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.80	0.86	99.14	coarse % > 0.5 mm	34.74%
	14	1.4	1.80	1.94	97.20		
	18	1.0	4.40	4.75	92.45		
	25	0.71	8.90	9.60	82.85		
	35	0.50	16.30	17.58	65.26		
medium	45	0.355	23.20	25.03	40.24	medium % 0.25 - 0.5 mm	45.42%
	60	0.250	18.90	20.39	19.85		
fine	80	0.180	7.60	8.20	11.65	Fine % 0.125 - 0.25	14.78%
	120	0.125	6.10	6.58	5.07		
silt	170	0.090	2.30	2.48	2.59	Silt % < 0.125	3.67%
	230	0.063	1.10	1.19	1.40		
pan	pan	0.001	1.30	1.40	0.00	Pan % < 0.063	1.40%
						Total	100.00%

Total (g)	92.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



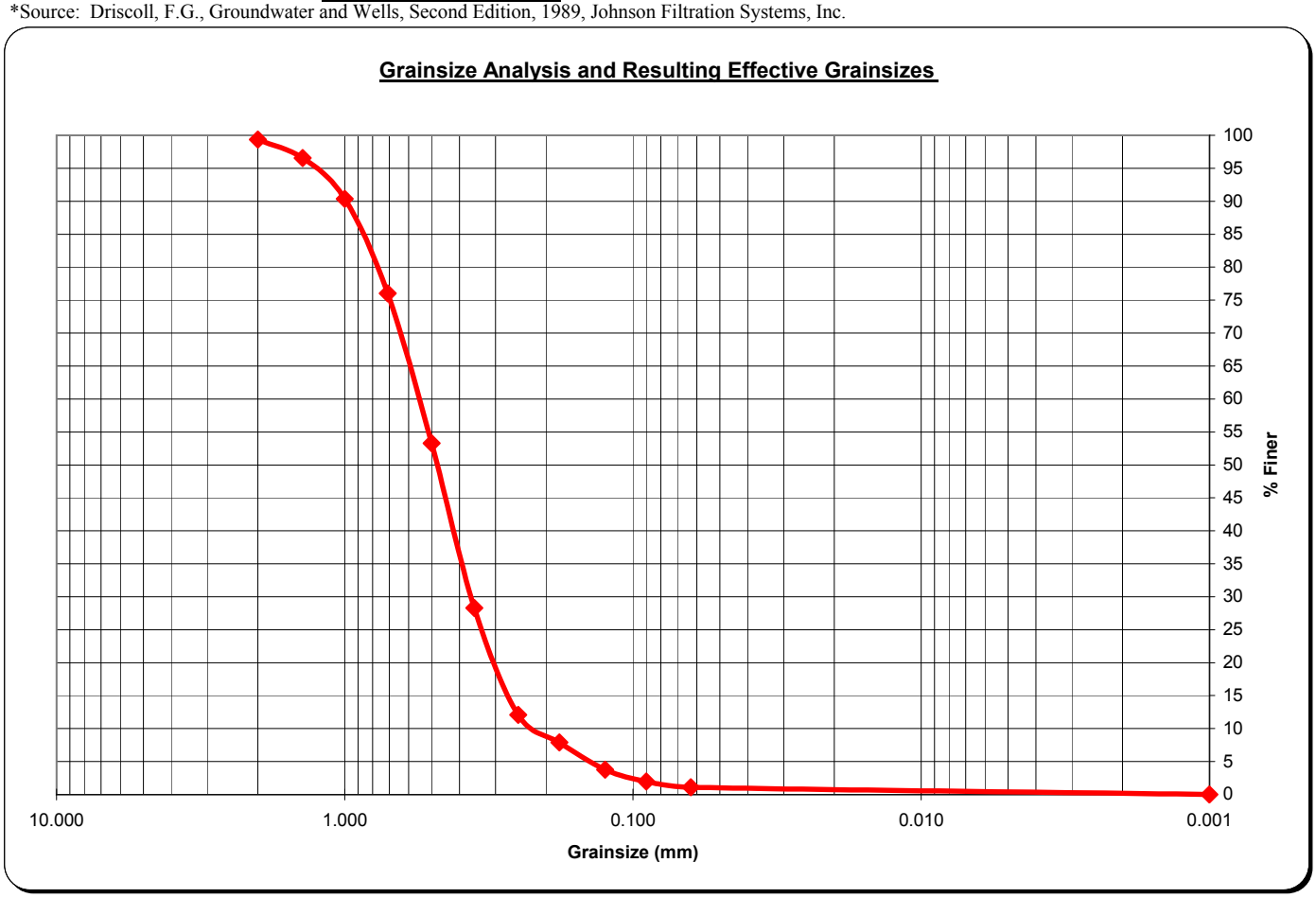
Sample ID:	ECP9-SB1
Sample Depth:	99-100 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.40 g
Total Sieve Weight:	90.10 g
Weight Loss:	0.3 g
Percent Loss:	0.33 %

17.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.67	99.33	coarse % > 0.5 mm	46.73%
	14	1.4	2.50	2.77	96.56		
	18	1.0	5.60	6.22	90.34		
	25	0.71	12.90	14.32	76.03		
	35	0.50	20.50	22.75	53.27		
medium	45	0.355	22.50	24.97	28.30	medium % 0.25 - 0.5 mm	41.18%
	60	0.250	14.60	16.20	12.10		
fine	80	0.180	3.80	4.22	7.88	Fine % 0.125 - 0.25	8.32%
	120	0.125	3.70	4.11	3.77		
silt	170	0.090	1.60	1.78	2.00	Silt % < 0.125	2.66%
	230	0.063	0.80	0.89	1.11		
pan	pan	0.001	1.00	1.11	0.00	Pan % < 0.063	1.11%
						Total	**100.00%**

Total (g)	**90.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



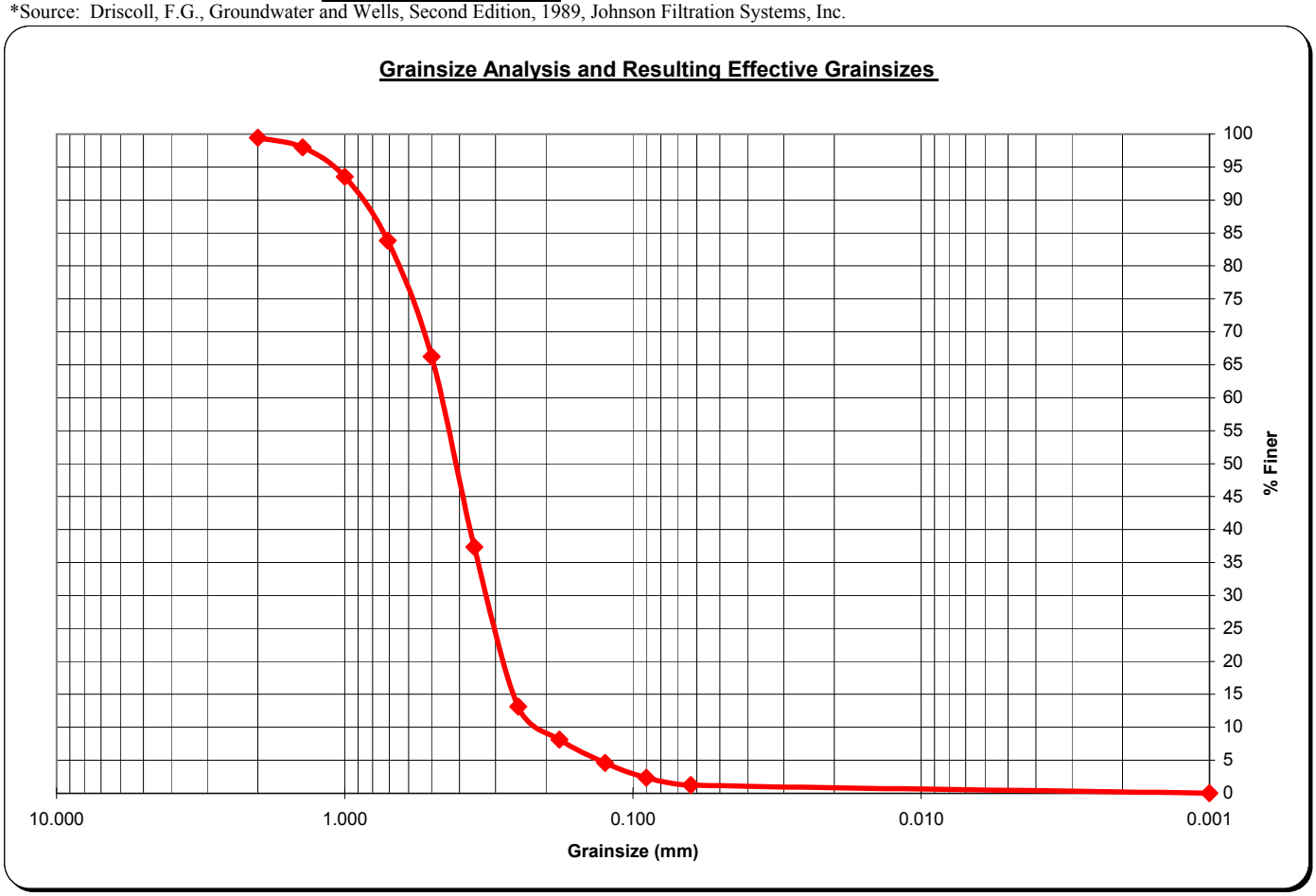
Sample ID:	ECP9-SB1	
Sample Depth:	100-101	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.10	g
Total Sieve Weight:	89.70	g
Weight Loss:	0.4	g
Percent Loss:	0.44	%

18.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.50	0.56	99.44	coarse % > 0.5 mm	33.78%
	14	1.4	1.30	1.45	97.99		
	18	1.0	4.00	4.46	93.53		
	25	0.71	8.70	9.70	83.84		
	35	0.50	15.80	17.61	66.22		
medium	45	0.355	25.90	28.87	37.35	medium % 0.25 - 0.5 mm	53.07%
	60	0.250	21.70	24.19	13.15		
fine	80	0.180	4.50	5.02	8.14	Fine % 0.125 - 0.25	8.58%
	120	0.125	3.20	3.57	4.57		
silt	170	0.090	2.00	2.23	2.34	Silt % < 0.125	3.34%
	230	0.063	1.00	1.11	1.23		
pan	pan	0.001	1.10	1.23	0.00	Pan % < 0.063	1.23%
						Total	**100.00%**

Total (g)	89.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



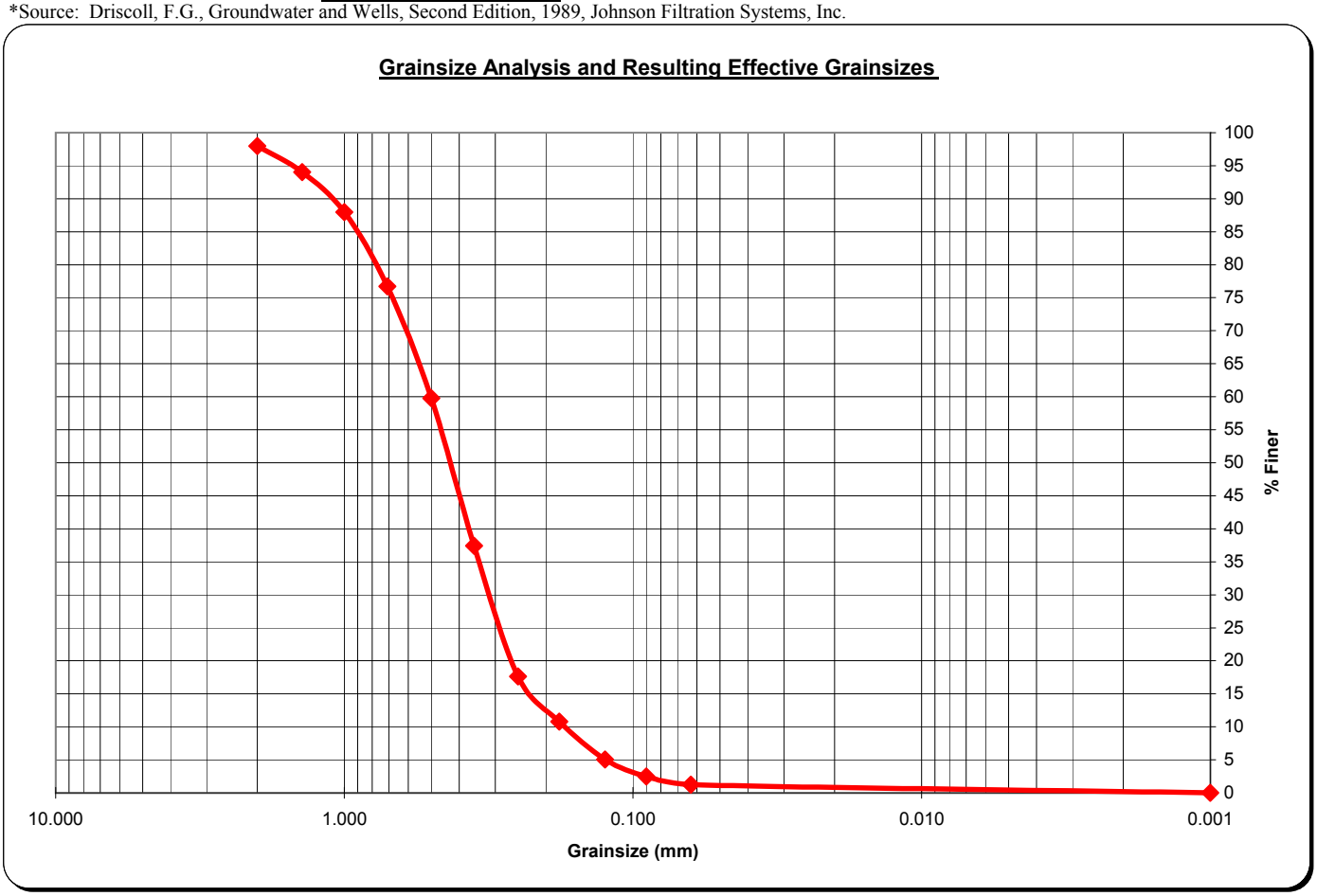
Sample ID:	ECP9-SB1	
Sample Depth:	101-102	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.10	g
Total Sieve Weight:	89.00	g
Weight Loss:	1.1	g
Percent Loss:	1.22	%

18.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.80	2.02	97.98	coarse % > 0.5 mm	40.22%
	14	1.4	3.50	3.93	94.04		
	18	1.0	5.40	6.07	87.98		
	25	0.71	10.00	11.24	76.74		
	35	0.50	15.10	16.97	59.78		
medium	45	0.355	19.90	22.36	37.42	medium % 0.25 - 0.5 mm	42.13%
	60	0.250	17.60	19.78	17.64		
fine	80	0.180	6.10	6.85	10.79	Fine % 0.125 - 0.25	12.58%
	120	0.125	5.10	5.73	5.06		
silt	170	0.090	2.30	2.58	2.47	Silt % < 0.125	3.82%
	230	0.063	1.10	1.24	1.24		
pan	pan	0.001	1.10	1.24	0.00	Pan % < 0.063	1.24%
						Total	**100.00%**

Total (g)	**89.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



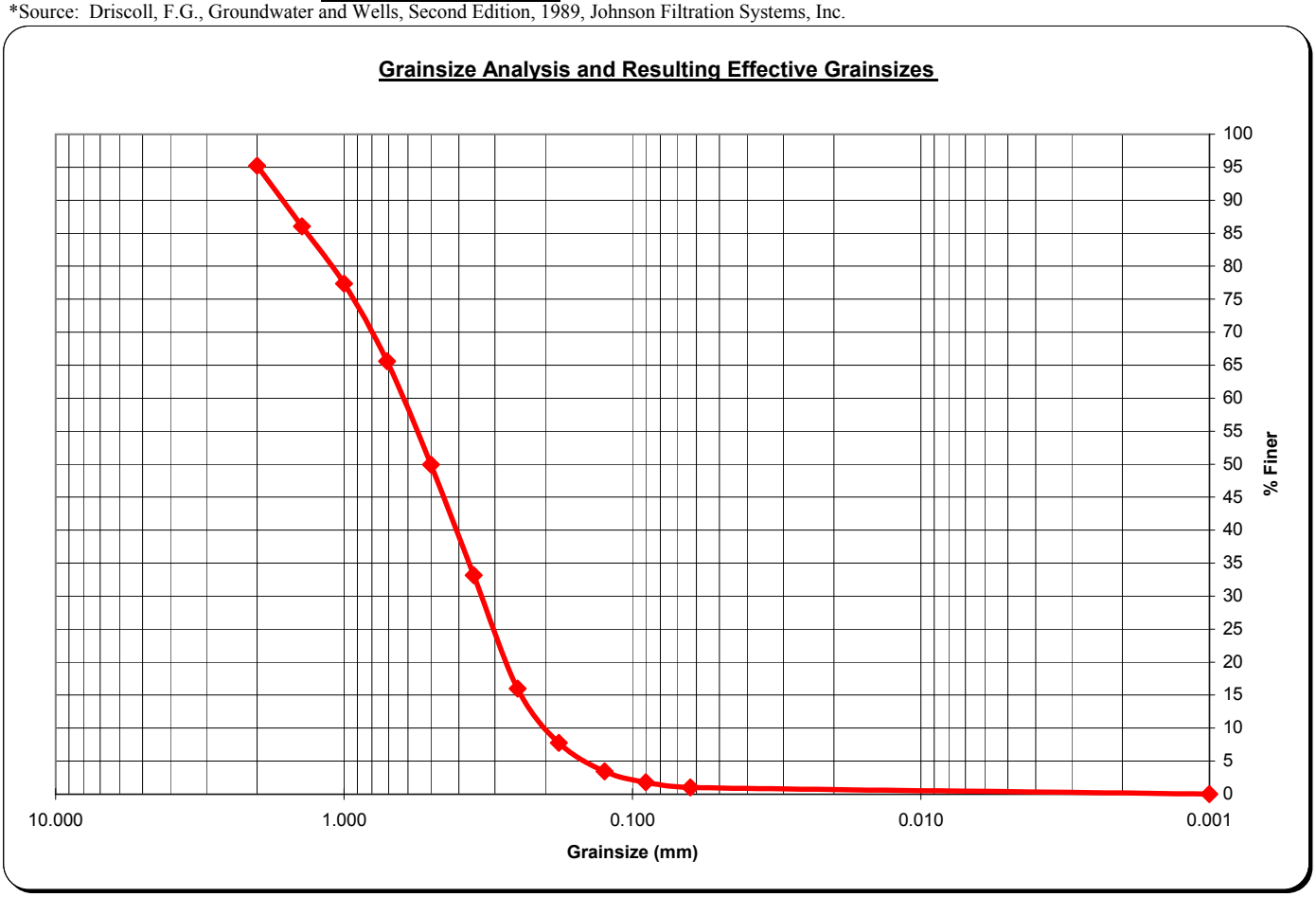
Sample ID:	ECP9-SB1
Sample Depth:	102-103 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.90 g
Total Sieve Weight:	90.10 g
Weight Loss:	0.8 g
Percent Loss:	0.88 %

17.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	4.30	4.77	95.23	coarse % > 0.5 mm	50.06%
	14	1.4	8.30	9.21	86.02		
	18	1.0	7.80	8.66	77.36		
	25	0.71	10.60	11.76	65.59		
	35	0.50	14.10	15.65	49.94		
medium	45	0.355	15.10	16.76	33.19	medium % 0.25 - 0.5 mm	33.96%
	60	0.250	15.50	17.20	15.98		
fine	80	0.180	7.40	8.21	7.77	Fine % 0.125 - 0.25	12.54%
	120	0.125	3.90	4.33	3.44		
silt	170	0.090	1.50	1.66	1.78	Silt % < 0.125	2.44%
	230	0.063	0.70	0.78	1.00		
pan	pan	0.001	0.90	1.00	0.00	Pan % < 0.063	1.00%
						Total	**100.00%**

Total (g)	90.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



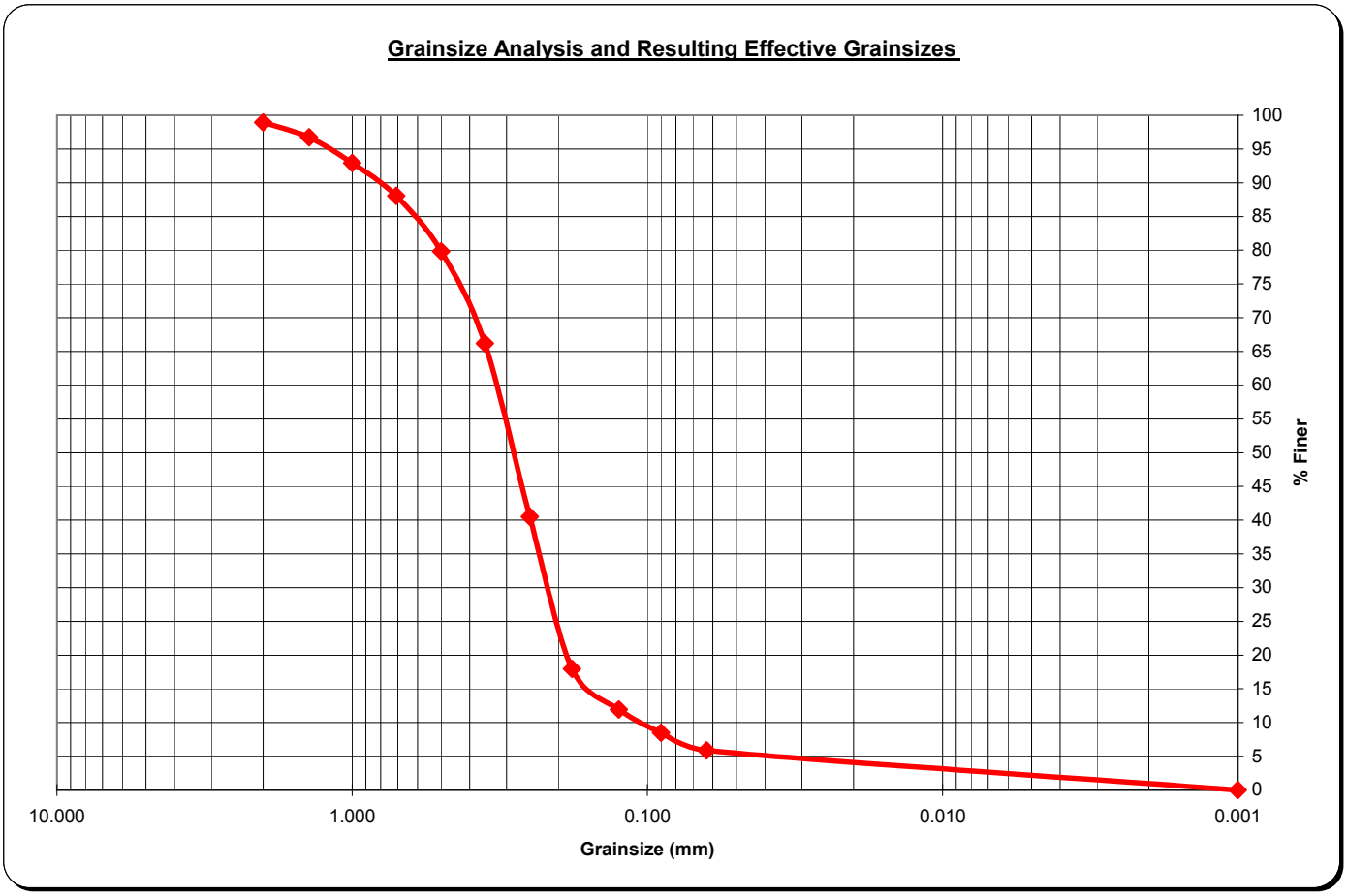
Sample ID:	ECP9-SB1
Sample Depth:	103-104 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	76.80 g
Total Sieve Weight:	76.30 g
Weight Loss:	0.5 g
Percent Loss:	0.65 %

30.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.80	1.05	98.95	coarse % > 0.5 mm	20.18%
	14	1.4	1.70	2.23	96.72		
	18	1.0	2.90	3.80	92.92		
	25	0.71	3.70	4.85	88.07		
	35	0.50	6.30	8.26	79.82		
medium	45	0.355	10.40	13.63	66.19	medium % 0.25 - 0.5 mm	39.32%
	60	0.250	19.60	25.69	40.50		
fine	80	0.180	17.20	22.54	17.96	Fine % 0.125 - 0.25	28.57%
	120	0.125	4.60	6.03	11.93		
silt	170	0.090	2.60	3.41	8.52	Silt % < 0.125	6.03%
	230	0.063	2.00	2.62	5.90		
pan	pan	0.001	4.50	5.90	0.00	Pan % < 0.063	5.90%
						Total	**100.00%**

Total (g)	**76.30**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



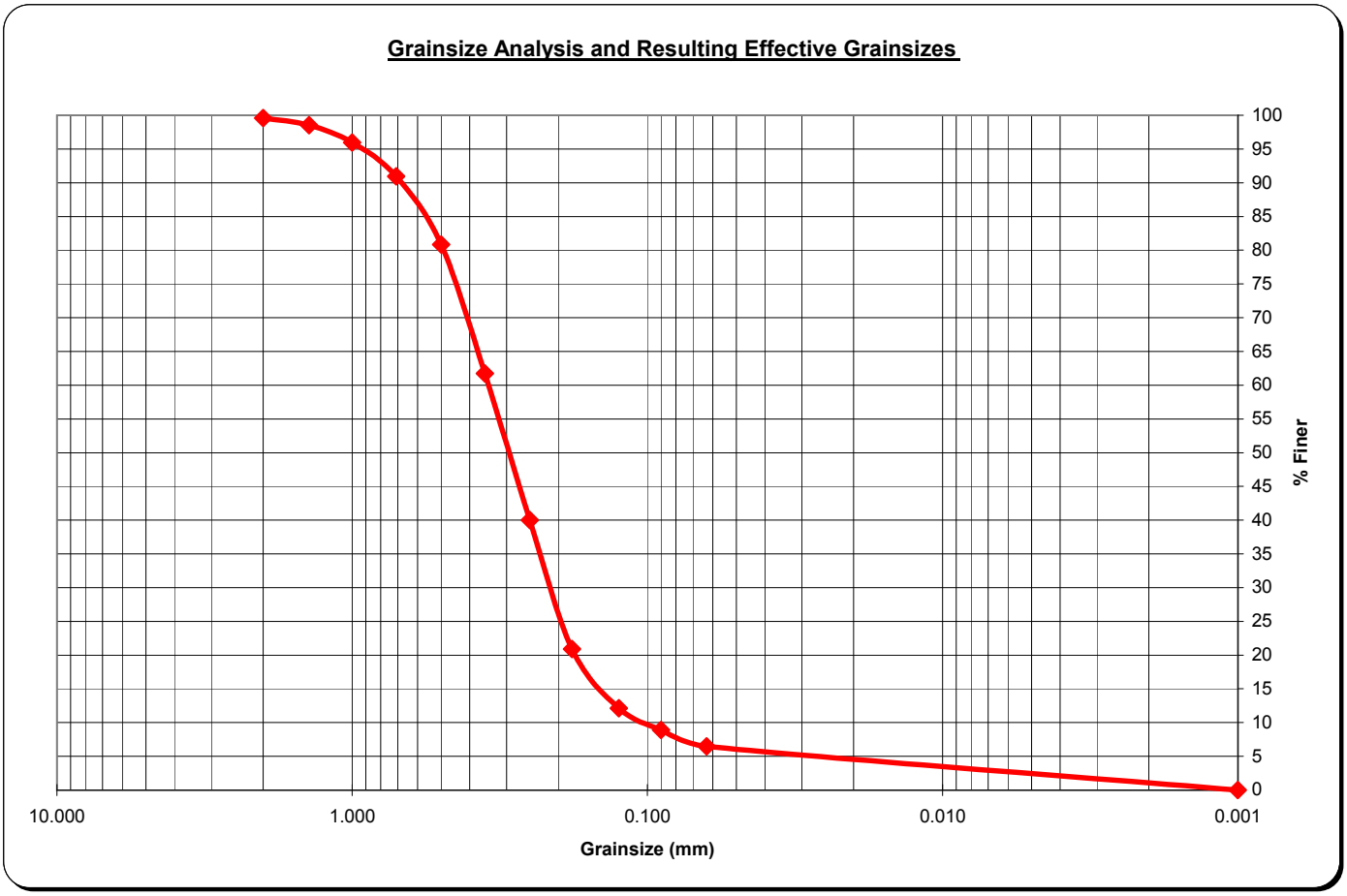
Sample ID:	ECP9-SB1
Sample Depth:	104-105 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	75.30 g
Total Sieve Weight:	74.20 g
Weight Loss:	1.1 g
Percent Loss:	1.46 %

31.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.40	99.60	coarse % > 0.5 mm	19.14%
	14	1.4	0.80	1.08	98.52		
	18	1.0	1.90	2.56	95.96		
	25	0.71	3.70	4.99	90.97		
	35	0.50	7.50	10.11	80.86		
medium	45	0.355	14.20	19.14	61.73	medium % 0.25 - 0.5 mm	40.84%
	60	0.250	16.10	21.70	40.03		
fine	80	0.180	14.20	19.14	20.89	Fine % 0.125 - 0.25	27.90%
	120	0.125	6.50	8.76	12.13		
silt	170	0.090	2.40	3.23	8.89	Silt % < 0.125	5.66%
	230	0.063	1.80	2.43	6.47		
pan	pan	0.001	4.80	6.47	0.00	Pan % < 0.063	6.47%
						Total	**100.00%**

Total (g)	**74.20**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



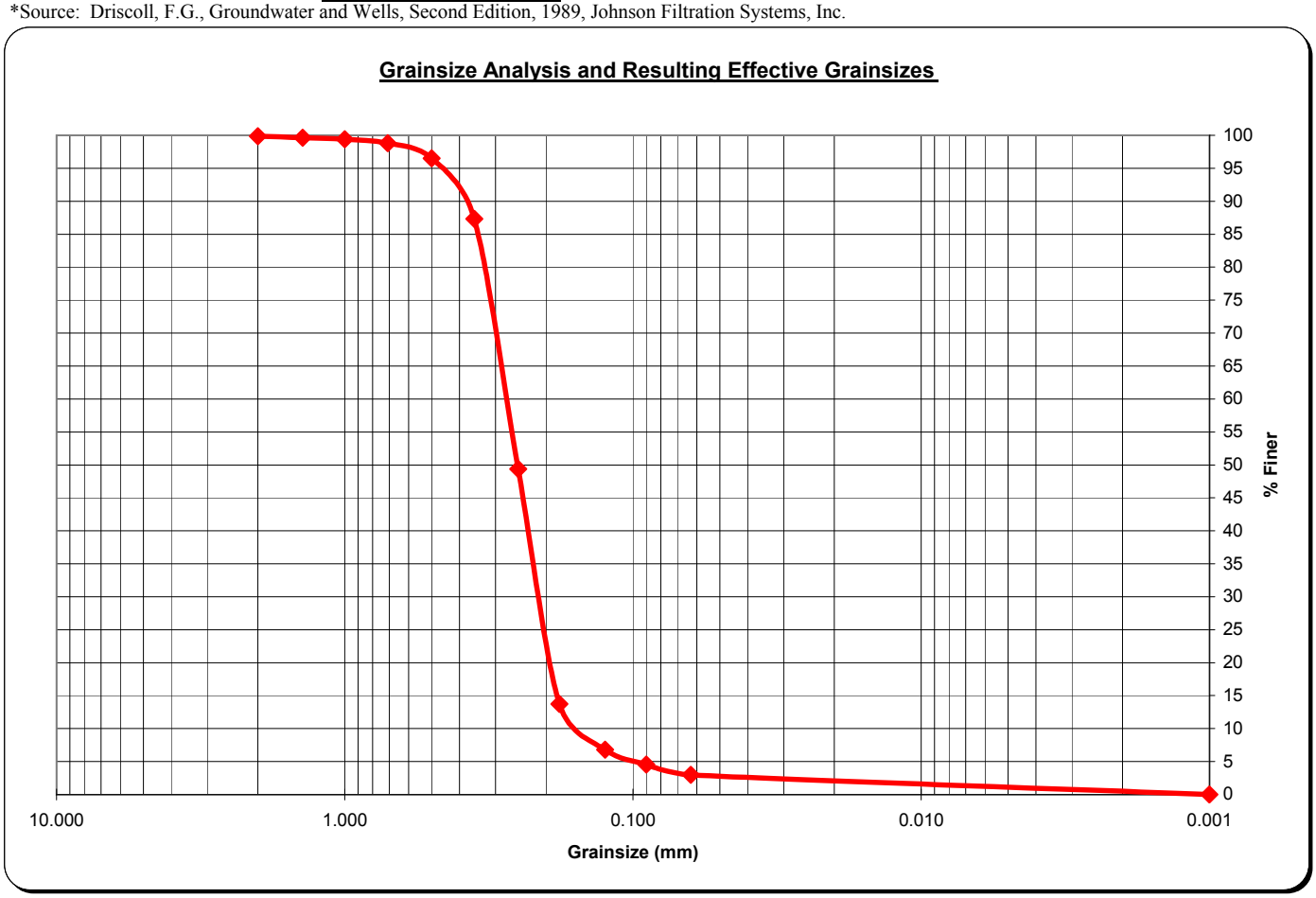
Sample ID:	ECP9-SB1
Sample Depth:	105-106 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.20 g
Total Sieve Weight:	83.60 g
Weight Loss:	0.6 g
Percent Loss:	0.71 %

23.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	3.47%
	14	1.4	0.20	0.24	99.64		
	18	1.0	0.20	0.24	99.40		
	25	0.71	0.50	0.60	98.80		
	35	0.50	1.90	2.27	96.53		
medium	45	0.355	7.70	9.21	87.32	medium % 0.25 - 0.5 mm	47.13%
	60	0.250	31.70	37.92	49.40		
fine	80	0.180	29.80	35.65	13.76	Fine % 0.125 - 0.25	42.58%
	120	0.125	5.80	6.94	6.82		
silt	170	0.090	1.90	2.27	4.55	Silt % < 0.125	3.83%
	230	0.063	1.30	1.56	2.99		
pan	pan	0.001	2.50	2.99	0.00	Pan % < 0.063	2.99%
						Total	**100.00%**

Total (g)	83.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



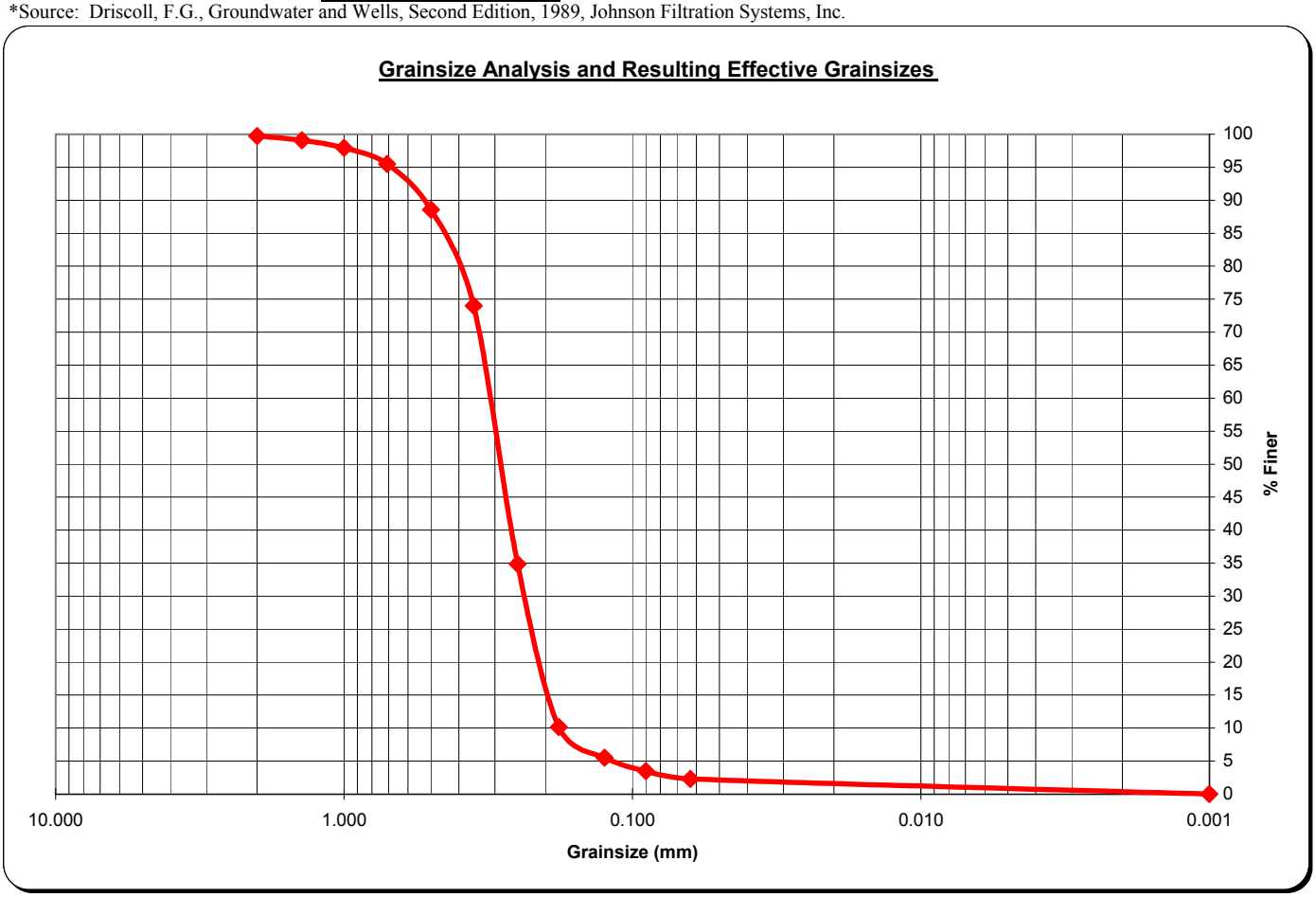
Sample ID:	ECP9-SB1
Sample Depth:	106-107 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	78.00 g
Total Sieve Weight:	77.70 g
Weight Loss:	0.3 g
Percent Loss:	0.38 %

29.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.26	99.74	coarse % > 0.5 mm	11.45%
	14	1.4	0.50	0.64	99.10		
	18	1.0	0.90	1.16	97.94		
	25	0.71	1.90	2.45	95.50		
	35	0.50	5.40	6.95	88.55		
medium	45	0.355	11.30	14.54	74.00	medium % 0.25 - 0.5 mm	53.67%
	60	0.250	30.40	39.12	34.88		
fine	80	0.180	19.20	24.71	10.17	Fine % 0.125 - 0.25	29.34%
	120	0.125	3.60	4.63	5.53		
silt	170	0.090	1.60	2.06	3.47	Silt % < 0.125	3.22%
	230	0.063	0.90	1.16	2.32		
pan	pan	0.001	1.80	2.32	0.00	Pan % < 0.063	2.32%
						Total	**100.00%**

Total (g)	**77.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



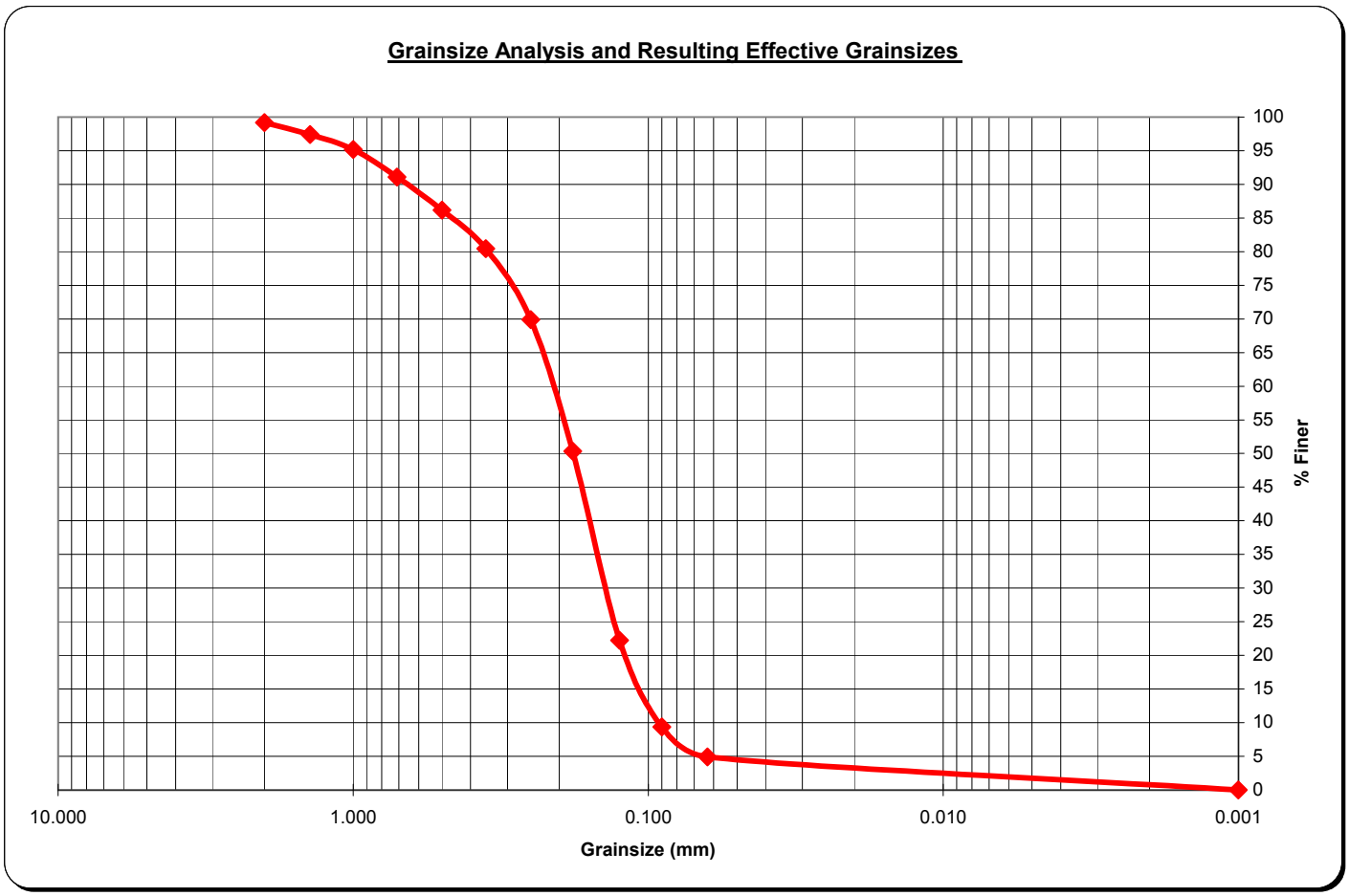
Sample ID:	ECP9-SB1	
Sample Depth:	107-108	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	85.30	g
Total Sieve Weight:	85.40	g
Weight Loss:	-0.1	g
Percent Loss:	-0.12	%

22.45 % Moisture

	Sieve number	2.36	Weight (g)	Weight %	100	Grain-Size	
coarse	10	2.0	0.70	0.82	99.18	coarse % > 0.5 mm	13.82%
	14	1.4	1.50	1.76	97.42		
	18	1.0	1.90	2.22	95.20		
	25	0.71	3.50	4.10	91.10		
	35	0.50	4.20	4.92	86.18		
medium	45	0.355	4.90	5.74	80.44	medium % 0.25 - 0.5 mm	16.28%
	60	0.250	9.00	10.54	69.91		
fine	80	0.180	16.70	19.56	50.35	Fine % 0.125 - 0.25	47.66%
	120	0.125	24.00	28.10	22.25		
silt	170	0.090	11.00	12.88	9.37	Silt % < 0.125	17.33%
	230	0.063	3.80	4.45	4.92		
pan	pan	0.001	4.20	4.92	0.00	Pan % < 0.063	4.92%
						Total	**100.00%**

Total (g)	85.40

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



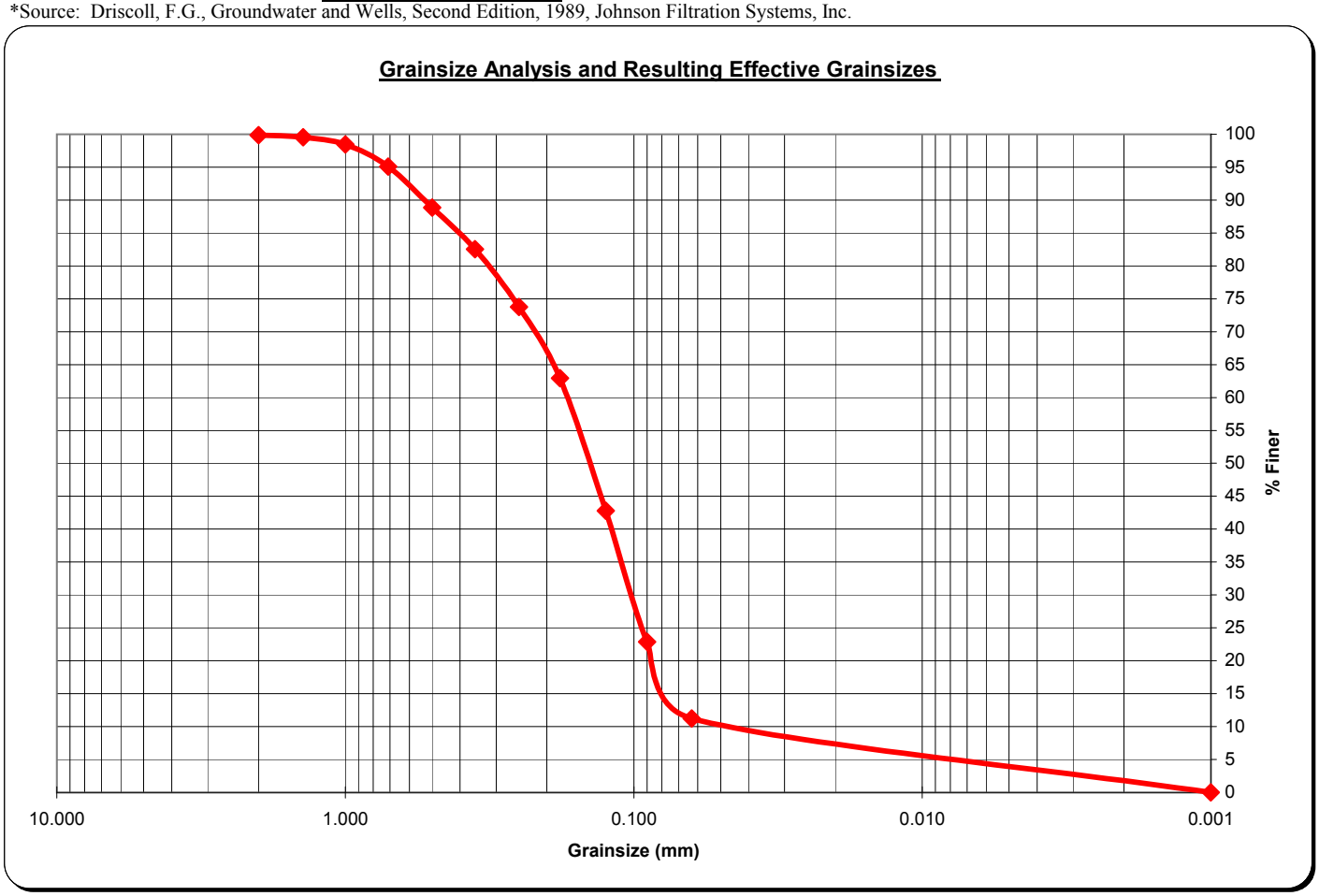
Sample ID:	ECP9-SB1
Sample Depth:	108-109 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.90 g
Total Sieve Weight:	85.30 g
Weight Loss:	0.6 g
Percent Loss:	0.70 %

21.91 % Moisture

	Sieve number	2.36	Weight (g)	Weight %	100	Grain-Size	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	11.14%
	14	1.4	0.30	0.35	99.53		
	18	1.0	0.90	1.06	98.48		
	25	0.71	2.90	3.40	95.08		
	35	0.50	5.30	6.21	88.86		
medium	45	0.355	5.40	6.33	82.53	medium % 0.25 - 0.5 mm	15.12%
	60	0.250	7.50	8.79	73.74		
fine	80	0.180	9.20	10.79	62.95	Fine % 0.125 - 0.25	30.95%
	120	0.125	17.20	20.16	42.79		
silt	170	0.090	17.00	19.93	22.86	Silt % < 0.125	31.54%
	230	0.063	9.90	11.61	11.25		
pan	pan	0.001	9.60	11.25	0.00	Pan % < 0.063	11.25%
						Total	**100.00%**

Total (g)	85.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



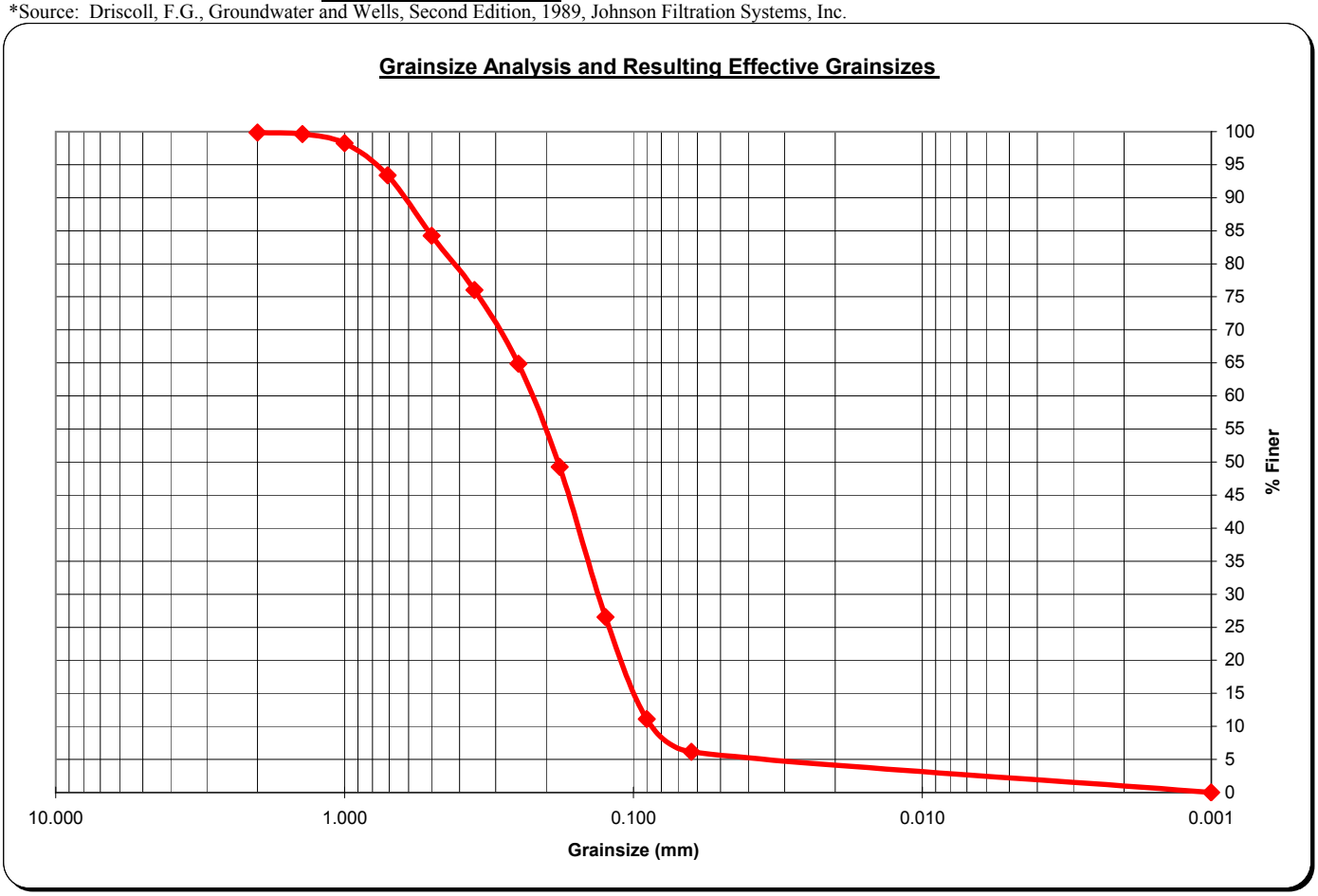
Sample ID:	ECP9-SB1
Sample Depth:	109-110 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.30 g
Total Sieve Weight:	86.30 g
Weight Loss:	2 g
Percent Loss:	2.27 %

19.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	15.76%
	14	1.4	0.20	0.23	99.65		
	18	1.0	1.20	1.39	98.26		
	25	0.71	4.20	4.87	93.40		
	35	0.50	7.90	9.15	84.24		
medium	45	0.355	7.10	8.23	76.01	medium % 0.25 - 0.5 mm	19.35%
	60	0.250	9.60	11.12	64.89		
fine	80	0.180	13.50	15.64	49.25	Fine % 0.125 - 0.25	38.35%
	120	0.125	19.60	22.71	26.54		
silt	170	0.090	13.30	15.41	11.12	Silt % < 0.125	20.39%
	230	0.063	4.30	4.98	6.14		
pan	pan	0.001	5.30	6.14	0.00	Pan % < 0.063	6.14%
						Total	**100.00%**

Total (g)	**86.30**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



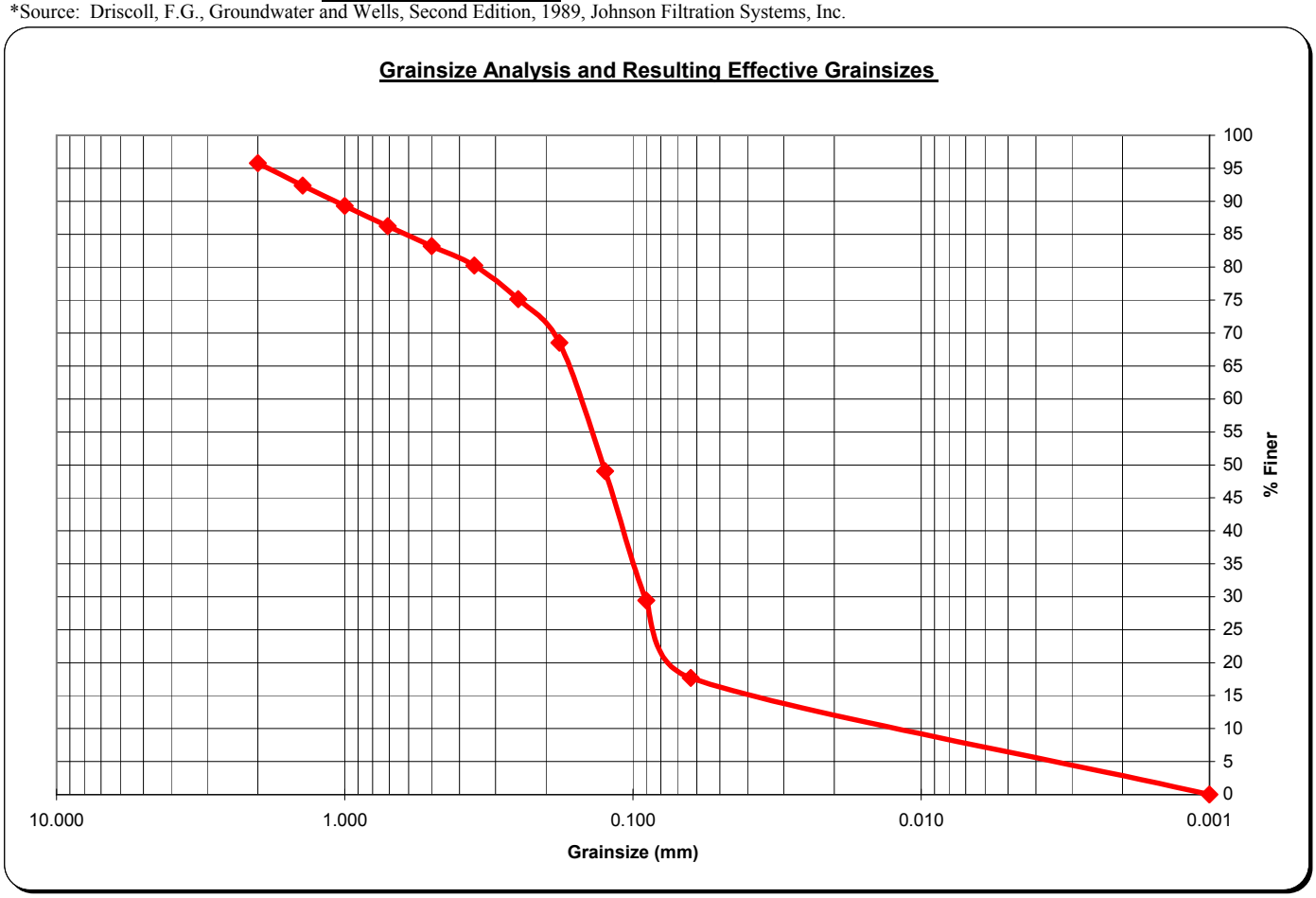
Sample ID:	ECP9-SB1
Sample Depth:	110-111 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	79.20 g
Total Sieve Weight:	78.50 g
Weight Loss:	0.7 g
Percent Loss:	0.88 %

28.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*		
coarse	10	2.0	3.30	4.20	95.80	coarse % > 0.5 mm	16.82%	CLAY
	14	1.4	2.70	3.44	92.36			CLAY
	18	1.0	2.40	3.06	89.30			CLAY
	25	0.71	2.40	3.06	86.24			CLAY
	35	0.50	2.40	3.06	83.18			CLAY
medium	45	0.355	2.30	2.93	80.25	medium % 0.25 - 0.5 mm	8.03%	CLAY
	60	0.250	4.00	5.10	75.16			
fine	80	0.180	5.20	6.62	68.54	Fine % 0.125 - 0.25	26.11%	
	120	0.125	15.30	19.49	49.04			
silt	170	0.090	15.40	19.62	29.43	Silt % < 0.125	31.34%	
	230	0.063	9.20	11.72	17.71			
pan	pan	0.001	13.90	17.71	0.00	Pan % < 0.063	17.71%	
						Total	**100.00%**	

Total (g)	**78.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



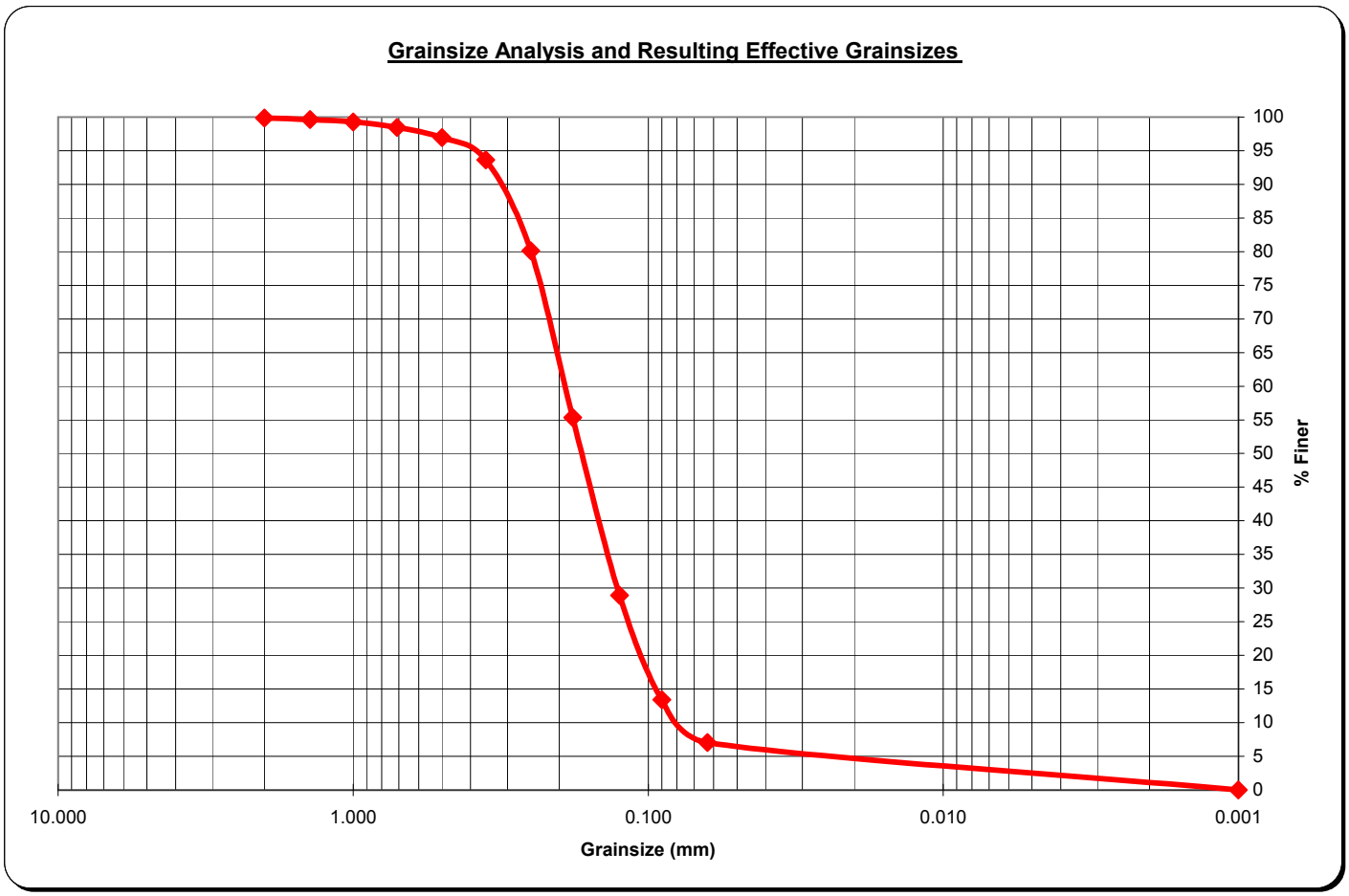
Sample ID:	ECP9-SB1	
Sample Depth:	111-112	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	86.00	g
Total Sieve Weight:	85.10	g
Weight Loss:	0.9	g
Percent Loss:	1.05	%

21.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	100	Grain-Size	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	3.06%
	14	1.4	0.20	0.24	99.65		
	18	1.0	0.30	0.35	99.29		
	25	0.71	0.70	0.82	98.47		
	35	0.50	1.30	1.53	96.94		
medium	45	0.355	2.80	3.29	93.65	medium % 0.25 - 0.5 mm	16.80%
	60	0.250	11.50	13.51	80.14		
fine	80	0.180	21.10	24.79	55.35	Fine % 0.125 - 0.25	51.23%
	120	0.125	22.50	26.44	28.91		
silt	170	0.090	13.20	15.51	13.40	Silt % < 0.125	21.86%
	230	0.063	5.40	6.35	7.05		
pan	pan	0.001	6.00	7.05	0.00	Pan % < 0.063	7.05%
						Total	**100.00%**

Total (g)	85.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



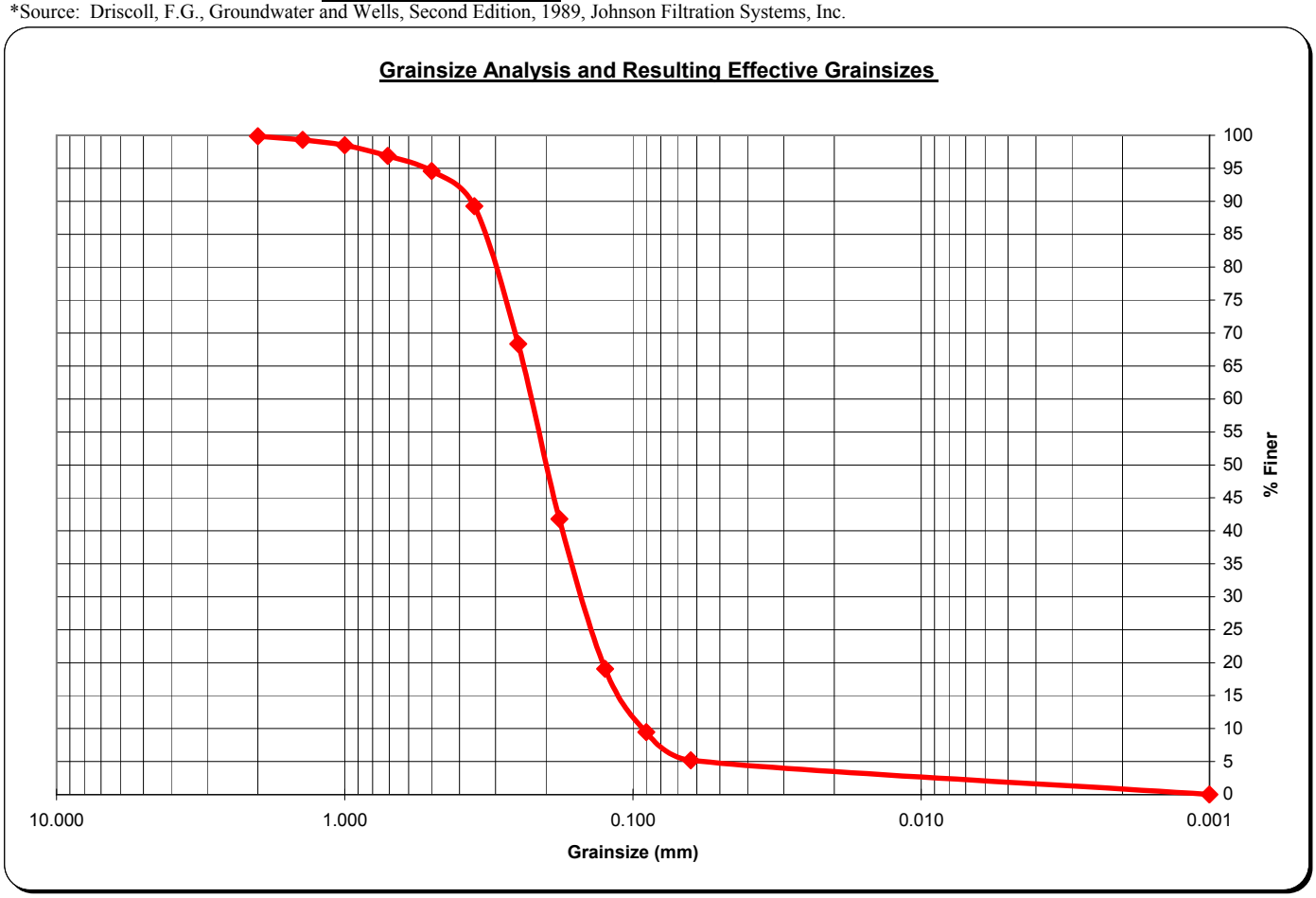
Sample ID:	ECP9-SB1
Sample Depth:	112-113 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.40 g
Total Sieve Weight:	86.60 g
Weight Loss:	0.8 g
Percent Loss:	0.92 %

20.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	5.43%
	14	1.4	0.50	0.58	99.31		
	18	1.0	0.70	0.81	98.50		
	25	0.71	1.40	1.62	96.88		
	35	0.50	2.00	2.31	94.57		
medium	45	0.355	4.60	5.31	89.26	medium % 0.25 - 0.5 mm	26.21%
	60	0.250	18.10	20.90	68.36		
fine	80	0.180	23.00	26.56	41.80	Fine % 0.125 - 0.25	49.31%
	120	0.125	19.70	22.75	19.05		
silt	170	0.090	8.30	9.58	9.47	Silt % < 0.125	13.86%
	230	0.063	3.70	4.27	5.20		
pan	pan	0.001	4.50	5.20	0.00	Pan % < 0.063	5.20%
						Total	**100.00%**

Total (g)	**86.60**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



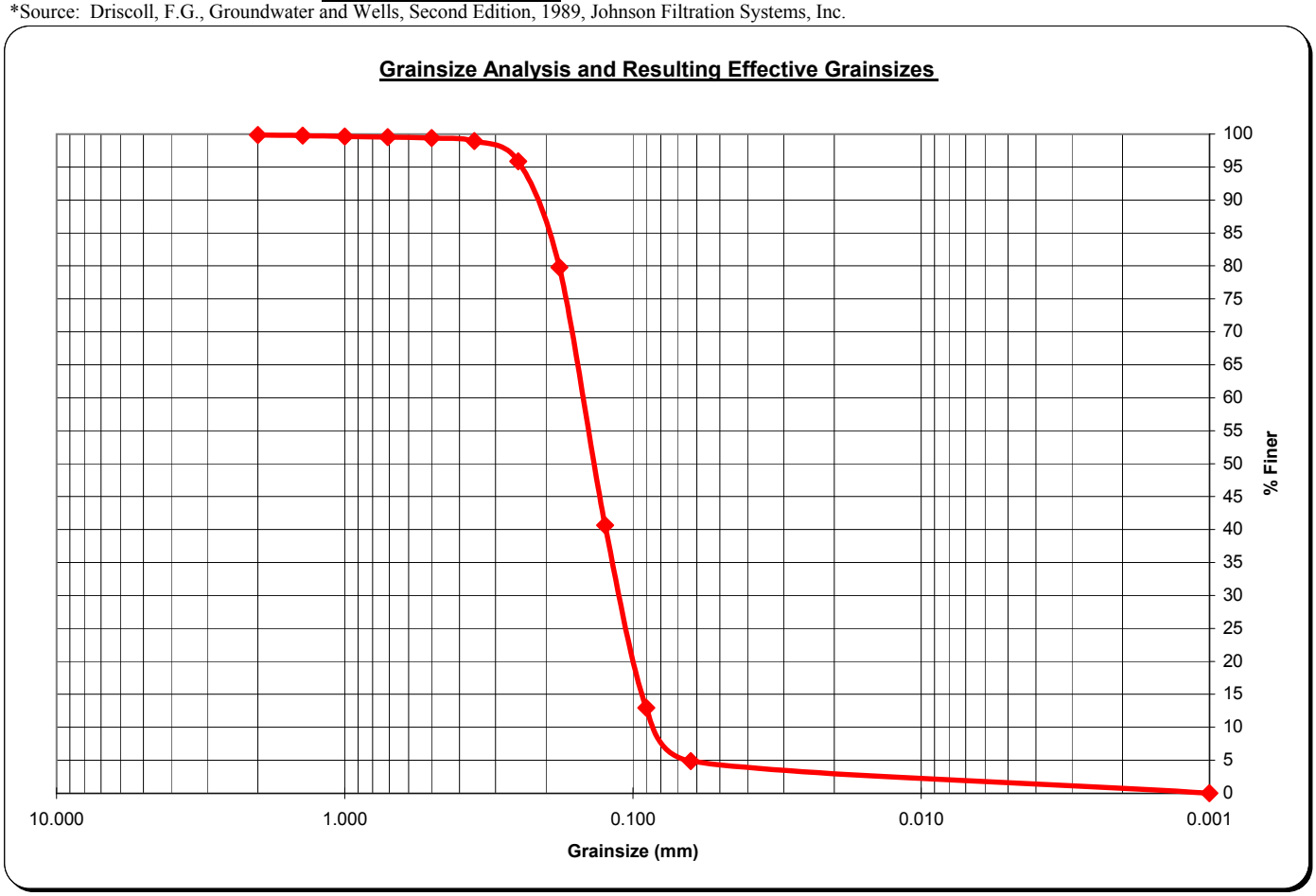
Sample ID:	ECP9-SB1
Sample Depth:	113-114 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.10 g
Total Sieve Weight:	86.60 g
Weight Loss:	0.5 g
Percent Loss:	0.57 %

20.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	0.58%
	14	1.4	0.10	0.12	99.77		
	18	1.0	0.10	0.12	99.65		
	25	0.71	0.10	0.12	99.54		
	35	0.50	0.10	0.12	99.42		
medium	45	0.355	0.40	0.46	98.96	medium % 0.25 - 0.5 mm	3.58%
	60	0.250	2.70	3.12	95.84		
fine	80	0.180	13.90	16.05	79.79	Fine % 0.125 - 0.25	55.20%
	120	0.125	33.90	39.15	40.65		
silt	170	0.090	24.00	27.71	12.93	Silt % < 0.125	35.80%
	230	0.063	7.00	8.08	4.85		
pan	pan	0.001	4.20	4.85	0.00	Pan % < 0.063	4.85%
						Total	**100.00%**

Total (g)	**86.60**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



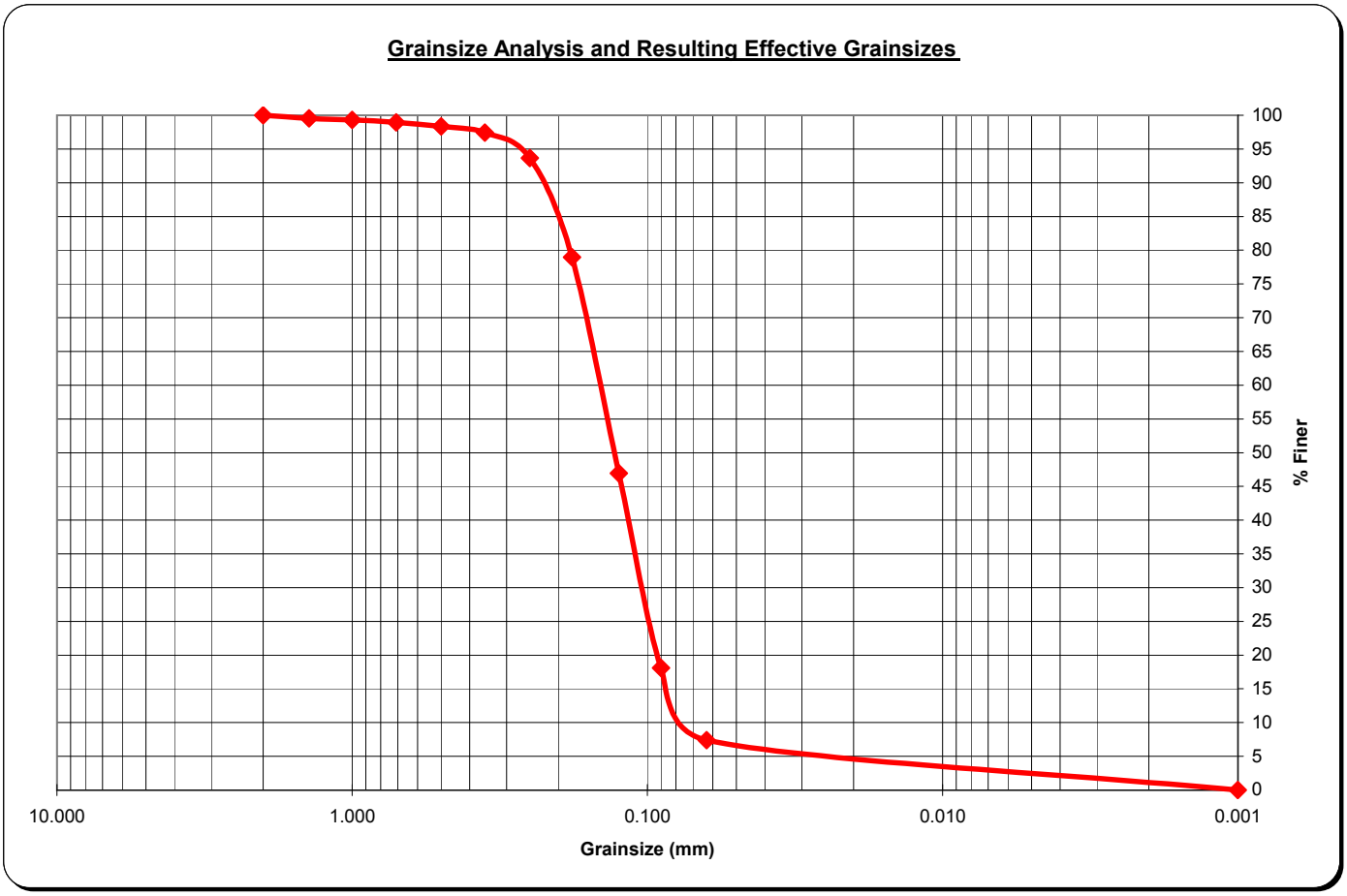
Sample ID:	ECP9-SB1
Sample Depth:	114-115 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.40 g
Total Sieve Weight:	85.00 g
Weight Loss:	0.4 g
Percent Loss:	0.47 %

22.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	1.65%
	14	1.4	0.40	0.47	99.53		
	18	1.0	0.20	0.24	99.29		
	25	0.71	0.30	0.35	98.94		
	35	0.50	0.50	0.59	98.35		
medium	45	0.355	0.80	0.94	97.41	medium % 0.25 - 0.5 mm	4.71%
	60	0.250	3.20	3.76	93.65		
fine	80	0.180	12.50	14.71	78.94	Fine % 0.125 - 0.25	46.71%
	120	0.125	27.20	32.00	46.94		
silt	170	0.090	24.50	28.82	18.12	Silt % < 0.125	39.53%
	230	0.063	9.10	10.71	7.41		
pan	pan	0.001	6.30	7.41	0.00	Pan % < 0.063	7.41%
						Total	**100.00%**

Total (g)	**85.00**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



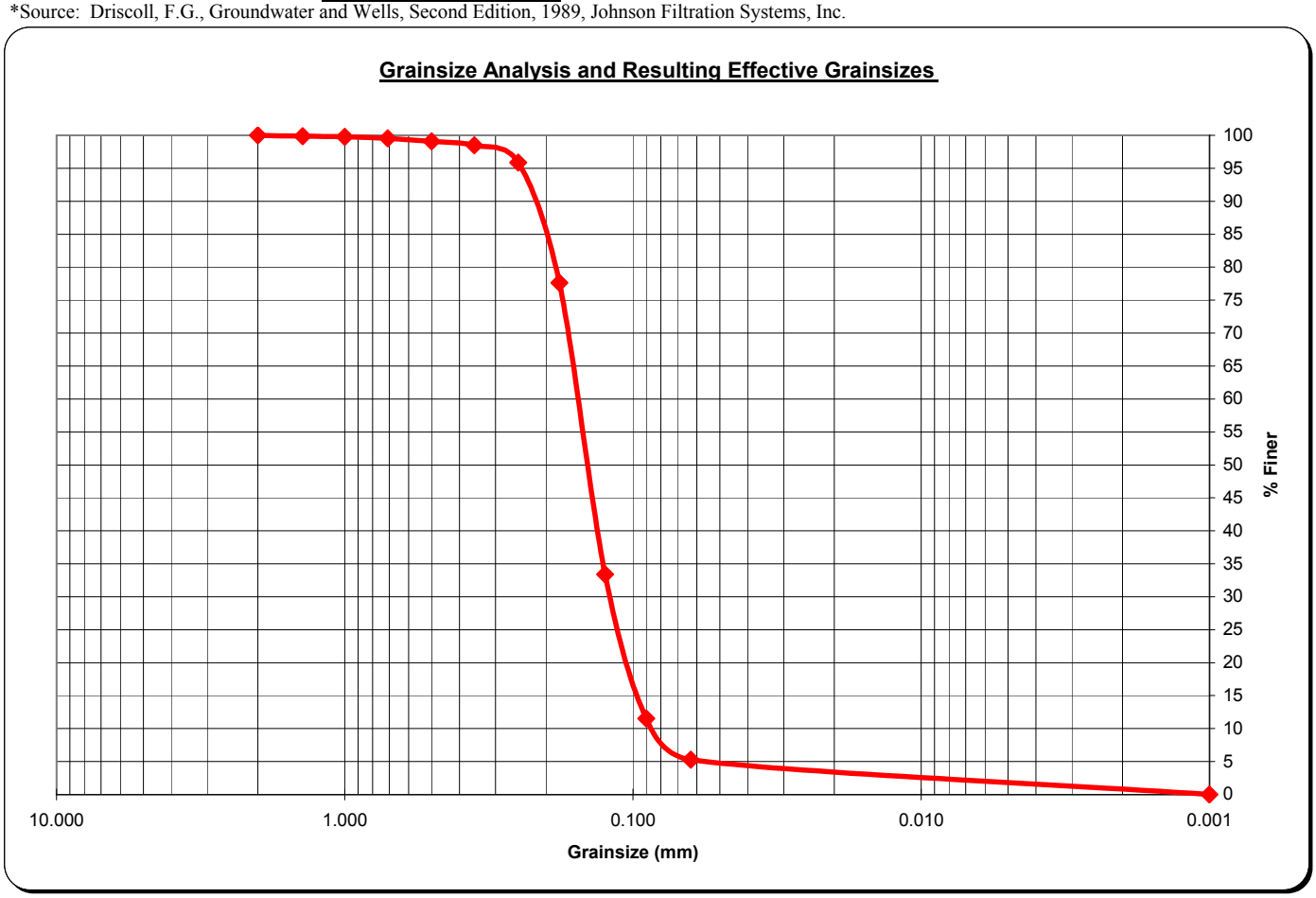
Sample ID:	ECP9-SB1	
Sample Depth:	115-116	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	86.90	g
Total Sieve Weight:	86.80	g
Weight Loss:	0.1	g
Percent Loss:	0.12	%

21.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	0.92%
	14	1.4	0.10	0.12	99.88		
	18	1.0	0.10	0.12	99.77		
	25	0.71	0.20	0.23	99.54		
	35	0.50	0.40	0.46	99.08		
medium	45	0.355	0.50	0.58	98.50	medium % 0.25 - 0.5 mm	3.23%
	60	0.250	2.30	2.65	95.85		
fine	80	0.180	15.80	18.20	77.65	Fine % 0.125 - 0.25	62.44%
	120	0.125	38.40	44.24	33.41		
silt	170	0.090	19.00	21.89	11.52	Silt % < 0.125	28.11%
	230	0.063	5.40	6.22	5.30		
pan	pan	0.001	4.60	5.30	0.00	Pan % < 0.063	5.30%
						Total	**100.00%**

Total (g)	86.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



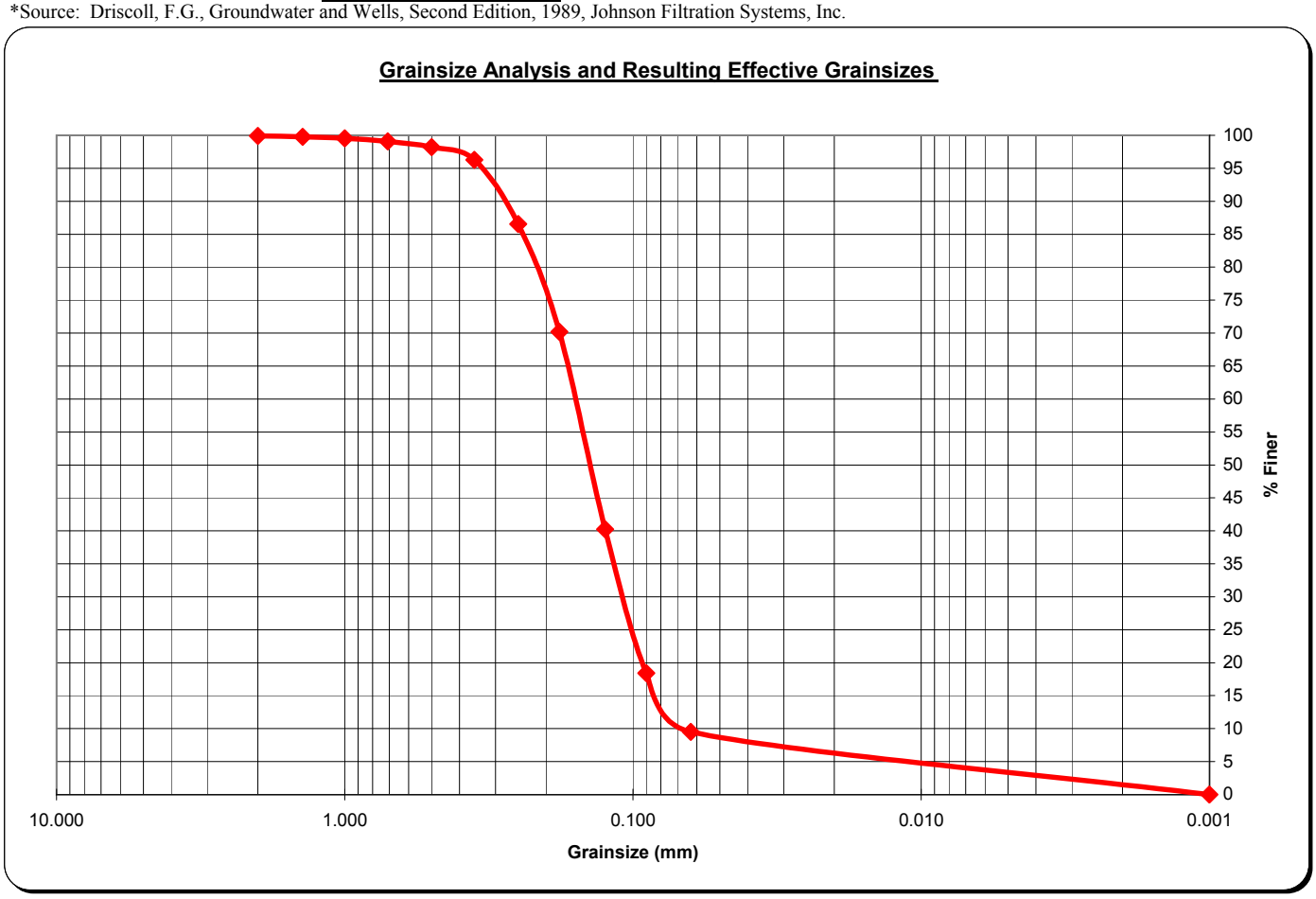
Sample ID:	ECP9-SB1
Sample Depth:	116-117 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	88.10 g
Total Sieve Weight:	88.50 g
Weight Loss:	-0.4 g
Percent Loss:	-0.45 %

19.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	1.81%
	14	1.4	0.10	0.11	99.77		
	18	1.0	0.20	0.23	99.55		
	25	0.71	0.40	0.45	99.10		
	35	0.50	0.80	0.90	98.19		
medium	45	0.355	1.70	1.92	96.27	medium % 0.25 - 0.5 mm	11.64%
	60	0.250	8.60	9.72	86.55		
fine	80	0.180	14.50	16.38	70.17	Fine % 0.125 - 0.25	46.33%
	120	0.125	26.50	29.94	40.23		
silt	170	0.090	19.30	21.81	18.42	Silt % < 0.125	30.73%
	230	0.063	7.90	8.93	9.49		
pan	pan	0.001	8.40	9.49	0.00	Pan % < 0.063	9.49%
						Total	**100.00%**

Total (g)	88.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



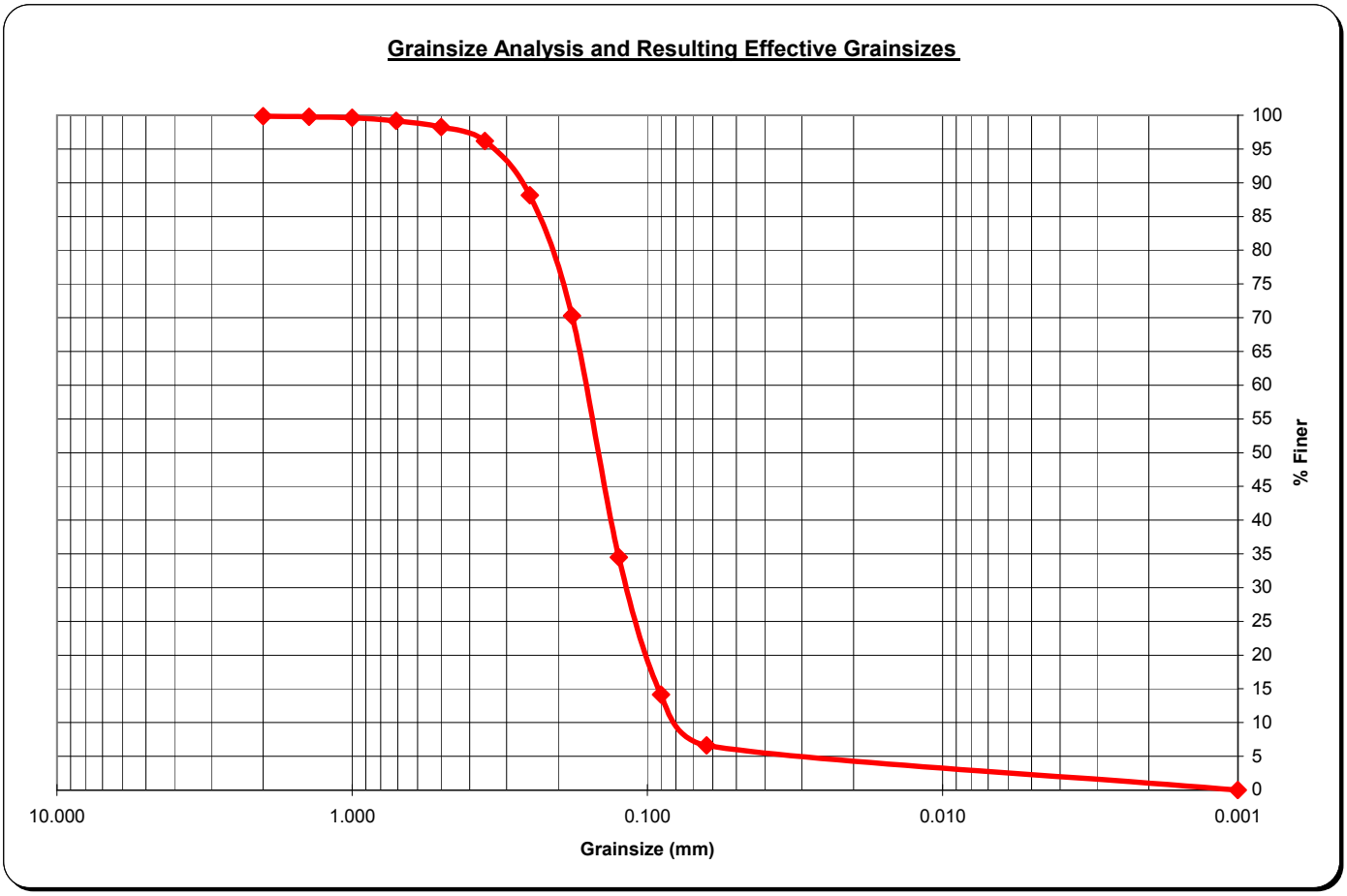
Sample ID:	ECP9-SB1
Sample Depth:	117-118 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.00 g
Total Sieve Weight:	86.10 g
Weight Loss:	-0.1 g
Percent Loss:	-0.12 %

21.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	1.74%
	14	1.4	0.10	0.12	99.77		
	18	1.0	0.10	0.12	99.65		
	25	0.71	0.40	0.46	99.19		
	35	0.50	0.80	0.93	98.26		
medium	45	0.355	1.80	2.09	96.17	medium % 0.25 - 0.5 mm	10.10%
	60	0.250	6.90	8.01	88.15		
fine	80	0.180	15.40	17.89	70.27	Fine % 0.125 - 0.25	53.66%
	120	0.125	30.80	35.77	34.49		
silt	170	0.090	17.50	20.33	14.17	Silt % < 0.125	27.87%
	230	0.063	6.50	7.55	6.62		
pan	pan	0.001	5.70	6.62	0.00	Pan % < 0.063	6.62%
						Total	**100.00%**

Total (g)	**86.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



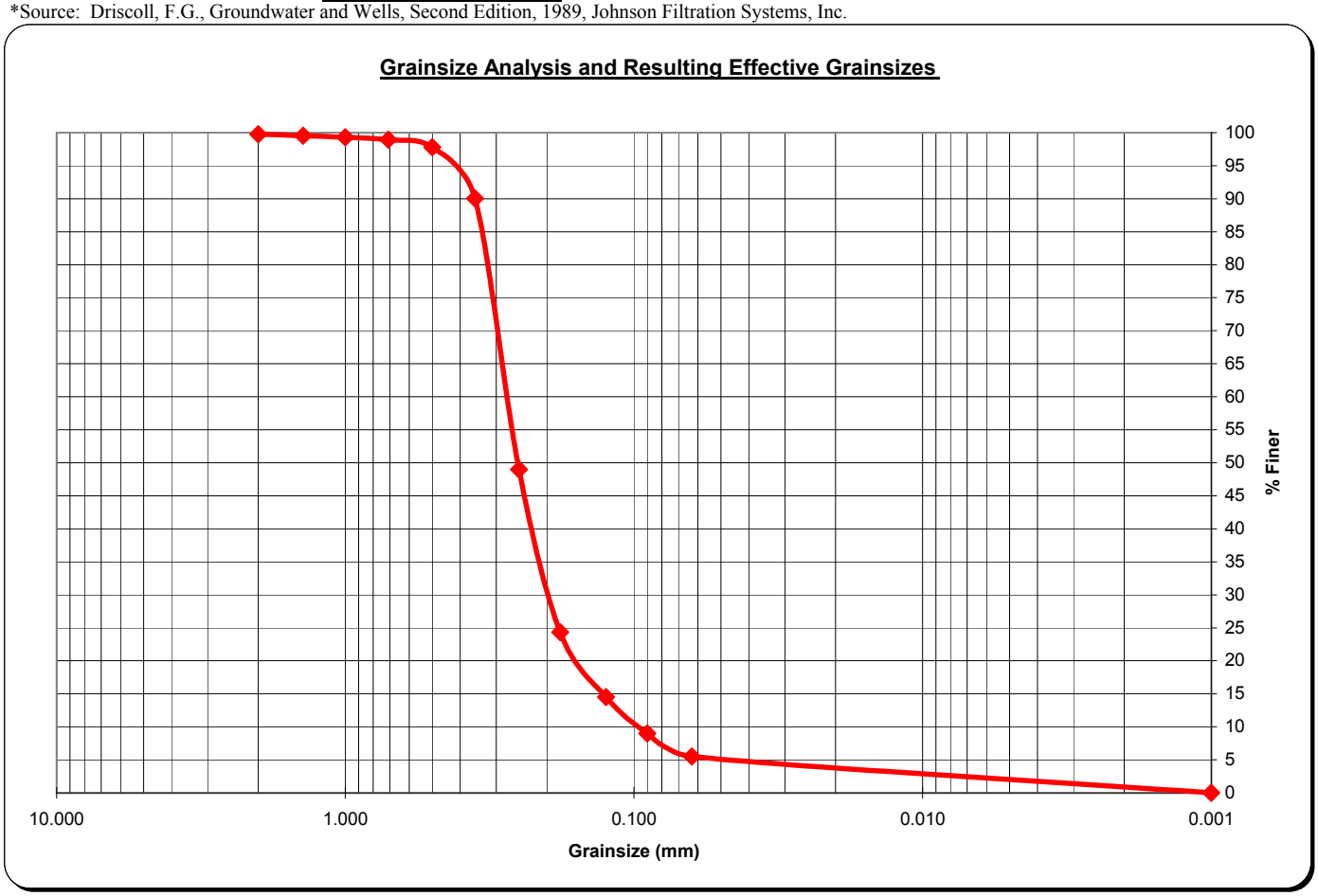
Sample ID:	ECP9-SB1
Sample Depth:	118-119 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	85.60 g
Total Sieve Weight:	85.50 g
Weight Loss:	0.1 g
Percent Loss:	0.12 %

22.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.23	99.77	coarse % > 0.5 mm	2.22%
	14	1.4	0.20	0.23	99.53		
	18	1.0	0.20	0.23	99.30		
	25	0.71	0.30	0.35	98.95		
	35	0.50	1.00	1.17	97.78		
medium	45	0.355	6.60	7.72	90.06	medium % 0.25 - 0.5 mm	48.77%
	60	0.250	35.10	41.05	49.01		
fine	80	0.180	21.10	24.68	24.33	Fine % 0.125 - 0.25	34.50%
	120	0.125	8.40	9.82	14.50		
silt	170	0.090	4.70	5.50	9.01	Silt % < 0.125	9.01%
	230	0.063	3.00	3.51	5.50		
pan	pan	0.001	4.70	5.50	0.00	Pan % < 0.063	5.50%
						Total	**100.00%**

Total (g)	85.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



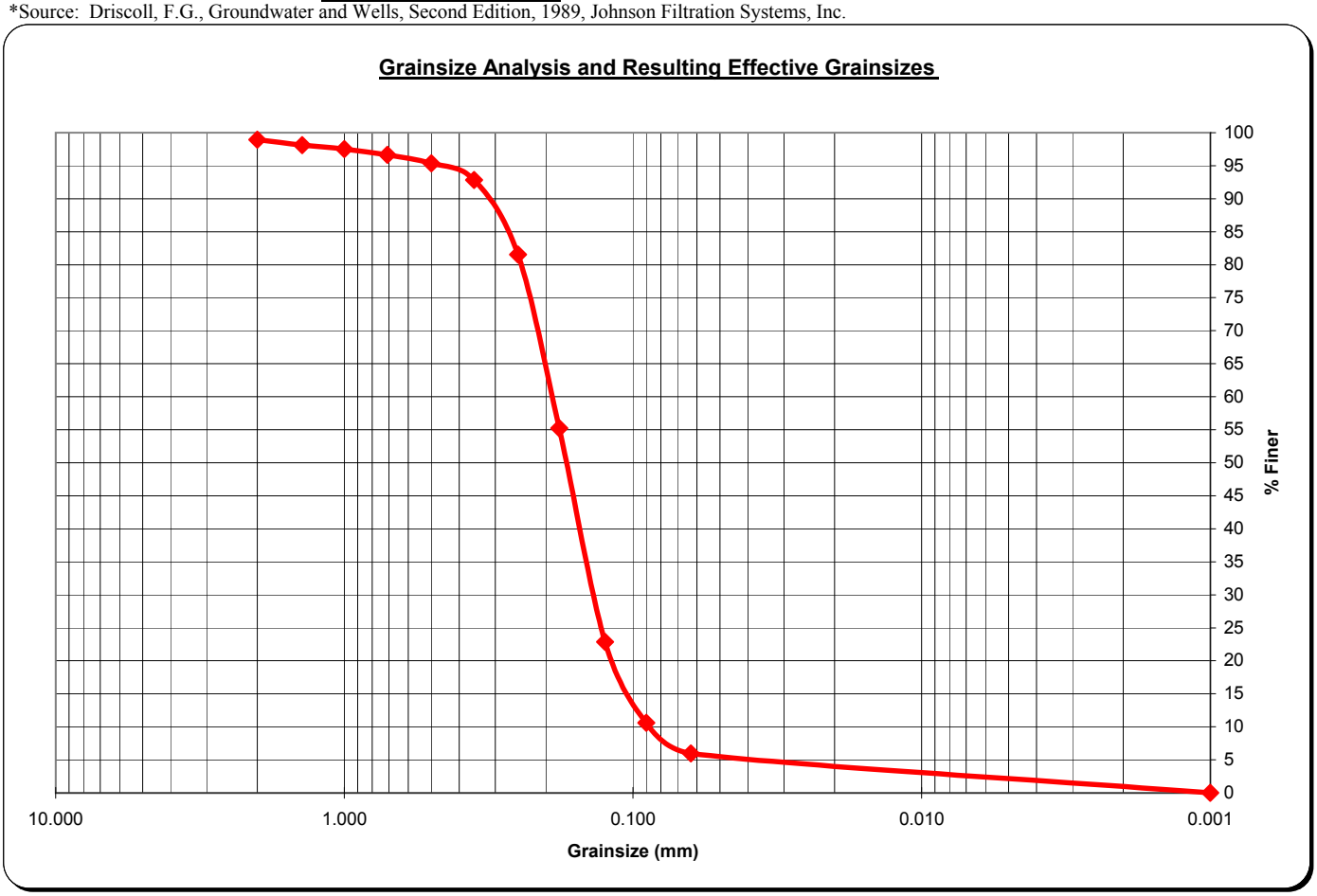
Sample ID:	ECP9-SB1	
Sample Depth:	119-120	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	84.70	g
Total Sieve Weight:	84.00	g
Weight Loss:	0.7	g
Percent Loss:	0.83	%

23.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.90	1.07	98.93	coarse % > 0.5 mm	4.64%
	14	1.4	0.70	0.83	98.10		
	18	1.0	0.50	0.60	97.50		
	25	0.71	0.70	0.83	96.67		
	35	0.50	1.10	1.31	95.36		
medium	45	0.355	2.10	2.50	92.86	medium % 0.25 - 0.5 mm	13.81%
	60	0.250	9.50	11.31	81.55		
fine	80	0.180	22.10	26.31	55.24	Fine % 0.125 - 0.25	58.69%
	120	0.125	27.20	32.38	22.86		
silt	170	0.090	10.30	12.26	10.60	Silt % < 0.125	16.90%
	230	0.063	3.90	4.64	5.95		
pan	pan	0.001	5.00	5.95	0.00	Pan % < 0.063	5.95%
						Total	100.00%

Total (g)	84.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



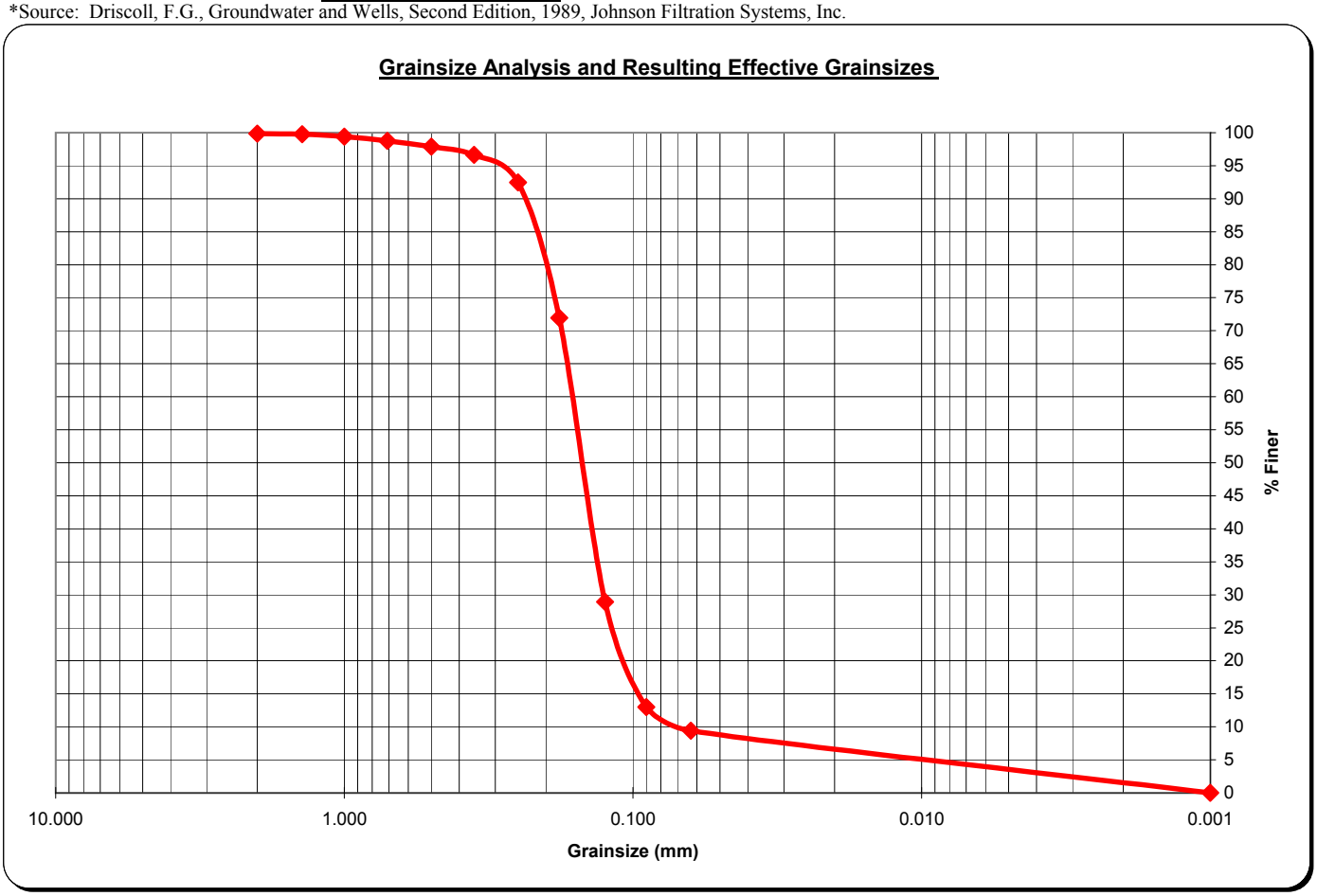
Sample ID:	ECP9-SB1
Sample Depth:	120-121 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	82.00 g
Total Sieve Weight:	80.90 g
Weight Loss:	1.1 g
Percent Loss:	1.34 %

25.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	2.10%
	14	1.4	0.10	0.12	99.75		
	18	1.0	0.30	0.37	99.38		
	25	0.71	0.50	0.62	98.76		
	35	0.50	0.70	0.87	97.90		
medium	45	0.355	1.00	1.24	96.66	medium % 0.25 - 0.5 mm	5.44%
	60	0.250	3.40	4.20	92.46		
fine	80	0.180	16.60	20.52	71.94	Fine % 0.125 - 0.25	63.54%
	120	0.125	34.80	43.02	28.92		
silt	170	0.090	12.90	15.95	12.98	Silt % < 0.125	19.53%
	230	0.063	2.90	3.58	9.39		
pan	pan	0.001	7.60	9.39	0.00	Pan % < 0.063	9.39%
						Total	100.00%

Total (g)	80.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



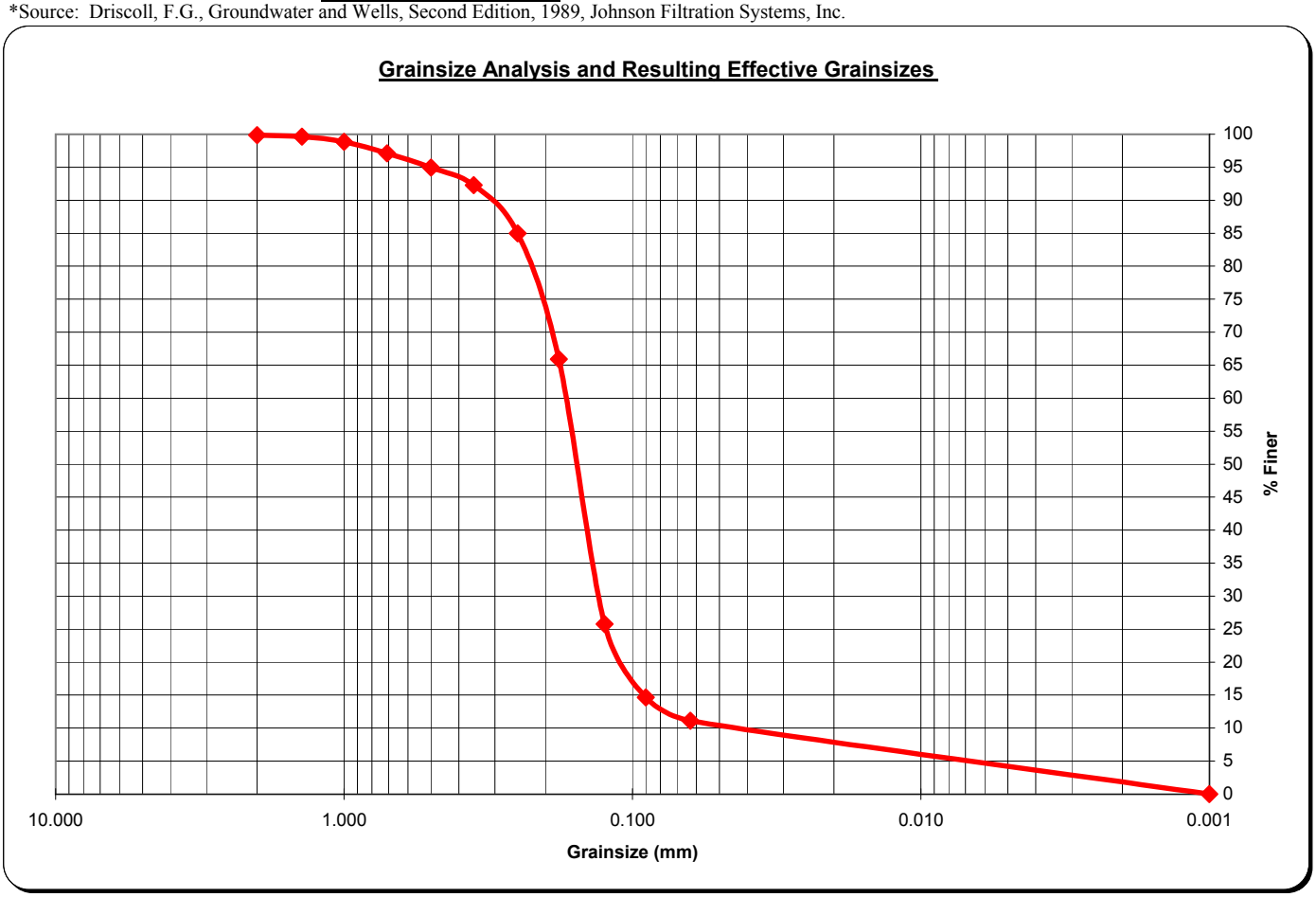
Sample ID:	ECP9-SB1
Sample Depth:	121-122 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	80.00 g
Total Sieve Weight:	79.20 g
Weight Loss:	0.8 g
Percent Loss:	1.00 %

27.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*		
coarse	10	2.0	0.10	0.13	99.87	coarse % > 0.5 mm	5.05%	CLAY
	14	1.4	0.20	0.25	99.62			CLAY
	18	1.0	0.60	0.76	98.86			CLAY
	25	0.71	1.40	1.77	97.10			CLAY
	35	0.50	1.70	2.15	94.95			CLAY
medium	45	0.355	2.10	2.65	92.30	medium % 0.25 - 0.5 mm	9.97%	CLAY
	60	0.250	5.80	7.32	84.97			CLAY
fine	80	0.180	15.10	19.07	65.91	Fine % 0.125 - 0.25	59.22%	
	120	0.125	31.80	40.15	25.76			
silt	170	0.090	8.80	11.11	14.65	Silt % < 0.125	14.65%	
	230	0.063	2.80	3.54	11.11			
pan	pan	0.001	8.80	11.11	0.00	Pan % < 0.063	11.11%	
						Total	**100.00%**	

Total (g)	**79.20**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



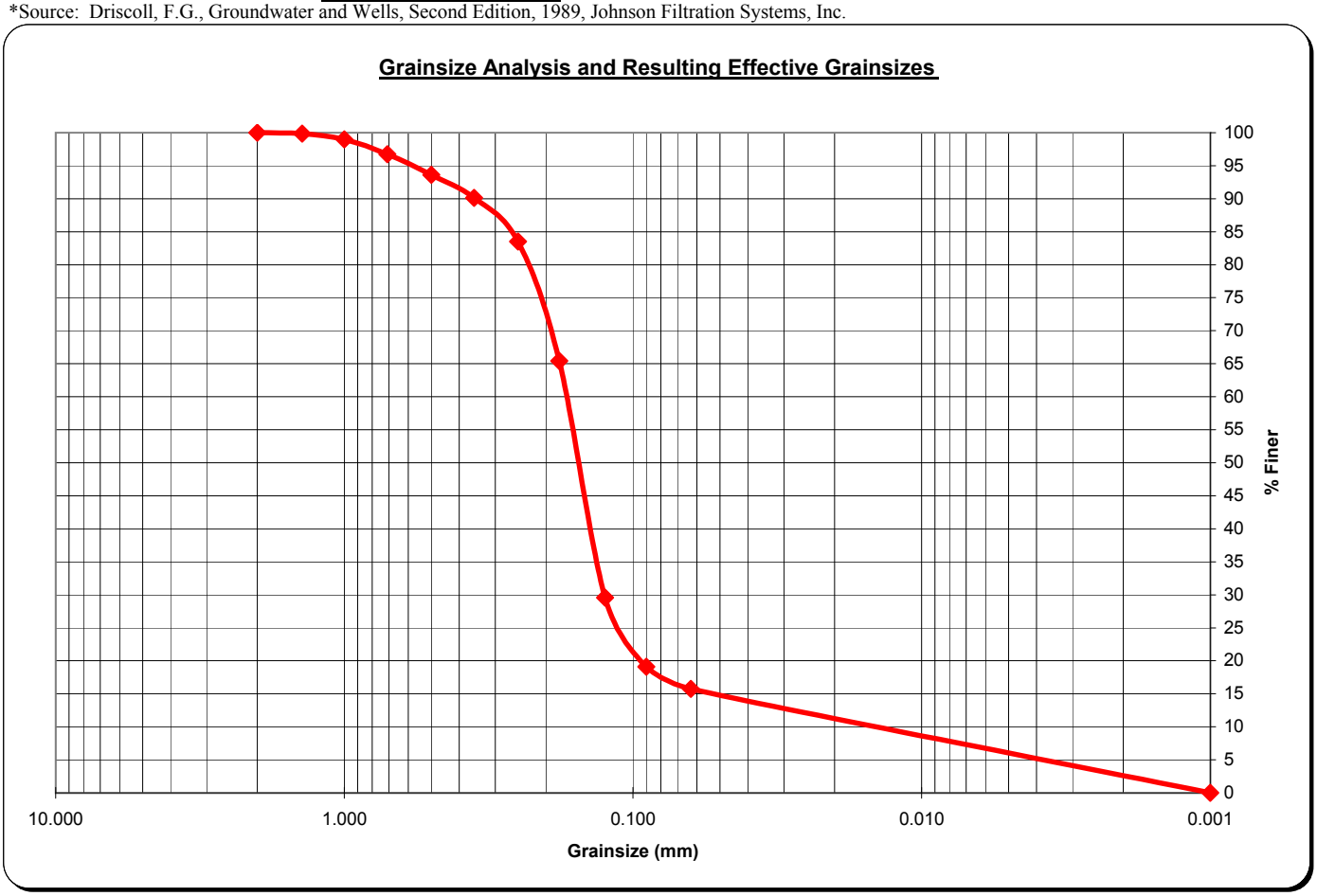
Sample ID:	ECP9-SB1
Sample Depth:	122-123 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	81.50 g
Total Sieve Weight:	80.10 g
Weight Loss:	1.4 g
Percent Loss:	1.72 %

25.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	6.37%
	14	1.4	0.10	0.12	99.88		
	18	1.0	0.70	0.87	99.00		
	25	0.71	1.80	2.25	96.75		
	35	0.50	2.50	3.12	93.63		
medium	45	0.355	2.80	3.50	90.14	medium % 0.25 - 0.5 mm	10.11%
	60	0.250	5.30	6.62	83.52		
fine	80	0.180	14.50	18.10	65.42	Fine % 0.125 - 0.25	53.93%
	120	0.125	28.70	35.83	29.59		
silt	170	0.090	8.40	10.49	19.10	Silt % < 0.125	13.86%
	230	0.063	2.70	3.37	15.73		
pan	pan	0.001	12.60	15.73	0.00	Pan % < 0.063	15.73%
						Total	**100.00%**

Total (g)	80.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



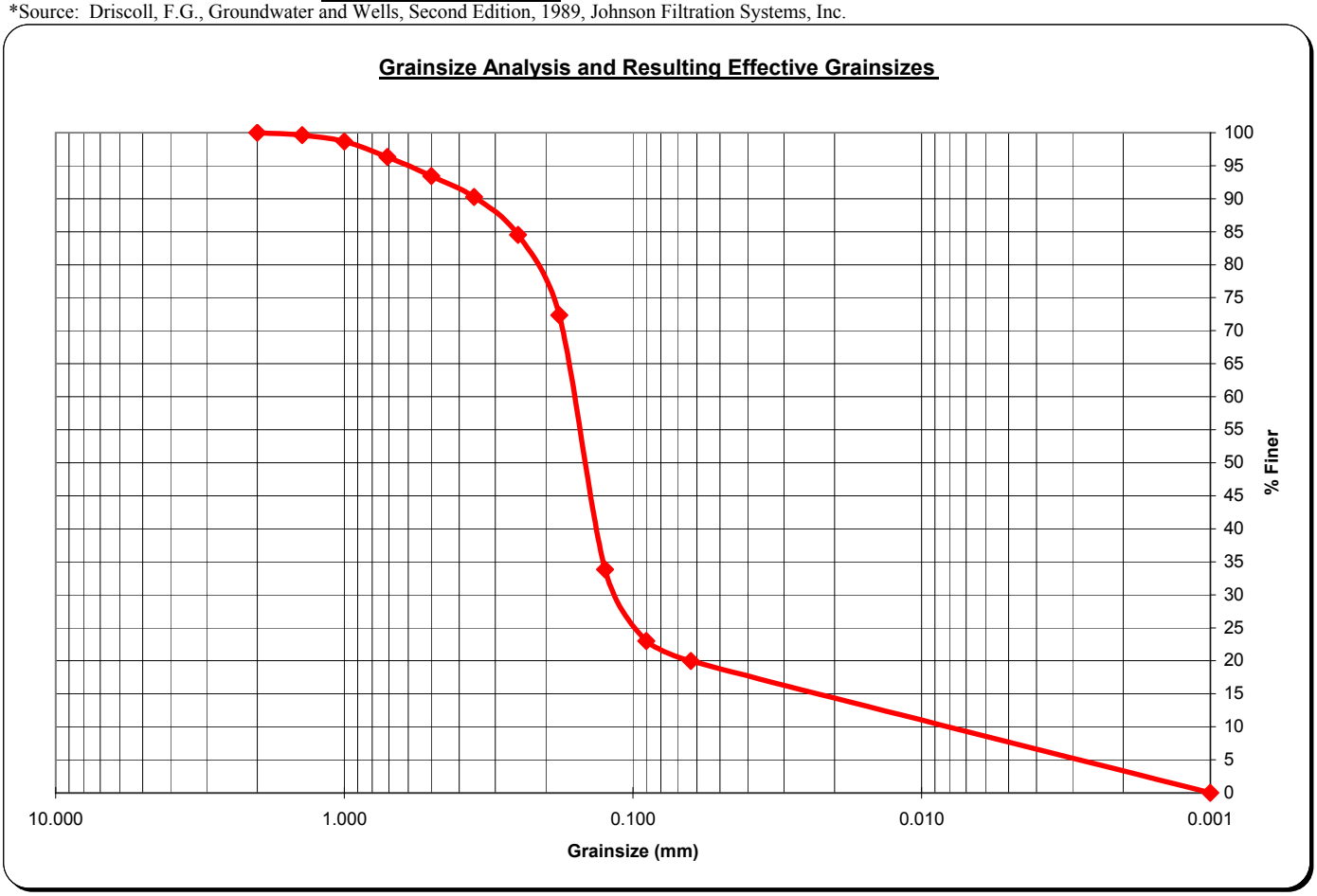
Sample ID:	ECP9-SB1
Sample Depth:	123-124 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	83.40 g
Total Sieve Weight:	82.10 g
Weight Loss:	1.3 g
Percent Loss:	1.56 %

24.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.00	0.00	100.00	coarse % > 0.5 mm	6.58%
	14	1.4	0.30	0.37	99.63		
	18	1.0	0.80	0.97	98.66		
	25	0.71	1.90	2.31	96.35		
	35	0.50	2.40	2.92	93.42		
medium	45	0.355	2.60	3.17	90.26	medium % 0.25 - 0.5 mm	8.89%
	60	0.250	4.70	5.72	84.53		
fine	80	0.180	10.00	12.18	72.35	Fine % 0.125 - 0.25	50.67%
	120	0.125	31.60	38.49	33.86		
silt	170	0.090	8.90	10.84	23.02	Silt % < 0.125	13.89%
	230	0.063	2.50	3.05	19.98		
pan	pan	0.001	16.40	19.98	0.00	Pan % < 0.063	19.98%
						Total	**100.00%**

Total (g)	**82.10**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



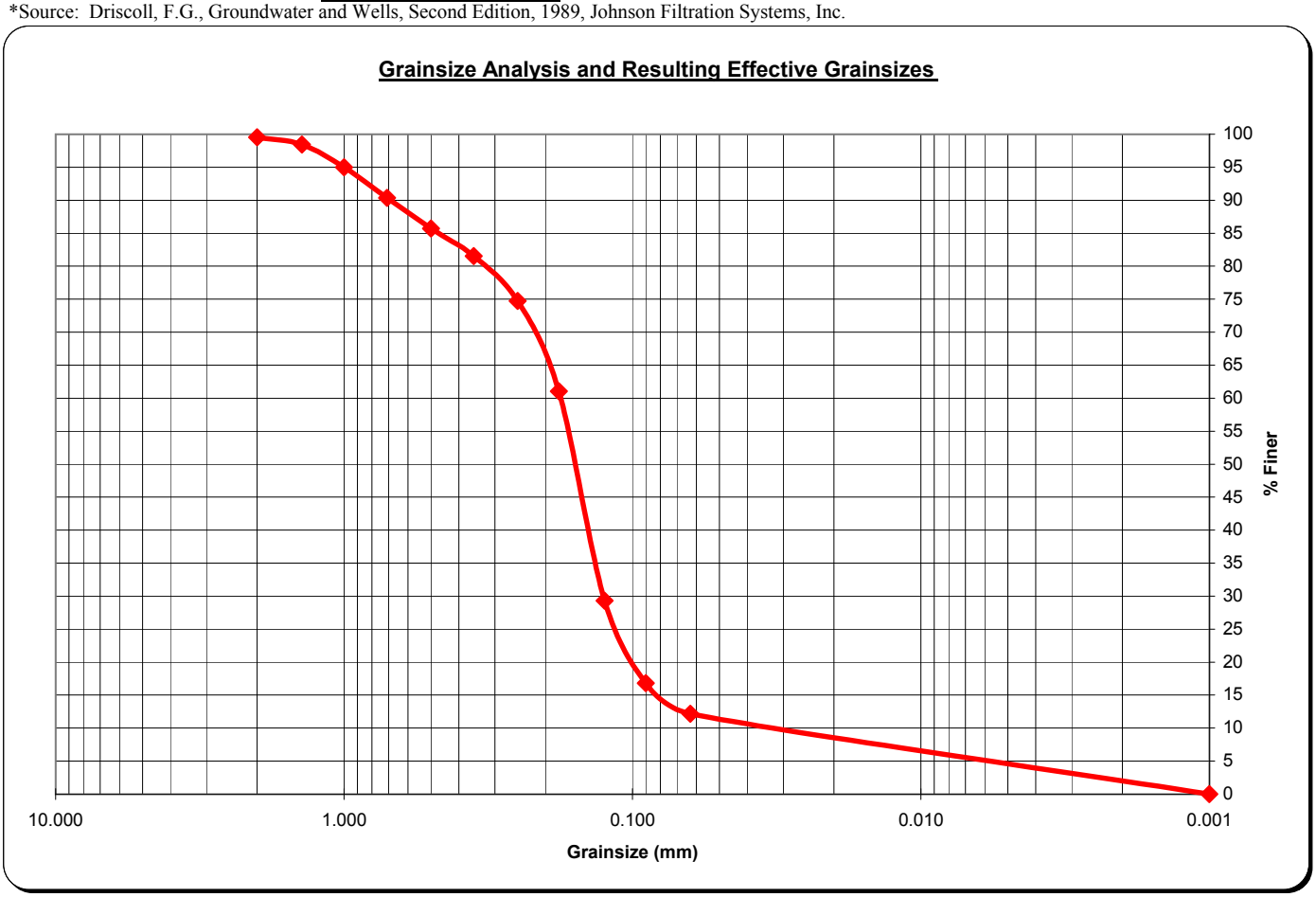
Sample ID:	ECP9-SB1
Sample Depth:	124-125 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.80 g
Total Sieve Weight:	83.90 g
Weight Loss:	0.9 g
Percent Loss:	1.06 %

22.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.48	99.52	coarse % > 0.5 mm	14.30%
	14	1.4	0.90	1.07	98.45		
	18	1.0	2.90	3.46	94.99		
	25	0.71	3.90	4.65	90.35		
	35	0.50	3.90	4.65	85.70		
medium	45	0.355	3.50	4.17	81.53	medium % 0.25 - 0.5 mm	10.97%
	60	0.250	5.70	6.79	74.73		
fine	80	0.180	11.50	13.71	61.03	Fine % 0.125 - 0.25	45.41%
	120	0.125	26.60	31.70	29.32		
silt	170	0.090	10.50	12.51	16.81	Silt % < 0.125	17.16%
	230	0.063	3.90	4.65	12.16		
pan	pan	0.001	10.20	12.16	0.00	Pan % < 0.063	12.16%
						Total	**100.00%**

Total (g)	83.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



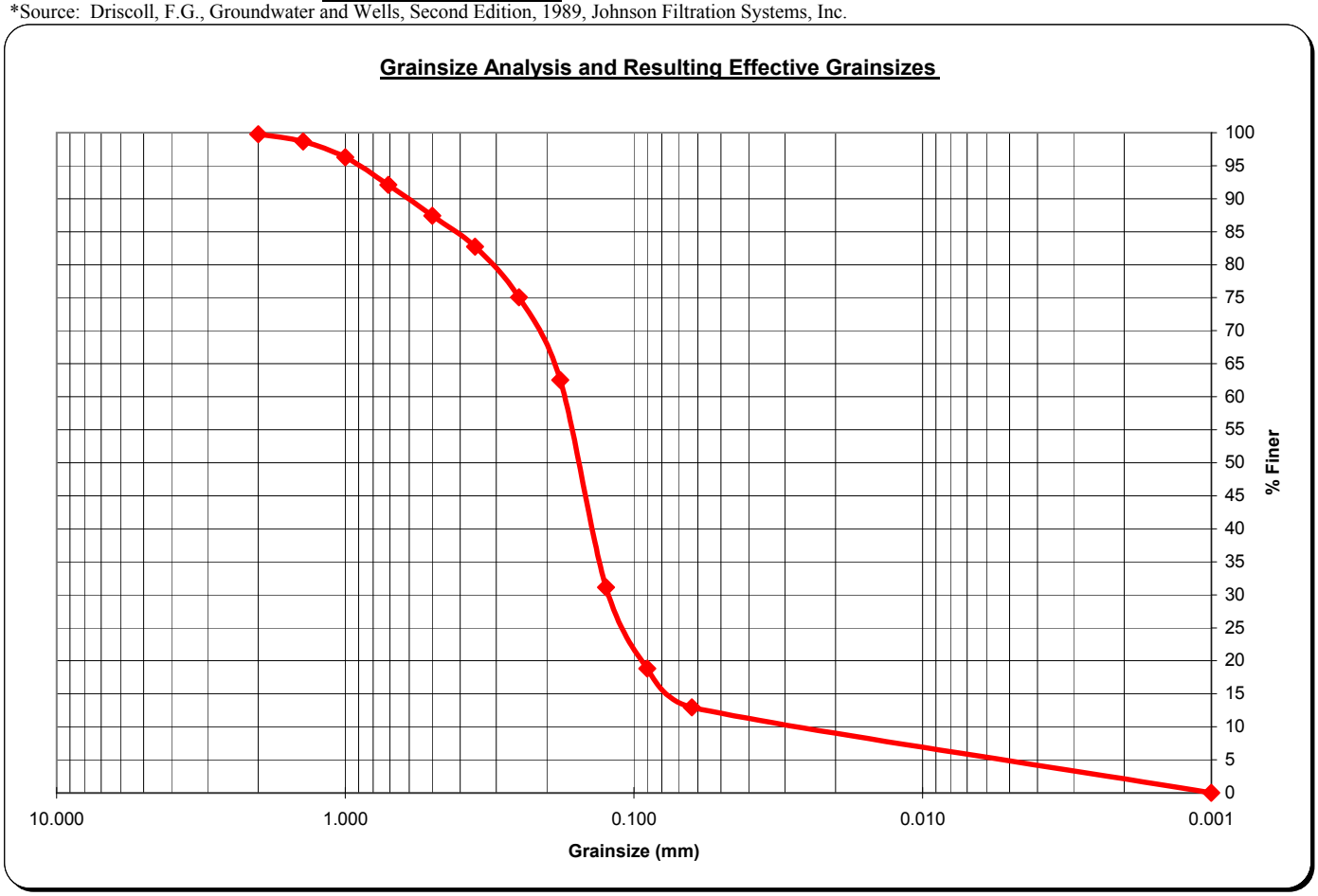
Sample ID:	ECP9-SB1
Sample Depth:	125-126 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.30 g
Total Sieve Weight:	83.50 g
Weight Loss:	0.8 g
Percent Loss:	0.95 %

23.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.20	0.24	99.76	coarse % > 0.5 mm	12.57%
	14	1.4	0.90	1.08	98.68		
	18	1.0	2.00	2.40	96.29		
	25	0.71	3.50	4.19	92.10		
	35	0.50	3.90	4.67	87.43		
medium	45	0.355	3.90	4.67	82.75	medium % 0.25 - 0.5 mm	12.34%
	60	0.250	6.40	7.66	75.09		
fine	80	0.180	10.50	12.57	62.51	Fine % 0.125 - 0.25	43.95%
	120	0.125	26.20	31.38	31.14		
silt	170	0.090	10.30	12.34	18.80	Silt % < 0.125	18.20%
	230	0.063	4.90	5.87	12.93		
pan	pan	0.001	10.80	12.93	0.00	Pan % < 0.063	12.93%
						Total	**100.00%**

Total (g)	83.50

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



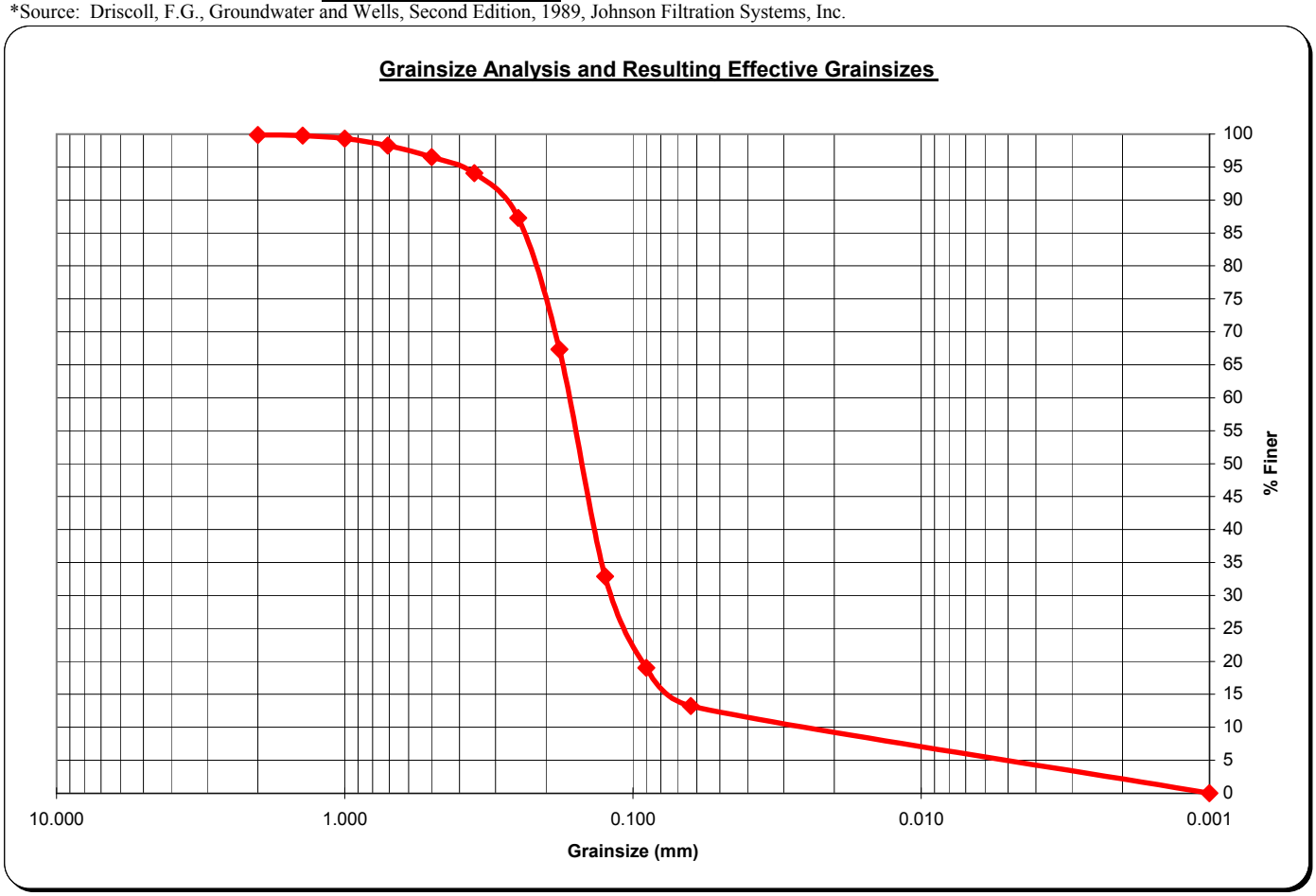
Sample ID:	ECP9-SB1
Sample Depth:	126-127 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.10 g
Total Sieve Weight:	86.30 g
Weight Loss:	0.8 g
Percent Loss:	0.92 %

20.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	3.48%
	14	1.4	0.10	0.12	99.77		
	18	1.0	0.40	0.46	99.30		
	25	0.71	0.90	1.04	98.26		
	35	0.50	1.50	1.74	96.52		
medium	45	0.355	2.10	2.43	94.09	medium % 0.25 - 0.5 mm	9.27%
	60	0.250	5.90	6.84	87.25		
fine	80	0.180	17.20	19.93	67.32	Fine % 0.125 - 0.25	54.35%
	120	0.125	29.70	34.41	32.91		
silt	170	0.090	12.00	13.90	19.00	Silt % < 0.125	19.70%
	230	0.063	5.00	5.79	13.21		
pan	pan	0.001	11.40	13.21	0.00	Pan % < 0.063	13.21%
						Total	**100.00%**

Total (g)	86.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



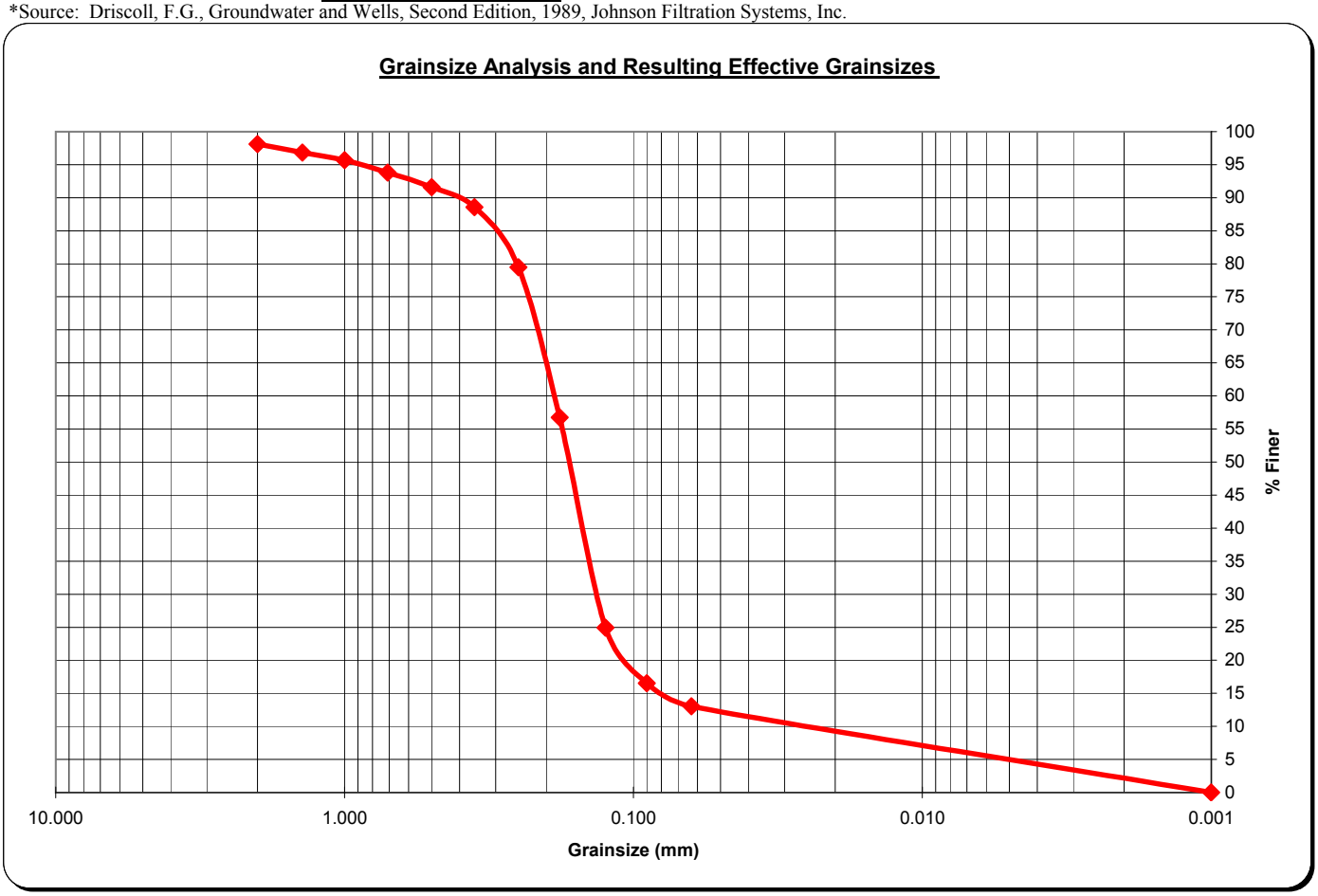
Sample ID:	ECP9-SB1
Sample Depth:	127-128 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.90 g
Total Sieve Weight:	85.80 g
Weight Loss:	1.1 g
Percent Loss:	1.27 %

21.00 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.60	1.86	98.14	coarse % > 0.5 mm	8.39%
	14	1.4	1.10	1.28	96.85		
	18	1.0	1.00	1.17	95.69		
	25	0.71	1.60	1.86	93.82		
	35	0.50	1.90	2.21	91.61		
medium	45	0.355	2.60	3.03	88.58	medium % 0.25 - 0.5 mm	12.12%
	60	0.250	7.80	9.09	79.49		
fine	80	0.180	19.50	22.73	56.76	Fine % 0.125 - 0.25	54.55%
	120	0.125	27.30	31.82	24.94		
silt	170	0.090	7.20	8.39	16.55	Silt % < 0.125	11.89%
	230	0.063	3.00	3.50	13.05		
pan	pan	0.001	11.20	13.05	0.00	Pan % < 0.063	13.05%
						Total	**100.00%**

Total (g)	85.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



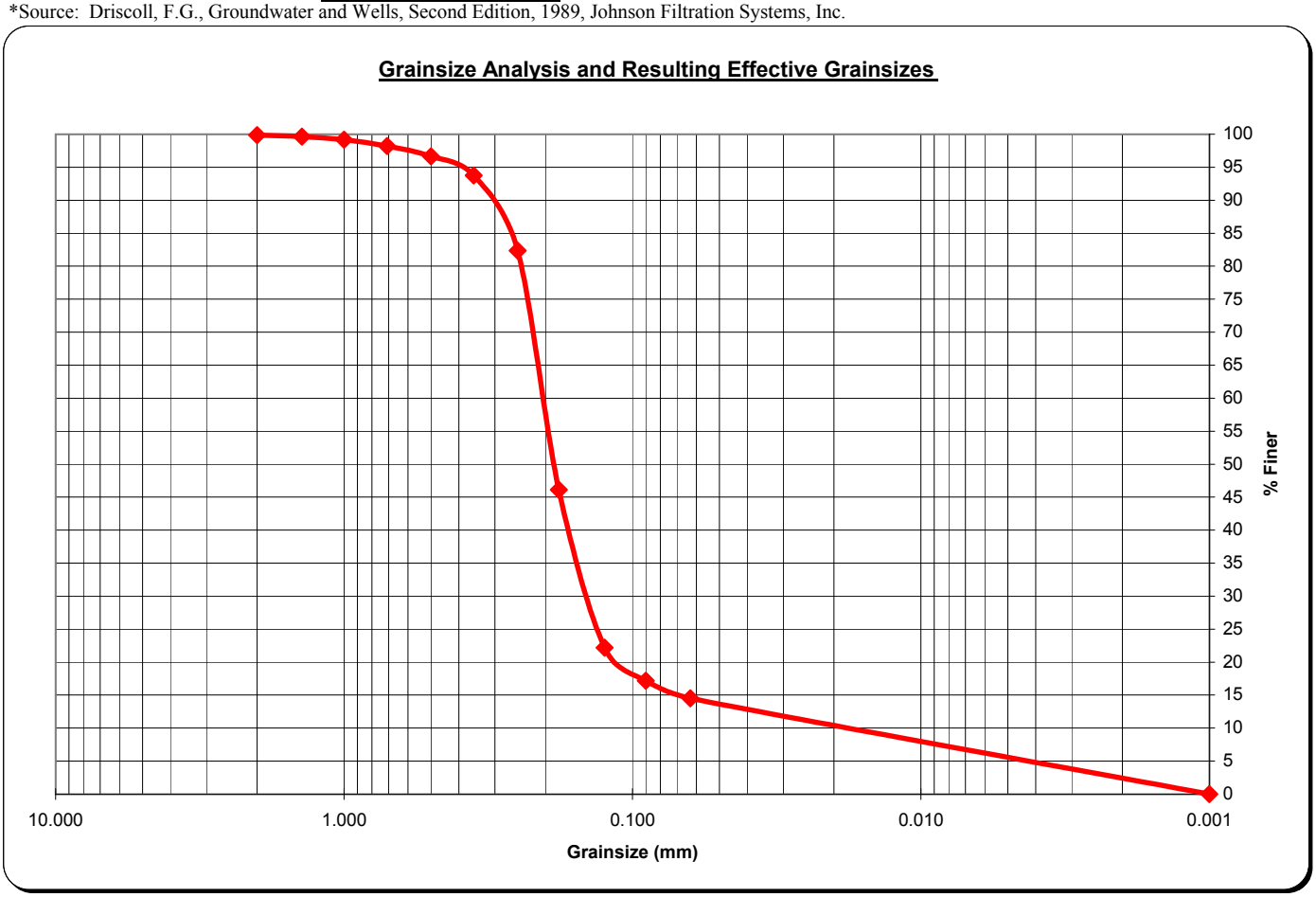
Sample ID:	ECP9-SB1
Sample Depth:	128-129 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.80 g
Total Sieve Weight:	83.30 g
Weight Loss:	1.5 g
Percent Loss:	1.77 %

22.91 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	3.36%
	14	1.4	0.20	0.24	99.64		
	18	1.0	0.40	0.48	99.16		
	25	0.71	0.80	0.96	98.20		
	35	0.50	1.30	1.56	96.64		
medium	45	0.355	2.40	2.88	93.76	medium % 0.25 - 0.5 mm	14.29%
	60	0.250	9.50	11.40	82.35		
fine	80	0.180	30.20	36.25	46.10	Fine % 0.125 - 0.25	60.14%
	120	0.125	19.90	23.89	22.21		
silt	170	0.090	4.20	5.04	17.17	Silt % < 0.125	7.68%
	230	0.063	2.20	2.64	14.53		
pan	pan	0.001	12.10	14.53	0.00	Pan % < 0.063	14.53%
						Total	**100.00%**

Total (g)	83.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



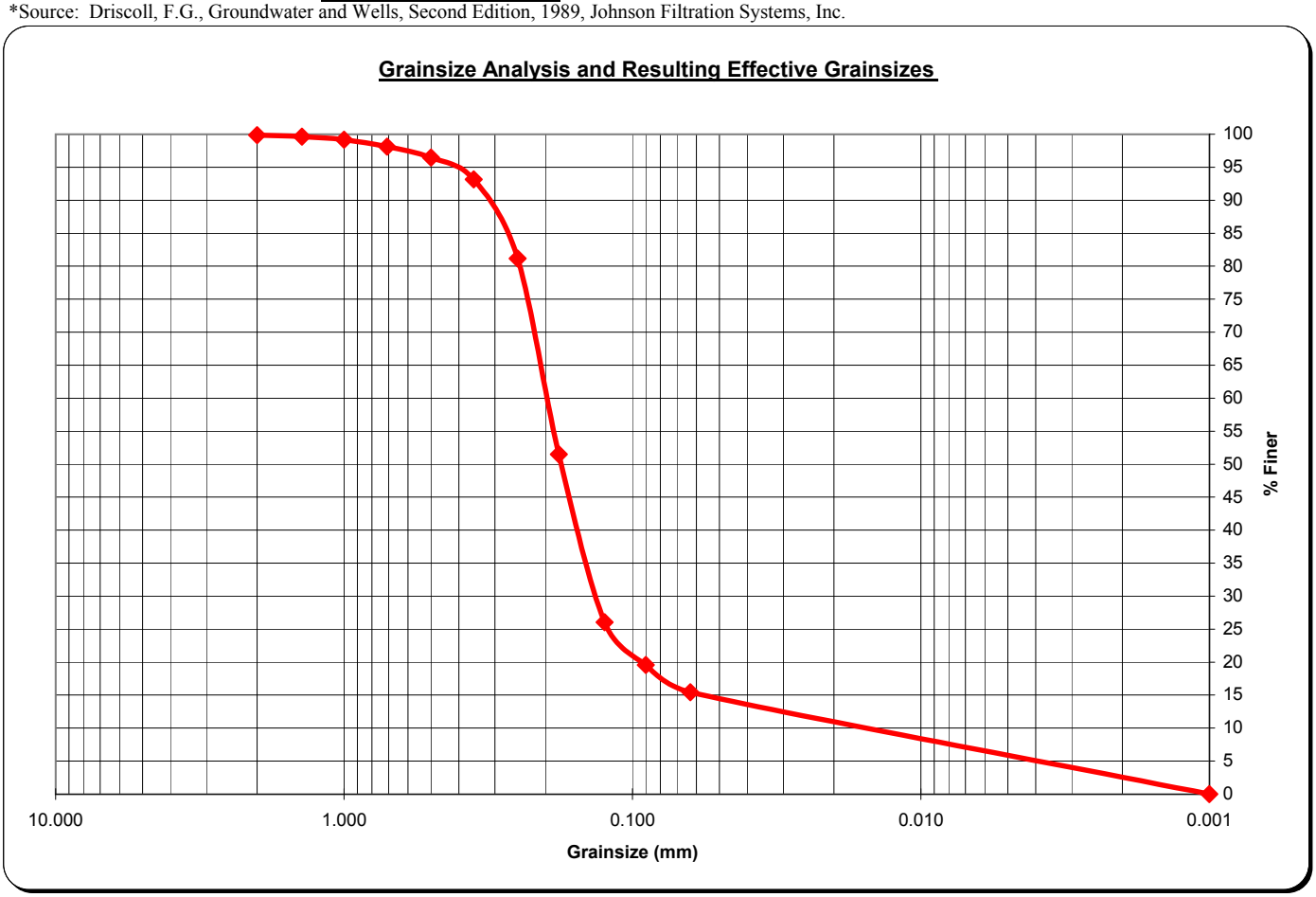
Sample ID:	ECP9-SB1
Sample Depth:	129-130 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	86.00 g
Total Sieve Weight:	84.90 g
Weight Loss:	1.1 g
Percent Loss:	1.28 %

21.82 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.12	99.88	coarse % > 0.5 mm	3.53%
	14	1.4	0.20	0.24	99.65		
	18	1.0	0.40	0.47	99.18		
	25	0.71	0.90	1.06	98.12		
	35	0.50	1.40	1.65	96.47		
medium	45	0.355	2.80	3.30	93.17	medium % 0.25 - 0.5 mm	15.31%
	60	0.250	10.20	12.01	81.15		
fine	80	0.180	25.20	29.68	51.47	Fine % 0.125 - 0.25	55.12%
	120	0.125	21.60	25.44	26.03		
silt	170	0.090	5.50	6.48	19.55	Silt % < 0.125	10.60%
	230	0.063	3.50	4.12	15.43		
pan	pan	0.001	13.10	15.43	0.00	Pan % < 0.063	15.43%
						Total	**100.00%**

Total (g)	**84.90**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



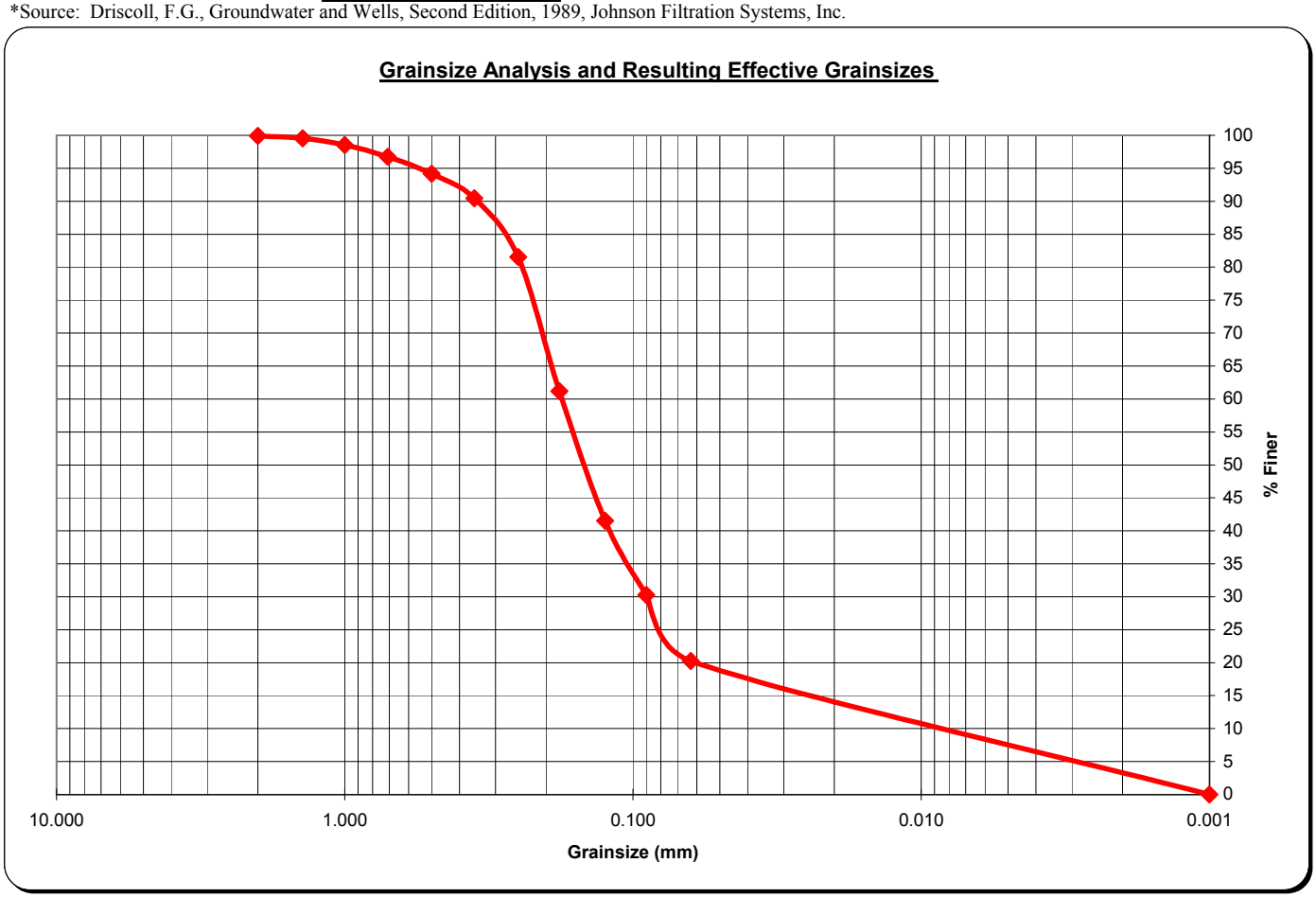
Sample ID:	ECP9-SB1
Sample Depth:	130-131 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	90.10 g
Total Sieve Weight:	88.90 g
Weight Loss:	1.2 g
Percent Loss:	1.33 %

18.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	5.85%
	14	1.4	0.30	0.34	99.55		
	18	1.0	0.90	1.01	98.54		
	25	0.71	1.60	1.80	96.74		
	35	0.50	2.30	2.59	94.15		
medium	45	0.355	3.30	3.71	90.44	medium % 0.25 - 0.5 mm	12.60%
	60	0.250	7.90	8.89	81.55		
fine	80	0.180	18.10	20.36	61.19	Fine % 0.125 - 0.25	40.04%
	120	0.125	17.50	19.69	41.51		
silt	170	0.090	10.00	11.25	30.26	Silt % < 0.125	21.26%
	230	0.063	8.90	10.01	20.25		
pan	pan	0.001	18.00	20.25	0.00	Pan % < 0.063	20.25%
						Total	**100.00%**

Total (g)	88.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



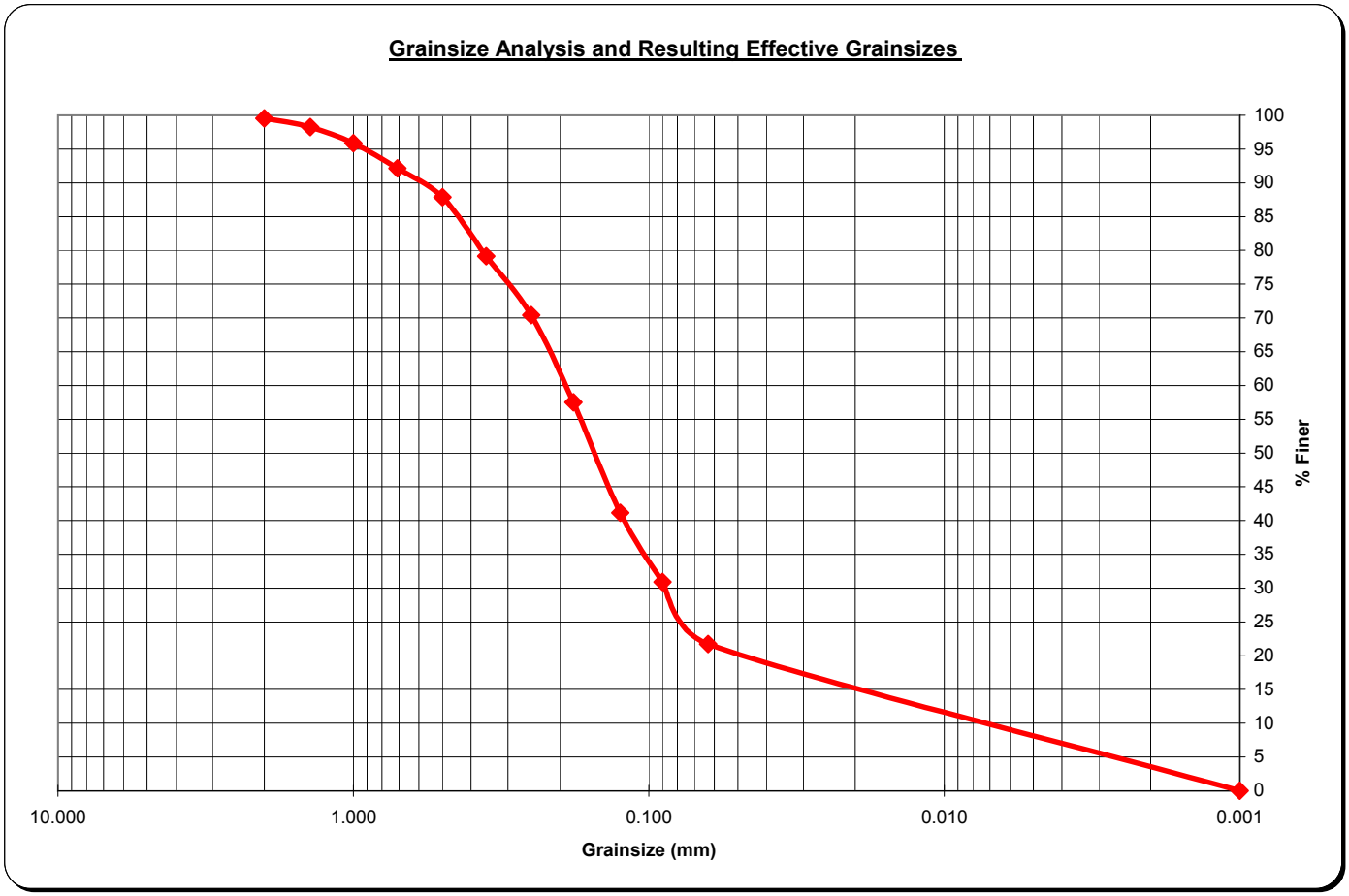
Sample ID:	ECP9-SB1
Sample Depth:	131-132 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	89.50 g
Total Sieve Weight:	91.60 g
Weight Loss:	-2.1 g
Percent Loss:	-2.35 %

18.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.44	99.56	coarse % > 0.5 mm	12.12%
	14	1.4	1.20	1.31	98.25		
	18	1.0	2.20	2.40	95.85		
	25	0.71	3.40	3.71	92.14		
	35	0.50	3.90	4.26	87.88		
medium	45	0.355	8.00	8.73	79.15	medium % 0.25 - 0.5 mm	17.47%
	60	0.250	8.00	8.73	70.41		
fine	80	0.180	11.80	12.88	57.53	Fine % 0.125 - 0.25	29.26%
	120	0.125	15.00	16.38	41.16		
silt	170	0.090	9.40	10.26	30.90	Silt % < 0.125	19.43%
	230	0.063	8.40	9.17	21.72		
pan	pan	0.001	19.90	21.72	0.00	Pan % < 0.063	21.72%
						Total	**100.00%**

Total (g)	91.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



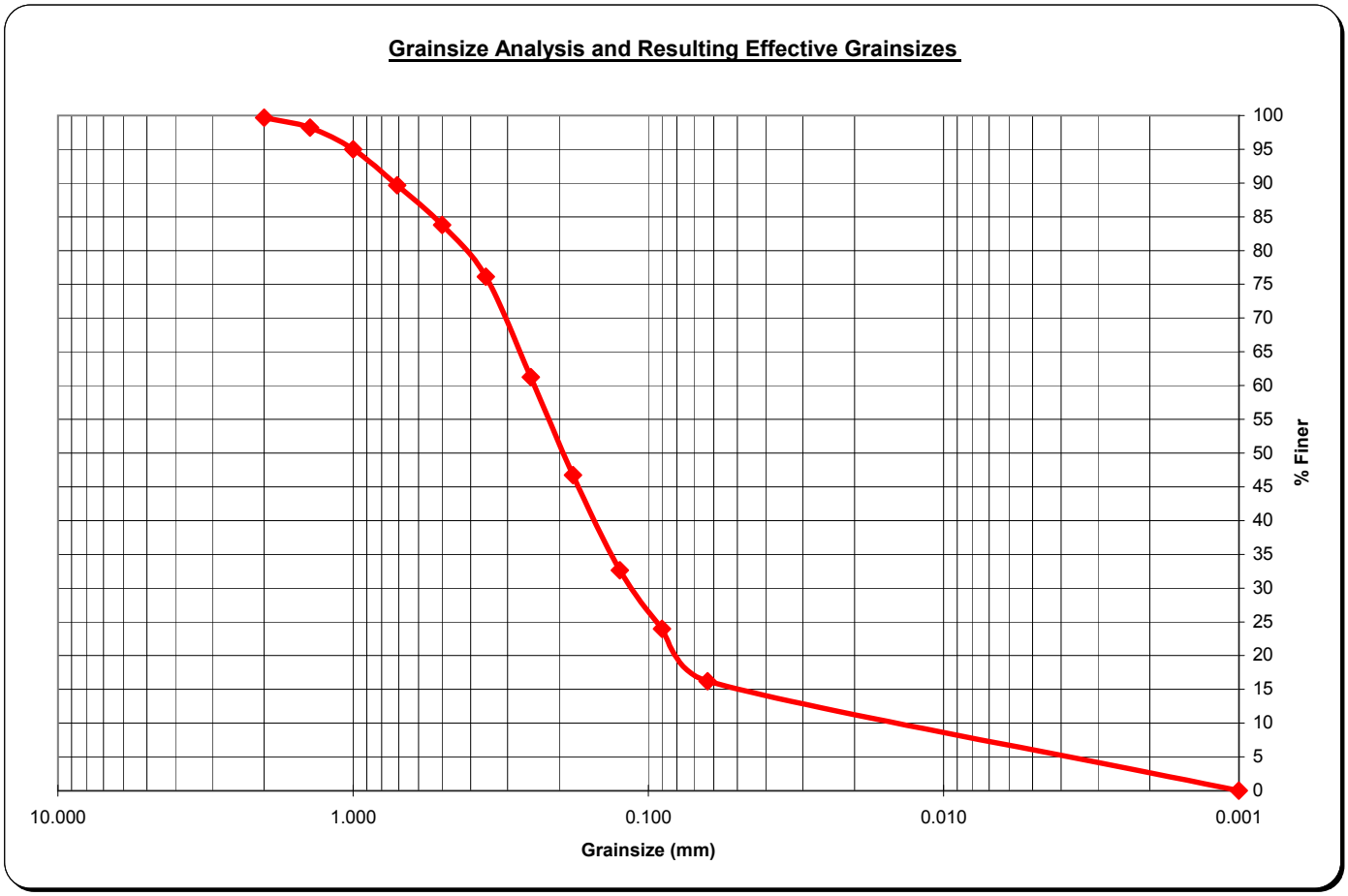
Sample ID:	ECP9-SB1	
Sample Depth:	132-133	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	88.60	g
Total Sieve Weight:	87.90	g
Weight Loss:	0.7	g
Percent Loss:	0.79	%

19.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.34	99.66	coarse % > 0.5 mm	18.54%
	14	1.4	1.60	1.82	97.84		
	18	1.0	4.00	4.55	93.29		
	25	0.71	5.10	5.80	87.49		
	35	0.50	5.30	6.03	81.46		
medium	45	0.355	5.10	5.80	75.65	medium % 0.25 - 0.5 mm	15.02%
	60	0.250	8.10	9.22	66.44		
fine	80	0.180	10.40	11.83	54.61	Fine % 0.125 - 0.25	28.56%
	120	0.125	14.70	16.72	37.88		
silt	170	0.090	12.00	13.65	24.23	Silt % < 0.125	22.98%
	230	0.063	8.20	9.33	14.90		
pan	pan	0.001	13.10	14.90	0.00	Pan % < 0.063	14.90%
						Total	**100.00%**

Total (g)	87.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



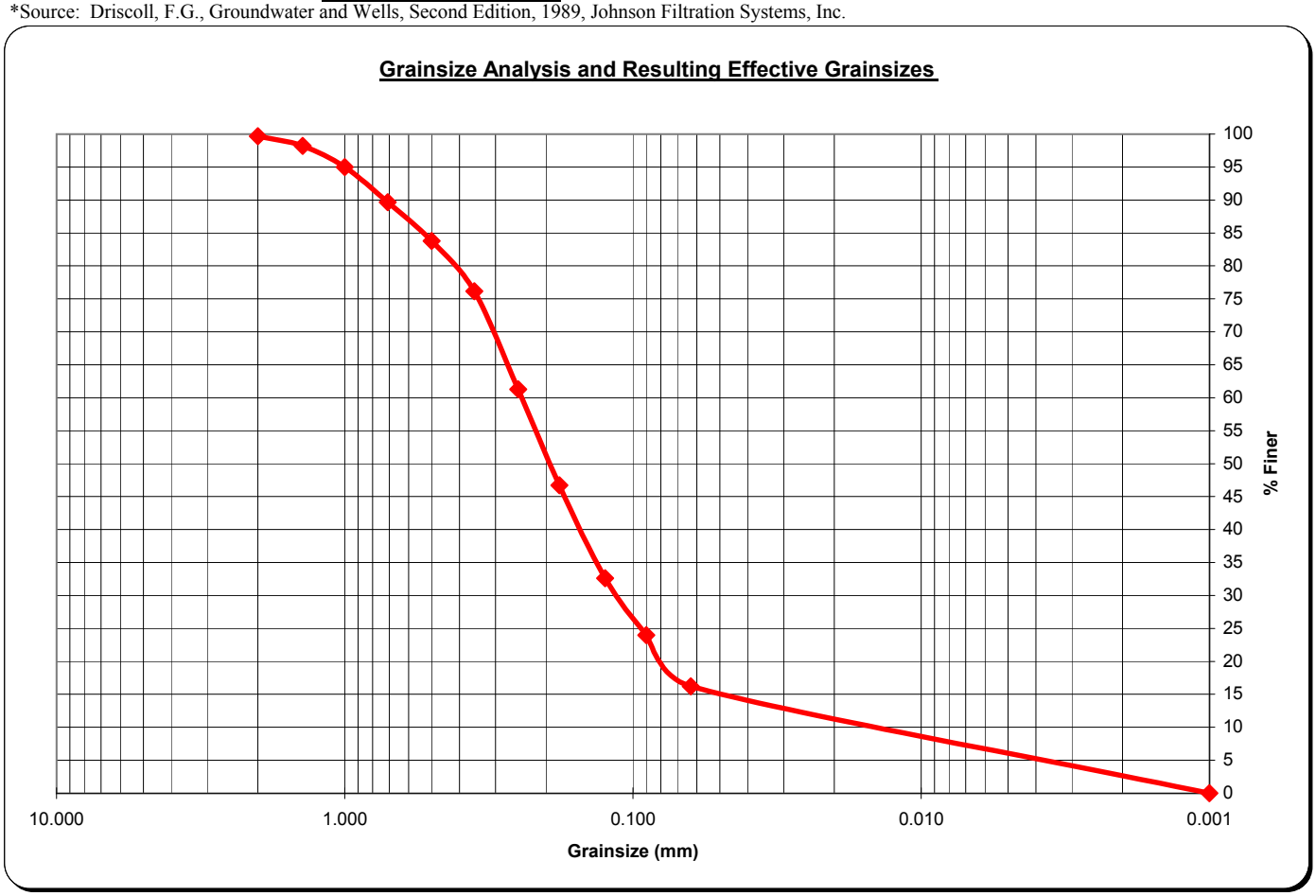
Sample ID:	ECP9-SB1	
Sample Depth:	133-134	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.70	g
Total Sieve Weight:	90.10	g
Weight Loss:	0.6	g
Percent Loss:	0.66	%

17.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.33	99.67	coarse % > 0.5 mm	16.20%
	14	1.4	1.30	1.44	98.22		
	18	1.0	2.90	3.22	95.01		
	25	0.71	4.80	5.33	89.68		
	35	0.50	5.30	5.88	83.80		
medium	45	0.355	6.90	7.66	76.14	medium % 0.25 - 0.5 mm	22.53%
	60	0.250	13.40	14.87	61.27		
fine	80	0.180	13.10	14.54	46.73	Fine % 0.125 - 0.25	28.63%
	120	0.125	12.70	14.10	32.63		
silt	170	0.090	7.80	8.66	23.97	Silt % < 0.125	16.43%
	230	0.063	7.00	7.77	16.20		
pan	pan	0.001	14.60	16.20	0.00	Pan % < 0.063	16.20%
						Total	**100.00%**

Total (g)	90.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



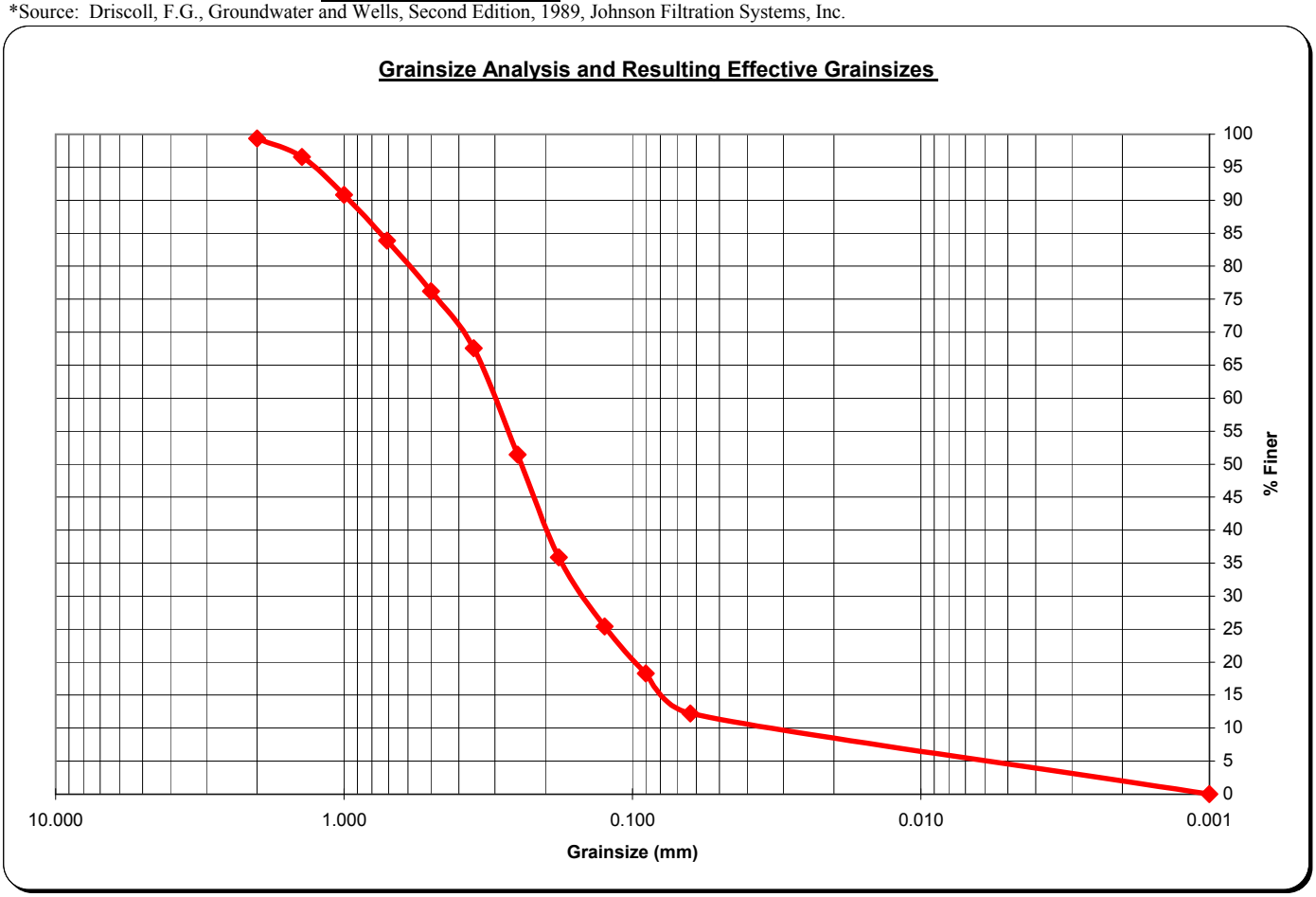
Sample ID:	ECP9-SB1
Sample Depth:	134-135 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.00 g
Total Sieve Weight:	92.50 g
Weight Loss:	0.5 g
Percent Loss:	0.54 %

15.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.60	0.65	99.35	coarse % > 0.5 mm	23.78%
	14	1.4	2.60	2.81	96.54		
	18	1.0	5.30	5.73	90.81		
	25	0.71	6.40	6.92	83.89		
	35	0.50	7.10	7.68	76.22		
medium	45	0.355	8.00	8.65	67.57	medium % 0.25 - 0.5 mm	24.76%
	60	0.250	14.90	16.11	51.46		
fine	80	0.180	14.40	15.57	35.89	Fine % 0.125 - 0.25	26.05%
	120	0.125	9.70	10.49	25.41		
silt	170	0.090	6.60	7.14	18.27	Silt % < 0.125	13.19%
	230	0.063	5.60	6.05	12.22		
pan	pan	0.001	11.30	12.22	0.00	Pan % < 0.063	12.22%
						Total	**100.00%**

Total (g)	**92.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



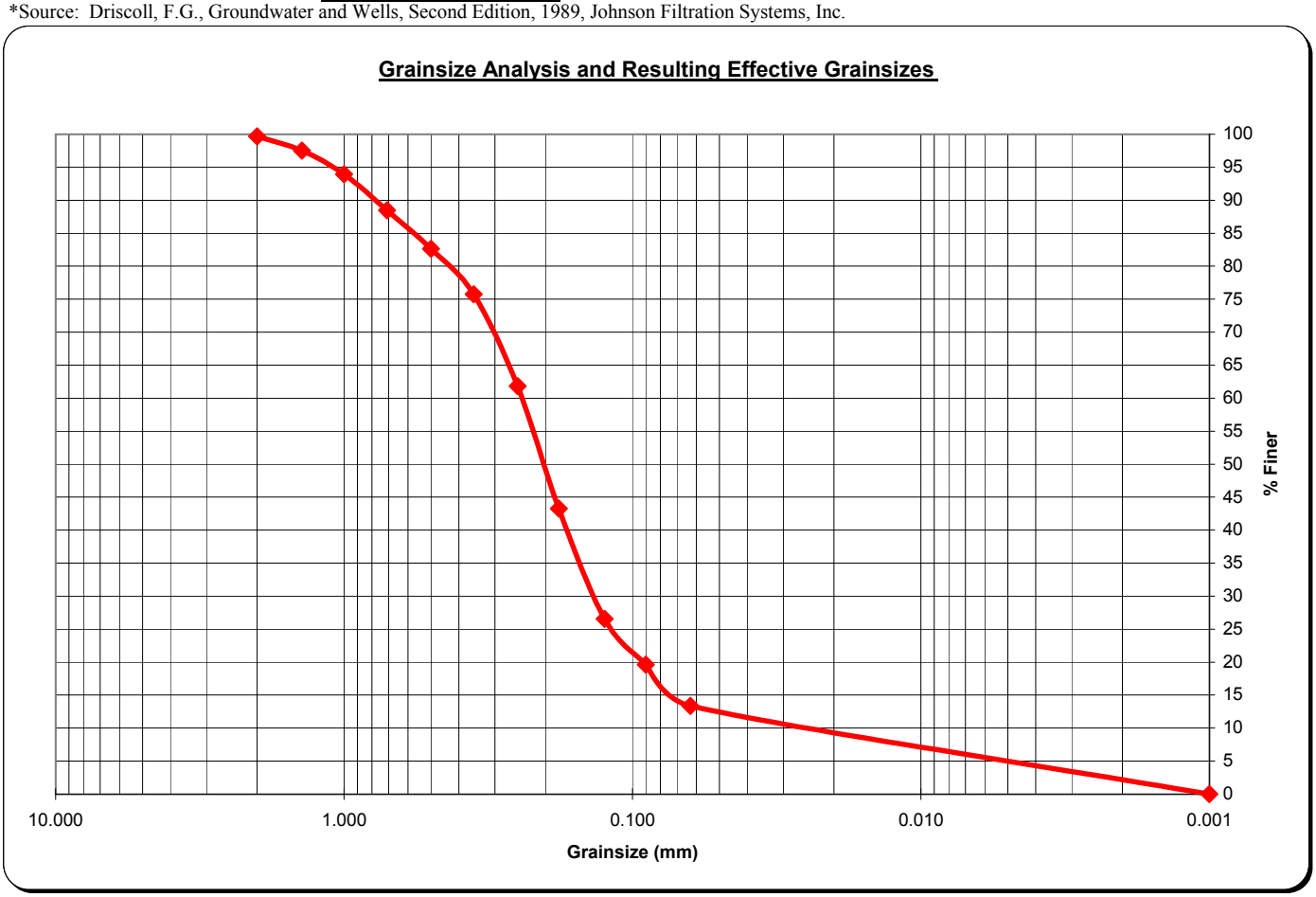
Sample ID:	ECP9-SB1
Sample Depth:	135-136 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.40 g
Total Sieve Weight:	92.70 g
Weight Loss:	0.7 g
Percent Loss:	0.75 %

15.09 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.32	99.68	coarse % > 0.5 mm	17.37%
	14	1.4	2.00	2.16	97.52		
	18	1.0	3.30	3.56	93.96		
	25	0.71	5.10	5.50	88.46		
	35	0.50	5.40	5.83	82.63		
medium	45	0.355	6.40	6.90	75.73	medium % 0.25 - 0.5 mm	20.82%
	60	0.250	12.90	13.92	61.81		
fine	80	0.180	17.20	18.55	43.26	Fine % 0.125 - 0.25	35.28%
	120	0.125	15.50	16.72	26.54		
silt	170	0.090	6.40	6.90	19.63	Silt % < 0.125	13.16%
	230	0.063	5.80	6.26	13.38		
pan	pan	0.001	12.40	13.38	0.00	Pan % < 0.063	13.38%
						Total	100.00%

Total (g)	92.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



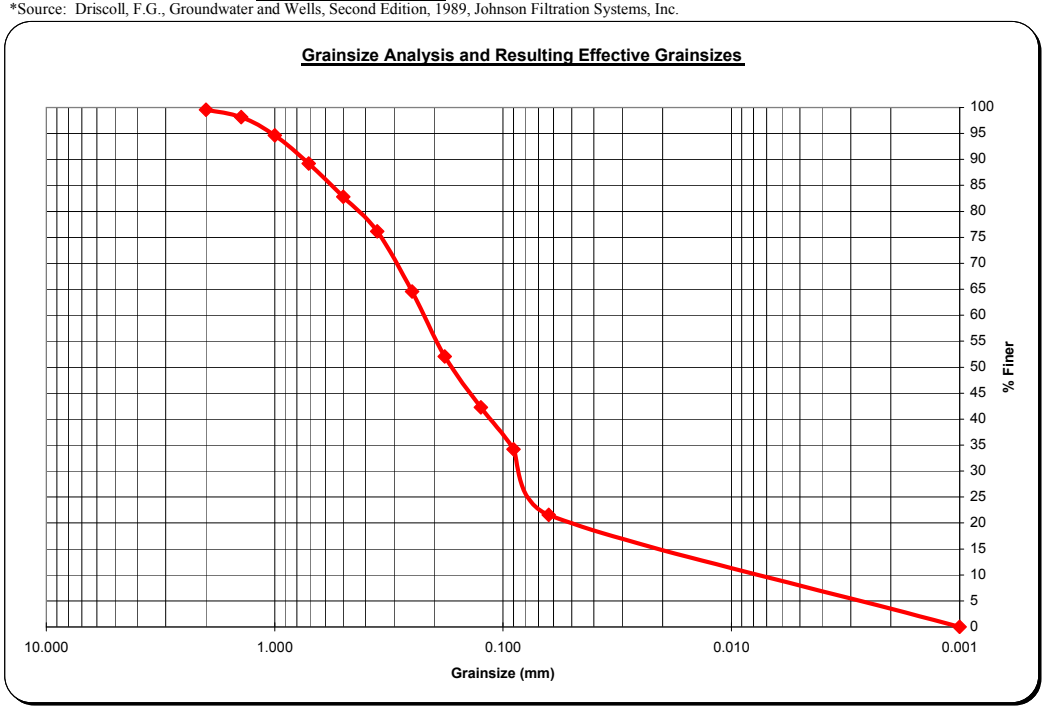
Sample ID:	ECP9-SB1	
Sample Depth:	136-137	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	91.70	g
Total Sieve Weight:	90.90	g
Weight Loss:	0.8	g
Percent Loss:	0.87	%

16.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.40	0.44	99.56	coarse % > 0.5 mm	17.16%
	14	1.4	1.30	1.43	98.13		
	18	1.0	3.20	3.52	94.61		
	25	0.71	4.90	5.39	89.22		
	35	0.50	5.80	6.38	82.84		
medium	45	0.355	6.10	6.71	76.13	medium % 0.25 - 0.5 mm	18.26%
	60	0.250	10.50	11.55	64.58		
fine	80	0.180	11.40	12.54	52.04	Fine % 0.125 - 0.25	22.33%
	120	0.125	8.90	9.79	42.24		
silt	170	0.090	7.30	8.03	34.21	Silt % < 0.125	20.68%
	230	0.063	11.50	12.65	21.56		
pan	pan	0.001	19.60	21.56	0.00	Pan % < 0.063	21.56%
						Total	**100.00%**

Total (g)	90.90

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



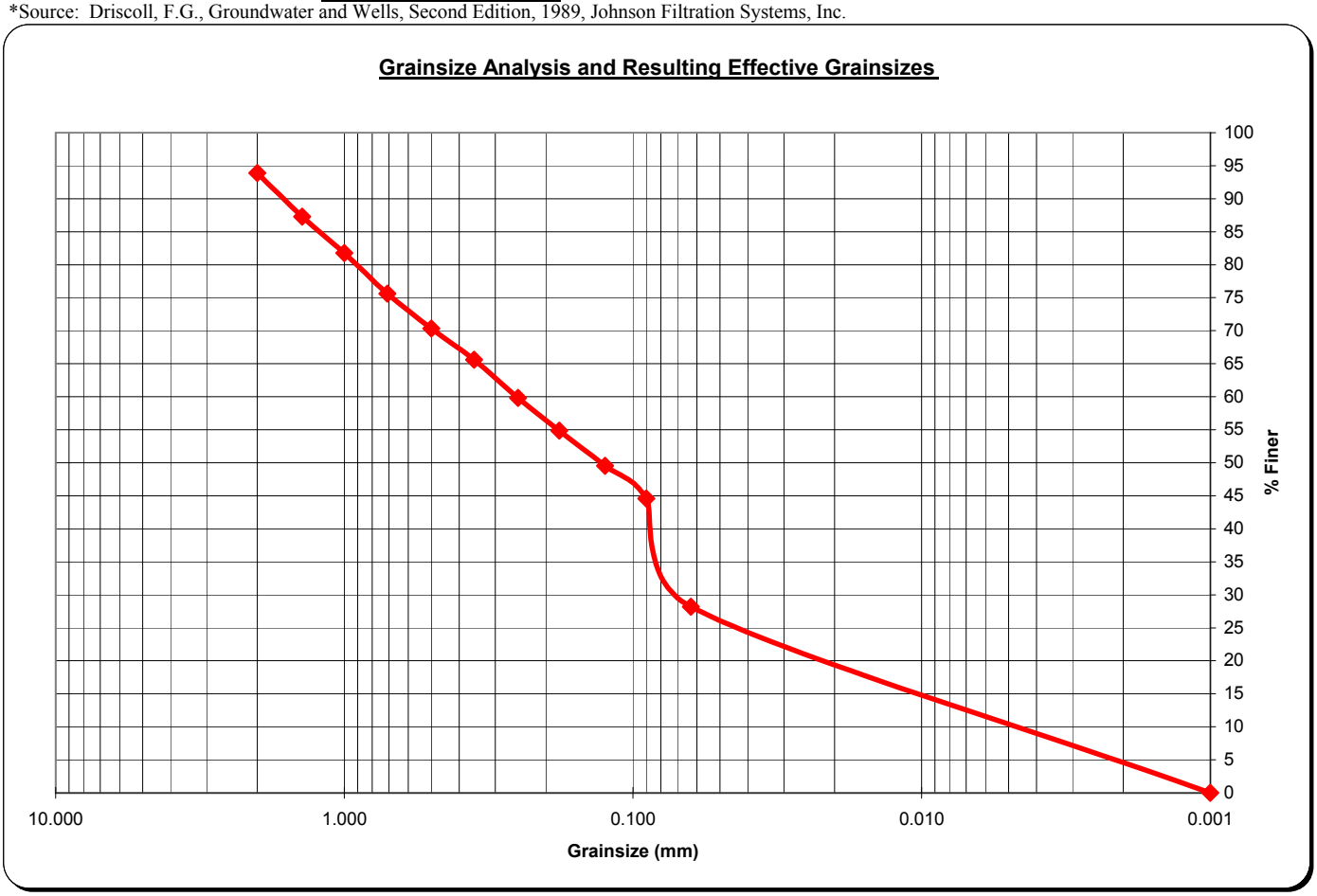
Sample ID:	ECP9-SB1
Sample Depth:	137-138 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	87.40 g
Total Sieve Weight:	86.60 g
Weight Loss:	0.8 g
Percent Loss:	0.92 %

20.55 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	5.30	6.12	93.88	coarse % > 0.5 mm	29.68%
	14	1.4	5.70	6.58	87.30		
	18	1.0	4.80	5.54	81.76		
	25	0.71	5.30	6.12	75.64		
	35	0.50	4.60	5.31	70.32		
medium	45	0.355	4.10	4.73	65.59	medium % 0.25 - 0.5 mm	10.51%
	60	0.250	5.00	5.77	59.82		
fine	80	0.180	4.30	4.97	54.85	Fine % 0.125 - 0.25	10.28%
	120	0.125	4.60	5.31	49.54		
silt	170	0.090	4.30	4.97	44.57	Silt % < 0.125	21.36%
	230	0.063	14.20	16.40	28.18		
pan	pan	0.001	24.40	28.18	0.00	Pan % < 0.063	28.18%
						Total	**100.00%**

Total (g)	86.60

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



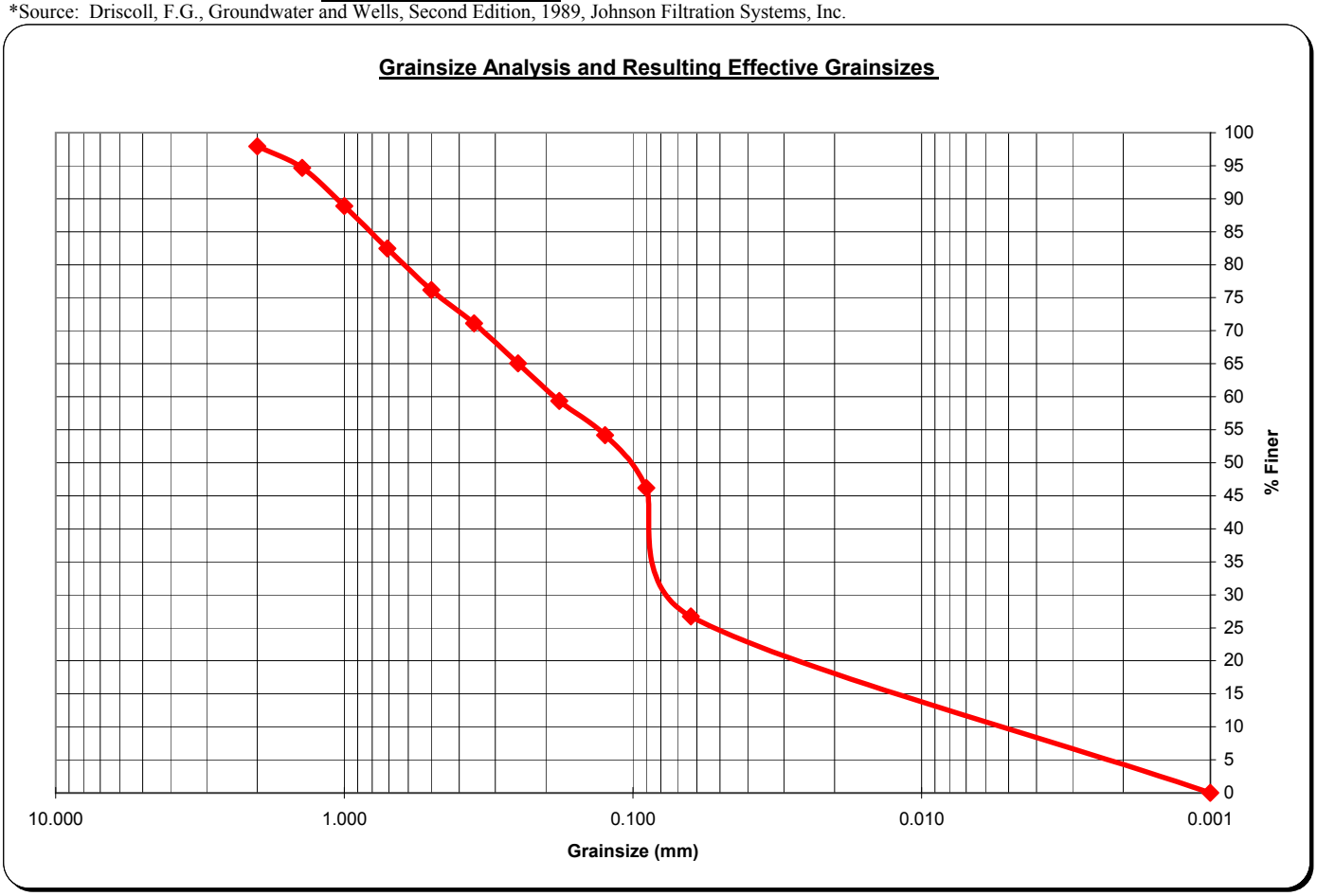
Sample ID:	ECP9-SB1
Sample Depth:	138-139 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	84.50 g
Total Sieve Weight:	82.70 g
Weight Loss:	1.8 g
Percent Loss:	2.13 %

23.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	1.70	2.06	97.94	coarse % > 0.5 mm	23.82%
	14	1.4	2.70	3.26	94.68		
	18	1.0	4.80	5.80	88.88		
	25	0.71	5.30	6.41	82.47		
	35	0.50	5.20	6.29	76.18		
medium	45	0.355	4.20	5.08	71.10	medium % 0.25 - 0.5 mm	11.12%
	60	0.250	5.00	6.05	65.05		
fine	80	0.180	4.70	5.68	59.37	Fine % 0.125 - 0.25	10.88%
	120	0.125	4.30	5.20	54.17		
silt	170	0.090	6.60	7.98	46.19	Silt % < 0.125	27.45%
	230	0.063	16.10	19.47	26.72		
pan	pan	0.001	22.10	26.72	0.00	Pan % < 0.063	26.72%
						Total	**100.00%**

Total (g)	82.70

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



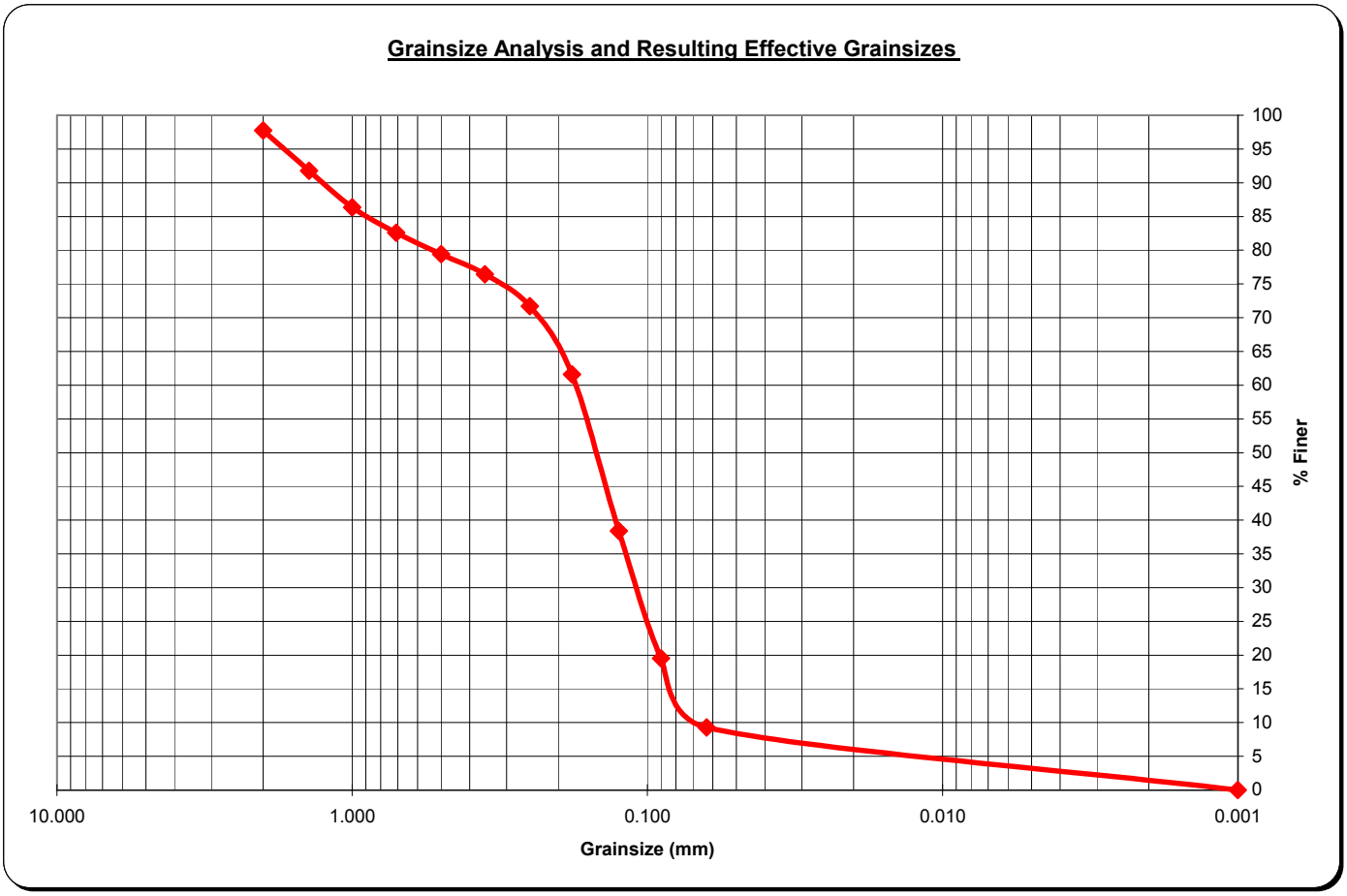
Sample ID:	ECP9-SB1
Sample Depth:	140-141 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	93.20 g
Total Sieve Weight:	93.70 g
Weight Loss:	-0.5 g
Percent Loss:	-0.54 %

15.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.10	2.24	97.76	coarse % > 0.5 mm	20.60%
	14	1.4	5.60	5.98	91.78		
	18	1.0	5.10	5.44	86.34		
	25	0.71	3.50	3.74	82.60		
	35	0.50	3.00	3.20	79.40		
medium	45	0.355	2.80	2.99	76.41	medium % 0.25 - 0.5 mm	7.68%
	60	0.250	4.40	4.70	71.72		
fine	80	0.180	9.50	10.14	61.58	Fine % 0.125 - 0.25	33.30%
	120	0.125	21.70	23.16	38.42		
silt	170	0.090	17.70	18.89	19.53	Silt % < 0.125	29.14%
	230	0.063	9.60	10.25	9.28		
pan	pan	0.001	8.70	9.28	0.00	Pan % < 0.063	9.28%
						Total	**100.00%**

Total (g)	**93.70**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



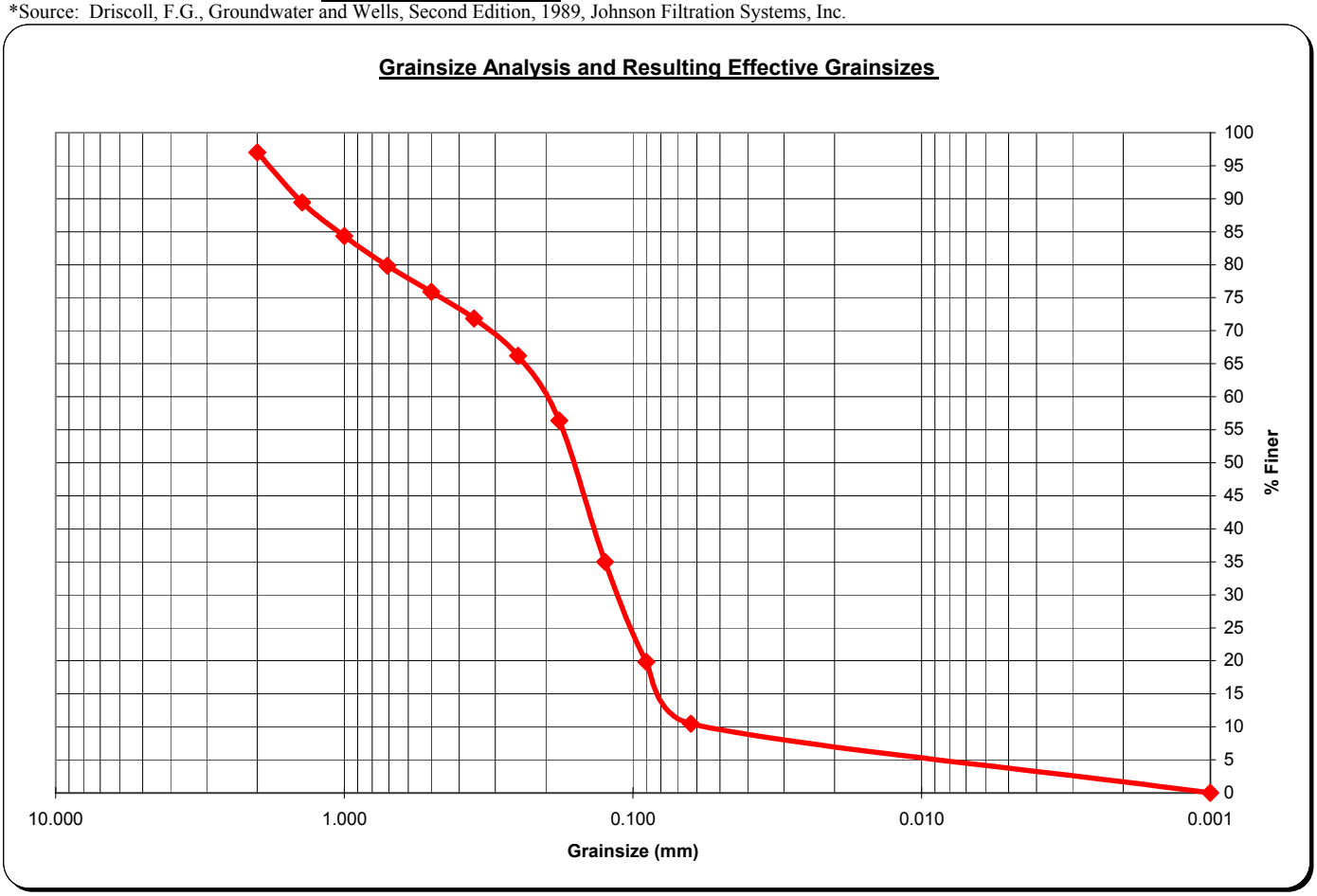
Sample ID:	ECP9-SB1
Sample Depth:	141-142 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.10 g
Total Sieve Weight:	93.80 g
Weight Loss:	0.3 g
Percent Loss:	0.32 %

14.45 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.80	2.99	97.01	coarse % > 0.5 mm	24.09%
	14	1.4	7.10	7.57	89.45		
	18	1.0	4.80	5.12	84.33		
	25	0.71	4.20	4.48	79.85		
	35	0.50	3.70	3.94	75.91		
medium	45	0.355	3.80	4.05	71.86	medium % 0.25 - 0.5 mm	9.70%
	60	0.250	5.30	5.65	66.20		
fine	80	0.180	9.20	9.81	56.40	Fine % 0.125 - 0.25	31.24%
	120	0.125	20.10	21.43	34.97		
silt	170	0.090	14.20	15.14	19.83	Silt % < 0.125	24.52%
	230	0.063	8.80	9.38	10.45		
pan	pan	0.001	9.80	10.45	0.00	Pan % < 0.063	10.45%
						Total	**100.00%**

Total (g)	93.80

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



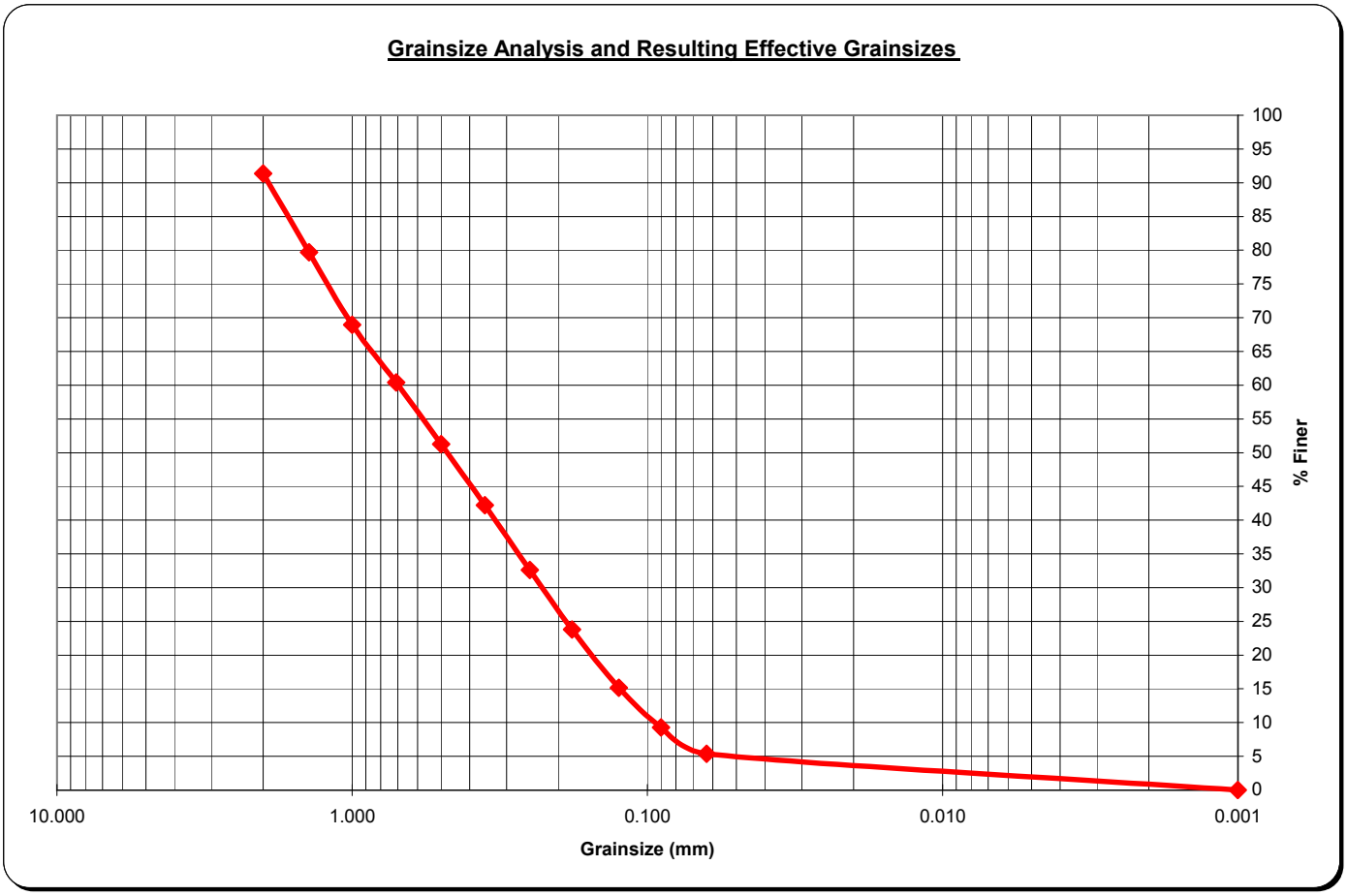
Sample ID:	ECP9-SB1
Sample Depth:	142-143 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.90 g
Total Sieve Weight:	95.00 g
Weight Loss:	-0.1 g
Percent Loss:	-0.11 %

13.73 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	8.20	8.63	91.37	coarse % > 0.5 mm	48.74%
	14	1.4	11.10	11.68	79.68		
	18	1.0	10.20	10.74	68.95		
	25	0.71	8.10	8.53	60.42		
	35	0.50	8.70	9.16	51.26		
medium	45	0.355	8.60	9.05	42.21	medium % 0.25 - 0.5 mm	18.63%
	60	0.250	9.10	9.58	32.63		
fine	80	0.180	8.40	8.84	23.79	Fine % 0.125 - 0.25	17.47%
	120	0.125	8.20	8.63	15.16		
silt	170	0.090	5.60	5.89	9.26	Silt % < 0.125	9.79%
	230	0.063	3.70	3.89	5.37		
pan	pan	0.001	5.10	5.37	0.00	Pan % < 0.063	5.37%
						Total	**100.00%**

Total (g)	95.00

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



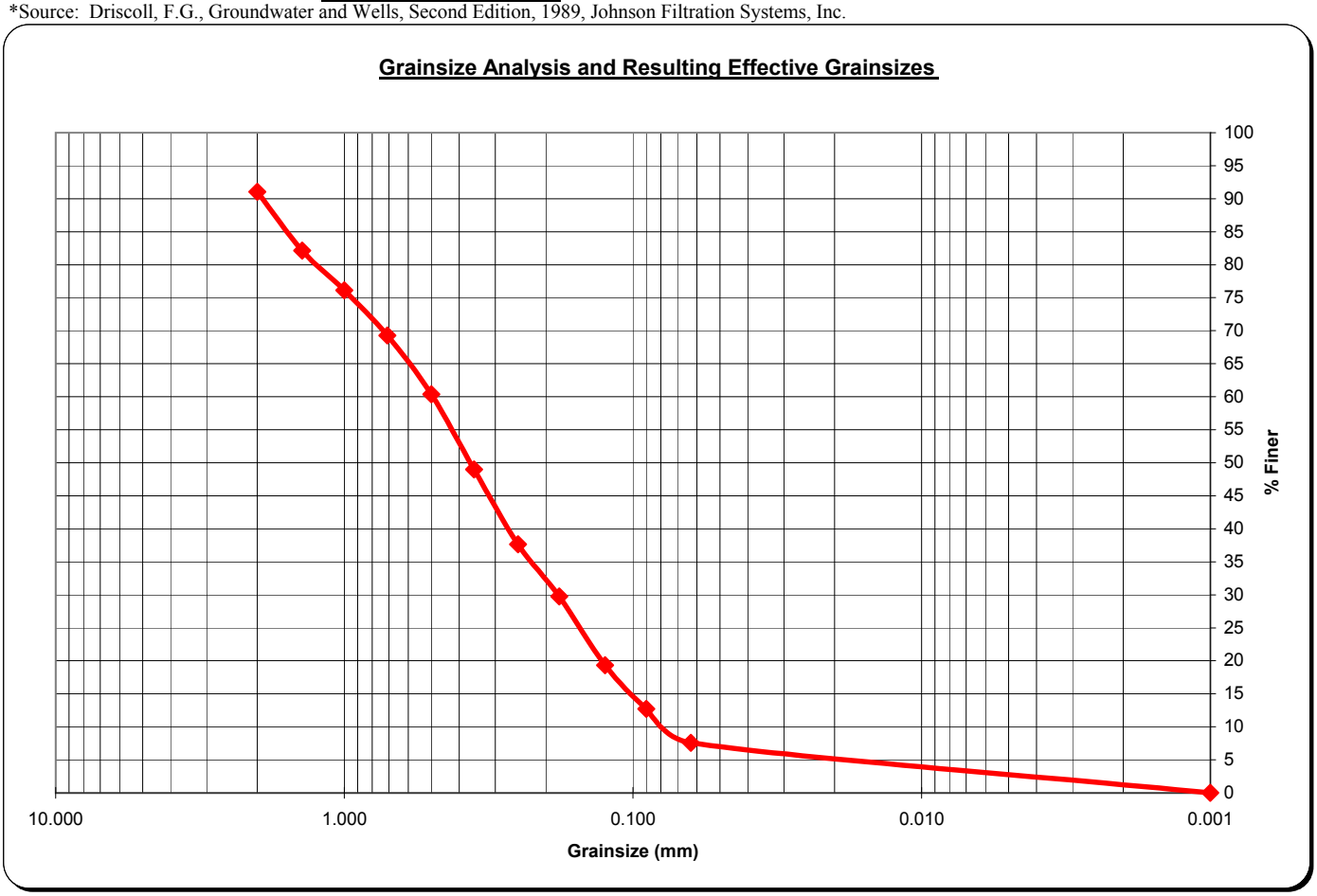
Sample ID:	ECP9-SB1	
Sample Depth:	143-144	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	94.20	g
Total Sieve Weight:	95.10	g
Weight Loss:	-0.9	g
Percent Loss:	-0.96	%

14.36 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	8.50	8.94	91.06	coarse % > 0.5 mm	39.64%
	14	1.4	8.50	8.94	82.12		
	18	1.0	5.70	5.99	76.13		
	25	0.71	6.50	6.83	69.30		
	35	0.50	8.50	8.94	60.36		
medium	45	0.355	10.80	11.36	49.00	medium % 0.25 - 0.5 mm	22.71%
	60	0.250	10.80	11.36	37.64		
fine	80	0.180	7.50	7.89	29.76	Fine % 0.125 - 0.25	18.30%
	120	0.125	9.90	10.41	19.35		
silt	170	0.090	6.30	6.62	12.72	Silt % < 0.125	11.78%
	230	0.063	4.90	5.15	7.57		
pan	pan	0.001	7.20	7.57	0.00	Pan % < 0.063	7.57%
						Total	**100.00%**

Total (g)	95.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



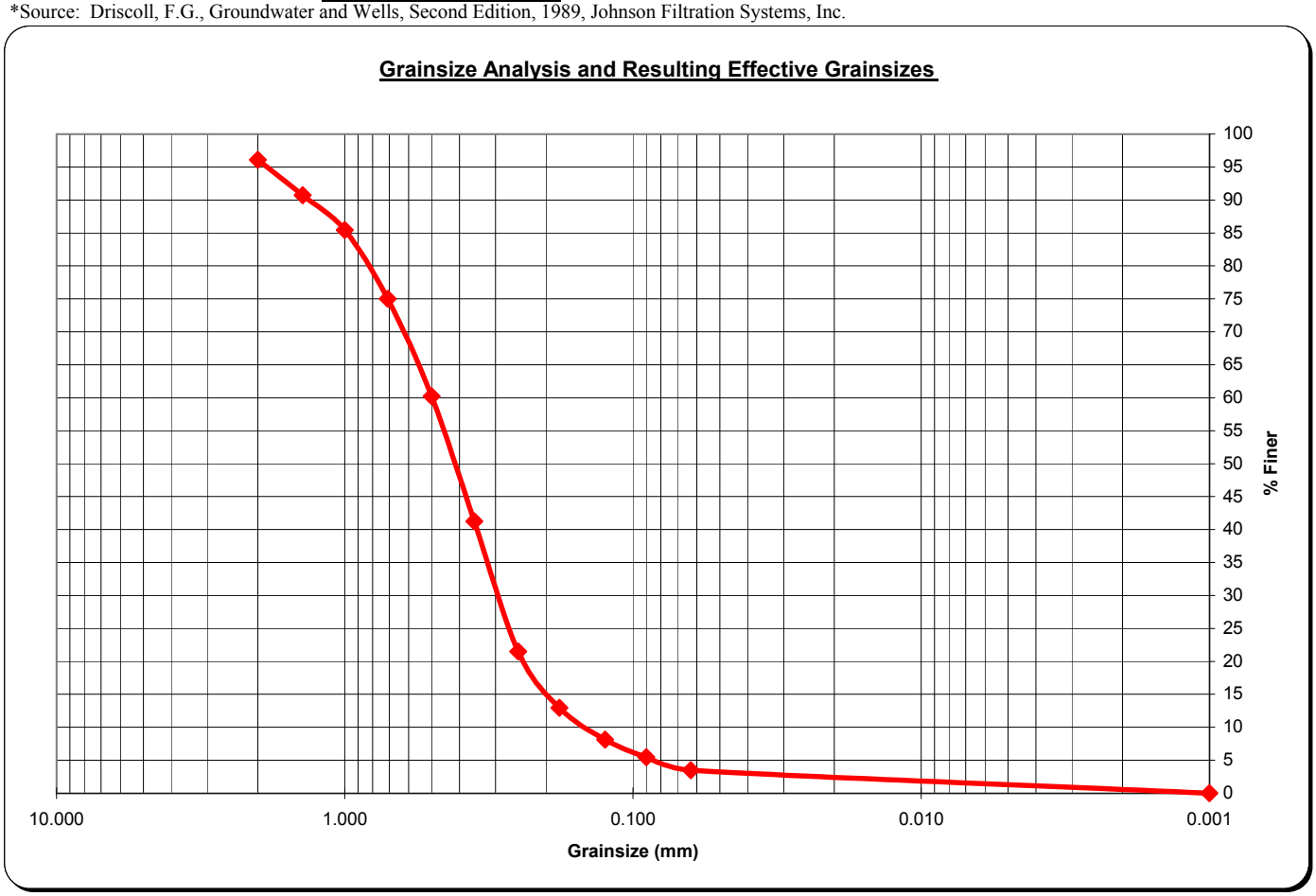
Sample ID:	ECP9-SB1
Sample Depth:	144-145 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	95.50 g
Total Sieve Weight:	94.80 g
Weight Loss:	0.7 g
Percent Loss:	0.73 %

13.18 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	3.70	3.90	96.10	coarse % > 0.5 mm	39.77%
	14	1.4	5.10	5.38	90.72		
	18	1.0	5.00	5.27	85.44		
	25	0.71	9.90	10.44	75.00		
	35	0.50	14.00	14.77	60.23		
medium	45	0.355	18.00	18.99	41.24	medium % 0.25 - 0.5 mm	38.71%
	60	0.250	18.70	19.73	21.52		
fine	80	0.180	8.10	8.54	12.97	Fine % 0.125 - 0.25	13.40%
	120	0.125	4.60	4.85	8.12		
silt	170	0.090	2.50	2.64	5.49	Silt % < 0.125	4.64%
	230	0.063	1.90	2.00	3.48		
pan	pan	0.001	3.30	3.48	0.00	Pan % < 0.063	3.48%
						Total	**100.00%**

Total (g)	**94.80**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



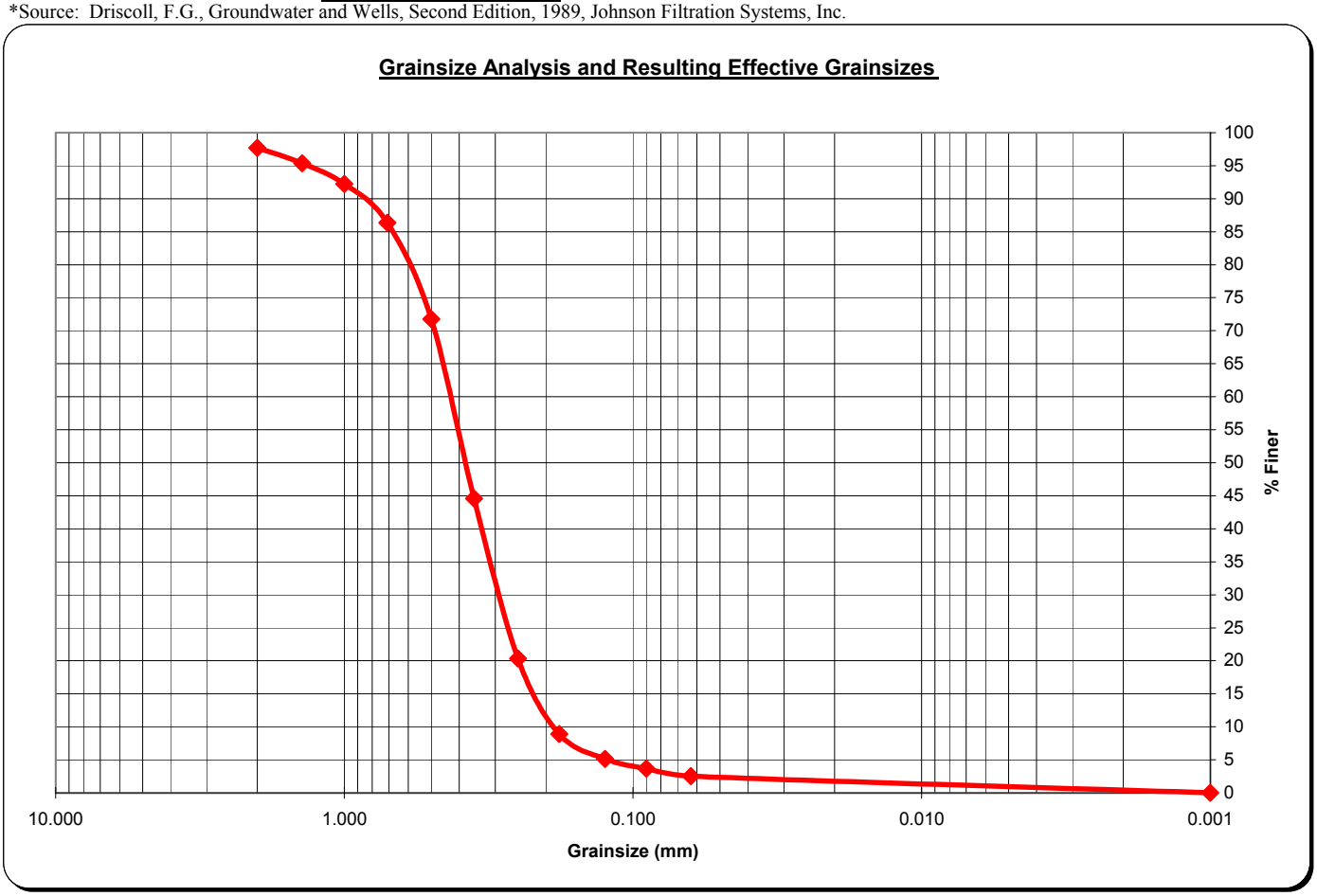
Sample ID:	ECP9-SB1	
Sample Depth:	145-146	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	96.10	g
Total Sieve Weight:	95.30	g
Weight Loss:	0.8	g
Percent Loss:	0.83	%

12.64 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	2.20	2.31	97.69	coarse % > 0.5 mm	28.23%
	14	1.4	2.20	2.31	95.38		
	18	1.0	3.00	3.15	92.24		
	25	0.71	5.60	5.88	86.36		
	35	0.50	13.90	14.59	71.77		
medium	45	0.355	25.90	27.18	44.60	medium % 0.25 - 0.5 mm	51.42%
	60	0.250	23.10	24.24	20.36		
fine	80	0.180	10.90	11.44	8.92	Fine % 0.125 - 0.25	15.22%
	120	0.125	3.60	3.78	5.14		
silt	170	0.090	1.40	1.47	3.67	Silt % < 0.125	2.62%
	230	0.063	1.10	1.15	2.52		
pan	pan	0.001	2.40	2.52	0.00	Pan % < 0.063	2.52%
						Total	**100.00%**

Total (g)	95.30

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



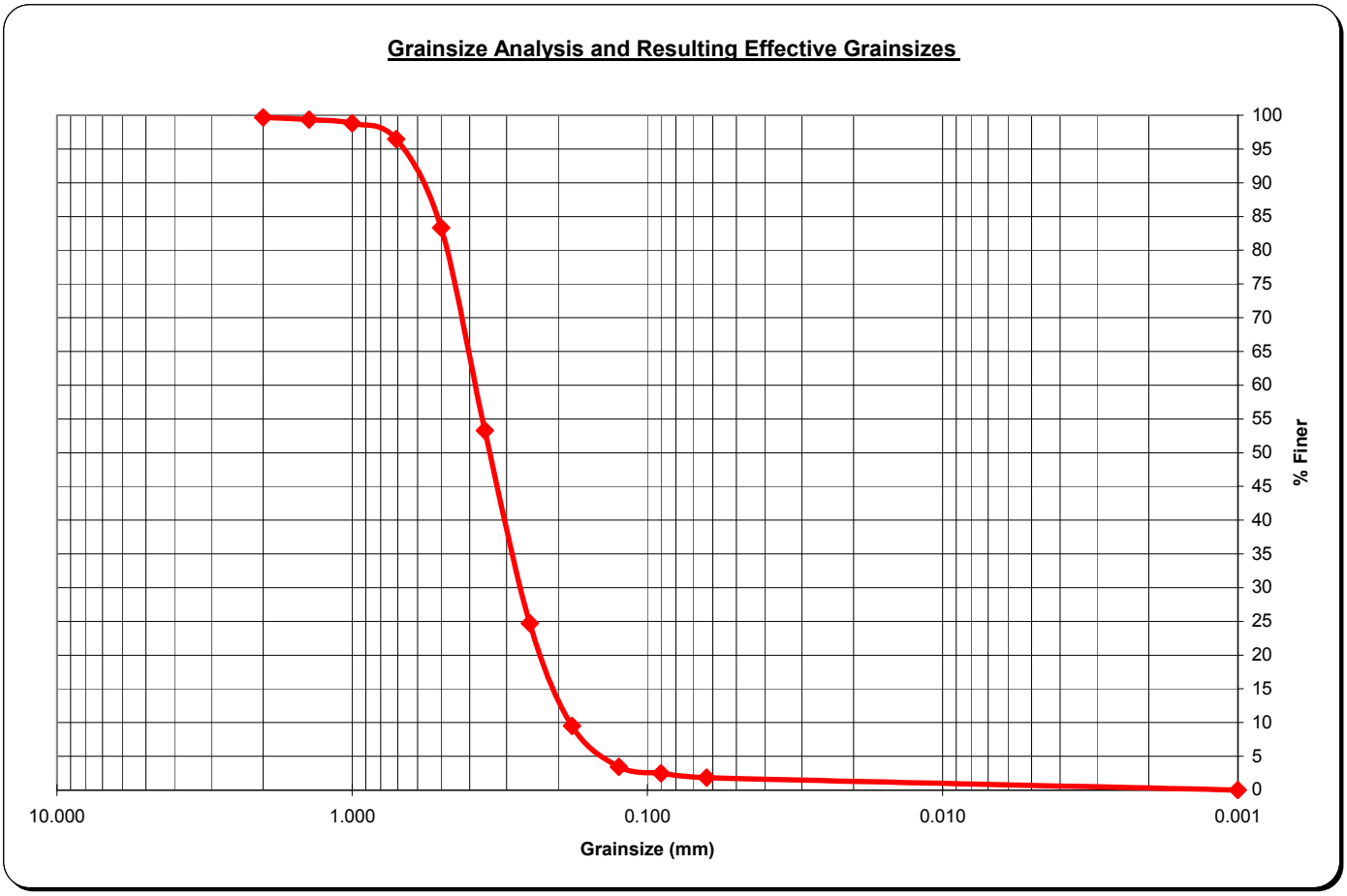
Sample ID:	ECP9-SB1
Sample Depth:	146-147 ft bls
Wet Weight:	110.00 g
Initial Dry Sample Weight:	94.30 g
Total Sieve Weight:	93.50 g
Weight Loss:	0.8 g
Percent Loss:	0.85 %

14.27 % Moisture

	Sieve number	mm	Weight (g)	Weight %	Cumulative % Finer	Grain-Size Classification*	
coarse	10	2.0	0.30	0.32	99.68	coarse % > 0.5 mm	16.68%
	14	1.4	0.30	0.32	99.36		
	18	1.0	0.50	0.53	98.82		
	25	0.71	2.20	2.35	96.47		
	35	0.50	12.30	13.16	83.32		
medium	45	0.355	28.10	30.05	53.26	medium % 0.25 - 0.5 mm	58.61%
	60	0.250	26.70	28.56	24.71		
fine	80	0.180	14.20	15.19	9.52	Fine % 0.125 - 0.25	21.28%
	120	0.125	5.70	6.10	3.42		
silt	170	0.090	0.90	0.96	2.46	Silt % < 0.125	1.60%
	230	0.063	0.60	0.64	1.82		
pan	pan	0.001	1.70	1.82	0.00	Pan % < 0.063	1.82%
						Total	**100.00%**

Total (g)	**93.50**

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



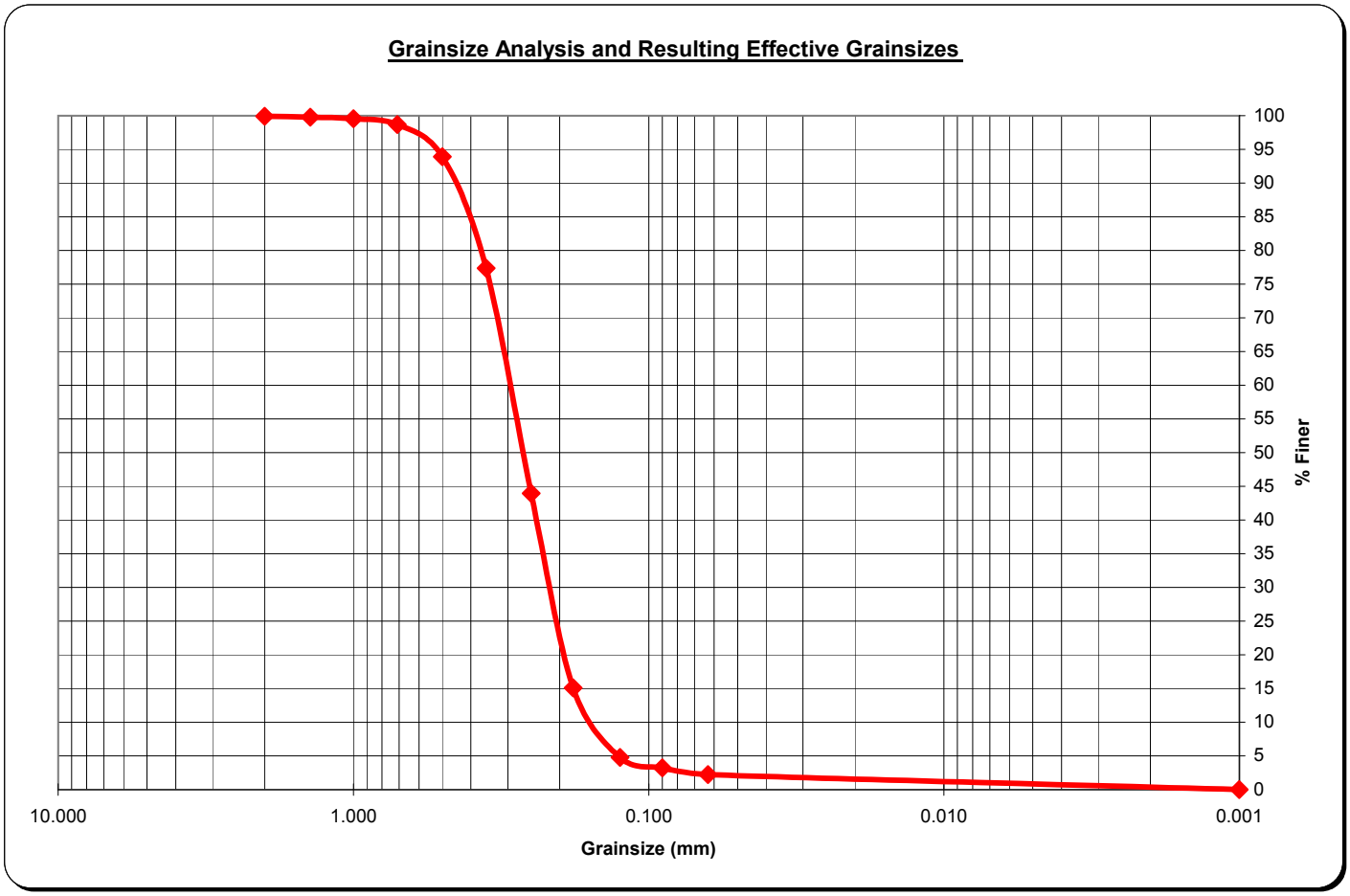
Sample ID:	ECP9-SB1	
Sample Depth:	147-148	ft bls
Wet Weight:	110.00	g
Initial Dry Sample Weight:	90.70	g
Total Sieve Weight:	90.10	g
Weight Loss:	0.6	g
Percent Loss:	0.66	%

17.55 % Moisture

	Sieve number	2.36	Weight (g)	Weight %	100	Grain-Size	
coarse	10	2.0	0.10	0.11	99.89	coarse % > 0.5 mm	6.10%
	14	1.4	0.10	0.11	99.78		
	18	1.0	0.20	0.22	99.56		
	25	0.71	0.80	0.89	98.67		
	35	0.50	4.30	4.77	93.90		
medium	45	0.355	14.90	16.54	77.36	medium % 0.25 - 0.5 mm	49.94%
	60	0.250	30.10	33.41	43.95		
fine	80	0.180	26.00	28.86	15.09	Fine % 0.125 - 0.25	39.18%
	120	0.125	9.30	10.32	4.77		
silt	170	0.090	1.40	1.55	3.22	Silt % < 0.125	2.55%
	230	0.063	0.90	1.00	2.22		
pan	pan	0.001	2.00	2.22	0.00	Pan % < 0.063	2.22%
						Total	**100.00%**

Total (g)	90.10

*Source: Driscoll, F.G., Groundwater and Wells, Second Edition, 1989, Johnson Filtration Systems, Inc.



Attachment I: Screening XRF (SRNL ERTS)

1st Set of Data

SAMPLE	Mid-depth	Reading No	Type	Duration	Zr	Zr Error	Sr	Sr Error	U	U Error	Rb	Rb Error	Th	Th Error	Pb	Pb Error
ECP8-SB1 (sieved)	42-43	7	Soil	180	670.85	6.57	167.79	3.26	20.74	4.24	54.17	2.46	22.99	3.08	27.95	4.66
ECP8-SB1 (sieved)	43-44	8	Soil	180	832.53	7.33	75.88	2.37	22.97	4.32	56.1	2.55	25.93	3.22	16.43	4.54
ECP8-SB1 (sieved)	44-45	9	Soil	180	960.11	8.99	417.08	5.69	32.86	5.56	57.67	3	24.26	3.64	27.31	5.49
ECP8-SB1 (sieved)	45-46	10	Soil	180	867.46	10.83	457.22	7.47	23.74	6.79	56.73	3.68	20.24	4.42	35.09	6.96
ECP8-SB1 (sieved)	45-46	11	Soil	180	924.44	7.72	428.35	5.03	19.16	4.5	52.21	2.45	25.19	3.16	30	4.63
ECP8-SB1 (sieved)	45-46	12	Soil	180	946.17	7.87	445.79	5.17	22.67	4.64	53.74	2.51	20.71	3.06	27.38	4.6
ECP8-SB1	15-16	13	Soil	180	120.36	2.4	5.09	0.82	< LOD	3.18	5.17	0.97	3.69	1.65	< LOD	3.78
ECP8-SB1	21-22	14	Soil	180	81.2	2.11	11.21	0.95	3.9	2.2	6.92	1.02	6.81	1.75	< LOD	3.77
ECP8-SB1	23-24	15	Soil	180	282.82	3.44	78.72	1.8	5.19	2.29	5.46	1.01	12.23	1.95	8.31	2.86
ECP8-SB1	23-24	16	Soil	180	300.5	3.53	53.11	1.55	5.49	2.29	5.49	1.01	4.81	1.73	5.79	2.8
ECP8-SB1	23-24	17	Soil	180	85.3	2.25	76.07	1.81	4.33	2.28	4.98	1	3.86	1.71	9.46	2.9
ECP8-SB1	24-25	18	Soil	180	73.79	2.16	87.94	1.9	4.66	2.28	4.99	1	6.69	1.79	10.01	2.9
ECP8-SB1	24-25	19	Soil	180	310.76	3.68	103.34	2.08	7.02	2.42	5.07	1.04	7.98	1.88	10.89	2.99
ECP8-SB1	25-26	20	Soil	180	658.59	5.55	246.96	3.29	18.97	3.23	15.86	1.47	13.29	2.26	20.44	3.52
ECP8-SB1	25-26	21	Soil	180	318.76	3.89	96.57	2.11	8.18	2.61	8.74	1.19	9.71	2.02	5.16	3.02
ECP8-SB1	25-26	22	Soil	180	351.54	4.09	156.14	2.61	13.95	2.91	15.12	1.37	12.31	2.13	14.15	3.27
ECP8-SB1	13-14	23	Soil	180	63.75	1.91	4.05	0.79	< LOD	2.99	3.87	0.91	2.94	1.58	< LOD	3.56
ECP8-SB1	33-34	24	Soil	180	115.72	2.39	55.54	1.55	< LOD	3.18	2.89	0.9	< LOD	2.32	< LOD	3.42
ECP8-SB1	35-36	25	Soil	180	200.45	2.94	65.95	1.66	< LOD	3.18	3.33	0.9	2.45	1.56	< LOD	3.42
ECP8-SB1	41-42	26	Soil	180	538.2	4.97	41.11	1.54	10.85	3.04	35.86	1.75	13.62	2.23	< LOD	4.6
ECP8-SB1	41-42	27	Soil	180	634.89	5.64	36.83	1.56	12.47	3.2	32.43	1.8	17.25	2.47	< LOD	4.93
ECP8-SB1	43-44	28	Soil	180	586.92	4.94	37.53	1.42	11.94	2.82	27.55	1.54	19.09	2.25	< LOD	4.05
ECP8-SB1	44-45	29	Soil	180	314.86	3.8	98.73	2.09	10.22	2.69	14.18	1.29	7.96	1.9	< LOD	3.89
ECP8-SB1	44-45	30	Soil	180	606.93	5.13	85.28	2	9.11	2.73	14.88	1.33	8.97	1.98	< LOD	4.11
ECP8-SB1	45-46	31	Soil	180	120.29	2.39	68.17	1.65	< LOD	3.24	7.74	1	< LOD	2.23	< LOD	3.29
ECP8-SB1	54-55	32	Soil	180	144.9	2.54	35.14	1.29	4.44	2.12	2.9	0.9	< LOD	2.19	< LOD	3.35
ECP8-SB1	55-56	33	Soil	180	78.77	1.99	33.34	1.22	< LOD	2.96	2.82	0.85	< LOD	2.18	< LOD	3.19

Notes:
units = ppm

"Sieved" samples only included silt and clay size fraction

1st Set of Data

SAMPLE	Mid-depth	Fe	Fe Error	V	V Error	Ti	Ti Error	K	K Error	Ba	Ba Error
ECP8-SB1 (sieved)	42-43	95573.98	325.16	173.72	30.05	5706.08	104.24	5378.87	160.66	< LOD	37.71
ECP8-SB1 (sieved)	43-44	119460.54	371.54	167.46	30.3	5388.59	105.49	5794.85	179.12	< LOD	37.55
ECP8-SB1 (sieved)	44-45	140121.34	447.07	171.31	31.45	4258.82	105.17	5023.01	158.8	414.42	33.77
ECP8-SB1 (sieved)	45-46	80862.11	426.59	50.93	14.45	2691.06	49.95	2252.65	70.18	< LOD	56.06
ECP8-SB1 (sieved)	45-46	65492.7	267.06	130.22	28.83	5425.25	99.22	4587.15	132.15	144.28	26.36
ECP8-SB1 (sieved)	45-46	69294.11	277.08	125.95	29.7	5467.81	102.19	5035.44	139.45	83.71	26.12
ECP8-SB1	15-16	16244.21	106.71	79.16	12.3	1920.61	41.01	1555.48	64.7	< LOD	31.32
ECP8-SB1	21-22	16541.13	107.88	62.85	11.13	1678.73	37.16	1450.36	60.83	< LOD	28.73
ECP8-SB1	23-24	15737.54	103.42	84.47	14.89	1542.54	47.85	1388.83	64.99	< LOD	31.64
ECP8-SB1	23-24	15253.82	102.87	68.14	14.31	1741.1	47.01	1433.44	64.49	< LOD	31.83
ECP8-SB1	23-24	14913.56	102.56	67.24	13.44	1280.51	43.14	1078.23	57.08	< LOD	32.63
ECP8-SB1	24-25	16274.67	106.12	62.19	15.91	1730.11	52.07	1193.36	60.19	< LOD	32.54
ECP8-SB1	24-25	17754.84	112.32	76.36	17.03	1967.93	55.77	1498.42	66.33	86.84	22.36
ECP8-SB1	25-26	26723.37	145.77	92.18	21.01	3057.15	70.31	1938.61	79.88	868.18	26.73
ECP8-SB1	25-26	22547.85	132.34	72.98	16.24	2738.28	55.2	1814.89	70.65	286.03	24.26
ECP8-SB1	25-26	28566.59	147.84	90.42	19.84	3056.14	66.92	2256.32	85.47	424.46	24.66
ECP8-SB1	13-14	17059.38	108.19	74.64	11.12	1324.54	35.72	1278.71	60.46	< LOD	30.88
ECP8-SB1	33-34	5414	61.33	18.65	11.39	1356.88	37.98	772.69	44.24	60.23	21.75
ECP8-SB1	35-36	5262.35	60.29	28.59	11.2	877.21	35.98	789.7	44.42	< LOD	30.95
ECP8-SB1	41-42	42627.22	185.93	137.56	25.62	6892.58	93.18	5542.31	144.67	< LOD	33.09
ECP8-SB1	41-42	50567.09	212.59	100.21	23.31	6394.22	85.79	4887.07	131.7	< LOD	36.06
ECP8-SB1	43-44	37287.66	165.92	107.65	22.03	4328.3	77.38	4517.61	130.36	< LOD	29.85
ECP8-SB1	44-45	21027.37	125.67	71.02	17.34	2297.89	57.81	2887.37	88.71	108.67	22.47
ECP8-SB1	44-45	21793.46	129.49	81.71	17.25	2368.64	57.5	3306.64	94.16	65.9	22.71
ECP8-SB1	45-46	8180.41	73.31	38.36	13.52	1902.72	45.38	2458.62	70.09	< LOD	30.2
ECP8-SB1	54-55	1810.78	36.63	< LOD	10.98	283.98	22.56	285.04	33.39	< LOD	31.85
ECP8-SB1	55-56	4031.72	51.15	16.65	9.94	1519.82	34.05	937.12	46.47	< LOD	29.31

Notes:
units = ppm

"Sieved" samples only included silt and clay size fraction

2nd Set of Data

SAMPLE	Mid-depth	Reading No	Type	Duration	U	U Error	Th	Th Error	Pb	Pb Error	Ba	Ba Error	Zr	Zr Error	Sr	Sr Error
ECP 8 23-24	23.5	1	Soil	180	6.29	2.44	7.44	1.91	14.56	3.14	288.19	23.36	199.98	3.12	75.72	1.86
ECP 8 23-24	23.5	2	Soil	180	6.62	2.44	9.35	1.96	14.74	3.14	312.37	23.47	203.55	3.14	80.86	1.9
ECP 8 24-25	24.5	4	Soil	180	9.06	2.71	11.58	2.14	26.69	3.56	688.94	25.77	254.23	3.6	146.9	2.54
ECP 8 24-25	24.5	5	Soil	180	9.95	2.66	16.43	2.23	22.34	3.42	631.49	25.2	190.49	3.19	139.69	2.46
ECP 8 25-26	25.5	7	Soil	180	17.16	3.19	18.71	2.47	17.51	3.6	918.86	27.8	621.12	5.53	171.94	2.88
ECP 8 25-26	25.5	8	Soil	180	13.11	2.95	10.27	2.11	15.86	3.38	845.04	26.73	235.49	3.56	159.24	2.68
ECP 8 28-29	28.5	13	Soil	180	< LOD	3.19	2.55	1.57	< LOD	3.4	150.42	21.83	71.83	2.04	44.57	1.43
ECP 8 28-29	28.5	14	Soil	180	< LOD	3.11	< LOD	2.32	< LOD	3.52	152.21	21.81	44.41	1.77	37.95	1.34
ECP 8 29-30	29.5	16	Soil	180	3.29	2.18	4.28	1.64	< LOD	3.54	48.47	21.57	111.21	2.38	50.48	1.51
ECP 8 29-30	29.5	17	Soil	180	3.66	2.23	8.67	1.83	< LOD	3.75	103.74	21.91	254	3.3	46	1.47
ECP 8 31-32	31.5	19	Soil	180	7.15	2.45	8.08	1.9	< LOD	3.98	166.43	22.84	538.97	4.76	37.27	1.42
ECP 8 31-32	31.5	20	Soil	180	5.26	2.16	4.7	1.64	< LOD	3.56	104.69	21.55	80.3	2.07	19.72	1.08
ECP 8 37-38	37.5	22	Soil	180	8.94	2.61	21.88	2.38	< LOD	4.46	449.81	24.59	744.04	5.66	72.77	1.88
ECP 8 37-38	37.5	23	Soil	180	< LOD	3.15	< LOD	2.36	< LOD	3.65	289.68	22.5	63.4	1.98	43.21	1.42
ECP 8 39-40	39.5	25	Soil	180	7.99	2.6	12.23	2.1	< LOD	4.28	41.37	22.87	566.22	4.98	22.04	1.23
ECP 8 39-40	39.5	26	Soil	180	4.4	2.16	3.5	1.62	< LOD	3.56	< LOD	32.35	87.52	2.14	6.05	0.84
ECP 8 44-45	44.5	28	Soil	180	22.03	3.73	33.44	3.06	8.81	3.79	740.12	27.98	986.7	7.28	191.79	3.22
ECP 8 44-45	44.5	29	Soil	180	8.96	2.72	5.49	1.85	< LOD	4.1	398.05	24.17	389.44	4.21	110.44	2.22
ECP 8 45-46	45.5	31	Soil	180	7.39	2.52	6.23	1.82	< LOD	4.17	320.75	23.24	164.02	2.89	93.18	2.01
ECP 8 45-46	45.5	32	Soil	180	5.55	2.35	< LOD	2.42	< LOD	3.6	284.81	22.68	93.29	2.3	68.53	1.73
ECP 8 46-47	46.5	36	Soil	180	8.57	2.9	9.77	2.05	< LOD	4.24	841.85	26.11	462.43	4.68	200.91	2.96
ECP 8 46-47	46.5	37	Soil	180	7.32	2.49	6.13	1.78	< LOD	3.71	542.44	23.77	199.74	3.1	102.89	2.09
ECP 8 47-48	47.5	39	Soil	180	< LOD	3.29	< LOD	2.37	< LOD	3.56	288.72	22.47	59.74	1.98	65.51	1.67
ECP 8 47-48	47.5	40	Soil	180	< LOD	3.31	2.62	1.59	< LOD	3.53	279.2	22.57	49.81	1.89	61.43	1.63
ECP 8 48-49	48.5	44	Soil	180	12.24	3.45	14.45	2.36	< LOD	4.78	1508.48	29.83	680.34	5.91	356.88	4.06
ECP 8 48-49	48.5	45	Soil	180	4.1	2.51	4.43	1.74	< LOD	3.79	827.56	25.36	194.97	3.15	156.2	2.53
ECP 8 49-50	49.5	50	Soil	180	< LOD	3.29	3.84	1.68	< LOD	3.94	74.22	21.69	294.39	3.5	37.86	1.37
ECP 8 49-50	49.5	51	Soil	180	6.95	2.44	4.17	1.75	< LOD	4.02	194.93	22.82	382.64	4.04	64.89	1.73

Notes:
units = ppm
Samples composited from sieved samples (various sizes were re-composited after sieving)

2nd Set of Data

SAMPLE	Mid-depth	Rb	Rb Error	Fe	Fe Error	V	V Error	Ti	Ti Error	K	K Error
ECP 8 23-24	23.5	5.73	1.07	15904.15	108.7	82.66	14.9	1456.52	47.76	1564.78	66.35
ECP 8 23-24	23.5	5.43	1.06	15849.12	108.13	79.85	15.65	1486.96	50.23	1494.34	64.52
ECP 8 24-25	24.5	7.83	1.19	21561.98	129.27	104.6	21.94	3232.83	73.13	1878.46	78.26
ECP 8 24-25	24.5	5.86	1.14	18205.63	117.85	90.84	17.93	1544.6	57.34	1511.73	67.02
ECP 8 25-26	25.5	13.47	1.45	27506.07	152.92	95.49	21.71	3299.79	73.01	2683.59	91.88
ECP 8 25-26	25.5	14.23	1.38	29860.51	154.26	112.28	21.33	2951.38	70.72	2594.69	90.6
ECP 8 28-29	28.5	3.74	0.93	6737.66	68.56	42.94	13.07	1734.94	43.5	1748.8	60.31
ECP 8 28-29	28.5	2.56	0.89	4609.94	56.94	30.35	10.2	761.75	32.45	1150.08	49.78
ECP 8 29-30	29.5	3.88	0.95	10543.44	85.39	41.74	15.66	3394.27	55.2	2426.05	74.35
ECP 8 29-30	29.5	4.22	0.97	6935.86	70.53	30.03	10.92	1207.61	35.97	1630.32	58.21
ECP 8 31-32	31.5	5.28	1.07	13249.98	100.03	68.44	17.92	5505.53	65.62	2268.56	76.01
ECP 8 31-32	31.5	2.17	0.9	5114.06	59.99	23.56	9.68	1073.32	31.9	1237.64	51.6
ECP 8 37-38	37.5	4.27	1.11	13521.71	102.84	68.59	18.47	4568	65.21	1633.08	66.73
ECP 8 37-38	37.5	2.37	0.89	6007.38	65.1	40.72	12.05	1169.56	39.07	1185.26	51.56
ECP 8 39-40	39.5	11.28	1.25	22509.16	133.14	85.25	19.59	6143.65	72.55	3105.89	94.26
ECP 8 39-40	39.5	3.7	0.94	8985.79	79.58	39.29	11.04	2190.12	38.75	2080.15	65.34
ECP 8 44-45	44.5	26.6	1.85	52300.37	223.8	157	31.39	6146.84	108.47	5076.78	146.92
ECP 8 44-45	44.5	14.01	1.3	18309.07	118.42	76.05	15.33	1847.06	50.22	2981.77	84.06
ECP 8 45-46	45.5	10.3	1.17	14015.11	101.64	66.97	16.98	3029.76	57.99	3375.1	87.2
ECP 8 45-46	45.5	7.5	1.07	8309	77.2	33.95	12	1473.71	39.86	2612.93	69.91
ECP 8 46-47	46.5	16.19	1.39	17177.18	116.19	64.26	21.48	3871.73	73.54	3505.33	95.11
ECP 8 46-47	46.5	7.7	1.11	6746.97	70.58	30.56	13.07	1823.6	43.92	2109.66	63.55
ECP 8 47-48	47.5	5.36	0.98	6234.55	66.44	24.89	12.14	1291.53	40	2196	64.33
ECP 8 47-48	47.5	4.71	0.97	5432.11	62.44	19.73	12.04	1669.14	40.68	1724.58	58.12
ECP 8 48-49	48.5	25.23	1.69	24716.78	145.66	77.59	27.06	5283.83	92.66	3993.44	105.5
ECP 8 48-49	48.5	9.44	1.15	7772.48	76	< LOD	23.63	1612.55	52	2449.63	68.5
ECP 8 49-50	49.5	3.26	0.94	5609.83	63.64	24.44	11.23	2243.19	39.52	1538.58	56.15
ECP 8 49-50	49.5	6.19	1.08	11189.38	90.83	34.41	14.69	2661.75	51.06	2792.15	78.81

Notes:
units = ppm
Samples composited from sieved samples (various sizes were re-composited after sieving)

Attachment J: Detailed Assessment of ECP8 Location

DETAILED ASSESSMENT OF ECP8 LOCATION

Of the four ECP locations characterized, the largest dataset is associated with ECP8; consequently ECP8 was chosen for detailed evaluation and interpretation of all available data. Inevitable inconsistencies within and among the datasets are present; these inconsistencies may derive from sampling effects, analytical variations and errors, and/or the heterogeneous nature of the sediments. Nevertheless, an attempt is made here to interpret the ECP8 location in its entirety.

Figure J1 summarizes the gamma log, depth-discrete (Shelby tube) soil properties, and XRD/XRF chemical data (analyzed by SRNL ADS) for the vadose zone at ECP8.

- Two zones (at approximately 24-25 and 40-42 feet deep) show increased gamma log signals, indicating the relative abundance of naturally-occurring potassium (K), thorium (Th), and uranium (U). Potassium is common in feldspars, micas, and some clay minerals, and thorium and uranium are common in heavy minerals and clays. The zone at 40-42 feet corresponds to the TCCZ, as noted in field core descriptions; laboratory sieve data corroborate these observations. The ~24-25 ft zone corresponds with a thin layer of clayey fine sand noted in field observations.
- Grain size analyses of Shelby tube samples show that sediments become more clay-rich and poorly sorted (having a wide variety of grain sizes) with depth. The pie charts illustrate the variety of grain sizes present. It is noteworthy that even an apparent abundance of clay-sized particles does not necessarily correlate with a positive gamma log response. This may be due to the presence of potassium-poor clay minerals (e.g., kaolinite) in these zones. Or it may be an artifact of unavoidable or unintended concentration of clay in the sample selected for grain size testing.
- Bulk XRF analyses of select zones -- shown as bar charts on the figure -- indicate greater amounts of aluminum (Al) and iron (Fe) in the shallow vadose zone than at greater depths. The relative percentage of each constituent analyzed (excluding silicon) is shown by the length of the bar.
- Zirconium (Zr), probably as the mineral zircon, is present in low concentrations (shown as mg/kg [ppm] on the figure. Zircons commonly contain trace amounts of naturally occurring U and Th, and the relative abundance of zircon-rich sediments can affect the gamma log signal.

Figure J2 shows the gamma log along with ES&BT's XRF screening data and dry sieve results for ECP8 vadose zone. These chemical and soil property data are more numerous and continuous through the vadose zone than the data shown in the previous figure. These data were generated by analyzing borehole samples (as opposed to Shelby tubes) and better correlate with the borehole gamma log.

- Two fine-grained zones are evident from the dry sieve results. The lower zone corresponds to the Tan Clay Confining Zone (TCCZ). Both zones correlate with elevated gamma log signals; this observation supports the use of the gamma log as a useful geophysical tool to distinguish sands from clays in this area and in this part of the stratigraphic section. *(If the sieve analyses had shown significant clay layers that lacked a gamma log response, this association would not be as useful.)*

- Relative to surrounding sediments, both fine-grained zones appear to be enriched in Fe, K, Rb, Th, Ti, U, V, and Zr. The relative abundance of Fe, K, Th, and Ti appears to be greater in the lower zone (TCCZ).
- Sr, Pb, and Ba – elements often associated with phosphate minerals – are elevated in the upper fine-grained zone. It is noteworthy that the Ba and Sr appear to be elevated also in a zone just below rather than in the TCCZ; this may reflect some leaching of the TCCZ.
- The Zr data shown at Figure J2 help to place in context the highest Zr analysis (discrete sample at 34-35 ft) shown on the previous figure. The two XRF datasets were collected using different instruments and techniques, and are not comparable in an absolute sense. However, the XRF Zr analyses of more closely spaced samples (Figure J2) show a correlation between Zr content and the elevated gamma log signature associated with fine-grained zones. It is reasonable to conclude that the gamma log may show the influence of U and Th present in fine-grained zircons.

Figure J3 shows thin section photomicrographs of four samples from ECP8 core.

- All thin sections show a dominance of angular quartz grains, with varying amounts and types of matrix (grain-coating and intergranular) material and degree of sorting.
- The sample from 14-15 ft has little matrix material compared to other samples. Quartz grains are mainly fine to medium sands. Matrix material appears to consist of discrete (unmixed) phases of clay and iron oxide/hydroxide minerals.
- The sample from 22-24 ft has more matrix material compared to the shallower sample. Quartz grains are fine to medium sands. Matrix material consists of intermixed clay and iron oxide/hydroxide minerals. According to XRD analyses, the clay minerals include kaolinite and illite. The iron oxide/hydroxides likely include goethite and anatase (a Ti dioxide). Zircons are common, along with some leucoxene (an amorphous Fe-Ti mineral; Figure J4). The increase in clay and iron oxide/hydroxide minerals, and the presence of zircons and leucoxene are consistent with the spike in the gamma log and the elevated concentrations of Al, Fe, K, Th, Ti, and U observed in the XRF analyses.
- The sample from 34-35 ft appears to have less matrix material than the sample from 22-24 ft. In addition, the quartz grains are a mixture of poorly sorted and fine to medium sands, varying widely in size compared to the other thin sections. In zones (identified by the dashed circle in Figure J3), the matrix material greatly increases and appears to consist of iron oxide/hydroxide minerals. This thin section also included a few other minerals including zircon and possibly muscovite.
- In the sample from 54-55 ft, matrix volume is similar to that of the 22-24 ft sample, but exists as discrete phases of clays and iron oxide/hydroxide minerals, as in the sample from 14-15 ft. Quartz grains are mainly fine and medium sands. The abundance of fine-grained matrix in this thin section sample is consistent with the MACTEC grain size analysis conducted on the Shelby tube sample. It is less consistent with the gamma log and CPT log responses, dry sieve results and XRF screening results, all of which did not indicate a clay-rich zone at this depth.

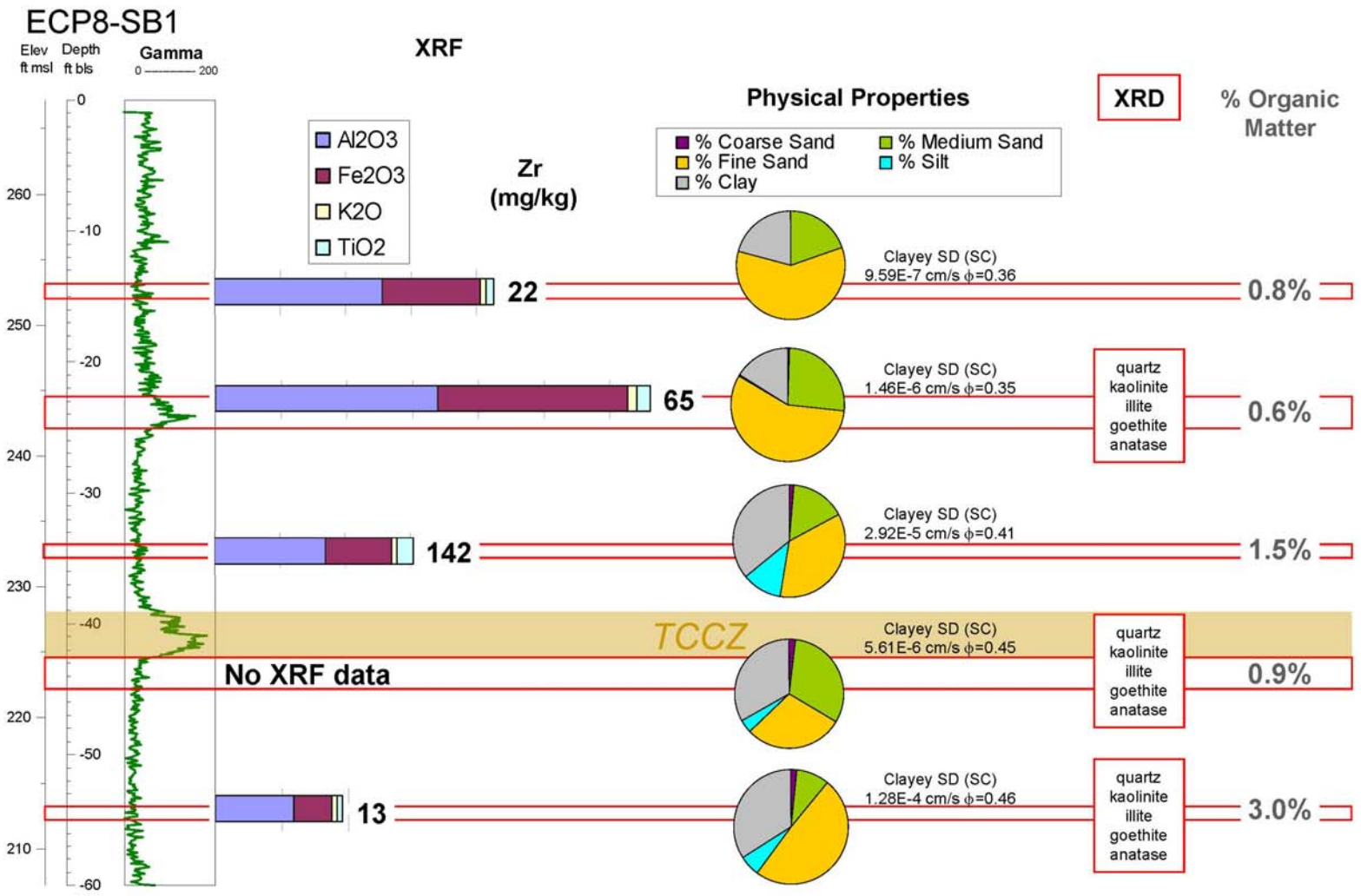


Figure J1. ECP8 Gamma Log and Depth Discrete Chemical and Soil Property Data

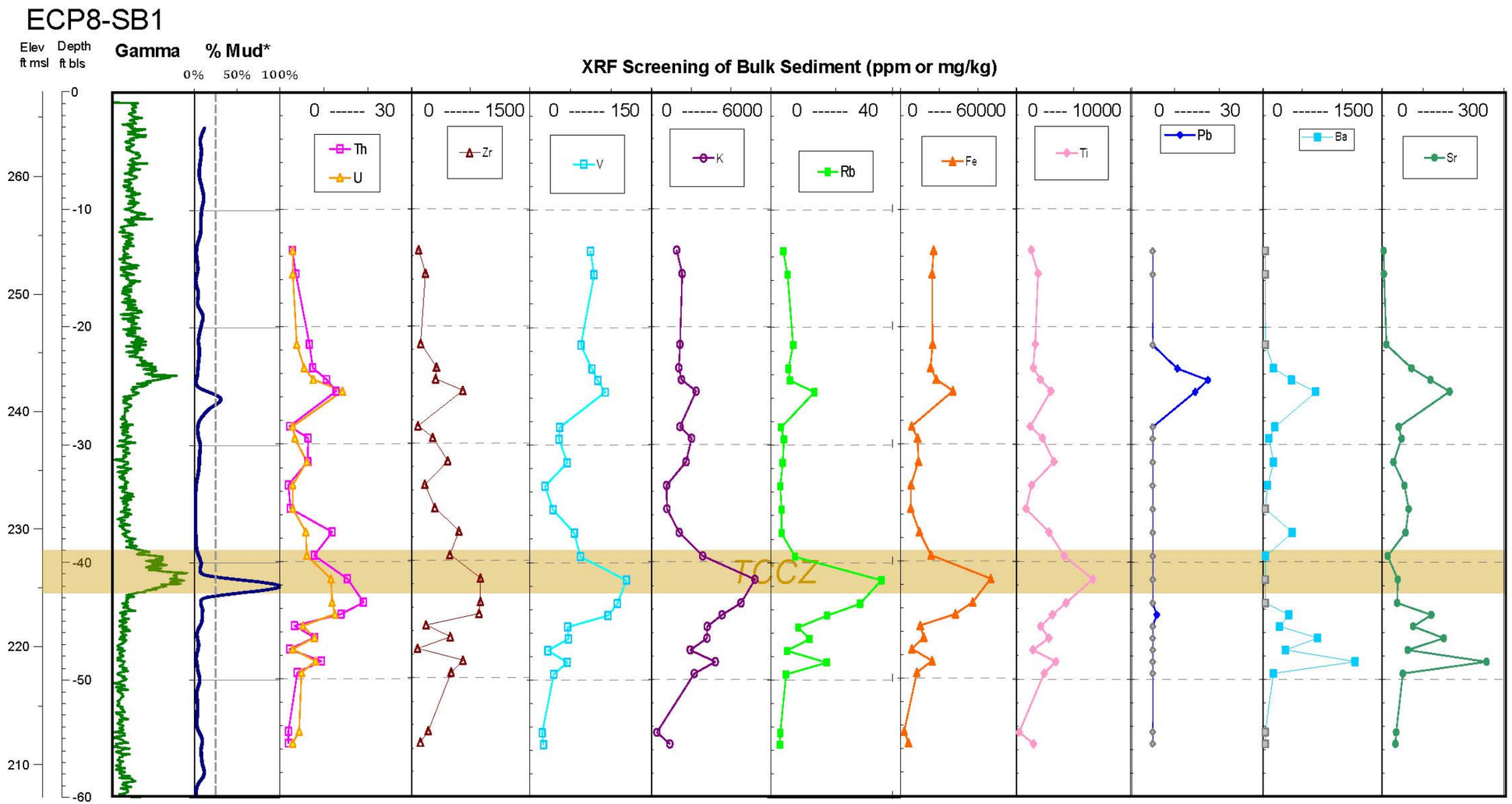


Figure J2. ECP8 Gamma Log, XRF Screening Data and Dry Sieve Data

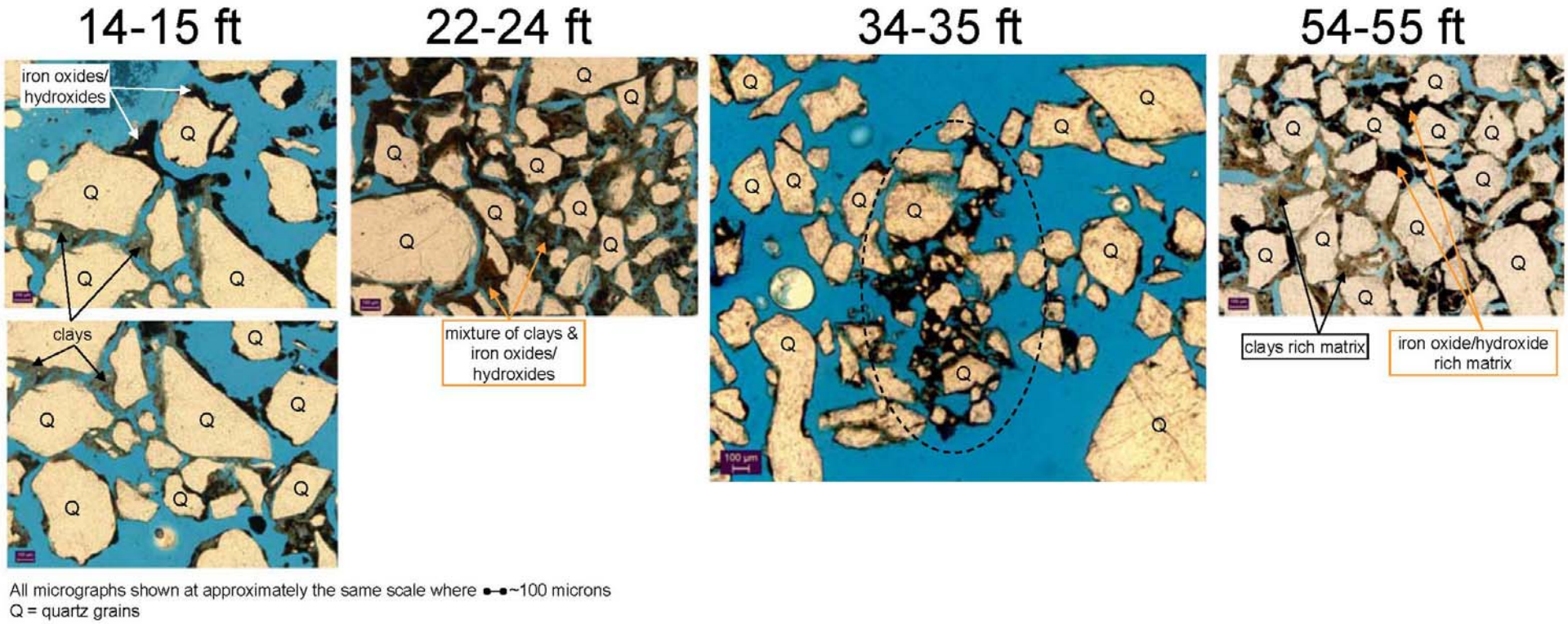


Figure J3. ECP8 Photomicrographs with Depth

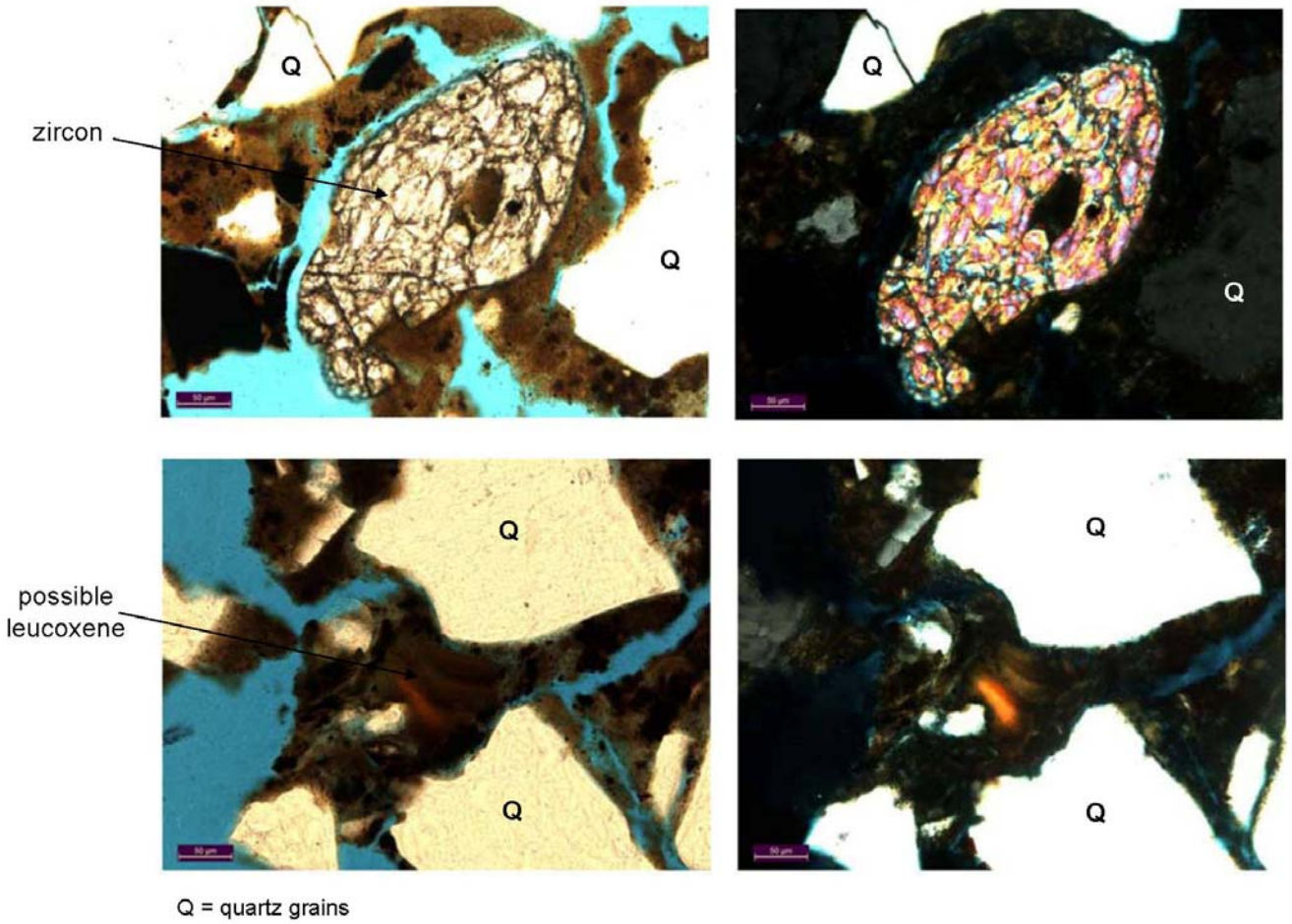


Figure J4. ECP8 Photomicrographs for 22-24 ft Sample

Distribution:
M. B. Amidon
R. S. Aylward, 773-42A
L. A. Bagwell, 773-42A
D. L. Beeler, 704-60E
H. H. Burns, 773-41A
B. T. Butcher, 773-43A
L. B. Collard, 773-43A
D. A. Crowley, 773-43A
K. D. Dixon
G. P. Flach, 773-42A
F. L. Fox, 704-59E
J. C. Griffin, 773-A
L. L. Hamm,703-41A
R. A. Hiergesell, 773-43A
G. K. Humphries, 705-3C
J. M. Jordan, 703-41A
D. I. Kaplan, 773-43A
D. Li, 773-43A
M. G. Looper, 704-36E
J. J. Mayer, 773-42A
M. R. Millings, 773-42A
T. O. Oliver, 773-42A
M. A. Phifer, 773-42A
S. R. Reed, 704-56E
K. A. Roberts, 773-43A
R. R. Seitz, 773-43A
D. F. Sink, 704-56E
F. G. Smith, 703-41A
R. F. Swingle, 773-43A
G. A. Taylor, 773-43A
K. L. Tempel, 704-56E
C. Wilson (1 file copy & 1 electronic copy), 773-43A - Rm. 213