# Table 1.3-1
# Survey Coordinates and Well Completion Information

| Well Name | Drilling Duration | | Total Depth (feet bgs[a]) | Yucca Mountain Project Survey Coordinates | | Ground Elevation[b] (feet amsl[c]) | Approximate Open-Hole Water Level at End of Drilling (feet bgs) | Screened Interval (feet bgs) | | Sandpack Interval (feet bgs) | | Lithology at Sandpack Interval | Well Casing Total Depth[d] (feet bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Start | Completion | | North Latitude | West Longitude | | | To | From | To | From | | |
| 16P | 12/13/02 | 1/27/03 | 2900.0 | 36° 43' 29.089" | 116° 29' 22.219" | 2888.9 | 496 | 489.4 | 549.4 | 474.8 | 555.3 | Tertiary Tuff | 559.9 |
| 24P | 7/16/03 | 8/19/03 | 1860.0 | 36° 42' 16.775" | 116° 26' 52.756" | 2789.8 | 404 | 400.0 | 440.0 | 393.2 | 446.8 | Tertiary Tuff | 450.0 |
| 27P | 11/20/02 | 12/12/02 | 1900.0 | 36° 44' 02.072" | 116° 29' 51.436" | 2973.4 | 583 | 580.7 | 620.6 | 563.0 | 626.7 | Tertiary Tuff | 631.0 |
| 28P | 10/21/02 | 11/20/02 | 2080.0 | 36° 42' 28.386" | 116° 29' 19.390" | 2767.2 | 374 | 370.0 | 449.0 | 365.6 | 451.5 | Tertiary Tuff | 459.3 |
| 29P | 6/25/03 | 7/15/03 | 790.7 | 36° 40' 57.297" | 116° 26' 52.884" | 2724.3 | 349 | 340.0 | 390.0 | 333.8 | 404.8 | Tertiary Tuff | 395.0 |
| 19PB | 12/2/03 | 12/18/03 | 634.0 | 36° 40' 15.440" | 116° 26' 55.593" | 2688.4 | 368 | 375.5 | 395.0 | 350.0 | 401.9 | Alluvium | 405.3 |
| | | | | | | | | 514.7 | 534.7 | 505.1 | 545.2 | Alluvium | 545.0 |

[a]Below ground surface.
[b]Ground elevations provided by the Yucca Mountain Project and based on a Global Positioning System. The elevations are not known to be precise to one-tenth of a meter.
[c]Above mean sea level.
[d]PVC blank well casing and screen with 2⅜-inch outside diameter.

## Table 1.6-1
## Phase IV Quality Assurance Documents

| Type | Number | Revision | Title | Date |
|---|---|---|---|---|
| Work Plan | WP-5 | 3 | Early Warning Drilling Program Phase IV Drilling and Well Construction Work Plan | 7/31/02 |
| | WP-6 | 1 | Early Warning Drilling Program Geophysical Logging Work Plan | 5/31/01 |
| | WP-8 | 3 | Sample Management Plan | 7/30/02 |
| Technical Procedure | TP-7.0 | 3 | Drill Site Management | 9/30/02 |
| | TP-8.0 | 4 | Field Logging and Handling of Borehole Samples | 10/28/02 |
| | | 5 | | 11/15/03 |
| Test Plan | TPN-5.1 | 0 | Construction of Sonic Corehole NC-EWDP-19PB | 11/15/03 |
| | TPN-8.1 | 0 | Constant Head Saturated Hydraulic Conductivity Measurements on Repacked Core Samples | 4/1/04 |

# Table 2.1-1
# Summary of Drilling Equipment Used in Reverse-Circulation Boreholes

| Well Name | Drilling Method | | | Dual-Wall Pipe Specifications | | | Drill Bit Assembly | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Depth Interval (feet) | | Diameter (inches) | Depth Interval (feet) | | Type | Diameter (inches) | Depth Interval (feet) | |
| | | From | To | | From | To | | | From | To |
| 29P | AR-RC[a] | 0 | 180 | 4.5 | 0 | 708 | Tricone center return | 6.25 | 0 | 180 |
| | APH-RC[b] | 180 | 203 | 4.75 | 708 | 788 | Hammer bit reverse circulation | 6.25 | 180 | 203 |
| | AR-RC | 203 | 280 | | | | Tricone center return | 6.25 | 203 | 280 |
| | APH-RC | 280 | 303 | | | | Hammer bit reverse circulation | 6.25 | 280 | 303 |
| | AR-RC | 303 | 791 | | | | Tricone center return | 6.25 | 303 | 791 |
| 24P | AR-RC | 0 | 80 | 4.5 | 0 | 1778 | Tricone center return | 6.25 | 0 | 80 |
| | APH-RC | 80 | 100 | 4.75 | 1778 | 1858 | Hammer bit reverse circulation | 6.25 | 80 | 100 |
| | AR-RC | 100 | 1860 | | | | Tricone center return | 6.25 | 100 | 1200 |
| | | | | | | | | 6.125 | 1200 | 1860 |
| 16P | AR-RC | 0 | 2900 | 4.5 | 0 | 2858 | Tricone center return | 6.5 | 0 | 1720 |
| | | | | 4.75 | 2858 | 2898 | | 6 | 1720 | 2122 |
| | | | | | | | | 5.75 | 2122 | 2662 |
| | | | | | | | | 5.625 | 2662 | 2900 |
| 27P | AR-RC | 0 | 1900 | 4.5 | 0 | 1858 | Tricone center return | 6.5 | 0 | 760 |
| | | | | 4.75 | 1858 | 1898 | | 6 | 760 | 1900 |
| 28P | AR-RC | 0 | 2080 | 4.5 | 0 | 2038 | Tricone center return | 6.5 | 0 | 1270 |
| | | | | 4.75 | 2038 | 2078 | | 6.125 | 1270 | 1283 |
| | | | | | | | | 5.625 | 1283 | 2080 |

[a]Air-rotary dual-wall reverse circulation.
[b]Air-percussion-hammer dual-wall reverse circulation.

## Table 2.2-1
## Summary of Drill Cuttings Sampling, Splitting, and Testing

| Borehole Name | Geologic Material | Drilling Method | Drill Cuttings Sample Interval (feet) | Total Number of Drill Cuttings Samples | Number of Drill Cuttings Samples[a] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Split (5-lb bag) | | | Nuclear Waste Repository Project Office (NWRPO) Laboratory Analysis | | | |
| | | | | | NWRPO/ SMF[b] Split | DOE YMP[c] SMF Split | NWRPO Laboratory Split | Gravimetric Water Content[d] | Soil Water Extract Electrical Conductivity[d] | Wet Sieve | Hydrometer |
| 16P | Alluvium[e] | AR-RC[f] | 2.5 | 66 | 66 | 66 | 33 | 33 | 33 | 33 | 6 |
| | Non-alluvium | | 5 | 547 | 547 | 547 | 37 | 37 | 0 | 0 | 0 |
| 24P | Alluvium | AR-RC | 2.5 | 151 | 151 | 151 | 78 | 78 | 78 | 78 | 6 |
| | Alluvium | APH-RC[g] | 2.5 | 8 | 8 | 8 | 4 | 4 | 4 | 4 | 0 |
| | Non-alluvium | AR-RC | 5 | 292 | 292 | 292 | 0 | 0 | 0 | 0 | 0 |
| 27P | Alluvium | AR-RC | 2.5 | 73 | 73 | 73 | 36 | 36 | 36 | 36 | 6 |
| | Non-alluvium | | 5 | 344 | 344 | 344 | 42 | 42 | 0 | 0 | 0 |
| 28P | Alluvium | AR-RC | 2.5 | 96 | 96 | 96 | 48 | 48 | 48 | 48 | 6 |
| | Non-alluvium | | 5 | 377 | 377 | 377 | 16 | 16 | 0 | 0 | 0 |
| 29P | Alluvium | AR-RC | 2.5 | 110 | 110 | 110 | 56 | 56 | 56 | 56 | 4 |
| | Alluvium | APH-RC | 2.5 | 18 | 18 | 18 | 6 | 8 | 8 | 8 | 2 |
| | Non-alluvium | AR-RC | 5 | 94 | 94 | 94 | 4 | 4 | 0 | 0 | 0 |
| TOTAL | | | | 2,176 | 2,176 | 2,176 | 362 | 362 | 263 | 263 | 30 |

[a]Density-related field measurements made on selected samples. Measurements not made on samples below the water table, or where water was used as a drilling fluid.
[b]Sample Management Facility.
[c]U.S. Department of Energy Yucca Mountain Project.
[d]Not conducted on samples below the water table.
[e]All unconsolidated sediments.
[f]Air-rotary dual-wall reverse circulation.
[g]Air-percussion-hammer dual-wall reverse circulation.

## Table 2.2-2
## Summary of Drive Core Sampling, Splitting, and Testing

| Borehole Name | Geologic Material | Coring Method | Number of Core Runs per Borehole | Number of Density-Related Field Measure-ments | Number of Drive Core Samples | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Split (6- and 3-inch liners and drive shoe) | | | Nuclear Waste Repository Project Office (NWRPO) Laboratory Analysis | | | | |
| | | | | | NWRPO SMF[a] Subsamples | DOE YMP[b] SMF Subsamples | NWRPO Laboratory Subsamples | Volumetric Water Content | Grain and Bulk Density | Wet Sieve | Hydrometer | Saturated Hydraulic Conductivity |
| 24P | Alluvium – unsaturated zone | APH-DC[c] | 8 | 8 | 16 | 4 | 22 | 14 | 14 | 22 | 22 | 14 |
| 29P | Alluvium – unsaturated zone | APH-DC | 3 | 3 | 2 | 4 | 9 | 6 | 6 | 9 | 9 | 6 |
| 19PB | Alluvium – saturated zone | SC-DC[d] | 5 | 5 | 3 | 6 | 10 | 10 | 10 | 10 | 10 | 10 |
| TOTAL | | | 16 | 16 | 21 | 14 | 41 | 30 | 30 | 41 | 41 | 30 |

[a] Sample Management Facility.
[b] U.S. Department of Energy Yucca Mountain Project.
[c] Air-percussion-hammer drive core.
[d] Sonic drive core.

## Table 2.2-3
## Summary of Sonic Core Sampling, Splitting, and Testing

| Sample Type | Total Number of Samples | Density-Related Field Measure-ments | Number of Assigned Samples | | | Number of Nuclear Waste Repository Project Office (NWRPO) Laboratory Analyses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DOE YMP SMF[a] | NWRPO Laboratory | Outside Researchers[b] | Gravimetric Water Content | Soil Water Extract EC[c] | Wet Sieve | Saturated Volumetric Water Content | Saturated Hydraulic Conductivity | Hydrometer | Atterberg Limits | Specific Gravity | Dry Bulk Density |
| Grab sample (water content split) | 219 | NA[d] | 0 | 199 | 0 | 199 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grab sample | 199 | NA | 0 | 199 | 55 | 0 | 0 | 199 | 0 | 0 | 75 | 45 | 75 | 0 |
| Sonic core segment[e] | 180 | 180 | 180 | 35[f] | 0 | 35 | 0 | 14 | 22 | 22 | 15 | 15 | 15 | 35 |
| TOTAL | 598 | NA | 180 | 433 | 55 | 234 | 19 | 213 | 22 | 22 | 90 | 60 | 90 | 35 |

[a]U.S. Department of Energy Yucca Mountain Project Sample Management Facility.
[b]Samples provided as a split of NWRPO laboratory grab samples when sufficient sample was available to U.S. Geological Survey and Center for Nuclear Waste Regulatory Analyses.
[c]Electrical conductivity analyses, not conducted on samples below the water table.
[d]Not applicable.
[e]Samples were repacked to target densities for saturated volumetric water content and hydraulic conductivity analyses.
[f]Selected core segments were transferred to the NWRPO laboratory from DOE/YMP sonic core segments.

# Table 2.4-1
# Summary of Laboratory Tests on Geologic Samples

| Type | Drilling/Coring Method | Sample Type | Number of Samples Tested | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Saturated Hydraulic Conductivity | Saturated Volumetric Water Content | Volumetric Water Content | Gravimetric Water Content | Specific Gravity (Grain Density) | Dry Bulk Density | Soil Water Extract Electrical Conductivity | Wet Sieve | Hydrometer | Atterberg Limits |
| Reverse-circulation (RC) borehole | AR-RC[a] | Drill cuttings | 0 | 0 | 0 | 350 | 0 | 0 | 251 | 251 | 28 | 0 |
| | APH-RC[b] | | 0 | 0 | 0 | 12 | 0 | 0 | 12 | 12 | 2 | 0 |
| | APH-DC[c] | Drive core | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 31 | 31 | 0 |
| Sonic (SC) borehole | SC[d] | Textural layer grab samples | 0 | 0 | 0 | 199 | 75 | 0 | 19 | 199 | 75 | 45 |
| | SC | Sonic core segment[e] | 22 | 22 | 0 | 35 | 15 | 35 | 0 | 14 | 15 | 15 |
| | SC-DC[f] | Drive core | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 10 | 10 | 10 |
| TOTAL | | | 52 | 52 | 30 | 626 | 120 | 65 | 282 | 517 | 161 | 70 |

[a]Air-rotary dual-wall reverse circulation.
[b]Air-percussion-hammer dual-wall reverse circulation.
[c]Air-percussion-hammer dual-wall drive core.
[d]Sonic core.
[e]Samples were repacked to target densities for saturated volumetric water content and hydraulic conductivity analyses.
[f]Sonic drive core.

# Table 2.4-2
# Laboratory Test Methods

| Laboratory Test | Laboratory Method | |
|---|---|---|
| | Nevada Geotech, Inc.[a] | Nuclear Waste Repository Project Office Testing Laboratory |
| Volumetric Water Content | ASTM D-2216-92. Method for laboratory determination of water (moisture content) of soil, rock, and soil-aggregate mixtures. In: *1996 Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. | Gardner, W.H. 1986, "Water Content." In: Klute, A. (ed), *Methods of Soil Analysis,* Part 1, Physical and Mineralogical Methods (2nd ed.), American Society of Agronomy, Chapter 21, pp. 493–507 (specifically page 506).[b] |
| Dry Bulk Density | Blake, G.R. and K.H. Hartge. 1986. "Bulk Density." In: Klute, A. (ed), *Methods of Soil Analysis,* Part 1, Physical and Mineralogical Methods (2nd ed.), American Society of Agronomy, Chapter 13, pp. 363-367. | Blake, G.R. and K.H. Hartge. 1986. "Bulk Density." In: Klute, A. (ed), *Methods of Soil Analysis,* Part 1, Physical and Mineralogical Methods (2nd ed.), American Society of Agronomy, Chapter 13, pp. 363-367.[b] |
| Specific Gravity (grain density) | ASTM D-854-92. Standard test method for specific gravity of soils. In: *1996 Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. | ASTM D-854-02. Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer. In: 2003 *Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. |
| Saturated Hydraulic Conductivity (constant head method) | Klute, A. , and C. Dirksen, 1986. "Hydraulic Conductivity and Diffusivity: Laboratory Methods." In: Klute, A. (ed), *Methods of Soil Analysis,* Part 1, Physical and Mineralogical Methods (2nd ed.), American Society of Agronomy, Chapter 28, pp. 694-700. | Klute, A., and C. Dirksen, 1986. "Hydraulic Conductivity Diffusivity: Laboratory Methods." In: Klute, A. (ed), *Methods of Soil Analysis,* Part 1, Physical and Mineralogical Methods (2nd ed.), American Society of Agronomy, Chapter 28, pp. 687-700.[b] |
| Atterberg Limits | Not applicable. | ASTM D-4318-00. Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils. In: 2003 *Annual Book of ASTM Standards*, Vol. 04.08, American Society for Testing and Materials. |
| Soil Extract Electrical Conductivity | Rhoades, J.D. 1986. Soluble salts—Electrical conductivity of saturation extract. In: Page, A.L. (ed), *Methods of Soil Analysis,* Part 2, Chemical and Microbiological Properties (2nd ed.), American Society of Agronomy, pp. 172-173. | Rhoades, J.D. 1982. Soluble Salts—Extracts at Soil/Water Ratios of 1:1 and 1:5, Electrical conductivity of saturation extract. In: Page, A.L. (ed), *Methods of Soil Analysis,* Part 2, Chemical and Microbiological Properties (2nd ed.), American Society of Agronomy, Chapter 10, pp. 169-170 and 172-173. |
| Gravimetric Water Content | ASTM D-2216-92. Method for laboratory determination of water (moisture content) of soil, rock, and soil-aggregate mixtures. In: *1996 Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. | ASTM D-2216-98. Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. In: 2003 *Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. |
| Wet Sieve Analysis | ASTM D-1140-97. Standard test method for amount of material in soil finer than the No. 200 (75 um) sieve (Method B for wet sieve analysis). In: *1997 Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. | ASTM D-1140-00. Standard Test Methods for Amount of Material in Soil Finer Than the No. 200 (75 um) Sieve (Method B for wet sieve analysis). In: 2003 *Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. |
| Hydrometer Analysis (silt/clay break) | ASTM D-422. Standard method for Particle Size Analysis of Soils. In: *1996 Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. | ASTM D-422-63 (Re-approved 1998). Standard Test Method for Particle Size Analysis of Soils. In: 2003 *Annual Book of ASTM Standards,* Vol. 04.08, American Society for Testing and Materials. |

[a]Contract testing laboratory.

[b]For repacked sonic core samples, detailed methods to repack samples and to measure saturated volumetric water content, saturated hydraulic conductivity, and dry bulk density are given in TPN-8.1, *Constant Head Saturated Hydraulic Conductivity Measurements on Repacked Samples*.

# Table 2.5-1
# Description of Types and Applications of Geophysical Logs

| Log Name | Suite | Description | Application |
|---|---|---|---|
| Caliper | Open-hole | Borehole diameter | Provides borehole correction (e.g., wash-out zones) for other logs, borehole volume for well completions, and possible identification of fractures and contacts. |
| Density | Drill-string, open-hole, and well completion | Tool output altered by formation materials[a] | Yields density information on adjacent borehole wall formation material; identifies washout zones. |
| Deviation | Drill-string, open-hole, and well completion | Deviation of borehole from vertical | Permits calculation of true elevations for lithologic contacts, well screens, water levels, and other borehole depth measurements. |
| Fluid Resistivity | Open-hole | Borehole fluid resistivity and conductivity | Estimates relative amount of dissolved salts in borehole fluid and may provide an indication of inflow in open boreholes. |
| Fluid Temperature (Temperature) | Drill-string, open-hole, and well completion | Borehole fluid temperature | Helps identify locations of inflow/outflow in open boreholes, and geothermal gradient in cased boreholes. |
| Gamma (Natural Gamma) | Drill-string, open-hole, and well completion | Gamma radiation from natural sources in formation and in borehole drilling fluids | Helps identify lithology and stratigraphic unit correlation; may respond to differences in clay content. |
| Magnetic Susceptibility | Open-hole and well completion | Ferromagnetism and conductivity in rocks | Indicates presence of magnetic minerals; may indicate deposition of magnetic minerals within porous media. |
| Neutron (Moisture) | Drill-string, open-hole, and well completion | Tool output altered by water in formation and borehole[b] | Identifies moisture content changes in the unsaturated zone and/or indicates porosity changes in the saturated zone. |
| Optical Televiewer | Open-hole | 360° image of reflection of borehole wall via prism mirror and camera | May help detect fractures, thin beds, and bedding dip; provides caliper and deviation data. |
| Resistivity (Formation) (R8, R16, R32, or R64) | Open-hole | Apparent formation resistivities at different distances from the borehole | Helps identify lithology and stratigraphic unit correlation; indicates relative changes in water quality. |
| Single-Point Resistivity (SPR) | Open-hole | Resistivity of borehole fluids and adjacent formation | Helps identify lithology and changes in borehole fluid composition. |
| Sonic (Acoustic Velocity) | Open-hole | Compressional wave velocity through fluids and formations | Helps define changes in porosity and lithology; indicates of fractures. |
| Spectral Gamma | Drill-string, open-hole, and well completion | Radiation emitted by uranium, thorium and potassium | Can help identify minerals containing uranium, thorium and potassium. |
| Spontaneous Potential | Open-hole | Electrical potential between fluids in borehole and adjacent formation | Helps identify lithology, clay, and shale content and relative changes in formation water quality. |

Source: Modified from Keys (1990) and Telford and others (1990).

[a]Geophysical Logging Services density tool contains no radioactive source; Century Geophysical tool uses a cesium-137 source.

[b]Geophysical Logging Services moisture tool contains no radioactive source; Century Geophysical tool uses a directed americium beryllium source

# Table 2.5-2
# Summary of Phase IV Geophysical Logs

| Well Name | Date | Suite | Interval Logged (feet) | | Log Name | | | | | | | | | | | | | Record Identification Desigation (RID) Number | Company Name | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gamma (Natural Gamma) | Density | Spectral Gamma | Neutron (Moisture) | Fluid Temperature | Resistivity (SPR, R8-R64) | Fluid Resistivity | Spontaneous Potential | Caliper | Acoustic Velocity (Sonic) | Magnetic Susceptibility | Optical Televiewer | Deviation | | | |
| 16P | 1/20/03 | Open-hole | 1,980 | 2,898 | X | X | X | X | X | | X | X | | X | | | | 5482 | Geophysical Logging Services (GLS) | Run in 6.5- to 5.625-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 1/20/03 | Drill-string | 0 | 2,880 | X | | | | X | | X | | | | | | X | 5481 | GLS | Run in 4.5-inch dual-wall drill pipe in 6.5- to 5.625-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 1/8/04 | Well-completion | 0 | 559.9 | X | X | X | X | | | | | | | X | | X | 6035 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |
| | 3/4/04 | | 0 | 560 | | | | | X | | | | | | | | | 6209 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |
| | 1/10/03 to 11/03 | Open-hole | 0 | 2,121 | X | X | | X | X | X | X | | X | | X | | X | 5485 | GLS | Run in 6.5- to 5.75-inch borehole with 61.5 feet of 12-inch surface casing. |
| 28P | 11/2/02 | Open-hole | 0 | 1,196.5 | | | | | | | | | | | | X | | 5340 | GLS | Run in 6.5- to 6.125-inch borehole. |
| | 11/2/02 | | 0 | 1,196.5 | X | X | X | X | X | X | X | | X | X | X | | X | 5341 | GLS | Run in 6.5- to 6.125-inch borehole. |
| | 11/13/02 | | 1,120 | 2,064 | X | | X | | X | X | X | | X | | | | | 5321 | GLS | Run in 6.5- to 5.625-inch borehole. |
| | 11/13/02 | Drill-string | 1,120 | 2,050 | X | X | X | X | X | X | | | | | | | X | 5337 | GLS | Run in 4.5-inch dual-wall drill pipe in 6.5- to 5.625-inch borehole. |
| | 1/8/04 | Well-completion | 0 | 459.3 | X | X | X | X | | | | | | | X | | X | 6034 | GLS | Run in 2-inch Schedule 80 PVC well casing. |
| | 3/4/04 | | 0 | 459 | | | | | X | | | | | | | | | 6213 | GLS | Run in 2-inch Schedule 80 PVC well casing. |

# Table 2.5-2
# Summary of Phase IV Geophysical Logs

| Well Name | Date | Suite | Interval Logged (feet) | | Log Name | | | | | | | | | | | | | Record Identification Desigation (RID) Number | Company Name | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gamma (Natural Gamma) | Density | Spectral Gamma | Neutron (Moisture) | Fluid Temperature | Resistivity (SPR, R8-R64) | Fluid Resistivity | Spontaneous Potential | Caliper | Acoustic Velocity (Sonic) | Magnetic Susceptibility | Optical Televiewer | Deviation | | | |
| 27P | 1/8/04 | Well-completion | 0 | 630.3 | X | X | X | X | | | | | | | X | | X | 6036 | GLS | Run in 2-inch Schedule 80 PVC well casing with 60.4 feet of 12-inch surface casing. |
| | 3/4/04 | | 0 | 631 | | | | | X | | | | | | | | | 6212 | GLS | Run in 2-inch Schedule 80 PVC well casing with 60.4 feet of 12-inch surface casing. |
| | 12/7/02 to /8/02 | Open-hole | 0 | 1,897.7 | X | X | | X | X | X | X | X | X | X | X | | X | 5536 | GLS | Run in 6.5- to 6-inch borehole with 60.4 feet of 12-inch surface casing. |
| | 12/7/02 to 12/8/02 | | 0 | 1,880 | | | | | | | | | | | | X | | 5484 | GLS | Run in 6.5- to 6-inch borehole with 60.4 feet of 12-inch surface casing. |
| 29P | 7/9/03 | Open-hole | 0 | 702 | X | X | | X | X | X | X | | X | X | X | | X | 5746 | GLS | Run in 5-inch steel casing inside 6.25-inch borehole to total depth with 61.5 feet of 12-inch surface casing. Inductive resistivity and inductive conductivity logs run as a test in the unsaturated zone. |
| | 7/9/03 | | 0 | 700 | | | | | | | | | | | | X | | 5745 | GLS | Run in 6.25-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 7/10/03 | Drill-string | 0 | 695.4 | X | | | X | | | | | | | | | | 5767 | Century Geophysical (Century) | Run in 5-inch steel casing inside 6.25-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 7/10/03 | | 0 | 695.4 | X | X | | | | | | | | | | | | 5766 | Century | Run in 5-inch steel casing inside 6.25-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 1/8/04 | Well-completion | 0 | 395 | X | X | X | X | | | | | | | X | | X | 6032 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |
| | 3/4/04 | | 0 | 395 | | | | | X | | | | | | | | X | 6214 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |

# Table 2.5-2
# Summary of Phase IV Geophysical Logs

| Well Name | Date | Suite | Interval Logged (feet) | | Log Name | | | | | | | | | | | | | Record Identification Desigation (RID) Number | Company Name | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gamma (Natural Gamma) | Density | Spectral Gamma | Neutron (Moisture) | Fluid Temperature | Resistivity (SPR, R8-R64) | Fluid Resistivity | Spontaneous Potential | Caliper | Acoustic Velocity (Sonic) | Magnetic Susceptibility | Optical Televiewer | Deviation | | | |
| 24P | 8/8/03 | Drill-string | 0 | 1,840 | X | X | X | X | X | X | | | | | | | X | 5831 | GLS | Run in 4.5-inch dual-wall drill pipe inside 6.25- to 6.125-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 8/9/03 | | 0 | 1,658.4 | X | | | X | | | | | | | | | | 5830 | Century | Run in 5-inch steel casing inside 6.25- to 6.125-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 8/9/03 | | 0 | 1,659.1 | X | X | | | | | | | | | | | | 5829 | Century | Run in 5-inch steel casing inside 6.25- to 6.125-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 8/10/03 | Open-hole | 0 | 1,733 | | | | | X | X | X | | X | X | | | | 6031 | GLS | Run in 6.25- to 6.125-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 8/10/03 | | 728 | 1,550 | | | | | | | | | | | | X | X | 6062 | GLS | Run in 6.25- to 6.125-inch borehole with 61.5 feet of 12-inch surface casing. |
| | 1/9/04 | Well-completion | 0 | 450 | X | X | | X | | | | | | | X | | X | 6037 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |
| | 3/4/04 | | 0 | 450 | | | | | X | | | | | | | | | 6211 | GLS | Run in 2-inch Schedule 80 PVC well casing with 61.5 feet of 12-inch surface casing. |
| 19PB | 11/22/03 | Open-hole | 0 | 350 | | | | | | | | | | | | | X | 6269 | GLS | Run in 10.625-inch borehole with 18 feet of 17.5-inch surface casing above the water table. |
| | 12/18/03 | Drill-string | 0 | 634 | X | X | X | X | X | | | | | | | | X | 6270 | GLS | Run in sonic coring casings within multiple telescoping casings and 18 feet of 17.5-inch surface casing. |
| | 12/19/03 | | 0 | 619.6 | X | X | | X | | | X | | | | | | | 6102 | Century | Run in 5.5-inch steel casing within multiple telescoping casings and 18 feet of 17.5-inch surface casing. |
| 19PB (deep) | 1/9/04 | Well-completion | 0 | 545 | X | X | X | X | | | | | | | X | | X | 6038 | GLS | Run in 2-inch Schedule 80 PVC within multiple telescoping casings and 18 feet of 17.5-inch surface casing. |
| | 3/4/04 | | 0 | 545 | | | | | X | | | | | | | | | 6210 | GLS | Run in 2-inch Schedule 80 PVC within multiple telescoping casings and 18 feet of 17.5-inch surface casing. |

# Table 3.1-1
# Summary of Well Elevations and Water Levels

| Well Name | Top of Casing Elevation[a] (feet amsl[b]) | Original Ground Surface Elevation[c] (feet amsl) | Water Level Measurement Date | Groundwater Elevation[d] (feet amsl) | Depth to Water[d] (feet) |
|---|---|---|---|---|---|
| 16P | 2891.6 | 2888.9 | 7/23/04 | 2393.0 | 498.6 |
| 24P | 2792.2 | 2789.8 | 7/23/04 | 2385.6 | 406.7 |
| 27P | 2976.1 | 2973.4 | 7/23/04 | 2390.5 | 585.6 |
| 28P | 2770.1 | 2767.2 | 7/23/04 | 2392.9 | 377.2 |
| 29P | 2726.2 | 2724.3 | 7/23/04 | 2378.0 | 348.1 |
| 19PB Shallow | 2690.3 | 2688.4 | 7/23/04 | 2321.0 | 369.4 |
| 19PB Deep | 2690.3 | 2688.4 | 7/23/04 | 2323.0 | 367.3 |

[a]Elevations provided by the Yucca Mountain Project and based on a Global Positioning System. The elevations are not known to be precise to one-tenth of a meter.
[b]Above mean sea level.
[c]Based on GPS survey elevation at top of casing, minus casing stickup.
[d]Groundwater elevation and depth-to-water data have not been corrected for borehole deviation.

# Table 4.1-1
# Summary of Censored Geologic Data

| Well Name | Sample Type | Field Logging Data Depth Interval (feet below ground surface [bgs]) | | Laboratory Test Data Depth Interval (feet bgs) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PSD and USCS Group Symbol[a] | Sample Bulk-Density-Related[b] | EC[c] | GWC[c] | Wet Sieve PSD[d] | Hydrometer PSD[e] | Dry Bulk Density[f] | Porosity[f] | Saturated Hydraulic Conductivity[f] |
| 16P | Drill Cuttings | 0-165 | 0-165 | | | | 32.5-35 | | | |
| | | | | | | | 57.5-60 | | | |
| | | | | | | | 82.5-85 | | | |
| 19PB | Sonic Core Grab Sample | 350.8-633.8 | | | | 378.1-378.4 | | | | |
| | | | | | | 416.8-418.4 | | | | |
| | | | | | | 522.1-522.7 | | | | |
| | Drive Core Run | 380.00-381.00 | | | | | | | | |
| | | 449.09-449.66 | | | | | | | | |
| | | 527.05-528.80 | | | | | | | | |
| | | 561.74-563.34 | | | | | | | | |
| | | 619.99-622.02 | | | | | | | | |
| | Drive Core Segment | | | | | | | | | 449.10-449.40 |
| 24P | Drill Cuttings | 0-400 | 0-400 | 405-410 | 405-410 | 405-410[g] | | | | |
| | | | | 415-420 | 415-420 | 415-420[g] | | | | |
| | Drive Core Run | 80.18-81.69 | | | | | | | | |
| | | 120.13-121.34 | | | | | | | | |
| | | 160.00-162.13 | 160.00-162.13 | | | | | | | |
| | | 200.31-200.87 | | | | | | | | |
| | | 240.00-241.75 | | | | | | | | |
| | | 280.40-281.00 | | | | | | | | |
| | | 322.50-323.44 | | | | | | | | |
| | | 360.00-360.71 | | | | | | | | |
| 27P | Drill Cuttings | 0-182.5 | 0-182.5 | | | | 157.5-160 | | | |
| 28P | Drill Cuttings | 0-240 | 0-240 | | | | 147.5-150 | | | |
| | | | | | | | 172.5-175 | | | |
| 29P | Drill Cuttings | 0-320 | 0-320 | | | | 162.5-165 | | | |
| | | | | | | | 182.5-185 | | | |
| | | | | | | | 232.5-235 | | | |
| | Drive Core Run | 100.00-102.27 | | | | | | | | |
| | | 180.00-181.13 | | | | | | | | |
| | | 279.98-282.11 | | | | | | | | |
| | Drive Core Segment | | | | | | 180.00-180.36 | 180.00-180.36 | 180.00-180.36 | |

[a] Field estimates of particle size distribution (PSD) and Unified Soil Classification System (USCS) group symbol data differ significantly from laboratory measurements.
[b] A significant amount of sample was not collected and weighed over drill run intervals.
[c] Electrical conductivity (EC) of soil-water extract and gravimetric water content (GWC) data obtained from alluvium drill cuttings are applicable to regions above the water table only.
[d] Data included a negative percent value for one or more of the smallest size fractions, likely from using separate sample splits to obtain air dry water contents.
[e] Hydrometer silt plus clay percent differed significantly from wet sieve fines percent.
[f] Core samples tested were observed to be loosely packed in their liners and obviously disturbed from in situ conditions.
[h] Wet sieve measurements not applicable to bedrock units beginning at approximately 400 feet bgs.

# Table 4.2-1
# Drive Core Recovery and Density Data

| Well Name | Coring Method | Core Run Number | Depth (feet) | | Recovery (feet) | | | Core Diameter (inches) | Sample Weight[a] (kilograms) | Average Sample Gravimetric Water Content (grams/gram [g/g]) | Calculated Oven Dry Sample Weight (g) | Sample Volume (cubic centimeter [$cm^3$]) | Dry Bulk Density[b] ($g/cm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | From | To | Core | Fill | Total Length | | | | | | |
| 24P | APH-DC[c] | 1 | 80.18 | 81.69 | 1.51 | 0.76 | 2.27 | 3.9 | 11.1 | 0.056 | 10510 | 5330 | 1.97 |
| | | 2 | 120.13 | 121.34 | 1.21 | 1.06 | 2.27 | 3.9 | 10.85 | 0.072 | 10130 | 5330 | 1.90 |
| | | 3 | 160.00 | 162.13 | 2.13 | 0.56 | 2.69 | 3.9 | 11.25 | 0.185 | 9490 | 6320 | 1.50[d] |
| | | 4 | 200.31 | 200.87 | 0.56 | 1.71 | 2.27 | 3.9 | 11.25 | 0.078 | 10440 | 5330 | 1.96 |
| | | 5 | 240.00 | 241.75 | 1.75 | 0.52 | 2.27 | 3.9 | 11.2 | 0.062 | 10550 | 5330 | 1.98 |
| | | 6 | 280.40 | 281.00 | 0.60 | 1.67 | 2.27 | 3.9 | 11.6 | 0.141 | 10170 | 5330 | 1.91 |
| | | 7 | 322.50 | 323.44 | 0.94 | 1.75 | 2.69 | 3.9 | 13.3 | 0.083 | 12290 | 6320 | 1.94 |
| | | 8 | 360.00 | 360.71 | 0.71 | 1.98 | 2.69 | 3.9 | 12.35 | 0.096 | 11270 | 6320 | 1.78 |
| | | | | | | | | | | | | Average | 1.92 |
| 29P | APH-DC | 1 | 100.00 | 102.27 | 2.27 | 0 | 2.27 | 3.9 | 11.3 | 0.108 | 10200 | 5330 | 1.91 |
| | | 2 | 180.00 | 181.13 | 1.13 | 1.14 | 2.27 | 3.9 | 11.2 | 0.108 | 10110 | 5330 | 1.90 |
| | | 3 | 279.98 | 282.11 | 2.13 | 0 | 2.13 | 3.9 | 11.55 | 0.107 | 10440 | 5000 | 2.09 |
| | | | | | | | | | | | | Average | 1.97 |
| 19PB | SC-DC[e] | 9 | 380.00 | 381.00 | 1.00 | 0.70 | 1.70 | 3.9 | ND[f] | NA[g] | NA | NA | NA |
| | | 19 | 449.09 | 449.66 | 0.57 | 1.49 | 2.06 | 3.9 | 9.25 | 0.130 | 8190 | 4860 | 1.69 |
| | | 32 | 527.05 | 528.80 | 1.75 | 0.94 | 2.69 | 3.9 | 13.0 | 0.148 | 11320 | 6320 | 1.79 |
| | | 41 | 561.74 | 563.34 | 1.60 | 0.68 | 2.28 | 3.9 | 11.45 | 0.173 | 9760 | 5360 | 1.82 |
| | | 53 | 619.99 | 622.02 | 2.03 | 0.14 | 2.17 | 3.9 | 11.25 | 0.152 | 9770 | 5100 | 1.92 |
| | | | | | | | | | | | | Average | 1.81 |

[a]Sample weight includes core and fill.
[b]Density of core plus fill assuming average water content of core equals that of fill.
[c]Air-percussion hammer drive core.
[d]Sample composed primarily of coring-related crushed gravel and cobbles. Density value not considered representative and not used in average calculation.
[e]Sonic drive core.
[f]Not determined.
[g]Not applicable.

# Table 4.2-2
# Saturated Formation Dry Bulk Density Data for 19PB Sonic Core Runs

| Core Barrel Diameter (inches) | Core Run Number | Depth Interval (feet below ground surface) | | Average Dry Bulk Density (grams per cubic centimeter [g/cm$^3$]) | | Lost Core (feet) |
|---|---|---|---|---|---|---|
| | | From | To | All Core Runs | Core Runs with Less than 0.2 Feet of Lost Core[a] | |
| 6.16 | 7 | 371.0 | 375.4 | 1.78 | | 0.3 |
| | 8 | 375.7 | 378.4 | 1.98 | | 0.6 |
| | 10 | 381.3 | 386.1 | 1.85 | 1.85 | 0.0 |
| | 11 | 386.1 | 396.1 | 1.85 | 1.85 | 0.0 |
| | 12 | 396.3 | 406.1 | 1.74 | 1.74 | 0.2 |
| | 13 | 406.3 | 416.1 | 1.84 | 1.84 | 0.0 |
| | 14 | 416.2 | 424.4 | 1.80 | 1.80 | 0.1 |
| | 15 | 424.6 | 429.3 | 1.78 | 1.78 | 0.2 |
| | 16 | 429.3 | 434.1 | 1.81 | | 1.1 |
| | 17 | 435.5 | 445.1 | 1.76 | | 1.9 |
| | 18 | 445.3 | 447.9 | 1.77 | | 0.5 |
| | 20 | 450.6 | 460.7 | 1.85 | 1.85 | 0.0 |
| | 21 | 460.7 | 466.3 | 1.66 | 1.66 | 0.2 |
| | 22 | 466.5 | 476.2 | 1.93 | 1.93 | 0.2 |
| | 23 | 476.4 | 478.0 | 2.11 | 2.11 | 0.2 |
| | 24 | 478.2 | 481.9 | 1.78 | | 1.0 |
| | 25 | 481.9 | 489.4 | 1.57 | 1.57 | 0.2 |
| | 26 | 489.6 | 494.6 | 1.85 | | 1.6 |
| | 27 | 495.2 | 499.0 | 1.72 | | 0.7 |
| | 28 | 500.1 | 510.0 | 1.67 | | 0.4 |
| | 29 | 510.0 | 519.4 | 1.57 | 1.57 | 0.0 |
| | 30 | 519.4 | 522.7 | 1.75 | | 1.7 |
| **Average Dry Bulk Density** | | | | **1.79** | **1.80** | |
| 4.5 | 31 | 524.4 | 527.1 | 1.75 | 1.75 | 0.0 |
| | 33 | 528.8 | 531.1 | 2.24 | | 0.9 |
| | 34 | 533.0 | 534.1 | 2.34 | | 1.3 |
| | 35 | 534.4 | 543.1 | 1.85 | 1.85 | 0.2 |
| | 36 | 543.3 | 545.7 | 2.23 | | 1.0 |
| | 37 | 545.9 | 549.6 | 1.83 | | 1.9 |
| | 38 | 550.7 | 553.3 | 1.79 | | 1.0 |
| | 39 | 553.7 | 557.8 | 2.17 | | 2.0 |
| | 40 | 559.6 | 560.4 | 2.95 | | 0.5 |
| | 42 | 563.3 | 565.9 | 1.60 | 1.60 | 0.0 |
| | 43 | 565.9 | 567.1 | 2.04 | | 1.3 |
| | 44 | 568.4 | 570.9 | 2.39 | | 0.8 |
| | 45[b] | 571.7 | 578.3 | 1.78 | 1.78 | 0.0 |
| | 46 | 578.3 | 581.8 | 2.15 | 2.15 | 0.1 |
| | 47 | 581.9 | 587.4 | 1.71 | | 0.9 |
| | 48 | 588.3 | 591.7 | 1.86 | 1.86 | 0.2 |
| | 49 | 591.9 | 601.0 | 1.88 | | 0.9 |
| | 50 | 601.9 | 605.2 | 1.86 | 1.86 | 0.0 |
| | 51 | 605.2 | 615.3 | 1.85 | 1.85 | 0.0 |
| | 52 | 615.3 | 619.9 | 1.64 | 1.64 | 0.0 |
| | 54 | 622.0 | 627.9 | 1.72 | | 0.5 |
| | 55 | 628.4 | 633.8 | 1.81 | 1.81 | 0.2 |
| **Average Dry Bulk Density** | | | | **1.97** | **1.82** | |

[a]Shading indicates excluded core run.

[b]Last core segment deleted from density calculation due to field error in mass.

Table 5.1-1
Laboratory Analysis Data for 19PB, 24P, and 29P Drive Core Samples
(Blanks indicate unmeasured parameters)

| Well Name | Sample Number | Sample Type | Volumetric Water Content ($cm^3/cm^3$) | | Calculated Porosity ($cm^3/cm^3$) | Density ($g/cm^3$) | | Wet Sieve (%) | | | Hydrometer (%) | | Saturated Hydraulic Conductivity (cm/sec) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Field Sample | Saturated Sample | | Specific Gravity | Dry Bulk Density | Gravel | Sand | Fines | Silt | Clay | |
| 19PB | 19PB-380.00-380.50-C | Core | 0.33 | 0.38 | 0.27 | 2.59 | 1.95 | 70 | 23 | 7 | | 4 | 4.2E-06 |
| 19PB | 19PB-380.50-381.00-C | Core | 0.38 | 0.48 | 0.33 | 2.53 | 1.74 | 21 | 63 | 16 | | 9 | 2.3E-06 |
| 19PB | 19PB-449.10-449.40-C | Core | 0.21 | 0.28 | 0.30 | 2.58 | 1.82 | 53 | 40 | 7 | | 3 | Censored |
| 19PB | 19PB-449.40-449.70-C | Core | 0.25 | 0.29 | 0.22 | 2.53 | 1.97 | 65 | 28 | 7 | | 5 | |
| 19PB | 19PB-527.61-528.11-C | Core | 0.29 | 0.31 | 0.25 | 2.53 | 1.94 | 46 | 38 | 16 | | 9 | 1.4E-05 |
| 19PB | 19PB-528.11-528.61-C | Core | 0.29 | 0.32 | 0.26 | 2.55 | 1.97 | 43 | 41 | 16 | | 9 | 7.0E-07 |
| 19PB | 19PB-562.07-562.57-C | Core | 0.32 | 0.34 | 0.28 | 2.51 | 1.86 | 43 | 47 | 10 | | 4 | 7.6E-06 |
| 19PB | 19PB-562.57-563.07-C | Core | 0.31 | 0.33 | 0.27 | 2.54 | 1.93 | 23 | 64 | 13 | | 5 | 1.1E-06 |
| 19PB | 19PB-620.75-621.25-C | Core | 0.38 | 0.45 | 0.31 | 2.56 | 1.85 | 37 | 50 | 13 | | 8 | 1.7E-05 |
| 19PB | 19PB-621.25-621.75-C | Core | 0.35 | 0.37 | 0.31 | 2.56 | 1.84 | 34 | 53 | 13 | | 7 | 5.3E-07 |
| 24P | 24P-120.13-120.58-C | Core | 0.13 | 0.26 | 0.27 | 2.59 | 1.88 | 31 | 58 | 11 | 6 | 6 | 2.8E-03 |
| 24P | 24P-120.58-121.08-C | Core | 0.14 | 0.25 | 0.29 | 2.59 | 1.85 | 30 | 60 | 10 | 4 | 6 | 2.6E-03 |
| 24P | 24P-121.08-121.34-C | Shoe Core | | | | | | 24 | 60 | 16 | 9 | 6 | |
| 24P | 24P-160.87-161.37-C | Core | 0.46 | 0.51 | 0.37 | 2.56 | 1.62 | 39 | 55 | 6 | 3 | 3 | 1.8E-03 |
| 24P | 24P-161.37-161.87-C | Core | 0.16 | 0.28 | 0.26 | 2.56 | 1.89 | 28 | 53 | 9 | 5 | 5 | 2.4E-03 |
| 24P | 24P-161.87-162.13-C | Shoe Core | | | | | | 34 | 52 | 14 | 4 | 9 | |

# Table 5.1-1
# Laboratory Analysis Data for 19PB, 24P, and 29P Drive Core Samples
# (Blanks indicate unmeasured parameters)

| Well Name | Sample Number | Sample Type | Volumetric Water Content ($cm^3/cm^3$) | | Calculated Porosity ($cm^3/cm^3$) | Density ($g/cm^3$) | | Wet Sieve (%) | | | Hydrometer (%) | | Saturated Hydraulic Conductivity (cm/sec) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Field Sample | Saturated Sample | | Specific Gravity | Dry Bulk Density | Gravel | Sand | Fines | Silt | Clay | |
| 24P | 24P-200.31-200.61-C | Core | 0.18 | 0.28 | 0.11 | 2.58 | 2.30 | 28 | 59 | 13 | 7 | 6 | 6.5E-06 |
| 24P | 24P-200.61-200.87-C | Shoe Core | | | | | | 28 | 62 | 10 | 6 | 5 | |
| 24P | 24P-240.48-240.98-C | Core | 0.13 | 0.16 | 0.24 | 2.59 | 1.98 | 32 | 64 | 4 | 1 | 2 | 3.0E-02 |
| 24P | 24P-240.98-241.48-C | Core | 0.11 | 0.26 | 0.27 | 2.59 | 1.90 | 24 | 64 | 12 | 6 | 6 | 3.2E-03 |
| 24P | 24P-241.48-241.75-C | Shoe Core | | | | | | 21 | 66 | 13 | 6 | 7 | |
| 24P | 24P-280.40-280.73-C | Core | 0.27 | 0.31 | 0.26 | 2.60 | 1.92 | 25 | 56 | 19 | 8 | 10 | 1.7E-05 |
| 24P | 24P-280.73-281.00-C | Shoe Core | | | | | | 19 | 56 | 25 | 12 | 14 | |
| 24P | 24P-322.50-322.75-C | Core | 0.19 | 0.23 | 0.18 | 2.63 | 2.16 | 32 | 49 | 19 | 10 | 9 | 1.7E-05 |
| 24P | 24P-322.75-323.25-C | Core | 0.16 | 0.21 | 0.22 | 2.63 | 2.05 | 29 | 50 | 21 | 9 | 13 | 1.2E-04 |
| 24P | 24P-323.25-323.44-C | Shoe Core | | | | | | 25 | 40 | 35 | 15 | 19 | |
| 24P | 24P-360.00-360.02-C | Core | | | | 2.54 | | 33 | 47 | 20 | 10 | 10 | |
| 24P | 24P-360.02-360.52-C | Core | 0.15 | 0.27 | 0.32 | 2.54 | 1.74 | 35 | 49 | 16 | 9 | 7 | 5.1E-03 |
| 24P | 24P-360.52-360.71-C | Shoe Core | | | | | | 49 | 33 | 18 | 9 | 8 | |
| 24P | 24P-80.43-80.93-C | Core | 0.10 | 0.19 | 0.22 | 2.54 | 1.97 | 29 | 61 | 10 | 6 | 4 | 4.9E-04 |
| 24P | 24P-80.93-81.43-C | Core | 0.12 | 0.21 | 0.24 | 2.54 | 1.93 | 29 | 60 | 11 | 6 | 6 | 2.2E-03 |
| 24P | 24P-81.43-81.69-C | Shoe Core | | | | | | 24 | 62 | 14 | 6 | 8 | |

Table 5.1-1
Laboratory Analysis Data for 19PB, 24P, and 29P Drive Core Samples
(Blanks indicate unmeasured parameters)

| Well Name | Sample Number | Sample Type | Volumetric Water Content ($cm^3/cm^3$) | | Calculated Porosity ($cm^3/cm^3$) | Density ($g/cm^3$) | | Wet Sieve (%) | | | Hydrometer (%) | | Saturated Hydraulic Conductivity (cm/sec) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Field Sample | Saturated Sample | | Specific Gravity | Dry Bulk Density | Gravel | Sand | Fines | Silt | Clay | |
| 29P | 29P-100.50-101.00-C | Core | 0.23 | 0.26 | 0.25 | 2.52 | 1.90 | 36 | 48 | 16 | 8 | 8 | 8.4E-06 |
| 29P | 29P-101.00-101.50-C | Core | 0.19 | 0.21 | 0.19 | 2.52 | 2.03 | 54 | 34 | 12 | 6 | 6 | 9.6E-06 |
| 29P | 29P-102.00-102.27-C | Shoe Core | | | | | | 50 | 36 | 14 | 6 | 8 | |
| 29P | 29P-180.00-180.36-C | Core | 0.23 | 0.25 | Censored | 2.58 | Censored | 47 | 39 | 14 | Censored | Censored | 1.8E-05 |
| 29P | 29P-180.36-180.86-C | Core | 0.13 | 0.22 | 0.21 | 2.58 | 2.04 | 54 | 34 | 12 | 6 | 6 | 5.0E-05 |
| 29P | 29P-180.86-181.13-C | Shoe Core | | | | | | 48 | 38 | 14 | 4 | 10 | |
| 29P | 29P-280.84-281.34-C | Core | 0.22 | 0.27 | 0.27 | 2.56 | 1.88 | 43 | 42 | 15 | 5 | 10 | 4.4E-05 |
| 29P | 29P-281.34-281.84-C | Core | 0.18 | 0.32 | 0.24 | 2.56 | 1.94 | 55 | 31 | 14 | 6 | 8 | 1.4E-05 |
| 29P | 29P-281.84-282.11-C | Shoe Core | | | | | | 41 | 39 | 20 | 7 | 13 | |

# Table 5.1-2
# Mean Dry Bulk Density and Saturated Hydraulic Conductivity Data for Drive Core Samples

| Well Name | Sample Number | Dry Bulk Density Arithmetic Mean ($g/cm^3$) | Saturated Hydraulic Conductivity (cm/sec) | | |
|---|---|---|---|---|---|
| | | | Core Value | Geometric Mean | Arithmetic Mean |
| 19PB | 19PB-380.00-380.50-C | 1.89 | 4.2E-06 | 3.0E-06 | 5.9E-06 |
| | 19PB-380.50-381.00-C | | 2.3E-06 | | |
| | 19PB-527.61-528.11-C | | 1.4E-05 | | |
| | 19PB-528.11-528.61-C | | 7.0E-07 | | |
| | 19PB-562.07-562.57-C | | 7.6E-06 | | |
| | 19PB-562.57-563.07-C | | 1.1E-06 | | |
| | 19PB-620.75-621.25-C | | 1.7E-05 | | |
| | 19PB-621.25-621.75-C | | 5.3E-07 | | |
| 24P | 24P-80.43-80.93 | 1.94 | 4.9E-04 | 6.50E-04 | 3.90E-03 |
| | 24P-80.93-81.43 | | 2.2E-03 | | |
| | 24P-120.13-120.58 | | 2.8E-03 | | |
| | 24P-120.58-121.08 | | 2.6E-03 | | |
| | 24P-160.87-161.37 | | 1.8E-03 | | |
| | 24P-161.37-161.87 | | 2.4E-03 | | |
| | 24P-200.31-200.61 | | 6.5E-06 | | |
| | 24P-240.48-240.98 | | 3.0E-02 | | |
| | 24P-240.98-241.48 | | 3.2E-03 | | |
| | 24P-280.40-280.73 | | 1.7E-05 | | |
| | 24P-322.50-322.75 | | 1.7E-05 | | |
| | 24P-322.75-323.25 | | 1.2E-04 | | |
| | 24P-360.02-360.52 | | 5.1E-03 | | |
| 29P | 29P-100.50-101.00 | 1.96 | 8.4E-06 | 1.9E-05 | 2.4E-05 |
| | 29P-101.00-101.50 | | 9.6E-06 | | |
| | 29P-180.36-180.86 | | 1.8E-05 | | |
| | 29P-180.00-180.36 | | 5.0E-05 | | |
| | 29P-280.84-281.34 | | 4.4E-05 | | |
| | 29P-281.34-281.84 | | 1.4E-05 | | |

Table 5.1-3
Laboratory Particle Size Distribution Data,
Summary Statistics for 24P and 29P Drive Core Samples

| Well Name | Depth Interval Containing Data (feet) | | Number of Samples in Depth Interval | Wet Sieve Parameter | Minimum (%) | Maximum (%) | Average (%) | Standard Deviation | Coefficient of Variation |
|---|---|---|---|---|---|---|---|---|---|
| 24P | 80.43 | 360.71 | 22 | Gravel | 19 | 49 | 30 | 6 | 22 |
| | | | | Sand | 33 | 66 | 55 | 8 | 15 |
| | | | | Fines | 4 | 35 | 15 | 7 | 46 |
| 29P | 100.5 | 282.11 | 9 | Gravel | 36 | 55 | 48 | 7 | 14 |
| | | | | Sand | 31 | 48 | 38 | 5 | 13 |
| | | | | Fines | 12 | 20 | 15 | 2 | 17 |

Table 5.1-4
Laboratory Particle Size Distribution Data,
Summary Statistics for 19PB Sonic Grab Core Samples

| Parameter | Depth Interval Containing Data (feet) | | Number of Samples in Depth Interval | Minimum | Maximum | Average | Standard Deviation | Coefficient of Variation |
|---|---|---|---|---|---|---|---|---|
| Wet Sieve Gravel (%) | 352.4 | 631.1 | 199 | 3.4 | 83.4 | 40.0 | 18.0 | 45 |
| Wet Sieve Sand (%) | 352.4 | 631.1 | 199 | 14.8 | 75.6 | 45.6 | 14.2 | 31 |
| Wet Sieve Fines (%) | 352.4 | 631.1 | 197 | 0.6 | 41.3 | 14.6 | 6.9 | 47 |

Table 5.1-5
Summary of Laboratory Analyses of 19PB Sonic Core Grab Samples
Repacked to Target Densities at Air-Dried and Optimum Water Contents
(Blanks indicate unmeasured parameters)

| Sample Number | Density ($g/cm^3$) | | Calculated Porosity ($cm^3/cm^3$) | Saturated Volumetric Water Content ($cm^3/cm^3$) | Saturated Hydraulic Conductivity (cm/sec) | Atterberg Limits Fines Classification | Particle Size Analysis (Percent)) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Wet Sieve | | | | Hydrometer |
| | Dry Bulk Density | Specific Gravity | | | | | Cobbles | Gravel | Sand | Fines | Clay |
| 19PB-388.9-394.1-SCR | 1.76 | 2.57 | 0.315 | 0.310 | 8.8E-04 | ML | 37 | 27 | 33 | 3 | 5 |
| 19PB-401.1-405.0-SCR | 1.74 | 2.54 | 0.315 | 0.317 | 3.1E-03 | ML | 0 | 43 | 47 | 10 | 7 |
| 19PB-406.3-408.5-SCR | 1.76 | 2.58 | 0.318 | 0.309 | 4.4E-03 | CL | 0 | 47 | 45 | 8 | 5 |
| 19PB-437.8-441.2-SCR | 1.75 | 2.53 | 0.308 | 0.317 | 8.8E-04 | | 0 | 19 | 72 | 9 | 5 |
| 19PB-450.3-455.1-SCR | 1.73 | 2.55 | 0.322 | 0.317 | 3.9E-03 | ML | 0 | 41 | 46 | 13 | 9 |
| 19PB-457.2-460.7-SCR | 1.79 | 2.55 | 0.298 | 0.295 | 3.0E-04 | ML | 0 | 45 | 42 | 13 | 6 |
| 19PB-478.2-481.9-SCR | 1.69 | 2.54 | 0.335 | 0.331 | 7.3E-04 | ML | 0 | 39 | 44 | 17 | 12 |
| 19PB-481.9-484.4-SCR | 1.65 | 2.53 | 0.348 | 0.342 | 2.1E-03 | ML | 0 | 45 | 42 | 13 | 11 |
| 19PB-512.1-514.2-SCR | 1.74 | 2.59 | 0.328 | 0.324 | 9.8E-04 | | | | | | |
| 19PB-517.3-519.4-SCR | 1.69 | 2.54 | 0.335 | 0.336 | 2.1E-03 | ML | 0 | 38 | 52 | 10 | 6 |
| 19PB-519.4-522.1-SCR | 1.68 | 2.53 | 0.336 | 0.346 | 5.4E-03 | CL | 0 | 48 | 40 | 12 | 7 |
| 19PB-547.6-553.3-SCR | 1.73 | 2.58 | 0.329 | 0.329 | 3.0E-04 | CL-ML | 0 | 38 | 43 | 19 | 11 |
| 19PB-553.7-557.8-SCR | 1.73 | 2.56 | 0.324 | 0.313 | 1.2E-04 | ML | 0 | 23 | 57 | 20 | 11 |
| 19PB-598.7-602.9-SCR | 1.67 | 2.52 | 0.337 | 0.326 | 1.8E-04 | ML | 0 | 24 | 60 | 16 | 8 |
| 19PB-618.9-624.9-SCR | 1.70 | 2.55 | 0.333 | 0.336 | 2.3E-04 | ML | 0 | 26 | 56 | 18 | 10 |
| 19PB-406.3-408.5-SCRM | 1.90 | | 0.264 | 0.251 | 6.9E-05 | | | | | | |
| 19PB-457.2-460.7-SCRM | 1.90 | | 0.255 | 0.262 | 4.0E-05 | | | | | | |
| 19PB-478.2-481.9-SCRM | 1.90 | | 0.252 | 0.253 | 7.9E-06 | | | | | | |
| 19PB-481.9-484.4-SCRM | 1.90 | | 0.252 | 0.244 | 1.6E-05 | | | | | | |
| 19PB-519.4-522.1-SCRM | 1.90 | | 0.249 | 0.261 | 7.6E-05 | | | | | | |
| 19PB-553.7-557.8-SCRM | 1.90 | | 0.258 | 0.265 | 1.0E-05 | | | | | | |
| 19PB-618.9-624.9-SCRM | 1.90 | | 0.255 | 0.237 | 5.2E-07 | | | | | | |

# Table 5.1-6
# Mean Saturated Hydraulic Conductivity Data for 19PB Drive Core Samples and Repacked Laboratory Samples

| Sample Number | Core Type | Saturated Hydraulic Conductivity (cm/sec) | | |
|---|---|---|---|---|
| | | Core Value | Geometric Mean | Arithmetic Mean |
| 19PB-380.00-380.50-C | Drive Core | 4.20E-06 | 3.0E-06 | 5.9E-06 |
| 19PB-380.50-381.00-C | | 2.30E-06 | | |
| 19PB-527.61-528.11-C | | 1.40E-05 | | |
| 19PB-528.11-528.61-C | | 7.00E-07 | | |
| 19PB-562.07-562.57-C | | 7.60E-06 | | |
| 19PB-562.57-563.07-C | | 1.10E-06 | | |
| 19PB-620.75-621.25-C | | 1.70E-05 | | |
| 19PB-621.25-621.75-C | | 5.30E-07 | | |
| 19PB-406.3-408.5-SCR | Repacked Core at Air-Dried Water Content | 4.4E-03 | 8.4E-04 | 1.9E-03 |
| 19PB-457.2-460.7-SCR | | 3.0E-04 | | |
| 19PB-478.2-481.9-SCR | | 7.3E-04 | | |
| 19PB-481.9-484.4-SCR | | 2.1E-03 | | |
| 19PB-519.4-522.1-SCR | | 5.4E-03 | | |
| 19PB-553.7-557.8-SCR | | 1.2E-04 | | |
| 19PB-618.9-624.9-SCR | | 2.3E-04 | | |
| 19PB-406.3-408.5-SCRM | Repacked Core at Optimum Water Content | 6.90E-05 | 1.7E-05 | 3.9E-05 |
| 19PB-457.2-460.7-SCRM | | 4.00E-05 | | |
| 19PB-478.2-481.9-SCRM | | 7.90E-06 | | |
| 19PB-481.9-484.4-SCRM | | 1.60E-05 | | |
| 19PB-519.4-522.1-SCRM | | 7.60E-05 | | |
| 19PB-553.7-557.8-SCRM | | 1.00E-05 | | |
| 19PB-618.9-624.9-SCRM | | 5.20E-07 | | |

# Table 5.1-7
# Comparison of Particle Size Distribution Data for 19PB Sonic Grab Core Samples and Repacked Laboratory Sample Splits

| Grab Sample | | | | | | | Repacked Laboratory Sample Split | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample Number | Field Split | | | Weighted Average of Field Split | | | Sample Number | Gravel (%) | Sand (%) | Fines (%) |
| | Gravel (%) | Sand (%) | Fines (%) | Gravel (%) | Sand (%) | Fines (%) | | | | |
| 19PB-388.9-394.1-SC | 42 | 41 | 17 | NA | NA | NA | 19PB-388.9-394.1-SCR | 27 | 33 | 3 |
| 19PB-401.1-406.1-SC | 68 | 25 | 7 | NA | NA | NA | 19PB-401.1-405.0-SCR | 43 | 47 | 10 |
| 19PB-406.3-407.5-SC | 72 | 25 | 3 | 69 | 28 | 3 | 19PB-406.3-408.5-SCR | 47 | 45 | 8 |
| 19PB-407.5-407.9-SC | 54 | 42 | 4 | | | | | | | |
| 19PB-407.9-408.5-SC | 75 | 24 | 1 | | | | | | | |
| 19PB-437.2-441.2-SC | 21 | 69 | 10 | NA | NA | NA | 19PB-437.8-441.2-SCR | 19 | 72 | 9 |
| 19PB-450.0-455.1-SC | 71 | 25 | 4 | NA | NA | NA | 19PB-450.3-455.1-SCR | 41 | 46 | 13 |
| 19PB-457.2-460.7-SC | 50 | 37 | 11 | NA | NA | NA | 19PB-457.2-460.7-SCR | 45 | 42 | 13 |
| 19PB-478.2-481.9-SC | 44 | 41 | 15 | NA | NA | NA | 19PB-478.2-481.9-SCR | 39 | 44 | 17 |
| 19PB-481.9-484.4-SC | 49 | 38 | 13 | NA | NA | NA | 19PB-481.9-484.4-SCR | 45 | 42 | 13 |
| 19PB-512.1-514.2-SC | 38 | 49 | 13 | NA | NA | NA | 19PB-512.1-514.2-SCR | | | |
| 19PB-517.3-519.4-SC | 28 | 57 | 15 | NA | NA | NA | 19PB-517.3-519.4-SCR | 38 | 52 | 10 |
| 19PB-519.4-519.7-SC | 52 | 43 | 6 | 67 | 28 | 5 | 19PB-519.4-522.1-SCR | 48 | 40 | 12 |
| 19PB-519.7-522.1-SC | 69 | 26 | 5 | | | | | | | |
| 19PB-547.6-549.6-SC | 26 | 49 | 25 | 22 | 52 | 26 | 19PB-547.6-553.3-SCR | 38 | 43 | 19 |
| 19PB-550.7-553.3-SC | 19 | 55 | 26 | | | | | | | |
| 19PB-553.7-554.8-SC | 31 | 50 | 18 | 27 | 53 | 21 | 19PB-553.7-557.8-SCR | 23 | 57 | 20 |
| 19OB-554.8-555.2-SC | 26 | 53 | 20 | | | | | | | |
| 19PB-555.2-557.8-SC | 25 | 54 | 22 | | | | | | | |
| 19PB-598.7-601.0-SC | 26 | 59 | 15 | 25 | 59 | 16 | 19PB-598.7-602.9-SCR | 24 | 60 | 16 |
| 19PB-601.9-602.9-SC | 25 | 57 | 18 | | | | | | | |
| 19PB-618.9-619.9-SC | 16 | 46 | 39 | 22 | 47 | 30 | 19PB-618.9-624.9-SCR | 26 | 56 | 18 |
| 19PB-622.0-622.5-SC | 28 | 56 | 16 | | | | | | | |
| 19PB-622.5-624.0-SC | 19 | 53 | 27 | | | | | | | |
| 19PB-624.0-624.9-SC | 32 | 34 | 35 | | | | | | | |

Table 5.2-1
Laboratory Particle Size Distribution Data,
Summary Statistics for 16P, 27P, and 28P Drill Cuttings Samples

| Well Name | Depth Interval Containing Data (feet) | | Number of Samples in Depth Interval | Wet Sieve Parameter | Summary Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | | Minimum (%) | Maximum (%) | Average (%) | Standard Deviation (%) | Coefficient of Variation |
| 16P | 2.5 | 165 | 33 | Gravel | 5 | 38 | 21.8 | 8.3 | 38 |
| | | | | Sand | 40 | 61 | 52.3 | 4.5 | 9 |
| | | | | Fines | 11 | 55 | 25.8 | 11.2 | 43 |
| 27P | 2.5 | 180 | 36 | Gravel | 9 | 42 | 20.9 | 7.6 | 36 |
| | | | | Sand | 35 | 76 | 57.7 | 8.8 | 15 |
| | | | | Fines | 6 | 50 | 21.4 | 11.1 | 52 |
| 28P | 2.5 | 240 | 48 | Gravel | 8 | 39 | 23 | 8.7 | 38 |
| | | | | Sand | 42 | 72 | 57.4 | 6.6 | 11 |
| | | | | Fines | 5 | 48 | 19.6 | 10.6 | 54 |

# Table 5.2-2
# Laboratory Particle Size Distribution Data,
# Summary Statistics for 24P and 29P Drill Cuttings Samples

| Well Name | Number of Samples in Depth Interval | Depth Interval Containing Data (feet) | | Wet Sieve Parameter | Summary Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | Minimum (%) | Maximum (%) | Average (%) | Standard Deviation (%) | Coefficient of Variation |
| 24P | 82 | 2.5 | 420 | Gravel | 6.0 | 47.0 | 26.6 | 9.7 | 36 |
| | | | | Sand | 43.0 | 78.0 | 59.3 | 6.3 | 11 |
| | | | | Fines | 3.0 | 36.0 | 14.1 | 7.4 | 53 |
| 29P | 64 | 2.5 | 320 | Gravel | 5.0 | 47.0 | 31.2 | 7.6 | 24 |
| | | | | Sand | 42.0 | 88.0 | 57.5 | 8.7 | 15 |
| | | | | Fines | 4.0 | 19.0 | 11.3 | 3.7 | 33 |

# Table 5.3-1
## Hydraulic Conductivity Data from Constant Head Tests in 19PB Piezometers

| 19PB Piezometer | Test (Sandpack) Interval (feet below ground surface) | | Test Number | Water Injection Rate (gallons/ minute) | Test Interval Length (feet) | Head of Water Acting on Test Interval[a] (feet) | Radius of Borehole (feet) | Hydraulic Conductivity (centimeters/ second) | Average Hydraulic Conductivity (centimeters/ second) |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | | | | | | |
| Deep | 505.1 | 545.2 | 1 | 12.8 | 40.1 | 43.6 | 0.34 | 3.9E-04 | 4.8E-04 |
| | | | 2 | 28.6 | 40.1 | 82.9 | 0.34 | 5.1E-04 | |
| | | | 3 | 35.3 | 40.1 | 110.8 | 0.34 | 5.0E-04 | |
| | | | 4 | 20.7 | 40.1 | 54.3 | 0.34 | 5.2E-04 | |
| Shallow | 350.0 | 401.9 | 1 | 2.3 | 51.9 | 155.6 | 0.25 | 2.0E-05 | 2.0E-05 |
| | | | 2 | 2.3 | 51.9 | 151.0 | 0.25 | 2.0E-05 | |

[a]Head is calculated as the applied head above the water table and assumes that the test interval is below the water table. However, the upper approximately 20 feet of the test interval in the shallow screen is above the water table. This fact was ignored in the calculation of applied head on the shallow screen test interval.

Table 5.3-2
Laboratory Particle Size Distribution Data,
Summary Statistics for 19PB Sonic Core Grab Samples
from both Shallow and Deep Piezometer Sandpack Intervals

| 19PB Piezometer | Number of Samples in Depth Interval | Depth Interval Containing Data (feet) | | Wet Sieve Parameter | Summary Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | Minimum (%) | Maximum (%) | Average (%) | Standard Deviation (%) | Coefficient of Variation |
| Deep | 27 | 506.0 | 544.7 | Gravel | 13.9 | 73.5 | 40.8 | 14.8 | 36 |
| | | | | Sand | 22.5 | 72.2 | 45.8 | 12.5 | 27 |
| | | | | Fines | 3.9 | 23.5 | 13.4 | 4.8 | 36 |
| Shallow | 42 | 352.4 | 401.1 | Gravel | 10.7 | 80.6 | 42.9 | 18.0 | 42 |
| | | | | Sand | 14.8 | 75.6 | 44.7 | 15.5 | 35 |
| | | | | Fines | 3.0 | 26.5 | 12.4 | 5.1 | 41 |

Table 5.3-3
Summary of Average Saturated Hydraulic Conductivity vs. Measurement Scale Data for Site 19 Core and In Situ Tests

| Type of Measurement | Well Name | Material Tested | Number of Samples/ Tests | Depth Interval Covered by Tests (feet bgs | | Average Density ($g/cm^3$) | Average Porosity ($cm^3/cm^3$) | Average Volume (Scale Volume) ($m^3$) | Relative Measurement Scale | Average Saturated Hydraulic Conductivity (m/sec) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | | | Arithmetic Mean | Geometric Mean |
| Laboratory constant head test on drive core samples | 19PB | Alluvium drive core (4 inches in diameter by 6 inches long) | 6 | 389.00 | 563.07 | 1.9 | 0.28 | 1.1E-03 | Smallest | 5.0E-08 | 3.0E-08 |
| Laboratory constant head test on repacked core with an average density of 1.7 $g/cm^3$ | 19PB | Alluvium repacked at air dry water content (6 inches in diameter by 12 inches long) | 13 | 388.9 | 557.8 | 1.7 | 0.32 | 5.6E-03 | Small | 1.9E-05 | 1.2E-05 |
| Laboratory constant head test on repacked core with an average density of 1.9 $g/cm^3$ | 19PB | Alluvium repacked at optimum water content (6 inches in diameter by 12 inches long) | 6 | 406.3 | 557.8 | 1.9 | 0.26 | 5.6E-03 | Small | 3.7E-07 | 2.5E-07 |
| Field piezometer constant head injection test in shallow and deep screens | 19PB | Alluvium formation with volume equal to injected water divided by porosity | 2 | 350.0 | 545.2 | 1.9[a] | 0.26 | 5.6E+00 | Intermediate | 2.5E-06 | 9.8E-07 |
| Field 48-hour aquifer constant rate pump test with all screens open (analysis done on upper two screens) | 19D | Alluvium formation with volume equal to pumped water divided by porosity | 1 | 408.5 | 519.0 | 1.9[a] | 0.26 | 5.2E+02 | Large | 2.7E-05 | 2.7E-05 |

[a]Estimated from borehole geophysical logs.

# Table 6.2-1
# Summary of Censored Geophysical Logs

| Well Name | Record Index Designator (RID) Number | Log Type | Interval (feet) | | Reason for Censoring |
|---|---|---|---|---|---|
| | | | From | To | |
| 16P | 5482 | Acoustic Velocity (Sonic) | 880 | 2898 | Tool does not seem to respond properly, or data are over-filtered. |
| | | Moisture | 1980 | 2898 | Moisture data are suspect; tool is possibly not functioning properly. |
| | 5485 | Density | 0 | 2121 | Density data are suspect; tool is possibly not functioning properly. |
| | | Caliper | 1300 | 2121 | Tool is not responding properly - possibly dragging on the borehole wall. |
| 28P | 5341 | Moisture | 0 | 1196.5 | Moisture data are suspect; tool is possibly not functioning properly or data are over-filtered. |
| | 5337 | Moisture | 1120 | 2050 | Moisture data are suspect; tool is possibly not functioning properly or data are over-filtered. |
| | | Density | 1120 | 2050 | Density data are suspect; tool is possibly not functioning properly or data are over-filtered. |
| 27P | 5536 | Moisture | 0 | 1897.7 | Moisture data are suspect; tool is possibly not functioning properly or data are over-filtered. |
| | | Density | 0 | 1897.7 | Density data are suspect; tool is possibly not functioning properly or data are over-filtered. |
| | | Acoustic Velocity (Sonic) | 607 | 612 | Negative travel times are not possible - tool was not functioning properly over this interval. |
| | | | 622 | 626 | Negative travel times are not possible - tool was not functioning properly over this interval. |
| 29P | 5746 | Conductivity | 345 | 702 | Data unreliable below the water table, as tool was calibrated for the 0 - 15 ohm*m scale. |
| | | Inductive Resistivity | 345 | 702 | Data unreliable below the water table, as tool was calibrated for the 0 - 15 ohm*m scale. |
| | | Resistivity (SPR, R8 - R64) | 0 | 702 | Data are unreliable. |
| | | Resistivity (R32) - repeat | 380 | 585 | Negative resistivity values occur due to tool being run on the "high" scale. |
| | | Resistivity (R64) - repeat | 380 | 585 | Negative resistivity values occur due to tool being run on the "high" scale. |
| | | Acoustic Velocity (Sonic) | 378 | 400 | Negative travel times are not possible - tool was not functioning properly over this interval. |
| 24P | 6031 | Acoustic Velocity (Sonic) | 465 | 1595 | Sonic data are suspect; tool is possibly not functioning properly. |