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Borehole Geophysical Logs at Naval Weapons Industrial Reserve Plant, Dallas, Texas

Open-File Report 00–076

U.S. Department of the Interior
U.S. Geological Survey

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U.S. GEOLOGICAL SURVEY
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Austin, Texas
2000

U.S. DEPARTMENT OF THE INTERIOR

Bruce Babbitt, Secretary

U.S. GEOLOGICAL SURVEY

Charles G. Groat, Director

For additional information write to

District Chief
U.S. Geological Survey
8027 Exchange Dr.
Austin, TX 78754–4733
E-mail: dc_tx@usgs.gov

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U.S. Geological Survey
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CONTENTS

PLATE

Plate is in pocket

FIGURES

TABLE

VERTICAL DATUM AND ABBREVIATIONS

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviations:

cps, counts per second
°F, degree Fahrenheit
ft, foot
ft/min, foot per minute
gal/d, gallon per day
gal/min, gallon per minute
in., inch
µg/L, microgram per liter
mi, mile
mS/m, millisiemens per meter
Ohm-m, Ohm-meter

Acronyms:

EM, electromagnetic
GOCO, government-owned, contractor-operated
NAS, Naval Air Station
NWIRP, Naval Weapons Industrial Reserve Plant
RCRA, Resource Conservation and Recovery Act
RFI, RCRA Facility Investigation
SOUTHDIV, Southern Division Naval Facilities Engineering Command
TCE, trichloroethene
USGS, U.S. Geological Survey

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Abstract

A shallow alluvial aquifer at the Naval Weapons Industrial Reserve Plant near Dallas, Texas, has been contaminated by organic solvents used in the fabrication and assembly of aircraft and aircraft parts. Natural gamma-ray and electromagnetic-induction borehole geophysical logs were obtained from 162 polyvinyl-chloride-cased wells at the plant and were integrated with existing lithologic data to improve site characterization of the subsurface alluvium. Software was developed for filtering and classifying the log data and for processing, analyzing, and creating graphical output of the digital data. The alluvium consists of mostly fine-grained low-permeability sediments; however for this study, the alluvium was classified into low, intermediate, and high clay-content sediments on the basis of the gamma-ray logs. The low clay-content sediments were interpreted as being relatively permeable, whereas the high clay-content sediments were interpreted as being relatively impermeable. Simple statistics were used to identify zones of potentially contaminated sediments on the basis of the gamma-ray log classifications and the electromagnetic-induction log conductivity data.

INTRODUCTION

A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) is being conducted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (SOUTHDIV) at the Naval Weapons Industrial Reserve Plant (NWIRP) located southwest of Dallas, Texas, in Grand Prairie (fig. 1). A base closure is underway at the adjacent Naval Air Station (NAS).

Military and commercial aircraft have been built at NWIRP since operation began in 1941. The facility is a government-owned contractor-operated (GOCO) plant. Vought Aircraft operated the facility from 1948 to 1994, and Northrup Grumman has operated the plant since 1994. Fabrication and assembly of aircraft and aircraft parts require the use of various organic solvents, paints, metals, oils, fuels, and other toxic chemicals.

Previous studies by EnSafe/Allen & Hoshall (1994, 1996a), the firm conducting the RFI, indicated the presence of a dissolved-phase solvent plume in the shallow alluvial aquifer beneath NWIRP and the adjacent NAS. Chemical analysis of water samples collected from monitoring wells during the RFI indicate the presence of organic solvents, such as trichloroethene (TCE) in concentrations ranging from less than analytical detection levels to 27,000 µg/L.

Concern about the fate and transport of the organic solvents in the ground water led SOUTHDIV to request that the U.S. Geological Survey (USGS) conduct a study to develop a better understanding of the geohydrology of the site and the subsurface characterization of the alluvium.

The aquifer consists of fine-grained alluvial sediments deposited over bedrock shale. The complex deposits of sediments with heterogeneous permeabilities, characteristic of alluvial deposits, typically yields a spatially variable permeability distribution with vertical anisotropy and, consequently, stratification of the ground-water contaminant plume. Descriptive lithologic log data were available for subsurface geologic site characterization (EnSafe/Allen & Hoshall, 1994, 1996a). Lithologic logs are subjective, involving the field description of the sediments without the aid of laboratory tests for grain-size distribution and mineralogy. The lithologic logs were prepared by several geologists, resulting in varied descriptions of the sediments. Natural gamma-ray and electromagnetic (EM)-induction

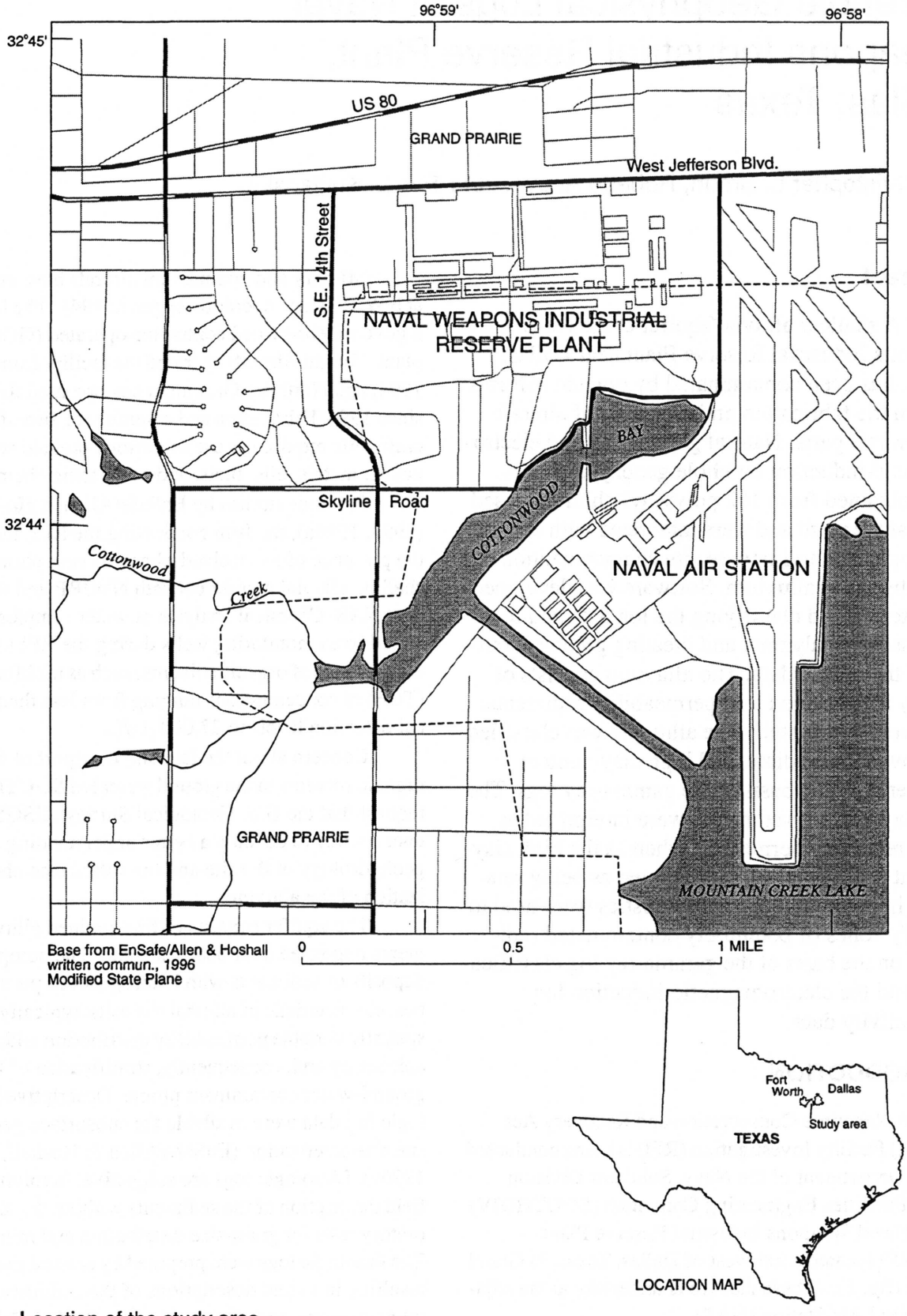

Figure 1. Location of the study area.

logs, which were collected by the USGS in 1997, provide an objective method for classifying the relative clay content of subsurface sediments and for distinguishing relatively permeable zones from relatively impermeable zones. These borehole geophysical log data were integrated with the existing lithologic log data to determine the relative clay content and the conductance of subsurface materials.

Purpose and Scope

This report describes the capabilities of the logging tools used to collect data to characterize the subsurface alluvium at NWIRP and discusses the processing and analysis of the data resulting from the logging. All logs collected at NWIRP by the USGS during July and August 1997 are included in this report and are interpreted and plotted in detail.

Description of Study Area

The study area is in north-central Texas in Dallas County adjacent to the city of Grand Prairie, southwest of Dallas. NWIRP (314 acres) is bounded on the east by NAS (837 acres), on the south by Cottonwood Bay, and on the north and west by residential, commercial, and industrial areas of Grand Prairie (fig. 1). The NWIRP site is relatively flat and drains into Cottonwood Bay, then drains towards Mountain Creek Lake, which drains into the West Fork Trinity River about 4 mi to the northeast. Land-surface altitudes range from 502 to 460 ft above sea level west to east and from 496 to 462 ft above sea level north to south (Jones and Paillet, 1997).

The climate is subhumid with summers generally long and hot (mean maximum July temperature during 1961–90 about 96 °F) and winters generally short and mild (mean minimum January temperature during 1961–90 about 34 °F) (Ramos, 1997). The average annual precipitation in north-central Texas is 32 in., with most of the precipitation occurring during spring and fall.

NWIRP is located on a stream terrace about 40 to 80 ft above the current flood plain of the West Fork Trinity River. The terrace alluvium is composed of Quaternary alluvial deposits and is underlain by the Upper Cretaceous Eagle Ford Shale, which dips very gently toward the east-southeast. The Upper Cretaceous Austin Chalk and Taylor Marl overlie the Eagle Ford Shale in eastern Dallas County. However, in western Dallas County where NWIRP is located, the Austin Chalk and Taylor Marl were removed by erosion during the late Tertiary Period, resulting in an unconformable contact between the Eagle Ford Shale and the Quaternary alluvial deposits (Dallas Geological Society, 1965).

The alluvial aquifer at NWIRP ranges in thickness from about 10 to 75 ft and consists of fine sand, silt, and clay. EnSafe/Allen & Hoshall (1994) identified three distinct water-yielding zones separated by thin, silty, clay layers. Pumping tests at more than 20 wells produced 1.5 to 2.0 gal/min of sustained flow from each well (Jones and Paillet, 1997). The bluish-black Eagle Ford Shale forms an underlying confining unit.

Approach

USGS personnel used portable geophysical well-logging equipment with a natural gamma-ray sonde and an EM-induction sonde to log 162 polyvinyl-chloride-cased wells at NWIRP during July and August 1997. At nested piezometers, only the deepest well at each site was logged. Each day, wells were logged proceeding from the least contaminated wells to the most contaminated wells on the basis of TCE concentrations from EnSafe/Allen & Hoshall (1996b). The geophysical-sonde probe and wetted cable were decontaminated after each use with a phosphate-free detergent wash. A scrub brush was used to remove mud from the probe, and both the probe and wetted part of the cable were rinsed with potable water. Northrup-Grumman granted permission for disposal of the rinsate, less than 2 gal/d, at the decontamination facility. Personnel tried to maintain a constant logging speed of 20 ft/min at each well. The geophysical log data were collected in digital form in the field using a laptop personal computer, stored on floppy disk, and subsequently entered into a database for analysis and graphical display. (See appendix for log data.) Multiple lithologic sections were developed from the logs and are described and plotted in detail by Anaya and others (2000).

After the field data were collected, well-construction and descriptive lithologic information were entered into ASCII text files for plotting with the geophysical logs. The Perl programming language was used to develop software for filtering the data (reducing statistical variations); for classifying the clay content of the sediments (assigning ranges of low, intermediate, and high on the basis of the natural gamma-ray logs);

for integrating the gamma-ray and EM log data with lithologic descriptions; and for processing, analyzing, and creating graphical output of the digital data.

After the clay content of the sediments was classified on the basis of the gamma-ray logs, the EM log data for wells located in uncontaminated areas were grouped by clay-content classification to determine the range of conductivity for each class of sediment. Simple statistical tools were used to verify that each class was unique and to determine the median and standard deviation of the conductivity of the sediments in uncontaminated areas. Conductivities greater than or equal to the median plus one standard deviation for a particular sediment class were interpreted as having anomalously large dissolved solids concentrations in the ground water at that location. Software was developed to define and plot the locations of these anomalous conductivity values.

BOREHOLE GEOPHYSICAL LOGS

The natural gamma-ray log provides a record of the natural gamma radiation detected in a borehole from materials within about 1 ft of the sonde (Keys and MacCary, 1971). The emission of natural gamma-ray particles is directly related to the amount of clay within rock materials because clay minerals have a higher percentage of radioactive potassium, thorium, and uranium isotopes than do many other minerals in sedimentary rocks. Gamma-ray logs have been used extensively in alluvial deposits to provide quantifiable data on the clay content of lithologic units. A clean sand produces gamma-ray particle emissions at a much lower rate than a silty clay. Because the permeability of a lithologic unit is inversely related to the amount of clay sediments within the lithologic unit, a silty sand or sandy clayey silt on a lithologic log can be compared with the gamma-ray log to quantify the relative clay content and thus, the relative permeabilities of subsurface sediments. Low clay-content sediments are considered relatively permeable, whereas high clay-content sediments are considered relatively impermeable.

The EM-induction log records the conductivity and resistivity of materials within about 3 ft of the sonde (McNeill and others, 1990). The conductivity of aquifer materials is sometimes used to identify zones of groundwater contamination. In a study of a sand and gravel aquifer of glacial origin, the conductivity ranged from less than 5 to 10 mS/m for uncontaminated water-bearing zones of clean sand and gravel, from 15 to 45 mS/m for uncontaminated water-bearing zones of silt and clay, and from 10 to 80 mS/m for contaminated water-bearing zones of sand and gravel (Williams and others, 1993).

Gamma-Ray Log Processing and Analysis

Gamma-ray log data, radiation emissions recorded in counts per second, were obtained with a scintillometer-logging sonde at 0.1-ft downhole intervals and were sent uphole digitally. The same gamma-ray logging sonde was used to collect all gamma-ray log data at the site over a relatively short period (15 days) to mitigate the effects of uncalibrated, raw gamma-radiation emissions. Natural gamma radiation is a random phenomenon and, thus, produces variable emissions even when the sonde is stationary (Schlumberger, 1972). A program was created to filter the statistical variations of the data with a user-defined, one-dimensional weighted-average convolution (moving window) algorithm. Using a trial and error method, a set of 15 windows was selected so that the weightings were linearly distributed with a 5:1 ratio between the central window and the outermost windows. The following equation was used to filter the gamma-ray logs for all of the wells at the NWIRP site:

$$\begin{aligned} gamma_i = {} & 0.023 \times g_{i-7} + 0.037 \times g_{i-6} + 0.050 \times g_{i-5} \\ & + 0.063 \times g_{i-4} + 0.076 \times g_{i-3} + 0.090 \times g_{i-2} \\ & + 0.103 \times g_{i-1} + 0.116 \times g_i + 0.103 \times g_{i+1} \\ & + 0.090 \times g_{i+2} + 0.076 \times g_{i+3} + 0.063 \times g_{i+4} \\ & + 0.050 \times g_{i+5} + 0.037 \times g_{i+6} + 0.023 \times g_{i+7}, \end{aligned}$$

where

$gamma_i$ = filtered gamma radiation, in counts per second,

g_i = actual gamma radiation, in counts per second, and

i = central window.

The filter had a smoothing effect on the graphical output of the logs, which aided in the interpretation of the relative clay content of sediments (fig. 2).

The interpretation of lithology from gamma-ray logs began with generalization of the gamma-ray log data using the digital filter and classification by compar-

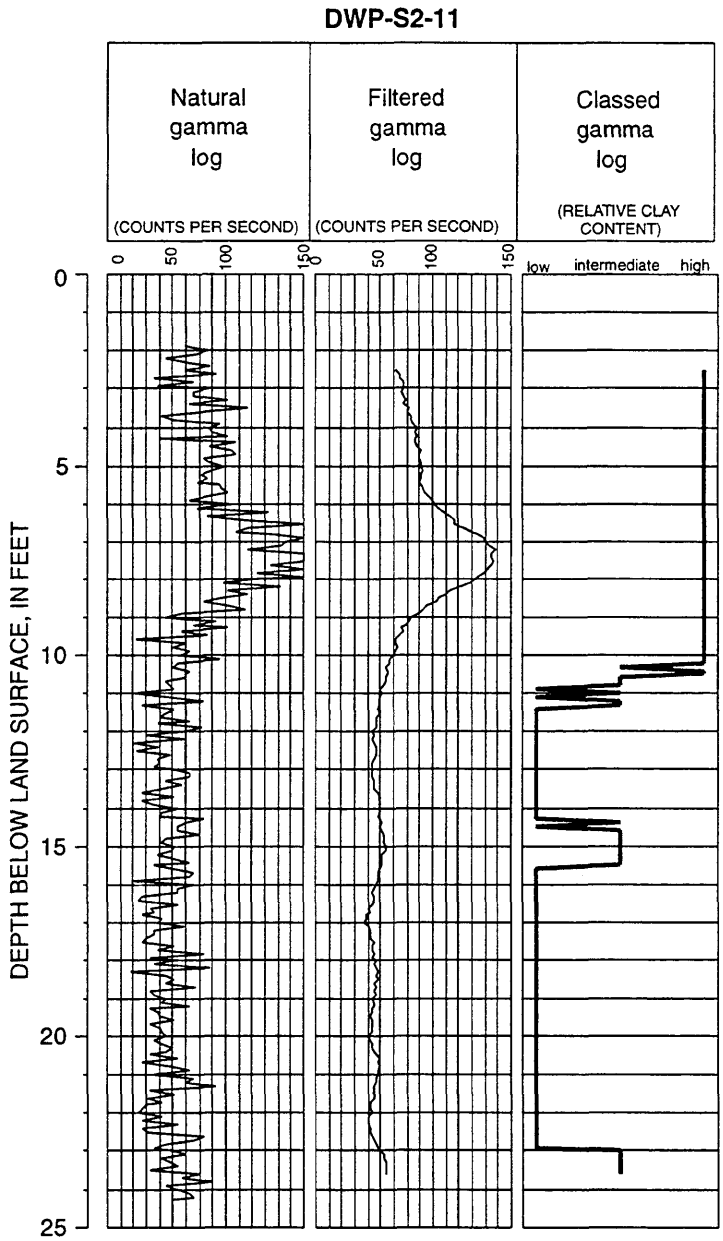

Figure 2. Comparison of raw (natural), filtered, and classified (classed) gamma-ray log data.

ing the filtered log data with existing lithologic log data. The filtering removed the statistical variations inherent in gamma radiation, whereas the classification aided in visual interpretation and separation of the log data into low, intermediate, and high clay-content sediments. Exploratory analysis of the filtered logs, in conjunction with their associated lithologic descriptions, provided values used in the development of an algorithm to separate the filtered gamma-ray log data into three groups on the basis of relative clay content. Classification of the gamma-ray data into low (less than 50 cps), intermediate (50 to 55 cps), and high (greater than 55 cps) relative clay content (fig. 2) simplified the process of correlating the well logs to develop lithologic sections.

Electromagnetic-Induction Log Processing and Analysis

The EM-induction logging tool uses an electromagnetic field to induce an electric current through the materials surrounding the borehole and measures conductivity, in millisiemens per meter, and inversely, the resistivity, in ohm-meters, of the materials within about 3 ft of the detector. The conductivity data for wells with no detected contaminants in the water (EnSafe/Allen & Hoshall, 1996b) were analyzed to determine the natural variability of conductivity for each of the sediment classes defined with the gamma-ray log data. Boxplots used in an initial exploratory analysis of the conductivity data indicated that for the majority of the data (interquartile range), conductivities generally increased as relative clay content increased (fig. 3). The Wilcoxon rank-sum test (Helsel and Hirsch, 1992) was used to determine whether conductivities for high clay-content sediments are the same as conductivities for intermediate clay-content sediments, whether conductivities for intermediate clay-content sediments are the same as conductivities for low clay-content sediments, and whether conductivities for low clay-content sediments are the same as conductivities for high clay-content sediments. The tests indicated a statistically significance difference at the $\alpha = 0.05$ significance level (two-sided p-value <=0.0000), thus providing an independent validation of the gamma-ray-based sediment classes.

The generally small concentrations of contaminants within the subsurface plume (EnSafe/Allen & Hoshall, 1994, 1996a) and mostly high relative clay content of sediments within the study area (see well logs in appendix) prohibited a direct quantifiable relation between conductivity and vertical distribution of the contaminant plume. A dataset of conductivities from the well log data for wells with no detected contaminants in the water was used to establish a baseline for the natural distribution of conductivity within the aquifer materials. The statistical medians and standard deviations were determined for low, intermediate, and high clay-content sediments (table 1). Conductivities greater than or equal to the median plus one standard deviation for each of the sediment classes were interpreted as indicators of potentially contaminated sediments. Conductivities equal to or greater than 155.63 mS/m for low clay-content sediments and equal to or greater than 194.68 mS/m for intermediate clay-content sediments indicated potential contamination. Conductivities for high clay-content sediments were not used to identify potentially contaminated zones because of the increased variance in conductivity associated with increases in relative clay content. The interquartile range in conductivity for high clay-content sediments (103 mS/m) was about 2 times that for low (49 mS/m) and intermediate (52 mS/m) clay-content sediments (fig. 3).

Table 1. Statistics for clay-content sediment classes in contaminant-free areas of shallow alluvial aquifer

[mS/m, millisiemens per meter]

Sediment class	Conductivity (mS/m)		
	Mean	Median	Standard deviation
Low clay	118.38	107.49	48.14
Intermediate clay	144.72	144.97	49.71
High clay	217.27	211.18	62.25

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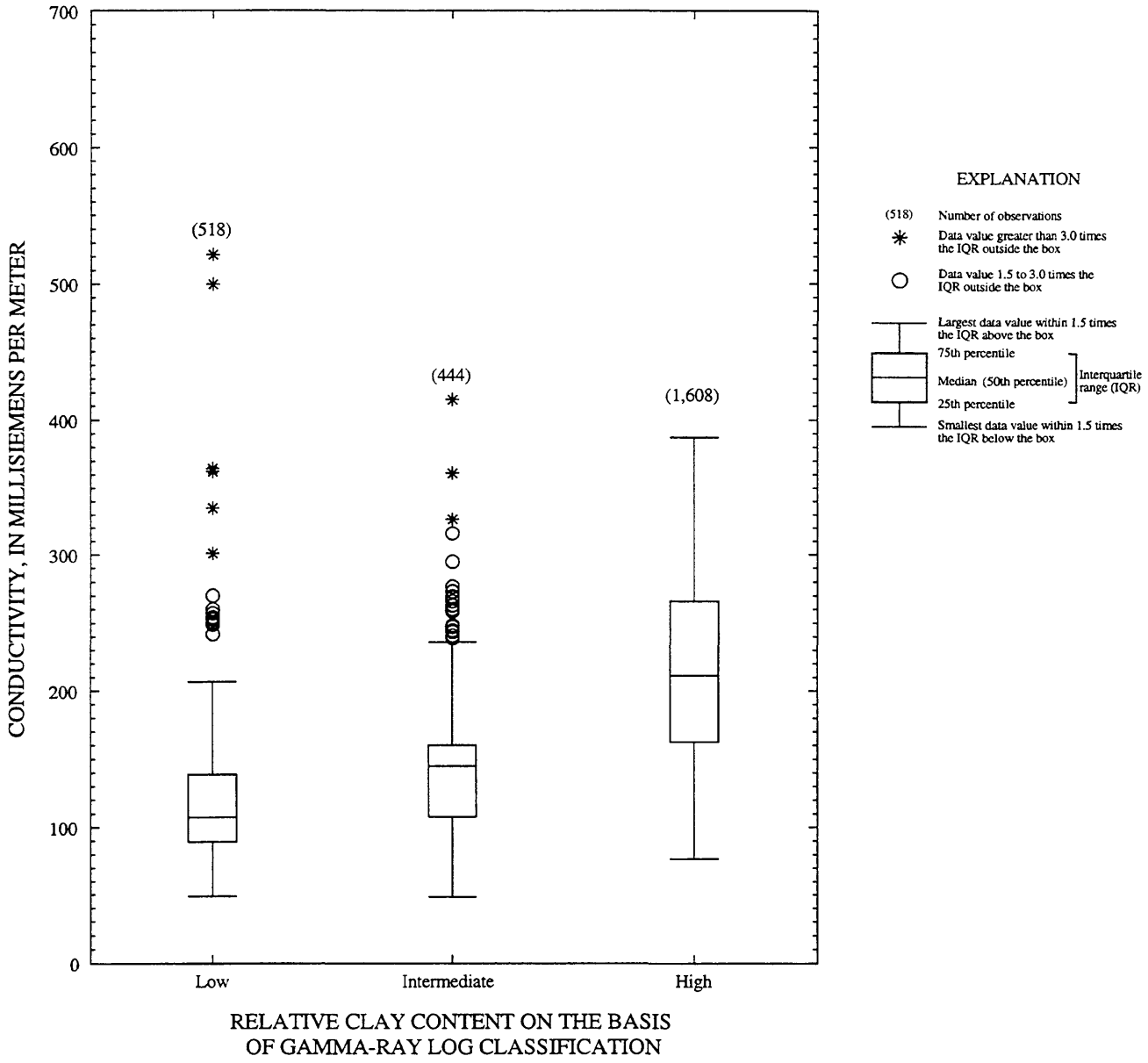

Figure 3. Range and distribution of conductivity for wells with no detected contaminants.

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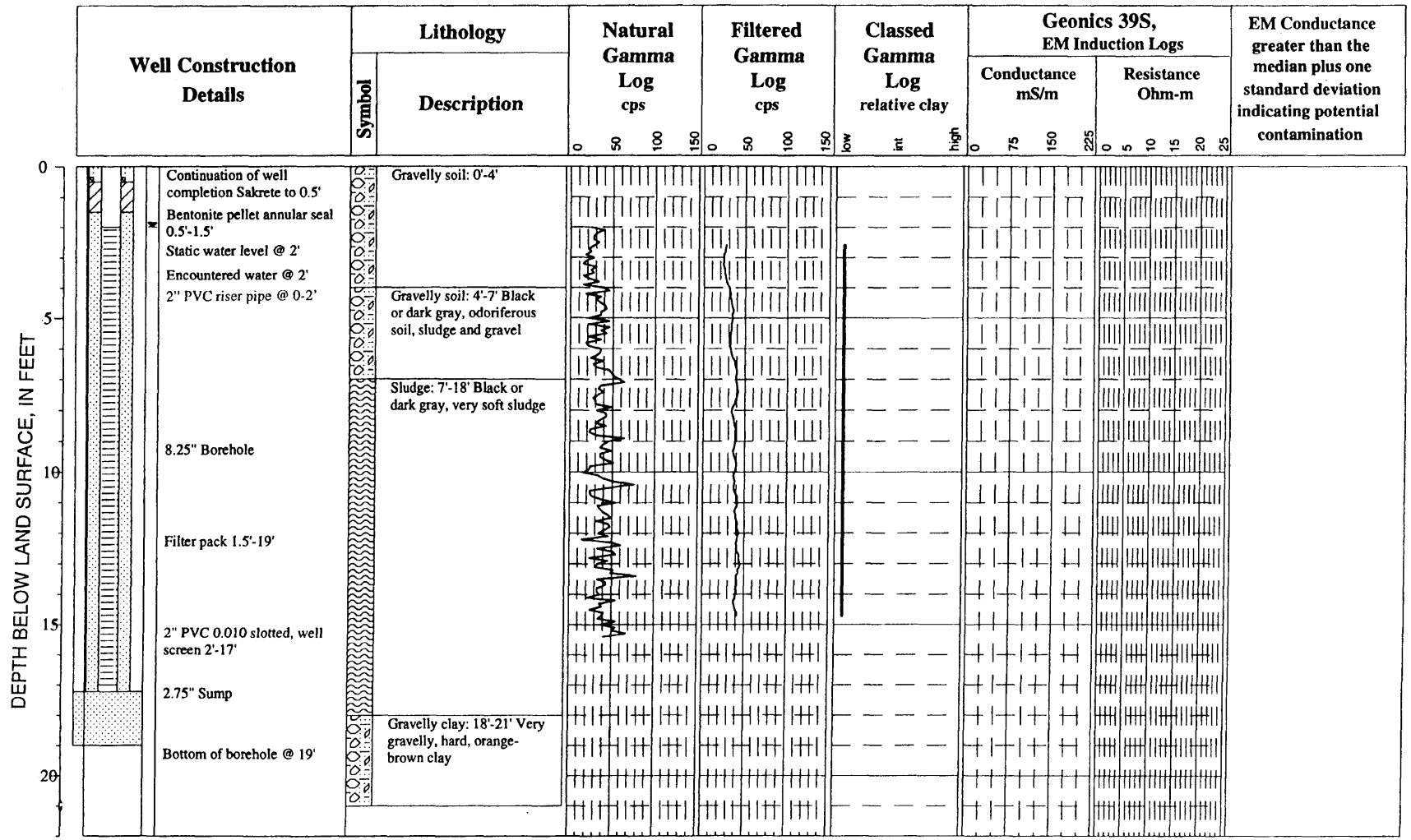
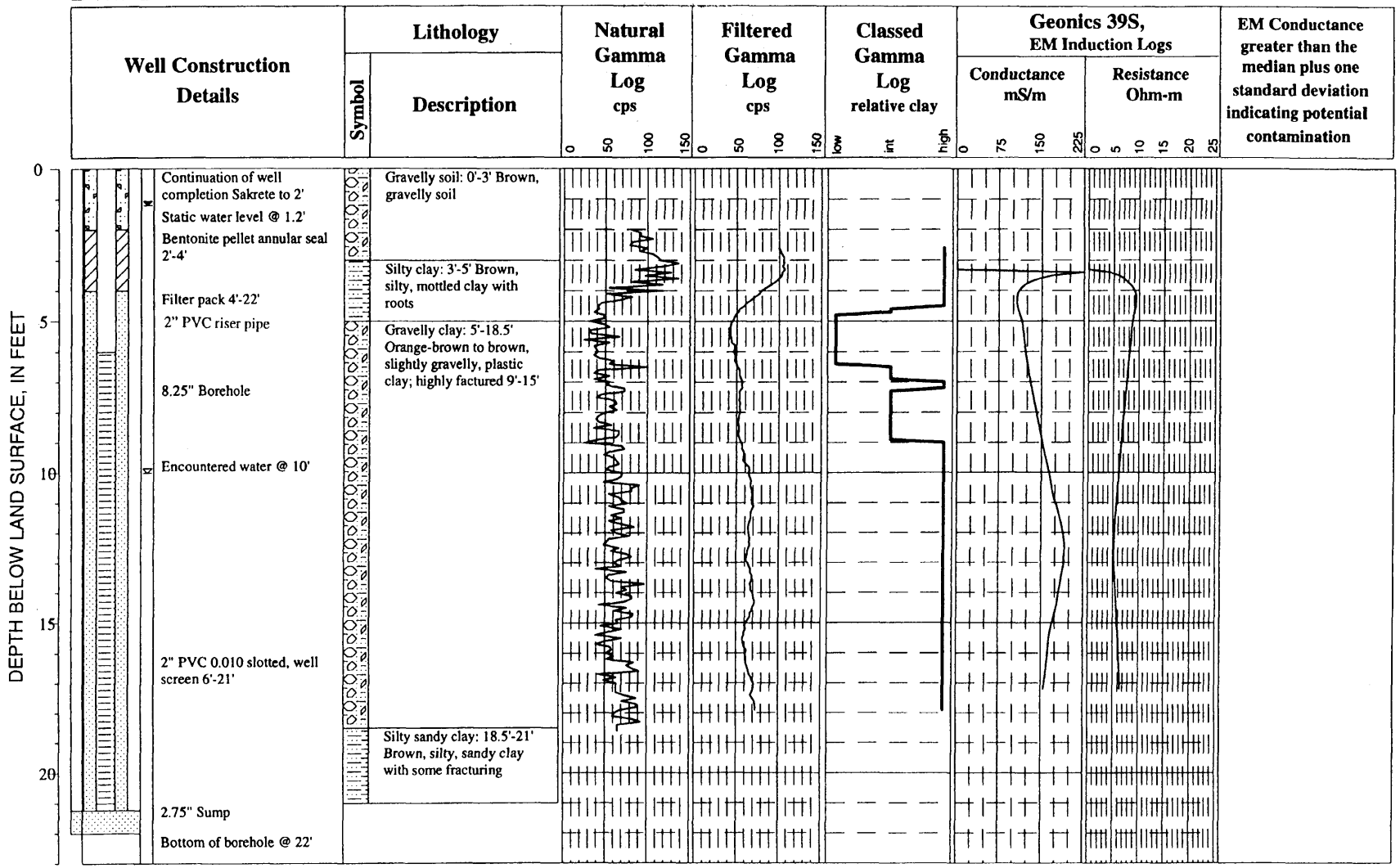
Appendix—Logged Well Data

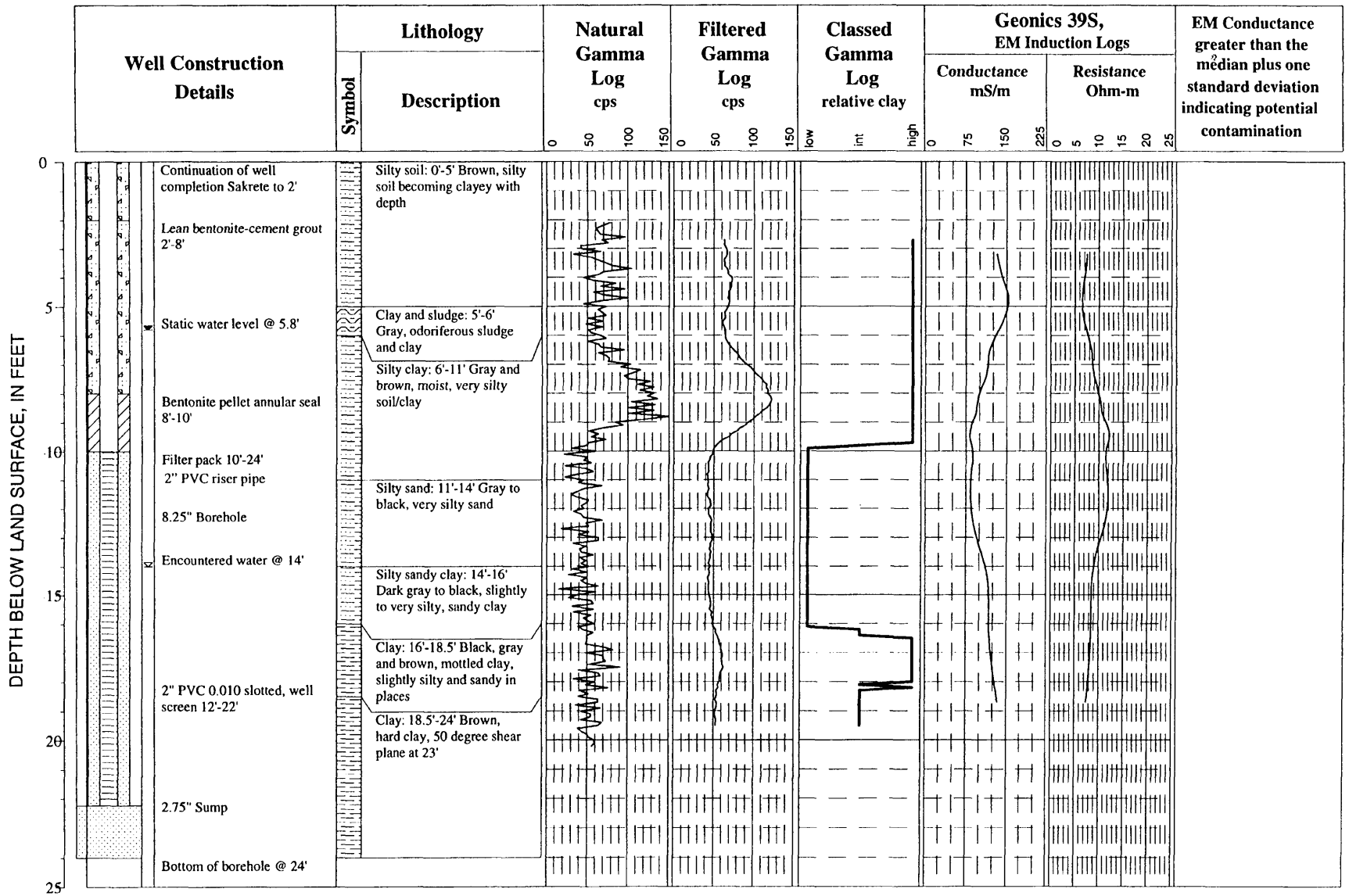
DWP-1-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Continuation of well completion Sakrete to 0.5'
Bentonite pellet annular seal 0.5'-1.5'
Static water level @ 2'
Encountered water @ 2'
2" PVC riser pipe @ 0-2'
8.25" Borehole
Filter pack 1.5'-19'
2" PVC 0.010 slotted, well screen 2'-17'
2.75" Sump
Bottom of borehole @ 19'
Gravelly soil: 0'-4'
Gravelly soil: 4'-7' Black or dark gray, odoriferous soil, sludge and gravel
Sludge: 7'-18' Black or dark gray, very soft sludge
Gravelly clay: 18'-21' Very gravelly, hard, orange-brown clay
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

DWP-1-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Continuation of well completion Sakrete to 2'
Static water level @ 1.2'
Bentonite pellet annular seal 2'-4'
Filter pack 4'-22'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 10'
2" PVC 0.010 slotted, well screen 6'-21'
2.75" Sump
Bottom of borehole @ 22'
Gravelly soil: 0'-3' Brown, gravelly soil
Silty clay: 3'-5' Brown, silty, mottled clay with roots
Gravelly clay: 5'-18.5' Orange-brown to brown, slighlty gravelly, plastic clay; highly factured 9'-15'
Silty sandy clay: 18.5'-21' Brown, silty, sandy clay with some fracturing

DWP-1-6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Symbol
Description
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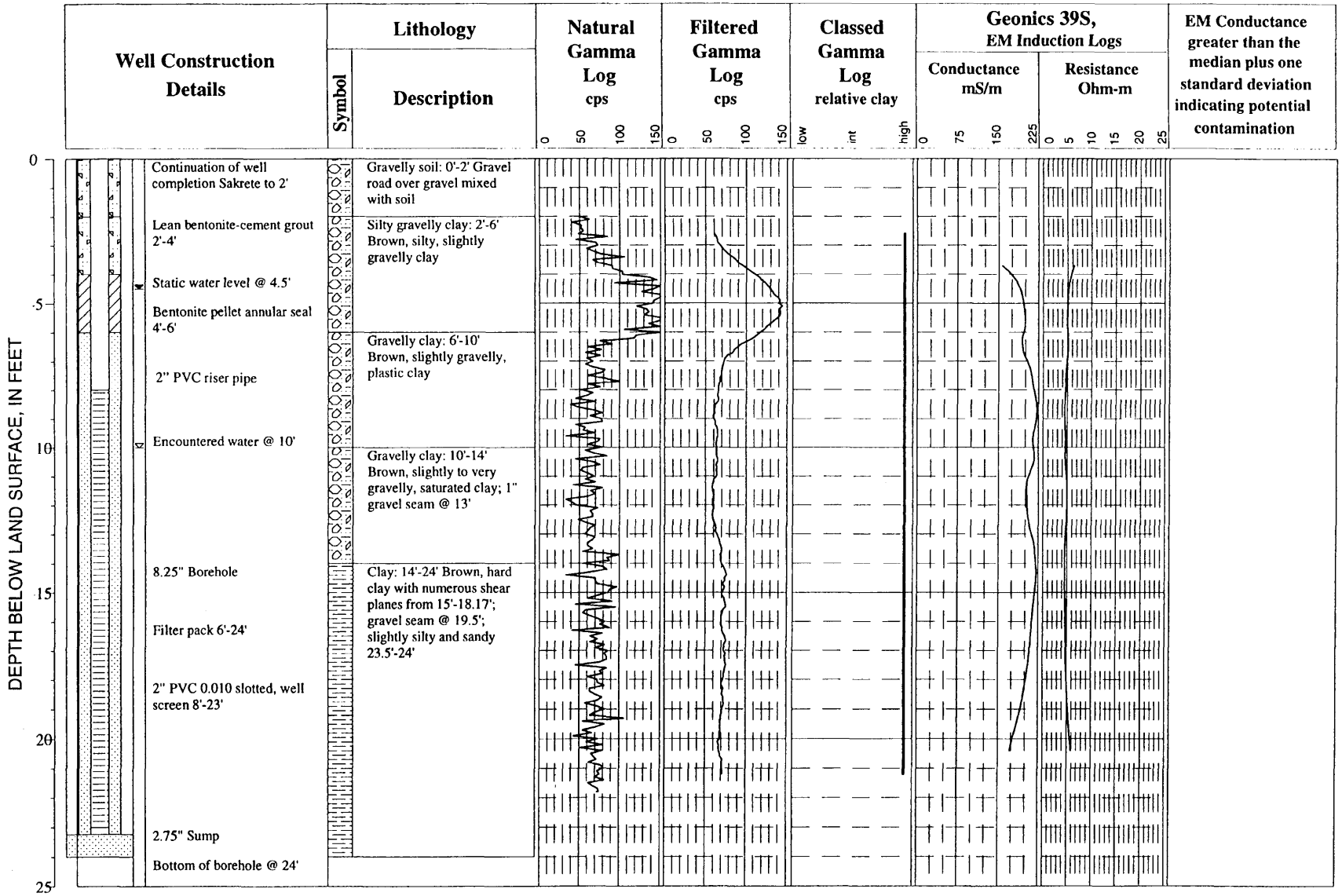
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-8'
Static water level @ 5.8'
Bentonite pellet annular seal 8'-10'
Filter pack 10'-24'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 14'
2" PVC 0.010 slotted, well screen 12'-22'
2.75" Sump
Bottom of borehole @ 24'
Silty soil: 0'-5' Brown, silty soil becoming clayey with depth
Clay and sludge: 5'-6' Gray, odoriferous sludge and clay
Silty clay: 6'-11' Gray and brown, moist, very silty soil/clay
Silty sand: 11'-14' Gray to black, very silty sand
Silty sandy clay: 14'-16' Dark gray to black, slightly to very silty, sandy clay
Clay: 16'-18.5' Black, gray and brown, mottled clay, slightly silty and sandy in places
Clay: 18.5'-24' Brown, hard clay, 50 degree shear plane at 23'

DWP-1-7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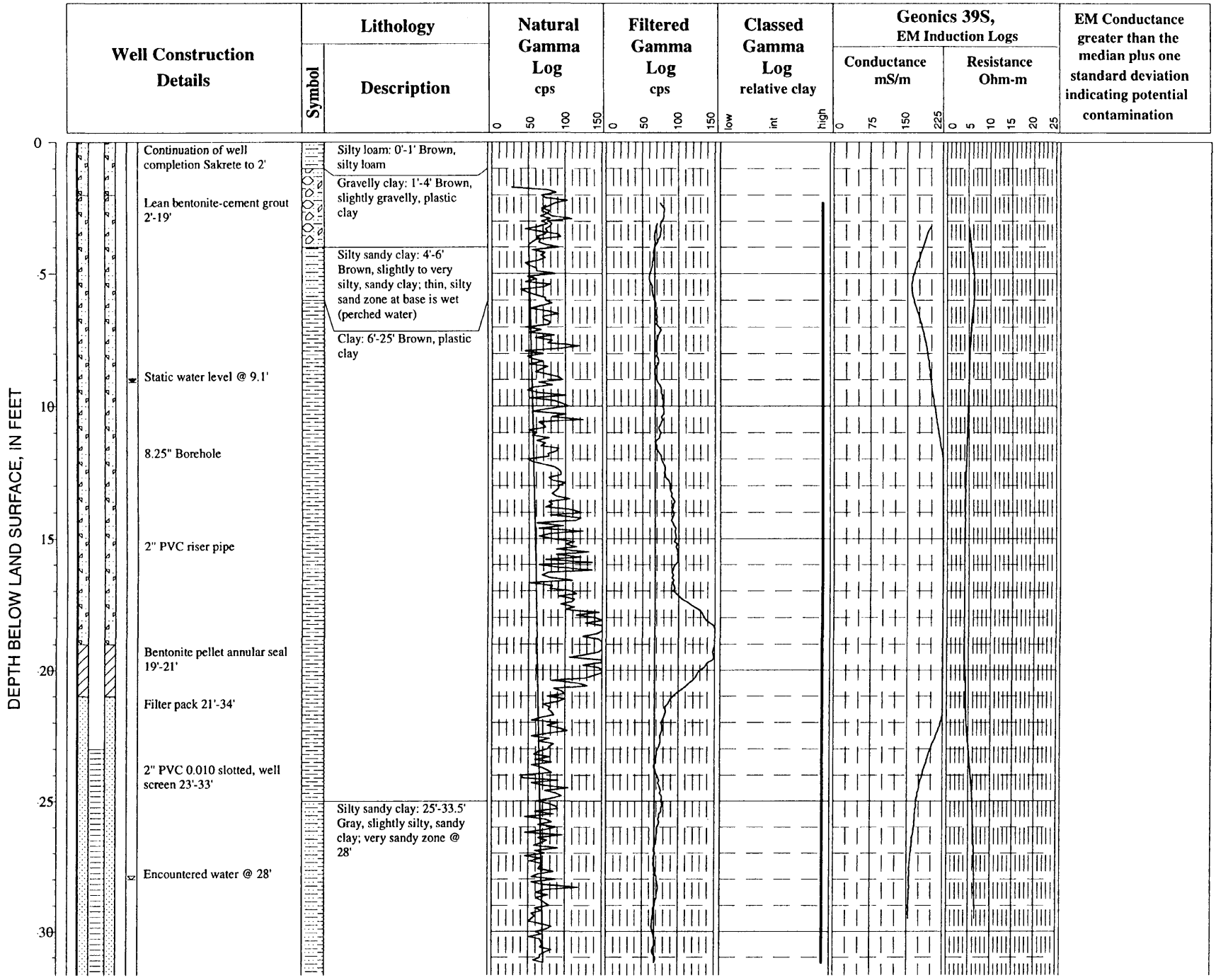
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0
50
100
150
low
int
high
75
225
5
10
15
20
25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-4'
Static water level @ 4.5'
Bentonite pellet annular seal 4'-6'
2" PVC riser pipe
Encountered water @ 10'
8.25" Borehole
Filter pack 6'-24'
2" PVC 0.010 slotted, well screen 8'-23'
2.75" Sump
Bottom of borehole @ 24'
Gravelly soil: 0'-2' Gravel road over gravel mixed with soil
Silty gravelly clay: 2'-6' Brown, silty, slightly gravelly clay
Gravelly clay: 6'-10' Brown, slightly gravelly, plastic clay
Gravelly clay: 10'-14' Brown, slightly to very gravelly, saturated clay; 1" gravel seam @ 13'
Clay: 14'-24' Brown, hard clay with numerous shear planes from 15'-18.17'; gravel seam @ 19.5'; slightly silty and sandy 23.5'-24'

DWP-1-8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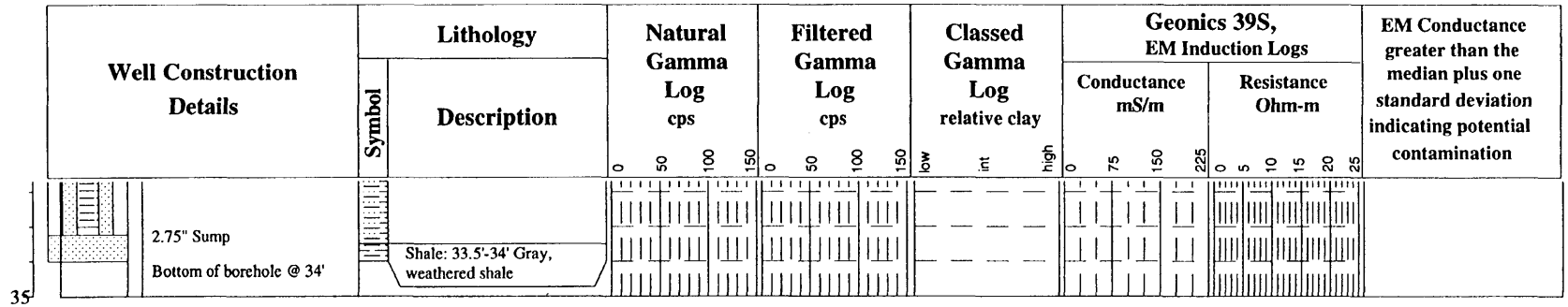
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-19'
Static water level @ 9.1'
8.25" Borehole
2" PVC riser pipe
Bentonite pellet annular seal 19'-21'
Filter pack 21'-34'
2" PVC 0.010 slotted, well screen 23'-33'
Encountered water @ 28'
Silty loam: 0'-1' Brown, silty loam
Gravelly clay: 1'-4' Brown, slightly gravelly, plastic clay
Silty sandy clay: 4'-6' Brown, slightly to very silty, sandy clay; thin, silty sand zone at base is wet (perched water)
Clay: 6'-25' Brown, plastic clay
Silty sandy clay: 25'-33.5' Gray, slightly silty, sandy clay; very sandy zone @ 28'
low
int
high

DWP-1-8—Continued



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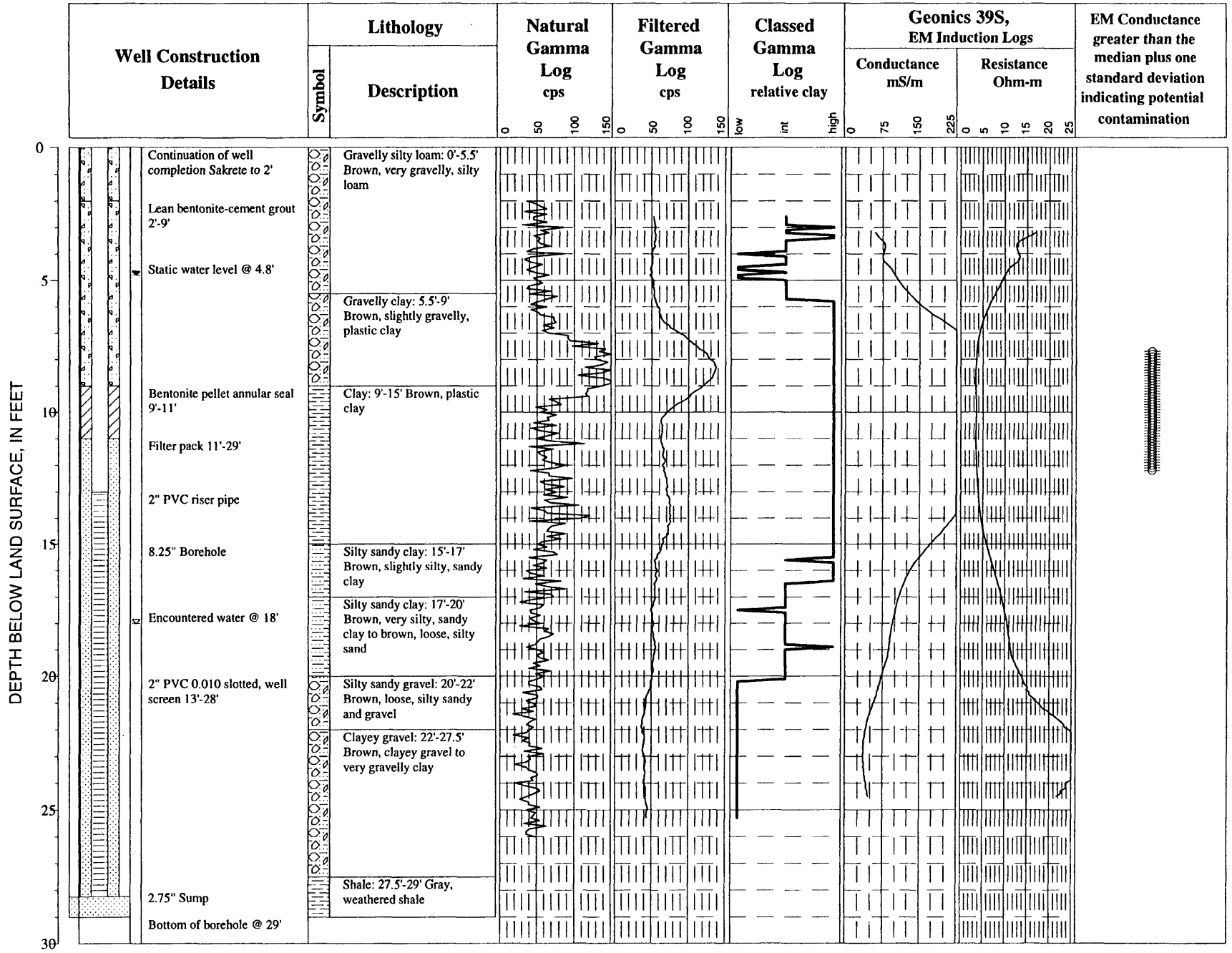
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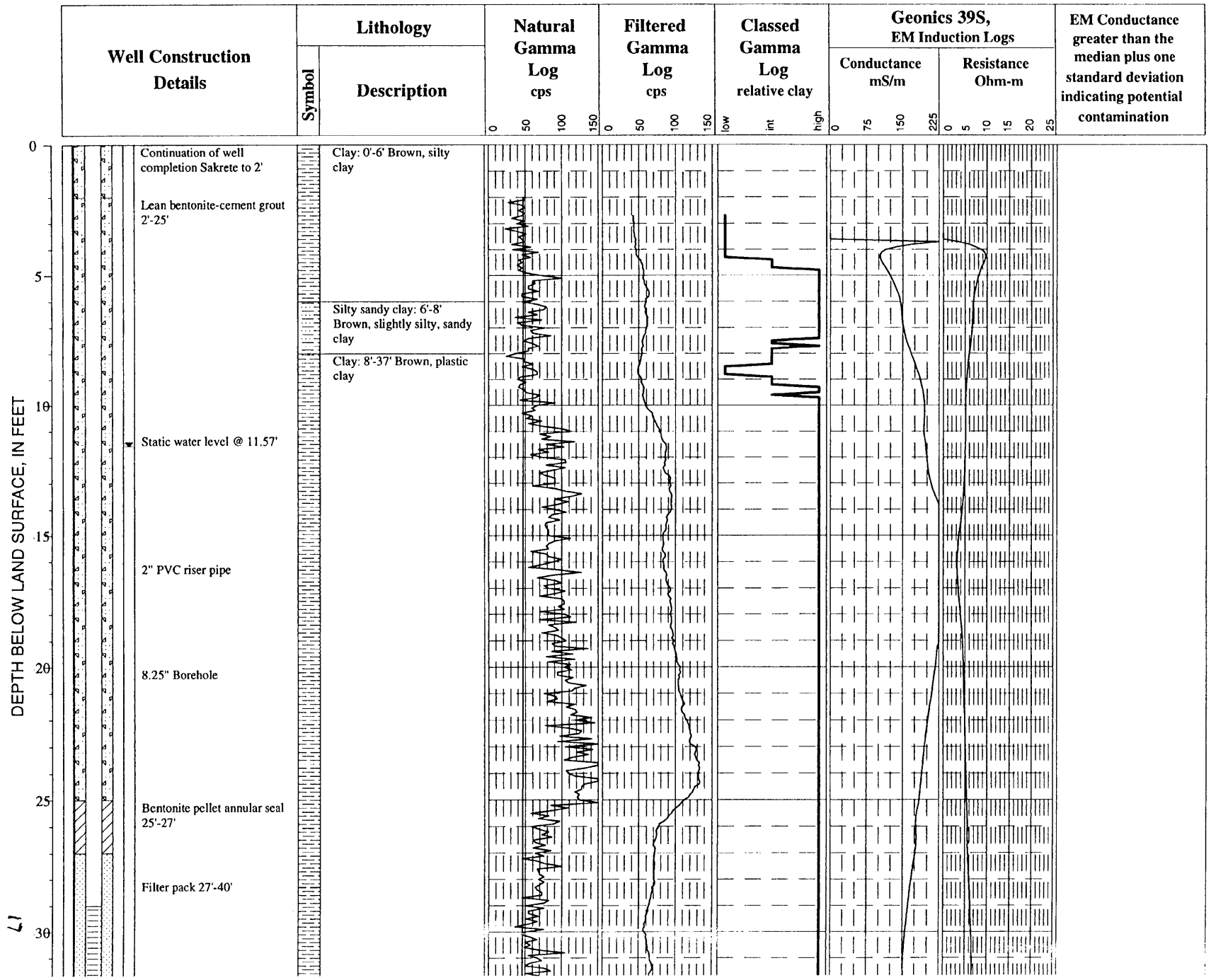
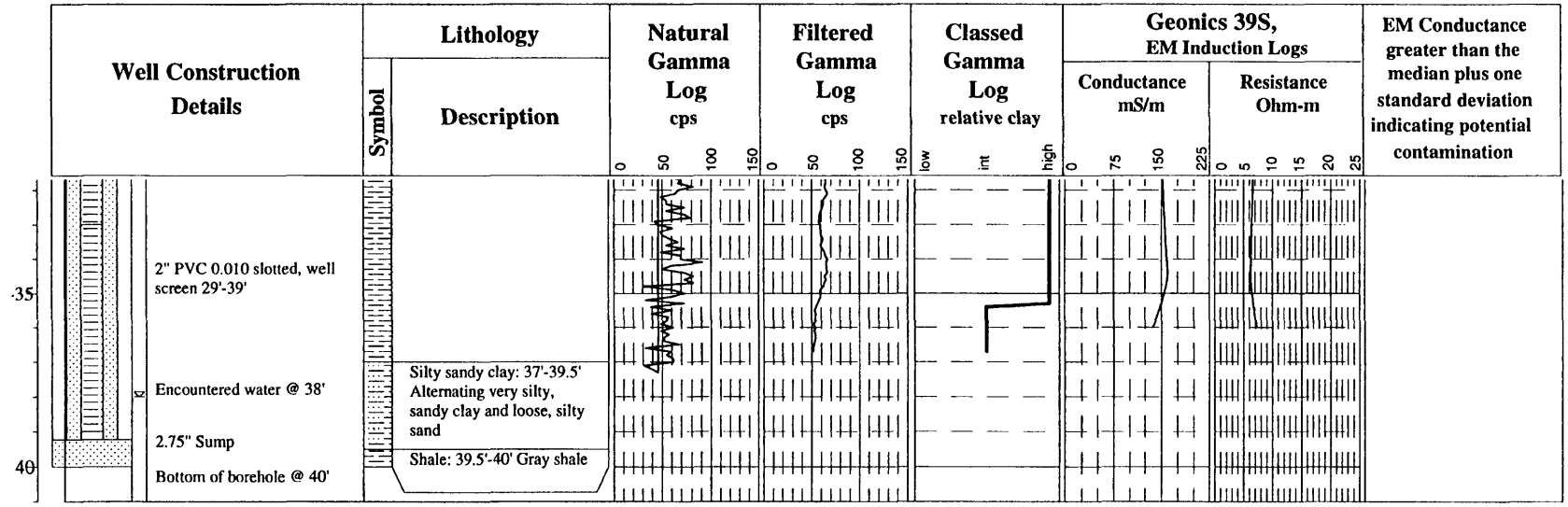
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Static water level @ 4.8'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Gravelly silty loam: 0'-5.5' Brown, very gravelly, silty loam
Gravelly clay: 5.5'-9' Brown, slightly gravelly, plastic clay
Clay: 9'-15' Brown, plastic clay
Silty sandy clay: 15'-17' Brown, slightly silty, sandy clay
Silty sandy clay: 17'-20' Brown, very silty, sandy clay to brown, loose, silty sand
Silty sandy gravel: 20'-22' Brown, loose, silty sandy and gravel
Clayey gravel: 22'-27.5' Brown, clayey gravel to very gravelly clay
Shale: 27.5'-29' Gray, weathered shale

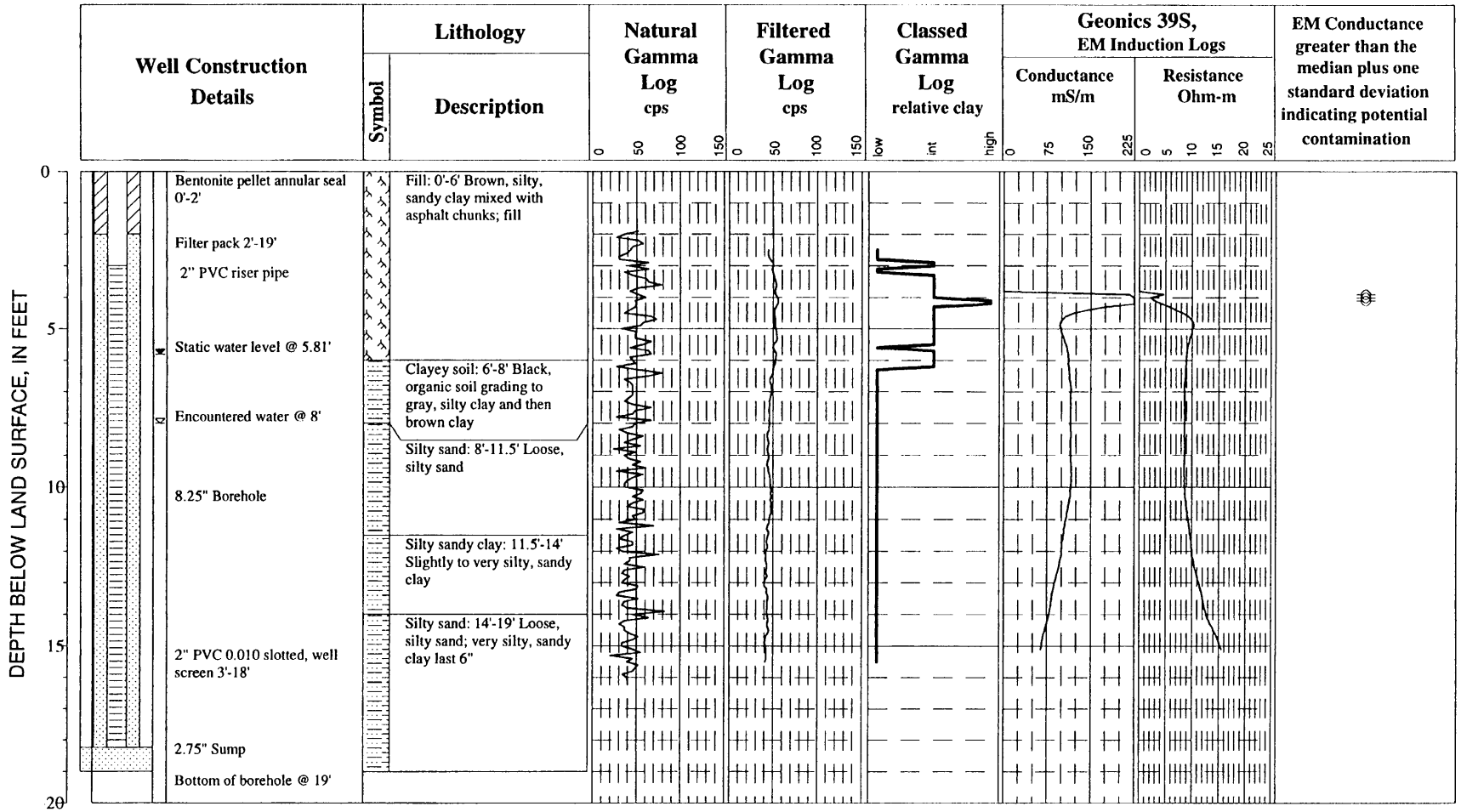
DWP-1-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-25'
Static water level @ 11.57'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 25'-27'
Filter pack 27'-40'
Clay: 0'-6' Brown, silty clay
Silty sandy clay: 6'-8' Brown, slightly silty, sandy clay
Clay: 8'-37' Brown, plastic clay
low
int
high

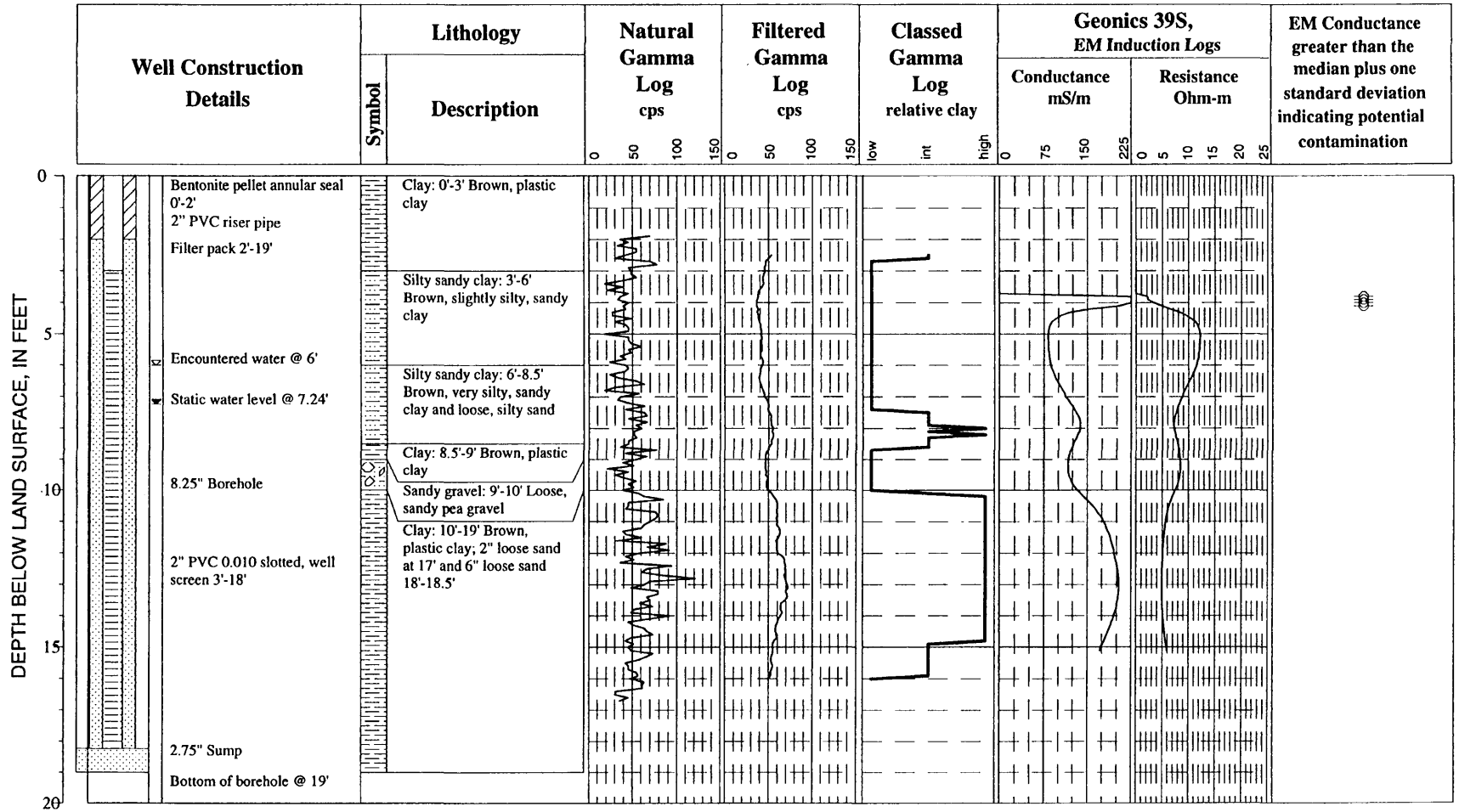
DWP-1-10—Continued



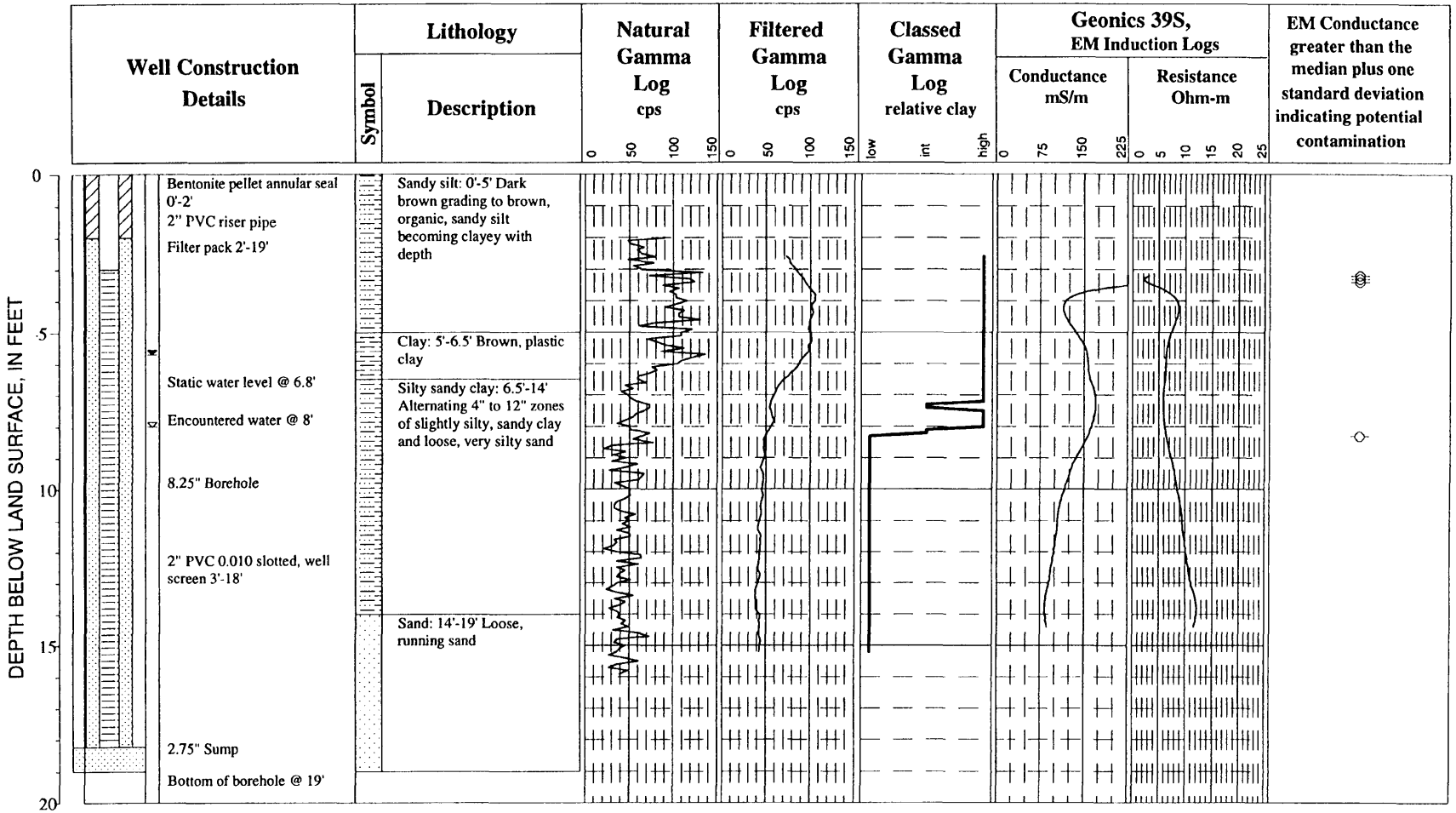
DWP-1-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
Filter pack 2'-19'
2" PVC riser pipe
Static water level @ 5.81'
Encountered water @ 8'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Fill: 0'-6' Brown, silty, sandy clay mixed with asphalt chunks; fill
Clayey soil: 6'-8' Black, organic soil grading to gray, silty clay and then brown clay
Silty sand: 8'-11.5' Loose, silty sand
Silty sandy clay: 11.5'-14' Slightly to very silty, sandy clay
Silty sand: 14'-19' Loose, silty sand; very silty, sandy clay last 6"

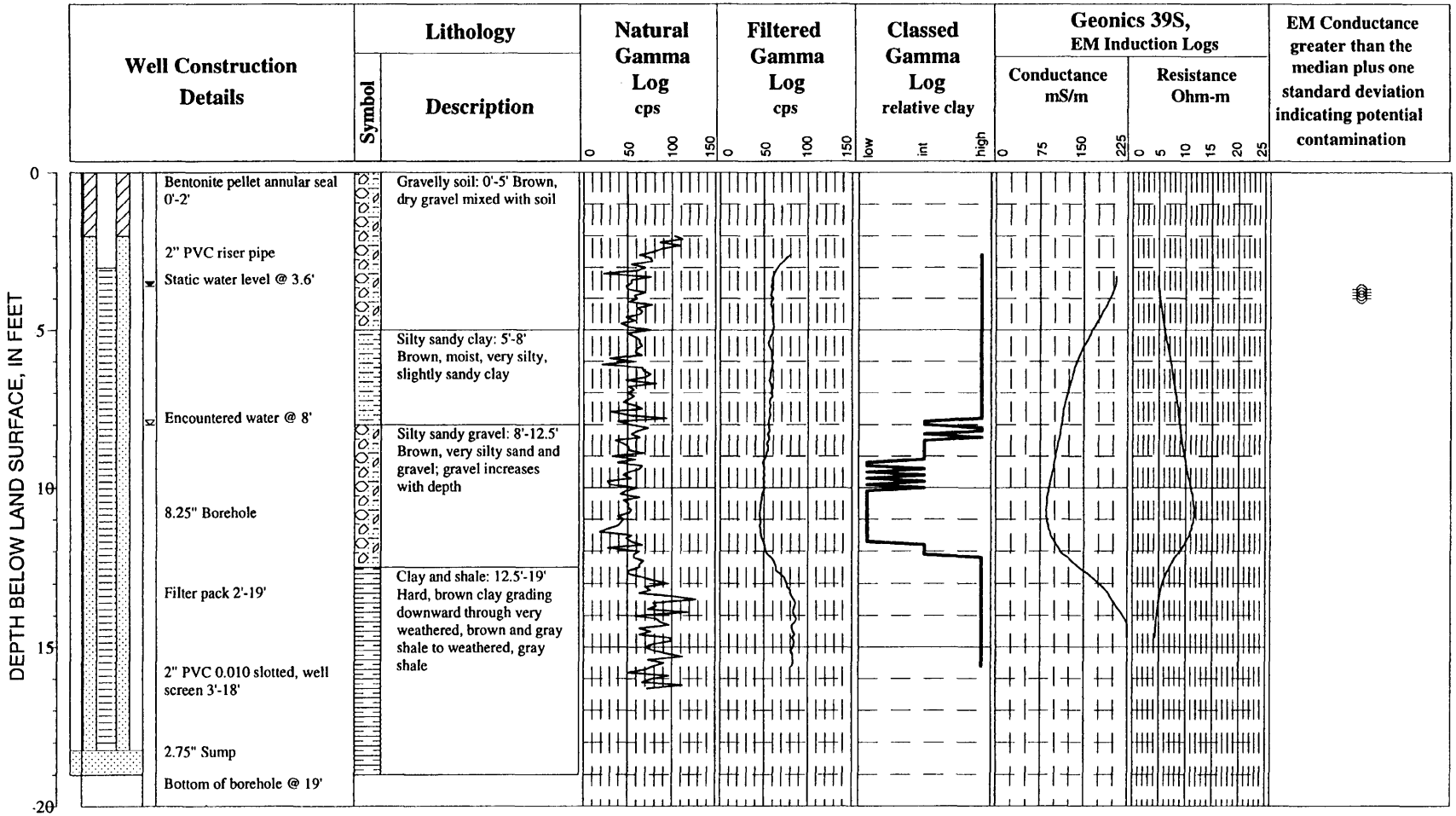
DWP-1-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Filter pack 2'-19'
Encountered water @ 6'
Static water level @ 7.24'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Clay: 0'-3' Brown, plastic clay
Silty sandy clay: 3'-6' Brown, slightly silty, sandy clay
Silty sandy clay: 6'-8.5' Brown, very silty, sandy clay and loose, silty sand
Clay: 8.5'-9' Brown, plastic clay
Sandy gravel: 9'-10' Loose, sandy pea gravel
Clay: 10'-19' Brown, plastic clay; 2" loose sand at 17' and 6" loose sand 18'-18.5'

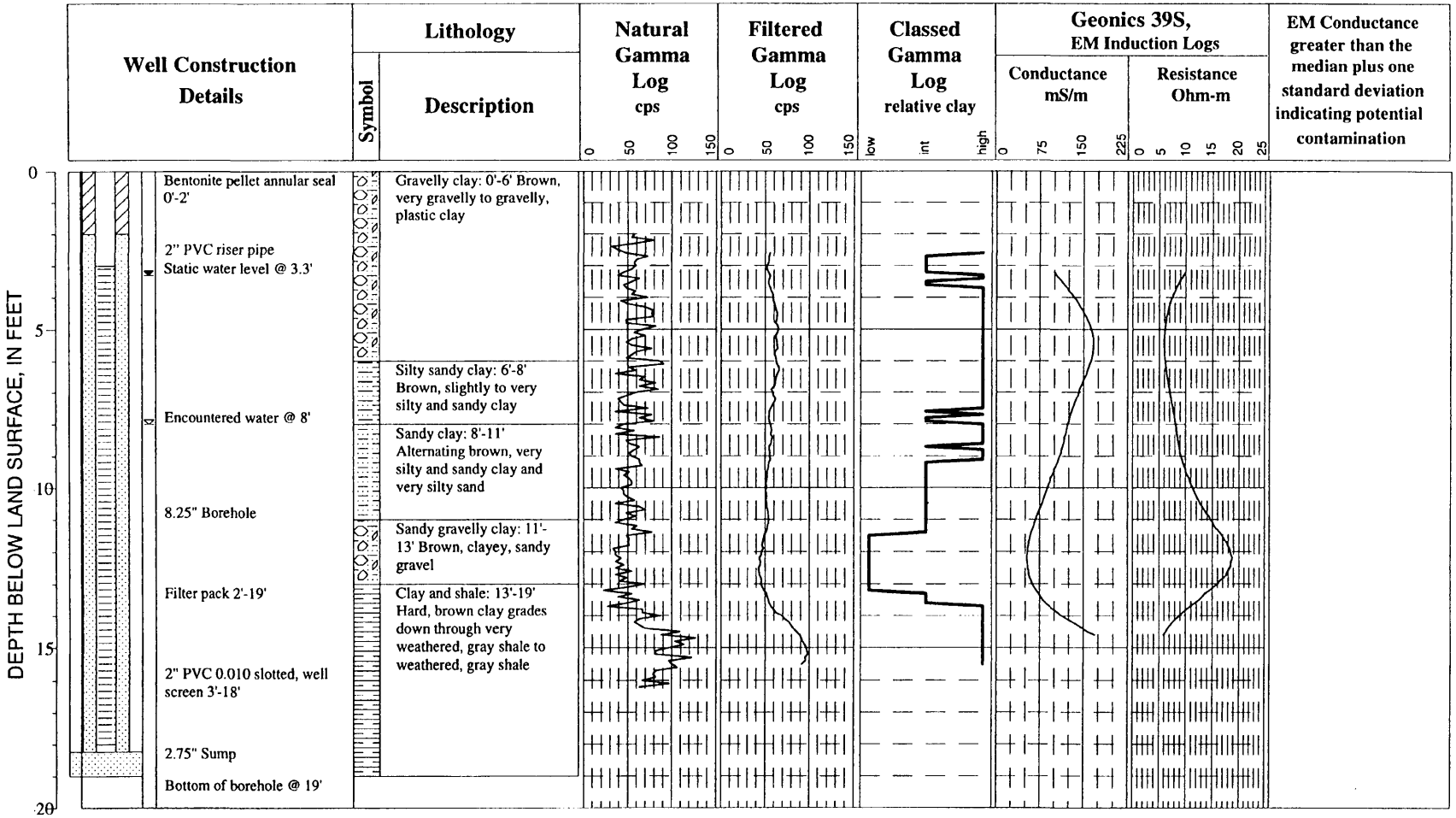
DWP-1-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Filter pack 2'-19'
Static water level @ 6.8'
Encountered water @ 8'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Sandy silt: 0'-5' Dark brown grading to brown, organic, sandy silt becoming clayey with depth
Clay: 5'-6.5' Brown, plastic clay
Silty sandy clay: 6.5'-14' Alternating 4" to 12" zones of slightly silty, sandy clay and loose, very silty sand
Sand: 14'-19' Loose, running sand

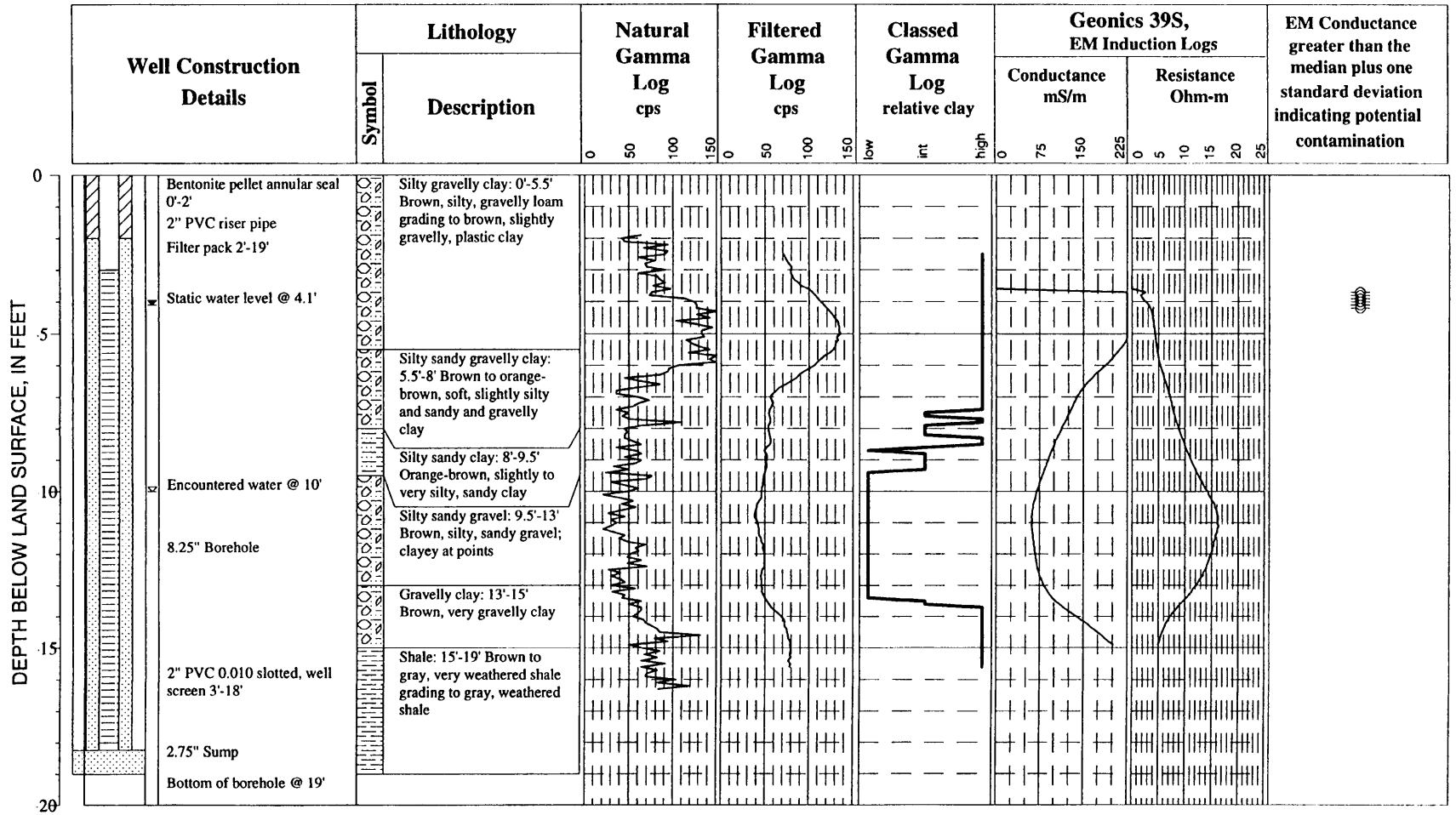
DWP-2-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Static water level @ 3.6'
Encountered water @ 8'
8.25" Borehole
Filter pack 2'-19'
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Gravelly soil: 0'-5' Brown, dry gravel mixed with soil
Silty sandy clay: 5'-8' Brown, moist, very silty, slightly sandy clay
Silty sandy gravel: 8'-12.5' Brown, very silty sand and gravel; gravel increases with depth
Clay and shale: 12.5'-19' Hard, brown clay grading downward through very weathered, brown and gray shale to weathered, gray shale

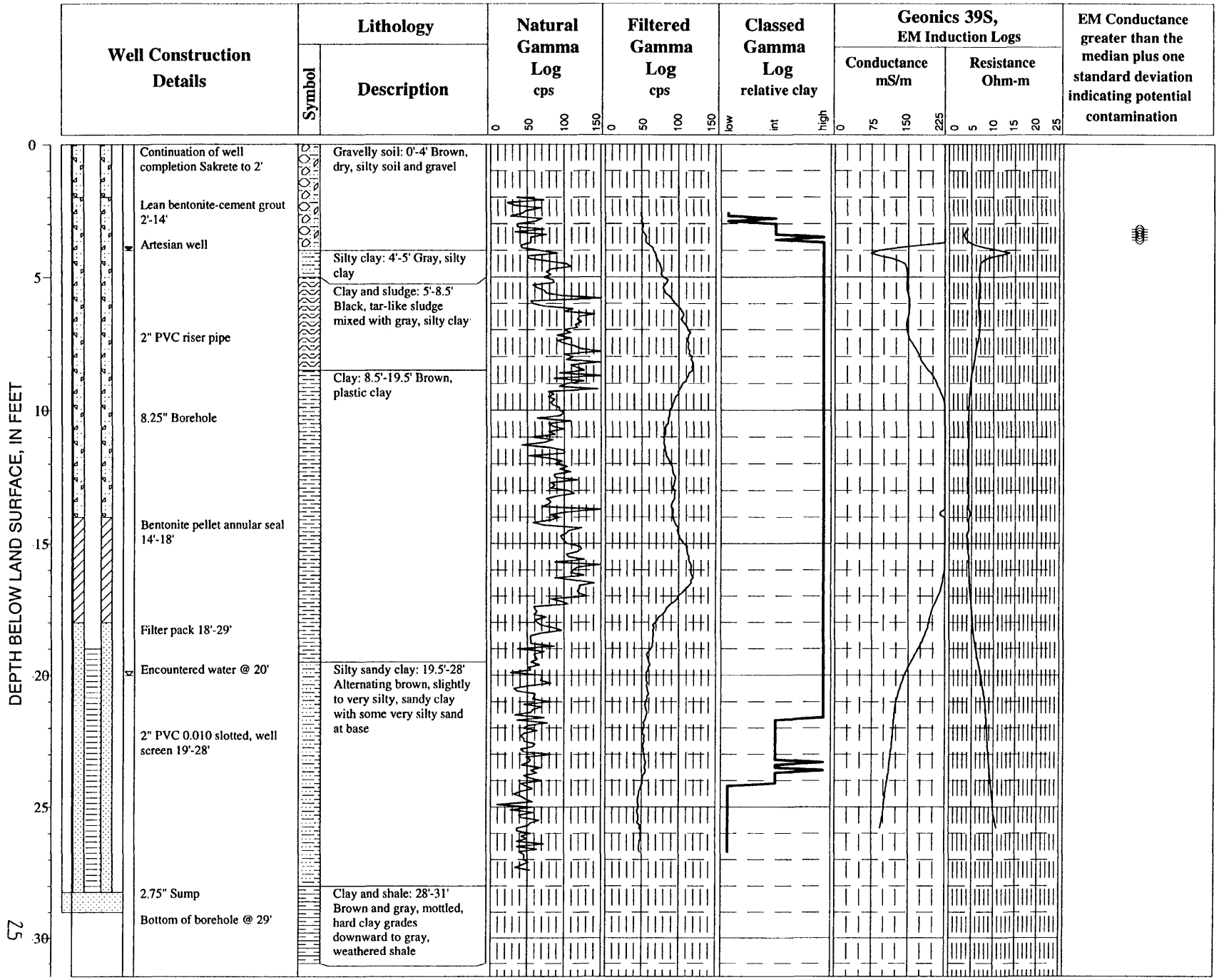
DWP-2-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0
50
100
150
low
int
high
75
225
5
10
15
20
25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Static water level @ 3.3'
Encountered water @ 8'
8.25" Borehole
Filter pack 2'-19'
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Gravelly clay: 0'-6' Brown, very gravelly to gravelly, plastic clay
Silty sandy clay: 6'-8' Brown, slightly to very silty and sandy clay
Sandy clay: 8'-11' Alternating brown, very silty and sandy clay and very silty sand
Sandy gravelly clay: 11'-13' Brown, clayey, sandy gravel
Clay and shale: 13'-19' Hard, brown clay grades down through very weathered, gray shale to weathered, gray shale

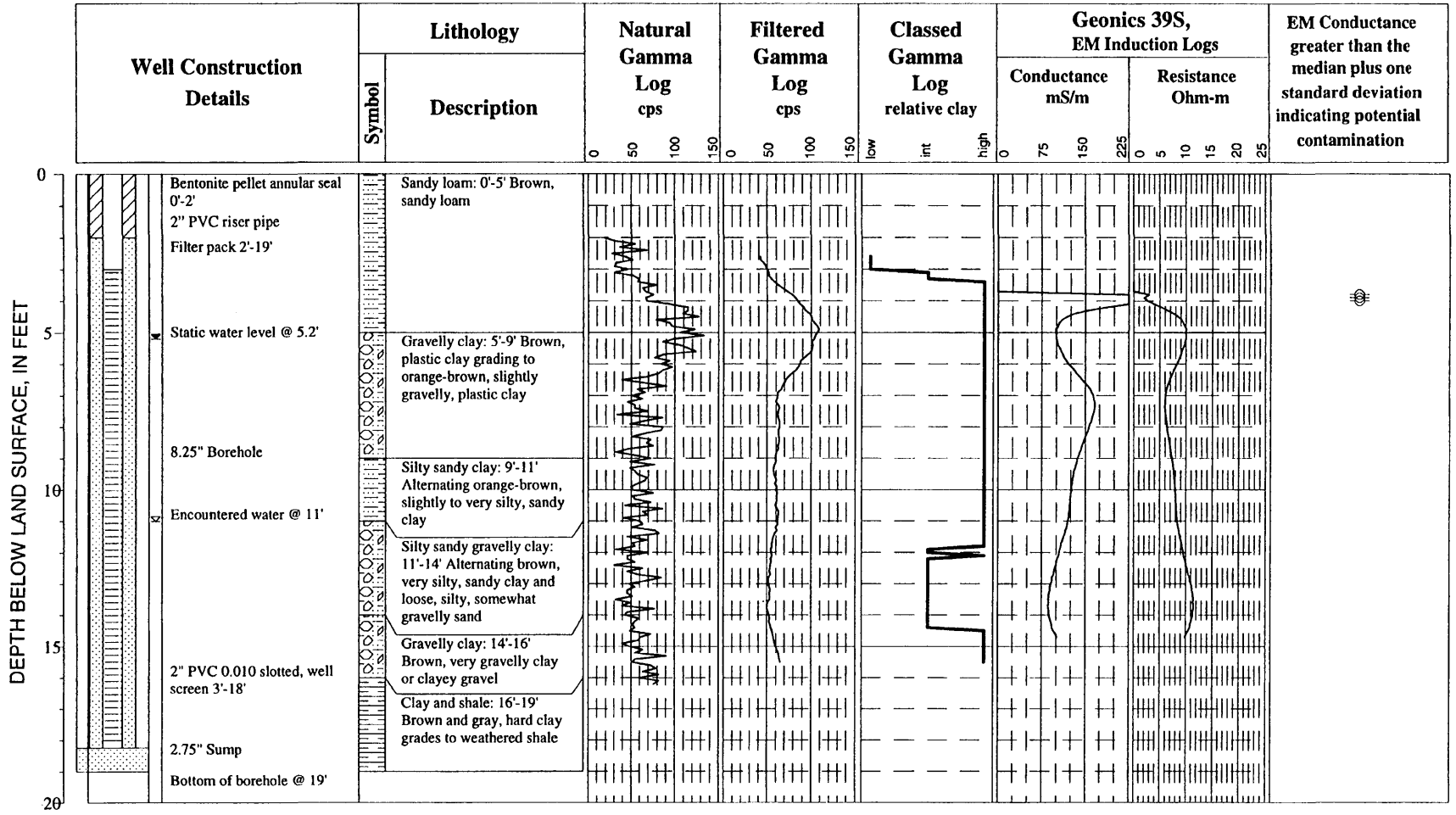
DWP-2-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Filter pack 2'-19'
Static water level @ 4.1'
Encountered water @ 10'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Silty gravelly clay: 0'-5.5' Brown, silty, gravelly loam grading to brown, slightly gravelly, plastic clay
Silty sandy gravelly clay: 5.5'-8' Brown to orange-brown, soft, slightly silty and sandy and gravelly clay
Silty sandy clay: 8'-9.5' Orange-brown, slightly to very silty, sandy clay
Silty sandy gravel: 9.5'-13' Brown, silty, sandy gravel; clayey at points
Gravelly clay: 13'-15' Brown, very gravelly clay
Shale: 15'-19' Brown to gray, very weathered shale grading to gray, weathered shale

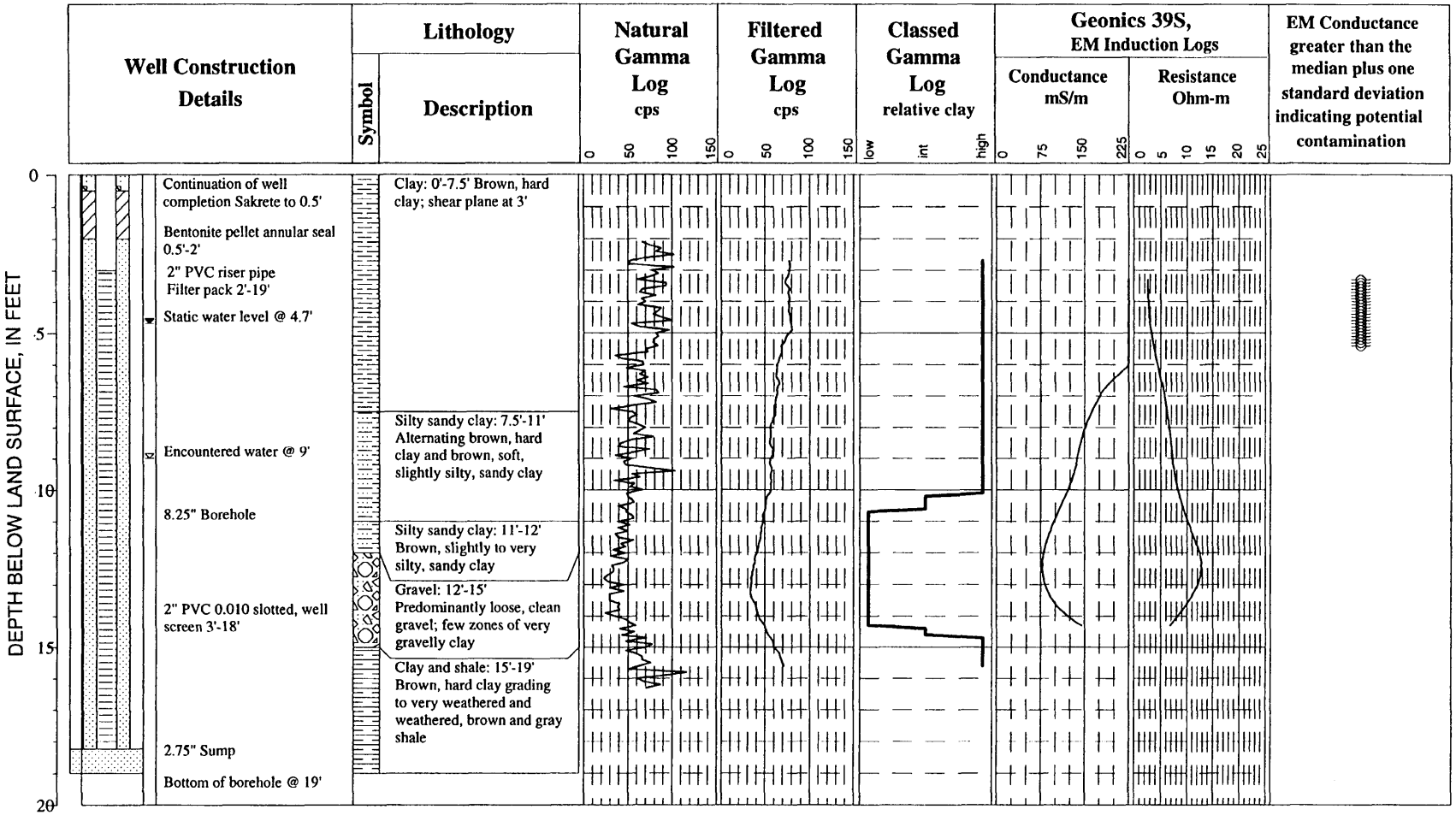
DWP-2-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
Artesian well
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-18'
Filter pack 18'-29'
Encountered water @ 20'
2" PVC 0.010 slotted, well screen 19'-28'
2.75" Sump
Bottom of borehole @ 29'
Gravelly soil: 0'-4' Brown, dry, silty soil and gravel
Silty clay: 4'-5' Gray, silty clay
Clay and sludge: 5'-8.5' Black, tar-like sludge mixed with gray, silty clay
Clay: 8.5'-19.5' Brown, plastic clay
Silty sandy clay: 19.5'-28' Alternating brown, slightly to very silty, sandy clay with some very silty sand at base
Clay and shale: 28'-31' Brown and gray, mottled, hard clay grades downward to gray, weathered shale
low
int
high

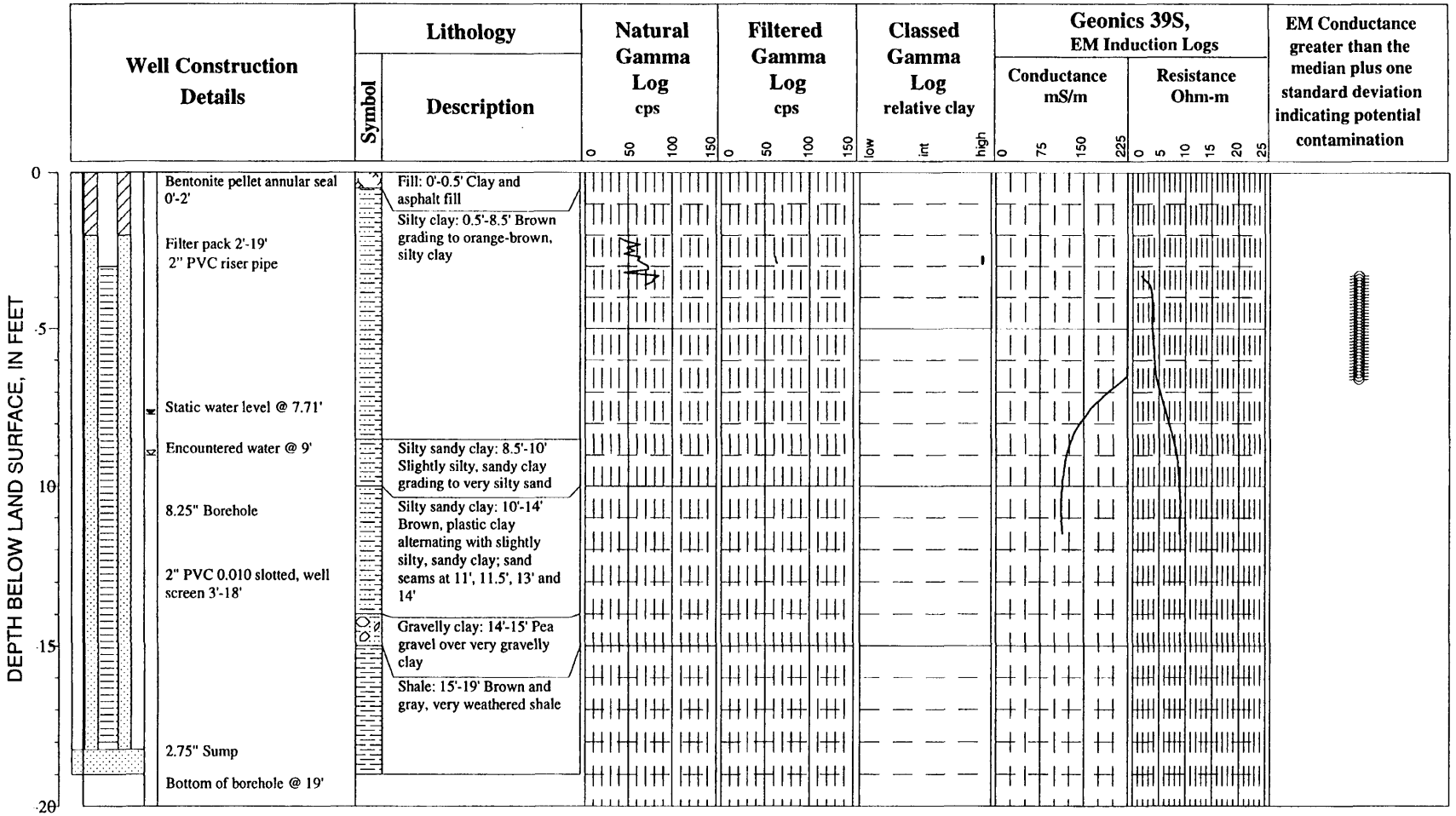
DWP-2-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Filter pack 2'-19'
Static water level @ 5.2'
8.25" Borehole
Encountered water @ 11'
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Sandy loam: 0'-5' Brown, sandy loam
Gravelly clay: 5'-9' Brown, plastic clay grading to orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 9'-11' Alternating orange-brown, slightly to very silty, sandy clay
Silty sandy gravelly clay: 11'-14' Alternating brown, very silty, sandy clay and loose, silty, somewhat gravelly sand
Gravelly clay: 14'-16' Brown, very gravelly clay or clayey gravel
Clay and shale: 16'-19' Brown and gray, hard clay grades to weathered shale

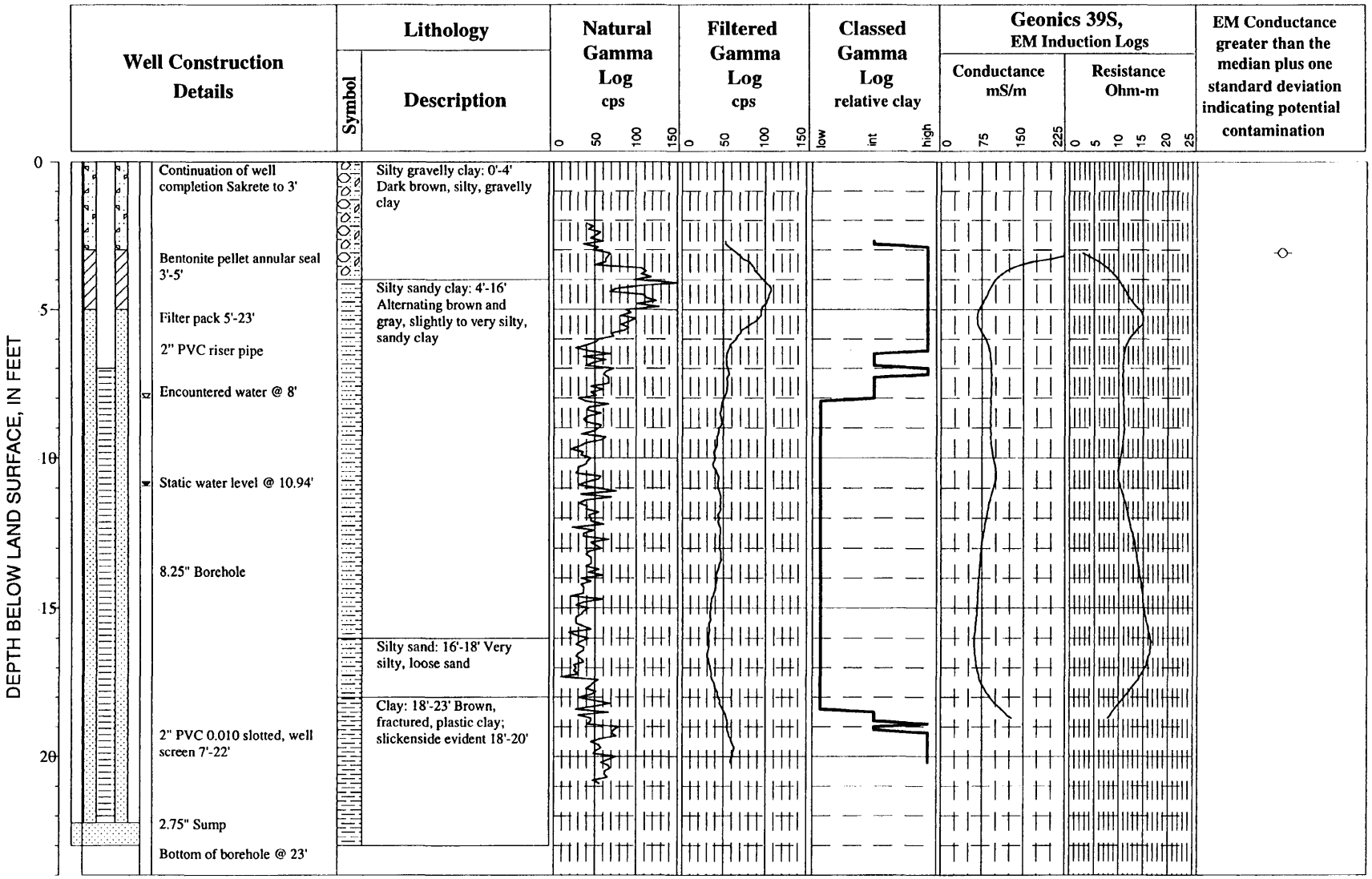
DWP-2-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
Filtered Gamma Log
cps
Classed Gamma Log
relative clay
low
int
high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
Resistance
Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 0.5'
Bentonite pellet annular seal 0.5'-2'
2" PVC riser pipe
Filter pack 2'-19'
Static water level @ 4.7'
Encountered water @ 9'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Clay: 0'-7.5' Brown, hard clay; shear plane at 3'
Silty sandy clay: 7.5'-11' Alternating brown, hard clay and brown, soft, slightly silty, sandy clay
Silty sandy clay: 11'-12' Brown, slightly to very silty, sandy clay
Gravel: 12'-15' Predominantly loose, clean gravel; few zones of very gravelly clay
Clay and shale: 15'-19' Brown, hard clay grading to very weathered and weathered, brown and gray shale

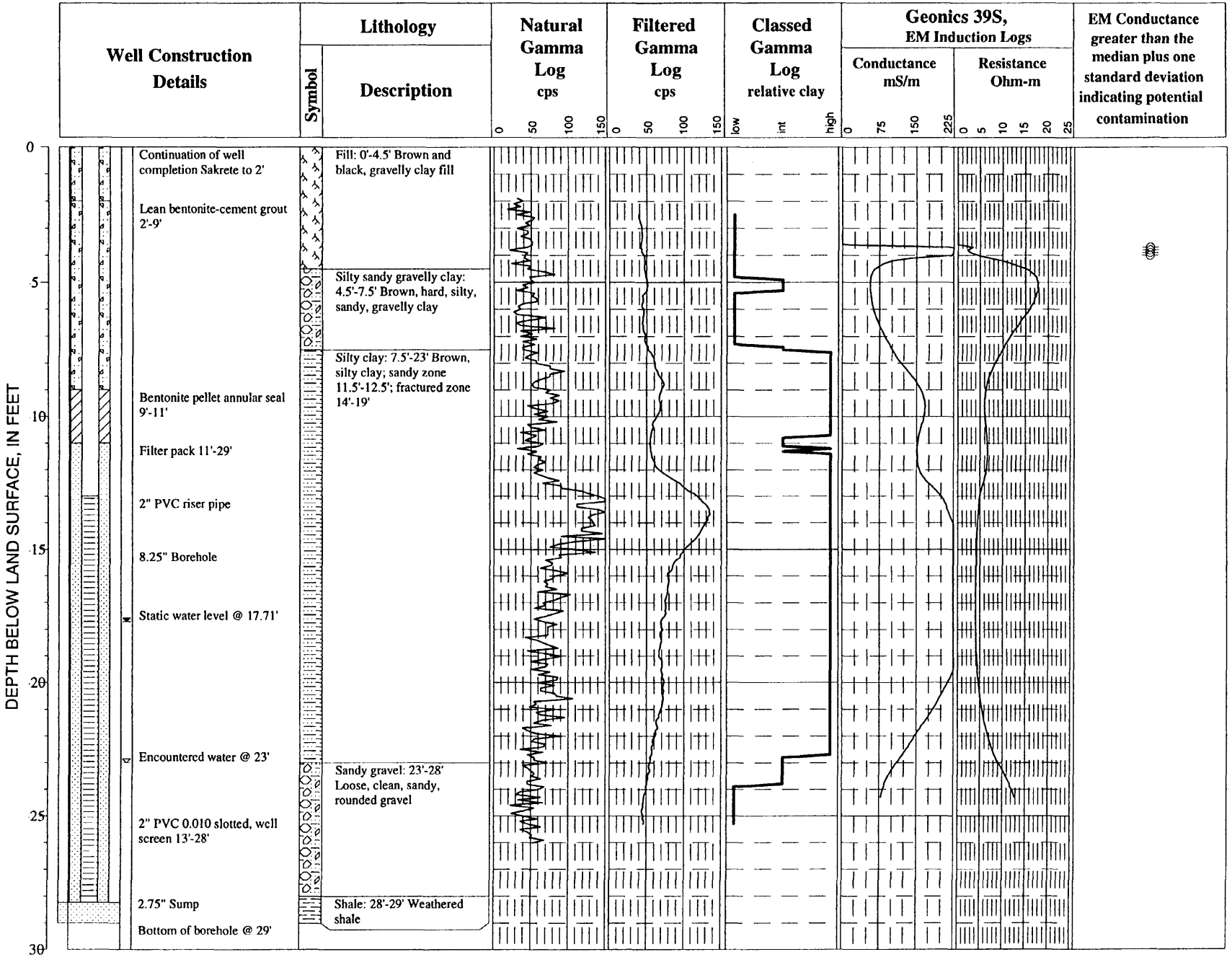
DWP-2-8


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite pellet annular seal 0'-2'
Filter pack 2'-19'
2" PVC riser pipe
Static water level @ 7.71'
Encountered water @ 9'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Fill: 0'-0.5' Clay and asphalt fill
Silty clay: 0.5'-8.5' Brown grading to orange-brown, silty clay
Silty sandy clay: 8.5'-10' Slightly silty, sandy clay grading to very silty sand
Silty sandy clay: 10'-14' Brown, plastic clay alternating with slightly silty, sandy clay; sand seams at 11', 11.5', 13' and 14'
Gravelly clay: 14'-15' Pea gravel over very gravelly clay
Shale: 15'-19' Brown and gray, very weathered shale

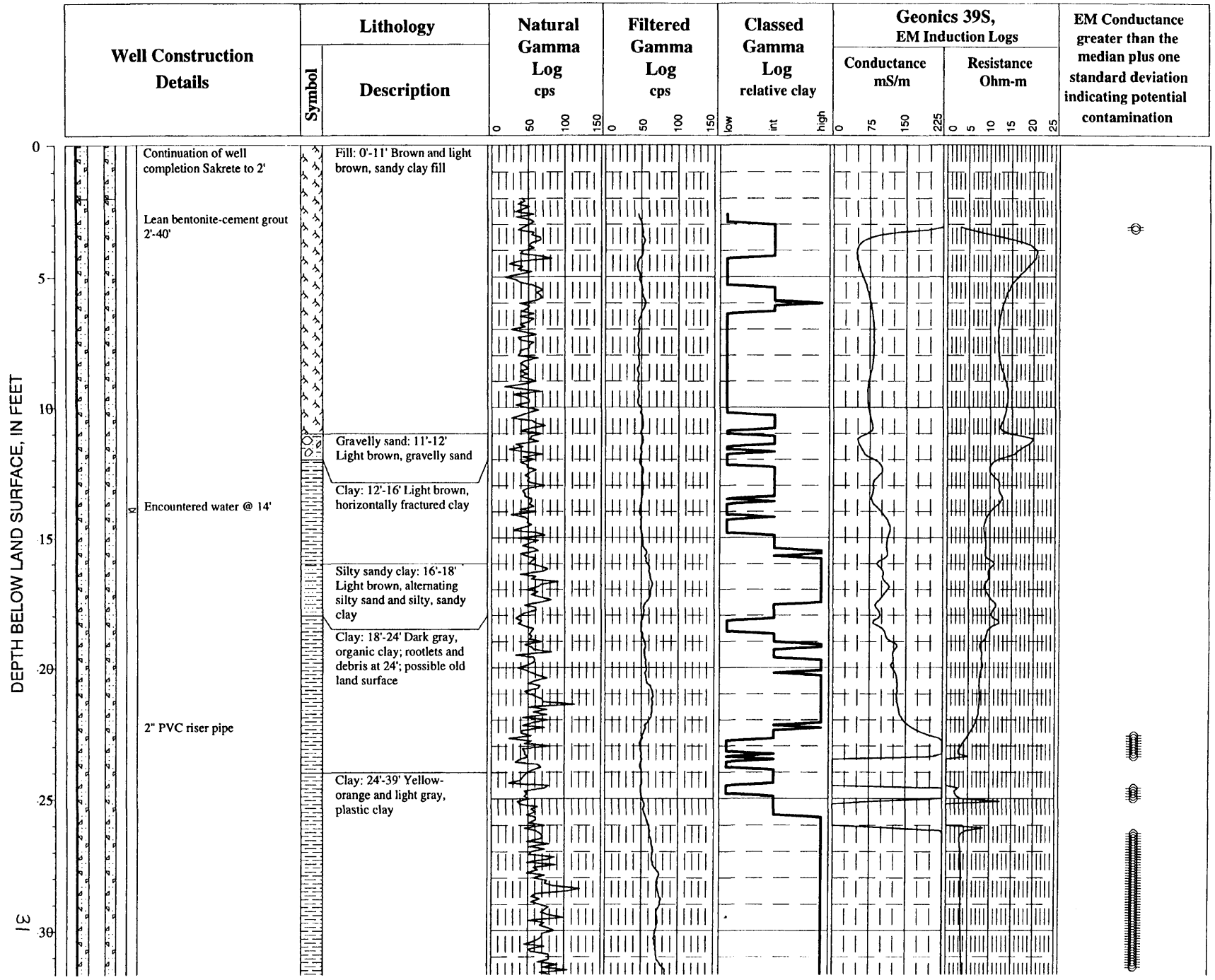
DWP-2-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 3'
Bentonite pellet annular seal 3'-5'
Filter pack 5'-23'
2" PVC riser pipe
Encountered water @ 8'
Static water level @ 10.94'
8.25" Borehole
2" PVC 0.010 slotted, well screen 7'-22'
2.75" Sump
Bottom of borehole @ 23'
Silty gravelly clay: 0'-4' Dark brown, silty, gravelly clay
Silty sandy clay: 4'-16' Alternating brown and gray, slightly to very silty, sandy clay
Silty sand: 16'-18' Very silty, loose sand
Clay: 18'-23' Brown, fractured, plastic clay; slickenside evident 18'-20'

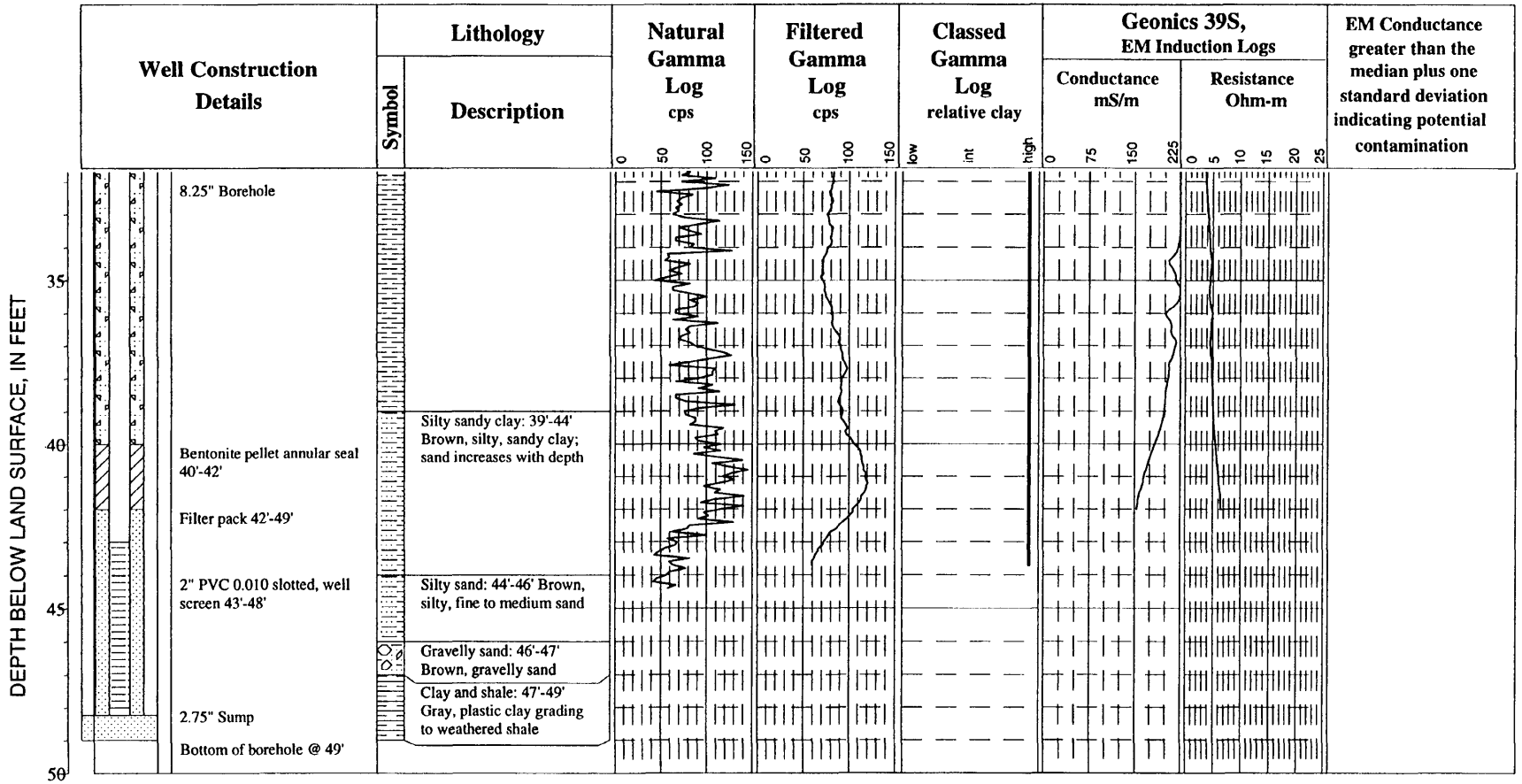
DWP-2-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
8.25" Borehole
Static water level @ 17.71'
Encountered water @ 23'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-4.5' Brown and black, gravelly clay fill
Silty sandy gravelly clay: 4.5'-7.5' Brown, hard, silty, sandy, gravelly clay
Silty clay: 7.5'-23' Brown, silty clay; sandy zone 11.5'-12.5'; fractured zone 14'-19'
Sandy gravel: 23'-28' Loose, clean, sandy, rounded gravel
Shale: 28'-29' Weathered shale

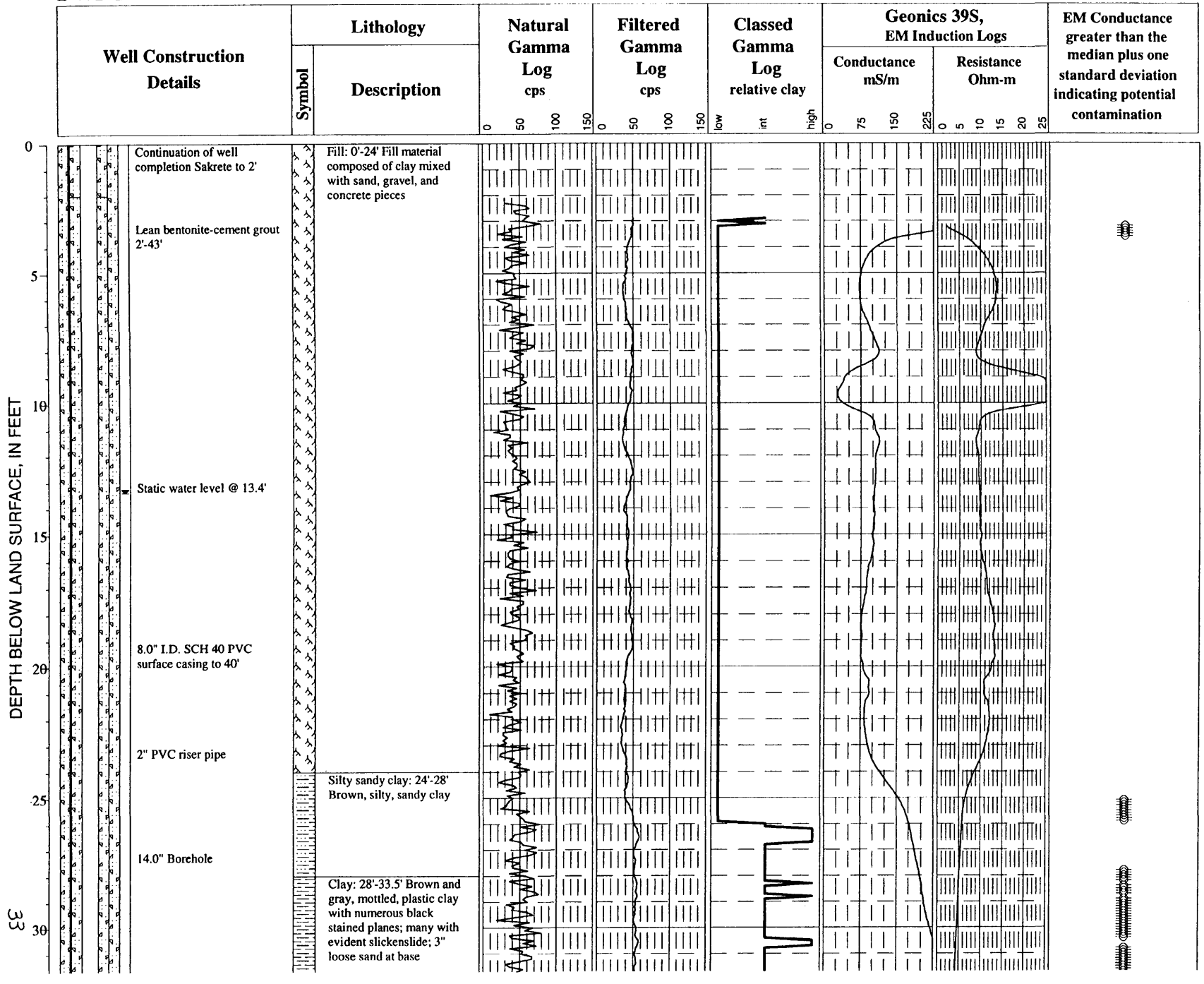
DWP-2-16


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-40'
Encountered water @ 14'
2" PVC riser pipe
Fill: 0'-11' Brown and light brown, sandy clay fill
Gravelly sand: 11'-12' Light brown, gravelly sand
Clay: 12'-16' Light brown, horizontally fractured clay
Silty sandy clay: 16'-18' Light brown, alternating silty sand and silty, sandy clay
Clay: 18'-24' Dark gray, organic clay; rootlets and debris at 24'; possible old land surface
Clay: 24'-39' Yellow-orange and light gray, plastic clay

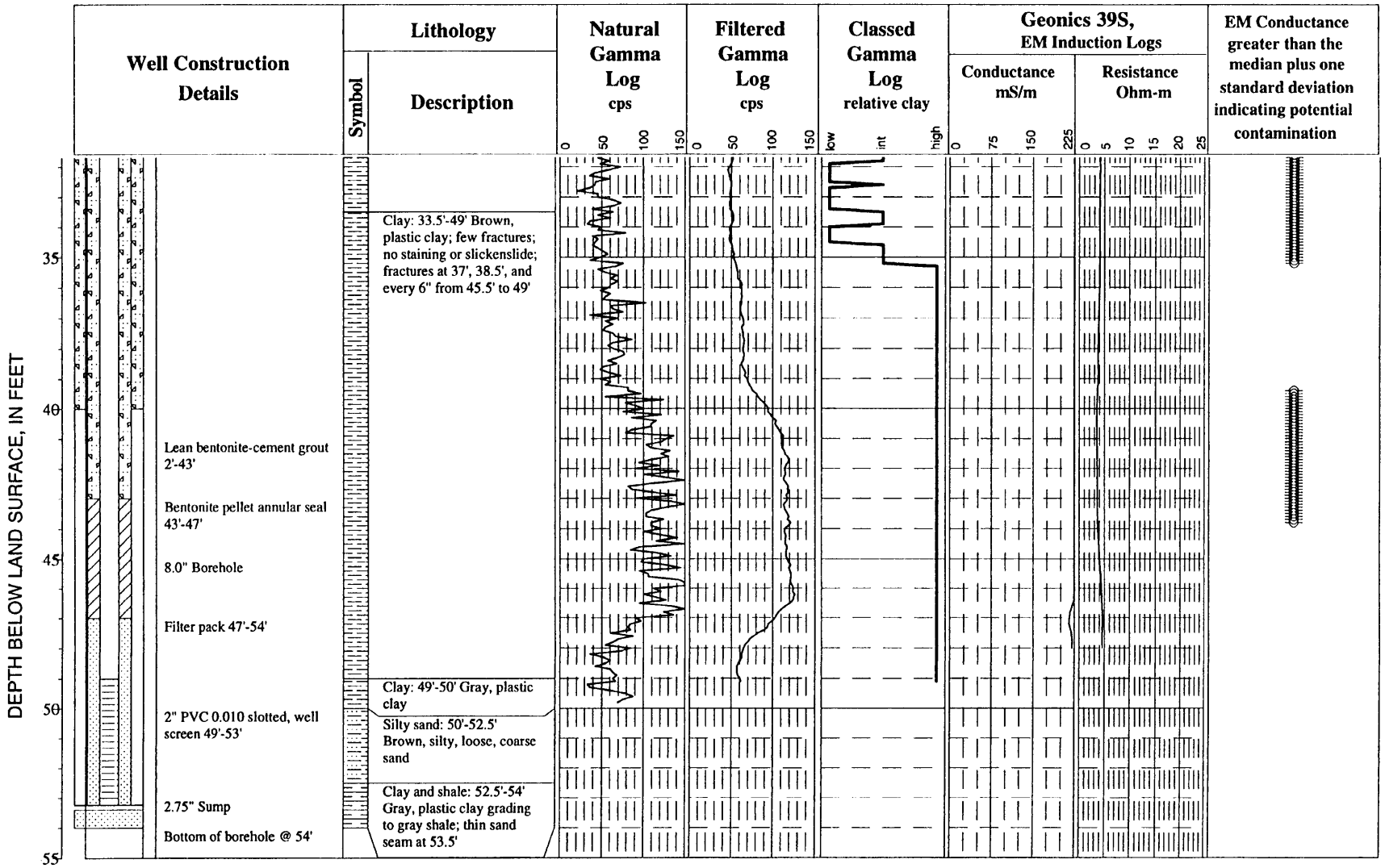
DWP-2-16—Continued



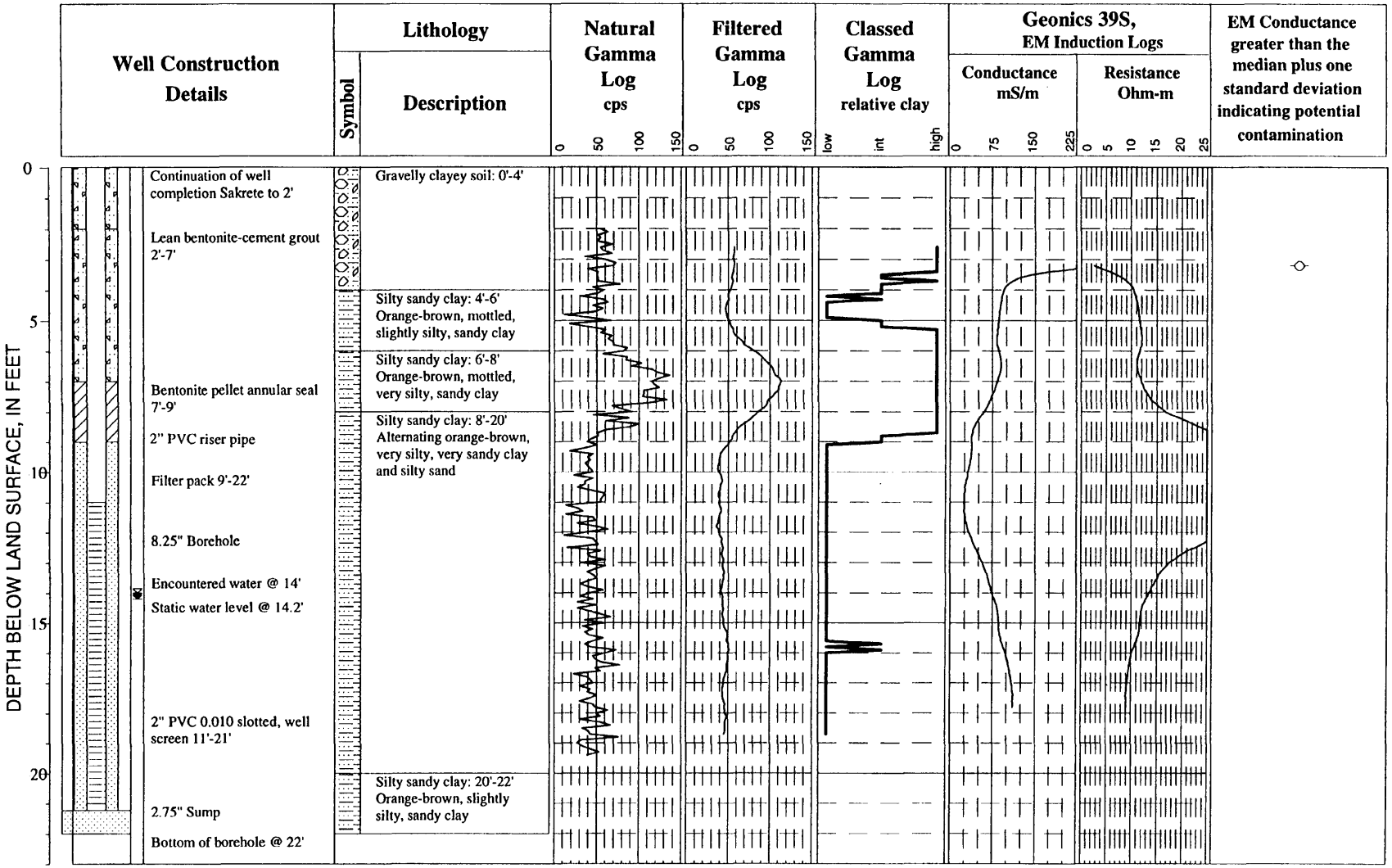
DWP-2-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-43'
Static water level @ 13.4'
8.0" I.D. SCH 40 PVC surface casing to 40'
2" PVC riser pipe
14.0" Borehole
Fill: 0'-24' Fill material composed of clay mixed with sand, gravel, and concrete pieces
Silty sandy clay: 24'-28' Brown, silty, sandy clay
Clay: 28'-33.5' Brown and gray, mottled, plastic clay with numerous black stained planes; many with evident slickenslide; 3" loose sand at base

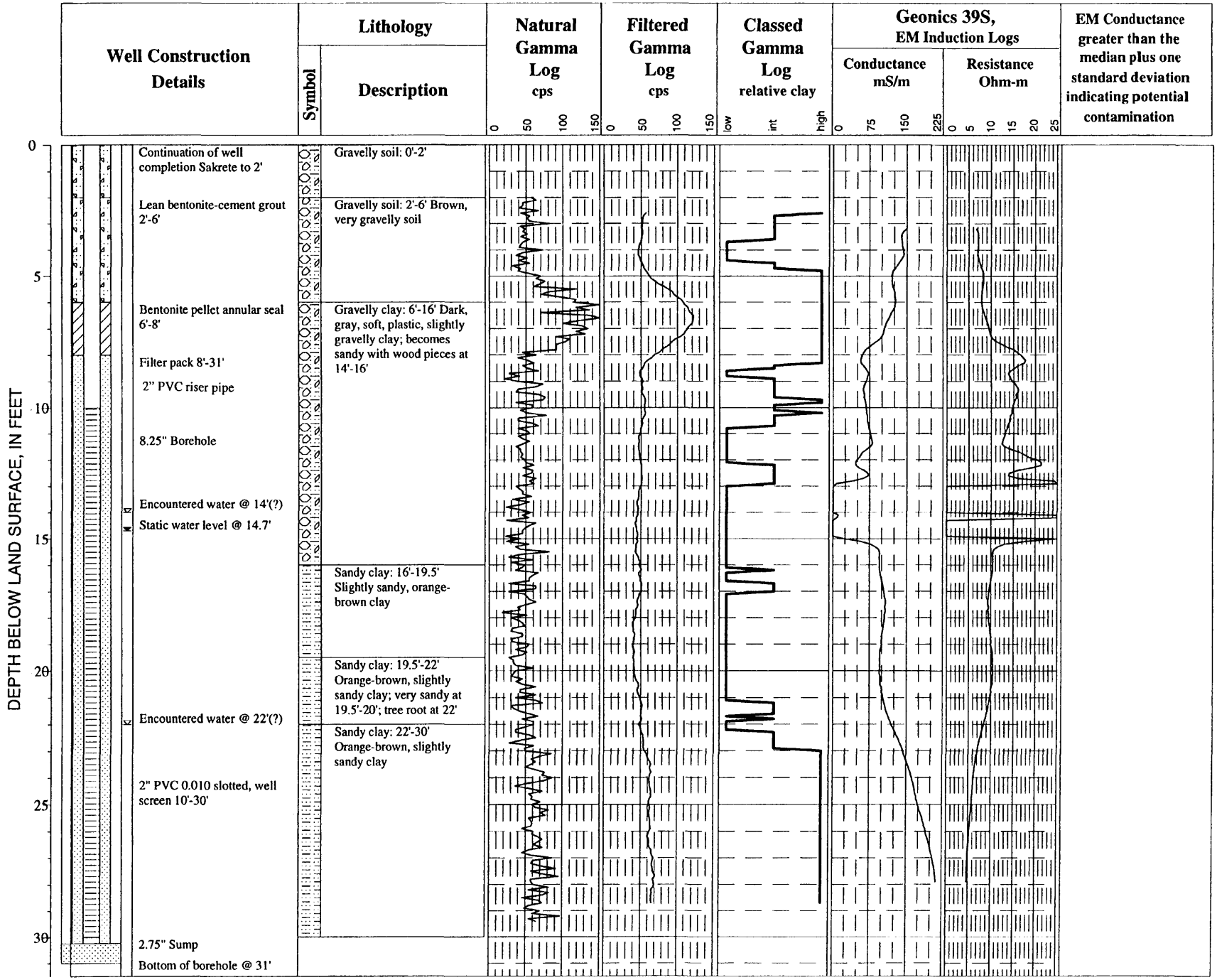
DWP-2-DW1—Continued



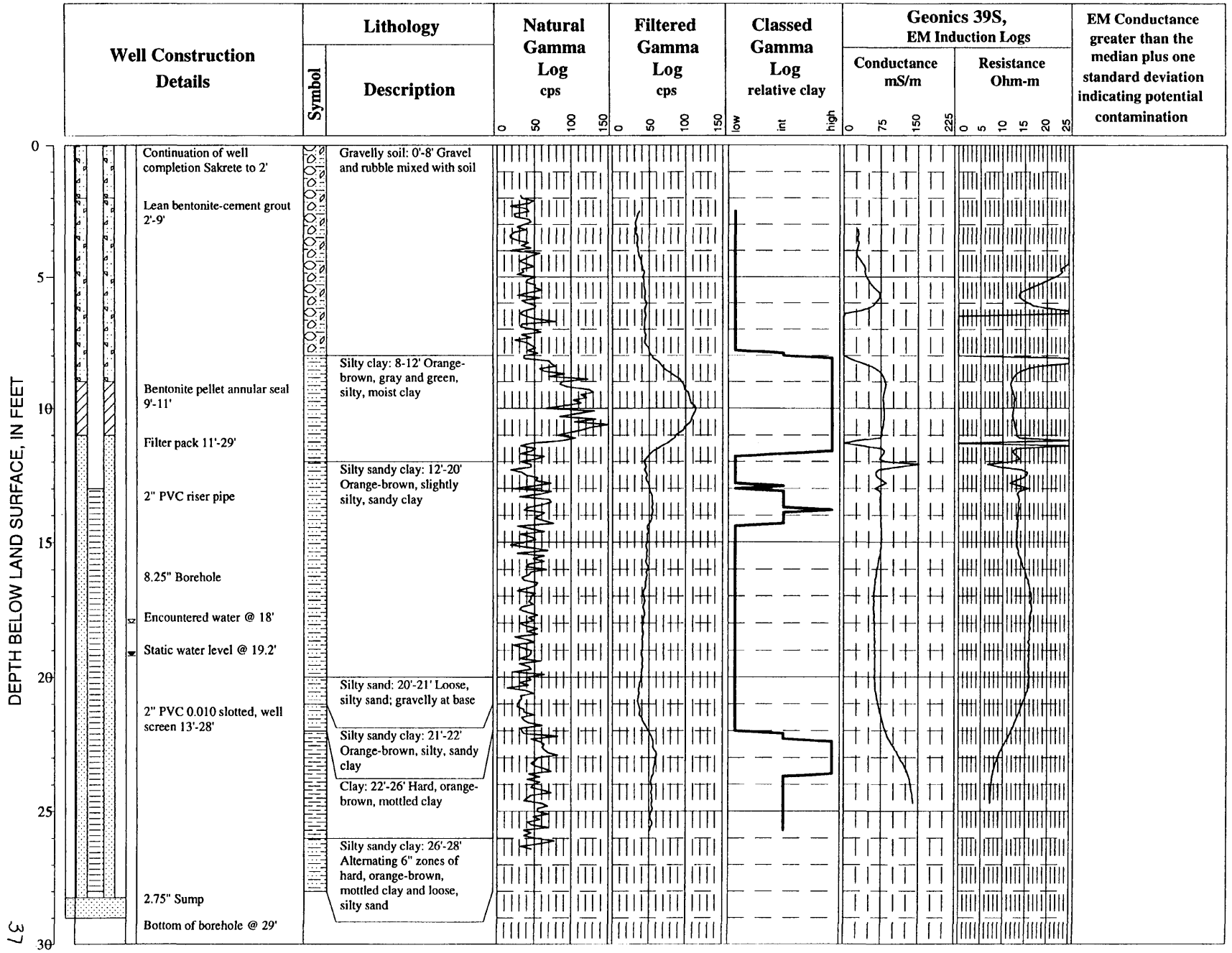
DWP-4-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
2" PVC riser pipe
Filter pack 9'-22'
8.25" Borehole
Encountered water @ 14'
Static water level @ 14.2'
2" PVC 0.010 slotted, well screen 11'-21'
2.75" Sump
Bottom of borehole @ 22'
Gravelly clayey soil: 0'-4'
Silty sandy clay: 4'-6' Orange-brown, mottled, slightly silty, sandy clay
Silty sandy clay: 6'-8' Orange-brown, mottled, very silty, sandy clay
Silty sandy clay: 8'-20' Alternating orange-brown, very silty, very sandy clay and silty sand
Silty sandy clay: 20'-22' Orange-brown, slightly silty, sandy clay

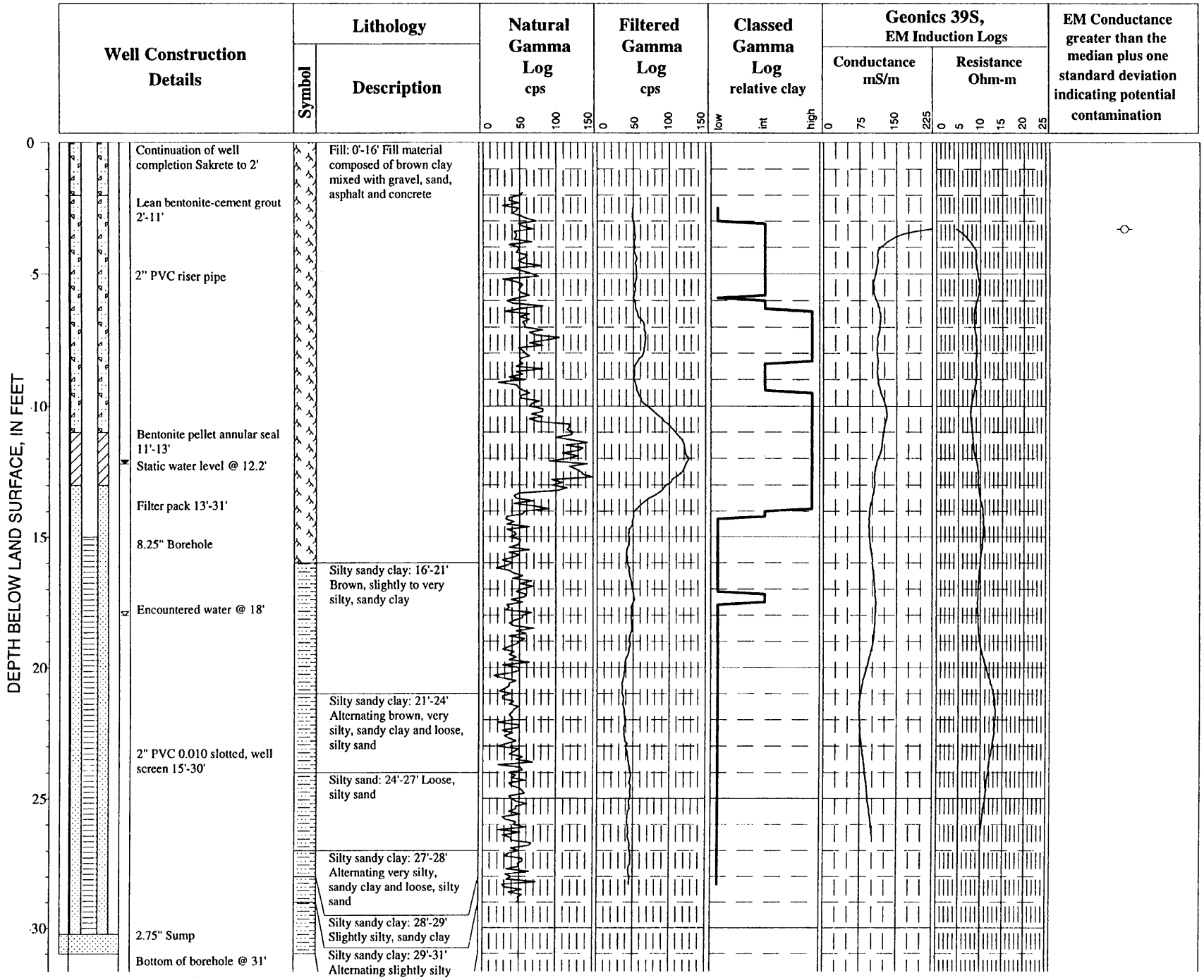
DWP-4-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-31'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 14'(?)
Static water level @ 14.7'
Encountered water @ 22'(?)
2" PVC 0.010 slotted, well screen 10'-30'
2.75" Sump
Bottom of borehole @ 31'
Gravelly soil: 0'-2'
Gravelly soil: 2'-6' Brown, very gravelly soil
Gravelly clay: 6'-16' Dark, gray, soft, plastic, slightly gravelly clay; becomes sandy with wood pieces at 14'-16'
Sandy clay: 16'-19.5' Slightly sandy, orange-brown clay
Sandy clay: 19.5'-22' Orange-brown, slightly sandy clay; very sandy at 19.5'-20'; tree root at 22'
Sandy clay: 22'-30' Orange-brown, slightly sandy clay

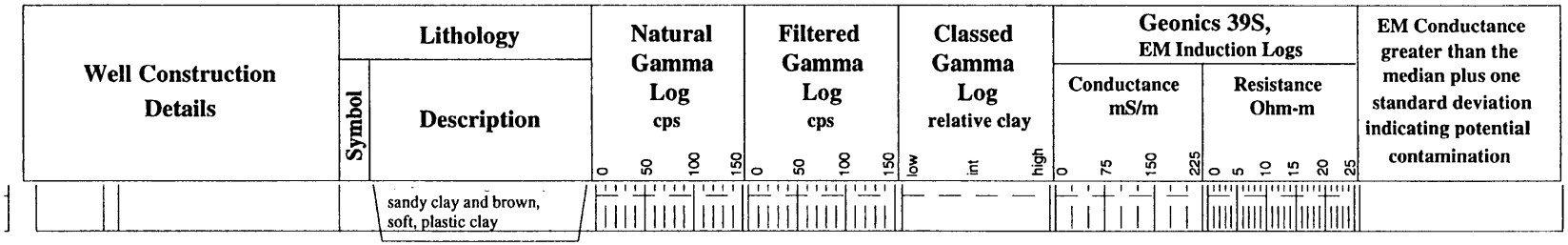
DWP-4-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 18'
Static water level @ 19.2'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Gravelly soil: 0'-8' Gravel and rubble mixed with soil
Silty clay: 8-12' Orange-brown, gray and green, silty, moist clay
Silty sandy clay: 12'-20' Orange-brown, slightly silty, sandy clay
Silty sand: 20'-21' Loose, silty sand; gravelly at base
Silty sandy clay: 21'-22' Orange-brown, silty, sandy clay
Clay: 22'-26' Hard, orange-brown, mottled clay
Silty sandy clay: 26'-28' Alternating 6" zones of hard, orange-brown, mottled clay and loose, silty sand
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30

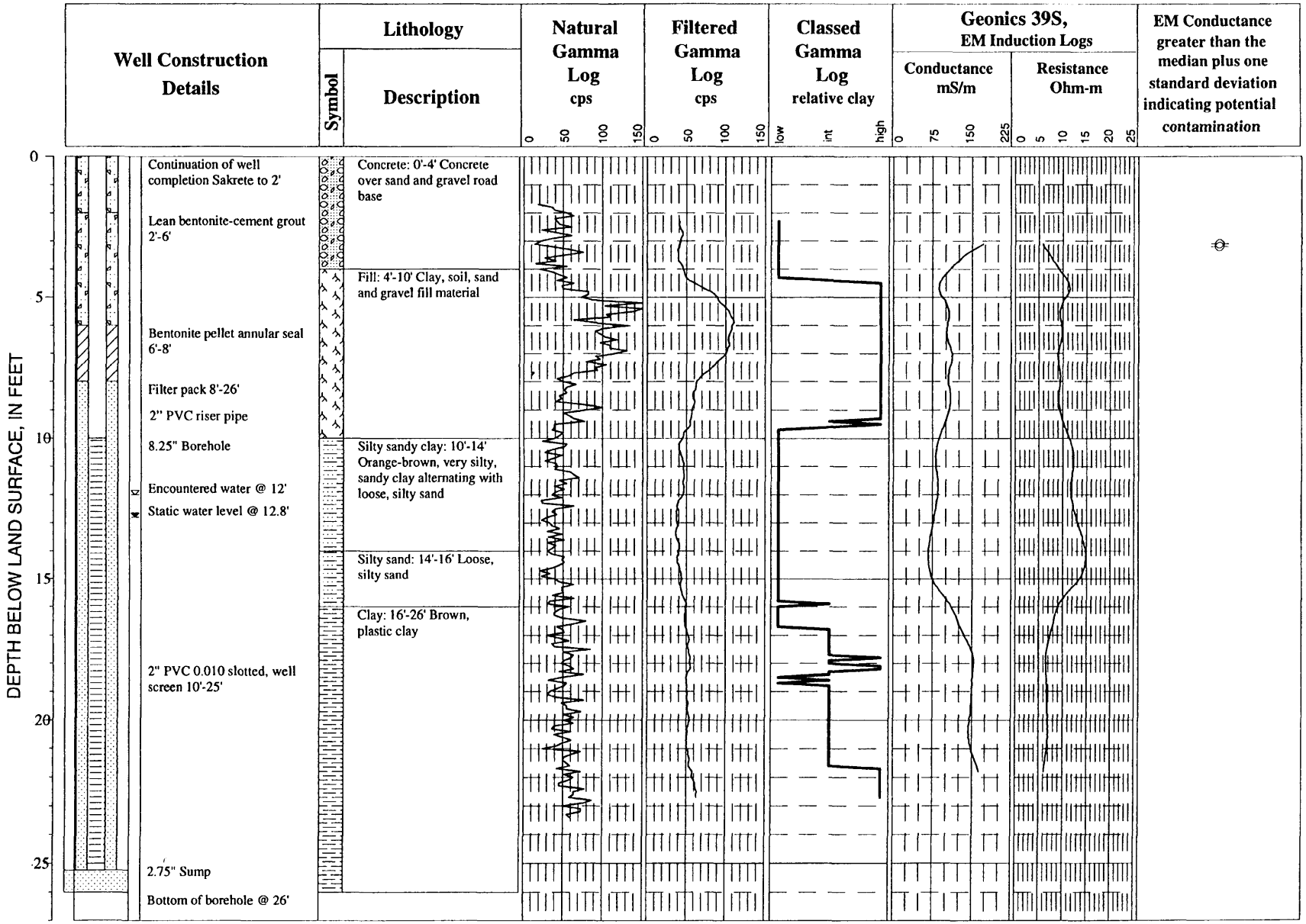
DWP-4-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
Bentonite pellet annular seal 11'-13'
Static water level @ 12.2'
Filter pack 13'-31'
8.25" Borehole
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Fill: 0'-16' Fill material composed of brown clay mixed with gravel, sand, asphalt and concrete
Silty sandy clay: 16'-21' Brown, slightly to very silty, sandy clay
Silty sandy clay: 21'-24' Alternating brown, very silty, sandy clay and loose, silty sand
Silty sand: 24'-27' Loose, silty sand
Silty sandy clay: 27'-28' Alternating very silty, sandy clay and loose, silty sand
Silty sandy clay: 28'-29' Slightly silty, sandy clay
Silty sandy clay: 29'-31' Alternating slightly silty

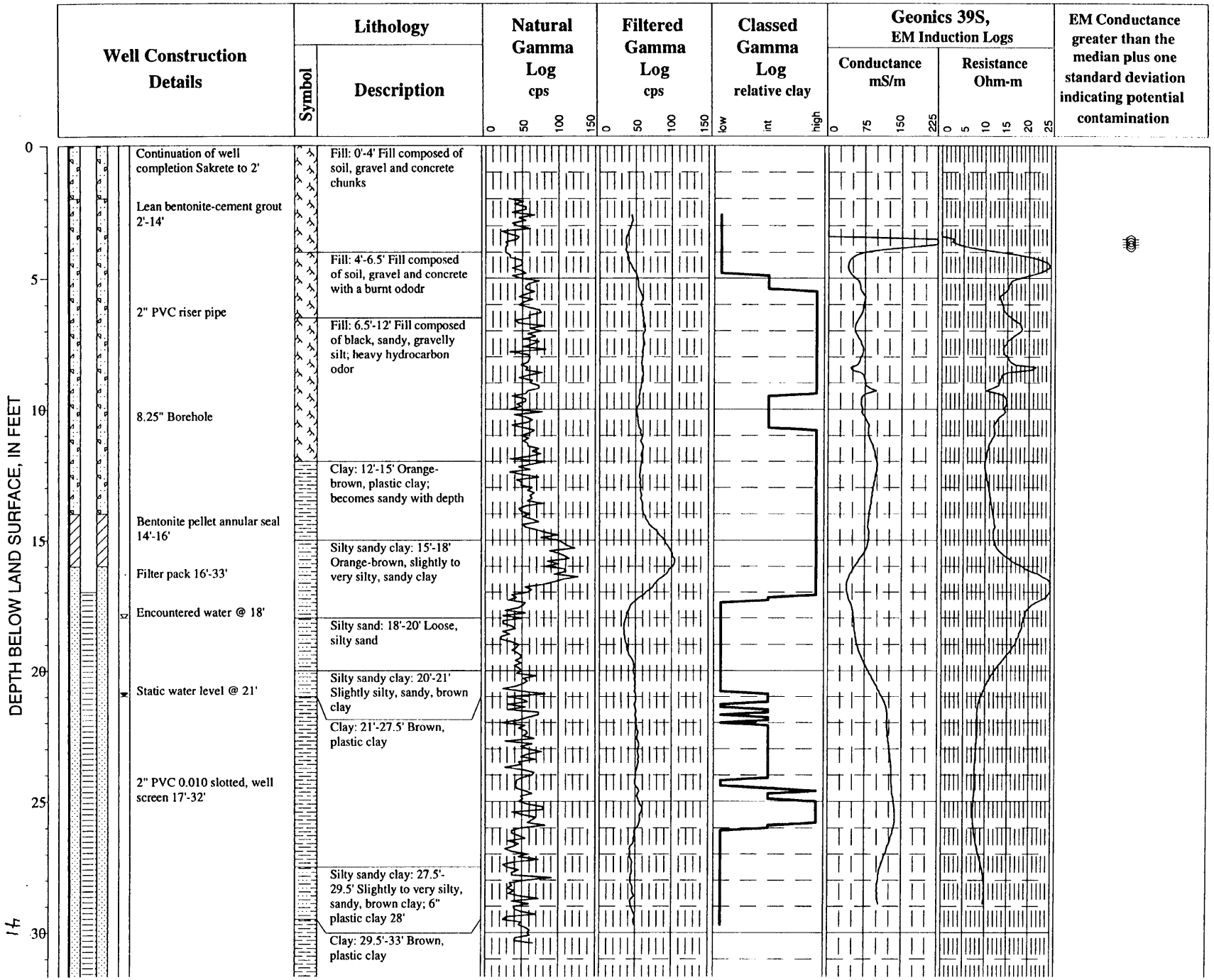
DWP-4-6—Continued



DWP-4-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 12'
Static water level @ 12.8'
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-4' Concrete over sand and gravel road base
Fill: 4'-10' Clay, soil, sand and gravel fill material
Silty sandy clay: 10'-14' Orange-brown, very silty, sandy clay alternating with loose, silty sand
Silty sand: 14'-16' Loose, silty sand
Clay: 16'-26' Brown, plastic clay
low
int
high

DWP-4-8

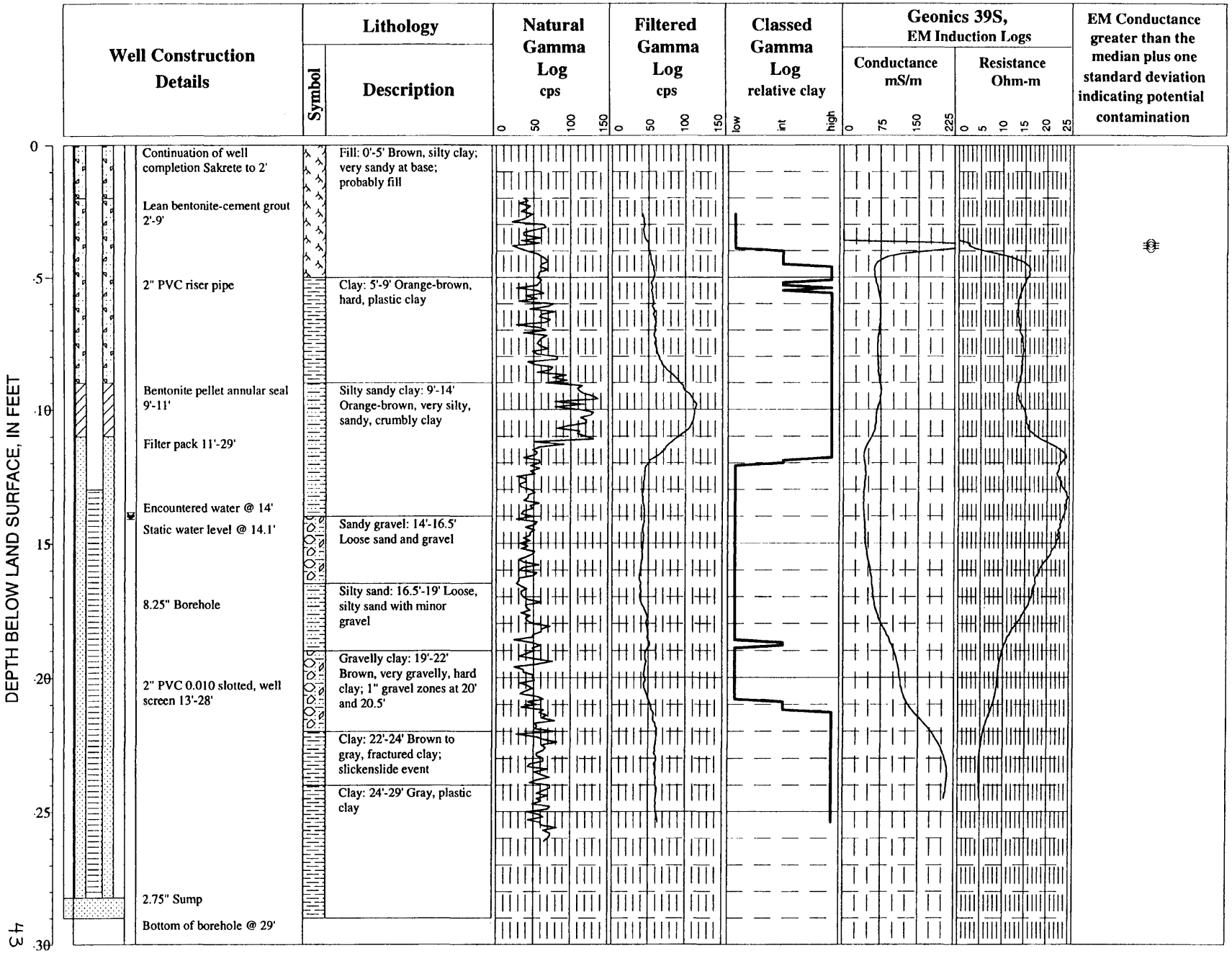

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-16'
Filter pack 16'-33'
Encountered water @ 18'
Static water level @ 21'
2" PVC 0.010 slotted, well screen 17'-32'
Fill: 0'-4' Fill composed of soil, gravel and concrete chunks
Fill: 4'-6.5' Fill composed of soil, gravel and concrete with a burnt ododr
Fill: 6.5'-12' Fill composed of black, sandy, gravelly silt; heavy hydrocarbon odor
Clay: 12'-15' Orange-brown, plastic clay; becomes sandy with depth
Silty sandy clay: 15'-18' Orange-brown, slightly to very silty, sandy clay
Silty sand: 18'-20' Loose, silty sand
Silty sandy clay: 20'-21' Slightly silty, sandy, brown clay
Clay: 21'-27.5' Brown, plastic clay
Silty sandy clay: 27.5'-29.5' Slightly to very silty, sandy, brown clay; 6" plastic clay 28'
Clay: 29.5'-33' Brown, plastic clay

14

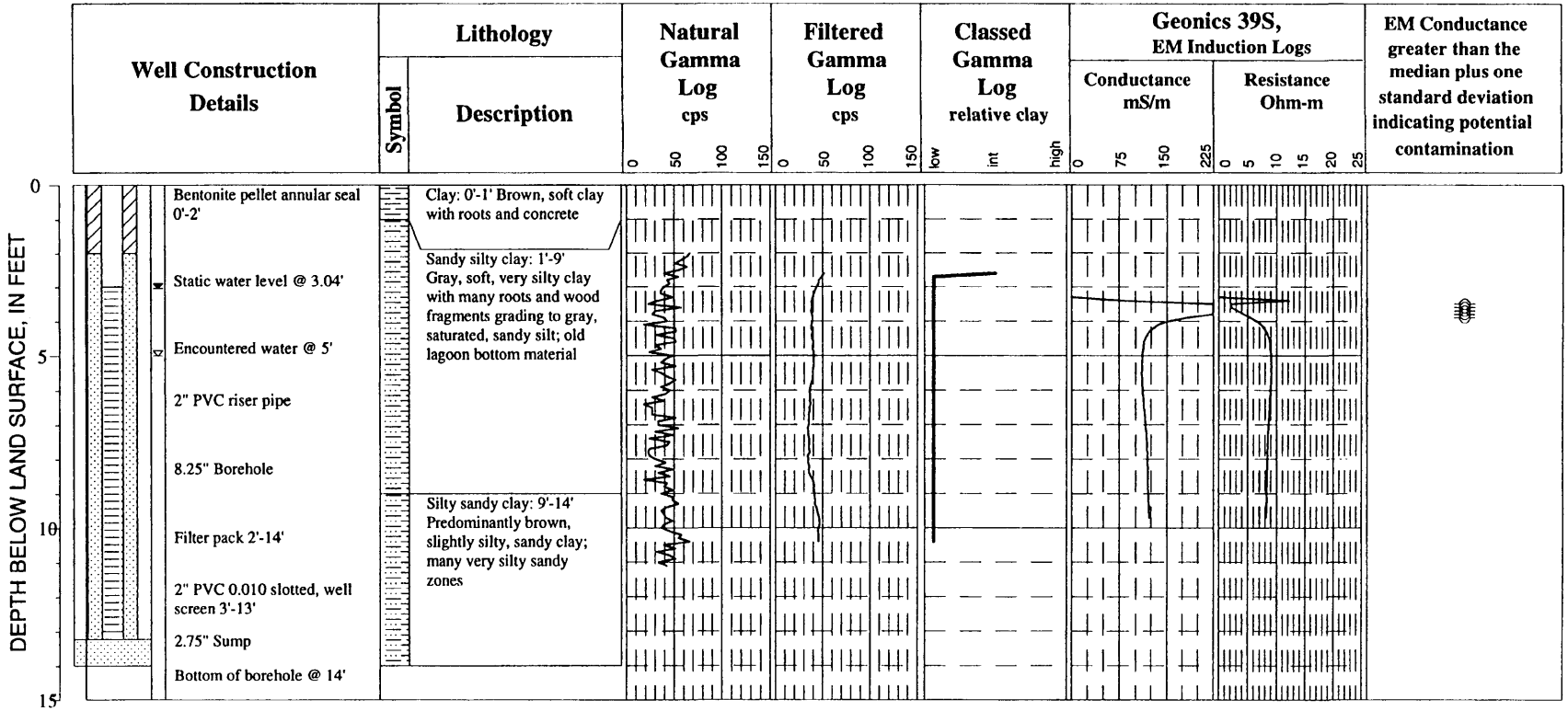
DWP-4-8—Continued

Well Construction Details	Lithology		Natural Gamma Log cps	Filtered Gamma Log cps	Classed Gamma Log relative clay	Geonics 39S, EM Induction Logs		EM Conductance greater than the median plus one standard deviation indicating potential contamination
	Symbol	Description				Conductance mS/m	Resistance Ohm-m	
			0 50 100 150	0 50 100 150	low int high	0 75 150 225	0 5 10 15 20 25	
2.75" Sump Bottom of borehole @ 33'								

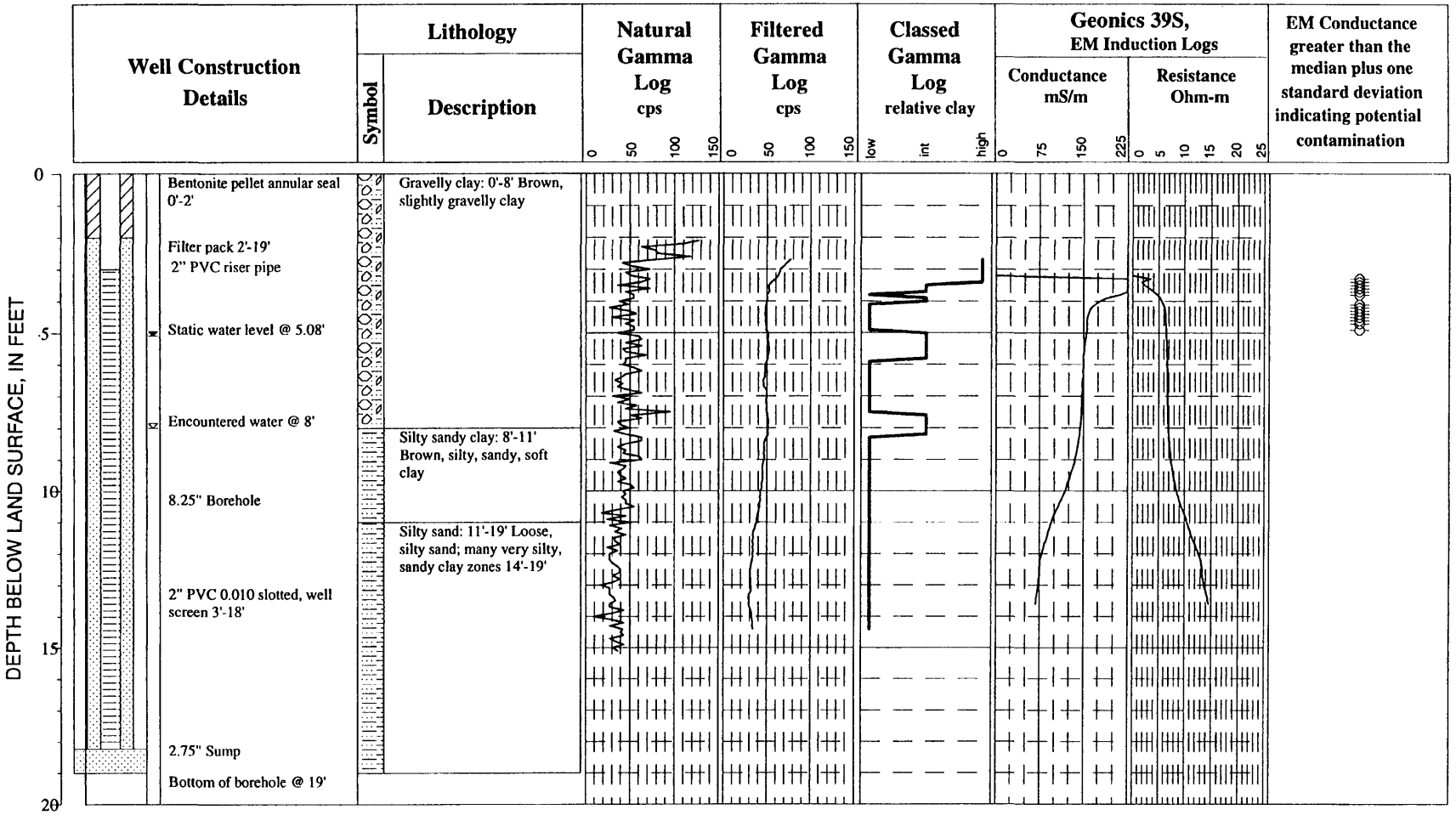
DWP-4-9


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 14'
Static water level @ 14.1'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-5' Brown, silty clay; very sandy at base; probably fill
Clay: 5'-9' Orange-brown, hard, plastic clay
Silty sandy clay: 9'-14' Orange-brown, very silty, sandy, crumbly clay
Sandy gravel: 14'-16.5' Loose sand and gravel
Silty sand: 16.5'-19' Loose, silty sand with minor gravel
Gravelly clay: 19'-22' Brown, very gravelly, hard clay; 1" gravel zones at 20' and 20.5'
Clay: 22'-24' Brown to gray, fractured clay; slickenslide event
Clay: 24'-29' Gray, plastic clay

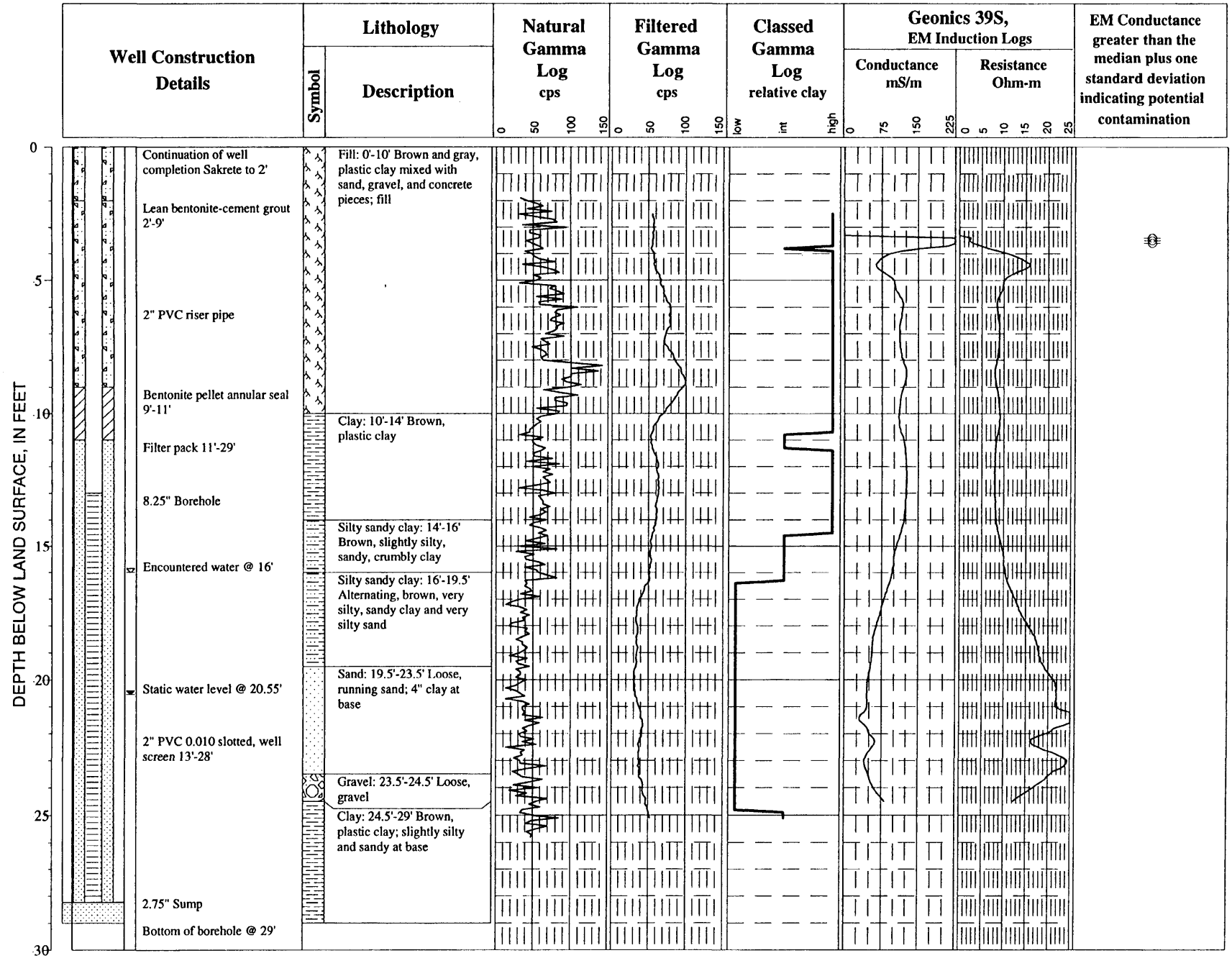
DWP-4-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite pellet annular seal 0'-2'
Static water level @ 3.04'
Encountered water @ 5'
2" PVC riser pipe
8.25" Borehole
Filter pack 2'-14'
2" PVC 0.010 slotted, well screen 3'-13'
2.75" Sump
Bottom of borehole @ 14'
Clay: 0'-1' Brown, soft clay with roots and concrete
Sandy silty clay: 1'-9' Gray, soft, very silty clay with many roots and wood fragments grading to gray, saturated, sandy silt; old lagoon bottom material
Silty sandy clay: 9'-14' Predominantly brown, slightly silty, sandy clay; many very silty sandy zones

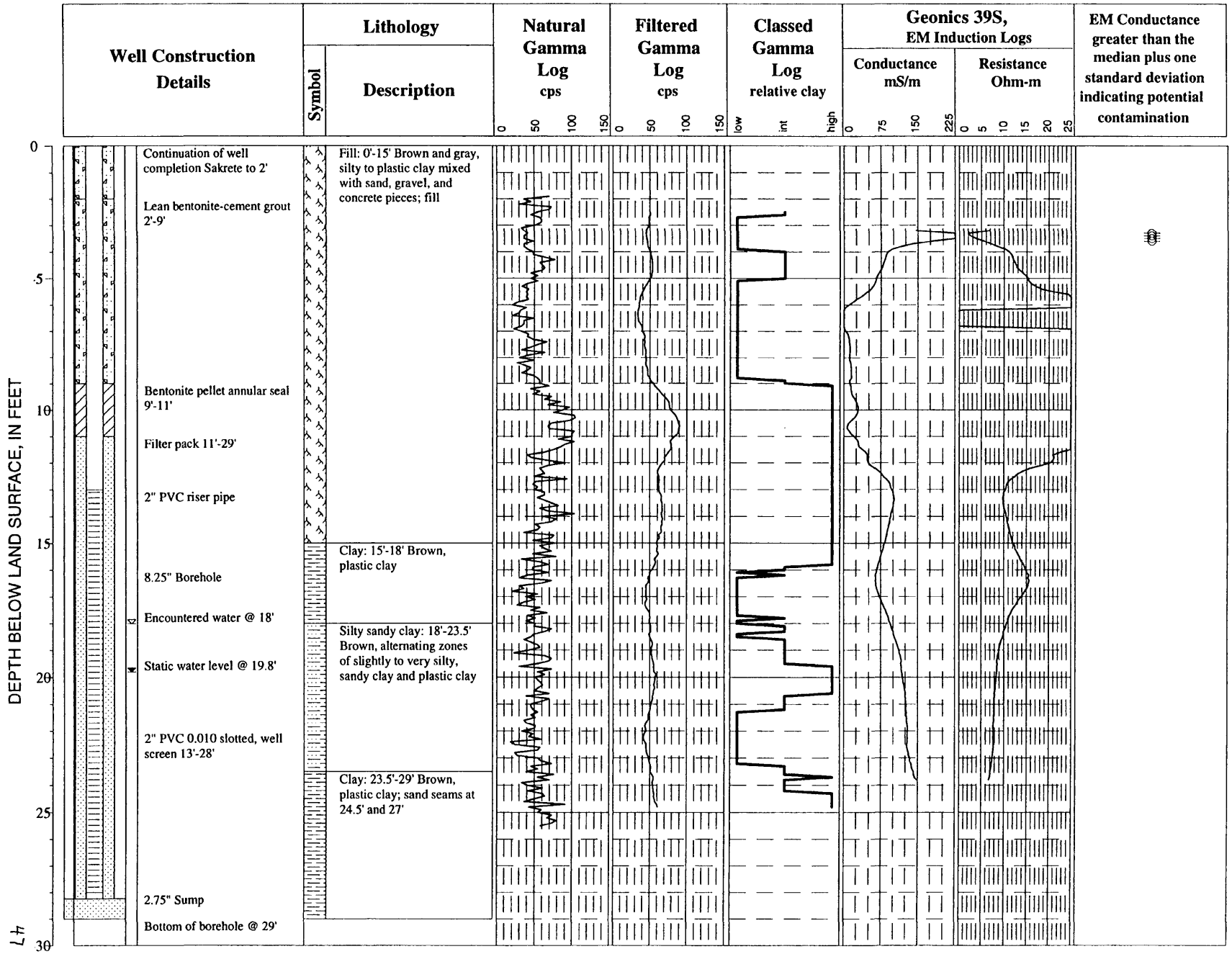
DWP-4-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0 50 100 150
Filtered Gamma Log
cps
0 50 100 150
Classed Gamma Log
relative clay
low int high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0 75 150 225
Resistance
Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
Filter pack 2'-19'
2" PVC riser pipe
Static water level @ 5.08'
Encountered water @ 8'
8.25" Borehole
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Gravelly clay: 0'-8' Brown, slightly gravelly clay
Silty sandy clay: 8'-11' Brown, silty, sandy, soft clay
Silty sand: 11'-19' Loose, silty sand; many very silty, sandy clay zones 14'-19'

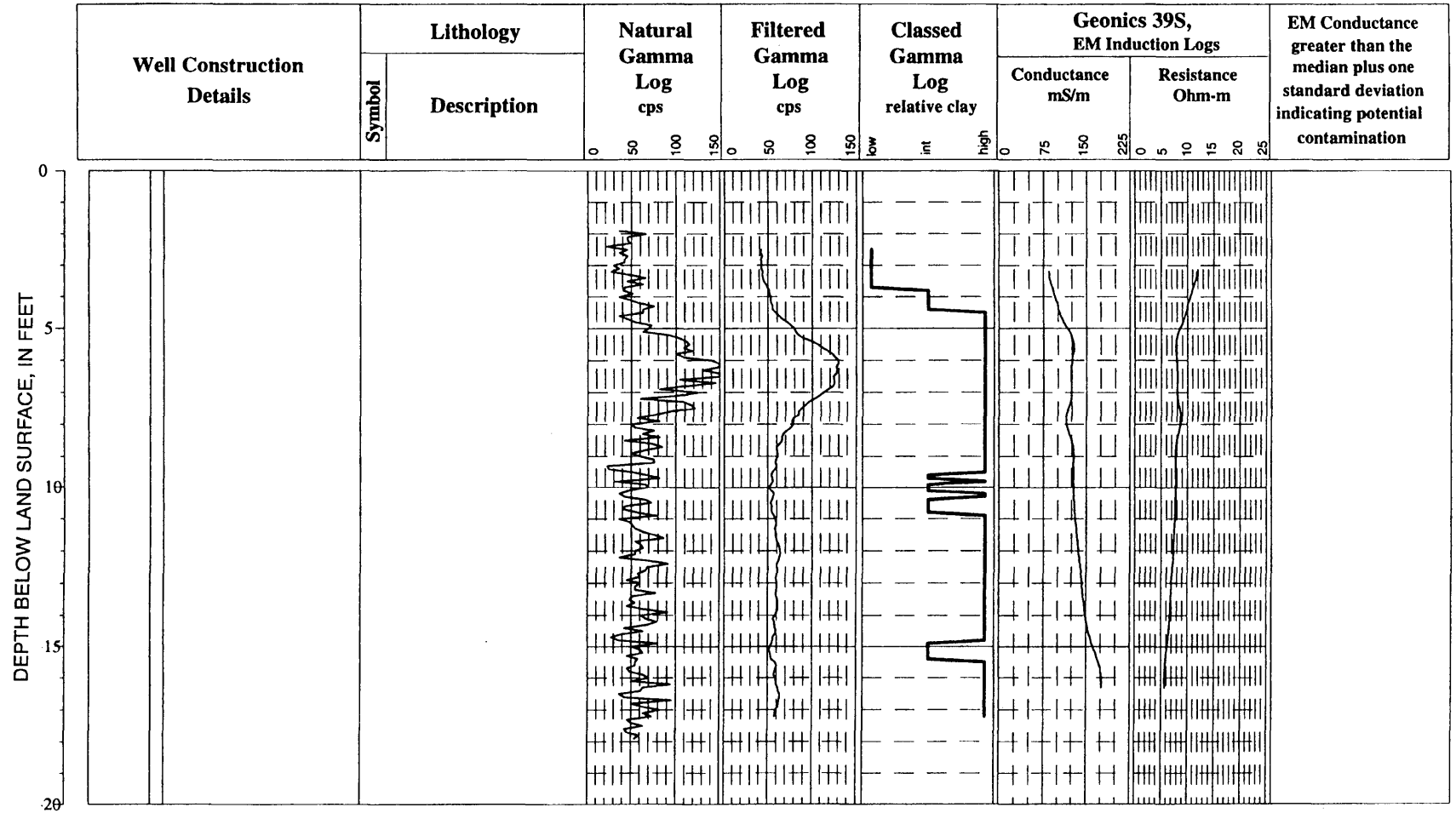
DWP-4-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Encountered water @ 16'
Static water level @ 20.55'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-10' Brown and gray, plastic clay mixed with sand, gravel, and concrete pieces; fill
Clay: 10'-14' Brown, plastic clay
Silty sandy clay: 14'-16' Brown, slightly silty, sandy, crumbly clay
Silty sandy clay: 16'-19.5' Alternating, brown, very silty, sandy clay and very silty sand
Sand: 19.5'-23.5' Loose, running sand; 4" clay at base
Gravel: 23.5'-24.5' Loose, gravel
Clay: 24.5'-29' Brown, plastic clay; slightly silty and sandy at base
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

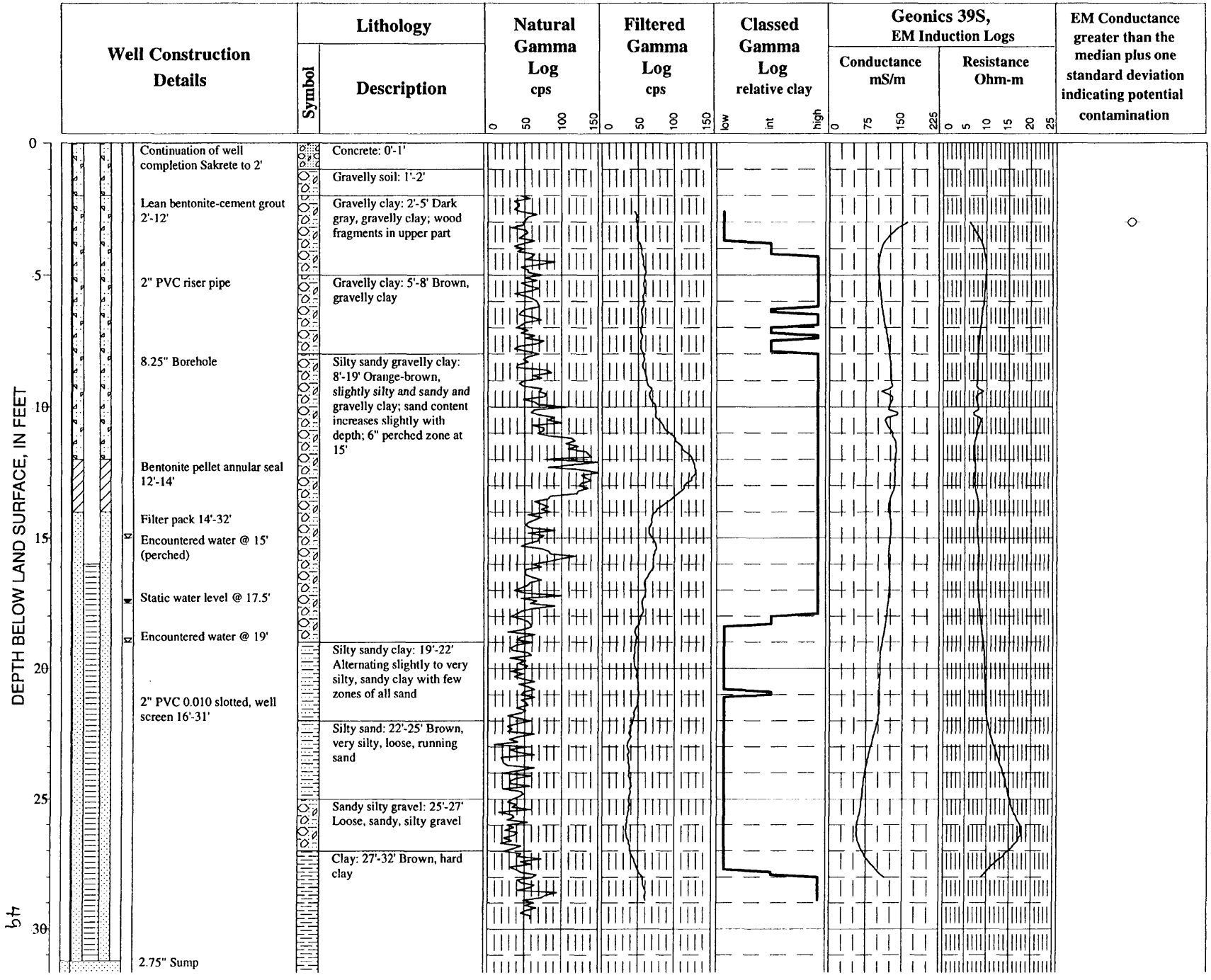
DWP-4-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 18'
Static water level @ 19.8'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-15' Brown and gray, silty to plastic clay mixed with sand, gravel, and concrete pieces; fill
Clay: 15'-18' Brown, plastic clay
Silty sandy clay: 18'-23.5' Brown, alternating zones of slightly to very silty, sandy clay and plastic clay
Clay: 23.5'-29' Brown, plastic clay; sand seams at 24.5' and 27'

DWP-4-14


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0
50
100
150
Filtered Gamma Log
cps
0
50
100
150
Classed Gamma Log
relative clay
low
int
high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0
75
150
225
Resistance
Ohm-m
0
5
10
15
20
25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20

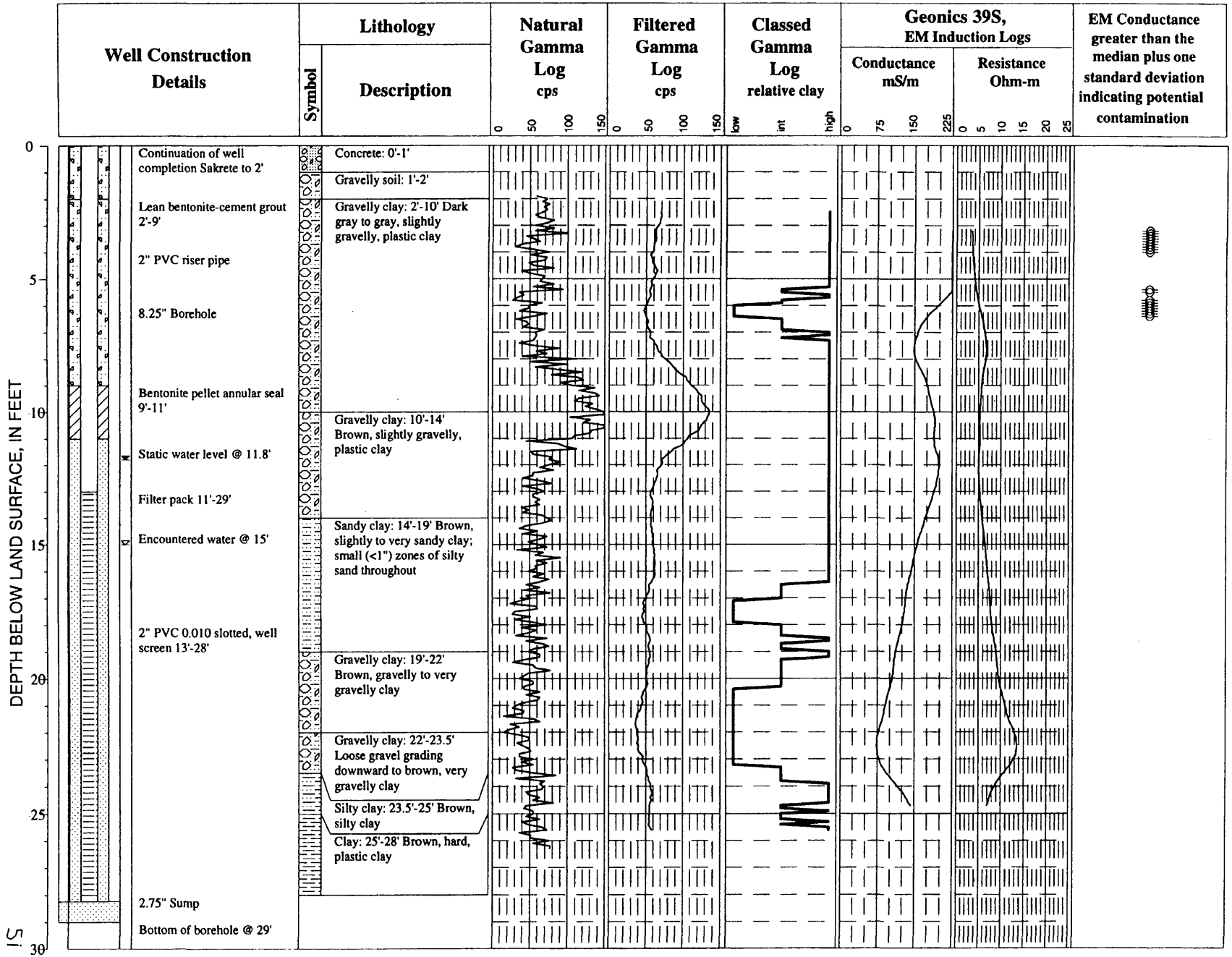
DWP-5-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-12'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 12'-14'
Filter pack 14'-32'
Encountered water @ 15' (perched)
Static water level @ 17.5'
Encountered water @ 19'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-5' Dark gray, gravelly clay; wood fragments in upper part
Gravelly clay: 5'-8' Brown, gravelly clay
Silty sandy gravelly clay: 8'-19' Orange-brown, slightly silty and sandy and gravelly clay; sand content increases slightly with depth; 6" perched zone at 15'
Silty sandy clay: 19'-22' Alternating slightly to very silty, sandy clay with few zones of all sand
Silty sand: 22'-25' Brown, very silty, loose, running sand
Sandy silty gravel: 25'-27' Loose, sandy, silty gravel
Clay: 27'-32' Brown, hard clay
low
int
high

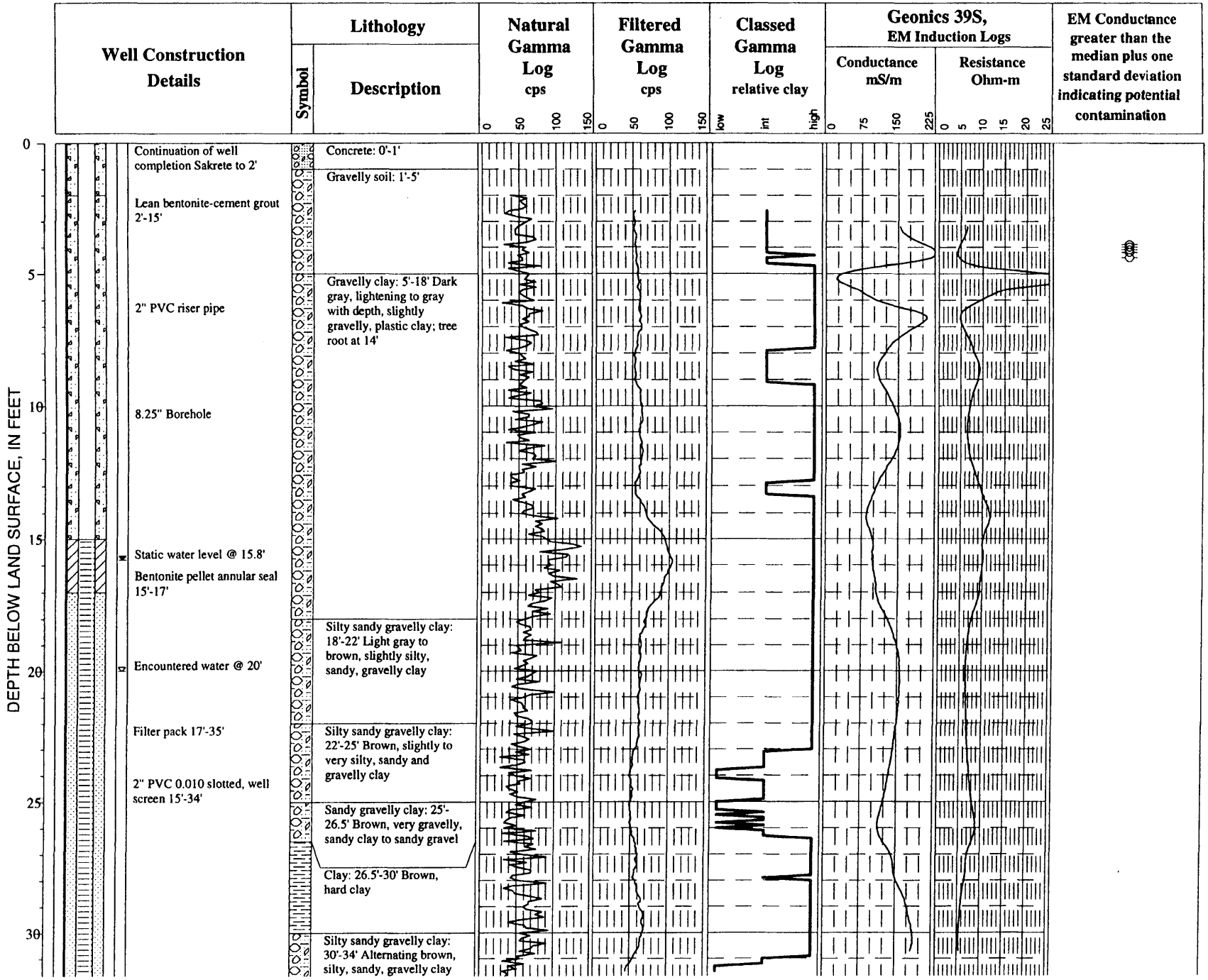
DWP-5-3—Continued

Well Construction Details	Lithology		Natural Gamma Log cps	Filtered Gamma Log cps	Classed Gamma Log relative clay	Geonics 39S, EM Induction Logs		EM Conductance greater than the median plus one standard deviation indicating potential contamination
	Symbol	Description				Conductance mS/m	Resistance Ohm-m	
			0 50 100 150	0 50 100 150	low int high	0 75 150 225	0 5 10 15 20 25	
Bottom of borehole @ 32'								

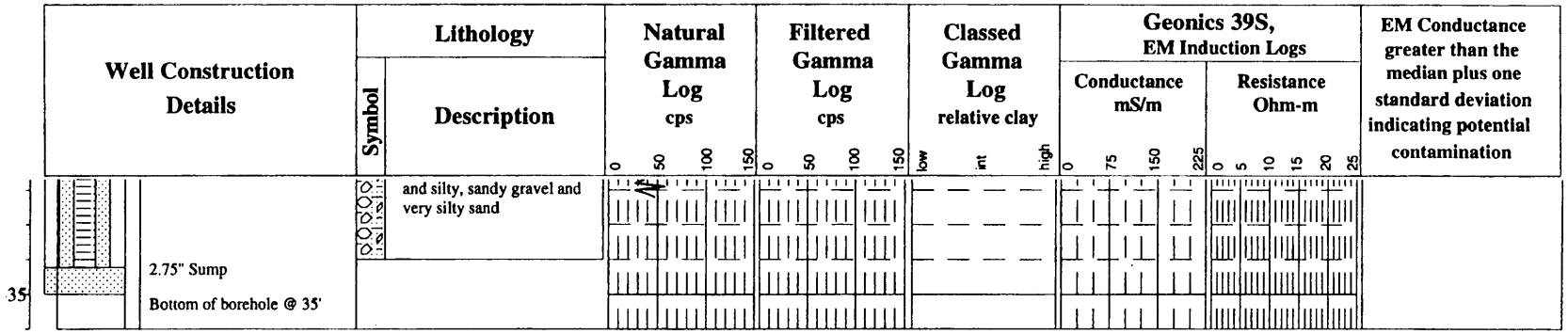
DWP-5-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 9'-11'
Static water level @ 11.8'
Filter pack 11'-29'
Encountered water @ 15'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-10' Dark gray to gray, slightly gravelly, plastic clay
Gravelly clay: 10'-14' Brown, slightly gravelly, plastic clay
Sandy clay: 14'-19' Brown, slightly to very sandy clay; small (<1") zones of silty sand throughout
Gravelly clay: 19'-22' Brown, gravelly to very gravelly clay
Gravelly clay: 22'-23.5' Loose gravel grading downward to brown, very gravelly clay
Silty clay: 23.5'-25' Brown, silty clay
Clay: 25'-28' Brown, hard, plastic clay
low
int
high

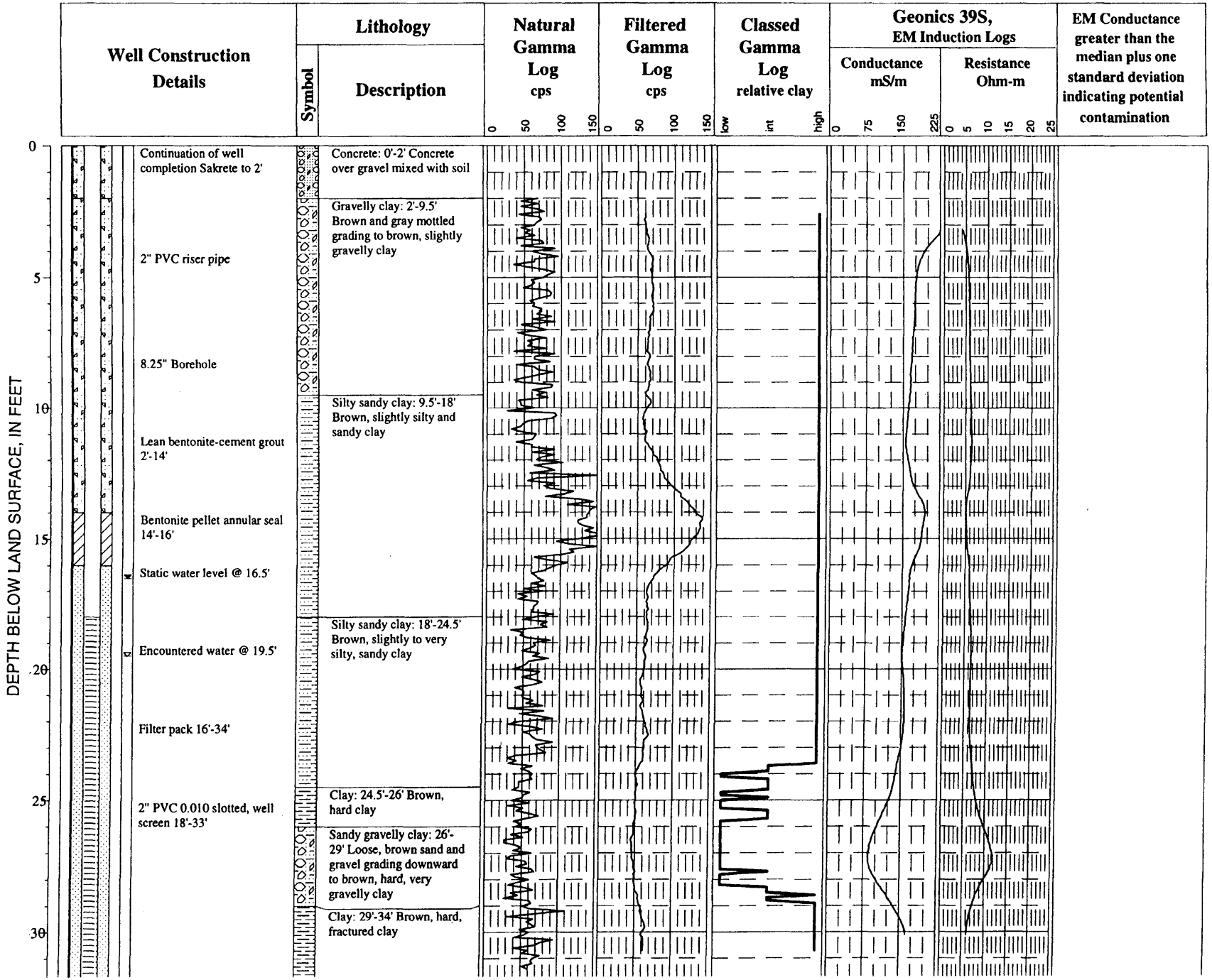
DWP-5-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-15'
2" PVC riser pipe
8.25" Borehole
Static water level @ 15.8'
Bentonite pellet annular seal 15'-17'
Encountered water @ 20'
Filter pack 17'-35'
2" PVC 0.010 slotted, well screen 15'-34'
Concrete: 0'-1'
Gravelly soil: 1'-5'
Gravelly clay: 5'-18' Dark gray, lightening to gray with depth, slightly gravelly, plastic clay; tree root at 14'
Silty sandy gravelly clay: 18'-22' Light gray to brown, slightly silty, sandy, gravelly clay
Silty sandy gravelly clay: 22'-25' Brown, slightly to very silty, sandy and gravelly clay
Sandy gravelly clay: 25'-26.5' Brown, very gravelly, sandy clay to sandy gravel
Clay: 26.5'-30' Brown, hard clay
Silty sandy gravelly clay: 30'-34' Alternating brown, silty, sandy, gravelly clay

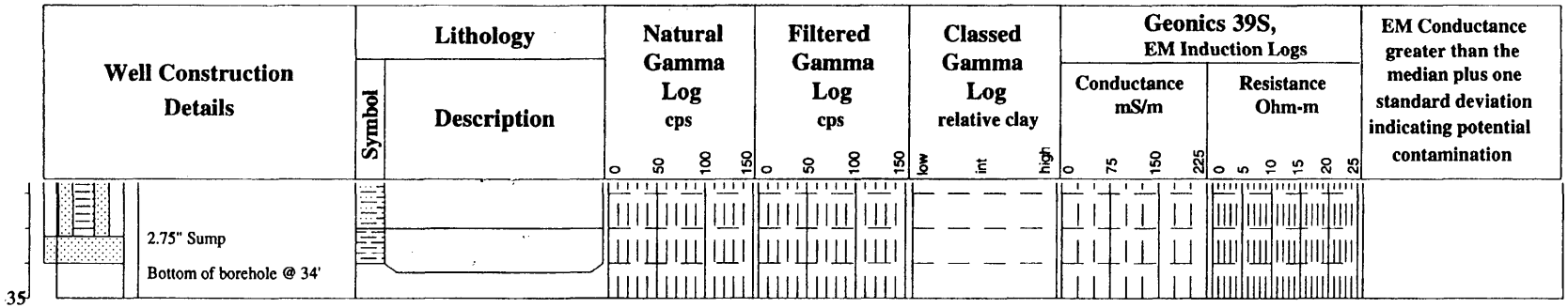
DWP-5-5—Continued



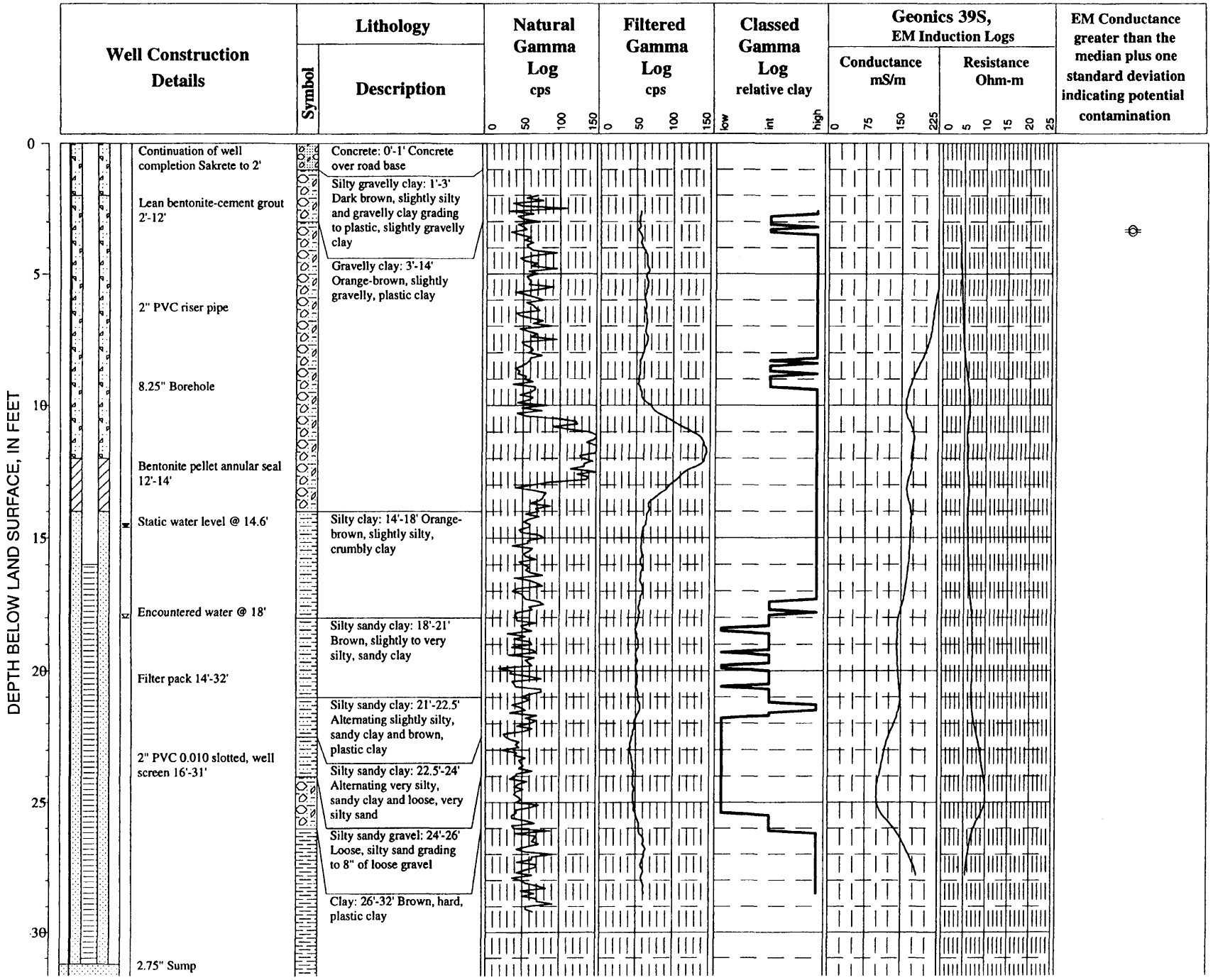
DWP-5-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-14'
Bentonite pellet annular seal 14'-16'
Static water level @ 16.5'
Encountered water @ 19.5'
Filter pack 16'-34'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-2' Concrete over gravel mixed with soil
Gravelly clay: 2'-9.5' Brown and gray mottled grading to brown, slightly gravelly clay
Silty sandy clay: 9.5'-18' Brown, slightly silty and sandy clay
Silty sandy clay: 18'-24.5' Brown, slightly to very silty, sandy clay
Clay: 24.5'-26' Brown, hard clay
Sandy gravelly clay: 26'-29' Loose, brown sand and gravel grading downward to brown, hard, very gravelly clay
Clay: 29'-34' Brown, hard, fractured clay

DWP-5-6—Continued



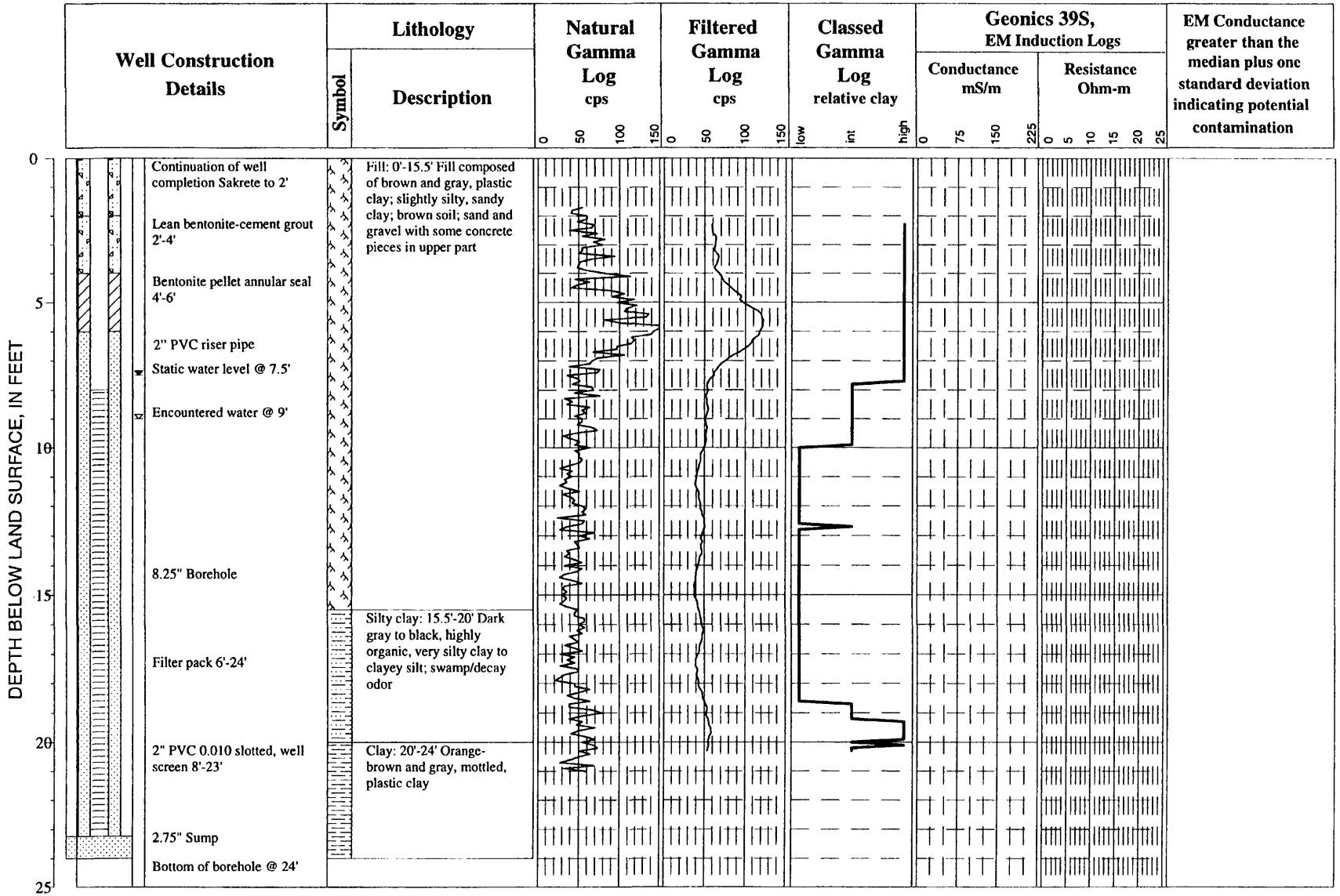
DWP-5-9


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-12'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 12'-14'
Static water level @ 14.6'
Encountered water @ 18'
Filter pack 14'-32'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Concrete: 0'-1' Concrete over road base
Silty gravelly clay: 1'-3' Dark brown, slightly silty and gravelly clay grading to plastic, slightly gravelly clay
Gravelly clay: 3'-14' Orange-brown, slightly gravelly, plastic clay
Silty clay: 14'-18' Orange-brown, slightly silty, crumbly clay
Silty sandy clay: 18'-21' Brown, slightly to very silty, sandy clay
Silty sandy clay: 21'-22.5' Alternating slightly silty, sandy clay and brown, plastic clay
Silty sandy clay: 22.5'-24' Alternating very silty, sandy clay and loose, very silty sand
Silty sandy gravel: 24'-26' Loose, silty sand grading to 8" of loose gravel
Clay: 26'-32' Brown, hard, plastic clay

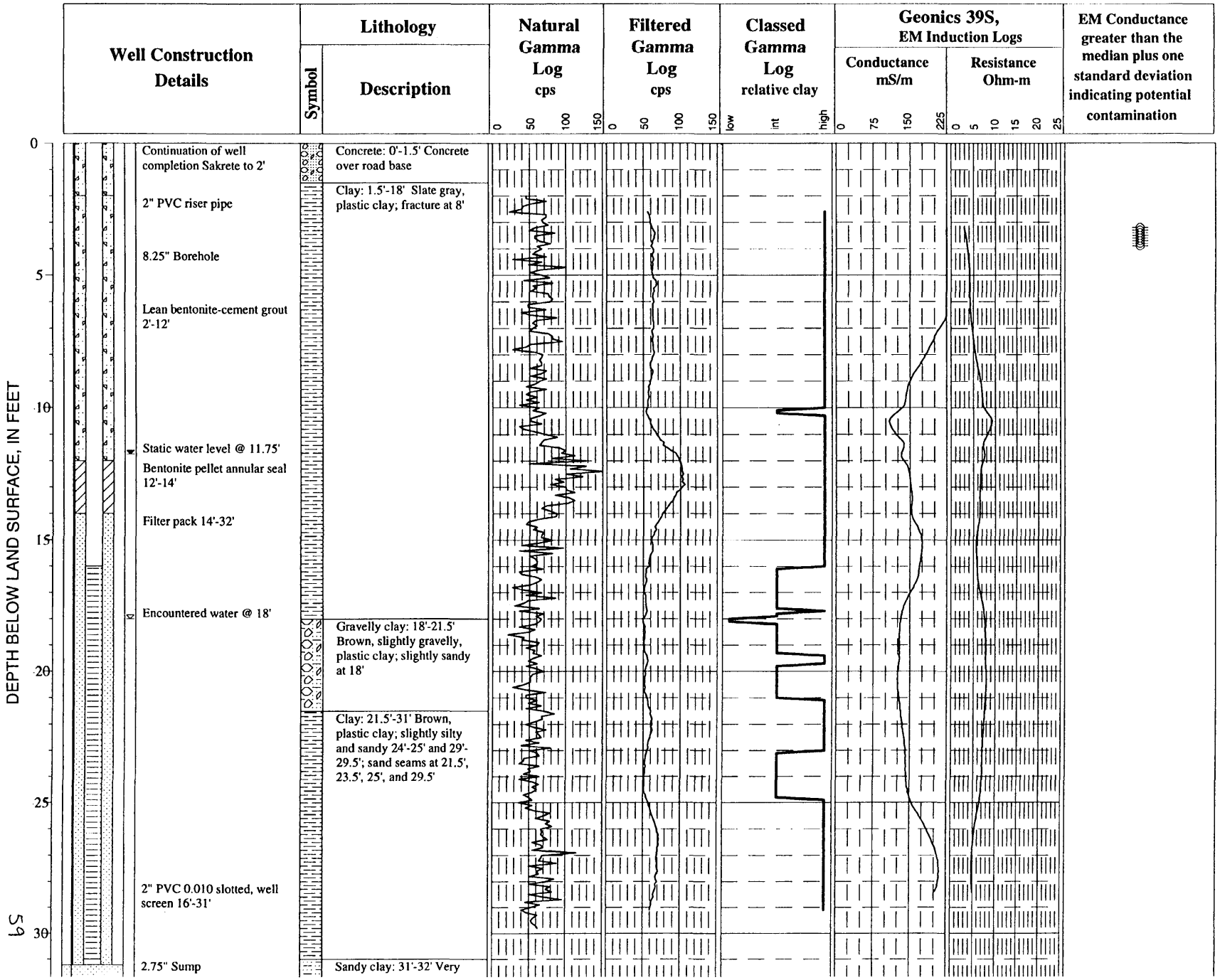
DWP-5-9—Continued

Well Construction Details	Lithology		Natural Gamma Log cps	Filtered Gamma Log cps	Classed Gamma Log relative clay	Geonics 39S, EM Induction Logs		EM Conductance greater than the median plus one standard deviation indicating potential contamination
	Symbol	Description				Conductance mS/m	Resistance Ohm-m	
			0 50 100 150	0 50 100 150	low int high	0 75 150 225	0 5 10 15 20 25	
Bottom of borehole @ 32'								

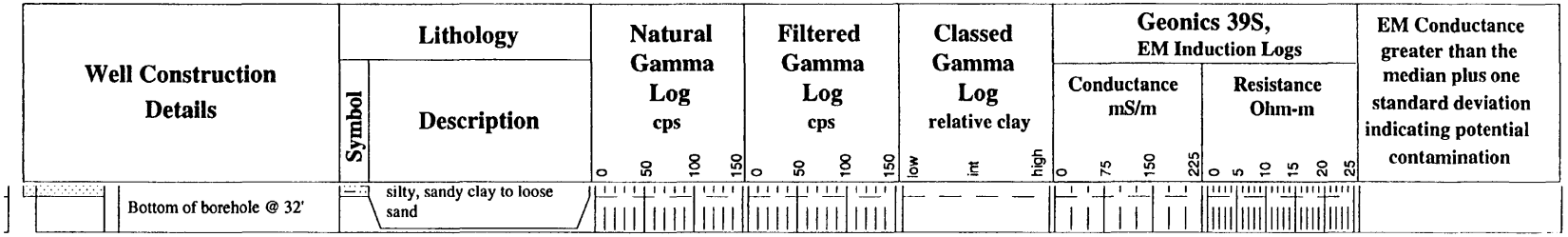
DWP-5-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-4'
Bentonite pellet annular seal 4'-6'
2" PVC riser pipe
Static water level @ 7.5'
Encountered water @ 9'
8.25" Borehole
Filter pack 6'-24'
2" PVC 0.010 slotted, well screen 8'-23'
2.75" Sump
Bottom of borehole @ 24'
Fill: 0'-15.5' Fill composed of brown and gray, plastic clay; slightly silty, sandy clay; brown soil; sand and gravel with some concrete pieces in upper part
Silty clay: 15.5'-20' Dark gray to black, highly organic, very silty clay to clayey silt; swamp/decay odor
Clay: 20'-24' Orange-brown and gray, mottled, plastic clay
low
int
high

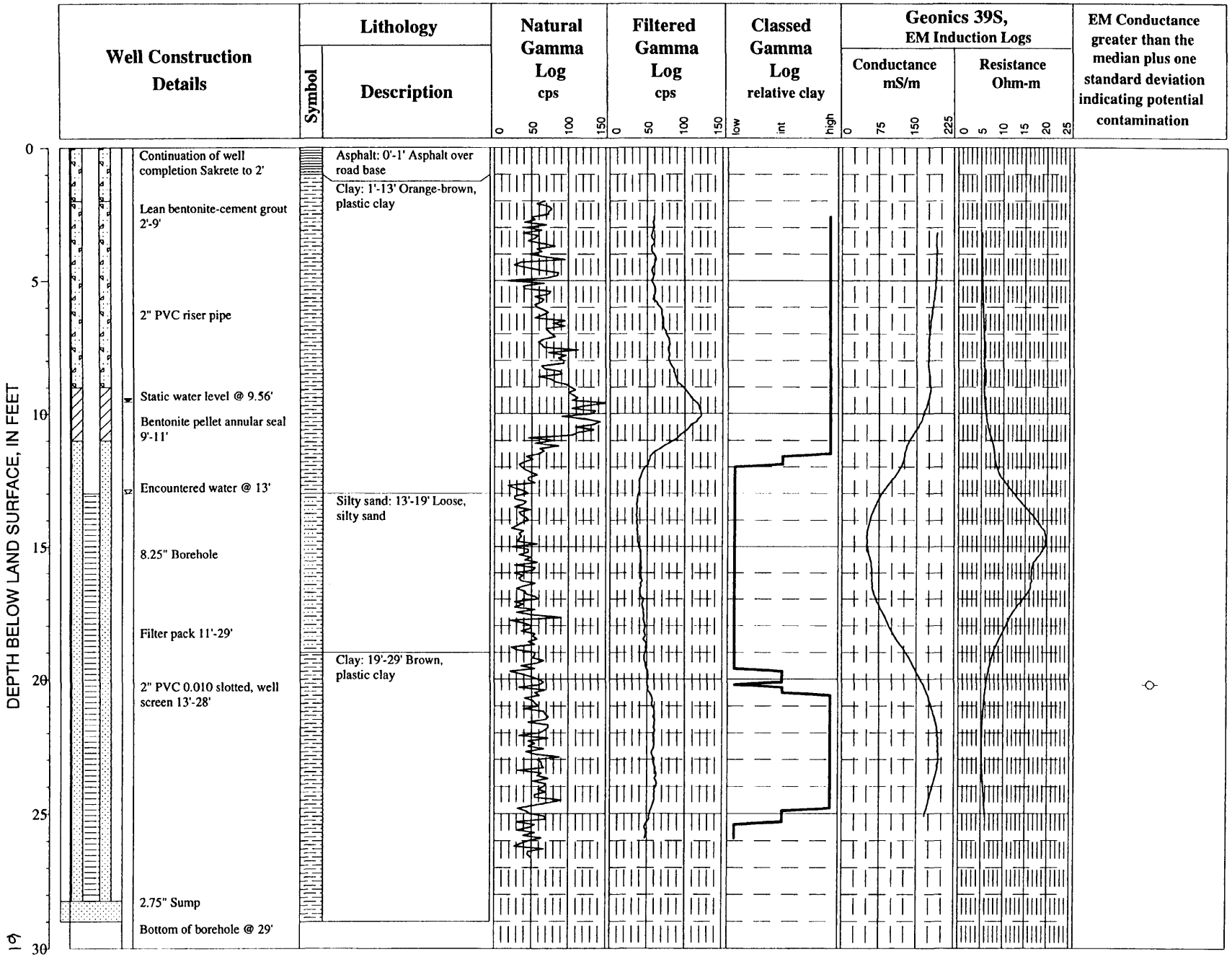
DWP-5-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-12'
Static water level @ 11.75'
Bentonite pellet annular seal 12'-14'
Filter pack 14'-32'
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Concrete: 0'-1.5' Concrete over road base
Clay: 1.5'-18' Slate gray, plastic clay; fracture at 8'
Gravelly clay: 18'-21.5' Brown, slightly gravelly, plastic clay; slightly sandy at 18'
Clay: 21.5'-31' Brown, plastic clay; slightly silty and sandy 24'-25' and 29'-29.5'; sand seams at 21.5', 23.5', 25', and 29.5'
Sandy clay: 31'-32' Very

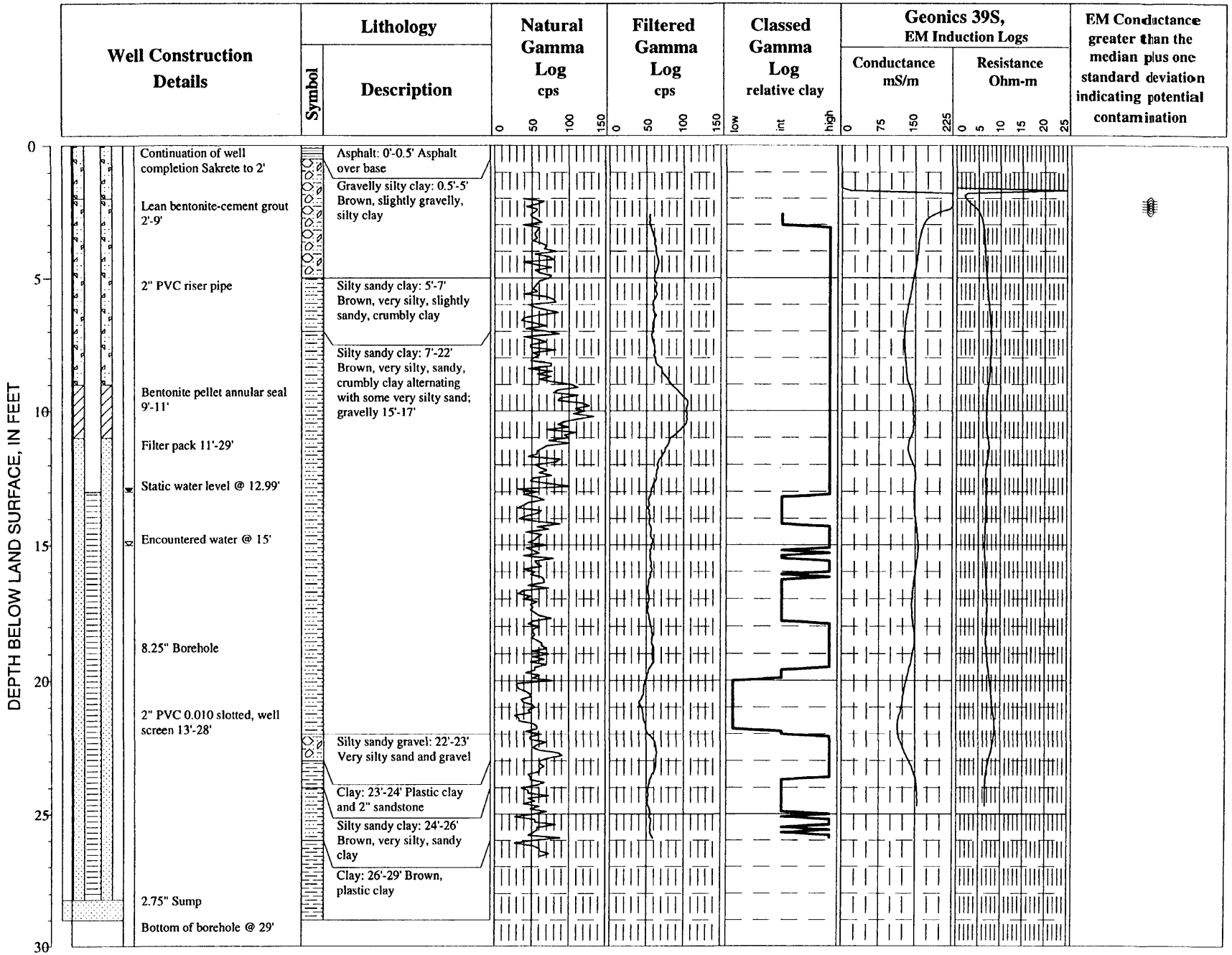
DWP-5-12—Continued



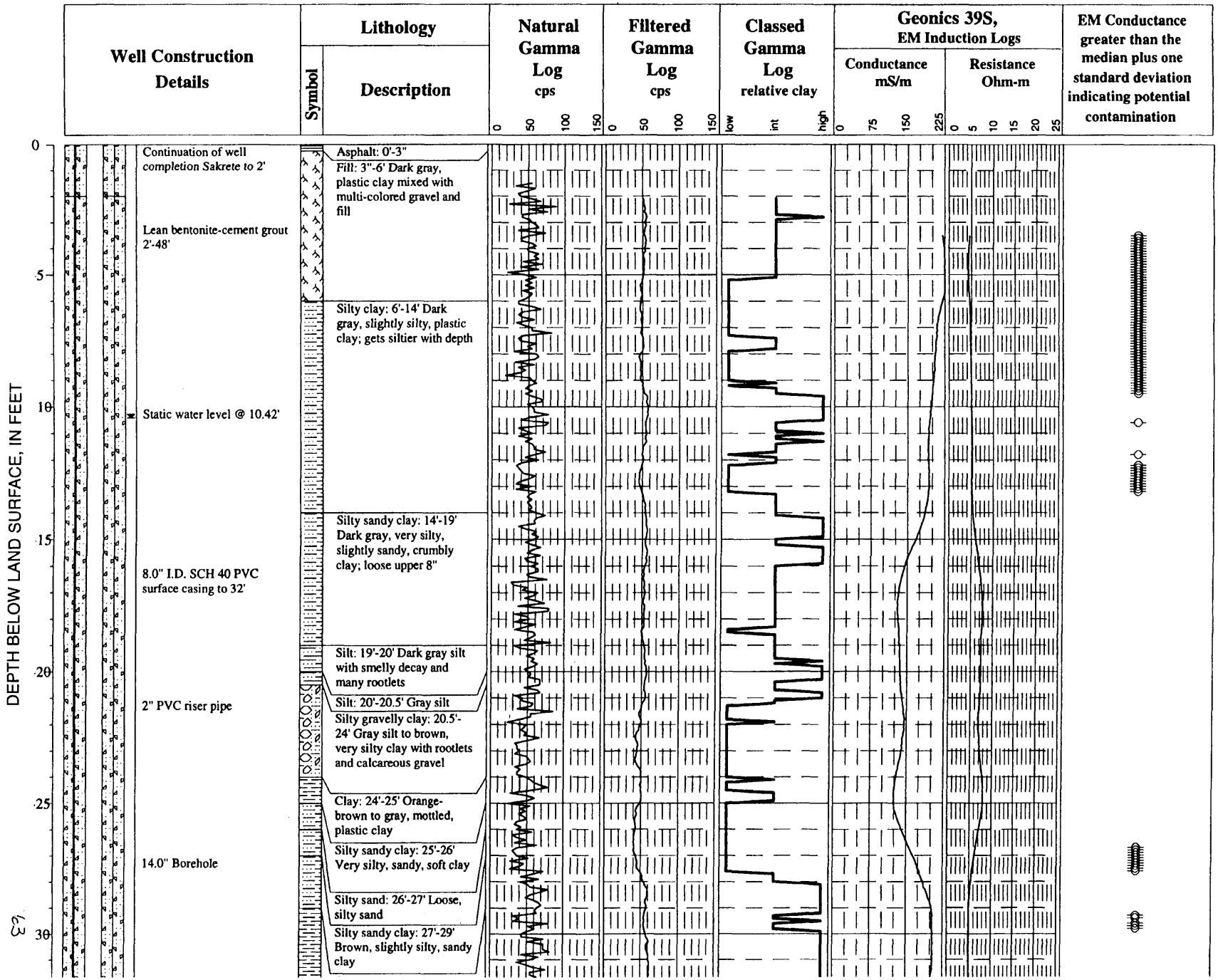
DWP-5-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Static water level @ 9.56'
Bentonite pellet annular seal 9'-11'
Encountered water @ 13'
8.25" Borehole
Filter pack 11'-29'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over road base
Clay: 1'-13' Orange-brown, plastic clay
Silty sand: 13'-19' Loose, silty sand
Clay: 19'-29' Brown, plastic clay

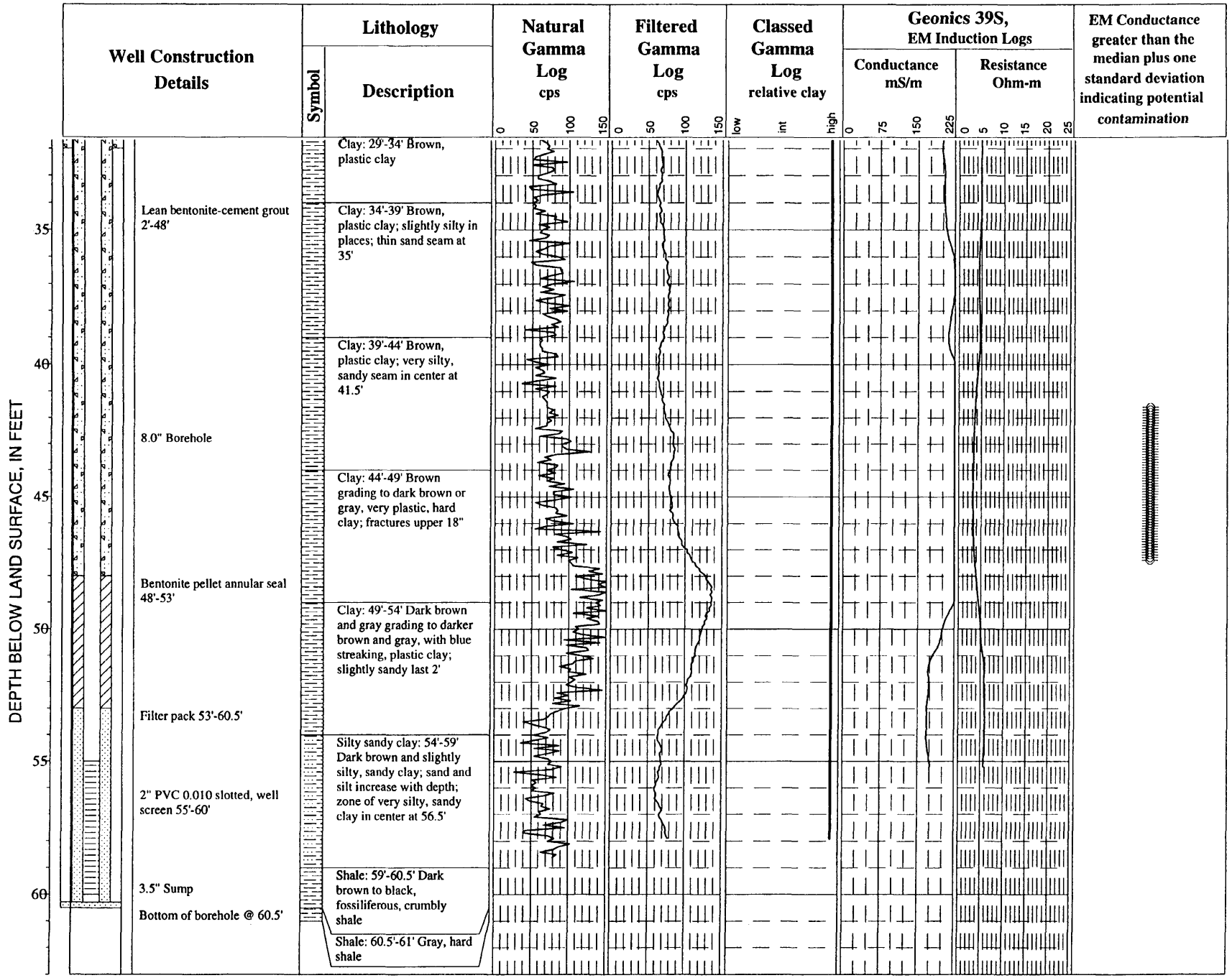
DWP-5-14


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0
50
100
150
low
int
high
75
225
5
10
15
20
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Static water level @ 12.99'
Encountered water @ 15'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-0.5' Asphalt over base
Gravelly silty clay: 0.5'-5' Brown, slightly gravelly, silty clay
Silty sandy clay: 5'-7' Brown, very silty, slightly sandy, crumbly clay
Silty sandy clay: 7'-22' Brown, very silty, sandy, crumbly clay alternating with some very silty sand; gravelly 15'-17'
Silty sandy gravel: 22'-23' Very silty sand and gravel
Clay: 23'-24' Plastic clay and 2" sandstone
Silty sandy clay: 24'-26' Brown, very silty, sandy clay
Clay: 26'-29' Brown, plastic clay

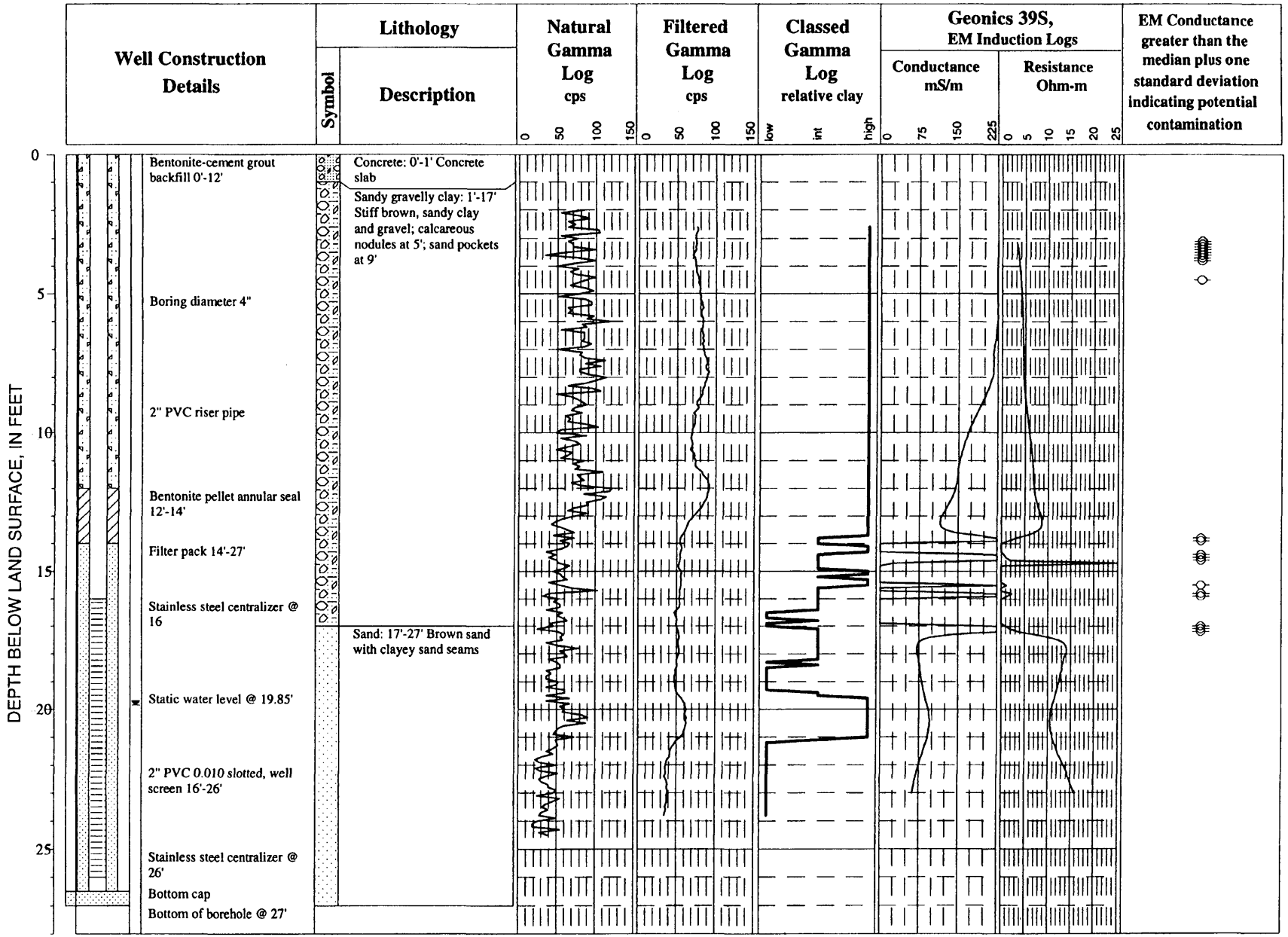
DWP-5-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-48'
Static water level @ 10.42'
8.0" I.D. SCH 40 PVC surface casing to 32'
2" PVC riser pipe
14.0" Borehole
Asphalt: 0'-3"
Fill: 3"-6' Dark gray, plastic clay mixed with multi-colored gravel and fill
Silty clay: 6'-14' Dark gray, slightly silty, plastic clay; gets siltier with depth
Silty sandy clay: 14'-19' Dark gray, very silty, slightly sandy, crumbly clay; loose upper 8"
Silt: 19'-20' Dark gray silt with smelly decay and many rootlets
Silt: 20'-20.5' Gray silt
Silty gravelly clay: 20.5'-24' Gray silt to brown, very silty clay with rootlets and calcareous gravel
Clay: 24'-25' Orange-brown to gray, mottled, plastic clay
Silty sandy clay: 25'-26' Very silty, sandy, soft clay
Silty sand: 26'-27' Loose, silty sand
Silty sandy clay: 27'-29' Brown, slightly silty, sandy clay

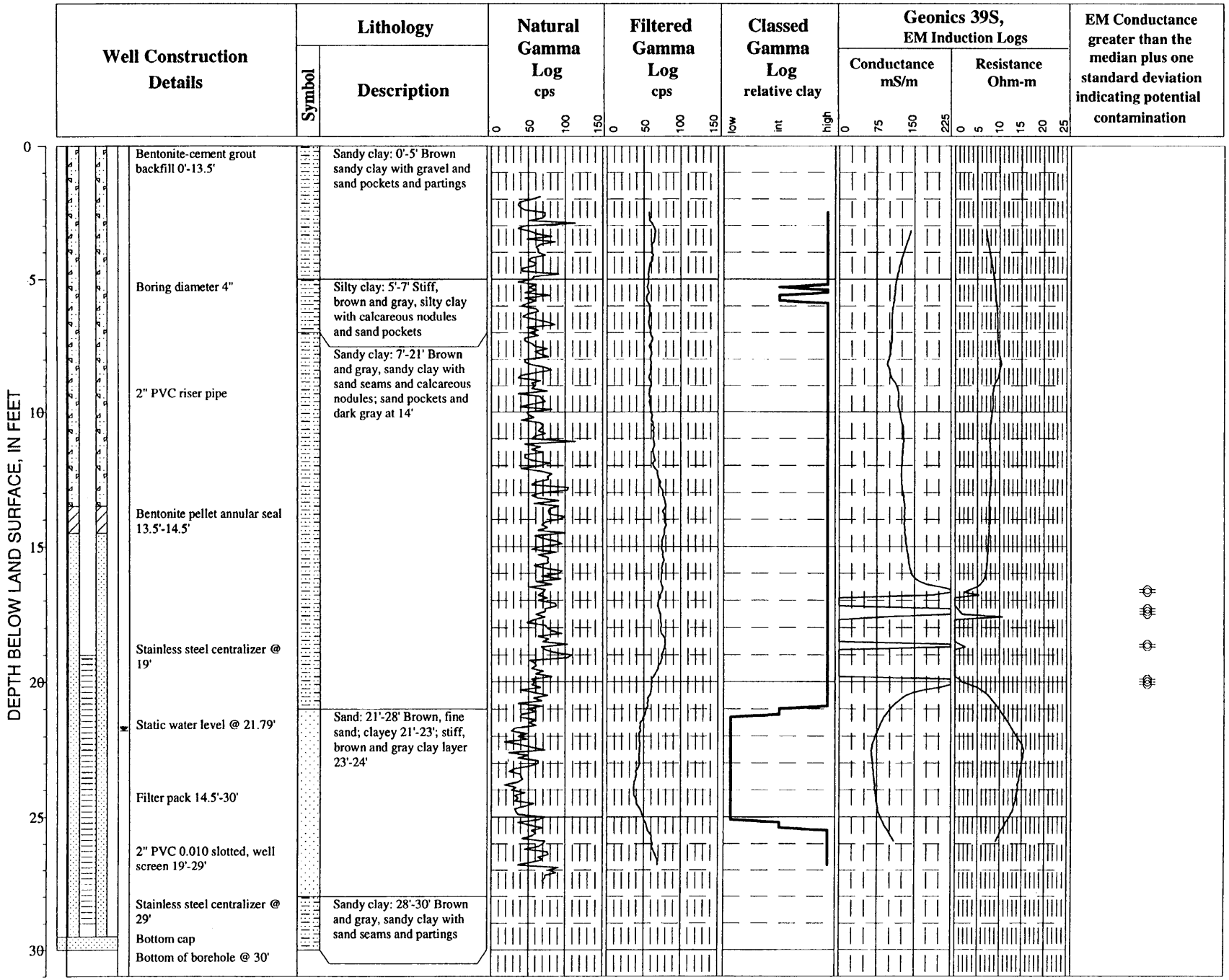
DWP-5-DW1—Continued



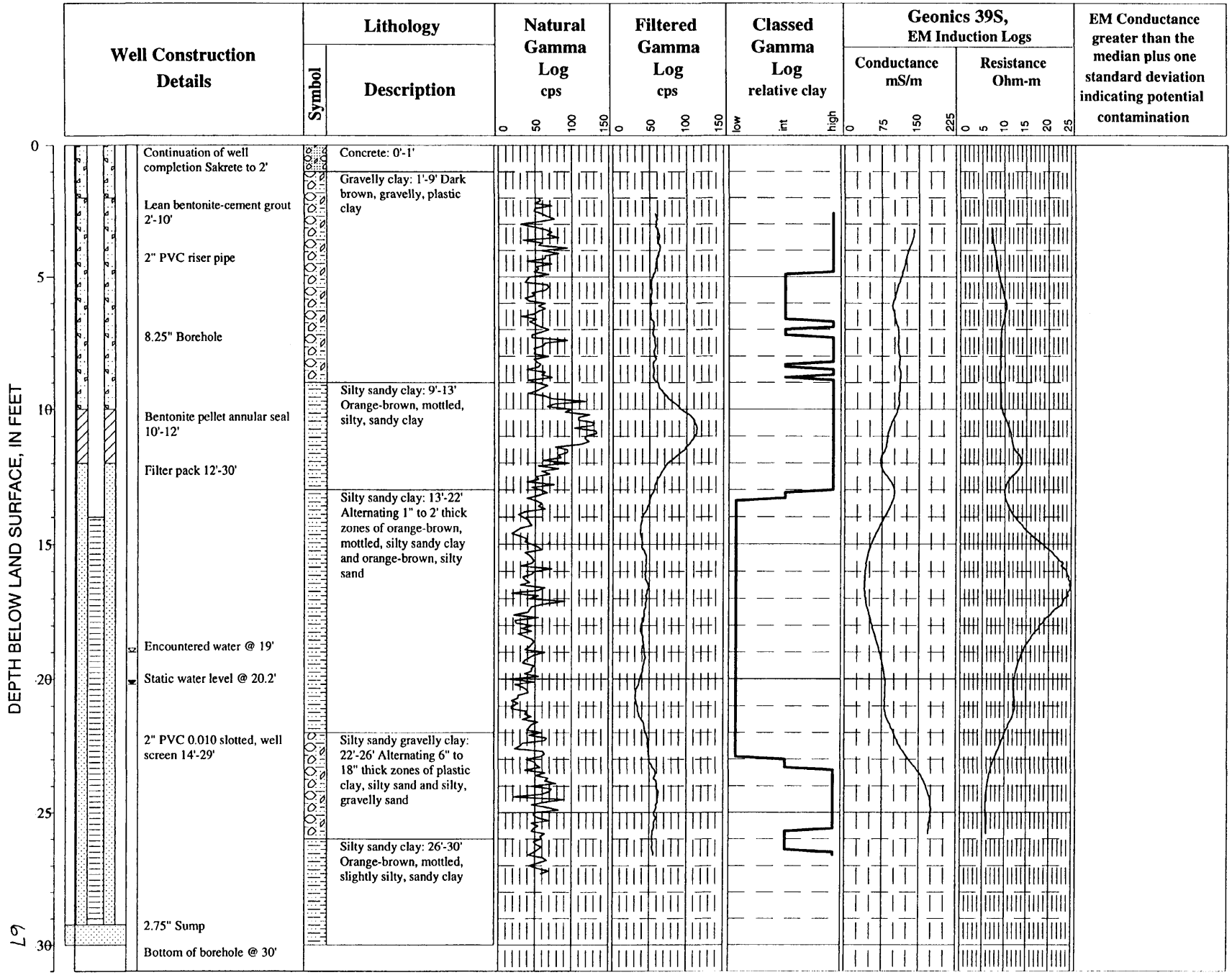
DWP-6-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite-cement grout backfill 0'-12'
Boring diameter 4"
2" PVC riser pipe
Bentonite pellet annular seal 12'-14'
Filter pack 14'-27'
Stainless steel centralizer @ 16
Static water level @ 19.85'
2" PVC 0.010 slotted, well screen 16'-26'
Stainless steel centralizer @ 26'
Bottom cap
Bottom of borehole @ 27'
Concrete: 0'-1' Concrete slab
Sandy gravelly clay: 1'-17' Stiff brown, sandy clay and gravel; calcareous nodules at 5'; sand pockets at 9'
Sand: 17'-27' Brown sand with clayey sand seams
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25

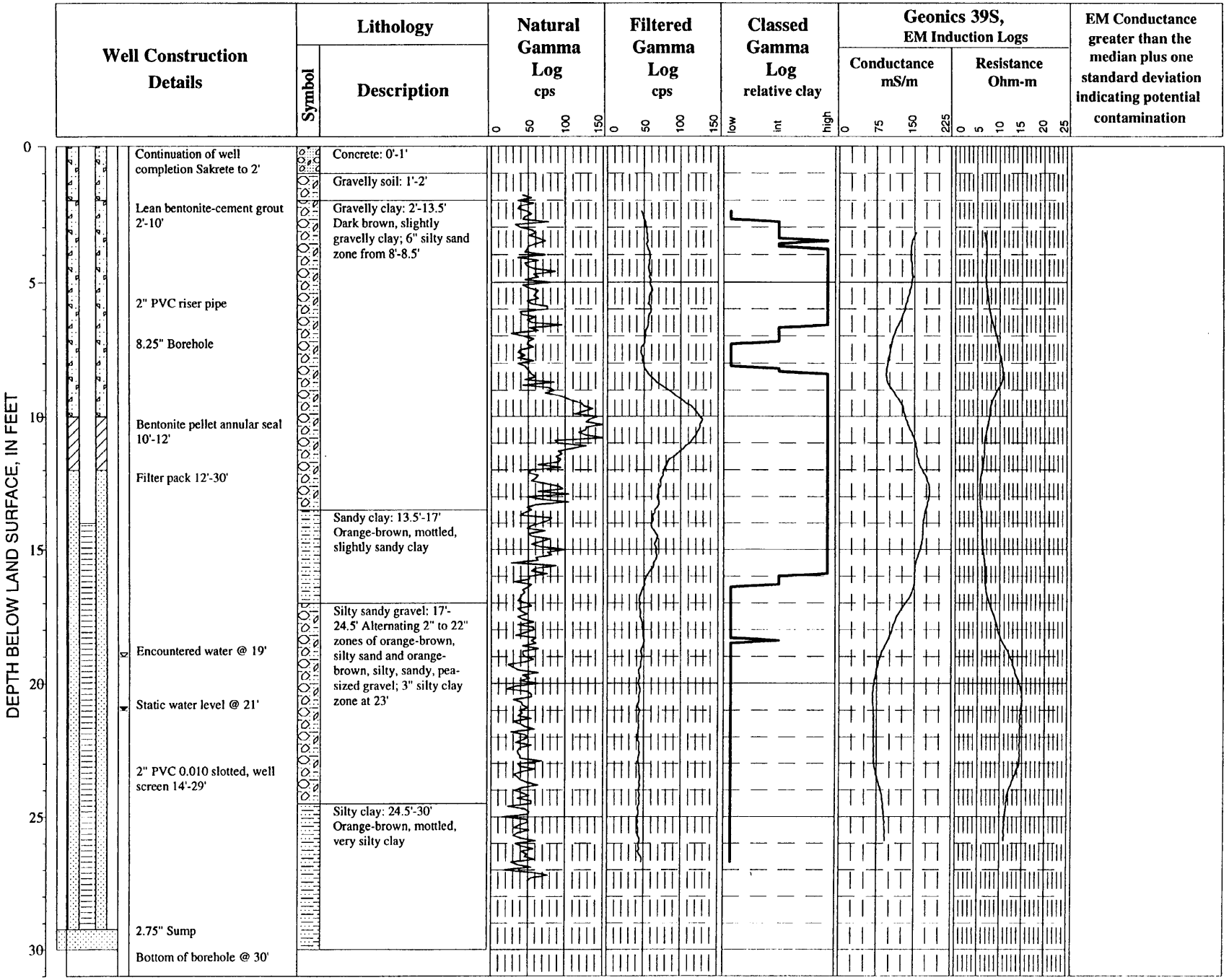
DWP-6-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0
50
100
150
low
int
high
75
225
5
10
15
20
25
Bentonite-cement grout backfill 0'-13.5'
Boring diameter 4"
2" PVC riser pipe
Bentonite pellet annular seal 13.5'-14.5'
Stainless steel centralizer @ 19'
Static water level @ 21.79'
Filter pack 14.5'-30'
2" PVC 0.010 slotted, well screen 19'-29'
Stainless steel centralizer @ 29'
Bottom cap
Bottom of borehole @ 30'
Sandy clay: 0'-5' Brown sandy clay with gravel and sand pockets and partings
Silty clay: 5'-7' Stiff, brown and gray, silty clay with calcareous nodules and sand pockets
Sandy clay: 7'-21' Brown and gray, sandy clay with sand seams and calcareous nodules; sand pockets and dark gray at 14'
Sand: 21'-28' Brown, fine sand; clayey 21'-23'; stiff, brown and gray clay layer 23'-24'
Sandy clay: 28'-30' Brown and gray, sandy clay with sand seams and partings

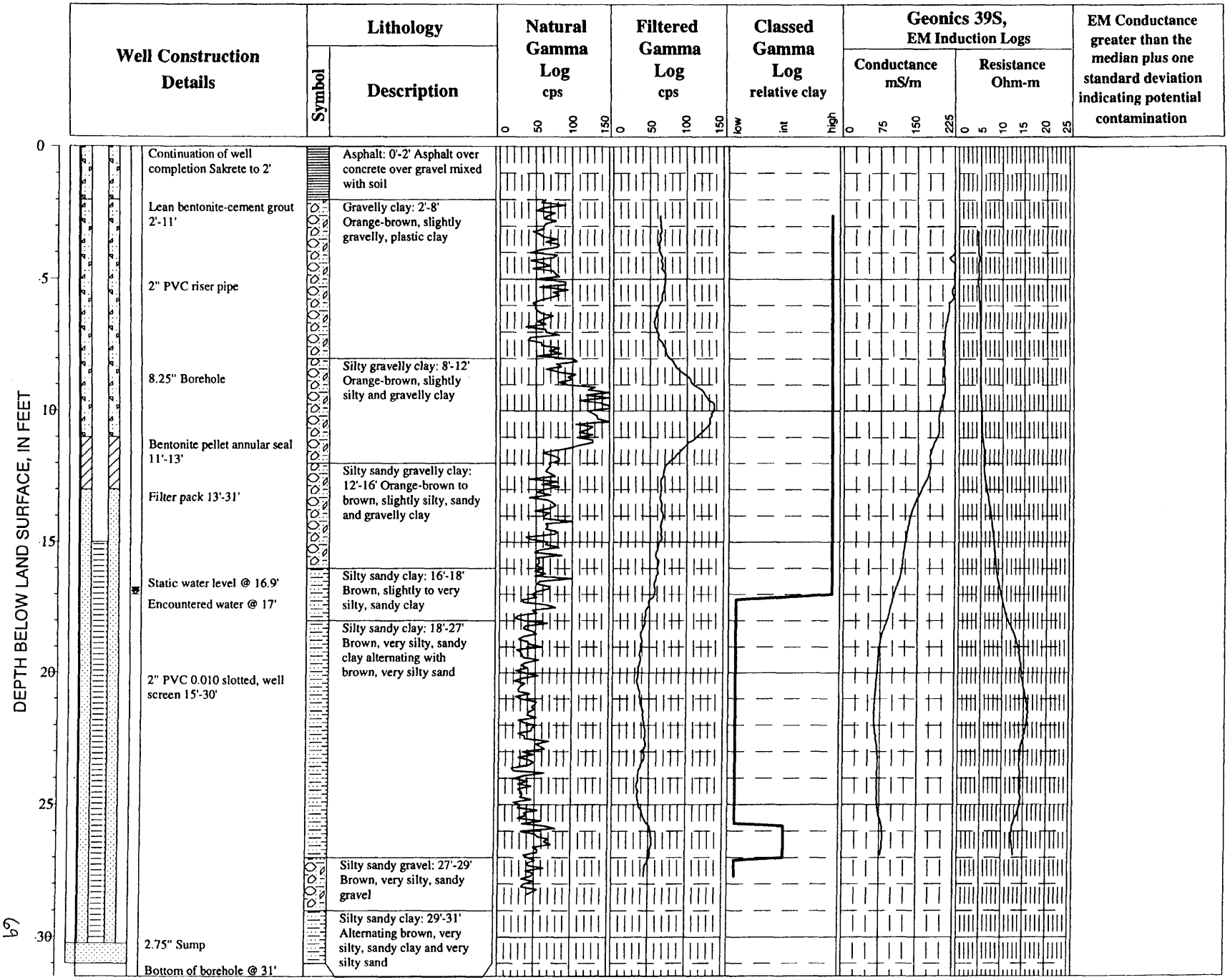
DWP-6-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-10'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 10'-12'
Filter pack 12'-30'
Encountered water @ 19'
Static water level @ 20.2'
2" PVC 0.010 slotted, well screen 14'-29'
2.75" Sump
Bottom of borehole @ 30'
Concrete: 0'-1'
Gravelly clay: 1'-9' Dark brown, gravelly, plastic clay
Silty sandy clay: 9'-13' Orange-brown, mottled, silty, sandy clay
Silty sandy clay: 13'-22' Alternating 1" to 2' thick zones of orange-brown, mottled, silty sandy clay and orange-brown, silty sand
Silty sandy gravelly clay: 22'-26' Alternating 6" to 18" thick zones of plastic clay, silty sand and silty, gravelly sand
Silty sandy clay: 26'-30' Orange-brown, mottled, slightly silty, sandy clay
low
int
high

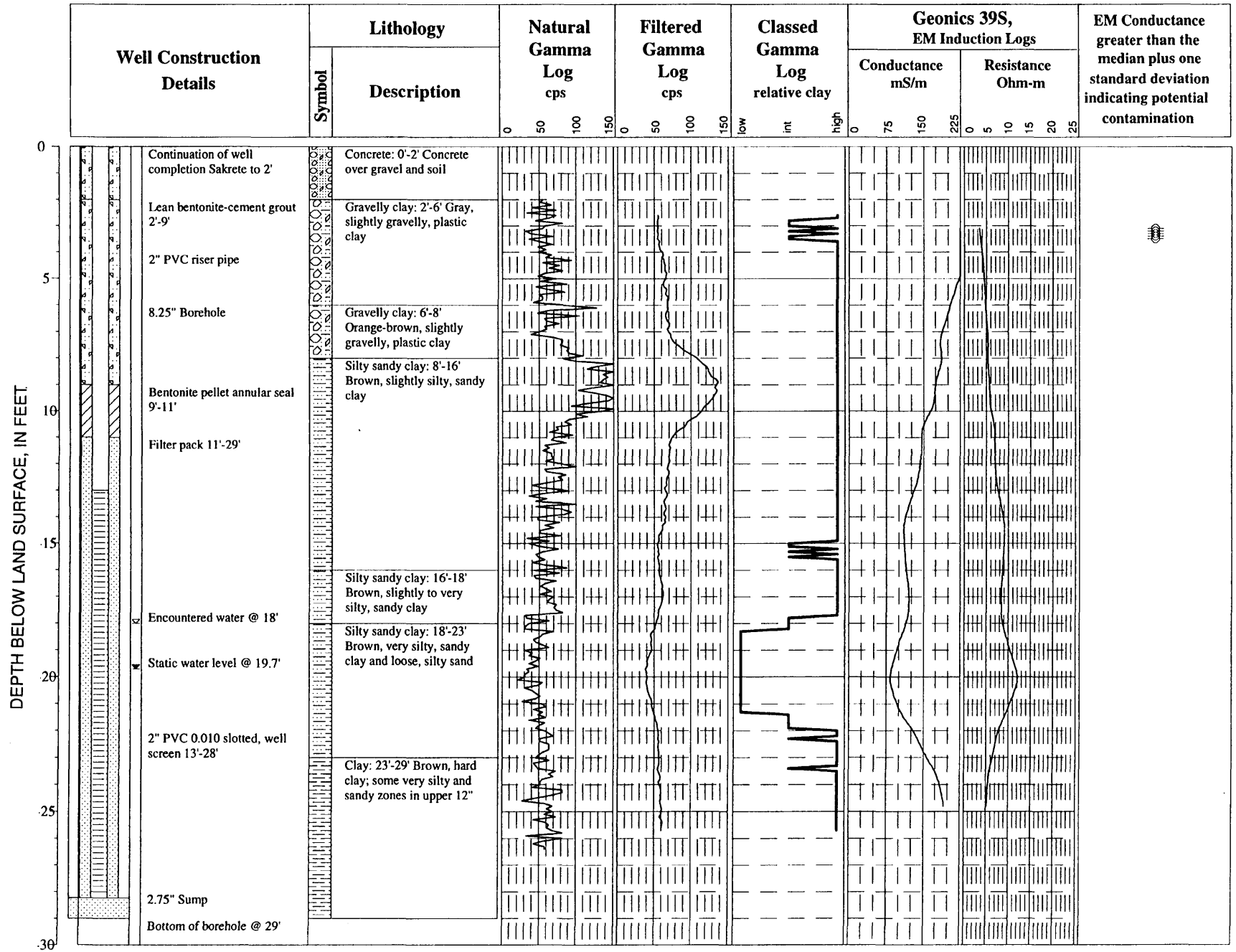
DWP-6-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-10'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 10'-12'
Filter pack 12'-30'
Encountered water @ 19'
Static water level @ 21'
2" PVC 0.010 slotted, well screen 14'-29'
2.75" Sump
Bottom of borehole @ 30'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-13.5' Dark brown, slightly gravelly clay; 6" silty sand zone from 8'-8.5'
Sandy clay: 13.5'-17' Orange-brown, mottled, slightly sandy clay
Silty sandy gravel: 17'-24.5' Alternating 2" to 22" zones of orange-brown, silty sand and orange-brown, silty, sandy, pea-sized gravel; 3" silty clay zone at 23'
Silty clay: 24.5'-30' Orange-brown, mottled, very silty clay

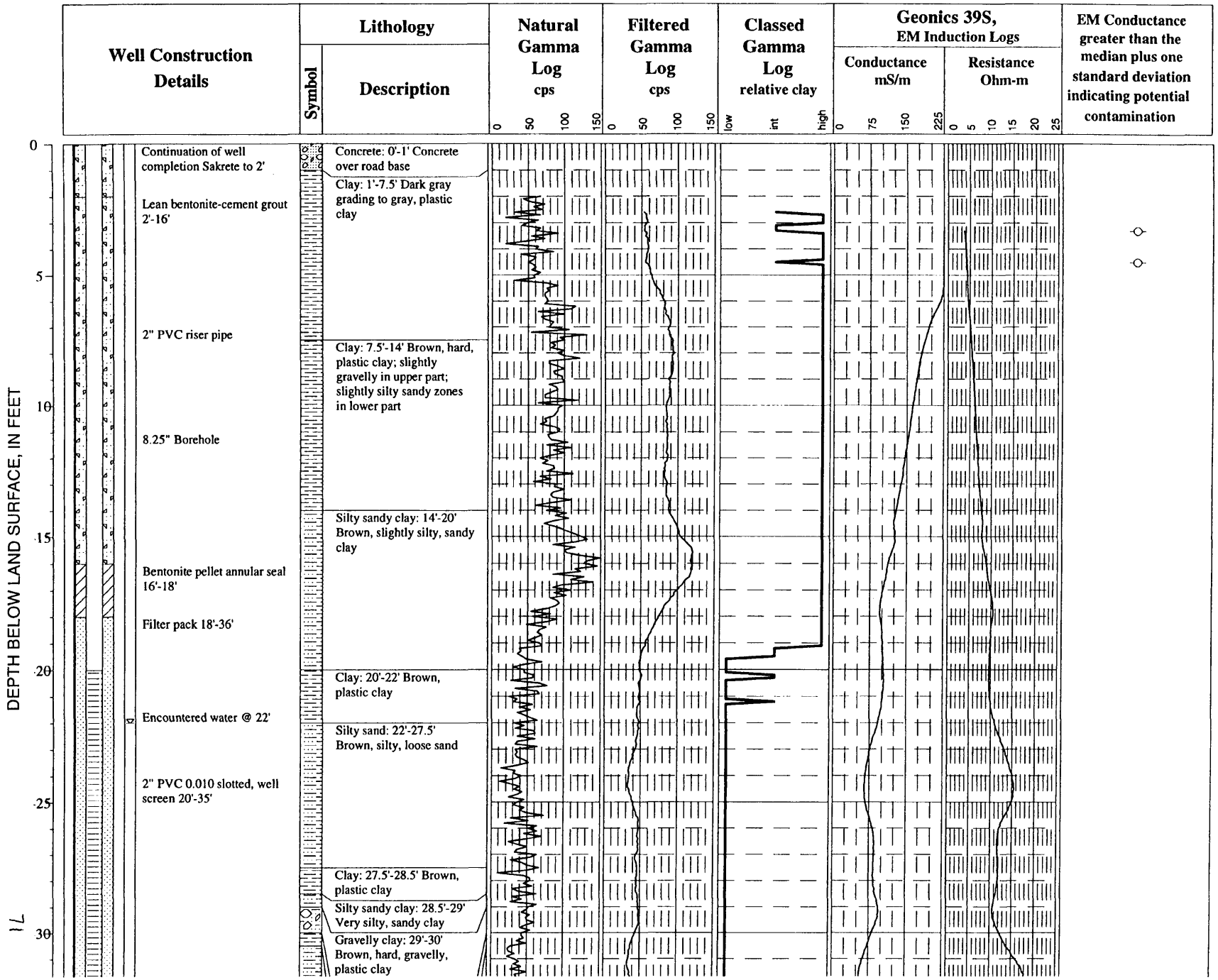
DWP-6-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 11'-13'
Filter pack 13'-31'
Static water level @ 16.9'
Encountered water @ 17'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Asphalt: 0'-2' Asphalt over concrete over gravel mixed with soil
Gravelly clay: 2'-8' Orange-brown, slightly gravelly, plastic clay
Silty gravelly clay: 8'-12' Orange-brown, slightly silty and gravelly clay
Silty sandy gravelly clay: 12'-16' Orange-brown to brown, slightly silty, sandy and gravelly clay
Silty sandy clay: 16'-18' Brown, slightly to very silty, sandy clay
Silty sandy clay: 18'-27' Brown, very silty, sandy clay alternating with brown, very silty sand
Silty sandy gravel: 27'-29' Brown, very silty, sandy gravel
Silty sandy clay: 29'-31' Alternating brown, very silty, sandy clay and very silty sand

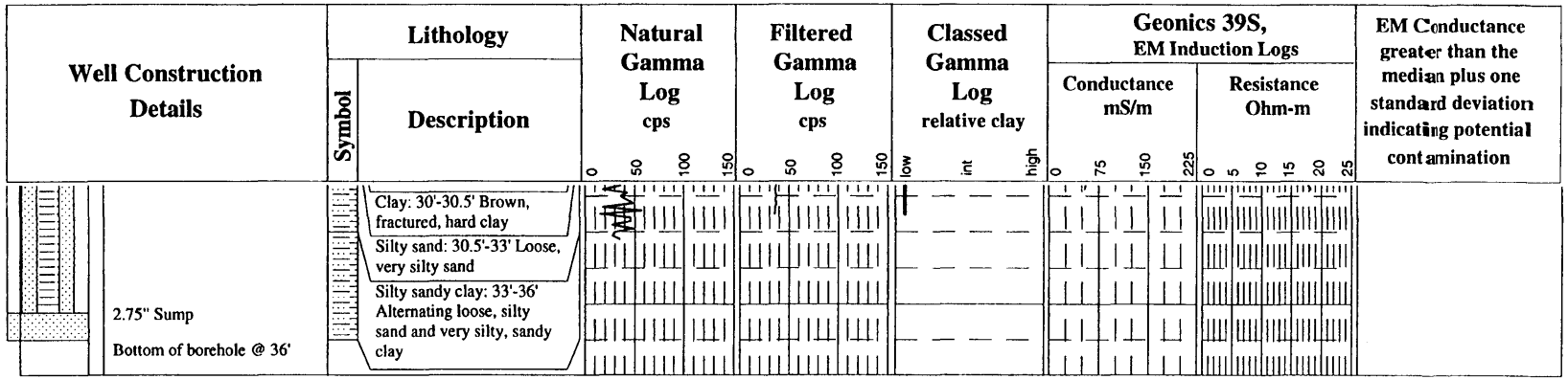
DWP-6-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 18'
Static water level @ 19.7'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-2' Concrete over gravel and soil
Gravelly clay: 2'-6' Gray, slightly gravelly, plastic clay
Gravelly clay: 6'-8' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 8'-16' Brown, slightly silty, sandy clay
Silty sandy clay: 16'-18' Brown, slightly to very silty, sandy clay
Silty sandy clay: 18'-23' Brown, very silty, sandy clay and loose, silty sand
Clay: 23'-29' Brown, hard clay; some very silty and sandy zones in upper 12"

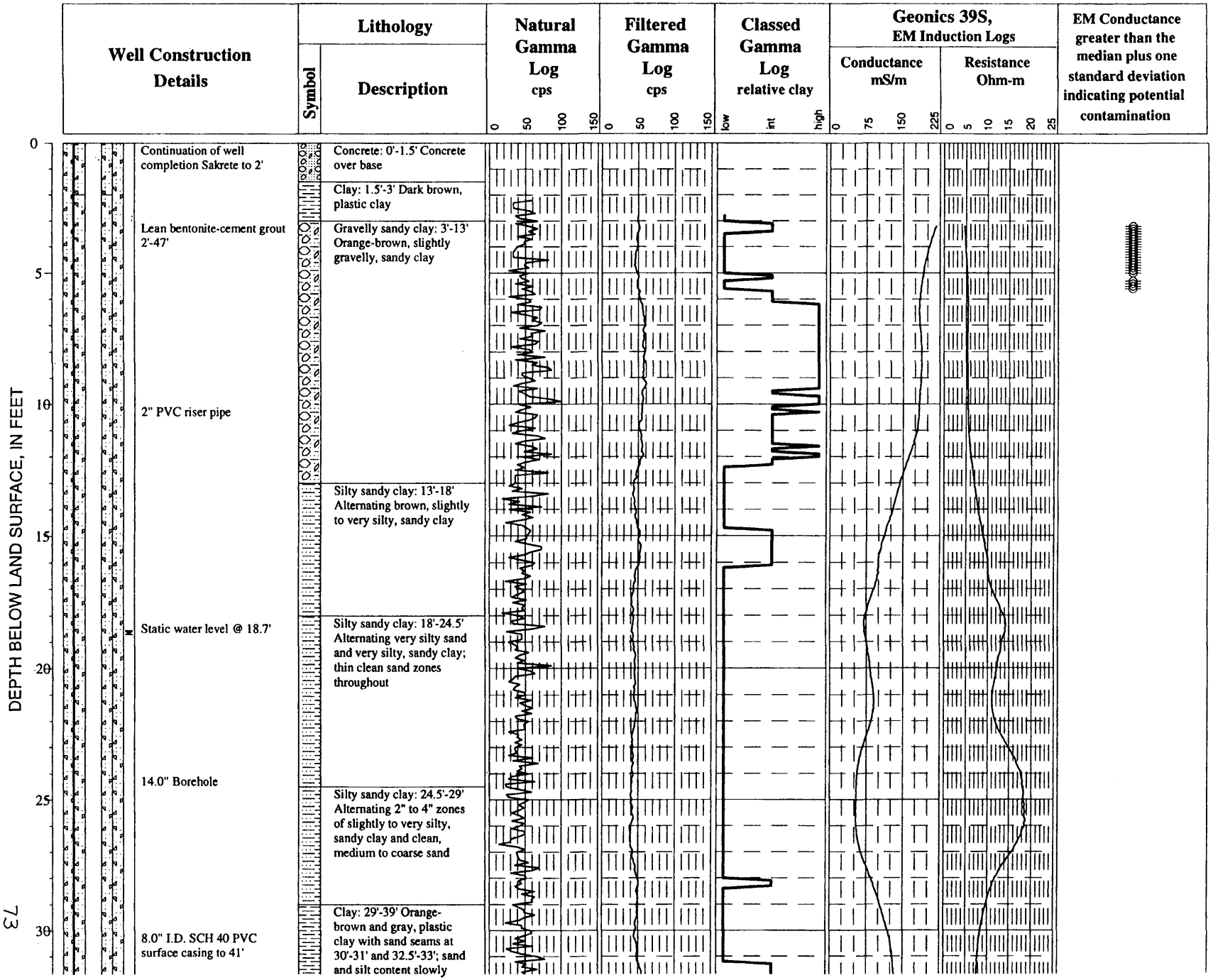
DWP-6-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-16'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 16'-18'
Filter pack 18'-36'
Encountered water @ 22'
2" PVC 0.010 slotted, well screen 20'-35'
Concrete: 0'-1' Concrete over road base
Clay: 1'-7.5' Dark gray grading to gray, plastic clay
Clay: 7.5'-14' Brown, hard, plastic clay; slightly gravelly in upper part; slightly silty sandy zones in lower part
Silty sandy clay: 14'-20' Brown, slightly silty, sandy clay
Clay: 20'-22' Brown, plastic clay
Silty sand: 22'-27.5' Brown, silty, loose sand
Clay: 27.5'-28.5' Brown, plastic clay
Silty sandy clay: 28.5'-29' Very silty, sandy clay
Gravelly clay: 29'-30' Brown, hard, gravelly, plastic clay
low
int
high

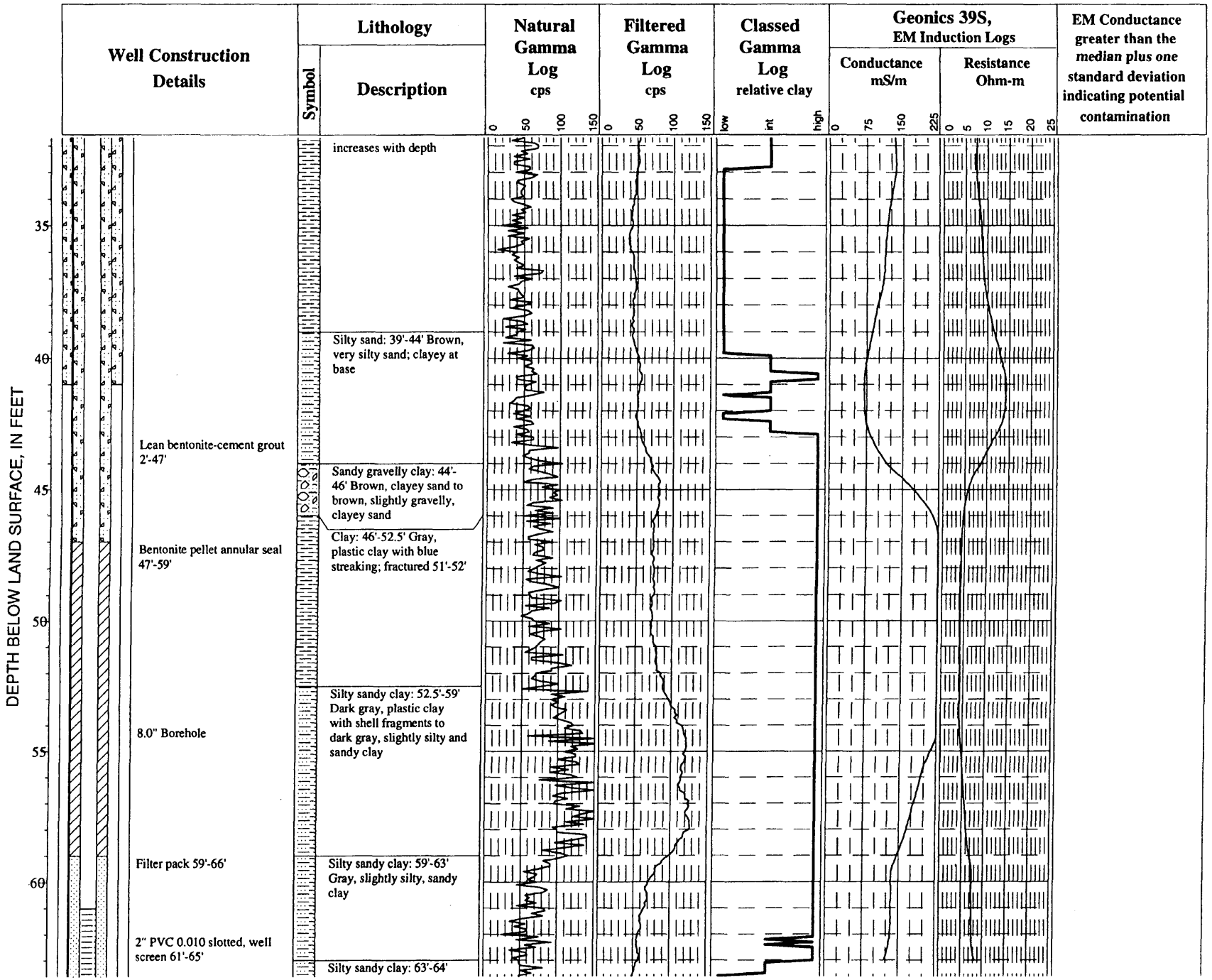
DWP-6-12—Continued



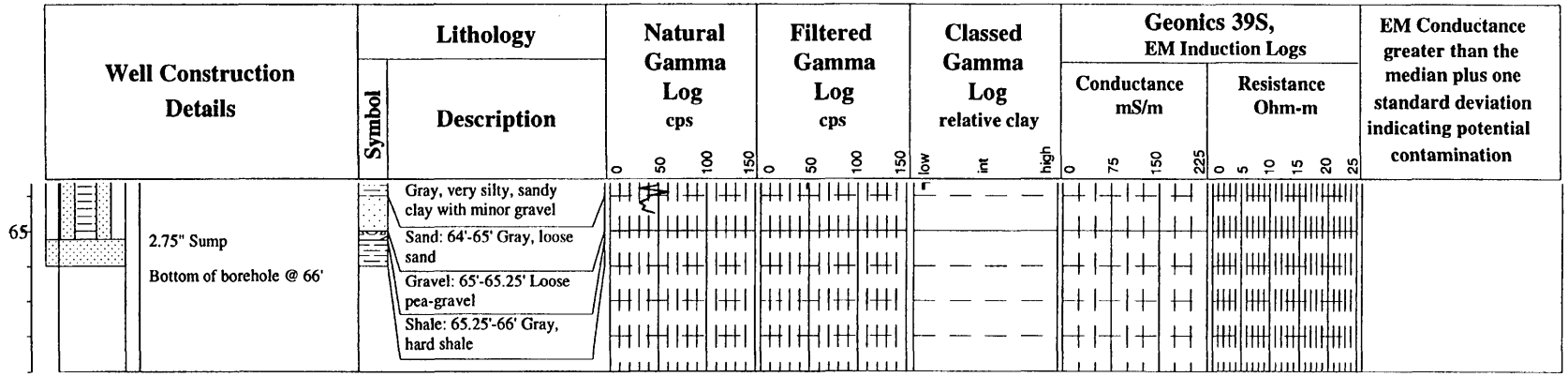
DWP-6-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0
50
100
150
Filtered Gamma Log
cps
0
50
100
150
Classed Gamma Log
relative clay
low
int
high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0
75
150
225
Resistance
Ohm-m
0
5
10
15
20
25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-47'
2" PVC riser pipe
Static water level @ 18.7'
14.0" Borehole
8.0" I.D. SCH 40 PVC surface casing to 41'
Concrete: 0'-1.5' Concrete over base
Clay: 1.5'-3' Dark brown, plastic clay
Gravelly sandy clay: 3'-13' Orange-brown, slightly gravelly, sandy clay
Silty sandy clay: 13'-18' Alternating brown, slightly to very silty, sandy clay
Silty sandy clay: 18'-24.5' Alternating very silty sand and very silty, sandy clay; thin clean sand zones throughout
Silty sandy clay: 24.5'-29' Alternating 2" to 4" zones of slightly to very silty, sandy clay and clean, medium to coarse sand
Clay: 29'-39' Orange-brown and gray, plastic clay with sand seams at 30'-31' and 32.5'-33'; sand and silt content slowly

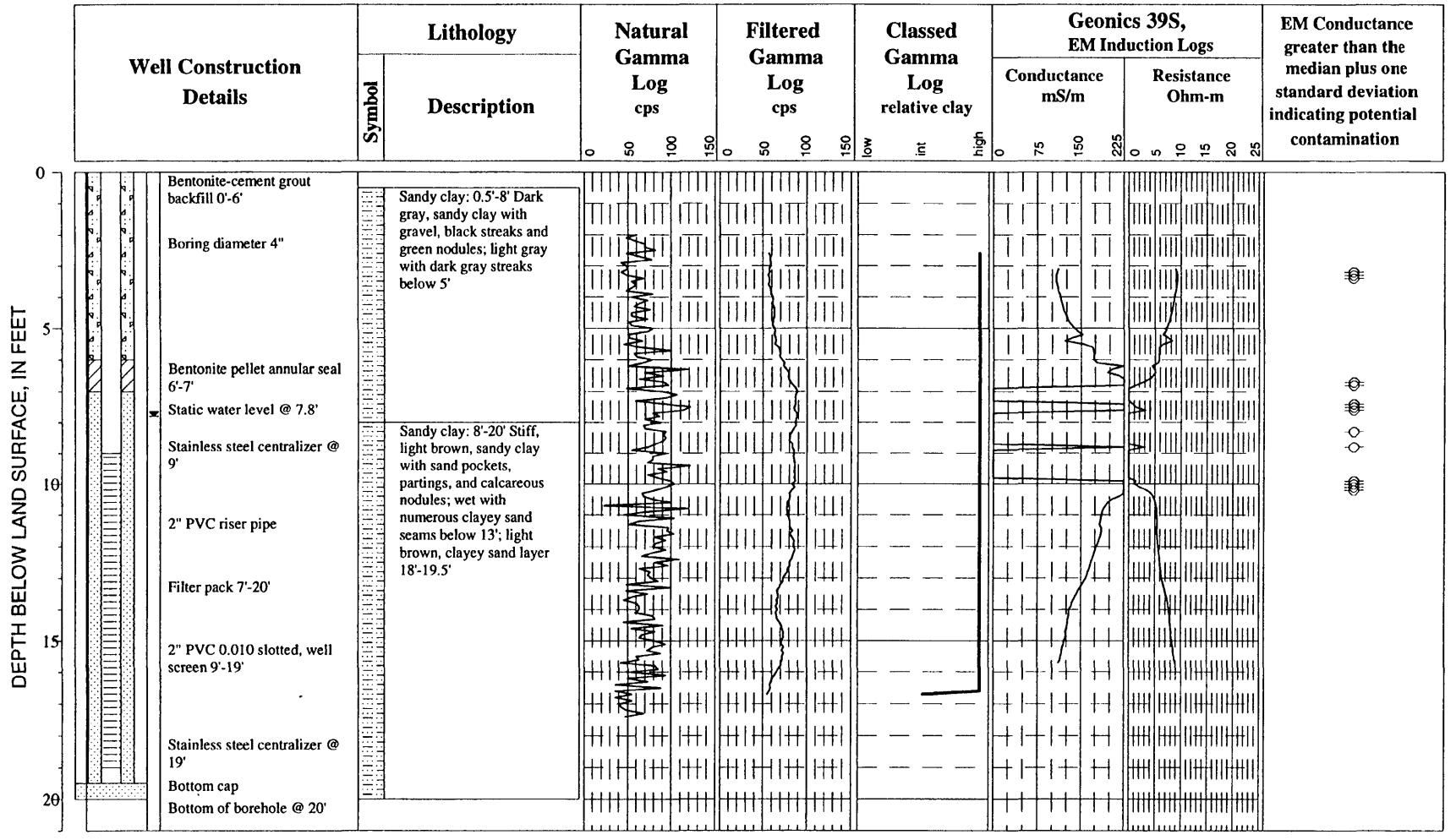
DWP-6-DW1—Continued



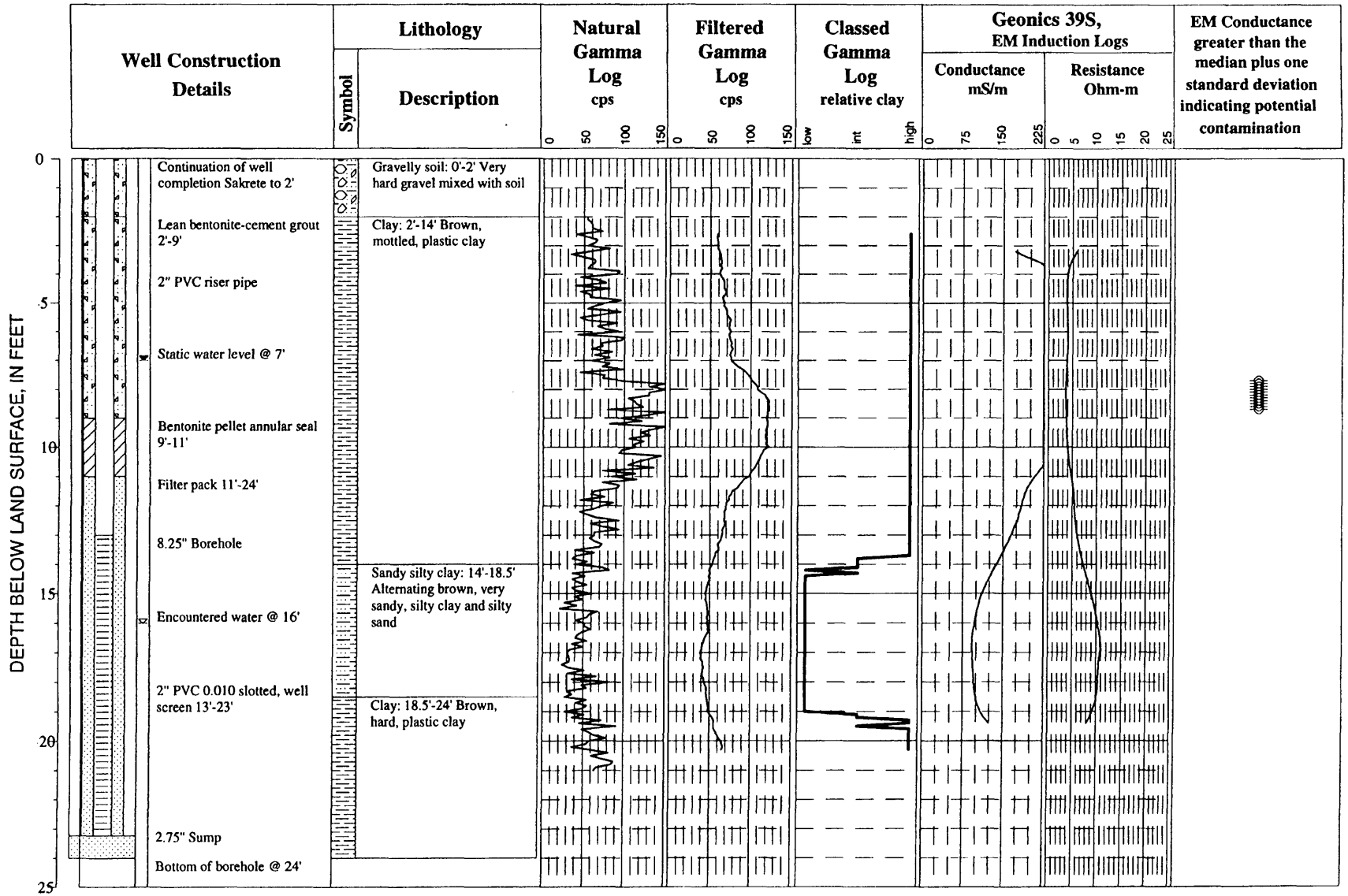
DWP-6-DW1—Continued



DWP-7-1

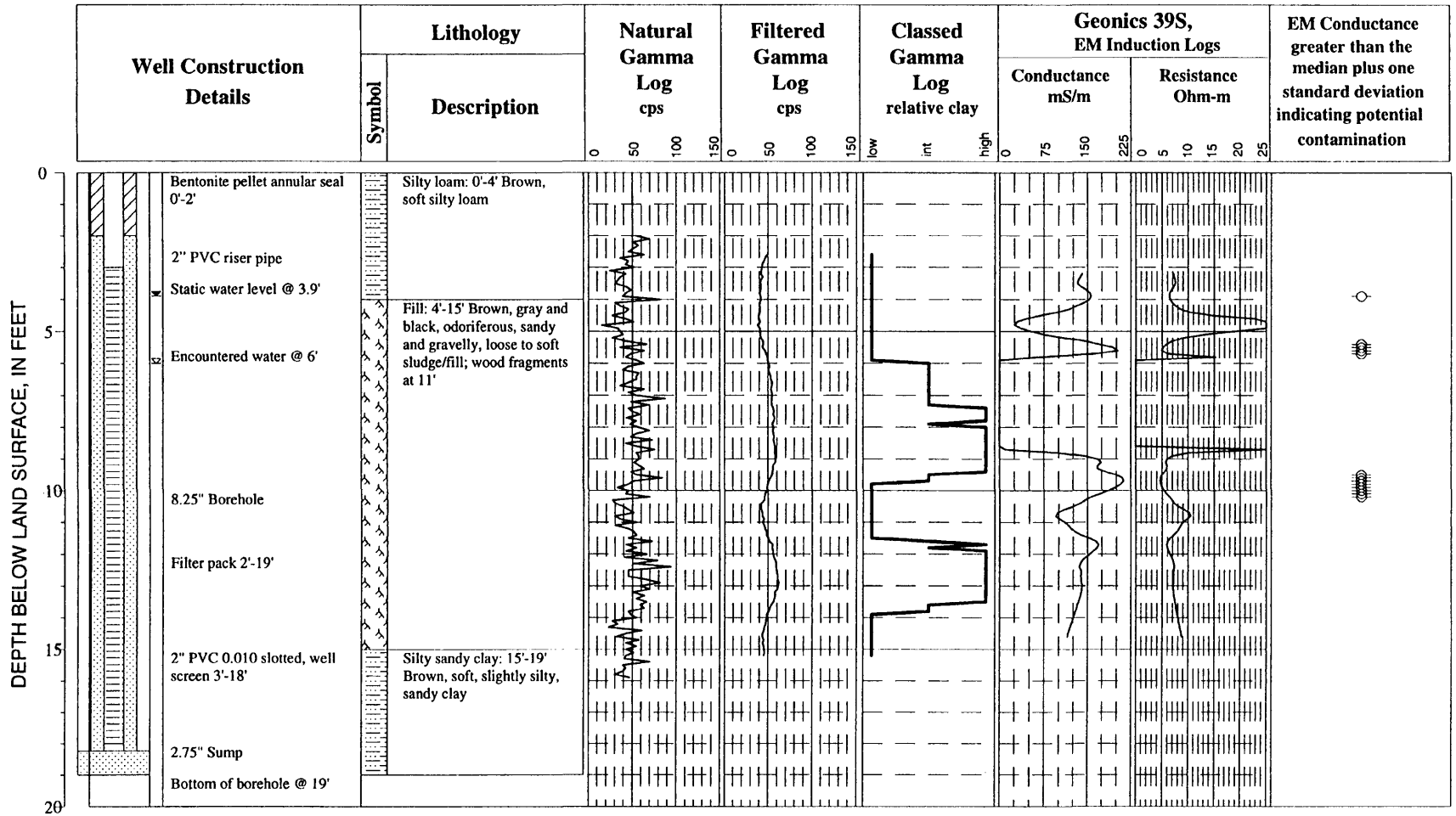

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Bentonite-cement grout backfill 0'-6'
Boring diameter 4"
Bentonite pellet annular seal 6'-7'
Static water level @ 7.8'
Stainless steel centralizer @ 9'
2" PVC riser pipe
Filter pack 7'-20'
2" PVC 0.010 slotted, well screen 9'-19'
Stainless steel centralizer @ 19'
Bottom cap
Bottom of borehole @ 20'
Sandy clay: 0.5'-8' Dark gray, sandy clay with gravel, black streaks and green nodules; light gray with dark gray streaks below 5'
Sandy clay: 8'-20' Stiff, light brown, sandy clay with sand pockets, partings, and calcareous nodules; wet with numerous clayey sand seams below 13'; light brown, clayey sand layer 18'-19.5'

DWP-7-2

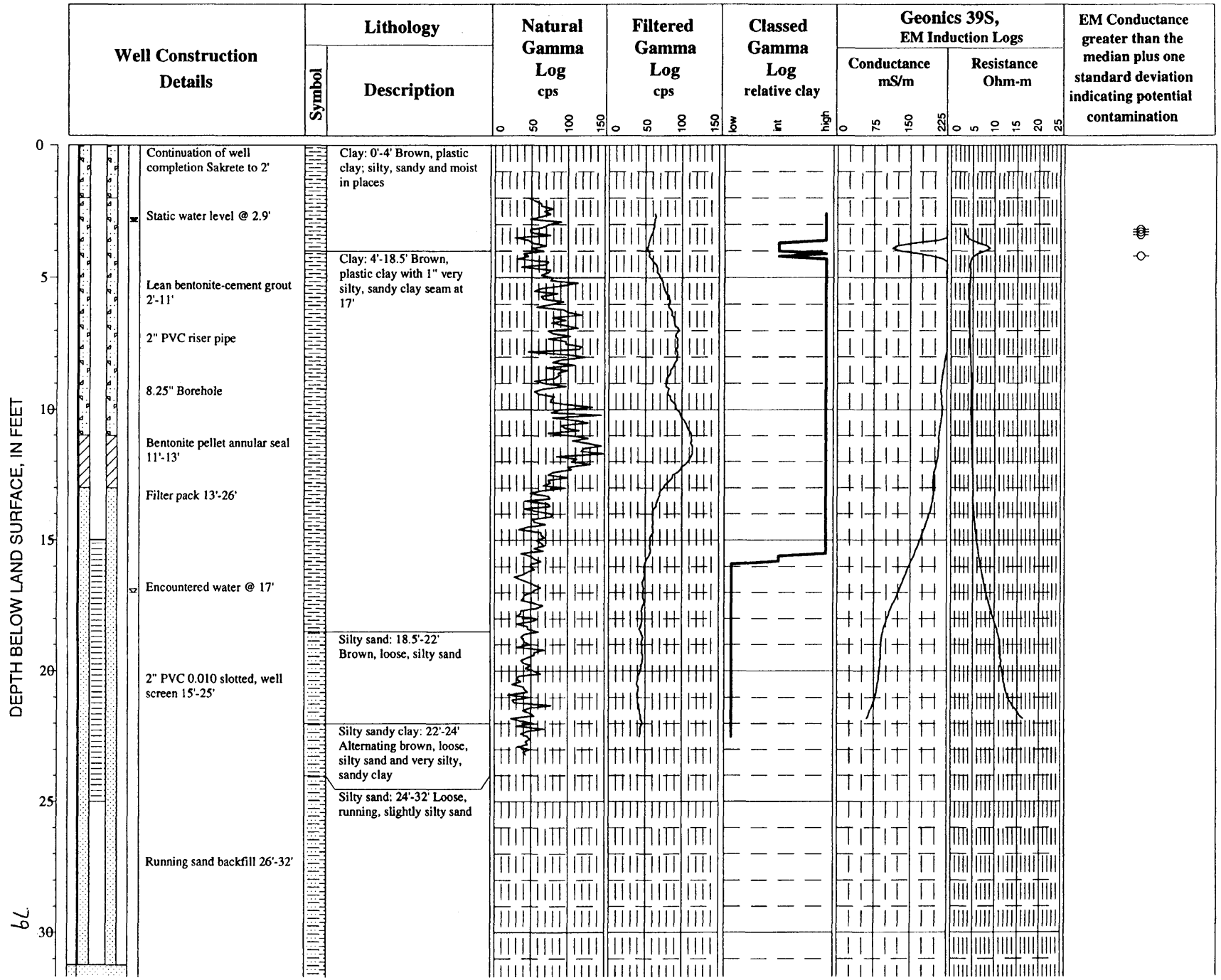

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Static water level @ 7'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-24'
8.25" Borehole
Encountered water @ 16'
2" PVC 0.010 slotted, well screen 13'-23'
2.75" Sump
Bottom of borehole @ 24'
Gravelly soil: 0'-2' Very hard gravel mixed with soil
Clay: 2'-14' Brown, mottled, plastic clay
Sandy silty clay: 14'-18.5' Alternating brown, very sandy, silty clay and silty sand
Clay: 18.5'-24' Brown, hard, plastic clay

8L

DWP-7-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Bentonite pellet annular seal 0'-2'
2" PVC riser pipe
Static water level @ 3.9'
Encountered water @ 6'
8.25" Borehole
Filter pack 2'-19'
2" PVC 0.010 slotted, well screen 3'-18'
2.75" Sump
Bottom of borehole @ 19'
Silty loam: 0'-4' Brown, soft silty loam
Fill: 4'-15' Brown, gray and black, odoriferous, sandy and gravelly, loose to soft sludge/fill; wood fragments at 11'
Silty sandy clay: 15'-19' Brown, soft, slightly silty, sandy clay

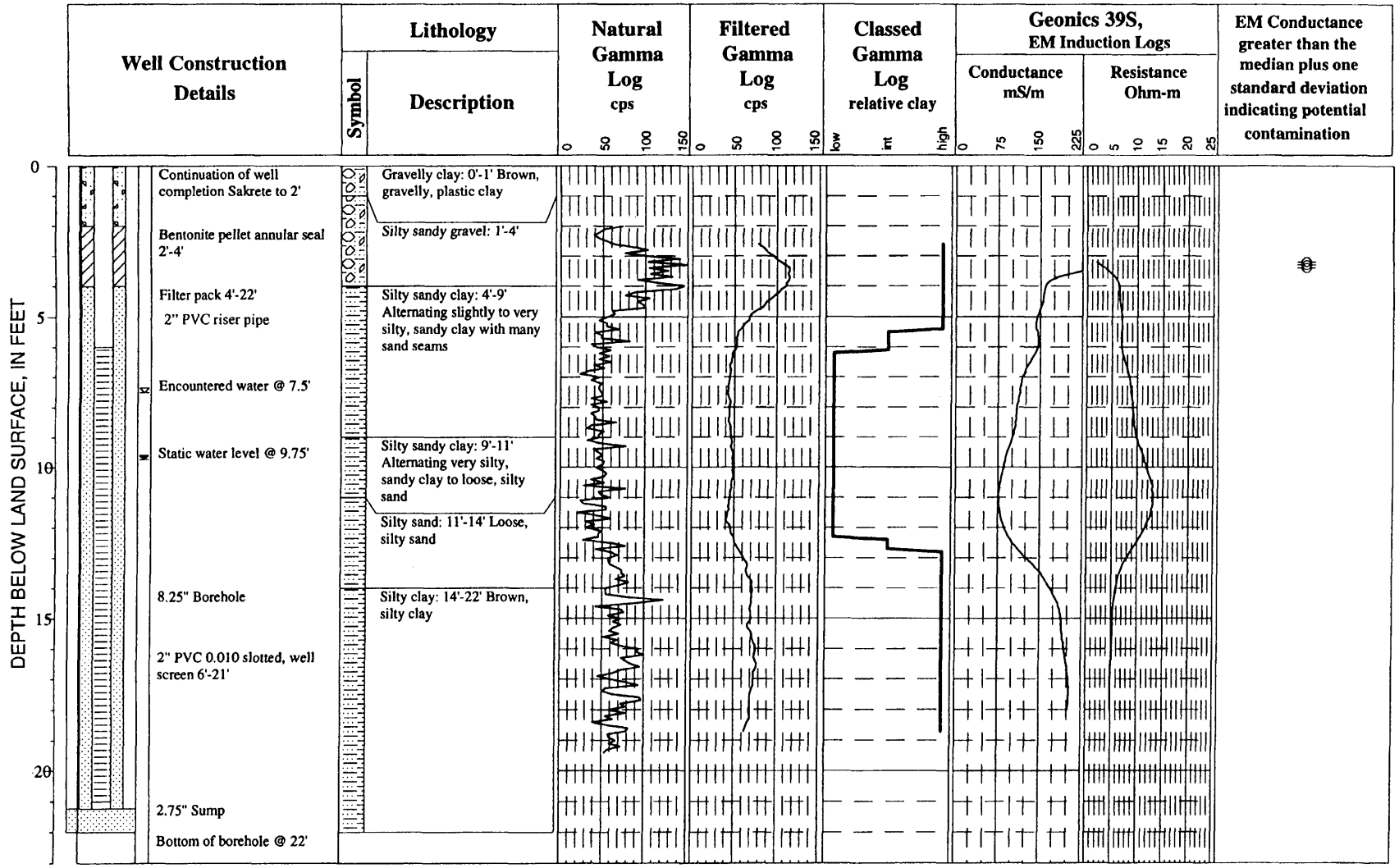
DWP-7-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Static water level @ 2.9'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 11'-13'
Filter pack 13'-26'
Encountered water @ 17'
2" PVC 0.010 slotted, well screen 15'-25'
Running sand backfill 26'-32'
Clay: 0'-4' Brown, plastic clay; silty, sandy and moist in places
Clay: 4'-18.5' Brown, plastic clay with 1" very silty, sandy clay seam at 17'
Silty sand: 18.5'-22' Brown, loose, silty sand
Silty sandy clay: 22'-24' Alternating brown, loose, silty sand and very silty, sandy clay
Silty sand: 24'-32' Loose, running, slightly silty sand

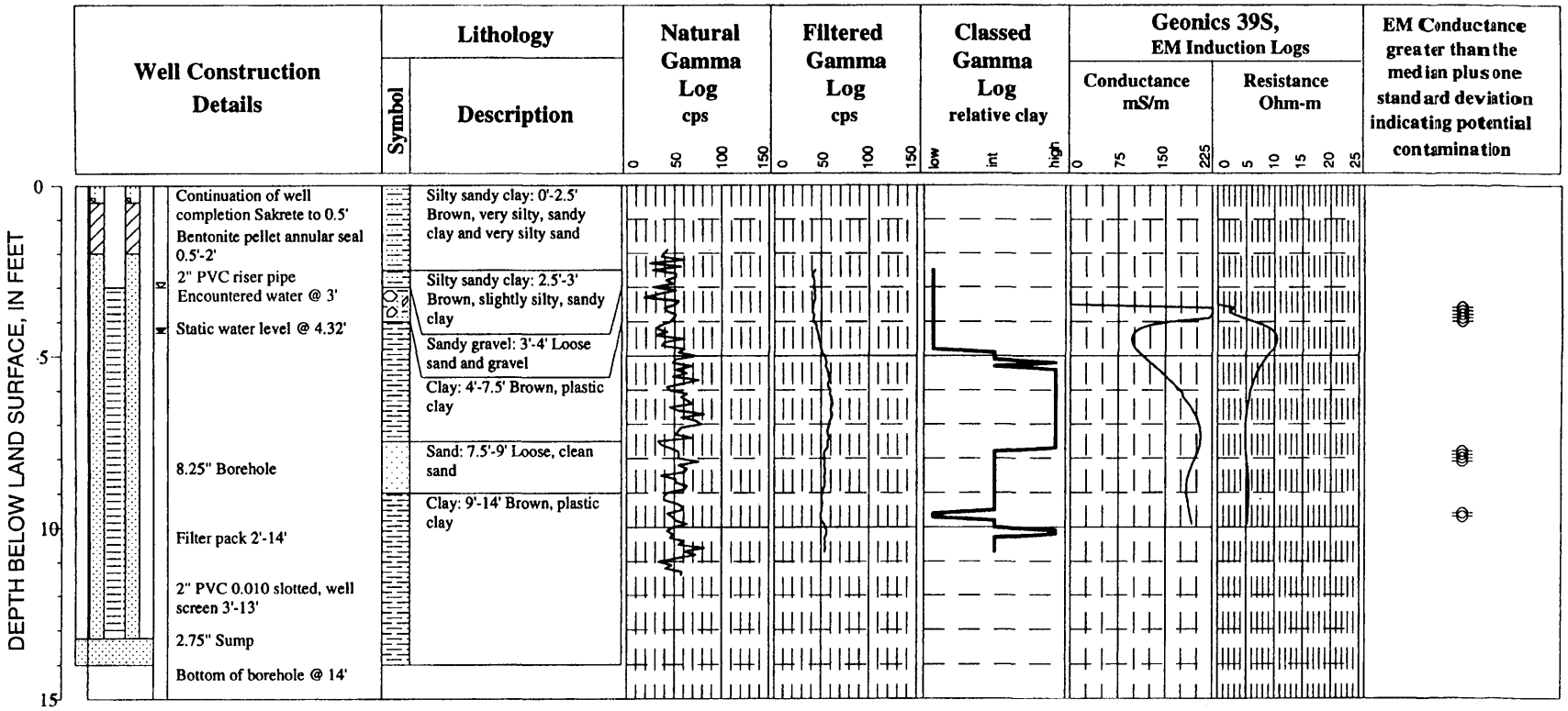
DWP-7-6—Continued

Well Construction Details	Lithology		Natural Gamma Log cps	Filtered Gamma Log cps	Classed Gamma Log relative clay	Geonics 39S, EM Induction Logs		EM Conductance greater than the median plus one standard deviation indicating potential contamination
	Symbol	Description				Conductance mS/m	Resistance Ohm-m	
			0 50 100 150	0 50 100 150	low int high	0 75 150 225	0 5 10 15 20 25	
Bottom of borehole @ 32'								

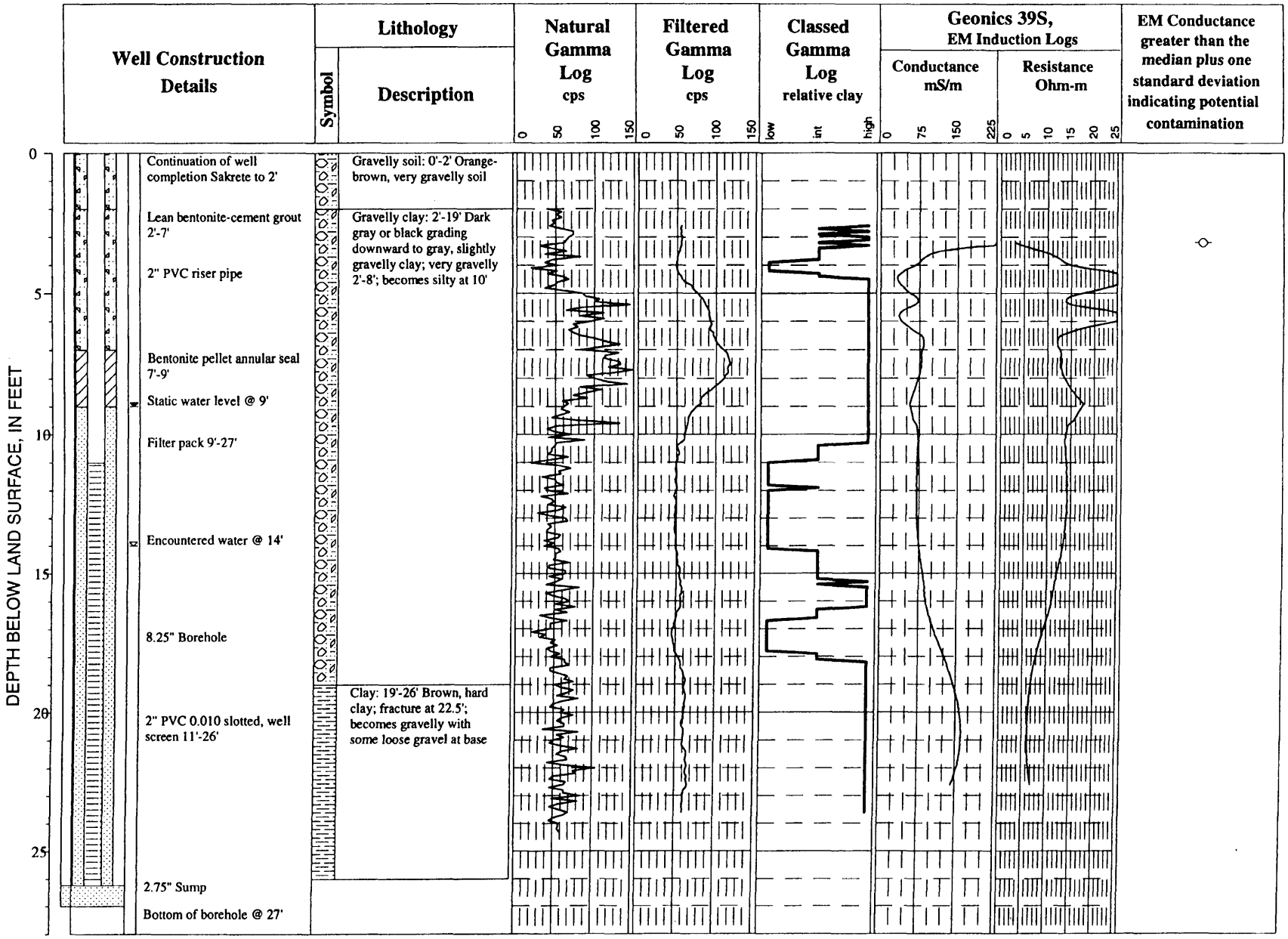
DWP-7-8


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Bentonite pellet annular seal 2'-4'
Filter pack 4'-22'
2" PVC riser pipe
Encountered water @ 7.5'
Static water level @ 9.75'
8.25" Borehole
2" PVC 0.010 slotted, well screen 6'-21'
2.75" Sump
Bottom of borehole @ 22'
Gravelly clay: 0'-1' Brown, gravelly, plastic clay
Silty sandy gravel: 1'-4'
Silty sandy clay: 4'-9' Alternating slightly to very silty, sandy clay with many sand seams
Silty sandy clay: 9'-11' Alternating very silty, sandy clay to loose, silty sand
Silty sand: 11'-14' Loose, silty sand
Silty clay: 14'-22' Brown, silty clay

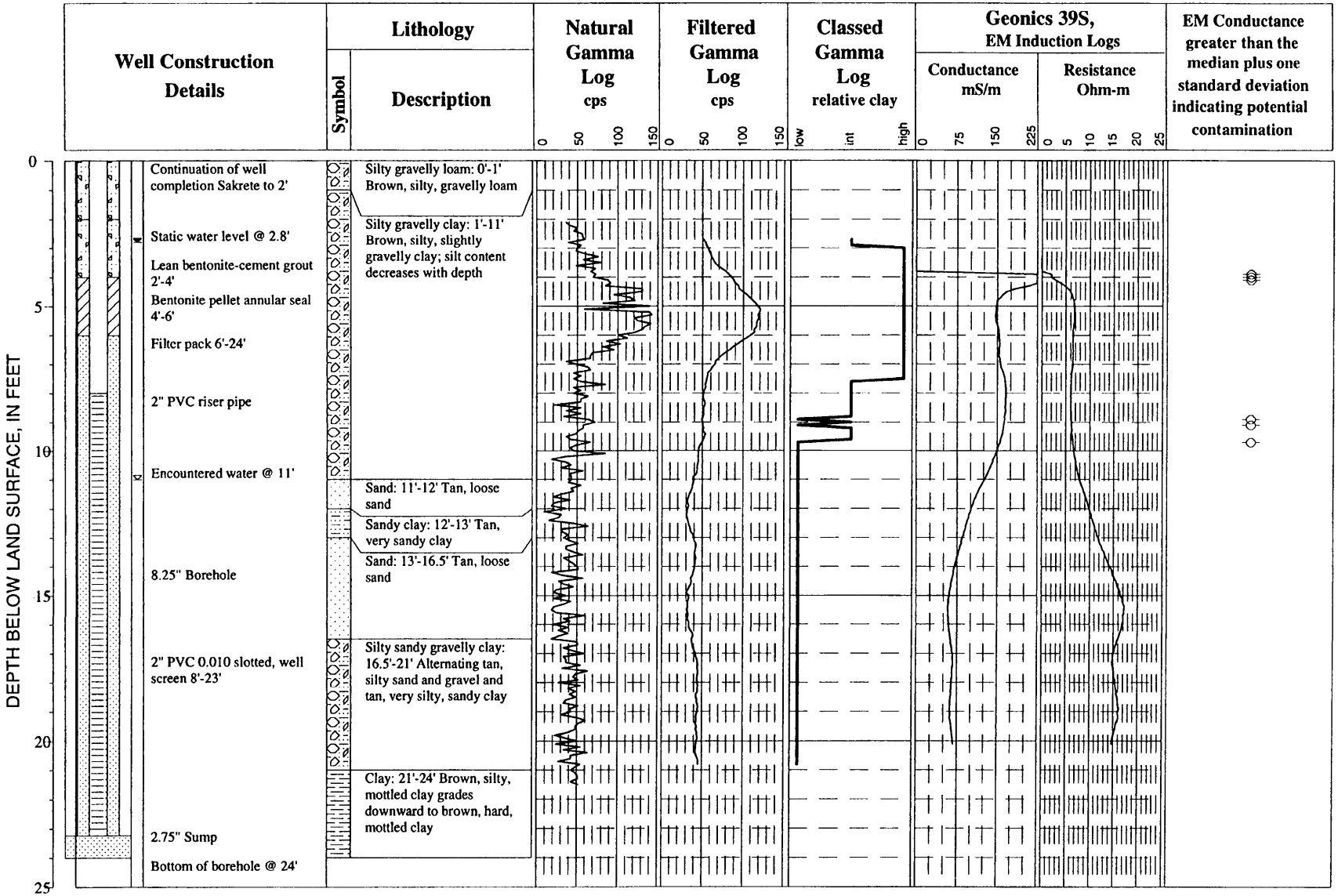
DWP-7-9


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 0.5'
Bentonite pellet annular seal 0.5'-2'
2" PVC riser pipe
Encountered water @ 3'
Static water level @ 4.32'
8.25" Borehole
Filter pack 2'-14'
2" PVC 0.010 slotted, well screen 3'-13'
2.75" Sump
Bottom of borehole @ 14'
Silty sandy clay: 0'-2.5' Brown, very silty, sandy clay and very silty sand
Silty sandy clay: 2.5'-3' Brown, slightly silty, sandy clay
Sandy gravel: 3'-4' Loose sand and gravel
Clay: 4'-7.5' Brown, plastic clay
Sand: 7.5'-9' Loose, clean sand
Clay: 9'-14' Brown, plastic clay

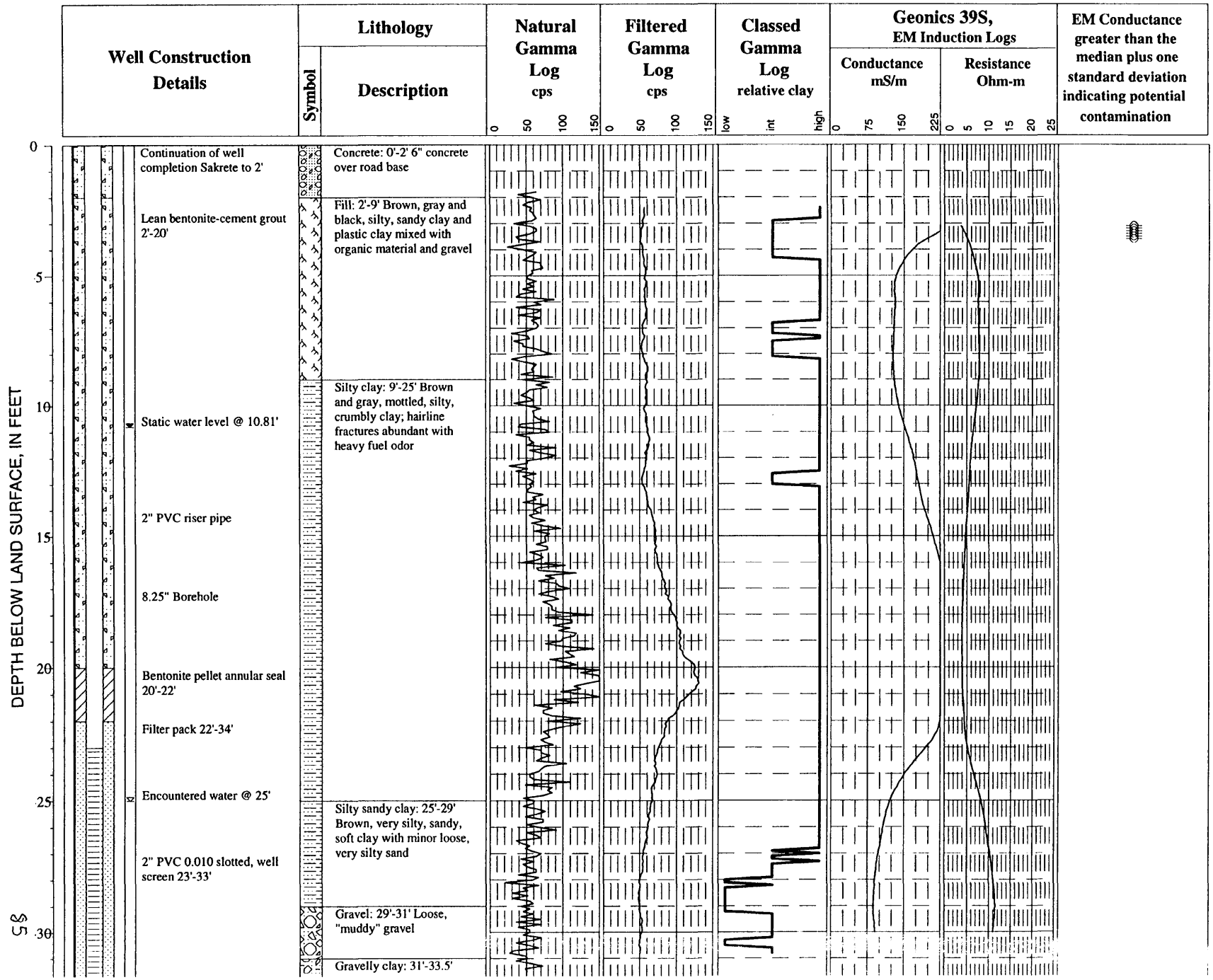
DWP-8-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Static water level @ 9'
Filter pack 9'-27'
Encountered water @ 14'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Gravelly soil: 0'-2' Orange-brown, very gravelly soil
Gravelly clay: 2'-19' Dark gray or black grading downward to gray, slightly gravelly clay; very gravelly 2'-8'; becomes silty at 10'
Clay: 19'-26' Brown, hard clay; fracture at 22.5'; becomes gravelly with some loose gravel at base

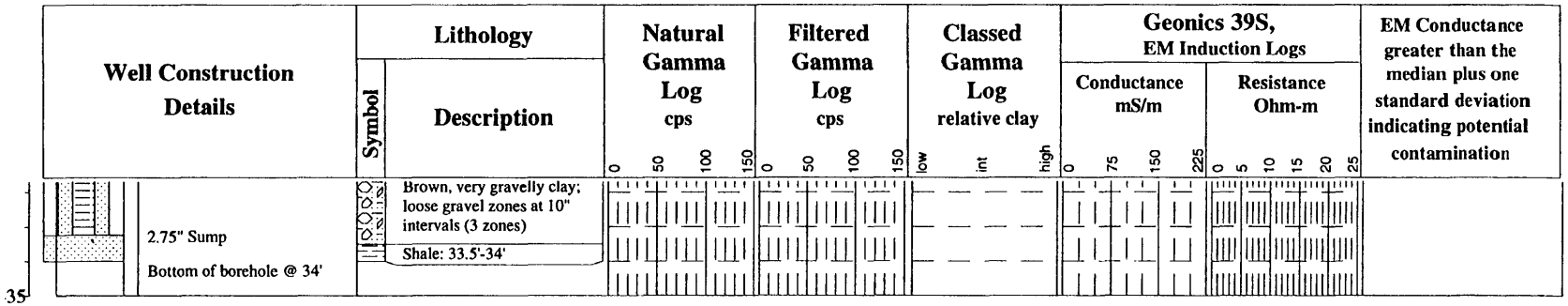
DWP-8-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Static water level @ 2.8'
Lean bentonite-cement grout 2'-4'
Bentonite pellet annular seal 4'-6'
Filter pack 6'-24'
2" PVC riser pipe
Encountered water @ 11'
8.25" Borehole
2" PVC 0.010 slotted, well screen 8'-23'
2.75" Sump
Bottom of borehole @ 24'
Silty gravelly loam: 0'-1' Brown, silty, gravelly loam
Silty gravelly clay: 1'-11' Brown, silty, slightly gravelly clay; silt content decreases with depth
Sand: 11'-12' Tan, loose sand
Sandy clay: 12'-13' Tan, very sandy clay
Sand: 13'-16.5' Tan, loose sand
Silty sandy gravelly clay: 16.5'-21' Alternating tan, silty sand and gravel and tan, very silty, sandy clay
Clay: 21'-24' Brown, silty, mottled clay grades downward to brown, hard, mottled clay
low
int
high

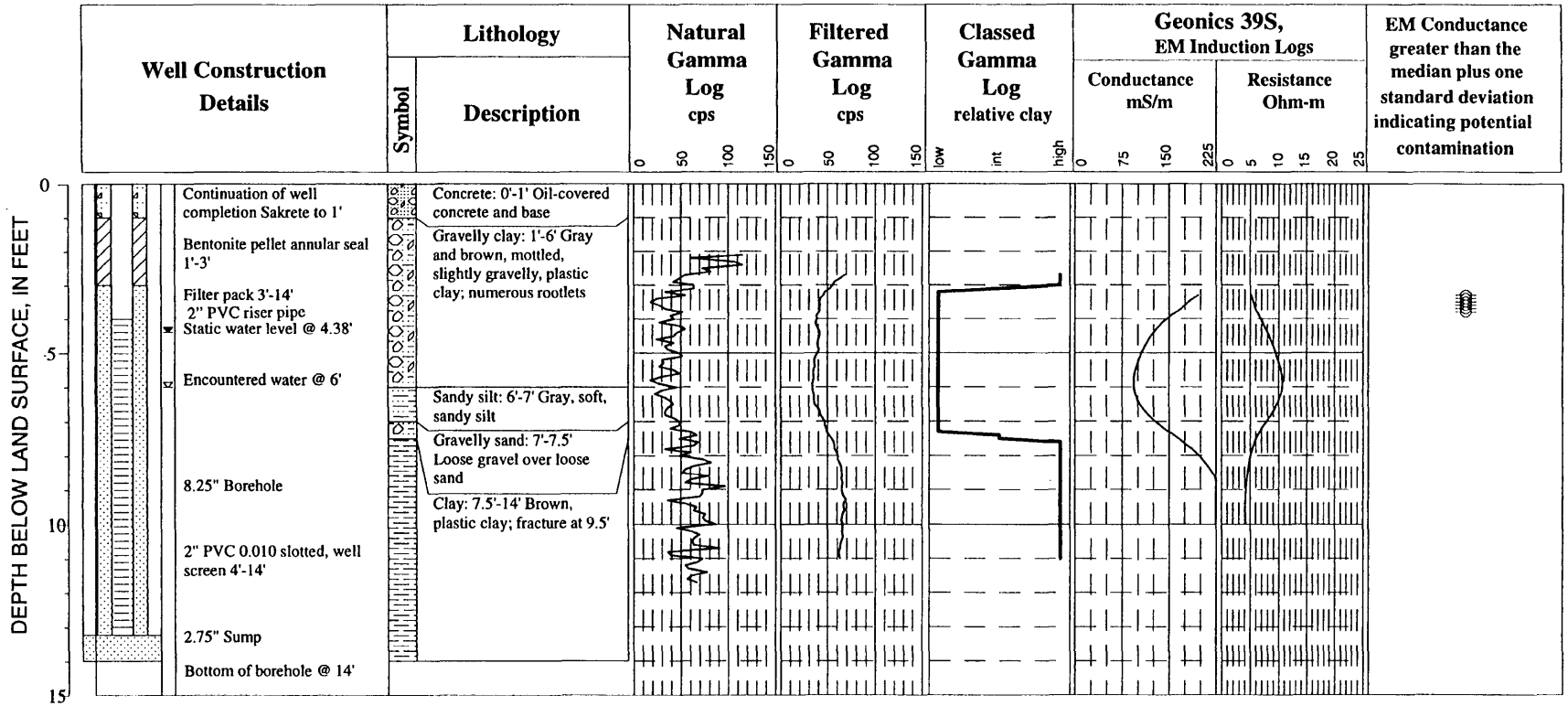
DWP-8-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-20'
Static water level @ 10.81'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 20'-22'
Filter pack 22'-34'
Encountered water @ 25'
2" PVC 0.010 slotted, well screen 23'-33'
Concrete: 0'-2' 6" concrete over road base
Fill: 2'-9' Brown, gray and black, silty, sandy clay and plastic clay mixed with organic material and gravel
Silty clay: 9'-25' Brown and gray, mottled, silty, crumbly clay; hairline fractures abundant with heavy fuel odor
Silty sandy clay: 25'-29' Brown, very silty, sandy, soft clay with minor loose, very silty sand
Gravel: 29'-31' Loose, "muddy" gravel
Gravelly clay: 31'-33.5'

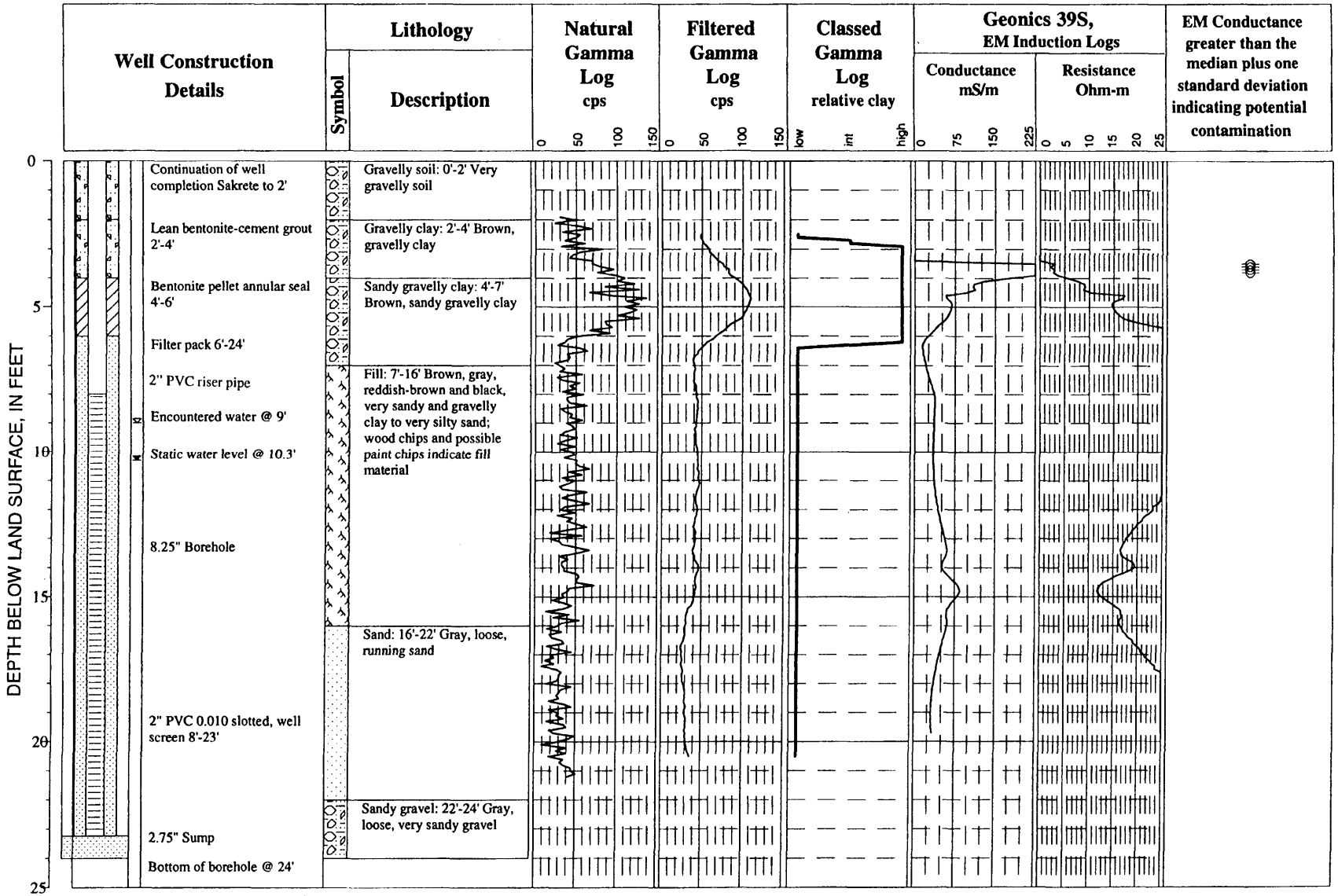
DWP-8-4—Continued



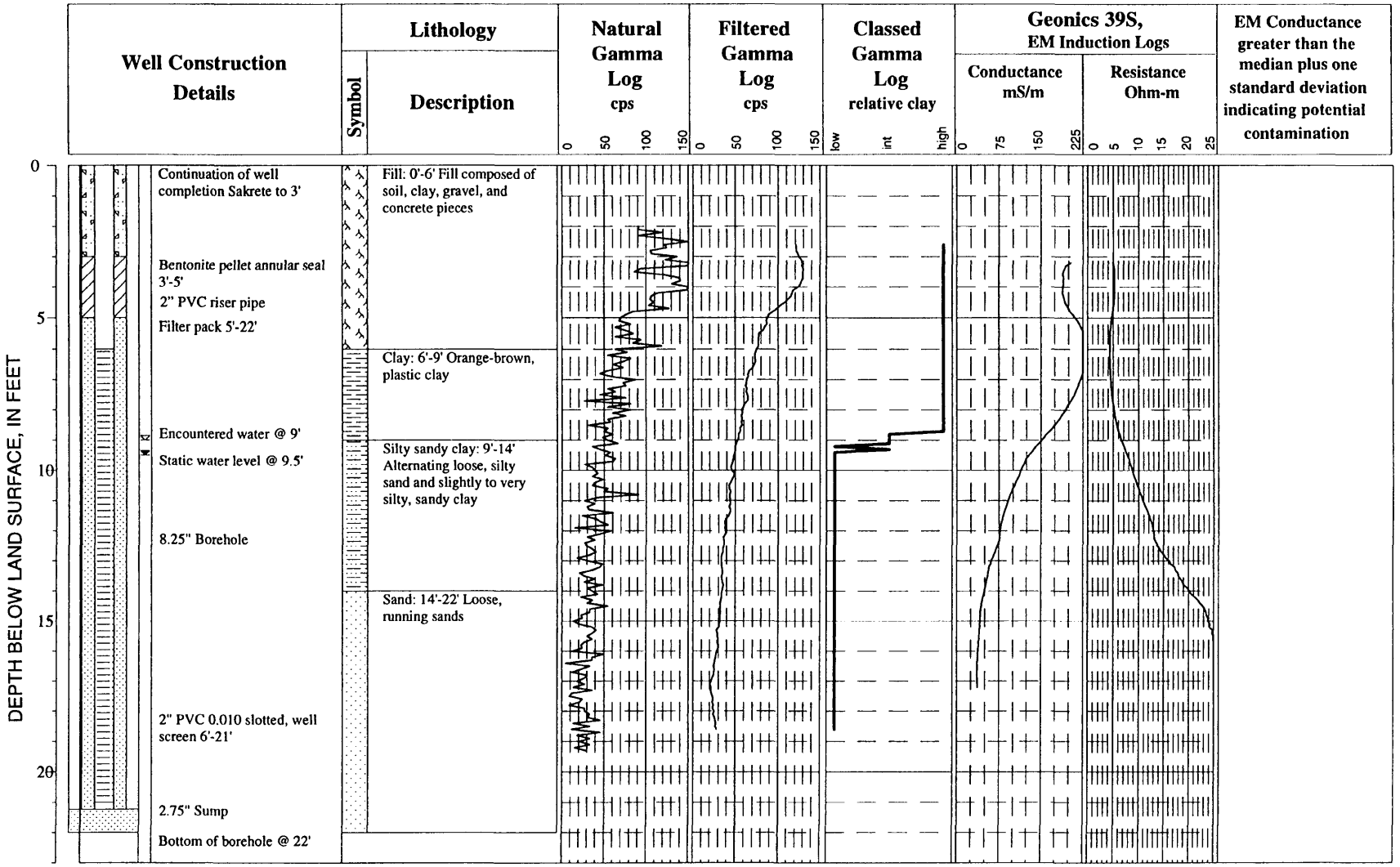
DWP-9-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 1'
Bentonite pellet annular seal 1'-3'
Filter pack 3'-14'
2" PVC riser pipe
Static water level @ 4.38'
Encountered water @ 6'
8.25" Borehole
2" PVC 0.010 slotted, well screen 4'-14'
2.75" Sump
Bottom of borehole @ 14'
Concrete: 0'-1' Oil-covered concrete and base
Gravelly clay: 1'-6' Gray and brown, mottled, slightly gravelly, plastic clay; numerous rootlets
Sandy silt: 6'-7' Gray, soft, sandy silt
Gravelly sand: 7'-7.5' Loose gravel over loose sand
Clay: 7.5'-14' Brown, plastic clay; fracture at 9.5'

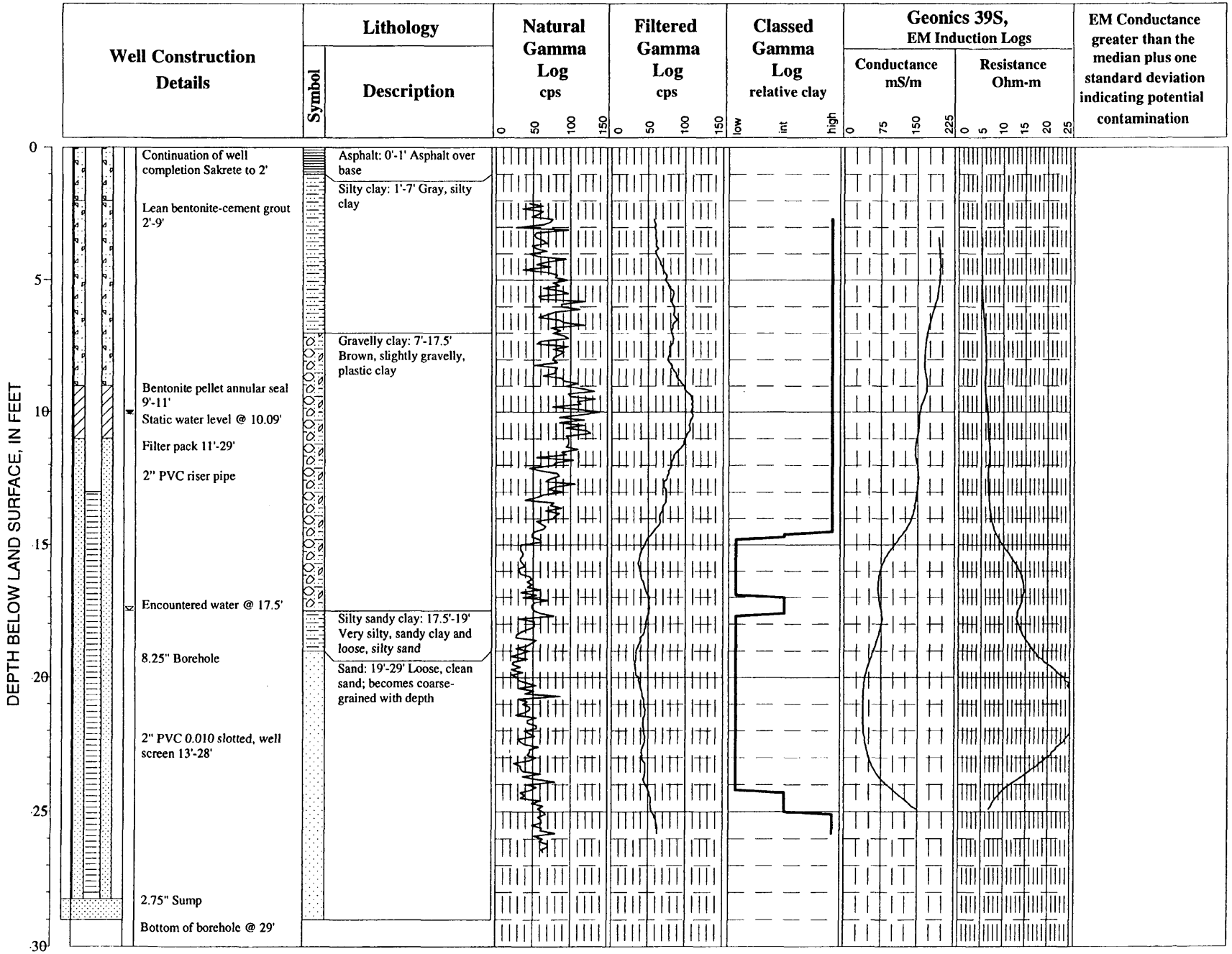
DWP-10-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-4'
Bentonite pellet annular seal 4'-6'
Filter pack 6'-24'
2" PVC riser pipe
Encountered water @ 9'
Static water level @ 10.3'
8.25" Borehole
2" PVC 0.010 slotted, well screen 8'-23'
2.75" Sump
Bottom of borehole @ 24'
Gravelly soil: 0'-2' Very gravelly soil
Gravelly clay: 2'-4' Brown, gravelly clay
Sandy gravelly clay: 4'-7' Brown, sandy gravelly clay
Fill: 7'-16' Brown, gray, reddish-brown and black, very sandy and gravelly clay to very silty sand; wood chips and possible paint chips indicate fill material
Sand: 16'-22' Gray, loose, running sand
Sandy gravel: 22'-24' Gray, loose, very sandy gravel

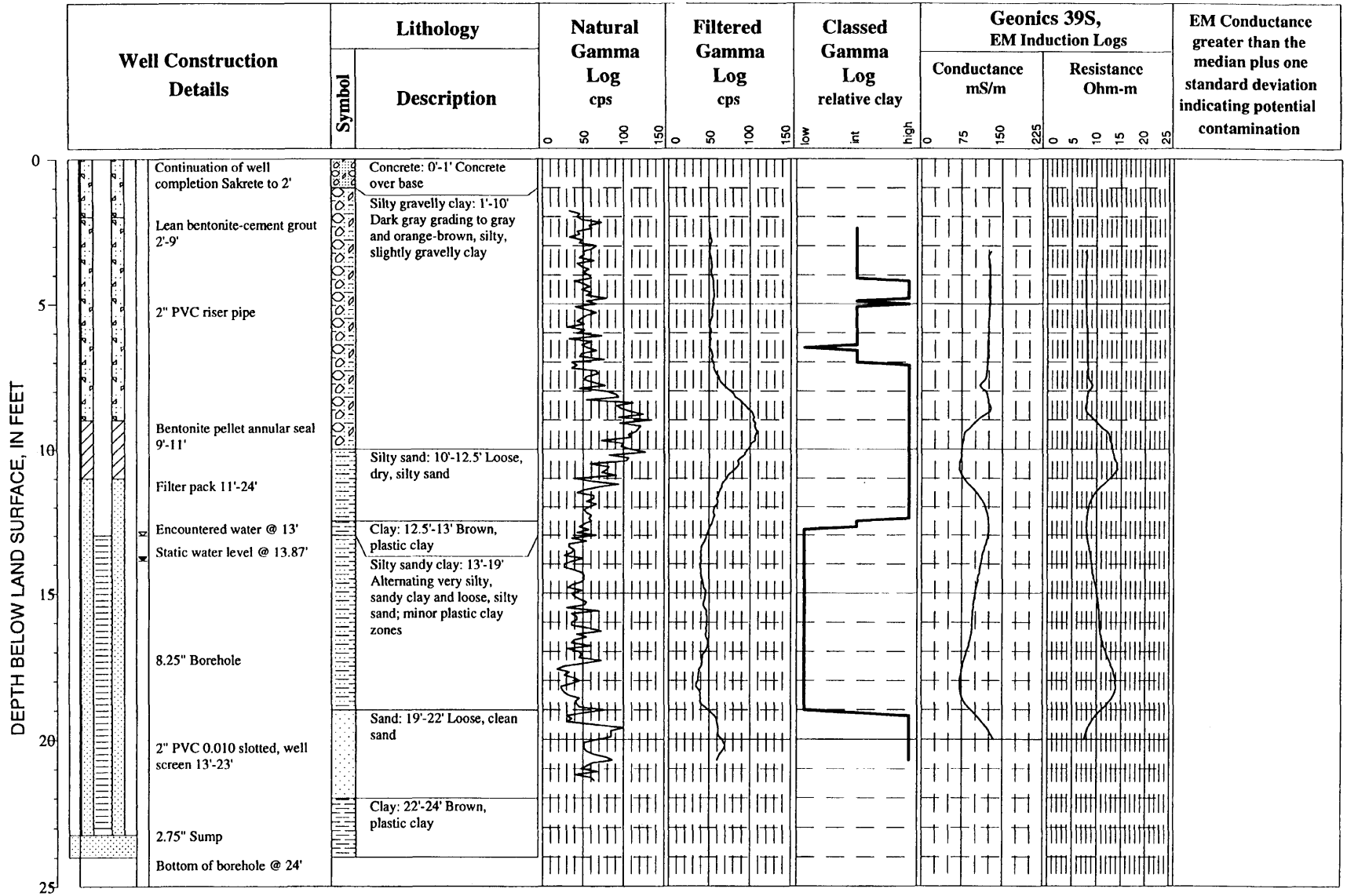
DWP-10-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Continuation of well completion Sakrete to 3'
Bentonite pellet annular seal 3'-5'
2" PVC riser pipe
Filter pack 5'-22'
Encountered water @ 9'
Static water level @ 9.5'
8.25" Borehole
2" PVC 0.010 slotted, well screen 6'-21'
2.75" Sump
Bottom of borehole @ 22'
Fill: 0'-6' Fill composed of soil, clay, gravel, and concrete pieces
Clay: 6'-9' Orange-brown, plastic clay
Silty sandy clay: 9'-14' Alternating loose, silty sand and slightly to very silty, sandy clay
Sand: 14'-22' Loose, running sands

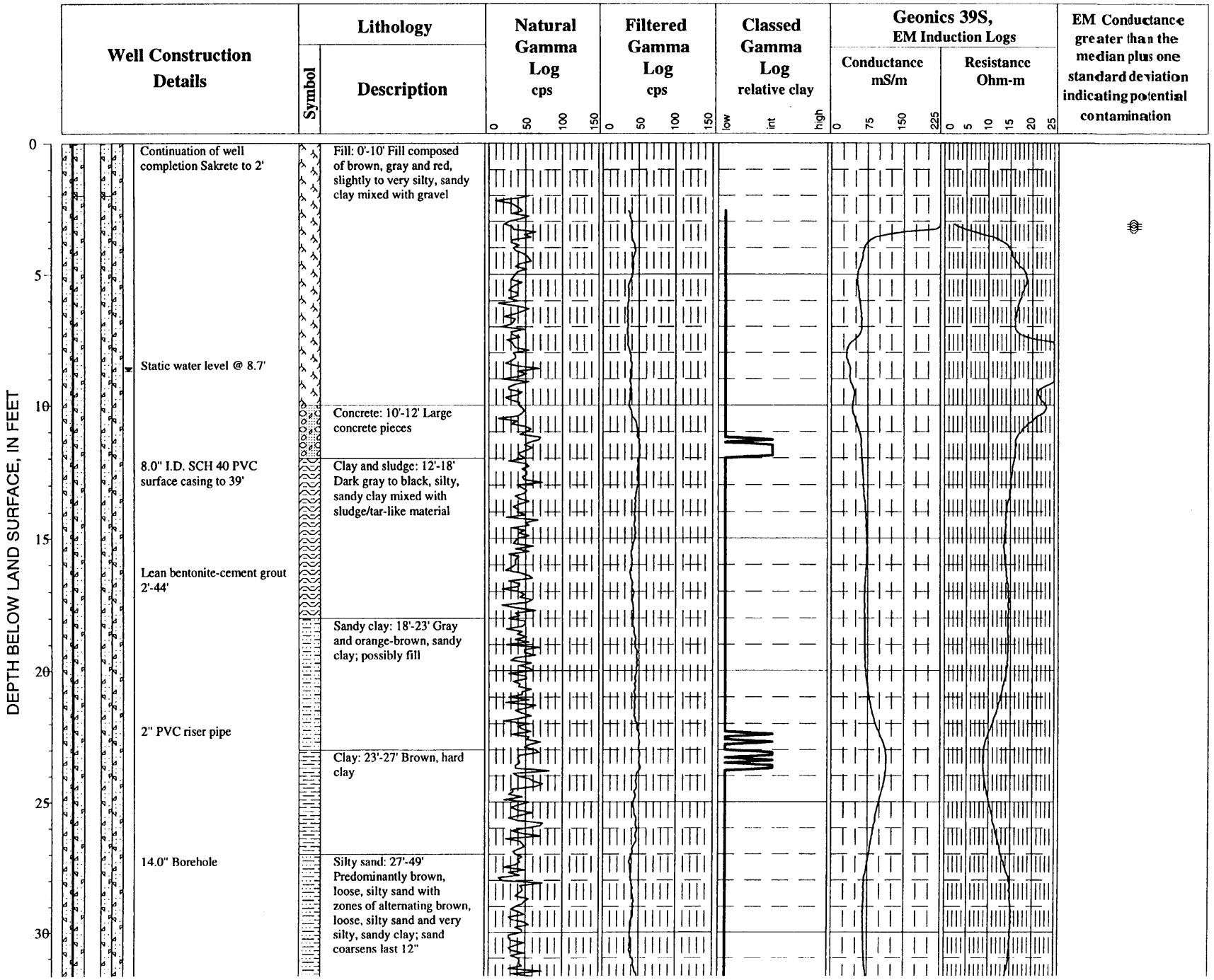
DWP-10-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Static water level @ 10.09'
Filter pack 11'-29'
2" PVC riser pipe
Encountered water @ 17.5'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over base
Silty clay: 1'-7' Gray, silty clay
Gravelly clay: 7'-17.5' Brown, slightly gravelly, plastic clay
Silty sandy clay: 17.5'-19' Very silty, sandy clay and loose, silty sand
Sand: 19'-29' Loose, clean sand; becomes coarse-grained with depth

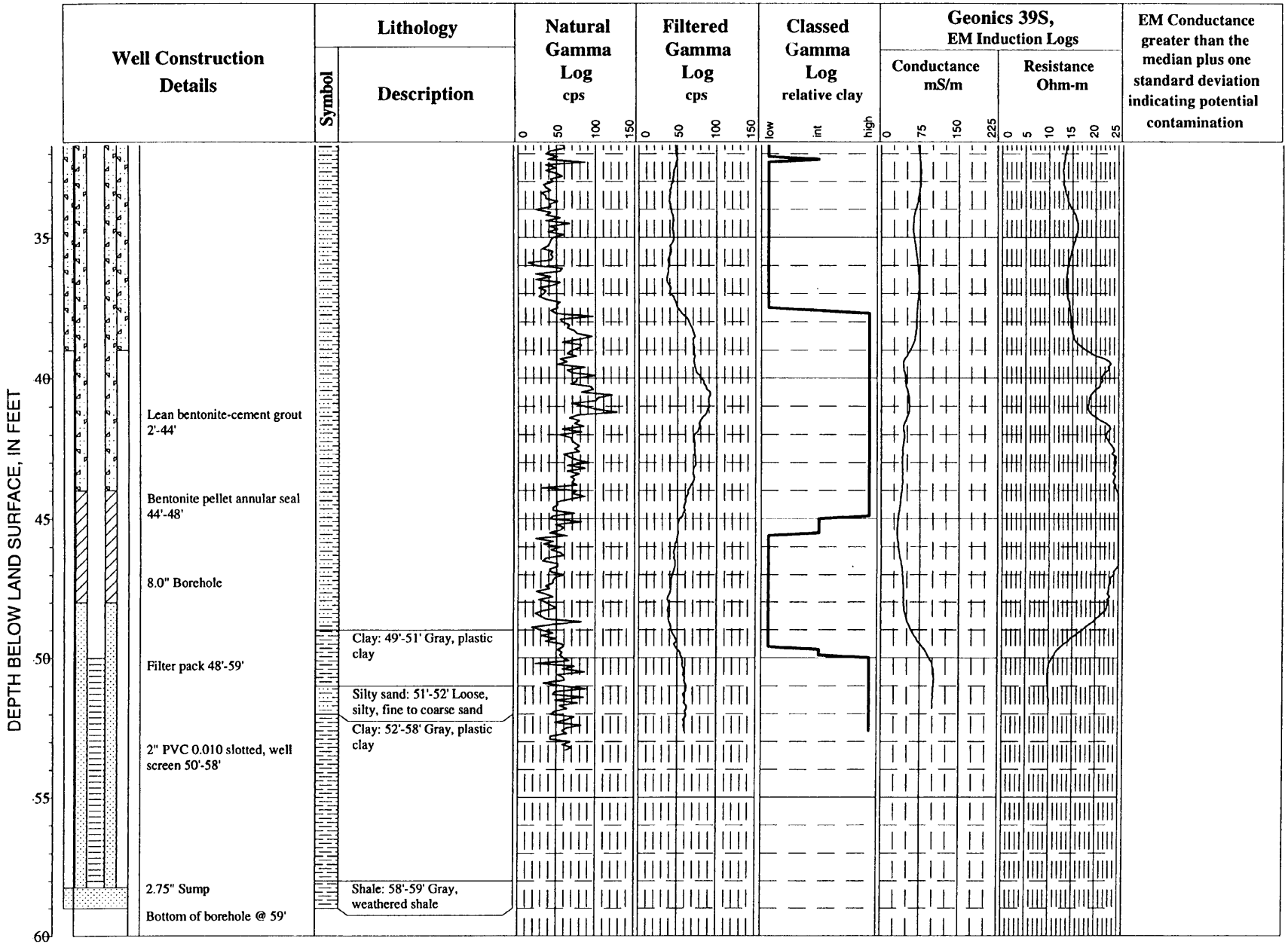
DWP-10-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-24'
Encountered water @ 13'
Static water level @ 13.87'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-23'
2.75" Sump
Bottom of borehole @ 24'
Concrete: 0'-1' Concrete over base
Silty gravelly clay: 1'-10' Dark gray grading to gray and orange-brown, silty, slightly gravelly clay
Silty sand: 10'-12.5' Loose, dry, silty sand
Clay: 12.5'-13' Brown, plastic clay
Silty sandy clay: 13'-19' Alternating very silty, sandy clay and loose, silty sand; minor plastic clay zones
Sand: 19'-22' Loose, clean sand
Clay: 22'-24' Brown, plastic clay

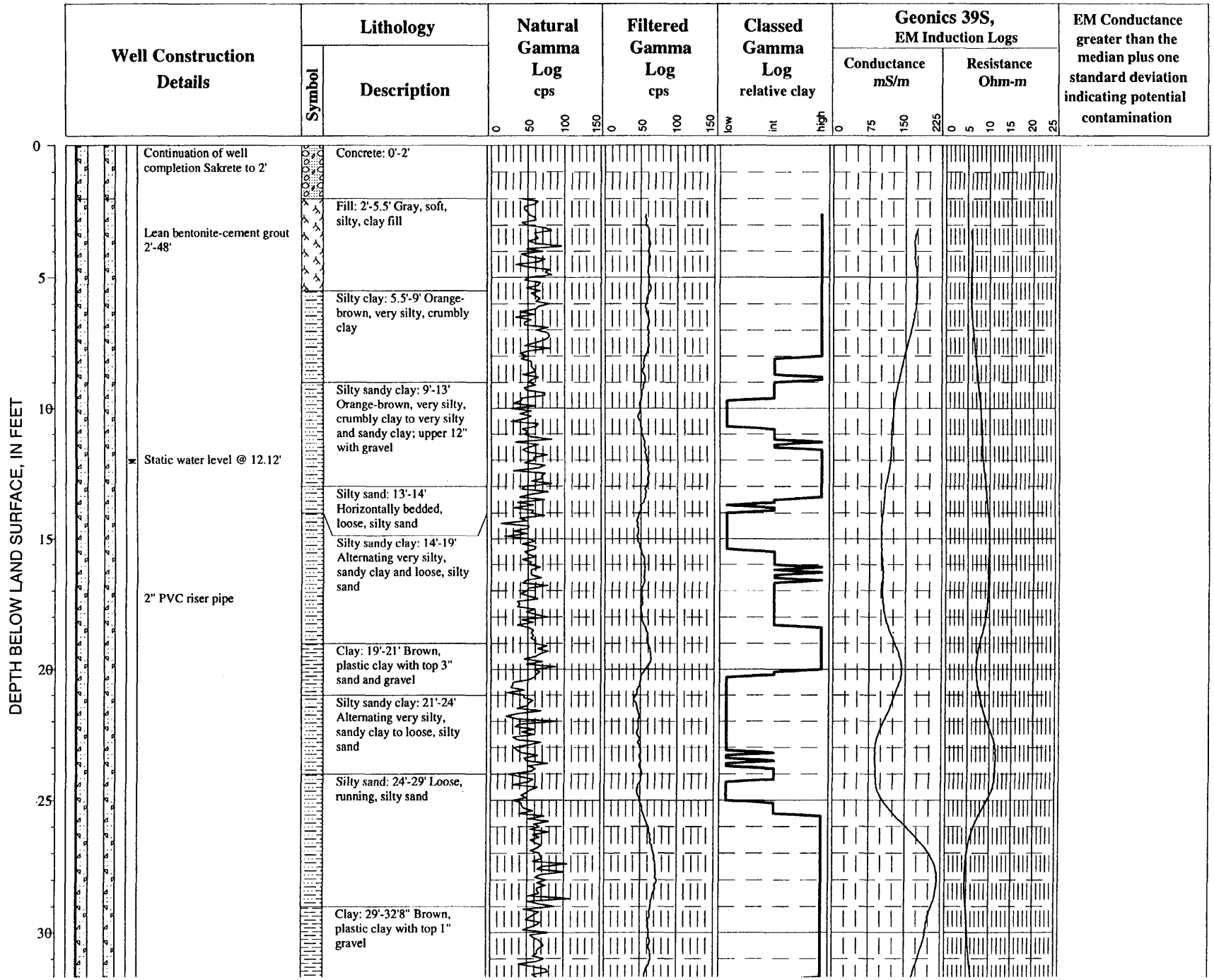
DWP-10-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Static water level @ 8.7'
8.0" I.D. SCH 40 PVC surface casing to 39'
Lean bentonite-cement grout 2'-44'
2" PVC riser pipe
14.0" Borehole
Fill: 0'-10' Fill composed of brown, gray and red, slightly to very silty, sandy clay mixed with gravel
Concrete: 10'-12' Large concrete pieces
Clay and sludge: 12'-18' Dark gray to black, silty, sandy clay mixed with sludge/tar-like material
Sandy clay: 18'-23' Gray and orange-brown, sandy clay; possibly fill
Clay: 23'-27' Brown, hard clay
Silty sand: 27'-49' Predominantly brown, loose, silty sand with zones of alternating brown, loose, silty sand and very silty, sandy clay; sand coarsens last 12"

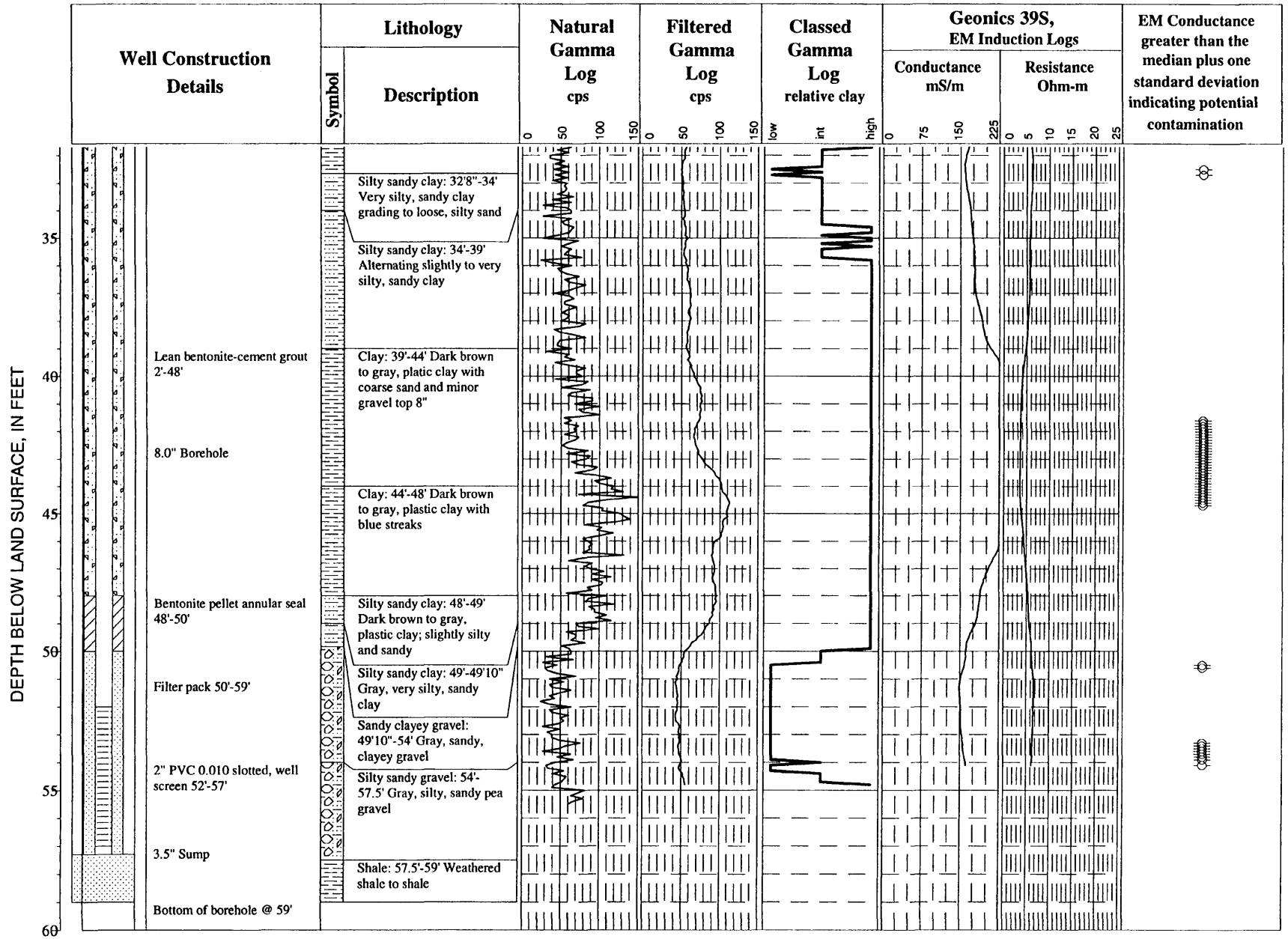
DWP-10-DW1—Continued



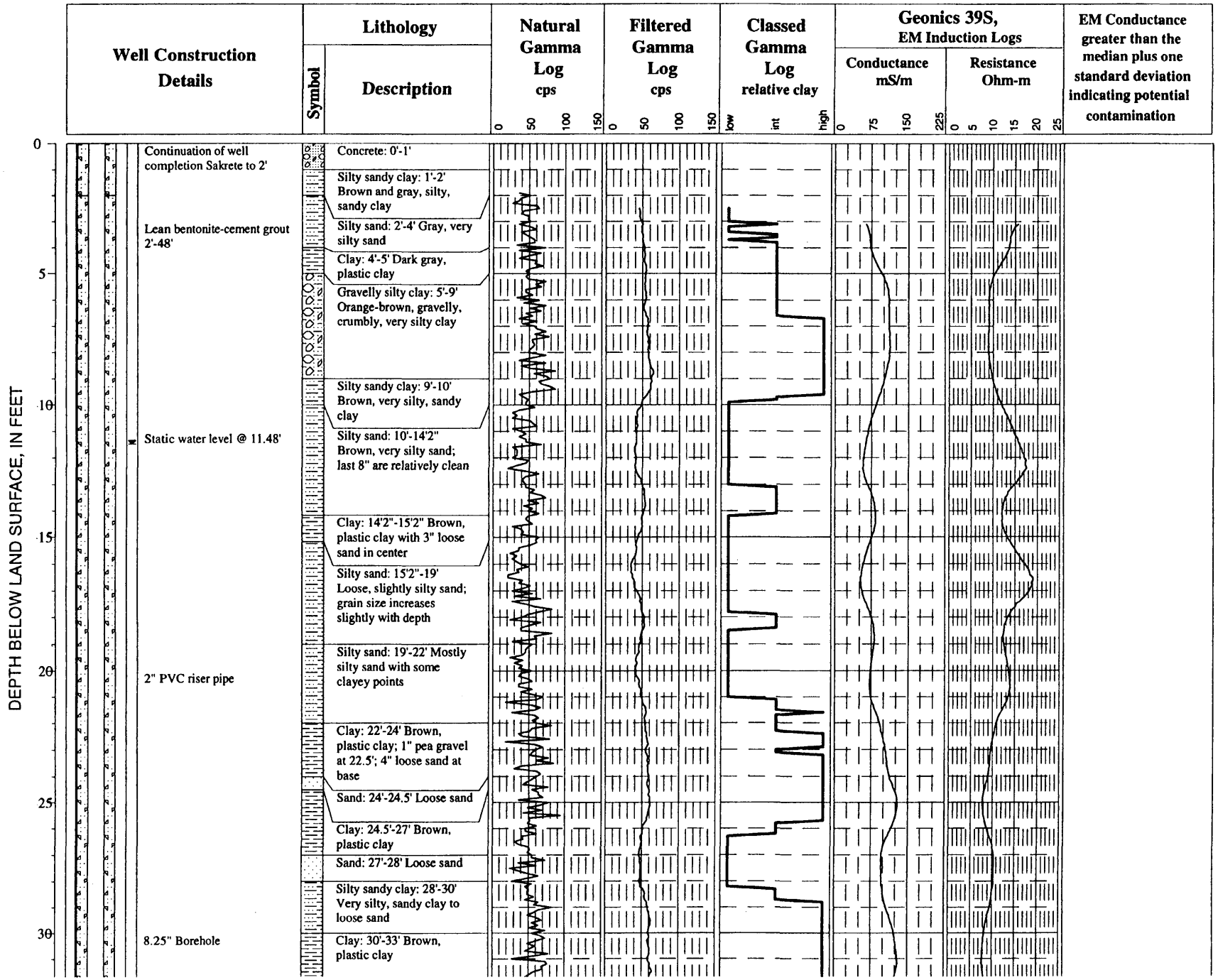
DWP-10-DW2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-48'
Static water level @ 12.12'
2" PVC riser pipe
Concrete: 0'-2'
Fill: 2'-5.5' Gray, soft, silty, clay fill
Silty clay: 5.5'-9' Orange-brown, very silty, crumbly clay
Silty sandy clay: 9'-13' Orange-brown, very silty, crumbly clay to very silty and sandy clay; upper 12" with gravel
Silty sand: 13'-14' Horizontally bedded, loose, silty sand
Silty sandy clay: 14'-19' Alternating very silty, sandy clay and loose, silty sand
Clay: 19'-21' Brown, plastic clay with top 3" sand and gravel
Silty sandy clay: 21'-24' Alternating very silty, sandy clay to loose, silty sand
Silty sand: 24'-29' Loose, running, silty sand
Clay: 29'-32'8" Brown, plastic clay with top 1" gravel

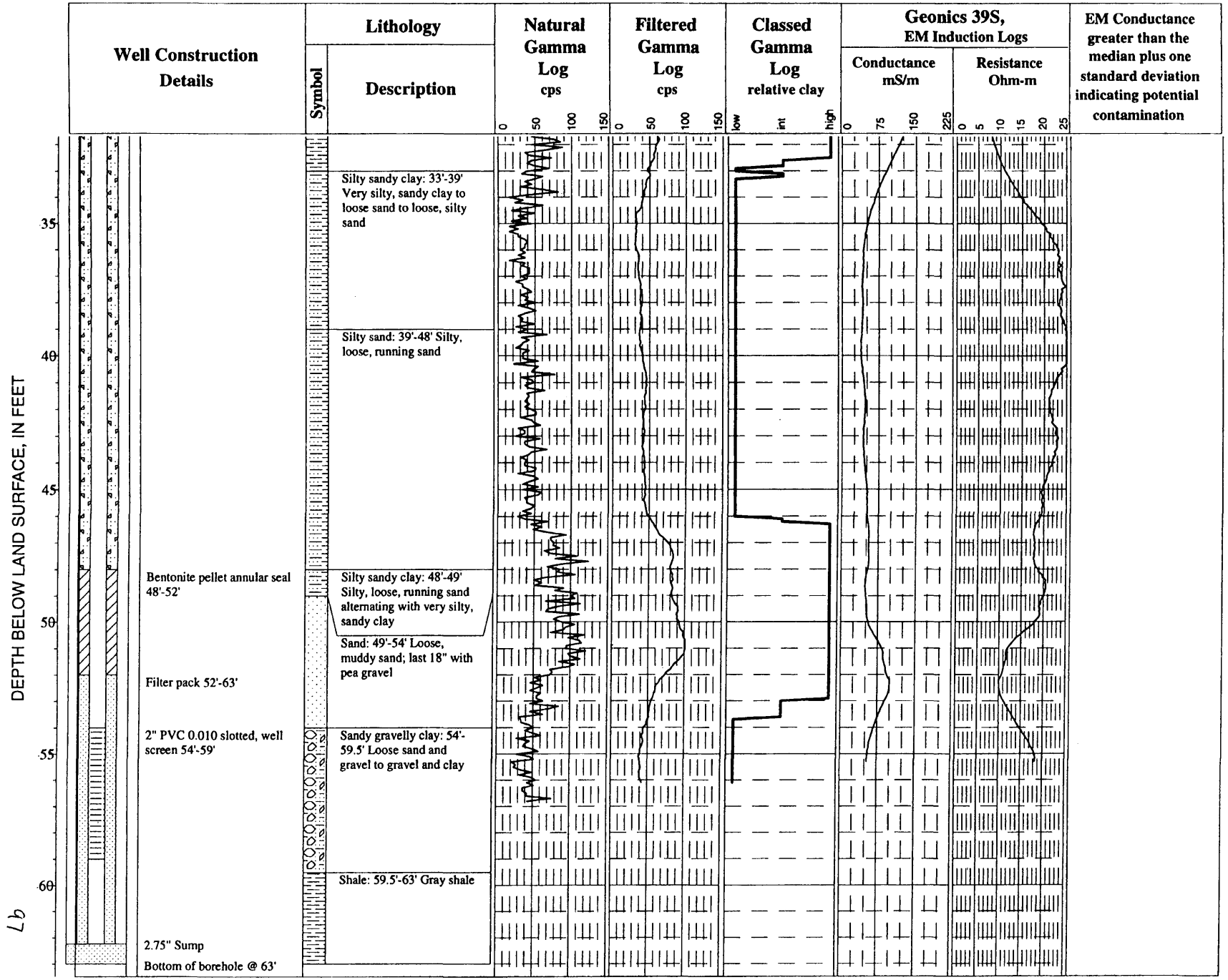
DWP-10-DW2—Continued



DWP-10-DW3

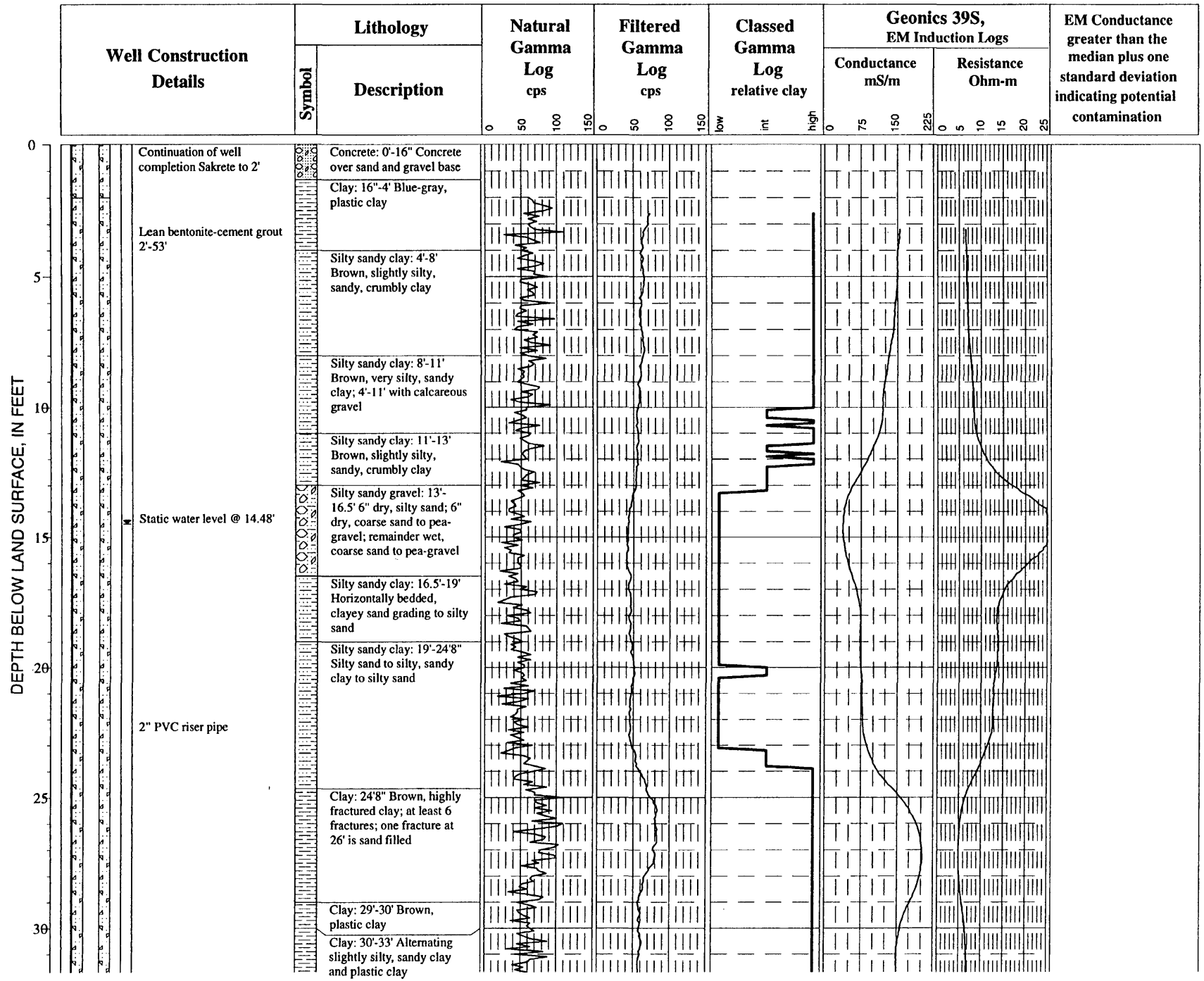

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-48'
Static water level @ 11.48'
2" PVC riser pipe
8.25" Borehole
Concrete: 0'-1'
Silty sandy clay: 1'-2' Brown and gray, silty, sandy clay
Silty sand: 2'-4' Gray, very silty sand
Clay: 4'-5' Dark gray, plastic clay
Gravelly silty clay: 5'-9' Orange-brown, gravelly, crumbly, very silty clay
Silty sandy clay: 9'-10' Brown, very silty, sandy clay
Silty sand: 10'-14'2" Brown, very silty sand; last 8" are relatively clean
Clay: 14'2"-15'2" Brown, plastic clay with 3" loose sand in center
Silty sand: 15'2"-19' Loose, slightly silty sand; grain size increases slightly with depth
Silty sand: 19'-22' Mostly silty sand with some clayey points
Clay: 22'-24' Brown, plastic clay; 1" pea gravel at 22.5'; 4" loose sand at base
Sand: 24'-24.5' Loose sand
Clay: 24.5'-27' Brown, plastic clay
Sand: 27'-28' Loose sand
Silty sandy clay: 28'-30' Very silty, sandy clay to loose sand
Clay: 30'-33' Brown, plastic clay
0
50
100
150
low
int
high
75
225
5
10
15
20
25
0
5
10
15
20
25
30

DWP-10-DW3—Continued

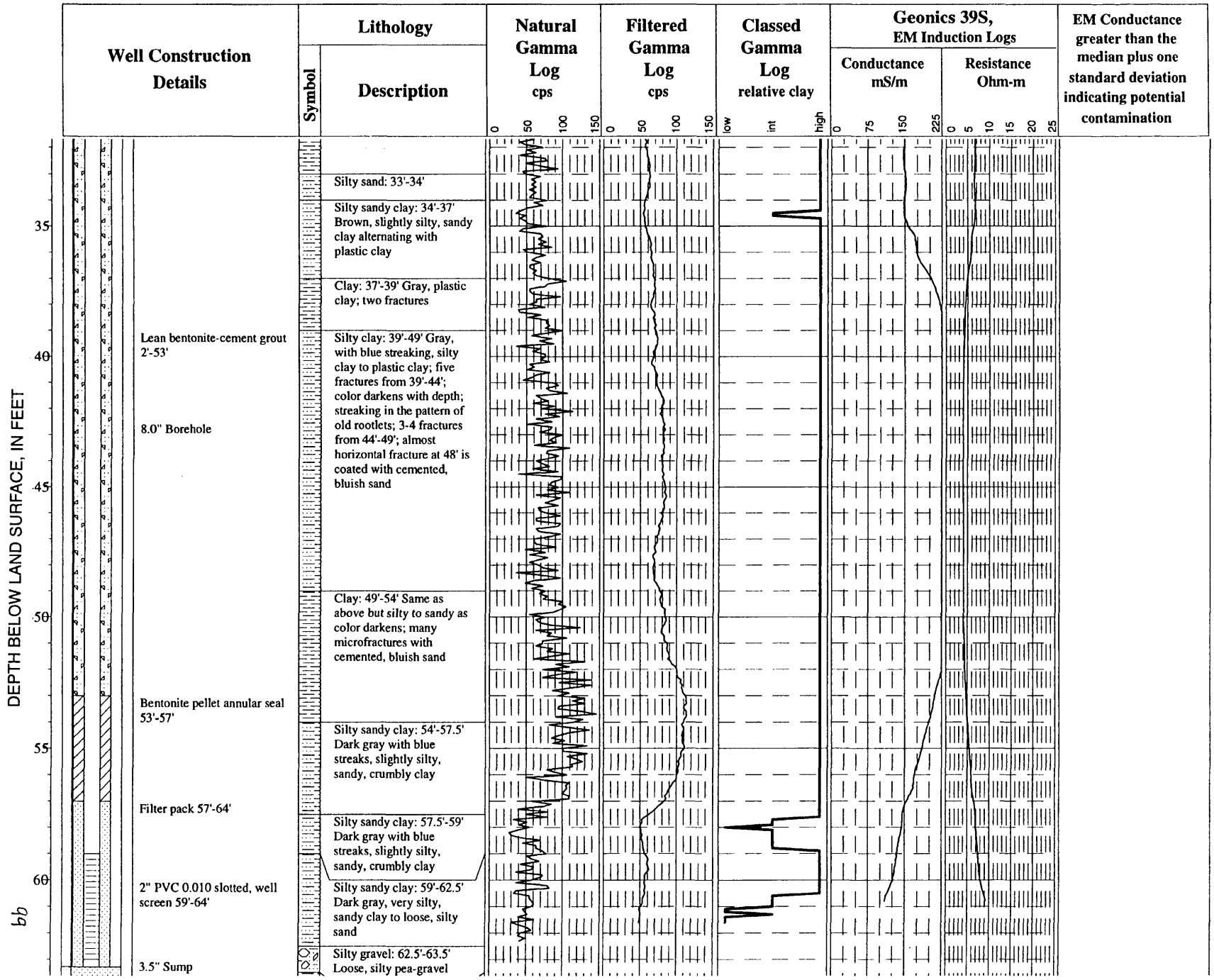


8b

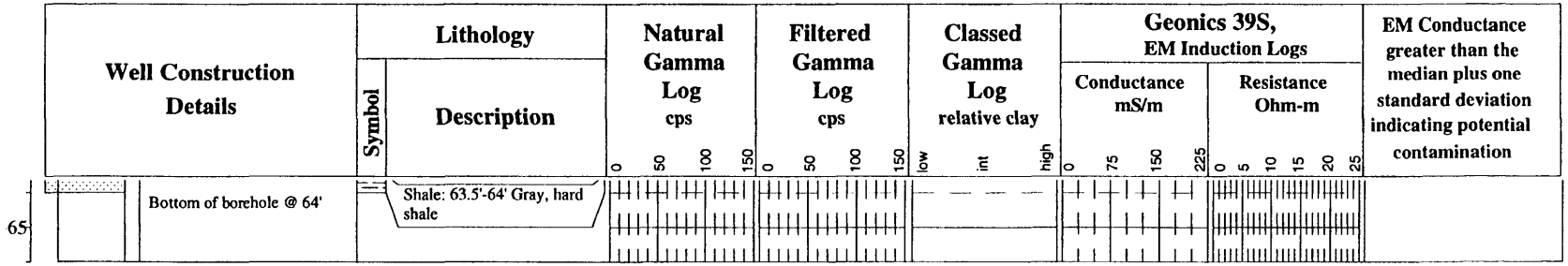
DWP-10-DW4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-53'
Static water level @ 14.48'
2" PVC riser pipe
Concrete: 0'-16" Concrete over sand and gravel base
Clay: 16"-4' Blue-gray, plastic clay
Silty sandy clay: 4'-8' Brown, slightly silty, sandy, crumbly clay
Silty sandy clay: 8'-11' Brown, very silty, sandy clay; 4'-11' with calcareous gravel
Silty sandy clay: 11'-13' Brown, slightly silty, sandy, crumbly clay
Silty sandy gravel: 13'-16.5' 6" dry, silty sand; 6" dry, coarse sand to pea-gravel; remainder wet, coarse sand to pea-gravel
Silty sandy clay: 16.5'-19' Horizontally bedded, clayey sand grading to silty sand
Silty sandy clay: 19'-24'8" Silty sand to silty, sandy clay to silty sand
Clay: 24'8" Brown, highly fractured clay; at least 6 fractures; one fracture at 26' is sand filled
Clay: 29'-30' Brown, plastic clay
Clay: 30'-33' Alternating slightly silty, sandy clay and plastic clay

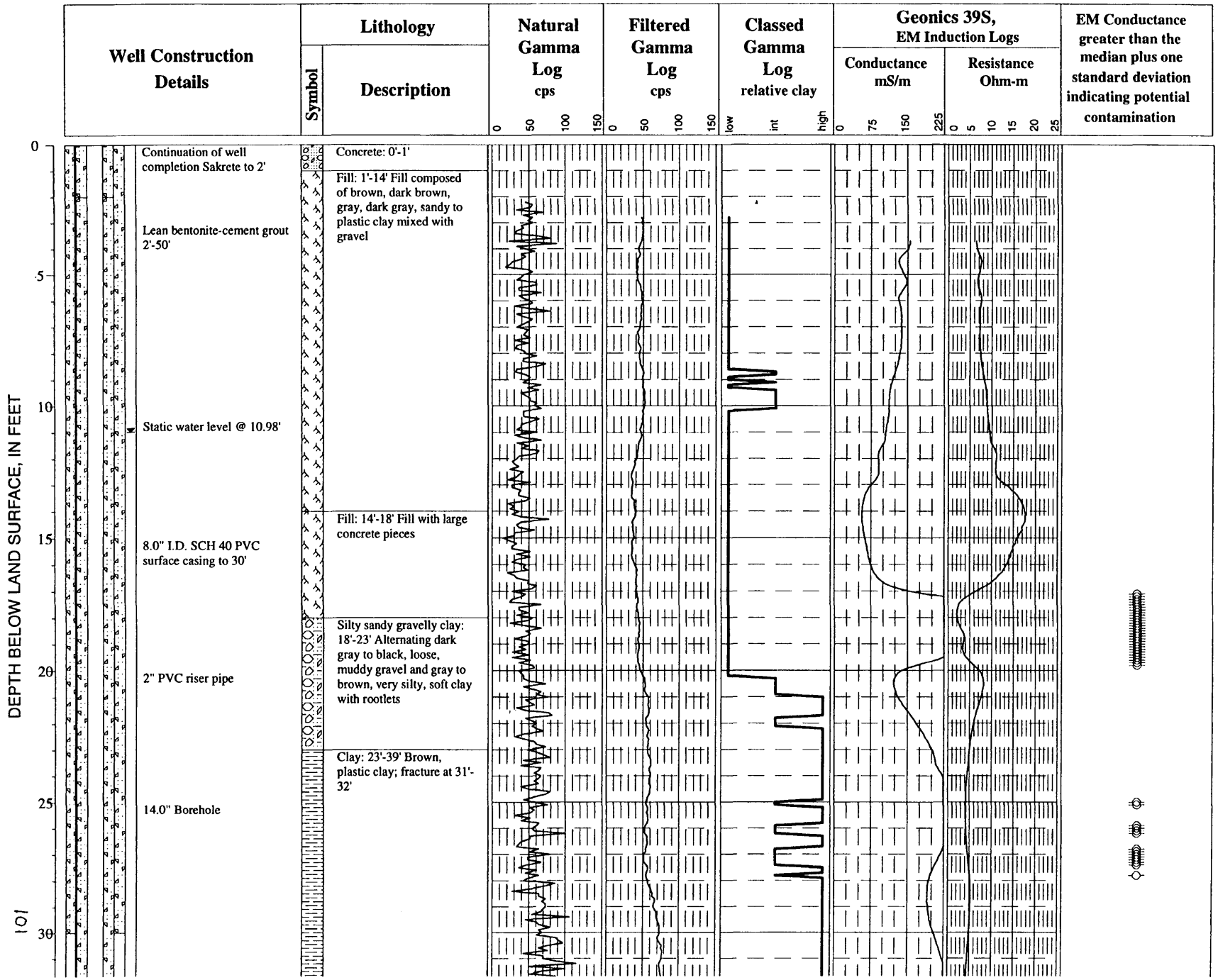
DWP-10-DW4—Continued



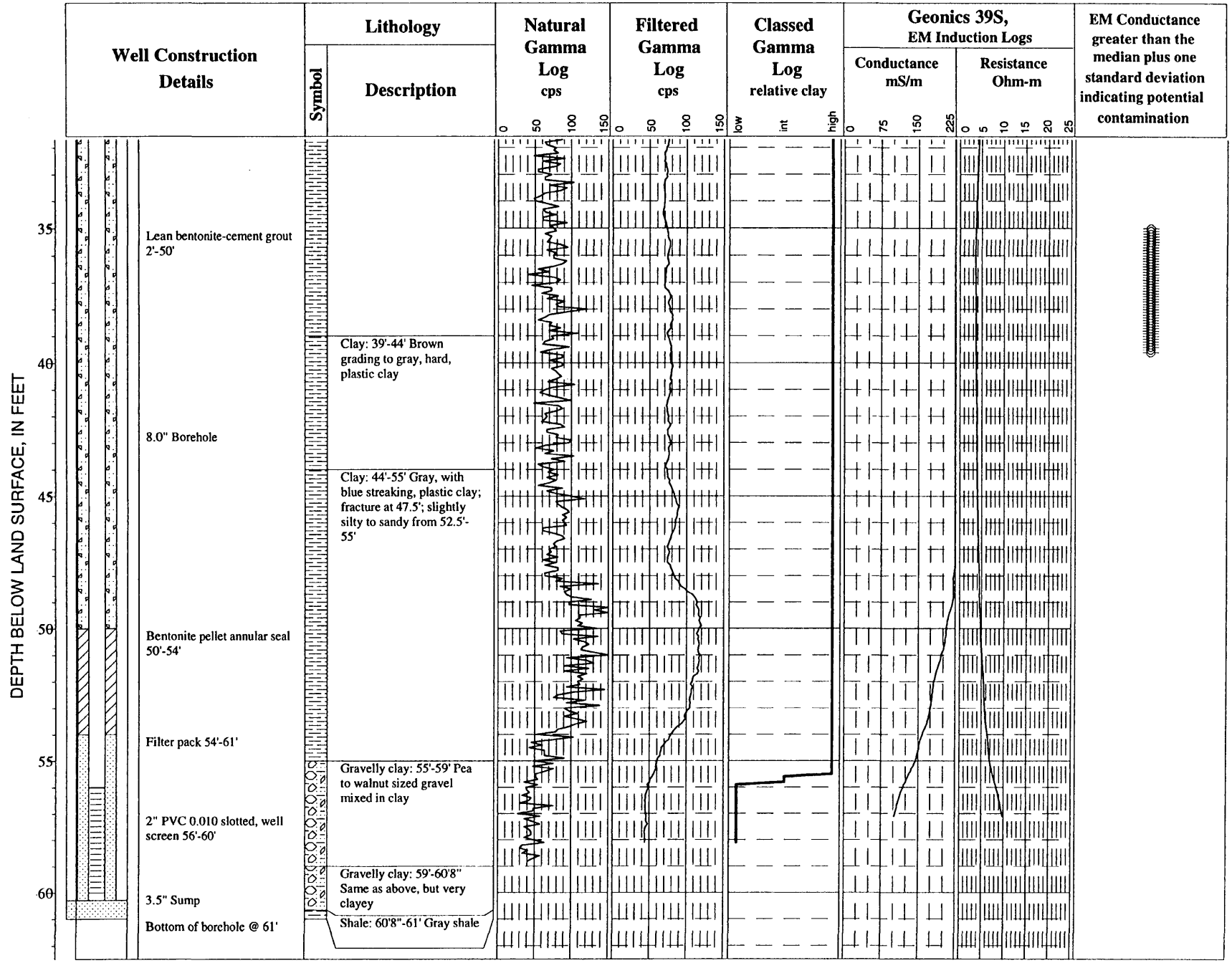
DWP-10-DW4—Continued



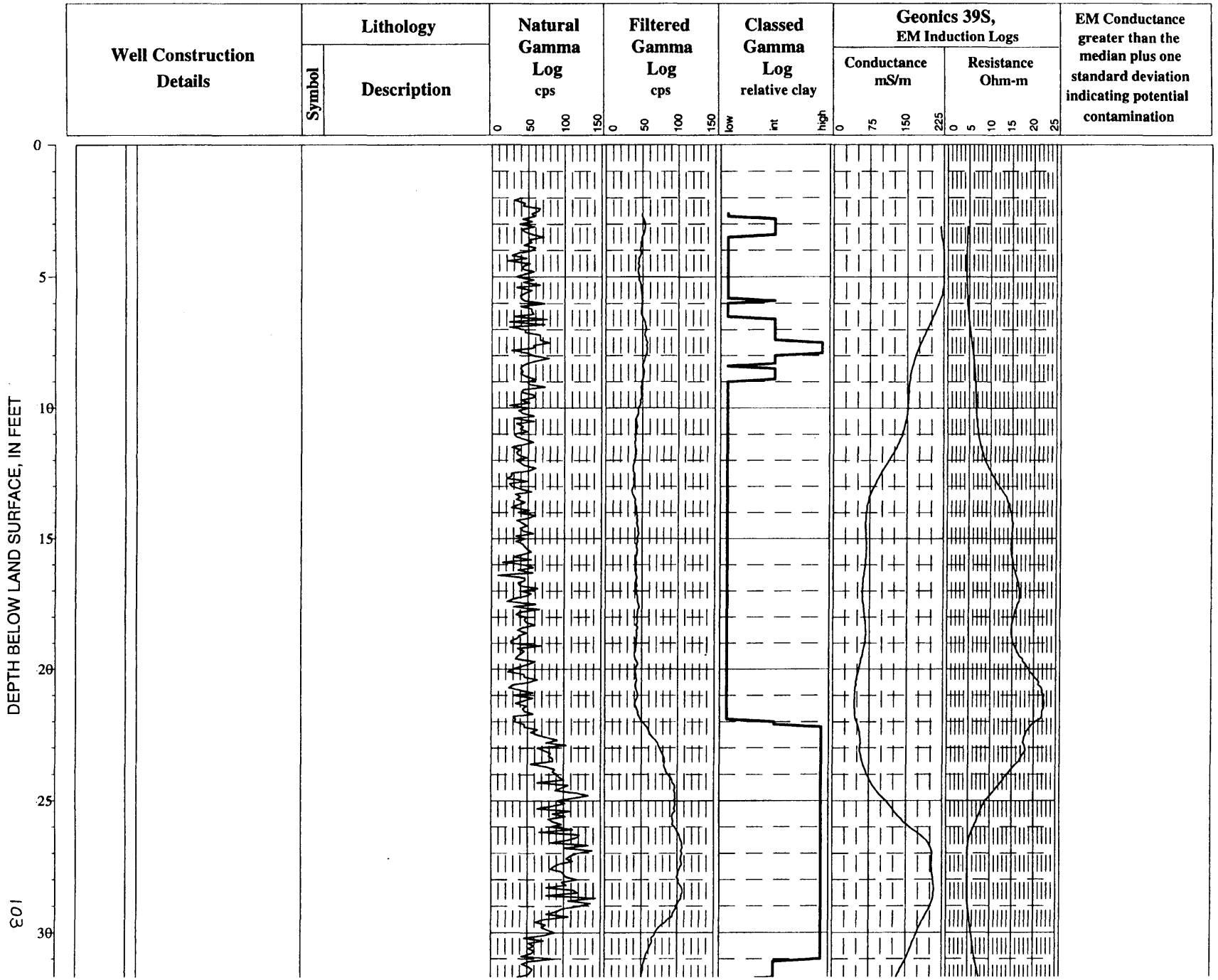
DWP-10-DW5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-50'
Static water level @ 10.98'
8.0" I.D. SCH 40 PVC surface casing to 30'
2" PVC riser pipe
14.0" Borehole
Concrete: 0'-1'
Fill: 1'-14' Fill composed of brown, dark brown, gray, dark gray, sandy to plastic clay mixed with gravel
Fill: 14'-18' Fill with large concrete pieces
Silty sandy gravelly clay: 18'-23' Alternating dark gray to black, loose, muddy gravel and gray to brown, very silty, soft clay with rootlets
Clay: 23'-39' Brown, plastic clay; fracture at 31'-32'
low
int
high

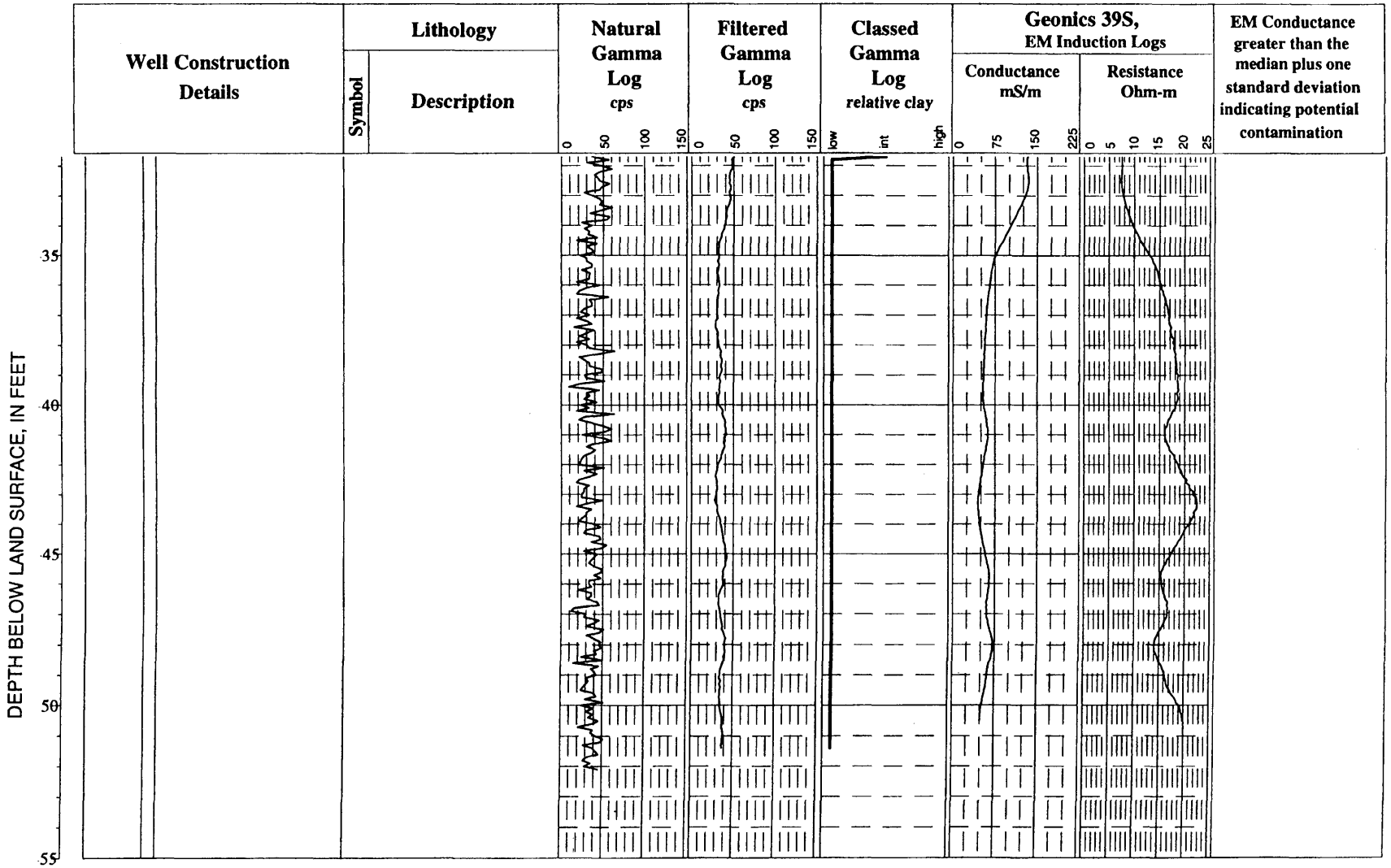
DWP-10-DW5—Continued



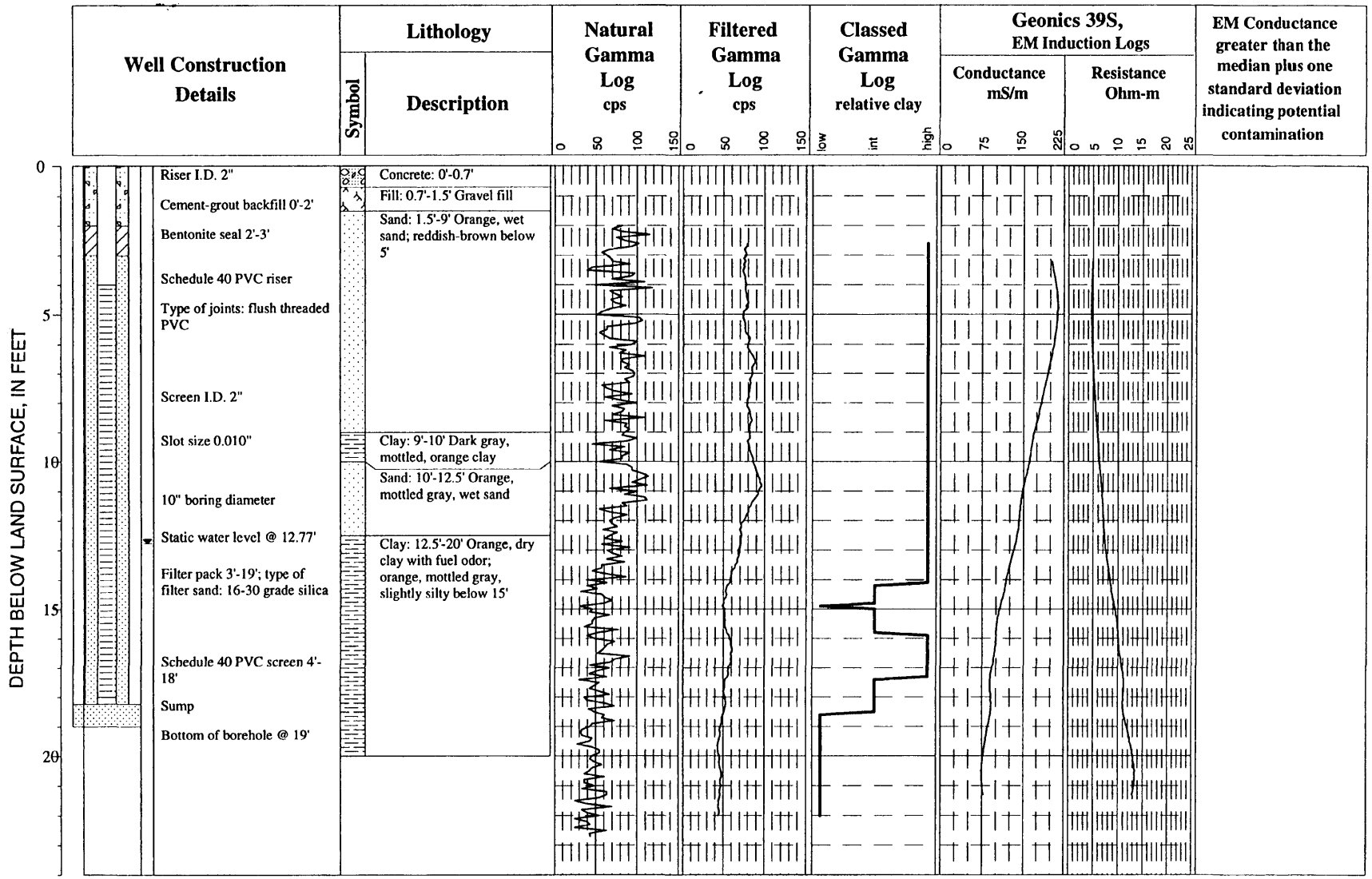
DWP-10-DW6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0 50 100 150
Filtered Gamma Log
cps
0 50 100 150
Classed Gamma Log
relative clay
low int high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0 75 150 225
Resistance
Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
103

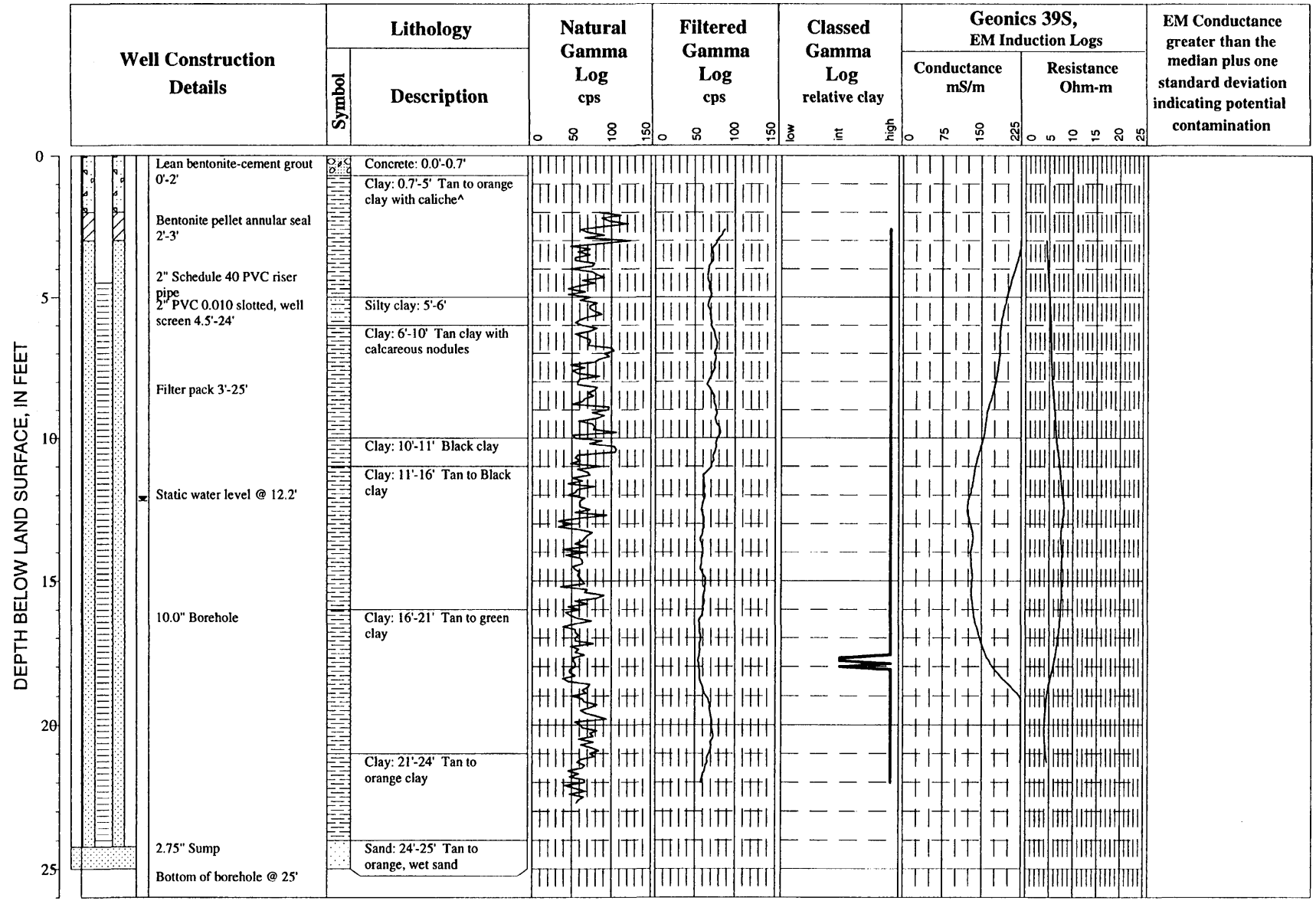
DWP-10-DW6—Continued



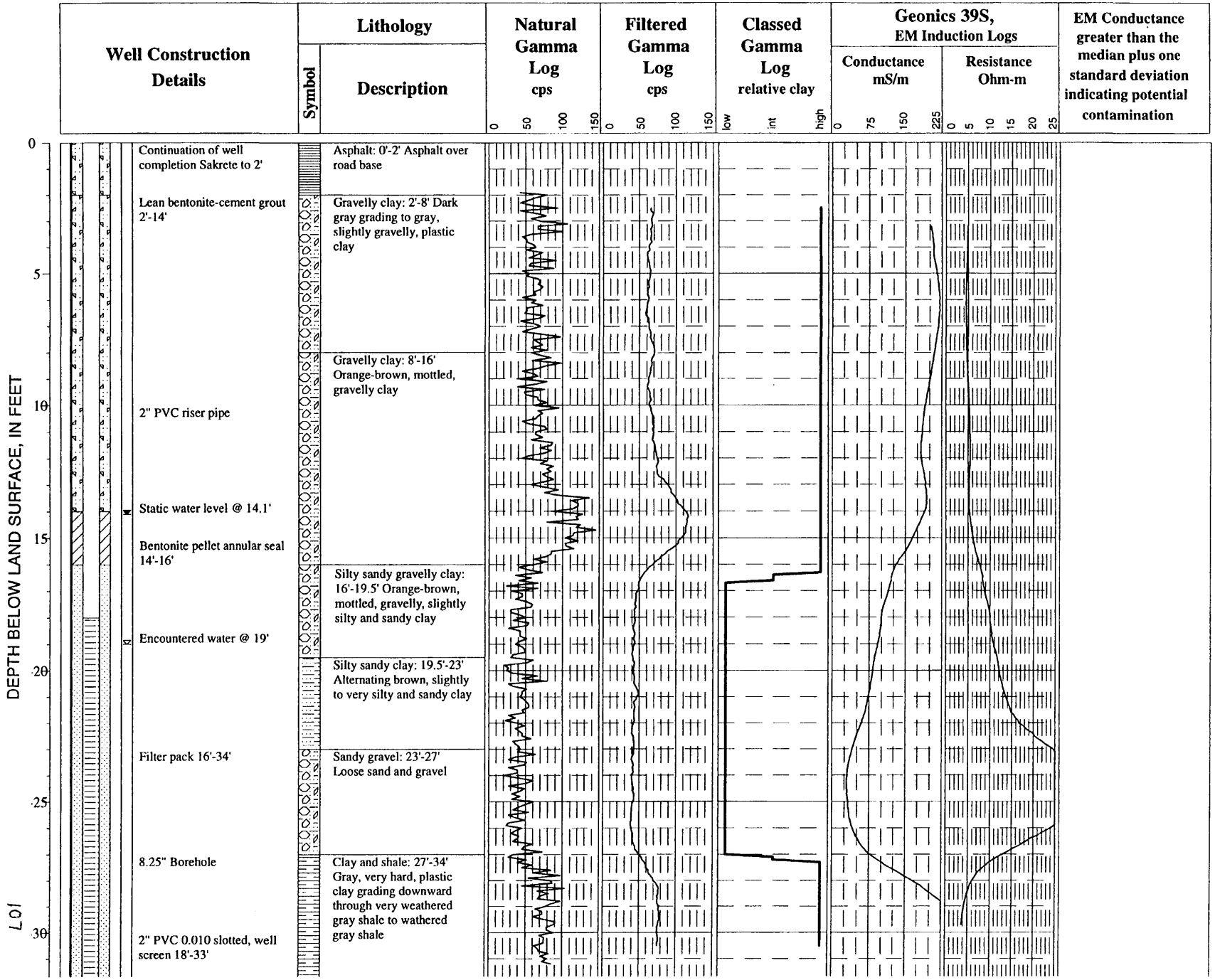
DWP-54-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Riser I.D. 2"
Cement-grout backfill 0'-2'
Bentonite seal 2'-3'
Schedule 40 PVC riser
Type of joints: flush threaded PVC
Screen I.D. 2"
Slot size 0.010"
10" boring diameter
Static water level @ 12.77'
Filter pack 3'-19'; type of filter sand: 16-30 grade silica
Schedule 40 PVC screen 4'-18'
Sump
Bottom of borehole @ 19'
Concrete: 0'-0.7'
Fill: 0.7'-1.5' Gravel fill
Sand: 1.5'-9' Orange, wet sand; reddish-brown below 5'
Clay: 9'-10' Dark gray, mottled, orange clay
Sand: 10'-12.5' Orange, mottled gray, wet sand
Clay: 12.5'-20' Orange, dry clay with fuel odor; orange, mottled gray, slightly silty below 15'

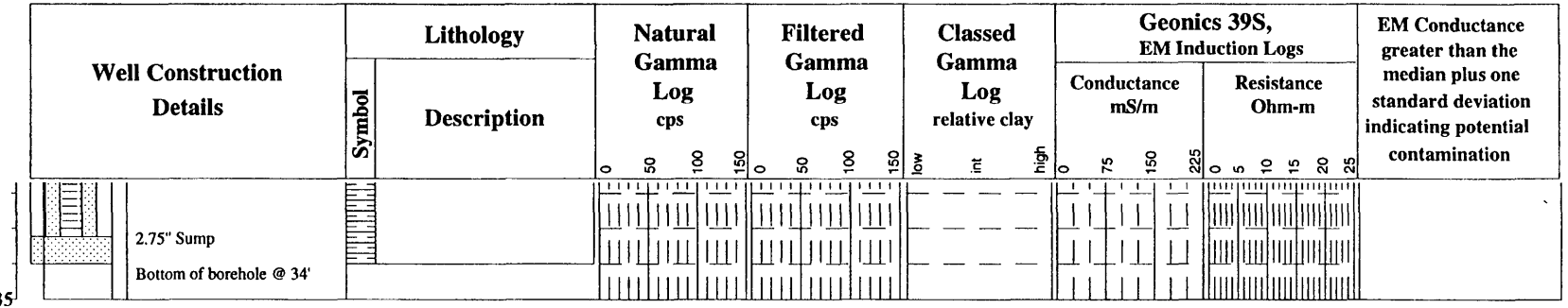
DWP-128-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Lean bentonite-cement grout 0'-2'
Bentonite pellet annular seal 2'-3'
2" Schedule 40 PVC riser pipe
2" PVC 0.010 slotted, well screen 4.5'-24'
Filter pack 3'-25'
Static water level @ 12.2'
10.0" Borehole
2.75" Sump
Bottom of borehole @ 25'
Concrete: 0.0'-0.7'
Clay: 0.7'-5' Tan to orange clay with caliche^
Silty clay: 5'-6'
Clay: 6'-10' Tan clay with calcareous nodules
Clay: 10'-11' Black clay
Clay: 11'-16' Tan to Black clay
Clay: 16'-21' Tan to green clay
Clay: 21'-24' Tan to orange clay
Sand: 24'-25' Tan to orange, wet sand

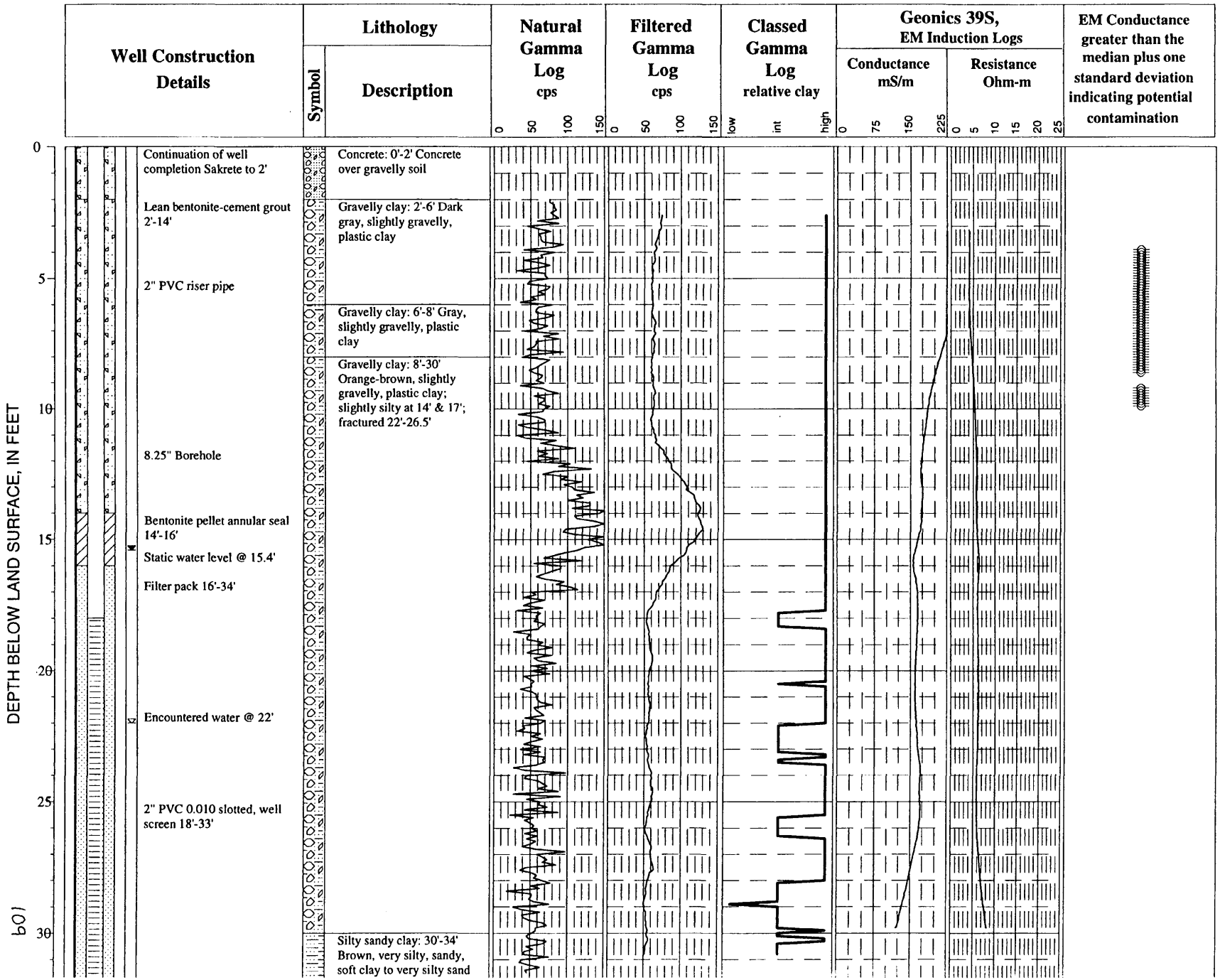
DWP-BG-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
Static water level @ 14.1'
Bentonite pellet annular seal 14'-16'
Encountered water @ 19'
Filter pack 16'-34'
8.25" Borehole
2" PVC 0.010 slotted, well screen 18'-33'
Asphalt: 0'-2' Asphalt over road base
Gravelly clay: 2'-8' Dark gray grading to gray, slightly gravelly, plastic clay
Gravelly clay: 8'-16' Orange-brown, mottled, gravelly clay
Silty sandy gravelly clay: 16'-19.5' Orange-brown, mottled, gravelly, slightly silty and sandy clay
Silty sandy clay: 19.5'-23' Alternating brown, slightly to very silty and sandy clay
Sandy gravel: 23'-27' Loose sand and gravel
Clay and shale: 27'-34' Gray, very hard, plastic clay grading downward through very weathered gray shale to wathered gray shale
low
int
high

DWP-BG-3—Continued



DWP-BG-4

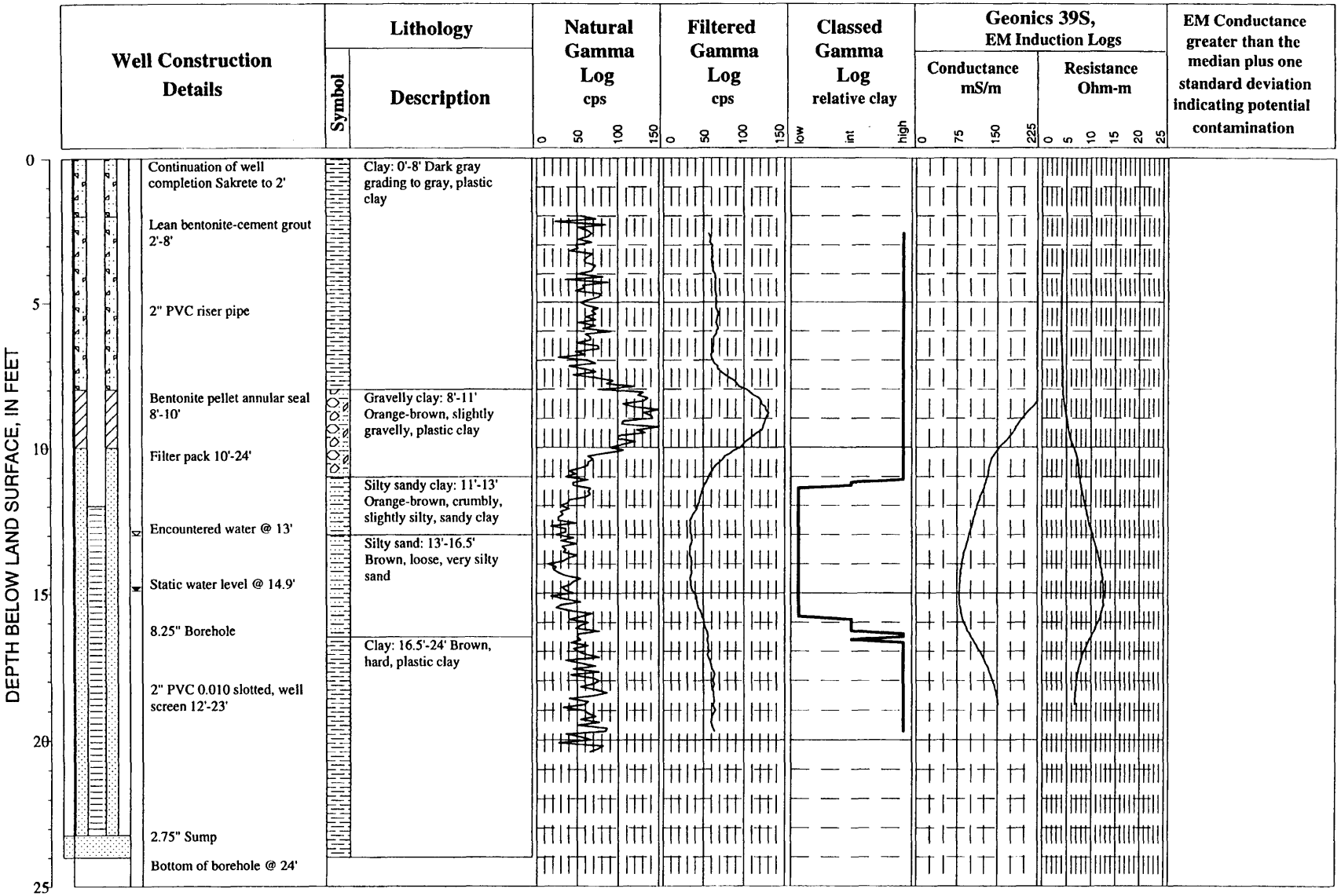

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-16'
Static water level @ 15.4'
Filter pack 16'-34'
Encountered water @ 22'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-2' Concrete over gravelly soil
Gravelly clay: 2'-6' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 6'-8' Gray, slightly gravelly, plastic clay
Gravelly clay: 8'-30' Orange-brown, slightly gravelly, plastic clay; slightly silty at 14' & 17'; fractured 22'-26.5'
Silty sandy clay: 30'-34' Brown, very silty, sandy, soft clay to very silty sand

DWP-BG-4—Continued

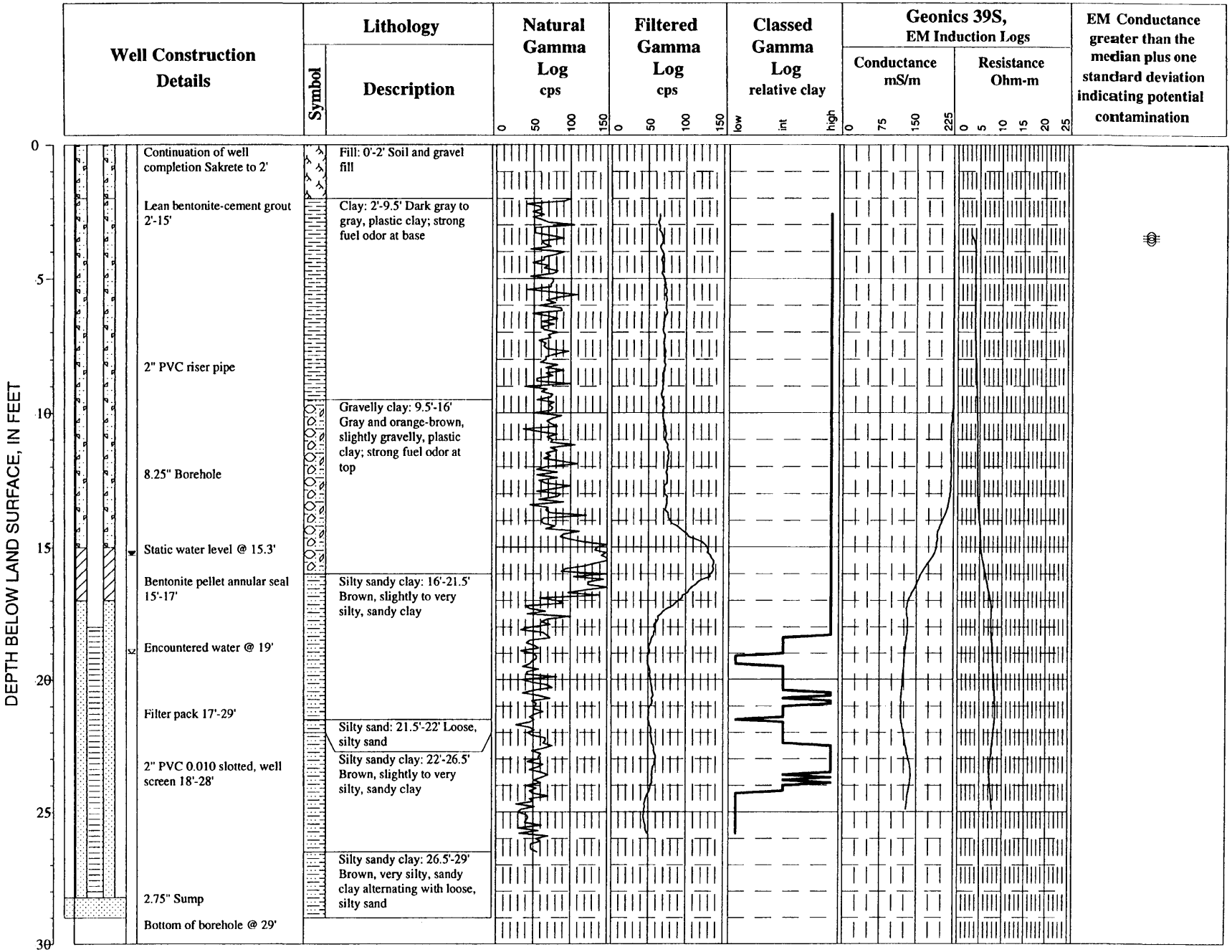
Well Construction Details	Lithology: Symbol	Lithology: Description	Natural Gamma Log cps (0, 50, 100, 150)	Filtered Gamma Log cps (0, 50, 100, 150)	Classed Gamma Log relative clay (low, int, high)	Geonics 39S, EM Induction Logs: Conductance mS/m (0, 75, 150, 225)	Geonics 39S, EM Induction Logs: Resistance Ohm-m (0, 5, 10, 15, 20, 25)	EM Conductance greater than the median plus one standard deviation indicating potential contamination
2.75" Sump Bottom of borehole @ 34'								

35

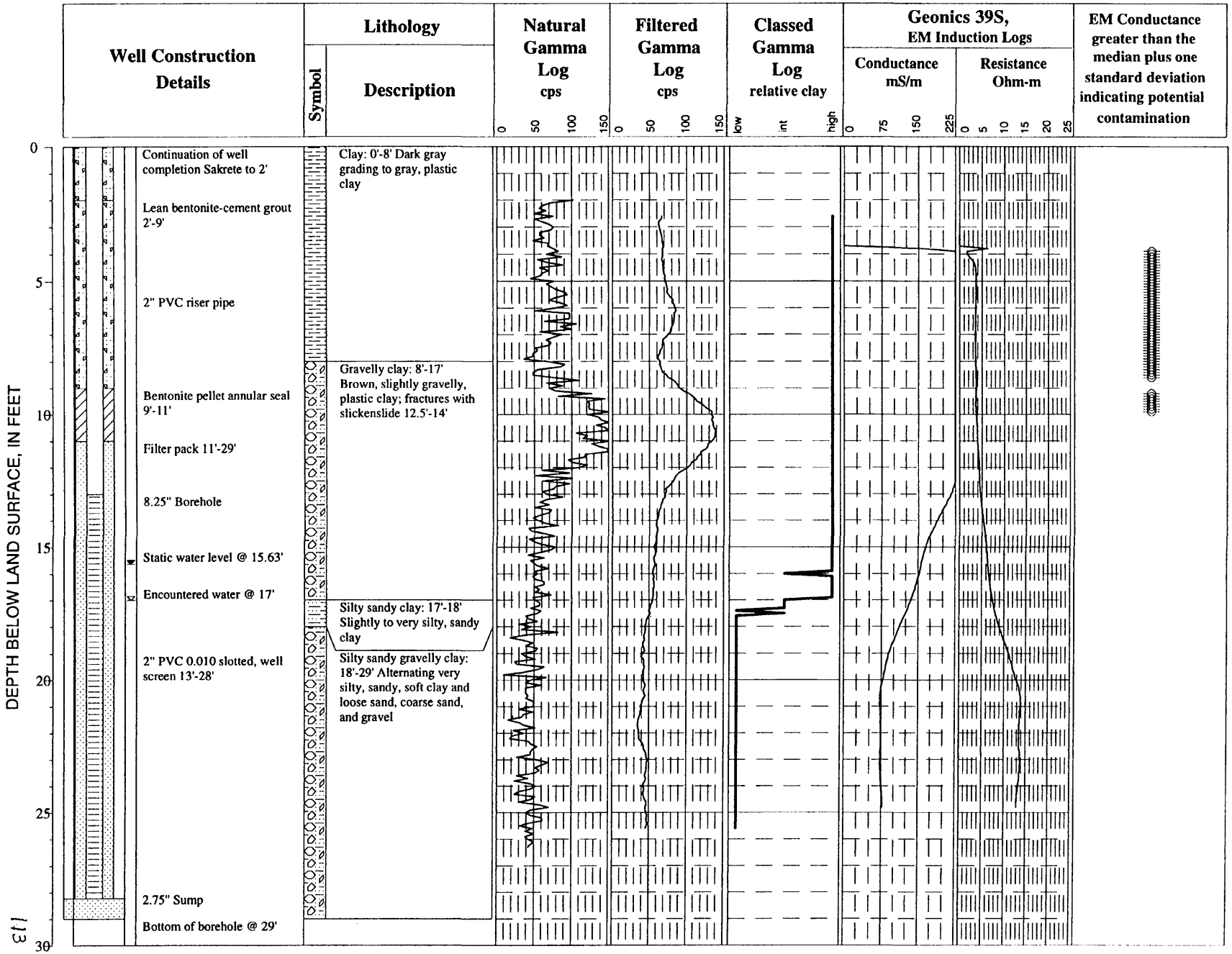
DWP-BG-4-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-8'
2" PVC riser pipe
Bentonite pellet annular seal 8'-10'
Filter pack 10'-24'
Encountered water @ 13'
Static water level @ 14.9'
8.25" Borehole
2" PVC 0.010 slotted, well screen 12'-23'
2.75" Sump
Bottom of borehole @ 24'
Clay: 0'-8' Dark gray grading to gray, plastic clay
Gravelly clay: 8'-11' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 11'-13' Orange-brown, crumbly, slightly silty, sandy clay
Silty sand: 13'-16.5' Brown, loose, very silty sand
Clay: 16.5'-24' Brown, hard, plastic clay

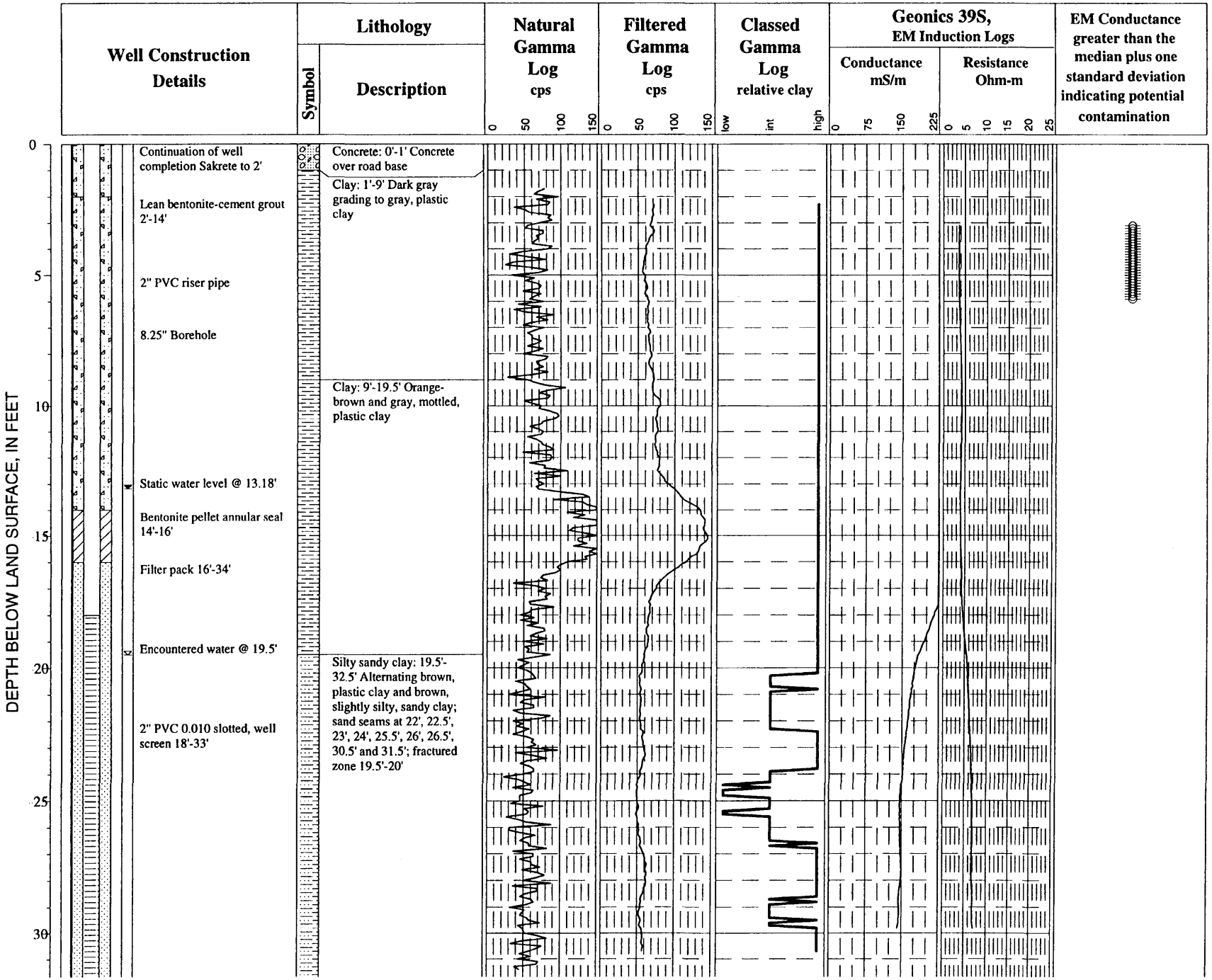
DWP-BG-4-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-15'
2" PVC riser pipe
8.25" Borehole
Static water level @ 15.3'
Bentonite pellet annular seal 15'-17'
Encountered water @ 19'
Filter pack 17'-29'
2" PVC 0.010 slotted, well screen 18'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-2' Soil and gravel fill
Clay: 2'-9.5' Dark gray to gray, plastic clay; strong fuel odor at base
Gravelly clay: 9.5'-16' Gray and orange-brown, slightly gravelly, plastic clay; strong fuel odor at top
Silty sandy clay: 16'-21.5' Brown, slightly to very silty, sandy clay
Silty sand: 21.5'-22' Loose, silty sand
Silty sandy clay: 22'-26.5' Brown, slightly to very silty, sandy clay
Silty sandy clay: 26.5'-29' Brown, very silty, sandy clay alternating with loose, silty sand
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

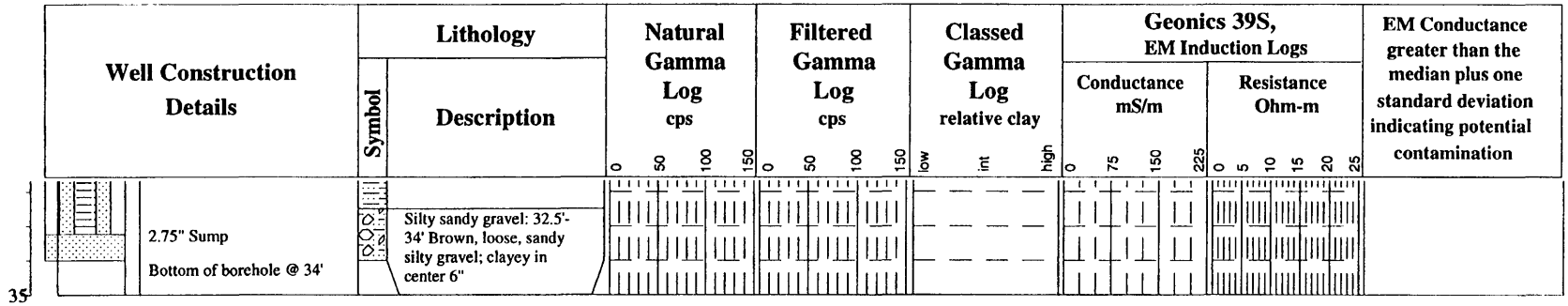
DWP-BG-4-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Static water level @ 15.63'
Encountered water @ 17'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Clay: 0'-8' Dark gray grading to gray, plastic clay
Gravelly clay: 8'-17' Brown, slightly gravelly, plastic clay; fractures with slickenslide 12.5'-14'
Silty sandy clay: 17'-18' Slightly to very silty, sandy clay
Silty sandy gravelly clay: 18'-29' Alternating very silty, sandy, soft clay and loose sand, coarse sand, and gravel
low
int
high

DWP-BG-4-5

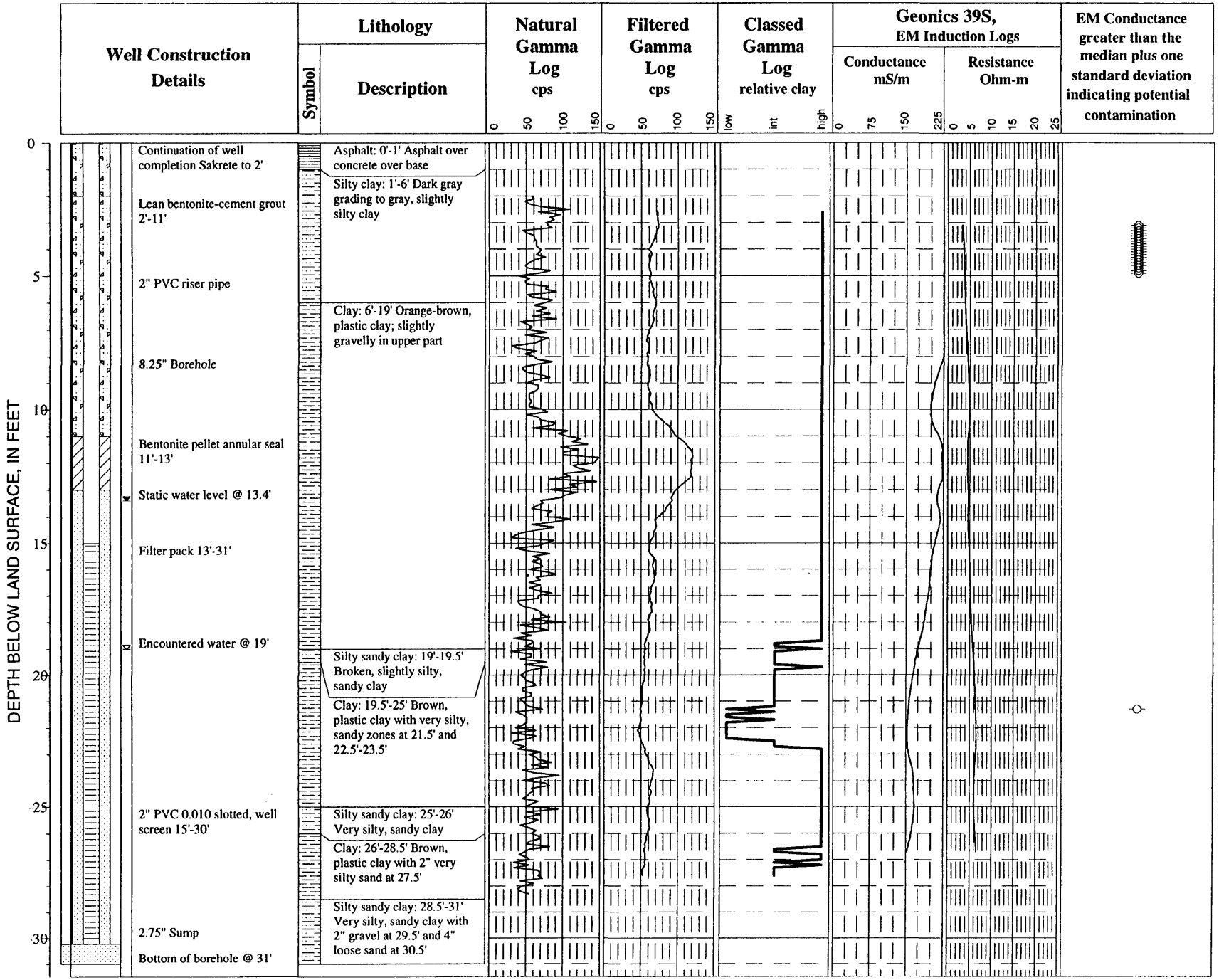

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Static water level @ 13.18'
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Encountered water @ 19.5'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-1' Concrete over road base
Clay: 1'-9' Dark gray grading to gray, plastic clay
Clay: 9'-19.5' Orange-brown and gray, mottled, plastic clay
Silty sandy clay: 19.5'-32.5' Alternating brown, plastic clay and brown, slightly silty, sandy clay; sand seams at 22', 22.5', 23', 24', 25.5', 26', 26.5', 30.5' and 31.5'; fractured zone 19.5'-20'

DWP-BG-4-5—Continued

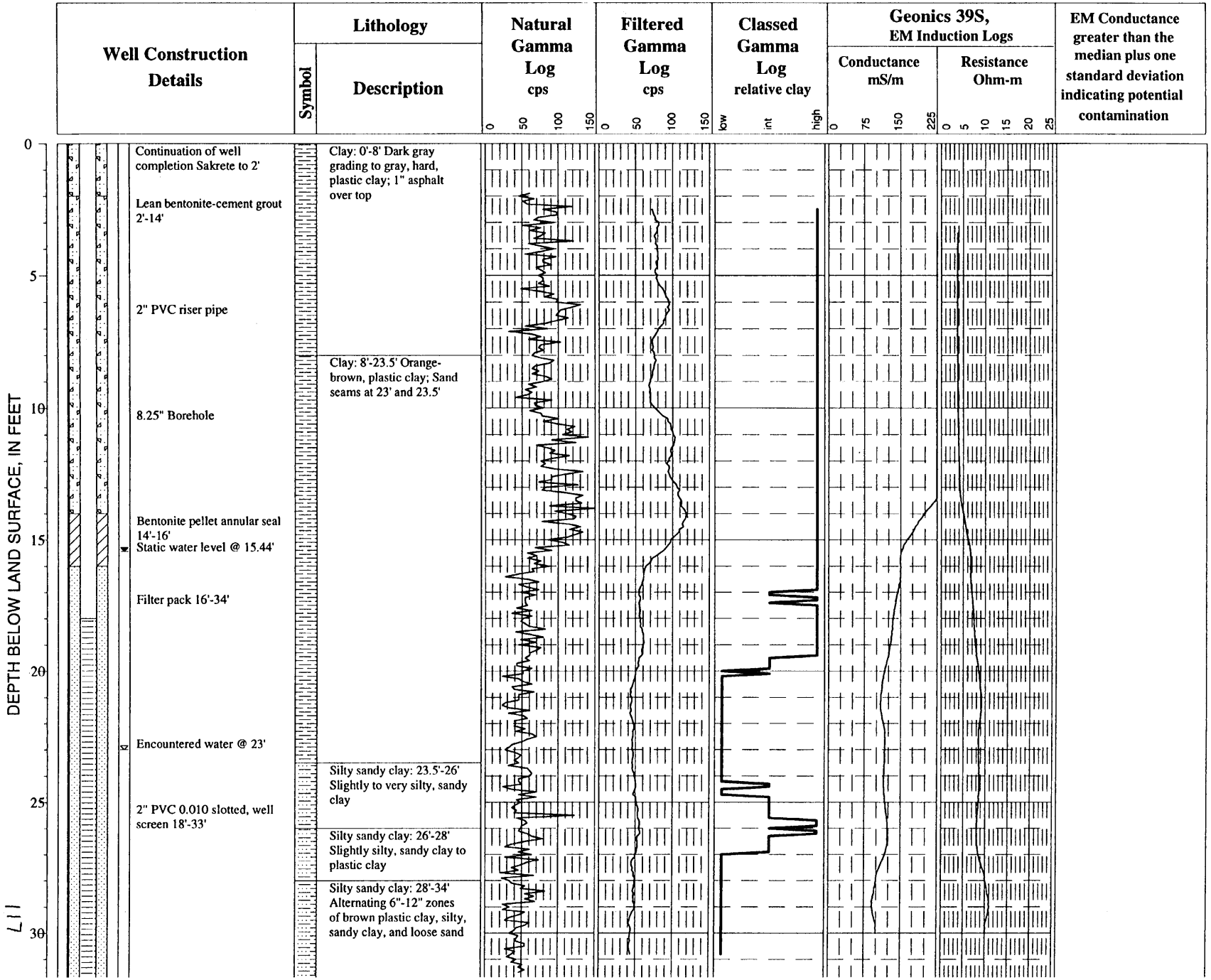


911

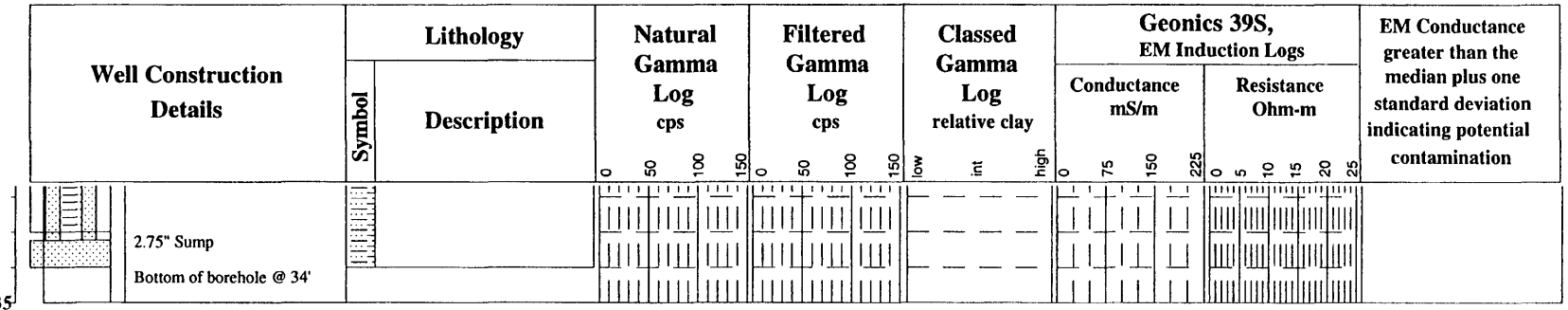
DWP-BG-4-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 11'-13'
Static water level @ 13.4'
Filter pack 13'-31'
Encountered water @ 19'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Asphalt: 0'-1' Asphalt over concrete over base
Silty clay: 1'-6' Dark gray grading to gray, slightly silty clay
Clay: 6'-19' Orange-brown, plastic clay; slightly gravelly in upper part
Silty sandy clay: 19'-19.5' Broken, slightly silty, sandy clay
Clay: 19.5'-25' Brown, plastic clay with very silty, sandy zones at 21.5' and 22.5'-23.5'
Silty sandy clay: 25'-26' Very silty, sandy clay
Clay: 26'-28.5' Brown, plastic clay with 2" very silty sand at 27.5'
Silty sandy clay: 28.5'-31' Very silty, sandy clay with 2" gravel at 29.5' and 4" loose sand at 30.5'

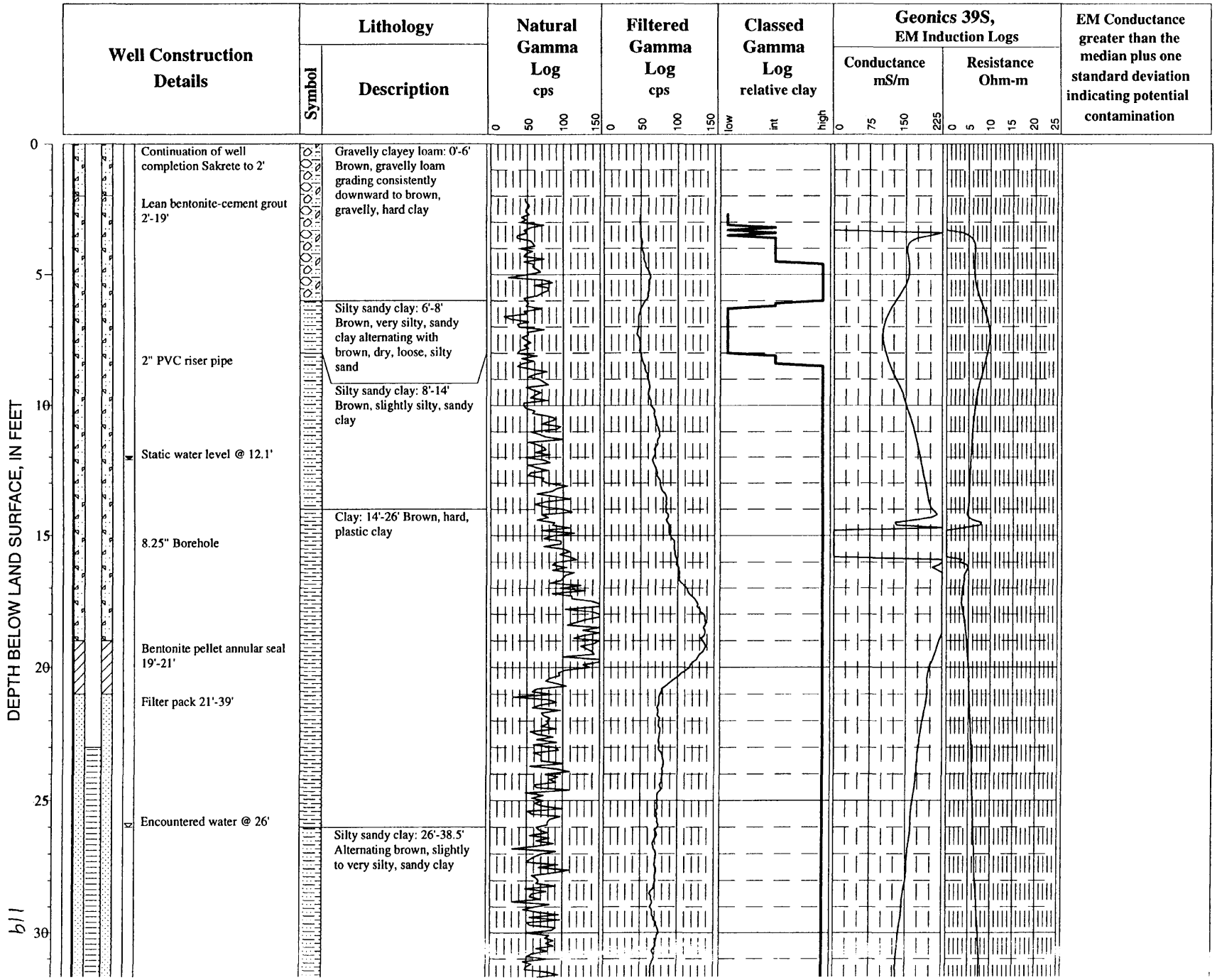
DWP-BG-4-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-16'
Static water level @ 15.44'
Filter pack 16'-34'
Encountered water @ 23'
2" PVC 0.010 slotted, well screen 18'-33'
Clay: 0'-8' Dark gray grading to gray, hard, plastic clay; 1" asphalt over top
Clay: 8'-23.5' Orange-brown, plastic clay; Sand seams at 23' and 23.5'
Silty sandy clay: 23.5'-26' Slightly to very silty, sandy clay
Silty sandy clay: 26'-28' Slightly silty, sandy clay to plastic clay
Silty sandy clay: 28'-34' Alternating 6"-12" zones of brown plastic clay, silty, sandy clay, and loose sand
LII

DWP-BG-4-7—Continued

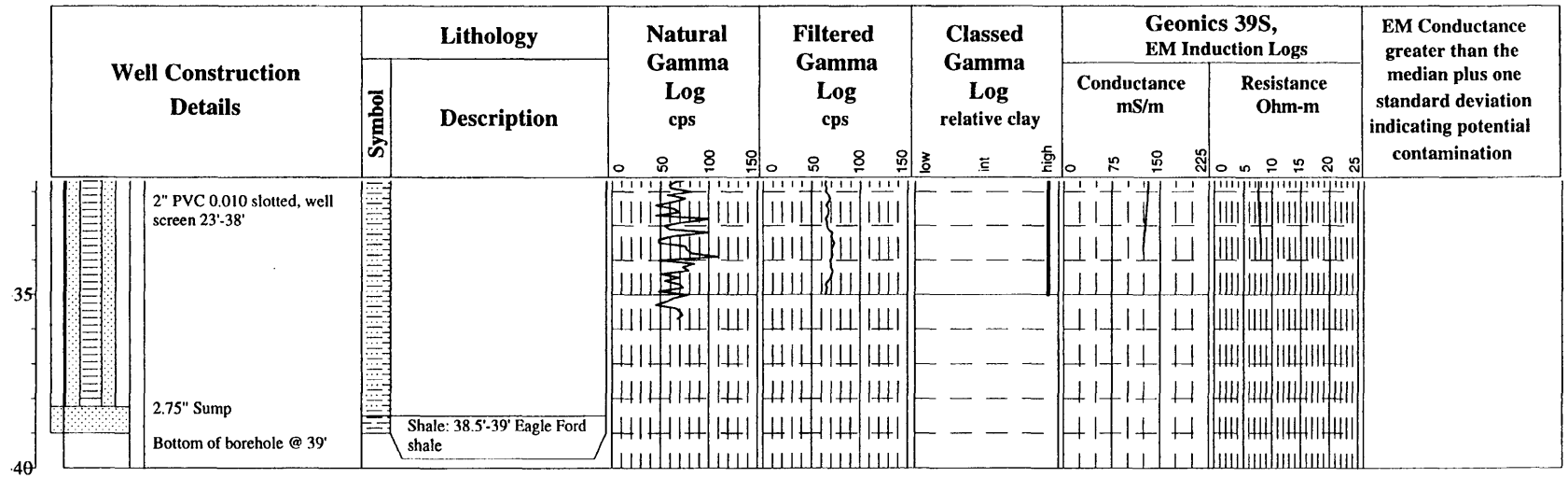


DWP-BG-6

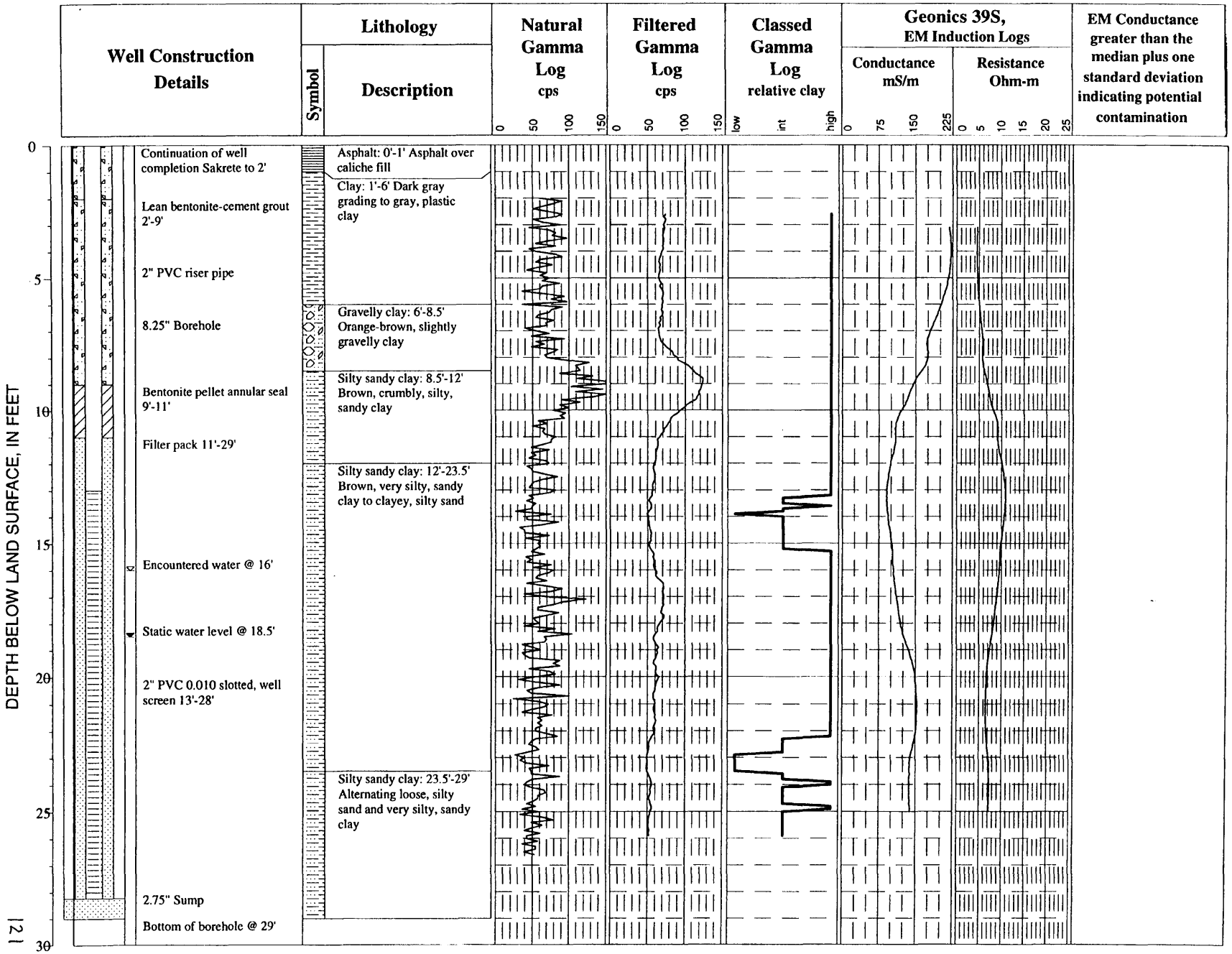

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-19'
2" PVC riser pipe
Static water level @ 12.1'
8.25" Borehole
Bentonite pellet annular seal 19'-21'
Filter pack 21'-39'
Encountered water @ 26'
Gravelly clayey loam: 0'-6' Brown, gravelly loam grading consistently downward to brown, gravelly, hard clay
Silty sandy clay: 6'-8' Brown, very silty, sandy clay alternating with brown, dry, loose, silty sand
Silty sandy clay: 8'-14' Brown, slightly silty, sandy clay
Clay: 14'-26' Brown, hard, plastic clay
Silty sandy clay: 26'-38.5' Alternating brown, slightly to very silty, sandy clay
low
int
high

b11

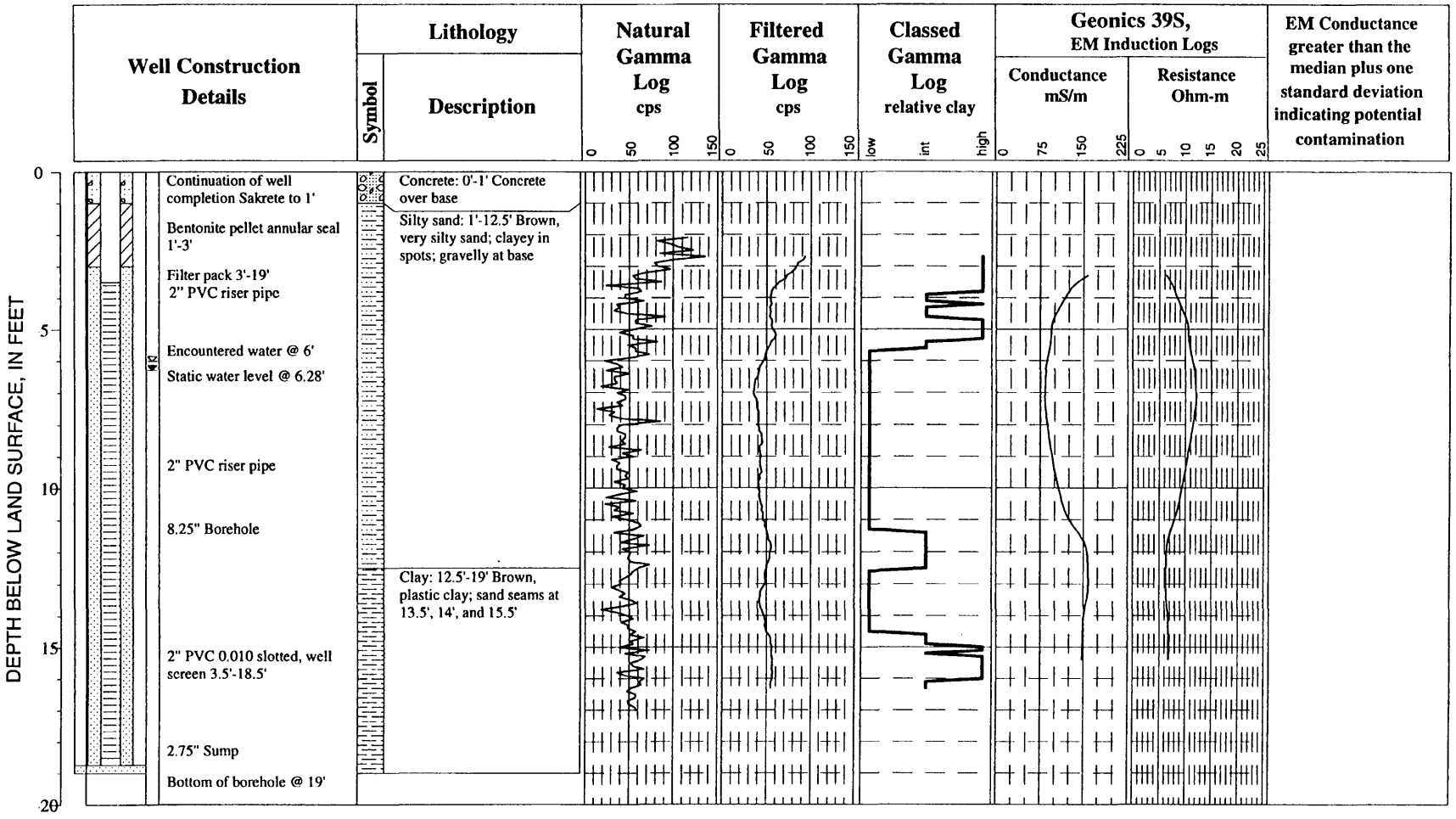
DWP-BG-6—Continued



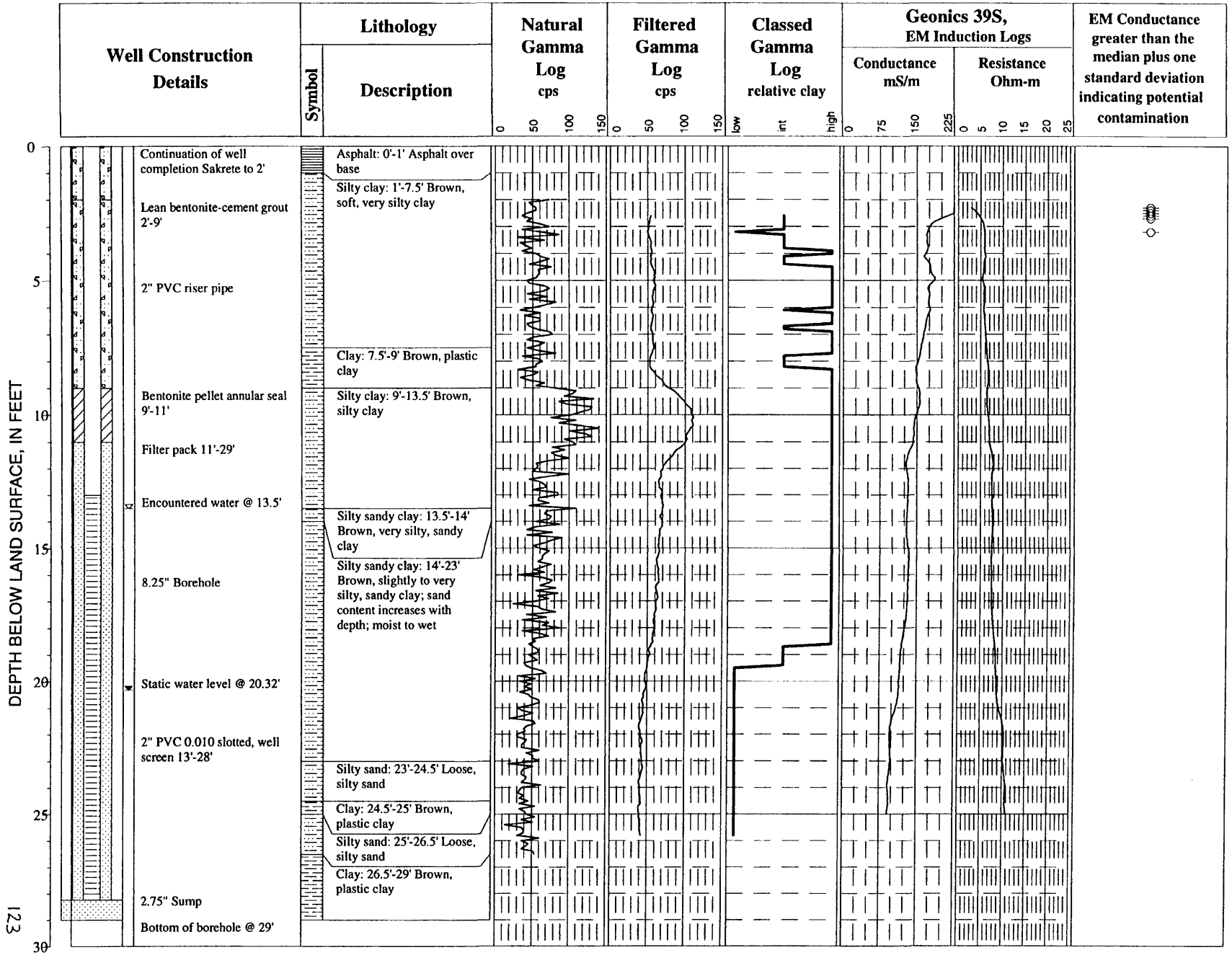
DWP-BG-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 16'
Static water level @ 18.5'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over caliche fill
Clay: 1'-6' Dark gray grading to gray, plastic clay
Gravelly clay: 6'-8.5' Orange-brown, slightly gravelly clay
Silty sandy clay: 8.5'-12' Brown, crumbly, silty, sandy clay
Silty sandy clay: 12'-23.5' Brown, very silty, sandy clay to clayey, silty sand
Silty sandy clay: 23.5'-29' Alternating loose, silty sand and very silty, sandy clay

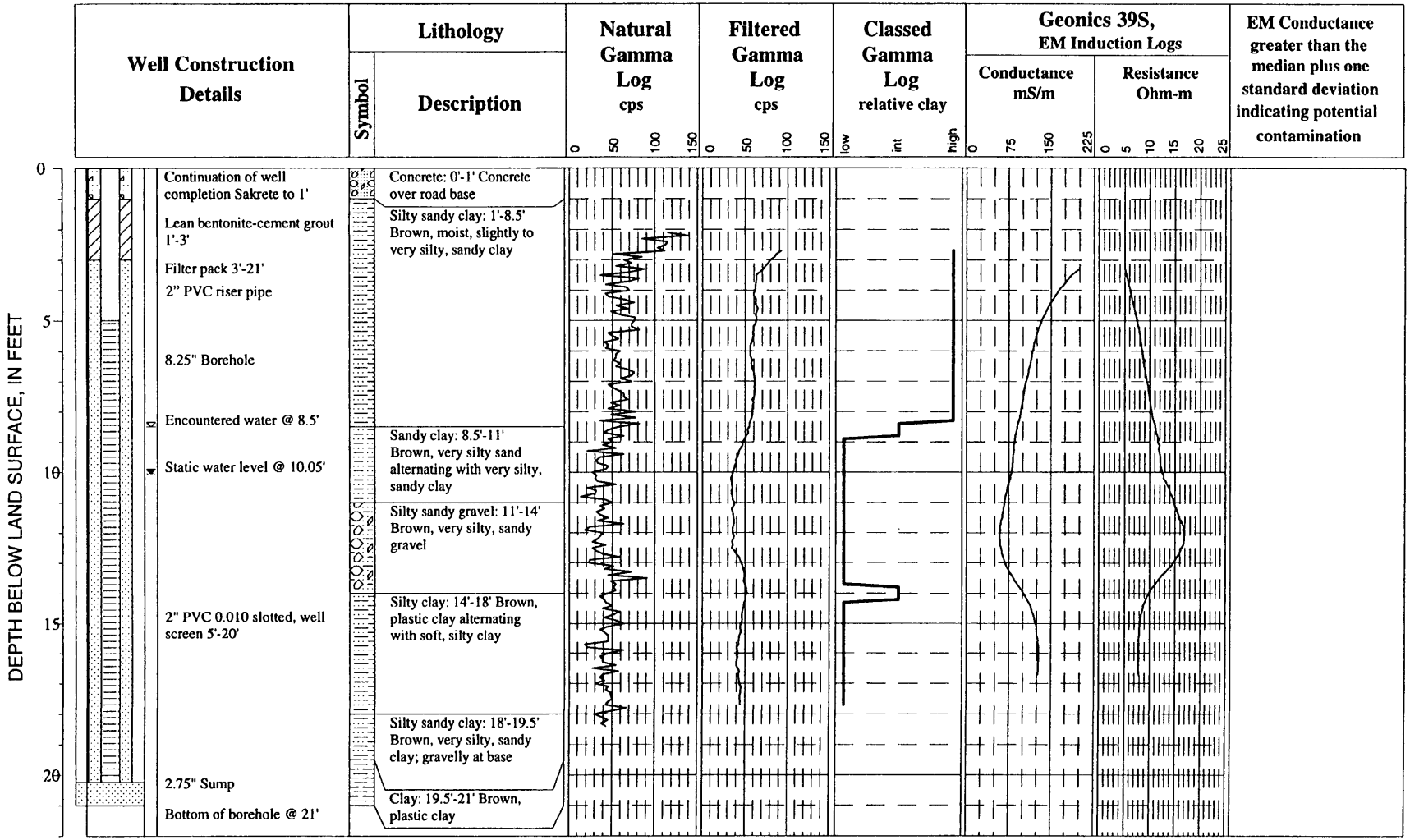
DWP-BG-8


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0
50
100
150
low
int
high
75
225
5
10
15
20
25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
Continuation of well completion Sakrete to 1'
Bentonite pellet annular seal 1'-3'
Filter pack 3'-19'
2" PVC riser pipe
Encountered water @ 6'
Static water level @ 6.28'
2" PVC riser pipe
8.25" Borehole
2" PVC 0.010 slotted, well screen 3.5'-18.5'
2.75" Sump
Bottom of borehole @ 19'
Concrete: 0'-1' Concrete over base
Silty sand: 1'-12.5' Brown, very silty sand; clayey in spots; gravelly at base
Clay: 12.5'-19' Brown, plastic clay; sand seams at 13.5', 14', and 15.5'

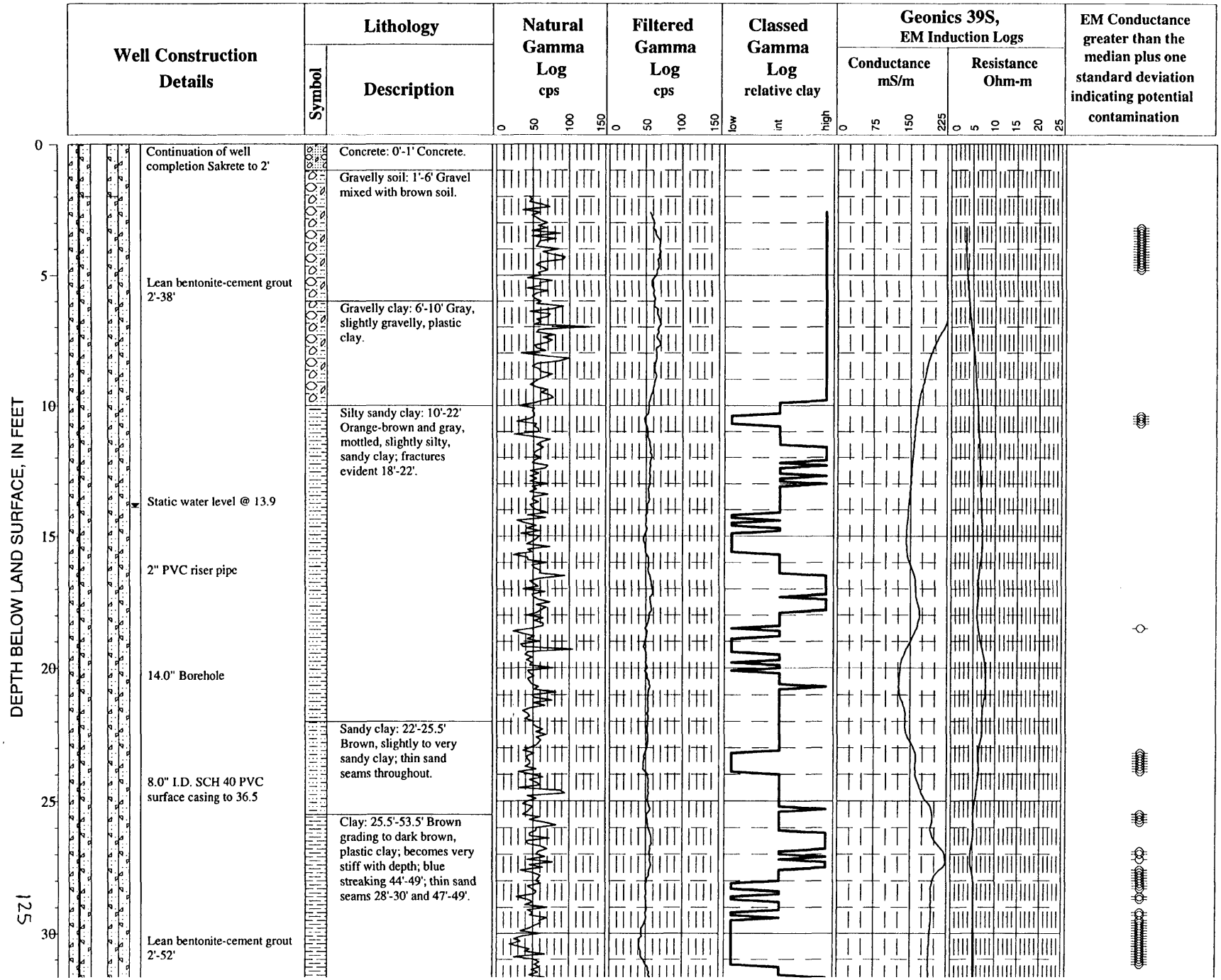
DWP-BG-9


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 13.5'
8.25" Borehole
Static water level @ 20.32'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over base
Silty clay: 1'-7.5' Brown, soft, very silty clay
Clay: 7.5'-9' Brown, plastic clay
Silty clay: 9'-13.5' Brown, silty clay
Silty sandy clay: 13.5'-14' Brown, very silty, sandy clay
Silty sandy clay: 14'-23' Brown, slightly to very silty, sandy clay; sand content increases with depth; moist to wet
Silty sand: 23'-24.5' Loose, silty sand
Clay: 24.5'-25' Brown, plastic clay
Silty sand: 25'-26.5' Loose, silty sand
Clay: 26.5'-29' Brown, plastic clay

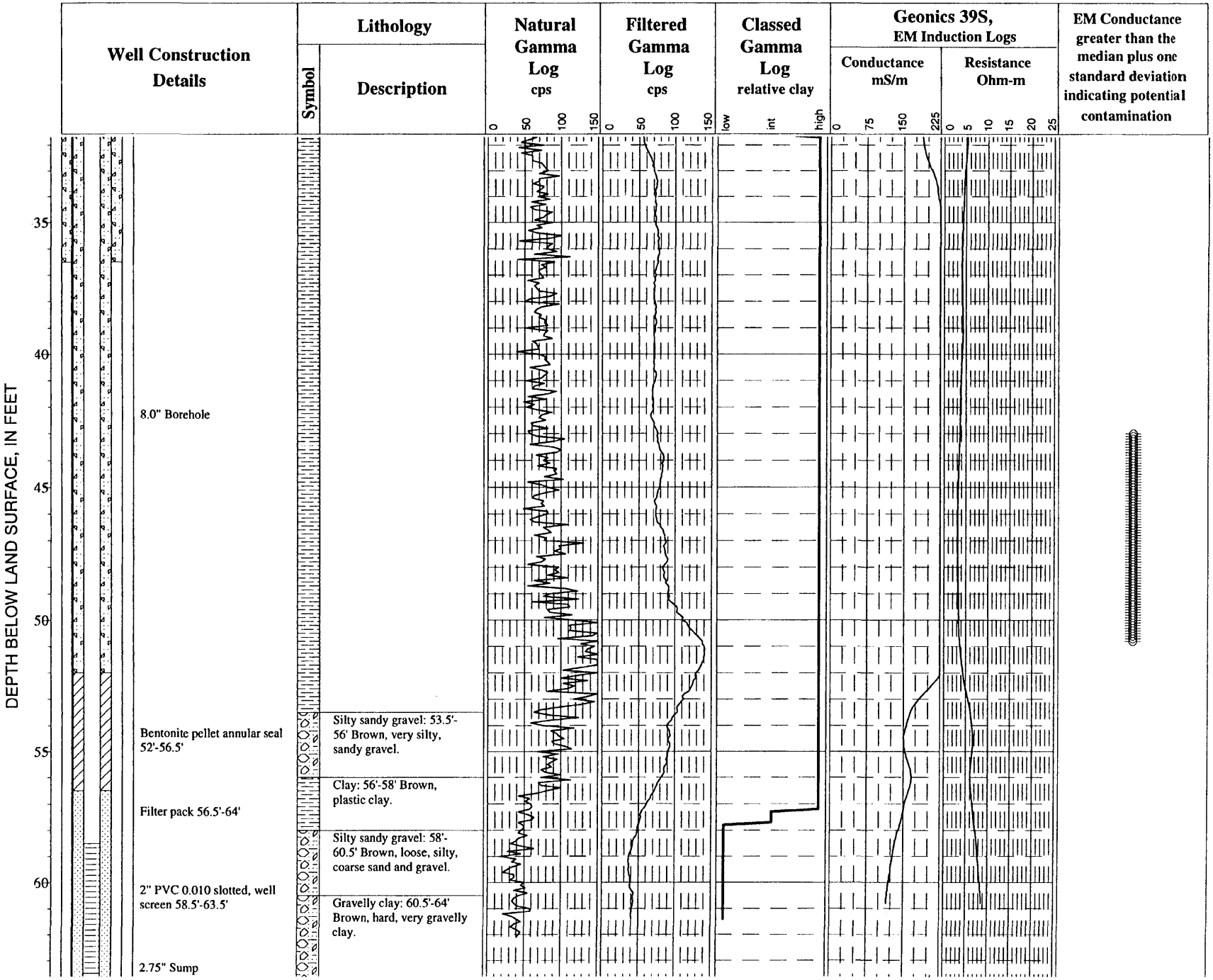
DWP-BG-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 1'
Lean bentonite-cement grout 1'-3'
Filter pack 3'-21'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 8.5'
Static water level @ 10.05'
2" PVC 0.010 slotted, well screen 5'-20'
2.75" Sump
Bottom of borehole @ 21'
Concrete: 0'-1' Concrete over road base
Silty sandy clay: 1'-8.5' Brown, moist, slightly to very silty, sandy clay
Sandy clay: 8.5'-11' Brown, very silty sand alternating with very silty, sandy clay
Silty sandy gravel: 11'-14' Brown, very silty, sandy gravel
Silty clay: 14'-18' Brown, plastic clay alternating with soft, silty clay
Silty sandy clay: 18'-19.5' Brown, very silty, sandy clay; gravelly at base
Clay: 19.5'-21' Brown, plastic clay

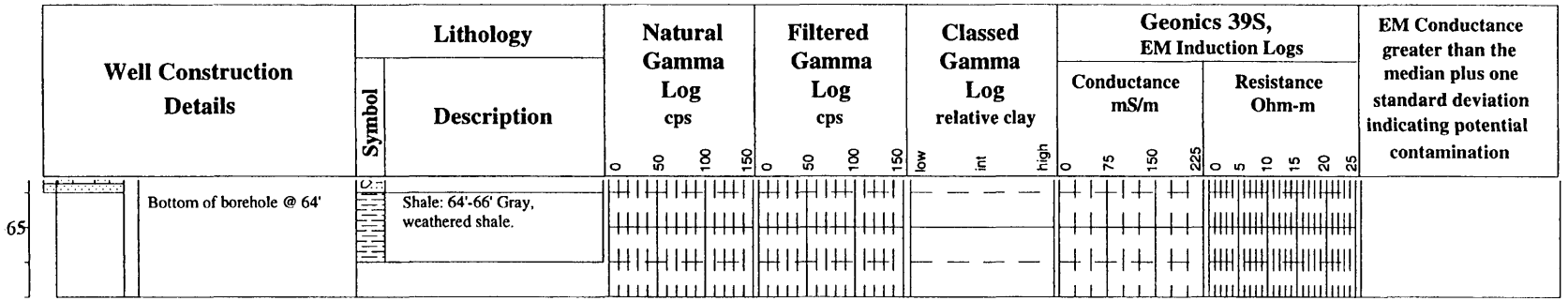
DWP-DBG-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-38'
Static water level @ 13.9
2" PVC riser pipe
14.0" Borehole
8.0" I.D. SCH 40 PVC surface casing to 36.5
Lean bentonite-cement grout 2'-52'
Concrete: 0'-1' Concrete.
Gravelly soil: 1'-6' Gravel mixed with brown soil.
Gravelly clay: 6'-10' Gray, slightly gravelly, plastic clay.
Silty sandy clay: 10'-22' Orange-brown and gray, mottled, slightly silty, sandy clay; fractures evident 18'-22'.
Sandy clay: 22'-25.5' Brown, slightly to very sandy clay; thin sand seams throughout.
Clay: 25.5'-53.5' Brown grading to dark brown, plastic clay; becomes very stiff with depth; blue streaking 44'-49'; thin sand seams 28'-30' and 47'-49'.

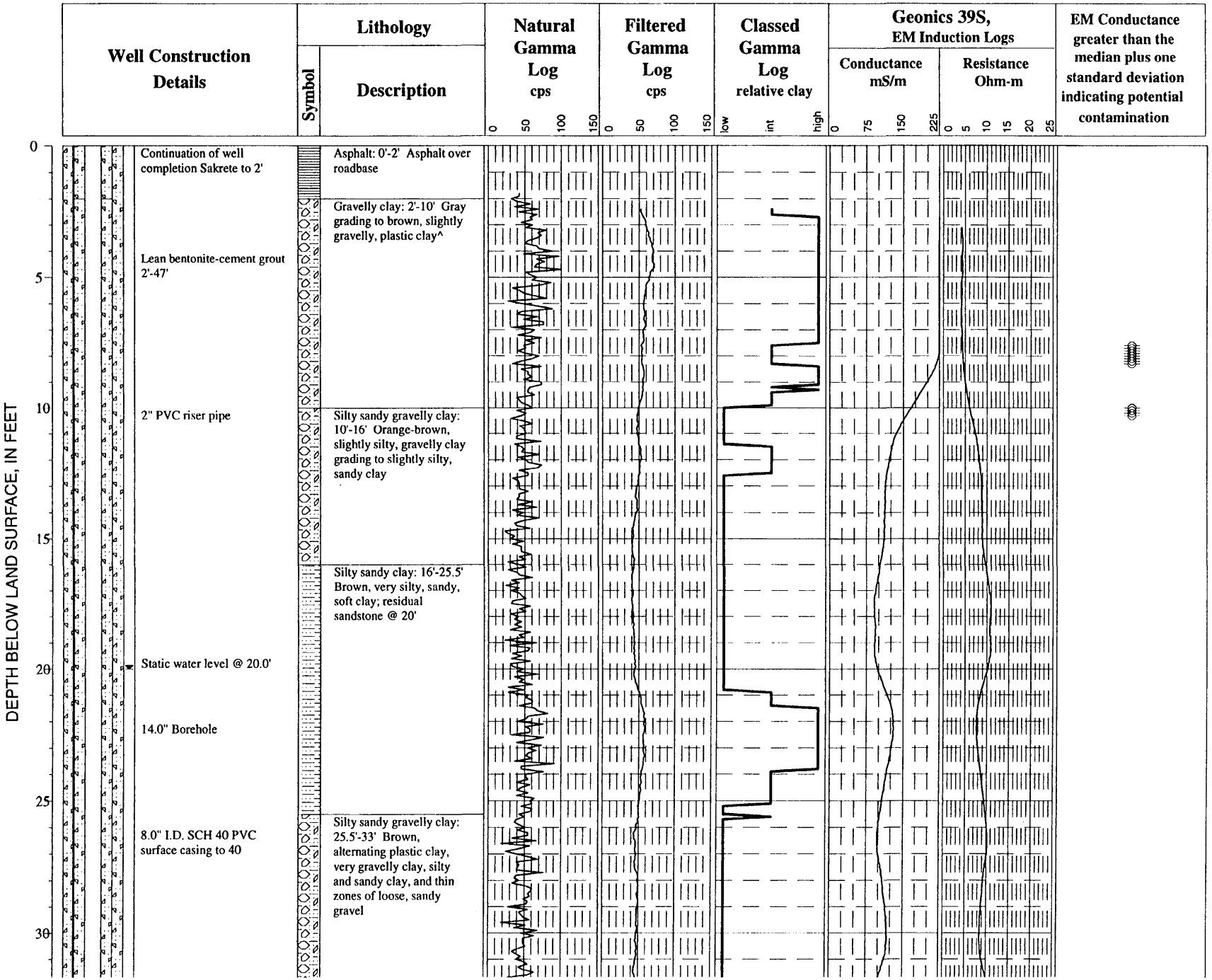
DWP-DBG-1—Continued



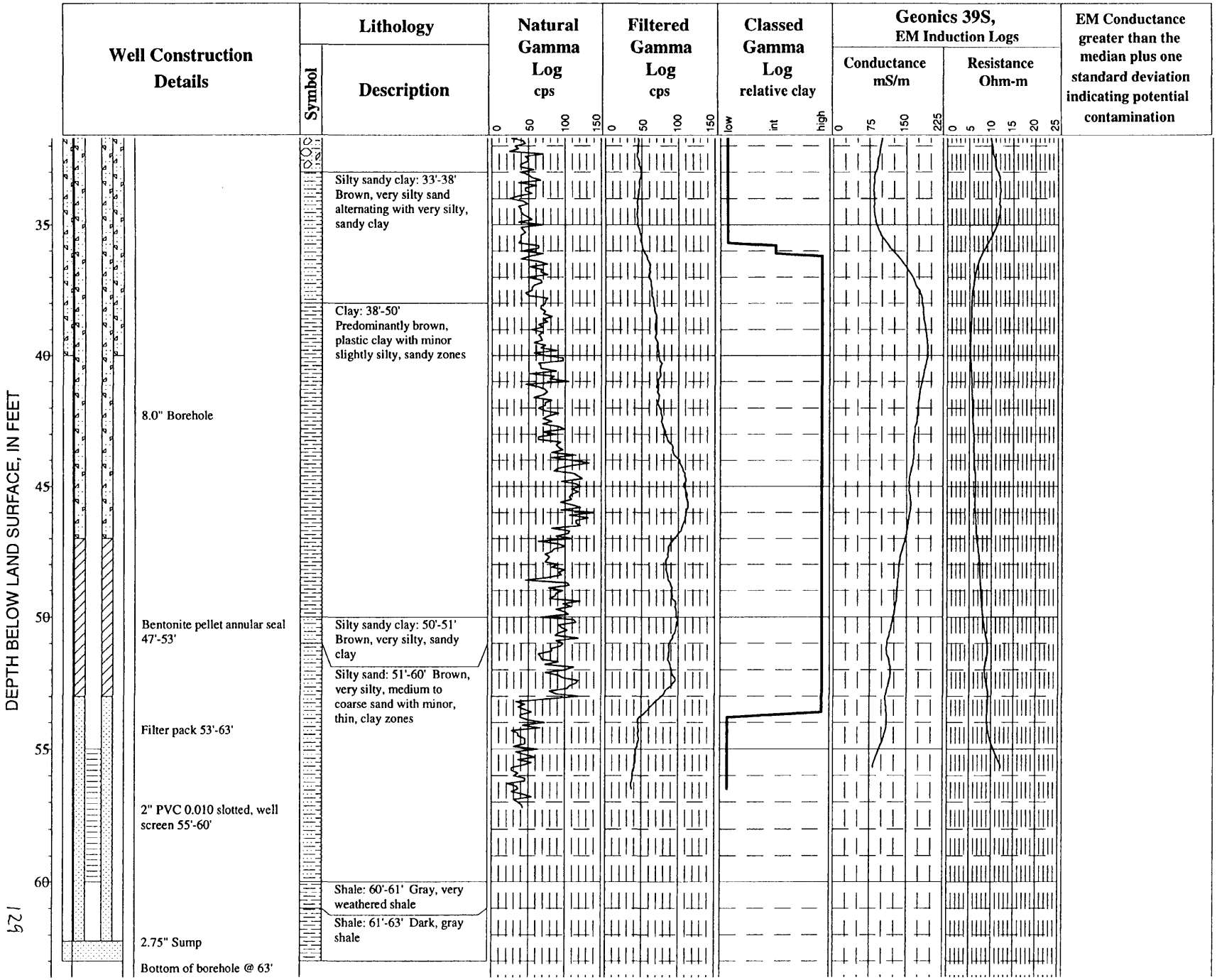
DWP-DBG-1—Continued



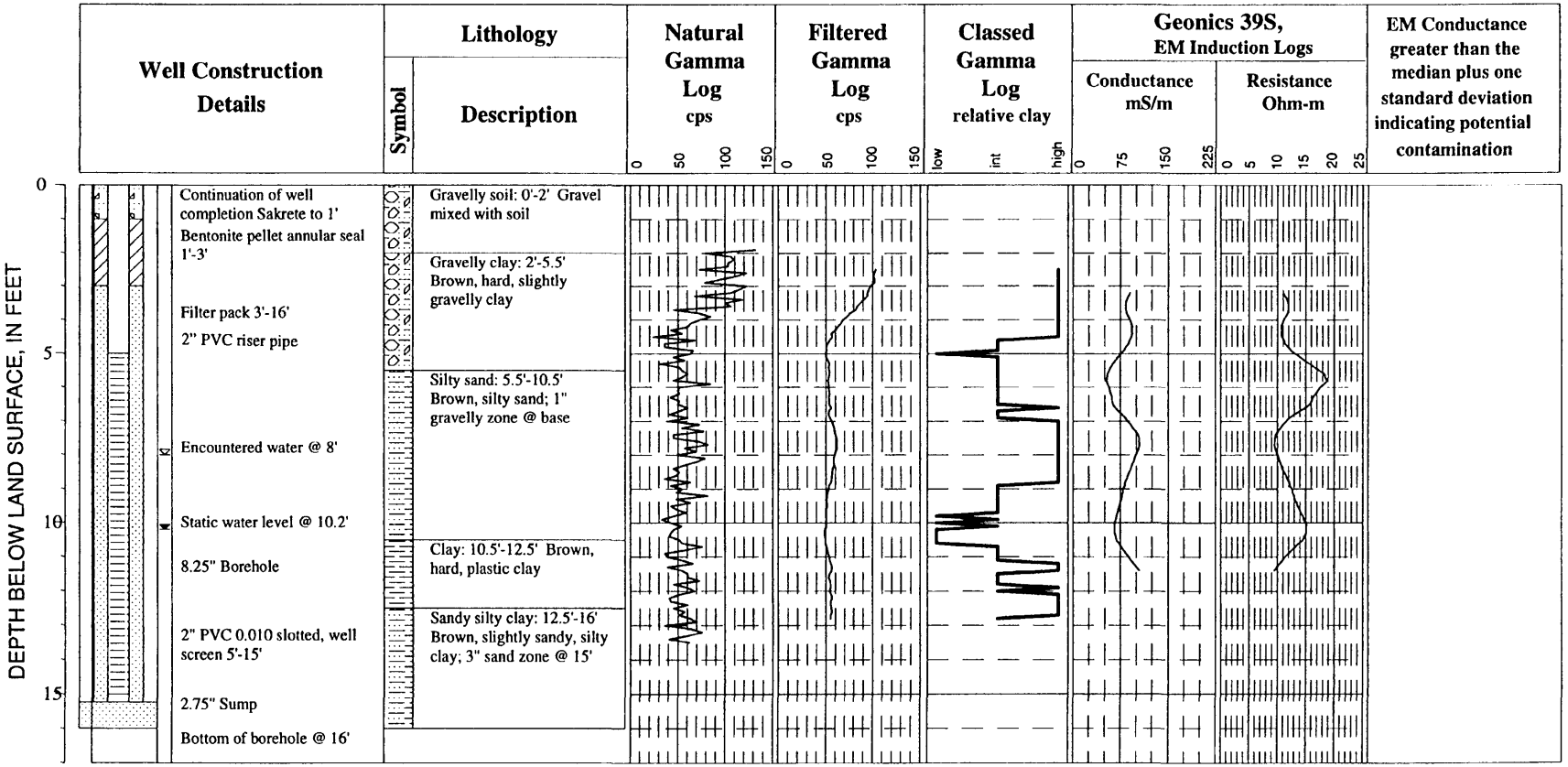
DWP-DBG-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-47'
2" PVC riser pipe
Static water level @ 20.0'
14.0" Borehole
8.0" I.D. SCH 40 PVC surface casing to 40
Asphalt: 0'-2' Asphalt over roadbase
Gravelly clay: 2'-10' Gray grading to brown, slightly gravelly, plastic clay^
Silty sandy gravelly clay: 10'-16' Orange-brown, slightly silty, gravelly clay grading to slightly silty, sandy clay
Silty sandy clay: 16'-25.5' Brown, very silty, sandy, soft clay; residual sandstone @ 20'
Silty sandy gravelly clay: 25.5'-33' Brown, alternating plastic clay, very gravelly clay, silty and sandy clay, and thin zones of loose, sandy gravel

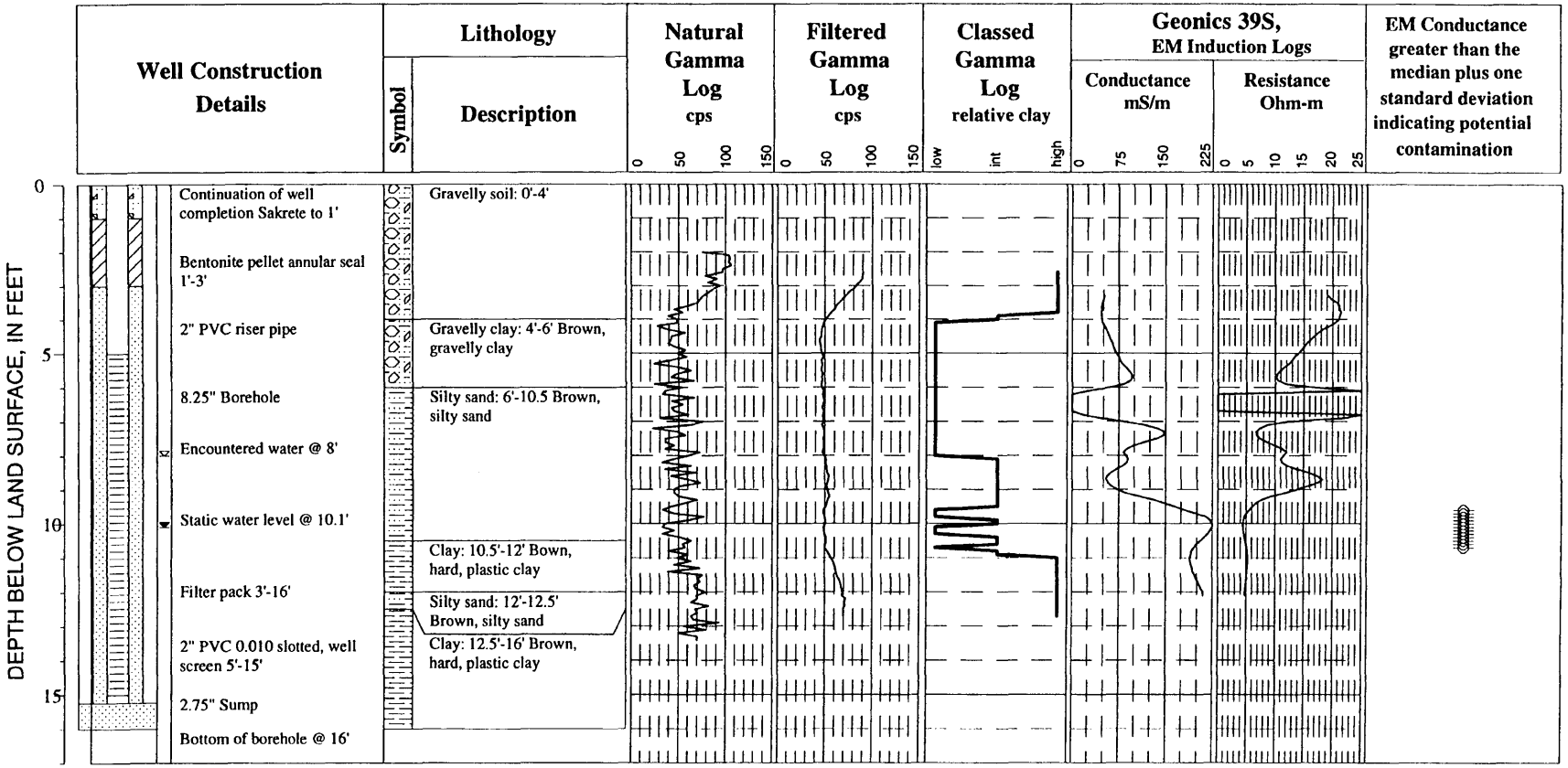
DWP-DBG-2—Continued



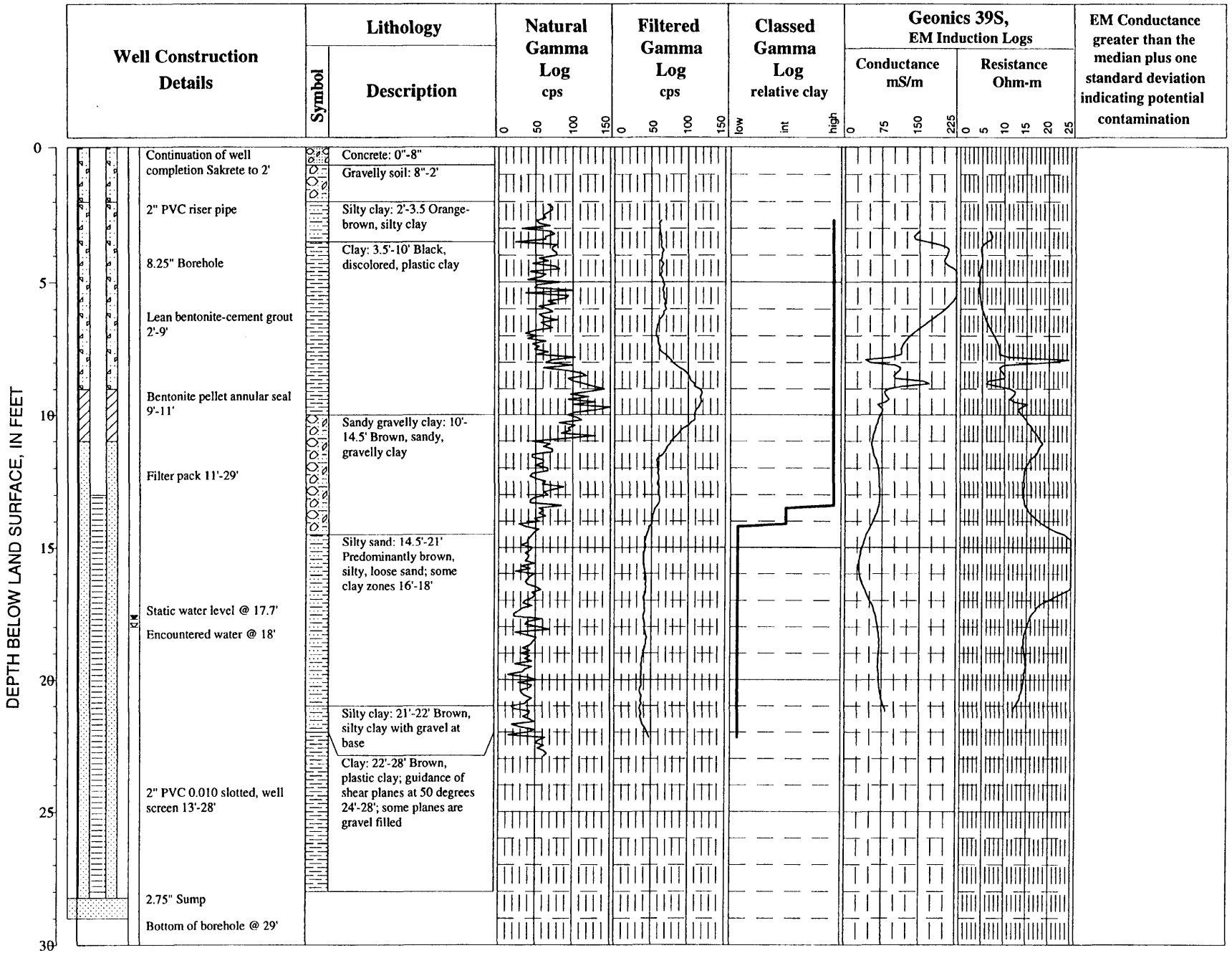
DWP-L1-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 1'
Bentonite pellet annular seal 1'-3'
Filter pack 3'-16'
2" PVC riser pipe
Encountered water @ 8'
Static water level @ 10.2'
8.25" Borehole
2" PVC 0.010 slotted, well screen 5'-15'
2.75" Sump
Bottom of borehole @ 16'
Gravelly soil: 0'-2' Gravel mixed with soil
Gravelly clay: 2'-5.5' Brown, hard, slightly gravelly clay
Silty sand: 5.5'-10.5' Brown, silty sand; 1" gravelly zone @ base
Clay: 10.5'-12.5' Brown, hard, plastic clay
Sandy silty clay: 12.5'-16' Brown, slightly sandy, silty clay; 3" sand zone @ 15'

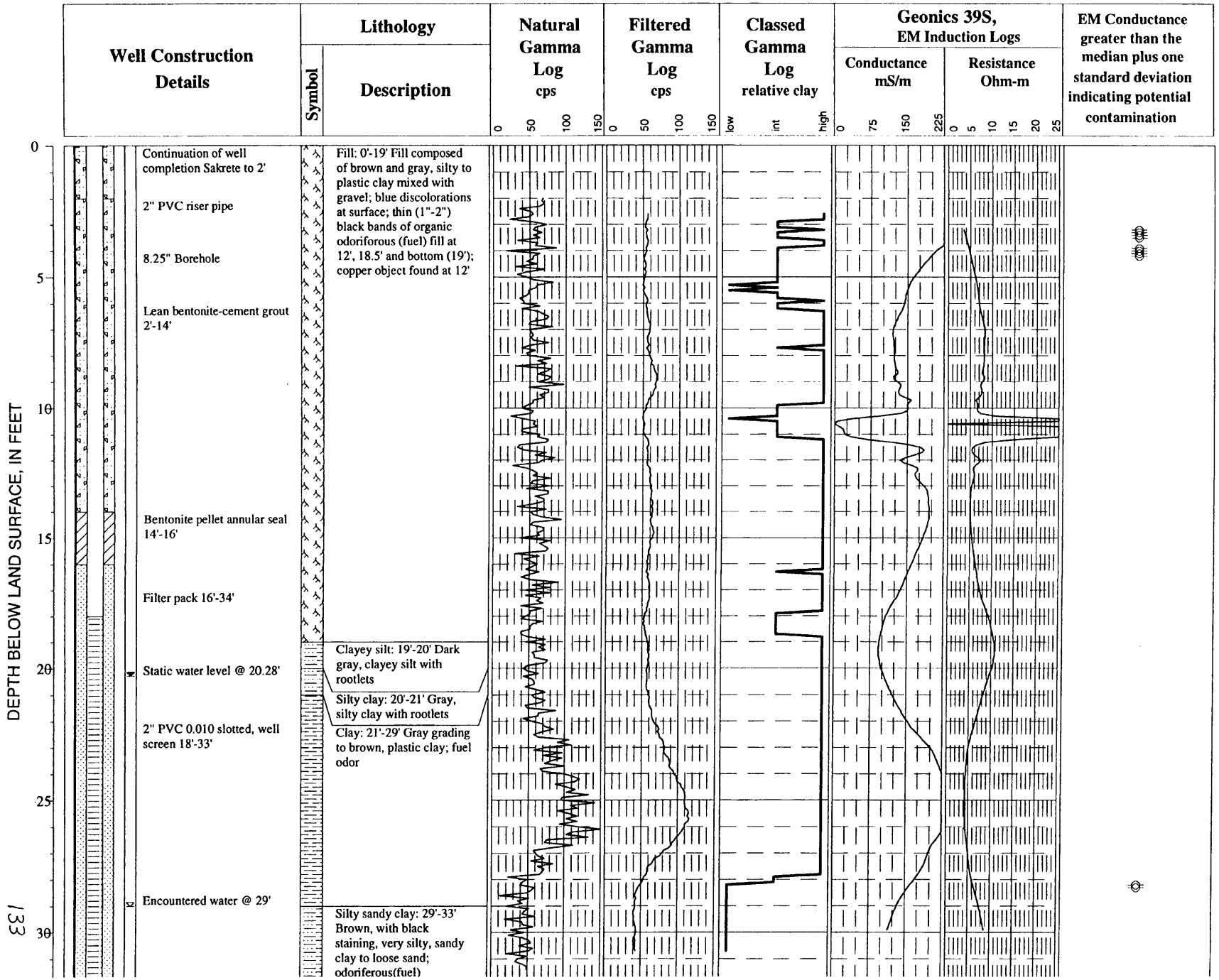
DWP-L1-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
Continuation of well completion Sakrete to 1'
Bentonite pellet annular seal 1'-3'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 8'
Static water level @ 10.1'
Filter pack 3'-16'
2" PVC 0.010 slotted, well screen 5'-15'
2.75" Sump
Bottom of borehole @ 16'
Gravelly soil: 0'-4'
Gravelly clay: 4'-6' Brown, gravelly clay
Silty sand: 6'-10.5 Brown, silty sand
Clay: 10.5'-12' Bown, hard, plastic clay
Silty sand: 12'-12.5' Brown, silty sand
Clay: 12.5'-16' Brown, hard, plastic clay

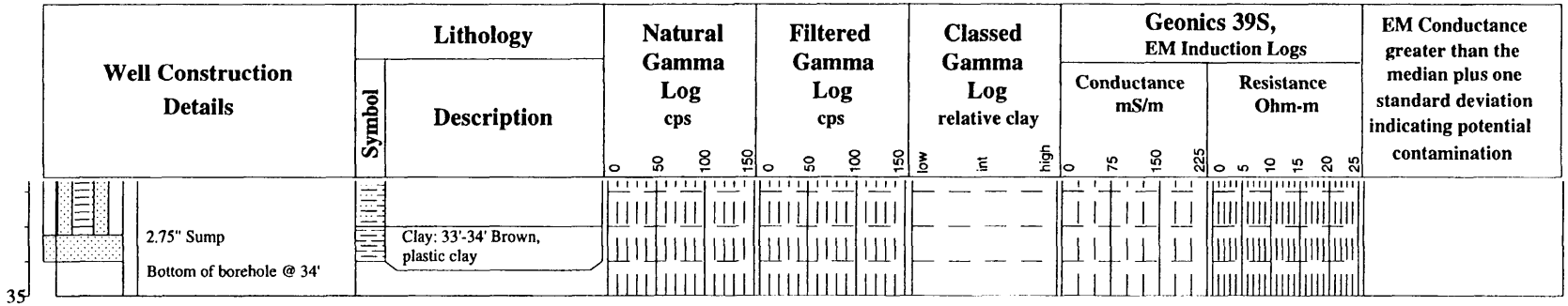
DWP-L1-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
0 50 100 150
Filtered Gamma Log cps
0 50 100 150
Classed Gamma Log relative clay
low int high
Geonics 39S, EM Induction Logs
Conductance mS/m
0 75 150 225
Resistance Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Static water level @ 17.7'
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0"-8"
Gravelly soil: 8"-2'
Silty clay: 2'-3.5 Orange-brown, silty clay
Clay: 3.5'-10' Black, discolored, plastic clay
Sandy gravelly clay: 10'-14.5' Brown, sandy, gravelly clay
Silty sand: 14.5'-21' Predominantly brown, silty, loose sand; some clay zones 16'-18'
Silty clay: 21'-22' Brown, silty clay with gravel at base
Clay: 22'-28' Brown, plastic clay; guidance of shear planes at 50 degrees 24'-28'; some planes are gravel filled

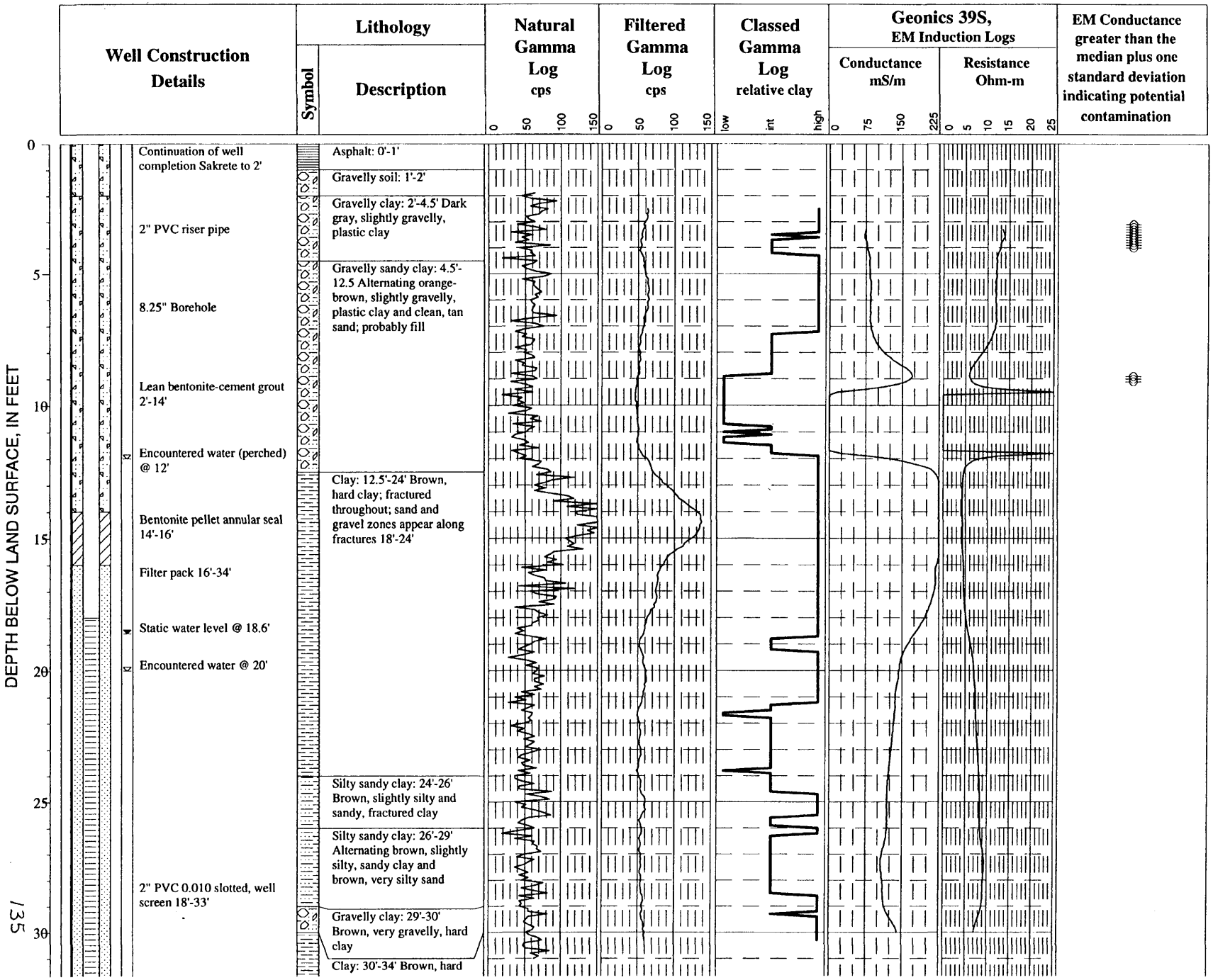
DWP-L1-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-14'
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Static water level @ 20.28'
2" PVC 0.010 slotted, well screen 18'-33'
Encountered water @ 29'
Fill: 0'-19' Fill composed of brown and gray, silty to plastic clay mixed with gravel; blue discolorations at surface; thin (1"-2") black bands of organic odoriforous (fuel) fill at 12', 18.5' and bottom (19'); copper object found at 12'
Clayey silt: 19'-20' Dark gray, clayey silt with rootlets
Silty clay: 20'-21' Gray, silty clay with rootlets
Clay: 21'-29' Gray grading to brown, plastic clay; fuel odor
Silty sandy clay: 29'-33' Brown, with black staining, very silty, sandy clay to loose sand; odoriferous(fuel)

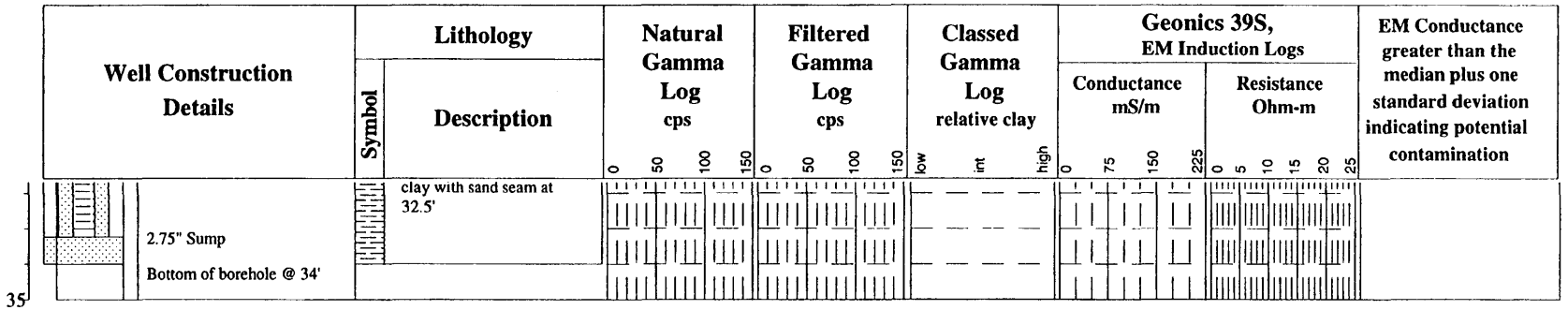
DWP-L1-5—Continued



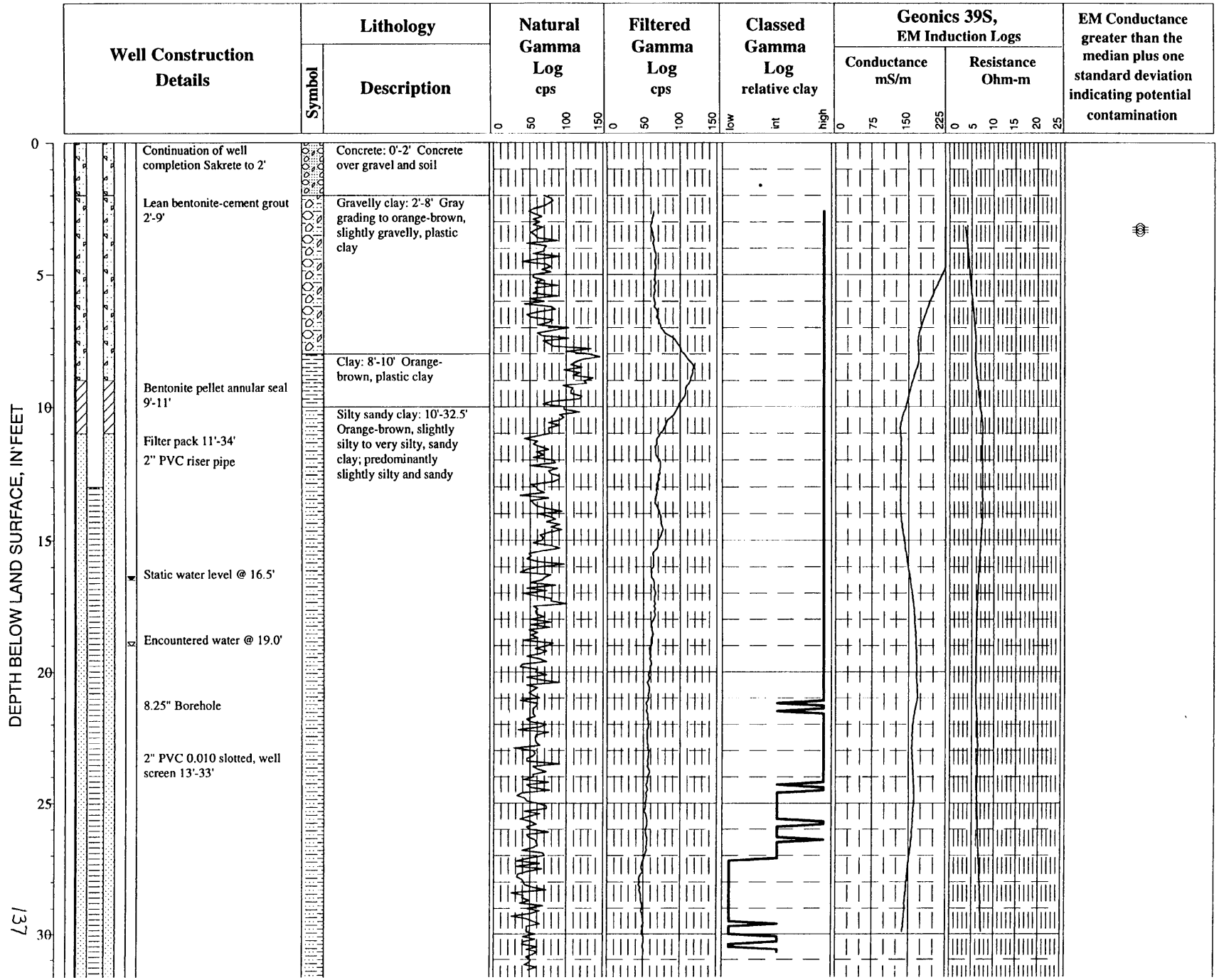
DWP-L2-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-14'
Encountered water (perched) @ 12'
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Static water level @ 18.6'
Encountered water @ 20'
2" PVC 0.010 slotted, well screen 18'-33'
Asphalt: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-4.5' Dark gray, slightly gravelly, plastic clay
Gravelly sandy clay: 4.5'-12.5 Alternating orange-brown, slightly gravelly, plastic clay and clean, tan sand; probably fill
Clay: 12.5'-24' Brown, hard clay; fractured throughout; sand and gravel zones appear along fractures 18'-24'
Silty sandy clay: 24'-26' Brown, slightly silty and sandy, fractured clay
Silty sandy clay: 26'-29' Alternating brown, slightly silty, sandy clay and brown, very silty sand
Gravelly clay: 29'-30' Brown, very gravelly, hard clay
Clay: 30'-34' Brown, hard

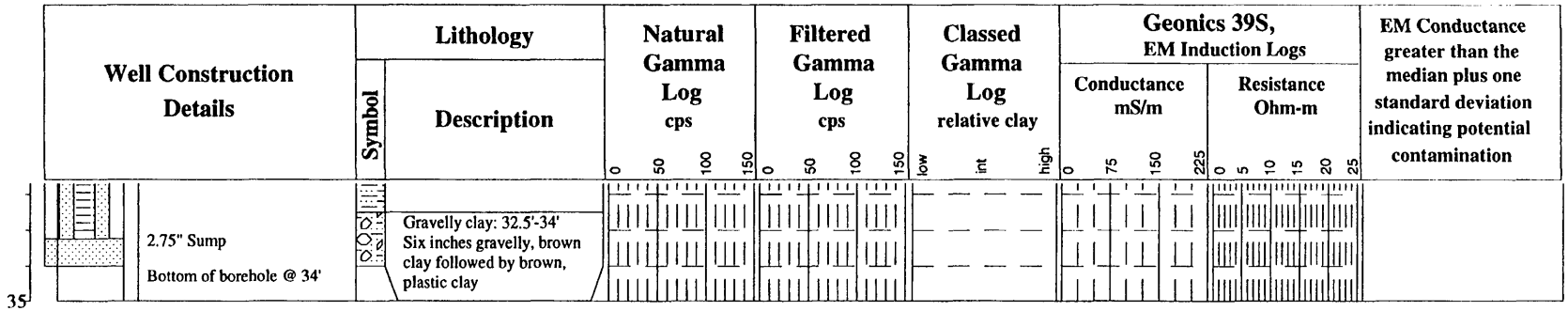
DWP-L2-1—Continued



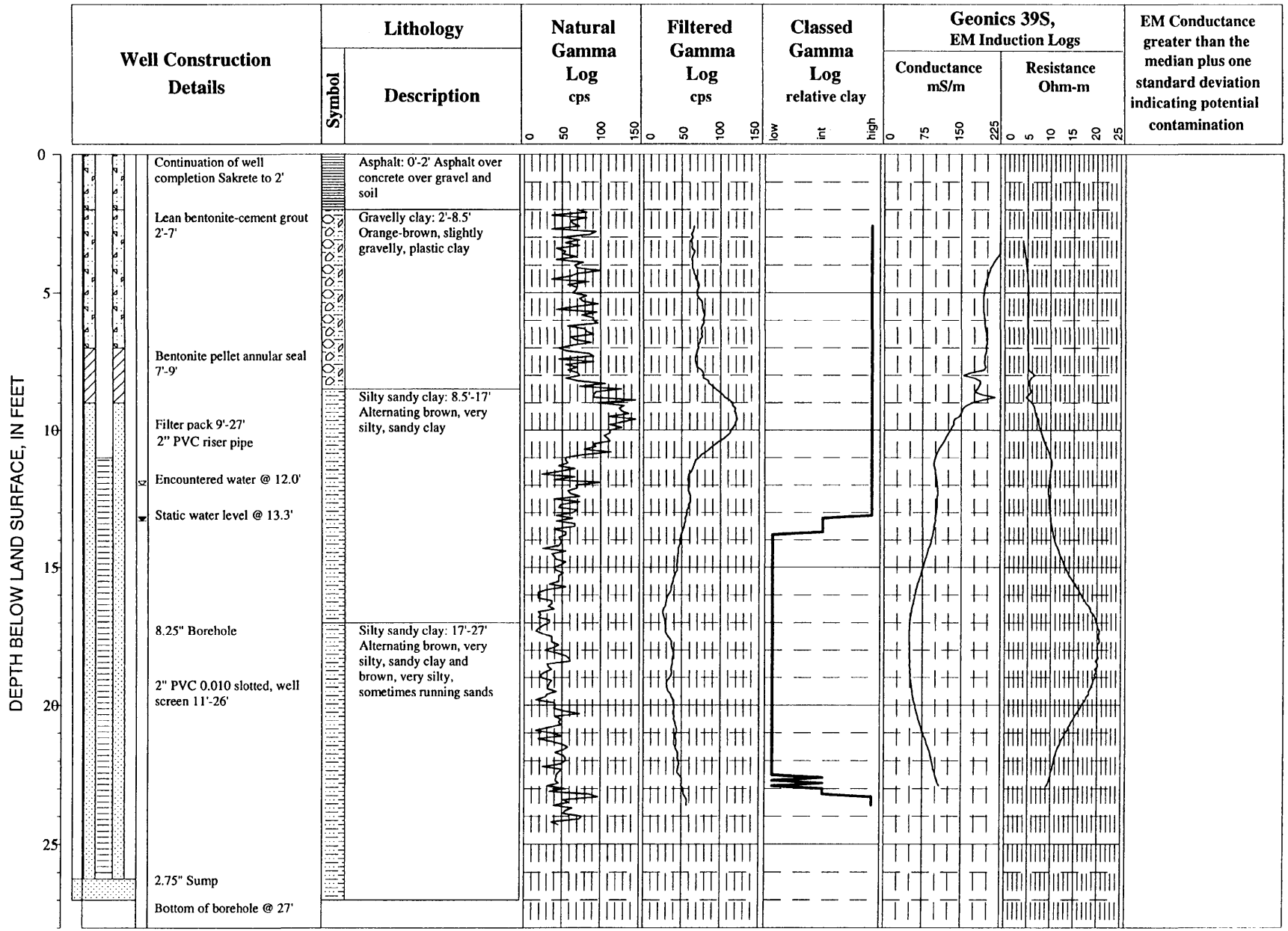
DWP-L2-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-34'
2" PVC riser pipe
Static water level @ 16.5'
Encountered water @ 19.0'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-33'
Concrete: 0'-2' Concrete over gravel and soil
Gravelly clay: 2'-8' Gray grading to orange-brown, slightly gravelly, plastic clay
Clay: 8'-10' Orange-brown, plastic clay
Silty sandy clay: 10'-32.5' Orange-brown, slightly silty to very silty, sandy clay; predominantly slightly silty and sandy
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30

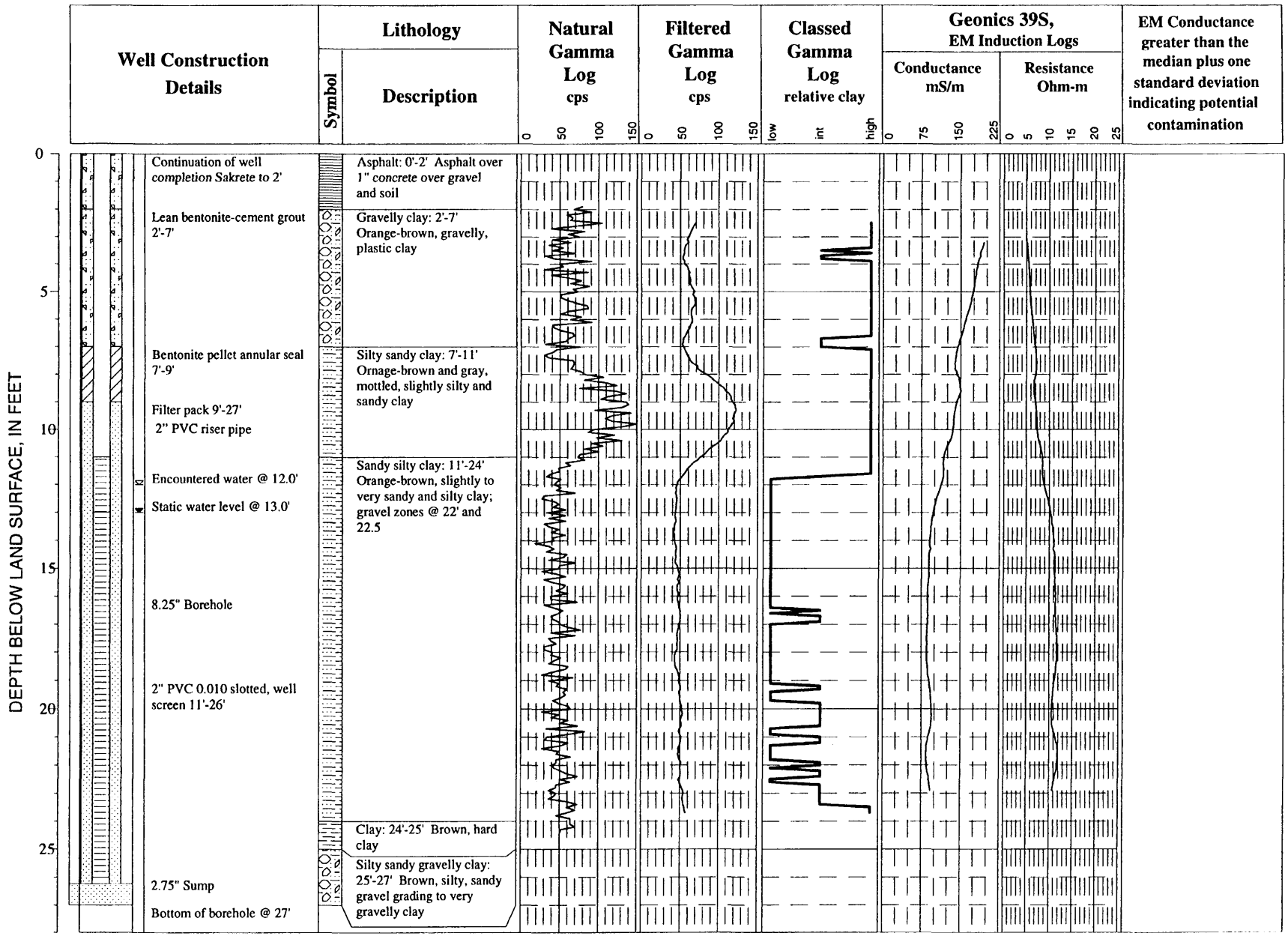
DWP-L2-3—Continued



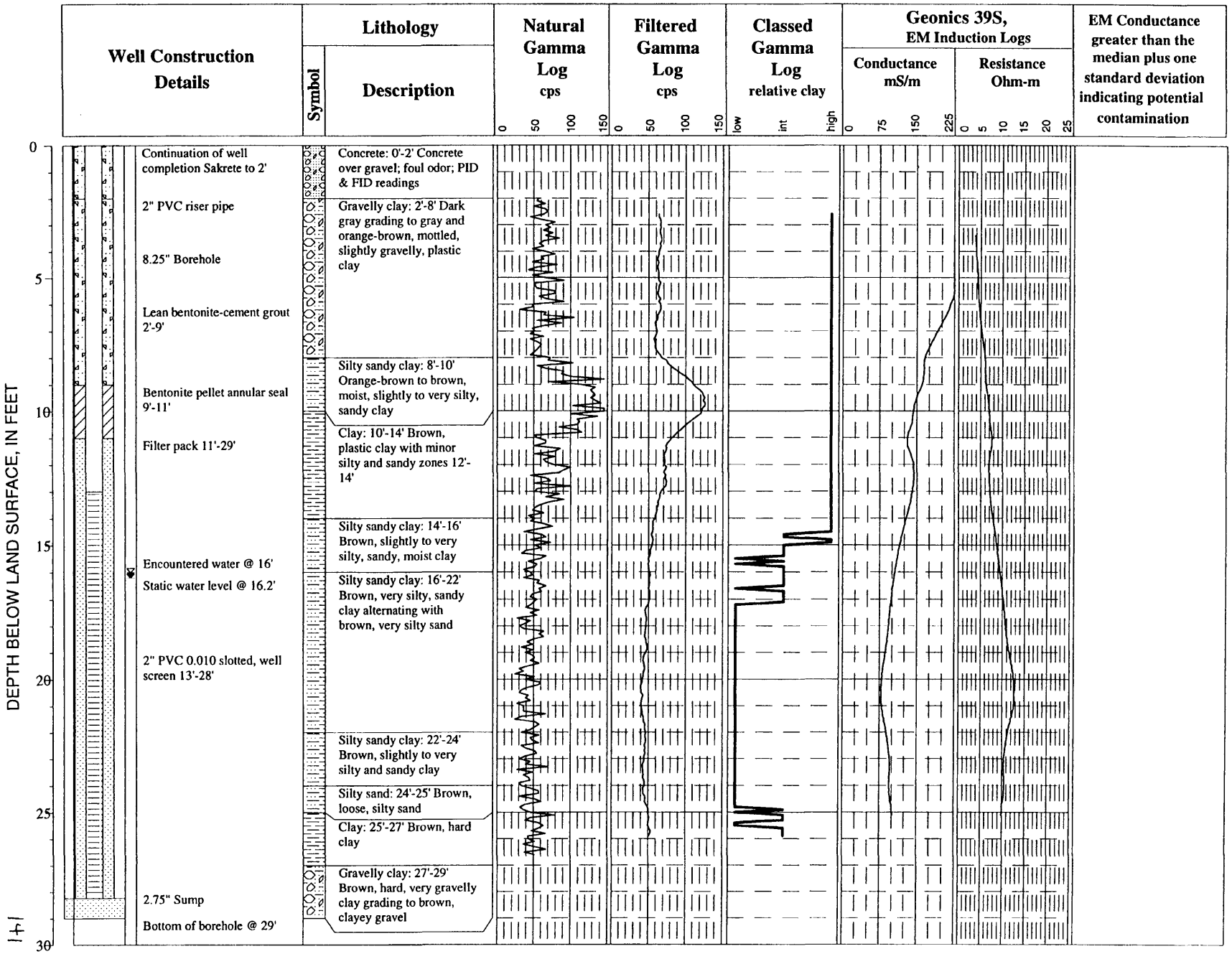
DWP-L2-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
2" PVC riser pipe
Encountered water @ 12.0'
Static water level @ 13.3'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Asphalt: 0'-2' Asphalt over concrete over gravel and soil
Gravelly clay: 2'-8.5' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 8.5'-17' Alternating brown, very silty, sandy clay
Silty sandy clay: 17'-27' Alternating brown, very silty, sandy clay and brown, very silty, sometimes running sands

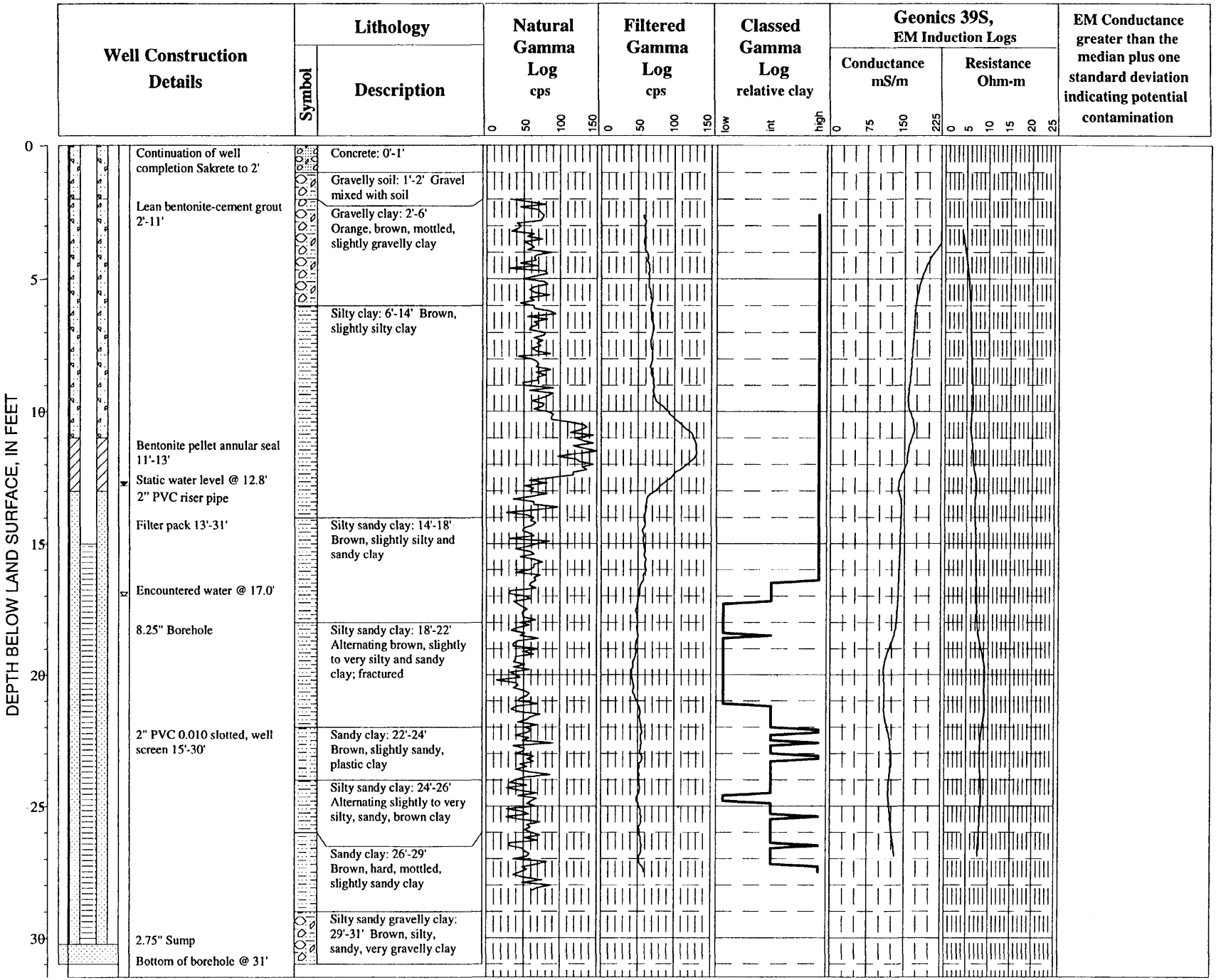
DWP-L2-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
2" PVC riser pipe
Encountered water @ 12.0'
Static water level @ 13.0'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Asphalt: 0'-2' Asphalt over 1" concrete over gravel and soil
Gravelly clay: 2'-7' Orange-brown, gravelly, plastic clay
Silty sandy clay: 7'-11' Ornage-brown and gray, mottled, slightly silty and sandy clay
Sandy silty clay: 11'-24' Orange-brown, slightly to very sandy and silty clay; gravel zones @ 22' and 22.5
Clay: 24'-25' Brown, hard clay
Silty sandy gravelly clay: 25'-27' Brown, silty, sandy gravel grading to very gravelly clay
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

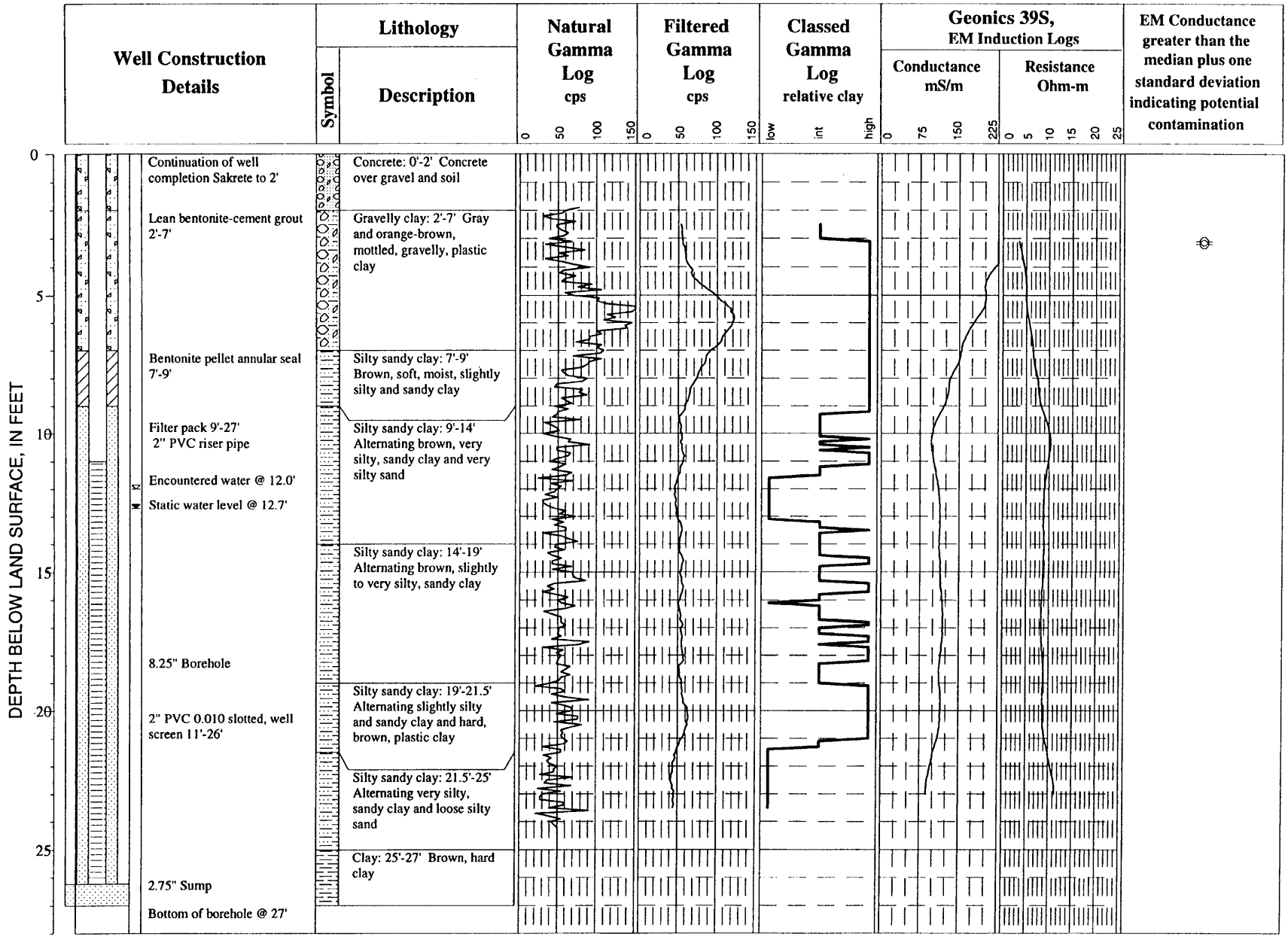
DWP-L2-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 16'
Static water level @ 16.2'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-2' Concrete over gravel; foul odor; PID & FID readings
Gravelly clay: 2'-8' Dark gray grading to gray and orange-brown, mottled, slightly gravelly, plastic clay
Silty sandy clay: 8'-10' Orange-brown to brown, moist, slightly to very silty, sandy clay
Clay: 10'-14' Brown, plastic clay with minor silty and sandy zones 12'-14'
Silty sandy clay: 14'-16' Brown, slightly to very silty, sandy, moist clay
Silty sandy clay: 16'-22' Brown, very silty, sandy clay alternating with brown, very silty sand
Silty sandy clay: 22'-24' Brown, slightly to very silty and sandy clay
Silty sand: 24'-25' Brown, loose, silty sand
Clay: 25'-27' Brown, hard clay
Gravelly clay: 27'-29' Brown, hard, very gravelly clay grading to brown, clayey gravel

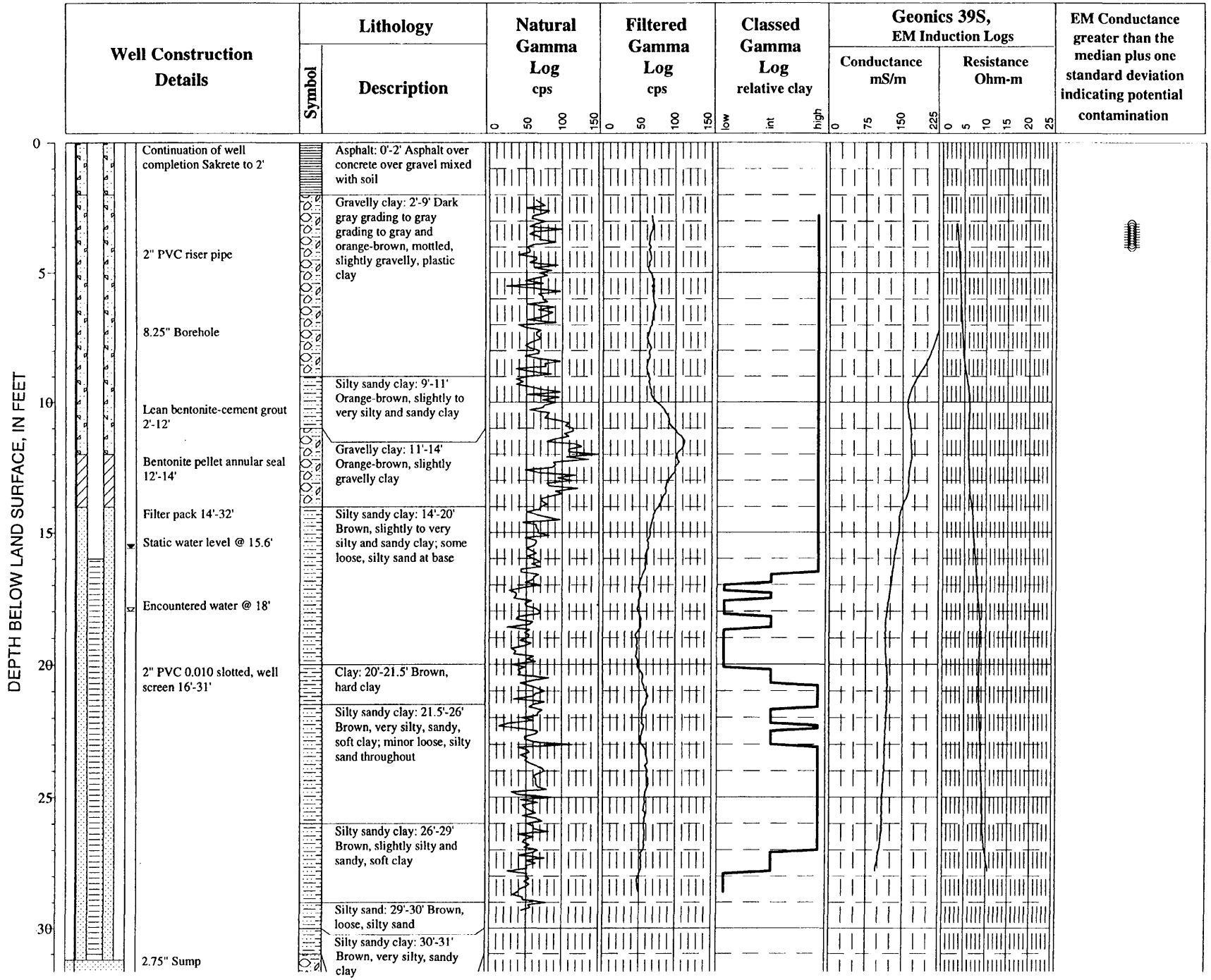
DWP-L2-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
Bentonite pellet annular seal 11'-13'
Static water level @ 12.8'
2" PVC riser pipe
Filter pack 13'-31'
Encountered water @ 17.0'
8.25" Borehole
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Concrete: 0'-1'
Gravelly soil: 1'-2' Gravel mixed with soil
Gravelly clay: 2'-6' Orange, brown, mottled, slightly gravelly clay
Silty clay: 6'-14' Brown, slightly silty clay
Silty sandy clay: 14'-18' Brown, slightly silty and sandy clay
Silty sandy clay: 18'-22' Alternating brown, slightly to very silty and sandy clay; fractured
Sandy clay: 22'-24' Brown, slightly sandy, plastic clay
Silty sandy clay: 24'-26' Alternating slightly to very silty, sandy, brown clay
Sandy clay: 26'-29' Brown, hard, mottled, slightly sandy clay
Silty sandy gravelly clay: 29'-31' Brown, silty, sandy, very gravelly clay
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

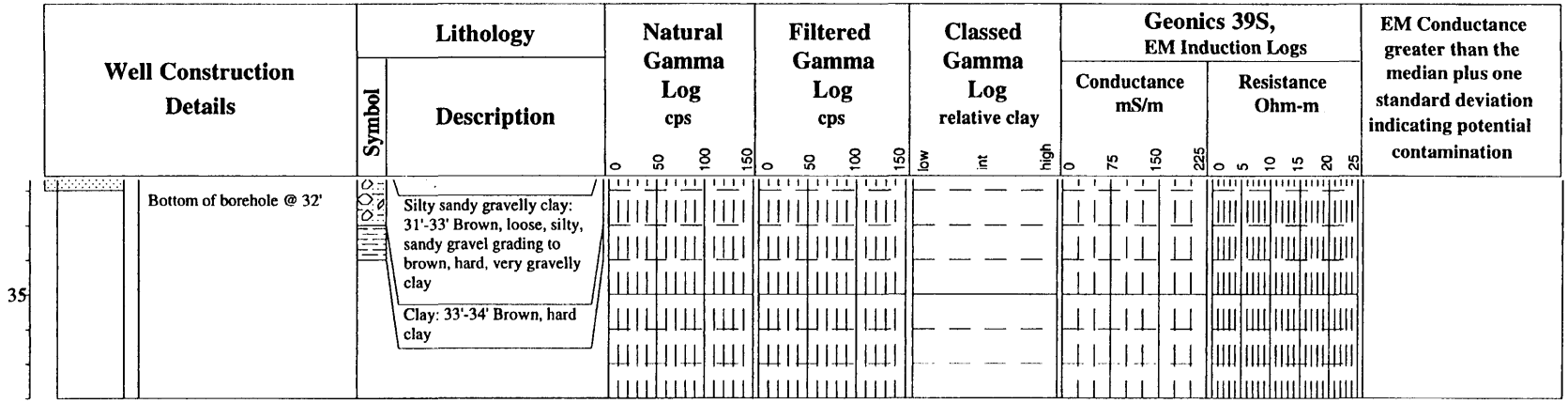
DWP-L2-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
2" PVC riser pipe
Encountered water @ 12.0'
Static water level @ 12.7'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Concrete: 0'-2' Concrete over gravel and soil
Gravelly clay: 2'-7' Gray and orange-brown, mottled, gravelly, plastic clay
Silty sandy clay: 7'-9' Brown, soft, moist, slightly silty and sandy clay
Silty sandy clay: 9'-14' Alternating brown, very silty, sandy clay and very silty sand
Silty sandy clay: 14'-19' Alternating brown, slightly to very silty, sandy clay
Silty sandy clay: 19'-21.5' Alternating slightly silty and sandy clay and hard, brown, plastic clay
Silty sandy clay: 21.5'-25' Alternating very silty, sandy clay and loose silty sand
Clay: 25'-27' Brown, hard clay

DWP-L2-13

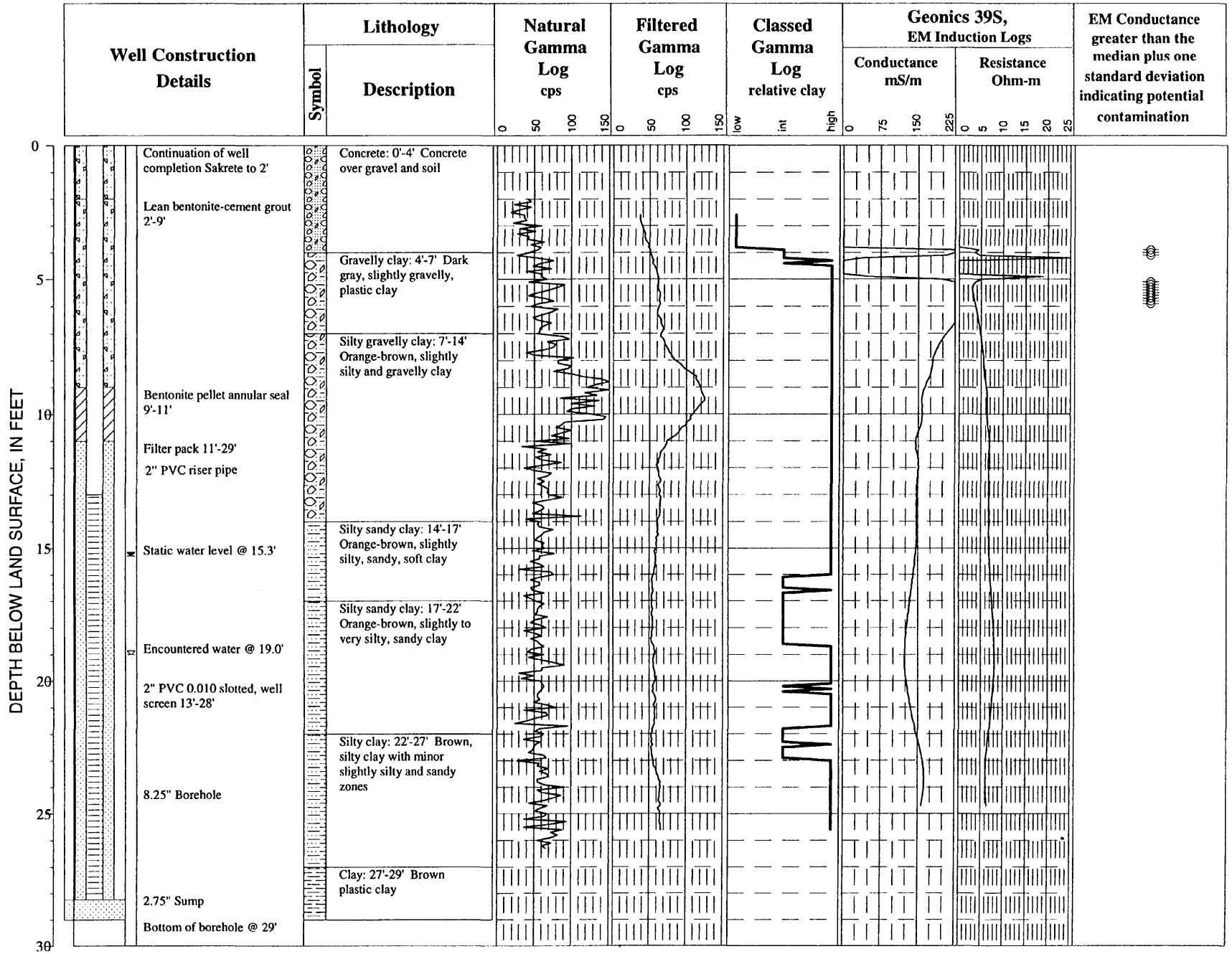

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-12'
Bentonite pellet annular seal 12'-14'
Filter pack 14'-32'
Static water level @ 15.6'
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Asphalt: 0'-2' Asphalt over concrete over gravel mixed with soil
Gravelly clay: 2'-9' Dark gray grading to gray grading to gray and orange-brown, mottled, slightly gravelly, plastic clay
Silty sandy clay: 9'-11' Orange-brown, slightly to very silty and sandy clay
Gravelly clay: 11'-14' Orange-brown, slightly gravelly clay
Silty sandy clay: 14'-20' Brown, slightly to very silty and sandy clay; some loose, silty sand at base
Clay: 20'-21.5' Brown, hard clay
Silty sandy clay: 21.5'-26' Brown, very silty, sandy, soft clay; minor loose, silty sand throughout
Silty sandy clay: 26'-29' Brown, slightly silty and sandy, soft clay
Silty sand: 29'-30' Brown, loose, silty sand
Silty sandy clay: 30'-31' Brown, very silty, sandy clay

DWP-L2-13—Continued

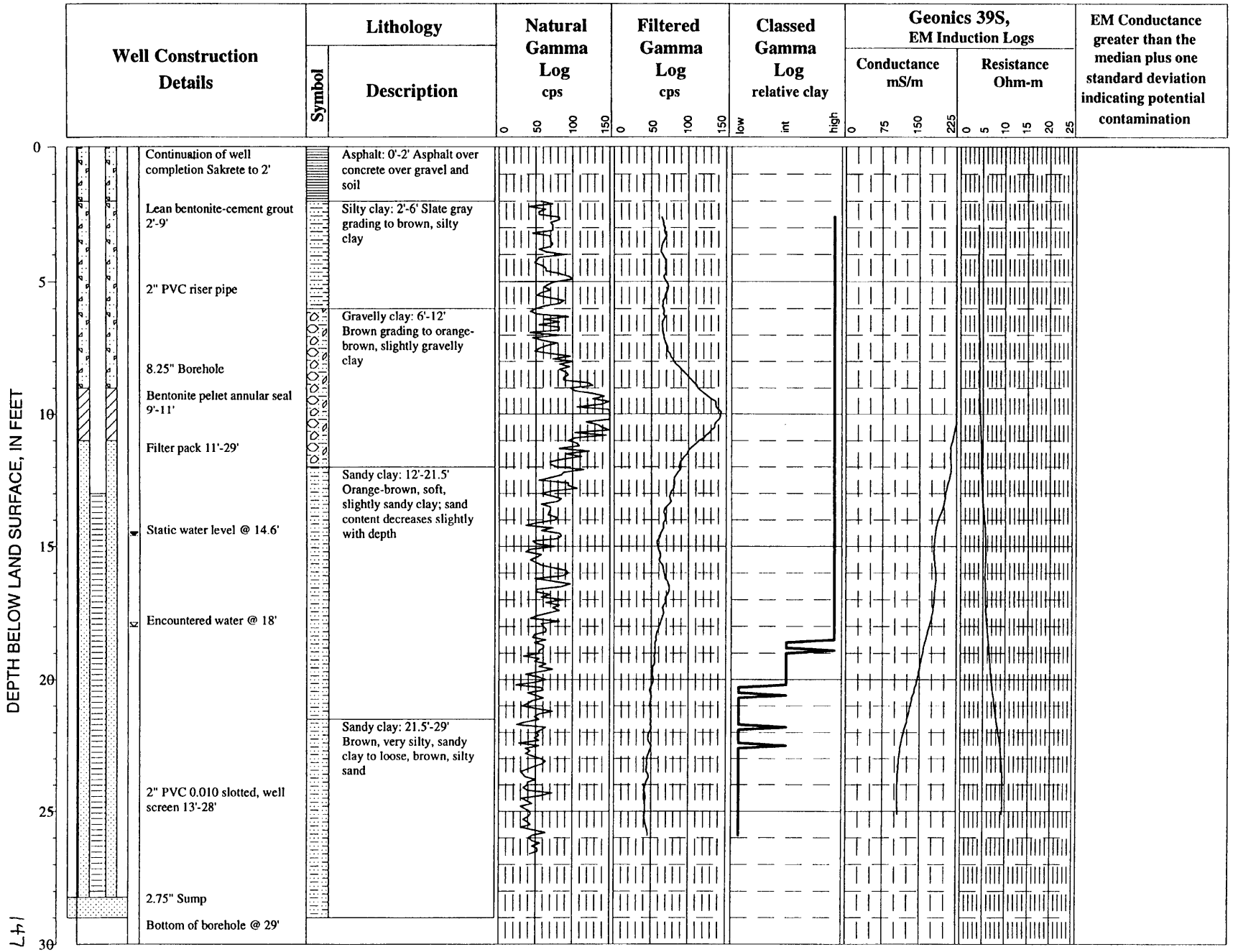


9/1

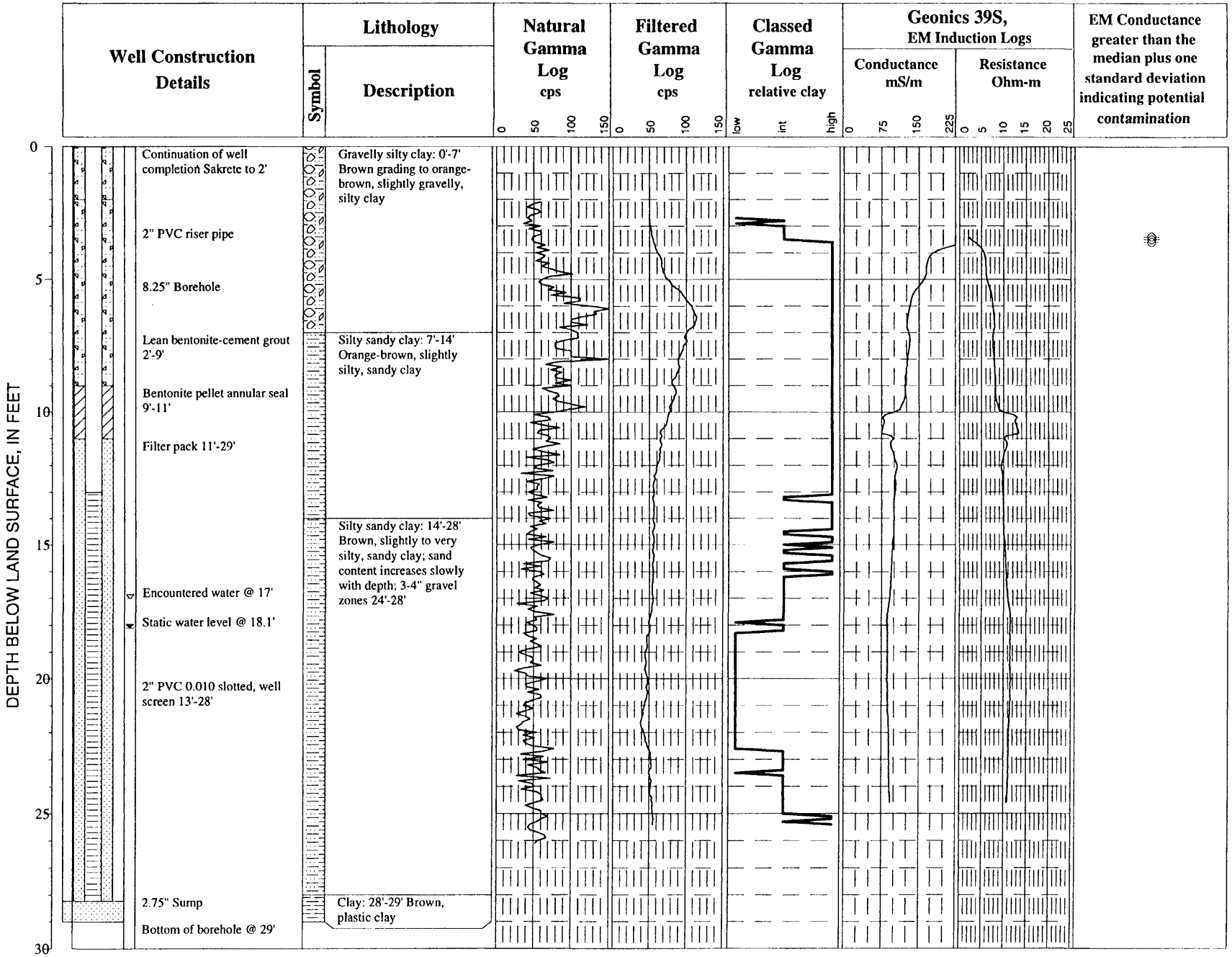
DWP-L2-14


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
Static water level @ 15.3'
Encountered water @ 19.0'
2" PVC 0.010 slotted, well screen 13'-28'
8.25" Borehole
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-4' Concrete over gravel and soil
Gravelly clay: 4'-7' Dark gray, slightly gravelly, plastic clay
Silty gravelly clay: 7'-14' Orange-brown, slightly silty and gravelly clay
Silty sandy clay: 14'-17' Orange-brown, slightly silty, sandy, soft clay
Silty sandy clay: 17'-22' Orange-brown, slightly to very silty, sandy clay
Silty clay: 22'-27' Brown, silty clay with minor slightly silty and sandy zones
Clay: 27'-29' Brown plastic clay
low
int
high

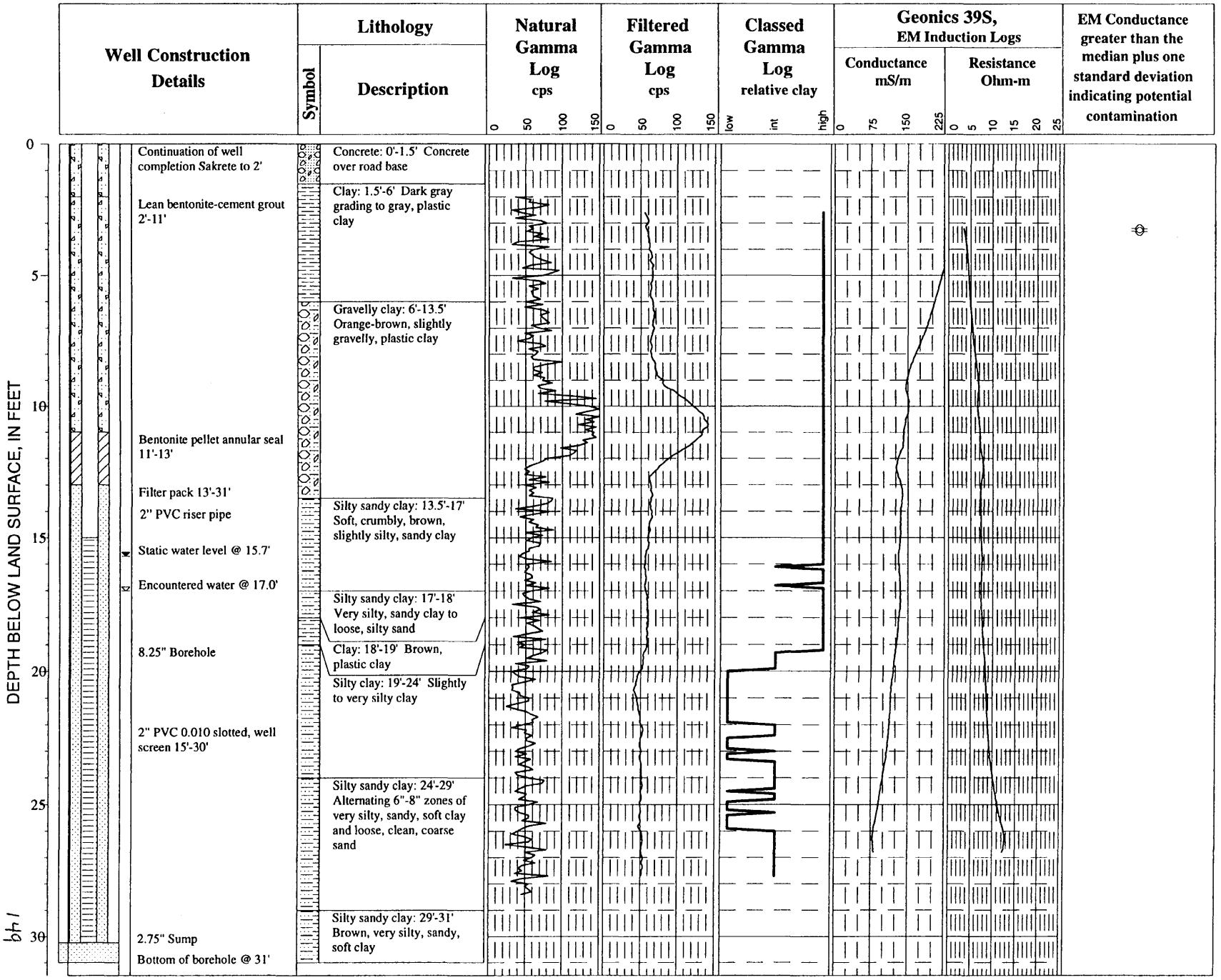
DWP-L2-15


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Static water level @ 14.6'
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-2' Asphalt over concrete over gravel and soil
Silty clay: 2'-6' Slate gray grading to brown, silty clay
Gravelly clay: 6'-12' Brown grading to orange-brown, slightly gravelly clay
Sandy clay: 12'-21.5' Orange-brown, soft, slightly sandy clay; sand content decreases slightly with depth
Sandy clay: 21.5'-29' Brown, very silty, sandy clay to loose, brown, silty sand

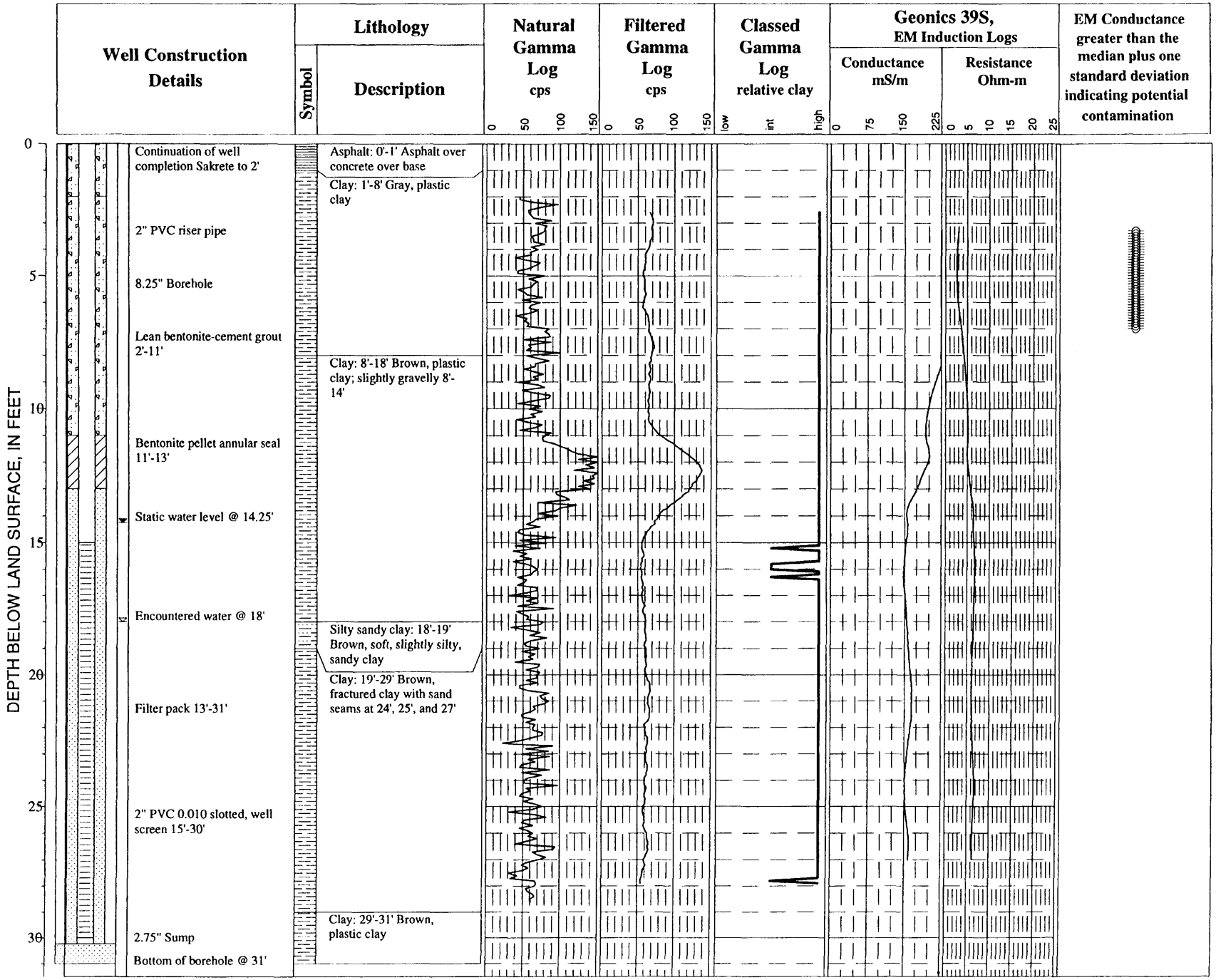
DWP-L2-16


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Encountered water @ 17'
Static water level @ 18.1'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Gravelly silty clay: 0'-7' Brown grading to orange-brown, slightly gravelly, silty clay
Silty sandy clay: 7'-14' Orange-brown, slightly silty, sandy clay
Silty sandy clay: 14'-28' Brown, slightly to very silty, sandy clay; sand content increases slowly with depth; 3-4" gravel zones 24'-28'
Clay: 28'-29' Brown, plastic clay
low
int
high

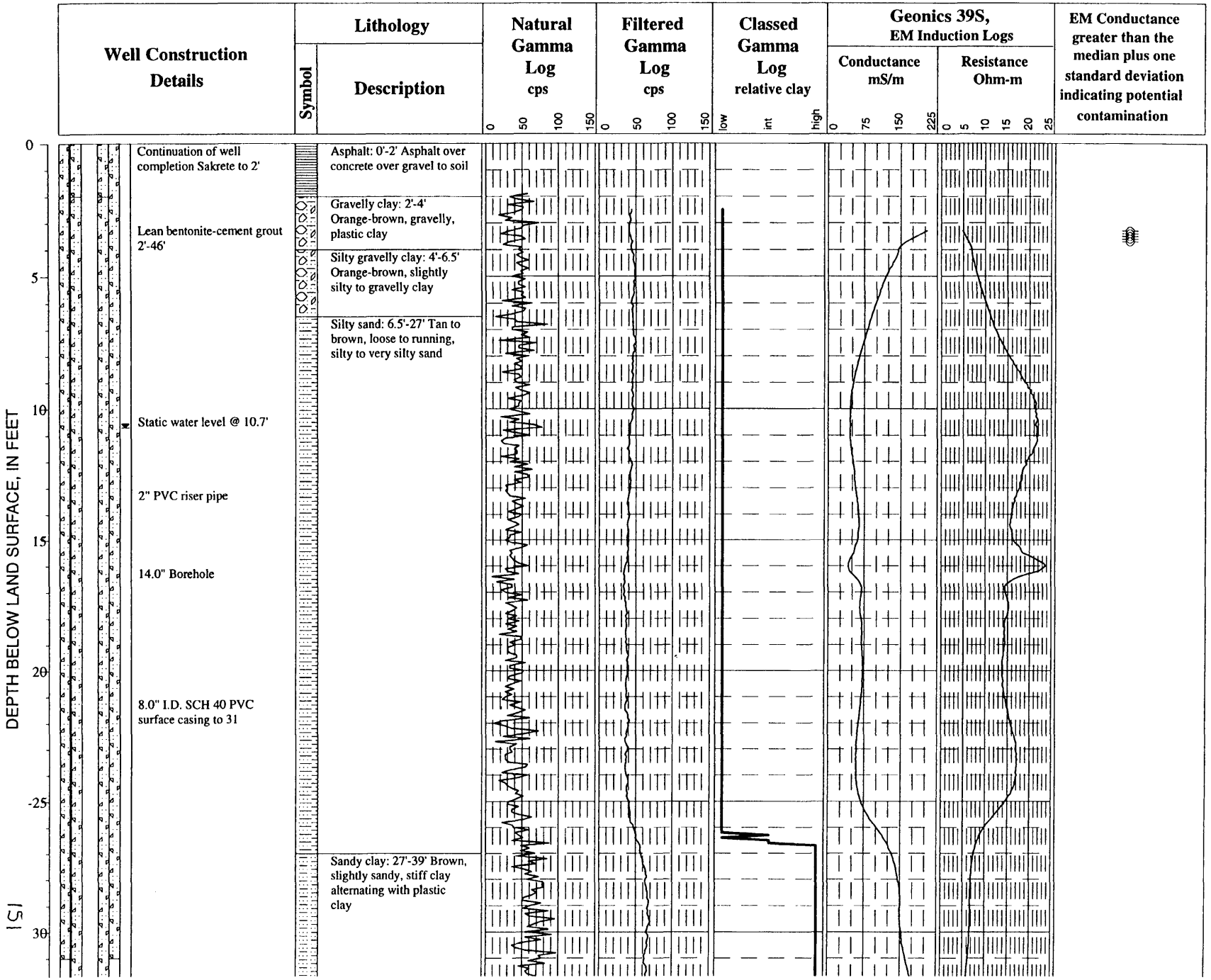
DWP-L2-17


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
Bentonite pellet annular seal 11'-13'
Filter pack 13'-31'
2" PVC riser pipe
Static water level @ 15.7'
Encountered water @ 17.0'
8.25" Borehole
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Concrete: 0'-1.5' Concrete over road base
Clay: 1.5'-6' Dark gray grading to gray, plastic clay
Gravelly clay: 6'-13.5' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 13.5'-17' Soft, crumbly, brown, slightly silty, sandy clay
Silty sandy clay: 17'-18' Very silty, sandy clay to loose, silty sand
Clay: 18'-19' Brown, plastic clay
Silty clay: 19'-24' Slightly to very silty clay
Silty sandy clay: 24'-29' Alternating 6"-8" zones of very silty, sandy, soft clay and loose, clean, coarse sand
Silty sandy clay: 29'-31' Brown, very silty, sandy, soft clay

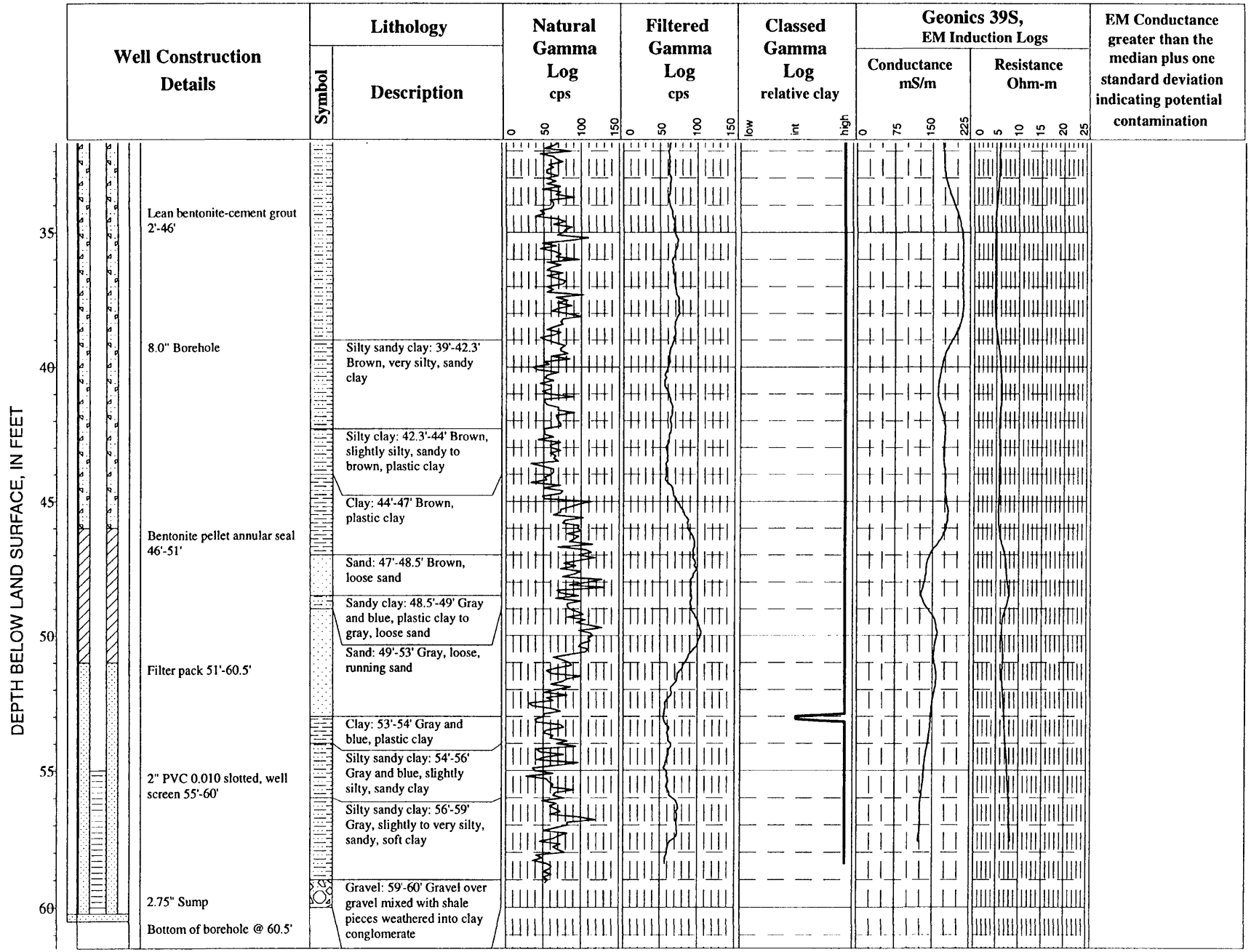
DWP-L2-25


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-11'
Bentonite pellet annular seal 11'-13'
Static water level @ 14.25'
Encountered water @ 18'
Filter pack 13'-31'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Asphalt: 0'-1' Asphalt over concrete over base
Clay: 1'-8' Gray, plastic clay
Clay: 8'-18' Brown, plastic clay; slightly gravelly 8'-14'
Silty sandy clay: 18'-19' Brown, soft, slightly silty, sandy clay
Clay: 19'-29' Brown, fractured clay with sand seams at 24', 25', and 27'
Clay: 29'-31' Brown, plastic clay
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

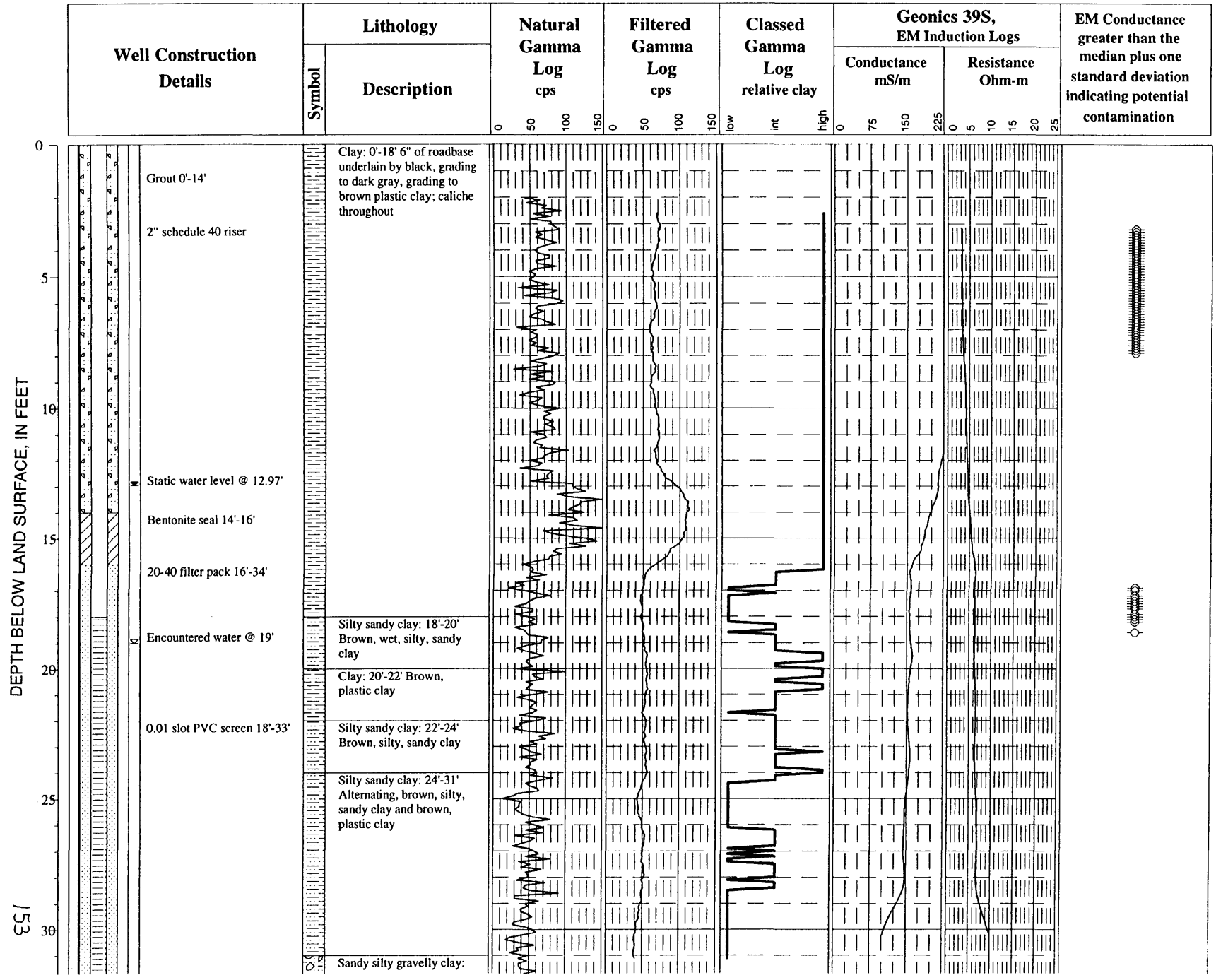
DWP-L2-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
-25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-46'
Static water level @ 10.7'
2" PVC riser pipe
14.0" Borehole
8.0" I.D. SCH 40 PVC surface casing to 31
Asphalt: 0'-2' Asphalt over concrete over gravel to soil
Gravelly clay: 2'-4' Orange-brown, gravelly, plastic clay
Silty gravelly clay: 4'-6.5' Orange-brown, slightly silty to gravelly clay
Silty sand: 6.5'-27' Tan to brown, loose to running, silty to very silty sand
Sandy clay: 27'-39' Brown, slightly sandy, stiff clay alternating with plastic clay
ISI

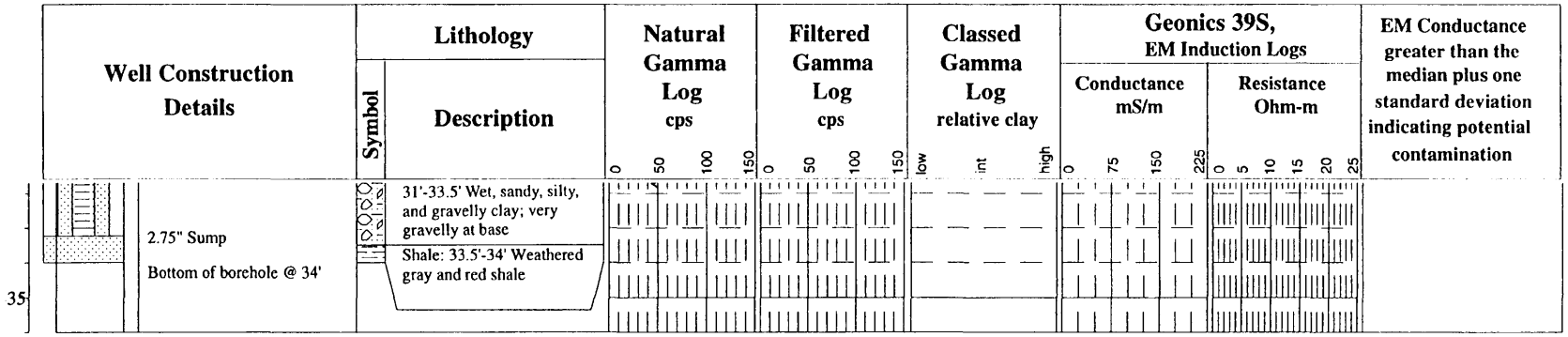
DWP-L2-DW1—Continued



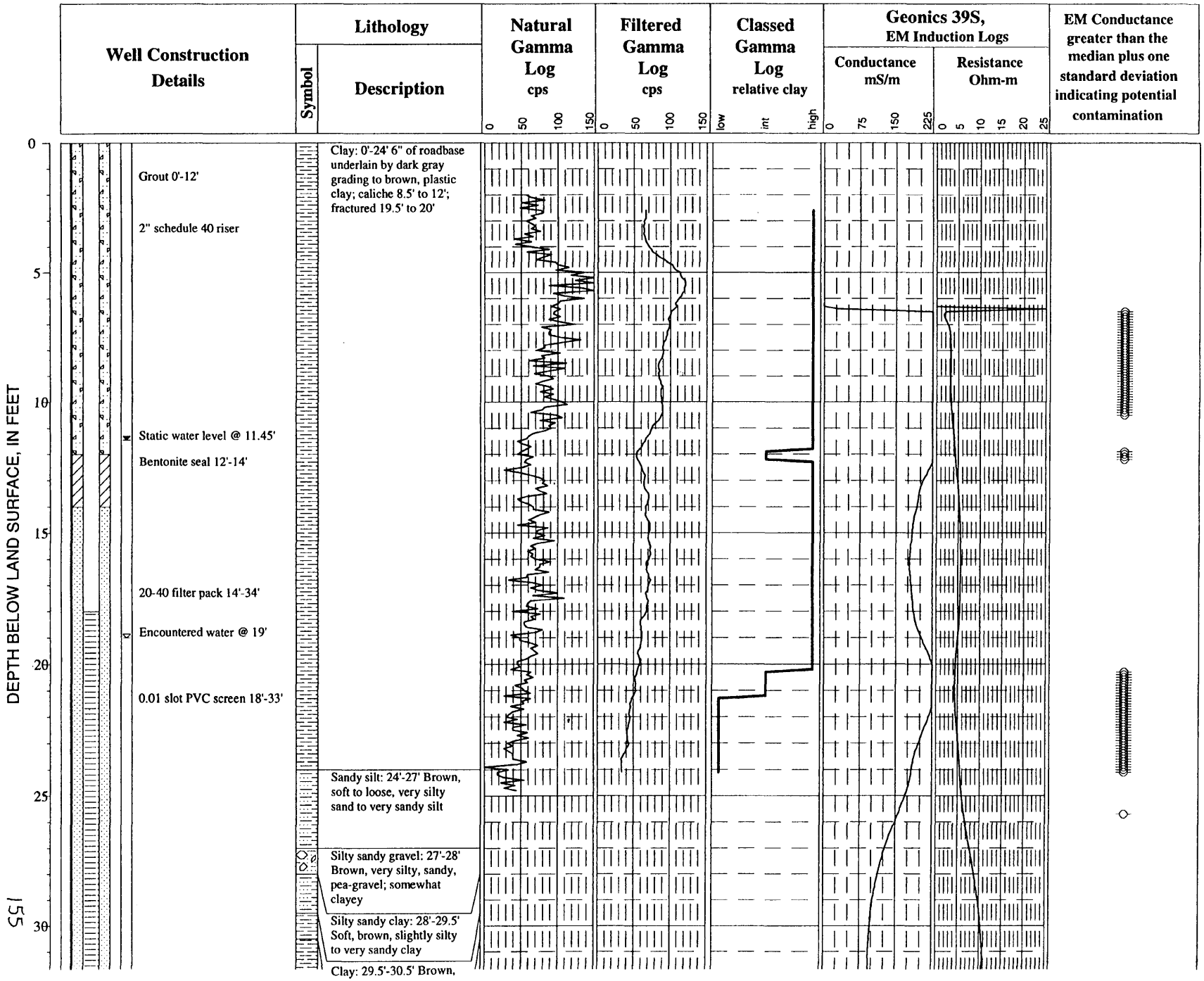
DWP-OFF-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Grout 0'-14'
2" schedule 40 riser
Static water level @ 12.97'
Bentonite seal 14'-16'
20-40 filter pack 16'-34'
Encountered water @ 19'
0.01 slot PVC screen 18'-33'
Clay: 0'-18' 6" of roadbase underlain by black, grading to dark gray, grading to brown plastic clay; caliche throughout
Silty sandy clay: 18'-20' Brown, wet, silty, sandy clay
Clay: 20'-22' Brown, plastic clay
Silty sandy clay: 22'-24' Brown, silty, sandy clay
Silty sandy clay: 24'-31' Alternating, brown, silty, sandy clay and brown, plastic clay
Sandy silty gravelly clay:

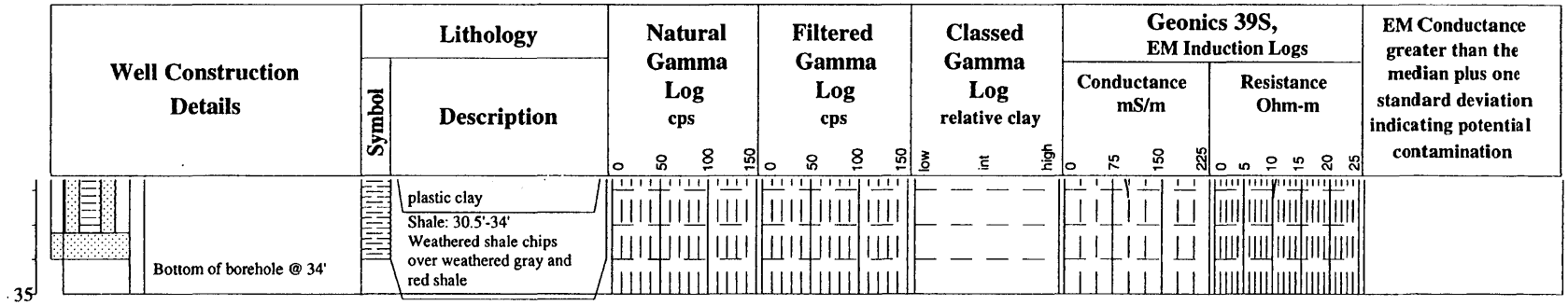
DWP-OFF-4—Continued



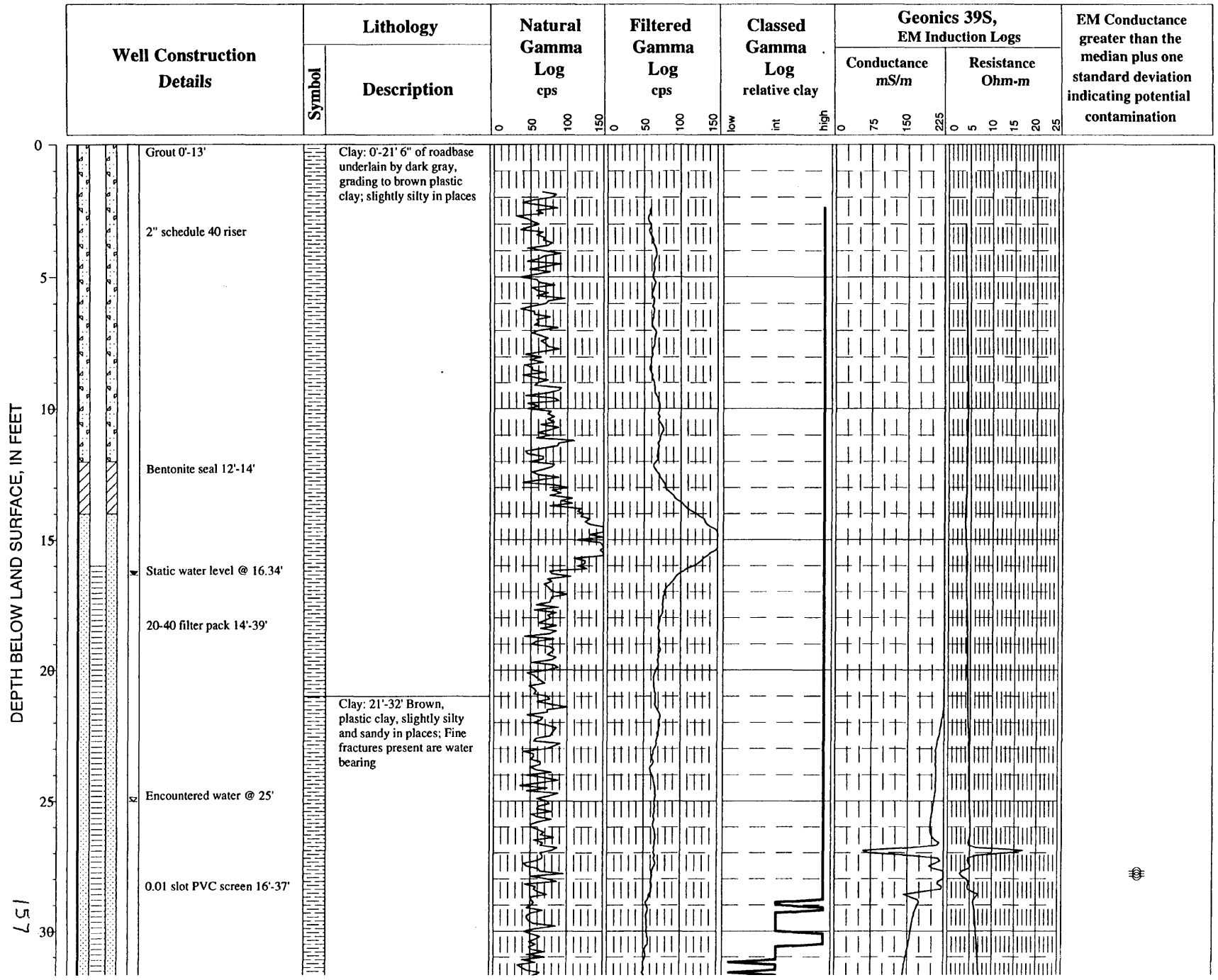
DWP-OFF-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Grout 0'-12'
2" schedule 40 riser
Static water level @ 11.45'
Bentonite seal 12'-14'
20-40 filter pack 14'-34'
Encountered water @ 19'
0.01 slot PVC screen 18'-33'
Clay: 0'-24' 6" of roadbase underlain by dark gray grading to brown, plastic clay; caliche 8.5' to 12'; fractured 19.5' to 20'
Sandy silt: 24'-27' Brown, soft to loose, very silty sand to very sandy silt
Silty sandy gravel: 27'-28' Brown, very silty, sandy, pea-gravel; somewhat clayey
Silty sandy clay: 28'-29.5' Soft, brown, slightly silty to very sandy clay
Clay: 29.5'-30.5' Brown,

DWP-OFF-5—Continued

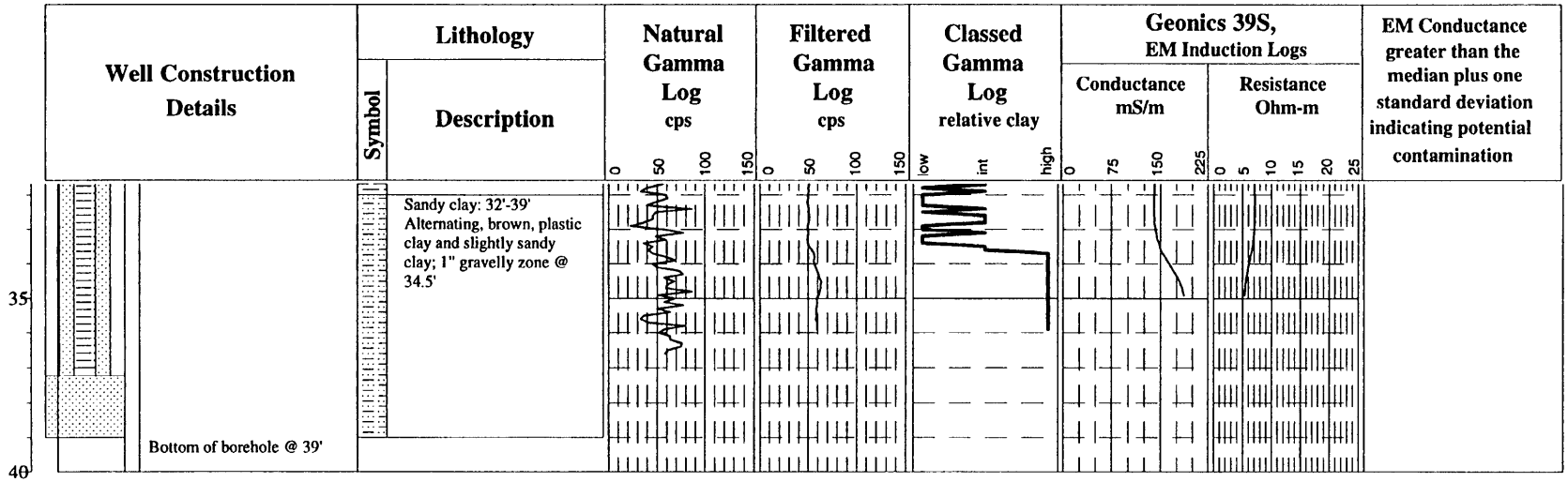


DWP-OFF-9

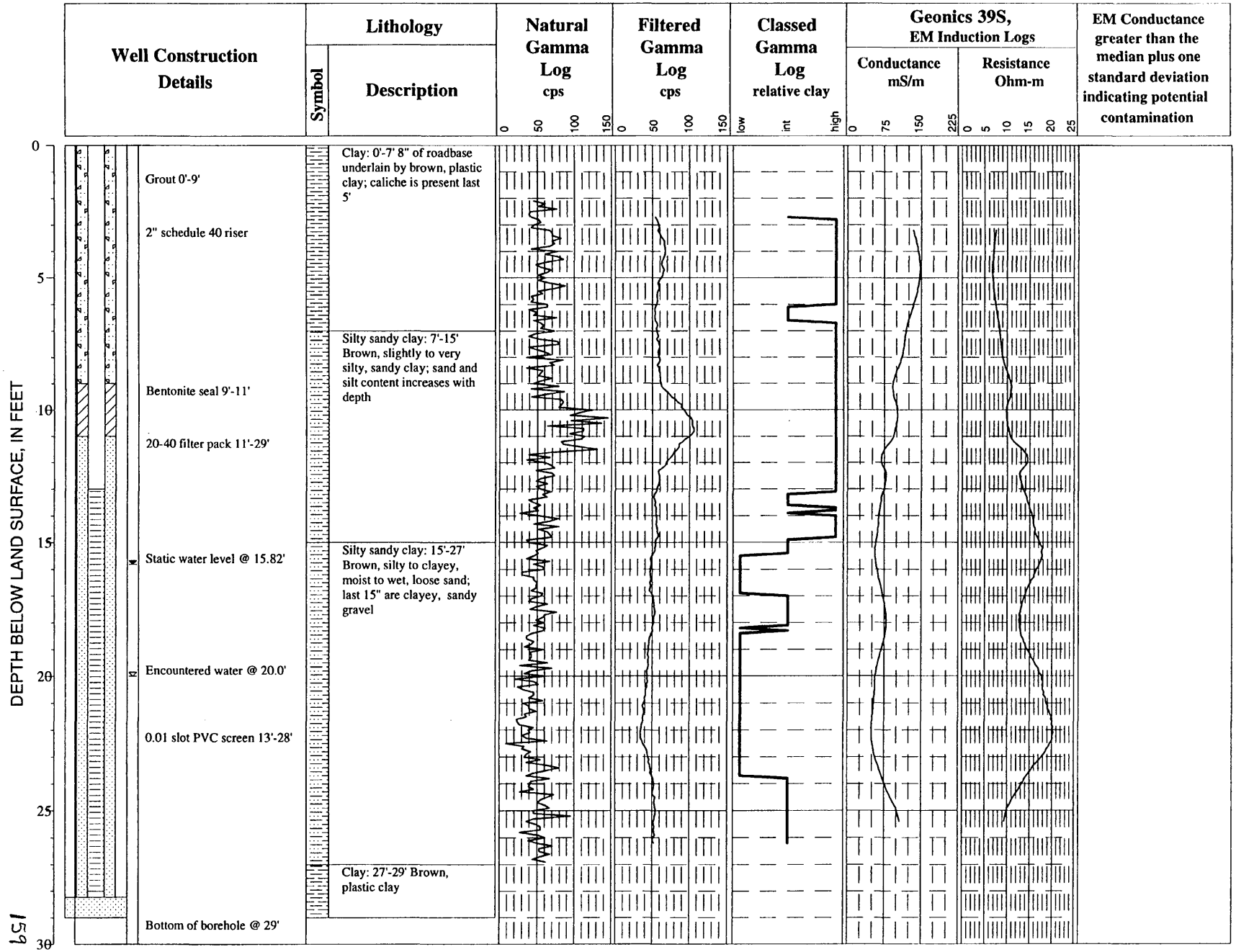

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Grout 0'-13'
2" schedule 40 riser
Bentonite seal 12'-14'
Static water level @ 16.34'
20-40 filter pack 14'-39'
Encountered water @ 25'
0.01 slot PVC screen 16'-37'
Clay: 0'-21' 6" of roadbase underlain by dark gray, grading to brown plastic clay; slightly silty in places
Clay: 21'-32' Brown, plastic clay, slightly silty and sandy in places; Fine fractures present are water bearing

157

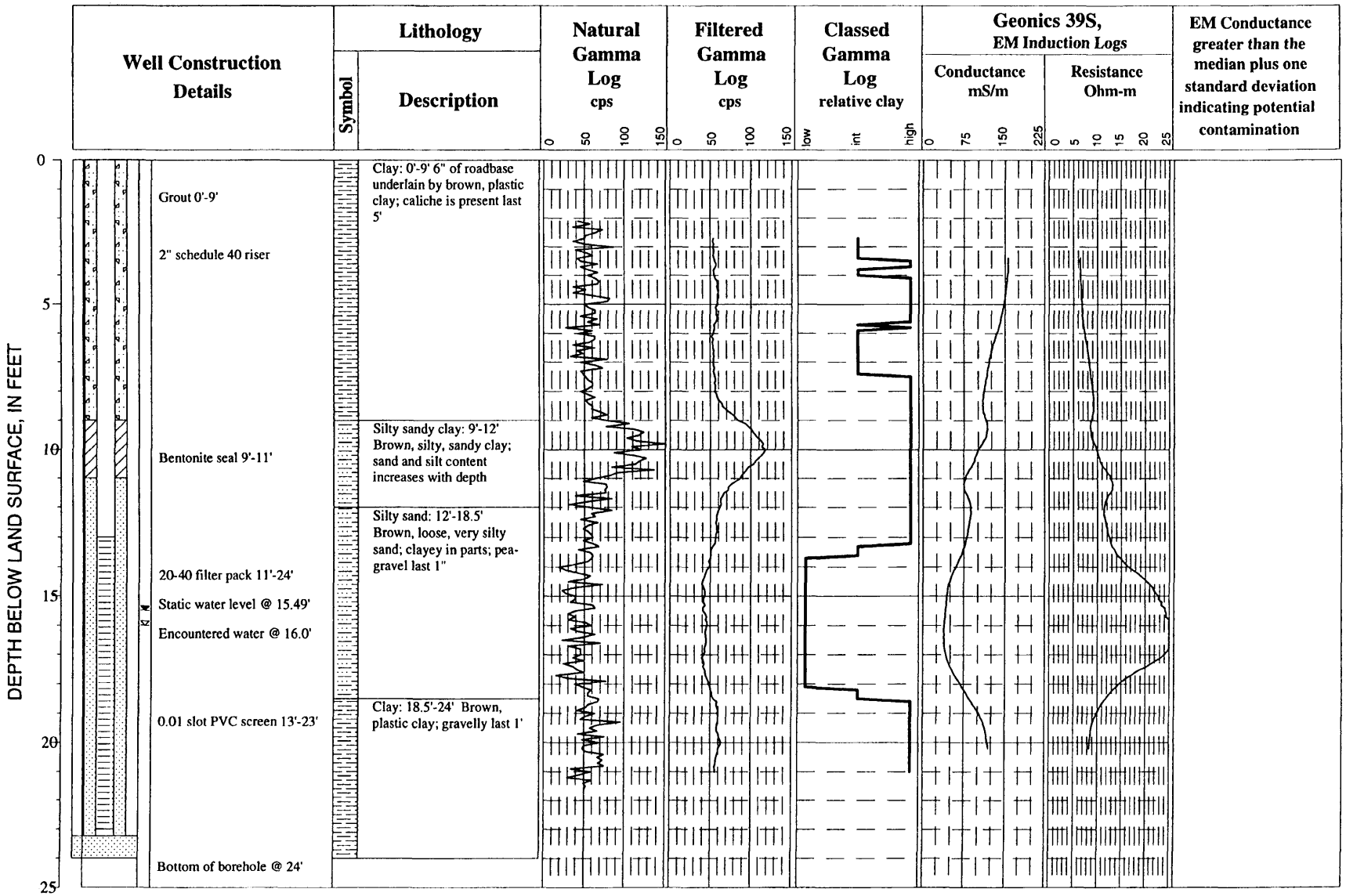
DWP-OFF-9—Continued



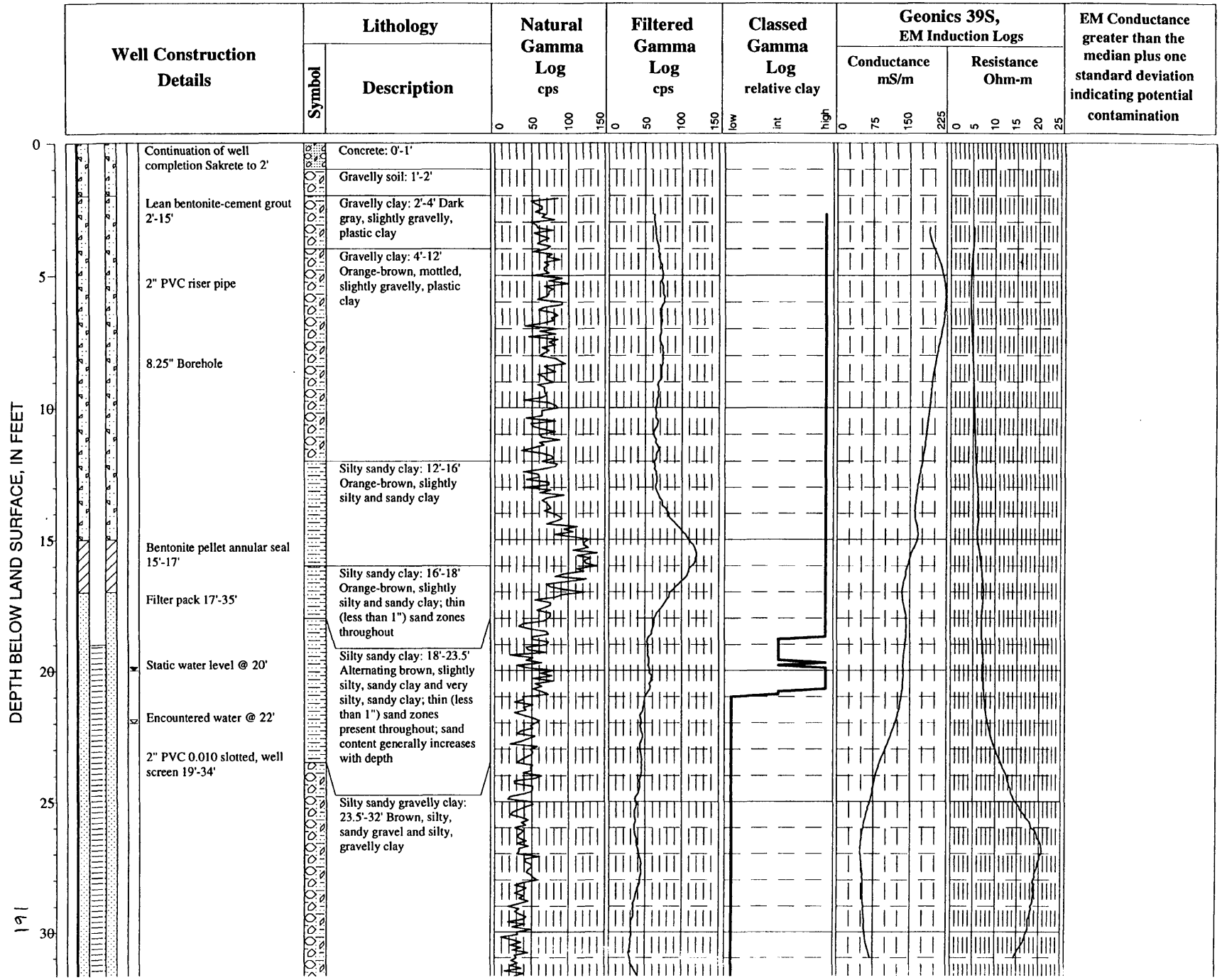
DWP-OFF-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Grout 0'-9'
2" schedule 40 riser
Bentonite seal 9'-11'
20-40 filter pack 11'-29'
Static water level @ 15.82'
Encountered water @ 20.0'
0.01 slot PVC screen 13'-28'
Bottom of borehole @ 29'
Clay: 0'-7' 8" of roadbase underlain by brown, plastic clay; caliche is present last 5'
Silty sandy clay: 7'-15' Brown, slightly to very silty, sandy clay; sand and silt content increases with depth
Silty sandy clay: 15'-27' Brown, silty to clayey, moist to wet, loose sand; last 15" are clayey, sandy gravel
Clay: 27'-29' Brown, plastic clay
low
int
high

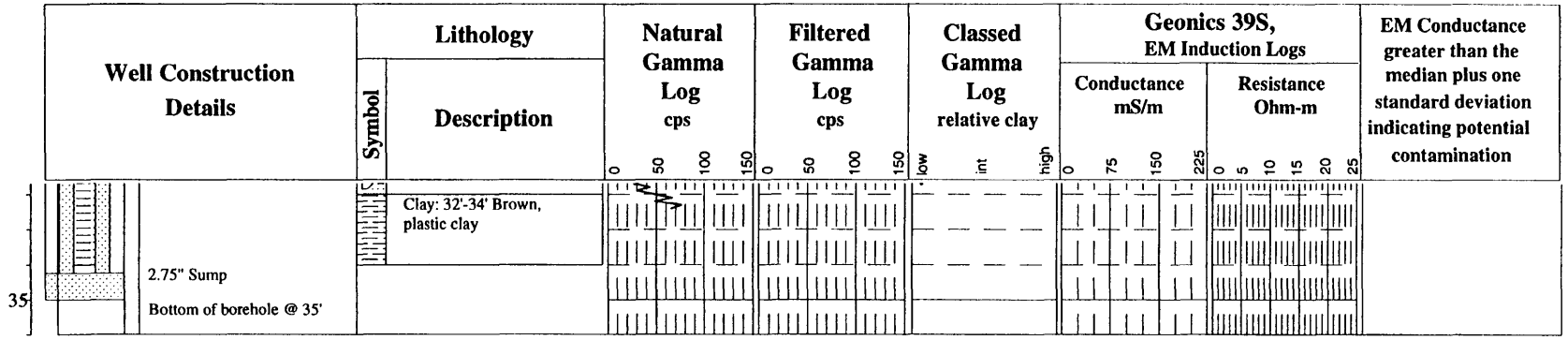
DWP-OFF-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Grout 0'-9'
2" schedule 40 riser
Bentonite seal 9'-11'
20-40 filter pack 11'-24'
Static water level @ 15.49'
Encountered water @ 16.0'
0.01 slot PVC screen 13'-23'
Bottom of borehole @ 24'
Clay: 0'-9' 6" of roadbase underlain by brown, plastic clay; caliche is present last 5'
Silty sandy clay: 9'-12' Brown, silty, sandy clay; sand and silt content increases with depth
Silty sand: 12'-18.5' Brown, loose, very silty sand; clayey in parts; pea-gravel last 1"
Clay: 18.5'-24' Brown, plastic clay; gravelly last 1'

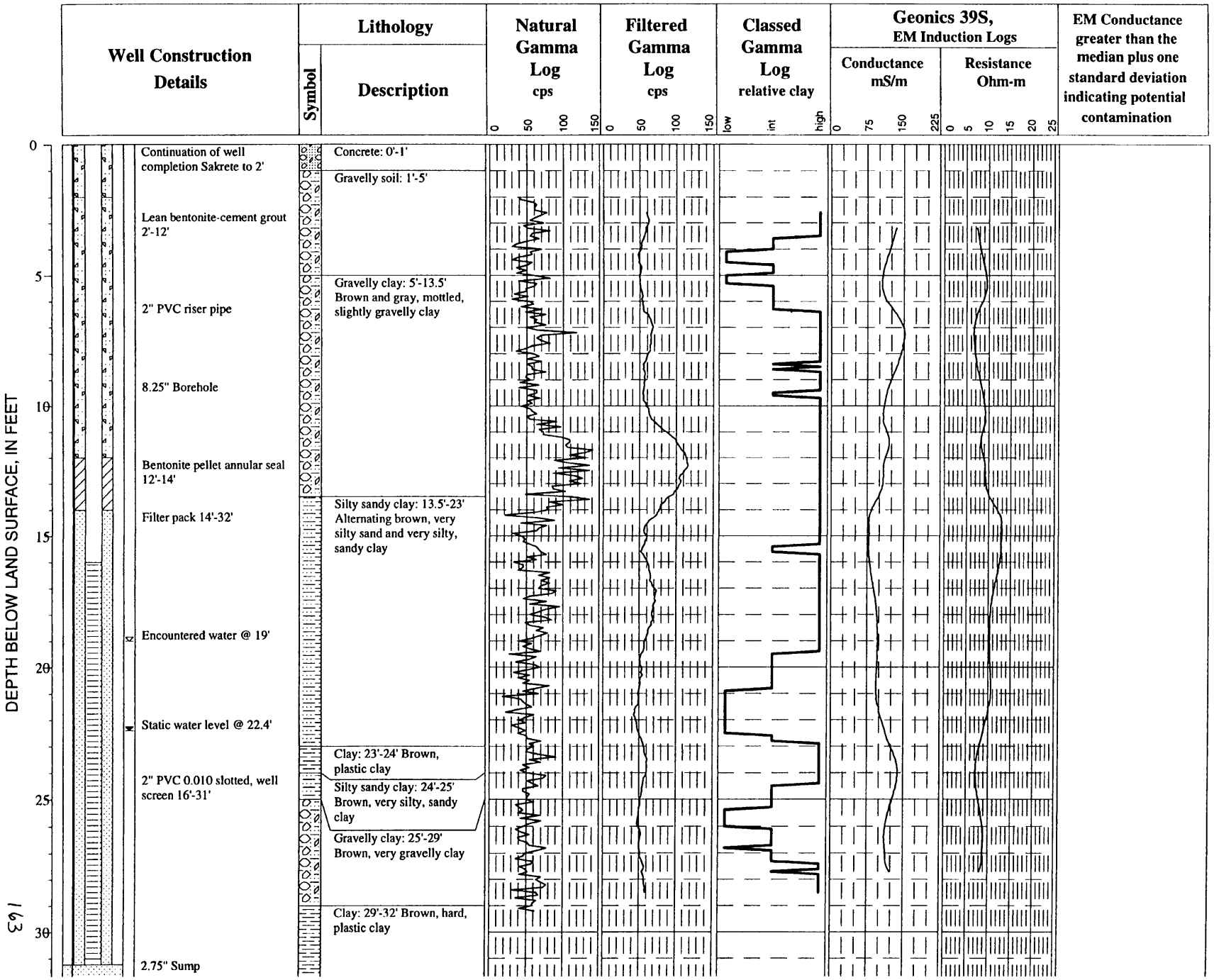
DWP-S1-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-15'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 15'-17'
Filter pack 17'-35'
Static water level @ 20'
Encountered water @ 22'
2" PVC 0.010 slotted, well screen 19'-34'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-4' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 4'-12' Orange-brown, mottled, slightly gravelly, plastic clay
Silty sandy clay: 12'-16' Orange-brown, slightly silty and sandy clay
Silty sandy clay: 16'-18' Orange-brown, slightly silty and sandy clay; thin (less than 1") sand zones throughout
Silty sandy clay: 18'-23.5' Alternating brown, slightly silty, sandy clay and very silty, sandy clay; thin (less than 1") sand zones present throughout; sand content generally increases with depth
Silty sandy gravelly clay: 23.5'-32' Brown, silty, sandy gravel and silty, gravelly clay

DWP-S1-3—Continued



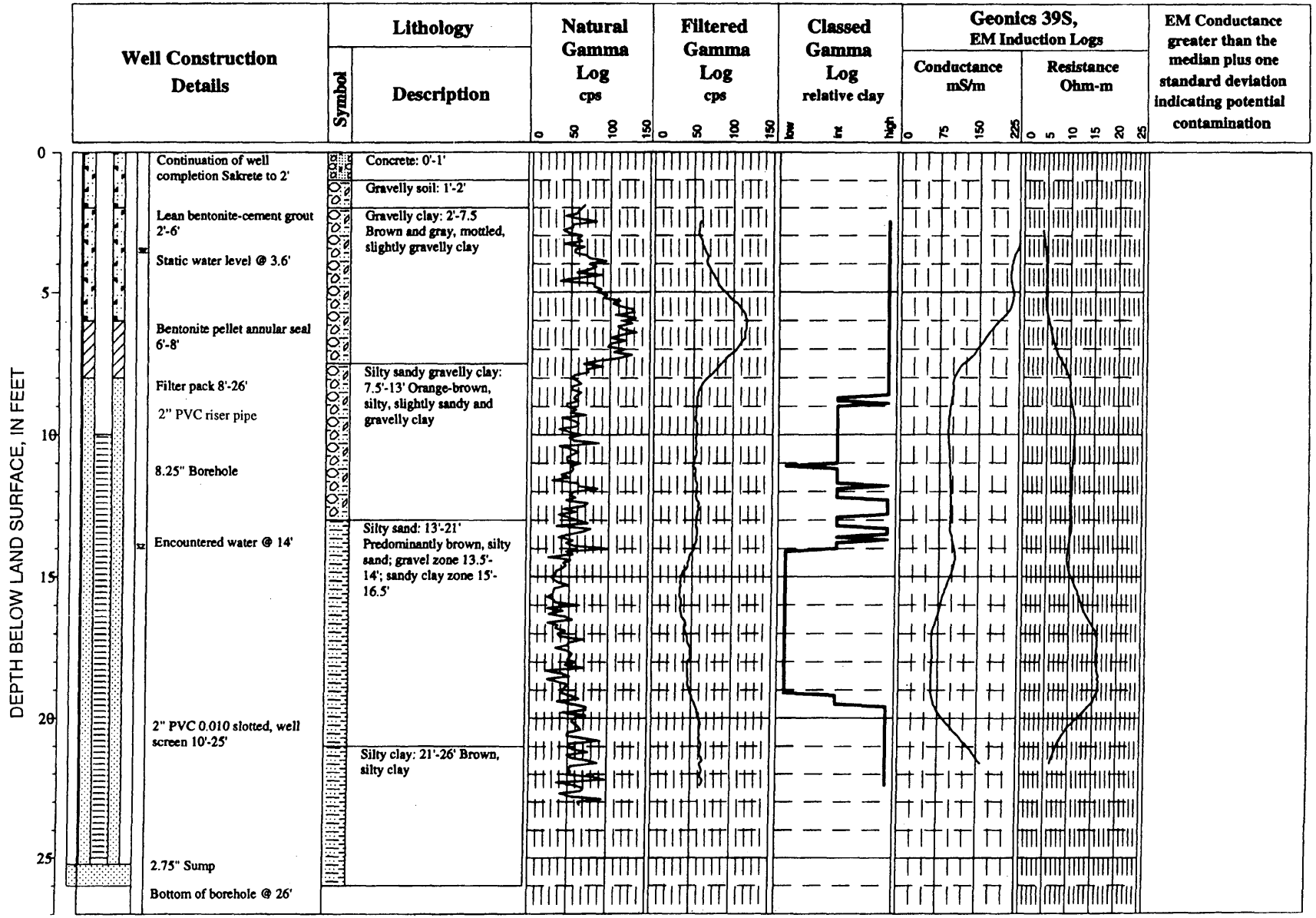
DWP-S1-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-12'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 12'-14'
Filter pack 14'-32'
Encountered water @ 19'
Static water level @ 22.4'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Concrete: 0'-1'
Gravelly soil: 1'-5'
Gravelly clay: 5'-13.5' Brown and gray, mottled, slightly gravelly clay
Silty sandy clay: 13.5'-23' Alternating brown, very silty sand and very silty, sandy clay
Clay: 23'-24' Brown, plastic clay
Silty sandy clay: 24'-25' Brown, very silty, sandy clay
Gravelly clay: 25'-29' Brown, very gravelly clay
Clay: 29'-32' Brown, hard, plastic clay
low
int
high

DWP-S1-4—Continued

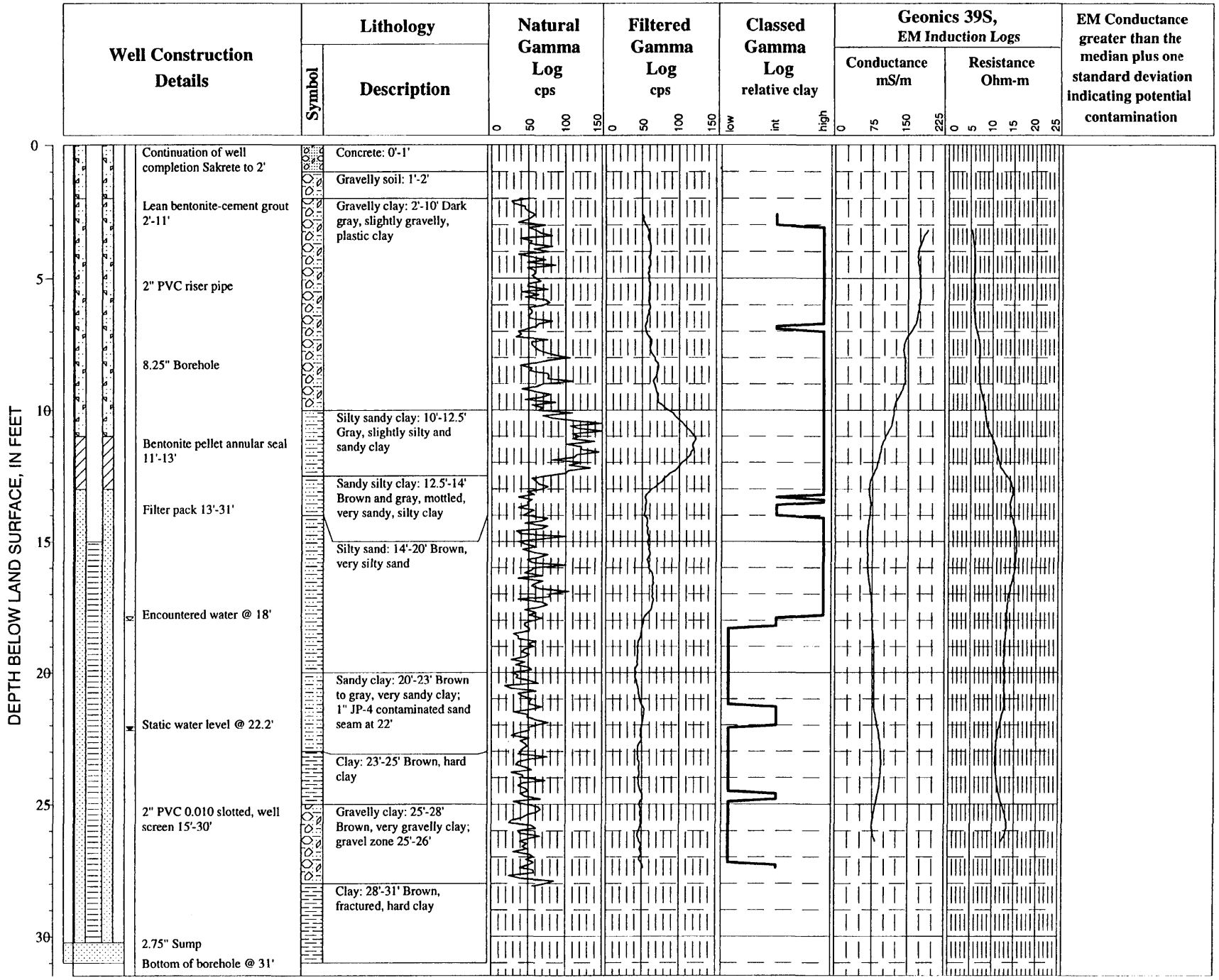
Well Construction Details	Lithology		Natural Gamma Log cps	Filtered Gamma Log cps	Classed Gamma Log relative clay	Geonics 39S, EM Induction Logs		EM Conductance greater than the median plus one standard deviation indicating potential contamination
	Symbol	Description				Conductance mS/m	Resistance Ohm-m	
			0 50 100 150	0 50 100 150	low int high	0 75 150 225	0 5 10 15 20 25	
Bottom of borehole @ 32'								

DWP-S1-5

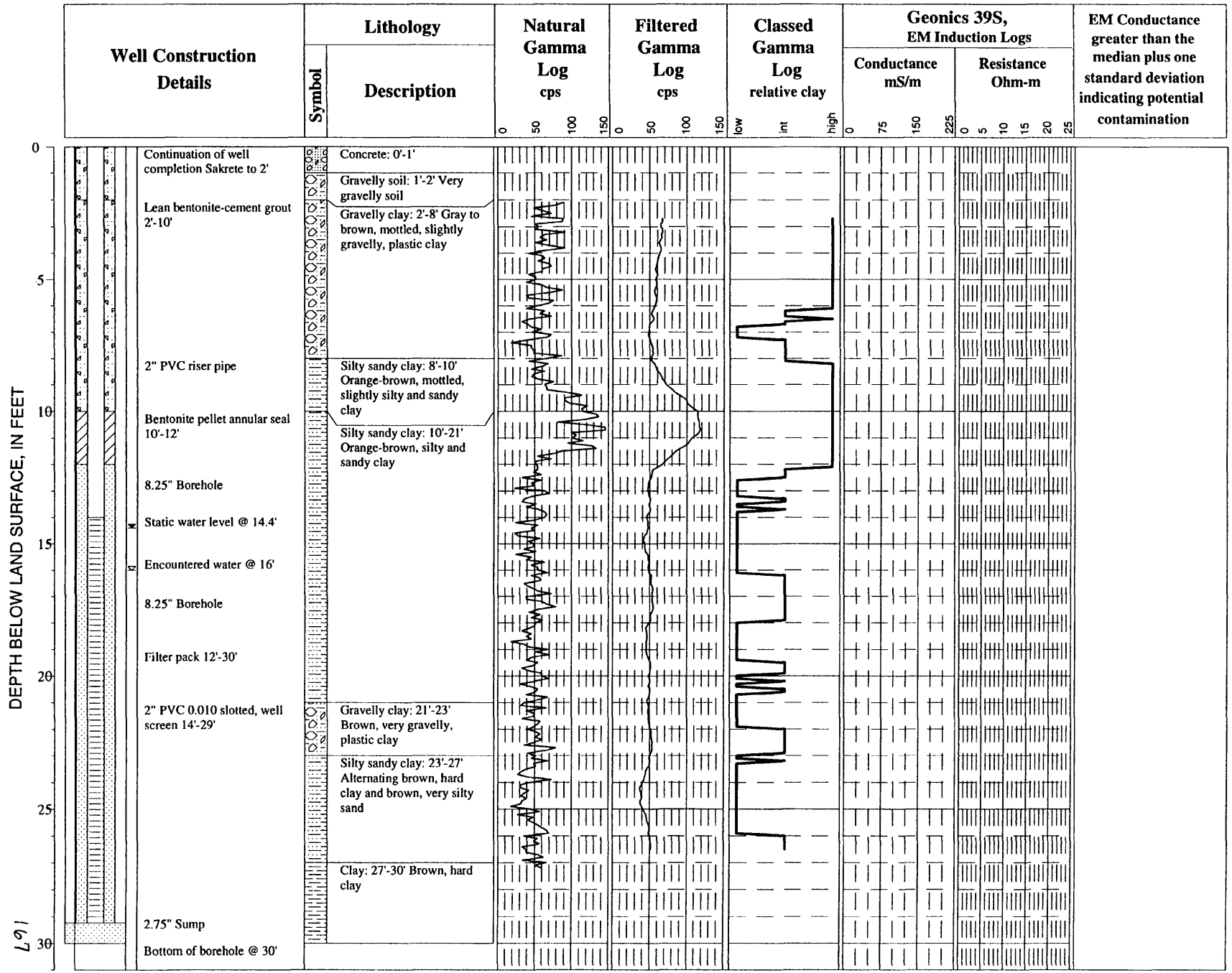

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Static water level @ 3.6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 14'
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-7.5 Brown and gray, mottled, slightly gravelly clay
Silty sandy gravelly clay: 7.5'-13' Orange-brown, silty, slightly sandy and gravelly clay
Silty sand: 13'-21' Predominantly brown, silty sand; gravel zone 13.5'-14'; sandy clay zone 15'-16.5'
Silty clay: 21'-26' Brown, silty clay
0
5
10
15
20
25
DEPTH BELOW LAND SURFACE, IN FEET

991

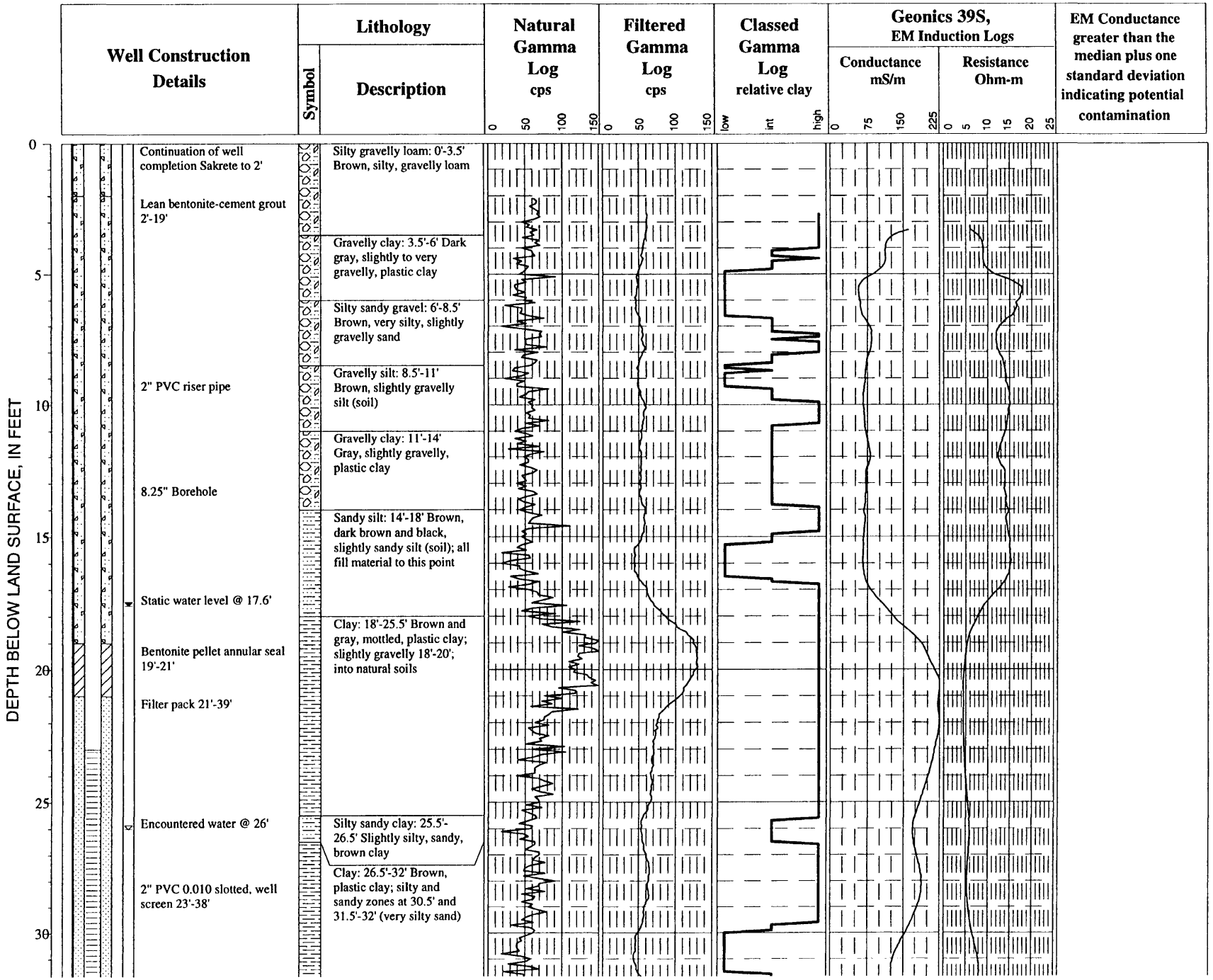
DWP-S1-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 11'-13'
Filter pack 13'-31'
Encountered water @ 18'
Static water level @ 22.2'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-10' Dark gray, slightly gravelly, plastic clay
Silty sandy clay: 10'-12.5' Gray, slightly silty and sandy clay
Sandy silty clay: 12.5'-14' Brown and gray, mottled, very sandy, silty clay
Silty sand: 14'-20' Brown, very silty sand
Sandy clay: 20'-23' Brown to gray, very sandy clay; 1" JP-4 contaminated sand seam at 22'
Clay: 23'-25' Brown, hard clay
Gravelly clay: 25'-28' Brown, very gravelly clay; gravel zone 25'-26'
Clay: 28'-31' Brown, fractured, hard clay
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

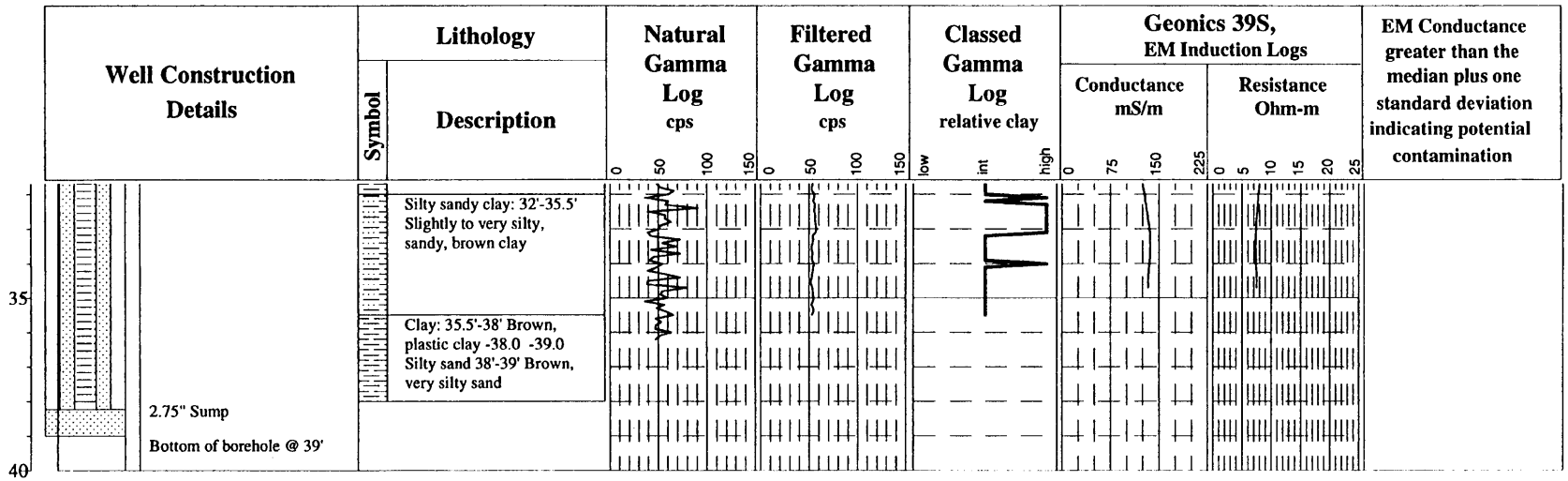
DWP-S1-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-10'
2" PVC riser pipe
Bentonite pellet annular seal 10'-12'
8.25" Borehole
Static water level @ 14.4'
Encountered water @ 16'
8.25" Borehole
Filter pack 12'-30'
2" PVC 0.010 slotted, well screen 14'-29'
2.75" Sump
Bottom of borehole @ 30'
Concrete: 0'-1'
Gravelly soil: 1'-2' Very gravelly soil
Gravelly clay: 2'-8' Gray to brown, mottled, slightly gravelly, plastic clay
Silty sandy clay: 8'-10' Orange-brown, mottled, slightly silty and sandy clay
Silty sandy clay: 10'-21' Orange-brown, silty and sandy clay
Gravelly clay: 21'-23' Brown, very gravelly, plastic clay
Silty sandy clay: 23'-27' Alternating brown, hard clay and brown, very silty sand
Clay: 27'-30' Brown, hard clay
low
int
high

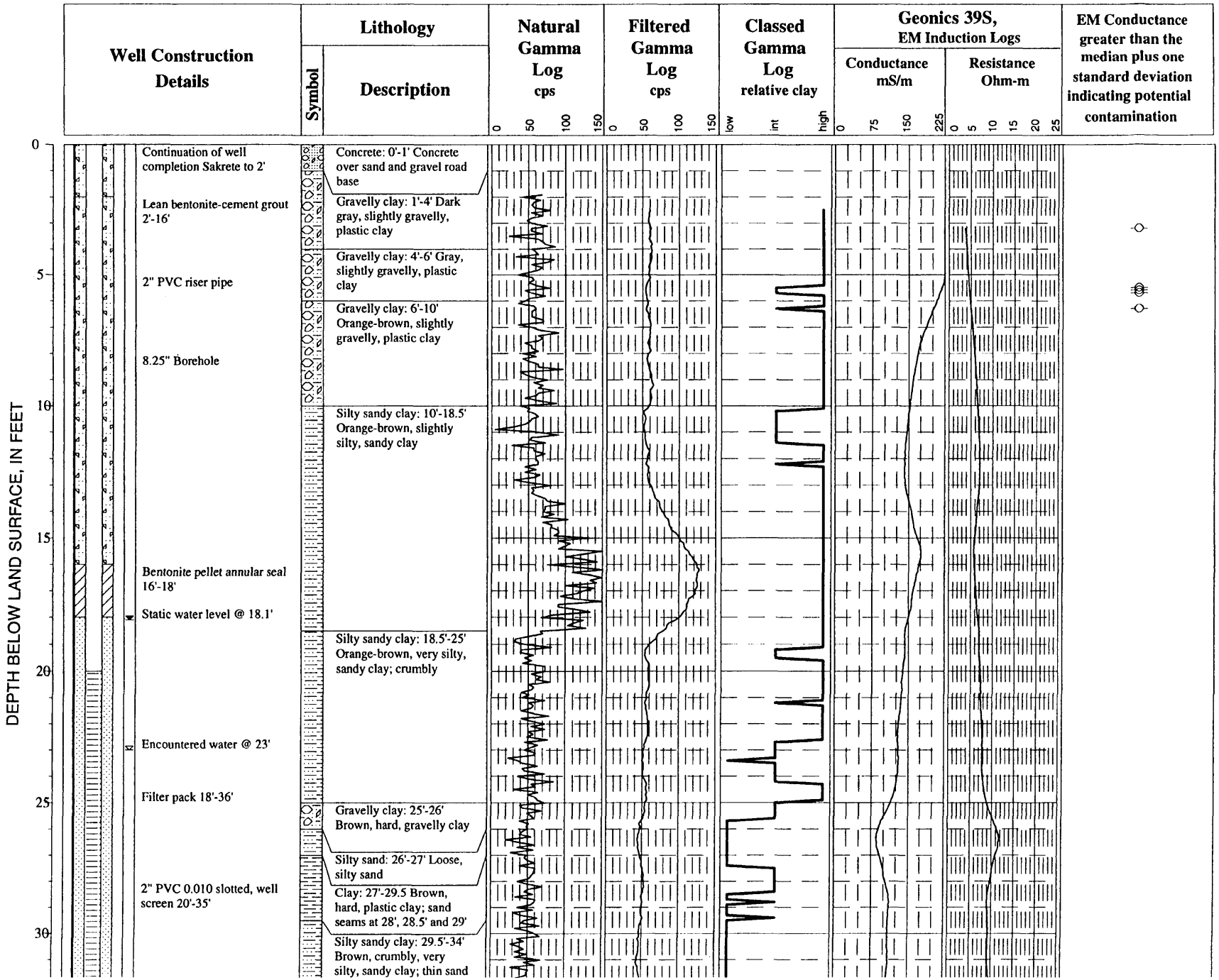
DWP-S1-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-19'
2" PVC riser pipe
8.25" Borehole
Static water level @ 17.6'
Bentonite pellet annular seal 19'-21'
Filter pack 21'-39'
Encountered water @ 26'
2" PVC 0.010 slotted, well screen 23'-38'
Silty gravelly loam: 0'-3.5' Brown, silty, gravelly loam
Gravelly clay: 3.5'-6' Dark gray, slightly to very gravelly, plastic clay
Silty sandy gravel: 6'-8.5' Brown, very silty, slightly gravelly sand
Gravelly silt: 8.5'-11' Brown, slightly gravelly silt (soil)
Gravelly clay: 11'-14' Gray, slightly gravelly, plastic clay
Sandy silt: 14'-18' Brown, dark brown and black, slightly sandy silt (soil); all fill material to this point
Clay: 18'-25.5' Brown and gray, mottled, plastic clay; slightly gravelly 18'-20'; into natural soils
Silty sandy clay: 25.5'-26.5' Slightly silty, sandy, brown clay
Clay: 26.5'-32' Brown, plastic clay; silty and sandy zones at 30.5' and 31.5'-32' (very silty sand)
0
5
10
15
20
25
30
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

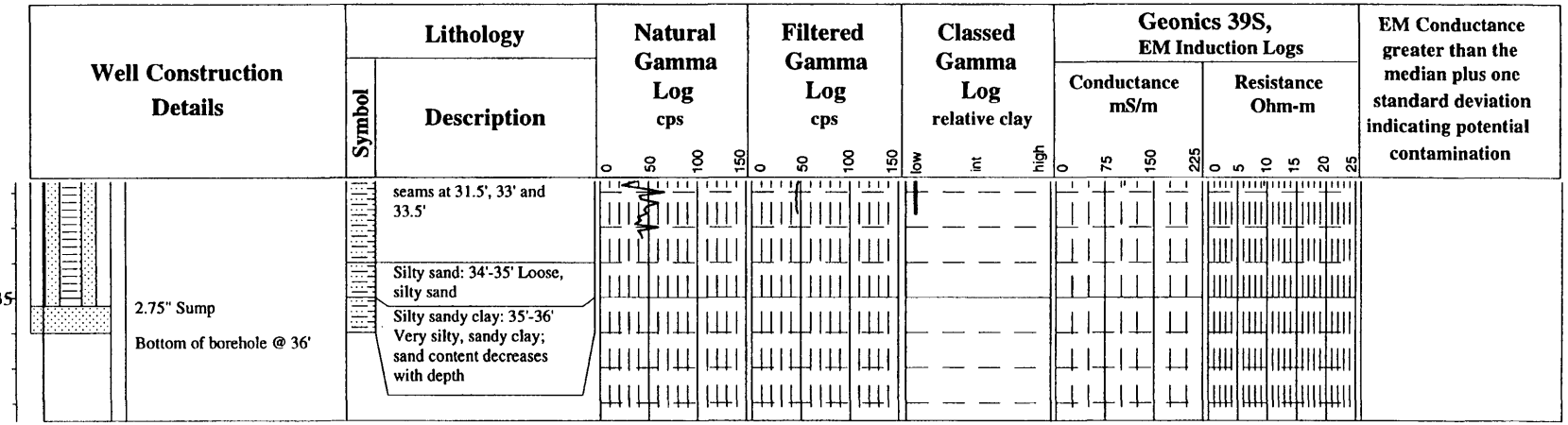
DWP-S1-11—Continued



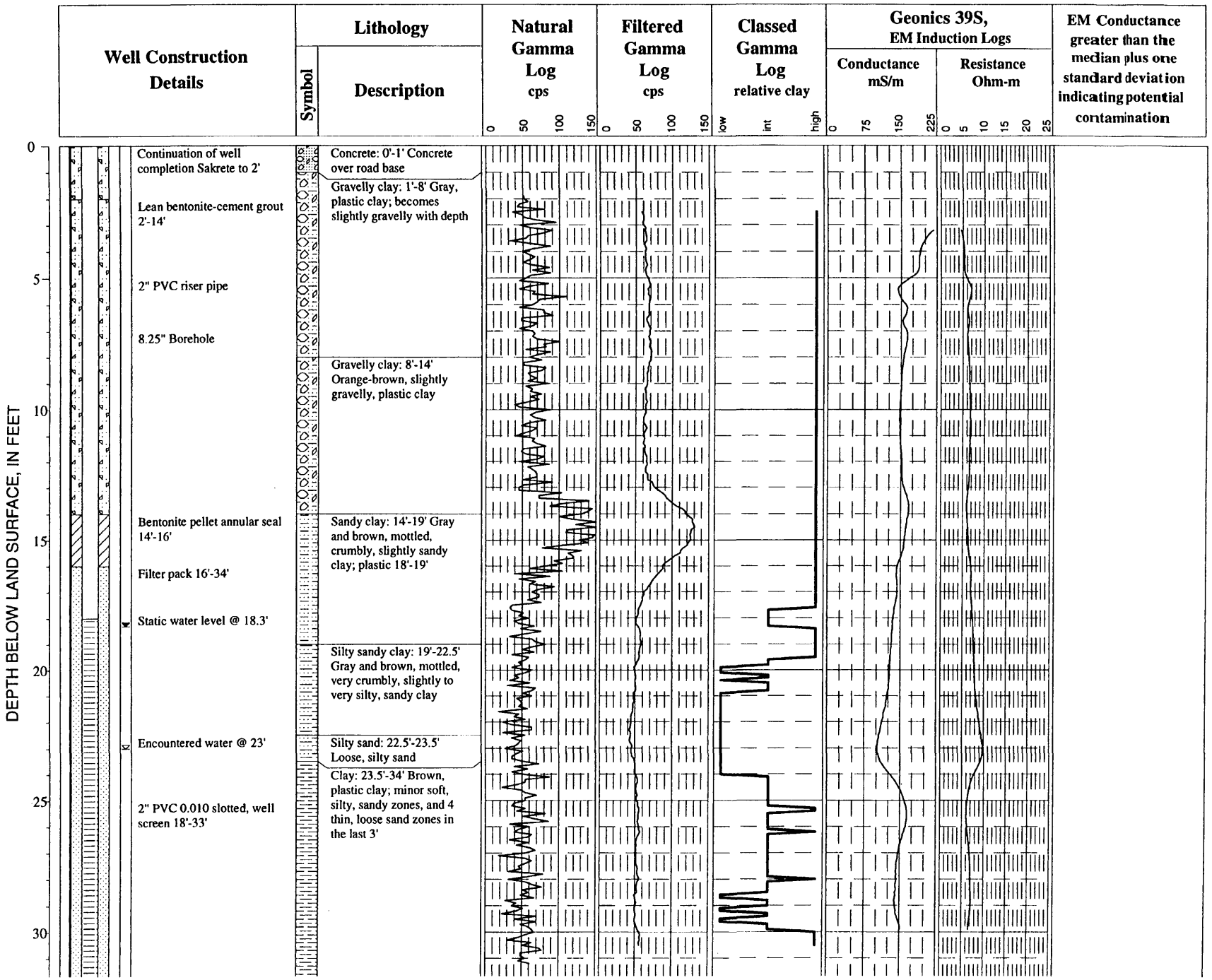
DWP-S1-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-16'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 16'-18'
Static water level @ 18.1'
Encountered water @ 23'
Filter pack 18'-36'
2" PVC 0.010 slotted, well screen 20'-35'
Concrete: 0'-1' Concrete over sand and gravel road base
Gravelly clay: 1'-4' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 4'-6' Gray, slightly gravelly, plastic clay
Gravelly clay: 6'-10' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 10'-18.5' Orange-brown, slightly silty, sandy clay
Silty sandy clay: 18.5'-25' Orange-brown, very silty, sandy clay; crumbly
Gravelly clay: 25'-26' Brown, hard, gravelly clay
Silty sand: 26'-27' Loose, silty sand
Clay: 27'-29.5 Brown, hard, plastic clay; sand seams at 28', 28.5' and 29'
Silty sandy clay: 29.5'-34' Brown, crumbly, very silty, sandy clay; thin sand

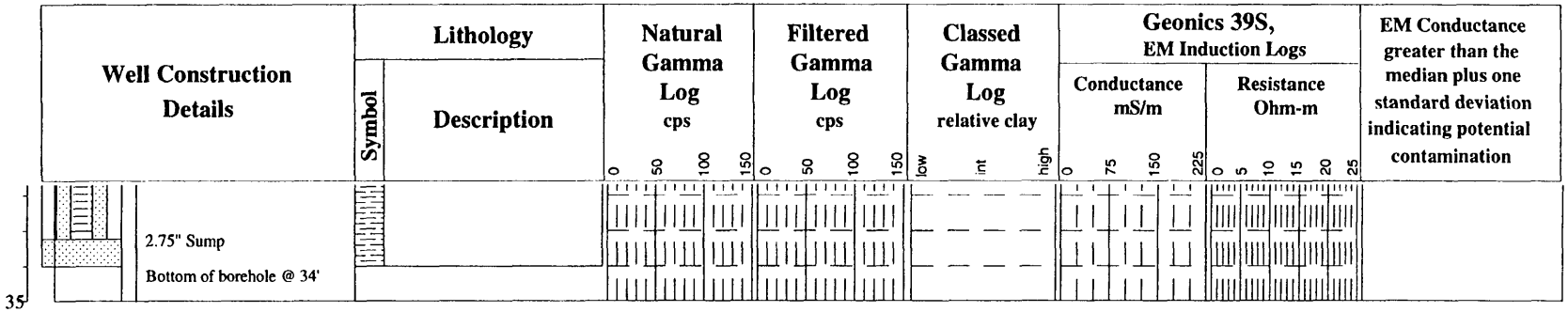
DWP-S1-12—Continued



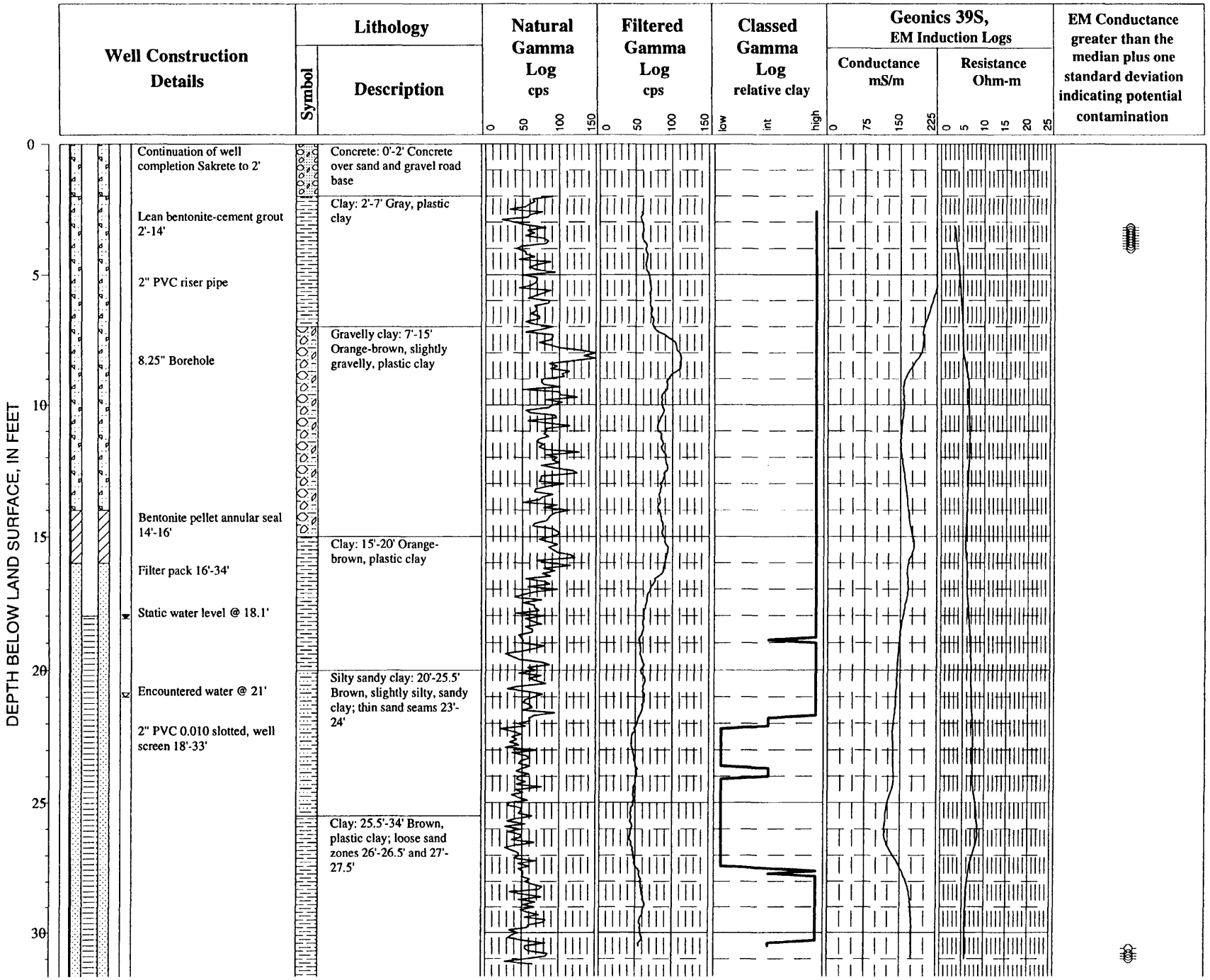
DWP-S1-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Static water level @ 18.3'
Encountered water @ 23'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-1' Concrete over road base
Gravelly clay: 1'-8' Gray, plastic clay; becomes slightly gravelly with depth
Gravelly clay: 8'-14' Orange-brown, slightly gravelly, plastic clay
Sandy clay: 14'-19' Gray and brown, mottled, crumbly, slightly sandy clay; plastic 18'-19'
Silty sandy clay: 19'-22.5' Gray and brown, mottled, very crumbly, slightly to very silty, sandy clay
Silty sand: 22.5'-23.5' Loose, silty sand
Clay: 23.5'-34' Brown, plastic clay; minor soft, silty, sandy zones, and 4 thin, loose sand zones in the last 3'
low
int
high

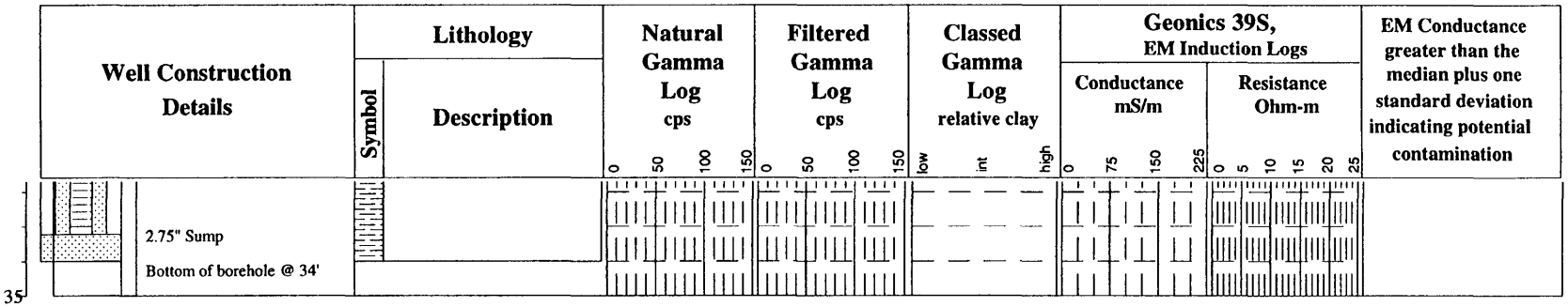
DWP-S1-13—Continued



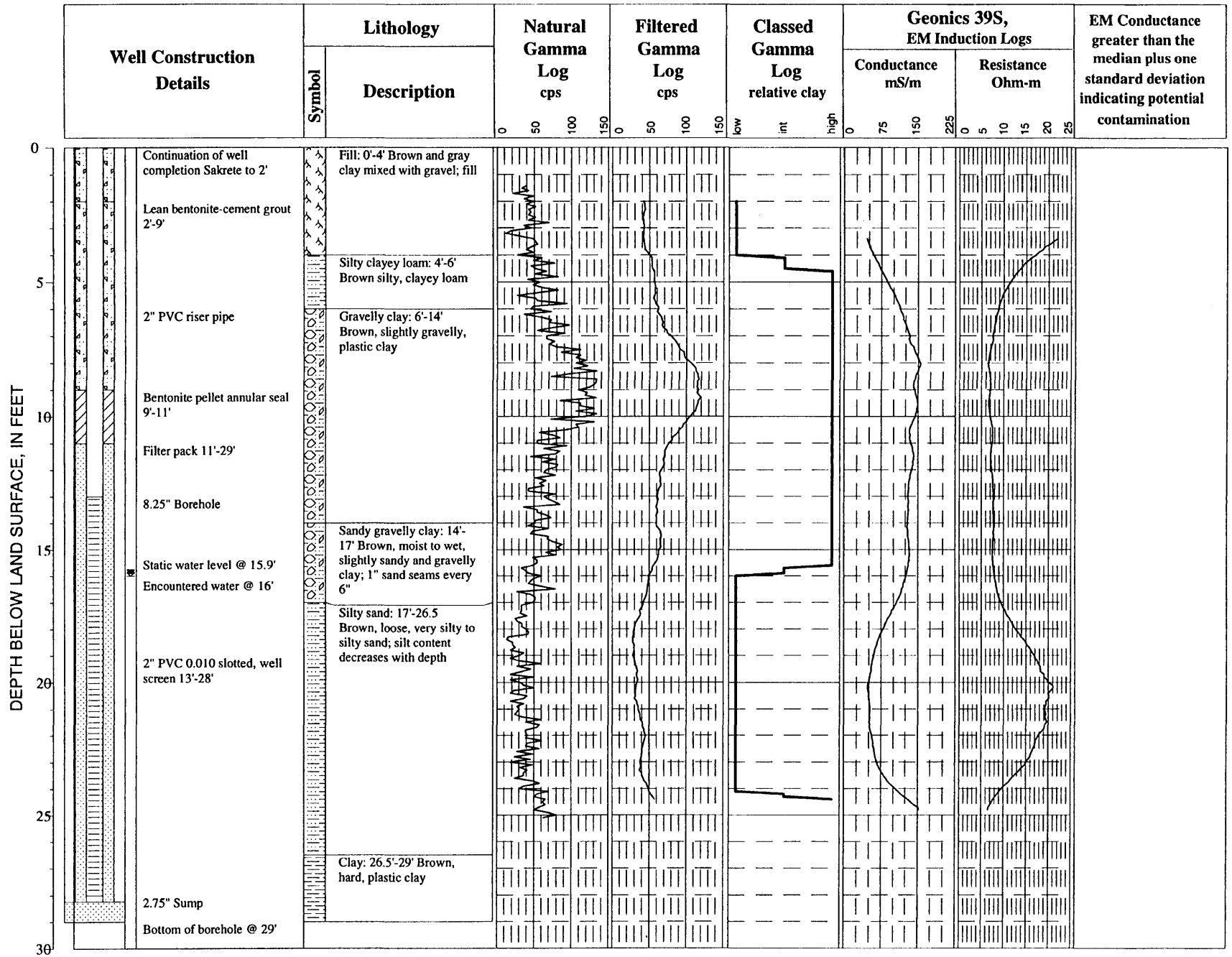
DWP-S1-15


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Static water level @ 18.1'
Encountered water @ 21'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-2' Concrete over sand and gravel road base
Clay: 2'-7' Gray, plastic clay
Gravelly clay: 7'-15' Orange-brown, slightly gravelly, plastic clay
Clay: 15'-20' Orange-brown, plastic clay
Silty sandy clay: 20'-25.5' Brown, slightly silty, sandy clay; thin sand seams 23'-24'
Clay: 25.5'-34' Brown, plastic clay; loose sand zones 26'-26.5' and 27'-27.5'

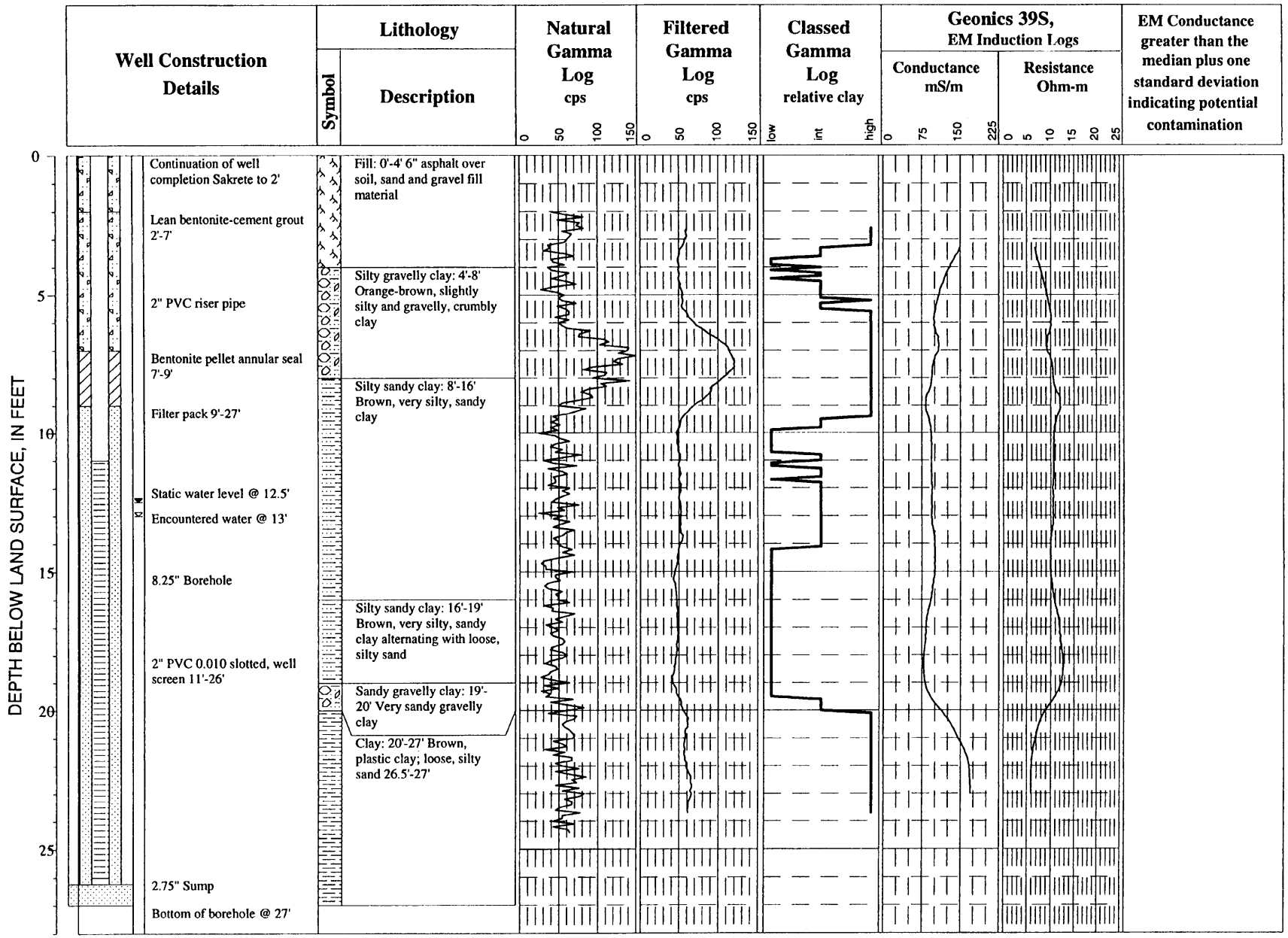
DWP-S1-15—Continued



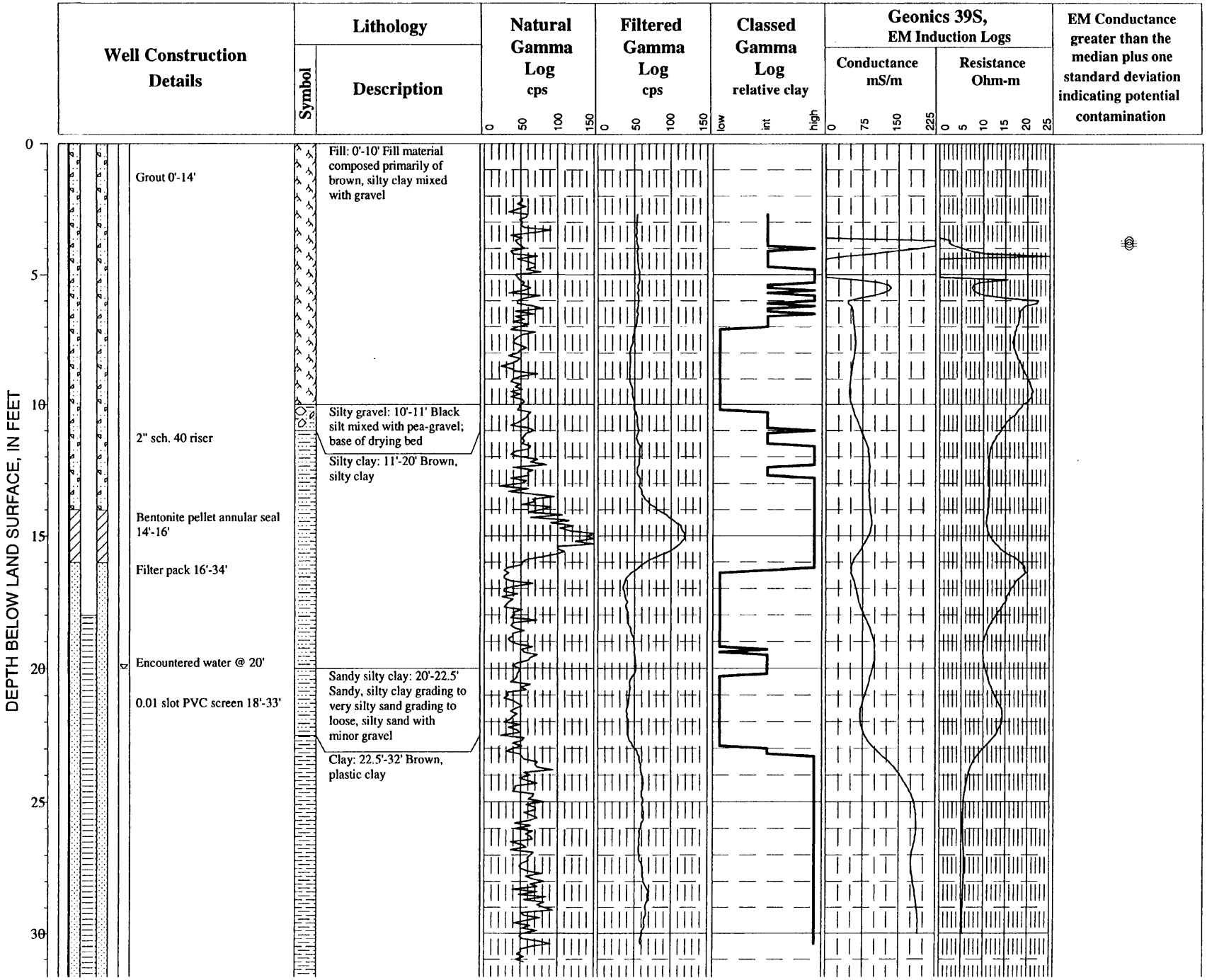
DWP-S1-16


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Static water level @ 15.9'
Encountered water @ 16'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-4' Brown and gray clay mixed with gravel; fill
Silty clayey loam: 4'-6' Brown silty, clayey loam
Gravelly clay: 6'-14' Brown, slightly gravelly, plastic clay
Sandy gravelly clay: 14'-17' Brown, moist to wet, slightly sandy and gravelly clay; 1" sand seams every 6"
Silty sand: 17'-26.5 Brown, loose, very silty to silty sand; silt content decreases with depth
Clay: 26.5'-29' Brown, hard, plastic clay

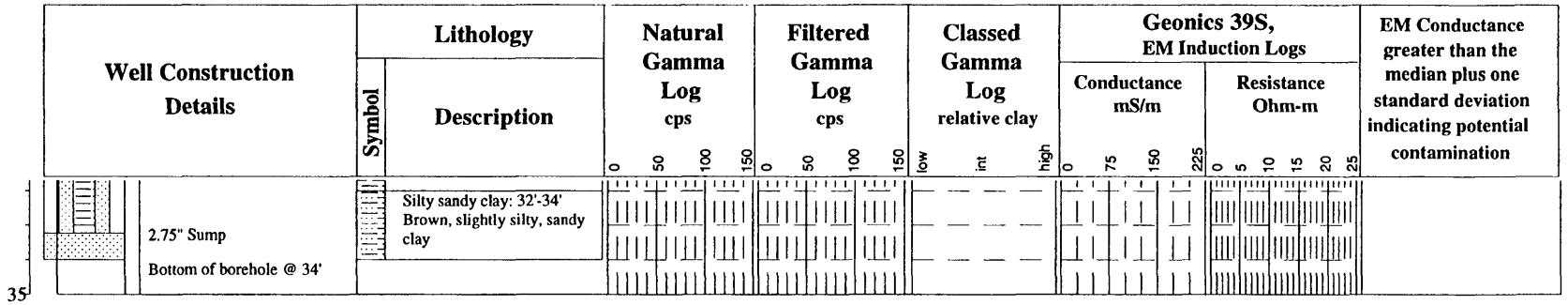
DWP-S1-18


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
Static water level @ 12.5'
Encountered water @ 13'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Fill: 0'-4' 6" asphalt over soil, sand and gravel fill material
Silty gravelly clay: 4'-8' Orange-brown, slightly silty and gravelly, crumbly clay
Silty sandy clay: 8'-16' Brown, very silty, sandy clay
Silty sandy clay: 16'-19' Brown, very silty, sandy clay alternating with loose, silty sand
Sandy gravelly clay: 19'-20' Very sandy gravelly clay
Clay: 20'-27' Brown, plastic clay; loose, silty sand 26.5'-27'

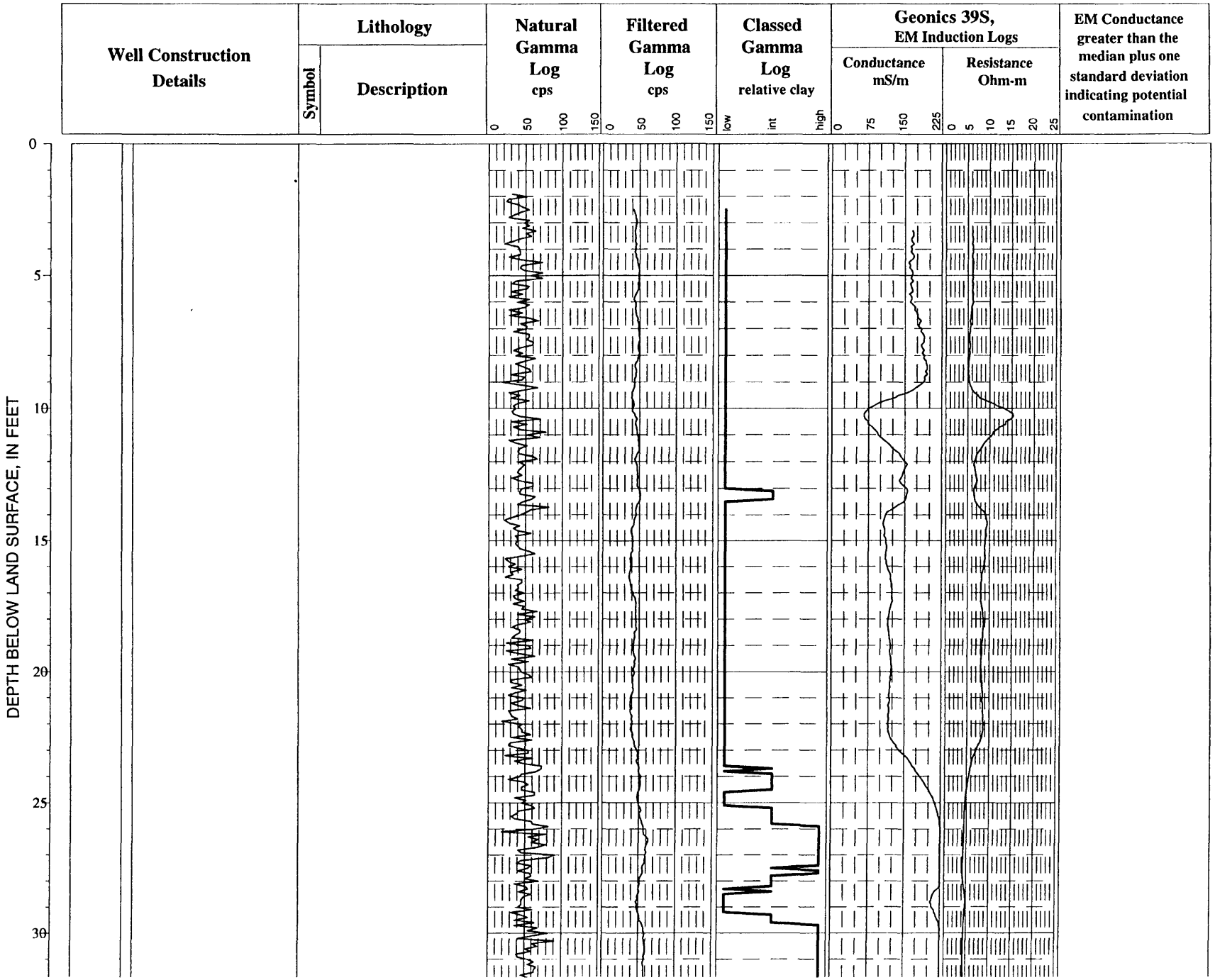
DWP-S1-24


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Grout 0'-14'
2" sch. 40 riser
Bentonite pellet annular seal 14'-16'
Filter pack 16'-34'
Encountered water @ 20'
0.01 slot PVC screen 18'-33'
Fill: 0'-10' Fill material composed primarily of brown, silty clay mixed with gravel
Silty gravel: 10'-11' Black silt mixed with pea-gravel; base of drying bed
Silty clay: 11'-20' Brown, silty clay
Sandy silty clay: 20'-22.5' Sandy, silty clay grading to very silty sand grading to loose, silty sand with minor gravel
Clay: 22.5'-32' Brown, plastic clay

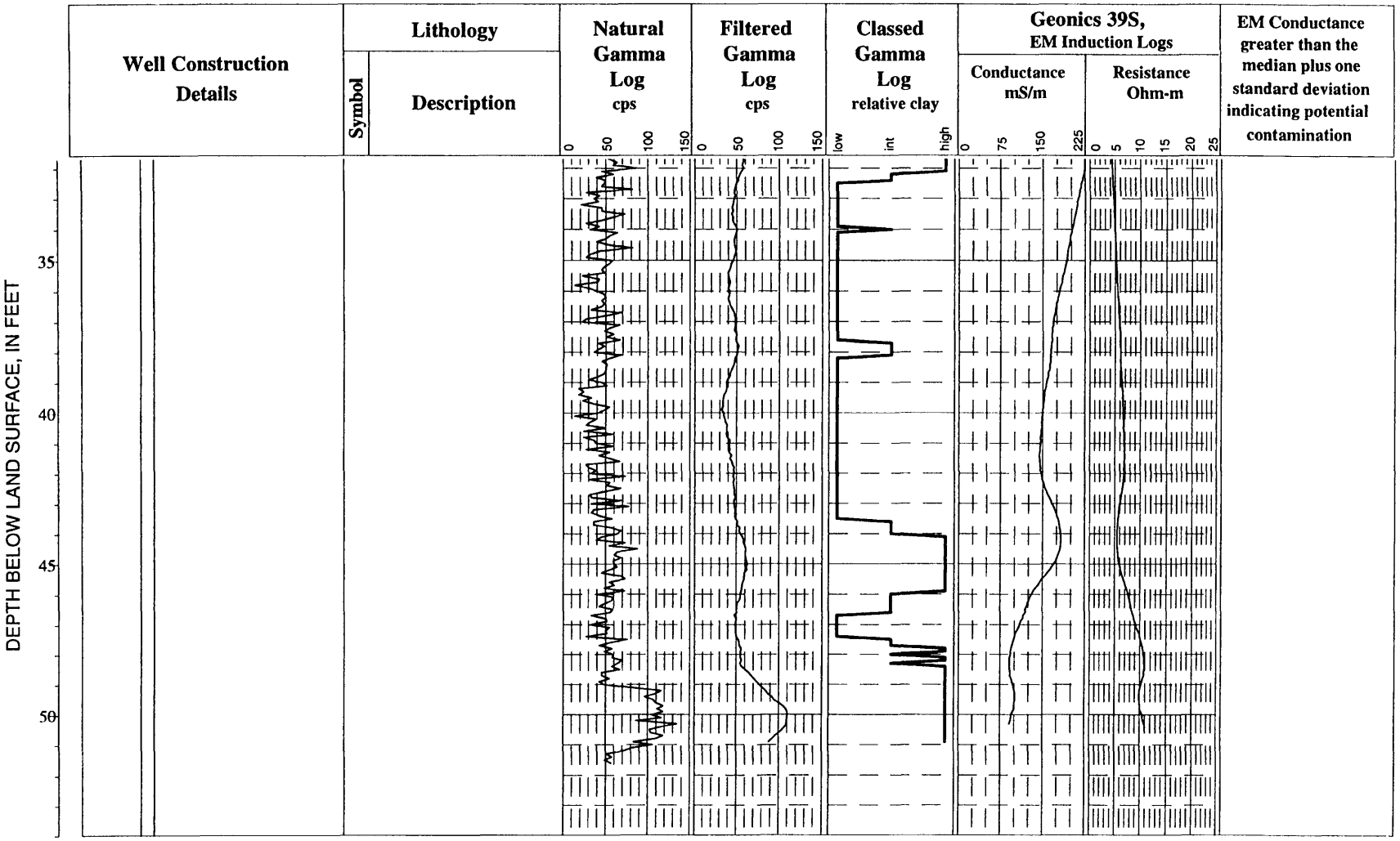
DWP-S1-24—Continued



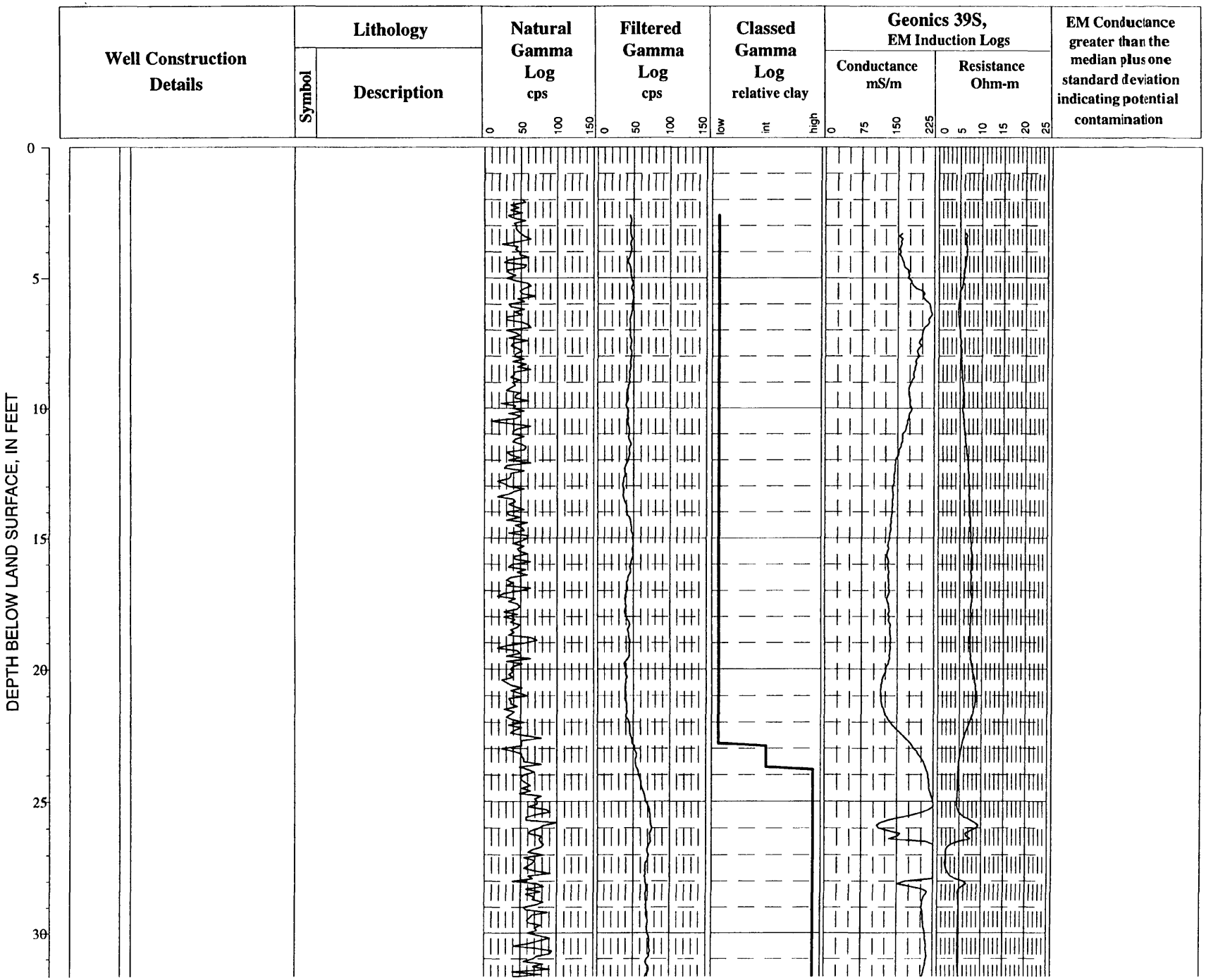
DWP-S1-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0
50
100
150
Filtered Gamma Log
cps
0
50
100
150
Classed Gamma Log
relative clay
low
int
high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0
75
150
225
Resistance
Ohm-m
0
5
10
15
20
25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30

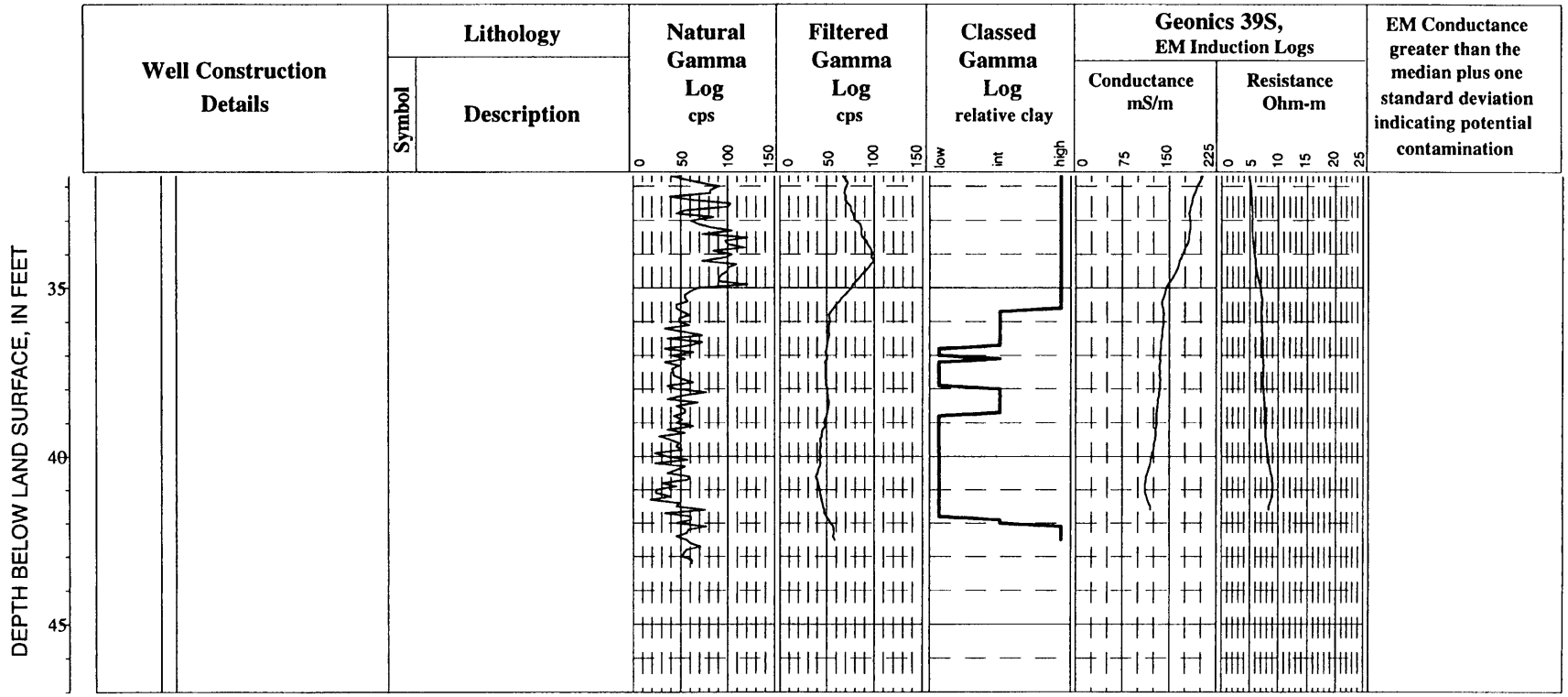
DWP-S1-DW1—Continued



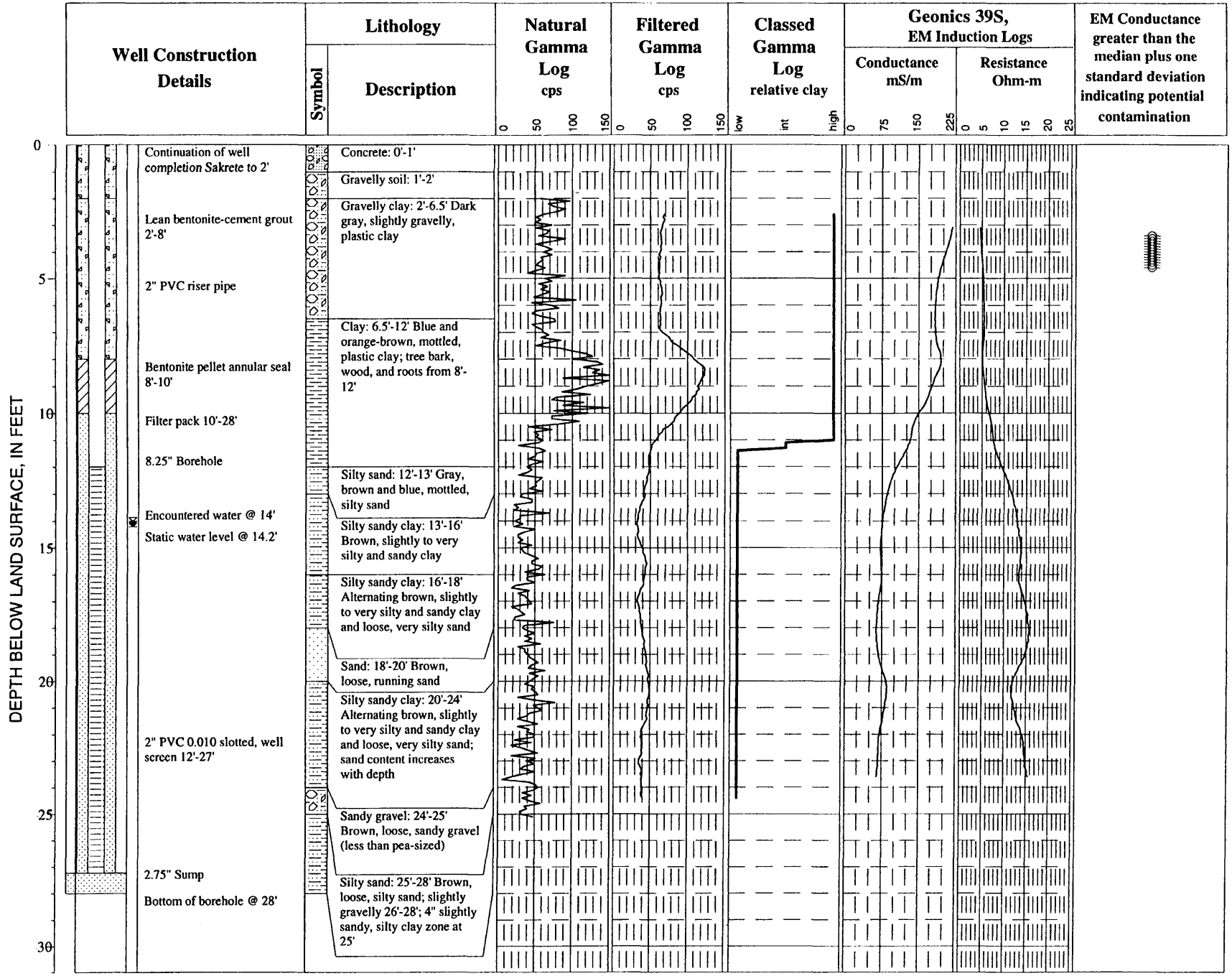
DWP-S1-DW2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
0 50 100 150
Filtered Gamma Log cps
0 50 100 150
Classed Gamma Log relative clay
low int high
Geonics 39S, EM Induction Logs
Conductance mS/m
0 75 150 225
Resistance Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30

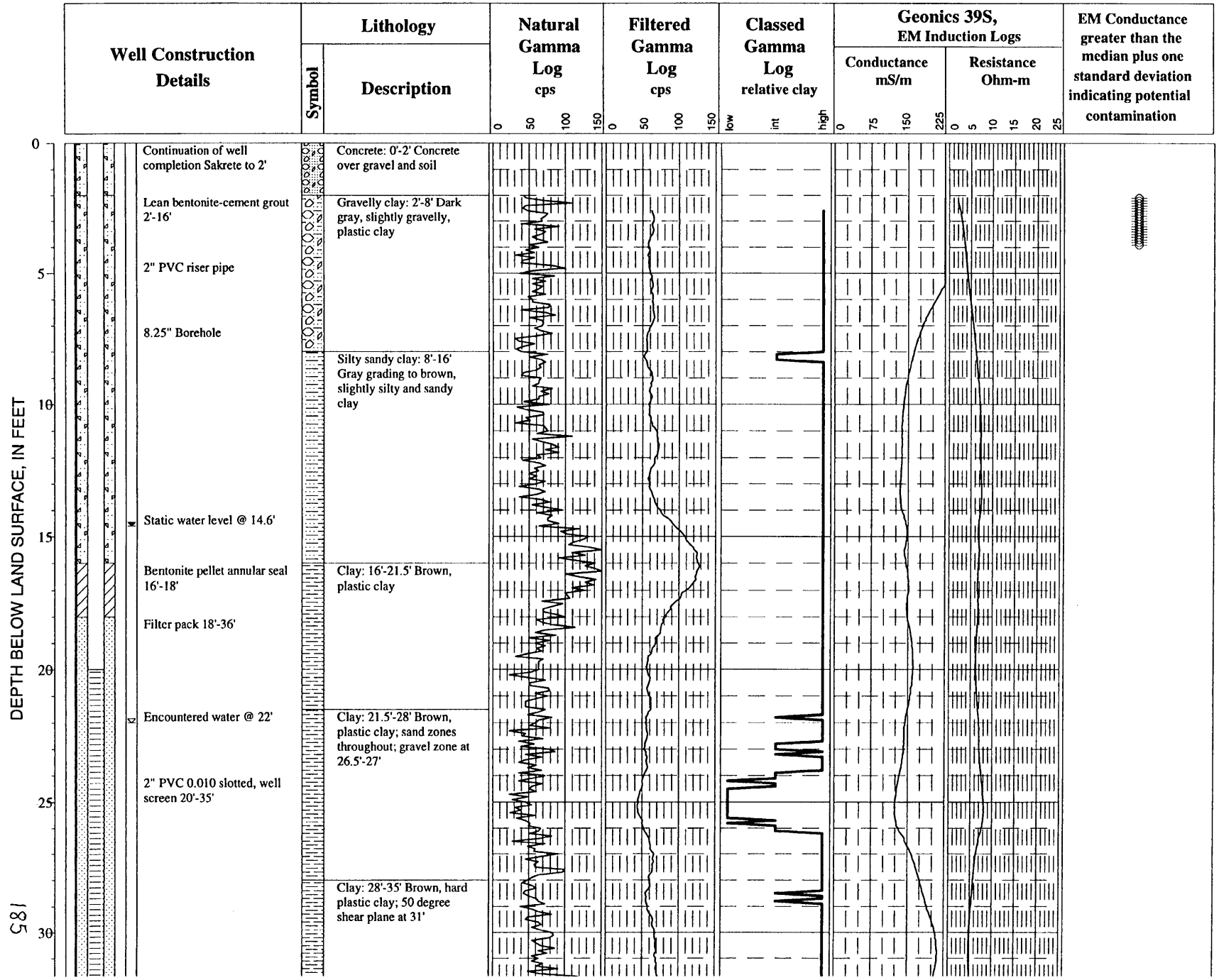
DWP-S1-DW2—Continued



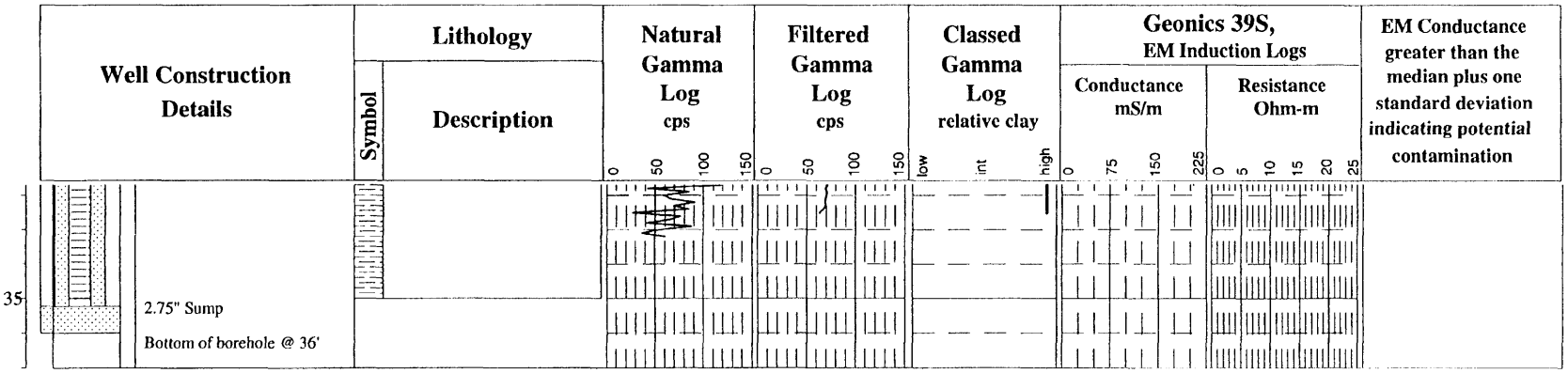
DWP-S2-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-8'
2" PVC riser pipe
Bentonite pellet annular seal 8'-10'
Filter pack 10'-28'
8.25" Borehole
Encountered water @ 14'
Static water level @ 14.2'
2" PVC 0.010 slotted, well screen 12'-27'
2.75" Sump
Bottom of borehole @ 28'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-6.5' Dark gray, slightly gravelly, plastic clay
Clay: 6.5'-12' Blue and orange-brown, mottled, plastic clay; tree bark, wood, and roots from 8'-12'
Silty sand: 12'-13' Gray, brown and blue, mottled, silty sand
Silty sandy clay: 13'-16' Brown, slightly to very silty and sandy clay
Silty sandy clay: 16'-18' Alternating brown, slightly to very silty and sandy clay and loose, very silty sand
Sand: 18'-20' Brown, loose, running sand
Silty sandy clay: 20'-24' Alternating brown, slightly to very silty and sandy clay and loose, very silty sand; sand content increases with depth
Sandy gravel: 24'-25' Brown, loose, sandy gravel (less than pea-sized)
Silty sand: 25'-28' Brown, loose, silty sand; slightly gravelly 26'-28'; 4" slightly sandy, silty clay zone at 25'
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

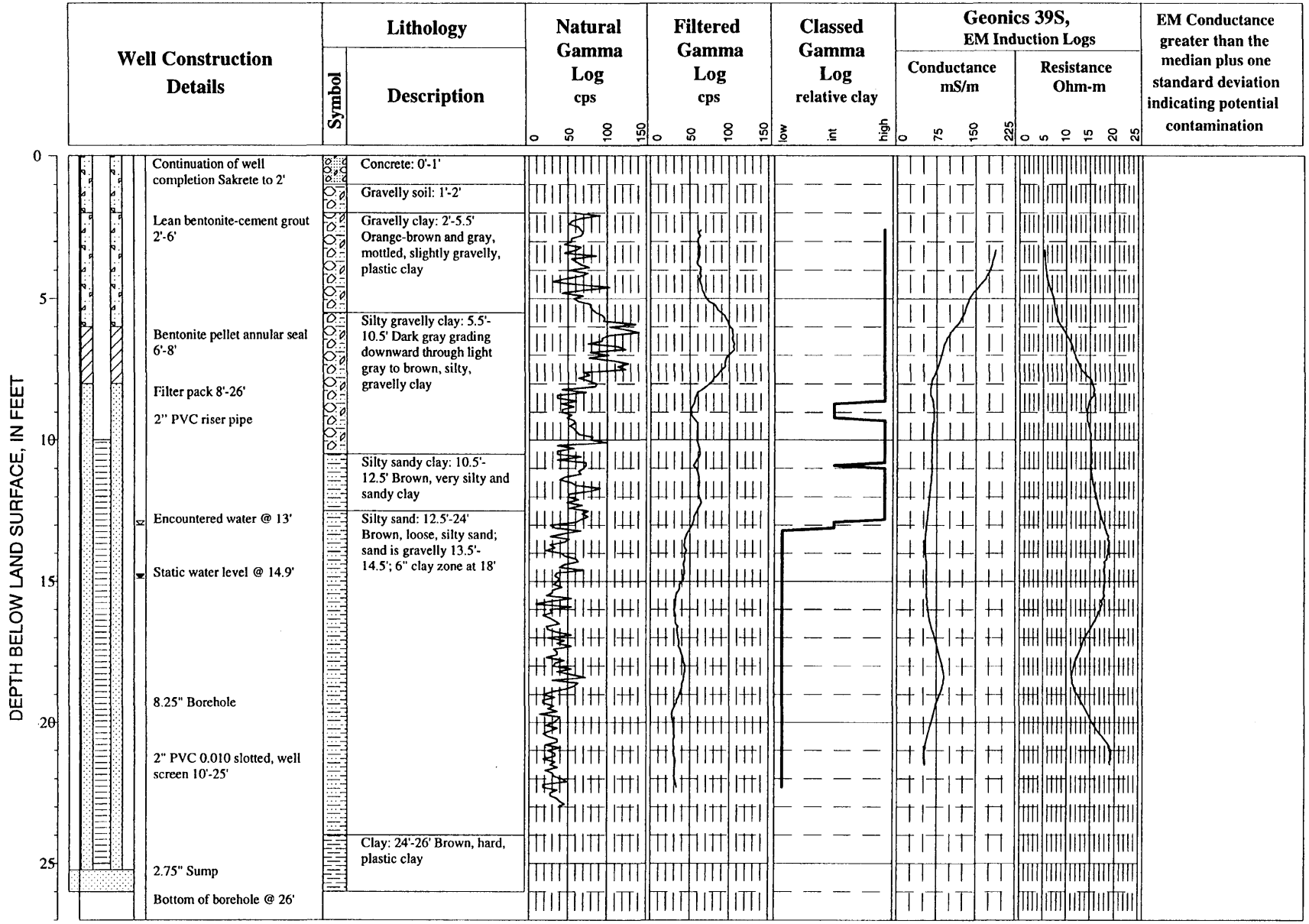
DWP-S2-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-16'
2" PVC riser pipe
8.25" Borehole
Static water level @ 14.6'
Bentonite pellet annular seal 16'-18'
Filter pack 18'-36'
Encountered water @ 22'
2" PVC 0.010 slotted, well screen 20'-35'
Concrete: 0'-2' Concrete over gravel and soil
Gravelly clay: 2'-8' Dark gray, slightly gravelly, plastic clay
Silty sandy clay: 8'-16' Gray grading to brown, slightly silty and sandy clay
Clay: 16'-21.5' Brown, plastic clay
Clay: 21.5'-28' Brown, plastic clay; sand zones throughout; gravel zone at 26.5'-27'
Clay: 28'-35' Brown, hard plastic clay; 50 degree shear plane at 31'

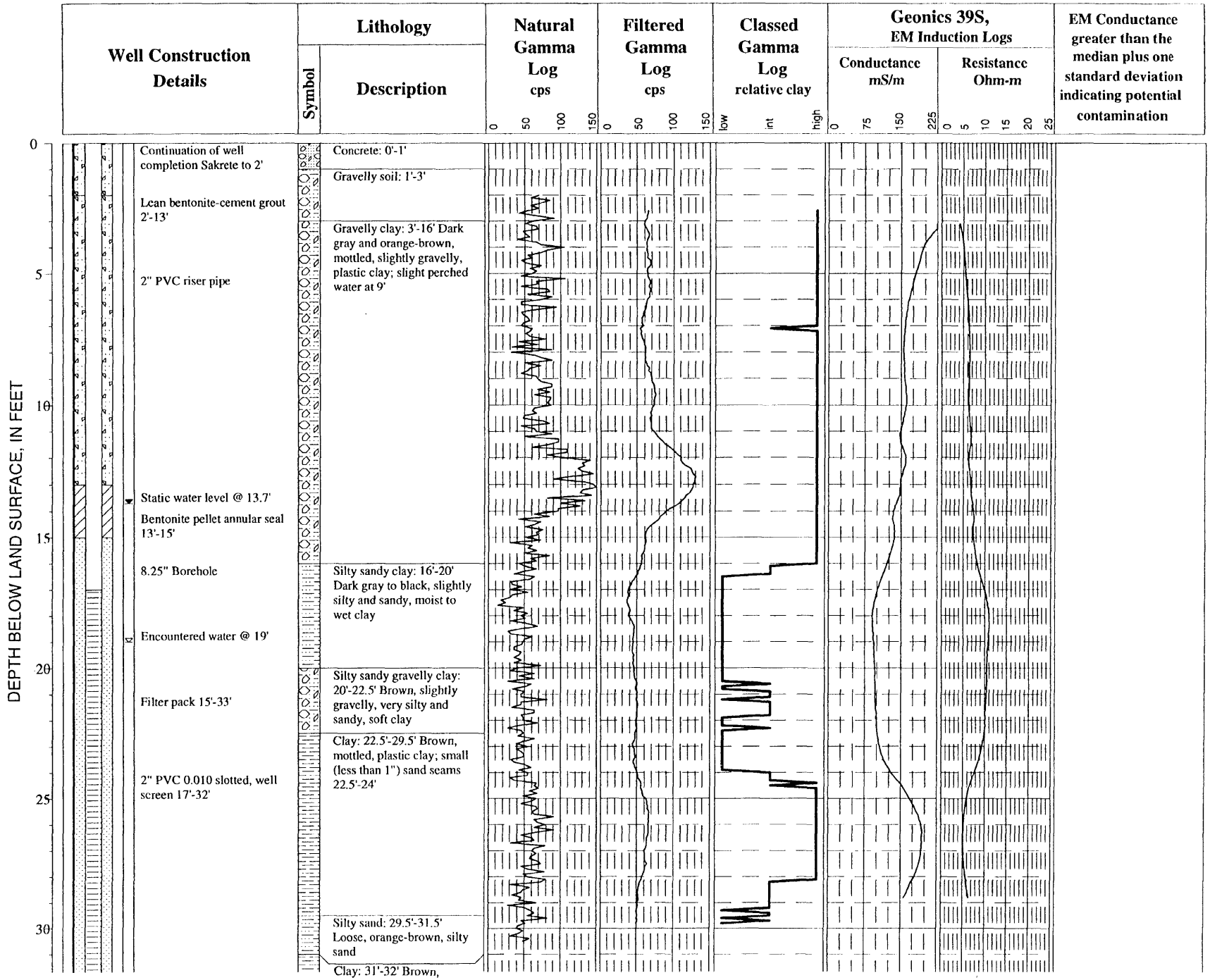
DWP-S2-2—Continued



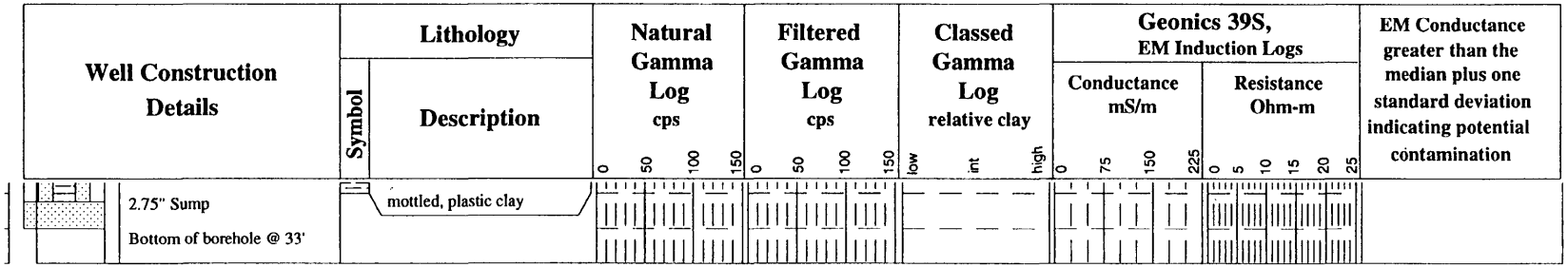
DWP-S2-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
Encountered water @ 13'
Static water level @ 14.9'
8.25" Borehole
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-5.5' Orange-brown and gray, mottled, slightly gravelly, plastic clay
Silty gravelly clay: 5.5'-10.5' Dark gray grading downward through light gray to brown, silty, gravelly clay
Silty sandy clay: 10.5'-12.5' Brown, very silty and sandy clay
Silty sand: 12.5'-24' Brown, loose, silty sand; sand is gravelly 13.5'-14.5'; 6" clay zone at 18'
Clay: 24'-26' Brown, hard, plastic clay

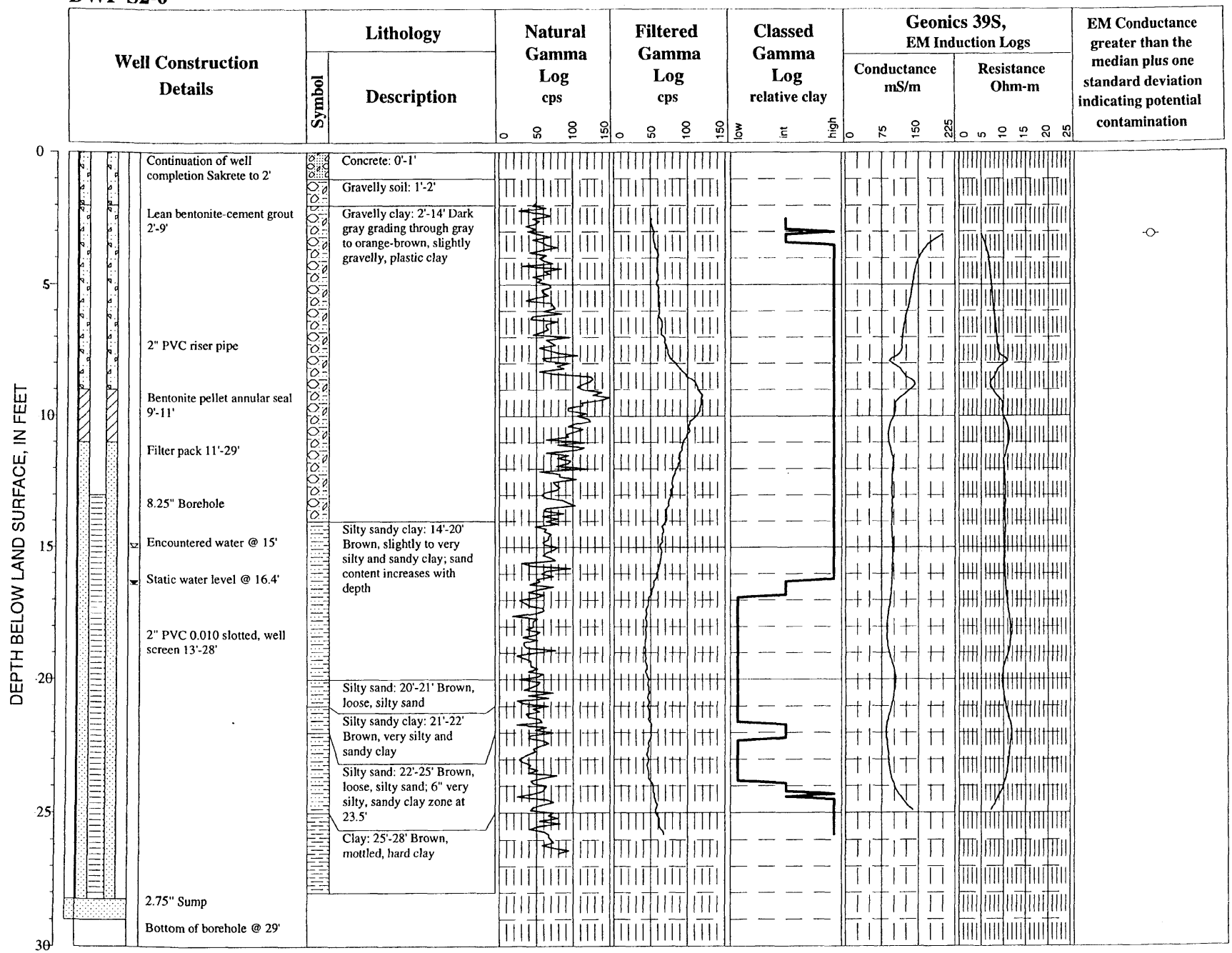
DWP-S2-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-13'
2" PVC riser pipe
Static water level @ 13.7'
Bentonite pellet annular seal 13'-15'
8.25" Borehole
Encountered water @ 19'
Filter pack 15'-33'
2" PVC 0.010 slotted, well screen 17'-32'
Concrete: 0'-1'
Gravelly soil: 1'-3'
Gravelly clay: 3'-16' Dark gray and orange-brown, mottled, slightly gravelly, plastic clay; slight perched water at 9'
Silty sandy clay: 16'-20' Dark gray to black, slightly silty and sandy, moist to wet clay
Silty sandy gravelly clay: 20'-22.5' Brown, slightly gravelly, very silty and sandy, soft clay
Clay: 22.5'-29.5' Brown, mottled, plastic clay; small (less than 1") sand seams 22.5'-24'
Silty sand: 29.5'-31.5' Loose, orange-brown, silty sand
Clay: 31'-32' Brown,

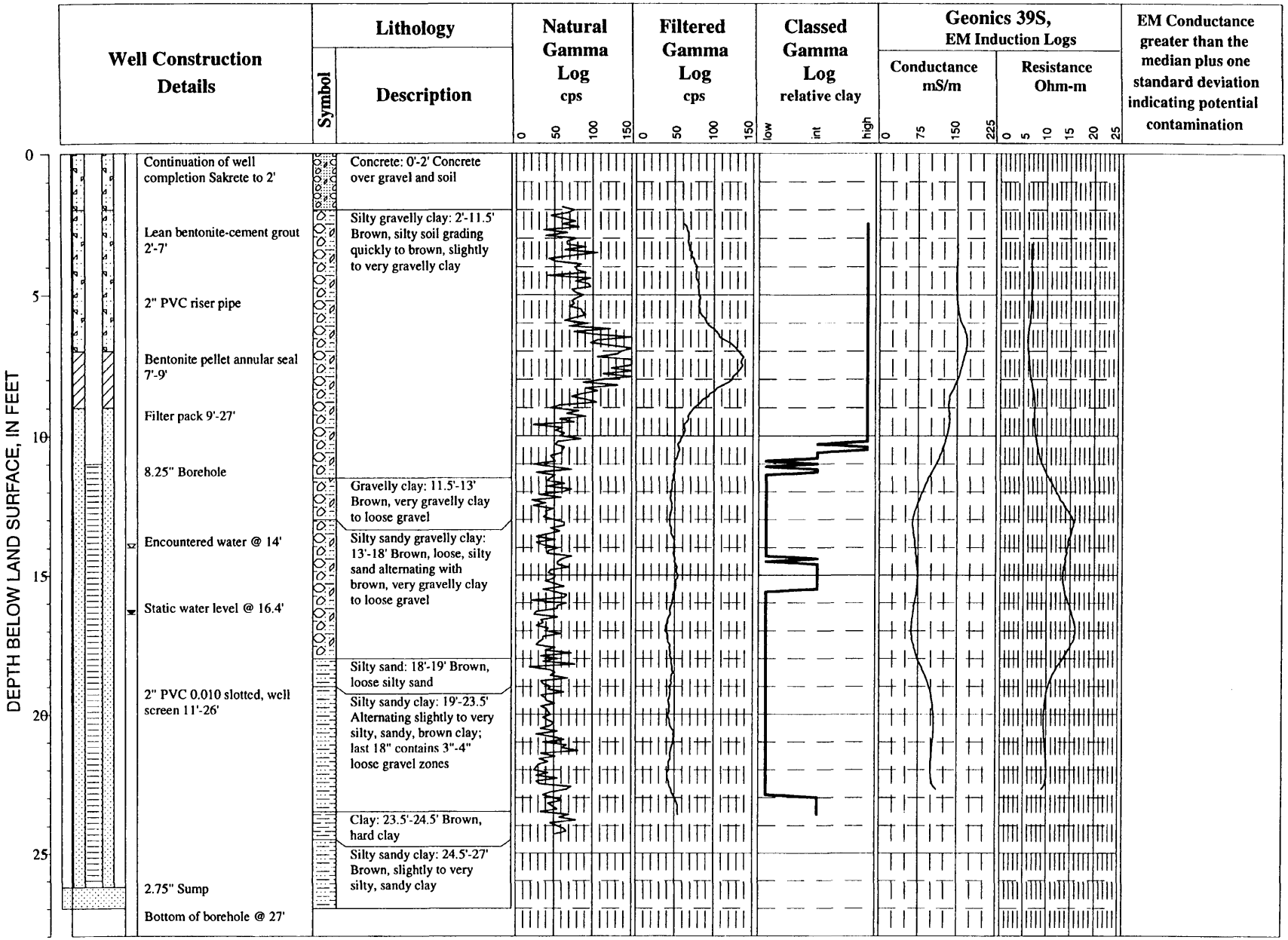
DWP-S2-5—Continued



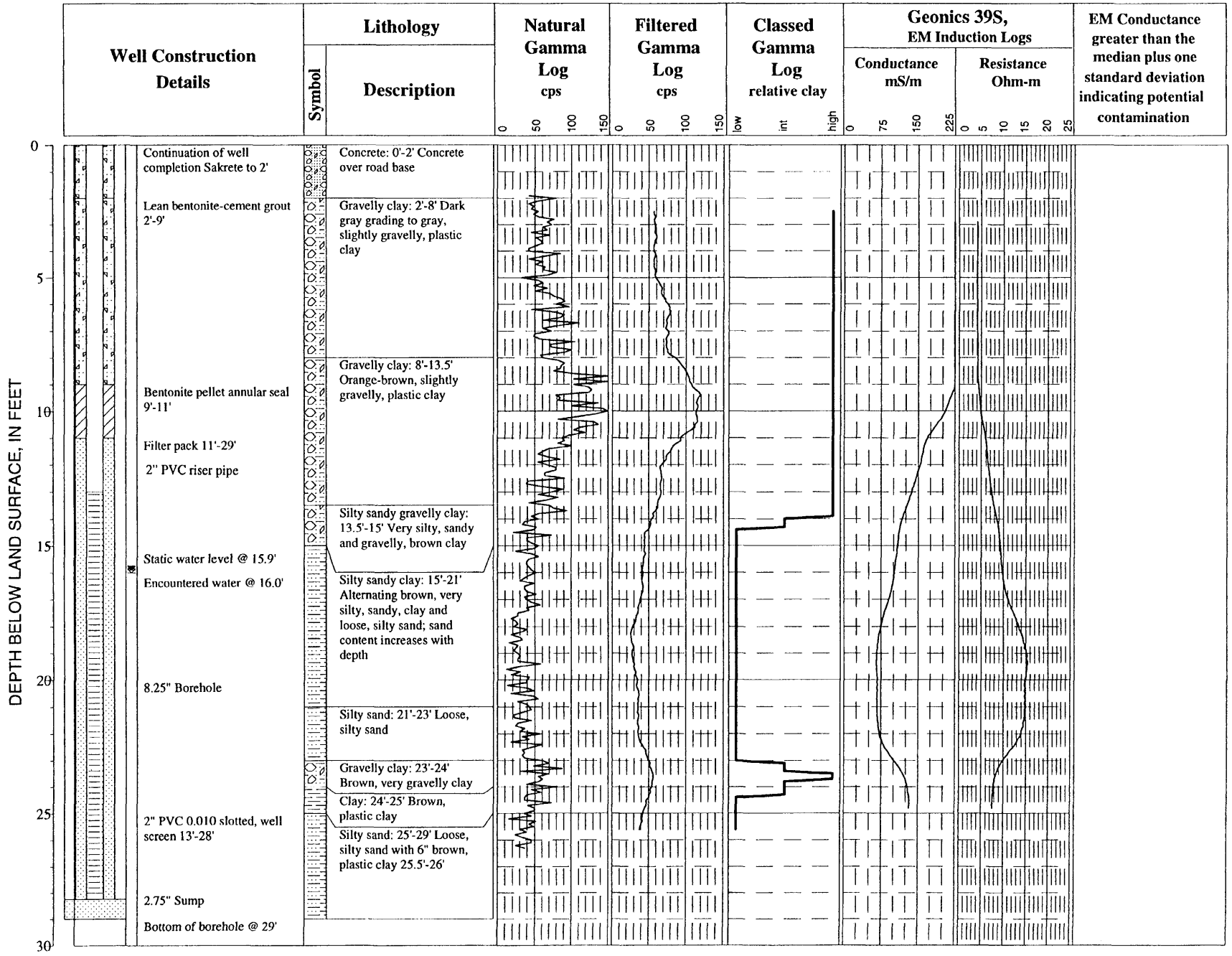
DWP-S2-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Encountered water @ 15'
Static water level @ 16.4'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-14' Dark gray grading through gray to orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 14'-20' Brown, slightly to very silty and sandy clay; sand content increases with depth
Silty sand: 20'-21' Brown, loose, silty sand
Silty sandy clay: 21'-22' Brown, very silty and sandy clay
Silty sand: 22'-25' Brown, loose, silty sand; 6" very silty, sandy clay zone at 23.5'
Clay: 25'-28' Brown, mottled, hard clay
low
int
high

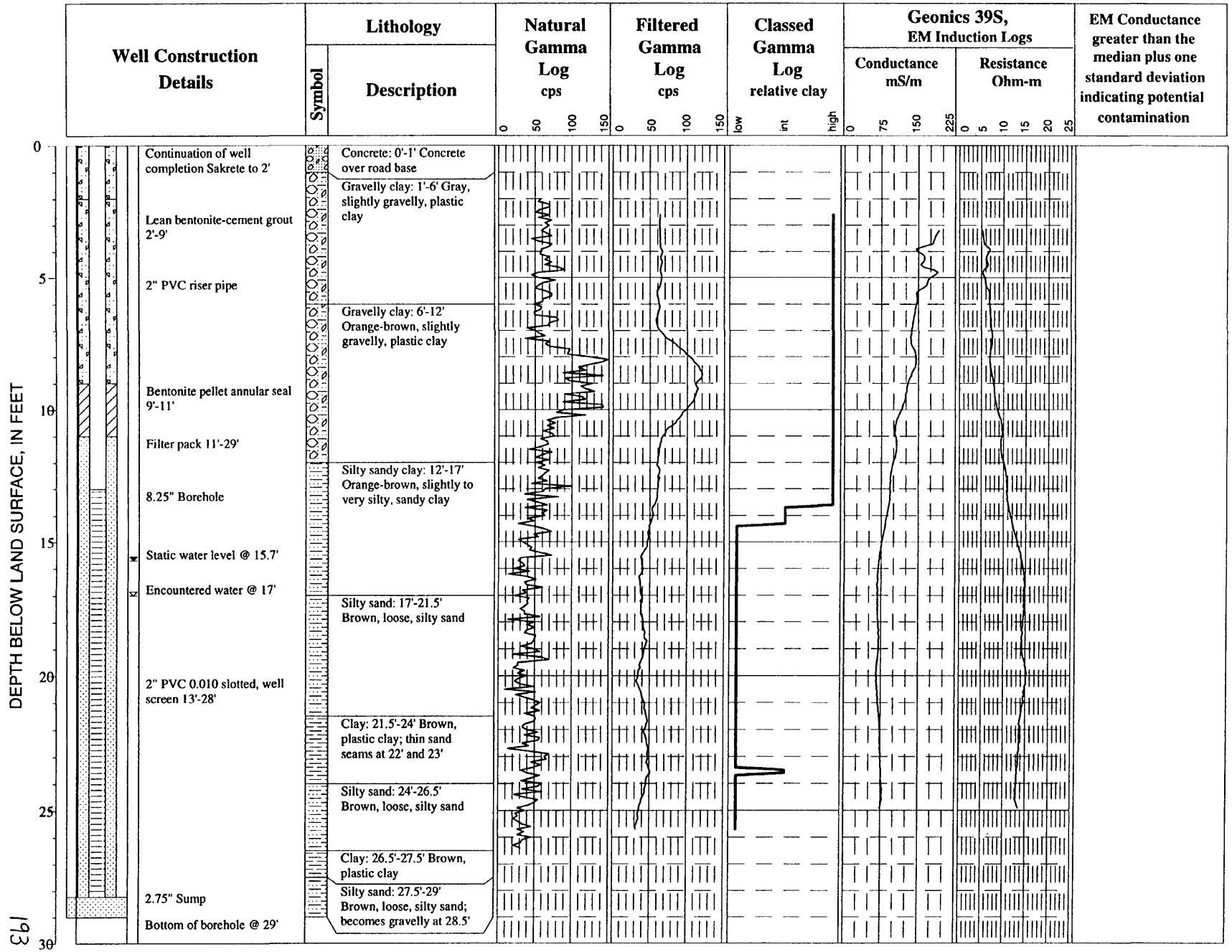
DWP-S2-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
0 50 100 150
Filtered Gamma Log cps
0 50 100 150
Classed Gamma Log relative clay
low int high
Geonics 39S, EM Induction Logs
Conductance mS/m
0 75 150 225
Resistance Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
8.25" Borehole
Encountered water @ 14'
Static water level @ 16.4'
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Concrete: 0'-2' Concrete over gravel and soil
Silty gravelly clay: 2'-11.5' Brown, silty soil grading quickly to brown, slightly to very gravelly clay
Gravelly clay: 11.5'-13' Brown, very gravelly clay to loose gravel
Silty sandy gravelly clay: 13'-18' Brown, loose, silty sand alternating with brown, very gravelly clay to loose gravel
Silty sand: 18'-19' Brown, loose silty sand
Silty sandy clay: 19'-23.5' Alternating slightly to very silty, sandy, brown clay; last 18" contains 3"-4" loose gravel zones
Clay: 23.5'-24.5' Brown, hard clay
Silty sandy clay: 24.5'-27' Brown, slightly to very silty, sandy clay

DWP-S2-12

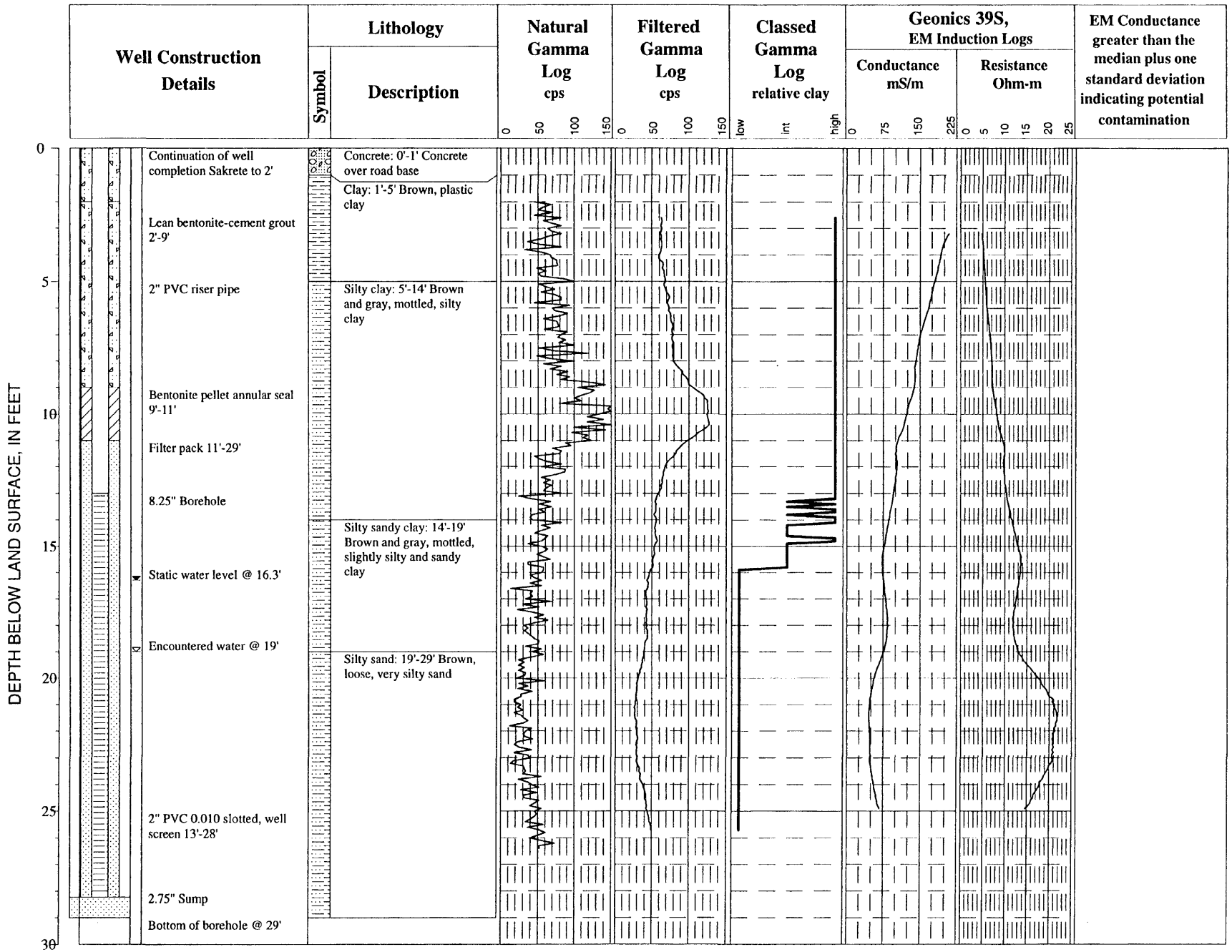

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
Static water level @ 15.9'
Encountered water @ 16.0'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-2' Concrete over road base
Gravelly clay: 2'-8' Dark gray grading to gray, slightly gravelly, plastic clay
Gravelly clay: 8'-13.5' Orange-brown, slightly gravelly, plastic clay
Silty sandy gravelly clay: 13.5'-15' Very silty, sandy and gravelly, brown clay
Silty sandy clay: 15'-21' Alternating brown, very silty, sandy, clay and loose, silty sand; sand content increases with depth
Silty sand: 21'-23' Loose, silty sand
Gravelly clay: 23'-24' Brown, very gravelly clay
Clay: 24'-25' Brown, plastic clay
Silty sand: 25'-29' Loose, silty sand with 6" brown, plastic clay 25.5'-26'

DWP-S2-13

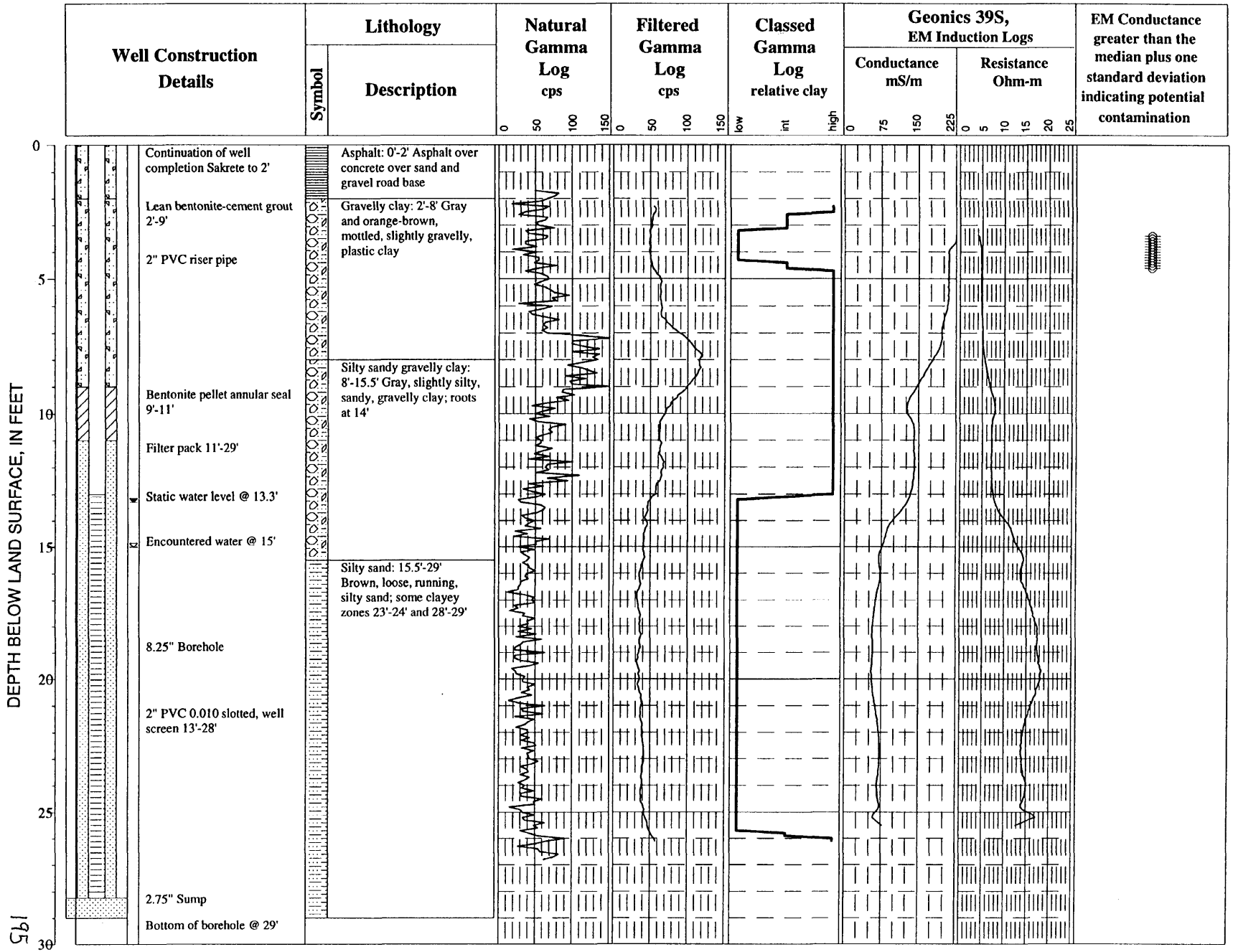

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Static water level @ 15.7'
Encountered water @ 17'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1' Concrete over road base
Gravelly clay: 1'-6' Gray, slightly gravelly, plastic clay
Gravelly clay: 6'-12' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 12'-17' Orange-brown, slightly to very silty, sandy clay
Silty sand: 17'-21.5' Brown, loose, silty sand
Clay: 21.5'-24' Brown, plastic clay; thin sand seams at 22' and 23'
Silty sand: 24'-26.5' Brown, loose, silty sand
Clay: 26.5'-27.5' Brown, plastic clay
Silty sand: 27.5'-29' Brown, loose, silty sand; becomes gravelly at 28.5'

193

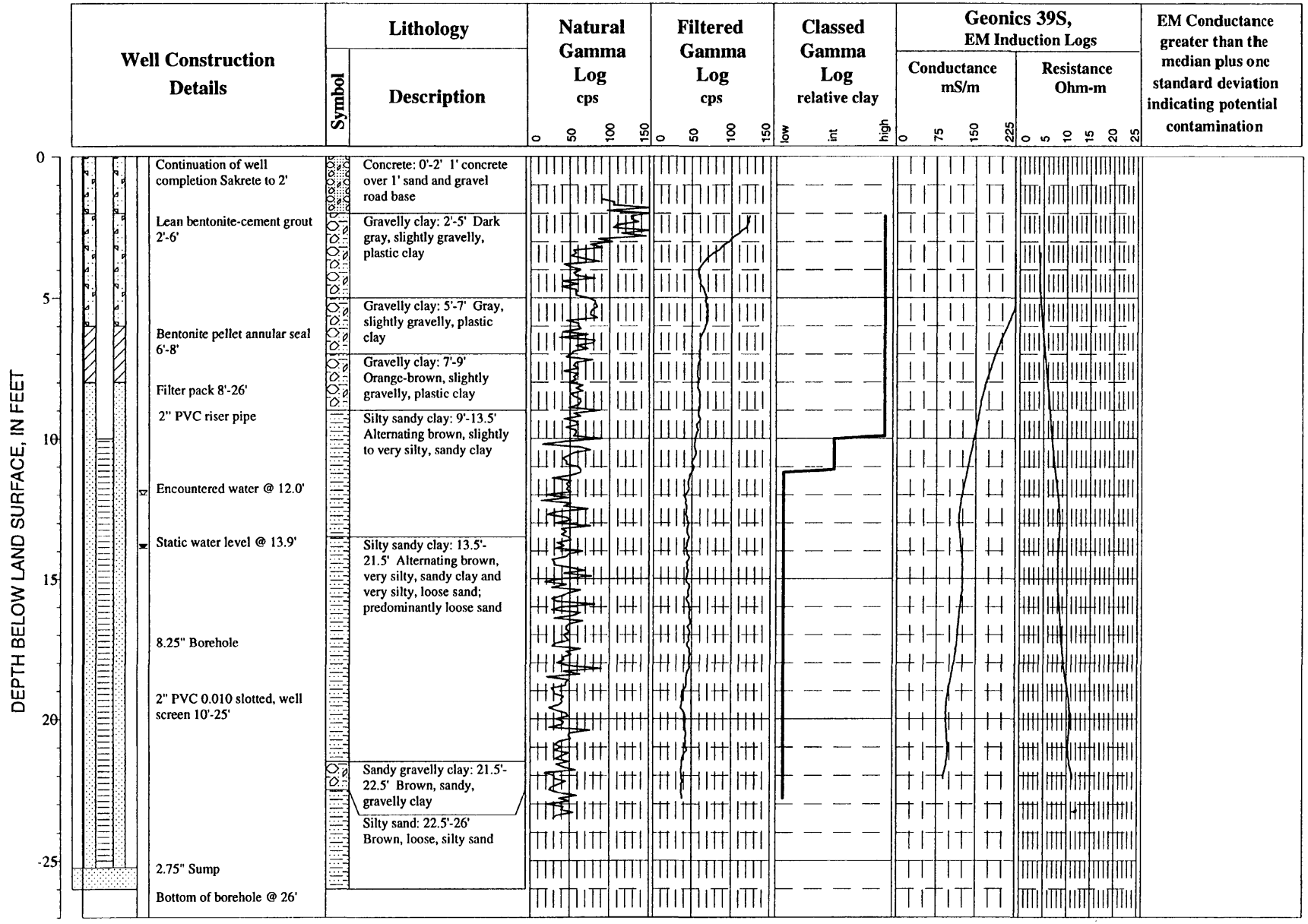
DWP-S2-15


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
8.25" Borehole
Static water level @ 16.3'
Encountered water @ 19'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1' Concrete over road base
Clay: 1'-5' Brown, plastic clay
Silty clay: 5'-14' Brown and gray, mottled, silty clay
Silty sandy clay: 14'-19' Brown and gray, mottled, slightly silty and sandy clay
Silty sand: 19'-29' Brown, loose, very silty sand

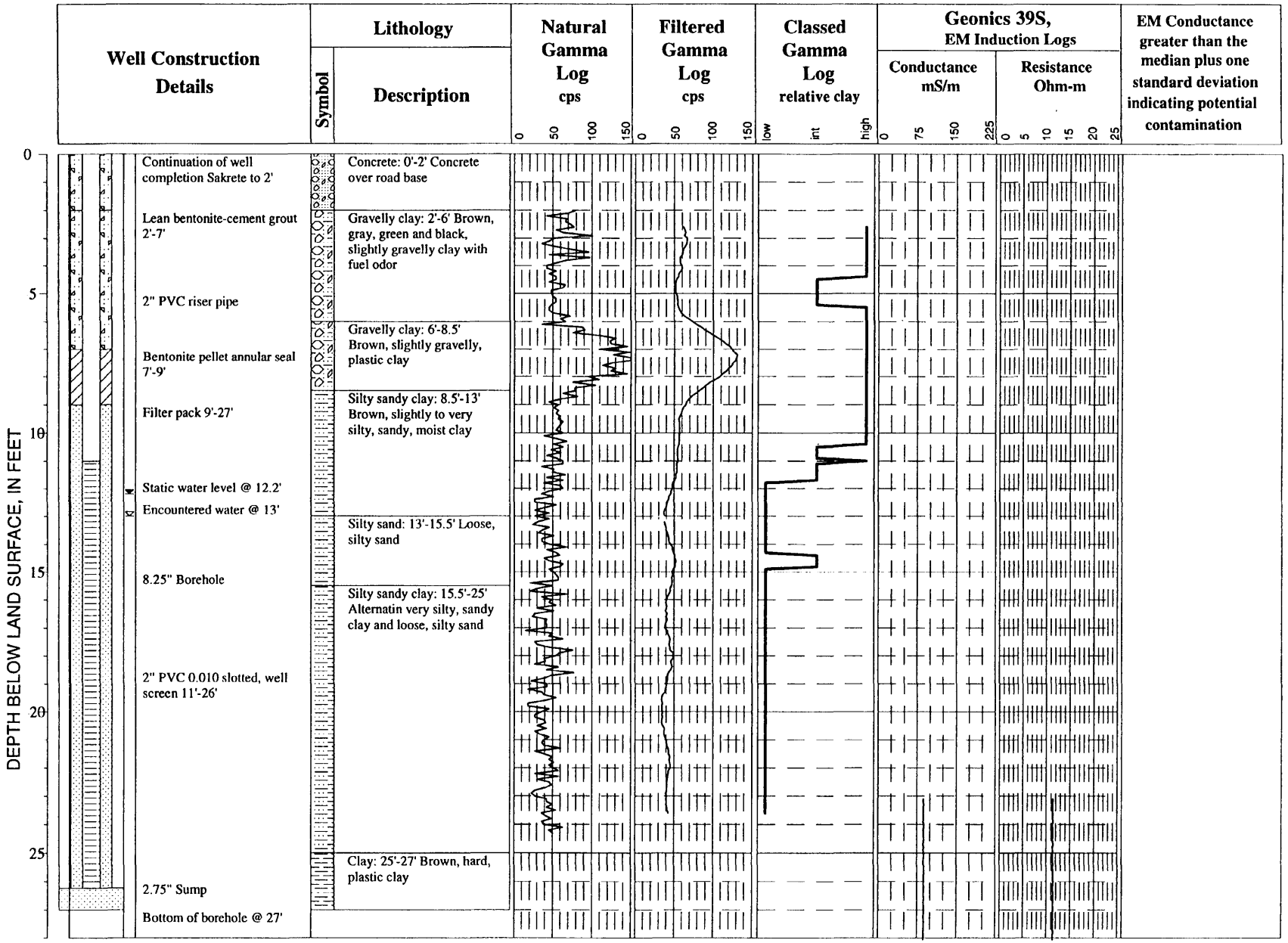
DWP-S2-16


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Static water level @ 13.3'
Encountered water @ 15'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-2' Asphalt over concrete over sand and gravel road base
Gravelly clay: 2'-8' Gray and orange-brown, mottled, slightly gravelly, plastic clay
Silty sandy gravelly clay: 8'-15.5' Gray, slightly silty, sandy, gravelly clay; roots at 14'
Silty sand: 15.5'-29' Brown, loose, running, silty sand; some clayey zones 23'-24' and 28'-29'

DWP-S2-17

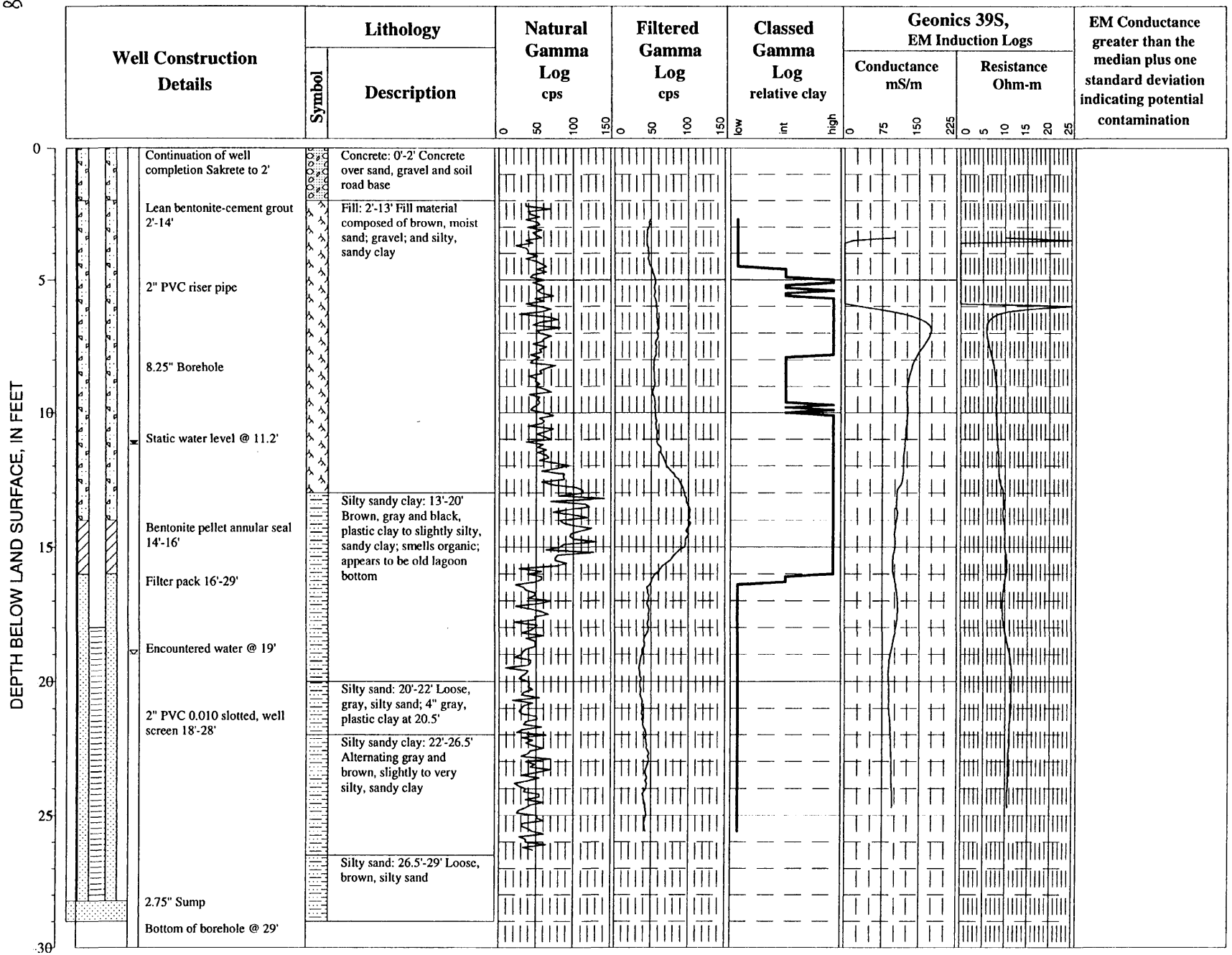

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
Encountered water @ 12.0'
Static water level @ 13.9'
8.25" Borehole
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-2' 1' concrete over 1' sand and gravel road base
Gravelly clay: 2'-5' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 5'-7' Gray, slightly gravelly, plastic clay
Gravelly clay: 7'-9' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 9'-13.5' Alternating brown, slightly to very silty, sandy clay
Silty sandy clay: 13.5'-21.5' Alternating brown, very silty, sandy clay and very silty, loose sand; predominantly loose sand
Sandy gravelly clay: 21.5'-22.5' Brown, sandy, gravelly clay
Silty sand: 22.5'-26' Brown, loose, silty sand
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

DWP-S2-18

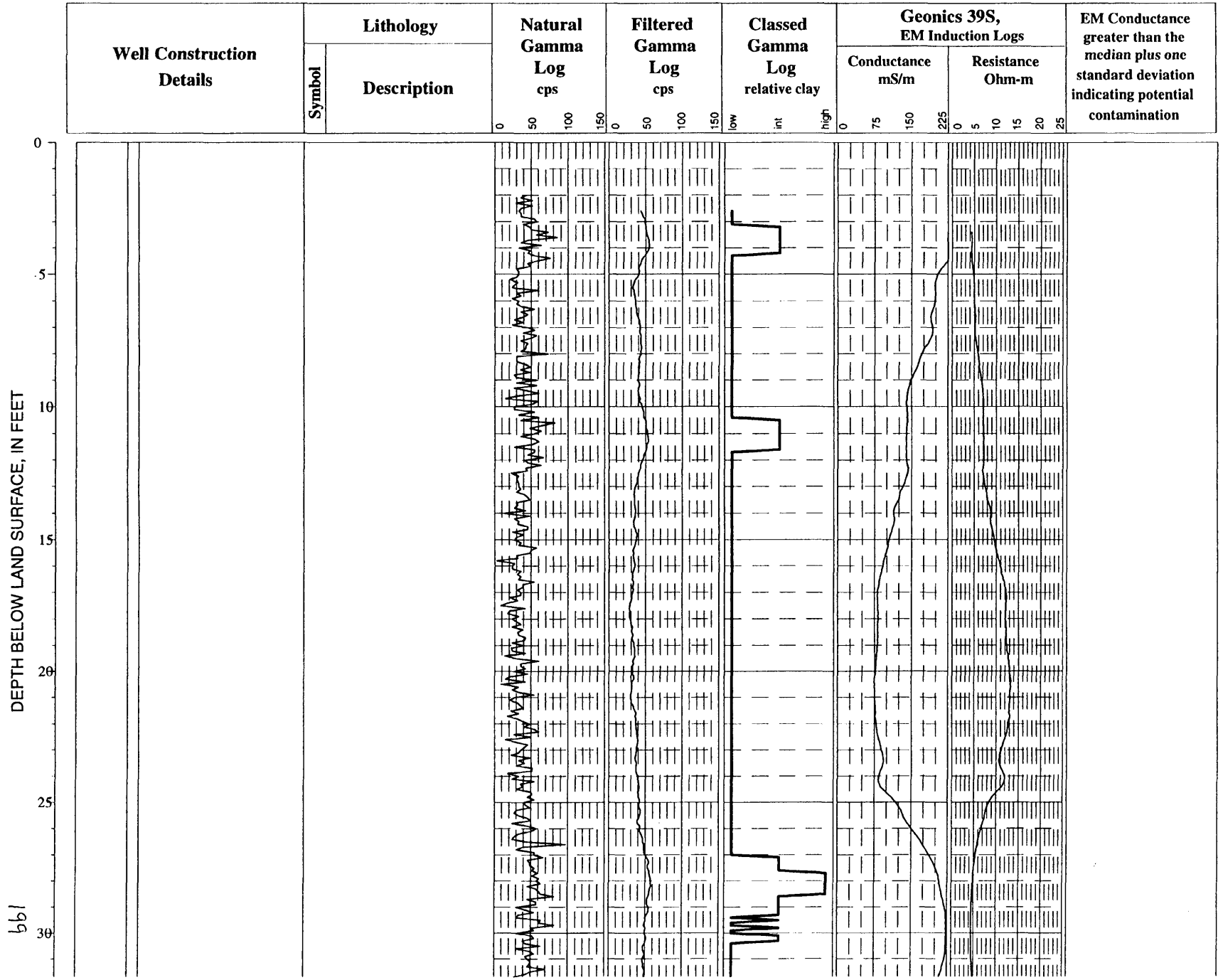

Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
Static water level @ 12.2'
Encountered water @ 13'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Concrete: 0'-2' Concrete over road base
Gravelly clay: 2'-6' Brown, gray, green and black, slightly gravelly clay with fuel odor
Gravelly clay: 6'-8.5' Brown, slightly gravelly, plastic clay
Silty sandy clay: 8.5'-13' Brown, slightly to very silty, sandy, moist clay
Silty sand: 13'-15.5' Loose, silty sand
Silty sandy clay: 15.5'-25' Alternatin very silty, sandy clay and loose, silty sand
Clay: 25'-27' Brown, hard, plastic clay

198

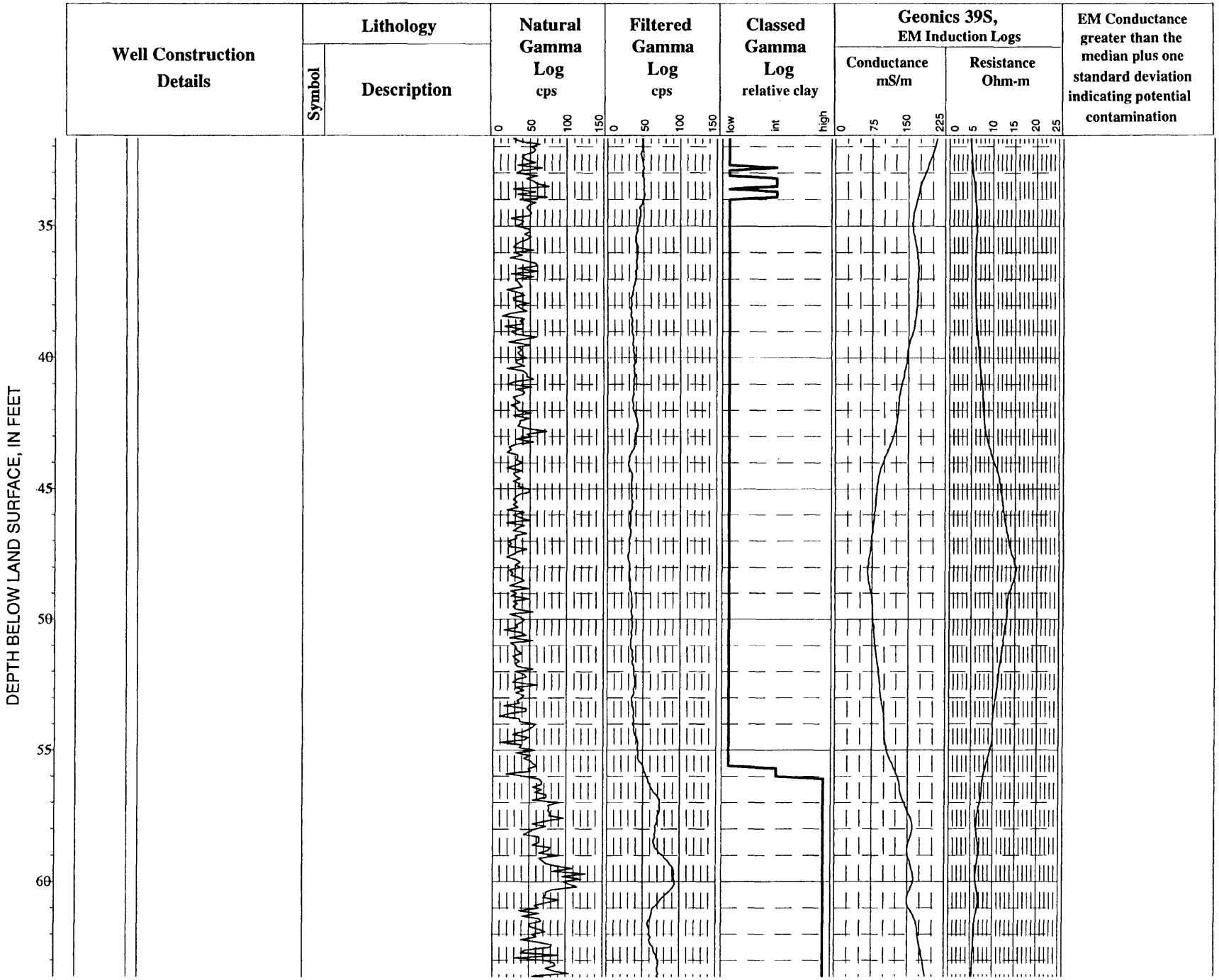
DWP-S2-19


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
2" PVC riser pipe
8.25" Borehole
Static water level @ 11.2'
Bentonite pellet annular seal 14'-16'
Filter pack 16'-29'
Encountered water @ 19'
2" PVC 0.010 slotted, well screen 18'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-2' Concrete over sand, gravel and soil road base
Fill: 2'-13' Fill material composed of brown, moist sand; gravel; and silty, sandy clay
Silty sandy clay: 13'-20' Brown, gray and black, plastic clay to slightly silty, sandy clay; smells organic; appears to be old lagoon bottom
Silty sand: 20'-22' Loose, gray, silty sand; 4" gray, plastic clay at 20.5'
Silty sandy clay: 22'-26.5' Alternating gray and brown, slightly to very silty, sandy clay
Silty sand: 26.5'-29' Loose, brown, silty sand
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

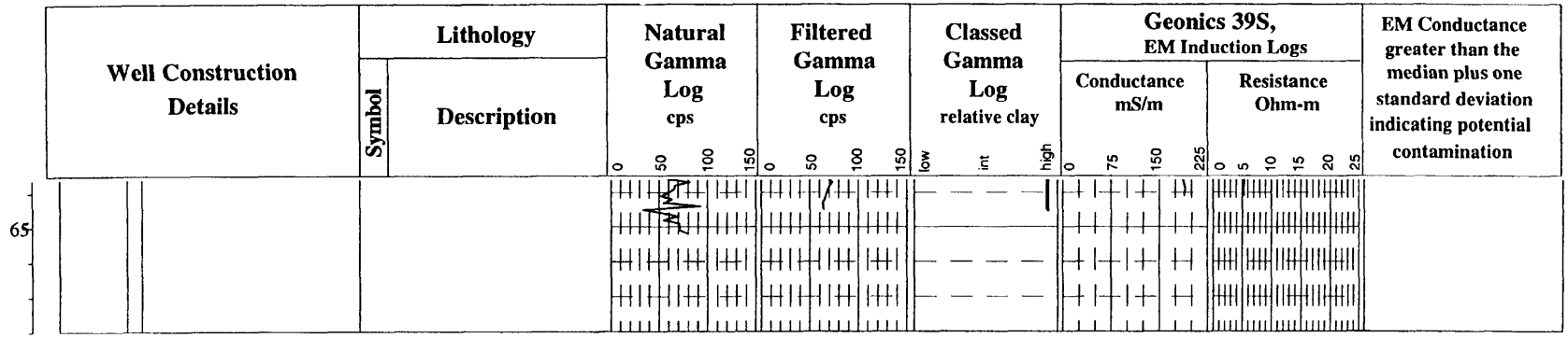
DWP-S2-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0 50 100 150
Filtered Gamma Log
cps
0 50 100 150
Classed Gamma Log
relative clay
low int high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0 75 150 225
Resistance
Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30

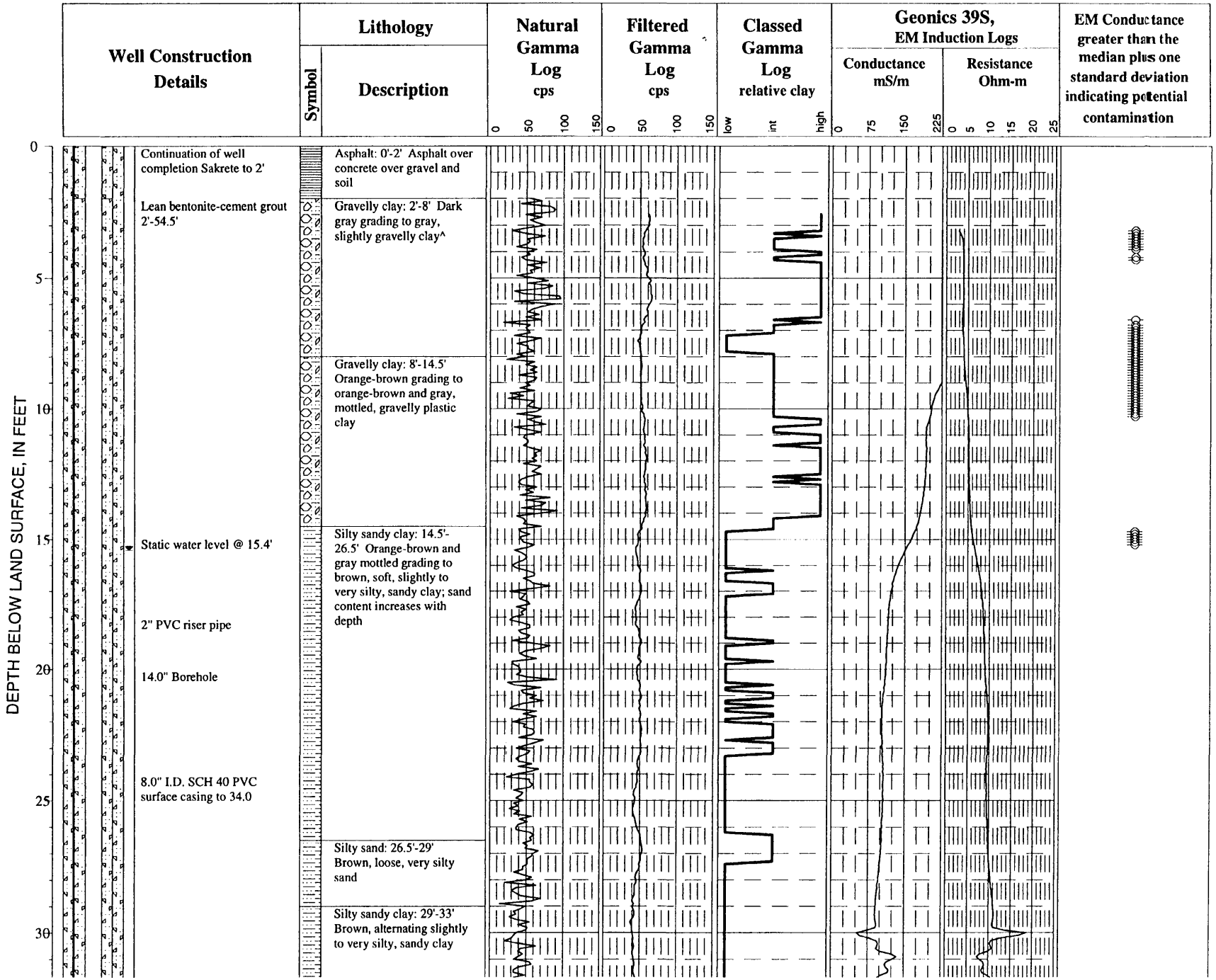
DWP-S2-DW1—Continued



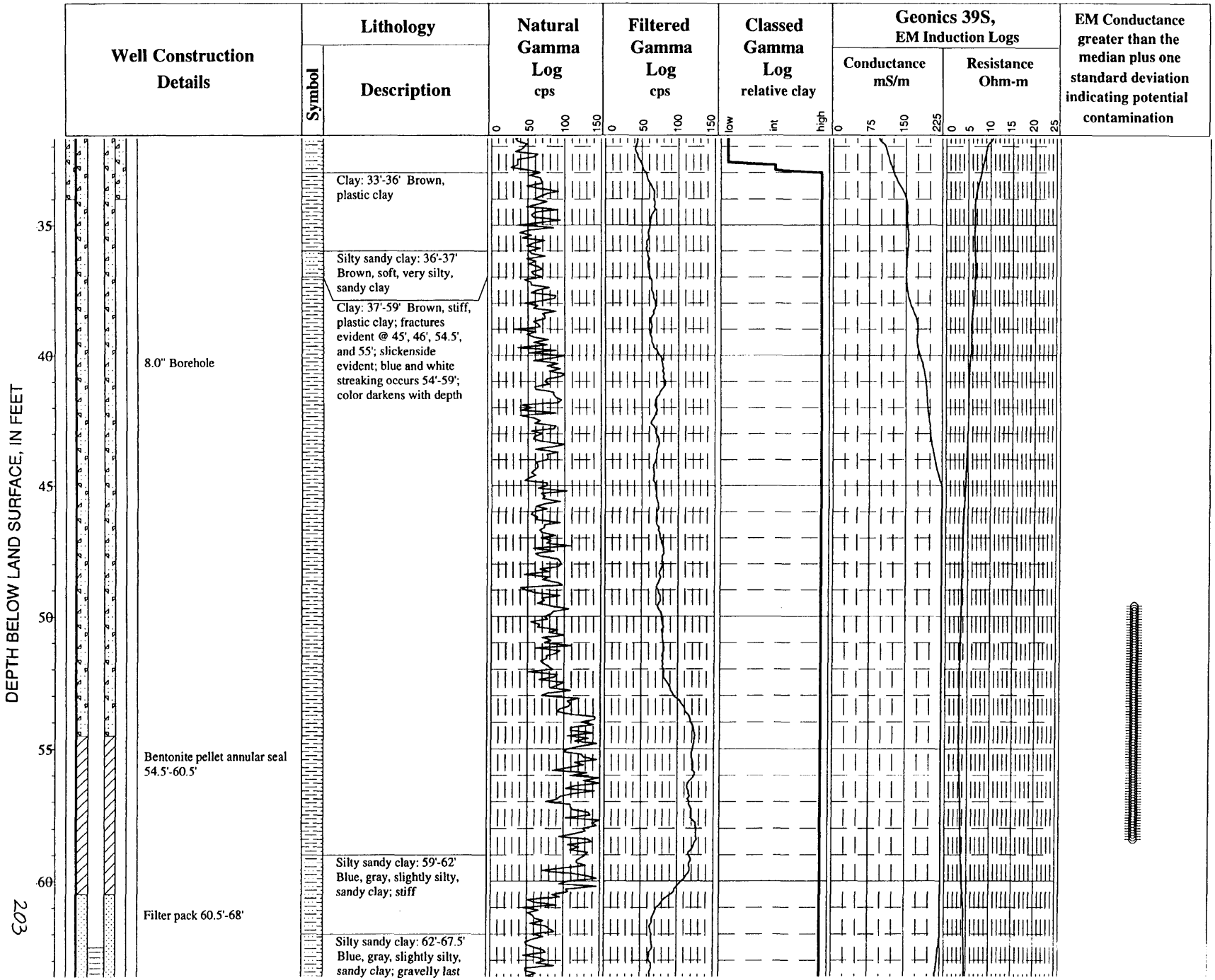
DWP-S2-DW1—Continued



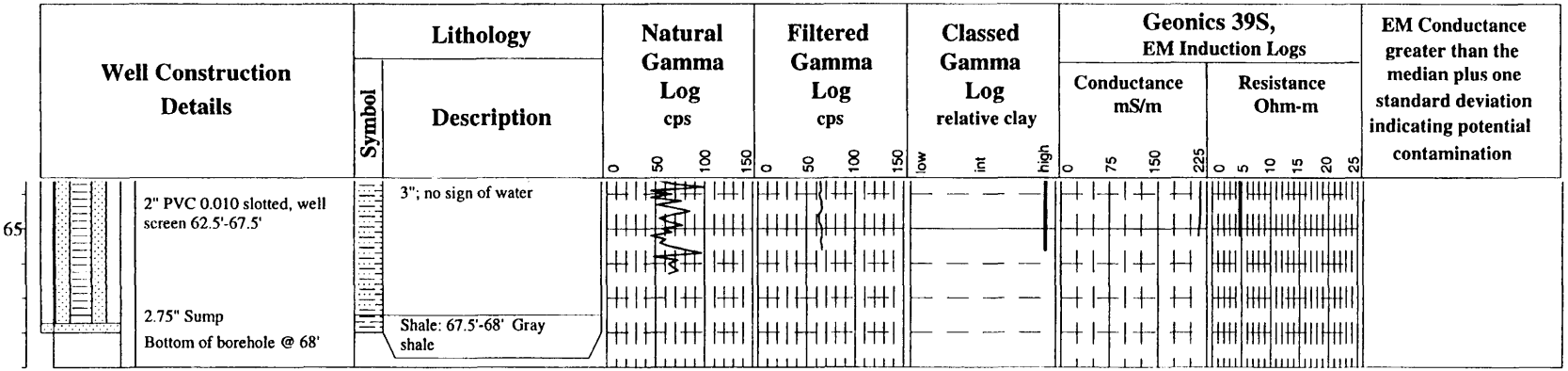
DWP-S3-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-54.5'
Static water level @ 15.4'
2" PVC riser pipe
14.0" Borehole
8.0" I.D. SCH 40 PVC surface casing to 34.0
Asphalt: 0'-2' Asphalt over concrete over gravel and soil
Gravelly clay: 2'-8' Dark gray grading to gray, slightly gravelly clay^
Gravelly clay: 8'-14.5' Orange-brown grading to orange-brown and gray, mottled, gravelly plastic clay
Silty sandy clay: 14.5'-26.5' Orange-brown and gray mottled grading to brown, soft, slightly to very silty, sandy clay; sand content increases with depth
Silty sand: 26.5'-29' Brown, loose, very silty sand
Silty sandy clay: 29'-33' Brown, alternating slightly to very silty, sandy clay

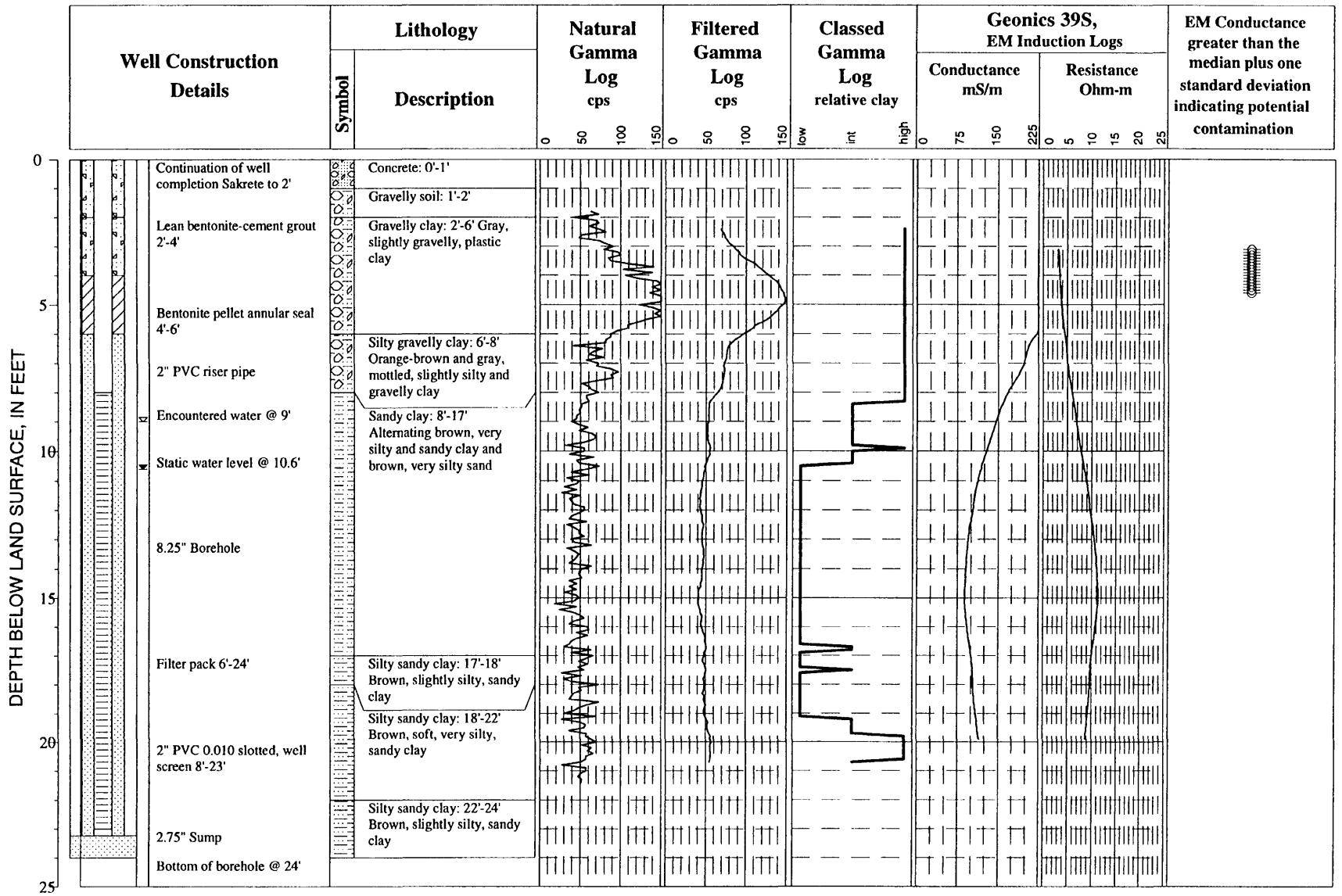
DWP-S3-DW1—Continued



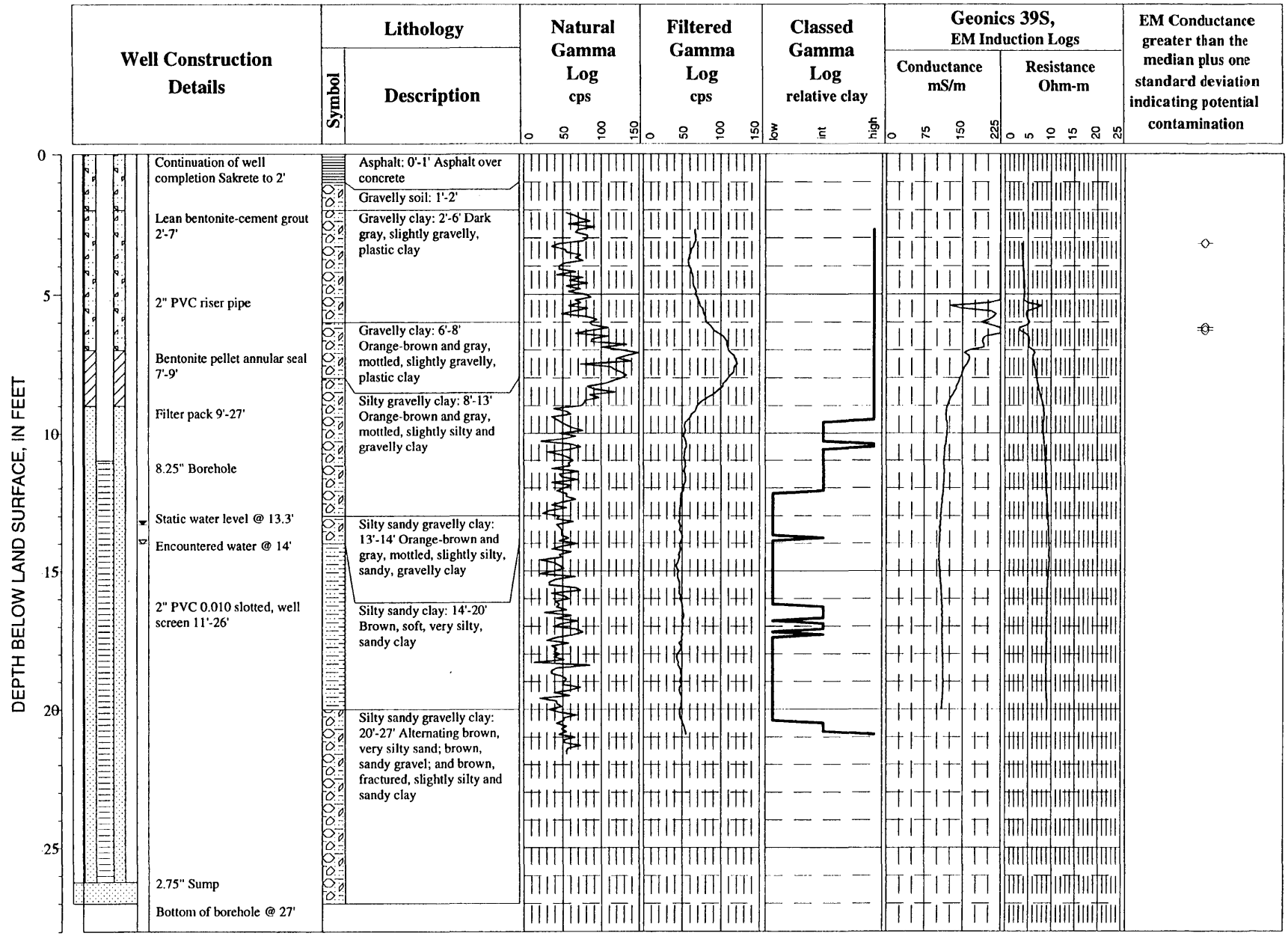
DWP-S3-DW1—Continued



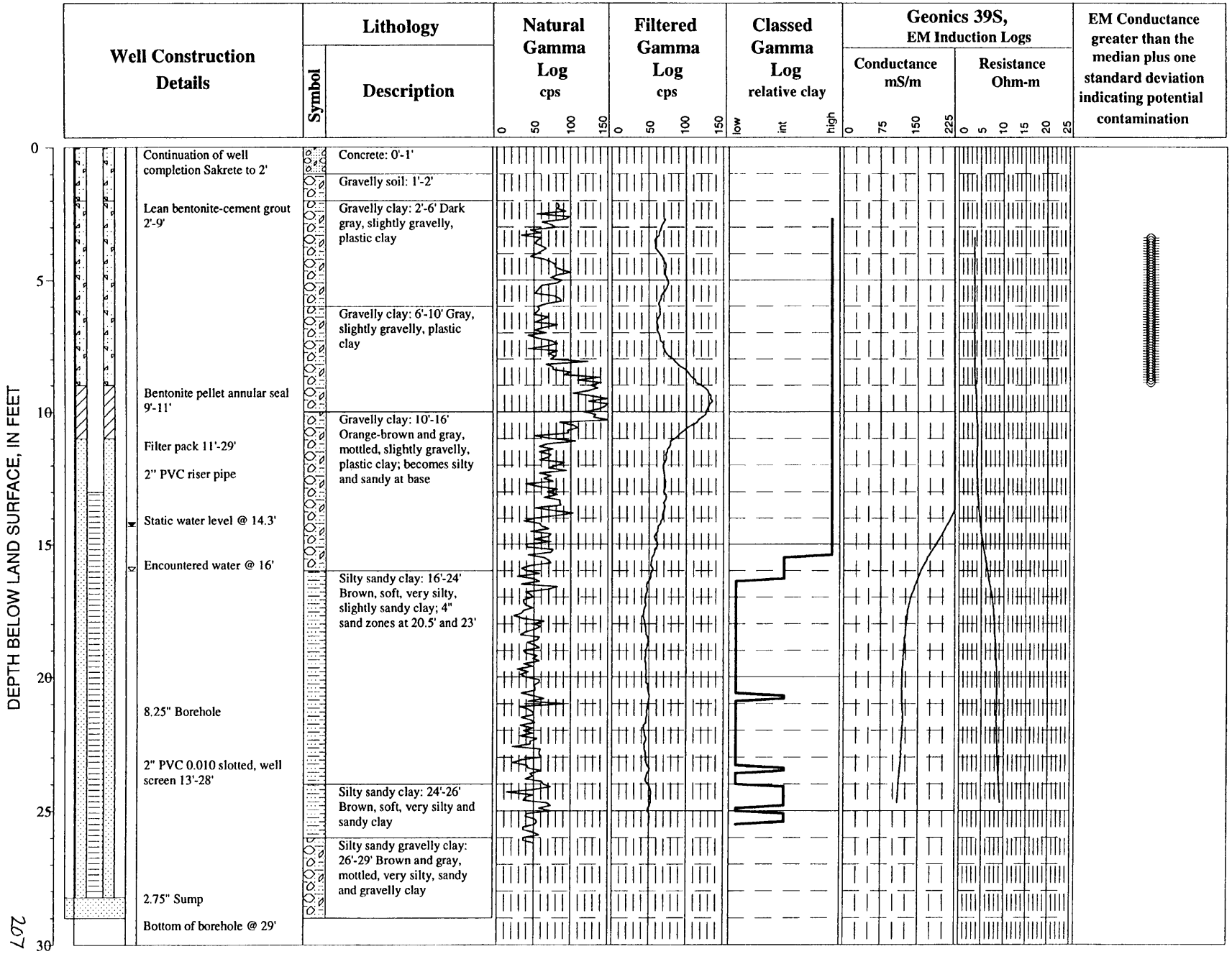
DWP-S4-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-4'
Bentonite pellet annular seal 4'-6'
2" PVC riser pipe
Encountered water @ 9'
Static water level @ 10.6'
8.25" Borehole
Filter pack 6'-24'
2" PVC 0.010 slotted, well screen 8'-23'
2.75" Sump
Bottom of borehole @ 24'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-6' Gray, slightly gravelly, plastic clay
Silty gravelly clay: 6'-8' Orange-brown and gray, mottled, slightly silty and gravelly clay
Sandy clay: 8'-17' Alternating brown, very silty and sandy clay and brown, very silty sand
Silty sandy clay: 17'-18' Brown, slightly silty, sandy clay
Silty sandy clay: 18'-22' Brown, soft, very silty, sandy clay
Silty sandy clay: 22'-24' Brown, slightly silty, sandy clay

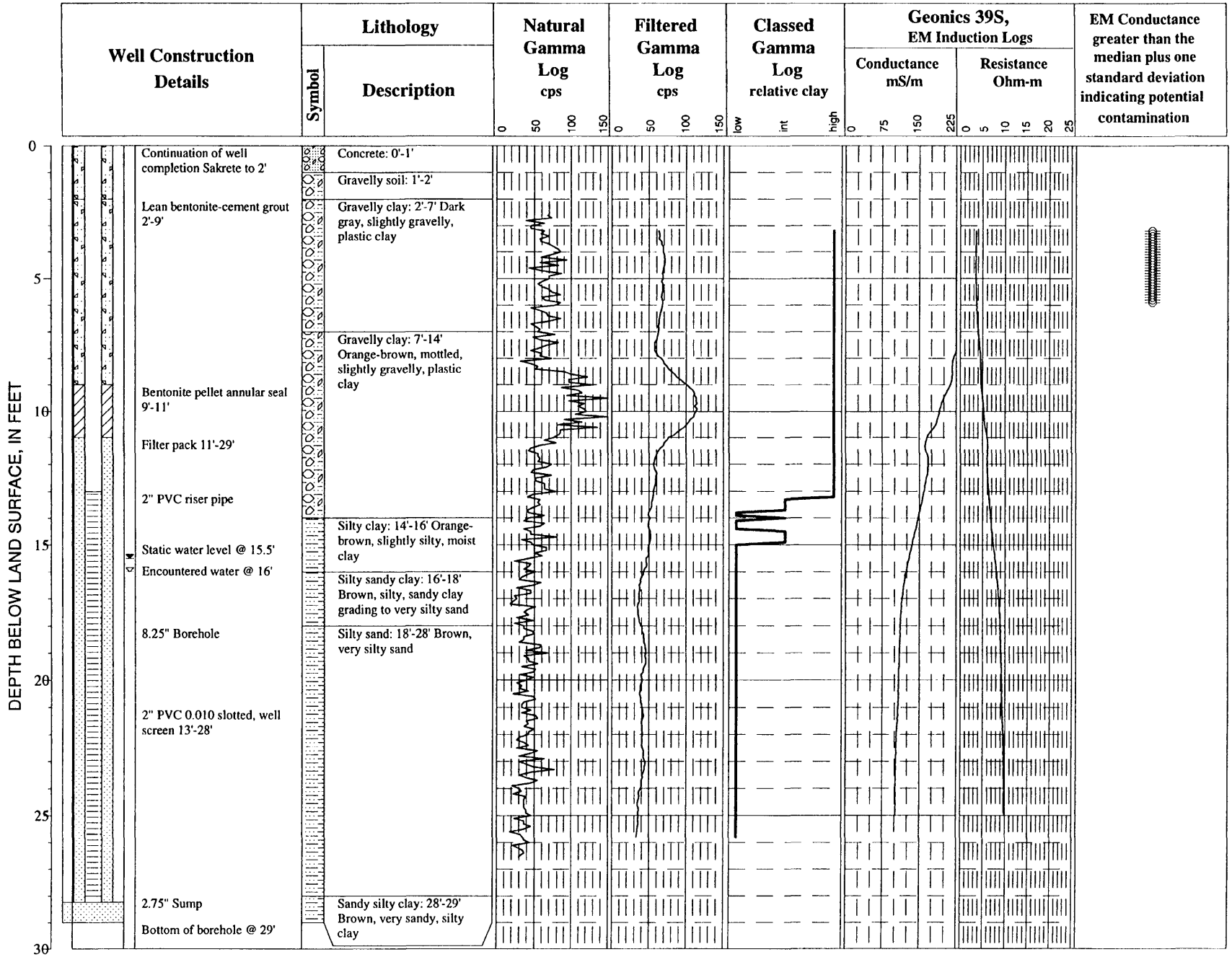
DWP-S5-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
8.25" Borehole
Static water level @ 13.3'
Encountered water @ 14'
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Asphalt: 0'-1' Asphalt over concrete
Gravelly soil: 1'-2'
Gravelly clay: 2'-6' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 6'-8' Orange-brown and gray, mottled, slightly gravelly, plastic clay
Silty gravelly clay: 8'-13' Orange-brown and gray, mottled, slightly silty and gravelly clay
Silty sandy gravelly clay: 13'-14' Orange-brown and gray, mottled, slightly silty, sandy, gravelly clay
Silty sandy clay: 14'-20' Brown, soft, very silty, sandy clay
Silty sandy gravelly clay: 20'-27' Alternating brown, very silty sand; brown, sandy gravel; and brown, fractured, slightly silty and sandy clay

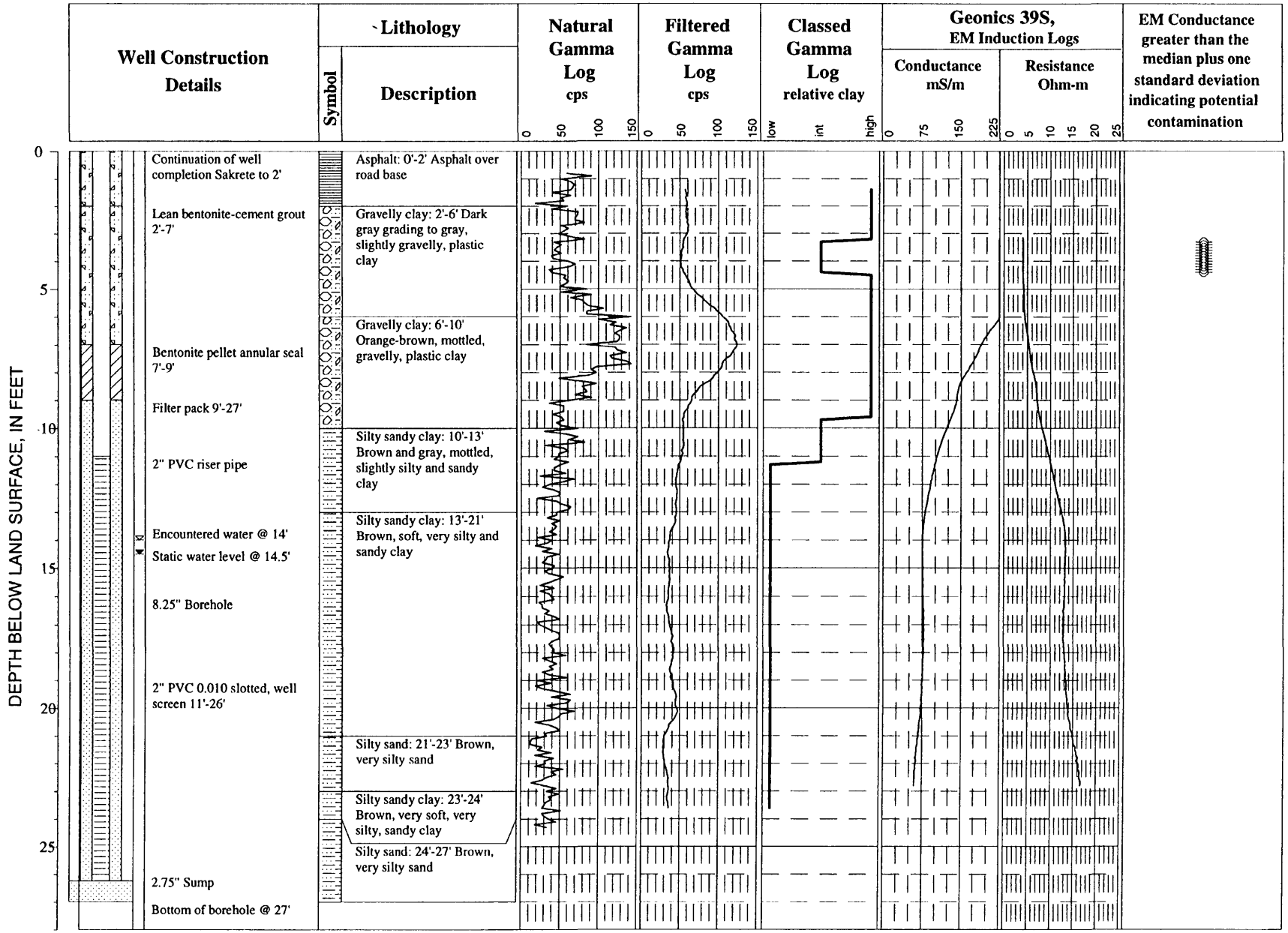
DWP-S5-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
Static water level @ 14.3'
Encountered water @ 16'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-6' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 6'-10' Gray, slightly gravelly, plastic clay
Gravelly clay: 10'-16' Orange-brown and gray, mottled, slightly gravelly, plastic clay; becomes silty and sandy at base
Silty sandy clay: 16'-24' Brown, soft, very silty, slightly sandy clay; 4" sand zones at 20.5' and 23'
Silty sandy clay: 24'-26' Brown, soft, very silty and sandy clay
Silty sandy gravelly clay: 26'-29' Brown and gray, mottled, very silty, sandy and gravelly clay
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

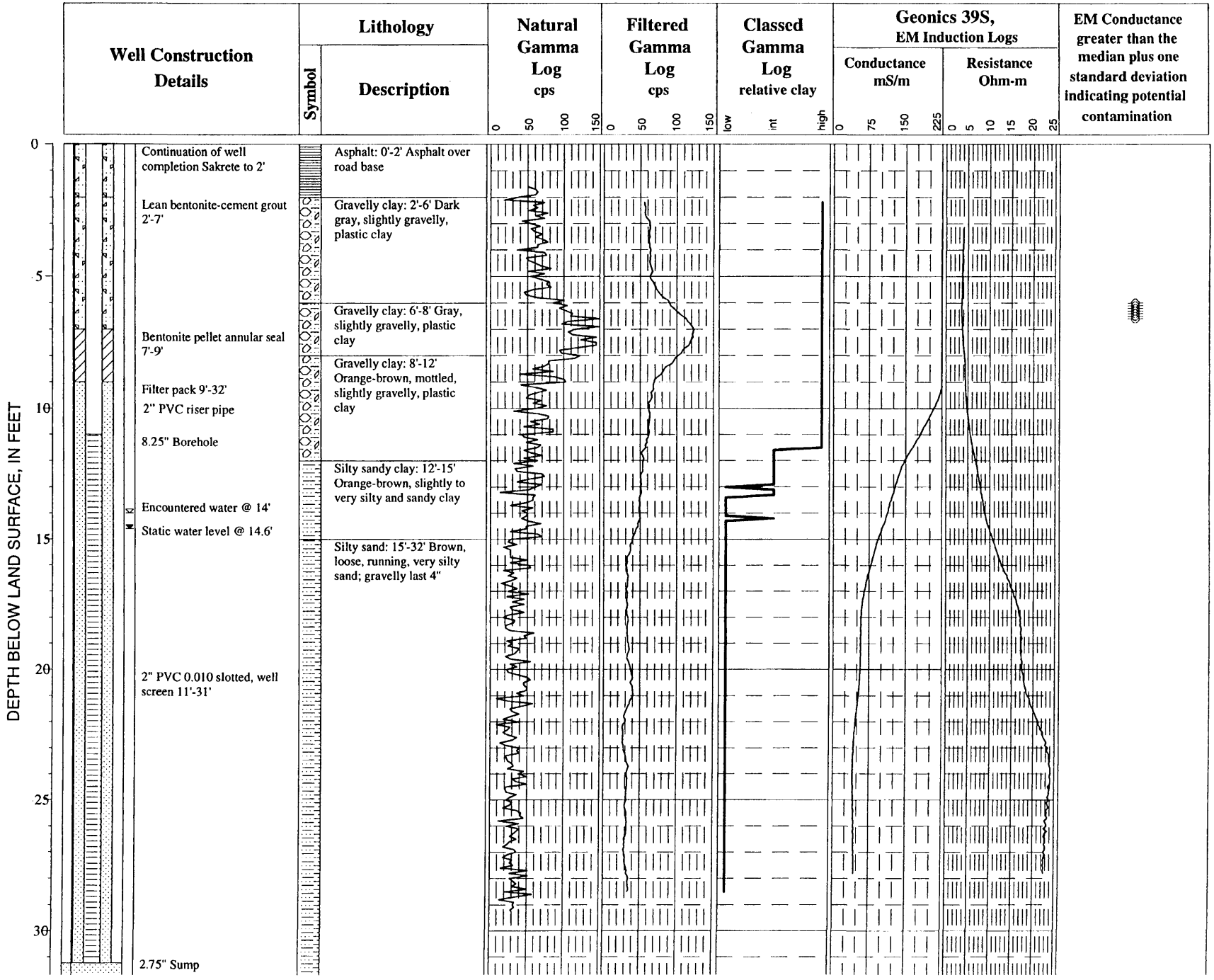
DWP-S5-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
Static water level @ 15.5'
Encountered water @ 16'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-7' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 7'-14' Orange-brown, mottled, slightly gravelly, plastic clay
Silty clay: 14'-16' Orange-brown, slightly silty, moist clay
Silty sandy clay: 16'-18' Brown, silty, sandy clay grading to very silty sand
Silty sand: 18'-28' Brown, very silty sand
Sandy silty clay: 28'-29' Brown, very sandy, silty clay

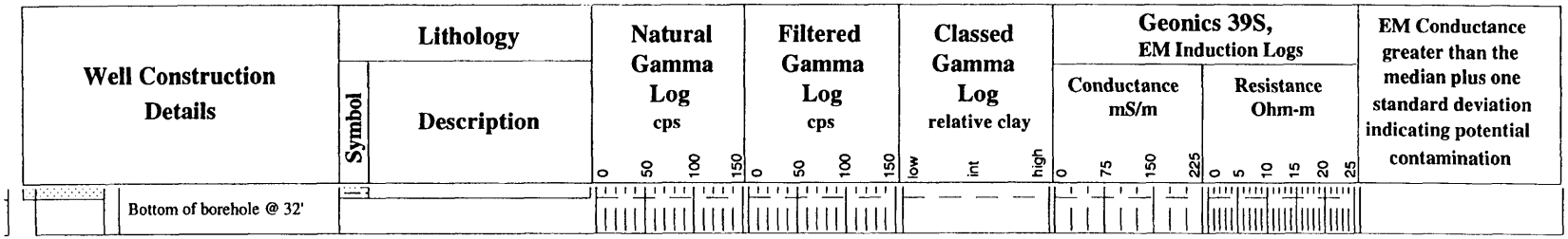
DWP-S5-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
Filter pack 9'-27'
2" PVC riser pipe
Encountered water @ 14'
Static water level @ 14.5'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Asphalt: 0'-2' Asphalt over road base
Gravelly clay: 2'-6' Dark gray grading to gray, slightly gravelly, plastic clay
Gravelly clay: 6'-10' Orange-brown, mottled, gravelly, plastic clay
Silty sandy clay: 10'-13' Brown and gray, mottled, slightly silty and sandy clay
Silty sandy clay: 13'-21' Brown, soft, very silty and sandy clay
Silty sand: 21'-23' Brown, very silty sand
Silty sandy clay: 23'-24' Brown, very soft, very silty, sandy clay
Silty sand: 24'-27' Brown, very silty sand

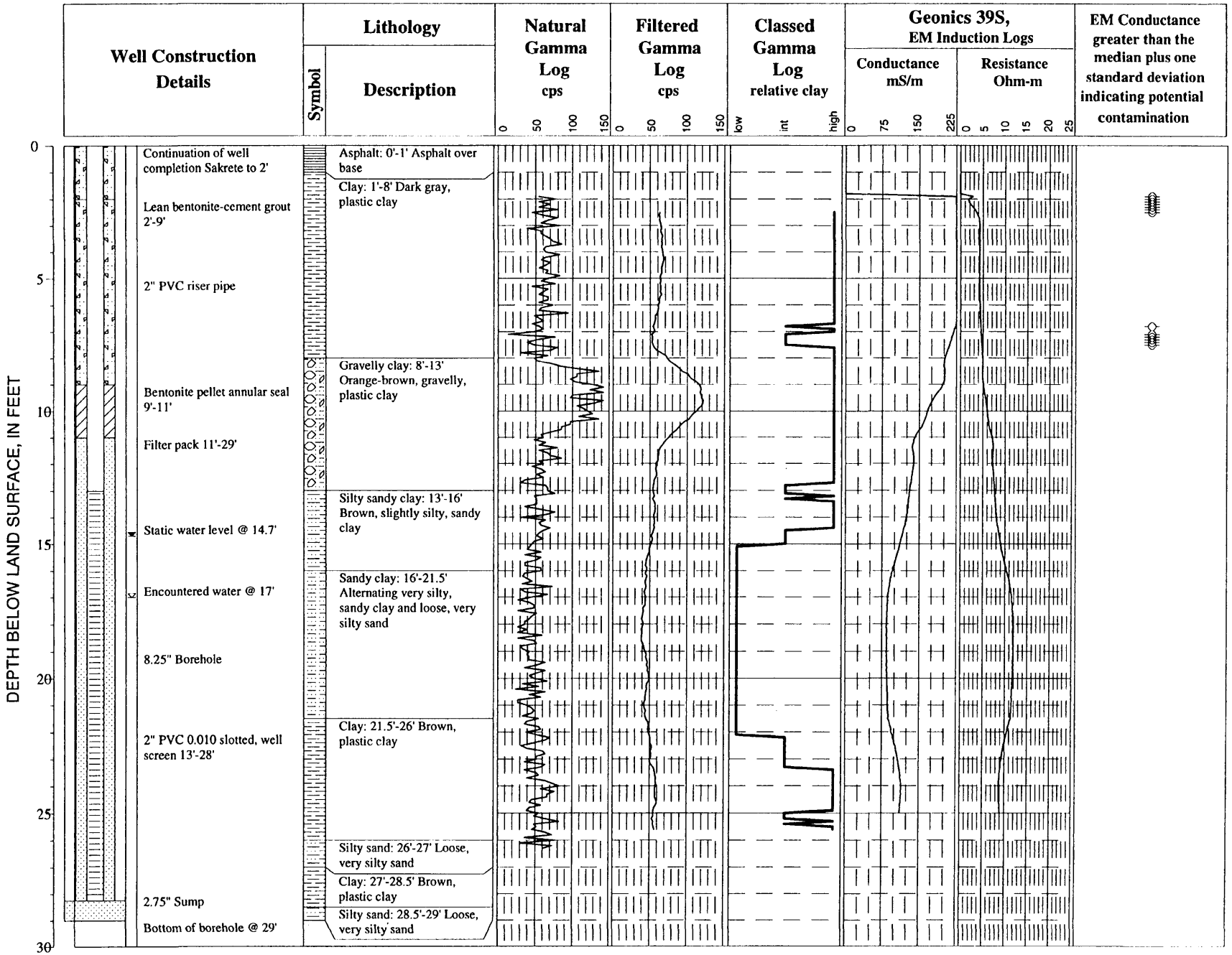
DWP-S5-5


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-7'
Bentonite pellet annular seal 7'-9'
Filter pack 9'-32'
2" PVC riser pipe
8.25" Borehole
Encountered water @ 14'
Static water level @ 14.6'
2" PVC 0.010 slotted, well screen 11'-31'
2.75" Sump
Asphalt: 0'-2' Asphalt over road base
Gravelly clay: 2'-6' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 6'-8' Gray, slightly gravelly, plastic clay
Gravelly clay: 8'-12' Orange-brown, mottled, slightly gravelly, plastic clay
Silty sandy clay: 12'-15' Orange-brown, slightly to very silty and sandy clay
Silty sand: 15'-32' Brown, loose, running, very silty sand; gravelly last 4"

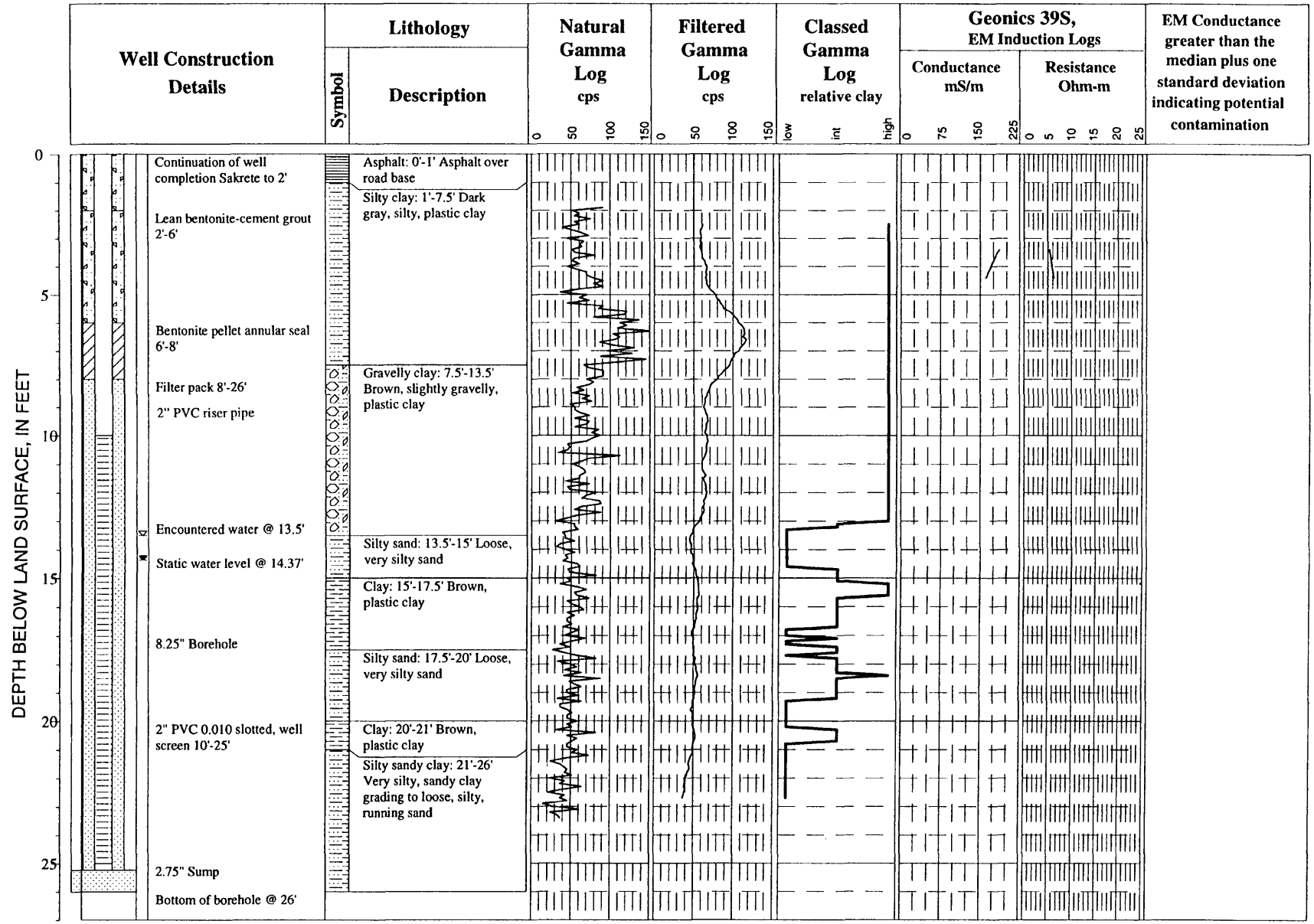
DWP-S5-5—Continued



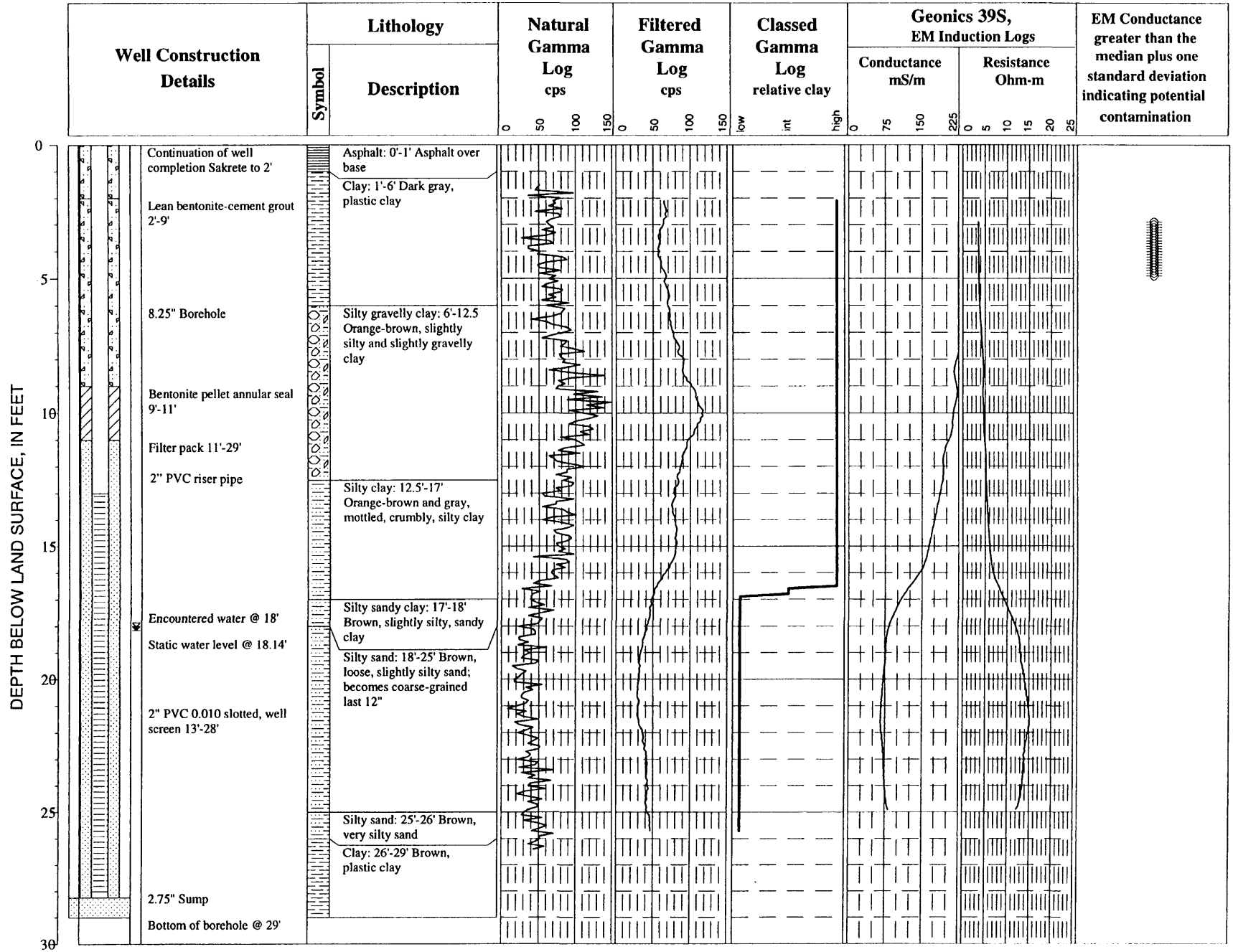
DWP-S5-6


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
2" PVC riser pipe
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
Static water level @ 14.7'
Encountered water @ 17'
8.25" Borehole
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over base
Clay: 1'-8' Dark gray, plastic clay
Gravelly clay: 8'-13' Orange-brown, gravelly, plastic clay
Silty sandy clay: 13'-16' Brown, slightly silty, sandy clay
Sandy clay: 16'-21.5' Alternating very silty, sandy clay and loose, very silty sand
Clay: 21.5'-26' Brown, plastic clay
Silty sand: 26'-27' Loose, very silty sand
Clay: 27'-28.5' Brown, plastic clay
Silty sand: 28.5'-29' Loose, very silty sand

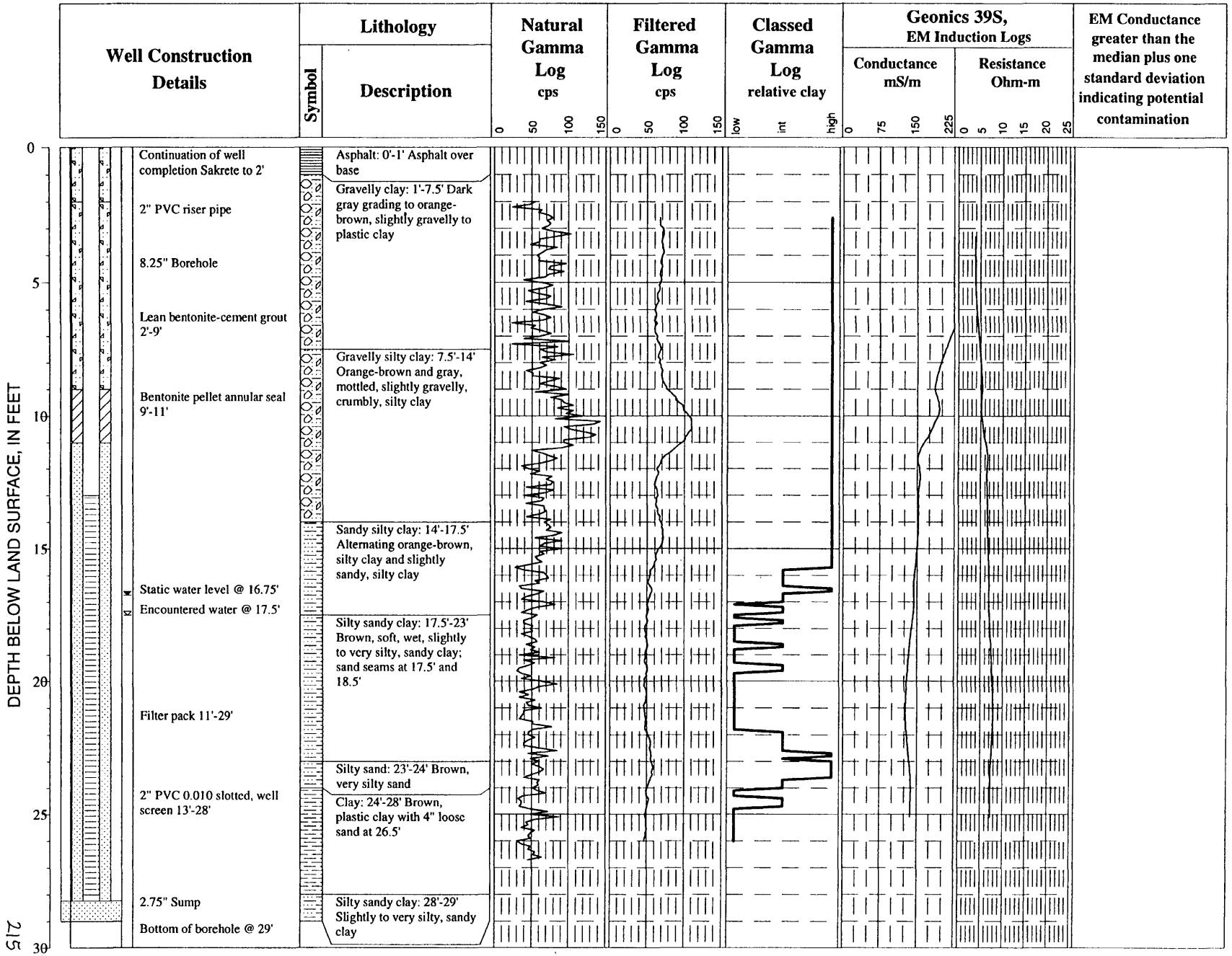
DWP-S5-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
Encountered water @ 13.5'
Static water level @ 14.37'
8.25" Borehole
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Asphalt: 0'-1' Asphalt over road base
Silty clay: 1'-7.5' Dark gray, silty, plastic clay
Gravelly clay: 7.5'-13.5' Brown, slightly gravelly, plastic clay
Silty sand: 13.5'-15' Loose, very silty sand
Clay: 15'-17.5' Brown, plastic clay
Silty sand: 17.5'-20' Loose, very silty sand
Clay: 20'-21' Brown, plastic clay
Silty sandy clay: 21'-26' Very silty, sandy clay grading to loose, silty, running sand

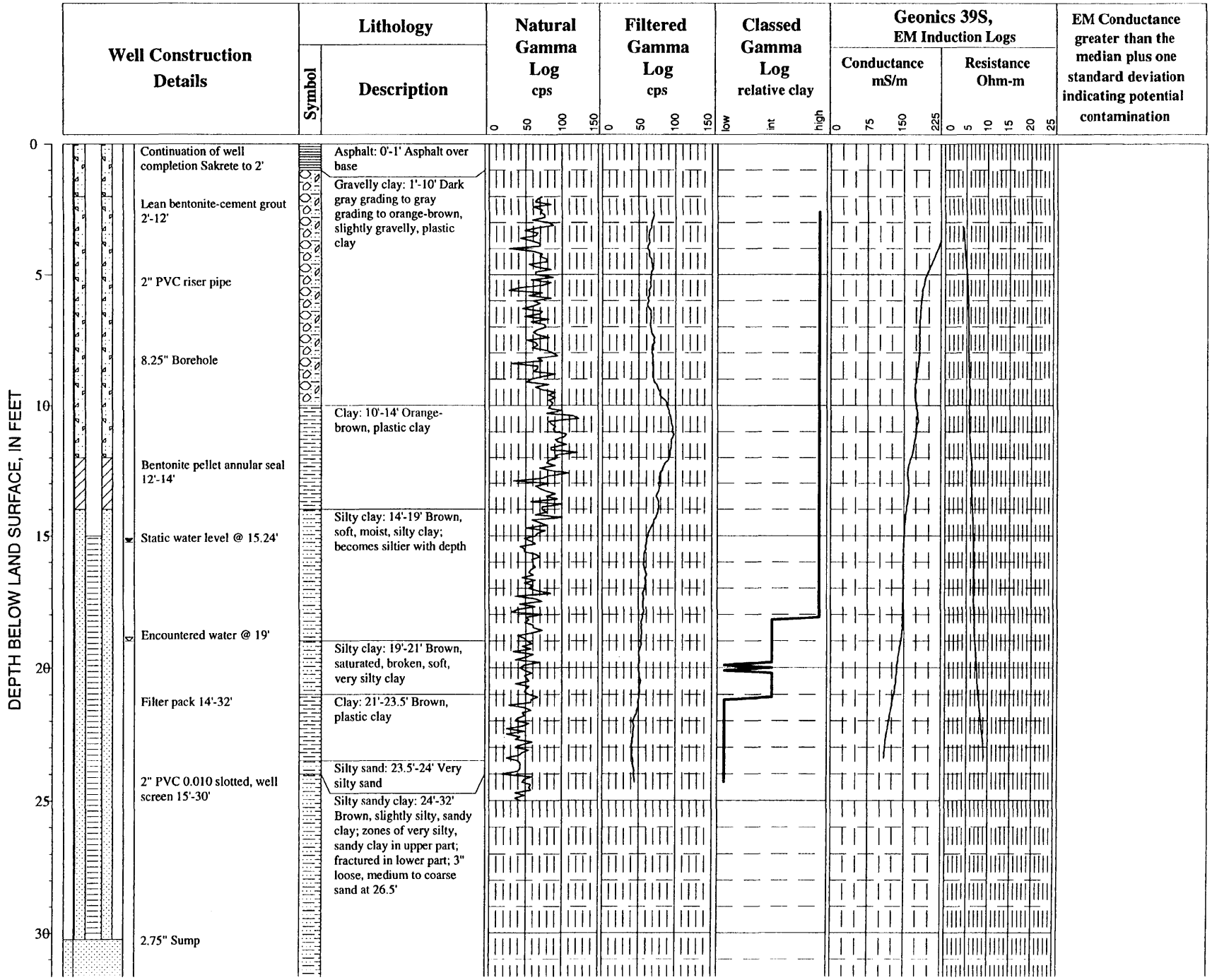
DWP-S5-8


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-9'
8.25" Borehole
Bentonite pellet annular seal 9'-11'
Filter pack 11'-29'
2" PVC riser pipe
Encountered water @ 18'
Static water level @ 18.14'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over base
Clay: 1'-6' Dark gray, plastic clay
Silty gravelly clay: 6'-12.5 Orange-brown, slightly silty and slightly gravelly clay
Silty clay: 12.5'-17' Orange-brown and gray, mottled, crumbly, silty clay
Silty sandy clay: 17'-18' Brown, slightly silty, sandy clay
Silty sand: 18'-25' Brown, loose, slightly silty sand; becomes coarse-grained last 12"
Silty sand: 25'-26' Brown, very silty sand
Clay: 26'-29' Brown, plastic clay
low
int
high

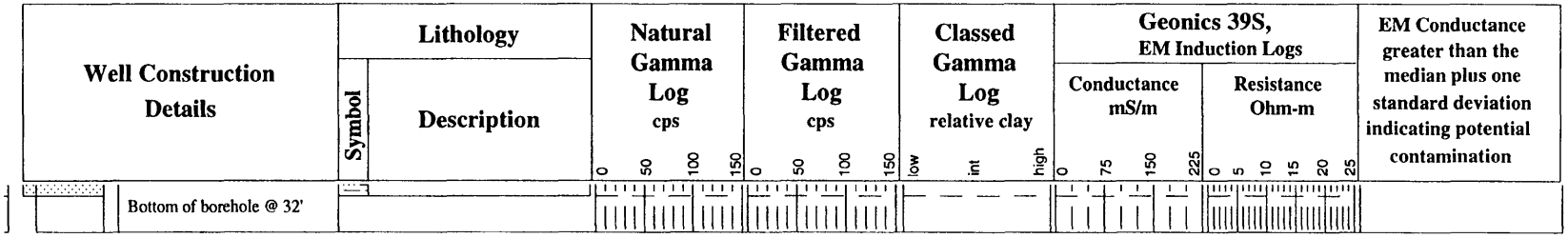
DWP-S5-9


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0 5 10 15 20 25 30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Static water level @ 16.75'
Encountered water @ 17.5'
Filter pack 11'-29'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Asphalt: 0'-1' Asphalt over base
Gravelly clay: 1'-7.5' Dark gray grading to orange-brown, slightly gravelly to plastic clay
Gravelly silty clay: 7.5'-14' Orange-brown and gray, mottled, slightly gravelly, crumbly, silty clay
Sandy silty clay: 14'-17.5' Alternating orange-brown, silty clay and slightly sandy, silty clay
Silty sandy clay: 17.5'-23' Brown, soft, wet, slightly to very silty, sandy clay; sand seams at 17.5' and 18.5'
Silty sand: 23'-24' Brown, very silty sand
Clay: 24'-28' Brown, plastic clay with 4" loose sand at 26.5'
Silty sandy clay: 28'-29' Slightly to very silty, sandy clay

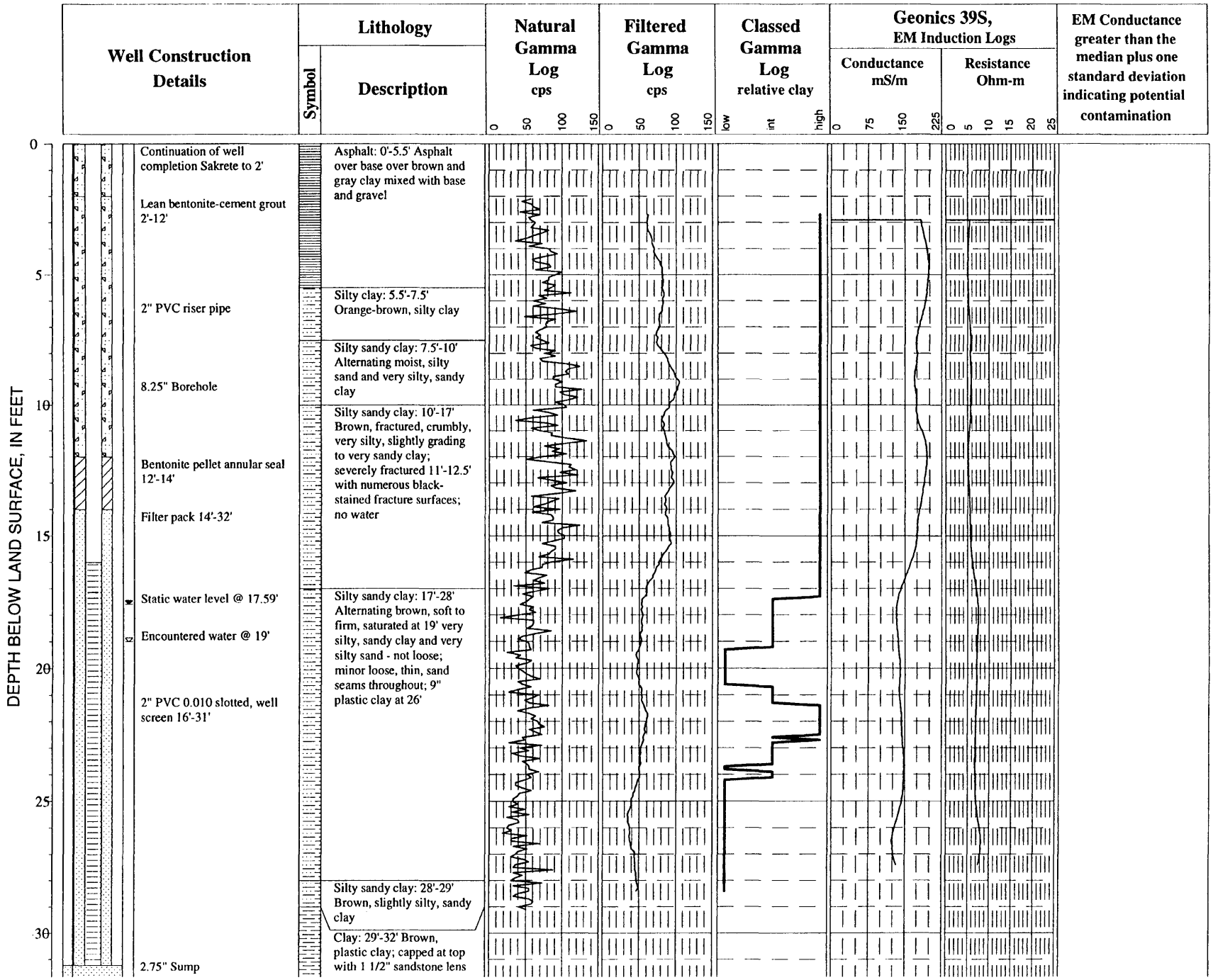
DWP-S5-10


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-12'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 12'-14'
Static water level @ 15.24'
Encountered water @ 19'
Filter pack 14'-32'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Asphalt: 0'-1' Asphalt over base
Gravelly clay: 1'-10' Dark gray grading to gray grading to orange-brown, slightly gravelly, plastic clay
Clay: 10'-14' Orange-brown, plastic clay
Silty clay: 14'-19' Brown, soft, moist, silty clay; becomes siltier with depth
Silty clay: 19'-21' Brown, saturated, broken, soft, very silty clay
Clay: 21'-23.5' Brown, plastic clay
Silty sand: 23.5'-24' Very silty sand
Silty sandy clay: 24'-32' Brown, slightly silty, sandy clay; zones of very silty, sandy clay in upper part; fractured in lower part; 3" loose, medium to coarse sand at 26.5'

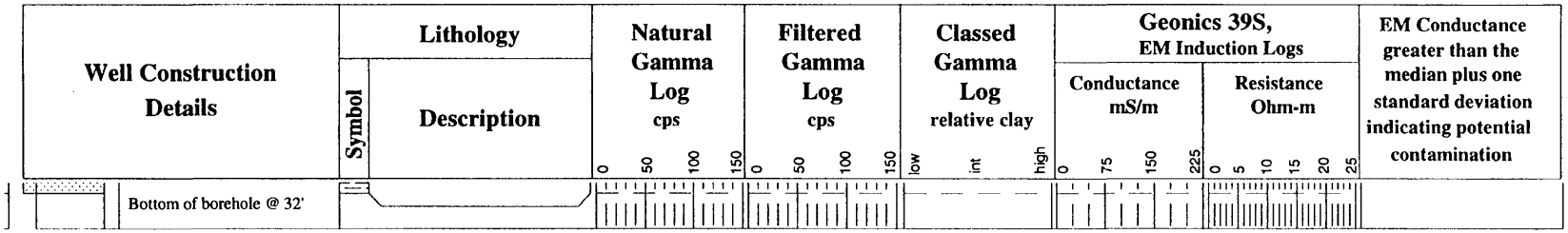
DWP-S5-10—Continued



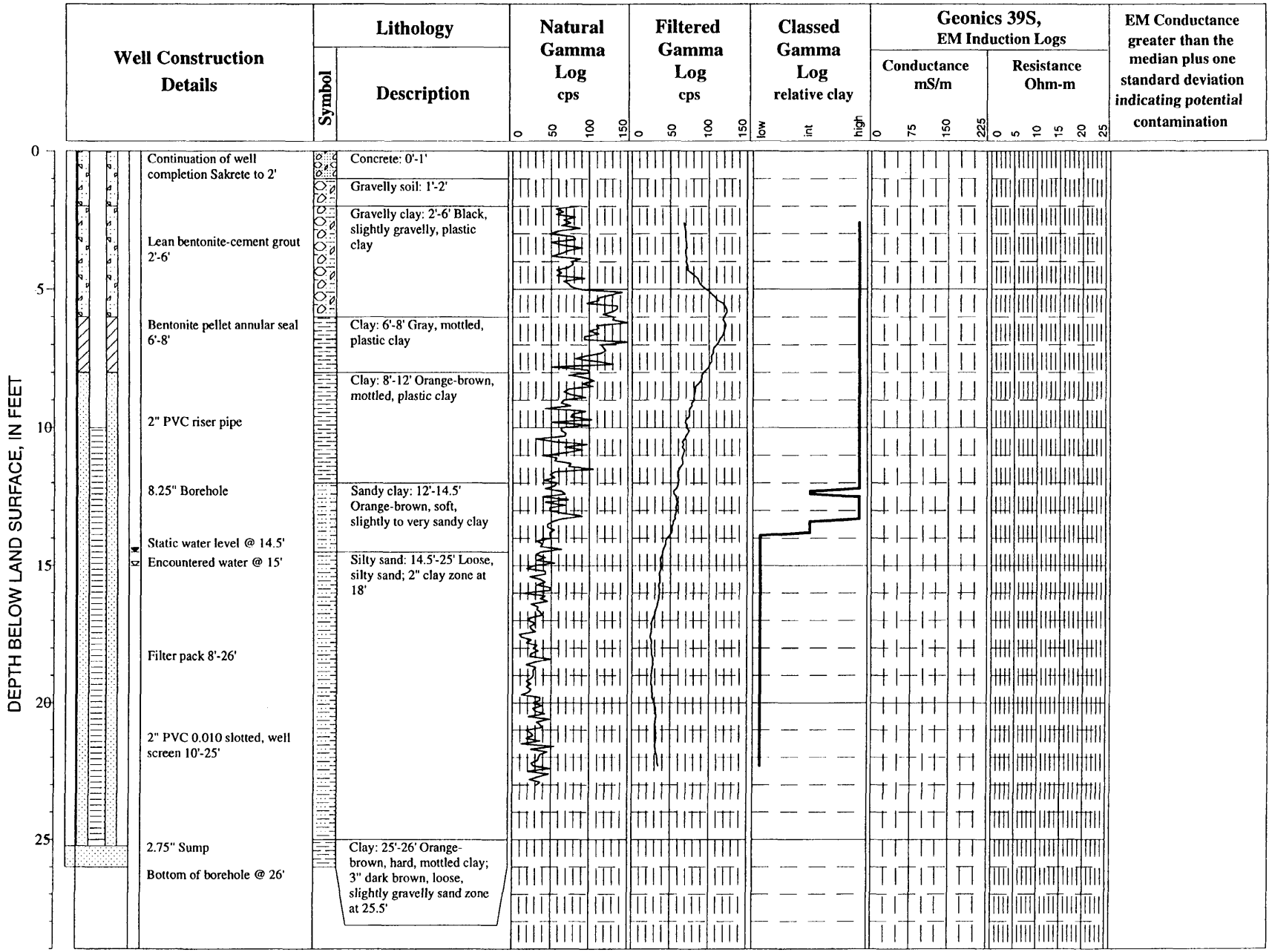
DWP-S5-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-12'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 12'-14'
Filter pack 14'-32'
Static water level @ 17.59'
Encountered water @ 19'
2" PVC 0.010 slotted, well screen 16'-31'
2.75" Sump
Asphalt: 0'-5.5' Asphalt over base over brown and gray clay mixed with base and gravel
Silty clay: 5.5'-7.5' Orange-brown, silty clay
Silty sandy clay: 7.5'-10' Alternating moist, silty sand and very silty, sandy clay
Silty sandy clay: 10'-17' Brown, fractured, crumbly, very silty, slightly grading to very sandy clay; severely fractured 11'-12.5' with numerous black-stained fracture surfaces; no water
Silty sandy clay: 17'-28' Alternating brown, soft to firm, saturated at 19' very silty, sandy clay and very silty sand - not loose; minor loose, thin, sand seams throughout; 9" plastic clay at 26'
Silty sandy clay: 28'-29' Brown, slightly silty, sandy clay
Clay: 29'-32' Brown, plastic clay; capped at top with 1 1/2" sandstone lens

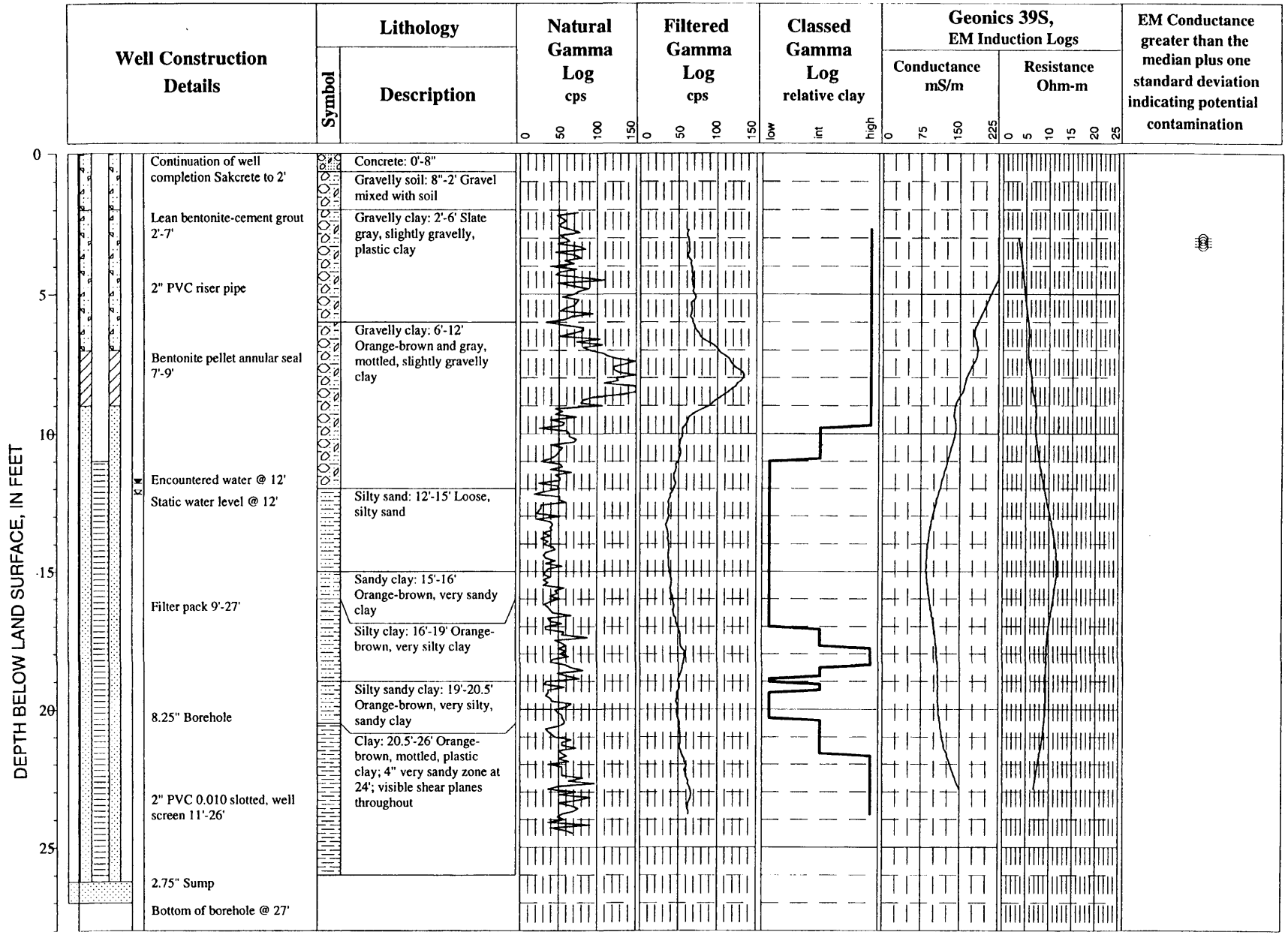
DWP-S5-11—Continued



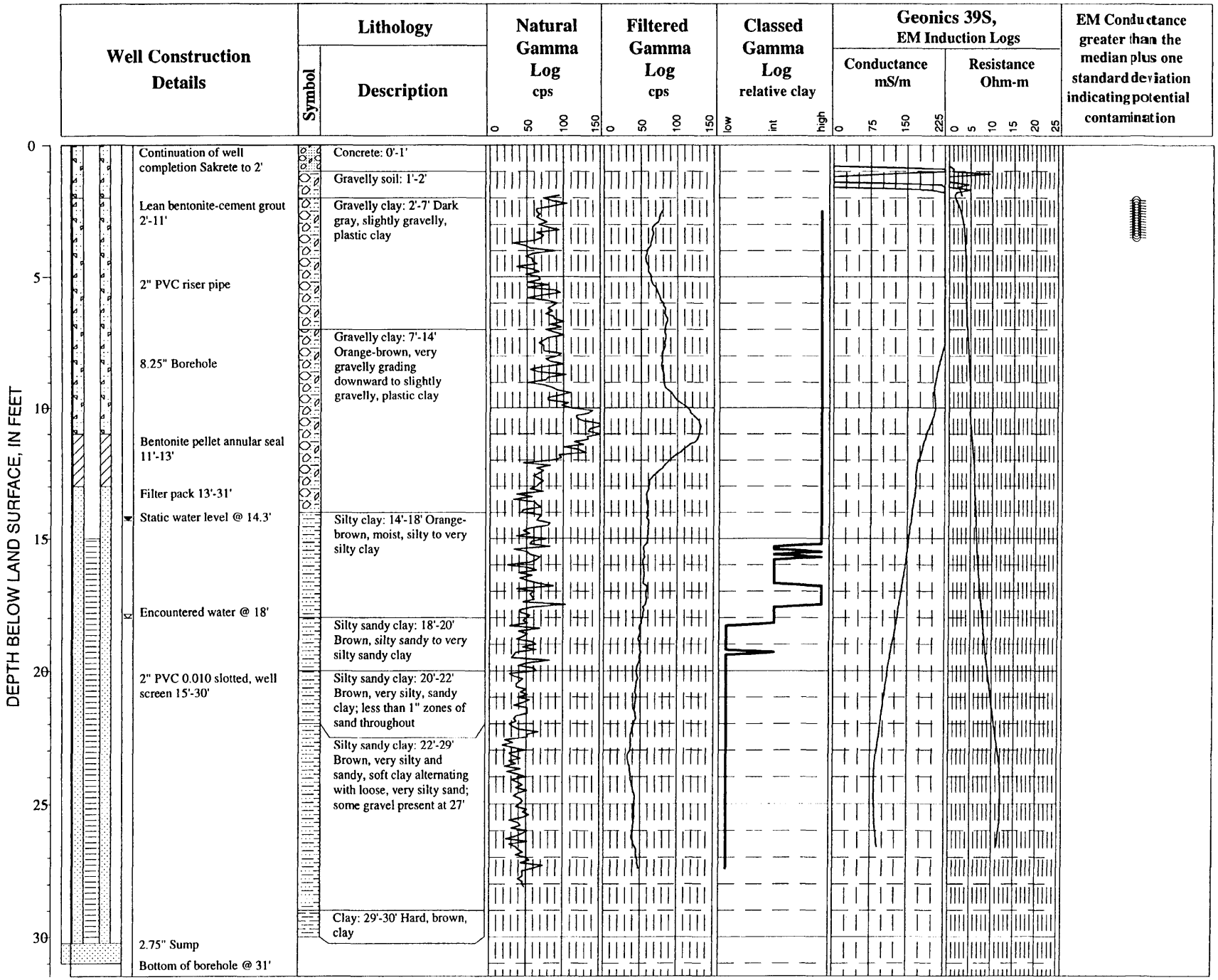
DWP-S6-3


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
2" PVC riser pipe
8.25" Borehole
Static water level @ 14.5'
Encountered water @ 15'
Filter pack 8'-26'
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-6' Black, slightly gravelly, plastic clay
Clay: 6'-8' Gray, mottled, plastic clay
Clay: 8'-12' Orange-brown, mottled, plastic clay
Sandy clay: 12'-14.5' Orange-brown, soft, slightly to very sandy clay
Silty sand: 14.5'-25' Loose, silty sand; 2" clay zone at 18'
Clay: 25'-26' Orange-brown, hard, mottled clay; 3" dark brown, loose, slightly gravelly sand zone at 25.5'

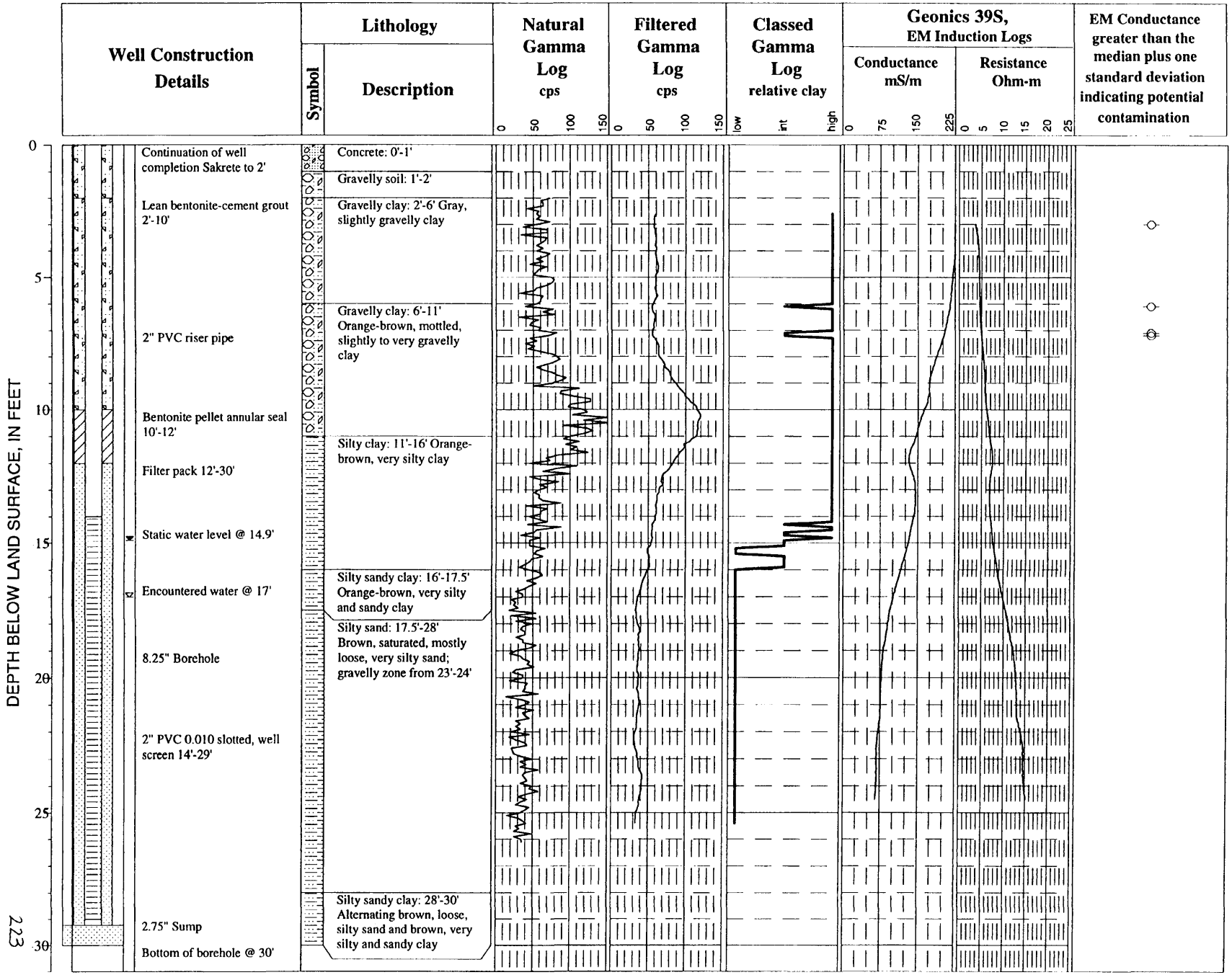
DWP-S6-4


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
Continuation of well completion Sakcrete to 2'
Lean bentonite-cement grout 2'-7'
2" PVC riser pipe
Bentonite pellet annular seal 7'-9'
Encountered water @ 12'
Static water level @ 12'
Filter pack 9'-27'
8.25" Borehole
2" PVC 0.010 slotted, well screen 11'-26'
2.75" Sump
Bottom of borehole @ 27'
Concrete: 0'-8"
Gravelly soil: 8"-2' Gravel mixed with soil
Gravelly clay: 2'-6' Slate gray, slightly gravelly, plastic clay
Gravelly clay: 6'-12' Orange-brown and gray, mottled, slightly gravelly clay
Silty sand: 12'-15' Loose, silty sand
Sandy clay: 15'-16' Orange-brown, very sandy clay
Silty clay: 16'-19' Orange-brown, very silty clay
Silty sandy clay: 19'-20.5' Orange-brown, very silty, sandy clay
Clay: 20.5'-26' Orange-brown, mottled, plastic clay; 4" very sandy zone at 24'; visible shear planes throughout

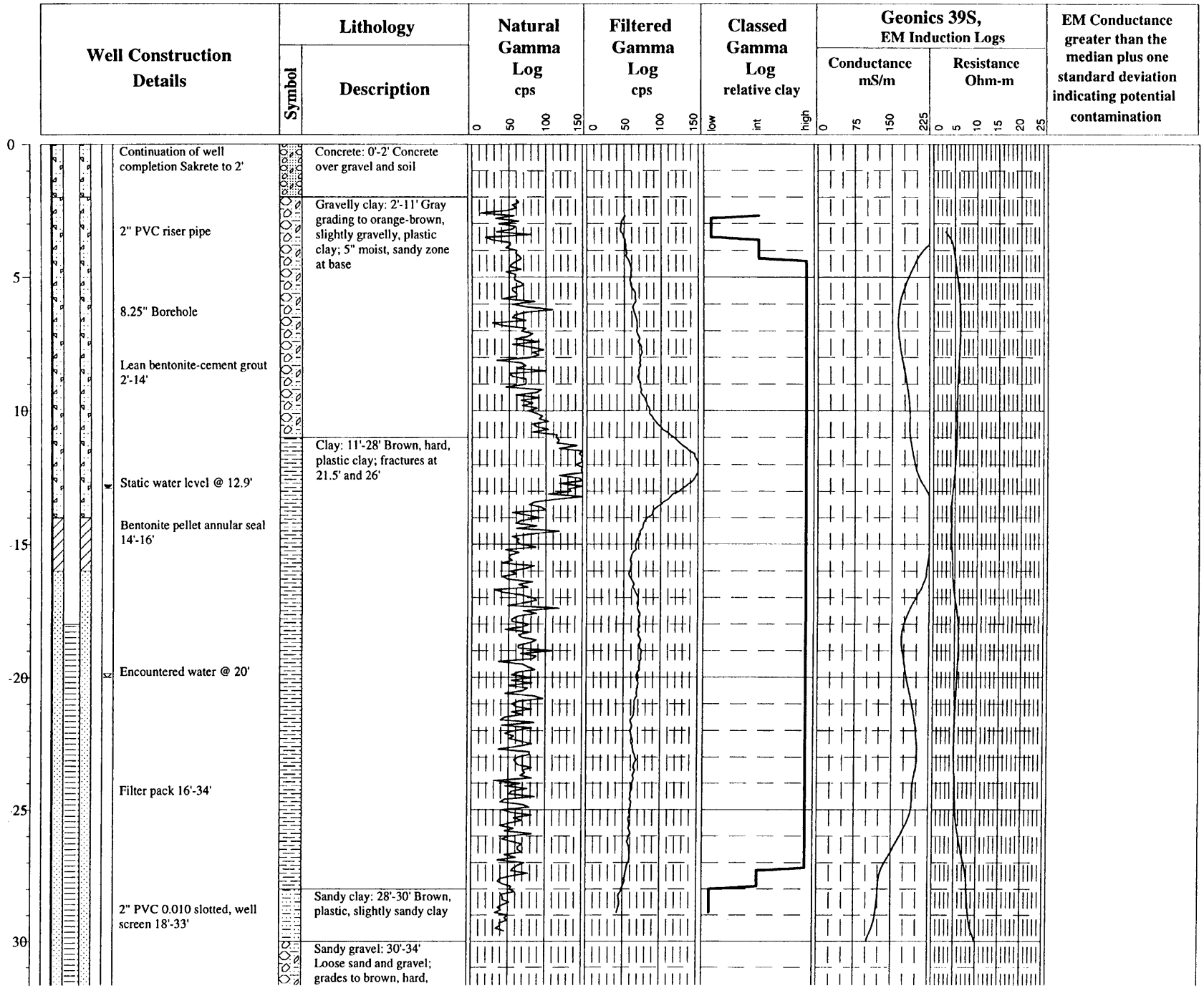
DWP-S6-7


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-11'
2" PVC riser pipe
8.25" Borehole
Bentonite pellet annular seal 11'-13'
Filter pack 13'-31'
Static water level @ 14.3'
Encountered water @ 18'
2" PVC 0.010 slotted, well screen 15'-30'
2.75" Sump
Bottom of borehole @ 31'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-7' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 7'-14' Orange-brown, very gravelly grading downward to slightly gravelly, plastic clay
Silty clay: 14'-18' Orange-brown, moist, silty to very silty clay
Silty sandy clay: 18'-20' Brown, silty sandy to very silty sandy clay
Silty sandy clay: 20'-22' Brown, very silty, sandy clay; less than 1" zones of sand throughout
Silty sandy clay: 22'-29' Brown, very silty and sandy, soft clay alternating with loose, very silty sand; some gravel present at 27'
Clay: 29'-30' Hard, brown, clay
0
5
10
15
20
25
30
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25

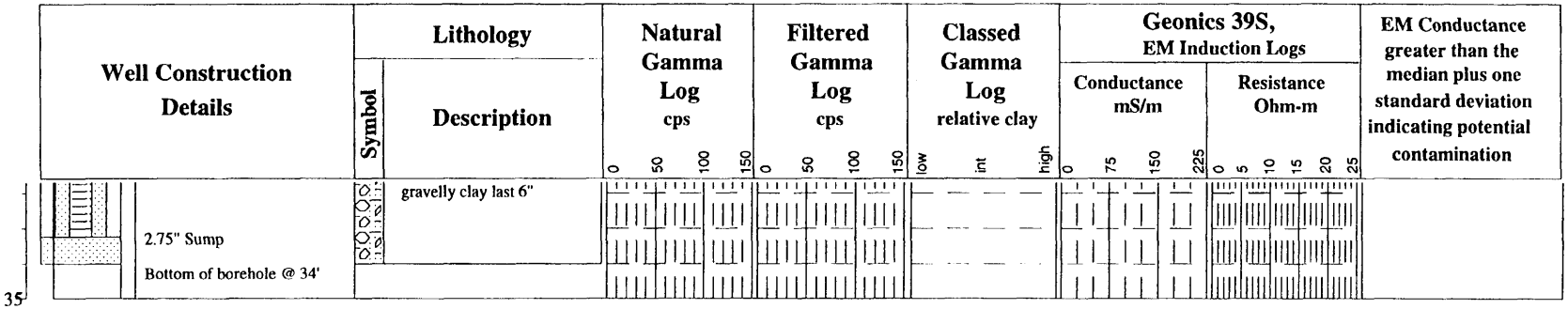
DWP-S6-8


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-10'
2" PVC riser pipe
Bentonite pellet annular seal 10'-12'
Filter pack 12'-30'
Static water level @ 14.9'
Encountered water @ 17'
8.25" Borehole
2" PVC 0.010 slotted, well screen 14'-29'
2.75" Sump
Bottom of borehole @ 30'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-6' Gray, slightly gravelly clay
Gravelly clay: 6'-11' Orange-brown, mottled, slightly to very gravelly clay
Silty clay: 11'-16' Orange-brown, very silty clay
Silty sandy clay: 16'-17.5' Orange-brown, very silty and sandy clay
Silty sand: 17.5'-28' Brown, saturated, mostly loose, very silty sand; gravelly zone from 23'-24'
Silty sandy clay: 28'-30' Alternating brown, loose, silty sand and brown, very silty and sandy clay

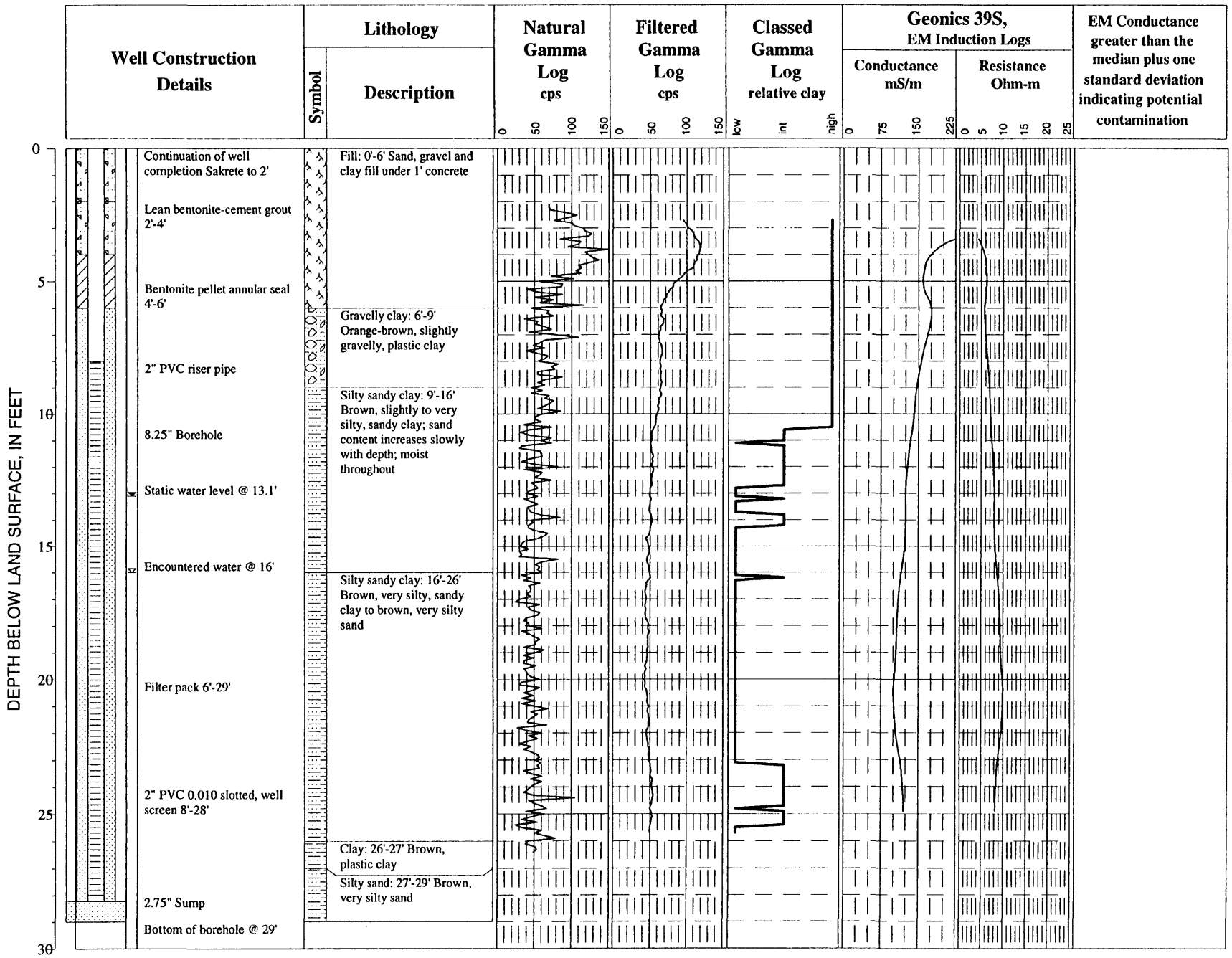
DWP-S6-11


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-14'
Static water level @ 12.9'
Bentonite pellet annular seal 14'-16'
Encountered water @ 20'
Filter pack 16'-34'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-2' Concrete over gravel and soil
Gravelly clay: 2'-11' Gray grading to orange-brown, slightly gravelly, plastic clay; 5" moist, sandy zone at base
Clay: 11'-28' Brown, hard, plastic clay; fractures at 21.5' and 26'
Sandy clay: 28'-30' Brown, plastic, slightly sandy clay
Sandy gravel: 30'-34' Loose sand and gravel; grades to brown, hard,

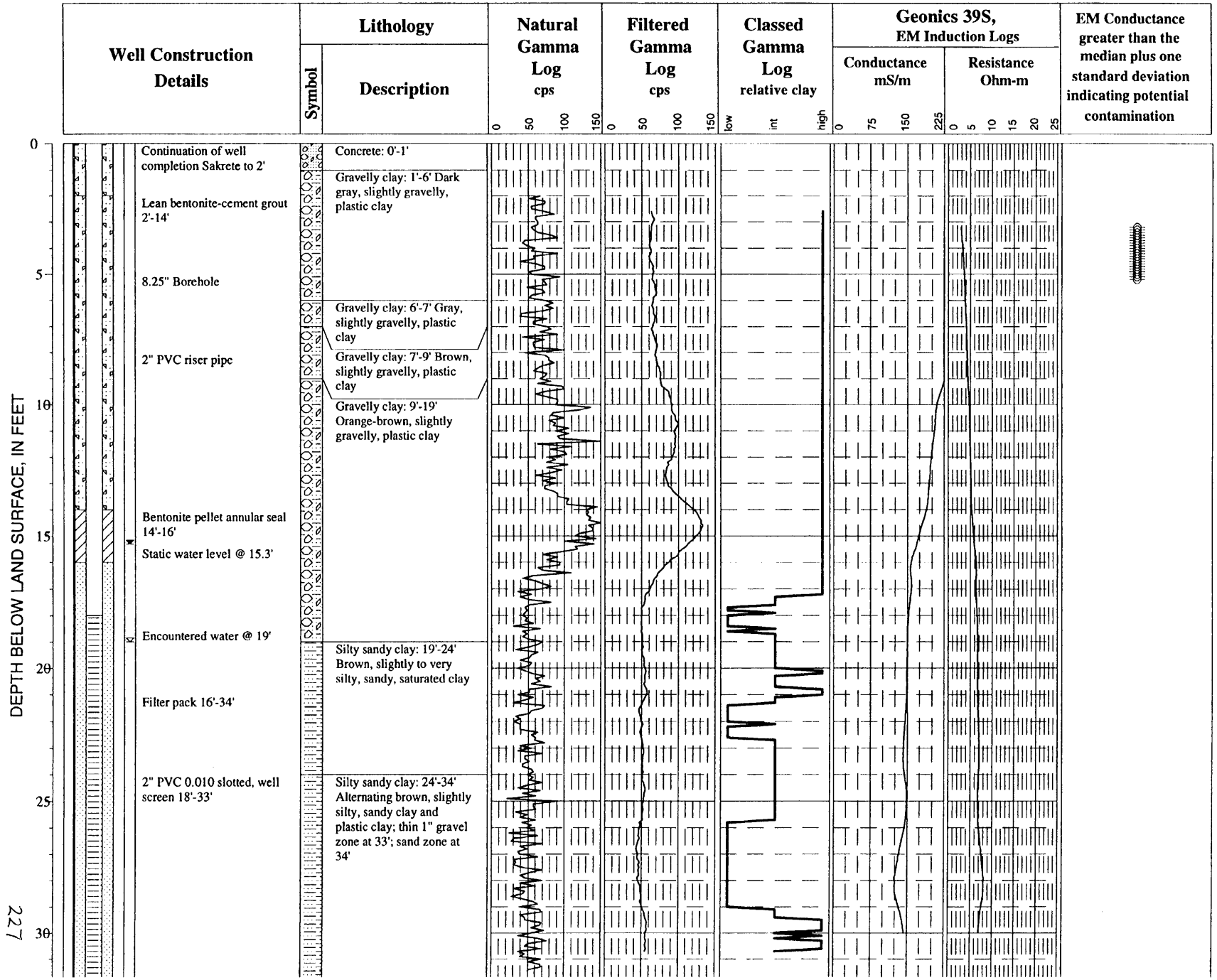
DWP-S6-11—Continued



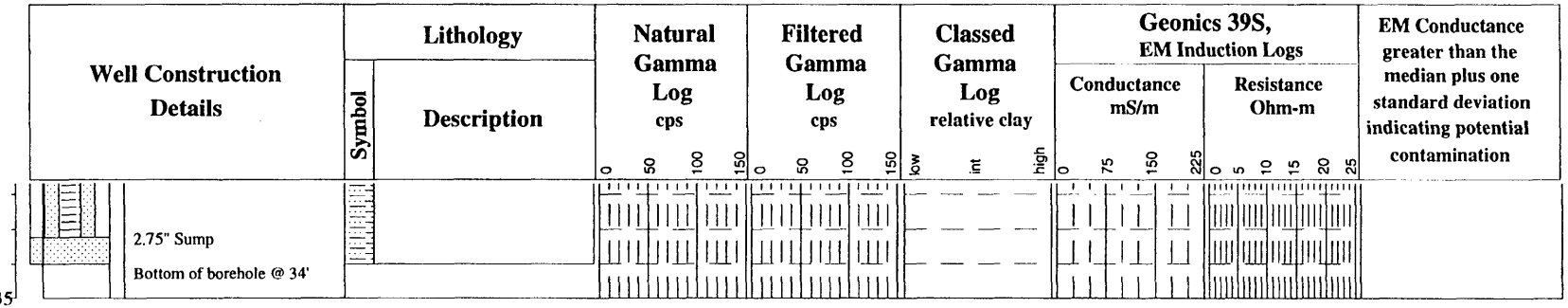
DWP-S6-12


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-4'
Bentonite pellet annular seal 4'-6'
2" PVC riser pipe
8.25" Borehole
Static water level @ 13.1'
Encountered water @ 16'
Filter pack 6'-29'
2" PVC 0.010 slotted, well screen 8'-28'
2.75" Sump
Bottom of borehole @ 29'
Fill: 0'-6' Sand, gravel and clay fill under 1' concrete
Gravelly clay: 6'-9' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 9'-16' Brown, slightly to very silty, sandy clay; sand content increases slowly with depth; moist throughout
Silty sandy clay: 16'-26' Brown, very silty, sandy clay to brown, very silty sand
Clay: 26'-27' Brown, plastic clay
Silty sand: 27'-29' Brown, very silty sand
low
int
high

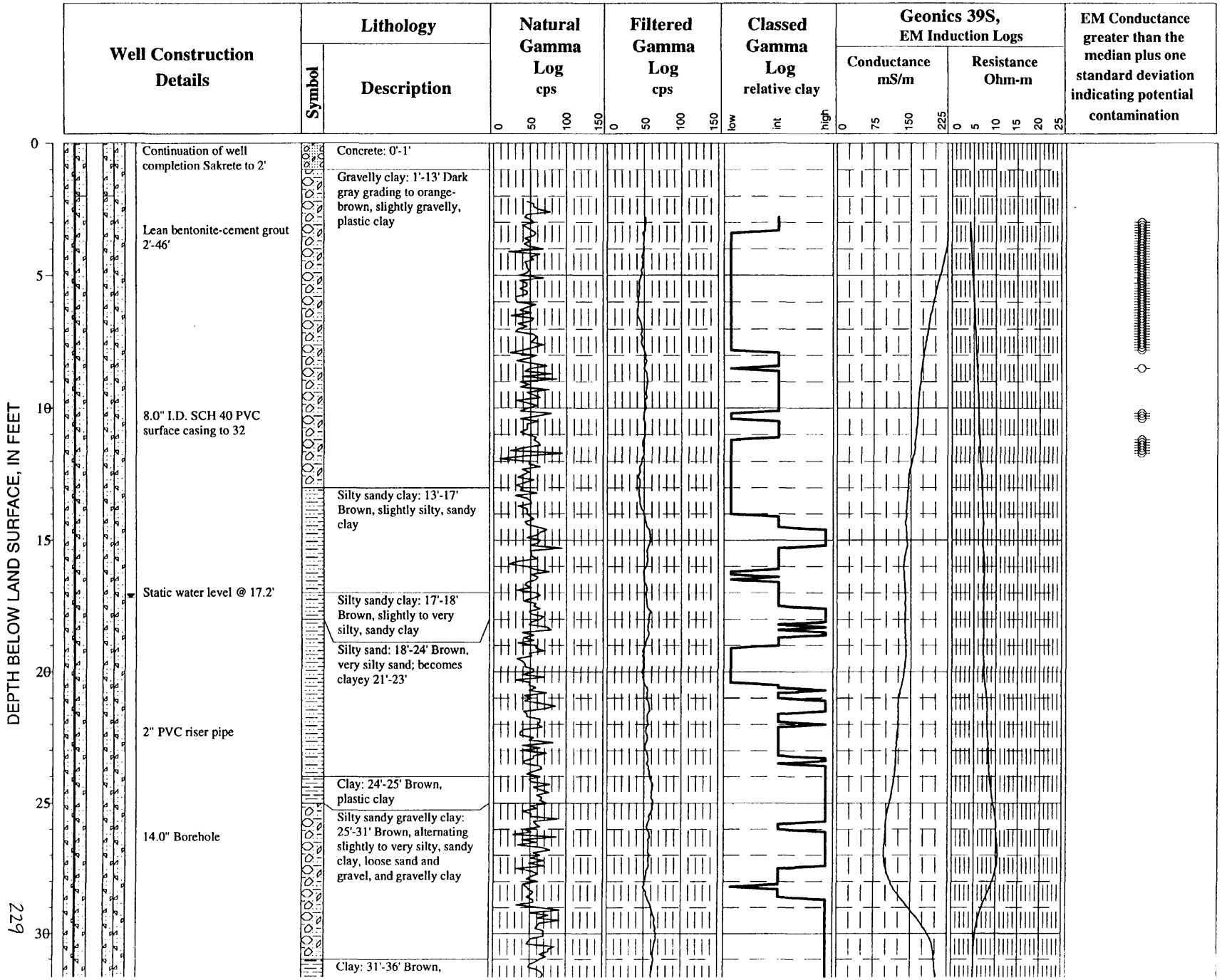
DWP-S6-13


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log
cps
0 50 100 150
Filtered Gamma Log
cps
0 50 100 150
Classed Gamma Log
relative clay
low int high
Geonics 39S,
EM Induction Logs
Conductance
mS/m
0 75 150 225
Resistance
Ohm-m
0 5 10 15 20 25
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
0
5
10
15
20
25
30
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-14'
8.25" Borehole
2" PVC riser pipe
Bentonite pellet annular seal 14'-16'
Static water level @ 15.3'
Encountered water @ 19'
Filter pack 16'-34'
2" PVC 0.010 slotted, well screen 18'-33'
Concrete: 0'-1'
Gravelly clay: 1'-6' Dark gray, slightly gravelly, plastic clay
Gravelly clay: 6'-7' Gray, slightly gravelly, plastic clay
Gravelly clay: 7'-9' Brown, slightly gravelly, plastic clay
Gravelly clay: 9'-19' Orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 19'-24' Brown, slightly to very silty, sandy, saturated clay
Silty sandy clay: 24'-34' Alternating brown, slightly silty, sandy clay and plastic clay; thin 1" gravel zone at 33'; sand zone at 34'

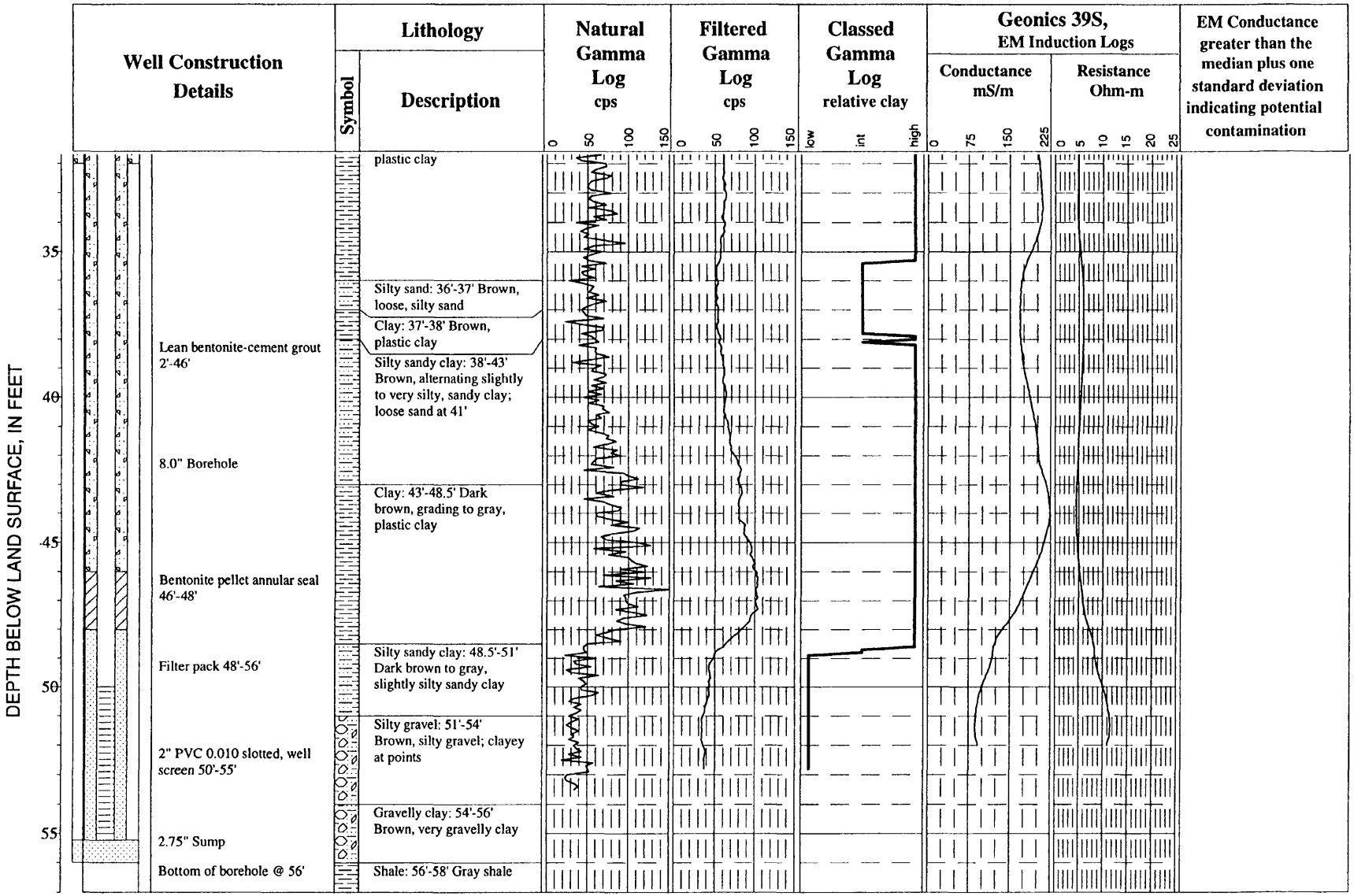
DWP-S6-13—Continued



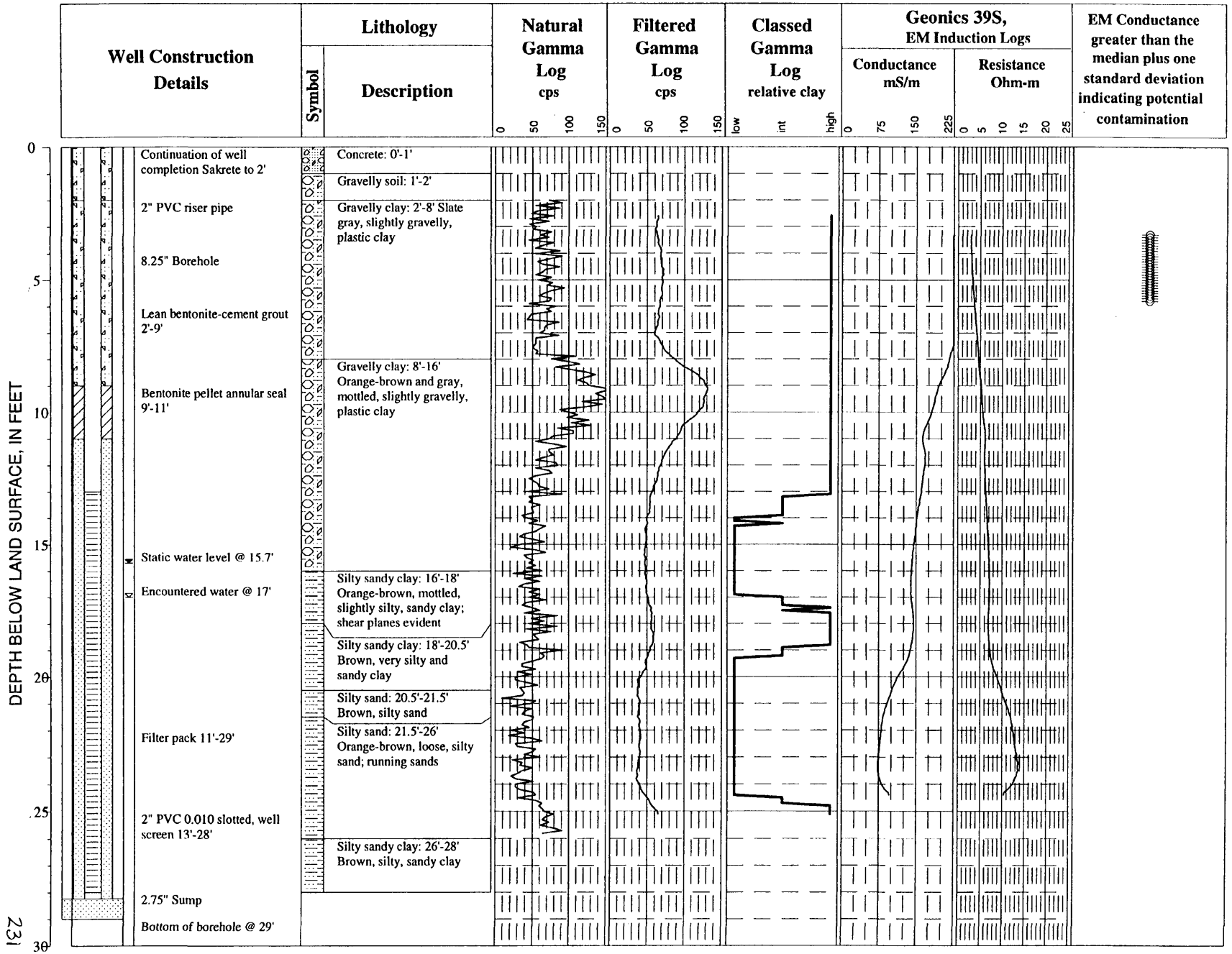
DWP-S6-DW1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-46'
8.0" I.D. SCH 40 PVC surface casing to 32
Static water level @ 17.2'
2" PVC riser pipe
14.0" Borehole
Concrete: 0'-1'
Gravelly clay: 1'-13' Dark gray grading to orange-brown, slightly gravelly, plastic clay
Silty sandy clay: 13'-17' Brown, slightly silty, sandy clay
Silty sandy clay: 17'-18' Brown, slightly to very silty, sandy clay
Silty sand: 18'-24' Brown, very silty sand; becomes clayey 21'-23'
Clay: 24'-25' Brown, plastic clay
Silty sandy gravelly clay: 25'-31' Brown, alternating slightly to very silty, sandy clay, loose sand and gravel, and gravelly clay
Clay: 31'-36' Brown,
low
int
high

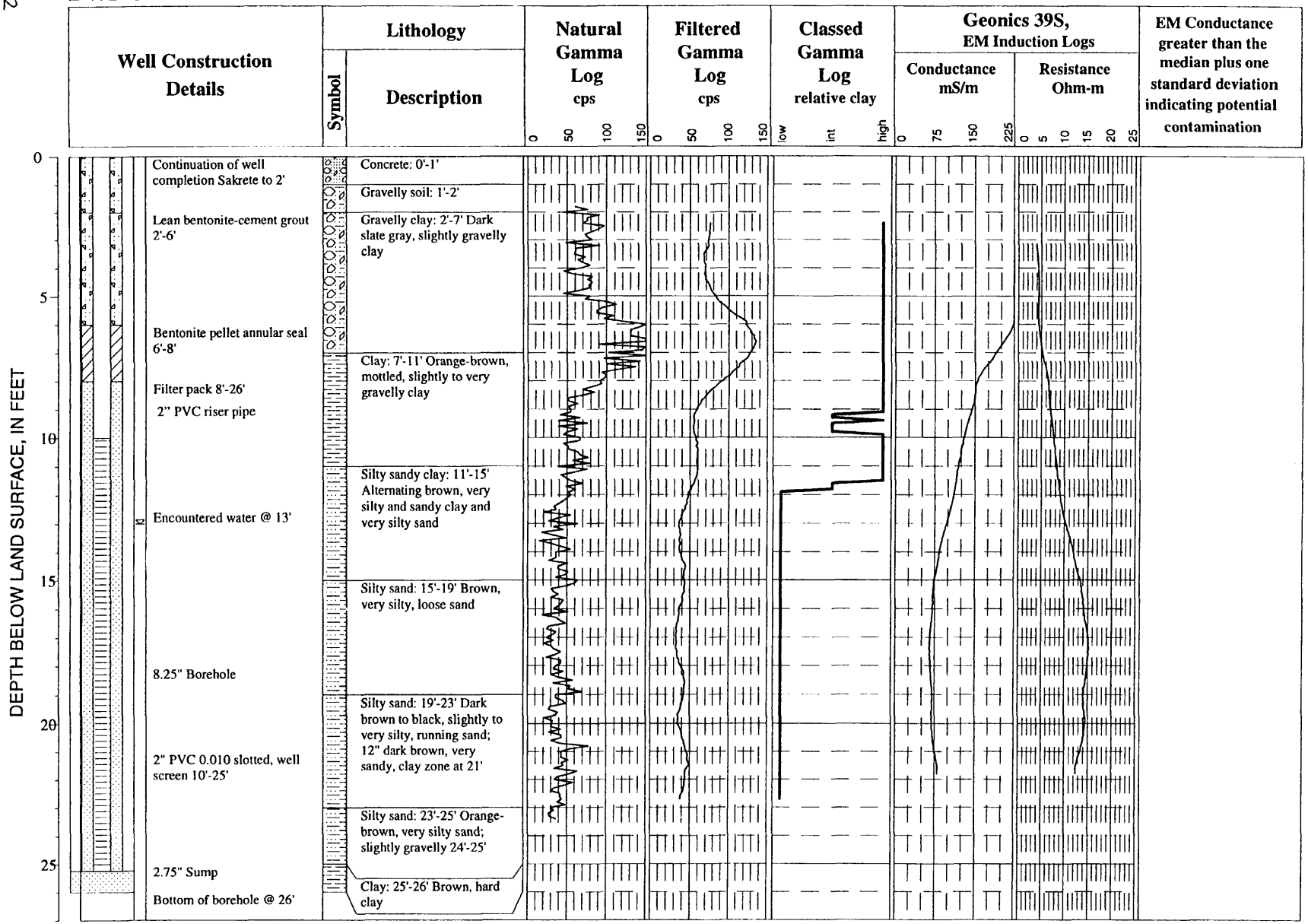
DWP-S6-DW1—Continued



DWP-S8-1


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
2" PVC riser pipe
8.25" Borehole
Lean bentonite-cement grout 2'-9'
Bentonite pellet annular seal 9'-11'
Static water level @ 15.7'
Encountered water @ 17'
Filter pack 11'-29'
2" PVC 0.010 slotted, well screen 13'-28'
2.75" Sump
Bottom of borehole @ 29'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-8' Slate gray, slightly gravelly, plastic clay
Gravelly clay: 8'-16' Orange-brown and gray, mottled, slightly gravelly, plastic clay
Silty sandy clay: 16'-18' Orange-brown, mottled, slightly silty, sandy clay; shear planes evident
Silty sandy clay: 18'-20.5' Brown, very silty and sandy clay
Silty sand: 20.5'-21.5' Brown, silty sand
Silty sand: 21.5'-26' Orange-brown, loose, silty sand; running sands
Silty sandy clay: 26'-28' Brown, silty, sandy clay
0 50 100 150
0 50 100 150
low int high
0 75 150 225
0 5 10 15 20 25
0 5 10 15 20 25 30

DWP-S8-2


Well Construction Details
Lithology
Symbol
Description
Natural Gamma Log cps
Filtered Gamma Log cps
Classed Gamma Log relative clay
Geonics 39S, EM Induction Logs
Conductance mS/m
Resistance Ohm-m
EM Conductance greater than the median plus one standard deviation indicating potential contamination
DEPTH BELOW LAND SURFACE, IN FEET
Continuation of well completion Sakrete to 2'
Lean bentonite-cement grout 2'-6'
Bentonite pellet annular seal 6'-8'
Filter pack 8'-26'
2" PVC riser pipe
Encountered water @ 13'
8.25" Borehole
2" PVC 0.010 slotted, well screen 10'-25'
2.75" Sump
Bottom of borehole @ 26'
Concrete: 0'-1'
Gravelly soil: 1'-2'
Gravelly clay: 2'-7' Dark slate gray, slightly gravelly clay
Clay: 7'-11' Orange-brown, mottled, slightly to very gravelly clay
Silty sandy clay: 11'-15' Alternating brown, very silty and sandy clay and very silty sand
Silty sand: 15'-19' Brown, very silty, loose sand
Silty sand: 19'-23' Dark brown to black, slightly to very silty, running sand; 12" dark brown, very sandy, clay zone at 21'
Silty sand: 23'-25' Orange-brown, very silty sand; slightly gravelly 24'-25'
Clay: 25'-26' Brown, hard clay
0
50
100
150
low
int
high
75
225
5
10
15
20
25