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SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION PART 1 ALTERNATE WATER SUPPLY INSTALLATION AND TEST OF A TEST WELL

02/01/92

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

REMEDIAL INVESTIGATION and FEASIBILITY STUDY

February 1992
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U.S. DEPARTMENT OF ENERGY
FERNALD OFFICE

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1.0 INTRODUCTION

As part of the South Groundwater Contamination Plume Removal Action, the Fernald Environmental Management Project (FEMP) will install alternate water supply wells for two local industries. This document describes the activities involved in installing an initial test well and the results of the pumping tests performed on that well as part of this task. Alternate water supply well AW-1 and the two piezometers for the test were installed between mid-July and mid-September, 1991. The well was developed and tested in late September and early October, 1991.

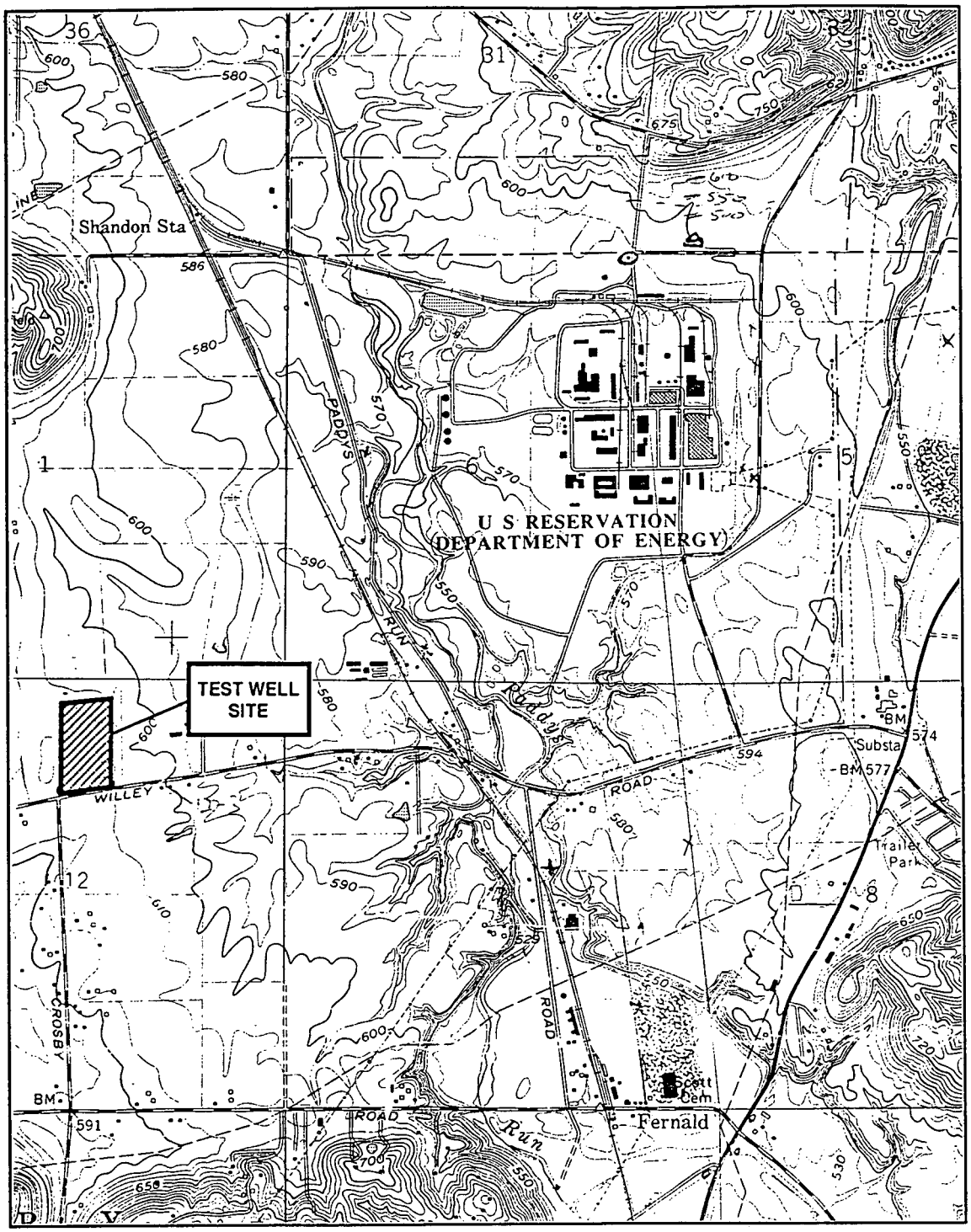
The minimum requirement for any one well is that it can provide a sustained flow of 250 gallon per minute (gpm). Up to four wells will be installed to ensure that the water supply will not be interrupted during periods when individual wells require maintenance. The water quality from these wells must also meet quality standards specified in the removal action work plan.

The alternate water supply well location is about 1.5 miles west of the FEMP near the intersection of Willey and Crosby Roads (Figure 1). This site was chosen because the location is upgradient from both the FEMP and the Paddys Run Road Ohio Superfund Site which are known to be groundwater contamination sources. The test well confirmed projections as to the thickness of the glacial overburden, thickness and composition of the aquifer, and the depth to bedrock. This data was used as the design basis for the selection of the length and slot-size of the well-screen.

A step drawdown and a 72-hour steady state pump test were performed in September and October, 1991. The tests were conducted as a water resources investigation to verify that a single well could yield a 250 gpm flow and to determine if there would be interference between wells in the proposed four-well field.

2.0 WELL INSTALLATION

The three wells were placed and constructed to provide good well test data. Since there is little known about the aquifer in the area where these wells were installed, grain size analyses and natural gamma logs were completed to help refine the geologic data at the well locations and to determine if the final well field would meet the requirements for an adequate water supply.



SCALE

0 1/4 1/2 1 MILE

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FIGURE 1. TEST WELL LOCATION MAP.

2.1 CONFIGURATION OF MONITORING SYSTEM

For the pump test, the well network consisted of a test well and two observation wells (piezometers) designated AW-1, PZ-1 and PZ-2, respectively. The test well will be used as one of the four production wells for the alternate water supply system. Observation well PZ-1 was located 25 feet east of the test well and PZ-2 was placed 300 feet north of PZ-1 (Figure 2) to determine the response, i.e. attendant well interference, of the aquifer to prolonged pumping during the pump test. The coordinates of the test wells are North 476,533.51/East 1,373,885.64 for AW-1, North 476,536.25/East 1,373,909.34 for PZ-1, and North 476,838.18/East 1,373,890.82 for PZ-2. This configuration was used so that the cone of depression induced in the aquifer by the pumping well could be determined.

Drilling of well AW-1 revealed that at this location the glacial overburden consists of till and interbedded minor sand and gravel lenses to 38 0.5 feet in depth. This overlies the Great Miami Aquifer which is 205 feet thick. Bedrock was encountered at a depth of 243.5 feet. The glacial overburden deposits overlying the sand and gravel aquifer in the vicinity of the water supply site generally prevent direct recharge of surface water to the aquifer (Spieker 1968). The Dry Fork of the Whitewater River, located approximately one mile west of the site, has eroded through the glacial overburden and is thought to be the principle source of recharge to the aquifer for the well site.

2.2 DRILLING AND WELL INSTALLATION

The wells were drilled using cable tool drilling techniques. The drilling program was conducted between July 16 and August 26, 1991. Field operations were conducted under the Health and Safety Plan for the South Groundwater Contamination Plume Removal Action, Part 1, Alternate Water Supply, Feed Materials Production Center, dated September 1990.

Initially, a 12-inch diameter nonthreaded carbon steel casing was driven. This welded casing was used to reduce friction while drilling through the glacial overburden. Although the drilling plan called for the 12-inch diameter casing to be driven to an approximate depth of 100 feet, it was driven only to a depth of 67 feet due to very dense glacial overburden and dry soil conditions. A 10-inch diameter, schedule 40, carbon steel, straight edge welded joint casing was telescoped inside the 12-inch casing and driven to a depth of 243.5 feet below ground surface, where the bedrock was encountered. This 10-inch diameter casing was also used as the riser casing of the finished well.

Split-spoon samples were not collected in the glacial overburden; however, the nature of the material being penetrated was assessed from the drill cuttings. Standard 18-inch-long split-spoon samples were collected at five-foot intervals from a depth of 80 to 220 feet below ground surface. This depth was chosen because it was the potential interval for the well screen. Below 220 feet split-spoon samples

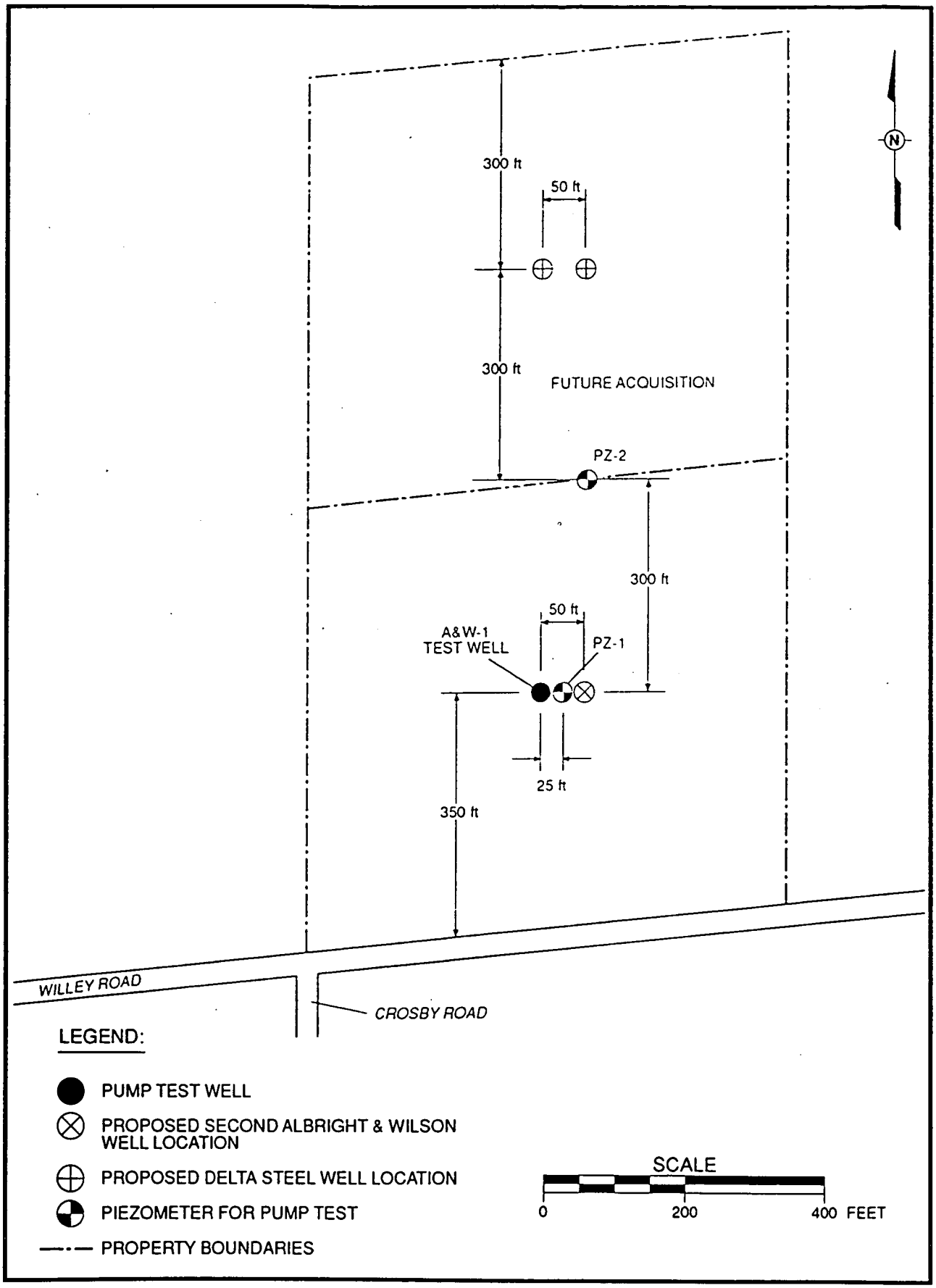

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FIGURE 2. TEST WELL AND PIEZOMETER LOCATIONS.

were collected every 10 feet until bedrock was encountered. Each split-spoon sample was described in accordance with the Unified Soil Classification System (USCS) by a field geologist. The boring log for well AW-1 is included in Appendix A. The samples were retained until the final drilling depth was reached, to facilitate the selection of the samples which would be submitted for grain-size analysis.

The split-spoon sample collected from 92.0 to 93.5 feet was clearly saturated, indicating it was from below the water table. Water level measurements taken after the well was installed indicated a static water level at 88 feet below ground surface. The aquifer is clearly unconfined in this area since there is a 50-foot-thick interval of unsaturated sands above the water table.

2.3 GRAIN-SIZE ANALYSIS

Selection of an appropriate screen slot size was based on grain-size analyses from eight split-spoon samples collected between the depths of 155 and 225 feet. It was anticipated that the screen for the well would be installed within this interval. Since the aquifer consists of a clean sand, the actual selection of samples was in part dependent on the percent recovery of individual split-spoon samples. The samples were shipped to the Howard Smith Screen Company (HSSC), Houston, Texas for grain-size analysis and screen slot-size determination.

Table 1 summarizes the results of the grain-size analysis. Appendix B is the report from HSSC which includes the results of grain-size analysis. The results in Table 1 indicate that the samples were relatively uniform in grain size. With the exception of one sample, 70 percent of the grains were greater than a 60-mesh size which is classified as a medium to coarse sand. HSSC recommended a 0.02-inch-slot size for this material which would provide a 30 percent retention of formation materials if a natural sand pack was used.

This means that during well construction the aquifer would be allowed to collapse around the screen rather than placing an artificial sand pack. Based on the grain-size data obtained, 70 percent of the grains in the aquifer in contact with the screen are too large to pass through the screen slots and 30 percent could potentially enter the screen. During well development the fine material near the screen is pulled into the well. The coarser fraction of the sands come together as the fines are removed to form a natural filter around the well screen. As will be discussed later, this resulted in a cost-effective and high quality well.

TABLE 1
SUMMARY OF GRAIN SIZE ANALYSIS

Sample Interval From (ft)	Sample Interval To (ft)	Cumulative Percent Greater than 60-Mesh Size	Recommended Screen Slot Size (in.)
155.0	156.5	85.9	0.021
164.0	165.5	79.8	0.025
175.5	177.0	75.5	0.024
185.0	186.5	87.2	0.025
190.0	191.5	74.9	0.017
211.0	212.5	77.4	0.029
215.0	216.5	65.9	0.019
220.0	221.5	72.6	0.019

2.4 NATURAL GAMMA LOG

A natural gamma geophysical log was prepared for well AW-1. Since natural clays contain potassium-40, clays give off low levels of gamma radiation. Clean sand, on the other hand, does not contain potassium-40 and therefore does not give off gamma radiation. The natural gamma logging process is intended to detect precisely where the clay-rich gamma-emitting layers are within the stratigraphic sequence.

The natural gamma logging equipment consists of a sensor suspended on an electrical cable. The cable passes over a calibrated wheel which is used to synchronize cable movement with a strip chart recorder. As the sensor is pulled up the boring the counts per minute from the sensor are recorded on the strip chart. The rate of strip chart movement per foot of boring can be varied to provide greater or less detail. The speed at which the sensor is pulled up the well can also be varied to provide longer count times.

The natural gamma log was run on August 28, 1991 using a portable Borehole Logger Model 1000-C, manufactured by Mount Sopris Instrument Company. The logger is equipped with a gross count,

dead-time corrected, gamma radiation downhole probe. Prior to lowering the probe into the boring, the gamma calibration and the strip chart recorder were checked for proper operation. The log was made through the 10-inch diameter steel casing in the boring and the water from the aquifer in the casing.

The probe was lowered to a depth of 243.5 feet and a test run was done from 243.5 to 220 feet. This test confirmed the operation of the equipment. The strip chart recorder span was set at five counts per second per centimeter (cps/cm) of chart width. On the 10-centimeter-wide chart this is 2.5 cps/chart division. The natural gamma log was then run from a depth of 243.5 feet to the surface at a rate of 15 feet/minute, which is three feet per centimeter on the strip chart. The natural gamma log is presented in Appendix C.

From 243.5 to 57 feet the log shows the presence of sand as the principal stratigraphic material. Variable but very small amounts of silt and clay are noticeable throughout the unit but not as significant or distinct beds. Although the boring log of AW-1 shows the absence of reportable clay layers, due to drilling technique, thin clay layers and/or lenses could have been drilled through in the nonsampled intervals. There is no evidence of the presence of the blue-clay layer that divides the aquifer under portions of the FEMP property. Readings oscillated between 10 and 20 cps with maximum readings no greater than 27 cps.

The water table was detected at 88 feet below ground surface which was consistent with water level measurements made prior to the logging. There is a slight shift to higher counts above 88 feet because the probe is in air rather than water.

At a depth of 67 feet, the probe exited the heavier wall thickness of the 10-inch casing and entered the 12-inch diameter casing. There was a slight increase in the readings due to the reduced shield effect of the casing. At a depth of 57 feet there is another rise in the counts to a range of 25 to 30 cps with some peaks reaching almost 35 cps. This interval clearly has more clay than the underlying aquifer material. The log also indicated that the glacial overburden is somewhat thicker than indicated in the geologic log which was based on drill cuttings. The natural gamma log confirms that the aquifer is unconfined in that sand extends well above the water table.

2.5 WELL INSTALLATION

Based on the grain-size analysis a 9-1/2-inch, 70-foot long, stainless steel, 0.020-inch slot, continuous wire wrapped screen was installed in the well. The bottom of the screen was set 219.5 feet below ground level and the top of the screen is at a depth of 149.5 feet. This interval was chosen to screen

the highest water-yielding zone of the aquifer. Driscoll (1986) states that the bottom one-third to one-half of an aquifer provides the optimum screening length in an homogeneous water table aquifer. Under the existing design specifications, the screened length of AW-1 covers approximately one-half of the aquifer.

The installation was performed by telescoping through the 10-inch diameter casing down to the selected interval. After the placement of the screen, the 10-inch diameter casing was pulled to 149.5 feet, a level just below the top of the screen, where the screen and casing were anchored via a cast rubber packer. As the 10-inch diameter casing was pulled, the natural aquifer material was allowed to collapse around the screen as a filter-pack as described earlier. The well was completed with cement grout placed in the annular space between the 10-inch and 12-inch diameter casings.

When the well installation was completed, the tops of the 10-inch and 12-inch diameter casings were at 2.5 feet above ground level and at ground level, respectively. A cement pad was constructed around the 10-inch diameter well and covered the 12-inch casing (Appendix A).

2.6 PIEZOMETER INSTALLATION

Drilling of observation wells PZ-1 and PZ-2 was performed using an eight-inch and 10-inch diameter, respectively, threaded carbon steel casing. No soil sampling was conducted during drilling; however, drill cuttings were examined to differentiate the formation changes. Each two-inch-diameter piezometer was constructed with 20 feet of 0.010-inch slot PVC screen installed at a total depth of approximately 120 feet. The piezometers were constructed with flush-threaded, schedule 40-PVC, riser-casing. As with the test well, a natural filterpack was used by allowing the natural soils to collapse around the well screen. The filter pack was extended up to the water table where the annular space was sealed with an approximately three-foot-thick bentonite pellet seal. Grout was used to seal the well from the top of the bentonite seal to the ground surface. The observation wells were finished with the installation of lockable protective casings. Piezometer completion diagrams are included in Appendix A.

Periodic water level measurements during and after drilling and installation showed that the water level inside the boreholes stabilized with the existing water table. This indicates that the piezometers are communicating with the surrounding aquifer. The piezometers were not developed because they will not be used to produce water for sampling or water supply.

2.7 WELL DEVELOPMENT

From September 13 through 15, 1991, the test well was developed by surging and pumping until the turbidity of water was clear, with an Nephelometric Turbidity Unit (NTU) reading of three. Turbidity refers to suspended solids and organic matter that do not settle out of water. The NTU is the measuring unit for turbidity and indicates how much light is transmitted or scattered when the light source is passed through a water sample. A total of about 10,500 gallons of water was removed from the well, while less than two 55-gallon drums were filled with fines during development.

After initial surging and bailing to remove coarse sediments from the well, development continued using a one-horsepower, 220-volt, 60-Hz, Model 100W1 submersible pump. The pump was lowered to the top of the screen and 5480 gallons of water were removed from the well at a 20 gpm rate. Development continued by lowering the pump to the middle of the screened section where about 4980 gallons of water was removed at 25 gpm.

2.8 CUTTINGS DISPOSAL

Drill cuttings and solids generated during well installation and development were drummed, hauled and disposed of on the soil pile south of the Storm Water Retention Basin located on FEMP property.

3.0 WELL TEST DESIGN

Testing consisted of:

- 6-hour step drawdown test
- 72-hour constant rate pumping test
- 21.5-hour recovery test

The testing was conducted to determine water supply and attendant well interference. Testing began on September 17 and was completed on September 27, 1991.

3.1 TEST EQUIPMENT

The well tests were conducted using a 30-horsepower, 460-volt, three-phase submersible pump. The flow rate was controlled by a discharge valve attached to a flow meter. The pumped water was discharged to a surface stream about 600 feet east of the well through a six-inch-diameter PVC pipe.

A Model 1000, Hermit, data logger was utilized to record the changes in water levels in the observation wells (PZ-1 and PZ-2). A second Model 1000 was used for the pumping well (AW-1) during the pumping and recovery tests. The piezometers were equipped with pressure

transducers with a 20-pound per square inch (psi) range. The pumping well was equipped with transducers with a 20- and a 50-psi range. The transducers connected to the data logger were the principal data collection devices for the drawdown and recovery tests. Periodic hand measurements of the water levels were made with an electric depth indicator on a graduated tape. These measurements were used to confirm the readings from the data logger.

The data logger was set so the original water level in the well represented a zero starting point. Changes relative to the initial water level were recorded over a logarithmic time scale. Initially the time interval between readings was 0.0033 minutes. The data logger increased the time interval to a maximum of five minutes between readings for the step drawdown test and 15 minutes for the 72 hour test. The raw data for the data logger transducers are contained in Appendix D.

3.2 STEP DRAWDOWN TEST

A step drawdown test (also called "well-performance test") is usually conducted to determine optimum yield of a water well prior to a constant rate pumping test. The test provides preliminary information on what the drawdown in a well would be if it were pumped at a rate that differs from the rate during the pumping test. In addition, the data obtained during the test is used to calculate the two components of drawdown in a pumped well: the aquifer losses and the well losses. A step-drawdown test is performed by systematically increasing the discharge rate for at least three steps. For each step, the pumping rate is increased to a higher constant discharge rate and the well is pumped until the drawdown stabilizes once again.

A step drawdown test was performed on pumping well AW-1 on September 17, 1991. In addition to monitoring the pumping well, levels were also monitored in both observation piezometers. During the step drawdown test, each pumping rate was maintained for 111.5 minutes. Discharge rates for each step were 130, 205, and 375 gpm.

Figure 3 shows the drawdown data for this portion of the testing program. Based on the data from the step test, this well could be expected to yield 250 gpm for 3.50 feet of drawdown. Data from the data loggers during the step test are included as Appendix D.

3.3 CONSTANT RATE TEST

A constant rate test was conducted on September 22, 1991, and continued for 72 hours to determine attendant well interference. A flow rate of 380 gpm, which was the maximum capacity of the pump, was maintained throughout the 72-hour period. Periodic discharge flow

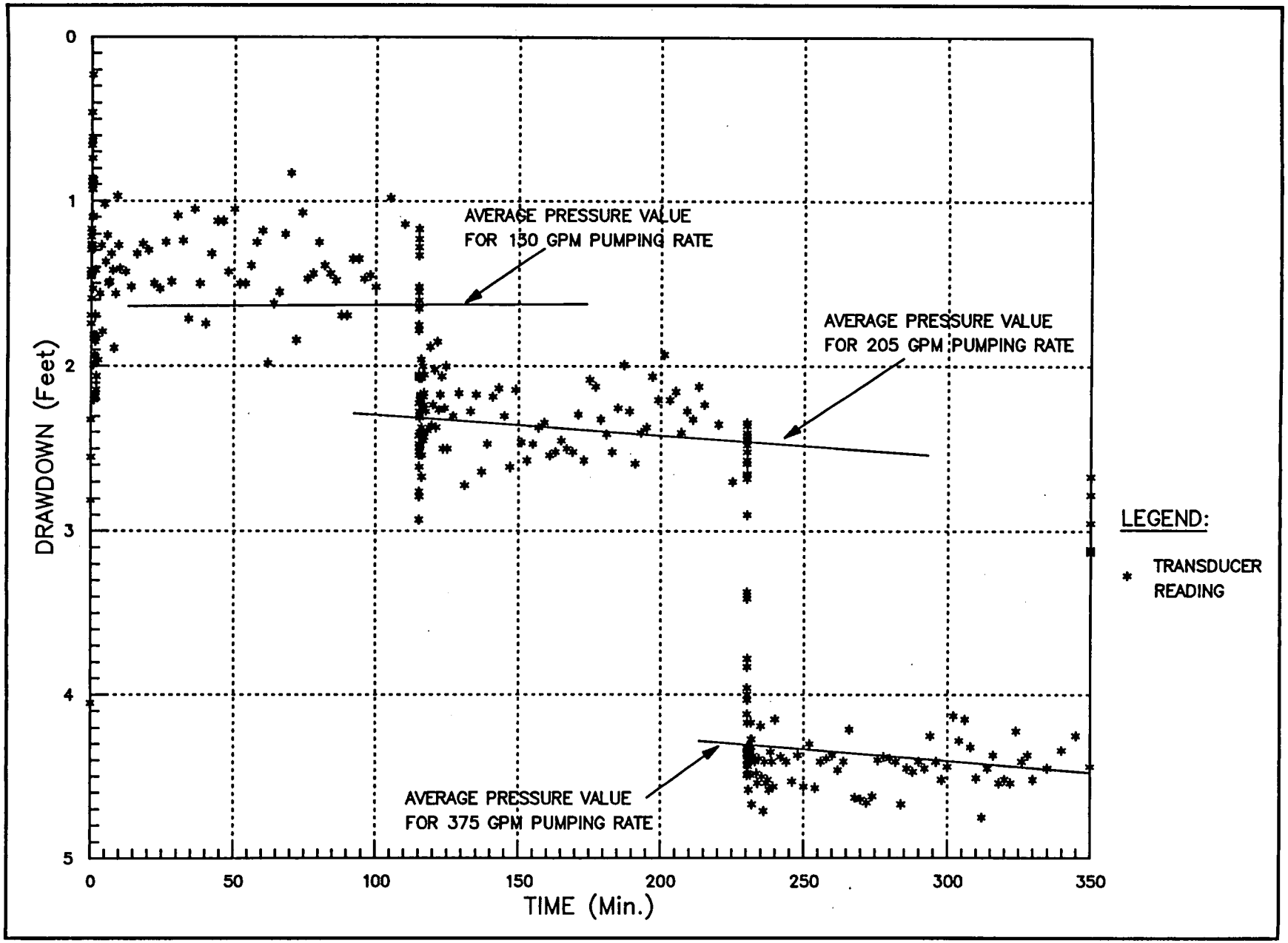

FIGURE 3. STEP DRAWDOWN FOR PUMPING WELL AW-1

measurements were taken during the constant-rate pump test to insure the constant discharge rate of the pump was at its maximum capacity. Water-level data was collected logarithmically using the Hermit data loggers. Data was recorded at both observation piezometers as well as the pumping well. Following completion of the 72-hour constant rate test, water levels were monitored for a 21-hour recovery period. All testing was completed on September 26, 1991.

3.4 AQUIFER YIELD

The objective of the testing program was to determine if this area would yield groundwater at flow rates which could be used as an alternate water supply for the South Groundwater Contamination Plume Removal Action. The data from the test shows that AW-1 can produce in excess of 250 gpm and would not interfere with other wells located 50 feet away.

A review of the data was also conducted to see if any other aquifer characteristics could be determined. To determine the aquifer characteristics of transmissivity and storativity, a variety of analytical and numerical procedures are available in the published literature. The cornerstone for most of the techniques addressing transient well hydraulics is a formula developed by C.V. Theis in 1935, as published by Lohman (1979) and Driscoll (1986).

Before any of these techniques can be used to calculate transmissivity or storage, the data must be reviewed and observation wells without sufficient response to pumpage should be discarded. Sufficient response was not observed in either PZ-1 or PZ-2. PZ-1 is located within 25 feet of the pumping well. Figure 4 shows the response of the monitoring points during the constant rate test.

The pumping well responded with 4.35 feet of drawdown after 72 hours of pumpage at a flow rate of 380 gpm (Figure 5). Water-level data from the data logger are included in Appendix D.

Figure 6 shows the recovery data from this portion of the test. Data for Figure 6 are shown in Table 2. It should be noted that recovery data collection started after the water levels had recovered 1.24 feet. This was due to a malfunction of the data recorder.

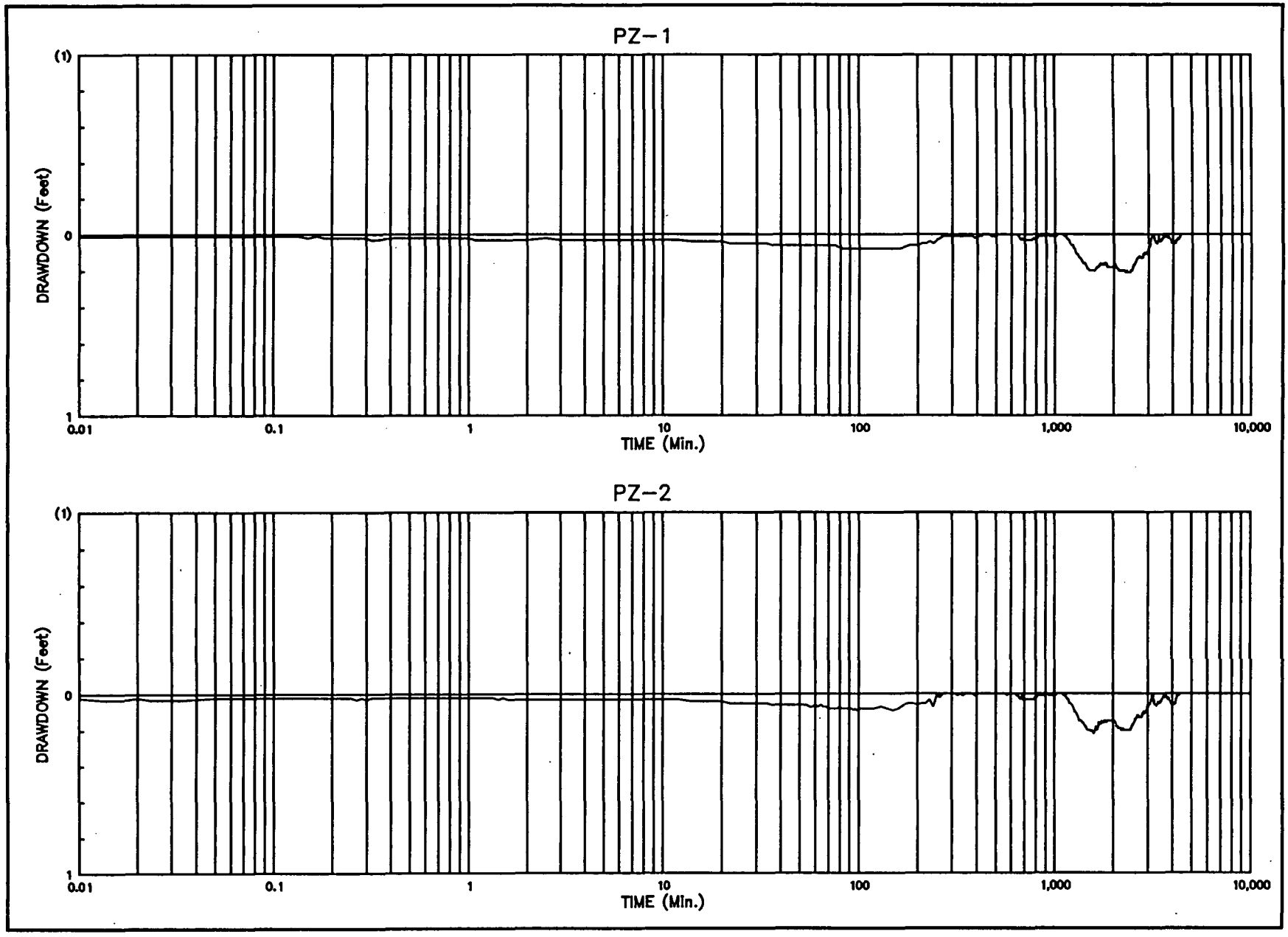

FIGURE 4. TIME-DRAWDOWN FOR OBSERVATION WELLS PZ-1 AND PZ-2
72 HOUR PUMP TEST, SEPTEMBER 22-25, 1991

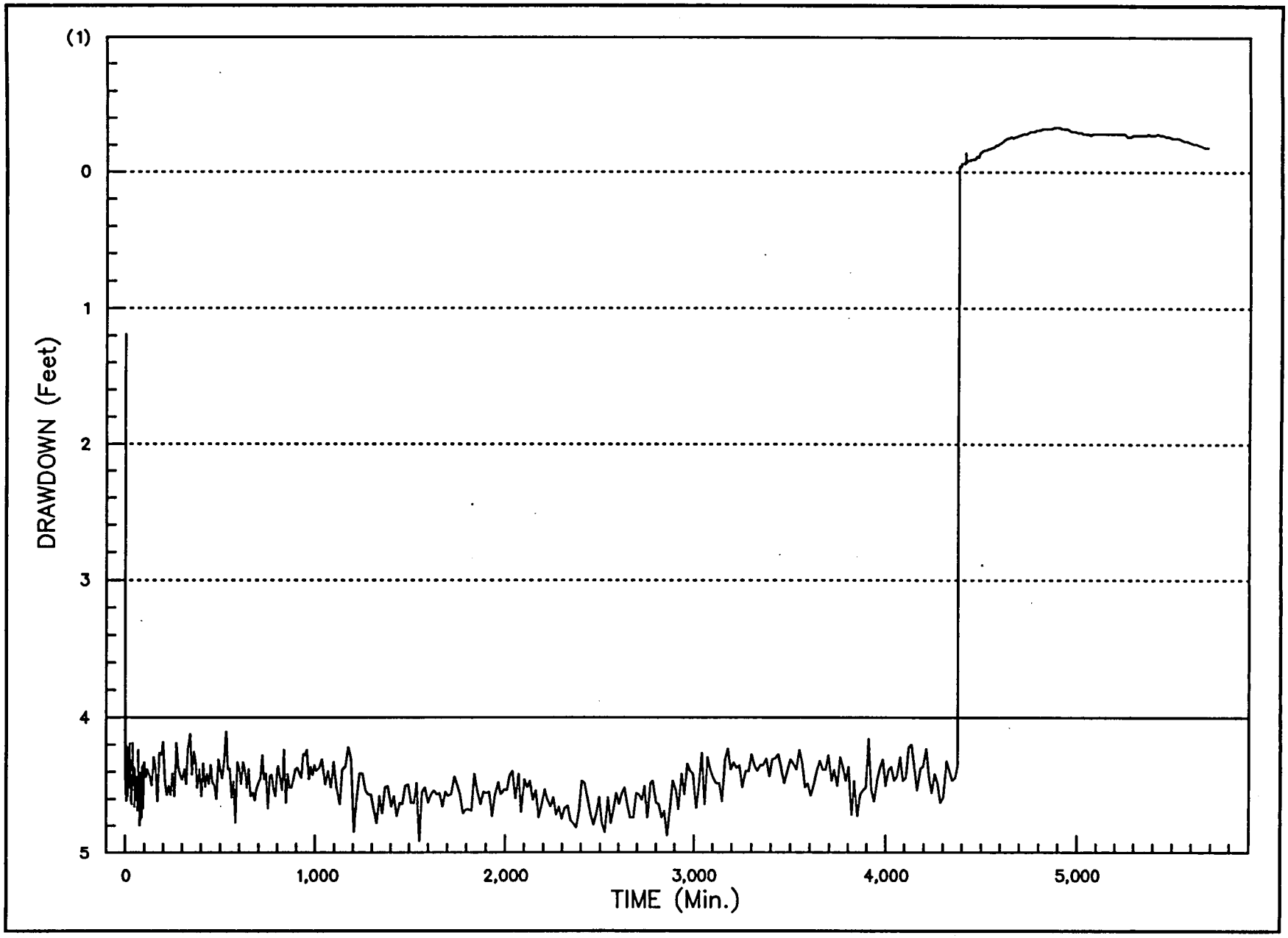

FIGURE 5. TIME–DRAWDOWN/RECOVERY FOR PUMPING WELL AW–1
72 HOUR PUMPING TEST, SEPTEMBER 22–25, 1991

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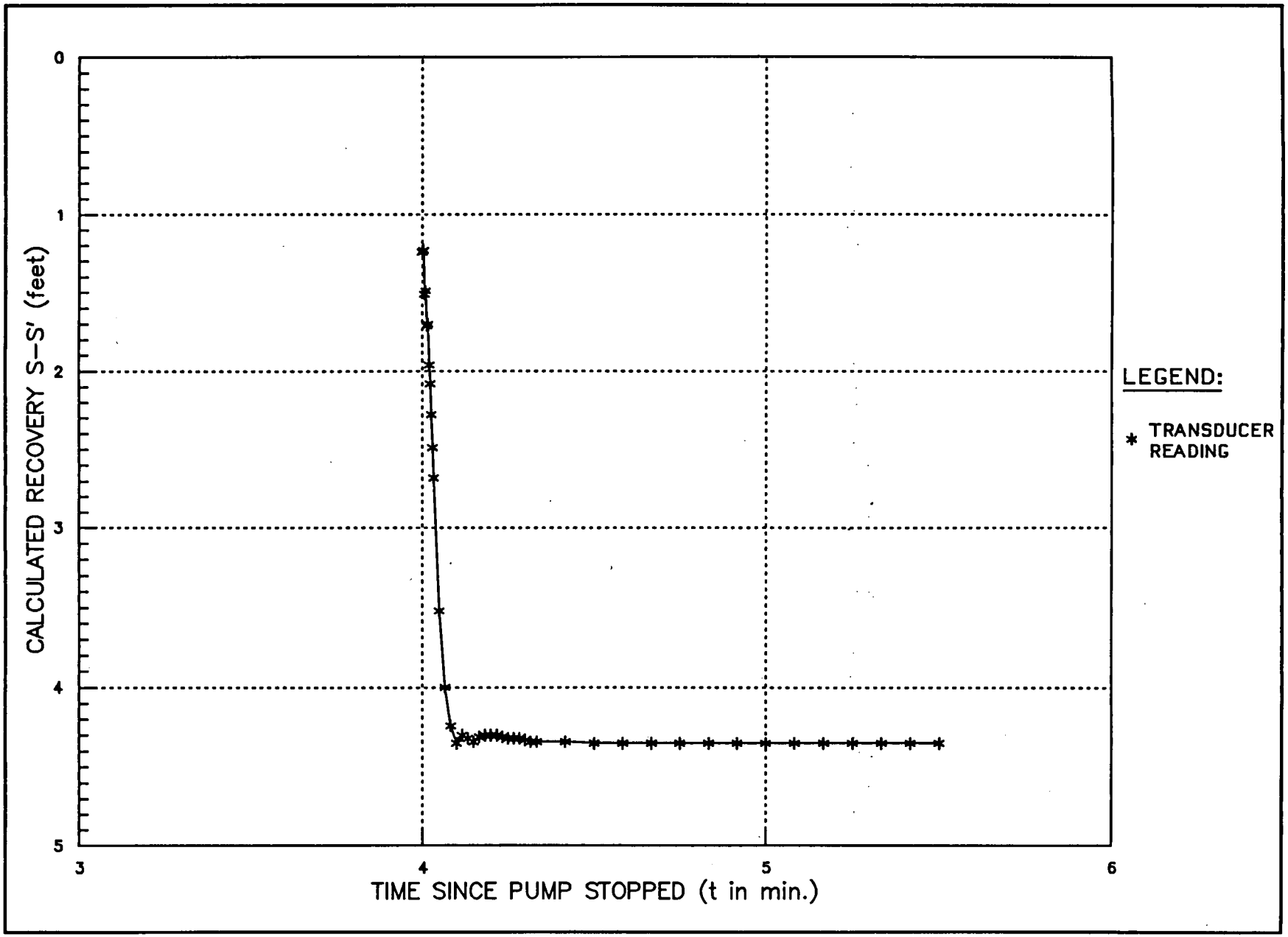

FIGURE 6. TIME–RECOVERY CURVE FOR WELL AW–1
72 HOUR TEST

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TABLE 2
RESIDUAL DRAWDOWN AND CALCULATED RECOVERY

Time Since			Drawdown		
Pump Test Started t min	Pump Stopped t' min	Ratio t/t'	Residual Drawdown s' ft.	From Pumping Curve s	Calculated Recovery s-s' ft
4330.00	4.0000	1082.5000	3.11	4.35	1.24
4330.00	4.0033	1081.6100	3.12	4.35	1.23
4330.01	4.0066	1080.7200	2.84	4.35	1.51
4330.01	4.0099	1079.8300	2.86	4.35	1.49
4330.01	4.0133	1078.9200	2.64	4.35	1.71
4330.02	4.0166	1078.0300	2.65	4.35	1.70
4330.02	4.0200	1077.1200	2.39	4.35	1.96
4330.02	4.0233	1076.2400	2.27	4.35	2.08
4330.03	4.0266	1075.3600	2.07	4.35	2.28
4330.03	4.0300	1074.4500	1.86	4.35	2.49
4330.03	4.0333	1073.5700	1.67	4.35	2.68
4330.05	4.0500	1069.1500	0.83	4.35	3.52
4330.07	4.0666	1064.7900	0.35	4.35	4.00
4330.08	4.0833	1060.4400	0.11	4.35	4.24
4330.10	4.1000	1056.1200	0.00	4.35	4.35
4330.12	4.1166	1051.8700	0.05	4.35	4.30
4330.13	4.1333	1047.6200	0.03	4.35	4.32
4330.15	4.1500	1043.4100	0.01	4.35	4.34
4330.17	4.1666	1039.2600	0.04	4.35	4.31
4330.18	4.1833	1035.1100	0.05	4.35	4.30
4330.20	4.2000	1031.0000	0.05	4.35	4.30
4330.22	4.2166	1026.9500	0.05	4.35	4.30
4330.23	4.2333	1022.9000	0.04	4.35	4.31
4330.25	4.2500	1018.8800	0.03	4.35	4.32
4330.27	4.2666	1014.9200	0.03	4.35	4.32
4330.28	4.2833	1010.9700	0.03	4.35	4.32
4330.30	4.3000	1007.0500	0.02	4.35	4.33
4330.32	4.3166	1003.1800	0.01	4.35	4.34
4330.33	4.3333	999.3150	0.01	4.35	4.34
4330.42	4.4167	980.4640	0.01	4.35	4.34
4330.50	4.5000	962.3330	0.00	4.35	4.35
4330.58	4.5833	944.8610	0.00	4.35	4.35
4330.67	4.6667	927.9930	0.00	4.35	4.35
4330.75	4.7500	911.7370	0.00	4.35	4.35

TABLE 2
Continued

Time Since			Drawdown		
Pump Test Started t min	Pump Stopped t' min	Ratio t/t'	Residual Drawdown s' ft.	From Pumping Curve s	Calculated Recovery s-s' ft
4330.83	4.8333	896.0410	0.00	4.35	4.35
4330.92	4.9167	880.8580	0.00	4.35	4.35
4331.00	5.0000	866.2000	0.00	4.35	4.35
4331.08	5.0833	852.0220	0.00	4.35	4.35
4331.17	5.1667	838.2850	0.00	4.35	4.35
4331.25	5.2500	825.0000	0.00	4.35	4.35
4331.33	5.3333	812.1300	0.00	4.35	4.35
4331.42	5.4166	799.6560	0.00	4.35	4.35
4331.50	5.5000	787.5450	0.00	4.35	4.35

The well test demonstrated that the current well AW-1 and the area which is being considered for the well field will yield water sufficient to meet the acceptance criteria for an alternate water supply system.

In addition, the step-drawdown test data was used to determine the specific capacity of AW-1 (Appendix E). The results revealed that AW-1 forms a high capacity well for a 500 gpm discharge rate. The predicted maximum drawdown did not exceed approximately six feet which was well below 50 percent of the saturated thickness of about 155 feet.

A well efficiency of approximately 95 percent was calculated by using drawdown data at 2500 minutes into the 72-hour constant-rate pump test (Appendix E). In a 100 percent efficient well, drawdown just outside of the well casing should equal the drawdown inside the well. However, an efficiency of 70 to 80 percent is usually considered very good, if good design, construction, and development practices are followed (Driscoll 1986).

4.0 WATER QUALITY

The quality of the water from the aquifer is a critical element in the removal action. The industrial user of the water specified water quality limits that have to be met for this well to serve as a water supply.

Water samples were collected from Well AW-1 during the pump test. Samples 63992 and 63994 were collected on September 22, 1991, the same day the test started and Samples 63997 and 63998 were collected on September 23, 1991. These four samples were shipped to IT

Analytical Services (ITAS) Oak Ridge, Tennessee, for analysis of Hazardous Substance List (HSL) metals, volatile and semivolatile organics, and radioisotopic analyses.

Because of the need to meet a 24-hour holding time for the alkalinity analysis, additional samples were collected early in the morning and delivered to the ITAS facility in Cincinnati, Ohio, for analysis of general water quality parameters including alkalinity, chloride, copper, iron, sodium, sulfate, sulfite, silica, and total phosphorous. Samples 63994 and 63998 were collected at 7:00 am on September 23 and 24, 1991, respectively.

Preliminary analytical results for the HSL and general groundwater quality parameters were received from both laboratories on November 6, 1991 (Appendix F).

There were no HSL volatile or semivolatile compounds detected in either groundwater sample. A library search, routinely done to identify unknown peaks in the analysis, tentatively identified 2-heptanone in both samples at 52 and 61 micrograms per liter. The laboratory blank contained 2-decanone at 43 micrograms per liter. These detections are attributed to laboratory contamination since decanone and heptanone are similar organic fragments.

Table 3 lists the analytical parameters and the target levels for the water supply. Table 4 presents the field parameters including specific conductance, pH, and the calculated hardness and alkalinity values as calcium carbonate equivalents. It is clearly evident from Tables 3 and 4 that the groundwater samples meet the requirements.

Total and isotopic-specific uranium analyses were received on December 12, 1991 (Appendix F). The results show that the total uranium analytical results of 1.15 and <1.0 ug/L are typical for background water quality in the area. This level is well below the proposed EPA drinking water standard of 20 ug/L and, therefore, is acceptable for public usage.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The test well has demonstrated that the water quality is adequate for the intended use of the water. The well test has also shown that the aquifer is able to produce the required 250 gpm to meet the flow requirements. There will be little or no interference if two wells are operating at the proposed separation of 50 feet. The test well is oversized for the intended purpose; however, it could serve as a water supply for a much larger population.

The additional wells to be installed can be constructed as smaller wells. Based on the information presented in this report, the well yield data, and the location of the water table at an approximate depth of 90 feet during the low season of the hydrologic cycle, the following specifications are recommended for future wells: the well should be 130 feet deep and six-inches in diameter with a 20-foot long 0.02-inch slot well screen placed from 110 to 130 feet.

TABLE 3
CRITICAL WATER QUALITY PARAMETERS IN mg/L

Parameter	Target Level	Sample Number and Sampling Date			
		63992[a] 9/22/91	63994[b] 9/22/91	63997[a] 9/23/91	63998[b] 9/23/91
Calcium	NA[c]	82.9	-	84.2	-
Magnesium	NA	20.7	-	20.9	-
Chloride	40	-	8.5	-	9.1
Copper	1	-	<0.005	-	<0.005
Iron	5	0.05	0.098	0.035	<0.006
Phosphate as PO_4	5	-	0.03	-	0.03
Silicon	15	5.60	-	5.58	-
Sulfate	100	-	33.0	-	30.0
Sulfite	NA	-	<0.5	-	0.5
Sodium	20	3.12	3.6	3.25	3.3

[a]Sample was analyzed for HSL metals. A dash in the column indicates that the parameter was not analyzed.
[b]Sample was analyzed for ground water quality parameters. A dash in the column indicates that the parameter was not analyzed.
[c]NA indicates that a target level does not exist for that parameter.

TABLE 4
PARAMETERS AS $CaCo_3$ EQUIVALENTS

Parameter	Target Level	Sampling Date 9/22/91	Sampling Date 9/24/91
pH in pH units	7-8.5	7.45	7.48
Specific conductivity in micromhos	700	518	518
Calcium hardness	300	207	210
Magnesium hardness	125	82	86
Total hardness	425	289	96
Alkalinity "P"	1	0	0
Alkalinity "M"	325	220	210

REFERENCES

Driscoll, F. G., 1986, "Groundwater and Wells", 2nd ed., Johnson Division, St. Paul, MN.

Fenneman, N. M., 1916, "The Geology of Cincinnati and Vicinity," Geological Society of Ohio, Bulletin 19, Div. of Geological Survey, Columbus, OH.

Lohman, S. W., 1979, "Groundwater Hydraulics", U.S. Geological Survey Professional Paper 708, available from U.S. Government Printing Office, Washington, DC.

Spieker, A. M., 1968, "Groundwater Hydrology and Geology of the Lower Great Miami River Valley, Ohio," U.S. Geological Survey Professional Paper 605-A, available from U.S. Government Printing Office, Washington, DC.

APPENDIX A
BORING LOG OF AW-1 AND WELL CONSTRUCTION LOGS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/16-17/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 1 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				Top soil medium stiff - light brown silty clay, moist w/ some decomposed organic roots				Boring location - middle of corn field 9.3' long 12" casing No split spoon samples taken from 0' to 79'
5								
								7' - 10' long 12" casing 7/17/91, 0850
10								
15								
								17' - 10' long 12" casing 1200
				Grayish clay				
20								
25								
								27' - 10' long 12" casing 1430
30								

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/17-18-19/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91, 1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 2 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
35								37' - 10' long 12" casing 7/18/91, 1010
				Glacial till - gray, sandy gravelly				cuttings (slurry) via sand bailer
40								
45								47' - 10' long 12" casing 1320
50								
55								57' - 10' long 12" casing 1/19/91, 0855 → 0925 took 30 min. to drive in to 67'
60								

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/19,25-26/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 3 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
65				Brown sandy gravel				67' - 10' long 10" casing 7/25/91, 1630 1640
70								
75								77' - slid down 78' - 10' long 10" casing 7/26/91, 1047 1125
80	s/1	84-6"	6	Very dense, brown, fine gravelly fine to coarse sand with trace silt, moist	sw			79' - Begin split spoon sampling, 5' interval
85	s/2	74-6"	6	Very dense, brown and gray, fine gravelly fine to coarse sand with trace silt and pebbles, moist	sw			
	s/3	60/54/55	12	Same as above with some cobbles	sw			88' - 10' long 10" casing 1645 1730
90								Caved-in material

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/27-28/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 4 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	s/4	45/70-3"	8	Very dense, brown/gray, fine to coarse sandy, fine to coarse gravel, wet	gw			
95								98' - 10' long 10" casing 1135 1150
100	s/5	34/50-5"	11	Same as above	gw			
105	s/6	50/50-5"	11	Same as above with few cobbles	gw			
								107' - 10' long 10" casing 1715 1800
110	s/7	15/15/19	12	Dense, brown/gray, fine to coarse sand, trace pebbles, wet	sw			
115	s/8	20/34/44	18	Very dense, brown/gray, fine to medium sand, wet	sw			
								117' - 10' long 10" casing 7/28/91, 1025 1038
120	s/9	21/31/43	18	Very dense, brown/gray, fine to coarse sand with trace pebbles, wet	sw			

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/28-29/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 5 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
125	s/10	32/50-5"	11	Very dense, brown/gray, fine to coarse sandy, fine to coarse gravel with trace pebbles, wet	gw			127' - 10' long 10" casing 1345 1353
130	s/11	18/18/35	18	Very dense, brown/gray, fine to coarse gravelly, fine to coarse sand, wet	sw			
135	s/12	32/41/50	18	Very dense, brown/gray medium to coarse gravel, some pebbles trace cobbles, wet	gw			137' - 10' long 10" casing 7/29/91, 0945 0955
140	s/13	8/14/19	12	Dense, brown/gray, medium to coarse gravel with some medium sand, trace pebbles, wet	gw			
145	s/14	50/50-5"	11	Very dense, brown/gray, fine to coarse gravel with some silt and sand, wet	gw			147' - 10' long 10" casing 1447 1500
150								

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 7/29-30/91, 8/20/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 6 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	s/15	50-3"	1	Very dense, gray/brown, gravelly silty clay, moist	cl			Insufficient sample for sieve analysis
155	s/16	17/50	10	Very dense, brown/gray, fine to coarse sand, trace pebbles, wet	sw			157' - 10' long 10" casing 7/30/91, 1005 1025
160	s/17	50-5"	4	Very dense, brown/gray, fine to coarse sand, trace gravel and silty clay, wet	sp			Insufficient sample for sieve analysis
165	s/18	50/ 50-2"	8	Very dense, brown/gray, fine to coarse sand, trace gravel, pebbles and silt, wet	sw			167' - 10' long 10" casing 8/20/91,1527 1543 168' - started drilling
170	s/19	100-4"	4	Very dense, brown/gray, fine to coarse sand, trace gravel, pebbles, wet	sw			
175	s/20	75/55 /49	18	Same as above	sw			175.5' - drilled in advance 177' - 10' long 10" casing 1323 1338
180								180' - drilled in advance

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 8/20-21-22-23-24/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 7 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	s/21	45/75/45	5	Same as above	SW			
185	s/22	42/92	12	Very dense, brown/gray, fine to medium sand, wet	SW			185' - drilled in advance 187' - 10' long 10" casing 8/21/91, 1415 1440 186-190', Quick sand problem
190	s/23	45/100-6"	12	Same as above	SW			
195	s/24	125/90-2"	6	Same as above	SW			197' - 10' long 10" casing 8/23/91, 1542 1600
200	s/25	102-3"	2	Very dense, brown/gray, fine to medium sand with trace silt and gravel, wet	SW			Insufficient sample
205	s/26	120-2"	-	No recovery, washed out	SW			No sample 207' - 10' long 10" casing 8/24/91, 0900 0932
210								

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 8/23-24-25-26/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 8 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	s/27	200-3"	2	Very dense, dark brown, fine to coarse sand with trace silt and pebbles, wet	sw			Insufficient sample
215	s/28	250-6"	2	Same as above	sw			217' - 10' long 10" casing 8/23/91, 1013 1035
220	s/29	147-6"	2	Same as above	sw			Begin 10' sampling interval
225								227' - 10' long 10" casing 8/24/91, 1435 1505
230	s/30	150-6"	4	Same as above	sw			
235								235' - Bailer brought out cobbles 237' - 10' long 10" casing 8/26/91, 1325
240								

NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 313327	PROJECT NAME: Albright & Wilson Alternate Water Supply	
BORING NUMBER: AW-1	COORDINATES: N476,533.51/E1,373,885.64	DATE: 8/26/91
ELEVATION: 612.10 - Ground	GWL: Depth 86.2' Date/Time 9/10/91,1650	DATE STARTED: 7/16/91
ENGINEER/GEOLOGIST: Musa Kesebir	Depth — Date/Time —	DATE COMPLETED: 8/26/91
DRILLING METHODS: Cable Tool	CHECKED BY: P. McCarren	PAGE 9 OF 9

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	s/31	143-3"	-					No recovery, washed out
				Shale, greenish gray				Below 242' - chunks of clay, gray-greenish
245				Bottom of boring 243.5'				8/26/91, 16:00
250								
255								
260								
265								
270								

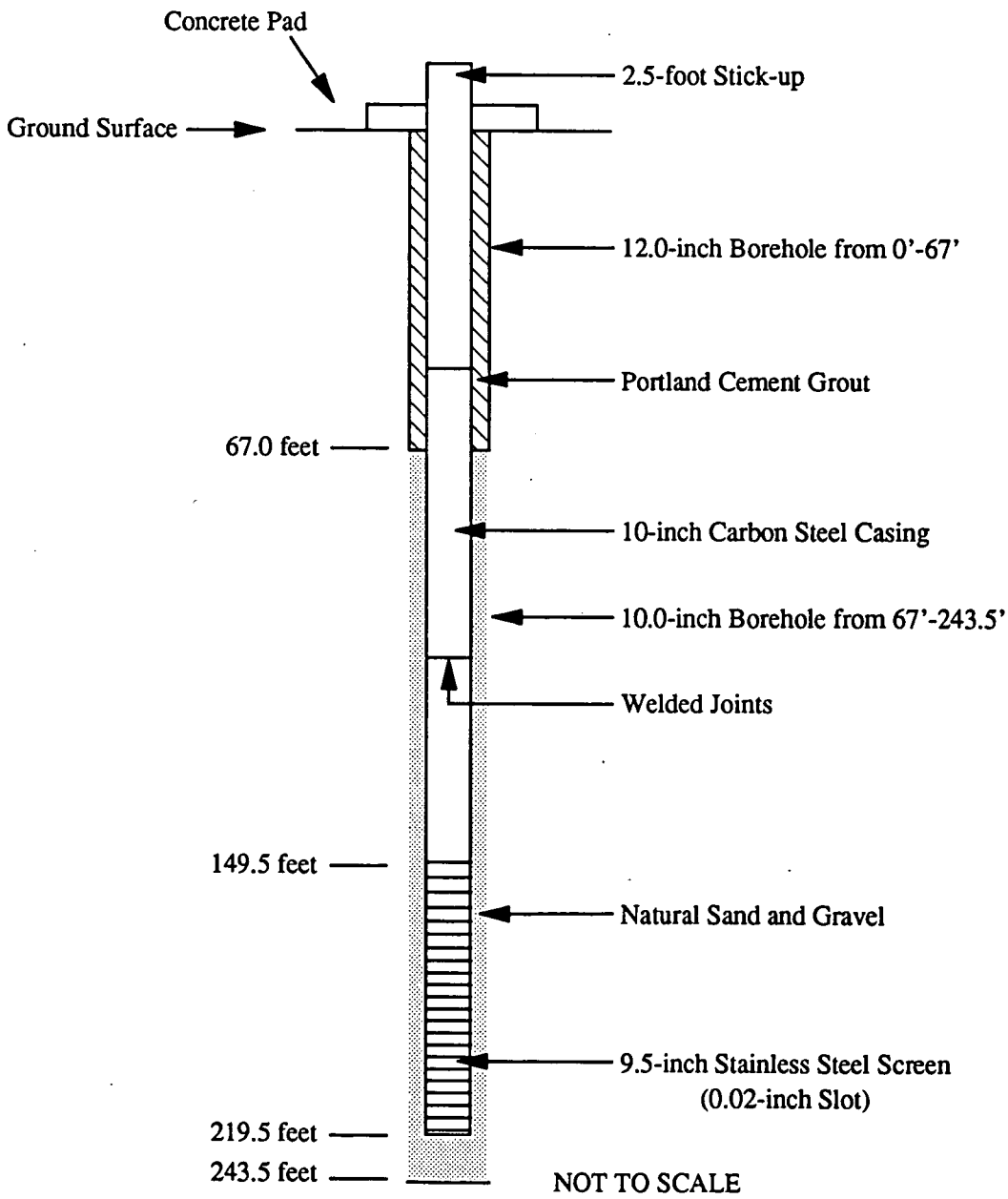
NOTES:

Drilling Co.: Pennsylvania Drilling
Drill Master: Joseph G. Barile
Helper: Gary A. Dye
Rig: 72 Speed Star - 1955
Serial # 10407

s = samples taken with a 1.5' long by 2" OD split spoon driven by a 140 lb hammer dropped 30"

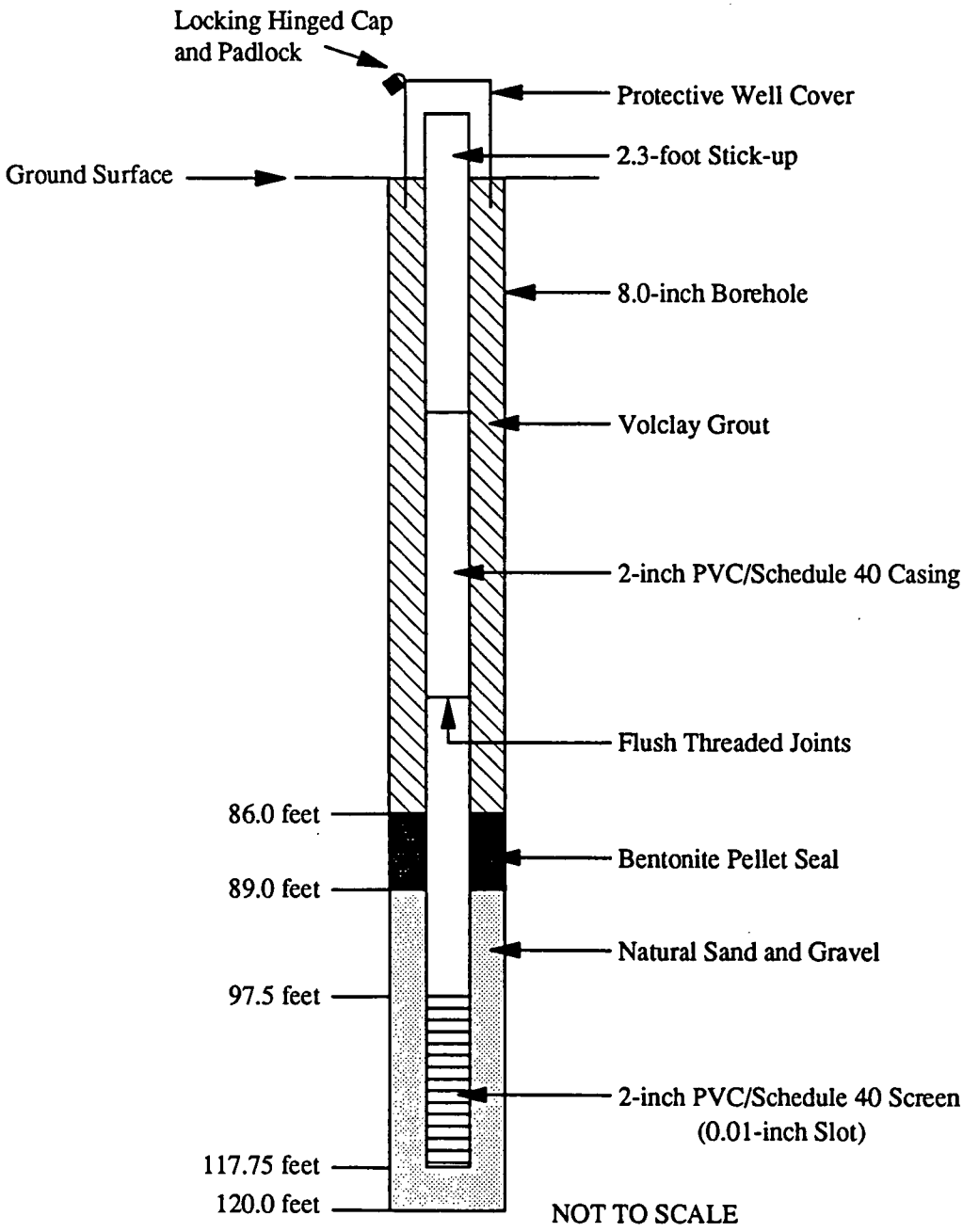
WELL CONSTRUCTION LOG

PROJECT NO: 313327 COMPLETION DATE: 9-12-91
WELL NO: AW-1 CLIENT: U.S. Department of Energy
DRILLING METHOD: Cable Tool DRILLER: Pennsylvania Drilling
LAND SURFACE ELEVATION: 612.10' DEPTH TO WATER:
MEASURING POINT ELEVATION: 614.54' (STATIC) 86.2' on 9-10-91



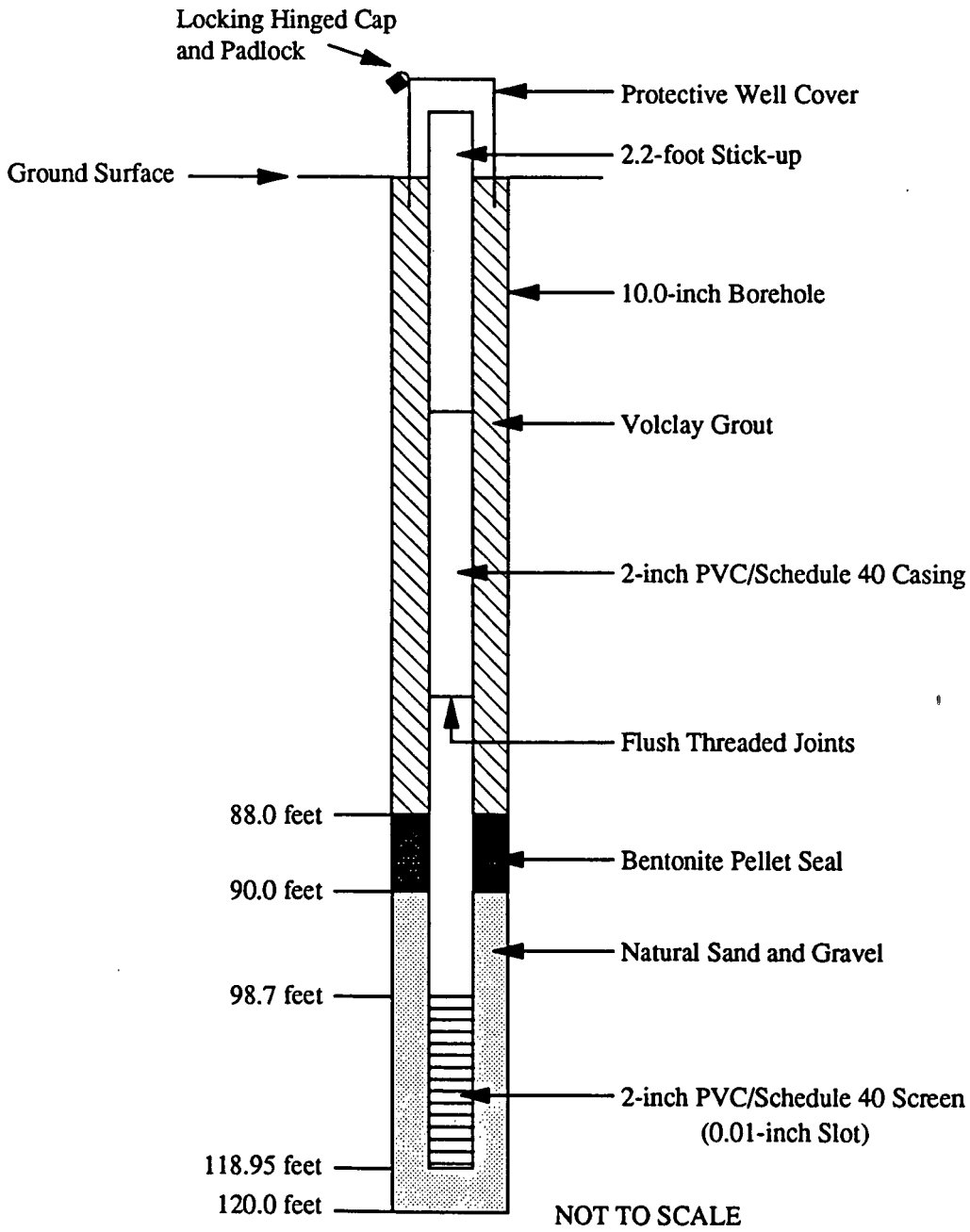
WELL CONSTRUCTION LOG

PROJECT NO: 313327 COMPLETION DATE: 9-6-91
WELL NO: PZ-1 CLIENT: U.S. Department of Energy
DRILLING METHOD: Cable Tool DRILLER: Pennsylvania Drilling
LAND SURFACE ELEVATION: 611.80' DEPTH TO WATER:
MEASURING POINT ELEVATION: 614.10' (STATIC) 86.0' on 9-10-91



WELL CONSTRUCTION LOG

PROJECT NO: 313327 COMPLETION DATE: 9-9-91
WELL NO: PZ-2 CLIENT: U.S. Department of Energy
DRILLING METHOD: Cable Tool DRILLER: Pennsylvania Drilling
LAND SURFACE ELEVATION: 612.40' DEPTH TO WATER:
MEASURING POINT ELEVATION: 614.18' (STATIC) 86.3' on 9-10-91



APPENDIX B
RESULTS OF GRAIN-SIZE ANALYSIS

HSSC
HOWARD SMITH
SCREEN COMPANY
A Halliburton Company
P.O. Box 666 • Houston, Texas 77001
713-869-5771 • Telex: 77-4667
1-800-527-4772

September 03, 1991

IT Corporation
2790 Mosside Blvd.
Monroeville, Pennsylvania 15146

Attention: Mr. Michael Pupeza

Reference: Albright & Wilson Well #1

Gentlemen:

Enclosed are the results of the sand analysis from the above referenced well.

The samples were fairly uniform and we suggest that a .020" slot be used in the construction of the 10" TS screen, in conjunction with a formation type completion. This slot is based on the samples submitted and the final recommendation must be yours.

Thank you for giving Howard Smith Screen Company the opportunity to offer its services and we look forward to supplying the screen for your project.

Very truly yours,

Michael Daniel

Michael Daniel

MD/dc

UNIFORMITY Cf: (40 d/90d) 0.4548/ 0.2042= 2.23
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.021 SLOT OPENING IN INCHES

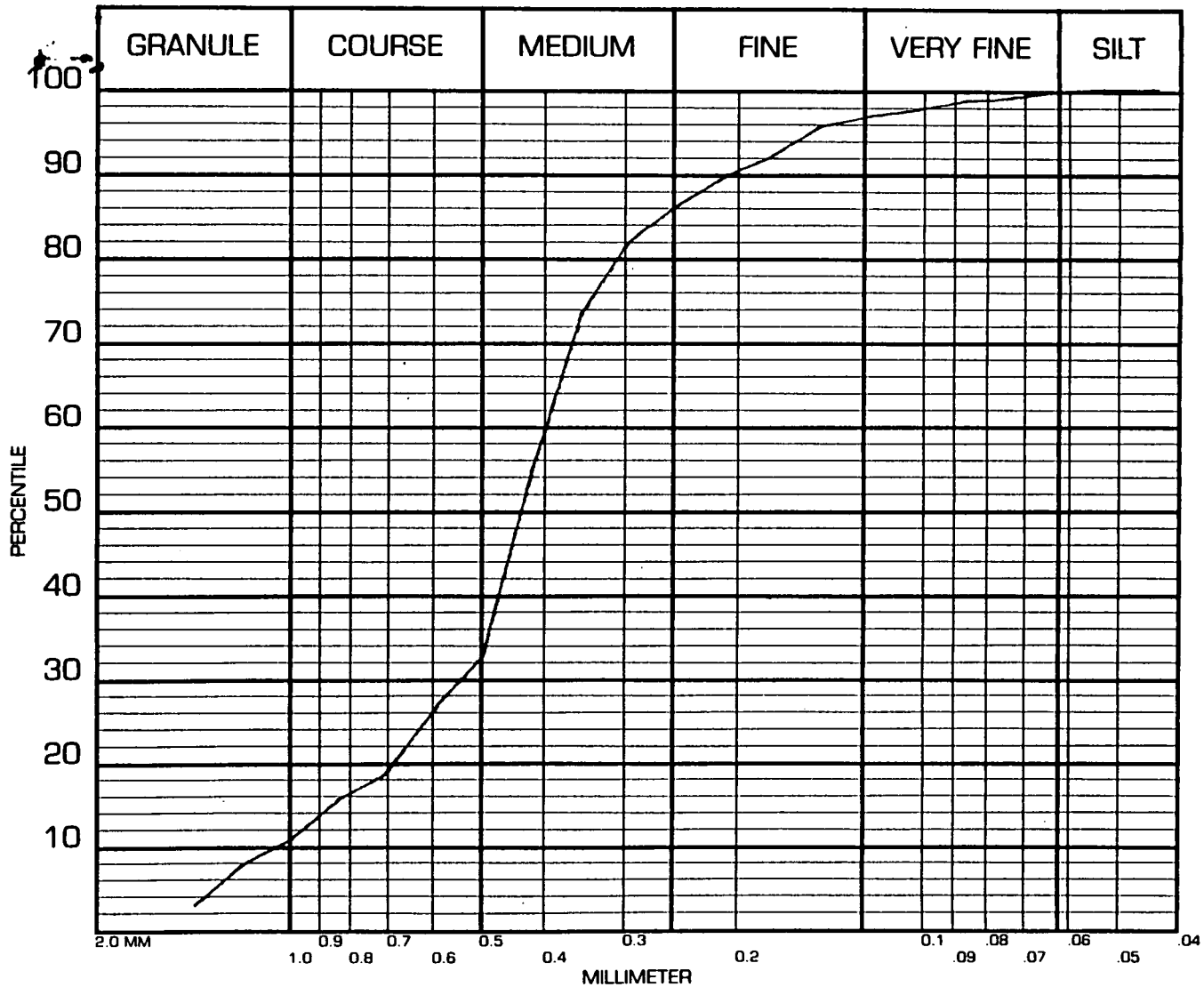
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1--800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....155-156.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
14	.0555	1.410	5.0	5.0	2.3
16	.0469	1.190	10.5	15.5	7.2
*	.0399	1.014			10.0
18	.0394	1.000	6.5	22.0	10.3
20	.0331	0.840	10.3	32.3	15.1
25	.0280	0.710	6.6	38.9	18.2
*	.0269	0.683			20.0
30	.0234	0.589	17.5	56.4	26.4
*	.0209	0.530			30.0
35	.0197	0.500	12.9	69.3	32.4
*	.0179	0.455			40.0
*	.0170	0.432			50.0
40	.0165	0.420	46.8	116.1	54.3
*	.0157	0.399			60.0
*	.0143	0.363			70.0
45	.0139	0.351	40.7	156.8	73.3
*	.0123	0.313			80.0
50	.0117	0.297	17.8	174.6	81.6
60	.0098	0.250	9.1	183.7	85.9
70	.0083	0.210	7.8	191.5	89.5
*	.0080	0.204			90.0
80	.0070	0.177	5.0	196.5	91.9
100	.0059	0.149	7.6	204.1	95.4
120	.0049	0.124	2.8	206.9	96.7
140	.0041	0.104	1.7	208.6	97.5
170	.0035	0.088	2.2	210.8	98.6
200	.0029	0.074	0.8	211.6	98.9
230	.0024	0.062	1.7	213.3	99.7
270	.0021	0.053	0.5	213.8	100.0
325	.0017	0.044	0.1	213.9	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

41

2852

UNIFORMITY Cf: (40 d/90d) 0.5085/ 0.16Q1= 3.18
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.025 SLOT OPENING IN INCHES

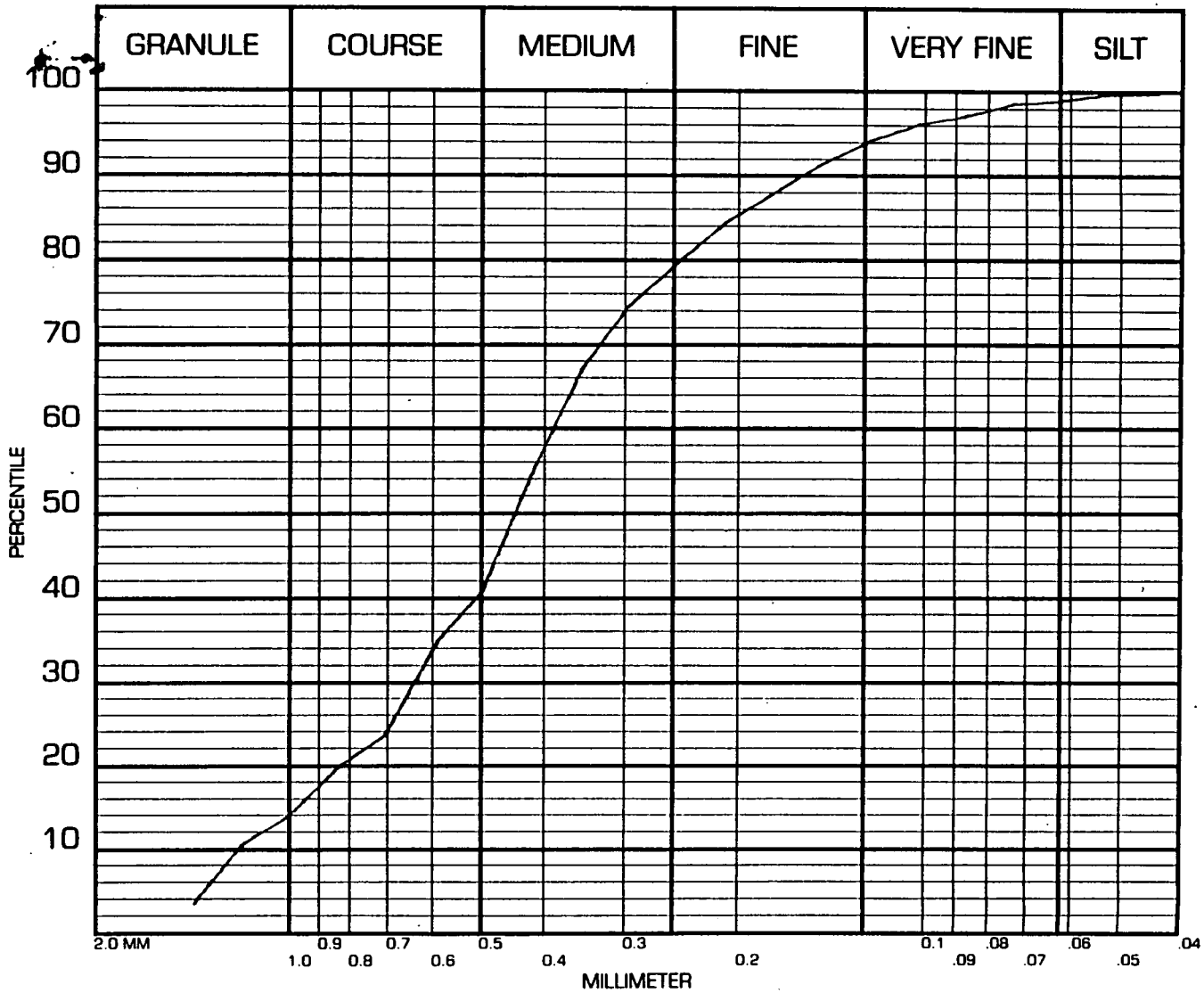
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1-800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....164-165.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
14	.0555	1.410	6.8	6.8	3.4
*	.0475	1.206			10.0
16	.0469	1.190	13.8	20.6	10.4
18	.0394	1.000	7.2	27.8	14.0
20	.0331	0.840	11.4	39.2	19.8
*	.0328	0.833			20.0
25	.0280	0.710	7.6	46.8	23.6
*	.0250	0.635			30.0
30	.0234	0.589	22.3	69.1	34.9
*	.0200	0.509			40.0
35	.0197	0.500	12.0	81.1	40.9
*	.0175	0.445			50.0
40	.0165	0.420	27.0	108.1	54.6
*	.0154	0.390			60.0
45	.0139	0.351	24.9	133.0	67.1
*	.0131	0.333			70.0
50	.0117	0.297	14.9	147.9	74.7
60	.0098	0.250	10.1	158.0	79.8
*	.0098	0.248			80.0
70	.0083	0.210	9.4	167.4	84.5
80	.0070	0.177	6.8	174.2	87.9
*	.0063	0.160			90.0
100	.0059	0.149	6.8	181.0	91.4
120	.0049	0.124	5.9	186.9	94.3
140	.0041	0.104	3.8	190.7	96.3
170	.0035	0.088	2.0	192.7	97.3
200	.0029	0.074	2.9	195.6	98.7
230	.0024	0.062	0.8	196.4	99.1
270	.0021	0.053	1.4	197.8	99.8
325	.0017	0.044	0.3	198.1	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

42

2852

UNIFORMITY Cf: (40 d/90d) 0.4597/ 0.1449= 3.17
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.024 SLOT OPENING IN INCHES

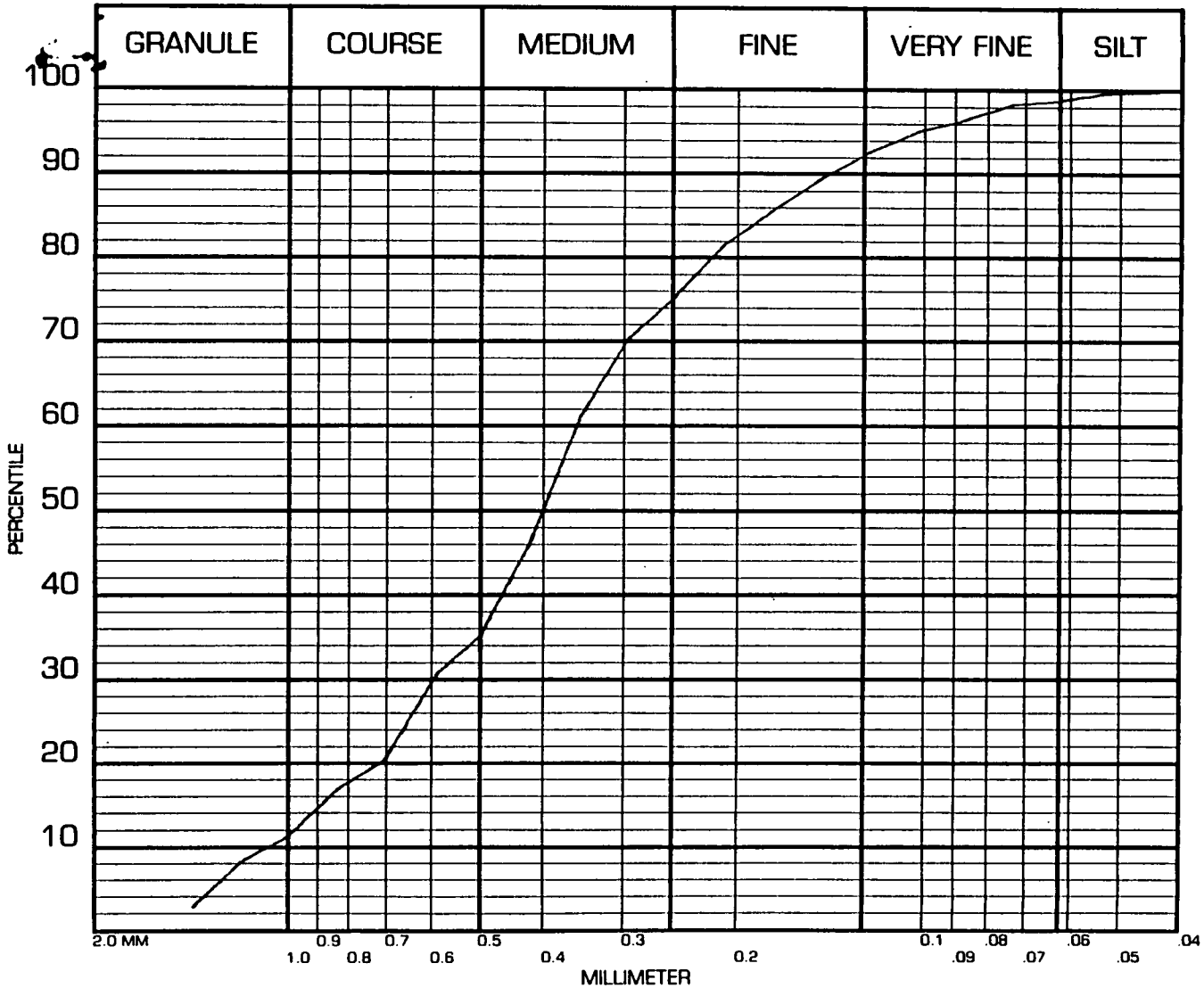
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1--800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....175.5-177

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
14	.0555	1.410	6.3	6.3	2.7
16	.0469	1.190	12.9	19.2	8.1
*	.0423	1.075			10.0
18	.0394	1.000	7.6	26.8	11.4
20	.0331	0.840	12.9	39.7	16.8
*	.0283	0.719			20.0
25	.0280	0.710	8.3	48.0	20.4
*	.0236	0.598			30.0
30	.0234	0.589	24.2	72.2	30.6
35	.0197	0.500	11.5	83.7	35.5
*	.0181	0.460			40.0
40	.0165	0.420	25.9	109.6	46.5
*	.0159	0.403			50.0
*	.0141	0.357			60.0
45	.0139	0.351	34.7	144.3	61.2
*	.0118	0.299			70.0
50	.0117	0.297	21.5	165.8	70.3
60	.0098	0.250	12.3	178.1	75.5
*	.0087	0.222			80.0
70	.0083	0.210	14.5	192.6	81.7
80	.0070	0.177	9.4	202.0	85.7
100	.0059	0.149	8.9	210.9	89.4
*	.0057	0.145			90.0
120	.0049	0.124	8.0	218.9	92.8
140	.0041	0.104	5.6	224.5	95.2
170	.0035	0.088	3.3	227.8	96.6
200	.0029	0.074	4.3	232.1	98.4
230	.0024	0.062	1.2	233.3	98.9
270	.0021	0.053	2.0	235.3	99.8
325	.0017	0.044	0.5	235.8	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

43

28552

UNIFORMITY Cf: (40 d/90d) 0.5182/ 0.2264= 2.29
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.025 SLOT OPENING IN INCHES

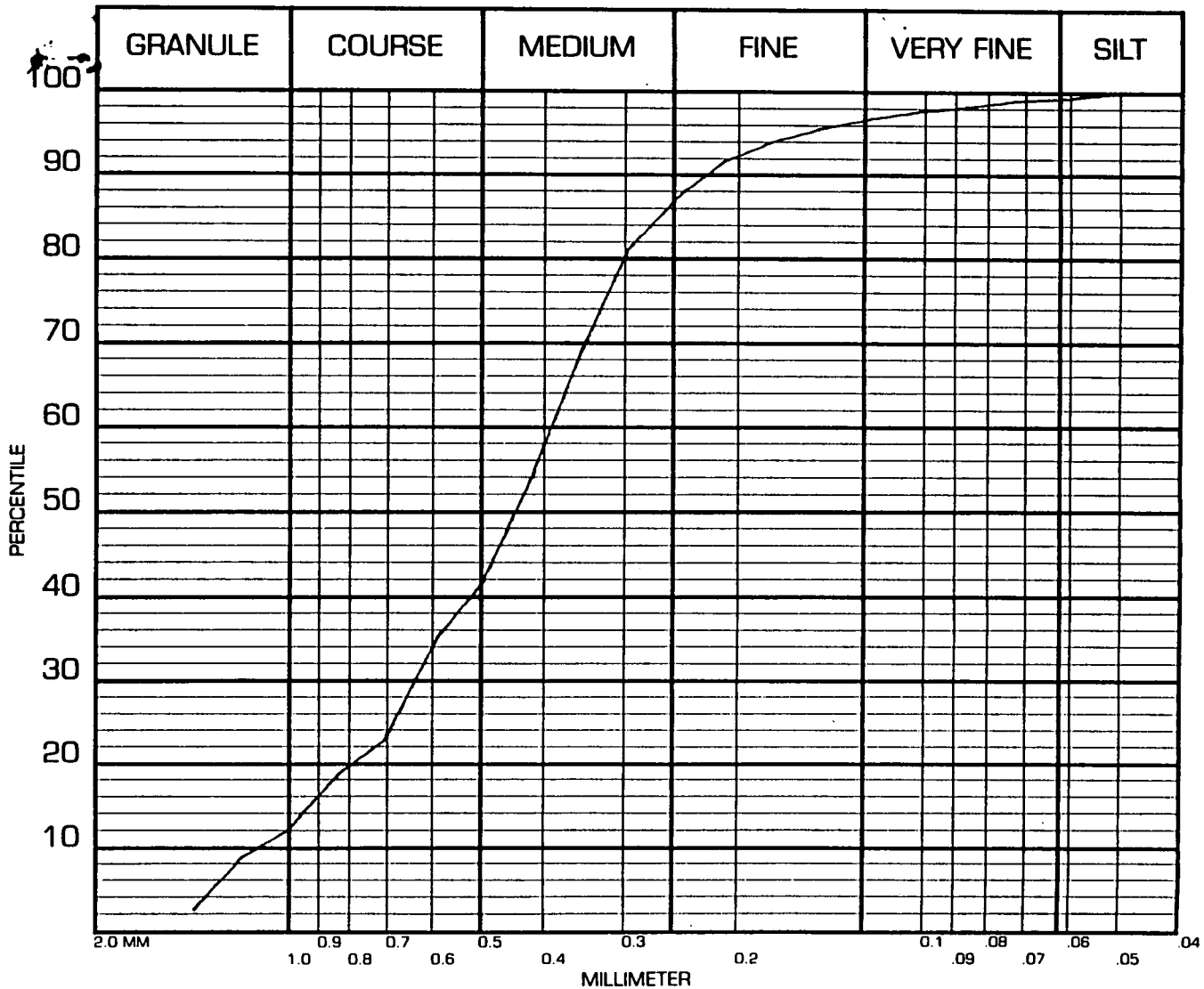
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1-800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....185-186.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
14	.0555	1.410	5.4	5.4	2.3
16	.0469	1.190	15.0	20.4	8.5
*	.0437	1.110			10.0
18	.0394	1.000	8.6	29.0	12.1
20	.0331	0.840	15.3	44.3	18.5
*	.0312	0.792			20.0
25	.0280	0.710	10.3	54.6	22.8
*	.0250	0.633			30.0
30	.0234	0.589	29.2	83.8	35.0
*	.0204	0.518			40.0
35	.0197	0.500	15.9	99.7	41.6
*	.0173	0.440			50.0
40	.0165	0.420	29.4	129.1	53.9
*	.0154	0.392			60.0
45	.0139	0.351	36.0	165.1	69.0
*	.0136	0.346			70.0
*	.0119	0.302			80.0
50	.0117	0.297	29.0	194.1	81.1
60	.0098	0.250	14.6	208.7	87.2
*	.0089	0.226			90.0
70	.0083	0.210	10.9	219.6	91.7
80	.0070	0.177	5.5	225.1	94.0
100	.0059	0.149	3.8	228.9	95.6
120	.0049	0.124	2.8	231.7	96.8
140	.0041	0.104	2.2	233.9	97.7
170	.0035	0.088	1.2	235.1	98.2
200	.0029	0.074	1.8	236.9	99.0
230	.0024	0.062	0.6	237.5	99.2
270	.0021	0.053	1.5	239.0	99.8
325	.0017	0.044	0.4	239.4	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

44

2852

UNIFORMITY Cf: (40 d/90d) 0.4001/ 0.1504= 2.66
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.017 SLOT OPENING IN INCHES

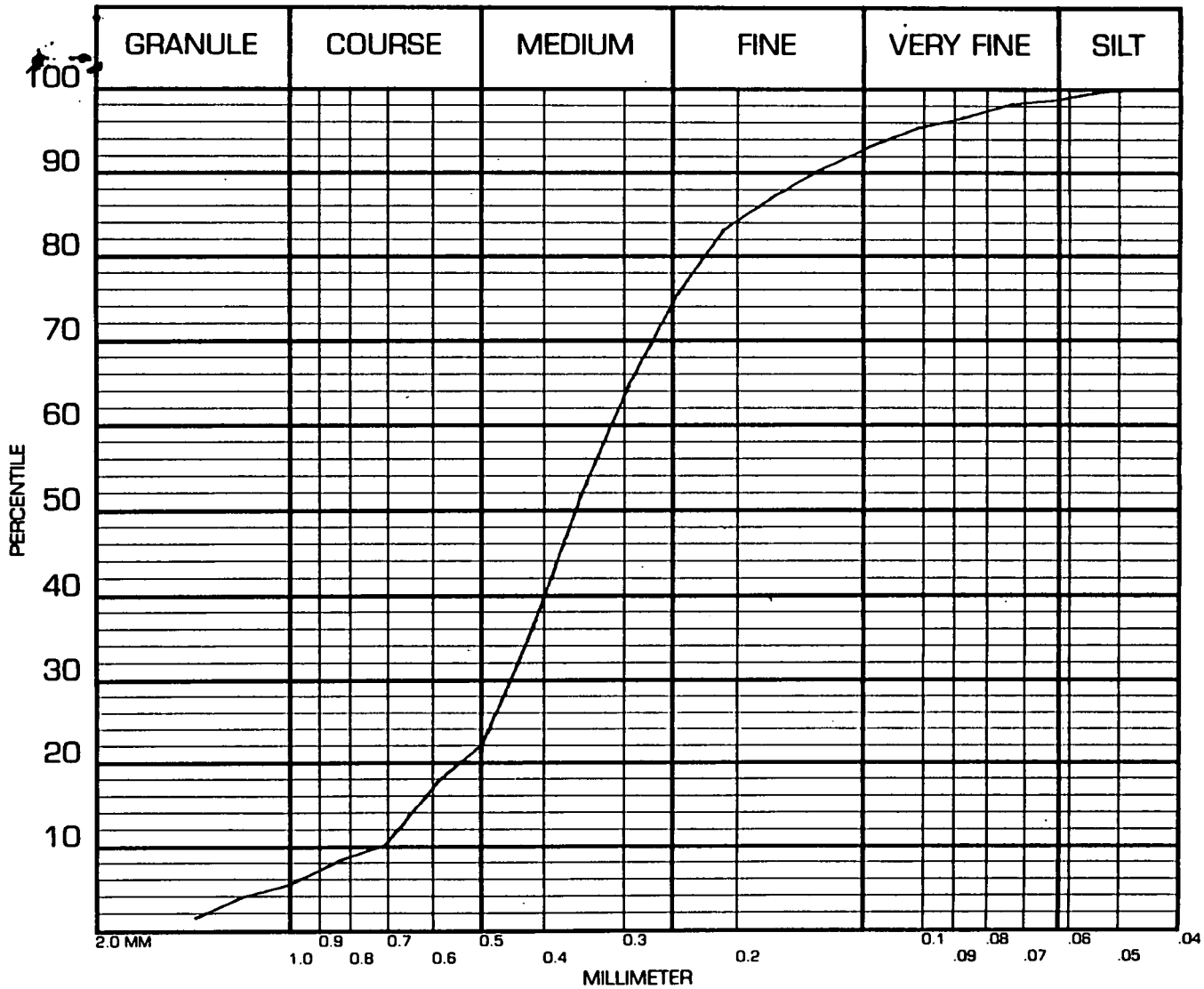
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1--800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....190-191.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
14	.0555	1.410	2.1	2.1	1.0
16	.0469	1.190	5.3	7.4	3.6
18	.0394	1.000	3.2	10.6	5.1
20	.0331	0.840	5.8	16.4	7.9
25	.0280	0.710	4.0	20.4	9.9
*	.0278	0.707			10.0
30	.0234	0.589	15.4	35.8	17.3
*	.0210	0.533			20.0
35	.0197	0.500	9.6	45.4	22.0
*	.0174	0.443			30.0
40	.0165	0.420	27.6	73.0	35.4
*	.0158	0.400			40.0
*	.0141	0.357			50.0
45	.0139	0.351	33.3	106.3	51.5
*	.0124	0.315			60.0
50	.0117	0.297	26.3	132.6	64.2
*	.0107	0.272			70.0
60	.0098	0.250	22.0	154.6	74.9
*	.0090	0.228			80.0
70	.0083	0.210	16.9	171.5	83.1
80	.0070	0.177	7.8	179.3	86.8
*	.0059	0.150			90.0
100	.0059	0.149	6.9	186.2	90.2
120	.0049	0.124	5.9	192.1	93.0
140	.0041	0.104	4.5	196.6	95.2
170	.0035	0.088	2.6	199.2	96.5
200	.0029	0.074	3.5	202.7	98.2
230	.0024	0.062	1.2	203.9	98.7
270	.0021	0.053	2.1	206.0	99.8
325	.0017	0.044	0.5	206.5	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

45

2852

UNIFORMITY Cf: (40 d/90d) 0.6085/ 0.1426= 4.27
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.029 SLOT OPENING IN INCHES

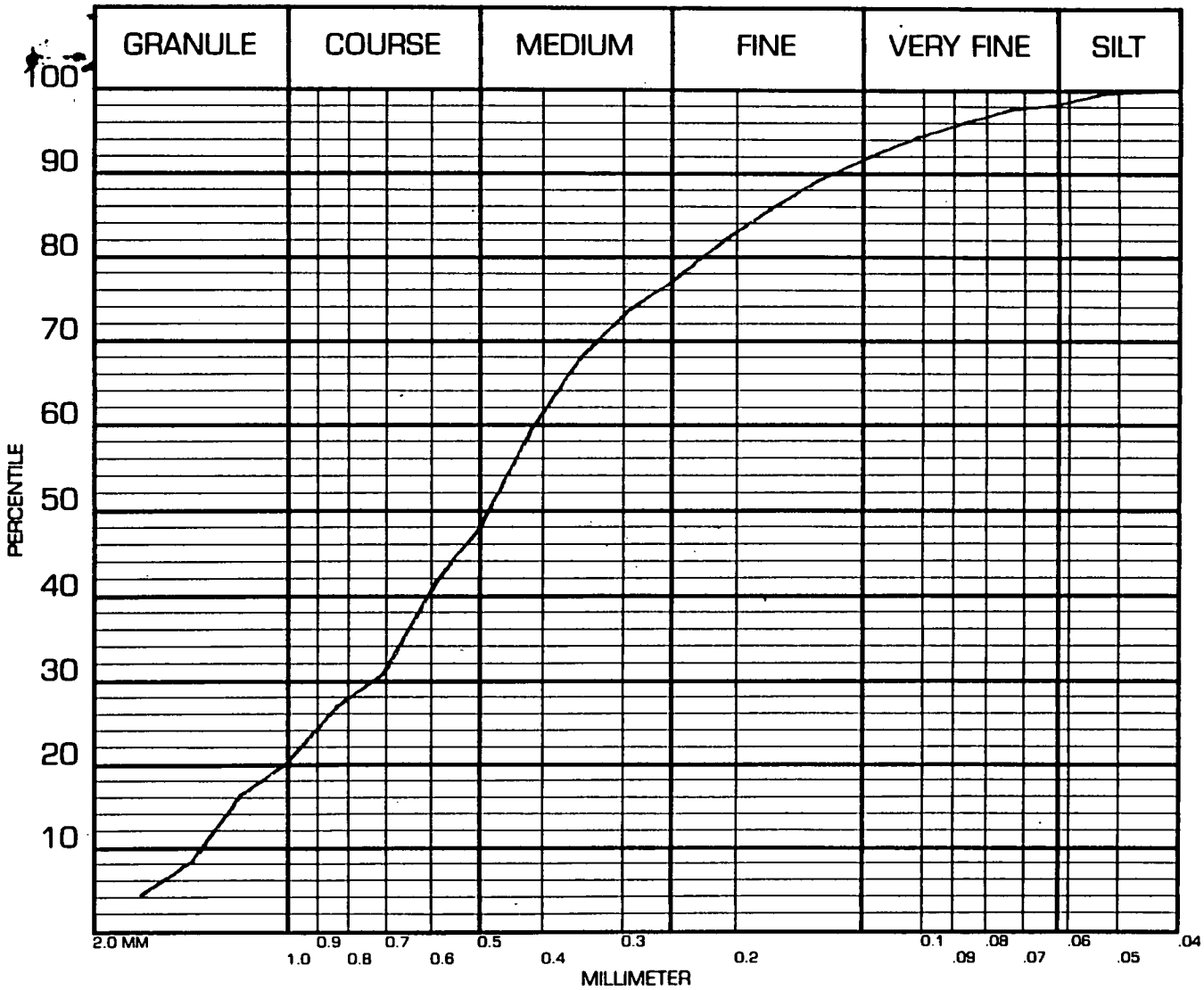
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1-800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....211-212.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
12	.0650	1.700	3.0	3.0	4.2
14	.0555	1.410	3.0	6.0	8.4
*	.0534	1.354			10.0
16	.0469	1.190	5.7	11.7	16.3
*	.0398	1.011			20.0
18	.0394	1.000	2.9	14.6	20.3
20	.0331	0.840	4.7	19.3	26.9
*	.0288	0.731			30.0
25	.0280	0.710	2.9	22.2	30.9
*	.0240	0.608			40.0
30	.0234	0.589	7.7	29.9	41.6
35	.0197	0.500	4.8	34.7	48.3
*	.0192	0.486			50.0
40	.0165	0.420	7.8	42.5	59.2
*	.0163	0.414			60.0
45	.0139	0.351	6.3	48.8	68.0
*	.0131	0.333			70.0
50	.0117	0.297	4.0	52.8	73.5
60	.0098	0.250	2.8	55.6	77.4
*	.0090	0.228			80.0
70	.0083	0.210	3.3	58.9	82.0
80	.0070	0.177	2.7	61.6	85.8
100	.0059	0.149	2.5	64.1	89.3
*	.0056	0.143			90.0
120	.0049	0.124	2.0	66.1	92.1
140	.0041	0.104	1.7	67.8	94.4
170	.0035	0.088	1.2	69.0	96.1
200	.0029	0.074	1.2	70.2	97.8
230	.0024	0.062	0.5	70.7	98.5
270	.0021	0.053	0.9	71.6	99.7
325	.0017	0.044	0.2	71.8	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

46

2852

UNIFORMITY Cf: (40 d/90d) 0.4441/ 0.1295= 3.43
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.019 SLOT OPENING IN INCHES

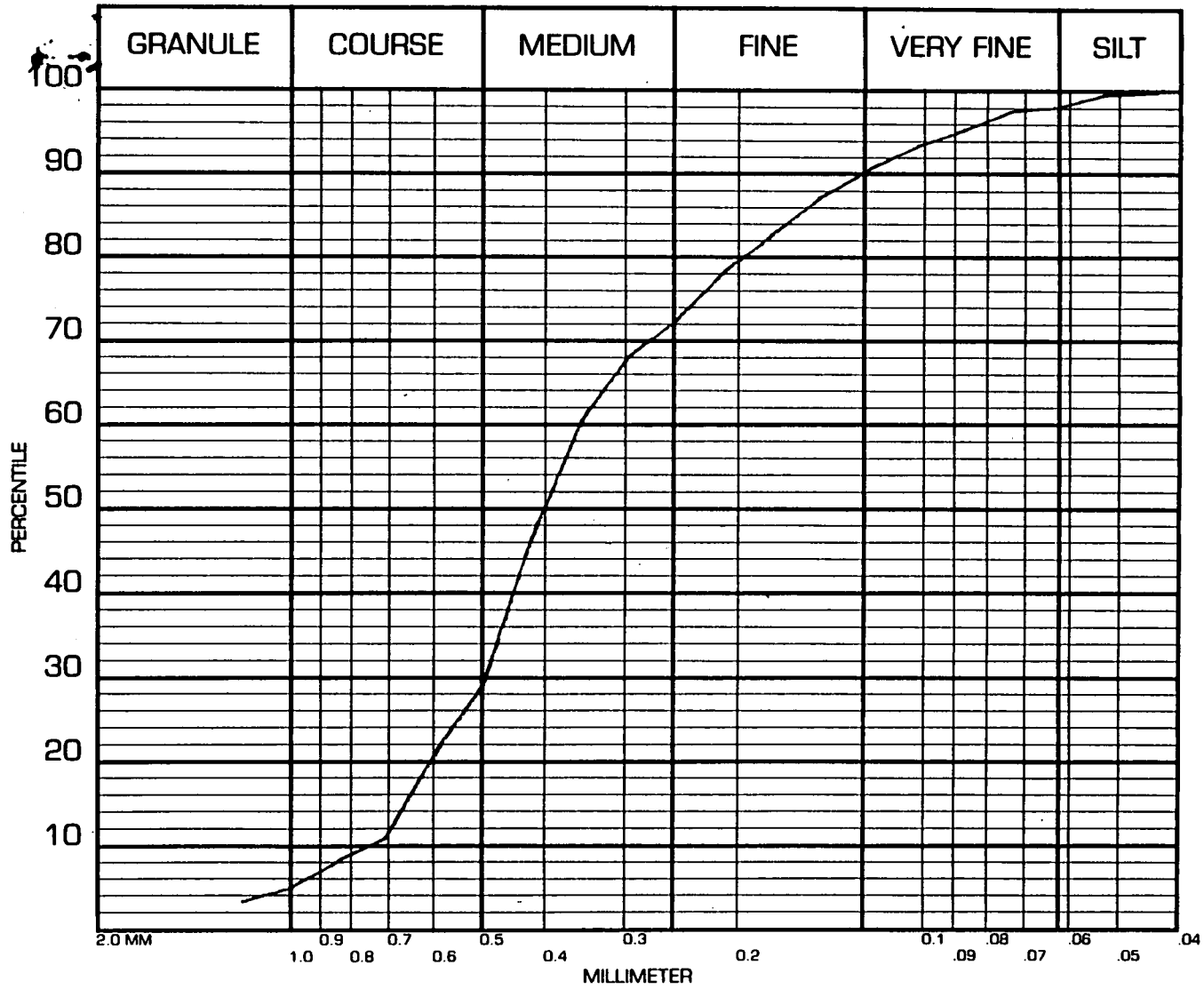
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1--800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....220-221.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
16	.0469	1.190	2.3	2.3	3.2
18	.0394	1.000	1.2	3.5	4.9
20	.0331	0.840	2.4	5.9	8.3
*	.0292	0.742			10.0
25	.0280	0.710	1.9	7.8	10.9
*	.0239	0.606			20.0
30	.0234	0.589	7.6	15.4	21.5
35	.0197	0.500	5.5	20.9	29.2
*	.0194	0.493			30.0
*	.0175	0.444			40.0
40	.0165	0.420	12.5	33.4	46.7
*	.0159	0.404			50.0
*	.0140	0.355			60.0
45	.0139	0.351	10.0	43.4	60.7
50	.0117	0.297	5.4	48.8	68.3
*	.0110	0.278			70.0
60	.0098	0.250	3.1	51.9	72.6
70	.0083	0.210	4.2	56.1	78.5
*	.0078	0.198			80.0
80	.0070	0.177	3.1	59.2	82.8
100	.0059	0.149	3.2	62.4	87.3
*	.0051	0.130			90.0
120	.0049	0.124	2.5	64.9	90.8
140	.0041	0.104	2.0	66.9	93.6
170	.0035	0.088	1.3	68.2	95.4
200	.0029	0.074	1.7	69.9	97.8
230	.0024	0.062	0.4	70.3	98.3
270	.0021	0.053	1.0	71.3	99.7
325	.0017	0.044	0.2	71.5	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

47

28852

UNIFORMITY Cf: (40 d/90d) 0.4412/ 0.1209= 3.65
RECOMMENDATION: (SCREEN ONLY)
SCREEN SLOT SIZE FOR 30 PERCENT RETENTION
0.019 SLOT OPENING IN INCHES

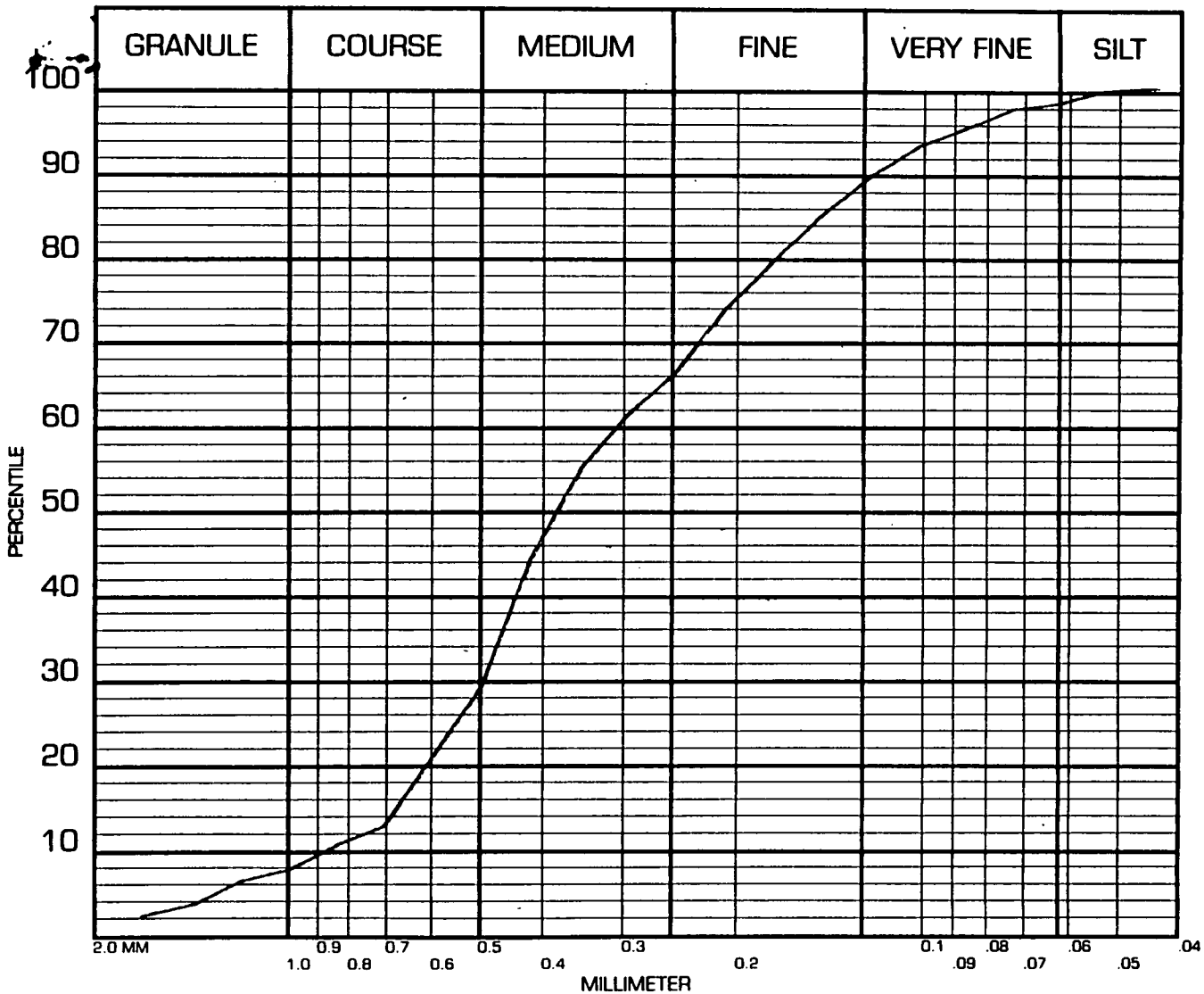
HSSC

HOWARD SMITH SCREEN CO.
A Halliburton Company
P. O. BOX 666 — HOUSTON, TEXAS 77001
713-869-5771 1-800-527-4772

COMPANY...I.T.CORPORATION
WELL NO...1
LOCATION..ALBRIGHT & WILSON
CONTACT...MICHAEL PUPEZA
TELEPHONE.412-372-7701
DEPTH.....215-216.5

US SIEVE	IN	MM	WT RET	CUM WT	CUM %
12	.0650	1.700	1.4	1.4	1.5
14	.0555	1.410	1.4	2.8	3.1
16	.0469	1.190	2.5	5.3	5.8
18	.0394	1.000	1.3	6.6	7.2
*	.0334	0.849			10.0
20	.0331	0.840	2.7	9.3	10.2
25	.0280	0.710	2.0	11.3	12.3
*	.0237	0.600			20.0
30	.0234	0.589	8.0	19.3	21.1
35	.0197	0.500	7.2	26.5	28.9
*	.0194	0.493			30.0
*	.0174	0.441			40.0
40	.0165	0.420	13.7	40.2	43.9
*	.0151	0.383			50.0
45	.0139	0.351	9.8	50.0	54.6
*	.0120	0.305			60.0
50	.0117	0.297	5.8	55.8	60.9
60	.0098	0.250	4.6	60.4	65.9
*	.0090	0.227			70.0
70	.0083	0.210	6.8	67.2	73.4
80	.0070	0.177	5.2	72.4	79.0
*	.0068	0.172			80.0
100	.0059	0.149	5.0	77.4	84.5
120	.0049	0.124	4.5	81.9	89.4
*	.0048	0.121			90.0
140	.0041	0.104	3.3	85.2	93.0
170	.0035	0.088	1.9	87.1	95.1
200	.0029	0.074	2.2	89.3	97.5
230	.0024	0.062	0.7	90.0	98.3
270	.0021	0.053	1.3	91.3	99.7
325	.0017	0.044	0.3	91.6	100.0

* - COMPUTED VALUE



08-30-1991 MIKE DANIEL

48

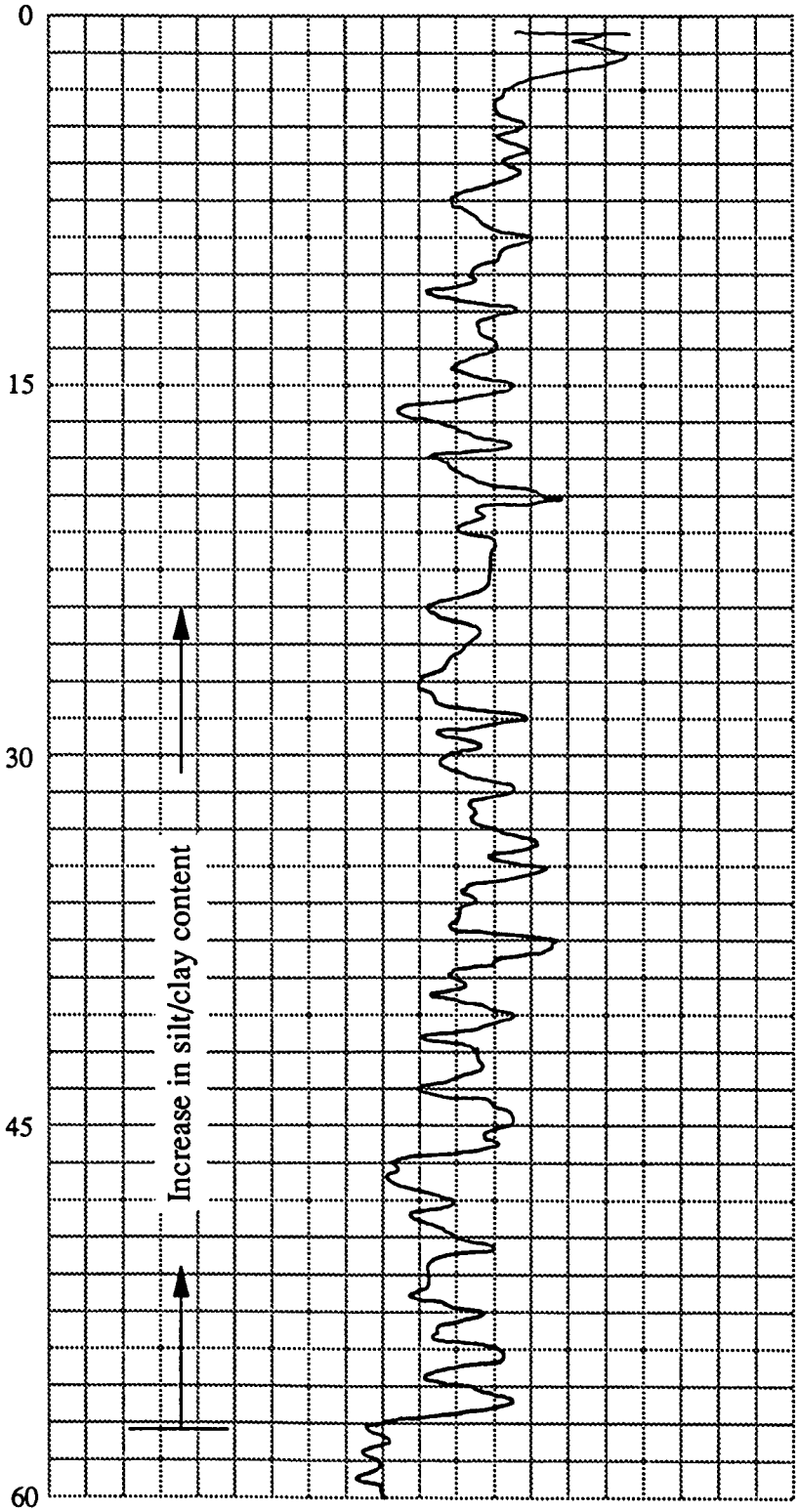
28852

APPENDIX C
NATURAL GAMMA LOG

NATURAL GAMMA GEOPHYSICAL LOG
WELL AW-1

Total Depth = 243.5 ft
12" casing at 67 ft
Water level at 88 ft
Date: 8/28/91

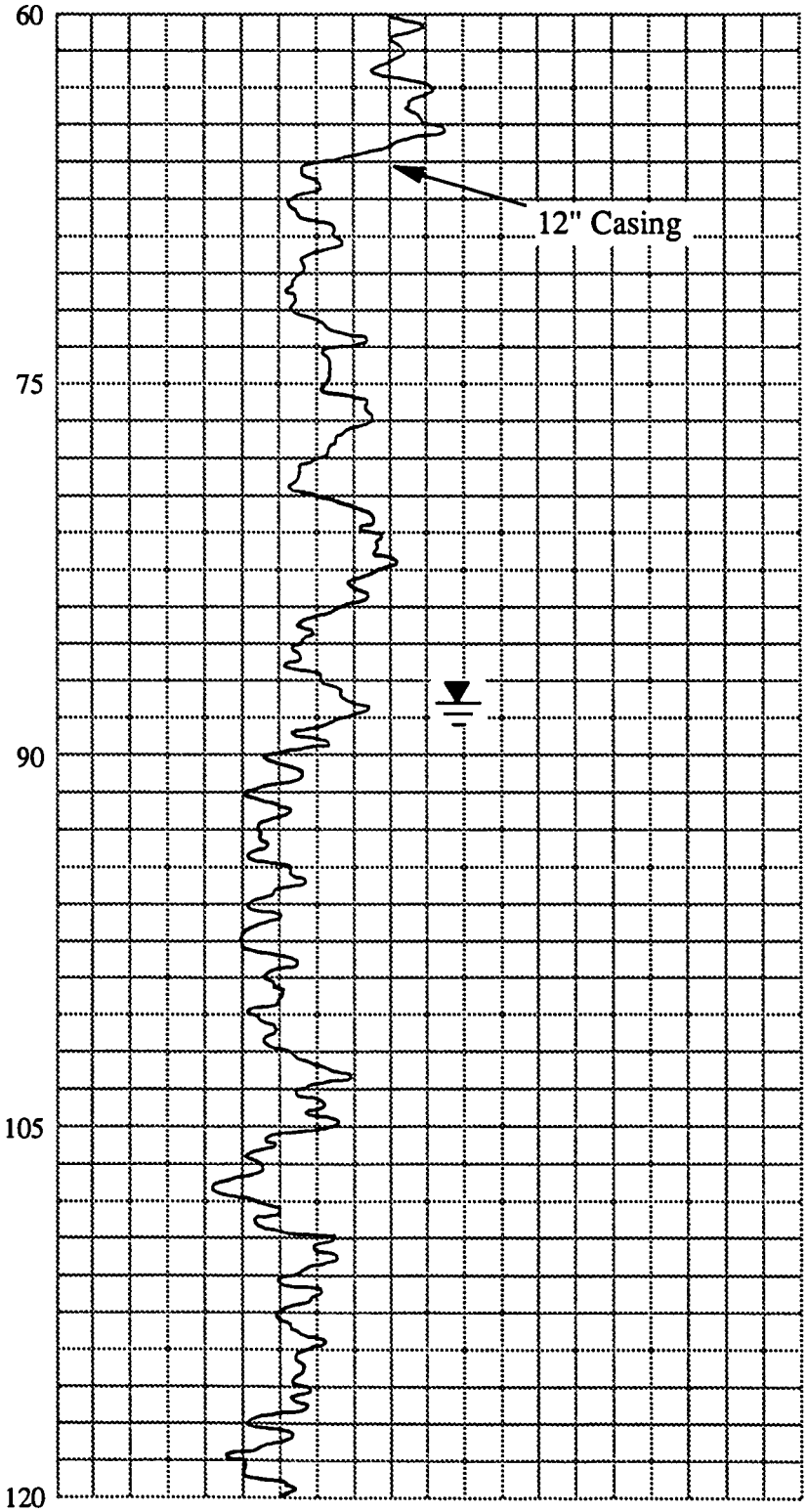
Scale
5 Counts/Sec



NATURAL GAMMA GEOPHYSICAL LOG
WELL AW-1 (Continued)

Total Depth = 243.5 ft
12" casing at 67 ft
Water level at 88 ft
Date: 8/28/91

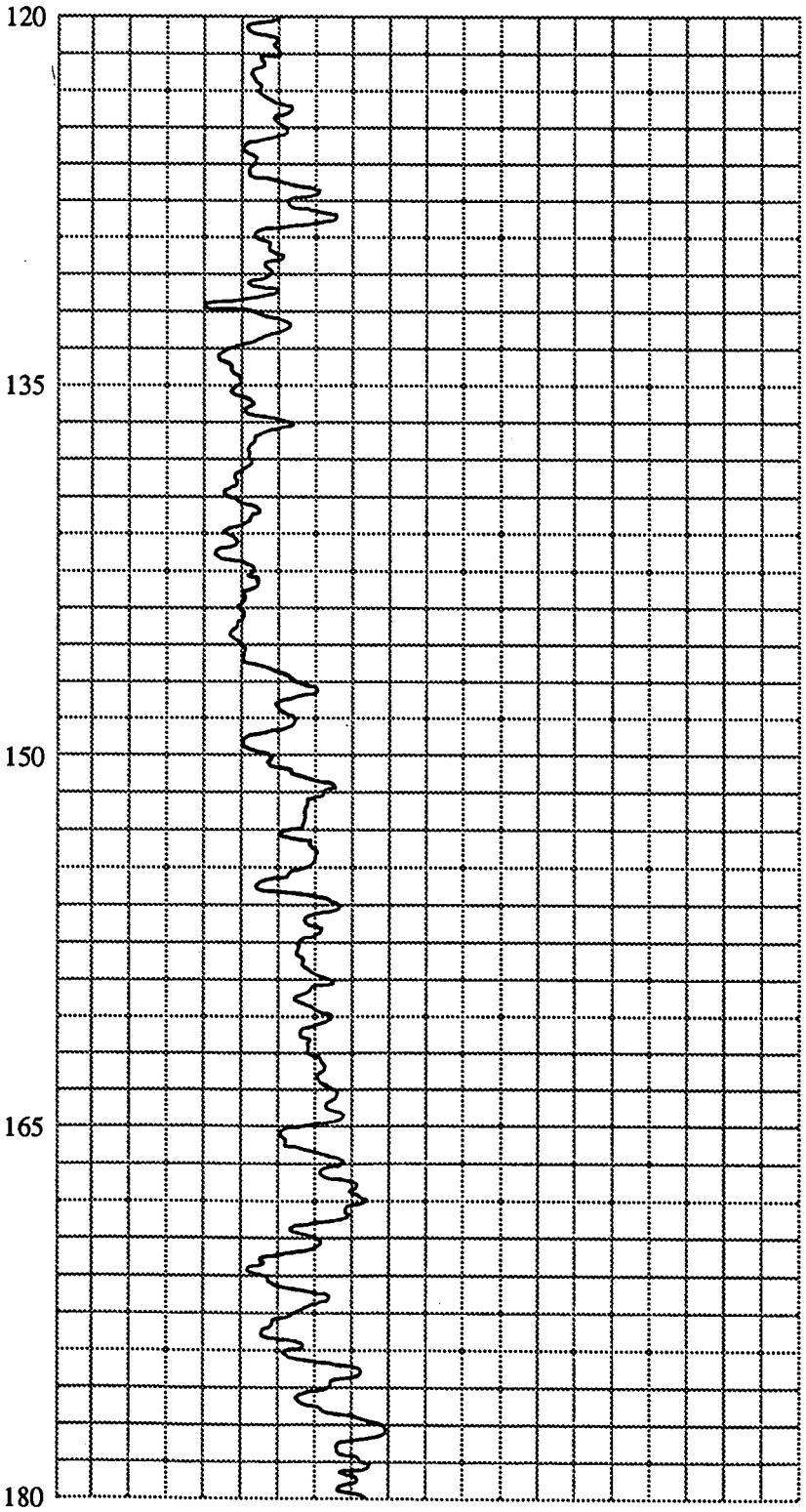
Scale
5 Counts/Sec



NATURAL GAMMA GEOPHYSICAL LOG
WELL AW-1 (Continued)

Total Depth = 243.5 ft
12" casing at 67 ft
Water level at 88 ft
Date: 8/28/91

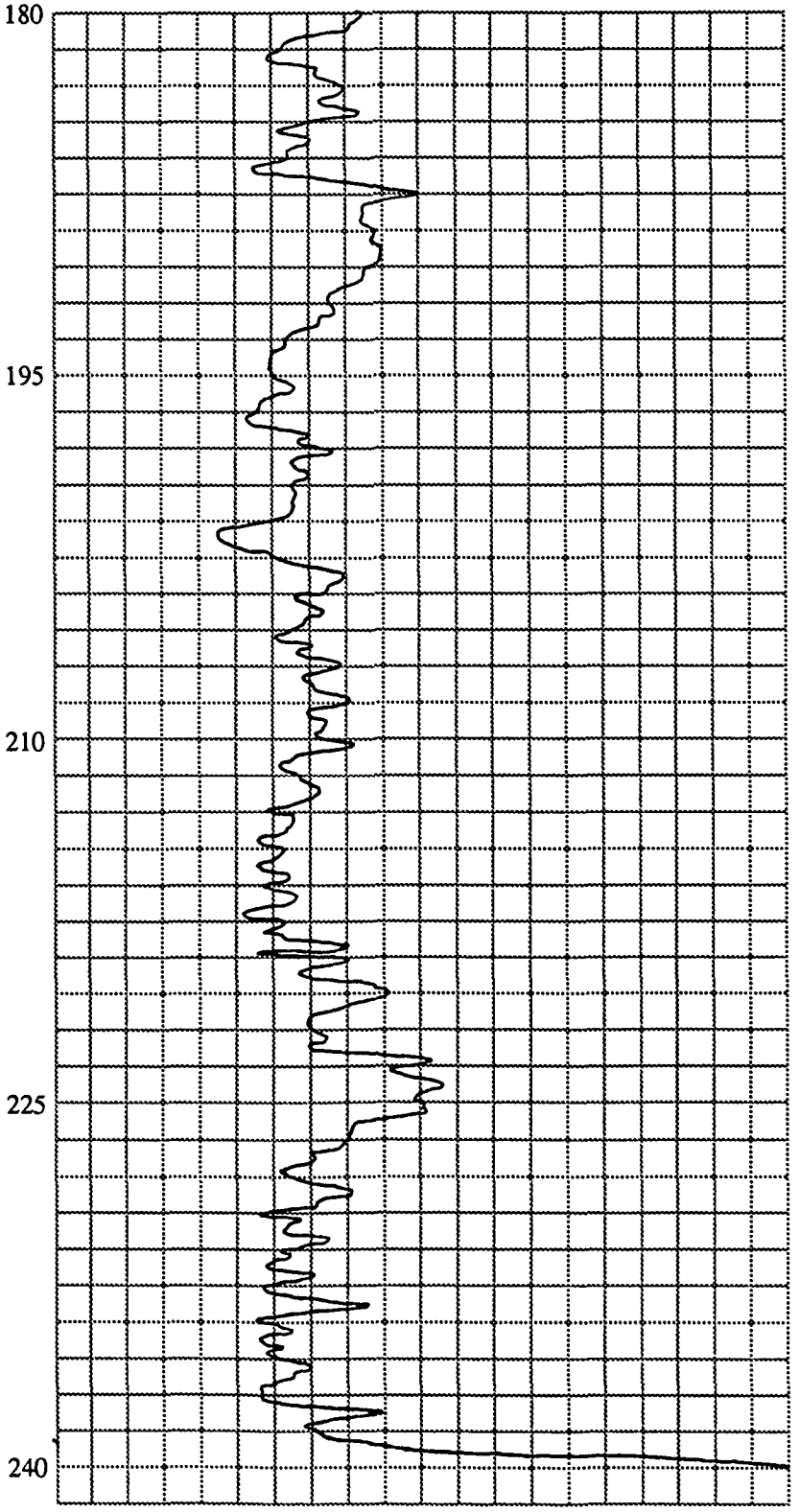
Scale
5 Counts/Sec



NATURAL GAMMA GEOPHYSICAL LOG
WELL AW-1 (Continued)

Total Depth = 243.5 ft
12" casing at 67 ft
Water level at 88 ft
Date: 8/28/91

Scale
5 Counts/Sec



APPENDIX D
TIME-DRAWDOWN AND TIME-RECOVERY DATA OF STEP-DRAWDOWN AND CONSTANT RATE PUMP TESTS

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D-3	Step drawdown test from 0 to 2 hours, Piezometer PZ-1, 20 psi transducer	D-5
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Table D-1

Hermit Data Logger Readings

Step drawdown test from 0 to 2 hours

Pumping Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:27

Unit# 00583 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 06:44

Elapsed Time	Value
0.0000	- 0.19
0.0033	- 1.84
0.0066	- 1.44
0.0099	- 1.45
0.0133	- 1.69
0.0166	- 1.30
0.0200	- 1.17
0.0233	- 1.22
0.0266	- 1.42
0.0300	- 1.46
0.0333	- 1.74
0.0500	4.05
0.0666	- 2.81
0.0833	- 2.32
0.1000	- 2.55
0.1166	- 1.59
0.1333	- 1.26
0.1500	- 0.66
0.1666	- 1.19
0.1833	- 0.88
0.2000	- 0.46
0.2166	- 1.27
0.2333	- 0.91
0.2500	- 0.61
0.2666	- 0.86
0.2833	- 0.63
0.3000	- 1.10
0.3166	- 0.74
0.3333	- 0.93
0.4167	- 0.23
0.5000	- 1.53
0.5833	- 0.87
0.6667	- 1.09
0.7500	- 1.29
0.8333	- 1.99
0.9167	- 1.83
1.0000	- 1.81
1.0833	- 1.93
1.1667	- 2.20
1.2500	- 2.17
1.3333	- 1.85
1.4166	- 1.69
1.5000	- 1.94
1.5833	- 1.42
1.6667	- 2.18
1.7500	- 1.83
1.8333	- 2.14
1.9167	- 1.81
2.0000	- 2.06
2.5000	- 1.96
3.0000	- 1.56
3.5000	- 1.27
4.0000	- 1.79
4.5000	- 1.02
5.0000	- 1.37
5.5000	- 1.21
6.0000	- 1.50
6.5000	- 1.49
7.0000	- 1.32
7.5000	- 1.42
8.0000	- 1.89
8.5000	- 1.56
9.0000	- 0.97
9.5000	- 1.27
10.0000	- 1.41
12.0000	- 1.43
14.0000	- 1.52

Elapsed Time		Value
16.0000	-	1.32
18.0000	-	1.26
20.0000	-	1.30
22.0000	-	1.50
24.0000	-	1.53
26.0000	-	1.25
28.0000	-	1.49
30.0000	-	1.09
32.0000	-	1.24
34.0000	-	1.71
36.0000	-	1.05
38.0000	-	1.50
40.0000	-	1.74
42.0000	-	1.32
44.0000	-	1.12
46.0000	-	1.12
48.0000	-	1.43
50.0000	-	1.05
52.0000	-	1.50
54.0000	-	1.50
56.0000	-	1.39
58.0000	-	1.25
60.0000	-	1.18
62.0000	-	1.98
64.0000	-	1.62
66.0000	-	1.55
68.0000	-	1.20
70.0000	-	0.83
72.0000	-	1.84
74.0000	-	1.07
76.0000	-	1.47
78.0000	-	1.44
80.0000	-	1.25
82.0000	-	1.39
84.0000	-	1.44
86.0000	-	1.48
88.0000	-	1.69
90.0000	-	1.69
92.0000	-	1.35
94.0000	-	1.35
96.0000	-	1.47
98.0000	-	1.45
100.000	-	1.52
105.000	-	0.98
110.000	-	1.14
115.000	-	1.17

END

Table D-2

Hermit Data Logger Readings

Step drawdown test from 0 to 2 hours.

Pumping Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/17 17:30

Unit# 00583 Test# 0

INPUT 2: Level (F)

Reference	0.00
Scale factor	49.79
Offset	0.12

Step# 0 09/17 06:44

Elapsed Time	Value
0.0000	0.12
0.0033	- 4.02
0.0066	- 2.93
0.0099	- 2.35
0.0133	- 1.60
0.0166	- 1.50
0.0200	- 1.41
0.0233	- 1.36
0.0266	- 1.47
0.0300	- 1.55
0.0333	- 1.69
0.0500	0.72
0.0666	- 1.98
0.0833	- 2.35
0.1000	- 2.35
0.1166	- 1.68
0.1333	- 1.54
0.1500	- 1.50
0.1666	- 1.25
0.1833	- 1.03
0.2000	- 1.22
0.2166	- 0.95
0.2333	- 0.95
0.2500	- 1.13
0.2666	- 1.06
0.2833	- 1.28
0.3000	- 0.94
0.3166	- 1.08
0.3333	- 0.94
0.4167	- 0.92
0.5000	- 0.92
0.5833	- 1.24
0.6667	- 1.24
0.7500	- 1.54
0.8333	- 2.01
0.9167	- 1.79
1.0000	- 1.93
1.0833	- 2.21
1.1667	- 1.83
1.2500	- 1.99
1.3333	- 1.83
1.4166	- 1.87
1.5000	- 1.91
1.5833	- 1.65
1.6667	- 1.80
1.7500	- 1.96
1.8333	- 1.88
1.9167	- 1.93
2.0000	- 1.93
2.5000	- 1.91
3.0000	- 1.47
3.5000	- 1.32
4.0000	- 1.58
4.5000	- 1.24
5.0000	- 1.17
5.5000	- 1.22
6.0000	- 1.35
6.5000	- 1.39
7.0000	- 1.33
7.5000	- 1.30
8.0000	- 1.32
8.5000	- 1.44
9.0000	- 1.49
9.5000	- 1.50
10.0000	- 1.44
12.0000	- 1.36
14.0000	- 1.55

Elapsed Time		Value
16.0000	-	1.44
18.0000	-	1.36
20.0000	-	1.58
22.0000	-	1.55
24.0000	-	1.32
26.0000	-	1.27
28.0000	-	1.44
30.0000	-	1.33
32.0000	-	1.50
34.0000	-	1.54
36.0000	-	1.22
38.0000	-	1.13
40.0000	-	1.21
42.0000	-	1.57
44.0000	-	1.38
46.0000	-	1.66
48.0000	-	1.32
50.0000	-	1.30
52.0000	-	1.06
54.0000	-	1.36
56.0000	-	1.38
58.0000	-	1.39
60.0000	-	1.55
62.0000	-	1.52
64.0000	-	1.19
66.0000	-	1.49
68.0000	-	1.50
70.0000	-	1.47
72.0000	-	1.28
74.0000	-	0.97
76.0000	-	1.28
78.0000	-	1.36
80.0000	-	1.38
82.0000	-	1.79
84.0000	-	1.49
86.0000	-	1.43
88.0000	-	1.49
90.0000	-	1.22
92.0000	-	1.41
94.0000	-	1.41
96.0000	-	1.24
98.0000	-	1.28
100.000	-	1.21
105.000	-	1.50
110.000	-	1.60
115.000	-	1.33

END

Table D-3

Hermit Data Logger Readings

Step drawdown test from 0 to 2 hours.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:02

Unit# 00884 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/17 06:44

Elapsed Time	Value
0.0000	- 0.02
0.0033	- 0.03
0.0066	- 0.03
0.0099	- 0.04
0.0133	- 0.04
0.0166	- 0.05
0.0200	- 0.05
0.0233	- 0.05
0.0266	- 0.05
0.0300	- 0.05
0.0333	- 0.05
0.0500	- 0.05
0.0666	- 0.05
0.0833	- 0.05
0.1000	- 0.05
0.1166	- 0.05
0.1333	- 0.05
0.1500	- 0.05
0.1666	- 0.05
0.1833	- 0.05
0.2000	- 0.05
0.2166	- 0.05
0.2333	- 0.05
0.2500	- 0.05
0.2666	- 0.05
0.2833	- 0.05
0.3000	- 0.05
0.3166	- 0.05
0.3333	- 0.05
0.4167	- 0.05
0.5000	- 0.05
0.5833	- 0.05
0.6667	- 0.05
0.7500	- 0.05
0.8333	- 0.06
0.9167	- 0.06
1.0000	- 0.06
1.0833	- 0.06
1.1667	- 0.06
1.2500	- 0.06
1.3333	- 0.06
1.4166	- 0.06
1.5000	- 0.06
1.5833	- 0.06
1.6667	- 0.06
1.7500	- 0.06
1.8333	- 0.06
1.9167	- 0.06
2.0000	- 0.06
2.5000	- 0.06
3.0000	- 0.06
3.5000	- 0.06
4.0000	- 0.06
4.5000	- 0.06
5.0000	- 0.06
5.5000	- 0.06
6.0000	- 0.06
6.5000	- 0.06
7.0000	- 0.06
7.5000	- 0.06
8.0000	- 0.06
8.5000	- 0.07
9.0000	- 0.07
9.5000	- 0.07
10.0000	- 0.07
12.0000	- 0.06
14.0000	- 0.06
16.0000	- 0.07
18.0000	- 0.07

Elapsed Time		Value
20.0000	-	0.08
22.0000	-	0.08
24.0000	-	0.08
26.0000	-	0.08
28.0000	-	0.08
30.0000	-	0.08
32.0000	-	0.09
34.0000	-	0.10
36.0000	-	0.10
38.0000	-	0.10
40.0000	-	0.10
42.0000	-	0.10
44.0000	-	0.10
46.0000	-	0.10
48.0000	-	0.10
50.0000	-	0.10
52.0000	-	0.10
54.0000	-	0.10
56.0000	-	0.10
58.0000	-	0.11
60.0000	-	0.11
62.0000	-	0.11
64.0000	-	0.11
66.0000	-	0.11
68.0000	-	0.11
70.0000	-	0.12
72.0000	-	0.12
74.0000	-	0.12
76.0000	-	0.12
78.0000	-	0.12
80.0000	-	0.12
82.0000	-	0.12
84.0000	-	0.13
86.0000	-	0.13
88.0000	-	0.13
90.0000	-	0.13
92.0000	-	0.13
94.0000	-	0.13
96.0000	-	0.13
98.0000	-	0.13
100.000	-	0.13
105.000	-	0.13
110.000	-	0.13
115.000	-	0.13

END

Table D-4

Hermit Data Logger Readings

Step drawdown test from 0 to 2 hours.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:05

Unit# 00884 Test# 0

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.94
Offset	0.00

Step# 0 09/17 06:44

Elapsed Time	Value
0.0000	0.00
0.0033	- 0.00
0.0066	- 0.00
0.0099	- 0.00
0.0133	- 0.00
0.0166	- 0.00
0.0200	- 0.01
0.0233	- 0.01
0.0266	- 0.01
0.0300	- 0.01
0.0333	- 0.01
0.0500	- 0.00
0.0666	- 0.00
0.0833	- 0.00
0.1000	- 0.00
0.1166	- 0.00
0.1333	- 0.00
0.1500	- 0.00
0.1666	- 0.00
0.1833	- 0.00
0.2000	- 0.00
0.2166	- 0.00
0.2333	- 0.00
0.2500	- 0.00
0.2666	- 0.00
0.2833	- 0.00
0.3000	- 0.00
0.3166	- 0.00
0.3333	- 0.00
0.4167	- 0.00
0.5000	- 0.00
0.5833	- 0.00
0.6667	- 0.00
0.7500	- 0.00
0.8333	- 0.00
0.9167	- 0.00
1.0000	- 0.00
1.0833	- 0.00
1.1667	- 0.00
1.2500	- 0.00
1.3333	- 0.00
1.4166	- 0.00
1.5000	- 0.00
1.5833	- 0.00
1.6667	- 0.00
1.7500	- 0.00
1.8333	- 0.00
1.9167	- 0.00
2.0000	- 0.00
2.5000	- 0.00
3.0000	- 0.00
3.5000	- 0.00
4.0000	0.00
4.5000	- 0.00
5.0000	- 0.00
5.5000	0.00
6.0000	- 0.00
6.5000	- 0.00
7.0000	- 0.00
7.5000	- 0.00
8.0000	- 0.00
8.5000	- 0.00
9.0000	- 0.00
9.5000	- 0.00
10.0000	- 0.00
12.0000	- 0.00
14.0000	- 0.00
16.0000	- 0.00
18.0000	- 0.01

Elapsed Time		Value
20.0000	-	0.01
22.0000	-	0.01
24.0000	-	0.01
26.0000	-	0.01
28.0000	-	0.01
30.0000	-	0.01
32.0000	-	0.01
34.0000	-	0.02
36.0000	-	0.02
38.0000	-	0.02
40.0000	-	0.02
42.0000	-	0.03
44.0000	-	0.03
46.0000	-	0.03
48.0000	-	0.02
50.0000	-	0.02
52.0000	-	0.02
54.0000	-	0.02
56.0000	-	0.03
58.0000	-	0.03
60.0000	-	0.03
62.0000	-	0.03
64.0000	-	0.03
66.0000	-	0.04
68.0000	-	0.04
70.0000	-	0.04
72.0000	-	0.04
74.0000	-	0.04
76.0000	-	0.04
78.0000	-	0.04
80.0000	-	0.04
82.0000	-	0.04
84.0000	-	0.04
86.0000	-	0.05
88.0000	-	0.05
90.0000	-	0.05
92.0000	-	0.05
94.0000	-	0.05
96.0000	-	0.05
98.0000	-	0.05
100.000	-	0.05
105.000	-	0.05
110.000	-	0.05
115.000	-	0.05

END

Table D-5

Hermit Data Logger Readings

Step drawdown test from 2 to 4 hours.

Pumping Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:33

Unit# 00583 Test# 1

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 08:43

Elapsed Time	Value
0.0000	- 2.01
0.0033	- 1.75
0.0066	- 1.65
0.0099	- 1.52
0.0133	- 1.60
0.0166	- 1.23
0.0200	- 1.28
0.0233	- 1.78
0.0266	- 2.05
0.0300	- 1.55
0.0333	- 1.33
0.0500	- 2.06
0.0666	- 2.22
0.0833	- 2.42
0.1000	- 2.49
0.1166	- 2.76
0.1333	- 2.93
0.1500	- 2.79
0.1666	- 2.61
0.1833	- 2.27
0.2000	- 2.42
0.2166	- 2.52
0.2333	- 2.07
0.2500	- 2.54
0.2666	- 2.47
0.2833	- 2.27
0.3000	- 2.29
0.3166	- 2.20
0.3333	- 2.31
0.4167	- 2.40
0.5000	- 2.49
0.5833	- 2.18
0.6667	- 2.48
0.7500	- 2.17
0.8333	- 1.96
0.9167	- 2.07
1.0000	- 2.67
1.0833	- 2.37
1.1667	- 2.54
1.2500	- 2.42
1.3333	- 2.26
1.4166	- 2.00
1.5000	- 2.25
1.5833	- 2.18
1.6667	- 2.45
1.7500	- 2.16
1.8333	- 2.43
1.9167	- 2.23
2.0000	- 2.05
2.5000	- 2.27
3.0000	- 2.39
3.5000	- 2.37
4.0000	- 1.88
4.5000	- 2.36
5.0000	- 2.23
5.5000	- 2.02
6.0000	- 2.37
6.5000	- 1.85
7.0000	- 2.26
7.5000	- 2.17
8.0000	- 2.06
8.5000	- 2.50
9.0000	- 2.25
9.5000	- 2.00
10.0000	- 2.50
12.0000	- 2.30
14.0000	- 2.16

Elapsed Time		Value
16.0000	-	2.72
18.0000	-	2.27
20.0000	-	2.17
22.0000	-	2.64
24.0000	-	2.47
26.0000	-	2.18
28.0000	-	2.13
30.0000	-	2.30
32.0000	-	2.61
34.0000	-	2.14
36.0000	-	2.46
38.0000	-	2.57
40.0000	-	2.47
42.0000	-	2.37
44.0000	-	2.34
46.0000	-	2.54
48.0000	-	2.52
50.0000	-	2.45
52.0000	-	2.50
54.0000	-	2.52
56.0000	-	2.29
58.0000	-	2.57
60.0000	-	2.08
62.0000	-	2.12
64.0000	-	2.32
66.0000	-	2.41
68.0000	-	2.52
70.0000	-	2.25
72.0000	-	1.99
74.0000	-	2.27
76.0000	-	2.59
78.0000	-	2.40
80.0000	-	2.37
82.0000	-	2.06
84.0000	-	2.20
86.0000	-	1.93
88.0000	-	2.20
90.0000	-	2.15
92.0000	-	2.40
94.0000	-	2.27
96.0000	-	2.32
98.0000	-	2.12
100.000	-	2.23
105.000	-	2.35
110.000	-	2.70
115.000	-	2.34

END

Table D-6

Hermit Data Logger Readings

Step drawdown test from 2 to 4 hours.

Pumping Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/17 17:36

Unit# 00583 Test# 1

INPUT 2: Level (F)

Reference	0.00
Scale factor	49.79
Offset	0.12

Step# 0 09/17 08:43

Elapsed Time	Value
0.0000	- 1.47
0.0033	- 1.49
0.0066	- 1.50
0.0099	- 1.52
0.0133	- 1.49
0.0166	- 1.38
0.0200	- 1.90
0.0233	- 1.71
0.0266	- 1.68
0.0300	- 1.47
0.0333	- 1.76
0.0500	- 1.96
0.0666	- 2.07
0.0833	- 2.35
0.1000	- 2.38
0.1166	- 2.42
0.1333	- 2.86
0.1500	- 2.81
0.1666	- 2.65
0.1833	- 2.40
0.2000	- 2.48
0.2166	- 2.40
0.2333	- 2.42
0.2500	- 2.42
0.2666	- 2.46
0.2833	- 2.29
0.3000	- 2.40
0.3166	- 2.29
0.3333	- 2.21
0.4167	- 2.13
0.5000	- 2.40
0.5833	- 2.15
0.6667	- 2.56
0.7500	- 2.38
0.8333	- 2.31
0.9167	- 2.21
1.0000	- 2.26
1.0833	- 2.34
1.1667	- 2.20
1.2500	- 2.29
1.3333	- 2.13
1.4166	- 2.16
1.5000	- 2.16
1.5833	- 2.48
1.6667	- 2.29
1.7500	- 2.18
1.8333	- 2.40
1.9167	- 2.10
2.0000	- 2.31
2.5000	- 2.26
3.0000	- 2.29
3.5000	- 2.20
4.0000	- 2.32
4.5000	- 2.37
5.0000	- 2.18
5.5000	- 2.35
6.0000	- 2.21
6.5000	- 2.42
7.0000	- 2.29
7.5000	- 2.43
8.0000	- 2.35
8.5000	- 2.23
9.0000	- 2.37
9.5000	- 2.18
10.0000	- 2.18
12.0000	- 2.31
14.0000	- 2.35

Elapsed Time		Value
16.0000	-	2.43
18.0000	-	2.27
20.0000	-	2.37
22.0000	-	2.35
24.0000	-	2.13
26.0000	-	2.15
28.0000	-	2.34
30.0000	-	2.24
32.0000	-	2.21
34.0000	-	2.24
36.0000	-	2.32
38.0000	-	2.40
40.0000	-	2.53
42.0000	-	2.45
44.0000	-	2.18
46.0000	-	2.37
48.0000	-	2.13
50.0000	-	2.34
52.0000	-	2.37
54.0000	-	2.46
56.0000	-	2.51
58.0000	-	2.51
60.0000	-	2.37
62.0000	-	2.21
64.0000	-	2.18
66.0000	-	2.31
68.0000	-	2.12
70.0000	-	2.42
72.0000	-	2.31
74.0000	-	2.40
76.0000	-	2.31
78.0000	-	2.31
80.0000	-	2.37
82.0000	-	2.42
84.0000	-	2.51
86.0000	-	2.37
88.0000	-	2.45
90.0000	-	2.35
92.0000	-	2.65
94.0000	-	2.31
96.0000	-	2.49
98.0000	-	2.26
100.000	-	2.38
105.000	-	2.51
110.000	-	2.01
115.000	-	2.32

END

Table D-7

Hermit Data Logger Readings

Step drawdown test from 2 to 4 hours.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:08

Unit# 00884 Test# 1

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/17 08:43

Elapsed Time		Value
0.0000	-	0.13
0.0033	-	0.14
0.0066	-	0.14
0.0099	-	0.15
0.0133	-	0.15
0.0166	-	0.15
0.0200	-	0.15
0.0233	-	0.15
0.0266	-	0.15
0.0300	-	0.15
0.0333	-	0.15
0.0500	-	0.15
0.0666	-	0.15
0.0833	-	0.15
0.1000	-	0.15
0.1166	-	0.15
0.1333	-	0.15
0.1500	-	0.15
0.1666	-	0.15
0.1833	-	0.16
0.2000	-	0.16
0.2166	-	0.15
0.2333	-	0.16
0.2500	-	0.15
0.2666	-	0.15
0.2833	-	0.16
0.3000	-	0.15
0.3166	-	0.16
0.3333	-	0.15
0.4167	-	0.16
0.5000	-	0.16
0.5833	-	0.15
0.6667	-	0.16
0.7500	-	0.16
0.8333	-	0.16
0.9167	-	0.16
1.0000	-	0.15
1.0833	-	0.16
1.1667	-	0.16
1.2500	-	0.16
1.3333	-	0.16
1.4166	-	0.16
1.5000	-	0.16
1.5833	-	0.16
1.6667	-	0.16
1.7500	-	0.16
1.8333	-	0.16
1.9167	-	0.16
2.0000	-	0.16
2.5000	-	0.15
3.0000	-	0.15
3.5000	-	0.15
4.0000	-	0.15
4.5000	-	0.15
5.0000	-	0.15
5.5000	-	0.16
6.0000	-	0.16
6.5000	-	0.16
7.0000	-	0.16
7.5000	-	0.16
8.0000	-	0.16
8.5000	-	0.16
9.0000	-	0.16
9.5000	-	0.16
10.0000	-	0.16
12.0000	-	0.15
14.0000	-	0.15

Elapsed Time	Value
16.0000	- 0.15
18.0000	- 0.15
20.0000	- 0.15
22.0000	- 0.15
24.0000	- 0.15
26.0000	- 0.15
28.0000	- 0.16
30.0000	- 0.16
32.0000	- 0.16
34.0000	

Table D-8

Hermit Data Logger Readings

Step drawdown test from 2 to 4 hours.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:11

Unit# 00884 Test# 1

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.94
Offset	0.00

Step# 0 09/17 08:43

Elapsed Time	Value
0.0000	- 0.05
0.0033	- 0.06
0.0066	- 0.06
0.0099	- 0.06
0.0133	- 0.06
0.0166	- 0.06
0.0200	- 0.06
0.0233	- 0.06
0.0266	- 0.06
0.0300	- 0.06
0.0333	- 0.06
0.0500	- 0.06
0.0666	- 0.06
0.0833	- 0.06
0.1000	- 0.06
0.1166	- 0.06
0.1333	- 0.06
0.1500	- 0.06
0.1666	- 0.06
0.1833	- 0.06
0.2000	- 0.06
0.2166	- 0.06
0.2333	- 0.06
0.2500	- 0.06
0.2666	- 0.06
0.2833	- 0.06
0.3000	- 0.06
0.3166	- 0.06
0.3333	- 0.06
0.4167	- 0.06
0.5000	- 0.06
0.5833	- 0.06
0.6667	- 0.06
0.7500	- 0.06
0.8333	- 0.06
0.9167	- 0.06
1.0000	- 0.06
1.0833	- 0.06
1.1667	- 0.06
1.2500	- 0.06
1.3333	- 0.06
1.4166	- 0.05
1.5000	- 0.06
1.5833	- 0.06
1.6667	- 0.05
1.7500	- 0.06
1.8333	- 0.05
1.9167	- 0.06
2.0000	- 0.05
2.5000	- 0.05
3.0000	- 0.05
3.5000	- 0.05
4.0000	- 0.05
4.5000	- 0.06
5.0000	- 0.06
5.5000	- 0.06
6.0000	- 0.06
6.5000	- 0.06
7.0000	- 0.06
7.5000	- 0.06
8.0000	- 0.06
8.5000	- 0.06
9.0000	- 0.06
9.5000	- 0.06
10.0000	- 0.06
12.0000	- 0.06
14.0000	- 0.06

Elapsed Time		Value
16.0000	-	0.06
18.0000	-	0.06
20.0000	-	0.06
22.0000	-	0.06
24.0000	-	0.06
26.0000	-	0.05
28.0000	-	0.05
30.0000	-	0.06
32.0000	-	0.06
34.0000	-	0.07
36.0000	-	0.06
38.0000	-	0.07
40.0000	-	0.06
42.0000	-	0.06
44.0000	-	0.09
46.0000	-	0.08
48.0000	-	0.07
50.0000	-	0.09
52.0000	-	0.08
54.0000	-	0.07
56.0000	-	0.08
58.0000	-	0.08
60.0000	-	0.08
62.0000	-	0.08
64.0000	-	0.08
66.0000	-	0.08
68.0000	-	0.08
70.0000	-	0.08
72.0000	-	0.09
74.0000	-	0.09
76.0000	-	0.10
78.0000	-	0.10
80.0000	-	0.10
82.0000	-	0.10
84.0000	-	0.09
86.0000	-	0.10
88.0000	-	0.10
90.0000	-	0.10
92.0000	-	0.10
94.0000	-	0.10
96.0000	-	0.10
98.0000	-	0.08
100.000	-	0.09
105.000	-	0.09
110.000	-	0.09
115.000	-	0.11

END

Table D-9

Hermit Data Logger Readings

Step drawdown test from 4 to 6 hours.

Pumping Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:39

Unit# 00583 Test# 2

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 10:43

Elapsed Time	Value
0.0000	2.42
0.0033	2.48
0.0066	2.44
0.0099	2.36
0.0133	2.45
0.0166	2.57
0.0200	2.59
0.0233	2.52
0.0266	2.40
0.0300	2.65
0.0333	2.66
0.0500	2.68
0.0666	2.90
0.0833	3.37
0.1000	3.39
0.1166	3.41
0.1333	3.83
0.1500	3.96
0.1666	4.03
0.1833	3.78
0.2000	4.32
0.2166	4.00
0.2333	4.12
0.2500	4.36
0.2666	4.17
0.2833	4.43
0.3000	4.17
0.3166	4.40
0.3333	4.49
0.4167	4.33
0.5000	4.37
0.5833	4.48
0.6667	4.44
0.7500	4.32
0.8333	4.58
0.9167	4.34
1.0000	4.38
1.0833	4.40
1.1667	4.34
1.2500	4.35
1.3333	4.36
1.4166	4.32
1.5000	4.49
1.5833	4.17
1.6667	4.27
1.7500	4.41
1.8333	4.27
1.9167	4.32
2.0000	4.67
2.5000	4.37
3.0000	4.41
3.5000	4.48
4.0000	4.54
4.5000	4.39
5.0000	4.19
5.5000	4.50
6.0000	4.71
6.5000	4.41
7.0000	4.54
7.5000	4.52
8.0000	4.58
8.5000	4.35
9.0000	4.41
9.5000	4.56
10.0000	4.15
12.0000	4.38
14.0000	4.41

Elapsed Time		Value
16.0000	-	4.53
18.0000	-	4.37
20.0000	-	4.56
22.0000	-	4.30
24.0000	-	4.57
26.0000	-	4.41
28.0000	-	4.39
30.0000	-	4.37
32.0000	-	4.46
34.0000	-	4.41
36.0000	-	4.21
38.0000	-	4.63
40.0000	-	4.64
42.0000	-	4.66
44.0000	-	4.62
46.0000	-	4.40
48.0000	-	4.38
50.0000	-	4.39
52.0000	-	4.41
54.0000	-	4.67
56.0000	-	4.45
58.0000	-	4.47
60.0000	-	4.41
62.0000	-	4.45
64.0000	-	4.25
66.0000	-	4.41
68.0000	-	4.52
70.0000	-	4.44
72.0000	-	4.13
74.0000	-	4.28
76.0000	-	4.15
78.0000	-	4.32
80.0000	-	4.51
82.0000	-	4.75
84.0000	-	4.45
86.0000	-	4.37
88.0000	-	4.54
90.0000	-	4.52
92.0000	-	4.54
94.0000	-	4.22
96.0000	-	4.41
98.0000	-	4.37
100.000	-	4.52
105.000	-	4.45
110.000	-	4.34
115.000	-	4.25
120.000	-	4.44

END

Table D-10

Hermit Data Logger Readings

Step drawdown test from 4 to 6 hours.

Pumping Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/17 17:39

Unit# 00583 Test# 2

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 10:43

Elapsed Time	Value
0.0000	2.42
0.0033	2.48
0.0066	2.44
0.0099	2.36
0.0133	2.45
0.0166	2.57
0.0200	2.59
0.0233	2.52
0.0266	2.40
0.0300	2.65
0.0333	2.66
0.0500	2.68
0.0666	2.90
0.0833	3.37
0.1000	3.39
0.1166	3.41
0.1333	3.83
0.1500	3.96
0.1666	4.03
0.1833	3.78
0.2000	4.32
0.2166	4.00
0.2333	4.12
0.2500	4.36
0.2666	4.17
0.2833	4.43
0.3000	4.17
0.3166	4.40
0.3333	4.49
0.4167	4.33
0.5000	4.37
0.5833	4.48
0.6667	4.44
0.7500	4.32
0.8333	4.58
0.9167	4.34
1.0000	4.38
1.0833	4.40
1.1667	4.34
1.2500	4.35
1.3333	4.36
1.4166	4.32
1.5000	4.49
1.5833	4.17
1.6667	4.27
1.7500	4.41
1.8333	4.27
1.9167	4.32
2.0000	4.67
2.5000	4.37
3.0000	4.41
3.5000	4.48
4.0000	4.54
4.5000	4.39
5.0000	4.19
5.5000	4.50
6.0000	4.71
6.5000	4.41
7.0000	4.54
7.5000	4.52
8.0000	4.58
8.5000	4.35
9.0000	4.41
9.5000	4.56
10.0000	4.15
12.0000	4.38
14.0000	4.41
16.0000	4.53
18.0000	4.37

Elapsed Time		Value
20.0000	-	4.56
22.0000	-	4.30
24.0000	-	4.57
26.0000	-	4.41
28.0000	-	4.39
30.0000	-	4.37
32.0000	-	4.46
34.0000	-	4.41
36.0000	-	4.21
38.0000	-	4.63
40.0000	-	4.64
42.0000	-	4.66
44.0000	-	4.62
46.0000	-	4.40
48.0000	-	4.38
50.0000	-	4.39
52.0000	-	4.41
54.0000	-	4.67
56.0000	-	4.45
58.0000	-	4.47
60.0000	-	4.41
62.0000	-	4.45
64.0000	-	4.25
66.0000	-	4.41
68.0000	-	4.52
70.0000	-	4.44
72.0000	-	4.13
74.0000	-	4.28
76.0000	-	4.15
78.0000	-	4.32
80.0000	-	4.51
82.0000	-	4.75
84.0000	-	4.45
86.0000	-	4.37
88.0000	-	4.54
90.0000	-	4.52
92.0000	-	4.54
94.0000	-	4.22
96.0000	-	4.41
98.0000	-	4.37
100.000	-	4.52
105.000	-	4.45
110.000	-	4.34
115.000	-	4.25
120.000	-	4.44

END

Table D-11

Hermit Data Logger Readings

Step drawdown test from 4 to 6 hours.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:13

Unit# 00884 Test# 2

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/17 10:43

Elapsed Time	Value
0.0000	- 0.20
0.0033	- 0.21
0.0066	- 0.22
0.0099	- 0.22
0.0133	- 0.22
0.0166	- 0.22
0.0200	- 0.22
0.0233	- 0.22
0.0266	- 0.22
0.0300	- 0.22
0.0333	- 0.22
0.0500	- 0.22
0.0666	- 0.22
0.0833	- 0.22
0.1000	- 0.22
0.1166	- 0.22
0.1333	- 0.22
0.1500	- 0.22
0.1666	- 0.22
0.1833	- 0.23
0.2000	- 0.22
0.2166	- 0.23
0.2333	- 0.23
0.2500	- 0.23
0.2666	- 0.23
0.2833	- 0.23
0.3000	- 0.23
0.3166	- 0.23
0.3333	- 0.23
0.4167	- 0.23
0.5000	- 0.23
0.5833	- 0.23
0.6667	- 0.23
0.7500	- 0.23
0.8333	- 0.23
0.9167	- 0.23
1.0000	- 0.23
1.0833	- 0.23
1.1667	- 0.23
1.2500	- 0.23
1.3333	- 0.23
1.4166	- 0.23
1.5000	- 0.23
1.5833	- 0.23
1.6667	- 0.23
1.7500	- 0.23
1.8333	- 0.23
1.9167	- 0.23
2.0000	- 0.23
2.5000	- 0.23
3.0000	- 0.23
3.5000	- 0.23
4.0000	- 0.23
4.5000	- 0.23
5.0000	- 0.23
5.5000	- 0.23
6.0000	- 0.23
6.5000	- 0.23
7.0000	- 0.23
7.5000	- 0.24
8.0000	- 0.24
8.5000	- 0.24
9.0000	- 0.24
9.5000	- 0.24
10.0000	- 0.24
12.0000	- 0.23
14.0000	- 0.23

Elapsed Time		Value
16.0000	-	0.23
18.0000	-	0.23
20.0000	-	0.23
22.0000	-	0.23
24.0000	-	0.23
26.0000	-	0.23
28.0000	-	0.25
30.0000	-	0.23
32.0000	-	0.23
34.0000	-	0.23
36.0000	-	0.23
38.0000	-	0.24
40.0000	-	0.23
42.0000	-	0.24
44.0000	-	0.24
46.0000	-	0.24
48.0000	-	0.24
50.0000	-	0.24
52.0000	-	0.25
54.0000	-	0.25
56.0000	-	0.25
58.0000	-	0.25
60.0000	-	0.25
62.0000	-	0.25
64.0000	-	0.25
66.0000	-	0.25
68.0000	-	0.25
70.0000	-	0.26
72.0000	-	0.25
74.0000	-	0.25
76.0000	-	0.25
78.0000	-	0.25
80.0000	-	0.25
82.0000	-	0.25
84.0000	-	0.25
86.0000	-	0.25
88.0000	-	0.25
90.0000	-	0.25
92.0000	-	0.25
94.0000	-	0.25
96.0000	-	0.25
98.0000	-	0.25
100.000	-	0.25
105.000	-	0.23
110.000	-	0.23
115.000	-	0.23
120.000	-	0.24

END

Table D-12

Hermit Data Logger Readings

Step drawdown test from 4 to 6 hours.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:16

Unit# 00884 Test# 2

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.94
Offset	0.00

Step# 0 09/17 10:43

Elapsed Time	Value
0.0000	- 0.15
0.0033	- 0.16
0.0066	- 0.16
0.0099	- 0.16
0.0133	- 0.16
0.0166	- 0.16
0.0200	- 0.16
0.0233	- 0.16
0.0266	- 0.16
0.0300	- 0.16
0.0333	- 0.16
0.0500	- 0.16
0.0666	- 0.16
0.0833	- 0.16
0.1000	- 0.16
0.1166	- 0.16
0.1333	- 0.15
0.1500	- 0.15
0.1666	- 0.15
0.1833	- 0.15
0.2000	- 0.15
0.2166	- 0.15
0.2333	- 0.15
0.2500	- 0.15
0.2666	- 0.15
0.2833	- 0.15
0.3000	- 0.15
0.3166	- 0.14
0.3333	- 0.14
0.4167	- 0.13
0.5000	- 0.13
0.5833	- 0.13
0.6667	- 0.14
0.7500	- 0.14
0.8333	- 0.15
0.9167	- 0.15
1.0000	- 0.15
1.0833	- 0.15
1.1667	- 0.14
1.2500	- 0.14
1.3333	- 0.15
1.4166	- 0.14
1.5000	- 0.13
1.5833	- 0.13
1.6667	- 0.12
1.7500	- 0.11
1.8333	- 0.11
1.9167	- 0.11
2.0000	- 0.11
2.5000	- 0.13
3.0000	- 0.15
3.5000	- 0.13
4.0000	- 0.15
4.5000	- 0.15
5.0000	- 0.15
5.5000	- 0.15
6.0000	- 0.15
6.5000	- 0.15
7.0000	- 0.15
7.5000	- 0.15
8.0000	- 0.15
8.5000	- 0.15
9.0000	- 0.16
9.5000	- 0.16
10.0000	- 0.16
12.0000	- 0.09
14.0000	- 0.15

Elapsed Time		Value
16.0000	-	0.08
18.0000	-	0.10
20.0000	-	0.08
22.0000	-	0.10
24.0000	-	0.13
26.0000	-	0.15
28.0000	-	0.13
30.0000	-	0.09
32.0000	-	0.10
34.0000	-	0.10
36.0000	-	0.15
38.0000	-	0.15
40.0000	-	0.10
42.0000	-	0.11
44.0000	-	0.13
46.0000	-	0.13
48.0000	-	0.13
50.0000	-	0.12
52.0000	-	0.12
54.0000	-	0.13
56.0000	-	0.12
58.0000	-	0.13
60.0000	-	0.12
62.0000	-	0.12
64.0000	-	0.11
66.0000	-	0.12
68.0000	-	0.12
70.0000	-	0.12
72.0000	-	0.11
74.0000	-	0.11
76.0000	-	0.13
78.0000	-	0.11
80.0000	-	0.11
82.0000	-	0.13
84.0000	-	0.13
86.0000	-	0.11
88.0000	-	0.10
90.0000	-	0.11
92.0000	-	0.10
94.0000	-	0.11
96.0000	-	0.10
98.0000	-	0.12
100.000	-	0.11
105.000	-	0.11
110.000	-	0.11
115.000	-	0.11
120.000	-	0.10

END

Table D-13

Hermit Data Logger Readings

Step drawdown test recovery.

Pumping Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:44

Unit# 00583 Test# 3

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 12:46

Elapsed Time	Value
0.0000	- 3.11
0.0033	- 3.13
0.0066	- 2.95
0.0099	- 2.78
0.0133	- 3.12
0.0166	- 2.67
0.0200	- 2.47
0.0233	- 2.32
0.0266	- 2.10
0.0300	- 1.95
0.0333	- 1.73
0.0500	- 0.94
0.0666	- 0.47
0.0833	- 0.19
0.1000	- 0.06
0.1166	- 0.03
0.1333	- 0.05
0.1500	- 0.08
0.1666	- 0.10
0.1833	- 0.11
0.2000	- 0.12
0.2166	- 0.11
0.2333	- 0.11
0.2500	- 0.10
0.2666	- 0.10
0.2833	- 0.09
0.3000	- 0.09
0.3166	- 0.08
0.3333	- 0.08
0.4167	- 0.07
0.5000	- 0.06
0.5833	- 0.06
0.6667	- 0.06
0.7500	- 0.06
0.8333	- 0.05
0.9167	- 0.05
1.0000	- 0.05
1.0833	- 0.05
1.1667	- 0.05
1.2500	- 0.05
1.3333	- 0.05
1.4166	- 0.05
1.5000	- 0.05
1.5833	- 0.05
1.6667	- 0.05
1.7500	- 0.05
1.8333	- 0.05
1.9167	- 0.05
2.0000	- 0.05
2.5000	- 0.05
3.0000	- 0.05
3.5000	- 0.05
4.0000	- 0.04
4.5000	- 0.04
5.0000	- 0.04
5.5000	- 0.04
6.0000	- 0.04
6.5000	- 0.03
7.0000	- 0.04
7.5000	- 0.03
8.0000	- 0.04
8.5000	- 0.03
9.0000	- 0.03
9.5000	- 0.03
10.0000	- 0.03
12.0000	- 0.03
14.0000	- 0.03
16.0000	- 0.03
18.0000	- 0.03
20.0000	- 0.02

Elapsed Time	Value
22.0000	- 0.02
24.0000	- 0.03
26.0000	- 0.02
28.0000	- 0.02
30.0000	- 0.02
32.0000	- 0.01
34.0000	- 0.01
36.0000	- 0.01
38.0000	- 0.01
40.0000	- 0.01
42.0000	- 0.01
44.0000	- 0.00
46.0000	- 0.00
48.0000	- 0.00
50.0000	- 0.00
52.0000	- 0.00
54.0000	0.00
56.0000	0.00
58.0000	0.00
60.0000	0.00
62.0000	0.00
64.0000	0.00
66.0000	0.00
68.0000	0.00
70.0000	0.00
72.0000	0.00
74.0000	0.00
76.0000	0.00
78.0000	0.00
80.0000	0.00
82.0000	0.00
84.0000	0.00
86.0000	0.00
88.0000	0.00
90.0000	0.00
92.0000	0.01
94.0000	0.01
96.0000	0.01
98.0000	0.01
100.000	0.01
105.000	0.01
110.000	0.01
115.000	0.01
120.000	0.02
125.000	0.02
130.000	0.02
135.000	0.02
140.000	0.02
145.000	0.03

END

Table D-14

Hermit Data Logger Readings

Step drawdown test recovery.

Pumping Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/17 17:46

Unit# 00583 Test# 3

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/17 12:46

Elapsed Time	Value
0.0000	- 3.11
0.0033	- 3.13
0.0066	- 2.95
0.0099	- 2.78
0.0133	- 3.12
0.0166	- 2.67
0.0200	- 2.47
0.0233	- 2.32
0.0266	- 2.10
0.0300	- 1.95
0.0333	- 1.73
0.0500	- 0.94
0.0666	- 0.47
0.0833	- 0.19
0.1000	- 0.06
0.1166	- 0.03
0.1333	- 0.05
0.1500	- 0.08
0.1666	- 0.10
0.1833	- 0.11
0.2000	- 0.12
0.2166	- 0.11
0.2333	- 0.11
0.2500	- 0.10
0.2666	- 0.10
0.2833	- 0.09
0.3000	- 0.09
0.3166	- 0.08
0.3333	- 0.08
0.4167	- 0.07
0.5000	- 0.06
0.5833	- 0.06
0.6667	- 0.06
0.7500	- 0.06
0.8333	- 0.05
0.9167	- 0.05
1.0000	- 0.05
1.0833	- 0.05
1.1667	- 0.05
1.2500	- 0.05
1.3333	- 0.05
1.4166	- 0.05
1.5000	- 0.05
1.5833	- 0.05
1.6667	- 0.05
1.7500	- 0.05
1.8333	- 0.05
1.9167	- 0.05
2.0000	- 0.05
2.5000	- 0.05
3.0000	- 0.05
3.5000	- 0.05
4.0000	- 0.04
4.5000	- 0.04
5.0000	- 0.04
5.5000	- 0.04
6.0000	- 0.04
6.5000	- 0.03
7.0000	- 0.04
7.5000	- 0.03
8.0000	- 0.04
8.5000	- 0.03
9.0000	- 0.03
9.5000	- 0.03
10.0000	- 0.03
12.0000	- 0.03
14.0000	- 0.03

Elapsed Time	Value
16.0000	- 0.03
18.0000	- 0.03
20.0000	- 0.02
22.0000	- 0.02
24.0000	- 0.03
26.0000	- 0.02
28.0000	- 0.02
30.0000	- 0.02
32.0000	- 0.01
34.0000	- 0.01
36.0000	- 0.01
38.0000	- 0.01
40.0000	- 0.01
42.0000	- 0.01
44.0000	- 0.00
46.0000	- 0.00
48.0000	- 0.00
50.0000	- 0.00
52.0000	- 0.00
54.0000	0.00
56.0000	0.00
58.0000	0.00
60.0000	0.00
62.0000	0.00
64.0000	0.00
66.0000	0.00
68.0000	0.00
70.0000	0.00
72.0000	0.00
74.0000	0.00
76.0000	0.00
78.0000	0.00
80.0000	0.00
82.0000	0.00
84.0000	0.00
86.0000	0.00
88.0000	0.00
90.0000	0.00
92.0000	0.01
94.0000	0.01
96.0000	0.01
98.0000	0.01
100.000	0.01
105.000	0.01
110.000	0.01
115.000	0.01
120.000	0.02
125.000	0.02
130.000	0.02
135.000	0.02
140.000	0.02
145.000	0.03

END

Table D-15

Hermit Data Logger Readings

Step drawdown test recovery.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:19

Unit# 00884 Test# 3

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/17 12:46

Elapsed Time	Value
0.0000	- 0.23
0.0033	- 0.23
0.0066	- 0.23
0.0099	- 0.23
0.0133	- 0.23
0.0166	- 0.23
0.0200	- 0.24
0.0233	- 0.23
0.0266	- 0.23
0.0300	- 0.23
0.0333	- 0.24
0.0500	- 0.23
0.0666	- 0.23
0.0833	- 0.23
0.1000	- 0.23
0.1166	- 0.23
0.1333	- 0.23
0.1500	- 0.23
0.1666	- 0.23
0.1833	- 0.23
0.2000	- 0.23
0.2166	- 0.23
0.2333	- 0.23
0.2500	- 0.23
0.2666	- 0.23
0.2833	- 0.22
0.3000	- 0.23
0.3166	- 0.22
0.3333	- 0.22
0.4167	- 0.22
0.5000	- 0.22
0.5833	- 0.22
0.6667	- 0.22
0.7500	- 0.22
0.8333	- 0.22
0.9167	- 0.22
1.0000	- 0.22
1.0833	- 0.22
1.1667	- 0.22
1.2500	- 0.22
1.3333	- 0.22
1.4166	- 0.22
1.5000	- 0.22
1.5833	- 0.22
1.6667	- 0.22
1.7500	- 0.22
1.8333	- 0.22
1.9167	- 0.22
2.0000	- 0.22
2.5000	- 0.21
3.0000	- 0.21
3.5000	- 0.21
4.0000	- 0.20
4.5000	- 0.20
5.0000	- 0.20
5.5000	- 0.20
6.0000	- 0.20
6.5000	- 0.20
7.0000	- 0.20
7.5000	- 0.20
8.0000	- 0.20
8.5000	- 0.20
9.0000	- 0.20
9.5000	- 0.20
10.0000	- 0.20
12.0000	- 0.18
14.0000	- 0.18
16.0000	- 0.18
18.0000	- 0.18

Elapsed Time		Value
20.0000	-	0.18
22.0000	-	0.17
24.0000	-	0.17
26.0000	-	0.17
28.0000	-	0.17
30.0000	-	0.17
32.0000	-	0.17
34.0000	-	0.16
36.0000	-	0.16
38.0000	-	0.15
40.0000	-	0.15
42.0000	-	0.15
44.0000	-	0.15
46.0000	-	0.14
48.0000	-	0.15
50.0000	-	0.14
52.0000	-	0.14
54.0000	-	0.14
56.0000	-	0.14
58.0000	-	0.14
60.0000	-	0.13
62.0000	-	0.13
64.0000	-	0.13
66.0000	-	0.13
68.0000	-	0.13
70.0000	-	0.13
72.0000	-	0.13
74.0000	-	0.13
76.0000	-	0.13
78.0000	-	0.13
80.0000	-	0.13
82.0000	-	0.13
84.0000	-	0.13
86.0000	-	0.13
88.0000	-	0.13
90.0000	-	0.13
92.0000	-	0.13
94.0000	-	0.13
96.0000	-	0.13
98.0000	-	0.12
100.000	-	0.12
105.000	-	0.11
110.000	-	0.11
115.000	-	0.11
120.000	-	0.11
125.000	-	0.10
130.000	-	0.10
135.000	-	0.10
140.000	-	0.11
145.000	-	0.11

END

Table D-16

Hermit Data Logger Readings

Step drawdown test recovery.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/17 17:23

Unit# 00884 Test# 3

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.94
Offset	0.00

Step# 0 09/17 12:46

Elapsed Time	Value
0.0000	- 0.11
0.0033	- 0.11
0.0066	- 0.11
0.0099	- 0.11
0.0133	- 0.11
0.0166	- 0.11
0.0200	- 0.11
0.0233	- 0.11
0.0266	- 0.11
0.0300	- 0.11
0.0333	- 0.11
0.0500	- 0.11
0.0666	- 0.11
0.0833	- 0.11
0.1000	- 0.11
0.1166	- 0.11
0.1333	- 0.11
0.1500	- 0.11
0.1666	- 0.11
0.1833	- 0.11
0.2000	- 0.11
0.2166	- 0.10
0.2333	- 0.10
0.2500	- 0.10
0.2666	- 0.10
0.2833	- 0.10
0.3000	- 0.10
0.3166	- 0.10
0.3333	- 0.10
0.4167	- 0.10
0.5000	- 0.10
0.5833	- 0.10
0.6667	- 0.10
0.7500	- 0.10
0.8333	- 0.10
0.9167	- 0.10
1.0000	- 0.10
1.0833	- 0.10
1.1667	- 0.09
1.2500	- 0.09
1.3333	- 0.09
1.4166	- 0.09
1.5000	- 0.09
1.5833	- 0.09
1.6667	- 0.09
1.7500	- 0.09
1.8333	- 0.09
1.9167	- 0.09
2.0000	- 0.09
2.5000	- 0.09
3.0000	- 0.09
3.5000	- 0.09
4.0000	- 0.10
4.5000	- 0.09
5.0000	- 0.09
5.5000	- 0.08
6.0000	- 0.08
6.5000	- 0.08
7.0000	- 0.07
7.5000	- 0.08
8.0000	- 0.08
8.5000	- 0.09
9.0000	- 0.08
9.5000	- 0.08
10.0000	- 0.08
12.0000	- 0.08
14.0000	- 0.08
16.0000	- 0.07
18.0000	- 0.08

Elapsed Time		Value
20.0000	-	0.07
22.0000	-	0.08
24.0000	-	0.07
26.0000	-	0.07
28.0000	-	0.07
30.0000	-	0.06
32.0000	-	0.06
34.0000	-	0.06
36.0000	-	0.06
38.0000	-	0.05
40.0000	-	0.06
42.0000	-	0.05
44.0000	-	0.05
46.0000	-	0.06
48.0000	-	0.05
50.0000	-	0.04
52.0000	-	0.05
54.0000	-	0.03
56.0000	-	0.05
58.0000	-	0.05
60.0000	-	0.04
62.0000	-	0.04
64.0000	-	0.04
66.0000	-	0.05
68.0000	-	0.05
70.0000	-	0.04
72.0000	-	0.04
74.0000	-	0.03
76.0000	-	0.03
78.0000	-	0.05
80.0000	-	0.03
82.0000	-	0.04
84.0000	-	0.03
86.0000	-	0.02
88.0000	-	0.03
90.0000	-	0.03
92.0000	-	0.03
94.0000	-	0.03
96.0000	-	0.02
98.0000	-	0.01
100.000	-	0.02
105.000	-	0.02
110.000	-	0.02
115.000	-	0.02
120.000	-	0.02
125.000	-	0.01
130.000	-	0.02
135.000	-	0.01
140.000	-	0.03
145.000	-	0.01

END

Table D-17

Hermit Data Logger Readings

Pumping test, 72 hour duration.

Pumping Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:36

Unit# 00583 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/22 10:15

Elapsed Time	Value
0.0000	- 1.69
0.0033	- 1.42
0.0066	- 1.78
0.0099	- 1.49
0.0133	- 1.33
0.0166	- 1.34
0.0200	- 1.28
0.0233	- 1.19
0.0266	- 1.25
0.0300	- 1.48
0.0333	- 1.61
0.0500	- 2.60
0.0666	- 3.33
0.0833	- 3.91
0.1000	- 4.10
0.1166	- 4.46
0.1333	- 4.44
0.1500	- 4.25
0.1666	- 4.21
0.1833	- 4.46
0.2000	- 4.38
0.2166	- 4.53
0.2333	- 4.52
0.2500	- 4.34
0.2666	- 4.36
0.2833	- 4.29
0.3000	- 4.36

Elapsed Time	Value
0.3166	- 4.52
0.3333	- 4.51
0.4167	- 4.54
0.5000	- 4.28
0.5833	- 3.91
0.6667	- 4.38
0.7500	- 4.24
0.8333	- 4.40
0.9167	- 4.51
1.0000	- 4.51
1.0833	- 4.34
1.1667	- 4.25
1.2500	- 4.21
1.3333	- 4.55
1.4166	- 4.02
1.5000	- 4.40
1.5833	- 4.43
1.6667	- 4.32
1.7500	- 4.41
1.8333	- 4.35
1.9167	- 4.57
2.0000	- 4.52
2.5000	- 4.46
3.0000	- 4.23
3.5000	- 4.50
4.0000	- 4.34
4.5000	- 4.21
5.0000	- 4.45
5.5000	- 4.62
6.0000	- 4.34
6.5000	- 4.21
7.0000	- 4.56
7.5000	- 4.27
8.0000	- 4.24
8.5000	- 4.44
9.0000	- 4.58
9.5000	- 4.42
10.0000	- 4.53
12.0000	- 4.29
14.0000	- 4.58
16.0000	- 4.22
18.0000	- 4.32

Elapsed Time	Value
20.0000	- 4.52
22.0000	- 4.32
24.0000	- 4.19
26.0000	- 4.35
28.0000	- 4.45
30.0000	- 4.62
32.0000	- 4.55
34.0000	- 4.64
36.0000	- 4.50
38.0000	- 4.49
40.0000	- 4.19
42.0000	- 4.50
44.0000	- 4.43
46.0000	- 4.36
48.0000	- 4.66
50.0000	- 4.60
52.0000	- 4.37
54.0000	- 4.57
56.0000	- 4.52
58.0000	- 4.57
60.0000	- 4.43
62.0000	- 4.58
64.0000	- 4.69
66.0000	- 4.50
68.0000	- 4.62
70.0000	- 4.24
72.0000	- 4.50
74.0000	- 4.58
76.0000	- 4.80
78.0000	- 4.40
80.0000	- 4.76
82.0000	- 4.62
84.0000	- 4.48
86.0000	- 4.41
88.0000	- 4.36
90.0000	- 4.74
92.0000	- 4.63
94.0000	- 4.35
96.0000	- 4.67
98.0000	- 4.54
100.000	- 4.33
110.000	- 4.44
120.000	- 4.38
130.000	- 4.43
140.000	- 4.50
150.000	- 4.29
160.000	- 4.37
170.000	- 4.62
180.000	- 4.26

Elapsed Time	Value
190.000	- 4.28
200.000	- 4.18
210.000	- 4.47
220.000	- 4.57
230.000	- 4.50
240.000	- 4.57
250.000	- 4.41
260.000	- 4.58
270.000	- 4.19
280.000	- 4.36
290.000	- 4.43
300.000	- 4.46
310.000	- 4.38
320.000	- 4.49
330.000	- 4.24
340.000	- 4.12
350.000	- 4.42
360.000	- 4.25
370.000	- 4.33
380.000	- 4.52
390.000	- 4.38
400.000	- 4.58
410.000	- 4.34
420.000	- 4.51
430.000	- 4.41
440.000	- 4.49
450.000	- 4.35
460.000	- 4.48
470.000	- 4.50
480.000	- 4.60
490.000	- 4.31
500.000	- 4.38
510.000	- 4.45
520.000	- 4.33
530.000	- 4.10
540.000	- 4.38
550.000	- 4.38
560.000	- 4.59
570.000	- 4.47
580.000	- 4.78
590.000	- 4.33
600.000	- 4.38
610.000	- 4.49
620.000	- 4.33
630.000	- 4.39
640.000	- 4.52
650.000	- 4.38
660.000	- 4.58
670.000	- 4.55

Elapsed Time	Value
680.000	- 4.61
690.000	- 4.53
700.000	- 4.48
710.000	- 4.45
720.000	- 4.28
730.000	- 4.46
740.000	- 4.41
750.000	- 4.67
760.000	- 4.43
770.000	- 4.42
780.000	- 4.53
790.000	- 4.58
800.000	- 4.38
810.000	- 4.46
820.000	- 4.55
830.000	- 4.26
840.000	- 4.64
850.000	- 4.43
860.000	- 4.53
870.000	- 4.53
880.000	- 4.47
890.000	- 4.40
900.000	- 4.39
910.000	- 4.43
920.000	- 4.46
930.000	- 4.29
940.000	- 4.30
950.000	- 4.26
960.000	- 4.47
970.000	- 4.38
980.000	- 4.44
990.000	- 4.37
1000.00	- 4.41
1015.00	- 4.39
1030.00	- 4.33
1045.00	- 4.51
1060.00	- 4.41
1075.00	- 4.53
1090.00	- 4.35
1105.00	- 4.53
1120.00	- 4.65
1135.00	- 4.40
1150.00	- 4.38
1165.00	- 4.24
1180.00	- 4.32
1195.00	- 4.85
1210.00	- 4.61
1225.00	- 4.43
1240.00	- 4.43

Elapsed Time	Value
1255.00	- 4.55
1270.00	- 4.58
1285.00	- 4.58
1300.00	- 4.69
1315.00	- 4.79
1330.00	- 4.59
1345.00	- 4.72
1360.00	- 4.53
1375.00	- 4.52
1390.00	- 4.67
1405.00	- 4.59
1420.00	- 4.74
1435.00	- 4.64
1450.00	- 4.65
1465.00	- 4.52
1480.00	- 4.51
1495.00	- 4.64
1510.00	- 4.64
1525.00	- 4.50
1540.00	- 4.92
1555.00	- 4.56
1570.00	- 4.53
1585.00	- 4.64
1600.00	- 4.58
1615.00	- 4.55
1630.00	- 4.58
1645.00	- 4.57
1660.00	- 4.67
1675.00	- 4.56
1690.00	- 4.59
1705.00	- 4.58
1720.00	- 4.45
1735.00	- 4.51
1750.00	- 4.58
1765.00	- 4.72
1780.00	- 4.69
1795.00	- 4.69
1810.00	- 4.70
1825.00	- 4.43
1840.00	- 4.56
1855.00	- 4.65
1870.00	- 4.56
1885.00	- 4.57
1900.00	- 4.56
1915.00	- 4.74
1930.00	- 4.58
1945.00	- 4.49
1960.00	- 4.58
1975.00	- 4.54

Elapsed Time	Value
1990.00	- 4.55
2005.00	- 4.44
2020.00	- 4.41
2035.00	- 4.61
2050.00	- 4.43
2065.00	- 4.71
2080.00	- 4.47
2095.00	- 4.53
2110.00	- 4.48
2125.00	- 4.62
2140.00	- 4.55
2155.00	- 4.75
2170.00	- 4.64
2185.00	- 4.54
2200.00	- 4.62
2215.00	- 4.67
2230.00	- 4.60
2245.00	- 4.73
2260.00	- 4.67
2275.00	- 4.76
2290.00	- 4.68
2305.00	- 4.66
2320.00	- 4.77
2335.00	- 4.79
2350.00	- 4.82
2365.00	- 4.70
2380.00	- 4.48
2395.00	- 4.50
2410.00	- 4.62
2425.00	- 4.73
2440.00	- 4.80
2455.00	- 4.72
2470.00	- 4.60
2485.00	- 4.79
2500.00	- 4.85
2515.00	- 4.60
2530.00	- 4.79
2545.00	- 4.69
2560.00	- 4.57
2575.00	- 4.65
2590.00	- 4.57
2605.00	- 4.53
2620.00	- 4.65
2635.00	- 4.75
2650.00	- 4.75
2665.00	- 4.57
2680.00	- 4.58
2695.00	- 4.62
2710.00	- 4.52

Elapsed Time	Value
2725.00	- 4.75
2740.00	- 4.50
2755.00	- 4.48
2770.00	- 4.64
2785.00	- 4.65
2800.00	- 4.75
2815.00	- 4.70
2830.00	- 4.88
2845.00	- 4.65
2860.00	- 4.48
2875.00	- 4.55
2890.00	- 4.69
2905.00	- 4.43
2920.00	- 4.58
2935.00	- 4.36
2950.00	- 4.41
2965.00	- 4.43
2980.00	- 4.68
2995.00	- 4.54
3010.00	- 4.28
3025.00	- 4.65
3040.00	- 4.31
3055.00	- 4.40
3070.00	- 4.46
3085.00	- 4.50
3100.00	- 4.50
3115.00	- 4.63
3130.00	- 4.33
3145.00	- 4.25
3160.00	- 4.40
3175.00	- 4.35
3190.00	- 4.39
3205.00	- 4.37
3220.00	- 4.53
3235.00	- 4.41
3250.00	- 4.41
3265.00	- 4.29
3280.00	- 4.37
3295.00	- 4.41
3310.00	- 4.37
3325.00	- 4.37
3340.00	- 4.32
3355.00	- 4.45
3370.00	- 4.33
3385.00	- 4.32
3400.00	- 4.29
3415.00	- 4.39
3430.00	- 4.50
3445.00	- 4.40

Elapsed Time	Value
3460.00	- 4.33
3475.00	- 4.36
3490.00	- 4.40
3505.00	- 4.26
3520.00	- 4.35
3535.00	- 4.53
3550.00	- 4.50
3565.00	- 4.59
3580.00	- 4.50
3595.00	- 4.40
3610.00	- 4.34
3625.00	- 4.40
3640.00	- 4.40
3655.00	- 4.30
3670.00	- 4.48
3685.00	- 4.40
3700.00	- 4.52
3715.00	- 4.31
3730.00	- 4.38
3745.00	- 4.48
3760.00	- 4.38
3775.00	- 4.73
3790.00	- 4.48
3805.00	- 4.74
3820.00	- 4.58
3835.00	- 4.55
3850.00	- 4.53
3865.00	- 4.18
3880.00	- 4.54
3895.00	- 4.63
3910.00	- 4.47
3925.00	- 4.38
3940.00	- 4.33
3955.00	- 4.52
3970.00	- 4.40
3985.00	- 4.38
4000.00	- 4.48
4015.00	- 4.45
4030.00	- 4.31
4045.00	- 4.48
4060.00	- 4.46
4075.00	- 4.24
4090.00	- 4.22
4105.00	- 4.38
4120.00	- 4.55
4135.00	- 4.39
4150.00	- 4.38
4165.00	- 4.25
4180.00	- 4.45

Elapsed Time	Value
4195.00	- 4.57
4210.00	- 4.43
4225.00	- 4.50
4240.00	- 4.64
4255.00	- 4.60
4270.00	- 4.34
4285.00	- 4.41
4300.00	- 4.48
4315.00	- 4.46
4330.00	- 4.35

END

Table D-18

Hermit Data Logger Readings

Pumping test, 72 hour duration.

Pumping Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/30 13:43

Unit# 00583 Test# 0

INPUT 2: Level (F)

Reference	0.00
Scale factor	49.79
Offset	0.12

Step# 0 09/22 10:15

Elapsed Time		Value
0.0000	-	2.93
0.0033	-	1.98
0.0066	-	2.10
0.0099	-	1.79
0.0133	-	1.38
0.0166	-	1.44
0.0200	-	1.46
0.0233	-	1.43
0.0266	-	1.36
0.0300	-	1.54
0.0333	-	1.76
0.0500	-	2.53
0.0666	-	2.89
0.0833	-	3.86
0.1000	-	4.14
0.1166	-	4.24
0.1333	-	4.13
0.1500	-	4.30
0.1666	-	4.29
0.1833	-	4.22
0.2000	-	4.40
0.2166	-	4.41
0.2333	-	4.33
0.2500	-	4.16
0.2666	-	4.52
0.2833	-	4.41
0.3000	-	4.33

Elapsed Time		Value
0.3166	-	4.51
0.3333	-	4.33
0.4167	-	4.43
0.5000	-	4.54
0.5833	-	4.08
0.6667	-	4.55
0.7500	-	4.40
0.8333	-	4.30
0.9167	-	4.40
1.0000	-	4.47
1.0833	-	4.27
1.1667	-	4.21
1.2500	-	4.29
1.3333	-	4.46
1.4166	-	4.40
1.5000	-	4.27
1.5833	-	4.49
1.6667	-	4.16
1.7500	-	4.51
1.8333	-	4.29
1.9167	-	4.38
2.0000	-	4.46
2.5000	-	4.44
3.0000	-	4.43
3.5000	-	4.32
4.0000	-	4.41
4.5000	-	4.36
5.0000	-	4.36
5.5000	-	4.46
6.0000	-	4.40
6.5000	-	4.11
7.0000	-	4.52
7.5000	-	4.35
8.0000	-	4.33
8.5000	-	4.30
9.0000	-	4.57
9.5000	-	4.49
10.0000	-	4.51
12.0000	-	4.52
14.0000	-	4.62
16.0000	-	4.58
18.0000	-	4.46

Elapsed Time	Value	Elapsed Time	Value
20.0000	- 4.40	190.000	- 4.32
22.0000	- 4.32	200.000	- 4.55
24.0000	- 4.35	210.000	- 4.40
26.0000	- 4.57	220.000	- 4.24
28.0000	- 4.36	230.000	- 4.44
30.0000	- 4.36	240.000	- 4.46
32.0000	- 4.41	250.000	- 4.36
34.0000	- 4.49	260.000	- 4.54
36.0000	- 4.46	270.000	- 4.41
38.0000	- 4.41	280.000	- 4.33
40.0000	- 4.33	290.000	- 4.25
42.0000	- 4.54	300.000	- 4.32
44.0000	- 4.35	310.000	- 4.41
46.0000	- 4.46	320.000	- 4.43
48.0000	- 4.60	330.000	- 4.30
50.0000	- 4.47	340.000	- 4.41
52.0000	- 4.49	350.000	- 4.36
54.0000	- 4.44	360.000	- 4.52
56.0000	- 4.46	370.000	- 4.38
58.0000	- 4.52	380.000	- 4.43
60.0000	- 4.38	390.000	- 4.40
62.0000	- 4.47	400.000	- 4.36
64.0000	- 4.55	410.000	- 4.57
66.0000	- 4.46	420.000	- 4.32
68.0000	- 4.63	430.000	- 4.30
70.0000	- 4.43	440.000	- 4.32
72.0000	- 4.33	450.000	- 4.44
74.0000	- 4.57	460.000	- 4.47
76.0000	- 4.49	470.000	- 4.43
78.0000	- 4.55	480.000	- 4.46
80.0000	- 4.46	490.000	- 4.30
82.0000	- 4.38	500.000	- 4.46
84.0000	- 4.46	510.000	- 4.38
86.0000	- 4.54	520.000	- 4.27
88.0000	- 4.25	530.000	- 4.51
90.0000	- 4.40	540.000	- 4.49
92.0000	- 4.46	550.000	- 4.29
94.0000	- 4.47	560.000	- 4.38
96.0000	- 4.43	570.000	- 4.29
98.0000	- 4.35	580.000	- 4.44
100.000	- 4.32	590.000	- 4.44
110.000	- 4.33	600.000	- 4.54
120.000	- 4.51	610.000	- 4.35
130.000	- 4.47	620.000	- 4.29
140.000	- 4.51	630.000	- 4.38
150.000	- 4.36	640.000	- 4.27
160.000	- 4.38	650.000	- 4.43
170.000	- 4.63	660.000	- 4.40
180.000	- 4.43	670.000	- 4.52

Elapsed Time	Value
680.000	- 4.33
690.000	- 4.36
700.000	- 4.44
710.000	- 4.52
720.000	- 4.43
730.000	- 4.33
740.000	- 4.57
750.000	- 4.55
760.000	- 4.52
770.000	- 4.46
780.000	- 4.49
790.000	- 4.44
800.000	- 4.49
810.000	- 4.43
820.000	- 4.49
830.000	- 4.46
840.000	- 4.49
850.000	- 4.38
860.000	- 4.11
870.000	- 4.51
880.000	- 4.69
890.000	- 4.30
900.000	- 4.33
910.000	- 4.43
920.000	- 4.44
930.000	- 4.55
940.000	- 4.55
950.000	- 4.36
960.000	- 4.55
970.000	- 4.14
980.000	- 4.55
990.000	- 4.18
1000.00	- 4.49
1015.00	- 4.24
1030.00	- 4.47
1045.00	- 4.49
1060.00	- 4.41
1075.00	- 4.43
1090.00	- 4.40
1105.00	- 4.51
1120.00	- 4.16
1135.00	- 4.25
1150.00	- 4.52
1165.00	- 4.21
1180.00	- 4.35
1195.00	- 4.55
1210.00	- 4.29
1225.00	- 4.63
1240.00	- 4.32

Elapsed Time	Value
1255.00	- 4.47
1270.00	- 4.52
1285.00	- 4.47
1300.00	- 4.76
1315.00	- 4.69
1330.00	- 4.44
1345.00	- 4.41
1360.00	- 4.74
1375.00	- 4.69
1390.00	- 4.47
1405.00	- 4.58
1420.00	- 4.71
1435.00	- 4.71
1450.00	- 4.44
1465.00	- 4.68
1480.00	- 4.63
1495.00	- 4.73
1510.00	- 4.58
1525.00	- 4.65
1540.00	- 4.49
1555.00	- 4.65
1570.00	- 4.71
1585.00	- 4.55
1600.00	- 4.51
1615.00	- 4.52
1630.00	- 4.58
1645.00	- 4.55
1660.00	- 4.47
1675.00	- 4.54
1690.00	- 4.47
1705.00	- 4.49
1720.00	- 4.57
1735.00	- 4.73
1750.00	- 4.51
1765.00	- 4.32
1780.00	- 4.51
1795.00	- 4.52
1810.00	- 4.71
1825.00	- 4.62
1840.00	- 4.52
1855.00	- 4.57
1870.00	- 4.24
1885.00	- 4.44
1900.00	- 4.49
1915.00	- 4.79
1930.00	- 4.43
1945.00	- 4.52
1960.00	- 4.30
1975.00	- 4.74

Elapsed Time	Value
1990.00	- 4.57
2005.00	- 4.41
2020.00	- 4.44
2035.00	- 4.49
2050.00	- 4.36
2065.00	- 4.49
2080.00	- 4.76
2095.00	- 4.66
2110.00	- 4.74
2125.00	- 4.77
2140.00	- 4.47
2155.00	- 4.57
2170.00	- 4.60
2185.00	- 4.65
2200.00	- 4.51
2215.00	- 4.47
2230.00	- 4.40
2245.00	- 4.46
2260.00	- 4.49
2275.00	- 4.46
2290.00	- 4.46
2305.00	- 4.51
2320.00	- 4.38
2335.00	- 4.87
2350.00	- 4.58
2365.00	- 4.47
2380.00	- 4.65
2395.00	- 4.44
2410.00	- 4.35
2425.00	- 4.47
2440.00	- 4.54
2455.00	- 4.47
2470.00	- 4.41
2485.00	- 4.49
2500.00	- 4.49
2515.00	- 4.54
2530.00	- 4.33
2545.00	- 4.41
2560.00	- 4.47
2575.00	- 4.62
2590.00	- 4.43
2605.00	- 4.32
2620.00	- 4.58
2635.00	- 4.49
2650.00	- 4.52
2665.00	- 4.43
2680.00	- 4.41
2695.00	- 4.46
2710.00	- 4.46

Elapsed Time	Value
2725.00	- 4.44
2740.00	- 4.43
2755.00	- 4.36
2770.00	- 4.33
2785.00	- 4.51
2800.00	- 4.66
2815.00	- 4.46
2830.00	- 4.76
2845.00	- 4.54
2860.00	- 4.41
2875.00	- 4.49
2890.00	- 4.49
2905.00	- 4.43
2920.00	- 4.54
2935.00	- 4.35
2950.00	- 4.16
2965.00	- 4.44
2980.00	- 4.47
2995.00	- 4.52
3010.00	- 4.36
3025.00	- 4.51
3040.00	- 4.24
3055.00	- 4.43
3070.00	- 4.35
3085.00	- 4.27
3100.00	- 4.40
3115.00	- 4.35
3130.00	- 4.41
3145.00	- 4.24
3160.00	- 4.27
3175.00	- 4.14
3190.00	- 4.44
3205.00	- 4.41
3220.00	- 4.33
3235.00	- 4.05
3250.00	- 4.29
3265.00	- 4.16
3280.00	- 4.08
3295.00	- 4.24
3310.00	- 4.19
3325.00	- 4.29
3340.00	- 4.14
3355.00	- 4.22
3370.00	- 4.32
3385.00	- 4.19
3400.00	- 4.30
3415.00	- 4.41
3430.00	- 4.16
3445.00	- 4.25

Elapsed Time		Value
3460.00	-	4.08
3475.00	-	4.00
3490.00	-	4.21
3505.00	-	4.22
3520.00	-	4.30
3535.00	-	4.44
3550.00	-	4.14
3565.00	-	4.44
3580.00	-	4.35
3595.00	-	4.38
3610.00	-	4.32
3625.00	-	4.19
3640.00	-	4.35
3655.00	-	4.25
3670.00	-	4.19
3685.00	-	4.36
3700.00	-	4.43
3715.00	-	4.29
3730.00	-	4.40
3745.00	-	4.30
3760.00	-	4.21
3775.00	-	4.08
3790.00	-	4.19
3805.00	-	4.32
3820.00	-	4.29
3835.00	-	4.25
3850.00	-	4.32
3865.00	-	4.40
3880.00	-	4.21
3895.00	-	4.10
3910.00	-	4.35
3925.00	-	4.36
3940.00	-	4.29
3955.00	-	4.25
3970.00	-	4.46
3985.00	-	4.29
4000.00	-	4.14
4015.00	-	4.32
4030.00	-	4.40
4045.00	-	4.19
4060.00	-	4.36
4075.00	-	4.10
4090.00	-	4.32
4105.00	-	4.29
4120.00	-	3.92
4135.00	-	4.11
4150.00	-	4.18
4165.00	-	4.22
4180.00	-	4.16

Elapsed Time		Value
4195.00	-	4.16
4210.00	-	4.13
4225.00	-	4.30
4240.00	-	4.33
4255.00	-	4.18
4270.00	-	4.11
4285.00	-	4.21
4300.00	-	4.38
4315.00	-	4.35
4330.00	-	4.47

END

Table D-19

Hermit Data Logger Readings

Pumping test, 72 hour duration.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:04

Unit# 00884 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/22 10:15

Elapsed Time	Value
0.0000	0.01
0.0033	0.00
0.0066	- 0.00
0.0099	- 0.01
0.0133	- 0.01
0.0166	- 0.01
0.0200	- 0.01
0.0233	- 0.01
0.0266	- 0.01
0.0300	- 0.01
0.0333	- 0.01
0.0500	- 0.01
0.0666	- 0.01
0.0833	- 0.01
0.1000	- 0.01
0.1166	- 0.01
0.1333	- 0.01
0.1500	- 0.02
0.1666	- 0.01
0.1833	- 0.02
0.2000	- 0.02
0.2166	- 0.02
0.2333	- 0.02
0.2500	- 0.02
0.2666	- 0.02
0.2833	- 0.02
0.3000	- 0.02
0.3166	- 0.03
0.3333	- 0.03
0.4167	- 0.02
0.5000	- 0.02
0.5833	- 0.02
0.6667	- 0.02
0.7500	- 0.02
0.8333	- 0.02
0.9167	- 0.02
1.0000	- 0.02
1.0833	- 0.03
1.1667	- 0.03
1.2500	- 0.03
1.3333	- 0.03
1.4166	- 0.03
1.5000	- 0.03
1.5833	- 0.03
1.6667	- 0.03
1.7500	- 0.03
1.8333	- 0.03
1.9167	- 0.03
2.0000	- 0.03
2.5000	- 0.02
3.0000	- 0.03
3.5000	- 0.03
4.0000	- 0.03
4.5000	- 0.03
5.0000	- 0.03
5.5000	- 0.03
6.0000	- 0.03
6.5000	- 0.03
7.0000	- 0.03
7.5000	- 0.03
8.0000	- 0.03
8.5000	- 0.03
9.0000	- 0.03
9.5000	- 0.03
10.0000	- 0.03
12.0000	- 0.03
14.0000	- 0.04
16.0000	- 0.04
18.0000	- 0.04

Elapsed Time	Value
20.0000	- 0.04
22.0000	- 0.05
24.0000	- 0.05
26.0000	- 0.05
28.0000	- 0.05
30.0000	- 0.05
32.0000	- 0.05
34.0000	- 0.05
36.0000	- 0.06
38.0000	- 0.06
40.0000	- 0.06
42.0000	- 0.06
44.0000	- 0.06
46.0000	- 0.06
48.0000	- 0.06
50.0000	- 0.06
52.0000	- 0.06
54.0000	- 0.06
56.0000	- 0.06
58.0000	- 0.06
60.0000	- 0.06
62.0000	- 0.06
64.0000	- 0.06
66.0000	- 0.06
68.0000	- 0.06
70.0000	- 0.06
72.0000	- 0.06
74.0000	- 0.06
76.0000	- 0.06
78.0000	- 0.07
80.0000	- 0.07
82.0000	- 0.08
84.0000	- 0.08
86.0000	- 0.08
88.0000	- 0.08
90.0000	- 0.08
92.0000	- 0.08
94.0000	- 0.08
96.0000	- 0.08
98.0000	- 0.08
100.000	- 0.08
110.000	- 0.08
120.000	- 0.08
130.000	- 0.08
140.000	- 0.08
150.000	- 0.08
160.000	- 0.08
170.000	- 0.07
180.000	- 0.06

Elapsed Time	Value
190.000	- 0.06
200.000	- 0.06
210.000	- 0.05
220.000	- 0.05
230.000	- 0.04
240.000	- 0.05
250.000	- 0.03
260.000	- 0.02
270.000	- 0.01
280.000	- 0.01
290.000	- 0.01
300.000	- 0.01
310.000	- 0.01
320.000	- 0.01
330.000	- 0.01
340.000	- 0.01
350.000	- 0.01
360.000	- 0.01
370.000	- 0.01
380.000	- 0.01
390.000	- 0.02
400.000	- 0.01
410.000	- 0.01
420.000	- 0.01
430.000	- 0.00
440.000	- 0.00
450.000	- 0.00
460.000	- 0.00
470.000	- 0.01
480.000	- 0.01
490.000	- 0.01
500.000	- 0.01
510.000	- 0.00
520.000	0.00
530.000	0.00
540.000	0.00
550.000	0.00
560.000	0.00
570.000	0.00
580.000	0.00
590.000	0.00
600.000	0.00
610.000	0.00
620.000	0.00
630.000	- 0.00
640.000	- 0.00
650.000	- 0.01
660.000	- 0.02
670.000	- 0.03

Elapsed Time	Value
680.000	- 0.02
690.000	- 0.03
700.000	- 0.03
710.000	- 0.03
720.000	- 0.03
730.000	- 0.03
740.000	- 0.03
750.000	- 0.03
760.000	- 0.03
770.000	- 0.02
780.000	- 0.03
790.000	- 0.02
800.000	- 0.02
810.000	- 0.02
820.000	- 0.01
830.000	- 0.01
840.000	- 0.01
850.000	- 0.01
860.000	- 0.01
870.000	- 0.00
880.000	- 0.01
890.000	- 0.01
900.000	- 0.00
910.000	- 0.00
920.000	- 0.00
930.000	- 0.01
940.000	- 0.01
950.000	- 0.01
960.000	- 0.01
970.000	- 0.01
980.000	- 0.01
990.000	- 0.01
1000.00	- 0.01
1015.00	- 0.01
1030.00	- 0.00
1045.00	0.00
1060.00	0.00
1075.00	0.00
1090.00	0.00
1105.00	0.00
1120.00	- 0.01
1135.00	- 0.01
1150.00	- 0.02
1165.00	- 0.03
1180.00	- 0.03
1195.00	- 0.05
1210.00	- 0.06
1225.00	- 0.06
1240.00	- 0.08

Elapsed Time	Value
1255.00	- 0.08
1270.00	- 0.10
1285.00	- 0.11
1300.00	- 0.11
1315.00	- 0.12
1330.00	- 0.13
1345.00	- 0.13
1360.00	- 0.14
1375.00	- 0.15
1390.00	- 0.16
1405.00	- 0.16
1420.00	- 0.16
1435.00	- 0.17
1450.00	- 0.18
1465.00	- 0.19
1480.00	- 0.19
1495.00	- 0.20
1510.00	- 0.20
1525.00	- 0.20
1540.00	- 0.20
1555.00	- 0.20
1570.00	- 0.20
1585.00	- 0.20
1600.00	- 0.20
1615.00	- 0.19
1630.00	- 0.18
1645.00	- 0.18
1660.00	- 0.18
1675.00	- 0.17
1690.00	- 0.17
1705.00	- 0.16
1720.00	- 0.17
1735.00	- 0.16
1750.00	- 0.17
1765.00	- 0.16
1780.00	- 0.17
1795.00	- 0.16
1810.00	- 0.16
1825.00	- 0.16
1840.00	- 0.17
1855.00	- 0.18
1870.00	- 0.18
1885.00	- 0.18
1900.00	- 0.18
1915.00	- 0.18
1930.00	- 0.18
1945.00	- 0.18
1960.00	- 0.18
1975.00	- 0.18

Elapsed Time	Value
1990.00	- 0.17
2005.00	- 0.17
2020.00	- 0.16
2035.00	- 0.17
2050.00	- 0.18
2065.00	- 0.18
2080.00	- 0.19
2095.00	- 0.19
2110.00	- 0.20
2125.00	- 0.20
2140.00	- 0.20
2155.00	- 0.20
2170.00	- 0.20
2185.00	- 0.20
2200.00	- 0.20
2215.00	- 0.20
2230.00	- 0.20
2245.00	- 0.20
2260.00	- 0.20
2275.00	- 0.20
2290.00	- 0.21
2305.00	- 0.20
2320.00	- 0.20
2335.00	- 0.21
2350.00	- 0.21
2365.00	- 0.21
2380.00	- 0.21
2395.00	- 0.21
2410.00	- 0.21
2425.00	- 0.20
2440.00	- 0.20
2455.00	- 0.20
2470.00	- 0.20
2485.00	- 0.19
2500.00	- 0.18
2515.00	- 0.17
2530.00	- 0.17
2545.00	- 0.16
2560.00	- 0.16
2575.00	- 0.15
2590.00	- 0.15
2605.00	- 0.14
2620.00	- 0.13
2635.00	- 0.13
2650.00	- 0.13
2665.00	- 0.13
2680.00	- 0.12
2695.00	- 0.13
2710.00	- 0.12

Elapsed Time	Value
2725.00	- 0.13
2740.00	- 0.13
2755.00	- 0.13
2770.00	- 0.13
2785.00	- 0.13
2800.00	- 0.12
2815.00	- 0.11
2830.00	- 0.11
2845.00	- 0.10
2860.00	- 0.11
2875.00	- 0.10
2890.00	- 0.11
2905.00	- 0.11
2920.00	- 0.11
2935.00	- 0.10
2950.00	- 0.10
2965.00	- 0.09
2980.00	- 0.08
2995.00	- 0.07
3010.00	- 0.06
3025.00	- 0.06
3040.00	- 0.07
3055.00	- 0.06
3070.00	- 0.05
3085.00	- 0.03
3100.00	- 0.02
3115.00	- 0.01
3130.00	- 0.00
3145.00	0.00
3160.00	0.00
3175.00	0.00
3190.00	0.01
3205.00	0.03
3220.00	0.02
3235.00	0.03
3250.00	0.04
3265.00	0.04
3280.00	0.05
3295.00	0.05
3310.00	0.05
3325.00	0.04
3340.00	0.04
3355.00	0.04
3370.00	0.03
3385.00	0.01
3400.00	0.03
3415.00	0.04
3430.00	0.04
3445.00	0.04

Elapsed Time	Value
3460.00	0.03
3475.00	0.04
3490.00	0.03
3505.00	0.02
3520.00	0.03
3535.00	0.03
3550.00	0.02
3565.00	0.01
3580.00	0.01
3595.00	0.01
3610.00	0.01
3625.00	0.02
3640.00	0.01
3655.00	0.01
3670.00	0.01
3685.00	0.02
3700.00	0.01
3715.00	0.01
3730.00	0.01
3745.00	0.01
3760.00	0.02
3775.00	0.02
3790.00	0.02
3805.00	0.01
3820.00	0.02
3835.00	0.02
3850.00	0.02
3865.00	0.03
3880.00	0.03
3895.00	0.03
3910.00	0.04
3925.00	0.05
3940.00	0.05
3955.00	0.05
3970.00	0.03
3985.00	0.04
4000.00	0.05
4015.00	0.05
4030.00	0.05
4045.00	0.05
4060.00	0.05
4075.00	0.05
4090.00	0.05
4105.00	0.04
4120.00	0.04
4135.00	0.04
4150.00	0.03
4165.00	0.03
4180.00	0.03
4195.00	0.03
4210.00	0.02
4225.00	0.02
4240.00	0.03
4255.00	0.02
4270.00	0.02
4285.00	0.02
4300.00	0.02
4315.00	0.02
4330.00	0.01

END

Table D-20

Hermit Data Logger Readings

Pumping test, 72 hour duration.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:12

Unit# 00884 Test# 0

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/22 10:15

Elapsed Time	Value
0.0000	- 0.01
0.0033	- 0.01
0.0066	- 0.02
0.0099	- 0.02
0.0133	- 0.03
0.0166	- 0.03
0.0200	- 0.02
0.0233	- 0.03
0.0266	- 0.03
0.0300	- 0.03
0.0333	- 0.03
0.0500	- 0.02
0.0666	- 0.02
0.0833	- 0.02
0.1000	- 0.02
0.1166	- 0.02
0.1333	- 0.02
0.1500	- 0.02
0.1666	- 0.02
0.1833	- 0.02
0.2000	- 0.02
0.2166	- 0.02
0.2333	- 0.02
0.2500	- 0.02
0.2666	- 0.03
0.2833	- 0.02
0.3000	- 0.03
0.3166	- 0.02
0.3333	- 0.02
0.4167	- 0.02
0.5000	- 0.02
0.5833	- 0.02
0.6667	- 0.02
0.7500	- 0.02
0.8333	- 0.02
0.9167	- 0.02
1.0000	- 0.02
1.0833	- 0.02
1.1667	- 0.02
1.2500	- 0.02
1.3333	- 0.02
1.4166	- 0.03
1.5000	- 0.02
1.5833	- 0.03
1.6667	- 0.03
1.7500	- 0.03
1.8333	- 0.03
1.9167	- 0.03
2.0000	- 0.03
2.5000	- 0.03
3.0000	- 0.03
3.5000	- 0.03
4.0000	- 0.03
4.5000	- 0.03
5.0000	- 0.03
5.5000	- 0.03
6.0000	- 0.03
6.5000	- 0.03
7.0000	- 0.03
7.5000	- 0.03
8.0000	- 0.03
8.5000	- 0.03
9.0000	- 0.03
9.5000	- 0.03
10.0000	- 0.03

Elapsed Time	Value
12.0000	- 0.03
14.0000	- 0.04
16.0000	- 0.04
18.0000	- 0.04
20.0000	- 0.04
22.0000	- 0.05
24.0000	- 0.05
26.0000	- 0.05
28.0000	- 0.05
30.0000	- 0.05
32.0000	- 0.05
34.0000	- 0.05
36.0000	- 0.06
38.0000	- 0.06
40.0000	- 0.06
42.0000	- 0.06
44.0000	- 0.06
46.0000	- 0.06
48.0000	- 0.06
50.0000	- 0.06
52.0000	- 0.06
54.0000	- 0.06
56.0000	- 0.07
58.0000	- 0.07
60.0000	- 0.06
62.0000	- 0.07
64.0000	- 0.06
66.0000	- 0.07
68.0000	- 0.07
70.0000	- 0.08
72.0000	- 0.08
74.0000	- 0.08
76.0000	- 0.08
78.0000	- 0.08
80.0000	- 0.07
82.0000	- 0.08
84.0000	- 0.08
86.0000	- 0.08
88.0000	- 0.08
90.0000	- 0.08
92.0000	- 0.08
94.0000	- 0.09
96.0000	- 0.08
98.0000	- 0.09
100.000	- 0.08
110.000	- 0.08
120.000	- 0.08
130.000	- 0.07
140.000	- 0.08

Elapsed Time	Value
150.000	- 0.09
160.000	- 0.08
170.000	- 0.06
180.000	- 0.05
190.000	- 0.05
200.000	- 0.06
210.000	- 0.05
220.000	- 0.05
230.000	- 0.03
240.000	- 0.07
250.000	0.01
260.000	- 0.02
270.000	0.00
280.000	0.00
290.000	- 0.00
300.000	0.00
310.000	0.00
320.000	0.01
330.000	0.00
340.000	0.01
350.000	0.00
360.000	0.00
370.000	0.00
380.000	0.00
390.000	0.01
400.000	0.00
410.000	0.00
420.000	0.00
430.000	0.00
440.000	0.00
450.000	0.00
460.000	0.00
470.000	- 0.00
480.000	- 0.00
490.000	- 0.00
500.000	- 0.00
510.000	0.00
520.000	0.00
530.000	0.00
540.000	0.00
550.000	0.00
560.000	0.00
570.000	0.01
580.000	0.00
590.000	0.00
600.000	0.00
610.000	0.00
620.000	0.00
630.000	- 0.00

Elapsed Time	Value
640.000	- 0.01
650.000	- 0.01
660.000	- 0.02
670.000	- 0.03
680.000	- 0.01
690.000	- 0.03
700.000	- 0.03
710.000	- 0.03
720.000	- 0.03
730.000	- 0.03
740.000	- 0.03
750.000	- 0.03
760.000	- 0.03
770.000	- 0.03
780.000	- 0.03
790.000	- 0.02
800.000	- 0.02
810.000	- 0.02
820.000	- 0.01
830.000	- 0.01
840.000	- 0.01
850.000	- 0.01
860.000	- 0.01
870.000	- 0.01
880.000	- 0.01
890.000	- 0.01
900.000	- 0.01
910.000	- 0.00
920.000	- 0.00
930.000	- 0.01
940.000	- 0.01
950.000	- 0.01
960.000	- 0.01
970.000	- 0.01
980.000	- 0.01
990.000	- 0.01
1000.00	- 0.01
1015.00	- 0.01
1030.00	- 0.00
1045.00	0.00
1060.00	- 0.00
1075.00	0.00
1090.00	0.00
1105.00	- 0.00
1120.00	- 0.01
1135.00	- 0.01
1150.00	- 0.02
1165.00	- 0.03
1180.00	- 0.03

Elapsed Time	Value
1195.00	- 0.05
1210.00	- 0.05
1225.00	- 0.06
1240.00	- 0.07
1255.00	- 0.08
1270.00	- 0.10
1285.00	- 0.10
1300.00	- 0.11
1315.00	- 0.12
1330.00	- 0.13
1345.00	- 0.15
1360.00	- 0.15
1375.00	- 0.15
1390.00	- 0.16
1405.00	- 0.16
1420.00	- 0.17
1435.00	- 0.18
1450.00	- 0.18
1465.00	- 0.19
1480.00	- 0.20
1495.00	- 0.20
1510.00	- 0.20
1525.00	- 0.20
1540.00	- 0.21
1555.00	- 0.20
1570.00	- 0.21
1585.00	- 0.22
1600.00	- 0.22
1615.00	- 0.20
1630.00	- 0.18
1645.00	- 0.20
1660.00	- 0.20
1675.00	- 0.18
1690.00	- 0.16
1705.00	- 0.16
1720.00	- 0.17
1735.00	- 0.16
1750.00	- 0.15
1765.00	- 0.16
1780.00	- 0.16
1795.00	- 0.16
1810.00	- 0.15
1825.00	- 0.15
1840.00	- 0.15
1855.00	- 0.16
1870.00	- 0.15
1885.00	- 0.15
1900.00	- 0.15
1915.00	- 0.15

Elapsed Time	Value
1930.00	- 0.15
1945.00	- 0.15
1960.00	- 0.15
1975.00	- 0.15
1990.00	- 0.15
2005.00	- 0.15
2020.00	- 0.15
2035.00	- 0.15
2050.00	- 0.16
2065.00	- 0.16
2080.00	- 0.18
2095.00	- 0.18
2110.00	- 0.18
2125.00	- 0.19
2140.00	- 0.19
2155.00	- 0.19
2170.00	- 0.19
2185.00	- 0.19
2200.00	- 0.20
2215.00	- 0.20
2230.00	- 0.20
2245.00	- 0.19
2260.00	- 0.20
2275.00	- 0.20
2290.00	- 0.20
2305.00	- 0.20
2320.00	- 0.20
2335.00	- 0.20
2350.00	- 0.20
2365.00	- 0.20
2380.00	- 0.20
2395.00	- 0.20
2410.00	- 0.20
2425.00	- 0.20
2440.00	- 0.20
2455.00	- 0.20
2470.00	- 0.19
2485.00	- 0.18
2500.00	- 0.18
2515.00	- 0.17
2530.00	- 0.17
2545.00	- 0.16
2560.00	- 0.16
2575.00	- 0.15
2590.00	- 0.14
2605.00	- 0.14
2620.00	- 0.13
2635.00	- 0.13
2650.00	- 0.13

Elapsed Time	Value
2665.00	- 0.12
2680.00	- 0.12
2695.00	- 0.12
2710.00	- 0.12
2725.00	- 0.13
2740.00	- 0.13
2755.00	- 0.13
2770.00	- 0.13
2785.00	- 0.13
2800.00	- 0.12
2815.00	- 0.11
2830.00	- 0.11
2845.00	- 0.10
2860.00	- 0.10
2875.00	- 0.10
2890.00	- 0.11
2905.00	- 0.11
2920.00	- 0.10
2935.00	- 0.10
2950.00	- 0.09
2965.00	- 0.08
2980.00	- 0.06
2995.00	- 0.07
3010.00	- 0.07
3025.00	- 0.06
3040.00	- 0.07
3055.00	- 0.06
3070.00	- 0.05
3085.00	- 0.06
3100.00	- 0.03
3115.00	- 0.04
3130.00	- 0.01
3145.00	- 0.01
3160.00	- 0.01
3175.00	0.01
3190.00	0.01
3205.00	0.05
3220.00	0.03
3235.00	0.05
3250.00	0.06
3265.00	0.06
3280.00	0.06
3295.00	0.06
3310.00	0.07
3325.00	0.06
3340.00	0.06
3355.00	0.06
3370.00	0.05
3385.00	0.04

Elapsed Time	Value
3400.00	0.05
3415.00	0.05
3430.00	0.05
3445.00	0.05
3460.00	0.04
3475.00	0.05
3490.00	0.04
3505.00	0.03
3520.00	0.04
3535.00	0.03
3550.00	0.03
3565.00	0.02
3580.00	0.02
3595.00	0.02
3610.00	0.01
3625.00	0.02
3640.00	0.02
3655.00	0.01
3670.00	0.02
3685.00	0.02
3700.00	0.02
3715.00	0.01
3730.00	0.02
3745.00	0.02
3760.00	0.03
3775.00	0.03
3790.00	0.03
3805.00	0.02
3820.00	0.03
3835.00	0.02
3850.00	0.03
3865.00	0.04
3880.00	0.04
3895.00	0.04
3910.00	0.05
3925.00	0.06
3940.00	0.05
3955.00	0.06
3970.00	0.05
3985.00	0.06
4000.00	0.06
4015.00	0.06
4030.00	0.06
4045.00	0.06
4060.00	0.05
4075.00	0.06
4090.00	0.06
4105.00	0.05
4120.00	0.05
4135.00	0.05
4150.00	0.04
4165.00	0.03
4180.00	0.03
4195.00	0.02
4210.00	0.01
4225.00	0.01
4240.00	0.01
4255.00	0.01
4270.00	0.01
4285.00	0.01
4300.00	0.01
4315.00	0.01
4330.00	0.00

END

Table D-21

Hermit Data Logger Readings

Pumping test recovery.

Well AW-1, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:49

Unit# 00583 Test# 1

INPUT 1: Level (F)

Reference	0.00
Scale factor	20.00
Offset	0.00

Step# 0 09/25 10:32

Elapsed Time	Value
0.0000	- 3.11
0.0033	- 3.12
0.0066	- 2.84
0.0099	- 2.86
0.0133	- 2.64
0.0166	- 2.65
0.0200	- 2.39
0.0233	- 2.27
0.0266	- 2.07
0.0300	- 1.86
0.0333	- 1.67
0.0500	- 0.83
0.0666	- 0.35
0.0833	- 0.11
0.1000	0.00
0.1166	0.05
0.1333	0.03
0.1500	- 0.01
0.1666	- 0.04
0.1833	- 0.05
0.2000	- 0.05
0.2166	- 0.05
0.2333	- 0.04
0.2500	- 0.03
0.2666	- 0.03
0.2833	- 0.03
0.3000	- 0.02
0.3166	- 0.01
0.3333	- 0.01
0.4167	- 0.01
0.5000	- 0.00
0.5833	- 0.00
0.6667	- 0.00
0.7500	- 0.00
0.8333	0.00
0.9167	0.00
1.0000	0.00
1.0833	0.00
1.1667	0.00
1.2500	0.00
1.3333	0.00
1.4166	0.00
1.5000	0.00
1.5833	0.00
1.6667	0.00
1.7500	0.00
1.8333	0.00
1.9167	0.00
2.0000	0.00
2.5000	0.00
3.0000	0.00
3.5000	0.00
4.0000	0.01
4.5000	0.01
5.0000	0.01
5.5000	0.01
6.0000	0.01
6.5000	0.01
7.0000	0.01
7.5000	0.01
8.0000	0.01
8.5000	0.01
9.0000	0.01
9.5000	0.01
10.0000	0.01
12.0000	0.03
14.0000	0.03
16.0000	0.03
18.0000	0.03

Elapsed Time	Value	Elapsed Time	Value
20.0000	0.03	190.000	0.17
22.0000	0.03	200.000	0.17
24.0000	0.03	210.000	0.18
26.0000	0.03	220.000	0.19
28.0000	0.03	230.000	0.20
30.0000	0.03	240.000	0.21
32.0000	0.04	250.000	0.22
34.0000	0.03	260.000	0.22
36.0000	0.11	270.000	0.23
38.0000	0.04	280.000	0.22
40.0000	0.04	290.000	0.23
42.0000	0.05	300.000	0.23
44.0000	0.05	310.000	0.24
46.0000	0.05	320.000	0.24
48.0000	0.05	330.000	0.25
50.0000	0.05	340.000	0.25
52.0000	0.05	350.000	0.25
54.0000	0.05	360.000	0.26
56.0000	0.06	370.000	0.27
58.0000	0.05	380.000	0.27
60.0000	0.06	390.000	0.27
62.0000	0.06	400.000	0.28
64.0000	0.06	410.000	0.28
66.0000	0.06	420.000	0.28
68.0000	0.06	430.000	0.29
70.0000	0.06	440.000	0.29
72.0000	0.06	450.000	0.29
74.0000	0.06	460.000	0.29
76.0000	0.06	470.000	0.29
78.0000	0.06	480.000	0.29
80.0000	0.06	490.000	0.30
82.0000	0.06	500.000	0.30
84.0000	0.07	510.000	0.30
86.0000	0.07	520.000	0.30
88.0000	0.07	530.000	0.29
90.0000	0.08	540.000	0.29
92.0000	0.08	550.000	0.29
94.0000	0.08	560.000	0.29
96.0000	0.08	570.000	0.28
98.0000	0.08	580.000	0.27
100.000	0.07	590.000	0.27
110.000	0.11	600.000	0.27
120.000	0.12	610.000	0.26
130.000	0.13	620.000	0.26
140.000	0.13	630.000	0.26
150.000	0.14	640.000	0.25
160.000	0.14	650.000	0.25
170.000	0.15	660.000	0.25
180.000	0.15	670.000	0.25

Elapsed Time	Value
680.000	0.24
690.000	0.25
700.000	0.25
710.000	0.25
720.000	0.25
730.000	0.25
740.000	0.25
750.000	0.25
760.000	0.25
770.000	0.25
780.000	0.25
790.000	0.25
800.000	0.25
810.000	0.25
820.000	0.25
830.000	0.25
840.000	0.25
850.000	0.25
860.000	0.25
870.000	0.23
880.000	0.23
890.000	0.23
900.000	0.24
910.000	0.24
920.000	0.24
930.000	0.24
940.000	0.24
950.000	0.24
960.000	0.24
970.000	0.24
980.000	0.25
990.000	0.24
1000.00	0.24
1015.00	0.24
1030.00	0.25
1045.00	0.24
1060.00	0.24
1075.00	0.23
1090.00	0.23
1105.00	0.22
1120.00	0.22
1135.00	0.22
1150.00	0.21
1165.00	0.20
1180.00	0.20
1195.00	0.19
1210.00	0.18
1225.00	0.18
1240.00	0.17
1255.00	0.16
1270.00	0.15
1285.00	0.15

END

Table D-22

Hermit Data Logger Readings

Pumping test recovery.

Well AW-1, 50 psi transducer.

SE1000B
Environmental Logger
09/30 13:54

Unit# 00583 Test# 1

INPUT 2: Level (F)

Reference	0.00
Scale factor	49.79
Offset	0.12

Step# 0 09/25 10:32

Elapsed Time	Value
0.0000	- 2.86
0.0033	- 2.78
0.0066	- 2.81
0.0099	- 2.54
0.0133	- 2.57
0.0166	- 2.32
0.0200	- 2.27
0.0233	- 2.07
0.0266	- 1.91
0.0300	- 1.76
0.0333	- 1.54
0.0500	- 0.80
0.0666	- 0.25
0.0833	0.07
0.1000	0.22
0.1166	0.23
0.1333	0.23
0.1500	0.22
0.1666	0.18
0.1833	0.17
0.2000	0.15
0.2166	0.17
0.2333	0.17
0.2500	0.17
0.2666	0.18
0.2833	0.18
0.3000	0.18
0.3166	0.18
0.3333	0.18
0.4167	0.20
0.5000	0.20
0.5833	0.20
0.6667	0.20
0.7500	0.20
0.8333	0.20
0.9167	0.22
1.0000	0.22
1.0833	0.22
1.1667	0.22
1.2500	0.22
1.3333	0.22
1.4166	0.22
1.5000	0.22
1.5833	0.22
1.6667	0.22
1.7500	0.22
1.8333	0.22
1.9167	0.22
2.0000	0.22
2.5000	0.22
3.0000	0.22
3.5000	0.22
4.0000	0.22
4.5000	0.22
5.0000	0.22
5.5000	0.22
6.0000	0.22
6.5000	0.23
7.0000	0.23
7.5000	0.23
8.0000	0.22
8.5000	0.23
9.0000	0.23
9.5000	0.23
10.0000	0.23
12.0000	0.23
14.0000	0.23
16.0000	0.23
18.0000	0.23

Elapsed Time	Value	Elapsed Time	Value
20.0000	0.23	190.000	0.34
22.0000	0.25	200.000	0.34
24.0000	0.25	210.000	0.36
26.0000	0.25	220.000	0.37
28.0000	0.25	230.000	0.39
30.0000	0.25	240.000	0.39
32.0000	0.25	250.000	0.40
34.0000	0.25	260.000	0.40
36.0000	0.26	270.000	0.40
38.0000	0.25	280.000	0.40
40.0000	0.26	290.000	0.42
42.0000	0.26	300.000	0.42
44.0000	0.26	310.000	0.42
46.0000	0.26	320.000	0.42
48.0000	0.26	330.000	0.42
50.0000	0.26	340.000	0.44
52.0000	0.26	350.000	0.44
54.0000	0.26	360.000	0.44
56.0000	0.26	370.000	0.44
58.0000	0.26	380.000	0.44
60.0000	0.28	390.000	0.44
62.0000	0.28	400.000	0.45
64.0000	0.26	410.000	0.45
66.0000	0.28	420.000	0.45
68.0000	0.28	430.000	0.45
70.0000	0.28	440.000	0.45
72.0000	0.28	450.000	0.47
74.0000	0.28	460.000	0.47
76.0000	0.28	470.000	0.47
78.0000	0.28	480.000	0.47
80.0000	0.28	490.000	0.48
82.0000	0.28	500.000	0.48
84.0000	0.28	510.000	0.48
86.0000	0.28	520.000	0.48
88.0000	0.28	530.000	0.48
90.0000	0.29	540.000	0.48
92.0000	0.29	550.000	0.47
94.0000	0.28	560.000	0.47
96.0000	0.29	570.000	0.47
98.0000	0.29	580.000	0.47
100.000	0.28	590.000	0.47
110.000	0.29	600.000	0.47
120.000	0.29	610.000	0.45
130.000	0.31	620.000	0.45
140.000	0.31	630.000	0.45
150.000	0.31	640.000	0.45
160.000	0.33	650.000	0.45
170.000	0.33	660.000	0.45
180.000	0.34	670.000	0.45

Elapsed Time	Value
680.000	0.44
690.000	0.45
700.000	0.45
710.000	0.45
720.000	0.45
730.000	0.45
740.000	0.45
750.000	0.45
760.000	0.45
770.000	0.45
780.000	0.45
790.000	0.45
800.000	0.45
810.000	0.45
820.000	0.45
830.000	0.45
840.000	0.45
850.000	0.45
860.000	0.45
870.000	0.44
880.000	0.44
890.000	0.44
900.000	0.45
910.000	0.45
920.000	0.45
930.000	0.45
940.000	0.45
950.000	0.45
960.000	0.45
970.000	0.45
980.000	0.45
990.000	0.45
1000.00	0.45
1015.00	0.45
1030.00	0.45
1045.00	0.45
1060.00	0.45
1075.00	0.44
1090.00	0.44
1105.00	0.44
1120.00	0.44
1135.00	0.42
1150.00	0.42
1165.00	0.42
1180.00	0.40
1195.00	0.40
1210.00	0.40
1225.00	0.39
1240.00	0.39
1255.00	0.37
1270.00	0.37
1285.00	0.36

END

Table D-23

Hermit Data Logger Readings

Pumping test recovery.

Piezometer PZ-1, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:19

Unit# 00884 Test# 1

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/25 10:32

Elapsed Time	Value
0.0000	0.01
0.0033	0.00
0.0066	0.00
0.0099	0.00
0.0133	- 0.00
0.0166	- 0.00
0.0200	- 0.00
0.0233	- 0.00
0.0266	- 0.00
0.0300	- 0.00
0.0333	- 0.00
0.0500	0.00
0.0666	0.00
0.0833	0.00
0.1000	0.00
0.1166	0.00
0.1333	0.00
0.1500	0.01
0.1666	0.01
0.1833	0.01
0.2000	0.01
0.2166	0.01
0.2333	0.01
0.2500	0.01
0.2666	0.01
0.2833	0.01
0.3000	0.01

Elapsed Time	Value
0.3166	0.01
0.3333	0.01
0.4167	0.02
0.5000	0.03
0.5833	0.02
0.6667	0.02
0.7500	0.03
0.8333	0.03
0.9167	0.03
1.0000	0.03
1.0833	0.03
1.1667	0.03
1.2500	0.03
1.3333	0.03
1.4166	0.03
1.5000	0.03
1.5833	0.03
1.6667	0.03
1.7500	0.03
1.8333	0.03
1.9167	0.03
2.0000	0.03
2.5000	0.04
3.0000	0.04
3.5000	0.05
4.0000	0.05
4.5000	0.05
5.0000	0.05
5.5000	0.05
6.0000	0.05
6.5000	0.05
7.0000	0.05
7.5000	0.05
8.0000	0.06
8.5000	0.06
9.0000	0.06
9.5000	0.06
10.0000	0.06
12.0000	0.07
14.0000	0.07
16.0000	0.08
18.0000	0.08

Elapsed Time	Value	Elapsed Time	Value
20.0000	0.08	190.000	0.20
22.0000	0.08	200.000	0.22
24.0000	0.09	210.000	0.22
26.0000	0.09	220.000	0.23
28.0000	0.10	230.000	0.25
30.0000	0.10	240.000	0.25
32.0000	0.10	250.000	0.26
34.0000	0.10	260.000	0.26
36.0000	0.10	270.000	0.27
38.0000	0.10	280.000	0.27
40.0000	0.11	290.000	0.27
42.0000	0.10	300.000	0.28
44.0000	0.10	310.000	0.28
46.0000	0.10	320.000	0.29
48.0000	0.10	330.000	0.29
50.0000	0.10	340.000	0.30
52.0000	0.10	350.000	0.30
54.0000	0.11	360.000	0.30
56.0000	0.11	370.000	0.31
58.0000	0.11	380.000	0.31
60.0000	0.11	390.000	0.32
62.0000	0.11	400.000	0.32
64.0000	0.11	410.000	0.32
66.0000	0.11	420.000	0.32
68.0000	0.11	430.000	0.32
70.0000	0.11	440.000	0.32
72.0000	0.11	450.000	0.32
74.0000	0.11	460.000	0.32
76.0000	0.12	470.000	0.32
78.0000	0.12	480.000	0.32
80.0000	0.12	490.000	0.33
82.0000	0.13	500.000	0.33
84.0000	0.13	510.000	0.33
86.0000	0.13	520.000	0.32
88.0000	0.13	530.000	0.32
90.0000	0.13	540.000	0.32
92.0000	0.13	550.000	0.31
94.0000	0.13	560.000	0.31
96.0000	0.13	570.000	0.31
98.0000	0.13	580.000	0.30
100.000	0.13	590.000	0.30
110.000	0.14	600.000	0.30
120.000	0.15	610.000	0.29
130.000	0.15	620.000	0.29
140.000	0.18	630.000	0.29
150.000	0.19	640.000	0.28
160.000	0.19	650.000	0.28
170.000	0.19	660.000	0.28
180.000	0.20	670.000	0.28

Elapsed Time	Value
680.000	0.28
690.000	0.28
700.000	0.28
710.000	0.29
720.000	0.28
730.000	0.28
740.000	0.28
750.000	0.28
760.000	0.29
770.000	0.29
780.000	0.28
790.000	0.29
800.000	0.29
810.000	0.29
820.000	0.29
830.000	0.29
840.000	0.29
850.000	0.29
860.000	0.28
870.000	0.27
880.000	0.28
890.000	0.28
900.000	0.28
910.000	0.28
920.000	0.28
930.000	0.28
940.000	0.28
950.000	0.28
960.000	0.28
970.000	0.28
980.000	0.28
990.000	0.28
1000.00	0.28
1015.00	0.28
1030.00	0.28
1045.00	0.28
1060.00	0.27
1075.00	0.27
1090.00	0.27
1105.00	0.26
1120.00	0.25
1135.00	0.25
1150.00	0.24
1165.00	0.24
1180.00	0.23
1195.00	0.22
1210.00	0.22
1225.00	0.21
1240.00	0.20
1255.00	0.19
1270.00	0.18
1285.00	0.17

END

Table D-24

Hermit Data Logger Readings

Pumping test recovery.

Piezometer PZ-2, 20 psi transducer.

SE1000B
Environmental Logger
09/30 13:23

Unit# 00884 Test# 1

INPUT 2: Level (F)

Reference	0.00
Scale factor	19.93
Offset	0.00

Step# 0 09/25 10:32

Elapsed Time	Value
0.0000	0.01
0.0033	0.00
0.0066	0.00
0.0099	0.00
0.0133	0.00
0.0166	0.00
0.0200	0.00
0.0233	0.00
0.0266	0.00
0.0300	0.00
0.0333	0.00
0.0500	0.00
0.0666	0.00
0.0833	0.00
0.1000	0.00
0.1166	0.00
0.1333	0.00
0.1500	0.00
0.1666	0.00
0.1833	0.00
0.2000	0.00
0.2166	0.00
0.2333	0.00
0.2500	0.00
0.2666	0.00
0.2833	0.00
0.3000	0.00
0.3166	0.00
0.3333	0.00
0.4167	0.01
0.5000	0.01
0.5833	0.01
0.6667	0.01
0.7500	0.01
0.8333	0.01
0.9167	0.01
1.0000	0.01
1.0833	0.01
1.1667	0.01
1.2500	0.01
1.3333	0.01
1.4166	0.01
1.5000	0.01
1.5833	0.01
1.6667	0.01
1.7500	0.01
1.8333	0.01
1.9167	0.01
2.0000	0.01
2.5000	0.02
3.0000	0.02
3.5000	0.03
4.0000	0.02
4.5000	0.03
5.0000	0.02
5.5000	0.02
6.0000	0.02
6.5000	0.02
7.0000	0.02
7.5000	0.03
8.0000	0.03
8.5000	0.03
9.0000	0.03
9.5000	0.03
10.0000	0.03
12.0000	0.02
14.0000	0.03
16.0000	0.03
18.0000	0.03

Elapsed Time	Value	Elapsed Time	Value
20.0000	0.03	190.000	0.15
22.0000	0.05	200.000	0.16
24.0000	0.05	210.000	0.17
26.0000	0.05	220.000	0.18
28.0000	0.05	230.000	0.19
30.0000	0.05	240.000	0.21
32.0000	0.05	250.000	0.21
34.0000	0.05	260.000	0.20
36.0000	0.06	270.000	0.22
38.0000	0.06	280.000	0.23
40.0000	0.06	290.000	0.23
42.0000	0.06	300.000	0.24
44.0000	0.06	310.000	0.23
46.0000	0.06	320.000	0.24
48.0000	0.06	330.000	0.25
50.0000	0.07	340.000	0.27
52.0000	0.06	350.000	0.25
54.0000	0.06	360.000	0.25
56.0000	0.08	370.000	0.27
58.0000	0.06	380.000	0.27
60.0000	0.07	390.000	0.27
62.0000	0.08	400.000	0.27
64.0000	0.07	410.000	0.28
66.0000	0.08	420.000	0.28
68.0000	0.08	430.000	0.28
70.0000	0.08	440.000	0.28
72.0000	0.08	450.000	0.28
74.0000	0.08	460.000	0.28
76.0000	0.08	470.000	0.28
78.0000	0.08	480.000	0.28
80.0000	0.08	490.000	0.28
82.0000	0.09	500.000	0.28
84.0000	0.10	510.000	0.28
86.0000	0.08	520.000	0.28
88.0000	0.08	530.000	0.27
90.0000	0.09	540.000	0.27
92.0000	0.10	550.000	0.27
94.0000	0.10	560.000	0.27
96.0000	0.09	570.000	0.27
98.0000	0.10	580.000	0.25
100.000	0.09	590.000	0.25
110.000	0.10	600.000	0.25
120.000	0.12	610.000	0.25
130.000	0.11	620.000	0.24
140.000	0.11	630.000	0.23
150.000	0.13	640.000	0.23
160.000	0.12	650.000	0.24
170.000	0.12	660.000	0.23
180.000	0.13	670.000	0.23

Elapsed Time	Value
680.000	0.22
690.000	0.24
700.000	0.24
710.000	0.24
720.000	0.24
730.000	0.24
740.000	0.24
750.000	0.24
760.000	0.23
770.000	0.23
780.000	0.23
790.000	0.23
800.000	0.23
810.000	0.24
820.000	0.23
830.000	0.24
840.000	0.23
850.000	0.23
860.000	0.23
870.000	0.22
880.000	0.22
890.000	0.22
900.000	0.23
910.000	0.23
920.000	0.23
930.000	0.23
940.000	0.23
950.000	0.23
960.000	0.24
970.000	0.25
980.000	0.24
990.000	0.24
1000.00	0.23
1015.00	0.23
1030.00	0.23
1045.00	0.23
1060.00	0.23
1075.00	0.22
1090.00	0.22
1105.00	0.22
1120.00	0.21
1135.00	0.20
1150.00	0.20
1165.00	0.19
1180.00	0.18
1195.00	0.18
1210.00	0.17
1225.00	0.16
1240.00	0.16
1255.00	0.15
1270.00	0.13
1285.00	0.12

END

APPENDIX E
SPECIFIC CAPACITY CALCULATION

DEC 20 1991

2852

FEED MATERIALS PRODUCTION CENTER
Remedial Investigation/Feasibility Study

Mr. Dennis Carr
Contract Technical Monitor
Westinghouse Environmental Management
Company of Ohio
P.O. Box 398704
Cincinnati, OH 45239

Dear Mr. Carr:

Subject: The Albright & Wilson Alternate Water Supply Well (AW-1)

This letter addresses concerns that Mr. Jesse Lacefield of A. M. Kinney expressed verbally to my staff regarding the subject well. As I understand them, Mr. Lacefield's concerns were:

- Can AW-1 provide a discharge rate of 500 gpm?
- Is the detected total uranium level in the well water acceptable for public usage?

Attached is a memo from Mr. Phil Jones and Mr. Robert Galbraith to me which should address Mr. Lacefield's questions. Also attached is a copy of the results from the laboratory for the total and isotopic uranium content of water samples collected from the well during the pump test.

If you have any questions concerning this, please contact Mr. W.A. Hertel or Mr. D.M. Harmel at 738-3100.

Sincerely,

John D. Wood for
John D. Wood
Project Director

WAH7461d10

Attachments

pc: w/Attachments
C. Fermaintt, DOE
D. Brettschneider, WEMCO
K. Broberg, WEMCO
J. Lacefield, A.M. Kinney
W. Hertel, IT
T. Mulder, IT
J. Razor, IT
R. Smith, IT
Project File 3.33

w/o Attachments
J. Craig, DOE
R. Galbraith, IT
P. Jones, IT
S. McGee, WEMCO
D. M. Harmel, ASI

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ADVANCED SCIENCES, INC/IT CORPORATION
11003 HAMILTON CLEVES ROAD • P.O. BOX 475 • ROSS, OHIO 45061 (513) 738-3100

INTERNATIONAL TECHNOLOGY CORPORATION

Memorandum

John Wood-ASI/John Razor-IT

Date: December 16, 1991

m: Phil Jones/Bob Galbraith

oject: **Albright & Wilson's Alternate Water Supply Well (AW-1) Efficiency and Its Water Quality**

Per telephone conversations between Mr. Jessie Lacefield of WEMCO and Mr. Phil Jones of IT Corporation during the week of December 2, 1991, the following items related to the Albright & Wilson's Alternate Water Supply Well (AW-1) were discussed:

- Can AW-1 provide a discharge rate of 500 gpm?
- Is the detected total uranium level in the well water acceptable for public usage?

The attached calculation sheets show that well AW-1 can easily produce water at 500 gpm with an estimated drawdown of slightly greater than six feet.

The attached laboratory analytical report also shows that the total uranium analyses of 1.15 and <1.0 μg/l are typical for background water quality in the area. This level is well below the proposed EPA drinking water standard of 20 μg/l and, therefore, is acceptable for public usage.

CI/12-91/EES-GS/a:\memo\bgl.mem

For AW-1 Specific Capacity Prediction:

72 hrs constant pump test resulted
s = 4.35' @ 380 gpm

$$specific\ capacity = \frac{Q}{s} \Rightarrow \frac{380}{4.35} = 87.4\ gpm/ft$$

s = drawdown in feet
Q = flow rate in gallons per minute

and

Drawdown(s) can be estimated for a new Q value by a graphical method shown on the attached page using the data from the step drawdown test.

for Q = 500 gpm
s = 6.08'

then

$$specific\ capacity = \frac{Q}{s} \Rightarrow \frac{500\ gpm}{6.08\ ft} = 82.2\ gpm/ft$$

with this drawdown, AW-1 forms a high capacity well for 500 gpm discharge rate. The drawdown of six feet is well below 50% of the saturated thickness of 155 feet.

PJ:RG:sh

CI/12-91/EES-GS/a:\memo\bg1.mem

Steps	Q (gpm)	Avg. s (ft)	s/Q
1	130	1.4	0.0107
2	205	2.3	0.0112
3	375	4.35	0.0116

$$\frac{Q}{s} = \frac{1}{CQ+B}$$ from Groundwater & wells by Driscoll page 557 (Eq. 16.10)

for Q = 500 gpm

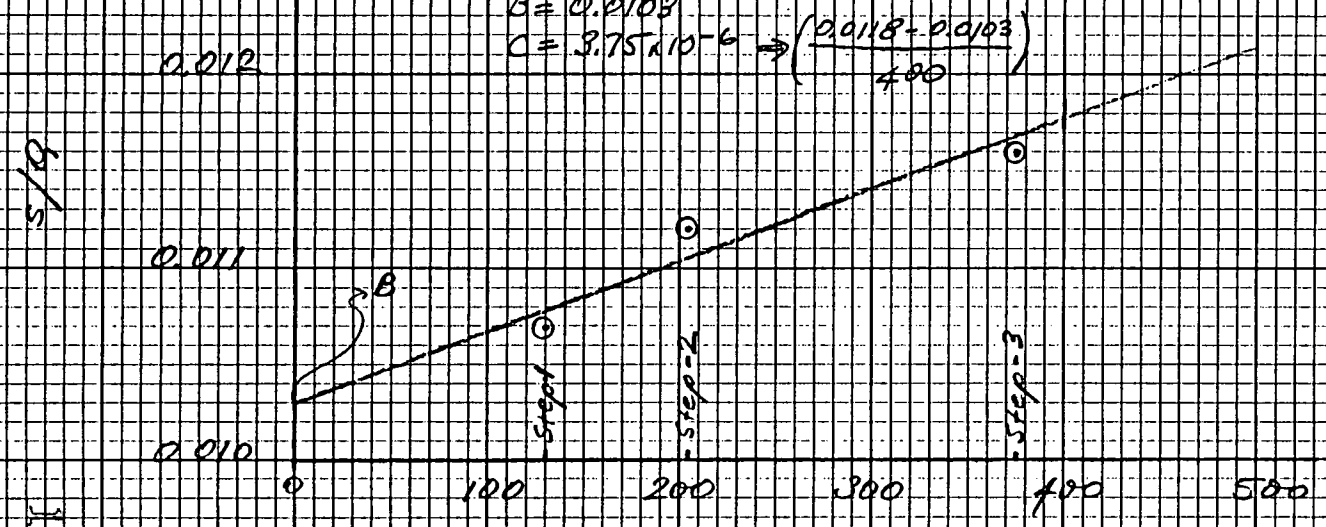
$s = Q(CQ+B)$

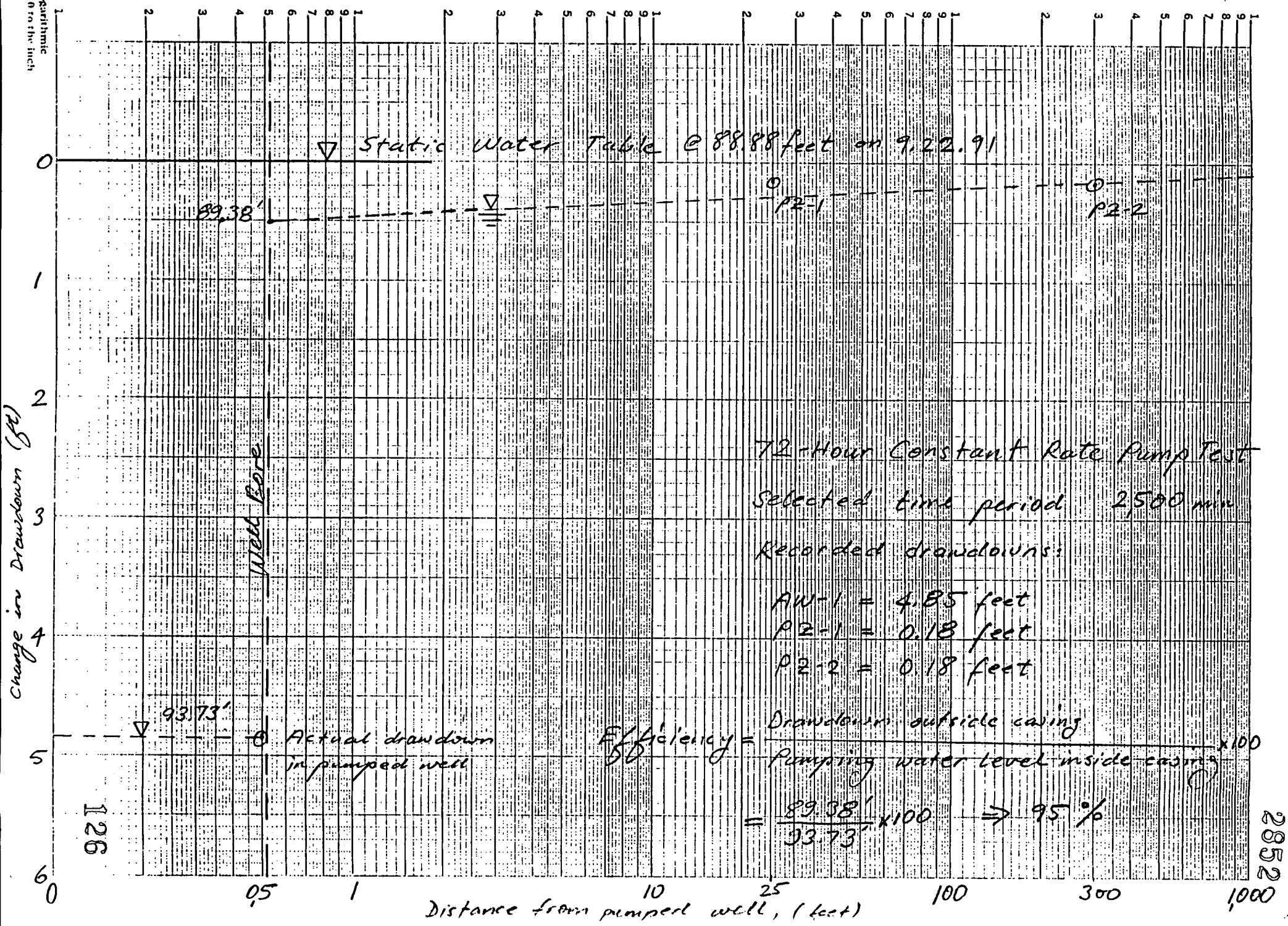
$s = 500(3.75\times10^{-6} \times 500 + 0.0103)$

$s = 6.08'$

$B = 0.0103$

$C = 3.75\times10^{-6} \Rightarrow \left(\frac{0.0118 - 0.0103}{400}\right)$




Static Water Table @ 88.88 feet on 9.22.91
89.38'
PZ-1
PZ-2
Well Bore
93.73'
Actual drawdown in pumped well
72-Hour Constant Rate Pump Test
Selected time period 2,500 min
Recorded drawdowns:
AW-1 = 4.85 feet
PZ-1 = 0.18 feet
PZ-2 = 0.18 feet
Efficiency = Drawdown outside casing / Pumping water level inside casing x100
= 89.38' / 93.73' x100 ⇒ 95 %
Change in Drawdown (ft)
Distance from pumped well, (feet)
0
1
2
3
4
5
6
0.5
1
10
25
100
300
1,000
126
2852

Rec.
DEC 12 1991 2852

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

ADVANCED SCIENCES, INC.
P. O. Box 475
Ross, OH 45061-0475

Date: December 10, 1991

Attn: Greta Laube/Project File

Page: 1 of 2

Work Order: S1-09-038

P.O. Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID: 602.3.35
Date Received By Lab: 09/24/91
Number of Samples: Two (02)
Sample Type: Liquid

I. INTRODUCTION

On September 24, 1991, two (02) liquid samples were received in good condition at ITAS-Oak Ridge, Tennessee laboratory from Advanced Sciences, Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

This is an amended report to include the re-analyzed Total Uranium results and Isotopic Uranium results for samples (01) 63992 and (02) 63997.

The samples were labeled as follows:

ASI SAMPLE ID	ITAS SAMPLE NUMBER	RECEIPT DATE	PARAMETERS REQUIRED
63992	S1-09-038-01	09/24/91	* Full List
63997	S1-09-038-02	09/24/91	* Full List

* Full List consist of: Isotopic Uranium and Total Uranium.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification, analytical results, and the appropriate detection limits.

Samples were prepared using Procedure RSL-201. Alpha isotopic analysis was performed for U using Procedure RSL-304. U-total was performed by KPA analysis Procedure RSL-121.

IT ANALYTICAL SERVICES
OAK RIDGE, TN

ADVANCED SCIENCES, INC.
Date: December 10, 1991
Client Project ID: 602.3.35

Work Order: S1-09-038

III. QUALITY CONTROL

QA/QC information was performed on the enclosed analytical data. The purpose of QA/QC information is to ensure the user that the data enclosed is scientifically valid and is used to assess the laboratory's performance.

All of the samples were analyzed within the required holding time.

IV. NONCONFORMANCE

Upon reviewing the KPA (U total) results previously reported to the client, it was found that the blank run with these samples was contaminated at 5 ug/l uranium. A typical blank should be at less than 1.0 ug/l. These samples were re-analyzed per client request.

Reviewed and Approved:

L. Lloyd Collins

L. Lloyd Collins
Laboratory Manager

LLC/bav

ITORL OAK RIDGE REPORT Work Order # S1-09-038

09/24/91 Results by Sample

53992 FRACTION 01A TEST CODE ASIRPT NAME FORM TO REPORT DATA

Date & Time Collected 09/22/91 12:30:00 Category LIQUID

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-234	1.91	0.35	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.13	0.25	pCi/l
U-TOTAL	1.15	0.12	ug/l

53997 FRACTION 02A TEST CODE ASIRPT NAME FORM TO REPORT DATA

Date & Time Collected 09/23/91 07:20:00 Category LIQUID

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-234	1.33	0.29	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.01	0.25	pCi/l
U-TOTAL	<1.0		ug/l

D SCIENCES, INC.

BY EPA

D: 11/08/91, 12/09/91
D: 11/08/91, 12/09/91

SOTOPIC

D: 10/02/91
D: 12/05/91

APPENDIX F
CERTIFICATES OF ANALYSIS

Rec.
DEC 12 1991

2852

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

ADVANCED SCIENCES, INC.
P. O. Box 475
Ross, OH 45061-0475

Date: December 10, 1991

Attn: Greta Laube/Project File

Page: 1 of 2

Work Order: S1-09-038

P.O. Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID: 602.3.35
Date Received By Lab: 09/24/91
Number of Samples: Two (02)
Sample Type: Liquid

I. INTRODUCTION

On September 24, 1991, two (02) liquid samples were received in good condition at ITAS-Oak Ridge, Tennessee laboratory from Advanced Sciences, Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

This is an amended report to include the re-analyzed Total Uranium results and Isotopic Uranium results for samples (01) 63992 and (02) 63997.

The samples were labeled as follows:

ASI SAMPLE ID	ITAS SAMPLE NUMBER	RECEIPT DATE	PARAMETERS REQUIRED
63992	S1-09-038-01	09/24/91	* Full List
63997	S1-09-038-02	09/24/91	* Full List

* Full List consist of: Isotopic Uranium and Total Uranium.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification, analytical results, and the appropriate detection limits.

Samples were prepared using Procedure RSL-201. Alpha isotopic analysis was performed for U using Procedure RSL-304. U-total was performed by KPA analysis Procedure RSL-121.

IT ANALYTICAL SERVICES
OAK RIDGE, TN

ADVANCED SCIENCES, INC.
Date: December 10, 1991
Client Project ID: 602.3.35

Work Order: S1-09-038

III. QUALITY CONTROL

QA/QC information was performed on the enclosed analytical data. The purpose of QA/QC information is to ensure the user that the data enclosed is scientifically valid and is used to assess the laboratory's performance.

All of the samples were analyzed within the required holding time.

IV. NONCONFORMANCE

Upon reviewing the KPA (U total) results previously reported to the client, it was found that the blank run with these samples was contaminated at 5 ug/l uranium. A typical blank should be at less than 1.0 ug/l. These samples were re-analyzed per client request.

Reviewed and Approved:

L. Lloyd Collins

L. Lloyd Collins
Laboratory Manager

LLC/bav

D 63992 FRACTION 01A TEST CODE ASIRPT NAME FORM TO REPORT DATA
Date & Time Collected 09/22/91 12:30:00 Category LIQUID

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-234	1.91	0.35	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.13	0.25	pCi/l
U-TOTAL	1.15	0.12	ug/l

D 63997 FRACTION 02A TEST CODE ASIRPT NAME FORM TO REPORT DATA
Date & Time Collected 09/23/91 07:20:00 Category LIQUID

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-234	1.33	0.29	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.01	0.25	pCi/l
U-TOTAL	<1.0		ug/l

SCIENCES, INC.

BY EPA

: 11/08/91, 12/09/91
: 11/08/91, 12/09/91

OTOPIC

: 10/02/91
: 12/05/91

Client: Albright and Wilson
Work Order: X1-09-158
10915802

IT ANALYTICAL SERVICES
CINCINNATI, OH

Analytical Results, mg/L

Client Sample ID	Water #	
Lab No.	63994 01	
Analyte		Detection Limit
Alkalinity	220	NA
Chloride	8.5	0.3
Total phosphorus	0.03	0.01
Silica	13	0.3
Sulfate	33	4
Sulfite	ND	0.5
Copper	ND	0.005
Iron	0.098	0.006
Sodium	3.6	0.05

ND = Not detected at or below the reported detection limit

Client: Albright and Wilson
Work Order: X1-09-158
10915804

2852

IT ANALYTICAL SERVICES
CINCINNATI, OH

Quality Assurance Data

Quality Control
Standard Reference Solutions

Analyte	Theoretical Value, mg/L	Percent Recovery
Alkalinity	300	104
Chloride	11	103
Total phosphorus	3.6	100.5, 102.4
Silica	5	99.4
Sulfate	60	94.5
Copper	1	93.1
Iron	1	87.7
Sodium	2	94.5

RI/FS

C/C Control No. 49068

PROJECT NAME: Albright + Wilson

PROJECT NUMBER: 602.04.04.01

PROJECT MANAGER: J. D. Wood

BILL TO: ASI
6739 Academy Rd NE
Albuquerque NM 87109

PURCHASE ORDER NO.: ~~25.91~~ 29.93 (FM)

DATE SAMPLES SHIPPED: 09-23-91

LAB DESTINATION: IT Cincinnati

LABORATORY CONTACT: Bruce R.

SEND LAB REPORT TO: L. Rafales c/o ASI
11003 Hamilton Cleves Hwy
Ross OH 45061

DATE REPORT REQUIRED: 12-23-91

PROJECT CONTACT: D. Harnel / D. Spatta

PROJECT CONTACT PHONE NO.: 513-738-3100

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
63994	Groundwater	2x 500 ml plastic	4°C H_2SO_4	[redacted] PO_4, ~~[illegible]~~	
↓	↓	2x 1L plastic	4°C	alkalinity, SO_4, SO_3, Cl	24-hr hold time
↓	↓	2x 1L plastic	4°C HNO_3	Cu, Na, Fe, Silica	
				ICI	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard X Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab α

FOR LAB USE ONLY

Received By Lanita Ridge Date/Time 9/23/91 ; 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

2 of 2

RI/FS

CHAIN-OF-CUSTODY RECORD

R/A Control No. 55702

C/C Control No. 49068

PROJECT NAME/NUMBER Albright + Wilson/602.04.04.11 LAB DESTINATION IT Cincinnati

SAMPLE TEAM MEMBERS A. MORA CARRIER/WAYBILL NO. Hand delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
63994	Groundwater AW-1 well	9-23-91 0720	Groundwater	2x 500ml plastic	Samples	
↓	↓	↓	↓	2x 1L plastic	Received Cold	
				2x 1L plastic	and in Good	
					Condition.	
					La Rita Ridge	
					9-23-91	

Special Instructions:

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: ALEX MORA, ASI, 09-23-91, 800
   Received By: Larry J Evans ASI 9-23-91 800
2. Relinquished By: Larry J Evans ASI 9-23-91 0900
   Received By: La Rita Ridge / ITAS-CINN / 9-23-91 / 0900
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

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2851

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

2852

CERTIFICATE OF ANALYSIS

ASI/IT Fernald RI/FS
11003 Hamilton Cleves Hwy
Ross, Ohio 45061

Date: October 20, 1991

Attn: L. Rafales

P.O. Number 29.93

This is the Certificate of Analysis for the following samples:

Client Project ID:	Albright and Wilson
Date Received:	September 24, 1991
Work Order:	X1-09-194
Number of Samples:	1
Sample Type:	Water

I. Introduction

One water sample arrived at ITAS Cincinnati on September 24, 1991. The sample was collected on September 24, 1991 and was labeled as follows:

Water # 63998

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. The data will include sample identification information, the analytical results, and the appropriate detection limits.

The analyses requested and the methods used are listed on the following page.

Reviewed and Approved by:

Bruce H Rohrbach

Bruce Rohrbach 10/21/91
Project Manager
109194

Client: Albright and Wilson
Work Order: X1-09-194
10919401

IT ANALYTICAL SERVICES
CINCINNATI, OH

II. Analytical Results/Methodology (cont.)

* Total Alkalinity to pH 4.5; EPA Method 310.1
* Chloride; EPA Method 325.2
* Total phosphorus
* Silica, Colorimetric
* Sulfate; EPA Method 9038
* Sulfite; EPA Method 377.1
* Copper, Iron and Sodium by Inductively Coupled Plasma Spectroscopy; EPA Method 6010

III. Quality Control

Immediately following the analytical data for the samples can be found the QA/QC information that pertains to these samples. The purpose of this information is to demonstrate that the data enclosed is scientifically valid and defensible. This QA/QC data is used to assess the laboratory's performance during the analysis of the samples it accompanies. All quantitations were performed within the calibrated range of the analytical instrument.

Client: Albright and Wilson
Work Order: X1-09-194
10919402

IT ANALYTICAL SERVICES
CINCINNATI, OH

Analytical Results, mg/L

Client Sample ID	Water #	
Lab No.	63998 01	
Analyte		Detection Limit
Alkalinity	210	NA
Chloride	9.1	0.2
Total phosphorus	0.03	0.01
Silica	13	0.3
Sulfate	30	4
Sulfite	ND	0.5
Copper	ND	0.005
Iron	ND	0.006
Sodium	3.3	0.05

ND = Not detected at or below the reported detection limit

Client: Albright and Wilson
Work Order: X1-09-194
10919403

IT ANALYTICAL SERVICES
CINCINNATI, OH

Quality Assurance Data

Quality Control
Standard Reference Solutions

Analyte	Theoretical Value, mg/L	Percent Recovery
Alkalinity	300	104
Chloride	11	103
Total phosphorus	3.6	100.5, 102.4
Silica	5	99.4
Sulfate	60	94.5
Copper	1	93.1
Iron	1	87.7
Sodium	2	94.5

RI/FS REQUEST FOR ANALYSIS

C/C Control No. 49065

PROJECT NAME: Albright + Wilson
PROJECT NUMBER: 602.04.04.11
PROJECT MANAGER: J.D. Wood
BILL TO: ASI
6739 Academy Rd. NE
Albuquerque NM 87109
PURCHASE ORDER NO. 29.93

DATE SAMPLES SHIPPED: 09-24-91
LAB DESTINATION: IT Cincinnati
LABORATORY CONTACT: Lanita Ridge
SEND LAB REPORT TO: L. Rafales c/o ASI
11003 Hamilton Cleves Hwy
Ross OH 45061
DATE REPORT REQUIRED: 12-24-91
PROJECT CONTACT: D. Harmel / D. Spatta
PROJECT CONTACT PHONE NO. 513-738-3100

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
63998	Groundwater	2x500ml plastic	4°C H_2SO_4	~~total~~ PO4	
↓	↓	2x1L plastic	4°C	2alkalinity SO4 SO3 Cl	24-hr hold time
↓	↓	2x1L plastic	4°C HNO_3	Cu Na Fe Silica	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard X Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Lanita Ridge Date/Time 9/24/91; 0945

WHITE - Original, to accompany samples
YELLOW - Field copy

2852

FERNALD RI/FS

CHAIN-OF-CUSTODY RECORD

R/A Control No. 22102

C/C Control No. 49065

PROJECT NAME/NUMBER Albright + Wilson / 602.04.04.11

LAB DESTINATION IT Cincinnati

SAMPLE TEAM MEMBERS A. MORA

CARRIER/WAYBILL NO. Hand delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
63998	Groundwater well AW-1	09-24-91 - 0700	Groundwater	2x500 ml plastic	Samples	
↓		↓	↓	2x1L plastic	Received cold	
				2x1L plastic	and in Good	
					Condition.	
					La Nita Ridge	
					9/24/91	

Special Instructions:

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: ALEX MORA, ASI, 09-24-91, 0730, [signature]
   Received By: Larry J Evans ASI 9-24-91 0730
2. Relinquished By: Larry J Evans ASI 9-24-91 9:40 AM
   Received By: La Nita Ridge / ITAS-CINTI / 9-24-91 / 0945
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

2852

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

C/O ASI, Inc.
11003 Hamilton Cleves Road
Ross, OH 45061
Attn: Greta Laube

Date: November 02, 1991

Page 1 of 5

Job Number: ADV 37053

P.O. Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID: Albright & Wilson 602.04.11
Date Received by Lab: 09/24/91
Number of Samples: Two (2)
Sample Type: Water

I. INTRODUCTION

On September 24, 1991, two (2) water samples, two (2) trip blanks and two (2) field blanks were received at the ITAS Oak Ridge, Tennessee laboratory from Advanced Sciences, Inc., Ross, Ohio. The samples were not analyzed for Alkalinity M & P, Sulfate and Chloride at the clients request. The list of analytical tests performed, as well as dates of analysis, can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B.". Data are reported with USEPA CLP qualifiers. Lists with concentration unit code, qualifier code, and lab and client suffix code definitions are attached.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and dates of preparation and analysis.

Reviewed and Approved:

Vicki Grave for Jenny Vance

Jenny Vance
Project Manager
JLV/vlg

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Analytical Services, 1550 Bear Creek Road, Oak Ridge, TN 37830

II. ANALYTICAL RESULTS/METHODOLOGY (Continued)

The samples were analyzed for Target Compound List (TCL) Volatile compounds using the USEPA CLP 2/88 Statement of Work.

The samples were analyzed for Target Compound List (TCL) Semivolatile compounds using the USEPA CLP 2/88 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) Metals using the USEPA CLP 7/88 Statement of Work.

III. QUALITY CONTROL

The samples were prepared and analyzed for Volatiles on 09/30/91. All internal standards and surrogate recoveries were within QC limits. A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were performed on sample 62014, Job Number: ADV 37029. All spike recoveries are within QC limits with the exception of Benzene. All RPDs were within QC limits with the exception of Trichloroethene and Benzene.

The samples were prepared for Semivolatiles on 09/30/91 and analyzed on 10/16/91. All internal standards and surrogate recoveries were within QC limits. A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were performed on sample 63791, Job Number: ADV 37019. Nine (9) spike recoveries were outside QC limits. All RPDs were within QC limits.

The samples were prepared for ICP on 10/10/91 and analyzed on 10/17/91. Potassium was prepared on 10/10/91 and analyzed on 10/17/91. The samples were prepared for Furnace on 10/10/91 and the analyses completed on 10/23/91. Preparation and analysis for Mercury was performed on 10/15/91. A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were performed on sample 63992. Boron is not a CLP element and no CRDL is available however, the original value was below the IDL and the Duplicate value was right above the IDL. Due to this the Boron was flagged as having the RPD being outside QC limits. All other RPDs and spike recoveries were within QC limits.

Advanced Sciences, Inc.
Date: November 02, 1991
Client Project ID: Albright & Wilson 602.04.11

Job Number: ADV 37053

SAMPLE DATA SUMMARY

FIELD #	ITAS #	MATRIX	CONC.	ANALYSIS
63992	GG2173	WATER	LOW	VOLATILES
63997	GG2174	WATER	LOW	VOLATILES
63990	GG2175	WATER	LOW	VOLATILES
63991	GG2176	WATER	LOW	VOLATILES
63995	GG2177	WATER	LOW	VOLATILES
63996	GG2178	WATER	LOW	VOLATILES
63993	GG2179	WATER	LOW	SEMIVOLATILES
63997	GG2180	WATER	LOW	SEMIVOLATILES
63992	GG2181	WATER	LOW	METALS
63992	GG2182	WATER	LOW	QC/DUP/METALS
63992	GG2183	WATER	LOW	QC/MS/METALS
63997	GG2184	WATER	LOW	UNF METALS

Abbreviations:

MS - Matrix Spike
DUP - Duplicate

Advanced Sciences, Inc.
Date: November 02, 1991
Client Project ID: Albright & Wilson 602.04.11

Job Number: ADV 37053

Organic Qualifiers

U = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C = This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the user to take appropriate action.

E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D = This flag identifies all compounds identified in analysis at a secondary dilution factor.

A = This flag indicates that a TIC is a suspected aldol-condensation product.

F = Estimated value due to a confirmed compound which is off-scale in both columns.

X = A flag that FORMASTER III CLP software automatically inserts to indicate that the data was entered manually.

Y = Indistinguishable isomer in tentatively identified compounds.

Z = No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* = Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: November 02, 1991
Client Project ID: Albright & Wilson 602.04.11

Inorganic Qualifiers

Concentration Qualifiers (C)

B = Reported value was obtained from a reading that was less than Contract Required Detection Limit (CRQL) but greater than or equal to the Instrument Detection Limit (IDL).

U = Analyte was analyzed for but not detected.

Quality Qualifiers (Q)

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions.

W = Post-digestion spike for Furnace AA analysis is not out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

G = Native analyte > 4 times spike added, therefore acceptance criteria do not apply.

X = Detection limit is higher than normal due to sample matrix interferences.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.955.

Method Qualifiers (M)

"P" for ICP
"A" for Flame AA
"F" for Furnace AA
"CV" for Manual Cold Vapor AA
"AV" for Automated Cold Vapor AA
"AS" for Semi-Automated Spectrophotometric
"C" for Manual Spectrophotometric
"T" for Titrimetric
"NR" if the analyte is not required to be analyzed

RI/FS

REQUEST FOR ANALYSIS

R/A Control No. 55101
C/C Control No. 49067

PROJECT NAME: Albright + Wilson
PROJECT NUMBER: 602.04.04.01
PROJECT MANAGER: J.D. Wood
BILL TO: ASI
6739 Academy Dr. NE
Albuquerque NM 87109
PURCHASE ORDER NO. ~~25.91~~ 29.93 (TM)

DATE SAMPLES SHIPPED: 9/24/91
LAB DESTINATION: IT RSL
LABORATORY CONTACT: J. Vance
SEND LAB REPORT TO: L. Rafales c/o ASI
11003 Hamilton - Cleves Hwy
Ross OH 45061
ADV 37053
DATE REPORT REQUIRED: 12/24/91
PROJECT CONTACT: D. Harmel / D. Spotta
PROJECT CONTACT PHONE NO. 513-738-3100

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
63990	Trip Blank	40 ml glass x 1	4° C	HSL VOA	
63991	Field Blank	40 ml glass x 1	4° C	HSL VOA	
63992	Groundwater	2x 40 ml glass	4°C	HSL VOA	
↓	↓	1x1L plastic	4°C HNO_3	HSL metals	
		1x1L plastic	4°C HNO_3	Total Uranium	Isotopic breakdown
		1x1L plastic	4°C	alkalinity, SO_4, Cl	
63993	Groundwater	1x 4l glass	4°C	HSL BNA semi-VOA	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard X Flammable ____ Skin Irritant ____ Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Melanie Mathew Moore Date/Time 9-24-91 ~~1600~~ 9-24-91 1620

WHITE - Original, to accompany samples

2852

IT FERNALD RI/FS ADV 37053

CHAIN-OF-CUSTODY RECORD

R/A Control No. 55101

C/C Control No. 49067

PROJECT NAME/NUMBER Albright + Wilson / 602.04.04.11

LAB DESTINATION IT RSL

SAMPLE TEAM MEMBERS T. Mulder, D. Jones

CARRIER/WAYBILL NO. Roberts 9/24/91

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
63990	Trip blank	9-22-91 1230	Blank	1 x 40ml glass	REC'D OK 4°C 9-21-91	
63991	Field Blank	↓	Blank	1 x 40ml glass		
63992	Groundwater AW-1	9-22-91 1300	Groundwater	2 x 40ml glass		
↓	↓	↓	↓	1 x 1L plastic		
				1 x 1L plastic		
				1 x 1L plastic		
63993	Groundwater AW-1	↓	↓	1 x 4L glass		

Special Instructions:

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: T. Mulder, IT, 9-22-91, 2040 hrs
   Received By: Larry Evans ASI 9-22-91 20:40
2. Relinquished By: Larry Evans ASI 9-24-91 0900
   Received By: Melanie Mayfew IT/RSL 9-24-91 1620
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples

2852

1522

IT FERNALD RI/FS

REQUEST FOR ANALYSIS

R/A Control No. 55115
C/C Control No. 49066

PROJECT NAME: Albright + Wilson
PROJECT NUMBER: 602.04.04.11
PROJECT MANAGER: J D Wood
BILL TO: ASI
6739 Academy Dr. NE
Albuquerque NM 87109
PURCHASE ORDER NO. 29.93

DATE SAMPLES SHIPPED: 09-24-91
LAB DESTINATION: IT RSL
LABORATORY CONTACT: J. Vance
SEND LAB REPORT TO: L. Rafales c/o ASI
11003 Hamilton-Cleves Hwy.
Ross OH 45061
ADV 37053
DATE REPORT REQUIRED: 12-24-91
PROJECT CONTACT: D. Harmel / D. Spatta
PROJECT CONTACT PHONE NO. 513-738-3100

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
63995	Trip blank	1 x 40 ml glass	4°C	HSL VOA	
63996	field blank	1 x 40ml glass	4°C	HSL VOA	
63997	groundwater	2 x 40ml glass	4°C	HSL VOA	
↓	↓	1 x 4L glass	4°C	HSL BNA	
		1 x 1L plastic	4°C	Alkalinity, SO4, Cl	
		1 x 1L plastic	4°C HNO3	HSL metals	
↓	↓	1 x 1L plastic	4°C HNO3	Total Uranium	Isotopic breakdown

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard X Flammable ____ Skin Irritant ____ Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab ____

FOR LAB USE ONLY
Received By Melanie Mayfew IT/ORC Date/Time 9-24-91 1620

WHITE - Original to accompany samples

28852

FERNALD RI/FS ADV 37053

CHAIN-OF-CUSTODY RECORD

R/A Control No. 55119

C/C Control No. 49066

PROJECT NAME/NUMBER Albright + Wilson / 602.04.04.11

LAB DESTINATION IT RSL

SAMPLE TEAM MEMBERS A. MORA.

CARRIER/WAYBILL NO. Roberts 9/24/91

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
63995	Trip blank	9-23-91 0720	Blank	1x 40ml glass	REC'D OK 4°C 9-24-91	
63996	Field Blank		Blank	1x 40ml glass		
63997	Groundwater AW-1		Groundwater	2x 40ml glass		
				1x 4L glass		
				1x 1L plastic		
				1x 1L plastic		
				1x 1L plastic		

Special Instructions:

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: ALEX MORA, ASI, 09-23-91, 745, [signature]
   Received By: T. Mulder, IT, 9-23-91, 745 [signature]
2. Relinquished By: T Mulder IT, 9-23-91, 0815 [signature]
   Received By: Lenny Evans ASI, 9-23-91 0815
3. Relinquished By: Lenny Evans ASI 9-24-91 0900
   Received by: Melanie Mayfew IT/ARC 9-24-91 1620
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

15

28552

2852 00005

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63990

Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2175

nple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2175

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	3	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO. 285

63990

Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2175

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2175

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn (pack/cap) PACK Dilution Factor: 1.0

mber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

WET
10/15/91

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63991

ɔ Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

ɔ Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2176

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2176

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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WET 10/15/91

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

63991

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2176

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2176

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn (pack/cap) PACK Dilution Factor: 1.0

mber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

WET
10/15/91

2852 00039

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63992

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2173

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2173

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	21	B
67-64-1	Acetone	5	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	2	BJ
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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1/87 Rev.

2852 00040

EPA SAMPLE NO.

63992

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

ab Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

ab Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

atrix: (soil/water) WATER Lab Sample ID: GG2173

ample wt/vol: 5.0 (g/mL) ML Lab File ID: GG2173

evel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

olumn (pack/cap) PACK Dilution Factor: 1.0

umber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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FORM I VOA-TIC

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1/87 Rev.

2852 00057

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

63995

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2177

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2177

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	8	B
67-64-1	Acetone	11	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

FORM I VOA

WET 10/15/91

1/87 Rev.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

63995

ab Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

ab Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

atrix: (soil/water) WATER Lab Sample ID: GG2177

ample wt/vol: 5.0 (g/mL) ML Lab File ID: GG2177

evel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

olumn (pack/cap) PACK Dilution Factor: 1.0

umber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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WET 10/15/91

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63996

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2178

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2178R

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	8	B
67-64-1	Acetone	8	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

WET 10/15/91

FORM I VOA 1/87 Rev.

2852 0076 mw

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

63996

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2178

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2178R

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn (pack/cap) PACK Dilution Factor: 1.0

mber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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FORM I VOA-TIC

WET 10/15/91

1/87 Rev.

2852 00091

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63997

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2174

mple wt/vol: 5.0 (g/mL) ML Lab File ID: GG2174

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	1	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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FORM I VOA

WET 10/15/91

1/87 Rev.

2852 • 00092

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

63997

ab Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

ab Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

atrix: (soil/water) WATER Lab Sample ID: GG2174

ample wt/vol: 5.0 (g/mL) ML Lab File ID: GG2174

evel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ Date Analyzed: 09/30/91

olumn (pack/cap) PACK Dilution Factor: 1.0

umber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

WET
10/15/91

FORM I VOA-TIC

1/87 Rev.

2852 00148

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKA093091

ab Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

ab Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

atrix: (soil/water) WATER Lab Sample ID: VBA0930

ample wt/vol: 5.0 (g/mL) ML Lab File ID: VBA0930

evel: (low/med) LOW Date Received: _____

Moisture: not dec. ____ Date Analyzed: 09/30/91

olumn: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	12	
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	2	J
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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1/87 Rev.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: VBLKA093091

b Name: ITAS-OAK RIDGE Contract: FERNALD-OU2

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: VBA0930

mple wt/vol: 5.0 (g/mL) ML Lab File ID: VBA0930

vel: (low/med) LOW Date Received: _____

Moisture: not dec. ____ Date Analyzed: 09/30/91

lumn (pack/cap) PACK Dilution Factor: 1.0

mber TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

WET
10/15/91

FORM I VOA-TIC 1/87 Rev.

2852000 mw
EPA SAMPLE NO. 00009 11-1-91

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

63993

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2179

mple wt/vol: 1000 (g/mL) ML Lab File ID: GG2179

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

NDS 10-24-91

2852 00010
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

63993

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2179

mple wt/vol: 1000 (g/mL) ML Lab File ID: GG2179

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

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(1) - Cannot be separated from Diphenylamine

28500011
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

63993

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2179

mple wt/vol: 1000 (g/mL) ML Lab File ID: GG2179

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

mber TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-43-0	2-HEPTANONE	7.30	52	J

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FORM I SV-TIC 1/87 Rev.

WO31024.S1

2852

00026

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63997

ıb Name: ITAS-OAK RIDGE Contract: ADV

ıb Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

ıtrix: (soil/water) WATER Lab Sample ID: GG2180

ımple wt/vol: 1000 (g/mL) ML Lab File ID: GG2180

ıvel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

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MDS1024.S1

2852 00027

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

63997

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2180

mple wt/vol: 1000 (g/mL) ML Lab File ID: GG2180

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

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FORM I SV-2 MDS 10-24-91 1/87 Rev.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

63997

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: GG2180

mple wt/vol: 1000 (g/mL) ML Lab File ID: GG2180

vel: (low/med) LOW Date Received: 09/24/91

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/16/91

C Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

mber TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-43-0	2-HEPTANONE	7.30	61	J

MS10-24-91

2852 0016

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKB1

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: Q2720

mple wt/vol: 1000 (g/mL) ML Lab File ID: Q2720B

vel: (low/med) LOW Date Received: _____

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/18/91

C Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

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JWS 10-24-91

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKB1

ıb Name: ITAS-OAK RIDGE Contract: ADV

ıb Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

ıtrix: (soil/water) WATER Lab Sample ID: Q2720

ımple wt/vol: 1000 (g/mL) ML Lab File ID: Q2720B

ɜvel: (low/med) LOW Date Received: _____

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

ctraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/18/91

ᵊC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-Octyl Phthalate	2	J
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 JWS 10.24.91 1/87 Rev.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKB1

b Name: ITAS-OAK RIDGE Contract: ADV

b Code: IT-MWL Case No.: 37053 SAS No.: NA SDG No.: 63990

trix: (soil/water) WATER Lab Sample ID: Q2720

mple wt/vol: 1000 (g/mL) ML Lab File ID: Q2720B

vel: (low/med) LOW Date Received: _____

Moisture: not dec. ____ dec. ____ Date Extracted: 09/30/91

traction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/18/91

C Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

mber TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 693-54-9	2-DECANONE	7.25	43	J

dw 10-24-91

FORM I SV-TIC

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ıb Name: IT_OAK_RIDGE_____ Contract: FERNALD-OU

ıb Code: ITMWL_ Case No.: 37053 SAS No.: _____ SDG No.:63990_

)W No.: 390__

EPA Sample No.	Lab Sample ID
_63992_____	__GG_2181_____
_63992_D_____	__GG_2182D_____
_63992_S_____	__GG_2183MS____
_63997_____	__GG_2184_____

ere ICP interelement corrections applied ? Yes/No YES

ere ICP background corrections applied ? Yes/No NO_
If yes - were raw data generated before application of background corrections ? Yes/No

mments:

certify that this data package is in compliance with the terms and nditions of the contract, both technically and for completeness, for her than the conditions detailed above. Release of the data contained this hardcopy data package and in the computer-readable data submitted floppy diskette has been authorized by the Laboratory Manager or the nager's designee, as verified by the following signature.

gnature: Soomi L Chung Name: Soomi L. Chung

te: 10-30-91 Title: Group Leader

2852
00002

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

63992

b Name: IT_OAK_RIDGE Contract: FERNALD-OU2

b Code: ITMWL Case No.: 37053 SAS No.: SDG No.: 63990

trix (soil/water): WATER Lab Sample ID: GG 2181

vel (low/med): Date Received: 09/24/91

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	84.0	B		P
7440-36-0	Antimony	30.0	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	23.2	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	2.8	B		P
7440-70-2	Calcium	82900			P
7440-47-3	Chromium	21.3			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	50.2	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	20700			P
7439-96-5	Manganese	183			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	1290	B		A
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	20.5			P
7440-23-5	Sodium	3120	B		P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	11.9	B		P
7440-66-6	Zinc	15.3	B		P
7439-98-7	Molybdenum	10.0	U		P
7440-21-3	Silicon	5600			P
7440-42-8	Boron	100	U	*	P
	Cyanide				NR
7440-31-5	Tin				NR

lor Before: COLORLESS Clarity Before: CLEAR Texture: N/A

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

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10-30-91

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

63997

Name: IT_OAK_RIDGE Contract: FERNALD-OU2

Code: ITMWL Case No.: 37053 SAS No.: SDG No.: 63990

trix (soil/water): WATER Lab Sample ID: GG 2184

vel (low/med): Date Received: 09/24/91

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	81.5	B		P
7440-36-0	Antimony	30.0	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	23.0	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	3.5	B		P
7440-70-2	Calcium	84200			P
7440-47-3	Chromium	22.0			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	35.9	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	20900			P
7439-96-5	Manganese	179			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	1310	B		A
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	21.1			P
7440-23-5	Sodium	3250	B		P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	13.5	B		P
7440-66-6	Zinc	12.1	B		P
7439-98-7	Molybdenum	10.0	U		P
7440-21-3	Silicon	5580			P
7440-42-8	Boron	100	U	*	P
	Cyanide				NR
7440-31-5	Tin				NR

lor Before: COLORLESS Clarity Before: CLEAR Texture: N/A

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

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3
BLANKS

b Name: IT_OAK_RIDGE_____ Contract: FERNALD-OU

b Code: ITMWL_ Case No.: 37053 SAS No.: _____ SDG No.: 63990_

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L_

nalyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
luminum	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
ntimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
rsenic	2.0	U	2.0	U					2.0	U	F
arium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
eryllium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
admium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
alcium	20.0	U	20.0	U	20.0	U	20.0	U	41.6	B	P
hromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
obalt	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
opper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
ron	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
ead	2.0	U	2.0	U					2.0	U	F
agnesium	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	P
anganese	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
ercury	0.2	U	0.2	U					0.2	U	CV
ickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
otassium	100.0	U	100.0	U					100.0	U	A
elenium	2.0	U	2.0	U	2.0	U			2.0	U	F
ilver	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
odium	100.0	U	100.0	U	100.0	U	100.0	U	100.0	U	P
hallium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
anadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
inc	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
olybdenum	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
ilicon	25.0	U	25.0	U	25.0	U	25.0	U	63.7		P
oron	100.0	U	100.0	U	100.0	U	100.0	U	100.0	U	P
yanide											NR
in											NR

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3
BLANKS

b Name: IT_OAK_RIDGE_____ Contract: FERNALD-OU

b Code: ITMWL_ Case No.: 37053 SAS No.: _____ SDG No.: 63990_

eparation Blank Matrix (soil/water): _____

eparation Blank Concentration Units (ug/L or mg/kg): _____

nalyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
luminum			60.0	U	60.0	U	60.0	U			P
ntimony			30.0	U	30.0	U	30.0	U			P
rsenic	2.0	U	2.0	U	2.0	U					F
arium			2.0	U	2.0	U	2.0	U			P
eryllium			2.0	U	2.0	U	2.0	U			P
admium			2.0	U	2.0	U	2.0	U			P
alcium			20.0	U	20.0	U	20.0	U			P
hromium			10.0	U	10.0	U	10.0	U			P
obalt			10.0	U	10.0	U	10.0	U			P
opper			10.0	U	10.0	U	10.0	U			P
ron			10.0	U	10.0	U	10.0	U			P
ead	2.0	U	2.0	U	2.0	U	2.0	U			F
agnesium			50.0	U	50.0	U	50.0	U			P
anganese			2.0	U	2.0	U	2.0	U			P
ercury											NR
ickel			20.0	U	20.0	U	20.0	U			P
otassium											NR
elenium											NR
ilver			10.0	U	10.0	U	10.0	U			P
odium			100.0	U	100.0	U	100.0	U			P
hallium			2.0	U							F
anadium			10.0	U	10.0	U	10.0	U			P
inc			5.0	U	5.0	U	5.0	U			P
olybdenum			10.0	U	10.0	U	10.0	U			P
ilicon			25.0	U	25.0	U	25.0	U			P
oron			100.0	U	100.0	U	100.0	U			P
yanide											NR
in											NR

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3
BLANKS

ab Name: IT_OAK_RIDGE_____ Contract: FERNALD-OU

ab Code: ITMWL_ Case No.: 37053 SAS No.: _____ SDG No.: 63990_

reparation Blank Matrix (soil/water): _____

reparation Blank Concentration Units (ug/L or mg/kg): _____

nalyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
luminum			60.0	U							P
ntimony			30.0	U							P
rsenic											NR
arium			2.0	U							P
eryllium			2.0	U							P
admium			2.0	U							P
alcium			20.0	U							P
hromium			10.0	U							P
obalt			10.0	U							P
opper			10.0	U							P
ron			10.0	U							P
ead											NR
agnesium			50.0	U							P
anganese			2.0	U							P
ercury											NR
ickel			20.0	U							P
otassium											NR
elenium											NR
ilver			10.0	U							P
odium			100.6	B							P
hallium											NR
anadium			10.0	U							P
inc			5.0	U							P
olybdenum			10.0	U							P
ilicon			25.0	U							P
oron			100.0	U							P
yanide											NR
in											NR

FORM III - IN

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U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

ab Name: IT_OAK_RIDGE_____ Contract: FERNALD-OU | 63992 S |

ab Code: ITMWL_ Case No.: 37053 SAS No.: _____ SDG No.: 63990_

atrix: __WATER_____ Level (low/med): _____

Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
luminum	75-125	2225.4840		83.9640	B	2000.00	107.1		P
ntimony	75-125	568.2220		30.0000	U	500.00	113.6		P
rsenic	75-125	39.0900		2.0000	U	40.00	97.7		F
arium	75-125	2021.8510		23.1560	B	2000.00	99.9		P
eryllium	75-125	50.4070		2.0000	U	50.00	100.8		P
admium	75-125	48.4200		2.7530	B	50.00	91.3		P
alcium									NR
hromium	75-125	215.3190		21.3010		200.00	97.0		P
obalt	75-125	487.8350		10.0000	U	500.00	97.6		P
opper	75-125	251.8790		10.0000	U	250.00	100.8		P
ron	75-125	1049.2100		50.1780	B	1000.00	99.9		P
ead	75-125	15.4600		2.0000	U	20.00	77.3		F
agnesium									NR
anganese	75-125	687.9380		183.1110		500.00	101.0		P
ercury	75-125	0.9200		0.2000	U	1.00	92.0		CV
ickel	75-125	502.4420		20.0000	U	500.00	100.5		P
otassium									NR
elenium	75-125	7.7400		2.0000	U	10.00	77.4		F
ilver	75-125	65.5120		20.5380		50.00	89.9		P
odium									NR
hallium	75-125	49.8500		2.0000	U	50.00	99.7		F
anadium	75-125	504.6330		11.8660	B	500.00	98.6		P
inc	75-125	496.5800		15.2810	B	500.00	96.3		P
olybdenum	75-125	1023.7580		10.0000	U	1000.00	102.4		P
ilicon	75-125	7822.1830		5595.5590		2000.00	111.3		P
oron	75-125	2131.7690		100.0000	U	2000.00	106.6		P
yanide									NR
in									NR

mments:

a
10-30-91