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TECHNICAL MEMORANDUM
LOWER AQUIFER INVESTIGATION REPORT

AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

PREPARED FOR:
ACS RD/RA EXECUTIVE COMMITTEE

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MAY 1996

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April 29, 1996

Reference No. 3481

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Dear Ms. Bianchin:

Re: Lower Aquifer Technical Memo
ACS Superfund Site - Griffith, Indiana

Please find enclosed copies of the Lower Aquifer Technical Memo.

Should you have any questions, please call.

Sincerely,

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EXECUTIVE SUMMARY

This Technical Memorandum has been prepared to summarize the investigation activities and results of the Lower Aquifer Investigation conducted at the American Chemical Service, Inc. NPL site in Griffith, Indiana during January, February, and March, 1996. The primary objectives of the investigation were to characterize the hydrogeology of the lower aquifer, define the site stratigraphy, determine the horizontal and vertical gradients, and to determine the horizontal and vertical extent of lower aquifer contamination. Results from the Lower Aquifer Investigation augment lower aquifer data presented in the June 1991 Remedial Investigation (RI) report.

Investigation activities were conducted in accordance with the Lower Aquifer Investigation SOW and SOPs, approved with modifications by the U.S. EPA on January 25, 1996. Continuous core sampling and vertical profiling across the lower aquifer were conducted at four locations using rotosonic drilling methods. Vertical profile samples were collected at ten-foot intervals from the top to the bottom of the lower aquifer and analyzed for target VOCs with an on-site field gas chromatograph (GC). Following completion of coring and vertical profiling, eight monitoring wells and three piezometers were installed in the lower aquifer at six locations. The wells were subsequently developed and sampled for VOCs, semi-volatile compounds, PCBs, and metals (total and dissolved). Continuous and "snapshot" water levels were measured in lower aquifer wells and piezometers.

Other investigation activities completed for the Lower Aquifer Investigation included evaluation and sampling of ACS production wells and identification of private wells located in the vicinity of the upper aquifer groundwater contamination detected during the Upper Aquifer Investigation.

The results of the Lower Aquifer Investigation indicate that the stratigraphy of unconsolidated deposits at the ACS site consists of an upper and lower sand aquifer separated by a clay confining layer. The thickness of the upper clay confining layer varies from 4 feet to the north to 35 feet to the south. Underlying the upper confining layer, the lower aquifer consists of homogeneous gray to brown fine sand which varies in thickness between 40 to 68 feet. Below the lower aquifer is the lower clay confining layer. It is about 12 to 20 feet thick and overlies dark gray shale bedrock.

Water levels measured on March 15, 1996 at the lower aquifer wells and piezometers indicate that the vertical gradients are relatively low and variable. Values ranged from 0.001 upward at one location, to 0.003 downward at another location. In general, the overall gradients were less than 0.001 downward. The horizontal gradient in the lower aquifer measured on March 15, 1996 was northward with a value of 0.0047. The direction of the gradient was consistent with previous measurements and the value of 0.0047 was consistent with the findings from the October 30, 1996 measurements.

Although potential VOC contaminants were indicated by the vertical profiling at two lower aquifer points, it was not confirmed by the sampling of monitoring wells at these points.

Individual VOC concentrations less than 14 ug/L were found in lower aquifer water samples collected from two ACS production wells.

The results of groundwater samples collected at the downgradient Site boundary in the lower aquifer indicate that contaminants have not migrated horizontally in the lower aquifer to the downgradient point of compliance. Therefore, no further well installations are recommended along the northern site boundary at this time. These monitoring wells will be included in the quarterly monitoring program to provide ongoing confirmation of compliance, or provide an indication of future contaminant migration

The bottom of the zone of contamination in the lower aquifer in the vicinity of existing monitoring well MW9 was successfully confirmed by the placement of MW29 during this investigation. Therefore no further investigation or monitoring well installations are recommended at this location. However these points will be included in the monitoring program.

A new zone of upper aquifer contamination was delineated during the Upper Aquifer Investigation. After new monitoring wells have confirmed the boundaries of upper aquifer contamination, recommendations will be made for additional lower aquifer monitoring wells in this area, if necessary, to evaluate the effects of this plume on the lower aquifer.

The nature of the contamination in the lower aquifer at the Site has been defined to date by the compounds detected at monitoring well MW9 and in the samples from the ACS production wells IW1 and IW4. Given the high levels of contamination inside the ACS Site and the strong downward gradients from the upper to lower aquifers, additional lower aquifer wells within the Site boundaries should be deferred until after the upper aquifer groundwater treatment system is operational. At that time, the highly contaminated areas will be dewatered and the strong downward gradient will be eliminated.

Upon U.S. EPA approval, the two abandoned and the four currently used ACS production wells be sealed and permanently abandoned.

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INTRODUCTION

This Technical Memorandum summarizes the investigation activities and results of the Lower Aquifer Investigation conducted at the American Chemical Service, Inc. NPL site in Griffith, Indiana during January, February, and March 1996. The investigation was conducted in accordance with the Lower Aquifer Investigation SOW and SOPs, approved with modifications, by the U.S. EPA on January 25, 1996. Results from the Lower Aquifer Investigation augment the lower aquifer data presented in the June 1991 Remedial Investigation Report (RI).

1.1 OBJECTIVES

The objectives of the Lower Aquifer Investigation were to:

1. Determine the stratigraphy of the lower aquifer.

2. Determine the horizontal and vertical extent of lower aquifer groundwater contamination.

3. Determine if contaminants have reached the downgradient point of compliance from the Site and if so, determine their vertical concentration profile in the lower aquifer.

4. Determine the horizontal and vertical gradients in the lower aquifer.

5. Determine if dense, non-aqueous phase liquids (DNAPLs) are present in the lower aquifer.

1.2 SCOPE OF WORK

The following activities were completed to meet the objectives of the Lower Aquifer Investigation:

- Continuous core samples of the lower aquifer matrix material were collected to the base of the lower aquifer at four locations using a rotosonic drilling method.
- Vertical profiling was conducted across the lower aquifer at four locations. Groundwater samples were collected at ten-foot intervals from the top to the bottom of the lower aquifer and analyzed for target VOCs with the on-site field gas chromatograph (GC).
- Eight monitoring wells and three piezometers were installed in the lower aquifer at six locations.
- Water levels were measured in lower aquifer wells and piezometers.
- The four current ACS production wells were sampled for VOCs.
- Chemical time-series samples were collected at ACS production well IW1 and analyzed with the field GC.
- The two abandoned ACS production wells were inspected.
- Water levels were measured and recorded in two monitoring wells and one piezometer continuously for approximately 30 days.
- Residences and industries located southeast of the ACS facility were reviewed to identify private wells in the vicinity of the upper aquifer contamination detected during the Upper Aquifer Investigation.

2

Field Activities

2.1 DRILLING

2.1.1 Setting Casing

Surface casing was initially installed at all boring locations to prevent interaction between the upper and lower aquifers. The eight-inch diameter casings were set, using a hollow stem auger drilling rig, into the top 12 inches of the clay confining layer (at a minimum) and sealed with cement bentonite grout.

2.1.2 Continuous Coring

Borings into the lower aquifer were conducted at six well locations surrounding the ACS facility: MW9, MW10, MW8, MW7, MW28, and M4 (Figure 1). At the first boring at each of the six locations, continuous core samples were collected with rotosonic drilling methods, starting at the base of the surface casing and continuing to the base of the lower aquifer. Cores were collected in ten foot lengths, extruded into core sleeves and stored in boxes staged on site. The cores were evaluated, logged, photographed, and screened for the presence of VOCs in the aquifer matrix using the PID headspace method. Table 1 identifies the number and location of continuous cores collected during the Lower Aquifer Investigation.

Drilling was conducted in accordance with the approved Sonic Drilling Sampling Protocol SOP for the Lower Aquifer Investigation (revision: January 25, 1996) with the following exception:

- Borings were extended to bedrock at the MW17 and MW10 locations. Because potential VOC contamination was indicated during vertical profiling at the base of the aquifer at MW8, the remainder of the borings were completed to the top of the lower clay confining unit located directly above bedrock. This was done to prevent the borehole from providing a possible conduit for vertical migration of contaminants from the lower aquifer to bedrock.

Boring logs for lower aquifer wells and piezometers are included in Appendix A.

2.1.3 Vertical Profiling

The objective of determining the presence of DNAPLs and screening for the vertical and horizontal extent of VOCs in the lower aquifer was accomplished by vertical profiling at four downgradient locations. Vertical profile samples, labeled with a VP designation, were collected at MW9 (VP1), MW10 (VP2), MW8 (VP3) and M4 (VP4) (Table 1). The locations of the vertical profile samples are shown on Figure 1.

After each ten-foot core run was extracted from the borehole, a power punch was inserted into the zone that was just cored. The water-tight power punch casing was subsequently retracted to expose a four-foot long, 1.75-inch diameter screen. Groundwater was then purged and sampled using a submersible pump and low-flow sampling methods.

Vertical profiling was conducted in accordance with the approved Sonic Drilling Sampling Protocol SOP for the Lower Aquifer Investigation (revision: January 25, 1996) with the following exceptions:

- Fine sandy soils were encountered during the vertical profiling activities. These sands often caused the screen of the power punch to become clogged. To address this difficulty, with concurrence from the U.S. EPA, filter pack sand was placed inside the power punch screen prior to installation to prevent sand from flowing into the power punch.

- The power punch was typically installed near the top of the cored interval rather than the center (i.e., if the core run was 25 to 35 feet, the power punch was installed from 25 to 29 feet). The modification was necessary because of the drilling platform heights and lengths of drill strings.

Vertical profiling purging and sampling information is presented in Appendix B.

2.1.4 Field GC

Groundwater samples from the vertical profiling were screened for target VOCs using a field GC. The target VOC list included the following compounds: acetone, 1,1-dichloroethene (1,1-DCE), cis- and trans-1,2-dichloroethene, methyl ethyl ketone, 1,2-dichloroethane (1,2-DCA), 1,1,1-trichloroethane (1,1,1-TCA), benzene, carbon tetrachloride, trichloroethene (TCE), methyl isobutyl ketone (MIBK), 1,1,2-trichloroethane, toluene, tetrachloroethene (PCE), chlorobenzene, ethylbenzene, m+p xylene, styrene and o-xylene.

All field GC analyses were performed in accordance with the approved SOP for the Lower Aquifer Investigation (Field GC - Purgeable Volatiles Analysis Protocol, revision: January 25, 1996).

2.2 WELLS AND PIEZOMETERS

2.2.1 Installation

Following completion of continuous coring at vertical profile locations, a monitoring well or piezometer was installed at the base of the aquifer. At each location, a second monitoring well or piezometer was then set at the approximate midpoint of the lower aquifer in a second borehole, which was not cored. At MW7 and MW28, where vertical profiling was not conducted, the first boring was cored to the base of the aquifer and a well or piezometer was screened at the base of the lower aquifer. A second boring was then installed at the approximate midpoint of the lower aquifer.

With the exception of location M4, where a thicker clay confining layer was encountered, each lower aquifer drilling location presently contains three screened devices (monitoring wells or piezometers), one near the base of the lower aquifer, one at the approximate midpoint of the lower aquifer, and one at the top of the lower aquifer. A summary of monitoring well and piezometer installation activities is presented in Table 1. Monitoring well and piezometer coordinates, ground and top-of-casing elevations, and construction details are presented in Table 2.

Well and piezometer installation was conducted in accordance with the approved Sonic Drilling Sampling Protocol SOP for the Lower Aquifer Investigation (revision: January 25, 1996) with the following exceptions:

- Because VOCs were detected at the base of the lower aquifer at MW8, with U.S. EPA concurrence, the deep PVC piezometer scheduled for installation at the base of the lower aquifer was replaced with a two-inch diameter stainless steel monitoring well with a ten-foot screen. This was not done at MW17 which was installed before the results from MW8 were available. However, the planned piezometers were replaced by monitoring wells in the lower zone at MW7, MW8, MW9, MW10 and M4 locations following U.S. EPA approval.

- Because the lower aquifer was thinner than estimated in the work plan (the bottom of the lower aquifer was encountered at an elevation of approximately 540 feet rather than 510 feet estimated in the Work Plan), wells or piezometers installed in the middle zone were not screened at the 550 foot elevation. Screen elevations for wells and piezometers are shown on Table 2. Vertical placement of the wells or piezometers in the middle zone of the lower aquifer was based on placement criteria stated in the Lower Aquifer Investigation SOW. This criteria indicated that wells or piezometers would be installed either at a depth exhibiting the highest concentrations of contamination detected by the vertical profiling, or, if no contamination was found, the well or piezometer would be installed at a depth representative of the middle zone of the aquifer.

- At the M4 location, the upper confining layer was significantly thicker than observed elsewhere at the ACS site and the lower aquifer correspondingly thinner.

The thickness of the lower aquifer at this location was approximately 40 feet. Because of the reduced thickness of the lower aquifer, only two screened devices are presently installed at the M4 location; monitoring well MW35 at the base of the lower aquifer, and existing well M4 screened at the top of the aquifer. The elevation of the upper zone at existing well M4 is laterally equivalent in elevation to the other middle zone wells installed during the lower aquifer investigation. Surface casing which was installed at M4 for placement of the middle zone well was left intact and sealed at the ground surface. The U.S. EPA oversight contractor was informed of the field judgment call not to install the third piezometer vertically between M4 and MW35. It is recognized that a middle zone well or piezometer could be installed at this location at a later date, if necessary, using the existing surface casing.

- Item number VI.B.6.c. of Installation of Wells and Piezometers in the SOP contains an error. The SOP states that six inches of fine sand should be placed above the bentonite seal. Actually, the fine sand is intended to prevent intrusion of the bentonite seal into the filter pack. Therefore, the fine sand was placed between the filter pack material and the bentonite seal. This field modification was made at all wells with the concurrence of the U.S. EPA oversight contractor.

- The protective covers were not set in a bed of sand. This was not done because the base of the protective covers were placed inside permanent casings installed as part of the surface casing installation activities. The permanent casings would not allow for drainage of water to occur that may have accumulated inside the protective cover. Weep holes were subsequently drilled into the stick-up well protectors to allow drainage of water.

- Brass locks were installed on all new wells and piezometers. Therefore, the locks did not require lubrication as stated in the SOP.

Well construction forms for lower aquifer wells and piezometers are included in Appendix C.

2.2.2 Development

Following installation of monitoring wells and piezometers in the lower aquifer, the wells and piezometers were surveyed and developed. Development was conducted in accordance with the approved March 1996 Well Development SOP for the Lower Aquifer Investigation with the following exceptions:

- Monitoring wells MW31, MW32, and MW33 were each surged for ten minutes using a bailer rather than the 20 to 30 minutes indicated in the SOP. After development of all wells except MW31, MW32, and MW33, it was apparent that using the submersible pump to surge the wells during development was more effective in removing sediment from the filter pack than the bailer. Additionally, by using the pump to surge the well, specific zones within the well screen were

incrementally developed by slowly raising and lowering the pump through the screened interval during purging. This field modification was made with the concurrence of the U.S. EPA oversight contractor.

- The submersible pump was not allowed to rest stationary at the well bottom. If the pump motor was positioned at the base of the pump (and not the intake), resting the pump at the bottom of the well would not let water flow around the motor and could potentially cause the pump to overheat. Additionally, the use of the pump to surge the well did not allow the pump to remain stationary at the bottom of the well.

- The relative recovery of the wells was not measured following development. This was not done because the pump was not equipped with a check valve to prevent backflow of water contained in the pump hosing from flowing back into the well. Therefore, as soon as the pump was turned off, the water contained within the pump hosing would flow back into the well and cause the water level in the well to become artificially recharged. Measurement of recharge would then be biased by the volume of water contained within the hose.

Well development forms are included as Appendix D.

2.3 WATER LEVELS

2.3.1 Continuous Measurements

To further evaluate the hydraulic characteristics in the lower aquifer, continuous water level readings were monitored with transducers and data loggers at MW7, MW9, and P-8 for a period of approximately 30 days during the lower aquifer investigation. The continuous monitoring was conducted to provide an extended record of variability of water levels in the upper and lower aquifers at the site.

Continuous monitoring activities were performed in accordance with the approved SOP for the Lower Aquifer Investigation (Groundwater Level Monitoring using Two-Channel Hermit Data Logger, April 1993) contained in the January 25, 1996 Lower Aquifer Investigation SOW and SOP. The data loggers were checked and downloaded every five to seven days to ensure they were functioning and recording representative data.

2.3.2 Snapshot Gauging Event

To determine horizontal and vertical gradients in the lower aquifer, water level measurements were made at new and existing lower aquifer wells and piezometers on March 15, 1996. Lower aquifer wells at the City of Griffith landfill (M1 through M5) were not measured because access could not be obtained from the landfill's consultant during the time frame requested.

2.4 ACS PRODUCTION WELLS

2.4.1 Current Wells

Four existing and two abandoned production wells were identified at the ACS facility in the Lower Aquifer SOP. Wells IW1 through IW4 are active wells which are currently used by ACS. The wells consist of four inch diameter casing which were formerly operated on a daily basis. The four active wells were sampled during the lower aquifer investigation and samples were analyzed by the laboratory for TCL VOCs. Sampling was conducted in accordance with the approved SOP, Active Production Well Evaluation and Sampling, for the Lower Aquifer Investigation (revision: January 25, 1996).

2.4.2 Abandoned Wells

The abandoned production wells IW5 and IW6 were inspected and field evaluated to determine:

- The surrounding casing and physical condition of the casing
- The total well depth and the depth to water
- The presence of any non-aqueous phase liquid in the well
- The feasibility of reclosing the well

Evaluation of the abandoned ACS production wells was conducted in accordance with the approved SOP, Abandoned Production Well Evaluation for the Lower Aquifer Investigation (revision: January 25, 1996).

2.4.3 Time-Series Sampling

On February 23, 1996, a series of water samples was collected from production well, IW1, during continuous pumping. The objective of the time-series sampling was to document variability in the concentrations of VOCs in IW1 (see Section 5.2) behaved in response to the continuous withdrawal of water from the well. Sampling was conducted in accordance with the approved SOP, Active Production Well Evaluation and Sampling for the Lower Aquifer Investigation (revision: January 25, 1996). Because the well was operated continuously over the eight hour period of sampling, it was assumed that the running water was representative of new formation water. Therefore, temperature measurements were not collected during sampling.

2.5 MONITORING WELL SAMPLING

To determine the horizontal and vertical extent of contamination in the lower aquifer and confirm the results of the vertical profiling, new lower aquifer monitoring wells at the site were sampled on March 12 to 14, 1996 for VOCs, semi-volatile compounds, PCBs and metals (total and dissolved). Sampling was conducted in accordance with the approved March 1996 Groundwater Monitoring Well Sampling SOP for the Lower Aquifer Investigation with the following exception:

- For dissolved metals analysis, the samples were not filtered using an in-line filtering device connected to the discharge line of the sampling pump. The inside diameter of the line was too large to provide a sufficient seal to allow water to pass through the filter. Therefore, filtering was conducted by filling a one-liter polyethylene container with the water sample and using a peristaltic pump with an attached 0.45 micron in-line filter to pump water through the filter. The sample was filtered immediately (within ten minutes) following collection.

Monitoring well sampling forms are included as Appendix E.

2.6 PRIVATE WELL IDENTIFICATION

Although not included in the Scope of Work for the Lower Aquifer Investigation, a private well identification process was initiated in the vicinity of the ACS site because of findings in the Upper Aquifer Investigation. The well search was intended to build on the well location data presented in the RI report and the Upper Aquifer Technical Memorandum. Well identification was focused on homes and businesses located along South Colfax Avenue and Main Street in the vicinity of ACS, and along Reder Road, Arbogast Avenue, and Avenue H. As discussed in the Upper Aquifer Technical Memorandum, based on the dimensions of the VOC plume in the upper aquifer, well locations in this area may be susceptible to potential VOC migration along the well casing from the upper to lower aquifer.

3

HYDROGEOLOGY OF THE LOWER AQUIFER

3.1 GEOLOGY

The geology and stratigraphy of the unconsolidated aquifers and confining layers was developed from a detailed inspection of the continuous cores, and grain size tests from discrete intervals in each of the six boring locations. Boring logs for existing well locations (MW9, MW10, MW8, MW7, MW28, and M4) are presented in Appendix A1; boring logs generated during the Lower Aquifer Investigation are included in Appendices A2 through A7. Stratigraphic depths, elevations and thickness of geologic units encountered at the site are summarized in Table 3. A location map of cross sections through the site is presented in Figure 2. Figure 3 shows the western cross section through the monitoring well locations PZ43, MW35, MW34, and MW33; Figure 4 presents the eastern cross section through PZ43, MW36, and MW8. Grain size distribution test results are presented in Table 4 and grain size reports are included in Appendix F.

As shown by the cross sections, the unconsolidated stratigraphy of the ACS site is generally uniform and consists of an upper and lower sand aquifer separated by a clay confining layer. Another clay confining layer was identified between the lower aquifer and the bedrock (Figures 3 and 4). Each of these hydrogeologic units is described below.

3.1.1 Upper Aquifer

Based on geotechnical results presented during the March 1996 Barrier Wall Alignment Investigation Report, soils of the upper aquifer are generally classified as a fine to coarse sand with a trace to some silt and clay. The soils encountered were classified with the Unified Soil Classification System (USCS) symbols of SP, SP-SM, and SM. The upper aquifer varied in thickness from approximately 27.5 feet at MW28 southeast of the site to 13.5 feet at MW33 to the northwest. At MW35, the upper aquifer was only 13 feet thick, which may be due to excavation activities at the Griffith landfill. More data on the geology of the upper aquifer is presented in the June 1991 Remedial Investigation (RI) Report

3.1.2 Upper Clay Confining Layer

From the RI investigation, it was evident that the upper clay confining layer was greater than 20 feet thick to the south of the site and that it thinned to less than five feet north and west of the ACS Site.

However, even after making three boreholes to install MW10C during the RI, uncertainty remained regarding the thickness of the confining clay layer in an area 300 feet northwest of the ACS facility (Figure 2). Three boreholes were made in March and April 1990 to place a well at the MW10C location. The drillers experienced difficulty in maintaining an open hole and collecting representative samples. The boring logs for MW10A, MW10B, and MW10C are included in Appendix A1, and these show the uncertainty in the thickness of the clay layer that remained after the RI. Approximately 3.5 feet of lean clay was indicated between a depth of 15.5 and 19 feet at boring MW10A. Approximately four feet of silty and sandy clay were indicated between a depth of 17 and 21 feet at MW10B. Approximately four feet of clay and silty clay were indicated at a depth of 16 feet in the borehole for MW10C.

During the RI, to evaluate the potential that this location might represent a discontinuity in the clay confining layer, a monitoring well was placed at borehole MW10C (Figure 2). Although the logs indicate thin clay layers that are silty and sandy, the hydraulic data has indicated that a low permeability layer does exist. The water levels in monitoring well have been consistently similar to the lower aquifer rather than the upper aquifer levels. The water level elevation at MW10C at the October 30, 1996 water level measurement was 619.77 feet msl. The water table elevation in the upper aquifer in the vicinity of MW10C was 629.15, as indicated by piezometer P-25. These water levels indicate that the strong downward gradient that exists elsewhere on site, where the clay confining layer has been confirmed to exist, also is found at location MW10C.

Borings made during the RI and the Dewatering/Barrier Wall Investigation show that the upper surface of the clay confining layer is consistently encountered at an elevation of approximately 620 feet msl. The 620 foot msl elevation was further confirmed at the six boring locations for this investigation of the lower aquifer. The clay confining layer is generally classified as clay with a USCS symbol of CL. The thickness of the confining unit documented during the lower aquifer investigation was consisent with the findings in the RI. It appears to thin from the south to northwest (Figure 3). At the southern portion of the site at MW35 and PZ43, the clay is 35 feet thick and 31 feet thick, respectively. At the northern side of the site, at MW33, the clay thickness is four feet thick.

According to the rigid-wall falling head permeability testing performed for the Barrier Wall Alignment Report (U.S. Army Corps of Engineers Method EM 1110-2-1906 (VII)), the permeability of the upper clay confining layer ranged from 1.7×10^{-8} cm/s (centimeters per second) to 2.4×10^{-8} cm/s based on relatively undisturbed Shelby tube samples (these results are similar to the results obtained in the RI). Liquid and plasticity limits ranged from 28 to 30% and 11 to 14%, respectively.

3.1.3 Lower Aquifer

The top of the lower aquifer was encountered at elevations ranging from 614 feet at MW33 located northwest of the ACS facility to 584 feet msl at MW35 (Figure 3; Table 3). Where the upper clay layer was thinner (MW33), the top of the lower aquifer was found at higher elevations.

The geology of the lower aquifer is homogeneous, consisting of gray to brown, dense, fine sand, with a trace of silt and clay (Appendix A). Grain size analyses of grab samples taken from various depths during rotosonic drilling indicates the general uniformity of the lower aquifer, with most sand fractions accounting for more than 90 percent of the total grain size fraction (Table 3). The soils encountered were classified with the USCS classification symbols of SP, SP-SM, and SM. No varves or bedding planes were evident in any of the continuous cores. In general, the rotosonic drilling appeared to provide relatively undisturbed cores of the unconsolidated lower aquifer material.

Some intervals within the lower aquifer contain occasional zones with more gravel or silt and clay fractions. At PZ43, basal sand and gravel was found at a depth of 96 to 98 feet immediately overlying the lower clay confining unit (Appendix A). At MW35, the lower aquifer contains more gravel at a depth of 48 to 55 feet (32% gravel at 55 feet; Table 4) and is siltier from 82 to 88 feet (14% silt and clay at 85 feet; Table 4). At MW31 and MW32, fine to coarse sand was encountered from 64 to 78 feet, and a cobble was found at 69 feet (Appendix A). Grain size analysis of a grab sample at 70 feet from MW31 indicated a gravel percentage of 13% (Table 4).

Based on borings made through the lower aquifer, the basal surface of the lower aquifer is relatively flat and ranges between 540 and 550 feet msl (Table 3). The thickness of the lower aquifer varies between approximately 40 feet to the south (MW35 and PZ43), and 65 feet to the north and northwest (MW32 and MW33).

3.1.4 Lower Confining Layer

A lower clay confining unit underlies the sands of the lower aquifer at elevations between 540 feet to 550 feet msl (Table 3). This lower confining unit consists of predominantly stiff, gray, lean silty clay with a trace of fine sand and gravel (Appendix A). The thickness of the lower confining unit was penetrated at the PZ43 and MW33 locations. At these locations, the clay unit was 12.5 feet and 20 feet thick, respectively.

3.1.5 Bedrock

Dark gray shale was the uppermost bedrock unit encountered at the site. Shale was found at PZ43 and MW33 locations at elevations of 538 feet and 527 feet msl, respectively. No other borings were extended through the lower clay during the Lower Aquifer Investigation.

3.2 WATER LEVEL MEASUREMENTS

Water level measurements were made at new and existing lower aquifer wells on March 15, 1996. Lower aquifer wells at the City of Griffith landfill (M1 through M5) were not measured because access could not be obtained from the landfill's consultant in the time frame available. The measured water level depths and calculated groundwater elevations are tabulated in Table 5. Depth to water in the lower aquifer ranged between 11.16 feet at MW23 to 25.80 feet at MW28 (Table 5).

The average water level elevation in the lower aquifer was approximately 622 feet msl. Water levels in the upper aquifer averaged approximately 630 feet msl as reported in the Upper Aquifer Investigation Technical Memorandum

3.3 VERTICAL GRADIENTS

Table 6 presents vertical hydraulic gradients measured between nested wells installed in the lower aquifer. Vertical gradients were calculated by dividing the difference in head between nested wells by the distance between the screen midpoints for the wells. Because access could not be obtained at M4, the vertical gradients between M4 and MW35 could not be determined.

Vertical gradients ranged from 0.001 feet upward between PZ42 and PZ43 installed in the middle and lower zones of the aquifer, to 0.003 feet downward between MW10 and MW30 installed in the upper and middle zones of the lower aquifer (Table 6). The greatest difference in groundwater elevation between nested wells was 0.11 feet at MW10 and MW30. Because of the head difference observed between MW10 and MW30, the continuous core collected at this location (MW33 core) was reexamined. A slight coarsening in sand grain size was observed between the upper portion of the lower aquifer screened by MW10 and the middle portion of the lower aquifer screened by MW30. No evidence of silt or clay layers was found in the core at this depth.

Other lower aquifer well nests exhibited head differences less than 0.10 feet (Table 6). Well nests, MW8/MW32, MW9/MW34, and MW28/PZ43, did not exhibit any vertical gradients between wells installed at the top of the lower aquifer to wells installed at the bottom of the aquifer. The lack of vertical gradients in the lower aquifer suggests that groundwater flows horizontally in the aquifer.

Based on the difference in groundwater elevation between the upper and lower aquifer (approximately 8 feet), there is a strong downward vertical gradient through the upper confining layer between the two aquifer systems. Using an average water level difference of 8 feet between the upper and lower aquifers, and considering the upper confining layer thickness at MW35 (35 feet thick) and MW33 (4 feet thick) to bound the range of thicknesses for the confining unit, the vertical gradients calculated between the two aquifer ranged from 0.23 to 2, respectively. This suggests that the low permeability of the upper confining layer (2×10^{-8} cm/s) provides a substantial barrier to vertical groundwater flow between the two aquifers.

3.4 GROUNDWATER FLOW DIRECTION

Figure 5 shows the groundwater potentiometric surface in the lower aquifer. The direction of horizontal groundwater flow in the lower aquifer is generally northward. This information is based on water levels measured in lower aquifer wells installed at the top of

the aquifer. These wells were utilized for groundwater flow determinations because: 1) most lower aquifer wells at the ACS site are screened at the top of the aquifer which subsequently provide more data points for the potentiometric surface contour plot; 2) water level data from the top of the lower aquifer are comparable to water level data previously collected for the lower aquifer; and 3) the lack of consistent vertical gradients in the lower aquifer suggests that horizontal flow at the top of the aquifer is the same as horizontal flow at the base of the aquifer. The northward direction of groundwater flow in the lower aquifer is consistent with lower aquifer data presented in June 1991 RI and the October 30, 1995 Technical Memorandum.

The horizontal hydraulic gradient in the lower aquifer was determined to be 0.0047, as measured from MW22 located in the southern portion of the site, to MW10 located at the northern site boundary. The gradient was determined by dividing the difference in head between the two wells (1.35 feet) by the lateral distance (2,850 feet). The resultant gradient (0.0047) is consistent with lower aquifer gradients presented in the RI report (gradient = 0.006) and the October 30, 1995 Technical Memorandum (gradient = 0.0041). Based on the March 15, 1996 water level measurements, the horizontal gradient ranges from 1.5 to more than five times the vertical gradients that were detected at the site.

3.5 CONTINUOUS WATER LEVEL MEASUREMENTS

Continuous water level measurements were recorded at three monitoring wells during the Lower Aquifer Investigation using pressure transducers and data loggers. Two wells monitored the upper and lower aquifer at one location (P8 and MW7, respectively) and one well (MW9) monitored the lower aquifer at a second location. The data collection activities are summarized below:

Well No.	Start Date	Start Time	End Date	End Time
P8	2/7/96	1610	3/5/96	1130
MW7	2/7/96	1610	3/5/96	1130
MW9	2/2/96	1000	3/5/96	1220

Due to a data logger malfunction, water level information at P8 and MW7 from February 2 to February 7, 1996 was not collected. Figure 6 shows a plot of the continuous water levels for the nested pair, P8 and MW7, and Figure 7 presents a plot of MW9. Raw data and plots of continuous water levels over consecutive ten-day periods are included in Appendix G.

The continuous water level data for all three wells show a similar pattern of fluctuations in response to environmental conditions. At the nested well pair, P8 and MW7, the upper aquifer well P8 appears to exhibit greater magnitude of fluctuation than the lower aquifer well, MW7, although the water level trends between the two aquifer systems are similar. The total variability in water levels exhibited by the three wells during the period of

continuous monitoring was approximately 0.7 feet in P8, 0.95 feet in MW7, and 1.0 feet in MW9 (Figures 6 and 7).

At both lower aquifer monitoring locations (MW7 and MW9), an increase in hydraulic head is noted over the last four days of continuous monitoring (February 27 through March 2). This increasing trend is also apparent in upper aquifer piezometer P8 on February 27 and 28. After February 28, the change in head in P8 stabilizes, whereas the lower aquifer wells, MW7 and MW9, continue to increase until March 2 (Figures 6 and 7).

4

ANALYTICAL RESULTS

4.1 VERTICAL PROFILE SAMPLING RESULTS

Target VOC analytical results for vertical profile samples collected at MW9 (VP1), MW10 (VP2), MW8 (VP3), and M4 (VP4) are presented in Table 5. A total of 24 vertical profile samples were collected and analyzed with a field GC during the Lower Aquifer Investigation at the four locations. Seven samples were taken at approximate ten-foot intervals at MW9 and MW10, six samples were collected at MW8, and, due to the thickness of the overlying clay confining layer, four samples were obtained from the lower aquifer at M4.

Acetone was the only target VOC detected at MW9 (VP1) and MW10 (VP2) during the vertical profiling (Table 6). Acetone was detected at 10 ug/L in the sample collected at a depth of 39 feet at MW9, whereas at MW10, acetone was detected at 37.7 ug/L in the sample collected at a depth of 29 feet. Cis-1,2-dichloroethene and 1,2-dichloroethane were detected in samples collected at MW8 (Table 6). Cis-1,2-dichloroethene was indicated at a concentration of 10 ug/L in a sample collected at 69 feet and 1,2-dichloroethane was indicated at 56.5 ug/L (63 ug/L with a duplicate) in a sample collected at a depth of 99 feet.

No target VOCs were detected in vertical profile samples collected at M4.

4.2 LABORATORY ANALYTICAL RESULTS

New lower aquifer monitoring wells were sampled at the site on March 12 to 14, 1996 for VOCs, semi-volatile compounds, PCBs and metals. Laboratory analytical results for metals are presented in Table 7. Laboratory analytical reports from IEA for VOCs, semi-volatile compounds and PCBs are included in Appendix H, and laboratory analytical reports for metals are included in Appendix I.

4.2.1 VOCs

The RI indicated that the lower aquifer was contaminated in the vicinity of monitoring well MW9. RI sampling indicated concentrations of chloroethane in the lower aquifer between 440 ug/L and 200 ug/L. The vertical profiling was conducted at the MW9 location to determine the vertical extent (depth) of contamination in the lower aquifer at this location. Monitoring well MW29 was installed specifically to sample the base of the zone of contamination. Chloroethane was estimated at a concentration of 2 ug/L (J-value) in the sample collected from MW29 during March 1996. This trace concentration is an indication

that the zone of contamination extends from to a depth of approximately 60 feet in the lower aquifer. No other VOCs were detected in monitoring well samples (Appendix H).

4.2.2 Semi-volatiles and PCBs

Bis(2-ethylhexyl)phthalate was detected in samples collected from MW29, MW30, MW32, and MW35 at concentrations ranging between 11 ug/L and 68 ug/L (Appendix H). This compound is a potential laboratory contaminant. It is used primarily as a plasticizer for producing plastics such as polyvinyl chloride (*Handbook of Environmental Data on Organic Chemicals, Second Edition*, Verschueren, 1983). Phenol was detected at an estimated concentration of 6 ug/L in MW33. No other semi-volatile organics or PCBs were detected in monitoring well samples (Appendix H).

4.2.3 Metals

Groundwater samples from new lower aquifer wells were analyzed for total and dissolved metals (Table 8). Major groundwater constituents, calcium, magnesium and sodium were detected at the highest concentrations in the lower aquifer, followed by detections of minor metal constituents, iron, potassium, manganese, and aluminum (Table 8). Other metals were generally not detected or were found below quantitation limits ("B" designation on Table 8).

The highest metals concentrations were generally detected at MW33 (northwest portion of the site). Several total and dissolved constituents were found in this well at levels three to five times concentrations detected in other wells at the site, including concentrations detected in nested well MW30. The highest concentrations were associated with major and minor groundwater constituents (calcium, magnesium, and sodium, iron, potassium). Other metals detected in this well include cadmium (1.4 ug/L), cobalt (6.1 ug/L), thallium (3.8 ug/L) and vanadium (1.8 ug/L).

Due to the low turbidity achieved during low flow sampling (Appendix E), most total metals analyses are directly comparable to dissolved analyses. Aluminum and iron (abundant clay mineral components) appear to be the constituents most variable between total and dissolved groundwater samples.

5

ACS PRODUCTION WELLS

5.1 EVALUATION OF PRODUCTION WELLS

There are four active production wells and two abandoned production wells at the ACS site. Information regarding the status of the existing wells and recommendations for abandoning the closed wells was presented in an April 5, 1996 memorandum from Montgomery Watson to U.S. EPA. This memorandum (with a revised "recommendations" section) is included in Appendix J.

The following summarizes the status of each well:

Well No.	Status
IW1	ACS refers to this well as the *Reclaim Production Well.* All water used from this well is for make-up in a non-contact cooling water system. The well is also available for fire protection, using a booster pump.
IW2	ACS refers to this well as the *Boiler Well.* When the ACS facility was connected to the public water supply on January 8, 1996, the well was converted to an emergency back-up water supply well. This well was the primary feed well to the main office, and for the boiler system to make steam. Drinking water in the office was treated by a reverse osmosis system.
IW3	ACS refers to this well as the *Additives Facility Production Well.* Its primary use is for fire protection, using a booster pump. It is also available for minimal process use.
IW4	ACS refers to this well as the *Epoxol Well.* This well supplies process water in the Epoxol building, and also provides water for employee showers in the locker room. The water is not used as a drinking supply. A water cooler is used in the building to supply bottled water.
IW5 (Abandoned)	ACS estimates that IW5 was taken out of service in the early 1970s. This well is locating near the blending facility. The surface exposure is a

two-inch diameter steel or galvanized metal pipe with a threaded cap, sticking up approximately two inches above the ground surface. The PID reading immediately upon removing the threaded cap was 43 ppm. Water was measured at a depth of approximately 3.3 feet below ground surface. During the inspection, an obstruction was encountered 3.5 feet below ground surface. ACS personnel attempted to removed the obstruction but simply pushed it a few inches deeper. Therefore, it was not possible to determine the total depth of the well.

IW6 (Abandoned)

ACS estimates that IW6 was taken out of service in the mid 1960s. This well is located just outside the main office building at the ACS facility. The two-inch steel or galvanized pipe sticks up approximately two feet above the ground surface. A threaded cap was removed from the well. No obstructions were encountered in the well. The water level was found to be 3.4 feet below ground surface. The oil/water interface probe used to measure the depth to water did not indicate the presence of oil or free-phase liquid on top of the water. However, the probe had an oily sheen upon withdrawal from the well. To eliminate the potential of carrying the sheen-material deeper into the aquifer, the probe was not lowered deeper in the well. Upon withdrawal from the well, the probe had accumulated a coating of white residue, where it had bumped against the inside of the casing.

5.2 PRODUCTION WELL SAMPLING RESULTS

Groundwater samples were collected from the four active production wells on February 6, 1996. Laboratory analytical results are presented in Table 9 and the laboratory analytical reports are included in Appendix K.

VOCs were detected in IW1 and IW4 (Table 9). In IW1, tetrachloroethene, acetone and 2-butanone were found at concentrations at or above 10 ug/L (10 ug/L in duplicate IW1-91, 14 ug/L and 11 ug/L, respectively), and other VOCs were detected at estimated concentrations less than 10 ug/L. Other detected VOCs included 1,2-dichloroethene (total), trichloroethene, 1,1,2-trichloroethane, bromoform, 4-methyl-2-pentanone and 1,1,2,2-tetrachloroethane. In IW4, xylene was detected at a concentration of 13 ug/L, and toluene and ethylbenzene were estimated at concentrations of 1 ug/L (J), and 4 ug/L (J), respectively (Table 9).

VOCs were not detected in water samples collected from IW2 and IW3.

5.3 TIME-SERIES SAMPLING OF IW1

A time-series of water samples was collected from production well IW1 during continuous pumping on February 23, 1996. The objective of the time-series sampling was to evaluate

how the concentrations of VOCs detected in IW1 (see Section 5.2) behaved during the continuous withdrawal of water from the well. At the start of the time-series test, the pumping rate in IW1 was set at approximately 25 gpm (as measured with a five-gallon bucket). At some time between 120 minutes and 180 minutes, the pumping rate increased to approximately 60 gpm. The reason for the increased pumping rate is unknown, but the higher rate served to increase the volume of water removed between sampling periods.

The following samples were collected during the time-series test:

Sample Time	Time Since Pumping Began (minutes)	Pumping Rate (gpm)	Incremental Volume Removed (gal)	Total Volume Removed (gal)
0835	0 - Start pump	0	0	0
0850	15	25	375	375
0905	30	25	375	750
0935	60	25	750	1,500
1035	120	25	1,500	3,000
1135	180	60*	2,725*	5,725*
1300	265	60	5,100	10,825
1445	370	60	6,340	17,165
1635	480	60	6,600	23,765

*Pumping rate estimated to increase from 25 gpm to 60 gpm at 1,100.

Field GC analytical results for the time-series samples are presented in Table 10. PCE and TCE were detected in samples collected up to 60 minutes after pumping was initiated. The concentration of PCE and TCE increased from 15 to 30 minutes, then decreased with additional pumping. After 60 minutes of continuous pumping, PCE was detected in the 120-minute, 180-minute, and 480-minute samples at concentrations of 7.4 ug/L, 5.2 ug/L and 5.3 ug/L, respectively. Based on the detection of PCE at 480 minutes near the reporting limits (5 ug/L for the field GC), it is likely that PCE concentrations stabilized at or below the 5 ug/L method reporting limit during the period between 180 and 480 minutes.

6

PRIVATE WELL SEARCH

In an effort to identify all private wells in the vicinity of the VOC plume in the upper aquifer southeast of the ACS site (as discussed in the Upper Aquifer Technical Memorandum), several sources of information were consulted. The Lake County, Indiana Health Department and the Griffith Public Works Department were contacted for information on wells in the area, and well logs were obtained from the Indiana Department of Natural Resources (IDNR). The well search built on the well location information presented in the RI report and Upper Aquifer Technical Memorandum.

The Lake County Health Department does not have information on private well locations. According to the Griffith Public Works Department, ACS and the Griffith Public Works Garage have been connected to the municipal water system. Other homes and businesses along South Colfax Avenue and Main Street in the vicinity of ACS, and along Reder Road, Arbogast, and Avenue H have not been connected to municipal water, and are therefore served by private wells.

IDNR well log locations were plotted on the Surrounding Well Locations map (Figure 8). This information was cross referenced with the RI well survey, the 1991 USGS Highland Quadrangle 7.5 Minute Topographic Map, and the location of residential homes and businesses observed in the field during the Upper Aquifer Investigation. Homes or businesses not identified on the IDNR well logs were field checked for the presence of wells, and their location added to the Surrounding Well Locations map. A summary of the updated private well information is presented in Table 11.

As stated in the Upper Aquifer Technical Memorandum, groundwater samples will be collected from the four residential wells identified closest to the zone of contamination in the upper aquifer, east of Colfax Avenue. Based on the dimensions of the VOC plume in the upper aquifer, these well locations may be susceptible to potential VOC migration along the well casing from the upper to lower aquifer. Two of the wells are located within the area of identified upper aquifer contamination (well numbers 5 and 13 on Table 11; Figure 8), and two wells are located outside the zone but near the zone of contamination (well numbers 15 and 17 on Table 11; Figure 8). Water samples from the four wells will be analyzed for full scan TCL/TAL list.

Because other private wells identified in the area are located beyond the limits of upper aquifer contamination presented in the Upper Aquifer Technical Memorandum, other wells have not been included in the sampling plan at this time.

7

CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

Lower Aquifer Investigation activities implemented during January, February and March 1996 at the ACS NPL site consisted of the following:

- Using a rotosonic drilling method to obtain continuous core samples to evaluate the stratigraphy of the lower aquifer;
- Vertical profiling across the lower aquifer at four locations, and field GC analysis of groundwater samples for target VOCs, to detect any zones of VOC contamination in the lower aquifer;
- Installation of eight monitoring wells and three piezometers in the lower aquifer at six locations;
- Sampling of eight new lower aquifer monitoring wells for full scan TAL/TCL (VOCs, semi-volatiles, PCBs, and metals);
- Measurement of water levels in the new wells and piezometers in the lower aquifer to determine horizontal and vertical gradients;
- Measurement of continuous water levels in two monitoring wells and one piezometer for approximately 30 days;
- Evaluation and sampling of current ACS production wells for VOCs;
- Chemical time-series sampling of ACS production well IW1 and analysis with the field GC;
- Inspection of two abandoned ACS production wells;
- Identification of private residential wells southeast of the ACS facility in the vicinity of upper aquifer contamination identified during the Upper Aquifer Investigation.

The following conclusions are based on the data developed from these activities:

1. The stratigraphy of the unconsolidated aquifers at the ACS site uniformly consists of upper and lower sand aquifers separated by a clay confining layer.

2. The upper clay confining layer varies in thickness from 35 feet to the south to four feet to the north. The top of the clay is consistently found at an elevation of approximately 620 feet msl.

3. The lower aquifer was determined to consist of homogeneous gray to brown fine sand which varies in thickness at the ACS site between 40 to 68 feet. Delineation of lower aquifer stratigraphy meets Objective #1 established for the Lower Aquifer Investigation.

4. The lower clay confining layer was found to be 12 to 20 feet thick at an elevation between 540 and 550 feet msl at two locations. Bedrock consists of dark gray shale at an elevation of 527 to 538 feet msl.

5. The vertical hydraulic gradient in the lower aquifer was less than or equal to 0.001 from upper to lower portions of the aquifer, as indicated by water levels collected at lower aquifer monitoring wells and piezometers on March 15, 1996.

6. The direction of groundwater flow in the lower aquifer is northward under a hydraulic gradient of 0.0047. The horizontal gradient ranges from 1.5 to more than five times the vertical gradients in the lower aquifer. The direction of groundwater flow and hydraulic gradient are consistent with those for the June 1991 RI and the October 1995 Technical Memorandum. Determination of horizontal and vertical gradients meets Objective #4 set forth in the SOW for the Lower Aquifer Investigation.

7. Although potential VOC contaminants were indicated by the vertical profiling at two lower aquifer points (MW8, MW10), it was not confirmed by the sampling of monitoring wells that were installed at these points.

8. Bis(2-ethylhexyl)phthalate was detected in samples collected from MW29, MW30, MW32, and MW35 at concentrations ranging between 11 ug/L and 68 ug/L. No other semi-volatiles or PCBs were detected above quantitation limits in monitoring well samples.

9. Major and minor groundwater metal constituents were detected at the highest concentrations in the lower aquifer. Other metals were generally not detected or were found below quantitation limits.

10. The detection of only trace levels (estimated 2 ug/L) of chloroethane at MW29 indicates that the zone of known contamination indicated at MW9 in the RI, extends to a depth of approximately 60 feet in the lower aquifer (vertical gradient component of Objective #3).

11. Contaminants have not migrated horizontally in the lower aquifer to the downgradient point of compliance, as defined by monitoring wells installed at the MW7, MW8, and MW10 well clusters (horizontal gradient component of Objective #3).

12. Although NAPLs are known to exist in the upper aquifer, the findings of the lower aquifer investigation did not provide evidence for the presence of DNAPLs in the lower aquifer (Objective #5). The presence of DNAPLs might have been indicated by either: 1) observations of DNAPL during coring, vertical profiling or monitoring well sampling; or 2) detections of elevated concentrations of contaminants during groundwater sampling in the lower aquifer (resulting from dissolution of DNAPL product into the groundwater).

13. VOC concentrations less than 14 ug/L were found in lower aquifer water samples collected from two ACS production wells.

7.2 RECOMMENDATIONS

7.2.1 Horizontal Extent Downgradient of Site

The results of the initial round of groundwater samples collected at the northern end of the ACS Site, downgradient in the lower aquifer, indicate that contaminants have not migrated horizontally in the lower aquifer to the downgradient point of compliance, as defined by monitoring wells installed at well clusters MW7, MW8, and MW10. Therefore, no further well installations are recommended along the northern site boundary at this time. These monitoring wells will be included in the quarterly monitoring program to provide ongoing confirmation of compliance, or provide an indication of future contaminant migration.

7.2.2 Vertical Extent at MW9

The detection of a trace level of chloroethane at MW29 (2 ug/L) in the March 1996 sampling, indicates that MW29 is positioned at the lower extent of contamination in the lower aquifer. Therefore no further investigation or monitoring well installations are recommended at this location. Monitoring wells MW9 and MW29 will be included in the quarterly monitoring program to provide future indications of compliance or contaminant migration in the lower aquifer at this location.

7.2.3 Character of Lower Aquifer Contamination

The nature of the contamination in the lower aquifer at the site has been defined to date by the compounds detected at monitoring well MW9 and in the samples from the ACS production wells IW1 and IW4.

There have been previous discussions with the U.S. EPA regarding the viability of installing additional lower aquifer wells within the ACS boundaries. Given the very high levels of contamination and the presence of non aqueous phase liquids (NAPLs) within the site boundaries, and given the strong downward gradient between the upper and lower aquifer, we believe that any additional lower aquifer wells within the Site boundaries should be deferred until after the upper aquifer groundwater treatment systems are in place and operational. When the treatment systems are operational, the highly contaminated areas will be dewatered and the dewatering will eliminate the strong downward gradient from the upper to the lower aquifer.

7.2.4 Potential Lower Aquifer Contamination in the Vicinity of Plume to Southeast

During the Upper Aquifer Investigation, samples were analyzed by field GC and used to delineate a plume of contamination in the upper aquifer extending south-southeast from the intersection of Reder Road and Colfax Avenue. Upper aquifer monitoring wells will be installed to confirm the extent of this plume and to monitor its future behavior. Upon confirmation of the plume with the new upper aquifer wells, it may be appropriate to install one or more additional monitoring wells in the lower aquifer to evaluate the potential effects of this plume on the lower aquifer. Recommendations regarding further lower aquifer investigation and monitoring well installations will be included with the completion of the upper aquifer delineation to the southeast.

7.2.5 ACS Production Wells

Upon U.S. EPA approval the two abandoned and the four currently used ACS production wells be sealed and permanently abandoned.

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Table 1
Summary of Lower Aquifer Sampling Activities and Well/Piezometer Installation
American Chemical Service, Inc.
Griffith, Indiana

Existing Well Identification[1]	Well(s)/Piezometers(s) installed during Lower Aquifer Investigation	Well Screen Depth in Lower Aquifer	Vertical Profile Location Number	Continuous Cores Collected?
M4		Upper		
	MW35	Lower	VP4	Yes
MW7		Upper		
	PZ44	Middle	NA	No
	MW36	Lower	NA	Yes
MW8		Upper		
	MW31	Middle	NA	No
	MW32	Lower	VP3	Yes
MW9		Upper		
	MW29	Middle	NA	No
	MW34	Lower	VP1	Yes
MW10		Upper		
	MW30	Middle	NA	No
	MW33	Lower	VP2	Yes
MW17		Upper Aquifer		
	MW28	Upper	NA	No
	PZ42	Middle	NA	No
	PZ43	Lower	NA	Yes

Notes:
(1) "Existing Wells" were installed prior to conducting the Lower Aquifer Investigation
Boring Logs for "Existing Wells" are included in Appendix A1
Boring Logs for Lower Aquifer wells are included in Appendix A as follows:
Appendix A2 - MW35
Appendix A3 - PZ44 and MW36
Appendix A4 - MW31 and MW32
Appendix A5 - MW29 and MW34
Appendix A6 - MW30 and MW33
Appendix A7 - MW28, PZ42 and PZ43

Table 2
Monitoring Well Information
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Well	Coordinates		Ground	Top of Casing	Screened Interval		Screen	Well	Year
ID	Northing	Easting	Elevation (1)	Elevation (1)	Top (1)	Bottom (1)	Length (2)	Material	Installed
MW28	5695.6	5657.2	649.0	648.77	588.70	578.70	10	2" SS	1996
MW29	7012.0	4885.5	635.7	638.06	585.90	575.90	10	2" SS	1996
MW30	7773.7	5193.9	632.1	634.25	585.00	575.00	10	2" SS	1996
MW31	7505.3	5906.8	639.4	641.64	574.60	564.60	10	2" SS	1996
MW32	7507.0	5902.2	639.5	641.84	547.30	537.30	10	2" SS	1996
MW33	7773.5	5188.6	632.0	634.13	556.00	546.00	10	2" SS	1996
MW34	7001.8	4880.4	635.8	638.14	552.80	542.80	10	2" SS	1996
MW35	6541.8	4933.9	632.4	634.50	551.80	541.80	10	2" SS	1996
MW36	6767.5	6164.0	636.2	637.85	552.70	542.70	10	2" SS	1996
PZ42	5696.3	5661.9	649.0	648.44	568.50	563.50	5	2" PVC	1996
PZ43	5701.7	5661.8	649.1	648.69	554.50	549.50	5	2" PVC	1996
PZ44	6766.0	6169.8	636.10	638.47	578.40	573.40	5	2" PVC	1996

Notes:

2" PVC = 2" Schedule 40 Poly vinyl chloride well screen and casing

2" SS = 2" Stainless steel well screen and casing

PZ = Piezometer

MW = Groundwater Monitoring Well

Footnotes:

(1) All elevations shown are in ft. MSL (Mean Sea Level).

(2) Screen lengths are shown as general measurements. For exact screen lengths, see Appendix B of Report.

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Table 3
Summary of Geologic Units
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

		Upper Aquifer				Upper Confining Unit				Lower Aquifer				Lower Confining Unit				Bedrock	
	Ground	Top		Bottom		Top		Bottom		Top		Bottom		Top		Bottom		Top	
Location	Surface	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
MW32	639.5	0.0	639.5	18.5	621.0	18.5	621.0	35.0	604.5	35.0	604.5	99.5	540.0	99.5	540.0	NA	NA	NA	NA
MW33	632.0	0.0	632.0	13.5	618.5	13.5	618.5	17.5	614.5	17.5	614.5	85.0	547.0	85.0	547.0	105.0	527.0	105.0	527.0
MW34	635.8	0.0	635.8	15.0	620.8	15.0	620.8	25.0	610.8	25.0	610.8	92.5	543.3	92.5	543.3	NA	NA	NA	NA
MW35	632.4	0.0	632.4	13.0	619.4	13.0	619.4	48.0	584.4	48.0	584.4	88.0	544.4	88.0	544.4	NA	NA	NA	NA
MW36	636.2	0.0	636.2	15.0	621.2	15.0	621.2	34.8	601.4	34.8	601.4	91.5	544.7	91.5	544.7	NA	NA	NA	NA
PZ43	649.1	0.0	649.1	27.5	621.6	27.5	621.6	58.0	591.1	58.0	591.1	98.5	550.6	98.5	550.6	111.0	538.1	111.0	538.1

Notes:

Depths are relative to ground surface.

Elevations are relative to Mean Sea Level.

NA = Not Applicable

Boring Logs are included in Appendix A.

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Table 4
Summary of Grain Size Analysis
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Well ID	Sample Type	Sample Depth (ft)	% Gravel	% Sand	% Silt + % Clay	USCS
MW28	Grab	65	0.0	93.9	6.1	SP-SM
MW29	Grab	56	0.0	98.0	2.0	SP
MW30	Grab	52	0.0	97.6	2.4	SP
MW31	Grab	70	12.5	86.0	1.5	SP
MW32	Grab	96	0.0	97.0	3.0	SP
MW33	Grab	80	0.0	96.9	3.1	SP
MW34	Grab	88	0.0	98.8	1.2	SP
MW35	Grab	55	32.1	65.7	2.2	SP
MW35	Grab	85	0.0	85.8	14.2	SM
MW36	Grab	87	0.1	93.6	6.3	SP-SM
PZ42	Grab	82	0.0	92.6	7.4	SP-SM
PZ43	Grab	96	0.0	78.3	21.7	SM
PZ44	Grab	60	0.3	96.9	2.8	SP

Notes:

Grab = Sample collected from core runs following well installation.

Geotechnical analytical reports are included in Appendix F.

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Table 5
Water Level Summary
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Nested Well	Reference Points				3/15/95	
Locations	East	North	GS	TOC	Depth	Elev
MW-7	6113	6732	638.7	641.46	19.06	622.40
P-44	6170	6766	636.1	638.47	16.10	622.37
MW-36	6164	6768	636.2	637.85	15.49	622.36
MW-8	5934	7506	638.2	640.43	18.45	621.98
MW-31	7907	7505	639.4	641.64	19.68	621.96
MW-32	5902	7507	639.5	641.84	19.86	621.98
MW-9	4893	6990	635.9	639.05	16.76	622.29
MW-29	4886	7012	635.7	638.06	15.80	622.26
MW-34	4880	7002	635.8	638.14	15.86	622.28
MW-10	5200	7784	633	635.49	13.63	621.86
MW-30	5194	7773	632.1	634.25	12.50	621.75
MW-33	5189	7774	632	634.13	12.36	621.77
MW-28	5657	5697	649	648.77	25.80	622.97
P-42	5662	5696	649	648.44	25.49	622.95
P-43	5662	5702	649.1	648.69	25.70	622.99
M-4D	4949	6538	627.13	633.32	NM	NA
MW-35	4934	6542	632.4	634.50	12.04	622.46

Single Well	Reference Points				3/15/95	
Locations	East	North	GS	TOC	Depth	Elev
MW-10C	5229	7554	634.7	637.45	15.35	622.10
MW-21	4546	7067	631.3	633.76	11.54	622.22
MW-22	5208	4898	634.3	636.48	13.27	623.21
MW-23	4717	7404	631.1	633.31	11.16	622.15
MW-24	4596	8033	633.1	635.22	13.49	621.73
ATMW-4D	5297	7311	635.2	637.99	17.00	620.99

Griffith	Reference Points				3/15/95	
Landfill Wells	East	North	GS	TOC	Depth	Elev
M-1D	4359	5747	632.75	638.32	NM	NA
M-2D	3997	6495	630.57	637.11	NM	NA
M-3D	4144	6821	626.09	632.19	NM	NA
M-5D	4171	7094	628.45	634.18	NM	NA

Notes:
NM = Not measured. Monitoring wells locked - could not be accessed.
NA = Not applicable due to inability to get water level data from well.
TOC = Top of inner casing
GS = Ground surface

Footnotes:
Elevations shown are in ft. MSL. (Mean Sea Level)
Shaded groundwater elevations were utilized to generate the lower aquifer potentiometric map.

Table 6
Vertical Gradient Calculations
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Well	Screen Interval		Screen	Groundwater Elevation			Vertical Gradients In Lower Aquifer		
Nest	Top	Bottom	Midpoint	Upper	Middle	Lower	Upper/Middle	Middle/Lower	Upper/Lower
MW7	595.9	590.9	593.4	622.4			-0.001		
PZ44	578.4	573.4	575.9		622.37			0.000	
MW36	552.7	542.7	547.7			622.36			-0.001
MW8	598.2	593.2	595.7	621.98			0.000		
MW31	574.6	564.6	569.6		621.96			0.000	
MW32	547.3	537.3	542.3			621.98			0.000
MW9	605.9	600.9	603.4	622.29			-0.001		
MW29	585.9	575.9	580.9		622.26			0.000	
MW34	552.8	542.8	547.8			622.28			0.000
MW10	603.0	598.0	600.5	621.86			-0.003		
MW30	585.0	575.0	580.0		621.75			0.000	
MW33	556.0	546.0	551.0			621.77			-0.001
MW28	588.7	578.7	583.7	622.97			0.000		
PZ42	568.5	563.5	566.0		622.95			0.001	
PZ43	554.5	549.5	552.0			622.99			0.000
M4	587.25	584.75	582.25	NA			NA		
MW35	551.8	541.8	546.8			622.46			NA

Notes:
(-) = Downward Vertical Gradient
(+) = Upward Vertical Gradient
Water Levels Collected by Montgomery Watson on March 15, 1996
NA = Not Applicable. Water elevations for the City of Griffith Landfill well M-4 were not available.

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Table 7
Field GC Results - Vertical Profile Borings
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Vertical Profile Location	Acetone	1,1 Dichloroethene	trans 1,2 Dichloroethene	1,1 Dichloroethane	2-Butanone (MEK)	cis 1,2 Dichloroethene	1,2 Dichloroethane	1,1,1 Trichloroethane	Benzene	Carbon tetrachloride	Trichloroethene	MIBK	1,1,2 Trichloroethane	Toluene	Tetrachloroethene	Chlorobenzene	Ethylbenzene	m+p Xylene	Styrene	o Xylene	Total VOCs
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW8 39' (VP3)																					
MW8 39' (VP3) Dup																					
MW8 49' (VP3)																					
MW8 59' (VP3)																					
MW8 69' (VP3)						5.1															5.1
MW8 69' (VP3) Dup																					
MW8 79' (VP3)																					
MW8 89' (VP3)																					
MW8 99' (VP3)							56.5														56.5
MW8 99' (VP3) Dup							63														63.0
MW9 30' (VP1)																					
MW9 39' (VP1)	10																				10.0
MW9 49' (VP1)																					
MW9 59' (VP1)																					
MW9 69' (VP1)																					
MW9 79' (VP1)																					
MW9 92' (VP1)																					

Table 7
Field GC Results - Vertical Profile Borings
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Vertical Profile Location	Acetone	1,1 Dichloroethene	trans 1,2 Dichloroethene	1,1 Dichloroethane	2-Butanone (MEK)	cis 1,2 Dichloroethene	1,2 Dichloroethane	1,1,1 Trichloroethane	Benzene	Carbon tetrachloride	Trichloroethene	MIBK	1,1,2 Trichloroethane	Toluene	Tetrachloroethene	Chlorobenzene	Ethylbenzene	m+p Xylene	Styrene	o Xylene	Total VOCs
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW10 29' (VP2)	38																				38.0
MW10 29' (VP2) Dup	24																				24.0
MW10 39' (VP2)																					
MW10 52' (VP2)																					
MW10 59' (VP2)																					
MW10 72' (VP2)																					
MW10 79' (VP2)																					
MW10 79' (VP2) Dup																					
MW10 86' (VP2)																					
M4 58' (VP4)																					
M4 68' (VP4)																					
M4 79' (VP4)																					
M4 89' (VP4)																					

NOTES:

This table presents the results of field GC analysis of soil samples collected during the Lower-Aquifer Investigation activities at the ACS Site in Griffith, Indiana during January and February 1996.

All results are considered to be estimated concentration. All samples were analyzed at a 1:1 dilution. The reporting limit for non-detected compounds is equal to the method reporting limit (5 ppb for all compounds except acetone and MEK).

Analytical results reported in micrograms per liter (ug/L).

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Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-RINSATE						APD-GW-MW28					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum		U/	13.0		U/	13.0		B/U	27.2		U/	13.0
Antimony		U/	2.0		U/	2.0		U/	2.0		U/	2.0
Arsenic		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Barium		U/	1.0		UE/	1.0	95.1	B/	1.0	95.7	BE/	1.0
Beryllium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Calcium		B/U	121		B/U	228	79400	/	18.0	79700	/	18.0
Chromium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cobalt		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Copper	14.0	B/	1.0		B/U	1.9		U/	1.0		U/	1.0
Iron		U/	8.0		UE/	8.0	1840	/	8.0	1740	E/	8.0
Lead	86.7		1.0		B/U	1.4		U/	1.0		U/	1.0
Magnesium		B/U	8.6		B/U	17.7	38100	/	7.0	37900	/	7.0
Manganese		U/	1.0		U/	1.0	119	/	1.0	117	/	1.0
Mercury		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Nickel		U/	1.0		U/	1.0		B/U	2.5		B/U	2.5
Potassium		UE/	22.0		BE/U	35.1	3580	BE/	22.0	3430	BE/	22.0
Selenium		U/	2.0		U/	2.0		U/	2.0		U/	2.0
Silver		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Sodium		U/	36.0		U/	36.0	14100	/	36.0	14500	/	36.0
Thallium		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Vanadium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Zinc		B/U	17.4		B/U	6.1		B/U	8.3		B/U	8.9

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

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Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-MW29						APD-GW-MW30					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum	131	B/	13.0		U/	13.0		B/U	84.3		B/U	36.9
Antimony		U/	2.0	3.4	B/	2.0		U/	2.0		U/	2.0
Arsenic		U/	3.0		U/	3.0		B/U	3.6		U/	3.0
Barium	62.0	B/	1.0	69.7	BE/	1.0	181	B/	1.0	162	BE/	1.0
Beryllium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Calcium	65200	/	18.0	75800	/	18.0	99100	/	18.0	92200	/	18.0
Chromium	16.4	/	1.0		U/	1.0	8.9	B/	1.0		U/	1.0
Cobalt	1.0	B/	1.0		U/	1.0	1.4	B/	1.0	1.0	B/	1.0
Copper		B/U	5.8		U/	1.0		B/U	1.1		U/	1.0
Iron	3030	/	8.0	2390	E/	8.0	5980	/	8.0	3820	E/	8.0
Lead		/U	4.6		U/	1.0		B/U	1.9		U/	1.0
Magnesium	33500	/	7.0	39500	/	7.0	51000	/	7.0	48400	/	7.0
Manganese	218.0	/	1.0	229	/	1.0	223	/	1.0	203	/	1.0
Mercury		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Nickel	20.1	B/	1.0		B/U	5.8	21.9	B/	1.0		B/U	15.3
Potassium	7040	E/	22.0	7760	E/	22.0	4980	BE/	22.0	4910	BE/	22.0
Selenium		B/U	2.2		U/	2.0		U/	2.0		B/U	2.1
Silver		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Sodium	50700	/	36.0	60200	/	36.0	40900	/	36.0	39500	/	36.0
Thallium		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Vanadium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Zinc		B/U	19.7		B/U	9.5		B/U	8.0		B/U	4.7

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

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Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-MW31						APD-GW-MW32					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum		B/U	88.5		B/U	31.5	766	/	13.0		B/U	37.3
Antimony	2.7	B/	2.0	2.6	B/	2.0		U/	2.0		U/	2.0
Arsenic		B/U	4.1		U/	3.0		B/U	3.7		U/	3.0
Barium	200	/	1.0	195	BE/	1.0	62.6	B/	1.0	54.2	BE/	1.0
Beryllium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Calcium	80900	/	18.0	79800	/	18.0	49100	/	18.0	52600	/	18.0
Chromium	13.6	/	1.0		U/	1.0	9.2	B/	1.0		U/	1.0
Cobalt	2.0	B/	1.0	1.1	B/	1.0		U/	1.0		U/	1.0
Copper		B/U	3.6		B/U	2.2		B/U	3.4		U/	1.0
Iron	2640	/	8.0	1770	E/	8.0	1550	/	8.0		BE/U	32.3
Lead		B/U	2.1		U/	1.0		B/U	2.1		U/	1.0
Magnesium	33900	/	7.0	33800	/	7.0	23200	/	7.0	25100	/	7.0
Manganese	122	/	1.0	117	/	1.0	219	/	1.0	212	/	1.0
Mercury		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Nickel	32.6	B/	1.0	40.7	/	1.0	8.6	B/	1.0		B/U	3.7
Potassium	3870	BE/	22.0	3970	BE/	22.0	5560	/E	22.0	6230	/E	22.0
Selenium		U/	2.0		B/U	2.3		U/	2.0		U/	2.0
Silver		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Sodium	17500	/	36.0	17700	/	36.0	55000	/	36.0	61600	/	36.0
Thallium		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Vanadium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Zinc		B/U	8.2		B/U	8.6		B/U	16.0		B/U	7.7

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

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Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-MW32 DUP						APD-GW-MW33					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum	1909	/	13.0		B/U	51.1		B/U	165		B/U	44.0
Antimony		U/	2.0	2.2	B/	2.0		U/	2.0		U/	2.0
Arsenic		B/U	3.8		U/	3.0		B/U	4.5		B/U	4.1
Barium	72.7	B/	1.0	56.2	BE/	1.0	902	/	1.0	991	/E	1.0
Beryllium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0	1.4	B/	1.0	1.3	B/	1.0
Calcium	56500	/	18.0	54500	/	18.0	248000	/	18.0	259000	/	18.0
Chromium	10.6	/	1.0		U/	1.0	15.4	/	1.0		U/	1.0
Cobalt		U/	1.0		U/	1.0	6.1	B/	1.0	5.5	B/	1.0
Copper		B/U	1.6		U/	1.0		B/U	4.6		U/	1.0
Iron	1880	/	8.0	15.5	BE/	8.0	24600	/	8.0	26300	E/	8.0
Lead		B/U	1.5		U/	1.0		/U	3.7		U/	1.0
Magnesium	26800	/	7.0	26300	/	7.0	56900	/	7.0	60300	/	7.0
Manganese	250	/	1.0	220	/	1.0	686	/	1.0	711	/	1.0
Mercury		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Nickel	9.7	B/	1.0		B/U	2.8	48.2	/	1.0	32.7	B/	1.0
Potassium	6470	E/	22.0	6660	E/	22.0	13900	E/	22.0	15500	E/	22.0
Selenium		B/U	2.1		U/	2.0		B/U	3.3		B/U	2.8
Silver		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Sodium	63400	/	36.0	64700	/	36.0	188000	/	36.0	203000	/	36.0
Thallium		U/	3.0		U/	3.0	3.8	B/	3.0		U/	3.0
Vanadium		U/	1.0		U/	1.0	1.8	B/	1.0	1.7	B/	1.0
Zinc		B/U	9.6		B/U	4.1		/U	34.2		B/U	18.4

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

RJR/jlv/JAH
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4/11/96

Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-MW34						APD-GW-MW35					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum		B/U	59.7		U/	13.0		B/U	75.9		U/	13.0
Antimony	2.1	B/	2.0	2.7	B/	2.0		U/	2.0	2.9	B/	2.0
Arsenic		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Barium	151	B/	1.0	126	BE/	1.0	54.2	B/	1.0	50.6	BE/	1.0
Beryllium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Calcium	78500	/	18.0	73700	/	18.0	32300	/	18.0	30100	/	18.0
Chromium	2.9	B/	1.0	1.4	B/	1.0	6.9	B/	1.0		U/	1.0
Cobalt	1.3	B/	1.0		U/	1.0	1.2	B/	1.0		U/	1.0
Copper		B/U	2.9		B/U	1.8	6.1	B/	1.0		B/U	1.3
Iron	4360	/	8.0	890	E/	8.0	1160	/	8.0	8.0	E/	8.0
Lead		B/U	1.8		U/	1.0		B/U	1.9		U/	1.0
Magnesium	46000	/	7.0	42600	/	7.0	22200	/	7.0	21800	/	7.0
Manganese	138	/	1.0	126	/	1.0	87.8	/	1.0	65.8	/	1.0
Mercury		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Nickel		B/U	3.8		B/U	4.9	16.5	B/	1.0		B/U	7.3
Potassium	5810	E/	22.0	5240	E/	22.0	7130	E/	22.0	7090	E/	22.0
Selenium		B/U	2.7		U/	2.0		U/	2.0		U/	2.0
Silver		U/	1.0		U/	1.0		U/	1.0		U/	1.0
Sodium	26600	/	36.0	25000	/	36.0	16000	/	36.0	15800	/	36.0
Thallium		U/	3.0		U/	3.0		U/	3.0		U/	3.0
Vanadium	1.1	B/	1.0		U/	1.0		U/	1.0		U/	1.0
Zinc		B/U	11.7		B/U	10.6		B/U	8.4	5.2	B/U	5.2

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

RJR/jlv/JAH
J:\4077\0076\METALS.XLS
4/11/96

Table 8

Summary of Metals Detections
Lower Aquifer Investigation
Amercian Chemical Service, Inc.
Griffith, Indiana

	APD-GW-MW36					
	Total	LQ/DVQ	RDL	Dissolved	LQ/DVQ	RDL
Aluminum		B/U	55.8		U/	13.0
Antimony		U/	2.0		U/	2.0
Arsenic		U/	3.0		U/	3.0
Barium	140	B/	1.0	141	BE/	1.0
Beryllium		U/	1.0		U/	1.0
Cadmium		U/	1.0		U/	1.0
Calcium	70600	/	18.0	72000	/	18.0
Chromium		U/	1.0		U/	1.0
Cobalt	1.1	B/	1.0	1.3	B/	1.0
Copper		U/	1.0		U/	1.0
Iron	2890	/	8.0	2830	E/	8.0
Lead		U/	1.0		U/	1.0
Magnesium	48100	/	7.0	48800	/	7.0
Manganese	145	/	1.0	151	/	1.0
Mercury		U/	0.2		U/	0.2
Nickel	12.3	B/	1.0		B/U	12.5
Potassium	6990	E/	22.0	6960	E/	22.0
Selenium		U/	2.0		U/	2.0
Silver		U/	1.0		U/	1.0
Sodium	25900	/	36.0	26700	/	36.0
Thallium		U/	3.0		U/	3.0
Vanadium		U/	1.0		U/	1.0
Zinc	7.2	B/U	7.2		B/U	8.4

1. All results in ug/L. Dissolved results are from field 0.45 um filtered sample aliquot, Total results were not filtered.
2. LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier Definitions:

B This flag is applied to a value greater than or equal to the instrument detection limit (IDL), but less than the Practical Quantitation Limit (PQL). (e.g., used by the EPA to indicate the results is 'bracketed' by the ICL and CRDL. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

E Interferences were encountered during the ICP analysis.

U Indicates analyte was analyzed for, but was not detected above the Reported Detection Limit (RDL). If the U flag is in the DVQ position, the analyte was detected in the blank and the result has been qualified as undetected, with the RDL set at the sample concentration.

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4/11/96

Table 9
Summary of Groundwater Analytical Results
Detected VOCs - Production Well Sampling
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

	Sample Identication Number					
Compound	IW1-01	IW1-91	IW2-01	IW3-01	IW4-01	IWTB-01
Acetone	14	ND	ND	ND	ND	ND
1,2-Dichloroethene	3 J	3 J	ND	ND	ND	ND
2-Butanone	11	ND	ND	ND	ND	ND
Trichloroethene	5 J	5 J	ND	ND	ND	ND
1,1,2-Trichloroethane	2 J	ND	ND	ND	ND	ND
Bromoform	2 J	ND	ND	ND	ND	ND
4-methyl-2-pentanone	7 J	ND	ND	ND	ND	ND
Tetrachloroethene	10 J	10	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5 J	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	1 J	ND
Ethyl benzene	ND	ND	ND	ND	4 J	ND
Xylene	ND	ND	ND	ND	13	ND

Notes:
Analytical results are presented in micrograms per liter (ug/l)
ND = Not Detected
J = Estimated concentration
IW1-01 = ACS production well number, sample event nnumber one.
IW1-91 = ACS production well number, duplicate sample.

Table 10
Time-Series Sampling - Production Well IW-1
Field GC Sampling Summary
American Chemical Service, Inc.
Griffith, Indiana

Sample	Pumping Rate	Acetone	1,1 Dichloroethene	trans 1,2 Dichloroethene	1,1 Dichloroethane	2-Butanone (MEK)	cis 1,2 Dichloroethene	1,2 Dichloroethane	1,1,1 Trichloroethane	Benzene	Carbon tetrachloride	Trichloroethene	MIBK	1,1,2 Trichloroethane	Toluene	Tetrachloroethene	Chlorobenzene	Ethylbenzene	m+p Xylene	Styrene	o Xylene	Total VOCs
	(gpm)	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
IW1-15 MIN	25											5.1				9.5						14.6
IW1-30 MIN	25											6.0				12.8						18.8
IW1-30 MINDUP	25											5.4				10.6						16.0
IW1-60 MIN	25											5.0				8.2						13.2
IW1-120 MIN	25															7.4						7.4
IW1-180 MIN	60															5.2						5.2
IW1-270 MIN	60																					
IW1-380 MIN	60																					
IW1-480 MIN	60															5.3						5.3

Notes:
This table presents the results of field GC analysis of water samples collected during field activities at the ACS Site in Griffith, Indiana during January and February 1996.

The suffix to the Sample Identification, indicates the elapsed time (i.e. IW1-60MIN was the sample collected after IW1 had been pumped for 60 minutes).

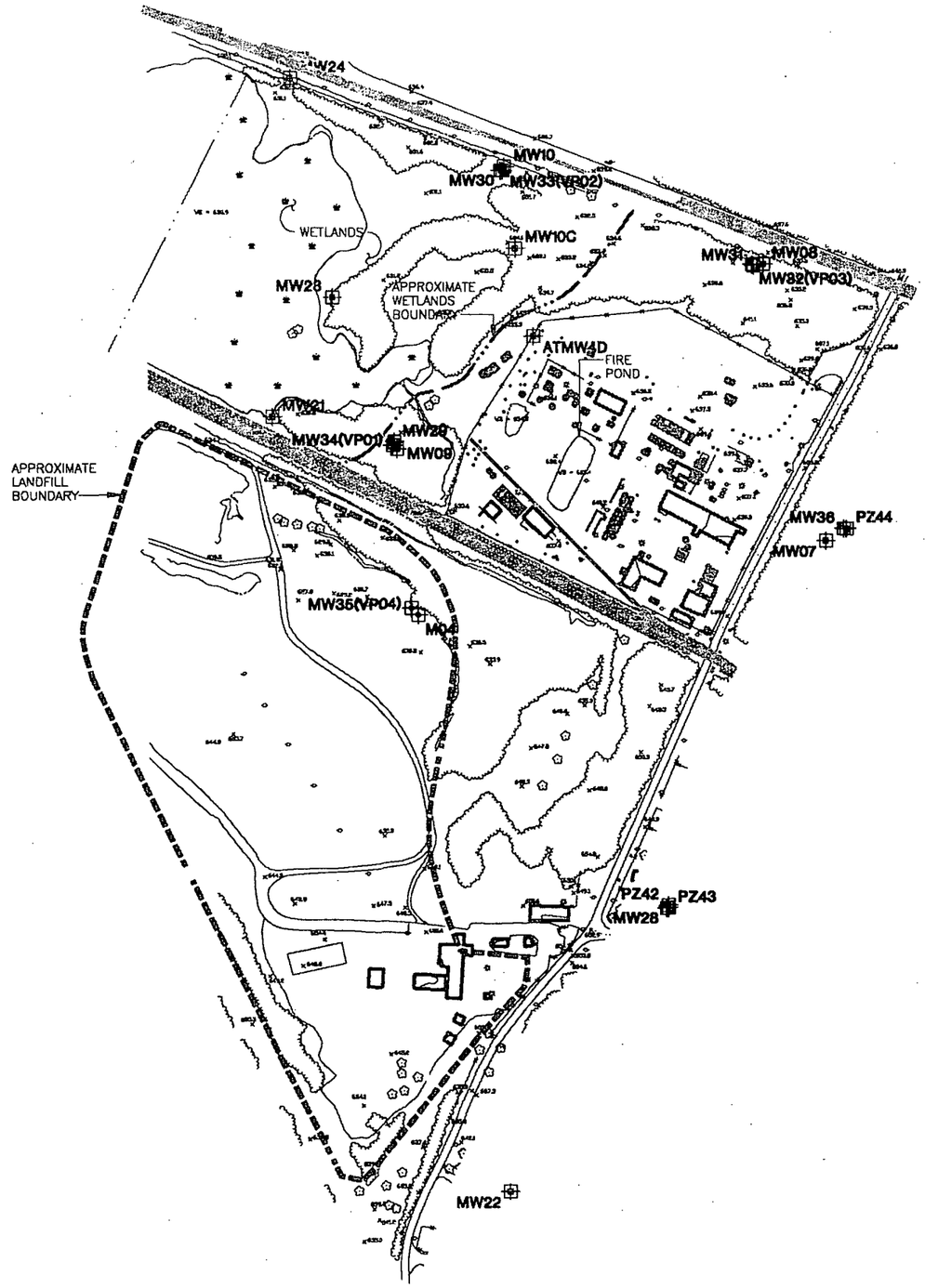
Blank spaces indicate the volatile organic compound was not detected

All results are considered to be estimated concentration. All samples were analyzed at a 1:1 dilution. The reporting limit for non-detected compounds is equal to the method reporting limit (5 ppb for all compounds except 10 ppb for acetone and MEK).

Table 11
Summary of Private Well Information
Lower Aquifer Investigation
American Chemical Service, Inc.
Griffith, Indiana

Well Number*	Well Usage/Owner	Well Location (Address)	Well Depth
1	Production Well- ACS	420 South Colfax	NA
2	Production Well- ACS	420 South Colfax	NA
3	Production Well- ACS	420 South Colfax	NA
4	Production Well- ACS	420 South Colfax	NA
5	Residential Well	1002 Reder Road	83
6	Residential Well	1007 Reder Road	NA
7	Residential Well	1009 Reder Road	NA
8	Residential Well	1029 Reder Road	NA
9	Residential Well	1033 Reder Road	65
10	Industrial - M&R Truck Repair	1045 Reder Road	NA
11	Industrial Usage- Clean Cities Recycling	1010/1012 Reder Road	NA
12	Prod. Well- Weldco	1020 Reder Road	NA
13	Residential Well	938 Arbogast	NA
14	Prod. Well - Aeromet	739 South Arbogast	NA
15	Residential Well	940 South Arbogast	NA
16	Residential Well	420 Avenue H	NA
17	Residential Well	430 Avenue H	NA
18	Residential Well	1008 South Arbogast	NA
19	Residential Well	1014 South Arbogast	NA
20	Residential Well	1016 South Arbogast	NA
21	Residential Well	1026 South Arbogast	51

Notes:
* Well Numbers correspond with numbers noted on Figure 8, "Private Well Location Map"
NA - Information not available



LEGEND

MW07	LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
MW28	NEW LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
PZ43	LOWER AQUIFER PIEZOMETER LOCATION AND NUMBER
(VP01)	VERTICAL PROFILE BORING LOCATION AND NUMBER

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL IS TWO FEET.
2. ELEVATIONS ARE BASED ON U.S.G.S. DATUM (MEAN SEA LEVEL).
3. GRID BASED ON INDIANA STATE PLANE COORDINATE SYSTEM.
4. MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 INSTALLED DURING FEBRUARY, 1996 BY BOART LONGYEAR, INC. UNDER SUPERVISION OF MONTGOMERY WATSON. SEE RI REPORT FOR INSTALLATION INFORMATION FOR MONITORING WELLS MW07 THROUGH MW10 AND MW17. MONITORING WELL M04 OWNED BY GRIFFITH LANDFILL.
5. LOCATION OF MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 BASED ON SURVEY CONDUCTED BY AREA SURVEY, CO., DURING MARCH, 1996.

north

0 400 800

SCALE IN FEET

FIGURE 1

Developed By RJR
Drawn By DLF
Approved By
Date
Reference
Revisions

MONITORING WELL/PIEZOMETER LOCATION MAP

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 **B1**

MONTGOMERY WATSON

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Graphic Standards 4-12-96
Lead Professional RJR 4-12-96
Technical Review
Project Manager
Management Review
Other

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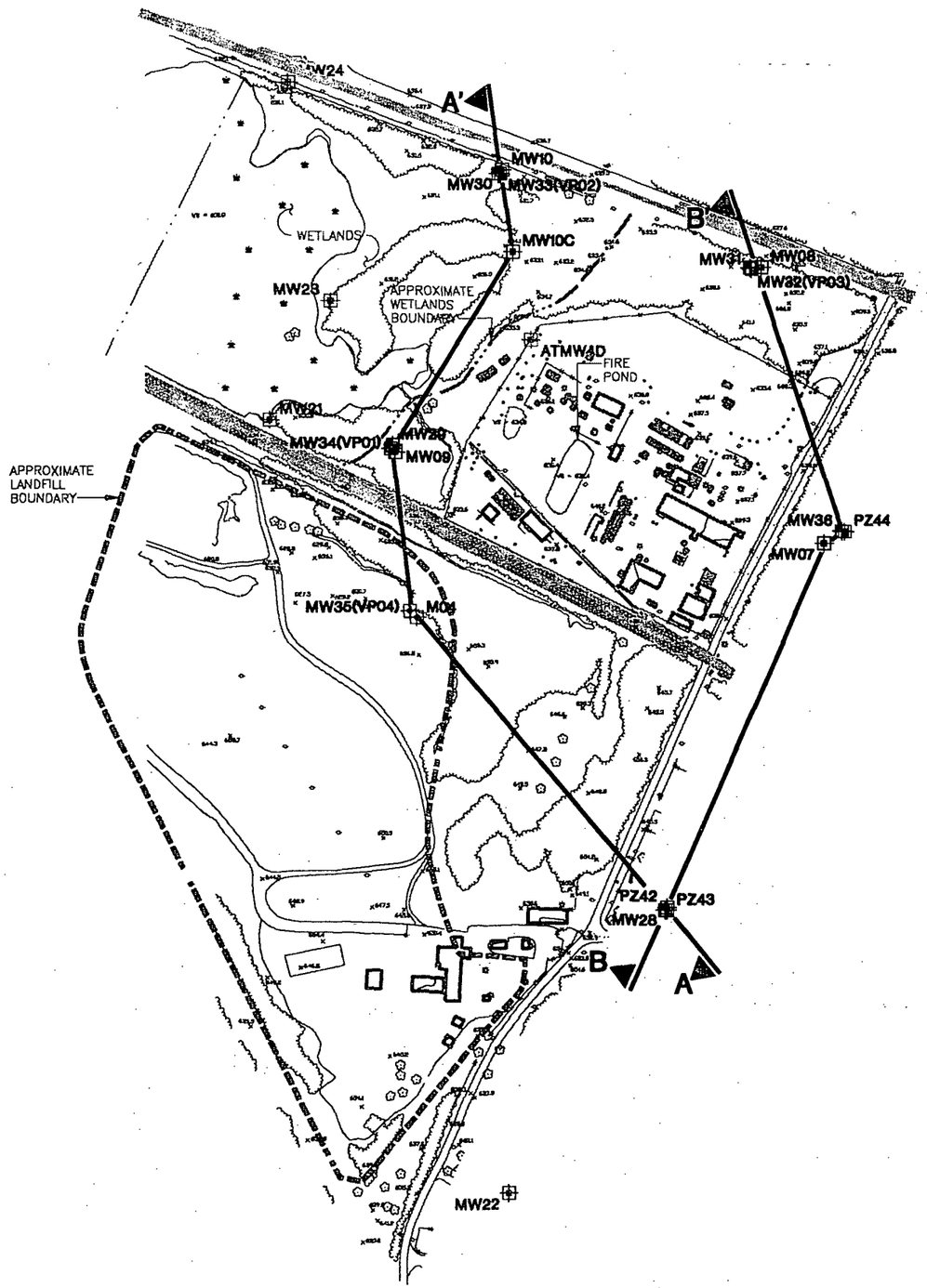

LEGEND

MW07	LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
MW28	NEW LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
PZ43	LOWER AQUIFER PIEZOMETER LOCATION AND NUMBER
(VP01)	VERTICAL PROFILE BORING LOCATION AND NUMBER
A	CROSS SECTION LOCATION LINE

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL IS TWO FEET.
2. ELEVATIONS ARE BASED ON U.S.G.S. DATUM (MEAN SEA LEVEL).
3. GRID BASED ON INDIANA STATE PLANE COORDINATE SYSTEM.
4. MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 INSTALLED DURING FEBRUARY, 1996 BY BOART LONGYEAR, INC. UNDER SUPERVISION OF MONTGOMERY WATSON. SEE RI REPORT FOR INSTALLATION INFORMATION FOR MONITORING WELLS MW07 THROUGH MW10 AND MW17. MONITORING WELL M04 OWNED BY GRIFFITH LANDFILL.
5. LOCATION OF MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 BASED ON SURVEY CONDUCTED BY AREA SURVEY, CO., DURING MARCH, 1996.

north

0 400 800

SCALE IN FEET

FIGURE 2

Developed By RJR
Drawn By DLF,LCL
Approved By
Date
Reference
Revisions

CROSS SECTION LOCATION MAP

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 **B2**

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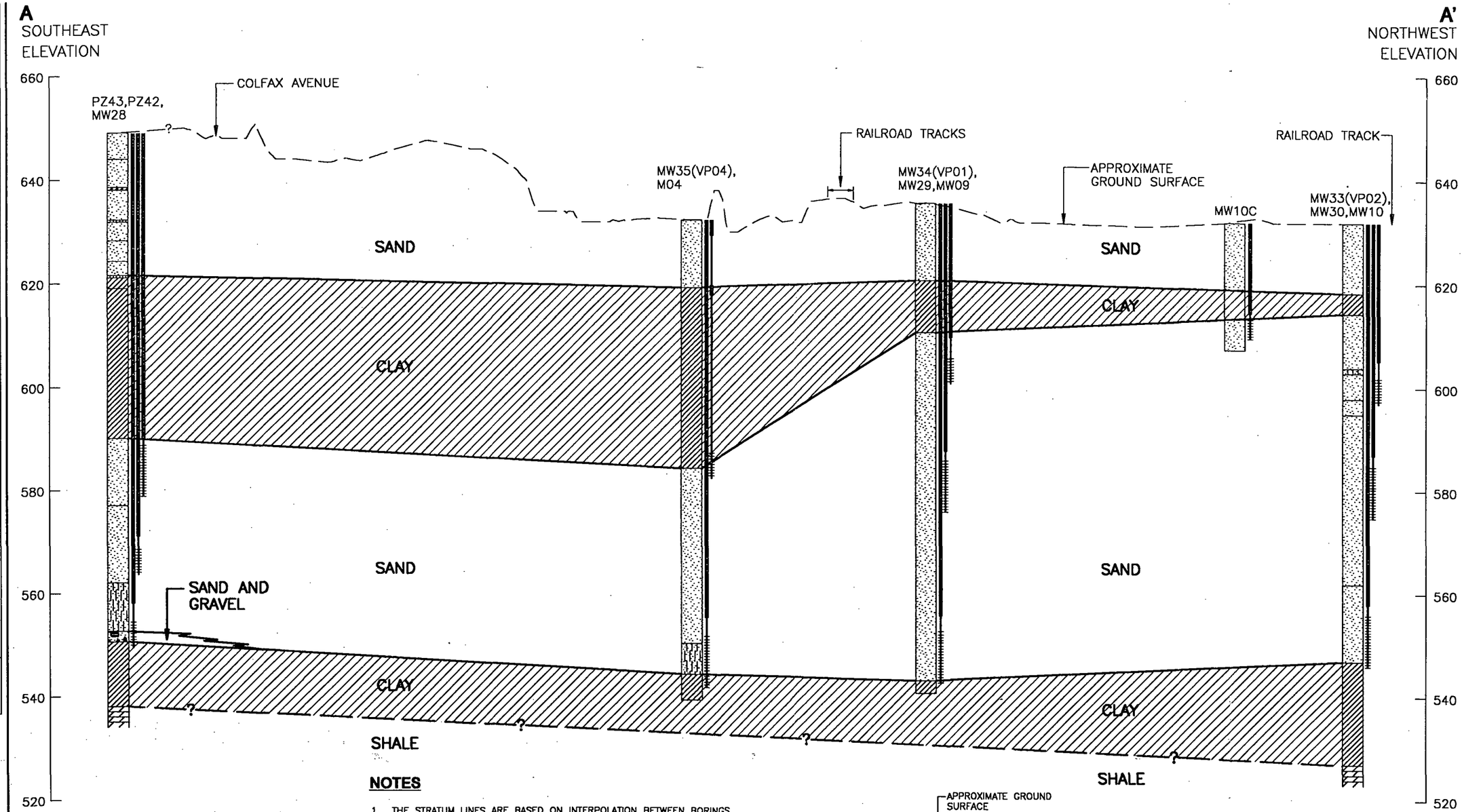
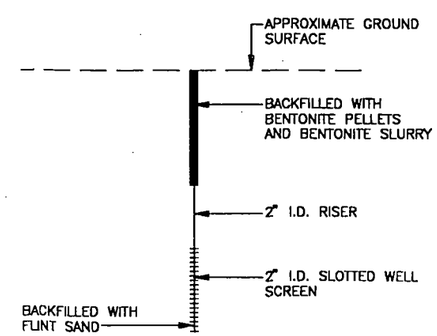


LEGEND

- SAND WITH LOW SILT AND CLAY CONTENT (SP)
- SILTY SAND (SM)
- SAND AND GRAVEL WITH LOW SILT AND CLAY CONTENT (SP/GP)
- SILT (ML)
- LEAN CLAY (CL)
- SHALE

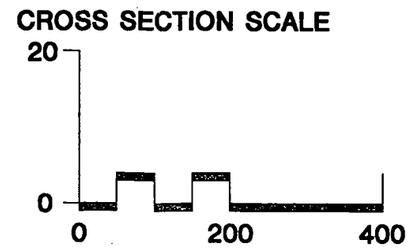
NOTES

1. THE STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. REFER TO FIGURE 1 FOR ADDITIONAL NOTES.
3. CROSS SECTION LOCATIONS ARE SHOWN ON FIGURE 2.
4. FOR THE PURPOSE OF ILLUSTRATING SUBSOIL CONDITIONS ON THE CROSS SECTIONS, SOME OF THE BORING LOGS HAVE BEEN SIMPLIFIED. FOR A DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS, APPENDIX A OF TEXT.
5. FOR COMPLETE MONITORING WELL INSTALLATION DETAILS REFER TO APPENDIX C OF TEXT.
6. HORIZONTAL DISTANCES ARE MEASURED WITH RESPECT TO THE CENTER OF EACH SOIL BORING LOCATION.
7. EXISTING GROUND SURFACE WAS TAKEN FROM FIGURE 1.
8. ELEVATIONS ARE SHOWN IN REFERENCE TO U.S.G.S. DATUM.
9. QUESTION MARKS AT THE CONTACTS BETWEEN SUBSOIL TYPES INDICATES THE CONTACTS ARE INFERRED.
10. WELL M04 INFORMATION OBTAINED FROM ATC BLATTERT, INC., INDIANAPOLIS, INDIANA, FOR CITY OF GRIFFITH, INDIANA.



TYPICAL WELL INSTALLATION DETAIL

NOT TO SCALE



SCALE IN FEET
VERTICAL EXAGGERATION: TEN TIMES

FIGURE 3

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Lead Professional RJR
Technical Review RJK 4-12-96
Project Manager
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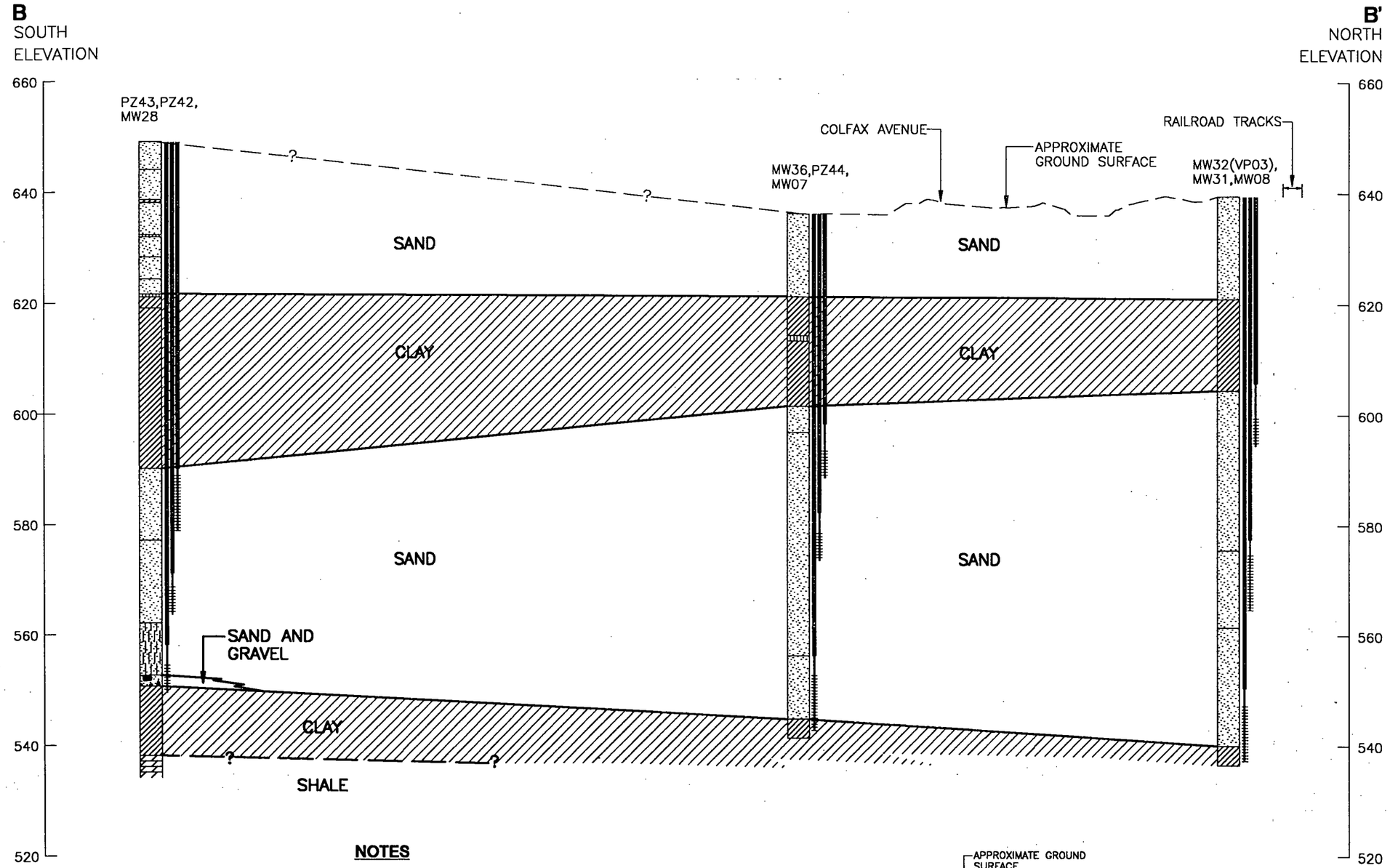
Revisions

CROSS SECTION A-A'
LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 B3

MONTGOMERY WATSON

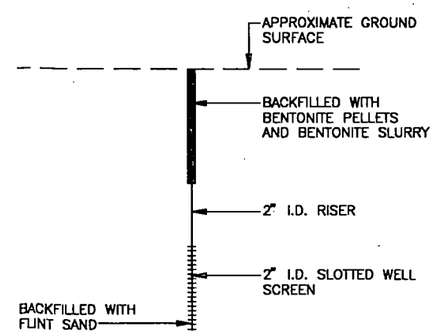


LEGEND

- SAND WITH LOW SILT AND CLAY CONTENT (SP)
- SILTY SAND (SM)
- SAND AND GRAVEL WITH LOW SILT AND CLAY CONTENT (SP/GP)
- SILT (ML)
- LEAN CLAY (CL)
- SHALE

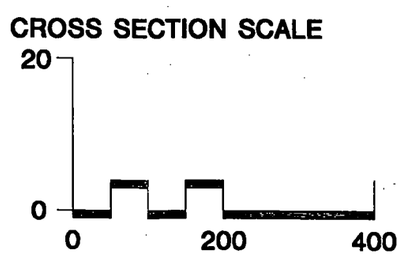
NOTES

1. THE STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. REFER TO FIGURE 1 FOR ADDITIONAL NOTES.
3. CROSS SECTION LOCATIONS ARE SHOWN ON FIGURE 2.
4. FOR THE PURPOSE OF ILLUSTRATING SUBSOIL CONDITIONS ON THE CROSS SECTIONS, SOME OF THE BORING LOGS HAVE BEEN SIMPLIFIED. FOR A DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS, APPENDIX A OF TEXT.
5. FOR COMPLETE MONITORING WELL INSTALLATION DETAILS REFER TO APPENDIX C OF TEXT.
6. HORIZONTAL DISTANCES ARE MEASURED WITH RESPECT TO THE CENTER OF EACH SOIL BORING LOCATION.
7. EXISTING GROUND SURFACE WAS TAKEN FROM FIGURE 1.
8. ELEVATIONS ARE SHOWN IN REFERENCE TO U.S.G.S. DATUM.
9. QUESTION MARKS AT THE CONTACTS BETWEEN SUBSOIL TYPES INDICATES THE CONTACTS ARE INFERRED.



TYPICAL WELL INSTALLATION DETAIL

NOT TO SCALE



VERTICAL EXAGGERATION: TEN TIMES

FIGURE 4

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Lead Professional
Technical Review
Project Manager
Management Review
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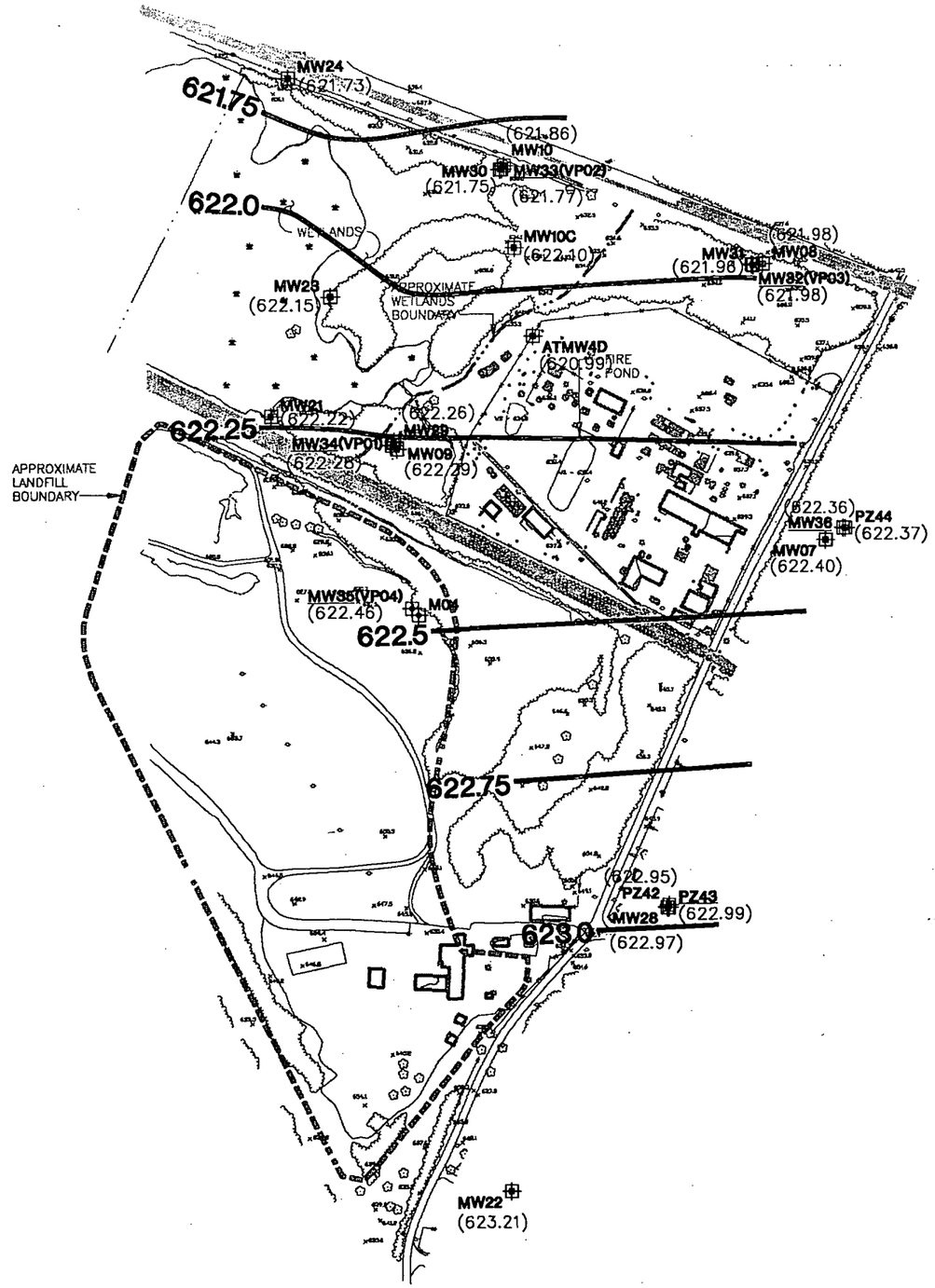
Drawn By LCL
Approved By
Date
Reference
Revisions

CROSS SECTION B-B'
LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 B4

MONTGOMERY WATSON



LEGEND

MW36 (622.36)	LOWER AQUIFER MONITORING WELL LOCATION, NUMBER, AND PIEZOMETRIC SURFACE ELEVATION
PZ43 (622.99)	LOWER AQUIFER PIEZOMETER LOCATION, NUMBER, AND PIEZOMETRIC SURFACE ELEVATION
622.0	POTENTIOMETRIC CONTOUR (CONTOUR INTERVAL: 0.25 FT)

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL IS TWO FEET.
2. ELEVATIONS ARE BASED ON U.S.G.S. DATUM (MEAN SEA LEVEL).
3. GRID BASED ON INDIANA STATE PLANE COORDINATE SYSTEM.
4. MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 INSTALLED DURING FEBRUARY, 1996 BY BOART LONGYEAR, INC. UNDER SUPERVISION OF MONTGOMERY WATSON. SEE RI REPORT FOR INSTALLATION INFORMATION FOR MONITORING WELLS MW07 THROUGH MW10 AND MW17. MONITORING WELL M04 OWNED BY GRIFFITH LANDFILL.
5. LOCATION OF MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 BASED ON SURVEY CONDUCTED BY AREA SURVEY, CO., DURING MARCH, 1996.
6. PIEZOMETRIC SURFACE ELEVATIONS MEASURED BY MONTGOMERY WATSON ON MARCH 15, 1996.

north

0 400 800

SCALE IN FEET

FIGURE 5

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Drawn By DLF,LCL
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POTENTIOMETRIC SURFACE MAP (MARCH 15, 1996)

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 **B5**

MONTGOMERY WATSON

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Other

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QUALITY CONTROL	Graphic Stand	Technical Review	Management R
	Lead Professi	Project Manager	Other

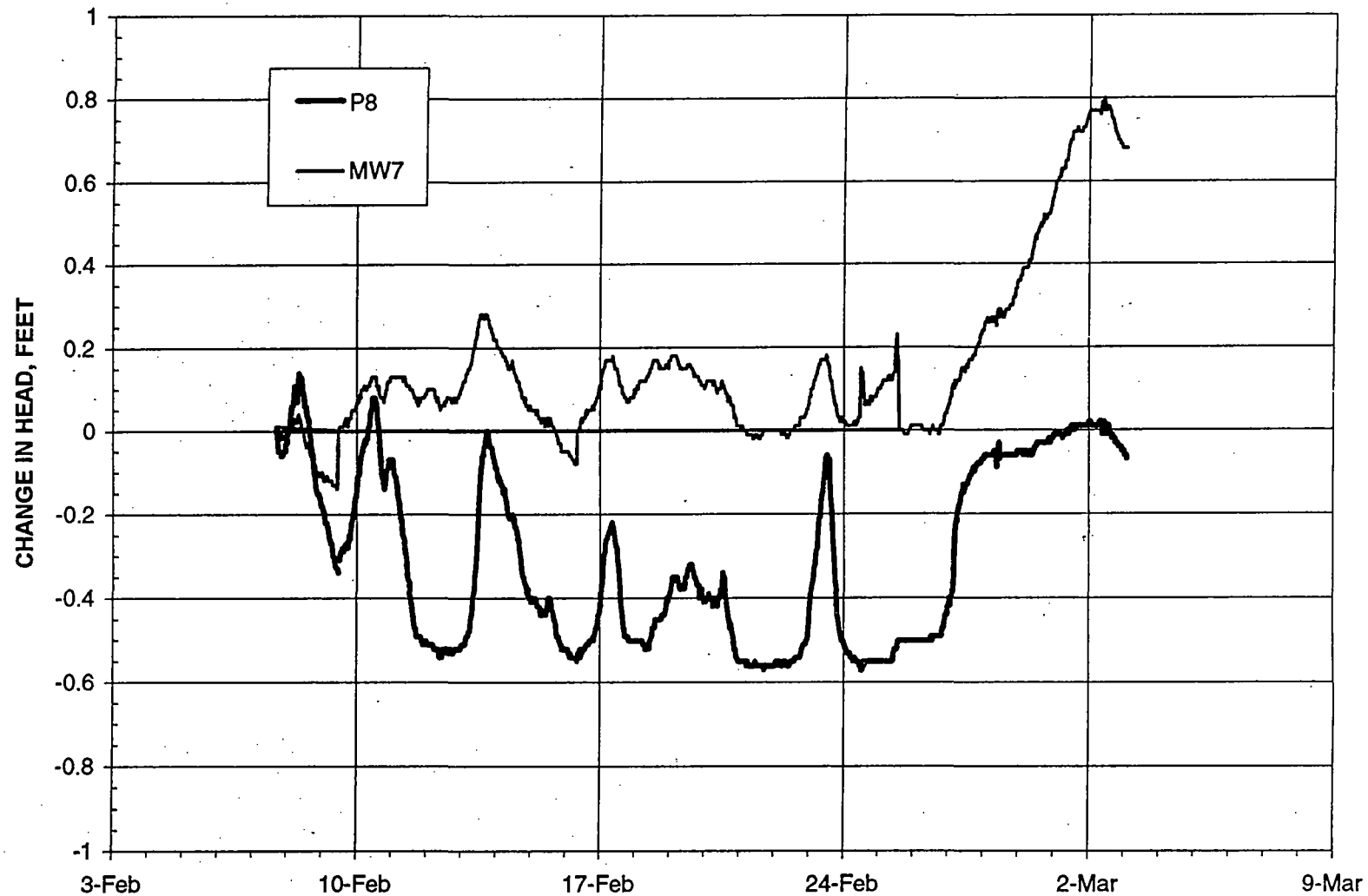

FIGURE 6

MONTGOMERY WATSON

Drawing Number 4077.0076 A1

CONTINUOUS WATER LEVEL MEASUREMENTS AT MONITORING WELL MW7 AND PIEZOMETER P8

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Developed By DAP
Drawn By DLF
Approved By
Date
Reference
Revisions

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QUALITY CONTROL	Graphic Stan	Technical Review	Management
	Lead Professional	Project Manager	Other

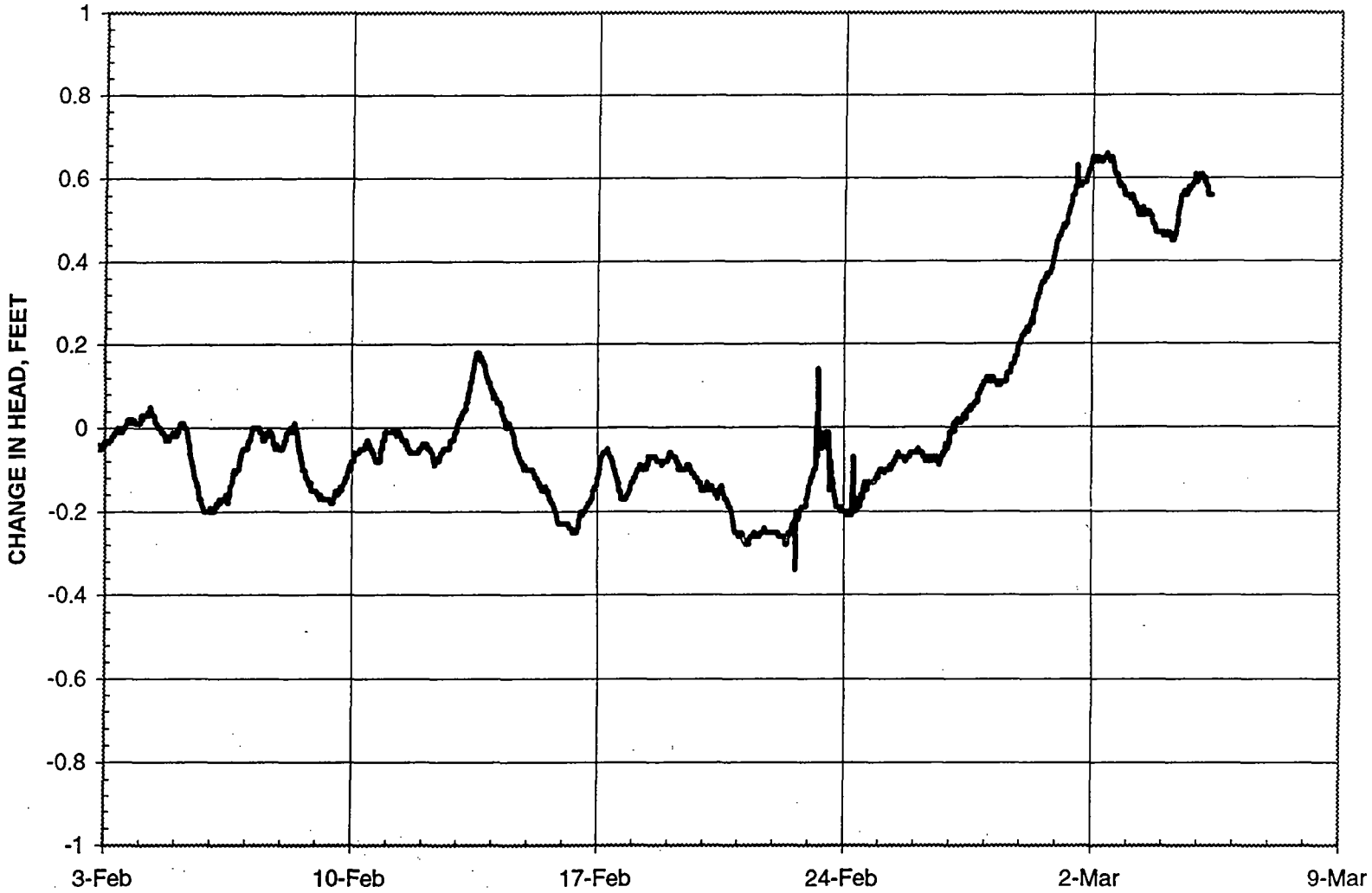


FIGURE 7

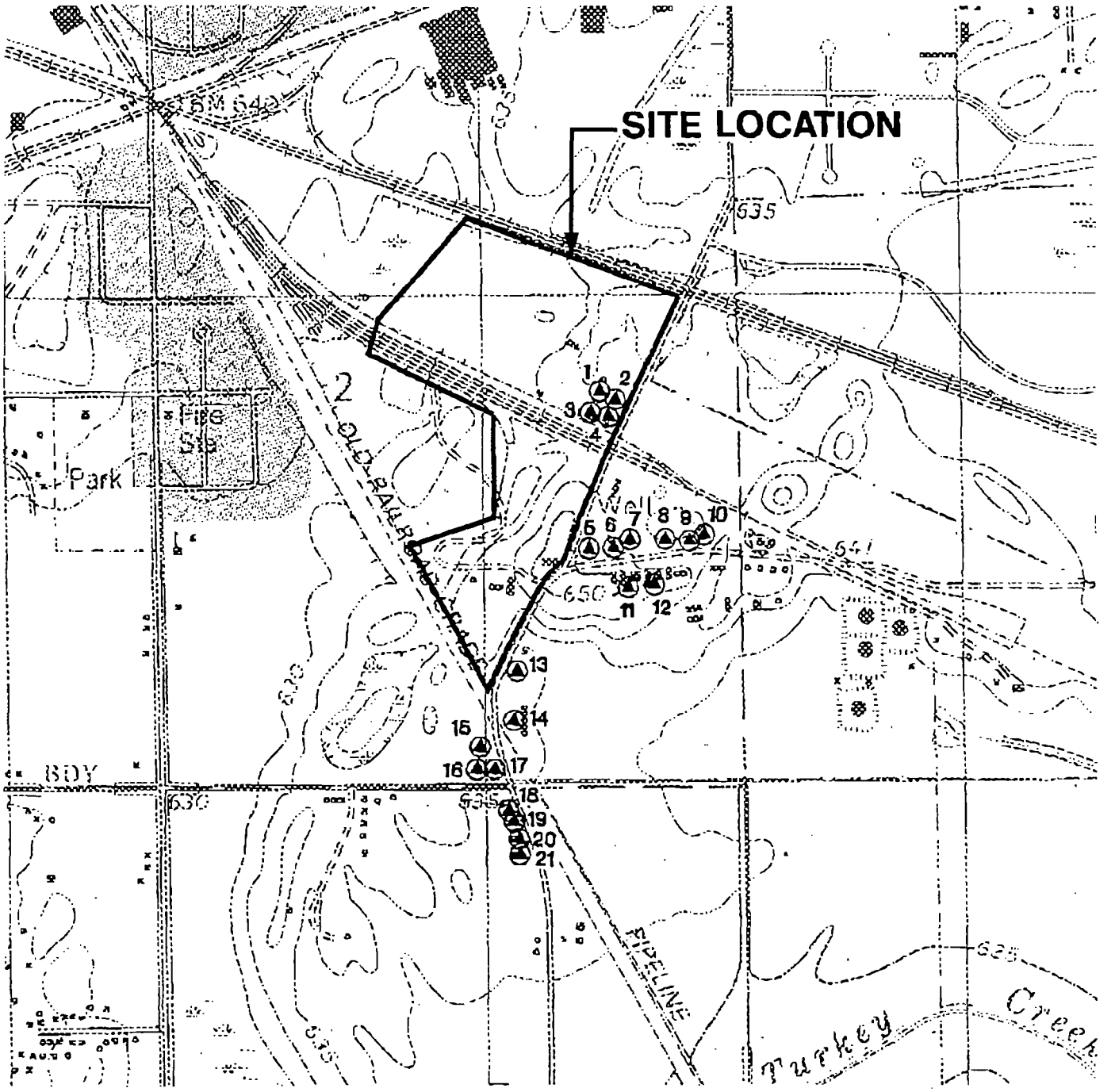
MONTGOMERY WATSON

Drawing Number 4077.0076 A2

CONTINUOUS WATER LEVEL MEASUREMENTS AT MONITORING WELL MW9

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Developed By DAP
Drawn By DLF
Approved By
Date
Reference
Revisions



LEGEND

1 PRIVATE WELL LOCATION AND NUMBER

NOTES

1. BASE MAP DEVELOPED FROM THE HIGHLAND, INDIANA, 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP, DATED 1991.
2. PRIVATE WELL DATA WAS OBTAINED FROM THE INDIANA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WATER WELL LOGS, OR A U.S.EPA SURVEY, OR A MONTGOMERY WATSON DOOR TO DOOR SURVEY.

north

0 1000 2000

SCALE IN FEET

FIGURE 8

Developed By DAP	Drawn By DLF	PRIVATE/INDUSTRIAL WELL LOCATION MAP	Drawing Number 4077.0076 A3
Approved By	Date	LOWER AQUIFER INVESTIGATION AMERICAN CHEMICAL SERVICE, INC. NPL SITE GRIFFITH, INDIANA	MONTGOMERY WATSON
Reference			
Revisions			

QUALITY CONTROL: Graphic Standards / Lead Professional; Technical Review / Project Manager; Management Review / Other

This document has been developed for a specific application and may not be used without the written approval of Montgomery Watson.

A

SOIL BORING LOGS

A1

EXISTING MONITORING WELLS MW7, MW8, MW9, MW10, MW10A, MW10B, MW10C, AND GRIFFITH LANDFILL WELL M-4

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW07
Well No. MW07
Sheet 1 of 2
Surface Elevation 638.7
Northing: 6732.0
Easting: 6113.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Vegetated Surface Near Marsh, Brown to Gray Fine SAND		
		1	0.4	5		Grades into Gray, Fine to Coarse SAND, Trace to Some Fine Gravel, Trace Pebbles, Wet (SP)		Rust Color at 5-6'
		2	0.1	10		At 9' grades into Gray Fine SAND, Well to Medium Sorted, Trace Fine Gravel, Wet (SW)		No Odor
		3	0.0	15		Grades into Dark Gray, Fine to Medium SAND, Trace to Some Silt, Trace Clay,		
		4	3.0			Increased Silt and Clay at 18.5'		
		5	0.8	20		Decreased Medium Sand and Gravel, Trace Thin (1/2") Silty Clay and Clayey Silt Layers Grades to Gray, Silty, Fine SAND to 20.5' (SP-SM)		Set 6" Permanent Casing to 21'
		6	0.0			Gray, Silty CLAY, Trace to Some Fine SAND, Trace Interbedding of Clay and Silt (CL)		
		7						
		8	0.0	25				
		9	0.0			Decreased Silt and Sand, Trace Fine Gravel at 27'		
		10	0.0	30				
		11	0.0			Becomes Very Dense and Slightly Gravel at 32'		
		12	0.0					
		13	0.0	35		Trace Fine Sand at 35'		
		14	0.0					
		15	0.0	40		Gray, Fine to Coarse SAND, Some Gravel,		

GENERAL NOTES

Start	3/7/90	Logger	TJM
End	3/14/90	Editor	
Driller	ETI	Chief	KKT
Rig	D-50	Drill Method	4 1/4" I.D. HSA (0-21'); RWB (21-50')

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW07
Well No. MW07
Sheet 2 of 2
Surface Elevation 638.7
Northing: 6732.0
Easting: 6113.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
		16	0.0			Trace to Little Silt and Pebbles (SP-SM)		
		17	0.0	45		Grades to Dark Gray, Poorly Sorted, Medium SAND, Trace to Some Fine Sand, Trace Coarse Sand and Fine Gravel and Silt, Occasional Limestone Pebbles, Wet Increased Fine Sand and Coarse Shale Gravel at 45' (SP-SM)		No Odor
		18	0.0	50		End of Boring at 50.0 ft Install Monitoring Well at 47.8 ft		
				55				
				60				
				65				
				70				
				75				
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW08
Well No. MW08
Sheet 1 of 2
Surface Elevation 638.2
Northing: 7506.0
Easting: 5934.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Vegetated Sandy Surface Black Sandy Loam to Brown Fine SAND, Trace Silt (SM)		
		1	0.0	5		Brown to Gray Fine SAND, Trace Fine Gravel (SP-SM)		No Odor
		2	6.0	10		Trace Medium Sand and Fine to Coarse Gravel (SP), Wet		Very Slight Odor at 10'
		3	22.0	15		Becomes Gray to Dark Gray, Fine to Coarse SAND, Trace Fine to Coarse Gravel (SP)		Slight Odor and Dark Staining at 16'
		4	0.2	20		Trace Silty Clay at 17' At 18', Grades to Gray, Silty, fine SAND, Trace Gray Silty Clay and Fine Gravel (SM)		
		5	1.0			Dense, Gray, Silty CLAY, Trace Fine Gravel (CL-ML)		Set 6" Permanent Casing to 22.5'
		6	0.0	25		Gray, Fine to Coarse SAND, Trace to Some Silt (SM)		
		7	0.0			Very Dense, Gray, Silty CLAY, Trace Fine to Medium Gravel (CL-ML)		
		8	0.0	30		Decreased Silt at 30'		
		9	0.0			Gray, Fine to Coarse SAND, Some Gravel (GP)		
				35		Gray, Fine SAND, Trace Silt and Medium Sand, Well Sorted, Wet (SM)		
		10	0.0			Gray, Silty CLAY and Clayey SILT (Interbedded), Trace to Some Fine Sand (CL-ML)		
		11	0.0	40				

GENERAL NOTES

Start	3/9/90	Logger	TJM
End	3/16/90	Editor	
Driller	ETI	Chief	KKT
Rig	D-50	Drill Method	4 1/4" I.D. HSA

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW08
Well No. MW08
Sheet 2 of 2
Surface Elevation 638.2
Northing: 7506.0
Easting: 5934.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Gray, Silty, Fine SAND, Trace Clay and Silt (laminated) (SM)		
						Gray, Silty CLAY, Trace Fine Sand (CL-ML)		
		12	0.0			Gray, Silty, Fine SAND and Sandy SILT, Trace Clay (SM-SC)		
				45				
		13	0.0			Gray, Very Silty, CLAY Layer (CL-ML)		
						Gray, Fine SAND, Trace Medium Sand and Fine Gravel (SP) At 44', Gray, Fine to Coarse SAND, with 2" Fine to Coarse Gravel Layer		
				50				
						End of Boring at 47.0 ft Installed Well to 45.0 ft		
				55				
				60				
				65				
				70				
				75				
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW09
Well No. MW09
Sheet 1 of 1
Surface Elevation 635.9
Northing: 6990.0
Easting: 4893.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Vegetated Surface Underlain by 1.5' of Black Sandy Loam		
		1	0.0	5		Brown and Gray Fine SAND, Trace Silt (SM)		
		2	2.5	10		At 10.3' Becomes Dark Gray to Gray, Silty, Fine SAND, Trace to Little Clay and Fine Gravel (SM), Grades to Gray Fine SAND, Trace Silt and Fine Gravel (SP-SM)		Very Slight Odor at 11'
		3	0.4	15				
		4	0.0			Dense, Gray, Silty CLAY, Trace Fine to Medium Sand and Gravel (CL-ML)		
		5	2.0	20		Thin Clayey, Fine to Coarse Sand Seam (1/2") at 19.2'		Set 6" Permanent Casing at 18.5'
		6	2.0					
		7	2.5	25				
		8	2.0			Dark Gray and Black, Fine SAND, Trace Medium Sand, Wet with Slight Odor (SP-SM)		
		9	2.0			At 26', Grades to Gray, Fine SAND, Trace Silt and Medium Sand (SP-SM)		
		10	1.0	30		Gray, Silty Clay Layer (1/4") at 27' Trace to Little Medium to Coarse Sand at 30'		
		11	0.2			Trace Fine Gravel at 33''		
				35		End of Boring at 35.0 ft Installed Well to 35.0 ft		
				40				

GENERAL NOTES

Start	3/12/90	Logger	TJM
End	3/20/90	Editor	
Driller	ETI	Chief	KKT
Rig	D-50	Drill Method	4 1/4" I.D. HSA 0-17'; 8 1/4" I.D. HSA 0-17.5

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW10
Well No. MW10
Sheet 1 of 1
Surface Elevation 633.0
Northing: 7784.0
Easting: 5200.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	VISUAL CLASSIFICATION	REMARKS
					Straight Drill to 5' Black Silty Fine SAND (SM)	
		1	13.0	5	Gray Fine to Coarse SAND, Trace to Some Gravel, 4.0' to 5.5' Grades to Gray Fine SAND, Trace Silt and Medium Sand, Wet (SM-SP)	
		2	20.0	10	Trace to Some Silt at 11-12', Some Gradational Fine to Coarse Sand Layering with Trace Fine to Coarse Sand and Fine Gravel, Trace Organics (roots)	
		3	8.0			
		4	10.0	15	Increased Silt and Fine to Coarse Gravel to 13.8'	
		5	8.0			Set 6" Permanent Casing to 15'
		6	15.0		Dense Gray Silty CLAY, Trace Fine Sand and Fine Gravel, Moist Trace Coarse Pebbles at 17.5'	
		7	25.0	20	Gray Silty CLAY to 20.2'	
		8	20.0		Gray Fine to Coarse SAND, Trace to Some Silt (SM)	
		9	22.0		Gray Fine SAND, Trace Medium Sand and Silt, Wet (SP)	
		10	13.0	25		
		11	13.0		Gray Silty SAND and GRAVEL, Trace Shale Pebbles (GM)	
		12	13.0	30	Gray Fine Sandy CLAY, Very Silty, Trace of Shale Gravel (SC)	
		13	12.0		Grades to Gray Silty Fine SAND, Trace Clay, Trace of Thin Silt-Clay Laminations at 27.3-28' (SM)	
		14	14.0			
				35	Gray Fine to Medium SAND, Trace Fine to Medium Gravel (SP), Trace to Little Silty Layers at 29-29.5', Trace Coarse Sand	
					End of Boring at 35.0 Ft Install Well MW10 to 35.0 ft	
				40		

GENERAL NOTES

Start	4/26/90	Logger	TJM
End	5/2/90	Editor	
Driller	ETI	Chief	KKT
Rig	D-50	Drill Method	4 1/4" I.D. HSA

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

WARZYN

LOG OF TEST BORING

Project American Chemical Services
RI/FS Phase II
Location Griffith, Indiana

Boring No. MW10A
Surface Elevation 634.3
Job No. 60251.12
Sheet 1 of 2

2100 CORPORATE DRIVE - ADDISON, ILLINOIS 60101 - TEL (708) 691-5000

SAMPLE No.	Type	Rec (in.)	Moist	N Value	Depth (ft.)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	PID (ppm)
						2" Black Sandy Silt TOPSOIL		
						Loose Reddish-Brown Silty Fine SAND (SM)		
1		24	M	7	5	Grades into Loose Gray Fine to Medium SAND, Little to Some Silt, Sandy Silt Seam at 7', occasional thin (1/4" to 1/2") silt seams (SM)		6.0
2		24	W	35	10	Medium Dense Gray Fine to Medium SAND, Little to Some Silt, occasional thin silt layers (SM)		40.0
3		18	W	23				40.0
4		24	W	53	15			35.0
5			W	28		Very Stiff to Hard Gray Lean CLAY, Trace Gravel (CL) Trace of Clayey Sand and Gravel at 19.0'		5.0
6		24	M	129				4.0 2.5
7		16	W	153	20	Gray Fine to Medium SAND, Trace Silt and Fine to Coarse Gravel, Trace of Silt Laminations, wet with chemical-like odors (SP-SM)		2.0
8		12	W	132				13.0
9		15	W/M	92		Grades into Gray Fine SAND		9.0 0.4
10		18	M/W	121	25	Gray Clayey SILT and Silty CLAY (layered), Trace to Some Fine Sand and Gravel (ML)		0.0
					30	Increased Amount of Gray Silty CLAY, Trace Fine Sand and Fine to Medium (Shale and Limestone) Gravel		0.0 0.0
						Grades to Gray Clayey SILT, Trace to Little Fine Sand (laminated) (CL-ML)		

WATER LEVEL OBSERVATIONS

While Drilling ▽ 7.0 Upon Completion of Drilling ▼
Time After Drilling
Depth to Water
Depth to Cave in

The stratification lines represent the approximate boundary between soil types; the transition may be gradual.

GENERAL NOTES

Start 3/21/90 End 3/27/90
Driller ETI Chief KKT Rig D-50
Logger PMS Editor TJM
Drill Method 4.25" HSA

WARZYN

LOG OF TEST BORING

Project American Chemical Services
RI/FS Phase II
Location Griffith, Indiana

Boring No. MW10A
Surface Elevation 634.3
Job No. 60251.12
Sheet 2 of 2

2100 CORPORATE DRIVE - ADDISON, ILLINOIS 60101 - TEL (708) 691-5000

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N Value	Depth (ft.)		qu (qa) (tsf)	PID (ppm)			
					35	Gray Fine to Medium SAND, Slight Trace of Clayey Pockets (1/4" layers) at 26.8' (SP)					
					40	End of Boring at 27.0 Feet Abandoned Location for Deep Monitoring Well Tremmie Grout Borehole					
					45						
					50						
					55						
					60						
					65						
					70						

WARZYN

LOG OF TEST BORING

Project American Chemical Services
RI/FS Phase II
Location Griffith, Indiana

Boring No. MW10B
Surface Elevation 634.2
Job No. 60251.12
Sheet 1 of 1

2100 CORPORATE DRIVE - ADDISON, ILLINOIS 60101 - TEL (708) 691-5000

SAMPLE No.	TYPE	Rec (in.)	Moist	N Value	Depth (ft.)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	PID (ppm)
						Straight Drill to 5' 6" of Dark Organic SILT on Surface		
1			W	18	5	Light Brown Fine to Coarse SAND (SM)		
2			W	42	10	Light Brown and Gray Fine to Coarse SAND, Trace Gravel (SP-SM)		
3			W	40				
4			W	62	15			30.0
5			M	104		Light Brown to Gray Silty CLAY, Trace of Fine to Coarse Gravel (CL-ML)		20.0
6			M/W	115	20			30.0
						Gray Silty to Sandy CLAY (SC)		10.0
						End of Boring at 21.0 Feet Abandoned Location for Deep Monitoring Well Tremmie Grout Borehole		
					25			
					30			

WATER LEVEL OBSERVATIONS

While Drilling ▽ 5.5 Upon Completion of Drilling ▼
Time After Drilling
Depth to Water
Depth to Cave in

The stratification lines represent the approximate boundary between soil types; the transition may be gradual.

GENERAL NOTES

Start 3/28/90 End 3/28/90
Driller ETI Chief KKT Rig D-50
Logger PMS Editor TJM
Drill Method 4.25" HSA

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
RI/FS Phase II
Location: Griffith, Indiana

Boring No. MW10C
Well No. MW10C
Sheet 1 of 1
Surface Elevation 634.7
Northing: 7554.0
Easting: 5229.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Straight Drill to 5' Brown Medium to Coarse Silty SAND, Trace of Shale and Coarse Gravel (SP-SM)		
		1	3.0	5				
						Gray Fine Dark SAND, Trace of Silt (SM)		
		2	50.0	10		Silty Clay Layer (2") at 10.2' Becomes Dark Gray to Brown Fine to Coarse SAND, Trace Coarse Sand (SP-SM)		
		3	15.0			Dark Gray to Brown Fine SAND, Interbedded with Coarse Sand and Gravel Layers (SP-SM)		
		4	2.5	15		Brown Silty CLAY Layer (3") at 13.6'		
		5	0.0			Light Brown Fine SAND Layer (4") at 14.2'		Set 6" Permanent Casing to 17'
		6	2.0			Dense Gray Lean CLAY, Trace of Shale and Gravel (CL)		
		7	3.0	20		Gray Silty CLAY, Trace Fine to Coarse Sand and Fine Gravel (CL-ML)		Odor Present
		8	1.0			Gray Fine to Coarse SAND, Trace Fine to Coarse GRAVEL, Silt and Clay (SP-SM)		
				25		Gray Silty CLAY, Trace Fine to Coarse Sand (CL-ML)		
						End of Boring at 25.0 Ft Well Venting Gas		
				30				
				35				
				40				

GENERAL NOTES

Start	3/28/90	Logger	SJB
End	4/3/90	Editor	TJM/SJC
Driller	ETI	Chief	KKT
Rig	D-50	Drill Method	4.25" I.D. HSA, 5.875" RWB

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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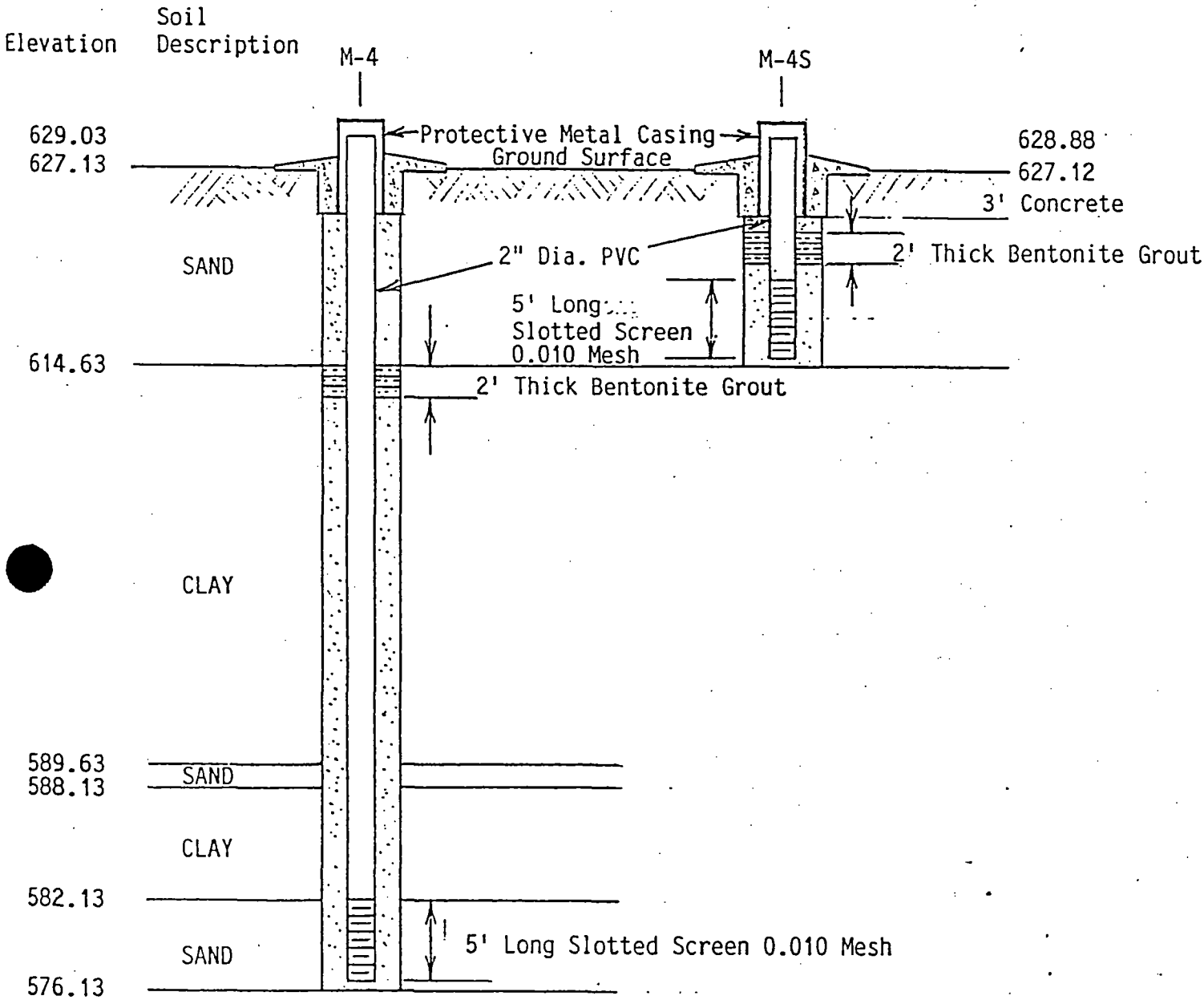
DETAILS OF MONITORING WELLS
M-4 and M-4S



Concrete

Bentonite Grout

Granular Backfill

Well Screen

DATE	Water Level ELEVATION	REMARKS
12-30-86	618.77	Water level elevations are for M-4
06-05-87	619.11	
07-27-87	616.83	
10-29-87	617.07	
01-26-88	619.03	
04-28-88	618.53	
07-28-88	617.00(?)	
10-24-88	614.03	

Note: Water level elevations for M-4S

A2

MONITORING WELL MW35

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP04
Well No. MW35
Sheet 1 of 3
Surface Elevation 632.4
Northing: 6541.8
Easting: 4933.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0 to 13.0 ft. See M04 Boring Log for Soil Profile and Descriptions		
				5				
				10				
				15		Medium Stiff to Stiff, Gray, Lean CLAY, Trace Sand and Gravel (CL)		8" permanent casing set at 14 ft
1		1	0.0					
				20				
		2	0.0					
2				25				
		3	0.0					
				30				
		4	0.0					
3				35				
		5	0.0					
				40				

GENERAL NOTES

Start	2/23/96	Logger	R.J. Ramsby
End	2/24/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP04
Well No. MW35
Sheet 2 of 3
Surface Elevation 632.4
Northing: 6541.8
Easting: 4933.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
		6	0.0	45				
4		7	0.0	50		Dense, Gray, Fine to Coarse SAND, Trace Silt, Little to Some Gravel (SP/GP)		
		8	0.0	55				
5		9	0.0	60		Dense, Gray to Brown, Fine to Coarse SAND, Trace Silt (SP)		Sample collected for grain size analysis at 55 ft Collect groundwater sample for field GC screen at 58 ft
		10	0.0	65				
6		11	0.0	70				Collect groundwater sample for field GC screen at 68 ft
		12	0.0	75				
7		13	0.0	80				Collect groundwater sample for field GC screen at 79 ft
		14	0.0	85		Dense, Gray to Brown, Fine to Medium SAND, Some Silt and Clay (SM)		

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP04
Well No. MW35
Sheet 3 of 3
Surface Elevation 632.4
Northing: 6541.8
Easting: 4933.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
8		15	0.0					Sample collected for grain size analysis at 85 ft
						Stiff, Gray, Lean CLAY, Trace Sand and Gravel (CL)		
		16	0.0	90				Collect groundwater sample for field GC screen at 89 ft
				95		End of Boring at 93.0 ft		
				100				
				105				
				110				
				115				
				120				
				125				
				130				

A3

MONITORING WELL MW36 AND PIEZOMETER PZ44

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW36
Well No. MW36
Sheet 1 of 3
Surface Elevation 636.2
Northing: 6767.5
Easting: 6164.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Earth Drilled 0 to 15.0 ft. See MW07 Boring Log for Soil Profile and Descriptions		
				5				
				10				
				15		Very Stiff to Hard, Gray, Lean CLAY, Trace Fine to Coarse Sand and Gravel (CL)		
1		1	0.0					8" permanent casing set at 17 ft
				20				
						Very Stiff, Gray, Clayey SILT (ML)		
		2	0.0			Very Stiff to Hard, Gray, Lean CLAY, Trace Fine to Coarse Sand and Gravel (CL)		
2				25				
		3	0.0					
				30				Collect groundwater sample for field GC screen at 30 ft
		4	0.0					
3				35		Dense, Dark Gray, Fine to Medium SAND (SP)		
		5	0.0					
				40				Collect groundwater sample for

GENERAL NOTES

Start	2/24/96	Logger	D.A. Pieczynski
End	2/25/96	Editor	R.J. Ramsby / M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW36
Well No. MW36
Sheet 2 of 3
Surface Elevation 636.2
Northing: 6767.5
Easting: 6164.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Dense, Gray to Brown, Fine SAND, Trace Silt (SP)		field GC screen at 39 ft
		6	0.0					
4				45				
		7	0.0					
				50				Collect groundwater sample for field GC screen at 49 ft
		8	0.0					
5				55				
		9	0.0					
				60				Collect groundwater sample for field GC screen at 59 ft Sample collected for grain size analysis at 60 ft
		10	0.0					
6				65				
		11	0.0					
				70				Collect groundwater sample for field GC screen at 69 ft
		12	0.0					
7				75				
		13	0.0					
				80		Dense, Gray to Brown, Fine SAND, Little Silt (SP-SM)		Collect groundwater sample for field GC screen at 79 ft
		14	0.0					
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW36
Well No. MW36
Sheet 3 of 3
Surface Elevation 636.2
Northing: 6767.5
Easting: 6164.0

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
8		15	0.0	90				Sample collected for grain size analysis at 87 ft
						Very Stiff to Hard, Gray, Lean CLAY, Trace Fine to Coarse Sand and Gravel (CL)		Collect groundwater sample for field GC screen at 92 ft
				95		End of Boring at 95.0 ft		
				100				
				105				
				110				
				115				
				120				
				125				
				130				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ44
Well No. PZ44
Sheet 1 of 2
Surface Elevation 636.1
Northing: 6766.0
Easting: 6169.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0-64 ft. See MW36 Boring Log for Soil Profile and Descriptions		
				5				
				10				
				15				
				20				8" permanent casing set at 20 ft
				25				
				30				
				35				
				40				

GENERAL NOTES

Start	2/25/96	Logger	R.J. Ramsby
End	2/25/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ44
Well No. PZ44
Sheet 2 of 2
Surface Elevation 636.1
Northing: 6766.0
Easting: 6169.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
				60				
				65		End of Boring at 64.0 ft		
				70				
				75				
				80				
				85				

A4

MONITORING WELLS MW31 AND MW32

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW31
Well No. MW31
Sheet 1 of 2
Surface Elevation 639.4
Northing: 7505.3
Easting: 7906.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0 to 74.8 ft. See VP03 (MW32) Boring Log for Soil Profile and Descriptions.		
				5				
				10				
				15				
				20				8" permanent casing set at 20.5 ft
				25				
				30				
				35				
				40				

GENERAL NOTES

Start	2/14/96	Logger	R.J. Ramsby
End	2/14/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770 D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW31
Well No. MW31
Sheet 2 of 2
Surface Elevation 639.4
Northing: 7505.3
Easting: 7906.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
				60				
				65				
				70				
				75		End of Boring at 74.8 ft		
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP03
Well No. MW32
Sheet 1 of 3
Surface Elevation 639.5
Northing: 7507.0
Easting: 5902.2

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Earth Drilled 0 to 18.5 ft. See MW08 Boring Log for Soil Profile and Descriptions		
				5				
				10				
				15				
				20		Stiff, Gray, Lean CLAY, Trace Gravel (CL)		
1								8" permanent casing set at 20.5 ft
		1	0.0					
				25				
2								
		2	0.0					
				30				
		3	0.0					
				35		Dense, Light Gray to Gray, Fine SAND, Trace Silt (SP)		
3								
		4	0.0					
				40				Collect groundwater sample for

GENERAL NOTES

Start	2/7/96	Logger	R.J. Ramsby
End	2/15/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP03
Well No. MW32
Sheet 2 of 3
Surface Elevation 639.5
Northing: 7507.0
Easting: 5902.2

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
								field GC screen at 39 ft
		5	0.0					
4				45				
		6	0.0					
				50				Collect groundwater sample for field GC screen at 49 ft
		7	0.0					
5				55				
		8	0.0					
				60				Collect groundwater sample for field GC screen at 59 ft
		9	0.0					
6				65		Dense, Gray to Brown, Fine to Coarse SAND, Trace silt (SP)		
		10	0.0					
				70		Cobble at 69.0 ft		Collect groundwater sample for field GC screen at 69 ft Sample collected for grain size analysis at 70 ft
		11	0.0					
7				75				
						Dense, Gray to Brown, Fine SAND, Trace Silt (SP)		
		12	0.0	80				Collect groundwater sample for field GC screen at 79 ft
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP03
Well No. MW32
Sheet 3 of 3
Surface Elevation 639.5
Northing: 7507.0
Easting: 5902.2

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
8		13	0.0	90				Collect groundwater sample for field GC screen at 89 ft
		14	0.0	95				
9		15	0.0					Sample collected for grain size analysis at 96 ft
		16	0.0	100		Very Stiff, Gray, Lean CLAY, Trace Gravel (CL)		Collect groundwater sample for field GC screen at 99 ft
				105		End of Boring at 103.0 ft		
				110				
				115				
				120				
				125				
				130				

A5

MONITORING WELLS MW29 AND MW34

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW29
Well No. MW29
Sheet 1 of 2
Surface Elevation 635.7
Northing: 7012.0
Easting: 4885.5

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0-60 ft. See VP01 (MW34) Boring Log for Soil Profile and Descriptions.		8" permanent casing set at 17 ft
				5				
				10				
				15				
				20				
				25				
				30				
				35				
				40				

GENERAL NOTES

Start	2/23/96	Logger	D.A. Pieczynski
End	2/24/96	Editor	R.J. Ramsby
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location Griffith, Indiana

Boring No. MW29
Well No. MW29
Sheet 2 of 2
Surface Elevation 635.7
Northing: 7012.0
Easting: 4885.5

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
				60		End of Boring at 60.0 ft		
				65				
				70				
				75				
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP01
Well No. MW34
Sheet 1 of 3
Surface Elevation 635.8
Northing: 7001.8
Easting: 4880.4

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Earth Drilled 0 to 15 ft. See MW09 Boring Log for Soil Profile and Descriptions.		
				5				
				10				
				15		Stiff, Gray, Lean CLAY, Trace Sand and Gravel (CL)		
1		1	0.0	20				8" permanent casing set at 17 ft
		2	0.0					
2				25		Dense, Gray to Brown, Fine SAND, Trace Silt (SP)		
		3	0.0					
				30				Collect groundwater sample for field GC screen at 30 ft
		4	0.0					
3				35				
		5	0.0					
				40				Collect groundwater sample for

GENERAL NOTES

Start	2/22/96	Logger	R.J. Ramsby / D.A. Pieczynski
End	2/23/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J:\4077\Gint\40770 D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location Griffith, Indiana

Boring No. VP01
Well No. MW34
Sheet 2 of 3
Surface Elevation 635.8
Northing: 7001.8
Easting: 4880.4

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
								field GC screen at 39 ft
		6	0.0					
4				45				
		7	0.0					
				50				Collect groundwater sample for field GC screen at 49 ft
		8	0.0					
5				55				Sample collected for grain size analysis at 56 ft
		9	0.0					Collect groundwater sample for field GC screen at 59 ft
				60				
		10	0.0					
6				65				
		11	0.0					
				70				Collect groundwater sample for field GC screen at 69 ft
		12	0.0					
7				75				
		13	0.0					
				80				Collect groundwater sample for field GC screen at 79 ft
		14	0.0					
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP01
Well No. MW34
Sheet 3 of 3
Surface Elevation 635.8
Northing: 7001.8
Easting: 4880.4

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
8		15	0.0					Sample collected for grain size analysis at 88 ft
				90				
		16	0.0					Collect groundwater sample for field GC screen at 92 ft
						Hard, Gray, Lean CLAY (CL)		
				95				
						End of Boring at 95.0 ft		
				100				
				105				
				110				
				115				
				120				
				125				
				130				

A6

MW30 AND MW33

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW30
Well No. MW30
Sheet 1 of 2
Surface Elevation 632.1
Northing: 7773.7
Easting: 5193.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0 to 57.1 ft. See VP02 (MW33) Boring Log for Soil Profile and Descriptions.		
				5				
				10				
				15				8" permanent casing set at 15 ft
				20				
				25				
				30				
				35				
				40				

GENERAL NOTES

Start	2/21/96	Logger	R.J. Ramsby
End	2/22/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770 D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW30
Well No. MW30
Sheet 2 of 2
Surface Elevation 632.1
Northing: 7773.7
Easting: 5193.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
						End of Boring at 57.1 ft		
				60				
				65				
				70				
				75				
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP02
Well No. MW33
Sheet 1 of 3
Surface Elevation 632.0
Northing: 7773.5
Easting: 5188.6

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Earth Drilled 0 to 13.5 ft. See MW10 Boring Log for Soil Profile and Descriptions		
				5, 10				
1				15		Stiff, Gray, Lean CLAY, Trace Sand and Gravel (CL)		8" permanent casing set at 15 ft
		1	67.0	20		Dense, Gray, Fine SAND, Trace Silt (SP)		
2		2	125.0	25				
		3	0.0					
						Dense, Gray, Silty SAND, Trace Clay (SM)		
				30		Dense, Gray, Fine SAND, Trace Silt and Gravel (SP)		Collect groundwater sample for field GC screen at 29 ft
		4	0.0					
3				35		Dense, Gray to Brown, Fine to Medium SAND, Trace Silt (SP)		
		5	0.0	40		Dense, Gray to Brown, Fine SAND, Trace Silt (SP)		Collect groundwater sample for

GENERAL NOTES

Start	2/20/96	Logger	R.J. Ramsby
End	2/21/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J:\4077\Gint\40770_D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP02
Well No. MW33
Sheet 2 of 3
Surface Elevation 632.0
Northing: 7773.5
Easting: 5188.6

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
								field GC screen at 39 ft
		6	0.0					
4				45				
		7	0.0					
				50				
		8	0.0					Sample collected for grain size analysis at 52 ft Collect groundwater sample for field GC screen at 52 ft
5				55				
		9	0.0					
				60				Collect groundwater sample for field GC screen at 59 ft
		10	0.0					
6				65				
		11	0.0					
				70		Dense, Gray to Brown, Fine to Medium SAND, Trace Silt (SP)		
		12	0.0					Collect groundwater sample for field GC screen at 72 ft
7				75				
		13	0.0					
				80				Collect groundwater sample for field GC screen at 79 ft Sample collected for grain size analysis at 80 ft
		14	0.0					
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. VP02
Well No. MW33
Sheet 3 of 3
Surface Elevation 632.0
Northing: 7773.5
Easting: 5188.6

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
8						Very Stiff, Gray, Lean CLAY, Trace to Little Gravel (CL)		Collect groundwater sample for field GC screen at 86 ft
		15	2.5					
				90				
		16	0.0					
9				95				
		17	0.0					
10				100				
		18	10.2			Dark Gray Shale in Bottom 1 in. of Core Barrel		
				105		End of Boring at 105.0 ft		
				110				
				115				
				120				
				125				
				130				

A7

MONITORING WELL MW28 AND PIEZOMETERS PZ42 AND PZ43

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. MW28
Well No. MW28
Sheet 1 of 2
Surface Elevation 649.0
Northing: 5696.6
Easting: 5657.2

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
						Earth Drilled 0-15 ft. See MW17 Boring Log for Soil Profile and Descriptions.		
				5				
				10				
		1		15		Medium Dense, Brown, Fine SAND, Trace Gravel and Silt (SP)		
		2				Soft, Gray, SILT, Trace Sand and Clay (ML)		
		3		20		Medium Dense, Brown, Fine SAND, Trace Gravel and Silt (SP)		Soil stained dark brown below saturation. Groundwater at 19.0 ft
		4				Medium Dense, Dark Brown, Medium to Coarse SAND, Trace to Little Gravel, Trace Silt (SP)		
		5		25		Medium Dense, Brown, Fine SAND, Trace Silt (SP)		
		6				Stiff, Gray, Clayey SILT, Trace Fine Sand (ML)		
				30		Stiff, Gray, Lean CLAY, Trace Silt (CL)		8" permanent casing set at 30 ft
						Earth Drilled 30 to 70.3 ft. See PZ43 Boring Log for Soil Profile and Descriptions.		
				35				
				40				

GENERAL NOTES

Start	1/30/96	Logger	R.J. Ramsby
End	2/6/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J:\4077\Gint\40770_D; SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location Griffith, Indiana

Boring No. MW28
Well No. MW28
Sheet 2 of 2
Surface Elevation 649.0
Northing: 5696.6
Easting: 5657.2

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
				60				
				65				
				70				
						End of Boring at 70.3 ft.		
				75				
				80				
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ42
Well No. PZ42
Sheet 1 of 3
Surface Elevation 649.0
Northing: 5696.3
Easting: 5661.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						Earth Drilled 0-30.0 ft. See MW28 Boring Log for Soil Profile and Descriptions		
				5				
				10				
				15				
				20				
				25				
				30		Earth Drilled 30-85.5 ft. See PZ43 Boring Log for Soil Profile and Descriptions		8" permanent casing set at 30 ft
				35				
				40				

GENERAL NOTES

Start	1/30/96	Logger	R.J. Ramsby
End	2/5/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770 D: SONIC

MONTGOMERY WATSON

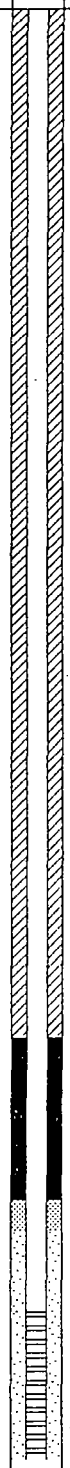
LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ42
Well No. PZ42
Sheet 2 of 3
Surface Elevation 649.0
Northing: 5696.3
Easting: 5661.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
				45				
				50				
				55				
				60				
				65				
				70				
				75				
				80				
				85				



MONTGOMERY WATSON

LOG OF TEST BORING

Project American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location Griffith, Indiana

Boring No. PZ42
Well No. PZ42
Sheet 3 of 3
Surface Elevation 649.0
Northing: 5696.3
Easting: 5661.9

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE					SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
Run No.	TYPE	Sample No.	PID	Depth (ft.)				
						End of Boring at 85.5 ft		
				90				
				95				
				100				
				105				
				110				
				115				
				120				
				125				
				130				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ43
Well No. PZ43
Sheet 1 of 3
Surface Elevation 649.1
Northing: 5701.7
Easting: 5661.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
				5, 10, 15, 20, 25		Earth Drilled 0-30 ft. See MW28 Boring Log for Soil Profile and Descriptions		
1		1	0.0	30		Stiff, Gray, Lean CLAY, Trace Fine to Coarse Sand and Gravel (CL)		8" permanent casing set at 30 ft
2				35, 40				

GENERAL NOTES

Start	1/31/96	Logger	R.J. Ramsby
End	2/2/96	Editor	M.D. Pauli
Driller	Boart Longyear	Chief	J. Duecette
Rig	CME75/Roto Sonic	Drill Method	12 1/4" I.D. HSA; 6" Roto Sonic

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

J\4077\Gint\40770 D: SONIC

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ43
Well No. PZ43
Sheet 2 of 3
Surface Elevation 649.1
Northing: 5701.7
Easting: 5661.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
3		2	0.0	45				
				50				
4		3	3.3	55				
				60		Dense, Gray to Brown, Fine SAND, Little Silt (SP-SM)		
		4	0.0					
5		5	0.0	65				Sample collected for grain size analysis at 65 ft
		6	0.0					
				70				
		7	0.0			Dense, Gray to Brown, Fine SAND, Little Silt (SP-SM)		
6				75				
		8	0.0					
				80				
		9	0.0					Sample collected for grain size analysis at 82 ft
				85				

MONTGOMERY WATSON

LOG OF TEST BORING

Project: American Chemical Service, Inc.
Still Bottoms/Treatment Lagoon
Location: Griffith, Indiana

Boring No. PZ43
Well No. PZ43
Sheet 3 of 3
Surface Elevation 649.1
Northing: 5701.7
Easting: 5661.8

2100 Corporate Drive, Addison, Illinois 60101, TEL. (708) 691-5000

SAMPLE Run No.	TYPE	Sample No.	PID	Depth (ft.)	SOIL GRAPHIC	VISUAL CLASSIFICATION	WELL DIAGRAM	REMARKS
7		10	0.0			Dense, Gray to Brown, Fine SAND, Some Silt and Clay (SM)		
				90				
		11	0.0					
				95				
8						Dense, Gray, Fine to Coarse SAND, Little to Some Gravel, Trace Silt (SP/GP)		Sample collected for grain size analysis at 96 ft
		12	0.0			Dense, Gray, Fine SAND, Trace Gravel (SP)		
				100		Hard, Gray, Lean CLAY, Trace Gravel (CL)		
				105				
9		13	0.0					
				110		Dark Gray Shale in Bottom 1 in. of Core Barrel		
						End of Boring at 111.0 ft		
				115				
				120				
				125				
				130				

B

B

VERTICAL PROFILING PURGING/SAMPLING INFORMATION

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Sampled @ 1016 A

Purge @ ~200 ml/min

Sample @ 200 ml/min

Well Number VP 2

Total Depth 29'

Depth to Water NA

Date 2-20-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
955:00			115	8.67	270	10.5
1008:00			85	8.10	428	11.5
1010:00			186	8.10	440	11.5
1012:00			380	8.10	440	11.5
1014:00			378	8.06	440	11.5
1015:00			340	8.05	440	11.5

J/4357/018/SAMPLFM.XLS

Sampled @ 1236

Vertical Profile

purge @ = 1 kgal/min

Sample @ = 250 ml/min.

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Well Number: VP2

Total Depth: 39'

Depth to Water: NA

Date: 2-20-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1226:00			92	8.33	255	11.0
1227:00			68	8.20	265	11.0
1228:00			61	8.18	265	11.0
1230:00			50	8.16	265	11.0
1232:00			68	8.17	260	11.0
1234:00			66	8.19	260	11.0
1235:00			69	8.19	265	11.0

J/4357/018/SAMPLFM.XLS

Sampled @ 222

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge @ ≈ 1/4 gal/min
Sample @ ≈ 300 ml/min

Well Number VP 2
Total Depth 52
Depth to Water NA
Date 2-20-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
204:00			1000	7.86	320	11.0
205:00			1000	7.95	325	11.0
208.00			760	8.06	330	11.0
209.00			114	8.11	320	11.5
210:00			89	8.14	315	12.0
211:00			67.5	8.18	310	12.0
212:00			52.0	8.20	285	12.0
213.00			30.0	8.21	285	12.0
215:00			29	8.26	285	12.0
218:00			28	8.30	285	12.0

J/4357/018/SAMPLFM.XLS

Sampled @ 342

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge ≈ 800ml/min

Sampled @ ≈ 150ml/min.

Well Number VPZ

Total Depth 591

Depth to Water NA

Date 2-20-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
334:00			84	8.14	235	11.0
35:30			70.4	8.26	240	11.0
37:00			63.6	8.30	240	11.0
38:00			58.8	8.32	240	11.0
39:00			60.5	8.34	240	11.0
340:00			59.6	8.36	240	11.0

J/4357/018/SAMPLFM.XLS

Sampled @ 458

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purged @ 1/2 gal/min
Sampled @

Well Number VP2
Total Depth 72'
Depth to Water NA
Date 2-20-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
447:30			78	6.85	1500	12.0
449:00			60	6.95	1500	12.5
450:00			58	7.03	1500	12.5
451:30			56	7.07	1510	12.5
452:30			71	7.11	1510	12.5
454:00			73	7.13	1510	13.0
455.00			75	7.15	1510	13.0
456:00			75	7.17	1520	13.0

J/4357/018/SAMPLFM.XLS

Sampled @ 828

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge ≈ 1/2 gal/min
Sampler ≈ 300 ml/min

Well Number: VP2
Total Depth: 79'
Depth to Water: NA
Date: 2-21-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
818:30			12.4	7.50	420	7.0
819:30			10.2	7.56	420	7.0
820:30			4.1	7.45	450	7.0
821:30			2.0	7.48	455	7.0
822:30			1.8	7.50	460	7.0
823:30			1.9	7.53	465	7.0
824:30			1.9	7.56	470	7.0
825:30			1.8	7.60	475	7.0

J/4357/018/SAMPLFM.XLS

Sample 1018

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge @ ≈ 1 gal/min
Sample @ ≈ 300 ml/min

Well Number: VP2
Total Depth: 86'
Depth to Water: NA
Date: 2-21-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1007:00			99	8.67	200	6.0
1009:30			100	8.77	200	6.0
1010:30			107	8.84	205	6.5
1011:30			98	8.88	210	7.0
1012:30			93	8.97	215	7.5
1013:30			87	8.99	220	7.5
1014:30			76	8.98	220	8.0
1015:30			73	8.95	220	8.0
1016:30			70	8.95	220	8.0

J/4357/018/SAMPLFM.XLS

Sampled @ 420

Vertical Profile

Purge @ ≈ 1/2 gal/min

Sample @ ≈ 300ml/min

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]S

PRE-DESIGN INVESTIGATION

Well Number: ~~S~~ VP4

Total Depth: 58

Depth to Water: NA

Date: 2-23-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
412:00			Overrang	8.01	485	7.0
413.00			"	8.10	485	7.0
414:00			"	8.11	485	7.0
415:06			"	8.12	485	7.0
416:00			"	8.14	485	7.0
417:00			"	8.16	485	7.0
418:0			"	8.17	485	7.0

J/4357/018/SAMPLFM.XLS

Sample de 748

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge @ ≈ 1/2 gal/min
Sample @ ≈ 250 ml/min

Well Number: VP4
Total Depth: 68'
Depth to Water: NA
Date: 2-24-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
739:00			183	7.69	240	8.0
7:40:00			176	7.94	245	9.0
7:41:00			253	8.10	250	9.0
742:00			297	8.19	250	9.5
743:00			272	8.29	250	9.5
744:00			242	8.38	255	10.0
745:00			230	8.46	260	10.0
746:00			257	8.55	260	10.5

J/4357/018/SAMPLFM.XLS

Sampled @ 1017

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purged } See logbook for description.
Sampled }

Well Number VP4
Total Depth 59
Depth to Water NA
Date 2-24-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1010:00			12	8.56	260	11.5
1013:00			23.	8.78	265	11.0

J/4357/018/SAMPLFM.XLS

Sampled @ 1208

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purged @ 1/2 gal/min
Sampled @ ≈ 300 ml/min.

Well Number VP4
Total Depth 89'
Depth to Water NA
Date 2-24-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1159:30			75.9	7.77	330	11.5
1200:30			39.2	7.76	330	11.5
1201:30			64	7.80	325	11.0
1202:30			62	7.89	325	11.5
1204:30			62	8.00	310	11.5
1205:30			68	8.01	305	12.0
1206:30			66	8.05	305	12.0

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

.75 gal purged
Purge rate @ ≈ 1/2 gal/min
Sample @ ≈ 300ml/min

Well Number VP3
Total Depth 39'
Depth to Water NA
Date 2-7-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
320:30			1500	7.48	200	10.5
322:30			600	7.80	210	10.5
323:30			600	7.97	200	10.5
325:01			400	7.97	200	10.5
326:30			600	8.04	210	10.5

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

purge & sample @ ≈ 300 ml/min.

Well Number: VP3

Total Depth: 491'

Depth to Water: NA

Date: 2-7-96

Sampled @ 5.07

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
456.00			110	7.47	300	10.5
458.00			74	7.58	300	10.5
459.00			83	7.65	300	11.0
500.00			88	7.70	300	11.0
502.00			117	7.78	300	11.0
503.00			146	7.82	300	11.0
504.00			101	7.84	300	11.0
505.00			169	7.88	300	11.0
506.00			66	7.92	300	11.0

J/4357/018/SAMPLFM.XLS

Begin Purge @ 1259
Sample @ 110

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge @ ≈ 1/2 gal/min
Sample @ ≈ 300 ml/min

Well Number: VP3
Total Depth: 59'
Depth to Water: NA
Date: 2-8-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
125930			136	7.83	200	10.5
101.30			161	8.05	200	11.5
102.30			134	8.18	200	11.5
103.30			104	8.21	200	11.5
104.30			115	8.30	200	11.5
105:30			126	9.03	120	11.5
107.30			113	8.39	210	11.5
109.30			113	8.41	210	11.5

J/4357/018/SAMPLFM.XLS

Sampled @ 327 P.

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

purge @ ≈ 1/2 gal/min

Sample @ 280 ml/min (measured)

Well Number MVP 3

Total Depth 69'

Depth to Water NA

Date 2-8-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
314:30			207	7.91	200	10.0
315:30			206	7.93	150	10.0
316:30			218	8.02	210	10.5
317:30			215	8.09	160	10.5
319:30			209	8.14	210	10.5
321:30			212	8.21	200	11.0
323:30			213	8.32	200	11.0
325:30			217	8.30	200	11.0

J/4357/018/SAMPLFM.XLS

Sampled @ 505

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge beginning @ ≈ 1/2 gal/min reduced to ≈ 250 ml/min

Sampled @ ≈ 250 ml/min

Well Number: VR3

Total Depth: 791

Depth to Water: NA

Date: 2-8-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
456.00			212	7.74	200	10.0
457:00			213	7.84	200	10.0
458:00			222	7.97	200	10.0
459.00			222	8.03	200	10.5
500:00			220	8.08	210	10.5
502:00			224	8.14	210	11.0
503:00			223	8.18	210	11.0
504:00			223	8.22	210	11.0

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Purge @ ≈ 4/2 gal/min

Sample @ ≈ 250 ml/min

Sampled @ 1011

Well Number VP3

Total Depth 89'

Depth to Water NA

Date 2-9-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
959:30			109	8.18	210	6.0
1001:30			87	8.22	210	7.0
1002:30			75	8.25	220	7.0
1004:00			82	8.21	220	7.5
1005:00			84	8.26	225	7.5
1006:30			84	8.28	225	8.0
1007:30			87	8.30	225	8.0
1009:00			85	8.34	225	8.0

J/4357/018/SAMPLFM.XLS

collect sample @ 535

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

purge @ ≈ 1/2 gal/min

Sample @ ≈280 ml/min.

Well Number VP3

Total Depth 99

Depth to Water NA

Date 2-12-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
526:00			183	8.09	215	7.0
528:00			173	8.14	215	7.0
529:00			168	8.21	220	7.0
530:00			160	8.24	220	7.5
531:00			148	8.32	225	7.5
532:00			137	8.36	230	8.0
533:00			126	8.40	230	8.0
534:00			114	8.43	230	8.0

J/4357/018/SAMPLFM.XLS

Sampled @ 4:00

Vertical Profile

purge @ ≈ 1/2 gal/min
Sampled @ ≈ 300 ml/min

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]S

PRE-DESIGN INVESTIGATION

Well Number: VP1
Total Depth: 30'
Depth to Water: NA
Date: 2-22-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
349:30			9.6	7.68	300	8.5
352:30			4.3	7.85	305	8.5
353:30			4.3	7.95	305	9.0
354:30			3.8	8.10	310	9.0
355:30			3.8	8.24	315	9.0
356:30			3.9	8.27	315	9.0
357:30			4.0	8.31	320	9.0
358:30			3.9	8.35	320	9.0

J/4357/018/SAMPLFM.XLS

Sampled @ 505

Vertical Profile

Purge = 1/2 gal/min

Sample = 300 ml/min

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Well Number: VP1

Total Depth: 391

Depth to Water: NA

Date: 2-22-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
452:00			39	7.49	215	7.0
453:00			55	7.56	220	7.0
454:00			97	7.62	220	7.0
455:00			116	7.70	220	7.0
456:00			175	8.04	220	7.0
457:00			211	8.35	235	7.0
458:00			143	8.53	245	7.0
459:00			131	8.40	285	7.0
500:00			75	8.27	285	7.0
501:00			74	8.22	285	7.5
502:00			70	8.15	285	7.5
503:00			68	8.16	290	7.5

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

VP1 ? Purged 1/2 gal a minute

ACS Vertical Profile

Sampled 300ml/min

Well Number VP1

Total Depth 49 ft

Depth to Water NA

Date 2-23-96

Sampled @ 820 AM

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
0810			175	8.27	220	7.5°C
0812			171	8.29	220	7.5°C
0815			171	8.30	220	7.5°C
0817			170	8.31	220	7.5°C
0820			169	8.31	220	7.5°C

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

ACS Vertical Profile

Well Number VP1

Total Depth 54 ft water sample

Depth to Water NA

Date 2-23-96

purged 1/2 gal/min
sampled @300m/m

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
930			900	8.07	225	7°C
932			664	8.19	225	7°C
935			656	8.24	225	7°C
938			616	8.42	225	7°C
940			640	8.50	215	7°C
942			555	8.54	215	7°C
943			800	8.6	220	7°C
945			785	8.73	230	7°C
950			850	8.88	230	7°C

* Had trouble stabilizing finally went dry - let recharge + sample @ 950 per Carter.

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted] ACS

PRE-DESIGN INVESTIGATION

Well Number VP1

Total Depth 65'

Depth to Water NA

Date 2-23-96

Sample @ 65'
purged @ 1/2 gal. min.
Sampled @ 300 ml/

purged APPX 5 gallons

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1050			813	7.86	230	8
1051			759	8.02	230	8
1052			740	8.10	230	8
1053			780	8.22	230	8
1054			782	8.32	235	8°C
1055			786	8.36	235	8°C
1056			812	8.38	235	8°C
1057			792	8.44	235	8°C
1058			775	8.48	235	8°C
1059			781	8.46	235	8°C
1100			786	"	"	"

J/4357/018/SAMPLFM.XLS

Sampled @ 1210 P.

Vertical Profile

Purged @ 1/2 gal/min
Sampled @ 300 ml/m

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Well Number: VP1
Total Depth: 79'
Depth to Water: NA
Date: 2-23-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
1157			850	8.52	225	8.5
1159			849	8.66	225	8.5
1202			848	9.68	225	8.5
1204			840	9.60	225	8.5
1206			810	8.58	225	8.5
1208			815	8.53	225	8.5

J/4357/018/SAMPLFM.XLS

Vertical Profile

[redacted] PURGE/SAMPLE INFORMATION

ACS [redacted]

PRE-DESIGN INVESTIGATION

Sampled @ 245'

purged @ 1/2 gal/min
Sampled @ 300 ml/min

Well Number: VP1
Total Depth: 92'
Depth to Water: NA
Date: 2-23-96

Purging Information		Field Parameters				
Time	Approx. Volume	D.O.	Turbitity	pH	Cond.	Temp
224			213	8.73	240	11.0
227			130	8.91	240	11.0
229			122	8.92	270	11.0
231			68	8.80	290	11.0
233			11	9.02	300	11.0
235			11	8.74	355	11.0
237			10	8.73	355	11.0
239:00			14	8.71	355	11.0
241:00			11	8.70	360	11.0

J/4357/018/SAMPLFM.XLS

C

C

MONITORING WELL CONSTRUCTION INFORMATION

MONTGOMERY WATSON

FLUSH MOUNT MONITORING WELL
CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW28
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 5695.6 ft. N, 5657.2 ft. E.	Date Well Installed 2/6/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Watertight Cover elevation _____ ft. MSL

Well casing top elevation 648.77 ft. MSL

Land surface elevation 649.0 ft. MSL

Surface Seal, bottom 646.0 ft. MSL or 3.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ■ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐
Hollow Stem Auger ☐
6" Roto Sonic Other ■

Drilling fluid used: Water ■ Air ☐
Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

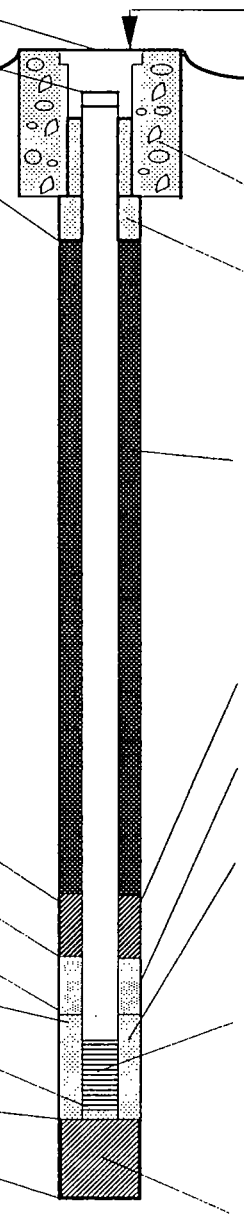
Source of water:
City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	596.0	ft. MSL or	53.0	ft.
Fine sand, top	591.0	ft. MSL or	58.0	ft.
Filter pack, top	590.0	ft. MSL or	59.0	ft.
Screen joint, top	588.7	ft. MSL or	60.3	ft.
Well bottom	578.7	ft. MSL or	70.3	ft.
Filter pack, bottom	578.7	ft. MSL or	70.3	ft.
Borehole, bottom	578.7	ft. MSL or	70.3	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. permanent casing grouted to 30.0 ft.**



Bolt down water tight cover:
Inside Diameter: 12.0 (in.) Length 12.0 (in.)

Water tight well cap? Yes ■ No ☐
Lock? Yes ■ No ☐

Surficial Seal: Concrete ■
Bentonite ■

Sand Drainage? Yes ☐ No ■

Material between well casing and protective pipe:
Bentonite ☐
Annular space seal ☐
Filter Sand Other ■

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
9.0 cu ft volume added for any of the above

How installed: Tremie ☐
Tremie pumped ■
Gravity ☐

Bentonite seal: Bentonite granules ☐
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐
3/8 in. Chipped Bentonite Other ■

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.0 cu ft

Well casing: Flush threaded PVC schedule 40 ☐
Flush threaded PVC schedule 80 ☐
#304 Stainless Steel Other ■

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐
Continuous slot ☐
Wire Wound Continuous Other ■

Manufacturer Johnson

Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■
Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	Montgomery Watson

J:\4077\Gint\MW28-MWC

MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW29
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7012.0 ft. N, 4885.5 ft. E.	Date Well Installed 2/24/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	D. Pieczynski - Mongtomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 638.06 ft. MSL

Land surface elevation 635.7 ft. MSL

Surface Seal, bottom 624.7 ft. MSL or 11.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

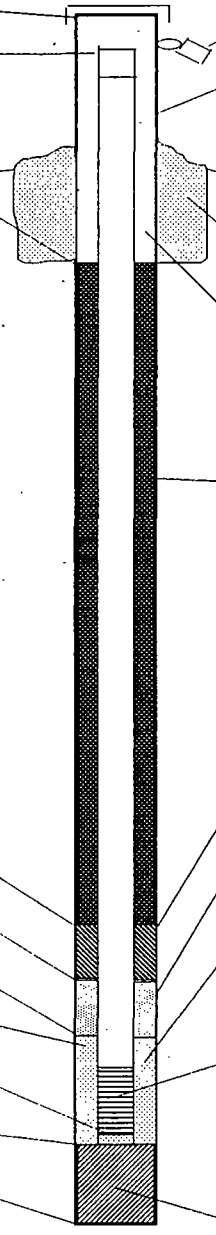
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	594.7	ft. MSL or	41.0	ft.
Fine sand, top	589.7	ft. MSL or	46.0	ft.
Filter pack, top	587.7	ft. MSL or	48.0	ft.
Screen joint, top	585.9	ft. MSL or	49.8	ft.
Well bottom	575.9	ft. MSL or	59.8	ft.
Filter pack, bottom	575.7	ft. MSL or	60.0	ft.
Borehole, bottom	575.7	ft. MSL or	60.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 17.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐ Bentonite-sand slurry ☐ Bentonite slurry ■ Bentonite-cement grout ☐
_____ Lbs/gal mud weight...
11 Lbs/gal mud weight.....
_____ % Bentonite.....
5.5 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.3 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.1 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW30
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7773.7 ft. N, 5193.9 ft. E.	Date Well Installed 2/22/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 634.25 ft. MSL

Land surface elevation 632.1 ft. MSL

Surface Seal, bottom 623.1 ft. MSL or 9.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

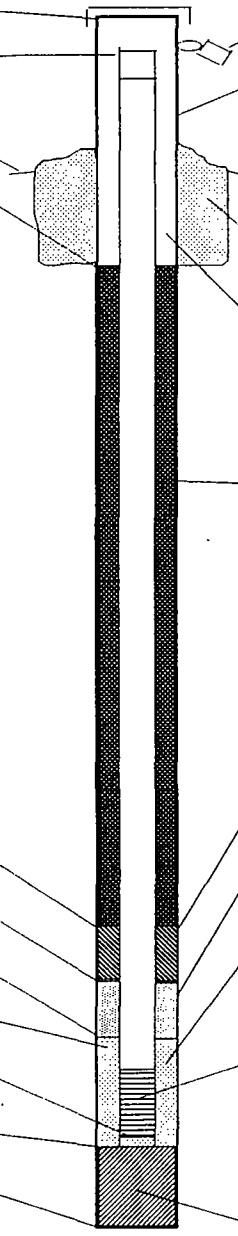
Source of water:
City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	593.1	ft. MSL or	39.0	ft.
Fine sand, top	588.1	ft. MSL or	44.0	ft.
Filter pack, top	587.1	ft. MSL or	45.0	ft.
Screen joint, top	585.0	ft. MSL or	47.1	ft.
Well bottom	575.0	ft. MSL or	57.1	ft.
Filter pack, bottom	575.0	ft. MSL or	57.1	ft.
Borehole, bottom	575.0	ft. MSL or	57.1	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 15.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
5.5 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.1 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson

Slot size: 0.010 in.

Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW31
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7505.3 ft. N, 5906.8 ft. E.	Date Well Installed 2/14/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 641.64 ft. MSL

Land surface elevation 639.4 ft. MSL

Surface Seal, bottom 630.9 ft. MSL or 8.5 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

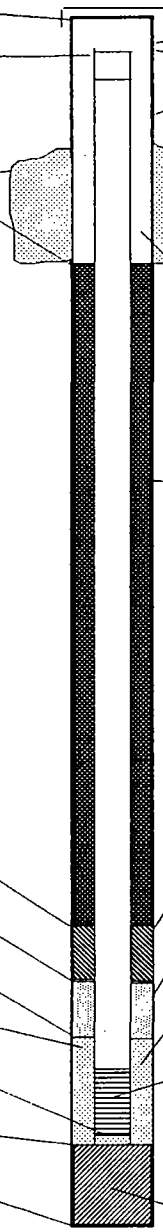
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	583.4	ft. MSL or	56.0	ft.
Fine sand, top	578.4	ft. MSL or	61.0	ft.
Filter pack, top	577.4	ft. MSL or	62.0	ft.
Screen joint, top	574.6	ft. MSL or	64.8	ft.
Well bottom	564.6	ft. MSL or	74.8	ft.
Filter pack, bottom	564.6	ft. MSL or	74.8	ft.
Borehole, bottom	564.6	ft. MSL or	74.8	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 20.5 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐
Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
% Bentonite..... Bentonite-cement grout ☐
8.5 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.2 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ft. ☐ N. ☐ S. ft. ☐ E. ☐ W.	Well Name MW32
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7507.0 ft. N, 5902.2 ft. E.	Date Well Installed 2/15/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 641.84 ft. MSL

Land surface elevation 639.5 ft. MSL

Surface Seal, bottom 627.5 ft. MSL or 12.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

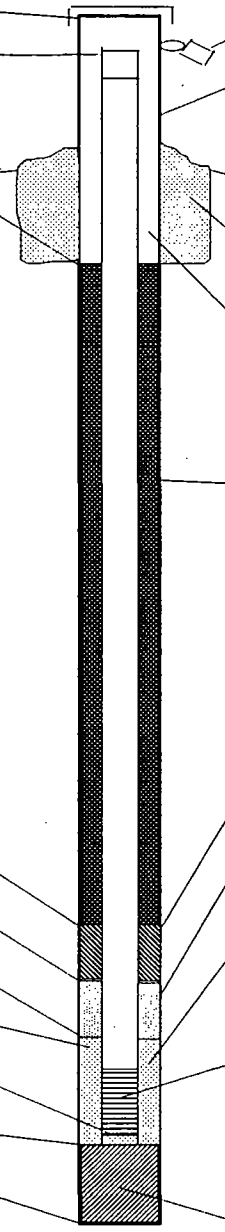
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	556.5	ft. MSL or	83.0	ft.
Fine sand, top	551.5	ft. MSL or	88.0	ft.
Filter pack, top	550.5	ft. MSL or	89.0	ft.
Screen joint, top	547.3	ft. MSL or	92.2	ft.
Well bottom	537.3	ft. MSL or	102.2	ft.
Filter pack, bottom	536.5	ft. MSL or	103.0	ft.
Borehole, bottom	536.5	ft. MSL or	103.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 20.5 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐ Bentonite-sand slurry ☐ Bentonite slurry ■ Bentonite-cement grout ☐
_____ Lbs/gal mud weight...
11 Lbs/gal mud weight.....
_____ % Bentonite.....
12.5 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.4 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

J:\4077\gint\MW32-MWC.xls

MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

lity/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW33
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7773.5 ft. N, 5188.6 ft. E.	Date Well Installed 2/21/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 634.13 ft. MSL

Land surface elevation 632.0 ft. MSL

Surface Seal, bottom 624.0 ft. MSL or 8.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

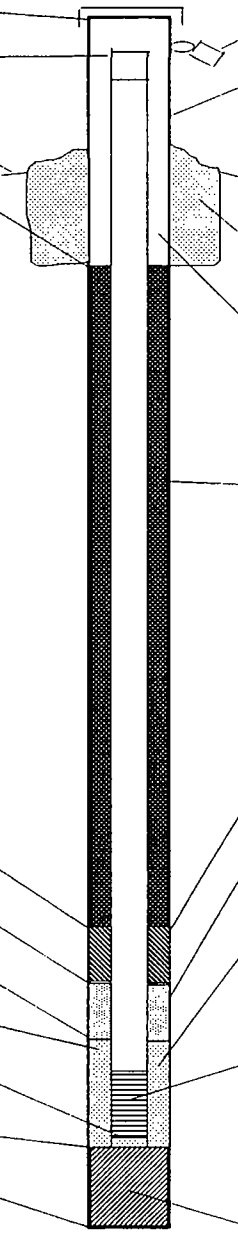
Source of water:
City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	565.0	ft. MSL or	67.0	ft.
Fine sand, top	559.0	ft. MSL or	73.0	ft.
Filter pack, top	558.0	ft. MSL or	74.0	ft.
Screen joint, top	556.0	ft. MSL or	76.0	ft.
Well bottom	546.0	ft. MSL or	86.0	ft.
Filter pack, bottom	545.0	ft. MSL or	87.0	ft.
Borehole, bottom	527.0	ft. MSL or	105.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 15.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐ Bentonite-sand slurry ☐ Bentonite slurry ■ Bentonite-cement grout ☐
_____ Lbs/gal mud weight...
11 Lbs/gal mud weight.....
_____ % Bentonite.....
10.5 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.2 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson

Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ☐ Other ■
3/8 in. Chipped Bentonite

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW34
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 7001.8 ft. N, 4880.4 ft. E.	Date Well Installed 2/23/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	RJR/DAP - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 638.14 ft. MSL

Land surface elevation 635.8 ft. MSL

Surface Seal, bottom 626.3 ft. MSL or 9.5 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

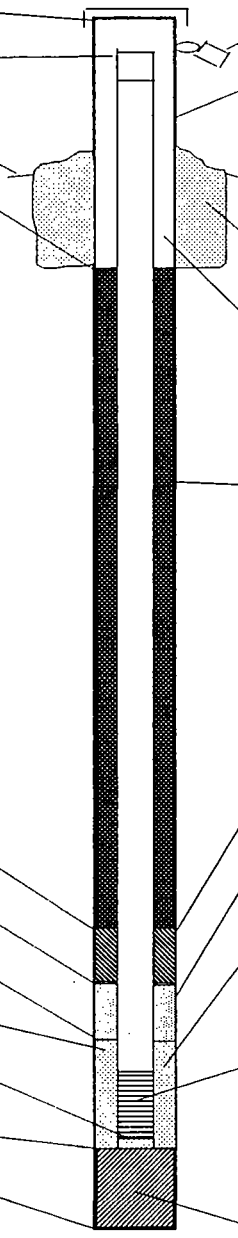
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	562.8	ft. MSL or	73.0	ft.
Fine sand, top	557.8	ft. MSL or	78.0	ft.
Filter pack, top	555.8	ft. MSL or	80.0	ft.
Screen joint, top	552.8	ft. MSL or	83.0	ft.
Well bottom	542.8	ft. MSL or	93.0	ft.
Filter pack, bottom	540.8	ft. MSL or	95.0	ft.
Borehole, bottom	540.8	ft. MSL or	95.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 17.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
11.0 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.3 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.6 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name MW35
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 6541.8 ft. N, 4933.9 ft. E.	Date Well Installed 2/24/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 634.50 ft. MSL

Land surface elevation 632.4 ft. MSL

Surface Seal, bottom 624.4 ft. MSL or 8.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ■ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

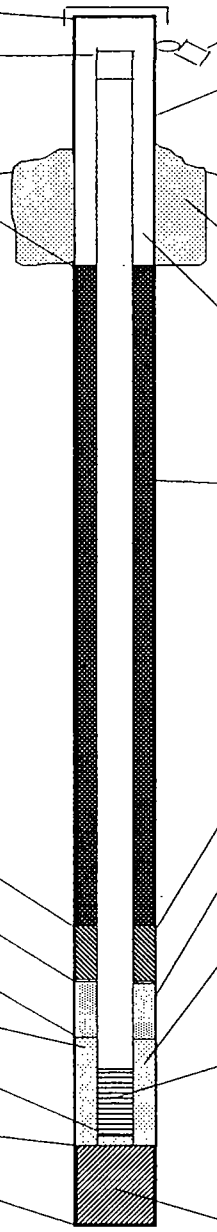
Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

Source of water:
City of Griffith



	ELEVATION		DEPTH	
Bentonite seal, top	561.4	ft. MSL or	71.0	ft.
Fine sand, top	556.4	ft. MSL or	76.0	ft.
Filter pack, top	555.4	ft. MSL or	77.0	ft.
Screen joint, top	551.8	ft. MSL or	80.6	ft.
Well bottom	541.8	ft. MSL or	90.6	ft.
Filter pack, bottom	541.4	ft. MSL or	91.0	ft.
Borehole, bottom	539.4	ft. MSL or	93.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in.

8 in. Permanent Casing Grouted to 14.0 ft
6 in. Permanent Casing from 13.0 ft to 73.5 ft

Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐ Bentonite-sand slurry ☐ Bentonite slurry ■ Bentonite-cement grout ☐
_____ Lbs/gal mud weight...
11 Lbs/gal mud weight.....
_____ % Bentonite.....
11.0 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.4 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ☐ Other ■
Natural Cave

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

Facility/Project Name: American Chemical Service, Inc.	Local Grid Location of Well: ft. ☐ N. ☐ S. ft. ☐ E. ☐ W.	Well Name: MW36
Type of Well: Water Table Observation Well ☐ Piezometer ■	Grid Origin Location: Lat. ____ Long. ____ or St. Plane 6767.5 ft. N, 6164.0 ft. E.	Date Well Installed: 2/25/96
	Section Location of Waste/Source: ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary: NA ft.	Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	D. Pieczynski - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation ____ ft. MSL

Well casing top elevation 637.85 ft. MSL

Land surface elevation 636.2 ft. MSL

Surface Seal, bottom 626.2 ft. MSL or 10.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ■ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe ____

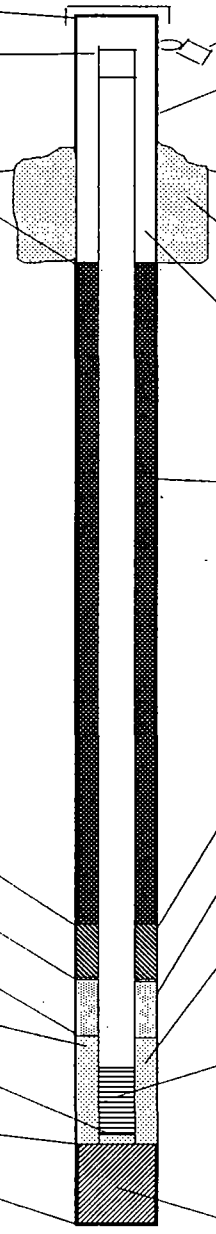
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	562.2	ft. MSL or	74.0	ft.
Fine sand, top	557.2	ft. MSL or	79.0	ft.
Filter pack, top	556.2	ft. MSL or	80.0	ft.
Screen joint, top	552.7	ft. MSL or	83.5	ft.
Well bottom	542.7	ft. MSL or	93.5	ft.
Filter pack, bottom	542.2	ft. MSL or	94.0	ft.
Borehole, bottom	541.2	ft. MSL or	95.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 20.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: ____

Surface seal: Bentonite ■ Concrete ☐ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐
____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
____ % Bentonite..... Bentonite-cement grout ☐
11.0 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 2.4 cu ft

Well casing: Flush threaded PVC schedule 40 ☐ Flush threaded PVC schedule 80 ☐ Other ■
#304 Stainless Steel

Screen material: #304 Stainless Steel

Screen type: Factory cut ☐ Continuous slot ☐ Other ■
Wire Wound Continuous

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 9.8 ft.

Backfill material (below filter pack): None ☐ Other ■
Natural Cave

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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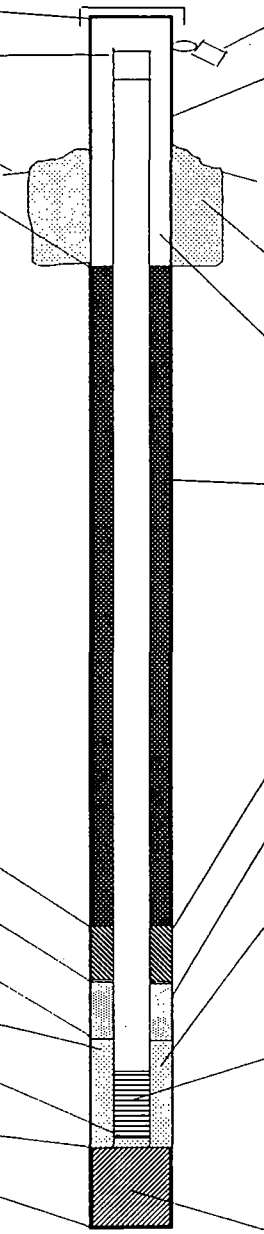
MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

Facility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name PZ42
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 5696.3 ft. N, 5661.9 ft. E.	Date Well Installed 2/5/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear



Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 648.44 ft. MSL

Land surface elevation 649.0 ft. MSL

Surface Seal, bottom 643.0 ft. MSL or 6.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ■ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	577.0	ft. MSL or	72.0	ft.
Fine sand, top	572.0	ft. MSL or	77.0	ft.
Filter pack, top	571.0	ft. MSL or	78.0	ft.
Screen joint, top	568.5	ft. MSL or	80.5	ft.
Well bottom	563.5	ft. MSL or	85.5	ft.
Filter pack, bottom	563.5	ft. MSL or	85.5	ft.
Borehole, bottom	563.5	ft. MSL or	85.5	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.4 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 30.0 ft**

Cap and lock? ■ Yes ☐ No
flushmount

Protective cover pipe:
Inside diameter: 12.0 in.
Length: 12.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ☐ Concrete ■ Other ☐

Material between well casing and protective pipe:
Bentonite ☐ Annular space seal ☐ Other ■
Filter Sand

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
11.0 cu ft volume added for any of the above

How installed: Tremie ☐ *Tremie pumped* ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 1.2 cu ft

Well casing: Flush threaded PVC schedule 40 ■ Flush threaded PVC schedule 80 ☐ Other ☐

Screen material: Sch. 40 PVC
Screen type: Factory cut ■ Continuous slot ☐ Other ☐
Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 4.7 ft.

Backfill material (below filter pack): None ■ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

Facility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ft. ☐ S. ☐ E. ft. ☐ W.	Well Name PZ43
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 5701.7 ft. N, 5661.8 ft. E.	Date Well Installed 2/2/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 648.69 ft. MSL

Land surface elevation 649.1 ft. MSL

Surface Seal, bottom 643.1 ft. MSL or 6.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ■ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ■
6" Roto Sonic

Drilling fluid used: Water ■ Air ☐ Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

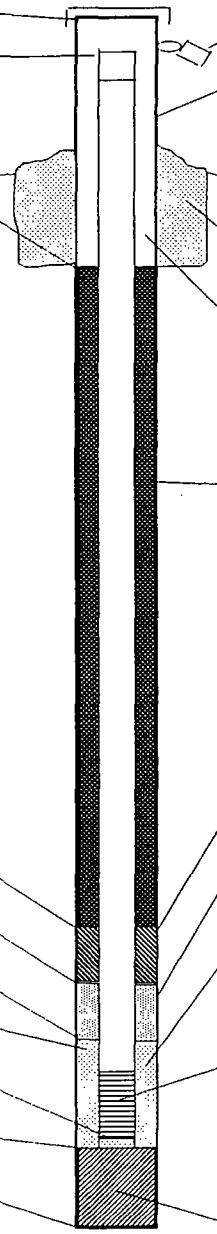
Source of water: City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	564.1	ft. MSL or	85.0	ft.
Fine sand, top	559.1	ft. MSL or	90.0	ft.
Filter pack, top	558.1	ft. MSL or	91.0	ft.
Screen joint, top	554.5	ft. MSL or	94.6	ft.
Well bottom	549.5	ft. MSL or	99.6	ft.
Filter pack, bottom	548.1	ft. MSL or	101.0	ft.
Borehole, bottom	538.1	ft. MSL or	111.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.2 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 30.0 ft**



Cap and lock? ■ Yes ☐ No
flushmount

Protective cover pipe:
Inside diameter: 12.0 in.
Length: 12.0 ft.
Material: Steel ■ Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ☐ Concrete ■ Other ☐

Material between well casing and protective pipe:
Filter Sand — Bentonite ☐ Annular space seal ☐ Other ■

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
13.0 cu ft volume added for any of the above

How installed: Tremie ☐ Tremie pumped ■ Gravity ☐

Bentonite seal: Bentonite granules ☐ Bentonite pellets ☐ Other ■
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in.
3/8 in. Chipped Bentonite

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 1.8 cu ft

Well casing: Flush threaded PVC schedule 40 ■ Flush threaded PVC schedule 80 ☐ Other ☐

Screen material: Sch. 40 PVC
Screen type: Factory cut ■ Continuous slot ☐ Other ☐
Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 4.7 ft.

Backfill material (below filter pack): None ☐ Other ■
3/8 in. Chipped Bentonite

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

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MONTGOMERY WATSON

STICK-UP MONITORING WELL CONSTRUCTION SUMMARY

JOB NO. 4077.0076

ility/Project Name American Chemical Service, Inc.	Local Grid Location of Well ☐ N. ☐ E. ft. ☐ S. ft. ☐ W.	Well Name PZ44
Type of Well Water Table Observation Well ☐ Piezometer ■	Grid Origin Location Lat. _____ Long. _____ or St. Plane 6766.0 ft. N, 6169.8 ft. E.	Date Well Installed 2/25/96
	Section Location of Waste/Source ☐ E. ☐ W.	Well Installed By: (Person's Name and Firm)
Distance Well Is From Waste/Source Boundary NA ft.	Location of Well Relative to Waste/Source ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known	J. Ramsby - Montgomery Watson J. Duecette - Boart Longyear

Protective pipe, top elevation _____ ft. MSL

Well casing top elevation 638.47 ft. MSL

Land surface elevation 636.1 ft. MSL

Surface Seal, bottom 625.1 ft. MSL or 11.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ■
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? ■ Yes ☐ No

Drilling method used: Rotary ☐
Hollow Stem Auger ☐
6" Roto Sonic Other ■

Drilling fluid used: Water ■ Air ☐
Drilling Mud ☐ None ☐

Drilling additives used? ☐ Yes ■ No

Describe _____

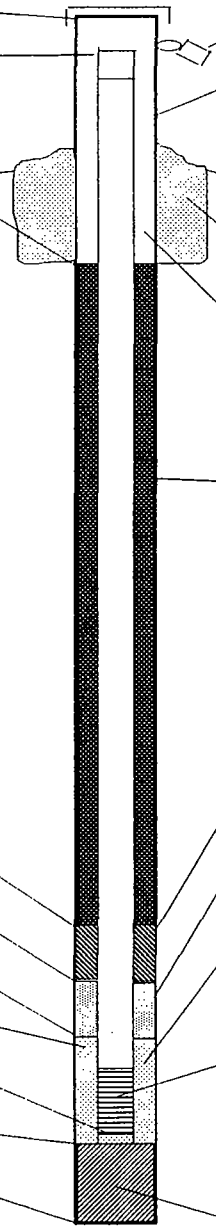
Source of water:
City of Griffith

	ELEVATION		DEPTH	
Bentonite seal, top	586.1	ft. MSL or	50.0	ft.
Fine sand, top	583.1	ft. MSL or	53.0	ft.
Filter pack, top	582.1	ft. MSL or	54.0	ft.
Screen joint, top	578.4	ft. MSL or	57.7	ft.
Well bottom	573.4	ft. MSL or	62.7	ft.
Filter pack, bottom	573.1	ft. MSL or	63.0	ft.
Borehole, bottom	572.1	ft. MSL or	64.0	ft.

Borehole, diameter 6.0 in.

O.D. well casing 2.4 in.

I.D. well casing 2.0 in. **8 in. Permanent Casing Grouted to 20.0 ft**



Cap and lock? ■ Yes ☐ No

Protective cover pipe:
Inside diameter: 4.0 in.
Length: 7.0 ft.
Material: Steel ■
Other ☐

Additional protection? ☐ Yes ■ No
If yes, describe: _____

Surface seal: Bentonite ■
Concrete ☐
Other ☐

Material between well casing and protective pipe:
Bentonite ☐
Annular space seal ☐
Filter Sand Other ■

Annular space seal: Granular Bentonite ☐
_____ Lbs/gal mud weight... Bentonite-sand slurry ☐
11 Lbs/gal mud weight..... Bentonite slurry ■
_____ % Bentonite..... Bentonite-cement grout ☐
6.5 cu ft volume added for any of the above

How installed: Tremie ☐
Tremie pumped ■
Gravity ☐

Bentonite seal: Bentonite granules ☐
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐
3/8 in. Chipped Bentonite Other ■

Fine sand material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 0.2 cu ft

Filter pack material: Manufacturer, product name & mesh size
Global Drilling Supplies
Volume added 1.5 cu ft

Well casing: Flush threaded PVC schedule 40 ■
Flush threaded PVC schedule 80 ☐
Other ☐

Screen material: Sch. 40 PVC
Screen type: Factory cut ■
Continuous slot ☐
Other ☐

Manufacturer Johnson
Slot size: 0.010 in.
Slotted length: 4.7 ft.

Backfill material (below filter pack): None ☐
Natural Cave Other ■

I hereby certify that the information on this form is true and correct to the best of my knowlege.

Signature	Firm
	MONTGOMERY WATSON

J:\4077\gint\PZ44-MWC.xls

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MONITORING WELL DEVELOPMENT INFORMATION

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW28
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

1. Can this well be purged dry? ☐ Yes ■ No

2. Well development method

surged with bailer and bailed	☐
surged with bailer and pumped	■
surged with block and bailed	☐
surged with block and pumped	☐
surged with block, bailed and pumped	☐
compressed air	☐
bailed only	☐
pumped only	☐
pumped slowly	☐
Other _____	☐

3. Time spent developing well 22 min.

4. Total well depth (TOC) (From well construction summary) 70.1 ft.

Measured well depth (Before) 70.1 ft.

Measured well depth (After) 70.1 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 12.2 gal.

7. Volume of water removed from well 73.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 25.97 ft.	____.__ ft.
Date:	b. 3 / 5 / 95 (mm dd yy)	3 / 5 / 96 (mm dd yy)
Time:	c. 3 : 45 ☐ a.m. ■ p.m.	4 : 07 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐	Clear ■
	Turbid ■	Turbid ☐
	(Describe)	(Describe)
Color	Light Gray	Clear
Odor	None	None
Turbidity	Moderate	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.1

Well casing Vol. (gallons) $0.16r^2l$ = 7.1

Saturated length of sand pack (ft.) (ls) 11.3

Length of water column (ft.) (l) 44.13

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW29
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 23 min.

4. Total well depth (TOC) 622.2 ft.
(From well construction summary)

Measured well depth (Before) 622.2 ft.

Measured well depth (After) 622.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 12.7 gal.

7. Volume of water removed from well 55.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 15.97 ft.	___.___ ft.
Date:	b. 3 / 6 / 95 (mm dd yy)	3 / 6 / 96 (mm dd yy)
Time:	c. 5 : 15 ☐ a.m. ■ p.m.	5 : 38 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐ Turbid ■ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Light Gray	Clear
Odor	None	None
Turbidity	Moderate	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.3

Well casing Vol. (gallons) $0.16r^2l$ = 7.4

Saturated length of sand pack (ft.) (ls) 11.8

Length of water column (ft.) (l) 46.23

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW30
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

1. Can this well be purged dry? ☐ Yes ■ No

2. Well development method

surged with bailer and bailed	☐
surged with bailer and pumped	■
surged with block and bailed	☐
surged with block and pumped	☐
surged with block, bailed and pumped	☐
compressed air	☐
bailed only	☐
pumped only	☐
pumped slowly	☐
Other _____	☐

3. Time spent developing well 23 min.

4. Total well depth (TOC) 59.2 ft.
(From well construction summary)

Measured well depth (Before) 59.2 ft.

Measured well depth (After) 59.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 13.3 gal.

7. Volume of water removed from well 58.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 9.72 ft.	___.___ ft.
Date:	b. 3 / 7 / 96 (mm dd yy)	3 / 7 / 96 (mm dd yy)
Time:	c. 11 : 55 ■ a.m. ☐ p.m.	12 : 18 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐	Clear ■
	Turbid ■	Turbid ☐
	(Describe)	(Describe)
Color	Milky	Clear
Odor	None	None
Turbidity	Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.4

Well casing Vol. (gallons) $0.16r^2l$ = 7.9

Saturated length of sand pack (ft.) (ls) 12.1

Length of water column (ft.) (l) 49.48

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW31
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 21 min.

4. Total well depth (TOC) 77.1 ft.
(From well construction summary)

Measured well depth (Before) 76.9 ft.

Measured well depth (After) 77.1 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 15.0 gal.

7. Volume of water removed from well 63.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 19.84 ft.	____.__ ft.
Date:	b. 3 / 8 / 96 (mm dd yy)	3 / 8 / 96 (mm dd yy)
Time:	c. 7 : 55 ■ a.m. ☐ p.m.	8 : 16 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	2.4 inches	0.0 inches
12 Water Observations:	Clear ☐ Turbid ■ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Milky	Clear
Odor	None	None
Turbidity	Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.8

Well casing Vol. (gallons) $0.16r^2l$ = 9.2

Saturated length of sand pack (ft.) (ls) 12.8

Length of water column (ft.) (l) 57.26

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW32
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

1. Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 22 min.

4. Total well depth (TOC) 104.5 ft.
(From well construction summary)

Measured well depth (Before) 104.5 ft.

Measured well depth (After) 104.5 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 19.4 gal.

7. Volume of water removed from well 71.0 gal.

Relative recovery rate _____ ft. per _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 20.07 ft.	____ ft.
Date:	b. 3 / 8 / 96 (mm dd yy)	3 / 8 / 96 (mm dd yy)
Time:	c. 8 : 35 ■ a.m. ☐ p.m.	8 : 57 ■ a.m. ☐ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐	Clear ■
	Turbid ■	Turbid ☐
	(Describe)	(Describe)
Color	Light Gray	Milky
Odor	None	None
Turbidity	Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.9

Well casing Vol. (gallons) $0.16r^2l$ = 13.5

Saturated length of sand pack (ft.) (ls) 13.2

Length of water column (ft.) (l) 84.43

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW33
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

1. Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 39 min.

4. Total well depth (TOC) 88.1 ft.
(From well construction summary)

Measured well depth (Before) 88.1 ft.

Measured well depth (After) 88.1 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 17.5 gal.

7. Volume of water removed from well 86.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 12.56 ft.	___.___ ft.
Date:	b. 3 / 7 / 96 (mm dd yy)	3 / 7 / 96 (mm dd yy)
Time:	c. 10 : 45 ■ a.m. ☐ p.m.	11 : 24 ■ a.m. ☐ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ■ Turbid ☐ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Clear	Clear
Odor	None	None
Turbidity	Very Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.4

Well casing Vol. (gallons) $0.16r^2l$ = 12.1

Saturated length of sand pack (ft.) (ls) 12.0

Length of water column (ft.) (l) 75.54

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW34
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 29 min.

4. Total well depth (TOC) 95.3 ft.
(From well construction summary)

Measured well depth (Before) 95.3 ft.

Measured well depth (After) 95.3 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 18.6 gal.

7. Volume of water removed from well 91.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 16.00 ft.	___.__ ft.
Date:	b. 3 / 6 / 96 (mm dd yy)	3 / 6 / 96 (mm dd yy)
Time:	c. 3 : 00 ☐ a.m. ■ p.m.	3 : 29 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐	Clear ■
	Turbid ■	Turbid ☐
	(Describe)	(Describe)
Color	Slight Milky	Clear
Odor	None	None
Turbidity	Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 5.9

Well casing Vol. (gallons) $0.16r^2l$ = 12.7

Saturated length of sand pack (ft.) (ls) 13.0

Length of water column (ft.) (l) 79.30

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW35
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

1. Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 28 min.

4. Total well depth (TOC) (From well construction summary) 92.7 ft.

Measured well depth (Before) 92.7 ft.

Measured well depth (After) 92.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 19.0 gal.

7. Volume of water removed from well 78.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 12.23 ft.	___.__ ft.
Date:	b. 3 / 6 / 96 (mm dd yy)	3 / 6 / 96 (mm dd yy)
Time:	c. 10 : 30 ■ a.m. ☐ p.m.	10 : 58 ■ a.m. ☐ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ■ Turbid ☐ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Clear	Clear
Odor	None	None
Turbidity	Very Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 6.1

Well casing Vol. (gallons) $0.16r^2l$ = 12.9

Saturated length of sand pack (ft.) (ls) 13.6

Length of water column (ft.) (l) 80.47

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	MW36
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ■
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ☐
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 37 min.

4. Total well depth (TOC) 95.2 ft.
(From well construction summary)

Measured well depth (Before) 95.2 ft.

Measured well depth (After) 95.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 18.8 gal.

7. Volume of water removed from well 110.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 15.60 ft.	___.__ ft.
Date:	b. 3 / 5 / 96 (mm dd yy)	3 / 5 / 96 (mm dd yy)
Time:	c. 12 : 05 ☐ a.m. ■ p.m.	12 : 42 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ■ Turbid ☐ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Slight Milky	Clear
Odor	None	None
Turbidity	Very Slight	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 6.1

Well casing Vol. (gallons) $0.16r^2l$ = 12.7

Saturated length of sand pack (ft.) (ls) 13.5

Length of water column (ft.) (l) 79.60

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	PZ42
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ☐
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ■
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 5 min.

4. Total well depth (TOC) 84.9 ft.
(From well construction summary)

Measured well depth (Before) 84.9 ft.

Measured well depth (After) 84.9 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 12.7 gal.

7. Volume of water removed from well 35.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 25.65 ft.	___.__ ft.
Date:	b. 3 / 5 / 96 (mm dd yy)	3 / 5 / 96 (mm dd yy)
Time:	c. 4 : 30 ☐ a.m. ■ p.m.	4 : 35 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐ Turbid ■ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Gray	Clear
Odor	None	None
Turbidity	Moderate	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 3.2

Well casing Vol. (gallons) $0.16r^2l$ = 9.5

Saturated length of sand pack (ft.) (ls) 7.5

Length of water column (ft.) (l) 59.95

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	PZ43
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ☐
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ■
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 10 min.

4. Total well depth (TOC) 99.2 ft.
(From well construction summary)

Measured well depth (Before) 99.2 ft.

Measured well depth (After) 99.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 15.4 gal.

7. Volume of water removed from well 40.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 25.89 ft.	___.__ ft.
Date:	b. 3 / 5 / 96 (mm dd yy)	3 / 5 / 96 (mm dd yy)
Time:	c. 4 : 50 ☐ a.m. ■ p.m.	5 : 00 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐ Turbid ■ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Gray	Clear
Odor	None	None
Turbidity	Moderate	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 3.7

Well casing Vol. (gallons) $0.16r^2l$ = 11.7

Saturated length of sand pack (ft.) (ls) 8.6

Length of water column (ft.) (l) 73.31

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

MONTGOMERY WATSON

MONITORING WELL DEVELOPMENT SUMMARY

Project Name	American Chemical Service, Inc.	Well No.	PZ44
Location	Griffith, Indiana	Project No.	4077.0076
Developed By	J. Ramsby	Checked By	M. Pauli

Can this well be purged dry? ☐ Yes ■ No

2. Well development method

- surged with bailer and bailed ☐
- surged with bailer and pumped ☐
- surged with block and bailed ☐
- surged with block and pumped ☐
- surged with block, bailed and pumped ☐
- compressed air ☐
- bailed only ☐
- pumped only ■
- pumped slowly ☐
- Other _____ ☐

3. Time spent developing well 6 min.

4. Total well depth (TOC) 65.1 ft.
(From well construction summary)

Measured well depth (Before) 65.1 ft.

Measured well depth (After) 65.1 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 11.5 gal.

7. Volume of water removed from well 50.0 gal.

Relative recovery rate _____ ft. per. _____ min.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

	Before Development	After Development
10 Depth to Water (from top of well casing)	a. 16.24 ft.	____ ft.
Date:	b. 3 / 5 / 96 (mm dd yy)	3 / 5 / 96 (mm dd yy)
Time:	c. 1 : 00 ☐ a.m. ■ p.m.	1 : 06 ☐ a.m. ■ p.m.
11 Sediment in well bottom:	0.0 inches	0.0 inches
12 Water Observations:	Clear ☐ Turbid ■ (Describe)	Clear ■ Turbid ☐ (Describe)
Color	Gray	Clear
Odor	None	None
Turbidity	Moderate	Very Slight
HNu		

Filter Pack Vol. (gallons) $0.057(R^2 - r^2)ls$ = 3.7

Well casing Vol. (gallons) $0.16r^2l$ = 7.8

Saturated length of sand pack (ft.) (ls) 8.7

Length of water column (ft.) (l) 48.86

R = Radius of borehole (in.) r = Well radius (in.)

Collect groundwater sample if drilling fluids were used and well is at solid waste facility:

13 Total suspended solids (500 ml Unfiltered)	_____ mg/l	_____ mg/l
14. COD (250 ml Unfiltered Sulfuric)	_____ mg/l (BEFORE)	_____ mg/l (AFTER)

Time	Gallons Purged	pH	Spec. Cond.	T deg. C	Spec. Cond. at 25 deg. C	Color	Odor	Turb.	Comment

E

MONITORING WELL PURGE/SAMPLING INFORMATION

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW28
Date 3-12-96
Depth to Water 26.03 Total Depth 70.1
Purge Rate 300 ml/min Sample Rate 300 ml/min
Time Sampled 1815

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
1625	1.0	128	7.21	510	13.7
1636		82	7.28	500	12.6
1646		68.3	7.21	500	13.5
1655		52	7.25	500	13.7
1705		68	7.23	510	13.8
1715		26.4	7.23	510	13.8
1725		14.4	7.24	500	13.8
1735	5.0	5.2	7.29	500	13.8
1741		4.0	7.29	500	13.7
1748		2.9	7.29	500	13.6
1755		1.9	7.31	500	13.9
1800		1.2	7.28	500	13.7
1805		1.3	7.32	500	13.6
1810	8.5	1.4	7.30	500	13.6

J/4077/SAMPLFM.XLS

Odor	Color	Turbidity
None	Clear	None

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW29
Date 3-13-96
Depth to Water ~~62.15~~ Total Depth 62.15
Purge Rate 250 ml/min Sample Rate 250 ml/min
Time Sampled 1030

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
916	1.0	52.6	7.82	520	11.7
938		17.7	7.70	690	12.5
955	2.9	8.0	7.64	680	12.4
1009		5.4	7.54	660	12.0
1020		5.4	7.55	650	11.8
1025	5.3	4.9	7.56	640	11.7

EPA collects split and MS/MSD.

J/4077/SAMPLFM.XLS

odor	color	turb
none	clear	see above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW30
Date 3-13-96
Depth to Water 12.57 Total Depth 59.2
Purge Rate 280 ml/min Sample Rate 280 ml/min
Start 4:15 Time Sampled 1740

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
1632	0.7	56.7	7.40	700	13.7
1646		26.9	7.38	770	14.4
1700	3.0	11.1	7.35	780	14.4
1712		8.2	7.48	800	14.0
1721	5.2	4.6	7.38	800	14.5
1727		4.3	7.39	790	14.2
1733		4.1	7.40	790	13.8

EPA collects split

J/4077/SAMPLFM.XLS

odor	color	turbidity
None	clear	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Begin Purge @ 936

Well Number MW31
Date 3-14-96
Depth to Water 19.76 Total Depth 77.05
Purge Rate 280 ml/min Sample Rate 280 ml/min
Time Sampled 1210

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
0950	1.5	90.5	7.34	460	13.9
1020	4.3	43.3	7.25	500	13.8
1052	6.3	15.2	7.16	510	14.5
1105		10.0	7.40	510	14.2
1120		7.4	7.28	510	14.5
1135	10.	5.6	7.27	510	14.7
1140		4.9	7.27	520	14.8
1145		4.5	7.29	520	14.8
1150		4.1	7.26	520	14.8
1155		4.1	7.31	520	14.8
1200	12.5	4.0	7.35	520	14.8

J/4077/SAMPLFM.XLS

color	odor	turbidity
clear	none	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Begin Purge @ 937

Well Number MW32
Date 3-14-96
Depth to Water 19.95 Total Depth 104.5
Purge Rate 250 ml/min Sample Rate 250 ml/min
Time Sampled 1120

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
0950	1.6	73.8	7.48	485	13.3
1024	4.2	28.3	7.54	550	12.9
1050	7.0	10.9	7.63	520	13.5
1105		11.4	7.64	510	13.2
1115	8.2	10.2	7.63	510	13.5

J/4077/SAMPLFM.XLS

odor	color	turbidity
none	Clear	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW33
Date 3-13-96
Depth to Water 12.45 Total Depth 88.1
Purge Rate 280 ml/min Sample Rate 280 ml/min
Time Sampled 1750

State 403

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
1623	1.0	11.0	6.81	1710	13.4
1637	2.0	10.1	6.77	1910	13.3
1644		7.9	6.79	2080	13.3
1658		4.7	6.75	2200	13.8
1710		3.7	6.72	2200	13.8
1717		3.3	6.73	2200	14.1
1724	4.0	2.2	6.74	2250	14.1
1730		2.2	6.76	2210	13.5
1737		2.3	6.79	2180	13.0

J/4077/SAMPLFM.XLS

odor	color	turbidity
None	Clear	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW34
Date 3-13-96
Depth to Water 15.97 Total Depth 95.3
Purge Rate 250 ml/min Sample Rate 250 ml/min
Time Sampled 1000

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
845	1.0	20.1	7.19	410	12.5
909		13.9	7.22	550	14.0
925	2.3	10.8	7.27	550	12.6
940		7.8	7.25	580	12.4
945		7.2	7.23	570	12.7
950	5.1	7.1	7.22	570	12.7

Collect MS/MSD

J/4077/SAMPLFM.XLS

odor	color	turbidity
none	Clear	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW35

Date 3-13-96

Depth to Water 12.17 Total Depth 92.7

Purge Rate ~~92.7 ml/min~~ 280 Sample Rate 280ml/min

Time Sampled 1420

start @ 1257

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
1315	1.1	29.0	8.15	330	13.6
1330		17.8	8.16	340	13.9
1346	2.8	14.4	8.19	330	13.9
1356		12.4	8.11	330	13.7
1402		11.4	8.04	320	13.9
1411	4.0	11.1	8.17	320	14.4

EPA collects split and Duplicate

J/4077/SAMPLFM.XLS

Odor	Color	turbidity
None	Clear	See above

PURGE/SAMPLE INFORMATION
ACS
PRE-DESIGN INVESTIGATION

Well Number MW36
Date 3-12-96
Depth to Water 15.68 Total Depth 95.15
Purge Rate 300 ml/min Sample Rate 300 ml/min
Time Sampled 1500

Purging Information					
Time	Approx. Volume (gal)	Turbitity	pH	Cond.	Temp
1350	1.0	33.6	7.60	520	13.3
1354		36.1	7.26	580	13.3
1357		33.2	7.16	580	13.8
1401		28.7	7.15	530	14.0
1407		19.9	7.13	560	14.0
1415	5.0	15.6	7.15	530	14.1
1427		7.0	7.12	530	14.0
1436		4.9	7.18	550	13.9
1441		3.3	7.19	550	13.6
1446		3.1	7.18	550	13.5
1451	10.5	3.0	7.22	550	13.5

J/4077/SAMPLFM.XLS

Color	Odor	Turbidity
~~Blue~~ Clear	None	None

F

GEOTECHNICAL ANALYSIS RESULTS – LOWER AQUIFER SOIL SAMPLES

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX INHOUSE ONLY: MONTGOMERY WATSON ANALYTICAL TESTING SERVICES XXXXXXXXXXXXXXXXXXXXXXXXXXXX

LABORATORY TRANSMITTAL
4077.0076
ACS

LOGIN (# OF SAMPLES): 12696 (13)

DATE: 15-MAR-96

SAMPLE DATE: 01-FEB-96 TO 24-FEB-96

TO: P. VAGT

MATRIX: Solid

REPORT: COMPLETE

REISSUE

PARTIAL

OFFICE: MADISON CHICAGO
DETROIT MILWAUKEE
PHILADELPHIA OHIO
CALIFORNIA

COMMENTS:

========== IF YOU HAVE ANY QUESTIONS, PLEASE FEEL FREE TO CALL DENNIS LINLEY AT (608)231-4755. ==========

Received Date: 04-FEB-96
Report Due Date: 19-FEB-96
Comments: -><-

TEST RESULTS ENCLOSED OR PREVIOUSLY REPORTED

Subcontract Work: C-WS-13

Soils:

Organic:

Wet Chem:

Metals:

OUTSTANDING TEST RESULTS

Subcontract Work:

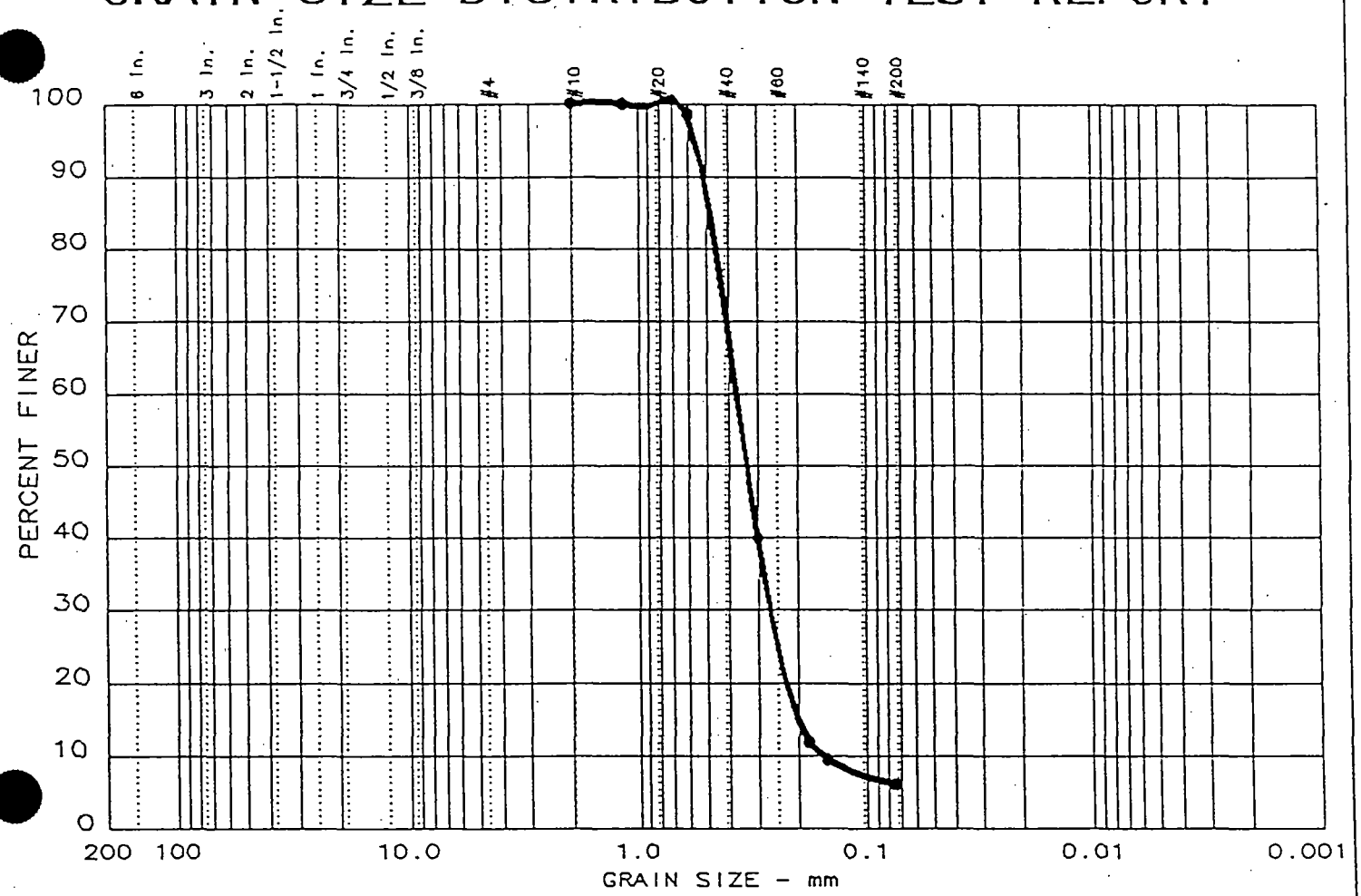
Soils:

Organic:

Wet Chem:

Metals:

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	1	0.0	0.0	93.9	6.1	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.48	0.37	0.33	0.265	0.2007	0.1576	1.21	2.3

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Little Silt	SP-SM	A-3

Project No.: C94050-39
Project: ACS 4077.0076
• Location: MW28 @ 65 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

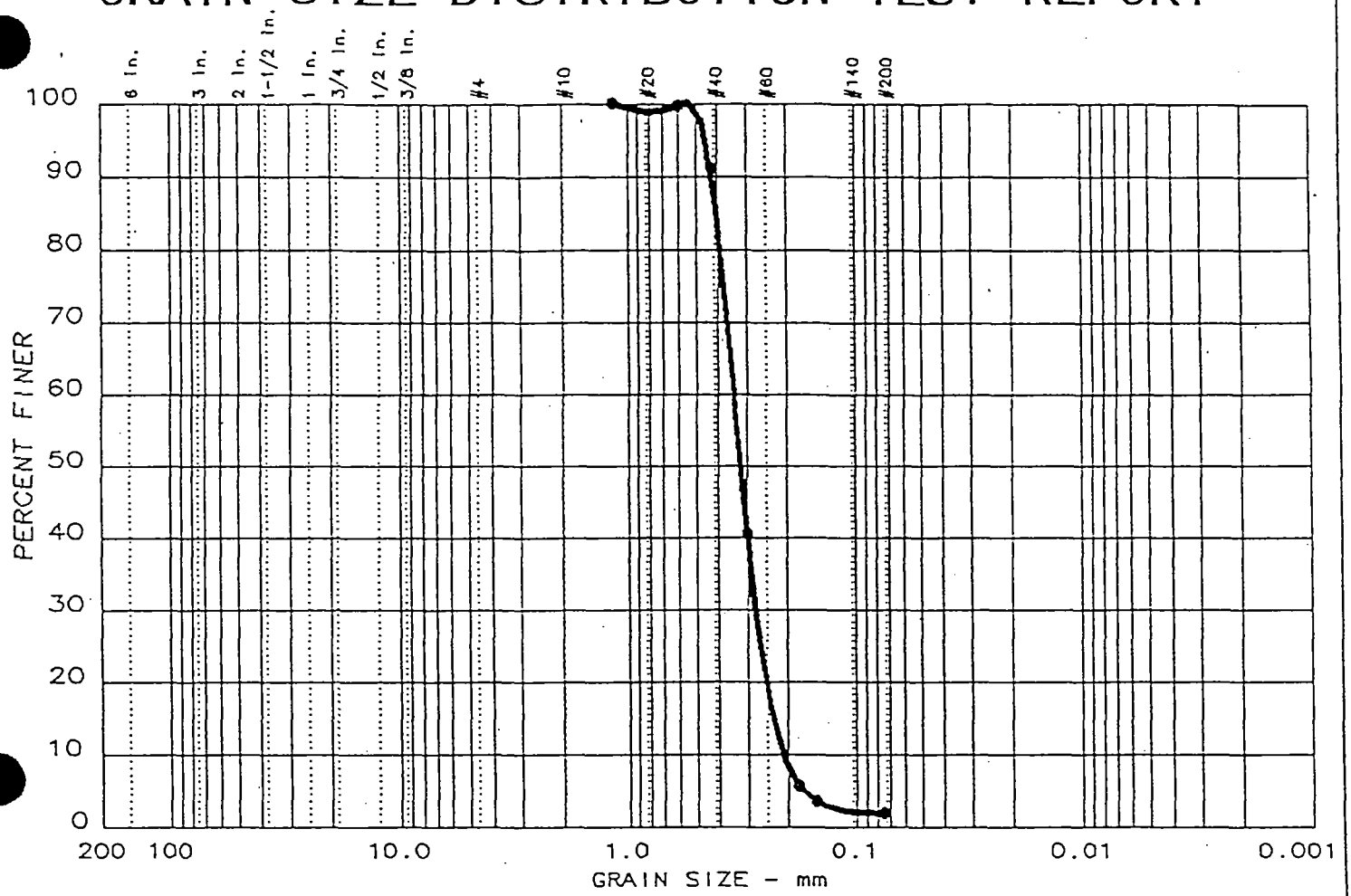
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	6	0.0	0.0	98.0	2.0	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.40	0.34	0.32	0.275	0.2304	0.2087	1.07	1.6

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
Location: MW29 @ 56 ft

Date: March 5, 1996

GRAIN SIZE DISTRIBUTION TEST REPORT
CGC, Inc.

Remarks:

Tested BY : KJL

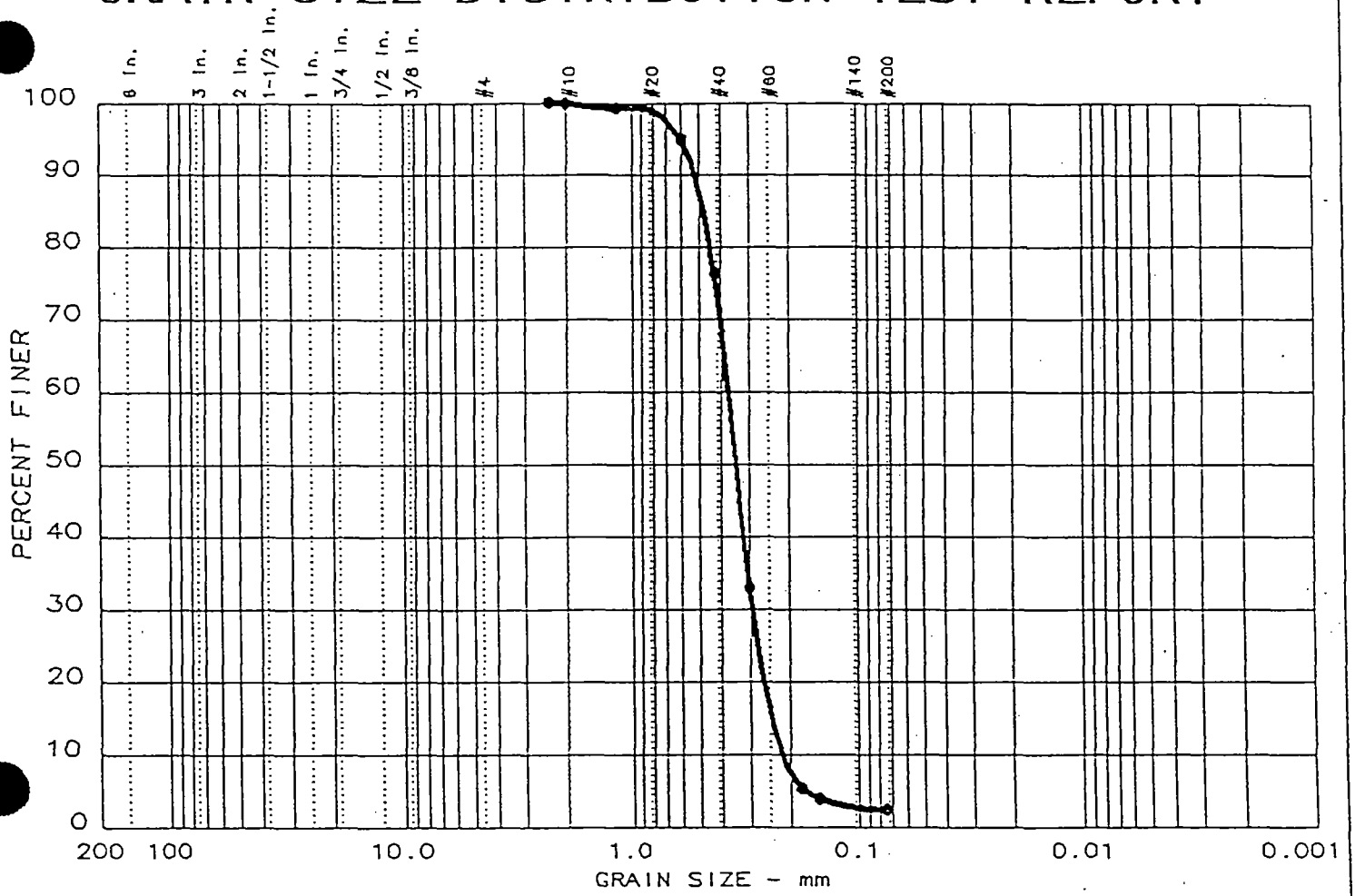
Input By : MES

Checked By : DWA

Approved By :

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	4	0.0	0.0	97.6	2.4	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.47	0.37	0.34	0.292	0.2410	0.2168	1.06	1.7

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
• Location: MW30 @ 52 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

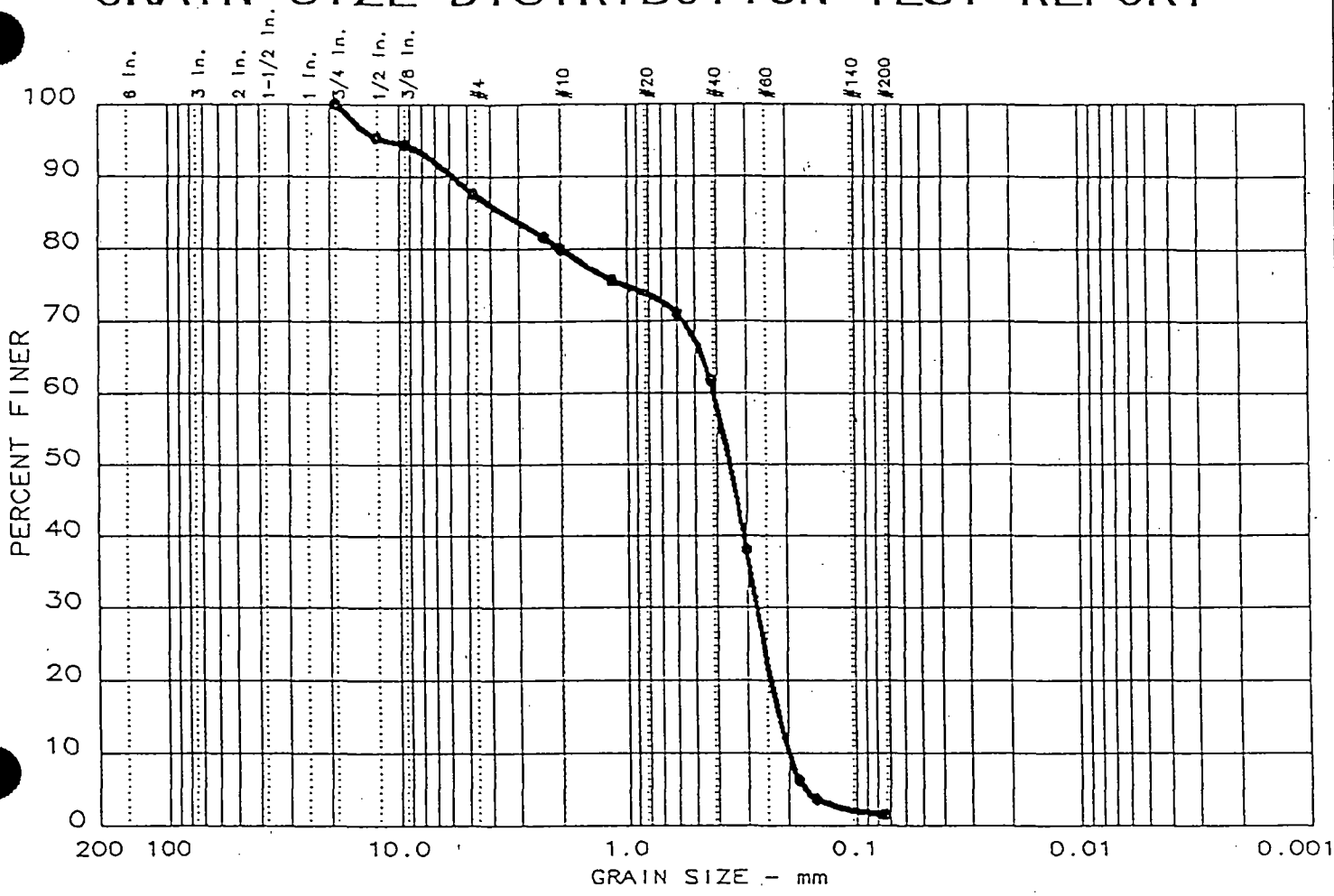
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	12	0.0	12.5	86.0	1.5	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	3.59	0.41	0.35	0.271	0.2185	0.1991	0.90	2.1

MATERIAL DESCRIPTION	USCS	AASHTO
● Gray-Brown F-C SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
Location: MW31 @ 70 ft

Date: March 5, 1996

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Remarks:

Tested BY : KJL

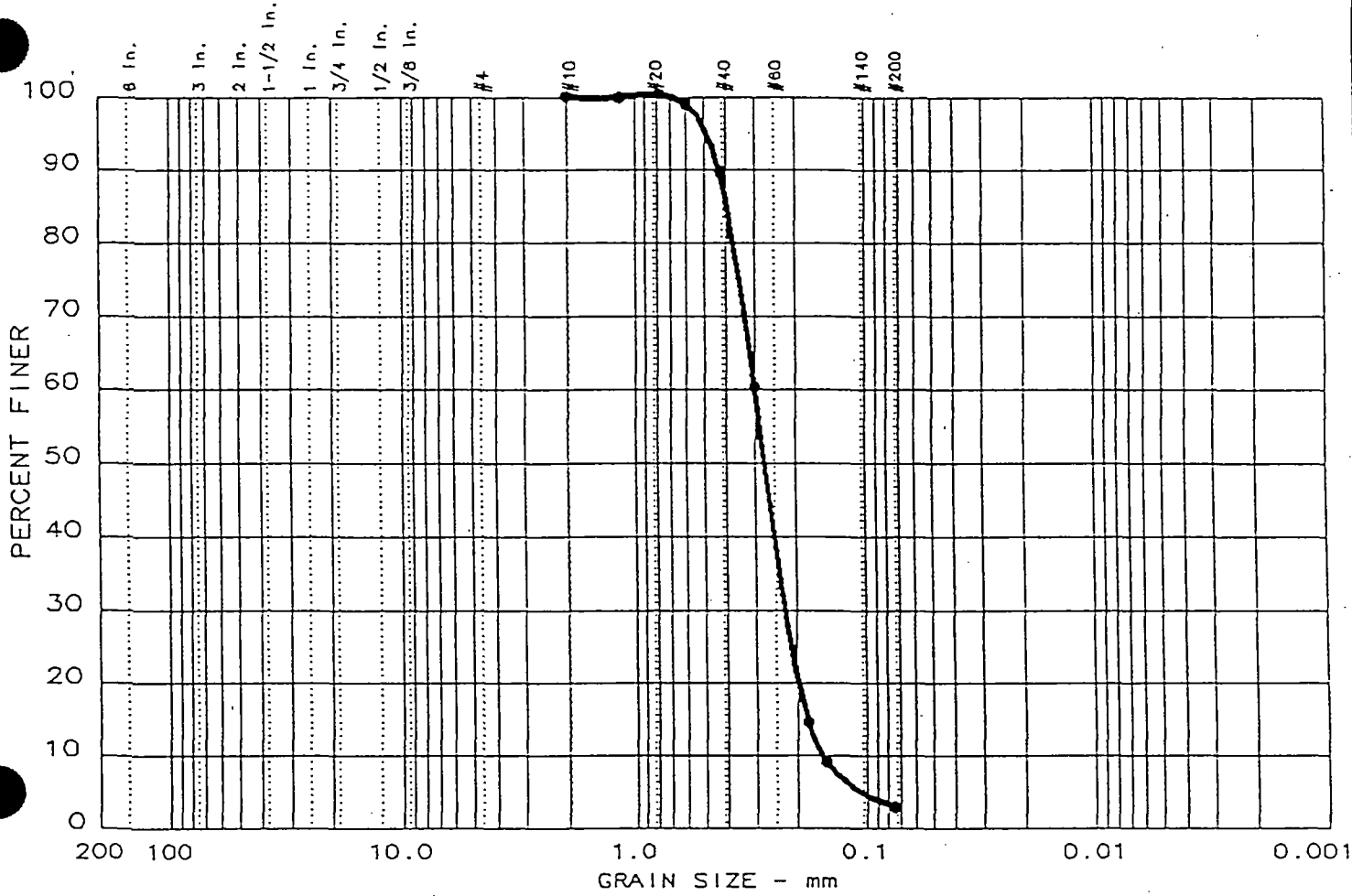
Input By : MES

Checked By : DWA

Approved By :

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	0.0	97.0	3.0	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.39	0.30	0.27	0.223	0.1813	0.1561	1.07	1.9

MATERIAL DESCRIPTION	USCS	AASHTO
● Gray-Brown Fine SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
● Location: MW32 @ 96 ft

Date: March 5, 1996

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Remarks:

Tested BY : KJL

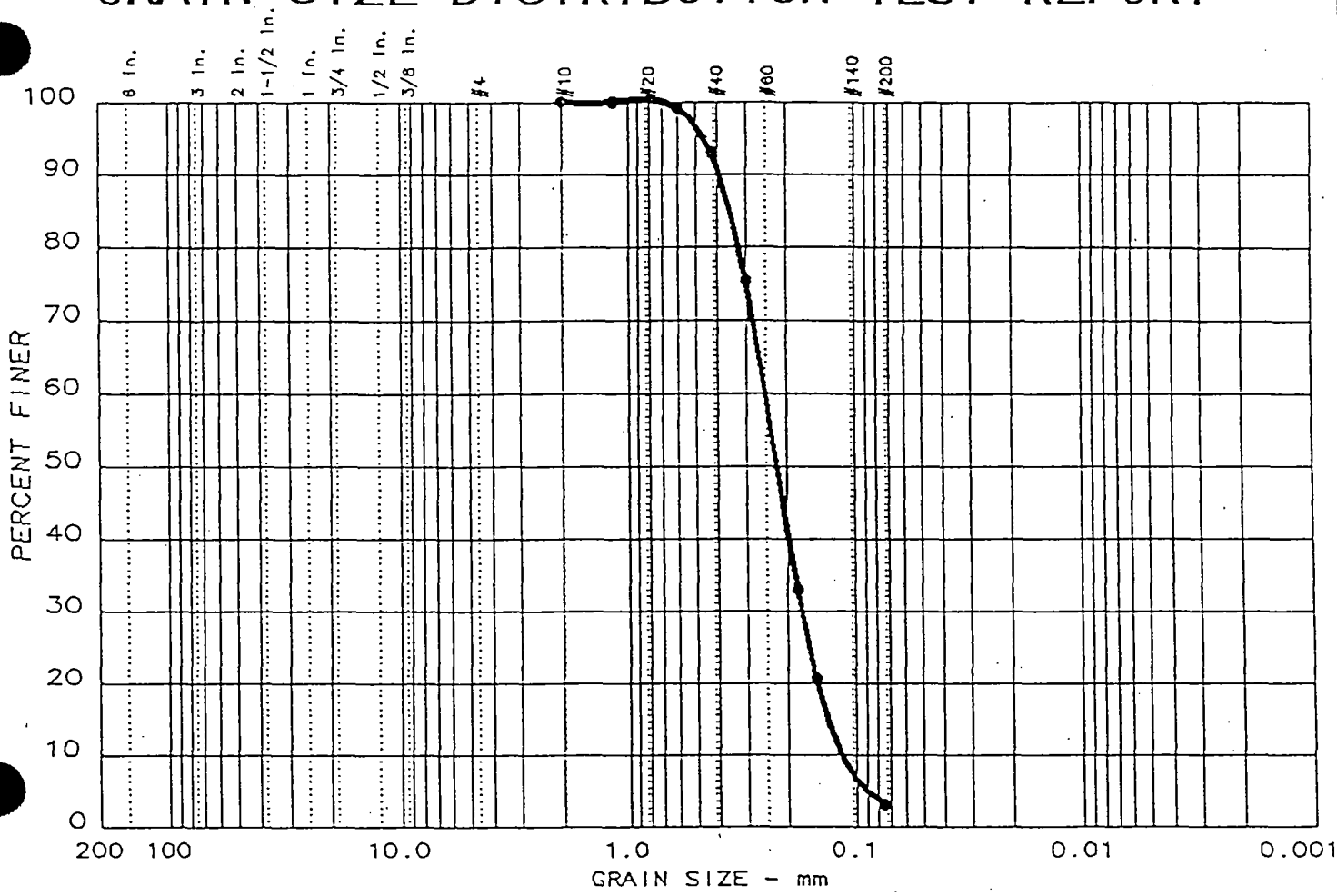
Input By : MES

Checked By : DWA

Approved By :

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	5	0.0	0.0	96.9	3.1	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.35	0.25	0.22	0.173	0.1337	0.1151	1.05	2.1

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown F-M SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
• Location: MW33 @ 80 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

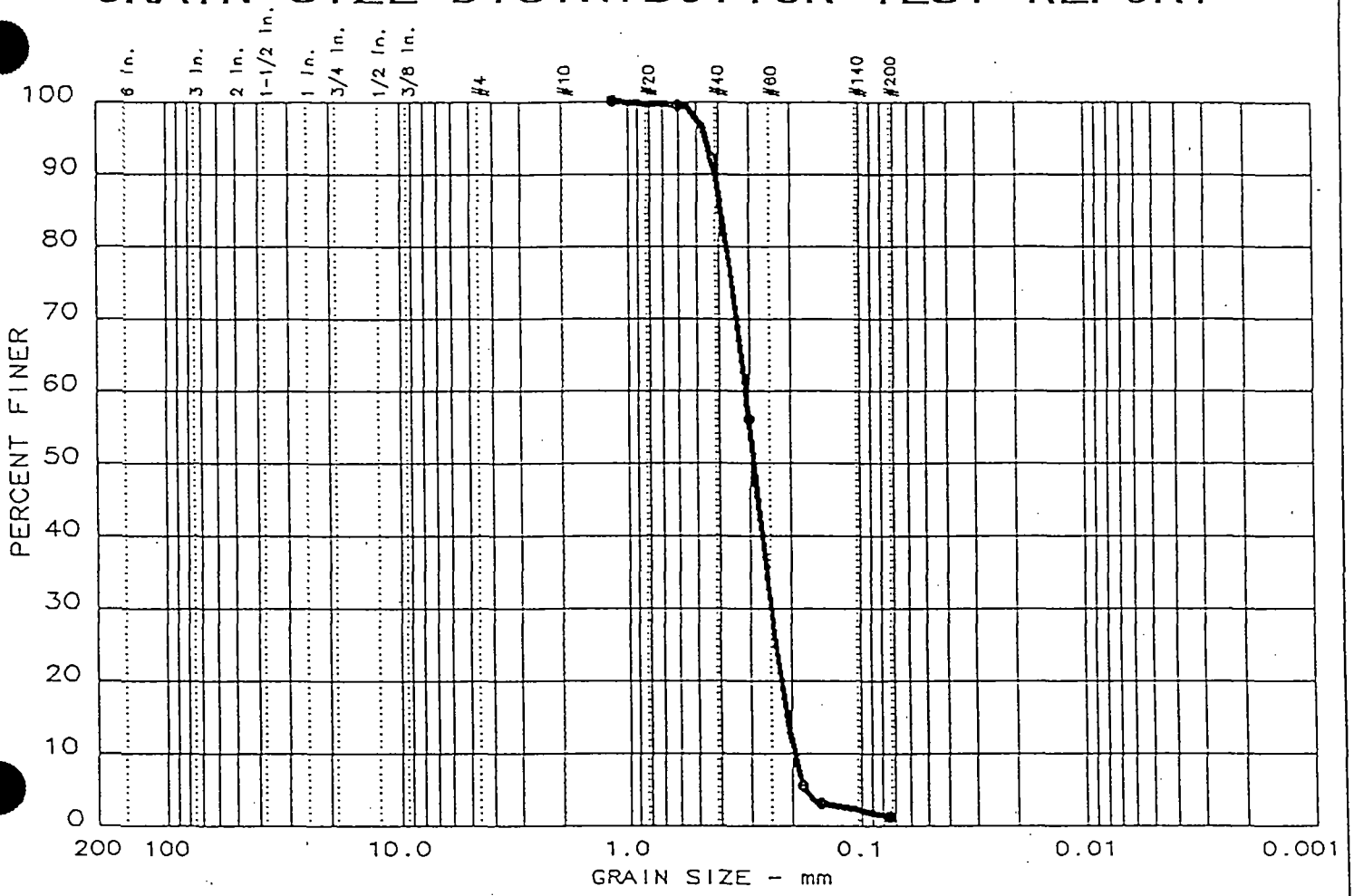
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	7	0.0	0.0	98.8	1.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.39	0.31	0.29	0.243	0.2092	0.1961	0.97	1.6

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
• Location: MW34 @ 88 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

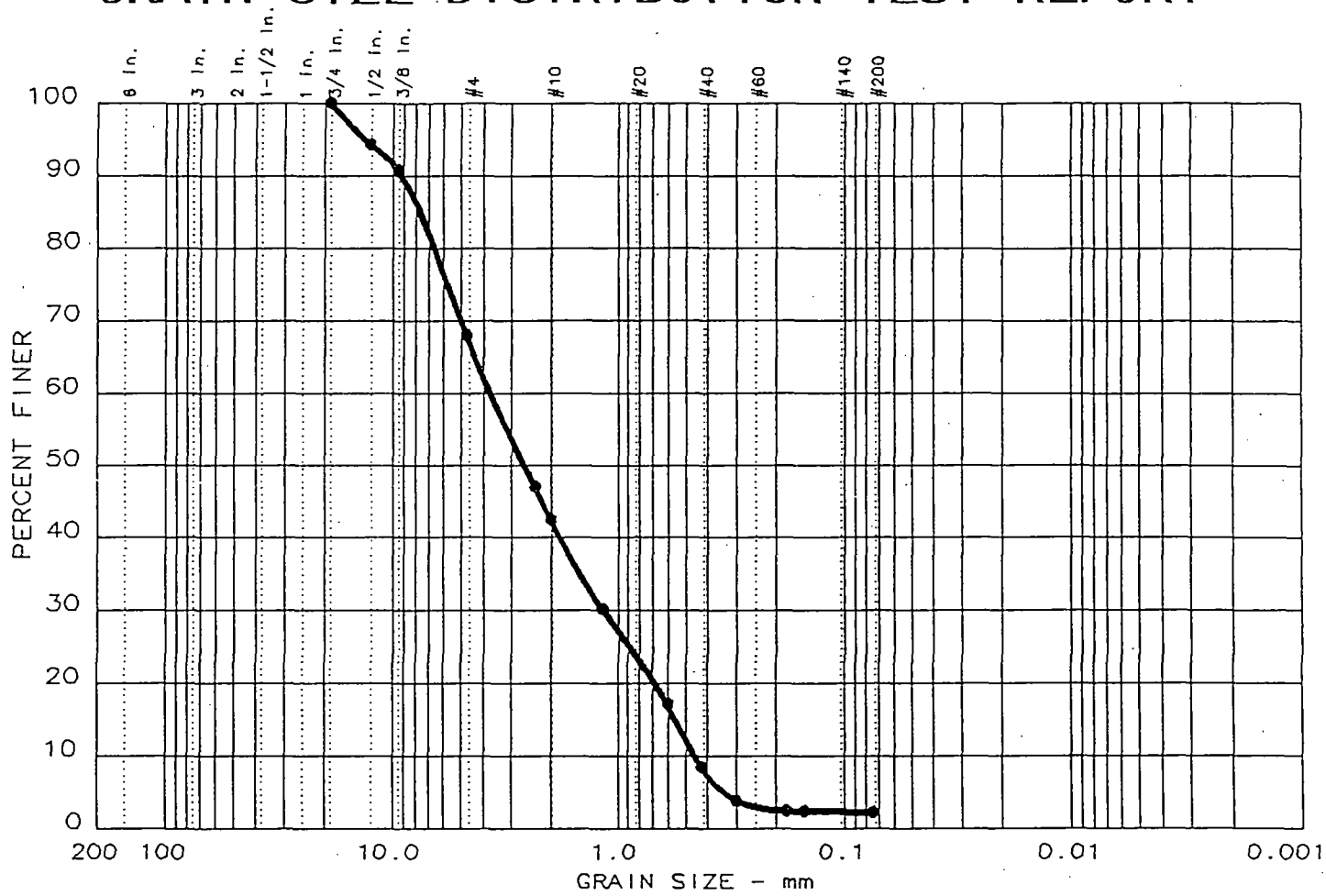
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	32.1	65.7	2.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	7.59	3.72	2.63	1.161	0.5495	0.4519	0.80	8.2

MATERIAL DESCRIPTION	USCS	AASHTO
● Gray-Brown F-C SAND, Some Gravel, Trace Silt	SP	A-1

Project No.: C94050-39
Project: ACS 4077.0076
● Location: MW35 @ 55 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

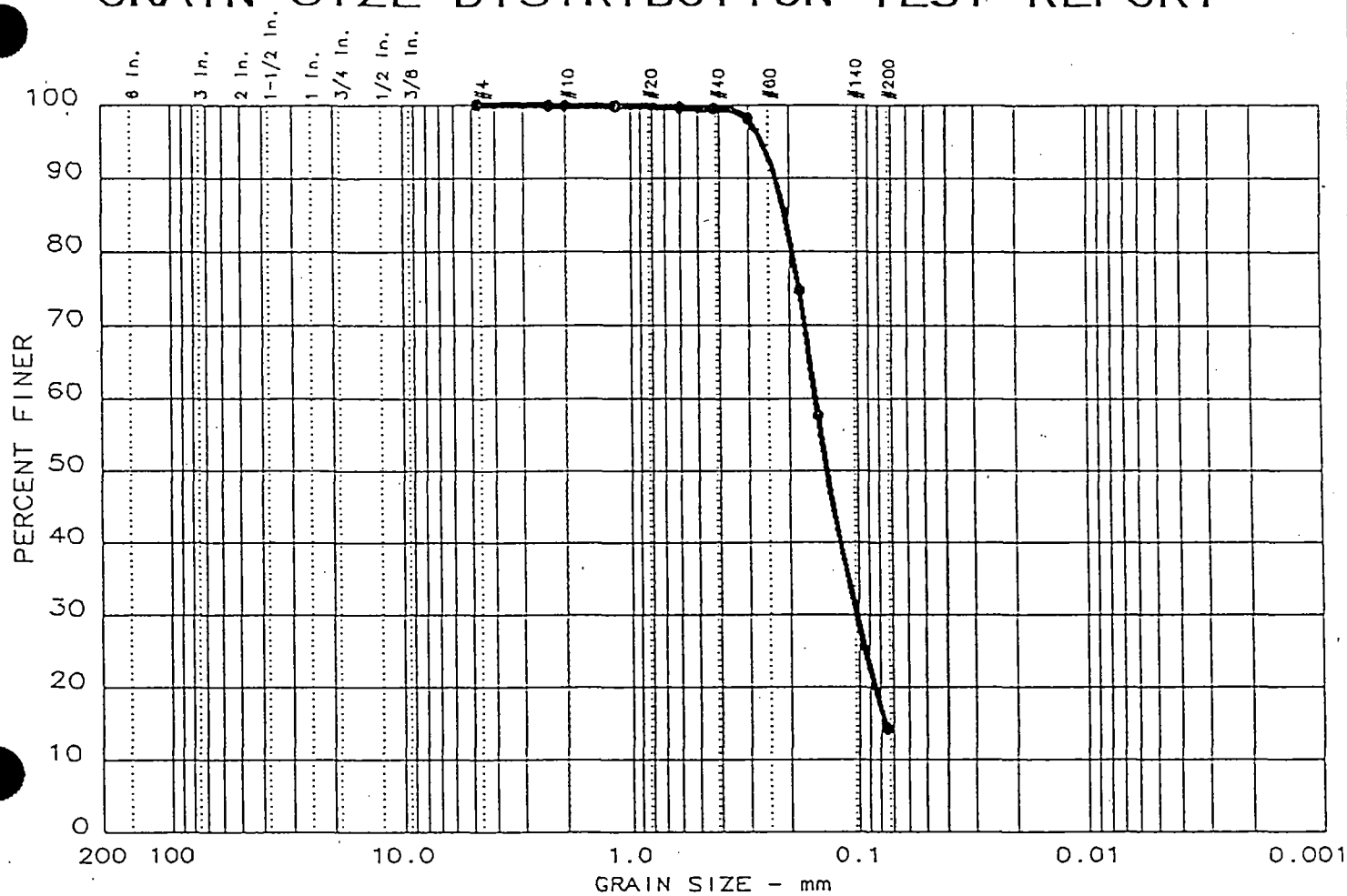
Approved By : DWA

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	11	0.0	0.0	85.8	14.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.21	0.15	0.14	0.102	0.0762			

MATERIAL DESCRIPTION	USCS	AASHTO
• ray-Brown F-M SAND, Some Silt & Clay	SM	A-2-4

Project No.: C94050-39
Project: ACS 4077.0076
Location: MW35 @ 85 ft

Date: March 5, 1996

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Remarks:

Tested BY : KJL

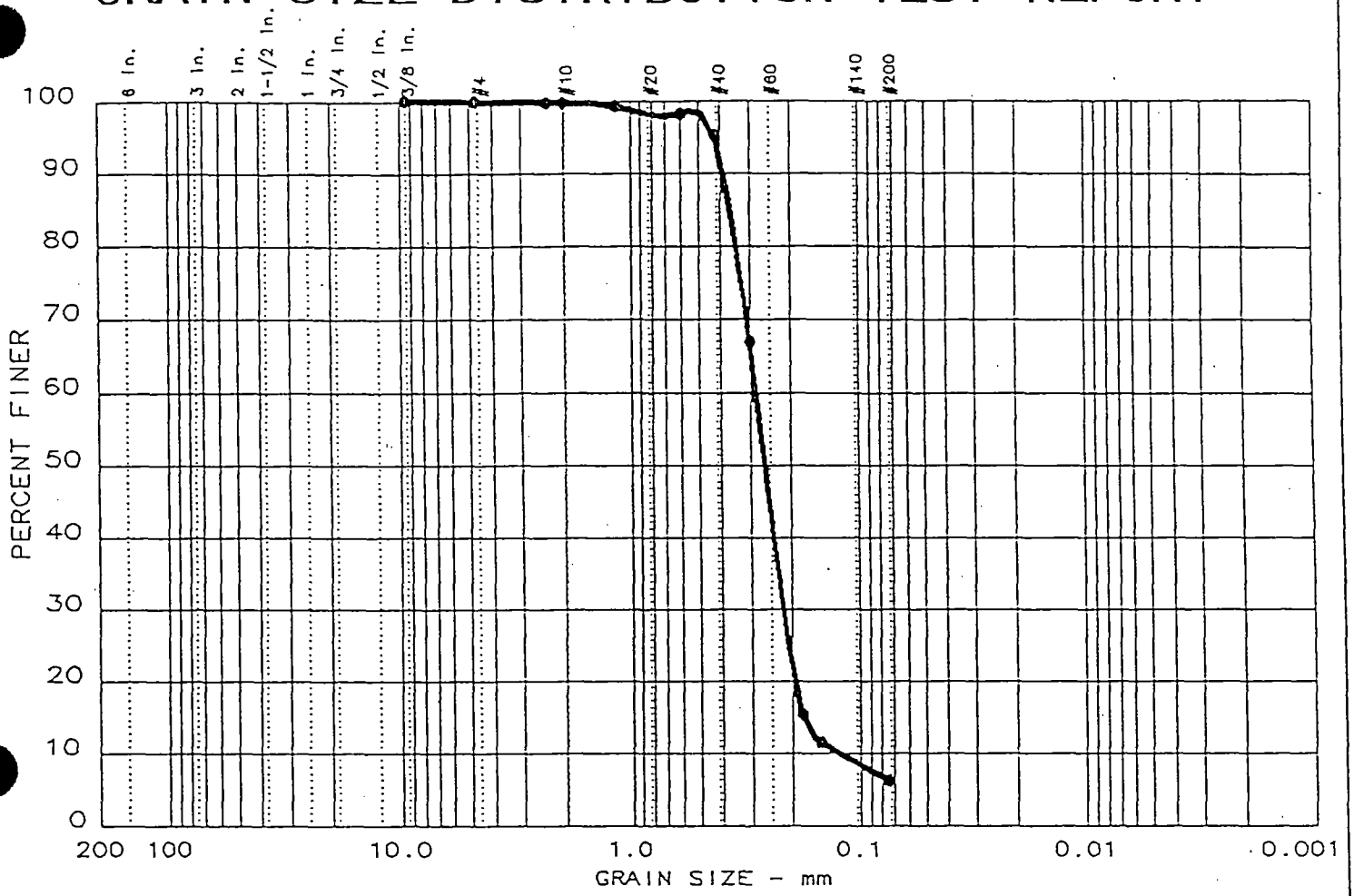
Input By : MES

Checked By : DWA

Approved By : DWA

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.1	93.6	6.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.36	0.28	0.26	0.218	0.1784	0.1235	1.36	2.3

MATERIAL DESCRIPTION	USCS	AASHTO
● Gray-Brown Fine SAND, Little Silt	SP-SM	A-3

Project No.: C94050-39
Project: ACS 4077.0076
Location: MW36 @ 87 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

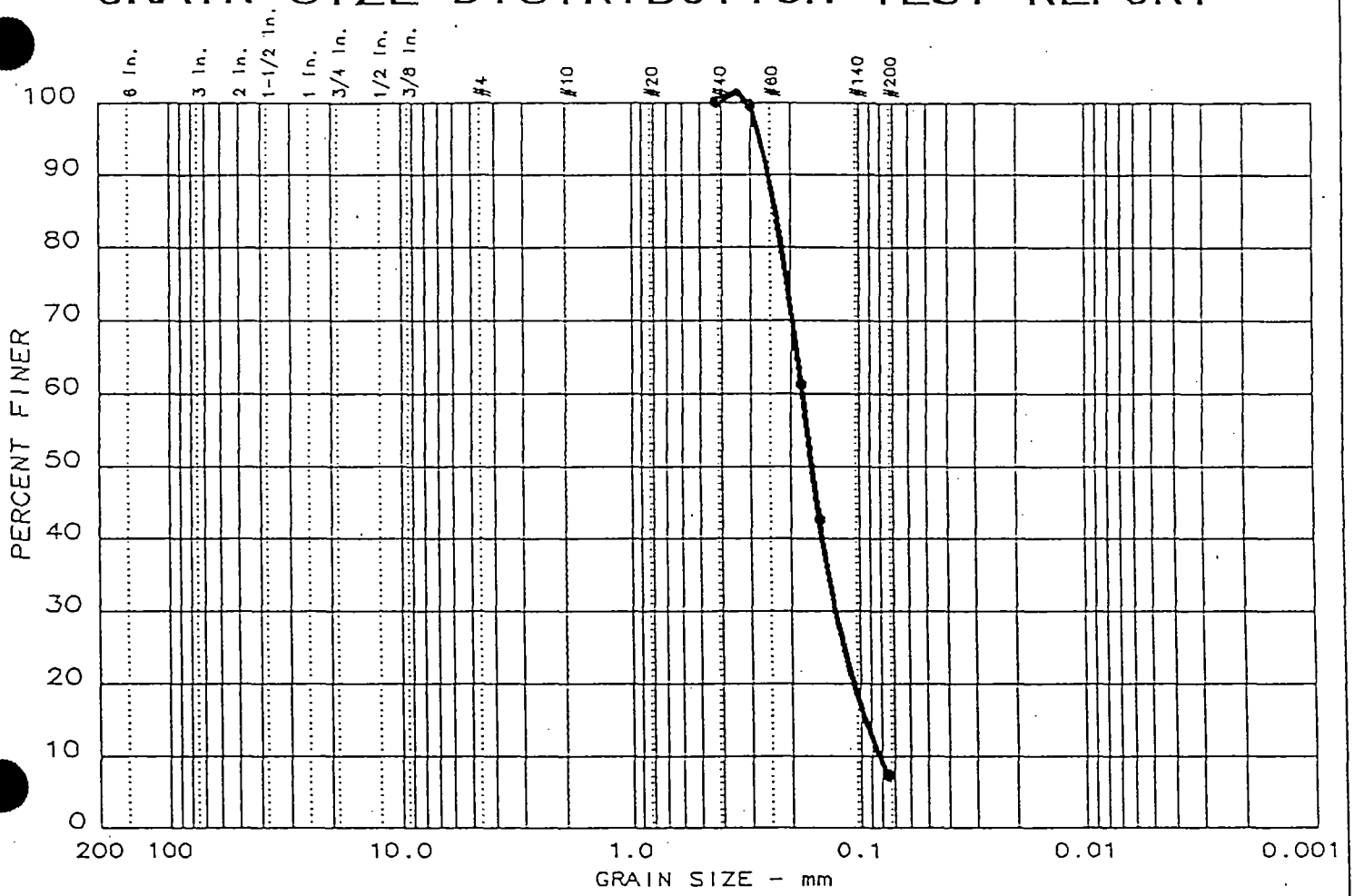
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	2	0.0	0.0	92.6	7.4	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.23	0.18	0.16	0.128	0.0950	0.0818	1.13	2.2

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Little Silt	SP-SM	A-3

Project No.: C94050-39
Project: ACS 4077.0076
Location: PZ42 @ 82 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

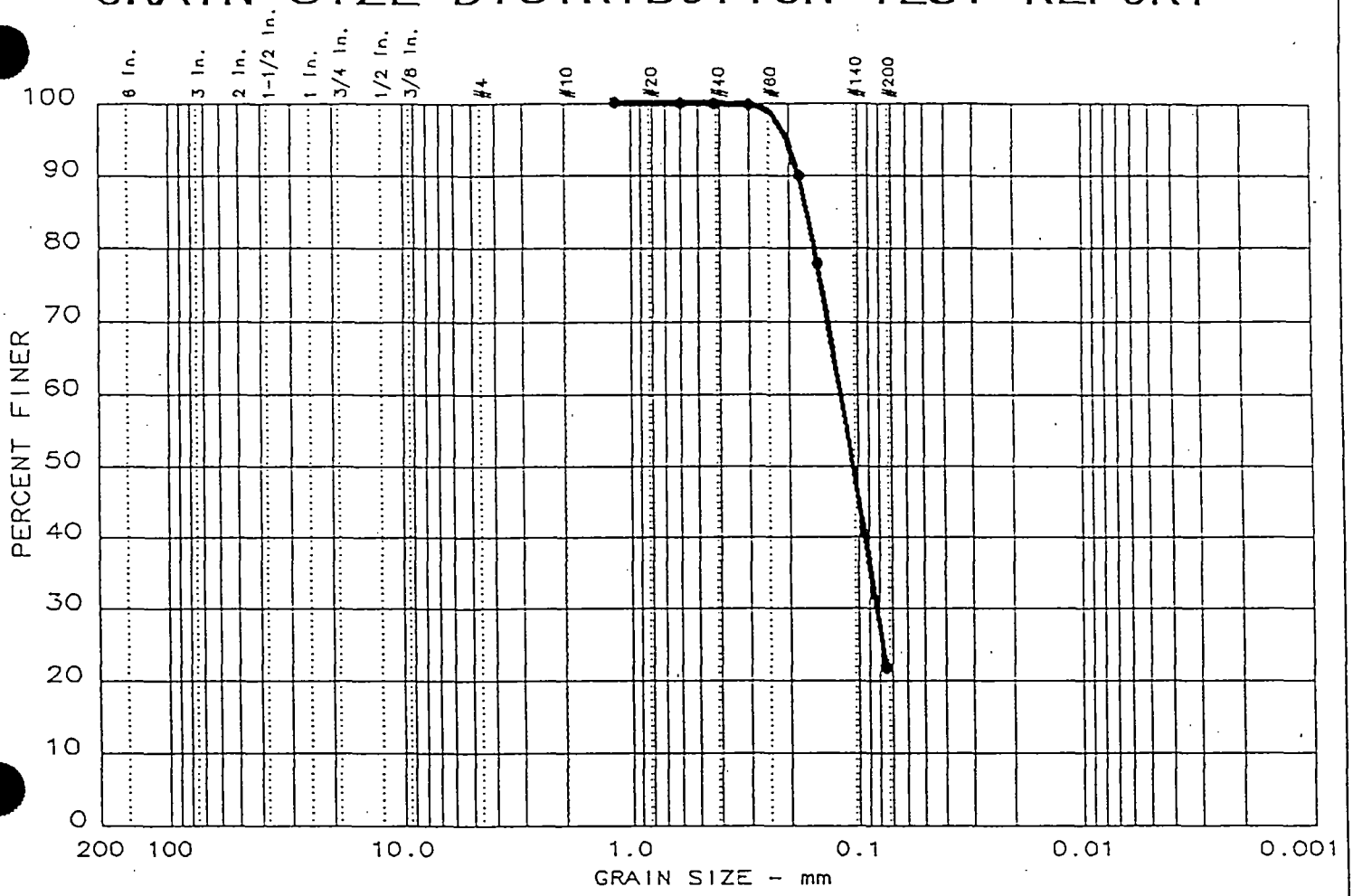
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	78.3	21.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.17	0.12	0.11	0.083				

MATERIAL DESCRIPTION	USCS	AASHTO
● Gray-Brown Fine SAND, Some Silt & Clay	SM	A-2-4

Project No.: C94050-39
Project: ACS 4077.0076
● Location: PZ43 @ 96 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

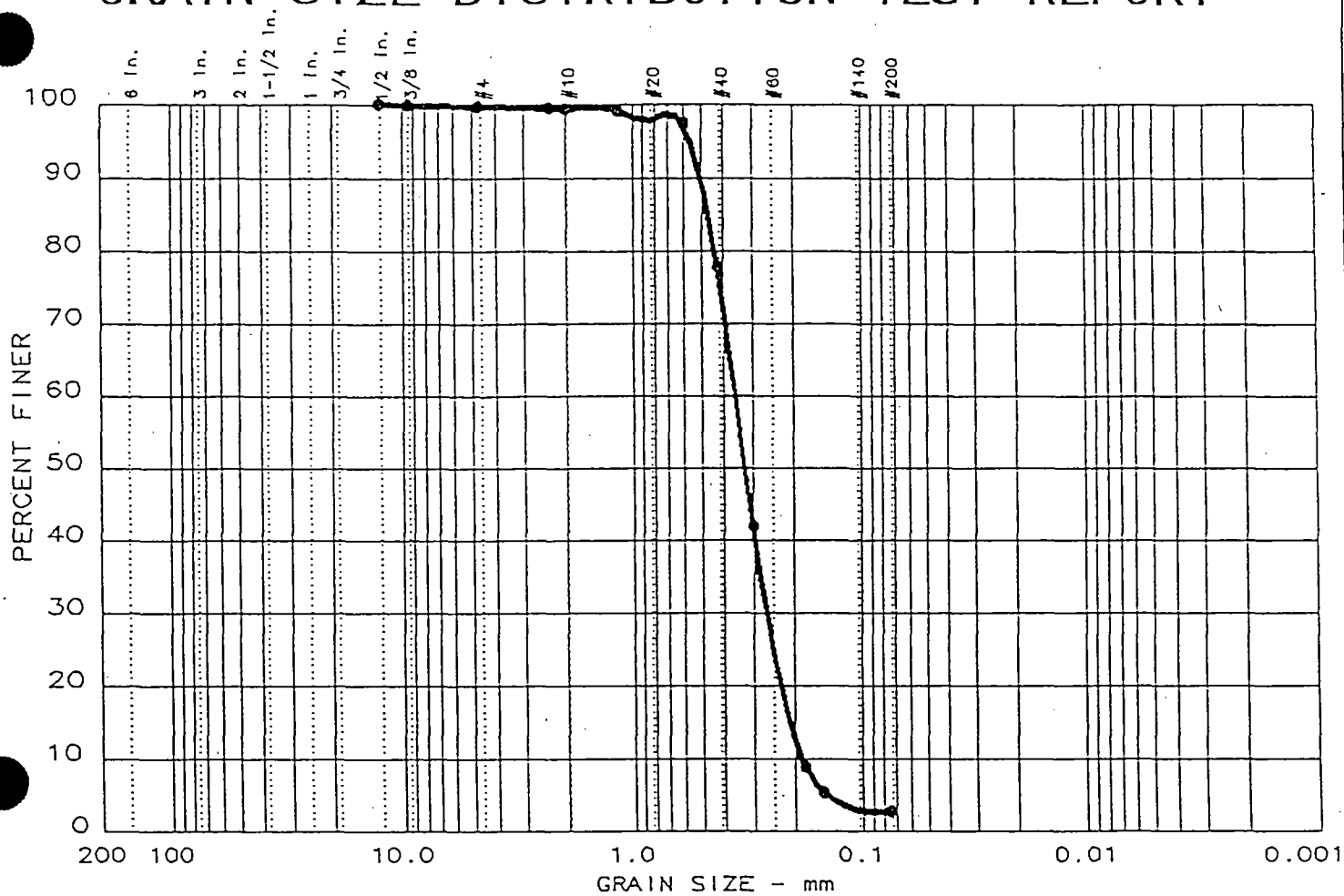
Approved By :

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	9	0.0	0.3	96.9	2.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•	NP	NP	0.46	0.36	0.32	0.262	0.2094	0.1862	1.04	1.9

MATERIAL DESCRIPTION	USCS	AASHTO
• Gray-Brown Fine SAND, Trace Silt	SP	A-3

Project No.: C94050-39
Project: ACS 4077.0076
Location: PZ44 @ 60 ft

Date: March 5, 1996

Remarks:

Tested BY : KJL

Input By : MES

Checked By : DWA

Approved By :

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT

CGC, Inc.

MONTGOMERY WATSON

CHAIN OF CUSTODY RECORD

SPECIAL INSTRUCTIONS:
- [ ] PECFA
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [ ] OTHER:

TURNAROUND
- [ ] 2 WEEKS (Standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: ACS Vertical Profile
PROJECT #: 4077.0076
CITY: Griffith
STATE: INDIANA
SAMPLER(S): Jeff Ramsey, David Pieczynski

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	Grain Size	Specific Gravity							REMARKS	LAB USE ONLY MATRIX	LAB NO.
2-1-96		X	ACS - MW28 - 65'	1	X									7	12896-001
2-1-96		X	ACS - PZ42 - 82'	1	X										-002
2-1-96		X	ACS - PZ43 - 96'	1	X										-003
2-20-96		X	ACS - MW30 - 52'	1	X										-004
2-21-96		X	ACS - MW33 - 80'	1	X										-005
2-23-96		X	ACS - MW29 - 56'	1	X										-006
2-23-96		X	ACS - MW34 - 88'	1	X										-007
2-24-96		X	ACS - MW36 - 87'	1	X										-008
2-24-96		X	ACS - PZ44 - 60'	1	X										-009
2-24-96		X	ACS - MW35 - 55'	1	X										-010
2-24-96		X	ACS - MW35 - 85'	1	X										-011

SPECIAL INSTRUCTIONS:

RECEIVED: [X] INTACT [ ] ON ICE TEMP Room °F

PROJ. MGR.: Pete Vajt

	SIGNATURE	PRINT NAME	COMPANY / TITLE	DATE	TIME
RELINQUISHED BY:	[signature]	David Pieczynski	Montgomery Watson / Hydrogeologist	2-29-96	1330
RECEIVED BY:					
RELINQUISHED BY:	[signature]	L. Collins	Mont Watson / Lab Tech	3/4/96	1:30 pm
RECEIVED BY:					

C-O-C No. 010576

NAME OF COURIER:

AIRBILL NUMBER:

MONTGOMERY WATSON

CHAIN OF CUSTODY RECORD

SPECIAL INSTRUCTIONS:
- [ ] PECFA
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [ ] OTHER:

TURNAROUND
- [ ] 2 WEEKS (standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: ACS Vertical Profile
PROJECT #: 4077.0076
CITY: Griffith
STATE: Indiana
SAMPLER(S): Jeff Ramsby, David Pieczynski

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	Grain Size								REMARKS	LAB USE ONLY MATRIX	LAB USE ONLY LAB NO.
2-8-96		X	ACS-MW31-70'	1	X									7	12696-012
2-9-96		X	ACS-MW32-96'	1	X									↓	↓-013

SPECIAL INSTRUCTIONS:

RECEIVED: [x] INTACT [ ] ON ICE TEMP Room °F

PROJ. MGR.: Pete VAGT

	SIGNATURE	PRINT NAME	COMPANY / TITLE	DATE	TIME
RELINQUISHED BY:	[signature]	DAVID A. PIECZYNSKI	Montgomery WATSON / Hydrogeologist	2-29-96	1330
RECEIVED BY:					
RELINQUISHED BY:	[signature]	L. Collins	Mont Watson / Lab Tech	3/4/96	1:30 pm
RECEIVED BY:					

C-O-C No. 010580

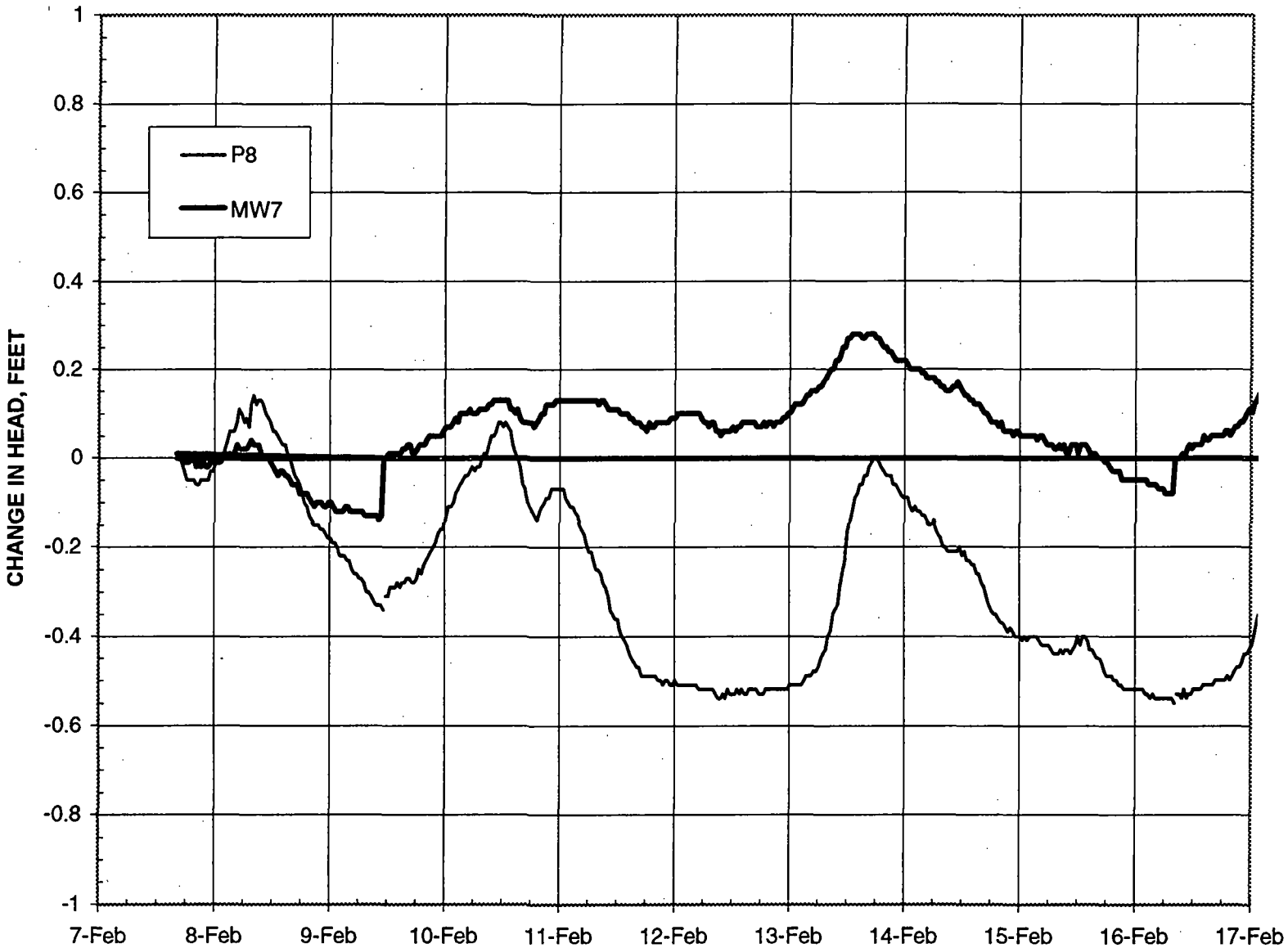
NAME OF COURIER:

AIRBILL NUMBER:

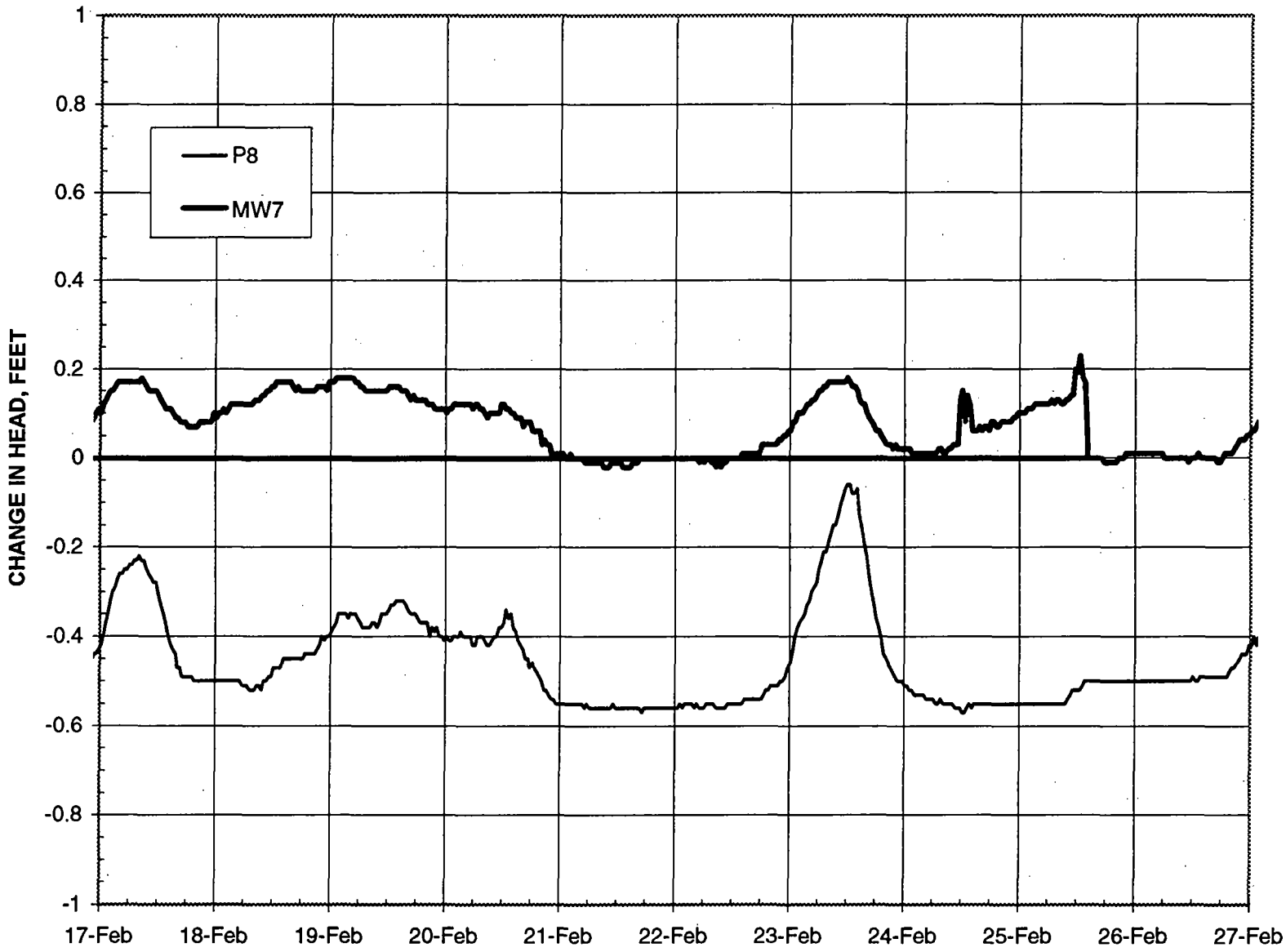
G

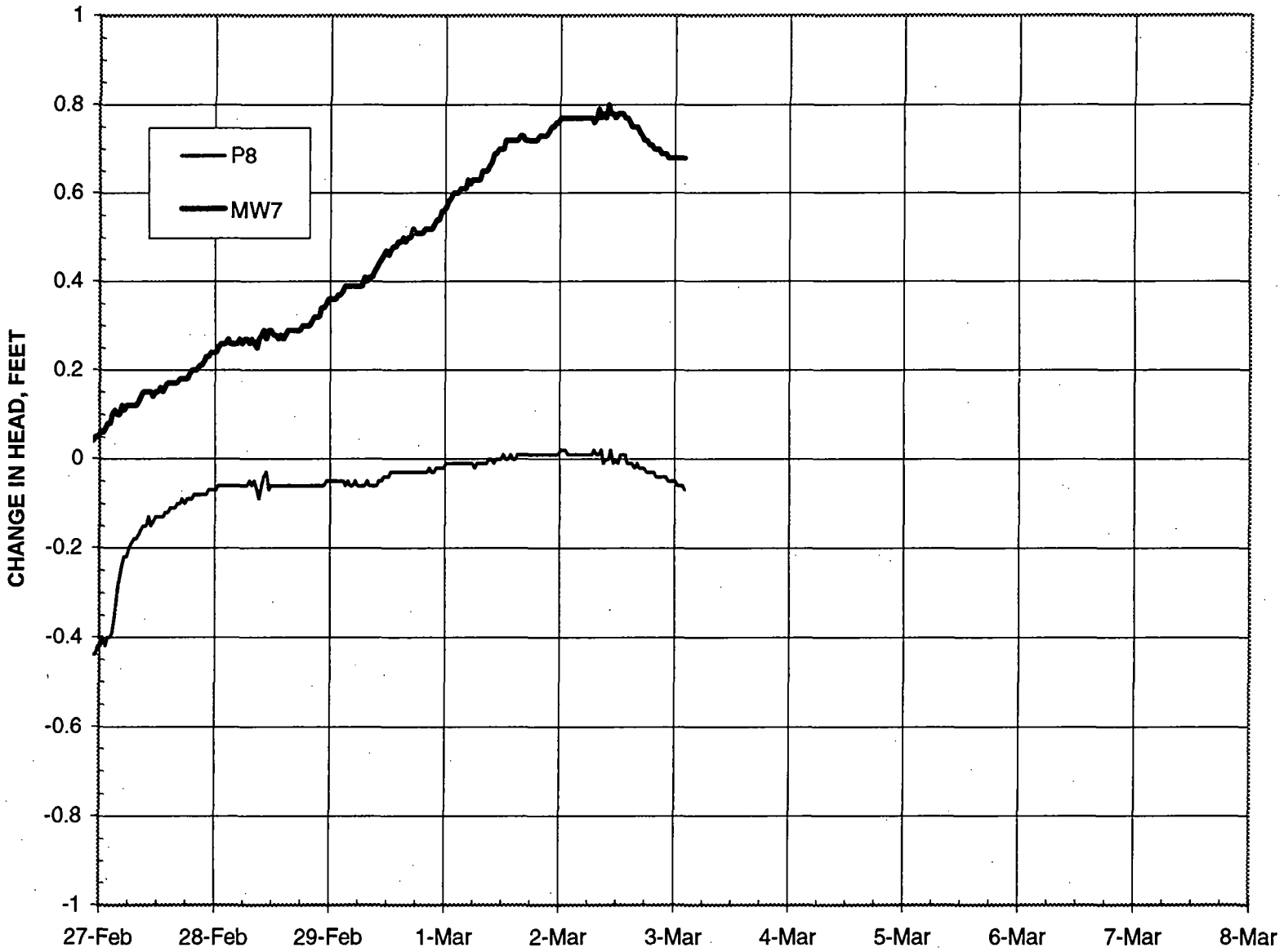
G

CONTINUOUS GROUNDWATER LEVEL MEASUREMENTS – RAW DATA


P8
MW7
CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
7-Feb
8-Feb
9-Feb
10-Feb
11-Feb
12-Feb
13-Feb
14-Feb
15-Feb
16-Feb
17-Feb

WATLEV8.XLS


P8
MW7
CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
17-Feb
18-Feb
19-Feb
20-Feb
21-Feb
22-Feb
23-Feb
24-Feb
25-Feb
26-Feb
27-Feb


P8
MW7
CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
27-Feb
28-Feb
29-Feb
1-Mar
2-Mar
3-Mar
4-Mar
5-Mar
6-Mar
7-Mar
8-Mar

WATLEV8.XLS

RAW WATER LEVEL DATA FROM CONTINUOUS RECORDER				
Cummulative Time				
Minutes	Days	Date of Measurement	P8	MW7
0	0.00	2/7/96 16:10	0	0.01
30	0.02	2/7/96 16:40	0	0
60	0.04	2/7/96 17:10	-0.01	0
90	0.06	2/7/96 17:40	-0.03	-0.01
120	0.08	2/7/96 18:10	-0.05	-0.01
150	0.10	2/7/96 18:40	-0.05	-0.01
180	0.13	2/7/96 19:10	-0.05	0
210	0.15	2/7/96 19:40	-0.05	0
240	0.17	2/7/96 20:10	-0.06	-0.02
270	0.19	2/7/96 20:40	-0.06	-0.01
300	0.21	2/7/96 21:10	-0.05	-0.02
330	0.23	2/7/96 21:40	-0.05	-0.01
360	0.25	2/7/96 22:10	-0.05	-0.02
390	0.27	2/7/96 22:40	-0.05	-0.02
420	0.29	2/7/96 23:10	-0.03	-0.01
450	0.31	2/7/96 23:40	-0.03	-0.01
480	0.33	2/8/96 0:10	-0.01	-0.01
510	0.35	2/8/96 0:40	0	-0.01
540	0.38	2/8/96 1:10	0	-0.01
570	0.40	2/8/96 1:40	0	0
600	0.42	2/8/96 2:10	0.02	0
630	0.44	2/8/96 2:40	0.04	0
660	0.46	2/8/96 3:10	0.06	0.01
690	0.48	2/8/96 3:40	0.06	0
720	0.50	2/8/96 4:10	0.06	0.01
750	0.52	2/8/96 4:40	0.08	0.03
780	0.54	2/8/96 5:10	0.11	0.02
810	0.56	2/8/96 5:40	0.1	0.02
840	0.58	2/8/96 6:10	0.08	0.02
870	0.60	2/8/96 6:40	0.09	0.02
900	0.63	2/8/96 7:10	0.07	0.03
930	0.65	2/8/96 7:40	0.12	0.04
960	0.67	2/8/96 8:10	0.14	0.03
990	0.69	2/8/96 8:40	0.12	0.03
1020	0.71	2/8/96 9:10	0.13	0.03
1050	0.73	2/8/96 9:40	0.13	0.01
1080	0.75	2/8/96 10:10	0.12	0
1110	0.77	2/8/96 10:40	0.1	0
1140	0.79	2/8/96 11:10	0.09	0
1170	0.81	2/8/96 11:40	0.08	-0.01
1200	0.83	2/8/96 12:10	0.06	-0.02
1230	0.85	2/8/96 12:40	0.06	-0.03
1260	0.88	2/8/96 13:10	0.05	-0.04
1290	0.90	2/8/96 13:40	0.04	-0.03
1320	0.92	2/8/96 14:10	0.03	-0.03
1350	0.94	2/8/96 14:40	0.03	-0.04
1380	0.96	2/8/96 15:10	0.01	-0.04
1410	0.98	2/8/96 15:40	0	-0.05
1440	1.00	2/8/96 16:10	-0.02	-0.06
1470	1.02	2/8/96 16:40	-0.04	-0.06
1500	1.04	2/8/96 17:10	-0.05	-0.06
1530	1.06	2/8/96 17:40	-0.06	-0.08
1560	1.08	2/8/96 18:10	-0.08	-0.08
1590	1.10	2/8/96 18:40	-0.1	-0.08
1620	1.13	2/8/96 19:10	-0.11	-0.08
1650	1.15	2/8/96 19:40	-0.13	-0.09
1680	1.17	2/8/96 20:10	-0.14	-0.1
1710	1.19	2/8/96 20:40	-0.15	-0.11
1740	1.21	2/8/96 21:10	-0.15	-0.1
1770	1.23	2/8/96 21:40	-0.15	-0.1
1800	1.25	2/8/96 22:10	-0.16	-0.1
1830	1.27	2/8/96 22:40	-0.16	-0.11
1860	1.29	2/8/96 23:10	-0.17	-0.11

1890	1.31	2/8/96 23:40	-0.18	-0.1
1920	1.33	2/9/96 0:10	-0.18	-0.1
1950	1.35	2/9/96 0:40	-0.19	-0.11
1980	1.38	2/9/96 1:10	-0.19	-0.12
2010	1.40	2/9/96 1:40	-0.2	-0.12
2040	1.42	2/9/96 2:10	-0.22	-0.12
2070	1.44	2/9/96 2:40	-0.22	-0.12
2100	1.46	2/9/96 3:10	-0.22	-0.11
2130	1.48	2/9/96 3:40	-0.23	-0.11
2160	1.50	2/9/96 4:10	-0.23	-0.12
2190	1.52	2/9/96 4:40	-0.25	-0.12
2220	1.54	2/9/96 5:10	-0.26	-0.12
2250	1.56	2/9/96 5:40	-0.26	-0.12
2280	1.58	2/9/96 6:10	-0.27	-0.12
2310	1.60	2/9/96 6:40	-0.27	-0.12
2340	1.63	2/9/96 7:10	-0.28	-0.13
2370	1.65	2/9/96 7:40	-0.3	-0.13
2400	1.67	2/9/96 8:10	-0.3	-0.13
2430	1.69	2/9/96 8:40	-0.31	-0.13
2460	1.71	2/9/96 9:10	-0.32	-0.13
2490	1.73	2/9/96 9:40	-0.33	-0.13
2520	1.75	2/9/96 10:10	-0.33	-0.14
2550	1.77	2/9/96 10:40	-0.33	-0.13
2580	1.79	2/9/96 11:10	-0.34	0
		2/7/96 16:10		0.01
2610	1.81	2/9/96 11:40	-0.31	0
2640	1.83	2/9/96 12:10	-0.31	0.01
2670	1.85	2/9/96 12:40	-0.29	0.01
2700	1.88	2/9/96 13:10	-0.29	0.01
2730	1.90	2/9/96 13:40	-0.29	0.01
2760	1.92	2/9/96 14:10	-0.28	0.01
2790	1.94	2/9/96 14:40	-0.29	0.01
2820	1.96	2/9/96 15:10	-0.28	0.02
2850	1.98	2/9/96 15:40	-0.28	0.02
2880	2.00	2/9/96 16:10	-0.27	0.03
2910	2.02	2/9/96 16:40	-0.27	0.03
2940	2.04	2/9/96 17:10	-0.28	0.01
2970	2.06	2/9/96 17:40	-0.28	0.01
3000	2.08	2/9/96 18:10	-0.27	0.02
3030	2.10	2/9/96 18:40	-0.25	0.03
3060	2.13	2/9/96 19:10	-0.26	0.03
3090	2.15	2/9/96 19:40	-0.24	0.03
3120	2.17	2/9/96 20:10	-0.23	0.04
3150	2.19	2/9/96 20:40	-0.22	0.05
3180	2.21	2/9/96 21:10	-0.21	0.05
3210	2.23	2/9/96 21:40	-0.2	0.05
3240	2.25	2/9/96 22:10	-0.19	0.05
3270	2.27	2/9/96 22:40	-0.17	0.05
3300	2.29	2/9/96 23:10	-0.16	0.05
3330	2.31	2/9/96 23:40	-0.16	0.06
3360	2.33	2/10/96 0:10	-0.13	0.07
3390	2.35	2/10/96 0:40	-0.11	0.07
3420	2.38	2/10/96 1:10	-0.11	0.07
3450	2.40	2/10/96 1:40	-0.1	0.08
3480	2.42	2/10/96 2:10	-0.08	0.09
3510	2.44	2/10/96 2:40	-0.07	0.08
3540	2.46	2/10/96 3:10	-0.06	0.1
3570	2.48	2/10/96 3:40	-0.05	0.1
3600	2.50	2/10/96 4:10	-0.04	0.1
3630	2.52	2/10/96 4:40	-0.04	0.1
3660	2.54	2/10/96 5:10	-0.03	0.11
3690	2.56	2/10/96 5:40	-0.02	0.1
3720	2.58	2/10/96 6:10	-0.03	0.1
3750	2.60	2/10/96 6:40	-0.02	0.1
3780	2.63	2/10/96 7:10	-0.02	0.11
3810	2.65	2/10/96 7:40	0	0.11
3840	2.67	2/10/96 8:10	0.01	0.11

3870	2.69	2/10/96 8:40	0.01	0.11
3900	2.71	2/10/96 9:10	0.03	0.12
3930	2.73	2/10/96 9:40	0.05	0.12
3960	2.75	2/10/96 10:10	0.05	0.13
3990	2.77	2/10/96 10:40	0.06	0.13
4020	2.79	2/10/96 11:10	0.08	0.13
4050	2.81	2/10/96 11:40	0.08	0.13
4080	2.83	2/10/96 12:10	0.07	0.13
4110	2.85	2/10/96 12:40	0.08	0.13
4140	2.88	2/10/96 13:10	0.07	0.13
4170	2.90	2/10/96 13:40	0.06	0.11
4200	2.92	2/10/96 14:10	0.03	0.11
4230	2.94	2/10/96 14:40	0.01	0.1
4260	2.96	2/10/96 15:10	0	0.11
4290	2.98	2/10/96 15:40	-0.02	0.09
4320	3.00	2/10/96 16:10	-0.06	0.08
4350	3.02	2/10/96 16:40	-0.07	0.08
4380	3.04	2/10/96 17:10	-0.1	0.08
4410	3.06	2/10/96 17:40	-0.11	0.08
4440	3.08	2/10/96 18:10	-0.12	0.08
4470	3.10	2/10/96 18:40	-0.13	0.07
4500	3.13	2/10/96 19:10	-0.14	0.08
4530	3.15	2/10/96 19:40	-0.12	0.09
4560	3.17	2/10/96 20:10	-0.11	0.1
4590	3.19	2/10/96 20:40	-0.1	0.1
4620	3.21	2/10/96 21:10	-0.09	0.12
4650	3.23	2/10/96 21:40	-0.09	0.12
4680	3.25	2/10/96 22:10	-0.07	0.12
4710	3.27	2/10/96 22:40	-0.07	0.12
4740	3.29	2/10/96 23:10	-0.07	0.13
4770	3.31	2/10/96 23:40	-0.07	0.13
4800	3.33	2/11/96 0:10	-0.07	0.13
4830	3.35	2/11/96 0:40	-0.07	0.13
4860	3.38	2/11/96 1:10	-0.09	0.13
4890	3.40	2/11/96 1:40	-0.1	0.13
4920	3.42	2/11/96 2:10	-0.11	0.13
4950	3.44	2/11/96 2:40	-0.11	0.13
4980	3.46	2/11/96 3:10	-0.12	0.13
5010	3.48	2/11/96 3:40	-0.13	0.13
5040	3.50	2/11/96 4:10	-0.15	0.13
5070	3.52	2/11/96 4:40	-0.16	0.13
5100	3.54	2/11/96 5:10	-0.17	0.13
5130	3.56	2/11/96 5:40	-0.19	0.13
5160	3.58	2/11/96 6:10	-0.21	0.13
5190	3.60	2/11/96 6:40	-0.21	0.13
5220	3.63	2/11/96 7:10	-0.23	0.13
5250	3.65	2/11/96 7:40	-0.25	0.13
5280	3.67	2/11/96 8:10	-0.25	0.12
5310	3.69	2/11/96 8:40	-0.26	0.13
5340	3.71	2/11/96 9:10	-0.28	0.13
5370	3.73	2/11/96 9:40	-0.29	0.12
5400	3.75	2/11/96 10:10	-0.31	0.11
5430	3.77	2/11/96 10:40	-0.34	0.11
5460	3.79	2/11/96 11:10	-0.35	0.11
5490	3.81	2/11/96 11:40	-0.36	0.11
5520	3.83	2/11/96 12:10	-0.36	0.11
5550	3.85	2/11/96 12:40	-0.39	0.1
5580	3.88	2/11/96 13:10	-0.4	0.1
5610	3.90	2/11/96 13:40	-0.41	0.1
5640	3.92	2/11/96 14:10	-0.42	0.1
5670	3.94	2/11/96 14:40	-0.44	0.09
5700	3.96	2/11/96 15:10	-0.45	0.09
5730	3.98	2/11/96 15:40	-0.46	0.08
5760	4.00	2/11/96 16:10	-0.47	0.08
5790	4.02	2/11/96 16:40	-0.47	0.08
5820	4.04	2/11/96 17:10	-0.49	0.07
5850	4.06	2/11/96 17:40	-0.49	0.07

5880	4.08	2/11/96 18:10	-0.49	0.06
5910	4.10	2/11/96 18:40	-0.49	0.08
5940	4.13	2/11/96 19:10	-0.49	0.07
5970	4.15	2/11/96 19:40	-0.49	0.07
6000	4.17	2/11/96 20:10	-0.49	0.08
6030	4.19	2/11/96 20:40	-0.5	0.08
6060	4.21	2/11/96 21:10	-0.5	0.08
6090	4.23	2/11/96 21:40	-0.51	0.08
6120	4.25	2/11/96 22:10	-0.5	0.08
6150	4.27	2/11/96 22:40	-0.5	0.08
6180	4.29	2/11/96 23:10	-0.51	0.09
6210	4.31	2/11/96 23:40	-0.51	0.09
6240	4.33	2/12/96 0:10	-0.5	0.09
6270	4.35	2/12/96 0:40	-0.51	0.1
6300	4.38	2/12/96 1:10	-0.51	0.1
6330	4.40	2/12/96 1:40	-0.51	0.1
6360	4.42	2/12/96 2:10	-0.51	0.1
6390	4.44	2/12/96 2:40	-0.51	0.1
6420	4.46	2/12/96 3:10	-0.51	0.1
6450	4.48	2/12/96 3:40	-0.51	0.1
6480	4.50	2/12/96 4:10	-0.51	0.1
6510	4.52	2/12/96 4:40	-0.51	0.1
6540	4.54	2/12/96 5:10	-0.52	0.1
6570	4.56	2/12/96 5:40	-0.52	0.09
6600	4.58	2/12/96 6:10	-0.52	0.08
6630	4.60	2/12/96 6:40	-0.52	0.08
6660	4.63	2/12/96 7:10	-0.52	0.07
6690	4.65	2/12/96 7:40	-0.52	0.08
6720	4.67	2/12/96 8:10	-0.52	0.08
6750	4.69	2/12/96 8:40	-0.53	0.06
6780	4.71	2/12/96 9:10	-0.54	0.06
6810	4.73	2/12/96 9:40	-0.54	0.05
6840	4.75	2/12/96 10:10	-0.53	0.06
6870	4.77	2/12/96 10:40	-0.54	0.06
6900	4.79	2/12/96 11:10	-0.52	0.06
6930	4.81	2/12/96 11:40	-0.53	0.06
6960	4.83	2/12/96 12:10	-0.53	0.07
6990	4.85	2/12/96 12:40	-0.53	0.06
7020	4.88	2/12/96 13:10	-0.52	0.07
7050	4.90	2/12/96 13:40	-0.53	0.07
7080	4.92	2/12/96 14:10	-0.52	0.08
7110	4.94	2/12/96 14:40	-0.53	0.08
7140	4.96	2/12/96 15:10	-0.53	0.08
7170	4.98	2/12/96 15:40	-0.52	0.08
7200	5.00	2/12/96 16:10	-0.52	0.08
7230	5.02	2/12/96 16:40	-0.52	0.08
7260	5.04	2/12/96 17:10	-0.52	0.07
7290	5.06	2/12/96 17:40	-0.53	0.07
7320	5.08	2/12/96 18:10	-0.53	0.07
7350	5.10	2/12/96 18:40	-0.53	0.08
7380	5.13	2/12/96 19:10	-0.52	0.07
7410	5.15	2/12/96 19:40	-0.52	0.08
7440	5.17	2/12/96 20:10	-0.52	0.08
7470	5.19	2/12/96 20:40	-0.52	0.07
7500	5.21	2/12/96 21:10	-0.52	0.08
7530	5.23	2/12/96 21:40	-0.52	0.08
7560	5.25	2/12/96 22:10	-0.52	0.08
7590	5.27	2/12/96 22:40	-0.52	0.09
7620	5.29	2/12/96 23:10	-0.52	0.09
7650	5.31	2/12/96 23:40	-0.52	0.1
7680	5.33	2/13/96 0:10	-0.51	0.1
7710	5.35	2/13/96 0:40	-0.51	0.11
7740	5.38	2/13/96 1:10	-0.51	0.12
7770	5.40	2/13/96 1:40	-0.51	0.12
7800	5.42	2/13/96 2:10	-0.51	0.12
7830	5.44	2/13/96 2:40	-0.51	0.12
7860	5.46	2/13/96 3:10	-0.5	0.13

7890	5.48	2/13/96 3:40	-0.49	0.14
7920	5.50	2/13/96 4:10	-0.49	0.14
7950	5.52	2/13/96 4:40	-0.49	0.15
7980	5.54	2/13/96 5:10	-0.48	0.15
8010	5.56	2/13/96 5:40	-0.48	0.15
8040	5.58	2/13/96 6:10	-0.47	0.16
8070	5.60	2/13/96 6:40	-0.45	0.16
8100	5.63	2/13/96 7:10	-0.44	0.17
8130	5.65	2/13/96 7:40	-0.43	0.18
8160	5.67	2/13/96 8:10	-0.4	0.19
8190	5.69	2/13/96 8:40	-0.39	0.2
8220	5.71	2/13/96 9:10	-0.35	0.2
8250	5.73	2/13/96 9:40	-0.34	0.22
8280	5.75	2/13/96 10:10	-0.33	0.22
8310	5.77	2/13/96 10:40	-0.29	0.23
8340	5.79	2/13/96 11:10	-0.26	0.25
8370	5.81	2/13/96 11:40	-0.23	0.25
8400	5.83	2/13/96 12:10	-0.17	0.27
8430	5.85	2/13/96 12:40	-0.14	0.27
8460	5.88	2/13/96 13:10	-0.12	0.28
8490	5.90	2/13/96 13:40	-0.09	0.28
8520	5.92	2/13/96 14:10	-0.08	0.28
8550	5.94	2/13/96 14:40	-0.06	0.28
8580	5.96	2/13/96 15:10	-0.06	0.27
8610	5.98	2/13/96 15:40	-0.04	0.27
8640	6.00	2/13/96 16:10	-0.04	0.28
8670	6.02	2/13/96 16:40	-0.02	0.28
8700	6.04	2/13/96 17:10	-0.01	0.28
8730	6.06	2/13/96 17:40	0	0.28
8760	6.08	2/13/96 18:10	0	0.27
8790	6.10	2/13/96 18:40	-0.01	0.27
8820	6.13	2/13/96 19:10	-0.02	0.26
8850	6.15	2/13/96 19:40	-0.03	0.25
8880	6.17	2/13/96 20:10	-0.04	0.25
8910	6.19	2/13/96 20:40	-0.04	0.24
8940	6.21	2/13/96 21:10	-0.04	0.24
8970	6.23	2/13/96 21:40	-0.06	0.23
9000	6.25	2/13/96 22:10	-0.06	0.22
9030	6.27	2/13/96 22:40	-0.07	0.22
9060	6.29	2/13/96 23:10	-0.08	0.22
9090	6.31	2/13/96 23:40	-0.09	0.22
9120	6.33	2/14/96 0:10	-0.09	0.22
9150	6.35	2/14/96 0:40	-0.09	0.21
9180	6.38	2/14/96 1:10	-0.11	0.2
9210	6.40	2/14/96 1:40	-0.12	0.2
9240	6.42	2/14/96 2:10	-0.11	0.2
9270	6.44	2/14/96 2:40	-0.12	0.2
9300	6.46	2/14/96 3:10	-0.12	0.2
9330	6.48	2/14/96 3:40	-0.13	0.19
9360	6.50	2/14/96 4:10	-0.13	0.19
9390	6.52	2/14/96 4:40	-0.14	0.18
9420	6.54	2/14/96 5:10	-0.15	0.18
9450	6.56	2/14/96 5:40	-0.15	0.18
9480	6.58	2/14/96 6:10	-0.14	0.18
9510	6.60	2/14/96 6:40	-0.16	0.17
9540	6.63	2/14/96 7:10	-0.17	0.17
9570	6.65	2/14/96 7:40	-0.18	0.16
9600	6.67	2/14/96 8:10	-0.2	0.16
9630	6.69	2/14/96 8:40	-0.2	0.15
9660	6.71	2/14/96 9:10	-0.21	0.15
9690	6.73	2/14/96 9:40	-0.21	0.15
9720	6.75	2/14/96 10:10	-0.21	0.16
9750	6.77	2/14/96 10:40	-0.21	0.16
9780	6.79	2/14/96 11:10	-0.21	0.17
9810	6.81	2/14/96 11:40	-0.2	0.16
9840	6.83	2/14/96 12:10	-0.22	0.15
9870	6.85	2/14/96 12:40	-0.21	0.14

9900	6.88	2/14/96 13:10	-0.23	0.14
9930	6.90	2/14/96 13:40	-0.23	0.13
9960	6.92	2/14/96 14:10	-0.24	0.13
9990	6.94	2/14/96 14:40	-0.24	0.12
10020	6.96	2/14/96 15:10	-0.26	0.12
10050	6.98	2/14/96 15:40	-0.26	0.12
10080	7.00	2/14/96 16:10	-0.28	0.11
10110	7.02	2/14/96 16:40	-0.29	0.1
10140	7.04	2/14/96 17:10	-0.31	0.1
10170	7.06	2/14/96 17:40	-0.33	0.09
10200	7.08	2/14/96 18:10	-0.34	0.08
10230	7.10	2/14/96 18:40	-0.35	0.08
10260	7.13	2/14/96 19:10	-0.35	0.08
10290	7.15	2/14/96 19:40	-0.36	0.07
10320	7.17	2/14/96 20:10	-0.37	0.08
10350	7.19	2/14/96 20:40	-0.37	0.06
10380	7.21	2/14/96 21:10	-0.38	0.06
10410	7.23	2/14/96 21:40	-0.39	0.06
10440	7.25	2/14/96 22:10	-0.38	0.06
10470	7.27	2/14/96 22:40	-0.39	0.05
10500	7.29	2/14/96 23:10	-0.4	0.06
10530	7.31	2/14/96 23:40	-0.4	0.06
10560	7.33	2/15/96 0:10	-0.4	0.05
10590	7.35	2/15/96 0:40	-0.41	0.05
10620	7.38	2/15/96 1:10	-0.4	0.05
10650	7.40	2/15/96 1:40	-0.41	0.05
10680	7.42	2/15/96 2:10	-0.4	0.05
10710	7.44	2/15/96 2:40	-0.4	0.05
10740	7.46	2/15/96 3:10	-0.4	0.05
10770	7.48	2/15/96 3:40	-0.4	0.04
10800	7.50	2/15/96 4:10	-0.41	0.05
10830	7.52	2/15/96 4:40	-0.42	0.05
10860	7.54	2/15/96 5:10	-0.42	0.04
10890	7.56	2/15/96 5:40	-0.42	0.03
10920	7.58	2/15/96 6:10	-0.42	0.03
10950	7.60	2/15/96 6:40	-0.43	0.03
10980	7.63	2/15/96 7:10	-0.44	0.02
11010	7.65	2/15/96 7:40	-0.44	0.02
11040	7.67	2/15/96 8:10	-0.44	0.03
11070	7.69	2/15/96 8:40	-0.43	0.02
11100	7.71	2/15/96 9:10	-0.44	0.03
11130	7.73	2/15/96 9:40	-0.43	0.01
11160	7.75	2/15/96 10:10	-0.43	0.01
11190	7.77	2/15/96 10:40	-0.44	0.03
11220	7.79	2/15/96 11:10	-0.43	0.03
11250	7.81	2/15/96 11:40	-0.42	0.03
11280	7.83	2/15/96 12:10	-0.4	0.01
11310	7.85	2/15/96 12:40	-0.42	0.03
11340	7.88	2/15/96 13:10	-0.4	0.03
11370	7.90	2/15/96 13:40	-0.4	0.03
11400	7.92	2/15/96 14:10	-0.41	0.02
11430	7.94	2/15/96 14:40	-0.43	0.01
11460	7.96	2/15/96 15:10	-0.43	0.01
11490	7.98	2/15/96 15:40	-0.44	0.01
11520	8.00	2/15/96 16:10	-0.45	0
11550	8.02	2/15/96 16:40	-0.45	0
11580	8.04	2/15/96 17:10	-0.46	0
11610	8.06	2/15/96 17:40	-0.48	-0.01
11640	8.08	2/15/96 18:10	-0.49	-0.01
11670	8.10	2/15/96 18:40	-0.49	-0.02
11700	8.13	2/15/96 19:10	-0.49	-0.03
11730	8.15	2/15/96 19:40	-0.5	-0.03
11760	8.17	2/15/96 20:10	-0.5	-0.03
11790	8.19	2/15/96 20:40	-0.51	-0.03
11820	8.21	2/15/96 21:10	-0.51	-0.05
11850	8.23	2/15/96 21:40	-0.52	-0.05
11880	8.25	2/15/96 22:10	-0.52	-0.05

11910	8.27	2/15/96 22:40	-0.52	-0.05
11940	8.29	2/15/96 23:10	-0.52	-0.05
11970	8.31	2/15/96 23:40	-0.52	-0.05
12000	8.33	2/16/96 0:10	-0.52	-0.05
12030	8.35	2/16/96 0:40	-0.52	-0.05
12060	8.38	2/16/96 1:10	-0.52	-0.05
12090	8.40	2/16/96 1:40	-0.52	-0.05
12120	8.42	2/16/96 2:10	-0.53	-0.05
12150	8.44	2/16/96 2:40	-0.53	-0.06
12180	8.46	2/16/96 3:10	-0.54	-0.06
12210	8.48	2/16/96 3:40	-0.53	-0.06
12240	8.50	2/16/96 4:10	-0.54	-0.06
12270	8.52	2/16/96 4:40	-0.54	-0.07
12300	8.54	2/16/96 5:10	-0.54	-0.07
12330	8.56	2/16/96 5:40	-0.54	-0.07
12360	8.58	2/16/96 6:10	-0.54	-0.08
12390	8.60	2/16/96 6:40	-0.54	-0.08
12420	8.63	2/16/96 7:10	-0.54	-0.08
12450	8.65	2/16/96 7:40	-0.54	-0.08
12480	8.67	2/16/96 8:10	-0.55	0
		2/7/96 16:10		0
12510	8.69	2/16/96 8:40	-0.53	0
12540	8.71	2/16/96 9:10	-0.53	0
12570	8.73	2/16/96 9:40	-0.54	0.01
12600	8.75	2/16/96 10:10	-0.52	0
12630	8.77	2/16/96 10:40	-0.54	0.02
12660	8.79	2/16/96 11:10	-0.53	0.03
12690	8.81	2/16/96 11:40	-0.53	0.02
12720	8.83	2/16/96 12:10	-0.52	0.03
12750	8.85	2/16/96 12:40	-0.52	0.03
12780	8.88	2/16/96 13:10	-0.52	0.03
12810	8.90	2/16/96 13:40	-0.52	0.03
12840	8.92	2/16/96 14:10	-0.51	0.05
12870	8.94	2/16/96 14:40	-0.51	0.04
12900	8.96	2/16/96 15:10	-0.51	0.04
12930	8.98	2/16/96 15:40	-0.51	0.05
12960	9.00	2/16/96 16:10	-0.51	0.05
12990	9.02	2/16/96 16:40	-0.5	0.05
13020	9.04	2/16/96 17:10	-0.5	0.05
13050	9.06	2/16/96 17:40	-0.5	0.05
13080	9.08	2/16/96 18:10	-0.5	0.05
13110	9.10	2/16/96 18:40	-0.5	0.06
13140	9.13	2/16/96 19:10	-0.49	0.06
13170	9.15	2/16/96 19:40	-0.5	0.05
13200	9.17	2/16/96 20:10	-0.49	0.06
13230	9.19	2/16/96 20:40	-0.48	0.07
13260	9.21	2/16/96 21:10	-0.47	0.07
13290	9.23	2/16/96 21:40	-0.47	0.08
13320	9.25	2/16/96 22:10	-0.46	0.08
13350	9.27	2/16/96 22:40	-0.44	0.09
13380	9.29	2/16/96 23:10	-0.44	0.1
13410	9.31	2/16/96 23:40	-0.43	0.11
13440	9.33	2/17/96 0:10	-0.42	0.1
13470	9.35	2/17/96 0:40	-0.4	0.12
13500	9.38	2/17/96 1:10	-0.37	0.13
13530	9.40	2/17/96 1:40	-0.35	0.14
13560	9.42	2/17/96 2:10	-0.32	0.15
13590	9.44	2/17/96 2:40	-0.3	0.15
13620	9.46	2/17/96 3:10	-0.29	0.16
13650	9.48	2/17/96 3:40	-0.27	0.17
13680	9.50	2/17/96 4:10	-0.26	0.17
13710	9.52	2/17/96 4:40	-0.26	0.17
13740	9.54	2/17/96 5:10	-0.25	0.17
13770	9.56	2/17/96 5:40	-0.25	0.17
13800	9.58	2/17/96 6:10	-0.24	0.17
13830	9.60	2/17/96 6:40	-0.24	0.17
13860	9.63	2/17/96 7:10	-0.23	0.17

13890	9.65	2/17/96 7:40	-0.23	0.17
13920	9.67	2/17/96 8:10	-0.22	0.17
13950	9.69	2/17/96 8:40	-0.23	0.18
13980	9.71	2/17/96 9:10	-0.23	0.17
14010	9.73	2/17/96 9:40	-0.25	0.16
14040	9.75	2/17/96 10:10	-0.26	0.15
14070	9.77	2/17/96 10:40	-0.27	0.15
14100	9.79	2/17/96 11:10	-0.28	0.15
14130	9.81	2/17/96 11:40	-0.28	0.15
14160	9.83	2/17/96 12:10	-0.31	0.14
14190	9.85	2/17/96 12:40	-0.33	0.13
14220	9.88	2/17/96 13:10	-0.35	0.12
14250	9.90	2/17/96 13:40	-0.37	0.11
14280	9.92	2/17/96 14:10	-0.4	0.11
14310	9.94	2/17/96 14:40	-0.42	0.11
14340	9.96	2/17/96 15:10	-0.43	0.1
14370	9.98	2/17/96 15:40	-0.44	0.09
14400	10.00	2/17/96 16:10	-0.47	0.09
14430	10.02	2/17/96 16:40	-0.47	0.08
14460	10.04	2/17/96 17:10	-0.49	0.08
14490	10.06	2/17/96 17:40	-0.49	0.08
14520	10.08	2/17/96 18:10	-0.49	0.07
14550	10.10	2/17/96 18:40	-0.49	0.07
14580	10.13	2/17/96 19:10	-0.49	0.07
14610	10.15	2/17/96 19:40	-0.5	0.07
14640	10.17	2/17/96 20:10	-0.5	0.07
14670	10.19	2/17/96 20:40	-0.5	0.08
14700	10.21	2/17/96 21:10	-0.5	0.08
14730	10.23	2/17/96 21:40	-0.5	0.08
14760	10.25	2/17/96 22:10	-0.5	0.08
14790	10.27	2/17/96 22:40	-0.5	0.08
14820	10.29	2/17/96 23:10	-0.5	0.08
14850	10.31	2/17/96 23:40	-0.5	0.1
14880	10.33	2/18/96 0:10	-0.5	0.09
14910	10.35	2/18/96 0:40	-0.5	0.1
14940	10.38	2/18/96 1:10	-0.5	0.1
14970	10.40	2/18/96 1:40	-0.5	0.11
15000	10.42	2/18/96 2:10	-0.5	0.1
15030	10.44	2/18/96 2:40	-0.5	0.11
15060	10.46	2/18/96 3:10	-0.5	0.12
15090	10.48	2/18/96 3:40	-0.5	0.12
15120	10.50	2/18/96 4:10	-0.5	0.12
15150	10.52	2/18/96 4:40	-0.5	0.12
15180	10.54	2/18/96 5:10	-0.5	0.12
15210	10.56	2/18/96 5:40	-0.51	0.12
15240	10.58	2/18/96 6:10	-0.51	0.12
15270	10.60	2/18/96 6:40	-0.51	0.12
15300	10.63	2/18/96 7:10	-0.52	0.12
15330	10.65	2/18/96 7:40	-0.52	0.12
15360	10.67	2/18/96 8:10	-0.52	0.13
15390	10.69	2/18/96 8:40	-0.51	0.13
15420	10.71	2/18/96 9:10	-0.51	0.13
15450	10.73	2/18/96 9:40	-0.52	0.14
15480	10.75	2/18/96 10:10	-0.5	0.14
15510	10.77	2/18/96 10:40	-0.5	0.15
15540	10.79	2/18/96 11:10	-0.49	0.15
15570	10.81	2/18/96 11:40	-0.49	0.16
15600	10.83	2/18/96 12:10	-0.47	0.16
15630	10.85	2/18/96 12:40	-0.47	0.17
15660	10.88	2/18/96 13:10	-0.47	0.17
15690	10.90	2/18/96 13:40	-0.47	0.17
15720	10.92	2/18/96 14:10	-0.45	0.17
15750	10.94	2/18/96 14:40	-0.45	0.17
15780	10.96	2/18/96 15:10	-0.45	0.17
15810	10.98	2/18/96 15:40	-0.45	0.17
15840	11.00	2/18/96 16:10	-0.45	0.16
15870	11.02	2/18/96 16:40	-0.45	0.15

15900	11.04	2/18/96 17:10	-0.45	0.16
15930	11.06	2/18/96 17:40	-0.45	0.15
15960	11.08	2/18/96 18:10	-0.45	0.15
15990	11.10	2/18/96 18:40	-0.44	0.15
16020	11.13	2/18/96 19:10	-0.44	0.15
16050	11.15	2/18/96 19:40	-0.44	0.15
16080	11.17	2/18/96 20:10	-0.44	0.15
16110	11.19	2/18/96 20:40	-0.44	0.15
16140	11.21	2/18/96 21:10	-0.43	0.16
16170	11.23	2/18/96 21:40	-0.42	0.16
16200	11.25	2/18/96 22:10	-0.4	0.16
16230	11.27	2/18/96 22:40	-0.41	0.16
16260	11.29	2/18/96 23:10	-0.4	0.15
16290	11.31	2/18/96 23:40	-0.4	0.17
16320	11.33	2/19/96 0:10	-0.39	0.17
16350	11.35	2/19/96 0:40	-0.38	0.17
16380	11.38	2/19/96 1:10	-0.37	0.18
16410	11.40	2/19/96 1:40	-0.35	0.18
16440	11.42	2/19/96 2:10	-0.35	0.18
16470	11.44	2/19/96 2:40	-0.35	0.18
16500	11.46	2/19/96 3:10	-0.35	0.18
16530	11.48	2/19/96 3:40	-0.36	0.18
16560	11.50	2/19/96 4:10	-0.35	0.18
16590	11.52	2/19/96 4:40	-0.35	0.18
16620	11.54	2/19/96 5:10	-0.35	0.17
16650	11.56	2/19/96 5:40	-0.36	0.17
16680	11.58	2/19/96 6:10	-0.37	0.16
16710	11.60	2/19/96 6:40	-0.38	0.16
16740	11.63	2/19/96 7:10	-0.38	0.15
16770	11.65	2/19/96 7:40	-0.38	0.15
16800	11.67	2/19/96 8:10	-0.38	0.15
16830	11.69	2/19/96 8:40	-0.37	0.15
16860	11.71	2/19/96 9:10	-0.37	0.15
16890	11.73	2/19/96 9:40	-0.38	0.15
16920	11.75	2/19/96 10:10	-0.37	0.15
16950	11.77	2/19/96 10:40	-0.35	0.15
16980	11.79	2/19/96 11:10	-0.35	0.15
17010	11.81	2/19/96 11:40	-0.35	0.15
17040	11.83	2/19/96 12:10	-0.34	0.16
17070	11.85	2/19/96 12:40	-0.33	0.16
17100	11.88	2/19/96 13:10	-0.33	0.16
17130	11.90	2/19/96 13:40	-0.32	0.16
17160	11.92	2/19/96 14:10	-0.32	0.16
17190	11.94	2/19/96 14:40	-0.32	0.15
17220	11.96	2/19/96 15:10	-0.32	0.15
17250	11.98	2/19/96 15:40	-0.33	0.15
17280	12.00	2/19/96 16:10	-0.34	0.14
17310	12.02	2/19/96 16:40	-0.35	0.13
17340	12.04	2/19/96 17:10	-0.35	0.14
17370	12.06	2/19/96 17:40	-0.35	0.13
17400	12.08	2/19/96 18:10	-0.36	0.13
17430	12.10	2/19/96 18:40	-0.37	0.13
17460	12.13	2/19/96 19:10	-0.37	0.13
17490	12.15	2/19/96 19:40	-0.37	0.13
17520	12.17	2/19/96 20:10	-0.37	0.12
17550	12.19	2/19/96 20:40	-0.4	0.12
17580	12.21	2/19/96 21:10	-0.38	0.12
17610	12.23	2/19/96 21:40	-0.39	0.11
17640	12.25	2/19/96 22:10	-0.38	0.11
17670	12.27	2/19/96 22:40	-0.4	0.11
17700	12.29	2/19/96 23:10	-0.4	0.11
17730	12.31	2/19/96 23:40	-0.41	0.11
17760	12.33	2/20/96 0:10	-0.4	0.1
17790	12.35	2/20/96 0:40	-0.41	0.11
17820	12.38	2/20/96 1:10	-0.41	0.11
17850	12.40	2/20/96 1:40	-0.4	0.12
17880	12.42	2/20/96 2:10	-0.4	0.12

17910	12.44	2/20/96 2:40	-0.4	0.12
17940	12.46	2/20/96 3:10	-0.39	0.12
17970	12.48	2/20/96 3:40	-0.4	0.12
18000	12.50	2/20/96 4:10	-0.4	0.12
18030	12.52	2/20/96 4:40	-0.4	0.12
18060	12.54	2/20/96 5:10	-0.4	0.12
18090	12.56	2/20/96 5:40	-0.42	0.11
18120	12.58	2/20/96 6:10	-0.42	0.12
18150	12.60	2/20/96 6:40	-0.4	0.12
18180	12.63	2/20/96 7:10	-0.4	0.11
18210	12.65	2/20/96 7:40	-0.4	0.11
18240	12.67	2/20/96 8:10	-0.41	0.1
18270	12.69	2/20/96 8:40	-0.42	0.09
18300	12.71	2/20/96 9:10	-0.42	0.1
18330	12.73	2/20/96 9:40	-0.41	0.1
18360	12.75	2/20/96 10:10	-0.4	0.1
18390	12.77	2/20/96 10:40	-0.4	0.1
18420	12.79	2/20/96 11:10	-0.38	0.1
18450	12.81	2/20/96 11:40	-0.38	0.12
18480	12.83	2/20/96 12:10	-0.37	0.12
18510	12.85	2/20/96 12:40	-0.34	0.11
18540	12.88	2/20/96 13:10	-0.36	0.11
18570	12.90	2/20/96 13:40	-0.35	0.1
18600	12.92	2/20/96 14:10	-0.38	0.1
18630	12.94	2/20/96 14:40	-0.39	0.09
18660	12.96	2/20/96 15:10	-0.41	0.09
18690	12.98	2/20/96 15:40	-0.42	0.09
18720	13.00	2/20/96 16:10	-0.43	0.07
18750	13.02	2/20/96 16:40	-0.45	0.08
18780	13.04	2/20/96 17:10	-0.45	0.08
18810	13.06	2/20/96 17:40	-0.47	0.08
18840	13.08	2/20/96 18:10	-0.46	0.06
18870	13.10	2/20/96 18:40	-0.47	0.06
18900	13.13	2/20/96 19:10	-0.48	0.06
18930	13.15	2/20/96 19:40	-0.49	0.06
18960	13.17	2/20/96 20:10	-0.5	0.03
18990	13.19	2/20/96 20:40	-0.52	0.04
19020	13.21	2/20/96 21:10	-0.52	0.03
19050	13.23	2/20/96 21:40	-0.53	0.03
19080	13.25	2/20/96 22:10	-0.54	0.01
19110	13.27	2/20/96 22:40	-0.54	0.01
19140	13.29	2/20/96 23:10	-0.55	0.01
19170	13.31	2/20/96 23:40	-0.55	0.01
19200	13.33	2/21/96 0:10	-0.55	0.01
19230	13.35	2/21/96 0:40	-0.55	0.01
19260	13.38	2/21/96 1:10	-0.55	0
19290	13.40	2/21/96 1:40	-0.55	0
19320	13.42	2/21/96 2:10	-0.55	0.01
19350	13.44	2/21/96 2:40	-0.55	0
19380	13.46	2/21/96 3:10	-0.55	0
19410	13.48	2/21/96 3:40	-0.55	0
19440	13.50	2/21/96 4:10	-0.55	0
19470	13.52	2/21/96 4:40	-0.55	0
19500	13.54	2/21/96 5:10	-0.56	-0.01
19530	13.56	2/21/96 5:40	-0.55	-0.01
19560	13.58	2/21/96 6:10	-0.56	-0.01
19590	13.60	2/21/96 6:40	-0.56	-0.01
19620	13.63	2/21/96 7:10	-0.56	-0.01
19650	13.65	2/21/96 7:40	-0.56	-0.01
19680	13.67	2/21/96 8:10	-0.56	-0.01
19710	13.69	2/21/96 8:40	-0.56	-0.01
19740	13.71	2/21/96 9:10	-0.56	-0.02
19770	13.73	2/21/96 9:40	-0.56	-0.02
19800	13.75	2/21/96 10:10	-0.56	-0.02
19830	13.77	2/21/96 10:40	-0.56	-0.01
19860	13.79	2/21/96 11:10	-0.55	-0.01
19890	13.81	2/21/96 11:40	-0.56	-0.01

19920	13.83	2/21/96 12:10	-0.56	-0.01
19950	13.85	2/21/96 12:40	-0.56	-0.01
19980	13.88	2/21/96 13:10	-0.56	-0.02
20010	13.90	2/21/96 13:40	-0.56	-0.02
20040	13.92	2/21/96 14:10	-0.56	-0.02
20070	13.94	2/21/96 14:40	-0.56	-0.02
20100	13.96	2/21/96 15:10	-0.56	-0.01
20130	13.98	2/21/96 15:40	-0.56	-0.01
20160	14.00	2/21/96 16:10	-0.56	-0.01
20190	14.02	2/21/96 16:40	-0.56	0
20220	14.04	2/21/96 17:10	-0.57	0
20250	14.06	2/21/96 17:40	-0.56	0
20280	14.08	2/21/96 18:10	-0.56	0
20310	14.10	2/21/96 18:40	-0.56	0
20340	14.13	2/21/96 19:10	-0.56	0
20370	14.15	2/21/96 19:40	-0.56	0
20400	14.17	2/21/96 20:10	-0.56	0
20430	14.19	2/21/96 20:40	-0.56	0
20460	14.21	2/21/96 21:10	-0.56	0
20490	14.23	2/21/96 21:40	-0.56	0
20520	14.25	2/21/96 22:10	-0.56	0
20550	14.27	2/21/96 22:40	-0.56	0
20580	14.29	2/21/96 23:10	-0.56	0
20610	14.31	2/21/96 23:40	-0.56	0
20640	14.33	2/22/96 0:10	-0.56	0
20670	14.35	2/22/96 0:40	-0.56	0
20700	14.38	2/22/96 1:10	-0.55	0
20730	14.40	2/22/96 1:40	-0.56	0
20760	14.42	2/22/96 2:10	-0.55	0
20790	14.44	2/22/96 2:40	-0.55	0
20820	14.46	2/22/96 3:10	-0.55	0
20850	14.48	2/22/96 3:40	-0.55	0
20880	14.50	2/22/96 4:10	-0.56	0
20910	14.52	2/22/96 4:40	-0.55	0
20940	14.54	2/22/96 5:10	-0.56	-0.01
20970	14.56	2/22/96 5:40	-0.56	0
21000	14.58	2/22/96 6:10	-0.56	-0.01
21030	14.60	2/22/96 6:40	-0.55	0
21060	14.63	2/22/96 7:10	-0.55	0
21090	14.65	2/22/96 7:40	-0.55	-0.01
21120	14.67	2/22/96 8:10	-0.55	-0.01
21150	14.69	2/22/96 8:40	-0.56	-0.02
21180	14.71	2/22/96 9:10	-0.56	-0.01
21210	14.73	2/22/96 9:40	-0.56	-0.02
21240	14.75	2/22/96 10:10	-0.56	-0.01
21270	14.77	2/22/96 10:40	-0.56	-0.01
21300	14.79	2/22/96 11:10	-0.55	0
21330	14.81	2/22/96 11:40	-0.55	0
21360	14.83	2/22/96 12:10	-0.55	0
21390	14.85	2/22/96 12:40	-0.55	0
21420	14.88	2/22/96 13:10	-0.55	0
21450	14.90	2/22/96 13:40	-0.55	0
21480	14.92	2/22/96 14:10	-0.55	0.01
21510	14.94	2/22/96 14:40	-0.54	0.01
21540	14.96	2/22/96 15:10	-0.54	0.01
21570	14.98	2/22/96 15:40	-0.54	0.01
21600	15.00	2/22/96 16:10	-0.54	0.01
21630	15.02	2/22/96 16:40	-0.54	0.01
21660	15.04	2/22/96 17:10	-0.54	0.01
21690	15.06	2/22/96 17:40	-0.54	0.01
21720	15.08	2/22/96 18:10	-0.54	0.03
21750	15.10	2/22/96 18:40	-0.53	0.03
21780	15.13	2/22/96 19:10	-0.52	0.03
21810	15.15	2/22/96 19:40	-0.52	0.03
21840	15.17	2/22/96 20:10	-0.51	0.03
21870	15.19	2/22/96 20:40	-0.51	0.03
21900	15.21	2/22/96 21:10	-0.51	0.03

21930	15.23	2/22/96 21:40	-0.51	0.04
21960	15.25	2/22/96 22:10	-0.5	0.04
21990	15.27	2/22/96 22:40	-0.5	0.05
22020	15.29	2/22/96 23:10	-0.49	0.05
22050	15.31	2/22/96 23:40	-0.47	0.06
22080	15.33	2/23/96 0:10	-0.46	0.06
22110	15.35	2/23/96 0:40	-0.43	0.08
22140	15.38	2/23/96 1:10	-0.4	0.08
22170	15.40	2/23/96 1:40	-0.38	0.1
22200	15.42	2/23/96 2:10	-0.37	0.1
22230	15.44	2/23/96 2:40	-0.36	0.1
22260	15.46	2/23/96 3:10	-0.35	0.11
22290	15.48	2/23/96 3:40	-0.33	0.12
22320	15.50	2/23/96 4:10	-0.32	0.12
22350	15.52	2/23/96 4:40	-0.3	0.13
22380	15.54	2/23/96 5:10	-0.29	0.13
22410	15.56	2/23/96 5:40	-0.28	0.14
22440	15.58	2/23/96 6:10	-0.25	0.15
22470	15.60	2/23/96 6:40	-0.23	0.15
22500	15.63	2/23/96 7:10	-0.21	0.16
22530	15.65	2/23/96 7:40	-0.21	0.16
22560	15.67	2/23/96 8:10	-0.19	0.17
22590	15.69	2/23/96 8:40	-0.17	0.17
22620	15.71	2/23/96 9:10	-0.15	0.17
22650	15.73	2/23/96 9:40	-0.15	0.17
22680	15.75	2/23/96 10:10	-0.13	0.17
22710	15.77	2/23/96 10:40	-0.11	0.17
22740	15.79	2/23/96 11:10	-0.09	0.17
22770	15.81	2/23/96 11:40	-0.07	0.17
22800	15.83	2/23/96 12:10	-0.06	0.18
22830	15.85	2/23/96 12:40	-0.06	0.17
22860	15.88	2/23/96 13:10	-0.08	0.16
22890	15.90	2/23/96 13:40	-0.08	0.16
22920	15.92	2/23/96 14:10	-0.07	0.15
22950	15.94	2/23/96 14:40	-0.13	0.13
22980	15.96	2/23/96 15:10	-0.16	0.12
23010	15.98	2/23/96 15:40	-0.19	0.12
23040	16.00	2/23/96 16:10	-0.22	0.1
23070	16.02	2/23/96 16:40	-0.26	0.09
23100	16.04	2/23/96 17:10	-0.3	0.08
23130	16.06	2/23/96 17:40	-0.33	0.07
23160	16.08	2/23/96 18:10	-0.36	0.06
23190	16.10	2/23/96 18:40	-0.38	0.06
23220	16.13	2/23/96 19:10	-0.4	0.05
23250	16.15	2/23/96 19:40	-0.44	0.04
23280	16.17	2/23/96 20:10	-0.45	0.03
23310	16.19	2/23/96 20:40	-0.46	0.03
23340	16.21	2/23/96 21:10	-0.47	0.03
23370	16.23	2/23/96 21:40	-0.48	0.02
23400	16.25	2/23/96 22:10	-0.49	0.03
23430	16.27	2/23/96 22:40	-0.5	0.02
23460	16.29	2/23/96 23:10	-0.5	0.02
23490	16.31	2/23/96 23:40	-0.5	0.02
23520	16.33	2/24/96 0:10	-0.51	0.02
23550	16.35	2/24/96 0:40	-0.51	0.02
23580	16.38	2/24/96 1:10	-0.52	0.02
23610	16.40	2/24/96 1:40	-0.52	0.01
23640	16.42	2/24/96 2:10	-0.53	0.01
23670	16.44	2/24/96 2:40	-0.53	0.01
23700	16.46	2/24/96 3:10	-0.53	0.01
23730	16.48	2/24/96 3:40	-0.53	0.01
23760	16.50	2/24/96 4:10	-0.53	0.01
23790	16.52	2/24/96 4:40	-0.54	0.01
23820	16.54	2/24/96 5:10	-0.54	0.01
23850	16.56	2/24/96 5:40	-0.54	0.01
23880	16.58	2/24/96 6:10	-0.54	0.01
23910	16.60	2/24/96 6:40	-0.55	0.01

23940	16.63	2/24/96 7:10	-0.55	0.02
23970	16.65	2/24/96 7:40	-0.54	0.02
24000	16.67	2/24/96 8:10	-0.55	0.01
24030	16.69	2/24/96 8:40	-0.55	0.01
24060	16.71	2/24/96 9:10	-0.55	0.02
24090	16.73	2/24/96 9:40	-0.55	0.02
24120	16.75	2/24/96 10:10	-0.55	0.03
24150	16.77	2/24/96 10:40	-0.56	0.03
24180	16.79	2/24/96 11:10	-0.56	0.03
24210	16.81	2/24/96 11:40	-0.56	0.13
24240	16.83	2/24/96 12:10	-0.57	0.15
24270	16.85	2/24/96 12:40	-0.57	0.08
24300	16.88	2/24/96 13:10	-0.56	0.14
24330	16.90	2/24/96 13:40	-0.55	0.12
24360	16.92	2/24/96 14:10	-0.56	0.06
24390	16.94	2/24/96 14:40	-0.55	0.06
24420	16.96	2/24/96 15:10	-0.55	0.06
24450	16.98	2/24/96 15:40	-0.55	0.07
24480	17.00	2/24/96 16:10	-0.55	0.06
24510	17.02	2/24/96 16:40	-0.55	0.07
24540	17.04	2/24/96 17:10	-0.55	0.07
24570	17.06	2/24/96 17:40	-0.55	0.06
24600	17.08	2/24/96 18:10	-0.55	0.08
24630	17.10	2/24/96 18:40	-0.55	0.08
24660	17.13	2/24/96 19:10	-0.55	0.07
24690	17.15	2/24/96 19:40	-0.55	0.07
24720	17.17	2/24/96 20:10	-0.55	0.08
24750	17.19	2/24/96 20:40	-0.55	0.08
24780	17.21	2/24/96 21:10	-0.55	0.08
24810	17.23	2/24/96 21:40	-0.55	0.08
24840	17.25	2/24/96 22:10	-0.55	0.08
24870	17.27	2/24/96 22:40	-0.55	0.09
24900	17.29	2/24/96 23:10	-0.55	0.09
24930	17.31	2/24/96 23:40	-0.55	0.1
24960	17.33	2/25/96 0:10	-0.55	0.1
24990	17.35	2/25/96 0:40	-0.55	0.1
25020	17.38	2/25/96 1:10	-0.55	0.1
25050	17.40	2/25/96 1:40	-0.55	0.11
25080	17.42	2/25/96 2:10	-0.55	0.11
25110	17.44	2/25/96 2:40	-0.55	0.11
25140	17.46	2/25/96 3:10	-0.55	0.12
25170	17.48	2/25/96 3:40	-0.55	0.12
25200	17.50	2/25/96 4:10	-0.55	0.12
25230	17.52	2/25/96 4:40	-0.55	0.12
25260	17.54	2/25/96 5:10	-0.55	0.12
25290	17.56	2/25/96 5:40	-0.55	0.12
25320	17.58	2/25/96 6:10	-0.55	0.12
25350	17.60	2/25/96 6:40	-0.55	0.13
25380	17.63	2/25/96 7:10	-0.55	0.12
25410	17.65	2/25/96 7:40	-0.55	0.13
25440	17.67	2/25/96 8:10	-0.55	0.13
25470	17.69	2/25/96 8:40	-0.55	0.12
25500	17.71	2/25/96 9:10	-0.55	0.12
25530	17.73	2/25/96 9:40	-0.55	0.13
25560	17.75	2/25/96 10:10	-0.54	0.13
25590	17.77	2/25/96 10:40	-0.53	0.14
25620	17.79	2/25/96 11:10	-0.52	0.14
25650	17.81	2/25/96 11:40	-0.52	0.2
25680	17.83	2/25/96 12:10	-0.52	0.19
25710	17.85	2/25/96 12:40	-0.52	0.23
25740	17.88	2/25/96 13:10	-0.51	0.18
25770	17.90	2/25/96 13:40	-0.5	0.17
25800	17.92	2/25/96 14:10	-0.5	0
		2/7/96 16:10		0
25830	17.94	2/25/96 14:40	-0.5	0
25860	17.96	2/25/96 15:10	-0.5	0
25890	17.98	2/25/96 15:40	-0.5	0

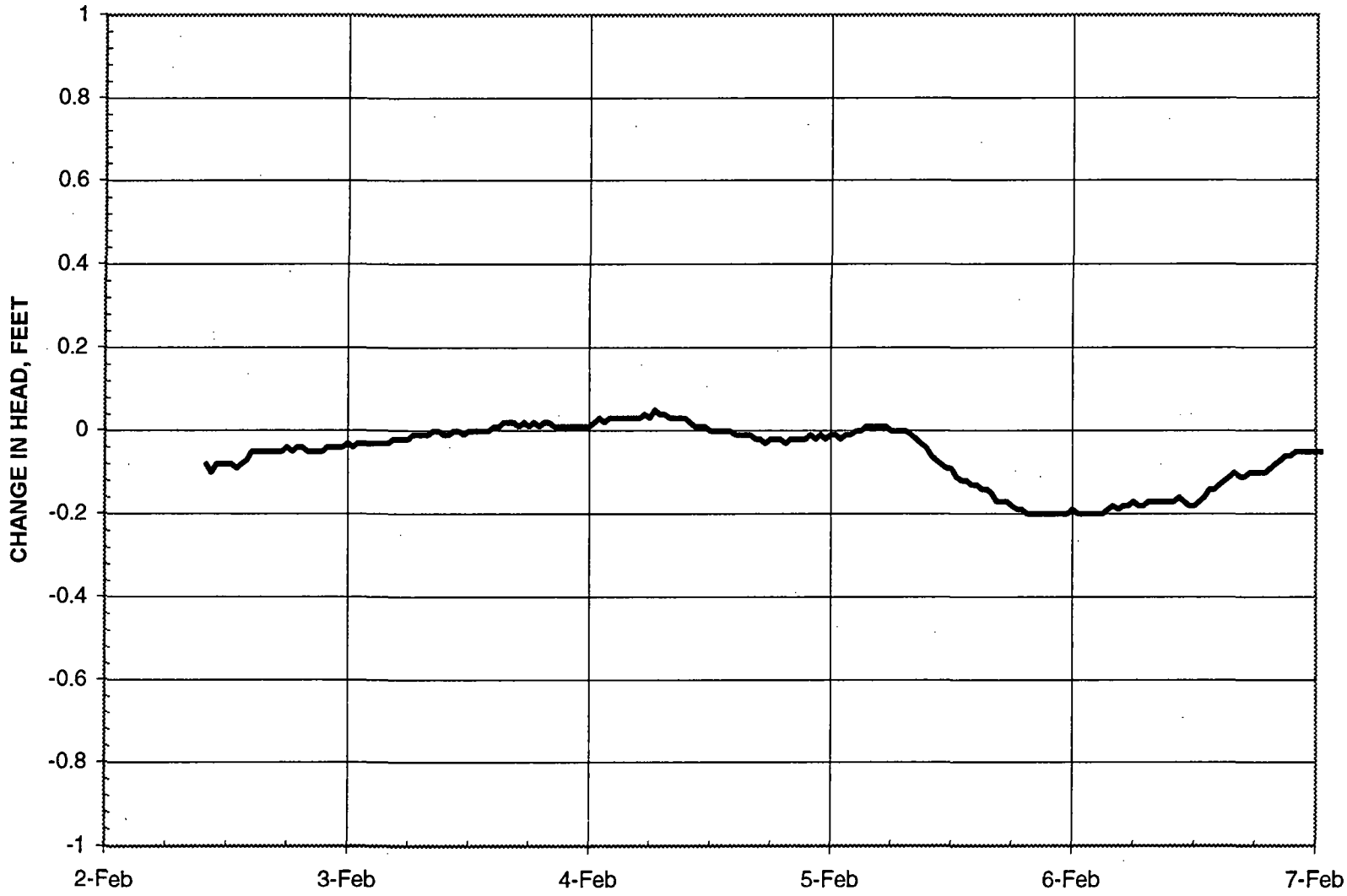
25920	18.00	2/25/96 16:10	-0.5	0
25950	18.02	2/25/96 16:40	-0.5	0
25980	18.04	2/25/96 17:10	-0.5	0
26010	18.06	2/25/96 17:40	-0.5	-0.01
26040	18.08	2/25/96 18:10	-0.5	-0.01
26070	18.10	2/25/96 18:40	-0.5	-0.01
26100	18.13	2/25/96 19:10	-0.5	-0.01
26130	18.15	2/25/96 19:40	-0.5	-0.01
26160	18.17	2/25/96 20:10	-0.5	-0.01
26190	18.19	2/25/96 20:40	-0.5	0
26220	18.21	2/25/96 21:10	-0.5	0
26250	18.23	2/25/96 21:40	-0.5	0
26280	18.25	2/25/96 22:10	-0.5	0.01
26310	18.27	2/25/96 22:40	-0.5	0.01
26340	18.29	2/25/96 23:10	-0.5	0.01
26370	18.31	2/25/96 23:40	-0.5	0.01
26400	18.33	2/26/96 0:10	-0.5	0.01
26430	18.35	2/26/96 0:40	-0.5	0.01
26460	18.38	2/26/96 1:10	-0.5	0.01
26490	18.40	2/26/96 1:40	-0.5	0.01
26520	18.42	2/26/96 2:10	-0.5	0.01
26550	18.44	2/26/96 2:40	-0.5	0.01
26580	18.46	2/26/96 3:10	-0.5	0.01
26610	18.48	2/26/96 3:40	-0.5	0.01
26640	18.50	2/26/96 4:10	-0.5	0.01
26670	18.52	2/26/96 4:40	-0.5	0.01
26700	18.54	2/26/96 5:10	-0.5	0.01
26730	18.56	2/26/96 5:40	-0.5	0.01
26760	18.58	2/26/96 6:10	-0.5	0
26790	18.60	2/26/96 6:40	-0.5	0
26820	18.63	2/26/96 7:10	-0.5	0
26850	18.65	2/26/96 7:40	-0.5	0
26880	18.67	2/26/96 8:10	-0.5	0
26910	18.69	2/26/96 8:40	-0.5	0
26940	18.71	2/26/96 9:10	-0.5	0
26970	18.73	2/26/96 9:40	-0.5	0
27000	18.75	2/26/96 10:10	-0.5	0
27030	18.77	2/26/96 10:40	-0.5	0
27060	18.79	2/26/96 11:10	-0.5	-0.01
27090	18.81	2/26/96 11:40	-0.5	0
27120	18.83	2/26/96 12:10	-0.49	0
27150	18.85	2/26/96 12:40	-0.5	0
27180	18.88	2/26/96 13:10	-0.5	0.01
27210	18.90	2/26/96 13:40	-0.49	0
27240	18.92	2/26/96 14:10	-0.49	0
27270	18.94	2/26/96 14:40	-0.49	0
27300	18.96	2/26/96 15:10	-0.49	0
27330	18.98	2/26/96 15:40	-0.49	0
27360	19.00	2/26/96 16:10	-0.49	0
27390	19.02	2/26/96 16:40	-0.49	0
27420	19.04	2/26/96 17:10	-0.49	-0.01
27450	19.06	2/26/96 17:40	-0.49	-0.01
27480	19.08	2/26/96 18:10	-0.49	0
27510	19.10	2/26/96 18:40	-0.49	0.01
27540	19.13	2/26/96 19:10	-0.49	0.01
27570	19.15	2/26/96 19:40	-0.48	0.01
27600	19.17	2/26/96 20:10	-0.47	0.01
27630	19.19	2/26/96 20:40	-0.47	0.02
27660	19.21	2/26/96 21:10	-0.46	0.03
27690	19.23	2/26/96 21:40	-0.45	0.04
27720	19.25	2/26/96 22:10	-0.44	0.04
27750	19.27	2/26/96 22:40	-0.44	0.04
27780	19.29	2/26/96 23:10	-0.44	0.05
27810	19.31	2/26/96 23:40	-0.42	0.05
27840	19.33	2/27/96 0:10	-0.42	0.06
27870	19.35	2/27/96 0:40	-0.4	0.06
27900	19.38	2/27/96 1:10	-0.42	0.07

27930	19.40	2/27/96 1:40	-0.4	0.08
27960	19.42	2/27/96 2:10	-0.4	0.08
27990	19.44	2/27/96 2:40	-0.39	0.1
28020	19.46	2/27/96 3:10	-0.35	0.11
28050	19.48	2/27/96 3:40	-0.3	0.1
28080	19.50	2/27/96 4:10	-0.27	0.1
28110	19.52	2/27/96 4:40	-0.24	0.12
28140	19.54	2/27/96 5:10	-0.22	0.11
28170	19.56	2/27/96 5:40	-0.22	0.12
28200	19.58	2/27/96 6:10	-0.2	0.12
28230	19.60	2/27/96 6:40	-0.19	0.12
28260	19.63	2/27/96 7:10	-0.18	0.12
28290	19.65	2/27/96 7:40	-0.18	0.12
28320	19.67	2/27/96 8:10	-0.17	0.13
28350	19.69	2/27/96 8:40	-0.16	0.14
28380	19.71	2/27/96 9:10	-0.15	0.15
28410	19.73	2/27/96 9:40	-0.15	0.15
28440	19.75	2/27/96 10:10	-0.13	0.15
28470	19.77	2/27/96 10:40	-0.15	0.15
28500	19.79	2/27/96 11:10	-0.14	0.14
28530	19.81	2/27/96 11:40	-0.13	0.15
28560	19.83	2/27/96 12:10	-0.13	0.15
28590	19.85	2/27/96 12:40	-0.13	0.16
28620	19.88	2/27/96 13:10	-0.13	0.15
28650	19.90	2/27/96 13:40	-0.12	0.16
28680	19.92	2/27/96 14:10	-0.12	0.17
28710	19.94	2/27/96 14:40	-0.11	0.17
28740	19.96	2/27/96 15:10	-0.11	0.17
28770	19.98	2/27/96 15:40	-0.11	0.17
28800	20.00	2/27/96 16:10	-0.1	0.17
28830	20.02	2/27/96 16:40	-0.1	0.18
28860	20.04	2/27/96 17:10	-0.09	0.18
28890	20.06	2/27/96 17:40	-0.1	0.18
28920	20.08	2/27/96 18:10	-0.09	0.18
28950	20.10	2/27/96 18:40	-0.09	0.19
28980	20.13	2/27/96 19:10	-0.09	0.2
29010	20.15	2/27/96 19:40	-0.08	0.2
29040	20.17	2/27/96 20:10	-0.08	0.2
29070	20.19	2/27/96 20:40	-0.08	0.21
29100	20.21	2/27/96 21:10	-0.08	0.21
29130	20.23	2/27/96 21:40	-0.08	0.22
29160	20.25	2/27/96 22:10	-0.08	0.23
29190	20.27	2/27/96 22:40	-0.07	0.23
29220	20.29	2/27/96 23:10	-0.07	0.24
29250	20.31	2/27/96 23:40	-0.07	0.24
29280	20.33	2/28/96 0:10	-0.07	0.24
29310	20.35	2/28/96 0:40	-0.06	0.25
29340	20.38	2/28/96 1:10	-0.06	0.26
29370	20.40	2/28/96 1:40	-0.06	0.26
29400	20.42	2/28/96 2:10	-0.06	0.26
29430	20.44	2/28/96 2:40	-0.06	0.27
29460	20.46	2/28/96 3:10	-0.06	0.26
29490	20.48	2/28/96 3:40	-0.06	0.26
29520	20.50	2/28/96 4:10	-0.06	0.26
29550	20.52	2/28/96 4:40	-0.06	0.26
29580	20.54	2/28/96 5:10	-0.06	0.27
29610	20.56	2/28/96 5:40	-0.06	0.26
29640	20.58	2/28/96 6:10	-0.06	0.27
29670	20.60	2/28/96 6:40	-0.06	0.27
29700	20.63	2/28/96 7:10	-0.05	0.26
29730	20.65	2/28/96 7:40	-0.06	0.27
29760	20.67	2/28/96 8:10	-0.05	0.26
29790	20.69	2/28/96 8:40	-0.07	0.25
29820	20.71	2/28/96 9:10	-0.09	0.27
29850	20.73	2/28/96 9:40	-0.06	0.28
29880	20.75	2/28/96 10:10	-0.04	0.29
29910	20.77	2/28/96 10:40	-0.03	0.27

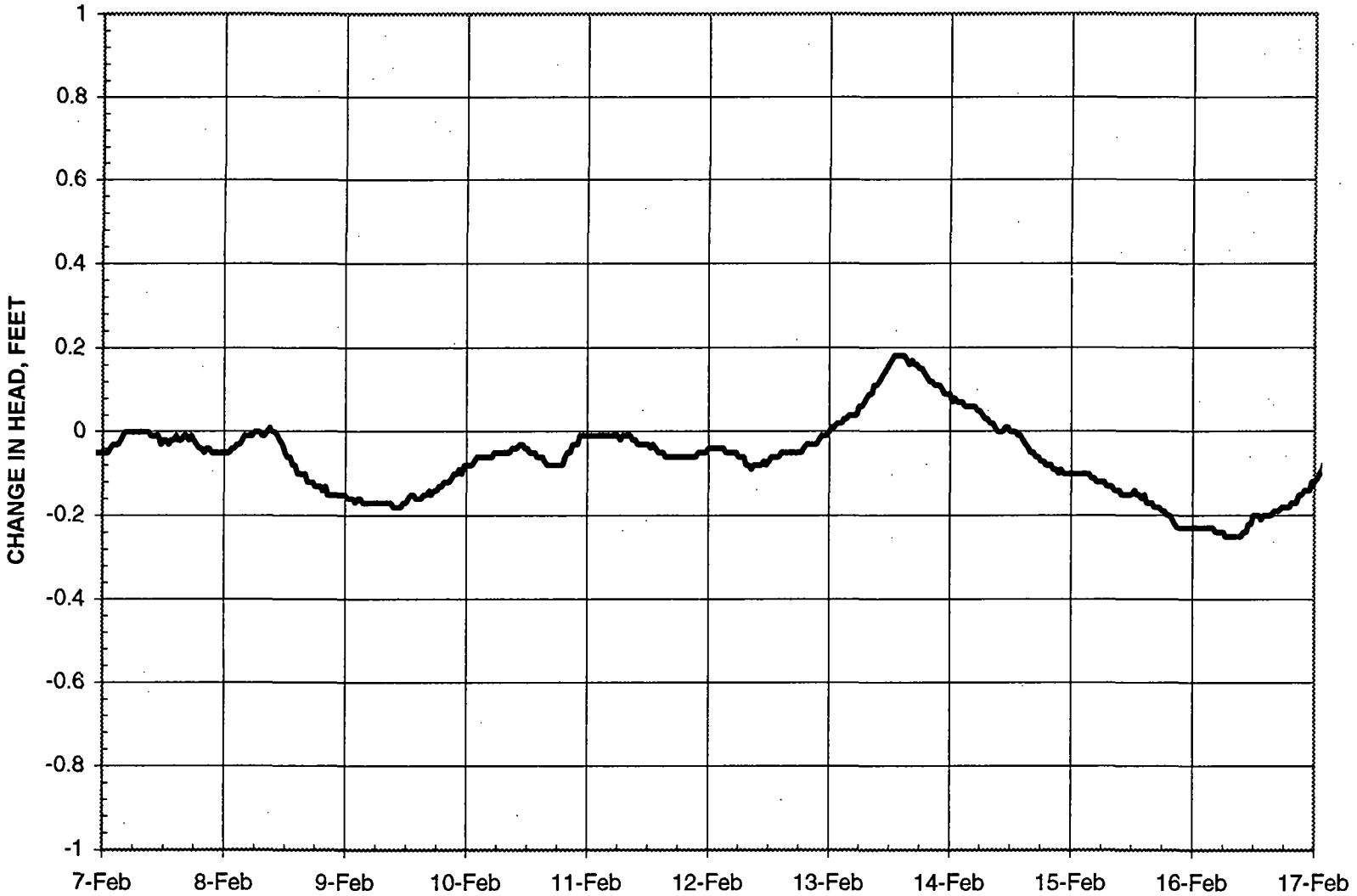
29940	20.79	2/28/96 11:10	-0.07	0.29
29970	20.81	2/28/96 11:40	-0.06	0.29
30000	20.83	2/28/96 12:10	-0.06	0.28
30030	20.85	2/28/96 12:40	-0.06	0.28
30060	20.88	2/28/96 13:10	-0.06	0.27
30090	20.90	2/28/96 13:40	-0.06	0.28
30120	20.92	2/28/96 14:10	-0.06	0.27
30150	20.94	2/28/96 14:40	-0.06	0.28
30180	20.96	2/28/96 15:10	-0.06	0.29
30210	20.98	2/28/96 15:40	-0.06	0.29
30240	21.00	2/28/96 16:10	-0.06	0.29
30270	21.02	2/28/96 16:40	-0.06	0.29
30300	21.04	2/28/96 17:10	-0.06	0.29
30330	21.06	2/28/96 17:40	-0.06	0.29
30360	21.08	2/28/96 18:10	-0.06	0.3
30390	21.10	2/28/96 18:40	-0.06	0.3
30420	21.13	2/28/96 19:10	-0.06	0.3
30450	21.15	2/28/96 19:40	-0.06	0.3
30480	21.17	2/28/96 20:10	-0.06	0.31
30510	21.19	2/28/96 20:40	-0.06	0.32
30540	21.21	2/28/96 21:10	-0.06	0.32
30570	21.23	2/28/96 21:40	-0.06	0.32
30600	21.25	2/28/96 22:10	-0.06	0.34
30630	21.27	2/28/96 22:40	-0.06	0.34
30660	21.29	2/28/96 23:10	-0.05	0.35
30690	21.31	2/28/96 23:40	-0.05	0.36
30720	21.33	2/29/96 0:10	-0.05	0.36
30750	21.35	2/29/96 0:40	-0.05	0.36
30780	21.38	2/29/96 1:10	-0.05	0.36
30810	21.40	2/29/96 1:40	-0.05	0.37
30840	21.42	2/29/96 2:10	-0.05	0.37
30870	21.44	2/29/96 2:40	-0.05	0.38
30900	21.46	2/29/96 3:10	-0.06	0.39
30930	21.48	2/29/96 3:40	-0.05	0.39
30960	21.50	2/29/96 4:10	-0.06	0.39
30990	21.52	2/29/96 4:40	-0.06	0.39
31020	21.54	2/29/96 5:10	-0.05	0.39
31050	21.56	2/29/96 5:40	-0.06	0.39
31080	21.58	2/29/96 6:10	-0.06	0.39
31110	21.60	2/29/96 6:40	-0.06	0.39
31140	21.63	2/29/96 7:10	-0.06	0.41
31170	21.65	2/29/96 7:40	-0.05	0.4
31200	21.67	2/29/96 8:10	-0.06	0.41
31230	21.69	2/29/96 8:40	-0.06	0.41
31260	21.71	2/29/96 9:10	-0.06	0.42
31290	21.73	2/29/96 9:40	-0.06	0.43
31320	21.75	2/29/96 10:10	-0.05	0.44
31350	21.77	2/29/96 10:40	-0.05	0.45
31380	21.79	2/29/96 11:10	-0.04	0.46
31410	21.81	2/29/96 11:40	-0.04	0.47
31440	21.83	2/29/96 12:10	-0.04	0.46
31470	21.85	2/29/96 12:40	-0.03	0.47
31500	21.88	2/29/96 13:10	-0.03	0.48
31530	21.90	2/29/96 13:40	-0.03	0.48
31560	21.92	2/29/96 14:10	-0.03	0.49
31590	21.94	2/29/96 14:40	-0.03	0.49
31620	21.96	2/29/96 15:10	-0.03	0.5
31650	21.98	2/29/96 15:40	-0.03	0.49
31680	22.00	2/29/96 16:10	-0.03	0.5
31710	22.02	2/29/96 16:40	-0.03	0.5
31740	22.04	2/29/96 17:10	-0.03	0.52
31770	22.06	2/29/96 17:40	-0.03	0.51
31800	22.08	2/29/96 18:10	-0.03	0.51
31830	22.10	2/29/96 18:40	-0.03	0.51
31860	22.13	2/29/96 19:10	-0.03	0.51
31890	22.15	2/29/96 19:40	-0.03	0.52
31920	22.17	2/29/96 20:10	-0.03	0.52

31950	22.19	2/29/96 20:40	-0.02	0.52
31980	22.21	2/29/96 21:10	-0.03	0.52
32010	22.23	2/29/96 21:40	-0.03	0.53
32040	22.25	2/29/96 22:10	-0.02	0.54
32070	22.27	2/29/96 22:40	-0.02	0.54
32100	22.29	2/29/96 23:10	-0.02	0.56
32130	22.31	2/29/96 23:40	-0.02	0.56
32160	22.33	3/1/96 0:10	-0.01	0.57
32190	22.35	3/1/96 0:40	-0.01	0.58
32220	22.38	3/1/96 1:10	-0.01	0.59
32250	22.40	3/1/96 1:40	-0.01	0.6
32280	22.42	3/1/96 2:10	-0.01	0.6
32310	22.44	3/1/96 2:40	-0.01	0.6
32340	22.46	3/1/96 3:10	-0.01	0.61
32370	22.48	3/1/96 3:40	-0.01	0.61
32400	22.50	3/1/96 4:10	-0.01	0.61
32430	22.52	3/1/96 4:40	-0.01	0.63
32460	22.54	3/1/96 5:10	-0.01	0.62
32490	22.56	3/1/96 5:40	-0.01	0.63
32520	22.58	3/1/96 6:10	-0.02	0.63
32550	22.60	3/1/96 6:40	-0.01	0.63
32580	22.63	3/1/96 7:10	-0.01	0.63
32610	22.65	3/1/96 7:40	-0.01	0.65
32640	22.67	3/1/96 8:10	-0.01	0.65
32670	22.69	3/1/96 8:40	-0.01	0.65
32700	22.71	3/1/96 9:10	0	0.66
32730	22.73	3/1/96 9:40	0	0.67
32760	22.75	3/1/96 10:10	-0.01	0.69
32790	22.77	3/1/96 10:40	0	0.69
32820	22.79	3/1/96 11:10	0	0.7
32850	22.81	3/1/96 11:40	0	0.7
32880	22.83	3/1/96 12:10	0.01	0.7
32910	22.85	3/1/96 12:40	0	0.72
32940	22.88	3/1/96 13:10	0	0.72
32970	22.90	3/1/96 13:40	0.01	0.72
33000	22.92	3/1/96 14:10	0	0.72
33030	22.94	3/1/96 14:40	0	0.72
33060	22.96	3/1/96 15:10	0.01	0.72
33090	22.98	3/1/96 15:40	0.01	0.73
33120	23.00	3/1/96 16:10	0.01	0.73
33150	23.02	3/1/96 16:40	0.01	0.72
33180	23.04	3/1/96 17:10	0.01	0.72
33210	23.06	3/1/96 17:40	0.01	0.72
33240	23.08	3/1/96 18:10	0.01	0.72
33270	23.10	3/1/96 18:40	0.01	0.72
33300	23.13	3/1/96 19:10	0.01	0.72
33330	23.15	3/1/96 19:40	0.01	0.73
33360	23.17	3/1/96 20:10	0.01	0.73
33390	23.19	3/1/96 20:40	0.01	0.73
33420	23.21	3/1/96 21:10	0.01	0.73
33450	23.23	3/1/96 21:40	0.01	0.74
33480	23.25	3/1/96 22:10	0.01	0.75
33510	23.27	3/1/96 22:40	0.01	0.75
33540	23.29	3/1/96 23:10	0.01	0.76
33570	23.31	3/1/96 23:40	0.01	0.76
33600	23.33	3/2/96 0:10	0.02	0.77
33630	23.35	3/2/96 0:40	0.02	0.77
33660	23.38	3/2/96 1:10	0.02	0.77
33690	23.40	3/2/96 1:40	0.01	0.77
33720	23.42	3/2/96 2:10	0.01	0.77
33750	23.44	3/2/96 2:40	0.01	0.77
33780	23.46	3/2/96 3:10	0.01	0.77
33810	23.48	3/2/96 3:40	0.01	0.77
33840	23.50	3/2/96 4:10	0.01	0.77
33870	23.52	3/2/96 4:40	0.01	0.77
33900	23.54	3/2/96 5:10	0.01	0.77
33930	23.56	3/2/96 5:40	0.01	0.77

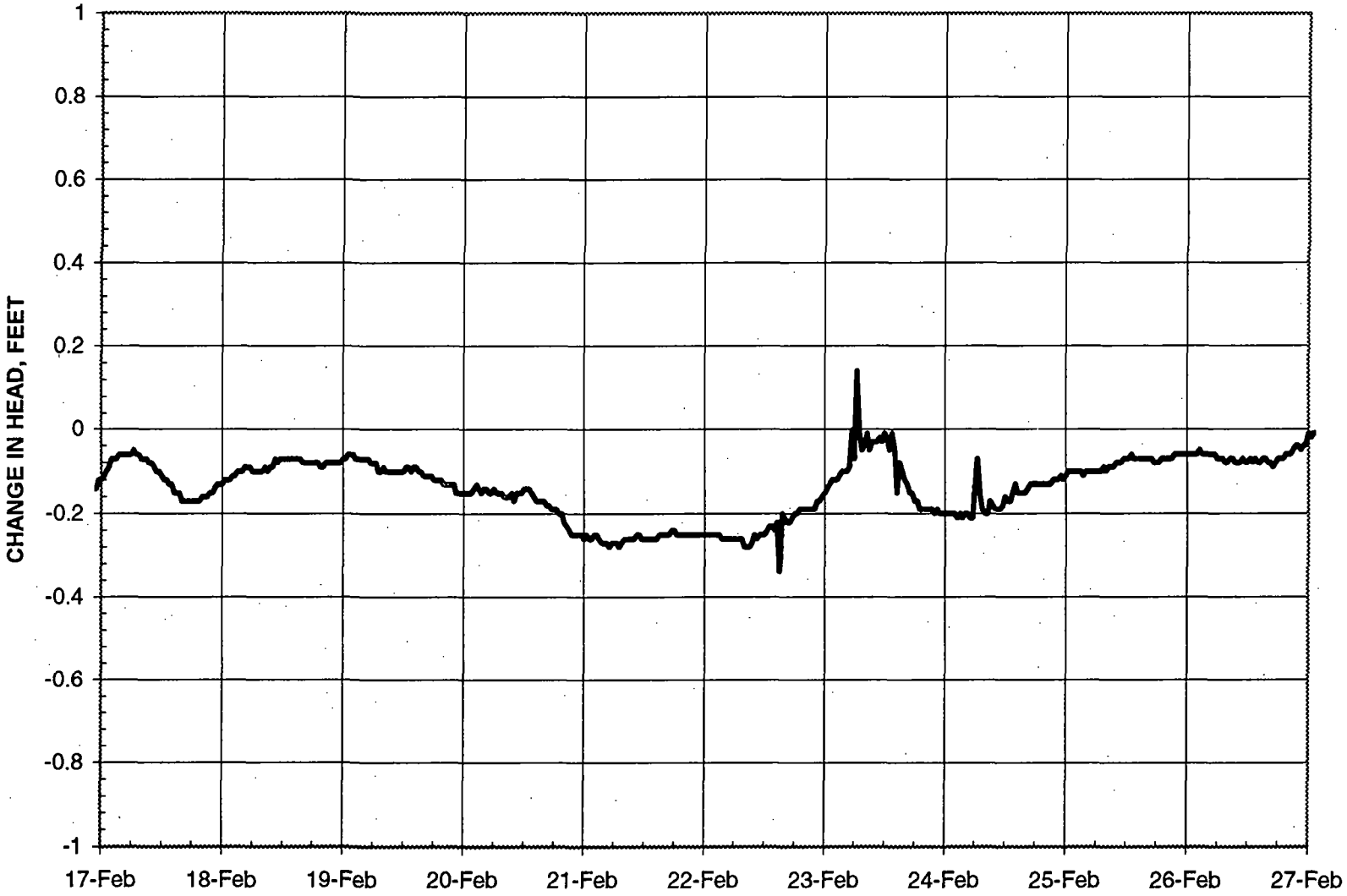
33960	23.58	3/2/96 6:10	0.01	0.77
33990	23.60	3/2/96 6:40	0.01	0.77
34020	23.63	3/2/96 7:10	0.02	0.76
34050	23.65	3/2/96 7:40	0.01	0.77
34080	23.67	3/2/96 8:10	0.01	0.79
34110	23.69	3/2/96 8:40	0.02	0.77
34140	23.71	3/2/96 9:10	-0.01	0.78
34170	23.73	3/2/96 9:40	0	0.77
34200	23.75	3/2/96 10:10	0	0.8
34230	23.77	3/2/96 10:40	0.02	0.78
34260	23.79	3/2/96 11:10	-0.01	0.78
34290	23.81	3/2/96 11:40	0	0.77
34320	23.83	3/2/96 12:10	-0.01	0.78
34350	23.85	3/2/96 12:40	0.01	0.78
34380	23.88	3/2/96 13:10	0.01	0.78
34410	23.90	3/2/96 13:40	0.01	0.77
34440	23.92	3/2/96 14:10	-0.01	0.77
34470	23.94	3/2/96 14:40	-0.01	0.76
34500	23.96	3/2/96 15:10	-0.01	0.75
34530	23.98	3/2/96 15:40	-0.02	0.75
34560	24.00	3/2/96 16:10	-0.01	0.75
34590	24.02	3/2/96 16:40	-0.02	0.74
34620	24.04	3/2/96 17:10	-0.02	0.73
34650	24.06	3/2/96 17:40	-0.02	0.72
34680	24.08	3/2/96 18:10	-0.03	0.72
34710	24.10	3/2/96 18:40	-0.03	0.71
34740	24.13	3/2/96 19:10	-0.03	0.71
34770	24.15	3/2/96 19:40	-0.03	0.7
34800	24.17	3/2/96 20:10	-0.04	0.7
34830	24.19	3/2/96 20:40	-0.04	0.7
34860	24.21	3/2/96 21:10	-0.04	0.69
34890	24.23	3/2/96 21:40	-0.04	0.69
34920	24.25	3/2/96 22:10	-0.04	0.69
34950	24.27	3/2/96 22:40	-0.05	0.68
34980	24.29	3/2/96 23:10	-0.05	0.68
35010	24.31	3/2/96 23:40	-0.05	0.68
35040	24.33	3/3/96 0:10	-0.05	0.68
35070	24.35	3/3/96 0:40	-0.06	0.68
35100	24.38	3/3/96 1:10	-0.06	0.68
35130	24.40	3/3/96 1:40	-0.06	0.68
35160	24.42	3/3/96 2:10	-0.07	0.68


CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
2-Feb
3-Feb
4-Feb
5-Feb
6-Feb
7-Feb

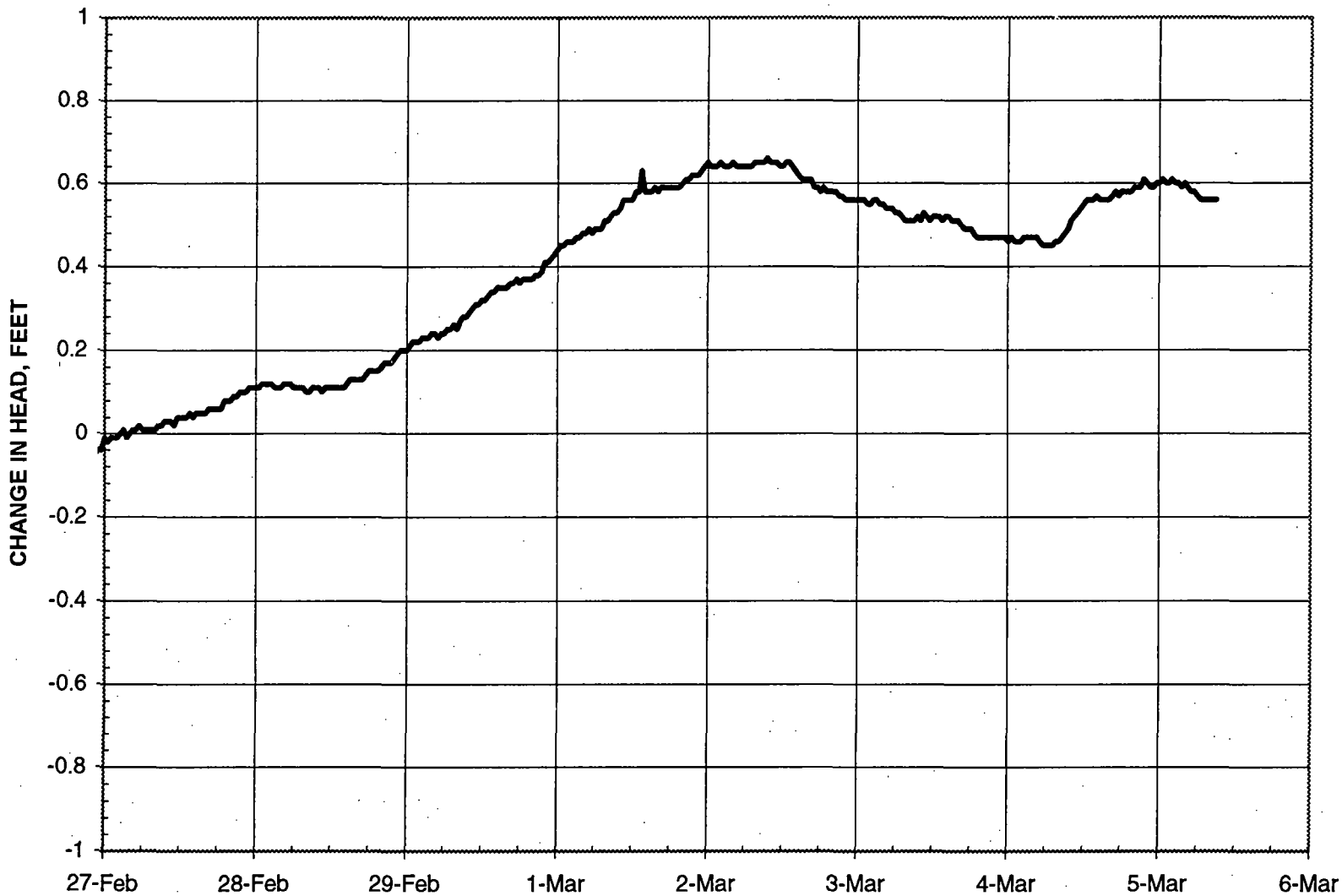
WATLEV9.XLS


CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
7-Feb
8-Feb
9-Feb
10-Feb
11-Feb
12-Feb
13-Feb
14-Feb
15-Feb
16-Feb
17-Feb

WATLEV9.XLS


CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
17-Feb
18-Feb
19-Feb
20-Feb
21-Feb
22-Feb
23-Feb
24-Feb
25-Feb
26-Feb
27-Feb

WATLEV9.XLS


CHANGE IN HEAD, FEET
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
27-Feb
28-Feb
29-Feb
1-Mar
2-Mar
3-Mar
4-Mar
5-Mar
6-Mar

WATLEV9.XLS

RAW DATA FOR MW9 CONTINUOUS HEAD MEASUREMENTS

Minutes	Days	Date of Measurement	Head Change
0	0.00	2/2/96 10:00	-0.08
30	0.02	2/2/96 10:30	-0.1
60	0.04	2/2/96 11:00	-0.08
90	0.06	2/2/96 11:30	-0.08
120	0.08	2/2/96 12:00	-0.08
150	0.10	2/2/96 12:30	-0.08
180	0.13	2/2/96 13:00	-0.09
210	0.15	2/2/96 13:30	-0.08
240	0.17	2/2/96 14:00	-0.07
270	0.19	2/2/96 14:30	-0.05
300	0.21	2/2/96 15:00	-0.05
330	0.23	2/2/96 15:30	-0.05
360	0.25	2/2/96 16:00	-0.05
390	0.27	2/2/96 16:30	-0.05
420	0.29	2/2/96 17:00	-0.05
450	0.31	2/2/96 17:30	-0.05
480	0.33	2/2/96 18:00	-0.04
510	0.35	2/2/96 18:30	-0.05
540	0.38	2/2/96 19:00	-0.04
570	0.40	2/2/96 19:30	-0.04
600	0.42	2/2/96 20:00	-0.05
630	0.44	2/2/96 20:30	-0.05
660	0.46	2/2/96 21:00	-0.05
690	0.48	2/2/96 21:30	-0.05
720	0.50	2/2/96 22:00	-0.04
750	0.52	2/2/96 22:30	-0.04
780	0.54	2/2/96 23:00	-0.04
810	0.56	2/2/96 23:30	-0.04
840	0.58	2/3/96 0:00	-0.03
870	0.60	2/3/96 0:30	-0.04
900	0.63	2/3/96 1:00	-0.03
930	0.65	2/3/96 1:30	-0.03
960	0.67	2/3/96 2:00	-0.03
990	0.69	2/3/96 2:30	-0.03
1020	0.71	2/3/96 3:00	-0.03
1050	0.73	2/3/96 3:30	-0.03
1080	0.75	2/3/96 4:00	-0.03
1110	0.77	2/3/96 4:30	-0.02
1140	0.79	2/3/96 5:00	-0.02
1170	0.81	2/3/96 5:30	-0.02
1200	0.83	2/3/96 6:00	-0.02
1230	0.85	2/3/96 6:30	-0.01
1260	0.88	2/3/96 7:00	-0.01
1290	0.90	2/3/96 7:30	-0.01
1320	0.92	2/3/96 8:00	-0.01
1350	0.94	2/3/96 8:30	0
1380	0.96	2/3/96 9:00	0

1410	0.98	2/3/96 9:30	-0.01	
1440	1.00	2/3/96 10:00	-0.01	
1470	1.02	2/3/96 10:30	0	
1500	1.04	2/3/96 11:00	0	
1530	1.06	2/3/96 11:30	-0.01	
1560	1.08	2/3/96 12:00	0	
1590	1.10	2/3/96 12:30	0	
1620	1.13	2/3/96 13:00	0	
1650	1.15	2/3/96 13:30	0	
1680	1.17	2/3/96 14:00	0	
1710	1.19	2/3/96 14:30	0.01	
1740	1.21	2/3/96 15:00	0.01	
1770	1.23	2/3/96 15:30	0.02	
1800	1.25	2/3/96 16:00	0.02	
1830	1.27	2/3/96 16:30	0.02	
1860	1.29	2/3/96 17:00	0.01	
1890	1.31	2/3/96 17:30	0.02	
1920	1.33	2/3/96 18:00	0.01	
1950	1.35	2/3/96 18:30	0.02	
1980	1.38	2/3/96 19:00	0.01	
2010	1.40	2/3/96 19:30	0.02	
2040	1.42	2/3/96 20:00	0.02	
2070	1.44	2/3/96 20:30	0.01	
2100	1.46	2/3/96 21:00	0.01	
2130	1.48	2/3/96 21:30	0.01	
2160	1.50	2/3/96 22:00	0.01	
2190	1.52	2/3/96 22:30	0.01	
2220	1.54	2/3/96 23:00	0.01	
2250	1.56	2/3/96 23:30	0.01	
2280	1.58	2/4/96 0:00	0.01	
2310	1.60	2/4/96 0:30	0.02	
2340	1.63	2/4/96 1:00	0.03	
2370	1.65	2/4/96 1:30	0.02	
2400	1.67	2/4/96 2:00	0.03	
2430	1.69	2/4/96 2:30	0.03	
2460	1.71	2/4/96 3:00	0.03	
2490	1.73	2/4/96 3:30	0.03	
2520	1.75	2/4/96 4:00	0.03	
2550	1.77	2/4/96 4:30	0.03	
2580	1.79	2/4/96 5:00	0.03	
2610	1.81	2/4/96 5:30	0.04	
2640	1.83	2/4/96 6:00	0.03	
2670	1.85	2/4/96 6:30	0.05	
2700	1.88	2/4/96 7:00	0.04	
2730	1.90	2/4/96 7:30	0.04	
2760	1.92	2/4/96 8:00	0.03	
2790	1.94	2/4/96 8:30	0.03	
2820	1.96	2/4/96 9:00	0.03	
2850	1.98	2/4/96 9:30	0.03	
2880	2.00	2/4/96 10:00	0.02	
2910	2.02	2/4/96 10:30	0.01	

2940	2.04	2/4/96 11:00	0.01	
2970	2.06	2/4/96 11:30	0.01	
3000	2.08	2/4/96 12:00	0	
3030	2.10	2/4/96 12:30	0	
3060	2.13	2/4/96 13:00	0	
3090	2.15	2/4/96 13:30	0	
3120	2.17	2/4/96 14:00	0	
3150	2.19	2/4/96 14:30	-0.01	
3180	2.21	2/4/96 15:00	-0.01	
3210	2.23	2/4/96 15:30	-0.01	
3240	2.25	2/4/96 16:00	-0.01	
3270	2.27	2/4/96 16:30	-0.02	
3300	2.29	2/4/96 17:00	-0.02	
3330	2.31	2/4/96 17:30	-0.03	
3360	2.33	2/4/96 18:00	-0.02	
3390	2.35	2/4/96 18:30	-0.02	
3420	2.38	2/4/96 19:00	-0.02	
3450	2.40	2/4/96 19:30	-0.03	
3480	2.42	2/4/96 20:00	-0.02	
3510	2.44	2/4/96 20:30	-0.02	
3540	2.46	2/4/96 21:00	-0.02	
3570	2.48	2/4/96 21:30	-0.02	
3600	2.50	2/4/96 22:00	-0.01	
3630	2.52	2/4/96 22:30	-0.02	
3660	2.54	2/4/96 23:00	-0.01	
3690	2.56	2/4/96 23:30	-0.02	
3720	2.58	2/5/96 0:00	-0.01	
3750	2.60	2/5/96 0:30	-0.01	
3780	2.63	2/5/96 1:00	-0.02	
3810	2.65	2/5/96 1:30	-0.01	
3840	2.67	2/5/96 2:00	-0.01	
3870	2.69	2/5/96 2:30	0	
3900	2.71	2/5/96 3:00	0	
3930	2.73	2/5/96 3:30	0.01	
3960	2.75	2/5/96 4:00	0.01	
3990	2.77	2/5/96 4:30	0.01	
4020	2.79	2/5/96 5:00	0.01	
4050	2.81	2/5/96 5:30	0.01	
4080	2.83	2/5/96 6:00	0	
4110	2.85	2/5/96 6:30	0	
4140	2.88	2/5/96 7:00	0	
4170	2.90	2/5/96 7:30	0	
4200	2.92	2/5/96 8:00	-0.01	
4230	2.94	2/5/96 8:30	-0.02	
4260	2.96	2/5/96 9:00	-0.03	
4290	2.98	2/5/96 9:30	-0.04	
4320	3.00	2/5/96 10:00	-0.06	
4350	3.02	2/5/96 10:30	-0.07	
4380	3.04	2/5/96 11:00	-0.08	
4410	3.06	2/5/96 11:30	-0.09	
4440	3.08	2/5/96 12:00	-0.09	

4470	3.10	2/5/96 12:30	-0.11	
4500	3.13	2/5/96 13:00	-0.12	
4530	3.15	2/5/96 13:30	-0.12	
4560	3.17	2/5/96 14:00	-0.13	
4590	3.19	2/5/96 14:30	-0.13	
4620	3.21	2/5/96 15:00	-0.14	
4650	3.23	2/5/96 15:30	-0.14	
4680	3.25	2/5/96 16:00	-0.15	
4710	3.27	2/5/96 16:30	-0.17	
4740	3.29	2/5/96 17:00	-0.17	
4770	3.31	2/5/96 17:30	-0.17	
4800	3.33	2/5/96 18:00	-0.18	
4830	3.35	2/5/96 18:30	-0.19	
4860	3.38	2/5/96 19:00	-0.19	
4890	3.40	2/5/96 19:30	-0.2	
4920	3.42	2/5/96 20:00	-0.2	
4950	3.44	2/5/96 20:30	-0.2	
4980	3.46	2/5/96 21:00	-0.2	
5010	3.48	2/5/96 21:30	-0.2	
5040	3.50	2/5/96 22:00	-0.2	
5070	3.52	2/5/96 22:30	-0.2	
5100	3.54	2/5/96 23:00	-0.2	
5130	3.56	2/5/96 23:30	-0.2	
5160	3.58	2/6/96 0:00	-0.19	
5190	3.60	2/6/96 0:30	-0.2	
5220	3.63	2/6/96 1:00	-0.2	
5250	3.65	2/6/96 1:30	-0.2	
5280	3.67	2/6/96 2:00	-0.2	
5310	3.69	2/6/96 2:30	-0.2	
5340	3.71	2/6/96 3:00	-0.2	
5370	3.73	2/6/96 3:30	-0.19	
5400	3.75	2/6/96 4:00	-0.18	
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5460	3.79	2/6/96 5:00	-0.18	
5490	3.81	2/6/96 5:30	-0.18	
5520	3.83	2/6/96 6:00	-0.17	
5550	3.85	2/6/96 6:30	-0.18	
5580	3.88	2/6/96 7:00	-0.18	
5610	3.90	2/6/96 7:30	-0.17	
5640	3.92	2/6/96 8:00	-0.17	
5670	3.94	2/6/96 8:30	-0.17	
5700	3.96	2/6/96 9:00	-0.17	
5730	3.98	2/6/96 9:30	-0.17	
5760	4.00	2/6/96 10:00	-0.17	
5790	4.02	2/6/96 10:30	-0.16	
5820	4.04	2/6/96 11:00	-0.17	
5850	4.06	2/6/96 11:30	-0.18	
5880	4.08	2/6/96 12:00	-0.18	
5910	4.10	2/6/96 12:30	-0.17	
5940	4.13	2/6/96 13:00	-0.16	
5970	4.15	2/6/96 13:30	-0.14	

6000	4.17	2/6/96 14:00	-0.14	
6030	4.19	2/6/96 14:30	-0.13	
6060	4.21	2/6/96 15:00	-0.12	
6090	4.23	2/6/96 15:30	-0.11	
6120	4.25	2/6/96 16:00	-0.1	
6150	4.27	2/6/96 16:30	-0.11	
6180	4.29	2/6/96 17:00	-0.11	
6210	4.31	2/6/96 17:30	-0.1	
6240	4.33	2/6/96 18:00	-0.1	
6270	4.35	2/6/96 18:30	-0.1	
6300	4.38	2/6/96 19:00	-0.1	
6330	4.40	2/6/96 19:30	-0.09	
6360	4.42	2/6/96 20:00	-0.08	
6390	4.44	2/6/96 20:30	-0.07	
6420	4.46	2/6/96 21:00	-0.06	
6450	4.48	2/6/96 21:30	-0.06	
6480	4.50	2/6/96 22:00	-0.05	
6510	4.52	2/6/96 22:30	-0.05	
6540	4.54	2/6/96 23:00	-0.05	
6570	4.56	2/6/96 23:30	-0.05	
6600	4.58	2/7/96 0:00	-0.05	
6630	4.60	2/7/96 0:30	-0.05	
6660	4.63	2/7/96 1:00	-0.05	
6690	4.65	2/7/96 1:30	-0.04	
6720	4.67	2/7/96 2:00	-0.03	
6750	4.69	2/7/96 2:30	-0.03	
6780	4.71	2/7/96 3:00	-0.03	
6810	4.73	2/7/96 3:30	-0.02	
6840	4.75	2/7/96 4:00	-0.01	
6870	4.77	2/7/96 4:30	0	
6900	4.79	2/7/96 5:00	0	
6930	4.81	2/7/96 5:30	0	
6960	4.83	2/7/96 6:00	0	
6990	4.85	2/7/96 6:30	0	
7020	4.88	2/7/96 7:00	0	
7050	4.90	2/7/96 7:30	0	
7080	4.92	2/7/96 8:00	0	
7110	4.94	2/7/96 8:30	0	
7140	4.96	2/7/96 9:00	0	
7170	4.98	2/7/96 9:30	-0.01	
7200	5.00	2/7/96 10:00	-0.01	
7230	5.02	2/7/96 10:30	-0.01	
7260	5.04	2/7/96 11:00	-0.01	
7290	5.06	2/7/96 11:30	-0.03	
7320	5.08	2/7/96 12:00	-0.02	
7350	5.10	2/7/96 12:30	-0.02	
7380	5.13	2/7/96 13:00	-0.03	
7410	5.15	2/7/96 13:30	-0.02	
7440	5.17	2/7/96 14:00	-0.02	
7470	5.19	2/7/96 14:30	-0.01	
7500	5.21	2/7/96 15:00	-0.02	

7530	5.23	2/7/96 15:30	-0.02	
7560	5.25	2/7/96 16:00	-0.01	
7590	5.27	2/7/96 16:30	-0.01	
7620	5.29	2/7/96 17:00	-0.02	
7650	5.31	2/7/96 17:30	-0.01	
7680	5.33	2/7/96 18:00	-0.02	
7710	5.35	2/7/96 18:30	-0.03	
7740	5.38	2/7/96 19:00	-0.04	
7770	5.40	2/7/96 19:30	-0.04	
7800	5.42	2/7/96 20:00	-0.05	
7830	5.44	2/7/96 20:30	-0.04	
7860	5.46	2/7/96 21:00	-0.04	
7890	5.48	2/7/96 21:30	-0.05	
7920	5.50	2/7/96 22:00	-0.05	
7950	5.52	2/7/96 22:30	-0.05	
7980	5.54	2/7/96 23:00	-0.05	
8010	5.56	2/7/96 23:30	-0.05	
8040	5.58	2/8/96 0:00	-0.05	
8070	5.60	2/8/96 0:30	-0.05	
8100	5.63	2/8/96 1:00	-0.05	
8130	5.65	2/8/96 1:30	-0.04	
8160	5.67	2/8/96 2:00	-0.04	
8190	5.69	2/8/96 2:30	-0.03	
8220	5.71	2/8/96 3:00	-0.03	
8250	5.73	2/8/96 3:30	-0.02	
8280	5.75	2/8/96 4:00	-0.01	
8310	5.77	2/8/96 4:30	-0.01	
8340	5.79	2/8/96 5:00	-0.01	
8370	5.81	2/8/96 5:30	-0.01	
8400	5.83	2/8/96 6:00	0	
8430	5.85	2/8/96 6:30	0	
8460	5.88	2/8/96 7:00	0	
8490	5.90	2/8/96 7:30	-0.01	
8520	5.92	2/8/96 8:00	-0.01	
8550	5.94	2/8/96 8:30	0	
8580	5.96	2/8/96 9:00	0.01	
8610	5.98	2/8/96 9:30	0	
8640	6.00	2/8/96 10:00	0	
8670	6.02	2/8/96 10:30	-0.01	
8700	6.04	2/8/96 11:00	-0.02	
8730	6.06	2/8/96 11:30	-0.03	
8760	6.08	2/8/96 12:00	-0.05	
8790	6.10	2/8/96 12:30	-0.06	
8820	6.13	2/8/96 13:00	-0.06	
8850	6.15	2/8/96 13:30	-0.08	
8880	6.17	2/8/96 14:00	-0.08	
8910	6.19	2/8/96 14:30	-0.1	
8940	6.21	2/8/96 15:00	-0.1	
8970	6.23	2/8/96 15:30	-0.1	
9000	6.25	2/8/96 16:00	-0.1	
9030	6.27	2/8/96 16:30	-0.12	

9060	6.29	2/8/96 17:00	-0.12	
9090	6.31	2/8/96 17:30	-0.12	
9120	6.33	2/8/96 18:00	-0.13	
9150	6.35	2/8/96 18:30	-0.13	
9180	6.38	2/8/96 19:00	-0.13	
9210	6.40	2/8/96 19:30	-0.14	
9240	6.42	2/8/96 20:00	-0.13	
9270	6.44	2/8/96 20:30	-0.15	
9300	6.46	2/8/96 21:00	-0.15	
9330	6.48	2/8/96 21:30	-0.15	
9360	6.50	2/8/96 22:00	-0.15	
9390	6.52	2/8/96 22:30	-0.15	
9420	6.54	2/8/96 23:00	-0.15	
9450	6.56	2/8/96 23:30	-0.15	
9480	6.58	2/9/96 0:00	-0.15	
9510	6.60	2/9/96 0:30	-0.16	
9540	6.63	2/9/96 1:00	-0.16	
9570	6.65	2/9/96 1:30	-0.16	
9600	6.67	2/9/96 2:00	-0.17	
9630	6.69	2/9/96 2:30	-0.16	
9660	6.71	2/9/96 3:00	-0.16	
9690	6.73	2/9/96 3:30	-0.17	
9720	6.75	2/9/96 4:00	-0.17	
9750	6.77	2/9/96 4:30	-0.17	
9780	6.79	2/9/96 5:00	-0.17	
9810	6.81	2/9/96 5:30	-0.17	
9840	6.83	2/9/96 6:00	-0.17	
9870	6.85	2/9/96 6:30	-0.17	
9900	6.88	2/9/96 7:00	-0.17	
9930	6.90	2/9/96 7:30	-0.17	
9960	6.92	2/9/96 8:00	-0.17	
9990	6.94	2/9/96 8:30	-0.17	
10020	6.96	2/9/96 9:00	-0.17	
10050	6.98	2/9/96 9:30	-0.18	
10080	7.00	2/9/96 10:00	-0.18	
		2/2/96 10:00		
10110	7.02	2/9/96 10:30	-0.18	
10140	7.04	2/9/96 11:00	-0.18	
10170	7.06	2/9/96 11:30	-0.17	
10200	7.08	2/9/96 12:00	-0.17	
10230	7.10	2/9/96 12:30	-0.16	
10260	7.13	2/9/96 13:00	-0.15	
10290	7.15	2/9/96 13:30	-0.15	
10320	7.17	2/9/96 14:00	-0.16	
10350	7.19	2/9/96 14:30	-0.16	
10380	7.21	2/9/96 15:00	-0.16	
10410	7.23	2/9/96 15:30	-0.15	
10440	7.25	2/9/96 16:00	-0.15	
10470	7.27	2/9/96 16:30	-0.14	
10500	7.29	2/9/96 17:00	-0.15	
10530	7.31	2/9/96 17:30	-0.14	

10560	7.33	2/9/96 18:00	-0.14	
10590	7.35	2/9/96 18:30	-0.13	
10620	7.38	2/9/96 19:00	-0.13	
10650	7.40	2/9/96 19:30	-0.12	
10680	7.42	2/9/96 20:00	-0.12	
10710	7.44	2/9/96 20:30	-0.12	
10740	7.46	2/9/96 21:00	-0.11	
10770	7.48	2/9/96 21:30	-0.1	
10800	7.50	2/9/96 22:00	-0.1	
10830	7.52	2/9/96 22:30	-0.09	
10860	7.54	2/9/96 23:00	-0.1	
10890	7.56	2/9/96 23:30	-0.08	
10920	7.58	2/10/96 0:00	-0.08	
10950	7.60	2/10/96 0:30	-0.08	
10980	7.63	2/10/96 1:00	-0.08	
11010	7.65	2/10/96 1:30	-0.07	
11040	7.67	2/10/96 2:00	-0.06	
11070	7.69	2/10/96 2:30	-0.06	
11100	7.71	2/10/96 3:00	-0.06	
11130	7.73	2/10/96 3:30	-0.06	
11160	7.75	2/10/96 4:00	-0.06	
11190	7.77	2/10/96 4:30	-0.06	
11220	7.79	2/10/96 5:00	-0.06	
11250	7.81	2/10/96 5:30	-0.05	
11280	7.83	2/10/96 6:00	-0.05	
11310	7.85	2/10/96 6:30	-0.05	
11340	7.88	2/10/96 7:00	-0.05	
11370	7.90	2/10/96 7:30	-0.05	
11400	7.92	2/10/96 8:00	-0.05	
11430	7.94	2/10/96 8:30	-0.05	
11460	7.96	2/10/96 9:00	-0.04	
11490	7.98	2/10/96 9:30	-0.04	
11520	8.00	2/10/96 10:00	-0.04	
11550	8.02	2/10/96 10:30	-0.03	
11580	8.04	2/10/96 11:00	-0.03	
11610	8.06	2/10/96 11:30	-0.04	
11640	8.08	2/10/96 12:00	-0.04	
11670	8.10	2/10/96 12:30	-0.05	
11700	8.13	2/10/96 13:00	-0.05	
11730	8.15	2/10/96 13:30	-0.05	
11760	8.17	2/10/96 14:00	-0.06	
11790	8.19	2/10/96 14:30	-0.06	
11820	8.21	2/10/96 15:00	-0.06	
11850	8.23	2/10/96 15:30	-0.07	
11880	8.25	2/10/96 16:00	-0.08	
11910	8.27	2/10/96 16:30	-0.08	
11940	8.29	2/10/96 17:00	-0.08	
11970	8.31	2/10/96 17:30	-0.08	
12000	8.33	2/10/96 18:00	-0.08	
12030	8.35	2/10/96 18:30	-0.08	
12060	8.38	2/10/96 19:00	-0.08	

12090	8.40	2/10/96 19:30	-0.06	
12120	8.42	2/10/96 20:00	-0.05	
12150	8.44	2/10/96 20:30	-0.05	
12180	8.46	2/10/96 21:00	-0.03	
12210	8.48	2/10/96 21:30	-0.03	
12240	8.50	2/10/96 22:00	-0.03	
12270	8.52	2/10/96 22:30	-0.01	
12300	8.54	2/10/96 23:00	-0.01	
12330	8.56	2/10/96 23:30	-0.01	
12360	8.58	2/11/96 0:00	-0.01	
12390	8.60	2/11/96 0:30	-0.01	
12420	8.63	2/11/96 1:00	-0.01	
12450	8.65	2/11/96 1:30	-0.01	
12480	8.67	2/11/96 2:00	-0.01	
12510	8.69	2/11/96 2:30	-0.01	
12540	8.71	2/11/96 3:00	-0.01	
12570	8.73	2/11/96 3:30	-0.01	
12600	8.75	2/11/96 4:00	-0.01	
12630	8.77	2/11/96 4:30	-0.01	
12660	8.79	2/11/96 5:00	-0.01	
12690	8.81	2/11/96 5:30	-0.01	
12720	8.83	2/11/96 6:00	-0.01	
12750	8.85	2/11/96 6:30	-0.02	
12780	8.88	2/11/96 7:00	-0.01	
12810	8.90	2/11/96 7:30	-0.01	
12840	8.92	2/11/96 8:00	-0.01	
12870	8.94	2/11/96 8:30	-0.01	
12900	8.96	2/11/96 9:00	-0.02	
12930	8.98	2/11/96 9:30	-0.02	
12960	9.00	2/11/96 10:00	-0.03	
12990	9.02	2/11/96 10:30	-0.03	
13020	9.04	2/11/96 11:00	-0.03	
13050	9.06	2/11/96 11:30	-0.03	
13080	9.08	2/11/96 12:00	-0.03	
13110	9.10	2/11/96 12:30	-0.04	
13140	9.13	2/11/96 13:00	-0.03	
13170	9.15	2/11/96 13:30	-0.04	
13200	9.17	2/11/96 14:00	-0.05	
13230	9.19	2/11/96 14:30	-0.05	
13260	9.21	2/11/96 15:00	-0.05	
13290	9.23	2/11/96 15:30	-0.06	
13320	9.25	2/11/96 16:00	-0.06	
13350	9.27	2/11/96 16:30	-0.06	
13380	9.29	2/11/96 17:00	-0.06	
13410	9.31	2/11/96 17:30	-0.06	
13440	9.33	2/11/96 18:00	-0.06	
13470	9.35	2/11/96 18:30	-0.06	
13500	9.38	2/11/96 19:00	-0.06	
13530	9.40	2/11/96 19:30	-0.06	
13560	9.42	2/11/96 20:00	-0.06	
13590	9.44	2/11/96 20:30	-0.06	

13620	9.46	2/11/96 21:00	-0.06	
13650	9.48	2/11/96 21:30	-0.06	
13680	9.50	2/11/96 22:00	-0.05	
13710	9.52	2/11/96 22:30	-0.05	
13740	9.54	2/11/96 23:00	-0.05	
13770	9.56	2/11/96 23:30	-0.05	
13800	9.58	2/12/96 0:00	-0.04	
13830	9.60	2/12/96 0:30	-0.04	
13860	9.63	2/12/96 1:00	-0.04	
13890	9.65	2/12/96 1:30	-0.04	
13920	9.67	2/12/96 2:00	-0.04	
13950	9.69	2/12/96 2:30	-0.04	
13980	9.71	2/12/96 3:00	-0.04	
14010	9.73	2/12/96 3:30	-0.05	
14040	9.75	2/12/96 4:00	-0.05	
14070	9.77	2/12/96 4:30	-0.05	
14100	9.79	2/12/96 5:00	-0.05	
14130	9.81	2/12/96 5:30	-0.05	
14160	9.83	2/12/96 6:00	-0.06	
14190	9.85	2/12/96 6:30	-0.06	
14220	9.88	2/12/96 7:00	-0.06	
14250	9.90	2/12/96 7:30	-0.08	
14280	9.92	2/12/96 8:00	-0.08	
14310	9.94	2/12/96 8:30	-0.09	
14340	9.96	2/12/96 9:00	-0.08	
14370	9.98	2/12/96 9:30	-0.08	
14400	10.00	2/12/96 10:00	-0.08	
14430	10.02	2/12/96 10:30	-0.08	
14460	10.04	2/12/96 11:00	-0.07	
14490	10.06	2/12/96 11:30	-0.08	
14520	10.08	2/12/96 12:00	-0.07	
14550	10.10	2/12/96 12:30	-0.06	
14580	10.13	2/12/96 13:00	-0.06	
14610	10.15	2/12/96 13:30	-0.06	
14640	10.17	2/12/96 14:00	-0.06	
14670	10.19	2/12/96 14:30	-0.05	
14700	10.21	2/12/96 15:00	-0.05	
14730	10.23	2/12/96 15:30	-0.05	
14760	10.25	2/12/96 16:00	-0.05	
14790	10.27	2/12/96 16:30	-0.05	
14820	10.29	2/12/96 17:00	-0.05	
14850	10.31	2/12/96 17:30	-0.05	
14880	10.33	2/12/96 18:00	-0.05	
14910	10.35	2/12/96 18:30	-0.05	
14940	10.38	2/12/96 19:00	-0.04	
14970	10.40	2/12/96 19:30	-0.03	
15000	10.42	2/12/96 20:00	-0.03	
15030	10.44	2/12/96 20:30	-0.03	
15060	10.46	2/12/96 21:00	-0.03	
15090	10.48	2/12/96 21:30	-0.03	
15120	10.50	2/12/96 22:00	-0.02	

15150	10.52	2/12/96 22:30	-0.01	
15180	10.54	2/12/96 23:00	-0.01	
15210	10.56	2/12/96 23:30	-0.01	
15240	10.58	2/13/96 0:00	0	
15270	10.60	2/13/96 0:30	0.01	
15300	10.63	2/13/96 1:00	0.01	
15330	10.65	2/13/96 1:30	0.02	
15360	10.67	2/13/96 2:00	0.02	
15390	10.69	2/13/96 2:30	0.02	
15420	10.71	2/13/96 3:00	0.03	
15450	10.73	2/13/96 3:30	0.03	
15480	10.75	2/13/96 4:00	0.04	
15510	10.77	2/13/96 4:30	0.04	
15540	10.79	2/13/96 5:00	0.04	
15570	10.81	2/13/96 5:30	0.04	
15600	10.83	2/13/96 6:00	0.06	
15630	10.85	2/13/96 6:30	0.06	
15660	10.88	2/13/96 7:00	0.07	
15690	10.90	2/13/96 7:30	0.08	
15720	10.92	2/13/96 8:00	0.09	
15750	10.94	2/13/96 8:30	0.09	
15780	10.96	2/13/96 9:00	0.11	
15810	10.98	2/13/96 9:30	0.11	
15840	11.00	2/13/96 10:00	0.12	
15870	11.02	2/13/96 10:30	0.13	
15900	11.04	2/13/96 11:00	0.14	
15930	11.06	2/13/96 11:30	0.15	
15960	11.08	2/13/96 12:00	0.16	
15990	11.10	2/13/96 12:30	0.17	
16020	11.13	2/13/96 13:00	0.18	
16050	11.15	2/13/96 13:30	0.18	
16080	11.17	2/13/96 14:00	0.18	
16110	11.19	2/13/96 14:30	0.18	
16140	11.21	2/13/96 15:00	0.18	
16170	11.23	2/13/96 15:30	0.17	
16200	11.25	2/13/96 16:00	0.16	
16230	11.27	2/13/96 16:30	0.17	
16260	11.29	2/13/96 17:00	0.16	
16290	11.31	2/13/96 17:30	0.16	
16320	11.33	2/13/96 18:00	0.15	
16350	11.35	2/13/96 18:30	0.15	
16380	11.38	2/13/96 19:00	0.14	
16410	11.40	2/13/96 19:30	0.13	
16440	11.42	2/13/96 20:00	0.12	
16470	11.44	2/13/96 20:30	0.12	
16500	11.46	2/13/96 21:00	0.11	
16530	11.48	2/13/96 21:30	0.11	
16560	11.50	2/13/96 22:00	0.11	
16590	11.52	2/13/96 22:30	0.1	
16620	11.54	2/13/96 23:00	0.09	
16650	11.56	2/13/96 23:30	0.09	

16680	11.58	2/14/96 0:00	0.09	
16710	11.60	2/14/96 0:30	0.07	
16740	11.63	2/14/96 1:00	0.08	
16770	11.65	2/14/96 1:30	0.07	
16800	11.67	2/14/96 2:00	0.07	
16830	11.69	2/14/96 2:30	0.07	
16860	11.71	2/14/96 3:00	0.06	
16890	11.73	2/14/96 3:30	0.06	
16920	11.75	2/14/96 4:00	0.06	
16950	11.77	2/14/96 4:30	0.06	
16980	11.79	2/14/96 5:00	0.06	
17010	11.81	2/14/96 5:30	0.05	
17040	11.83	2/14/96 6:00	0.05	
17070	11.85	2/14/96 6:30	0.04	
17100	11.88	2/14/96 7:00	0.03	
17130	11.90	2/14/96 7:30	0.03	
17160	11.92	2/14/96 8:00	0.02	
17190	11.94	2/14/96 8:30	0.02	
17220	11.96	2/14/96 9:00	0.01	
17250	11.98	2/14/96 9:30	0	
17280	12.00	2/14/96 10:00	0	
17310	12.02	2/14/96 10:30	0	
17340	12.04	2/14/96 11:00	0.01	
17370	12.06	2/14/96 11:30	0.01	
17400	12.08	2/14/96 12:00	0	
17430	12.10	2/14/96 12:30	0	
17460	12.13	2/14/96 13:00	0	
17490	12.15	2/14/96 13:30	-0.01	
17520	12.17	2/14/96 14:00	-0.01	
17550	12.19	2/14/96 14:30	-0.02	
17580	12.21	2/14/96 15:00	-0.03	
17610	12.23	2/14/96 15:30	-0.04	
17640	12.25	2/14/96 16:00	-0.05	
17670	12.27	2/14/96 16:30	-0.05	
17700	12.29	2/14/96 17:00	-0.06	
17730	12.31	2/14/96 17:30	-0.06	
17760	12.33	2/14/96 18:00	-0.07	
17790	12.35	2/14/96 18:30	-0.07	
17820	12.38	2/14/96 19:00	-0.08	
17850	12.40	2/14/96 19:30	-0.08	
17880	12.42	2/14/96 20:00	-0.08	
17910	12.44	2/14/96 20:30	-0.09	
17940	12.46	2/14/96 21:00	-0.09	
17970	12.48	2/14/96 21:30	-0.1	
18000	12.50	2/14/96 22:00	-0.09	
18030	12.52	2/14/96 22:30	-0.1	
18060	12.54	2/14/96 23:00	-0.1	
18090	12.56	2/14/96 23:30	-0.1	
18120	12.58	2/15/96 0:00	-0.1	
18150	12.60	2/15/96 0:30	-0.1	
18180	12.63	2/15/96 1:00	-0.1	

18210	12.65	2/15/96 1:30	-0.1	
18240	12.67	2/15/96 2:00	-0.1	
18270	12.69	2/15/96 2:30	-0.1	
18300	12.71	2/15/96 3:00	-0.1	
18330	12.73	2/15/96 3:30	-0.1	
18360	12.75	2/15/96 4:00	-0.11	
18390	12.77	2/15/96 4:30	-0.11	
18420	12.79	2/15/96 5:00	-0.12	
18450	12.81	2/15/96 5:30	-0.12	
18480	12.83	2/15/96 6:00	-0.12	
18510	12.85	2/15/96 6:30	-0.12	
18540	12.88	2/15/96 7:00	-0.13	
18570	12.90	2/15/96 7:30	-0.13	
18600	12.92	2/15/96 8:00	-0.13	
18630	12.94	2/15/96 8:30	-0.14	
18660	12.96	2/15/96 9:00	-0.14	
18690	12.98	2/15/96 9:30	-0.14	
18720	13.00	2/15/96 10:00	-0.15	
18750	13.02	2/15/96 10:30	-0.15	
18780	13.04	2/15/96 11:00	-0.15	
18810	13.06	2/15/96 11:30	-0.15	
18840	13.08	2/15/96 12:00	-0.15	
18870	13.10	2/15/96 12:30	-0.14	
18900	13.13	2/15/96 13:00	-0.15	
18930	13.15	2/15/96 13:30	-0.15	
18960	13.17	2/15/96 14:00	-0.16	
18990	13.19	2/15/96 14:30	-0.15	
19020	13.21	2/15/96 15:00	-0.17	
19050	13.23	2/15/96 15:30	-0.17	
19080	13.25	2/15/96 16:00	-0.17	
19110	13.27	2/15/96 16:30	-0.18	
19140	13.29	2/15/96 17:00	-0.18	
19170	13.31	2/15/96 17:30	-0.18	
19200	13.33	2/15/96 18:00	-0.19	
19230	13.35	2/15/96 18:30	-0.19	
19260	13.38	2/15/96 19:00	-0.2	
19290	13.40	2/15/96 19:30	-0.2	
19320	13.42	2/15/96 20:00	-0.21	
19350	13.44	2/15/96 20:30	-0.22	
19380	13.46	2/15/96 21:00	-0.23	
19410	13.48	2/15/96 21:30	-0.23	
19440	13.50	2/15/96 22:00	-0.23	
19470	13.52	2/15/96 22:30	-0.23	
19500	13.54	2/15/96 23:00	-0.23	
19530	13.56	2/15/96 23:30	-0.23	
19560	13.58	2/16/96 0:00	-0.23	
19590	13.60	2/16/96 0:30	-0.23	
19620	13.63	2/16/96 1:00	-0.23	
19650	13.65	2/16/96 1:30	-0.23	
19680	13.67	2/16/96 2:00	-0.23	
19710	13.69	2/16/96 2:30	-0.23	

19740	13.71	2/16/96 3:00	-0.23	
19770	13.73	2/16/96 3:30	-0.23	
19800	13.75	2/16/96 4:00	-0.23	
19830	13.77	2/16/96 4:30	-0.24	
19860	13.79	2/16/96 5:00	-0.24	
19890	13.81	2/16/96 5:30	-0.24	
19920	13.83	2/16/96 6:00	-0.24	
19950	13.85	2/16/96 6:30	-0.25	
19980	13.88	2/16/96 7:00	-0.25	
20010	13.90	2/16/96 7:30	-0.25	
20040	13.92	2/16/96 8:00	-0.25	
20070	13.94	2/16/96 8:30	-0.25	
		2/2/96 10:00		
20100	13.96	2/16/96 9:00	-0.25	
20130	13.98	2/16/96 9:30	-0.25	
20160	14.00	2/16/96 10:00	-0.24	
20190	14.02	2/16/96 10:30	-0.24	
20220	14.04	2/16/96 11:00	-0.22	
20250	14.06	2/16/96 11:30	-0.22	
20280	14.08	2/16/96 12:00	-0.2	
20310	14.10	2/16/96 12:30	-0.2	
20340	14.13	2/16/96 13:00	-0.2	
20370	14.15	2/16/96 13:30	-0.21	
20400	14.17	2/16/96 14:00	-0.2	
20430	14.19	2/16/96 14:30	-0.2	
20460	14.21	2/16/96 15:00	-0.2	
20490	14.23	2/16/96 15:30	-0.2	
20520	14.25	2/16/96 16:00	-0.19	
20550	14.27	2/16/96 16:30	-0.19	
20580	14.29	2/16/96 17:00	-0.19	
20610	14.31	2/16/96 17:30	-0.18	
20640	14.33	2/16/96 18:00	-0.18	
20670	14.35	2/16/96 18:30	-0.18	
20700	14.38	2/16/96 19:00	-0.18	
20730	14.40	2/16/96 19:30	-0.17	
20760	14.42	2/16/96 20:00	-0.17	
20790	14.44	2/16/96 20:30	-0.17	
20820	14.46	2/16/96 21:00	-0.15	
20850	14.48	2/16/96 21:30	-0.15	
20880	14.50	2/16/96 22:00	-0.14	
20910	14.52	2/16/96 22:30	-0.14	
20940	14.54	2/16/96 23:00	-0.14	
20970	14.56	2/16/96 23:30	-0.12	
21000	14.58	2/17/96 0:00	-0.12	
21030	14.60	2/17/96 0:30	-0.11	
21060	14.63	2/17/96 1:00	-0.1	
21090	14.65	2/17/96 1:30	-0.09	
21120	14.67	2/17/96 2:00	-0.07	
21150	14.69	2/17/96 2:30	-0.07	
21180	14.71	2/17/96 3:00	-0.07	
21210	14.73	2/17/96 3:30	-0.06	

21240	14.75	2/17/96 4:00	-0.06	
21270	14.77	2/17/96 4:30	-0.06	
21300	14.79	2/17/96 5:00	-0.06	
21330	14.81	2/17/96 5:30	-0.06	
21360	14.83	2/17/96 6:00	-0.06	
21390	14.85	2/17/96 6:30	-0.05	
21420	14.88	2/17/96 7:00	-0.06	
21450	14.90	2/17/96 7:30	-0.06	
21480	14.92	2/17/96 8:00	-0.07	
21510	14.94	2/17/96 8:30	-0.07	
21540	14.96	2/17/96 9:00	-0.07	
21570	14.98	2/17/96 9:30	-0.08	
21600	15.00	2/17/96 10:00	-0.08	
21630	15.02	2/17/96 10:30	-0.09	
21660	15.04	2/17/96 11:00	-0.1	
21690	15.06	2/17/96 11:30	-0.1	
21720	15.08	2/17/96 12:00	-0.11	
21750	15.10	2/17/96 12:30	-0.12	
21780	15.13	2/17/96 13:00	-0.12	
21810	15.15	2/17/96 13:30	-0.13	
21840	15.17	2/17/96 14:00	-0.13	
21870	15.19	2/17/96 14:30	-0.15	
21900	15.21	2/17/96 15:00	-0.15	
21930	15.23	2/17/96 15:30	-0.15	
21960	15.25	2/17/96 16:00	-0.17	
21990	15.27	2/17/96 16:30	-0.17	
22020	15.29	2/17/96 17:00	-0.17	
22050	15.31	2/17/96 17:30	-0.17	
22080	15.33	2/17/96 18:00	-0.17	
22110	15.35	2/17/96 18:30	-0.17	
22140	15.38	2/17/96 19:00	-0.17	
22170	15.40	2/17/96 19:30	-0.17	
22200	15.42	2/17/96 20:00	-0.16	
22230	15.44	2/17/96 20:30	-0.16	
22260	15.46	2/17/96 21:00	-0.16	
22290	15.48	2/17/96 21:30	-0.15	
22320	15.50	2/17/96 22:00	-0.15	
22350	15.52	2/17/96 22:30	-0.14	
22380	15.54	2/17/96 23:00	-0.13	
22410	15.56	2/17/96 23:30	-0.13	
22440	15.58	2/18/96 0:00	-0.13	
22470	15.60	2/18/96 0:30	-0.12	
22500	15.63	2/18/96 1:00	-0.12	
22530	15.65	2/18/96 1:30	-0.12	
22560	15.67	2/18/96 2:00	-0.11	
22590	15.69	2/18/96 2:30	-0.11	
22620	15.71	2/18/96 3:00	-0.1	
22650	15.73	2/18/96 3:30	-0.1	
22680	15.75	2/18/96 4:00	-0.1	
22710	15.77	2/18/96 4:30	-0.09	
22740	15.79	2/18/96 5:00	-0.09	

22770	15.81	2/18/96 5:30	-0.09	
22800	15.83	2/18/96 6:00	-0.1	
22830	15.85	2/18/96 6:30	-0.1	
22860	15.88	2/18/96 7:00	-0.1	
22890	15.90	2/18/96 7:30	-0.1	
22920	15.92	2/18/96 8:00	-0.1	
22950	15.94	2/18/96 8:30	-0.09	
22980	15.96	2/18/96 9:00	-0.1	
23010	15.98	2/18/96 9:30	-0.09	
23040	16.00	2/18/96 10:00	-0.09	
23070	16.02	2/18/96 10:30	-0.07	
23100	16.04	2/18/96 11:00	-0.08	
23130	16.06	2/18/96 11:30	-0.07	
23160	16.08	2/18/96 12:00	-0.07	
23190	16.10	2/18/96 12:30	-0.07	
23220	16.13	2/18/96 13:00	-0.07	
23250	16.15	2/18/96 13:30	-0.07	
23280	16.17	2/18/96 14:00	-0.07	
23310	16.19	2/18/96 14:30	-0.07	
23340	16.21	2/18/96 15:00	-0.07	
23370	16.23	2/18/96 15:30	-0.07	
23400	16.25	2/18/96 16:00	-0.08	
23430	16.27	2/18/96 16:30	-0.08	
23460	16.29	2/18/96 17:00	-0.08	
23490	16.31	2/18/96 17:30	-0.08	
23520	16.33	2/18/96 18:00	-0.08	
23550	16.35	2/18/96 18:30	-0.08	
23580	16.38	2/18/96 19:00	-0.08	
23610	16.40	2/18/96 19:30	-0.09	
23640	16.42	2/18/96 20:00	-0.09	
23670	16.44	2/18/96 20:30	-0.08	
23700	16.46	2/18/96 21:00	-0.08	
23730	16.48	2/18/96 21:30	-0.08	
23760	16.50	2/18/96 22:00	-0.08	
23790	16.52	2/18/96 22:30	-0.08	
23820	16.54	2/18/96 23:00	-0.08	
23850	16.56	2/18/96 23:30	-0.08	
23880	16.58	2/19/96 0:00	-0.07	
23910	16.60	2/19/96 0:30	-0.07	
23940	16.63	2/19/96 1:00	-0.06	
23970	16.65	2/19/96 1:30	-0.06	
24000	16.67	2/19/96 2:00	-0.06	
24030	16.69	2/19/96 2:30	-0.07	
24060	16.71	2/19/96 3:00	-0.07	
24090	16.73	2/19/96 3:30	-0.07	
24120	16.75	2/19/96 4:00	-0.07	
24150	16.77	2/19/96 4:30	-0.07	
24180	16.79	2/19/96 5:00	-0.07	
24210	16.81	2/19/96 5:30	-0.08	
24240	16.83	2/19/96 6:00	-0.08	
24270	16.85	2/19/96 6:30	-0.08	

24300	16.88	2/19/96 7:00	-0.1	
24330	16.90	2/19/96 7:30	-0.1	
24360	16.92	2/19/96 8:00	-0.09	
24390	16.94	2/19/96 8:30	-0.1	
24420	16.96	2/19/96 9:00	-0.1	
24450	16.98	2/19/96 9:30	-0.1	
24480	17.00	2/19/96 10:00	-0.1	
24510	17.02	2/19/96 10:30	-0.1	
24540	17.04	2/19/96 11:00	-0.1	
24570	17.06	2/19/96 11:30	-0.1	
24600	17.08	2/19/96 12:00	-0.1	
24630	17.10	2/19/96 12:30	-0.09	
24660	17.13	2/19/96 13:00	-0.09	
24690	17.15	2/19/96 13:30	-0.1	
24720	17.17	2/19/96 14:00	-0.09	
24750	17.19	2/19/96 14:30	-0.09	
24780	17.21	2/19/96 15:00	-0.1	
24810	17.23	2/19/96 15:30	-0.1	
24840	17.25	2/19/96 16:00	-0.11	
24870	17.27	2/19/96 16:30	-0.11	
24900	17.29	2/19/96 17:00	-0.11	
24930	17.31	2/19/96 17:30	-0.11	
24960	17.33	2/19/96 18:00	-0.12	
24990	17.35	2/19/96 18:30	-0.12	
25020	17.38	2/19/96 19:00	-0.12	
25050	17.40	2/19/96 19:30	-0.12	
25080	17.42	2/19/96 20:00	-0.13	
25110	17.44	2/19/96 20:30	-0.13	
25140	17.46	2/19/96 21:00	-0.13	
25170	17.48	2/19/96 21:30	-0.13	
25200	17.50	2/19/96 22:00	-0.13	
25230	17.52	2/19/96 22:30	-0.15	
25260	17.54	2/19/96 23:00	-0.15	
25290	17.56	2/19/96 23:30	-0.15	
25320	17.58	2/20/96 0:00	-0.15	
25350	17.60	2/20/96 0:30	-0.15	
25380	17.63	2/20/96 1:00	-0.15	
25410	17.65	2/20/96 1:30	-0.15	
25440	17.67	2/20/96 2:00	-0.14	
25470	17.69	2/20/96 2:30	-0.13	
25500	17.71	2/20/96 3:00	-0.14	
25530	17.73	2/20/96 3:30	-0.15	
25560	17.75	2/20/96 4:00	-0.14	
25590	17.77	2/20/96 4:30	-0.14	
25620	17.79	2/20/96 5:00	-0.15	
25650	17.81	2/20/96 5:30	-0.15	
25680	17.83	2/20/96 6:00	-0.14	
25710	17.85	2/20/96 6:30	-0.15	
25740	17.88	2/20/96 7:00	-0.15	
25770	17.90	2/20/96 7:30	-0.15	
25800	17.92	2/20/96 8:00	-0.16	

25830	17.94	2/20/96 8:30	-0.16	
25860	17.96	2/20/96 9:00	-0.16	
25890	17.98	2/20/96 9:30	-0.15	
25920	18.00	2/20/96 10:00	-0.17	
25950	18.02	2/20/96 10:30	-0.15	
25980	18.04	2/20/96 11:00	-0.15	
26010	18.06	2/20/96 11:30	-0.15	
26040	18.08	2/20/96 12:00	-0.14	
26070	18.10	2/20/96 12:30	-0.14	
26100	18.13	2/20/96 13:00	-0.14	
26130	18.15	2/20/96 13:30	-0.15	
26160	18.17	2/20/96 14:00	-0.16	
26190	18.19	2/20/96 14:30	-0.17	
26220	18.21	2/20/96 15:00	-0.17	
26250	18.23	2/20/96 15:30	-0.17	
26280	18.25	2/20/96 16:00	-0.17	
26310	18.27	2/20/96 16:30	-0.18	
26340	18.29	2/20/96 17:00	-0.18	
26370	18.31	2/20/96 17:30	-0.19	
26400	18.33	2/20/96 18:00	-0.19	
26430	18.35	2/20/96 18:30	-0.19	
26460	18.38	2/20/96 19:00	-0.2	
26490	18.40	2/20/96 19:30	-0.2	
26520	18.42	2/20/96 20:00	-0.22	
26550	18.44	2/20/96 20:30	-0.23	
26580	18.46	2/20/96 21:00	-0.24	
26610	18.48	2/20/96 21:30	-0.25	
26640	18.50	2/20/96 22:00	-0.25	
26670	18.52	2/20/96 22:30	-0.25	
26700	18.54	2/20/96 23:00	-0.25	
26730	18.56	2/20/96 23:30	-0.25	
26760	18.58	2/21/96 0:00	-0.26	
26790	18.60	2/21/96 0:30	-0.25	
26820	18.63	2/21/96 1:00	-0.26	
26850	18.65	2/21/96 1:30	-0.26	
26880	18.67	2/21/96 2:00	-0.25	
26910	18.69	2/21/96 2:30	-0.25	
26940	18.71	2/21/96 3:00	-0.26	
26970	18.73	2/21/96 3:30	-0.27	
27000	18.75	2/21/96 4:00	-0.27	
27030	18.77	2/21/96 4:30	-0.27	
27060	18.79	2/21/96 5:00	-0.28	
27090	18.81	2/21/96 5:30	-0.27	
27120	18.83	2/21/96 6:00	-0.27	
27150	18.85	2/21/96 6:30	-0.27	
27180	18.88	2/21/96 7:00	-0.28	
27210	18.90	2/21/96 7:30	-0.27	
27240	18.92	2/21/96 8:00	-0.26	
27270	18.94	2/21/96 8:30	-0.26	
27300	18.96	2/21/96 9:00	-0.26	
27330	18.98	2/21/96 9:30	-0.26	

27360	19.00	2/21/96 10:00	-0.26	
27390	19.02	2/21/96 10:30	-0.25	
27420	19.04	2/21/96 11:00	-0.25	
27450	19.06	2/21/96 11:30	-0.26	
27480	19.08	2/21/96 12:00	-0.26	
27510	19.10	2/21/96 12:30	-0.26	
27540	19.13	2/21/96 13:00	-0.26	
27570	19.15	2/21/96 13:30	-0.26	
27600	19.17	2/21/96 14:00	-0.26	
27630	19.19	2/21/96 14:30	-0.26	
27660	19.21	2/21/96 15:00	-0.25	
27690	19.23	2/21/96 15:30	-0.25	
27720	19.25	2/21/96 16:00	-0.25	
27750	19.27	2/21/96 16:30	-0.25	
27780	19.29	2/21/96 17:00	-0.25	
27810	19.31	2/21/96 17:30	-0.24	
27840	19.33	2/21/96 18:00	-0.24	
27870	19.35	2/21/96 18:30	-0.25	
27900	19.38	2/21/96 19:00	-0.25	
27930	19.40	2/21/96 19:30	-0.25	
27960	19.42	2/21/96 20:00	-0.25	
27990	19.44	2/21/96 20:30	-0.25	
28020	19.46	2/21/96 21:00	-0.25	
28050	19.48	2/21/96 21:30	-0.25	
28080	19.50	2/21/96 22:00	-0.25	
28110	19.52	2/21/96 22:30	-0.25	
28140	19.54	2/21/96 23:00	-0.25	
28170	19.56	2/21/96 23:30	-0.25	
28200	19.58	2/22/96 0:00	-0.25	
28230	19.60	2/22/96 0:30	-0.25	
28260	19.63	2/22/96 1:00	-0.25	
28290	19.65	2/22/96 1:30	-0.25	
28320	19.67	2/22/96 2:00	-0.25	
28350	19.69	2/22/96 2:30	-0.25	
28380	19.71	2/22/96 3:00	-0.25	
28410	19.73	2/22/96 3:30	-0.26	
28440	19.75	2/22/96 4:00	-0.26	
28470	19.77	2/22/96 4:30	-0.26	
28500	19.79	2/22/96 5:00	-0.26	
28530	19.81	2/22/96 5:30	-0.26	
28560	19.83	2/22/96 6:00	-0.26	
28590	19.85	2/22/96 6:30	-0.26	
28620	19.88	2/22/96 7:00	-0.26	
28650	19.90	2/22/96 7:30	-0.26	
28680	19.92	2/22/96 8:00	-0.28	
28710	19.94	2/22/96 8:30	-0.28	
28740	19.96	2/22/96 9:00	-0.28	
28770	19.98	2/22/96 9:30	-0.27	
28800	20.00	2/22/96 10:00	-0.25	
28830	20.02	2/22/96 10:30	-0.26	
28860	20.04	2/22/96 11:00	-0.25	

28890	20.06	2/22/96 11:30	-0.25	
28920	20.08	2/22/96 12:00	-0.25	
28950	20.10	2/22/96 12:30	-0.24	
28980	20.13	2/22/96 13:00	-0.23	
29010	20.15	2/22/96 13:30	-0.23	
29040	20.17	2/22/96 14:00	-0.24	
29070	20.19	2/22/96 14:30	-0.22	
29100	20.21	2/22/96 15:00	-0.34	
29130	20.23	2/22/96 15:30	-0.2	
29160	20.25	2/22/96 16:00	-0.21	
29190	20.27	2/22/96 16:30	-0.22	
29220	20.29	2/22/96 17:00	-0.22	
29250	20.31	2/22/96 17:30	-0.21	
29280	20.33	2/22/96 18:00	-0.2	
29310	20.35	2/22/96 18:30	-0.2	
29340	20.38	2/22/96 19:00	-0.19	
29370	20.40	2/22/96 19:30	-0.19	
29400	20.42	2/22/96 20:00	-0.19	
29430	20.44	2/22/96 20:30	-0.19	
29460	20.46	2/22/96 21:00	-0.19	
29490	20.48	2/22/96 21:30	-0.19	
29520	20.50	2/22/96 22:00	-0.19	
29550	20.52	2/22/96 22:30	-0.17	
29580	20.54	2/22/96 23:00	-0.17	
29610	20.56	2/22/96 23:30	-0.16	
29640	20.58	2/23/96 0:00	-0.15	
29670	20.60	2/23/96 0:30	-0.14	
29700	20.63	2/23/96 1:00	-0.13	
29730	20.65	2/23/96 1:30	-0.12	
29760	20.67	2/23/96 2:00	-0.12	
29790	20.69	2/23/96 2:30	-0.12	
29820	20.71	2/23/96 3:00	-0.11	
29850	20.73	2/23/96 3:30	-0.1	
29880	20.75	2/23/96 4:00	-0.1	
29910	20.77	2/23/96 4:30	-0.1	
29940	20.79	2/23/96 5:00	-0.09	
29970	20.81	2/23/96 5:30	0	
30000	20.83	2/23/96 6:00	-0.07	
30030	20.85	2/23/96 6:30	0.14	
30060	20.88	2/23/96 7:00	-0.01	
30090	20.90	2/23/96 7:30	-0.05	
30120	20.92	2/23/96 8:00	-0.04	
30150	20.94	2/23/96 8:30	-0.01	
30180	20.96	2/23/96 9:00	-0.05	
30210	20.98	2/23/96 9:30	-0.03	
30240	21.00	2/23/96 10:00	-0.03	
30270	21.02	2/23/96 10:30	-0.03	
30300	21.04	2/23/96 11:00	-0.02	
30330	21.06	2/23/96 11:30	-0.03	
30360	21.08	2/23/96 12:00	-0.01	
30390	21.10	2/23/96 12:30	-0.02	

30420	21.13	2/23/96 13:00	-0.05	
30450	21.15	2/23/96 13:30	-0.01	
30480	21.17	2/23/96 14:00	-0.05	
30510	21.19	2/23/96 14:30	-0.15	
30540	21.21	2/23/96 15:00	-0.08	
30570	21.23	2/23/96 15:30	-0.1	
30600	21.25	2/23/96 16:00	-0.12	
30630	21.27	2/23/96 16:30	-0.13	
30660	21.29	2/23/96 17:00	-0.15	
30690	21.31	2/23/96 17:30	-0.15	
30720	21.33	2/23/96 18:00	-0.17	
30750	21.35	2/23/96 18:30	-0.17	
30780	21.38	2/23/96 19:00	-0.19	
30810	21.40	2/23/96 19:30	-0.19	
30840	21.42	2/23/96 20:00	-0.19	
30870	21.44	2/23/96 20:30	-0.19	
30900	21.46	2/23/96 21:00	-0.19	
30930	21.48	2/23/96 21:30	-0.19	
30960	21.50	2/23/96 22:00	-0.2	
30990	21.52	2/23/96 22:30	-0.19	
31020	21.54	2/23/96 23:00	-0.2	
31050	21.56	2/23/96 23:30	-0.2	
31080	21.58	2/24/96 0:00	-0.2	
31110	21.60	2/24/96 0:30	-0.2	
31140	21.63	2/24/96 1:00	-0.2	
31170	21.65	2/24/96 1:30	-0.2	
31200	21.67	2/24/96 2:00	-0.2	
31230	21.69	2/24/96 2:30	-0.21	
31260	21.71	2/24/96 3:00	-0.2	
31290	21.73	2/24/96 3:30	-0.21	
31320	21.75	2/24/96 4:00	-0.2	
31350	21.77	2/24/96 4:30	-0.2	
31380	21.79	2/24/96 5:00	-0.21	
31410	21.81	2/24/96 5:30	-0.21	
31440	21.83	2/24/96 6:00	-0.14	
31470	21.85	2/24/96 6:30	-0.07	
31500	21.88	2/24/96 7:00	-0.16	
31530	21.90	2/24/96 7:30	-0.19	
31560	21.92	2/24/96 8:00	-0.2	
31590	21.94	2/24/96 8:30	-0.2	
31620	21.96	2/24/96 9:00	-0.17	
31650	21.98	2/24/96 9:30	-0.18	
31680	22.00	2/24/96 10:00	-0.19	
31710	22.02	2/24/96 10:30	-0.19	
31740	22.04	2/24/96 11:00	-0.19	
31770	22.06	2/24/96 11:30	-0.18	
31800	22.08	2/24/96 12:00	-0.16	
31830	22.10	2/24/96 12:30	-0.17	
31860	22.13	2/24/96 13:00	-0.17	
31890	22.15	2/24/96 13:30	-0.15	
31920	22.17	2/24/96 14:00	-0.13	

31950	22.19	2/24/96 14:30	-0.15	
31980	22.21	2/24/96 15:00	-0.15	
32010	22.23	2/24/96 15:30	-0.15	
32040	22.25	2/24/96 16:00	-0.15	
32070	22.27	2/24/96 16:30	-0.14	
32100	22.29	2/24/96 17:00	-0.13	
32130	22.31	2/24/96 17:30	-0.13	
32160	22.33	2/24/96 18:00	-0.13	
32190	22.35	2/24/96 18:30	-0.13	
32220	22.38	2/24/96 19:00	-0.13	
32250	22.40	2/24/96 19:30	-0.13	
32280	22.42	2/24/96 20:00	-0.13	
32310	22.44	2/24/96 20:30	-0.13	
32340	22.46	2/24/96 21:00	-0.13	
32370	22.48	2/24/96 21:30	-0.12	
32400	22.50	2/24/96 22:00	-0.12	
32430	22.52	2/24/96 22:30	-0.12	
32460	22.54	2/24/96 23:00	-0.11	
32490	22.56	2/24/96 23:30	-0.12	
32520	22.58	2/25/96 0:00	-0.11	
32550	22.60	2/25/96 0:30	-0.1	
32580	22.63	2/25/96 1:00	-0.1	
32610	22.65	2/25/96 1:30	-0.1	
32640	22.67	2/25/96 2:00	-0.1	
32670	22.69	2/25/96 2:30	-0.1	
32700	22.71	2/25/96 3:00	-0.1	
32730	22.73	2/25/96 3:30	-0.11	
32760	22.75	2/25/96 4:00	-0.1	
32790	22.77	2/25/96 4:30	-0.1	
32820	22.79	2/25/96 5:00	-0.1	
32850	22.81	2/25/96 5:30	-0.1	
32880	22.83	2/25/96 6:00	-0.1	
32910	22.85	2/25/96 6:30	-0.1	
32940	22.88	2/25/96 7:00	-0.1	
32970	22.90	2/25/96 7:30	-0.09	
33000	22.92	2/25/96 8:00	-0.1	
33030	22.94	2/25/96 8:30	-0.09	
33060	22.96	2/25/96 9:00	-0.09	
33090	22.98	2/25/96 9:30	-0.09	
33120	23.00	2/25/96 10:00	-0.08	
33150	23.02	2/25/96 10:30	-0.08	
33180	23.04	2/25/96 11:00	-0.08	
33210	23.06	2/25/96 11:30	-0.07	
33240	23.08	2/25/96 12:00	-0.07	
33270	23.10	2/25/96 12:30	-0.07	
33300	23.13	2/25/96 13:00	-0.06	
33330	23.15	2/25/96 13:30	-0.07	
33360	23.17	2/25/96 14:00	-0.07	
		2/2/96 10:00		
33390	23.19	2/25/96 14:30	-0.07	
33420	23.21	2/25/96 15:00	-0.07	

33450	23.23	2/25/96 15:30	-0.07	
33480	23.25	2/25/96 16:00	-0.07	
33510	23.27	2/25/96 16:30	-0.07	
33540	23.29	2/25/96 17:00	-0.07	
33570	23.31	2/25/96 17:30	-0.08	
33600	23.33	2/25/96 18:00	-0.08	
33630	23.35	2/25/96 18:30	-0.08	
33660	23.38	2/25/96 19:00	-0.07	
33690	23.40	2/25/96 19:30	-0.07	
33720	23.42	2/25/96 20:00	-0.07	
33750	23.44	2/25/96 20:30	-0.07	
33780	23.46	2/25/96 21:00	-0.07	
33810	23.48	2/25/96 21:30	-0.06	
33840	23.50	2/25/96 22:00	-0.06	
33870	23.52	2/25/96 22:30	-0.06	
33900	23.54	2/25/96 23:00	-0.06	
33930	23.56	2/25/96 23:30	-0.06	
33960	23.58	2/26/96 0:00	-0.06	
33990	23.60	2/26/96 0:30	-0.06	
34020	23.63	2/26/96 1:00	-0.06	
34050	23.65	2/26/96 1:30	-0.06	
34080	23.67	2/26/96 2:00	-0.06	
34110	23.69	2/26/96 2:30	-0.05	
34140	23.71	2/26/96 3:00	-0.06	
34170	23.73	2/26/96 3:30	-0.06	
34200	23.75	2/26/96 4:00	-0.06	
34230	23.77	2/26/96 4:30	-0.06	
34260	23.79	2/26/96 5:00	-0.06	
34290	23.81	2/26/96 5:30	-0.06	
34320	23.83	2/26/96 6:00	-0.07	
34350	23.85	2/26/96 6:30	-0.07	
34380	23.88	2/26/96 7:00	-0.07	
34410	23.90	2/26/96 7:30	-0.08	
34440	23.92	2/26/96 8:00	-0.08	
34470	23.94	2/26/96 8:30	-0.07	
34500	23.96	2/26/96 9:00	-0.07	
34530	23.98	2/26/96 9:30	-0.08	
34560	24.00	2/26/96 10:00	-0.08	
34590	24.02	2/26/96 10:30	-0.08	
34620	24.04	2/26/96 11:00	-0.07	
34650	24.06	2/26/96 11:30	-0.08	
34680	24.08	2/26/96 12:00	-0.08	
34710	24.10	2/26/96 12:30	-0.07	
34740	24.13	2/26/96 13:00	-0.08	
34770	24.15	2/26/96 13:30	-0.07	
34800	24.17	2/26/96 14:00	-0.08	
34830	24.19	2/26/96 14:30	-0.08	
34860	24.21	2/26/96 15:00	-0.07	
34890	24.23	2/26/96 15:30	-0.07	
34920	24.25	2/26/96 16:00	-0.08	
34950	24.27	2/26/96 16:30	-0.08	

34980	24.29	2/26/96 17:00	-0.09	
35010	24.31	2/26/96 17:30	-0.08	
35040	24.33	2/26/96 18:00	-0.07	
35070	24.35	2/26/96 18:30	-0.07	
35100	24.38	2/26/96 19:00	-0.07	
35130	24.40	2/26/96 19:30	-0.06	
35160	24.42	2/26/96 20:00	-0.06	
35190	24.44	2/26/96 20:30	-0.06	
35220	24.46	2/26/96 21:00	-0.05	
35250	24.48	2/26/96 21:30	-0.04	
35280	24.50	2/26/96 22:00	-0.04	
35310	24.52	2/26/96 22:30	-0.05	
35340	24.54	2/26/96 23:00	-0.04	
35370	24.56	2/26/96 23:30	-0.04	
35400	24.58	2/27/96 0:00	-0.01	
35430	24.60	2/27/96 0:30	-0.02	
35460	24.63	2/27/96 1:00	-0.01	
35490	24.65	2/27/96 1:30	-0.01	
35520	24.67	2/27/96 2:00	-0.01	
35550	24.69	2/27/96 2:30	0	
35580	24.71	2/27/96 3:00	0.01	
35610	24.73	2/27/96 3:30	-0.01	
35640	24.75	2/27/96 4:00	0	
35670	24.77	2/27/96 4:30	0.01	
35700	24.79	2/27/96 5:00	0.01	
35730	24.81	2/27/96 5:30	0.02	
35760	24.83	2/27/96 6:00	0.01	
35790	24.85	2/27/96 6:30	0.01	
35820	24.88	2/27/96 7:00	0.01	
35850	24.90	2/27/96 7:30	0.01	
35880	24.92	2/27/96 8:00	0.01	
35910	24.94	2/27/96 8:30	0.02	
35940	24.96	2/27/96 9:00	0.02	
35970	24.98	2/27/96 9:30	0.03	
36000	25.00	2/27/96 10:00	0.03	
36030	25.02	2/27/96 10:30	0.03	
36060	25.04	2/27/96 11:00	0.02	
36090	25.06	2/27/96 11:30	0.04	
36120	25.08	2/27/96 12:00	0.04	
36150	25.10	2/27/96 12:30	0.04	
36180	25.13	2/27/96 13:00	0.04	
36210	25.15	2/27/96 13:30	0.05	
36240	25.17	2/27/96 14:00	0.04	
36270	25.19	2/27/96 14:30	0.05	
36300	25.21	2/27/96 15:00	0.05	
36330	25.23	2/27/96 15:30	0.05	
36360	25.25	2/27/96 16:00	0.05	
36390	25.27	2/27/96 16:30	0.06	
36420	25.29	2/27/96 17:00	0.06	
36450	25.31	2/27/96 17:30	0.06	
36480	25.33	2/27/96 18:00	0.06	

36510	25.35	2/27/96 18:30	0.06	
36540	25.38	2/27/96 19:00	0.08	
36570	25.40	2/27/96 19:30	0.08	
36600	25.42	2/27/96 20:00	0.08	
36630	25.44	2/27/96 20:30	0.09	
36660	25.46	2/27/96 21:00	0.09	
36690	25.48	2/27/96 21:30	0.1	
36720	25.50	2/27/96 22:00	0.1	
36750	25.52	2/27/96 22:30	0.1	
36780	25.54	2/27/96 23:00	0.11	
36810	25.56	2/27/96 23:30	0.11	
36840	25.58	2/28/96 0:00	0.11	
36870	25.60	2/28/96 0:30	0.11	
36900	25.63	2/28/96 1:00	0.12	
36930	25.65	2/28/96 1:30	0.12	
36960	25.67	2/28/96 2:00	0.12	
36990	25.69	2/28/96 2:30	0.12	
37020	25.71	2/28/96 3:00	0.11	
37050	25.73	2/28/96 3:30	0.11	
37080	25.75	2/28/96 4:00	0.11	
37110	25.77	2/28/96 4:30	0.12	
37140	25.79	2/28/96 5:00	0.12	
37170	25.81	2/28/96 5:30	0.12	
37200	25.83	2/28/96 6:00	0.11	
37230	25.85	2/28/96 6:30	0.11	
37260	25.88	2/28/96 7:00	0.11	
37290	25.90	2/28/96 7:30	0.11	
37320	25.92	2/28/96 8:00	0.1	
37350	25.94	2/28/96 8:30	0.1	
37380	25.96	2/28/96 9:00	0.11	
37410	25.98	2/28/96 9:30	0.11	
37440	26.00	2/28/96 10:00	0.11	
37470	26.02	2/28/96 10:30	0.1	
37500	26.04	2/28/96 11:00	0.11	
37530	26.06	2/28/96 11:30	0.11	
37560	26.08	2/28/96 12:00	0.11	
37590	26.10	2/28/96 12:30	0.11	
37620	26.13	2/28/96 13:00	0.11	
37650	26.15	2/28/96 13:30	0.11	
37680	26.17	2/28/96 14:00	0.11	
37710	26.19	2/28/96 14:30	0.12	
37740	26.21	2/28/96 15:00	0.13	
37770	26.23	2/28/96 15:30	0.13	
37800	26.25	2/28/96 16:00	0.13	
37830	26.27	2/28/96 16:30	0.13	
37860	26.29	2/28/96 17:00	0.13	
37890	26.31	2/28/96 17:30	0.14	
37920	26.33	2/28/96 18:00	0.15	
37950	26.35	2/28/96 18:30	0.15	
37980	26.38	2/28/96 19:00	0.15	
38010	26.40	2/28/96 19:30	0.15	

38040	26.42	2/28/96 20:00	0.16	
38070	26.44	2/28/96 20:30	0.17	
38100	26.46	2/28/96 21:00	0.17	
38130	26.48	2/28/96 21:30	0.17	
38160	26.50	2/28/96 22:00	0.18	
38190	26.52	2/28/96 22:30	0.19	
38220	26.54	2/28/96 23:00	0.2	
38250	26.56	2/28/96 23:30	0.2	
38280	26.58	2/29/96 0:00	0.2	
38310	26.60	2/29/96 0:30	0.21	
38340	26.63	2/29/96 1:00	0.22	
38370	26.65	2/29/96 1:30	0.22	
38400	26.67	2/29/96 2:00	0.22	
38430	26.69	2/29/96 2:30	0.23	
38460	26.71	2/29/96 3:00	0.23	
38490	26.73	2/29/96 3:30	0.23	
38520	26.75	2/29/96 4:00	0.24	
38550	26.77	2/29/96 4:30	0.24	
38580	26.79	2/29/96 5:00	0.23	
38610	26.81	2/29/96 5:30	0.24	
38640	26.83	2/29/96 6:00	0.24	
38670	26.85	2/29/96 6:30	0.25	
38700	26.88	2/29/96 7:00	0.25	
38730	26.90	2/29/96 7:30	0.26	
38760	26.92	2/29/96 8:00	0.25	
38790	26.94	2/29/96 8:30	0.27	
38820	26.96	2/29/96 9:00	0.28	
38850	26.98	2/29/96 9:30	0.28	
38880	27.00	2/29/96 10:00	0.29	
38910	27.02	2/29/96 10:30	0.3	
38940	27.04	2/29/96 11:00	0.31	
38970	27.06	2/29/96 11:30	0.31	
39000	27.08	2/29/96 12:00	0.32	
39030	27.10	2/29/96 12:30	0.32	
39060	27.13	2/29/96 13:00	0.33	
39090	27.15	2/29/96 13:30	0.34	
39120	27.17	2/29/96 14:00	0.34	
39150	27.19	2/29/96 14:30	0.35	
39180	27.21	2/29/96 15:00	0.35	
39210	27.23	2/29/96 15:30	0.35	
39240	27.25	2/29/96 16:00	0.35	
39270	27.27	2/29/96 16:30	0.36	
39300	27.29	2/29/96 17:00	0.36	
39330	27.31	2/29/96 17:30	0.37	
39360	27.33	2/29/96 18:00	0.36	
39390	27.35	2/29/96 18:30	0.37	
39420	27.38	2/29/96 19:00	0.37	
39450	27.40	2/29/96 19:30	0.37	
39480	27.42	2/29/96 20:00	0.37	
39510	27.44	2/29/96 20:30	0.38	
39540	27.46	2/29/96 21:00	0.38	

39570	27.48	2/29/96 21:30	0.39	
39600	27.50	2/29/96 22:00	0.41	
39630	27.52	2/29/96 22:30	0.41	
39660	27.54	2/29/96 23:00	0.42	
39690	27.56	2/29/96 23:30	0.43	
39720	27.58	3/1/96 0:00	0.44	
39750	27.60	3/1/96 0:30	0.45	
39780	27.63	3/1/96 1:00	0.45	
39810	27.65	3/1/96 1:30	0.46	
39840	27.67	3/1/96 2:00	0.46	
39870	27.69	3/1/96 2:30	0.46	
39900	27.71	3/1/96 3:00	0.47	
39930	27.73	3/1/96 3:30	0.47	
39960	27.75	3/1/96 4:00	0.48	
39990	27.77	3/1/96 4:30	0.48	
40020	27.79	3/1/96 5:00	0.49	
40050	27.81	3/1/96 5:30	0.48	
40080	27.83	3/1/96 6:00	0.49	
40110	27.85	3/1/96 6:30	0.49	
40140	27.88	3/1/96 7:00	0.49	
40170	27.90	3/1/96 7:30	0.51	
40200	27.92	3/1/96 8:00	0.51	
40230	27.94	3/1/96 8:30	0.52	
40260	27.96	3/1/96 9:00	0.53	
40290	27.98	3/1/96 9:30	0.53	
40320	28.00	3/1/96 10:00	0.54	
40350	28.02	3/1/96 10:30	0.56	
40380	28.04	3/1/96 11:00	0.56	
40410	28.06	3/1/96 11:30	0.56	
40440	28.08	3/1/96 12:00	0.56	
40470	28.10	3/1/96 12:30	0.58	
40500	28.13	3/1/96 13:00	0.58	
40530	28.15	3/1/96 13:30	0.63	
40560	28.17	3/1/96 14:00	0.58	
40590	28.19	3/1/96 14:30	0.58	
40620	28.21	3/1/96 15:00	0.58	
40650	28.23	3/1/96 15:30	0.59	
40680	28.25	3/1/96 16:00	0.58	
40710	28.27	3/1/96 16:30	0.59	
40740	28.29	3/1/96 17:00	0.59	
40770	28.31	3/1/96 17:30	0.59	
40800	28.33	3/1/96 18:00	0.59	
40830	28.35	3/1/96 18:30	0.59	
40860	28.38	3/1/96 19:00	0.59	
40890	28.40	3/1/96 19:30	0.59	
40920	28.42	3/1/96 20:00	0.6	
40950	28.44	3/1/96 20:30	0.61	
40980	28.46	3/1/96 21:00	0.61	
41010	28.48	3/1/96 21:30	0.62	
41040	28.50	3/1/96 22:00	0.62	
41070	28.52	3/1/96 22:30	0.62	

41100	28.54	3/1/96 23:00	0.63	
41130	28.56	3/1/96 23:30	0.64	
41160	28.58	3/2/96 0:00	0.65	
41190	28.60	3/2/96 0:30	0.64	
41220	28.63	3/2/96 1:00	0.64	
41250	28.65	3/2/96 1:30	0.64	
41280	28.67	3/2/96 2:00	0.65	
41310	28.69	3/2/96 2:30	0.64	
41340	28.71	3/2/96 3:00	0.64	
41370	28.73	3/2/96 3:30	0.64	
41400	28.75	3/2/96 4:00	0.65	
41430	28.77	3/2/96 4:30	0.64	
41460	28.79	3/2/96 5:00	0.64	
41490	28.81	3/2/96 5:30	0.64	
41520	28.83	3/2/96 6:00	0.64	
41550	28.85	3/2/96 6:30	0.64	
41580	28.88	3/2/96 7:00	0.64	
41610	28.90	3/2/96 7:30	0.65	
41640	28.92	3/2/96 8:00	0.65	
41670	28.94	3/2/96 8:30	0.65	
41700	28.96	3/2/96 9:00	0.65	
41730	28.98	3/2/96 9:30	0.66	
41760	29.00	3/2/96 10:00	0.65	
41790	29.02	3/2/96 10:30	0.65	
41820	29.04	3/2/96 11:00	0.65	
41850	29.06	3/2/96 11:30	0.64	
41880	29.08	3/2/96 12:00	0.64	
41910	29.10	3/2/96 12:30	0.65	
41940	29.13	3/2/96 13:00	0.65	
41970	29.15	3/2/96 13:30	0.64	
42000	29.17	3/2/96 14:00	0.63	
42030	29.19	3/2/96 14:30	0.62	
42060	29.21	3/2/96 15:00	0.61	
42090	29.23	3/2/96 15:30	0.61	
42120	29.25	3/2/96 16:00	0.61	
42150	29.27	3/2/96 16:30	0.61	
42180	29.29	3/2/96 17:00	0.59	
42210	29.31	3/2/96 17:30	0.59	
42240	29.33	3/2/96 18:00	0.58	
42270	29.35	3/2/96 18:30	0.59	
42300	29.38	3/2/96 19:00	0.58	
42330	29.40	3/2/96 19:30	0.58	
42360	29.42	3/2/96 20:00	0.58	
42390	29.44	3/2/96 20:30	0.58	
42420	29.46	3/2/96 21:00	0.57	
42450	29.48	3/2/96 21:30	0.57	
42480	29.50	3/2/96 22:00	0.56	
42510	29.52	3/2/96 22:30	0.56	
42540	29.54	3/2/96 23:00	0.56	
42570	29.56	3/2/96 23:30	0.56	
42600	29.58	3/3/96 0:00	0.56	

42630	29.60	3/3/96 0:30	0.56	
42660	29.63	3/3/96 1:00	0.56	
42690	29.65	3/3/96 1:30	0.55	
42720	29.67	3/3/96 2:00	0.55	
42750	29.69	3/3/96 2:30	0.56	
42780	29.71	3/3/96 3:00	0.56	
42810	29.73	3/3/96 3:30	0.55	
42840	29.75	3/3/96 4:00	0.55	
42870	29.77	3/3/96 4:30	0.54	
42900	29.79	3/3/96 5:00	0.54	
42930	29.81	3/3/96 5:30	0.54	
42960	29.83	3/3/96 6:00	0.53	
42990	29.85	3/3/96 6:30	0.53	
43020	29.88	3/3/96 7:00	0.52	
43050	29.90	3/3/96 7:30	0.51	
43080	29.92	3/3/96 8:00	0.51	
43110	29.94	3/3/96 8:30	0.51	
43140	29.96	3/3/96 9:00	0.51	
43170	29.98	3/3/96 9:30	0.52	
43200	30.00	3/3/96 10:00	0.51	
43230	30.02	3/3/96 10:30	0.53	
43260	30.04	3/3/96 11:00	0.52	
43290	30.06	3/3/96 11:30	0.51	
43320	30.08	3/3/96 12:00	0.52	
43350	30.10	3/3/96 12:30	0.52	
43380	30.13	3/3/96 13:00	0.52	
43410	30.15	3/3/96 13:30	0.51	
43440	30.17	3/3/96 14:00	0.52	
43470	30.19	3/3/96 14:30	0.52	
43500	30.21	3/3/96 15:00	0.51	
43530	30.23	3/3/96 15:30	0.51	
43560	30.25	3/3/96 16:00	0.51	
43590	30.27	3/3/96 16:30	0.5	
43620	30.29	3/3/96 17:00	0.49	
43650	30.31	3/3/96 17:30	0.49	
43680	30.33	3/3/96 18:00	0.49	
43710	30.35	3/3/96 18:30	0.48	
43740	30.38	3/3/96 19:00	0.47	
43770	30.40	3/3/96 19:30	0.47	
43800	30.42	3/3/96 20:00	0.47	
43830	30.44	3/3/96 20:30	0.47	
43860	30.46	3/3/96 21:00	0.47	
43890	30.48	3/3/96 21:30	0.47	
43920	30.50	3/3/96 22:00	0.47	
43950	30.52	3/3/96 22:30	0.47	
43980	30.54	3/3/96 23:00	0.47	
44010	30.56	3/3/96 23:30	0.47	
44040	30.58	3/4/96 0:00	0.46	
44070	30.60	3/4/96 0:30	0.47	
44100	30.63	3/4/96 1:00	0.46	
44130	30.65	3/4/96 1:30	0.46	

44160	30.67	3/4/96 2:00	0.46	
44190	30.69	3/4/96 2:30	0.47	
44220	30.71	3/4/96 3:00	0.47	
44250	30.73	3/4/96 3:30	0.47	
44280	30.75	3/4/96 4:00	0.47	
44310	30.77	3/4/96 4:30	0.47	
44340	30.79	3/4/96 5:00	0.46	
44370	30.81	3/4/96 5:30	0.45	
44400	30.83	3/4/96 6:00	0.45	
44430	30.85	3/4/96 6:30	0.45	
44460	30.88	3/4/96 7:00	0.45	
44490	30.90	3/4/96 7:30	0.46	
44520	30.92	3/4/96 8:00	0.46	
44550	30.94	3/4/96 8:30	0.47	
44580	30.96	3/4/96 9:00	0.48	
44610	30.98	3/4/96 9:30	0.49	
44640	31.00	3/4/96 10:00	0.51	
44670	31.02	3/4/96 10:30	0.52	
44700	31.04	3/4/96 11:00	0.53	
44730	31.06	3/4/96 11:30	0.54	
44760	31.08	3/4/96 12:00	0.55	
44790	31.10	3/4/96 12:30	0.56	
44820	31.13	3/4/96 13:00	0.56	
44850	31.15	3/4/96 13:30	0.56	
44880	31.17	3/4/96 14:00	0.57	
44910	31.19	3/4/96 14:30	0.56	
44940	31.21	3/4/96 15:00	0.56	
44970	31.23	3/4/96 15:30	0.56	
45000	31.25	3/4/96 16:00	0.56	
45030	31.27	3/4/96 16:30	0.57	
45060	31.29	3/4/96 17:00	0.58	
45090	31.31	3/4/96 17:30	0.57	
45120	31.33	3/4/96 18:00	0.58	
45150	31.35	3/4/96 18:30	0.58	
45180	31.38	3/4/96 19:00	0.58	
45210	31.40	3/4/96 19:30	0.58	
45240	31.42	3/4/96 20:00	0.59	
45270	31.44	3/4/96 20:30	0.59	
45300	31.46	3/4/96 21:00	0.59	
45330	31.48	3/4/96 21:30	0.61	
45360	31.50	3/4/96 22:00	0.6	
45390	31.52	3/4/96 22:30	0.59	
45420	31.54	3/4/96 23:00	0.59	
45450	31.56	3/4/96 23:30	0.6	
45480	31.58	3/5/96 0:00	0.6	
45510	31.60	3/5/96 0:30	0.61	
45540	31.63	3/5/96 1:00	0.6	
45570	31.65	3/5/96 1:30	0.6	
45600	31.67	3/5/96 2:00	0.61	
45630	31.69	3/5/96 2:30	0.6	
45660	31.71	3/5/96 3:00	0.6	

45690	31.73	3/5/96 3:30	0.59	
45720	31.75	3/5/96 4:00	0.6	
45750	31.77	3/5/96 4:30	0.59	
45780	31.79	3/5/96 5:00	0.58	
45810	31.81	3/5/96 5:30	0.58	
45840	31.83	3/5/96 6:00	0.57	
45870	31.85	3/5/96 6:30	0.56	
45900	31.88	3/5/96 7:00	0.56	
45930	31.90	3/5/96 7:30	0.56	
45960	31.92	3/5/96 8:00	0.56	
45990	31.94	3/5/96 8:30	0.56	
46020	31.96	3/5/96 9:00	0.56	

H

GROUNDWATER ANALYTICAL REPORTS – ORGANICS

IEA SDG NARRATIVE VOLATILE FRACTION

PROJECT: 1589-137 BATCH: 03349 METHOD: 1/91 SOW

SAMPLES: Fifteen (15) Soil Samples

These samples were received at Industrial and Environmental Analysts, Inc. (IEA) on March 14 and 15, 1996. Each sample was assigned a 9-character "IEA" lab identification number (lab ID) and an abbreviated client ID for simplicity in forms generation. This package makes reference to these ID's as listed on the IEA Assigned Number Index. In addition the pH for the water samples are listed on this index. All analyses were performed according to the EPA 1/91 SOW and meet the requirements of the IEA Quality Assurance Program. Please see the enclosed data package for your results and Chain of Custody (COC) documentation.

There is an air peak that is common to all of the volatile analyses and a solvent peak that is common to some volatile analyses. These peaks are present at the beginning of the Reconstructed Ion Chromatograms (RIC) and are labeled. These peaks are not searched as Tentatively Identified Compounds (TIC's).

The chromatographic separation of the analytes is performed using a J & W Scientific 75 m X 0.53 mm DB-624 fused silica capillary column with a 3.0 μm film thickness.

The trap used in the purge-and-trap apparatus is a Supelco trap K (VOCARB 3000) consisting of 10 cm of Carbopack B, 6 cm of Carboxen 1000, and 1 cm of Carboxen 1001. This trap meets the criteria in the SOW for contract OLM03.1 for an equivalent trap. Documentation is maintained within the QA department for on-site review.

The "J" flag used on the Form I VOA indicates an estimated concentration between the Contract Required Quantitation Limit (CRQL) and the Method Detection Limit (MDL), not accounting for dilution of the sample prior to analysis. This flag is also used on the Form I VOA-TIC to indicate an estimated amount for all non-target concentrations.

The "N" flag used on the Form I VOA-TIC indicates that there is the presumptive evidence of a compound based on the mass spectral library search and the interpretation of the mass spectral interpretation specialist.

The "B" flag used on the Form I VOA and/or Form I VOA-TIC indicates that this compound was present in the associated method blank.

The "Y" flag is used as a qualifier on the Form I VOA-TIC to indicate a siloxane contaminant attributed to trap breakdown.

The "M" flag used on the data system report form designates that a manual integration was required to provide an accurate quantification of that analyte. Manual integrations have been initialled and dated by the analyst.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his designee, as verified by the following signature.

Brian D. Neptune 04/12/96

Brian D. Neptune
Lead Analyst, GC/MS Final Review
IEA, Inc.

SDG NARRATIVE SEMIVOLATILE FRACTION

PROJECT: 1589-137 BATCH: 03349 METHOD: CLP 1/91

Samples: Ten (10) Water Samples

The samples were received at Industrial and Environmental Analysts, Inc. (IEA) on 03/15/96. Each sample was assigned a 9-character "IEA" lab identification number (lab ID) and an abbreviated client ID which is referenced on the IEA Assigned Number Index. All analyses are performed in accordance with EPA approved methodologies and meet the requirements of the IEA Quality Assurance Program. Please see the enclosed data package for your results and Chain of Custody documentation.

The chromatographic separation of the analytes was performed using a Restek 30 X 0.32 XTI-5 fused silica capillary column with a 0.5 μm bonded phase film thickness.

Instrument data printouts identify the compound 2,2'-oxybis(1-Chloropropane) with CAS number 108-60-1. Alternative nomenclature for this compound is bis(2-Chloroisopropyl)ether which is included on report forms submitted.

The "J" flag used on the Form I SV indicates an estimated concentration between the CRQL and the Method Detection Limit (MDL) on column in the sample extract, not accounting for dilution of the extract prior to analysis.

The "B" flag used on the Form I SV indicates that this compound was present in the associated extraction blank.

The "M" flag used on the data system report form designates that a manual integration was required to provide an accurate quantification of that analyte. Manual integrations have been initialed and dated by the analyst.

The "X" flag used on the Form I SV indicates that this compound is an extraction artifact.

Any nonconformances associated with the analysis of the samples in this project are as follows:

Sample MW-35 recovered Phenol d-5 below method criteria. The sample was re-extracted and the re-extraction is reported. The re-extraction just passed the minimum criteria. This indicates a definate matrix effect on the surrogate. The internal standard recoveries for the sample MW-35RE failed criteria for Acenaphthene d-10 and Perylene d-12. These internal standard failures were confirmed through re-analysis. The re-analysis is identified as MW-35RE1 and is included in the data package.

I certify that this data package is in compliance with the procedures and methods defined for this project, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data (if applicable) as submitted has been authorized by the laboratory manager or his designee, as verified by the following signature.

_____ 04/12/96

Keith B. Scott
Organic Laboratory Manager
IEA, Inc.

IEA

SDG NARRATIVE PESTICIDE FRACTION

PROJECT:1589-137 SDG:03349 METHOD:SOW 1/91 (PCB ONLY)

Samples: (12) Water Samples

This case was closed at Industrial and Environmental Analysts, Inc. (IEA) on March 15, 1996. Each sample was assigned a 9-character "IEA" lab identification number (lab ID) and an abbreviated client ID which is referenced on the IEA Assigned Number Index. All analyses are performed in accordance with EPA approved methodologies and meet the requirements of the IEA Quality Assurance Program. Please see the enclosed data package for your results and Chain of Custody documentation.

The chromatographic separation of the analytes was performed using a J & W 30 m X 0.53 mm DB-1701 fused silica capillary column with a 1.0 μm bonded phase film thickness and a Restek 30 m X 0.53 mm Rt_x-35 fused silica capillary column with a 1.0 μm bonded phase film thickness.

Any nonconformances associated with the analysis of the samples in this project are as follows:

Surrogate recovery was above the method limits for samples MW33 and PBLK42 on the RTX-35 column. The recoveries were within the criteria on the DB-1701 column. No target compounds were present.

The matrix spike/matrix spike duplicate were spiked with an Aroclor-1260 spike instead of the CLP pesticide spiking solution because the samples analyzed were for PCBs only. Matrix spike/matrix spike duplicate recovery was within the method limits.

I certify that this data package is in compliance with the procedures and methods defined for this project, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data (if applicable) as submitted has been authorized by the laboratory manager or his designee, as verified by the following signature.

04/12/96

Katrina L. Travis
GC Volatile Supervisor
IEA, Inc.

METHOD BLANKS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK98

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK98

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319904.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLK98

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK98

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319904.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 128370	Butylated Hydroxytoluene	23.920	20	NJY
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK99

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK99

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I02.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLK99

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK99

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I02.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 128370	Butylated Hydroxytoluene	23.890	22	NJY
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK9A

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK9A

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320902.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLK9A

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: VBLK9A

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320902.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 128370	Butylated Hydroxytoluene	23.920	13	NJY
2.	Trichlorobenzene isomer	27.360	6	J
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK27

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK27

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406403.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK27

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK27

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406403.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLK27

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK27

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406403.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 2

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	108930	Cyclohexanol	7.470	34	NJ
2.		Unknown	7.590	3	J
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK32

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406404.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK32

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406404.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLK32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK32

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406404.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	1,2-Cyclohexanol Isomer	10.750	4	J
2.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK85

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK85

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412402.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK85

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK85

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412402.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLK85

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: SBLK85

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412402.D

Level: (low/med) LOW Date Received: / /

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108930	Cyclohexanol	7.300	5	NJ
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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PBLK42

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: PBLK42

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3033096_053.D

% Moisture: _____ decanted: (Y/N)___ Date Received: / /

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 04/03/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2------	Aroclor-1016	1.0	U
11104-28-2------	Aroclor-1221	2.0	U
11141-16-5------	Aroclor-1232	1.0	U
53469-21-9------	Aroclor-1242	1.0	U
12672-29-6------	Aroclor-1248	1.0	U
11097-69-1------	Aroclor-1254	1.0	U
11096-82-5------	Aroclor-1260	1.0	U

APD-GW-RINSATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I10.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I10.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406409.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406409.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406409.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. ~~108930~~	~~Cyclohexanol~~	~~7.460~~	~~16~~	~~NXBJ~~
2.	~~Unknown~~	~~7.590~~	~~5~~	~~JB~~
3. 124072	Octanoic Acid	12.410	2	NJ
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FORM I SV-TIC

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

APGW

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335407

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_180.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

HPD-GWS-MW28

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319913.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319913.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_178.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406407.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406407.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW28

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334904

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406407.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108930	Cyclohexanol	7.470	31	NBXJ
2.	Unknown	7.590	4	JB
3.	Unknown	10.090	7	J
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VALIDATED 2 029

HPD-GW-MW29

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319914.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	2	J
75-09-2	Methylene Chloride	10 u ~~2~~	~~J~~
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319914.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115071	Propene	4.340	5	NJ
2.				
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406408.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406408.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	27	
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406408.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.920	8	J
2. 108930	Cyclohexanol	7.470	2	NBXJ
3. 822673	2-Cyclohexen-1-ol	7.530	3	NXB
4. 930687	2-Cyclohexen-1-one	8.440	5	NXJ
5.	Unknown	10.140	13	J
6.	Unknown	11.450	36	J
7. 20324338	2-Propanol, 1-[2-(2-methoxy-	14.280	2	NJ
8. 87412	1(3H)-Isobenzofuranone	15.250	2	NJ
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW29

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334905

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_179.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2------	Aroclor-1016	1.0	U
11104-28-2------	Aroclor-1221	2.0	U
11141-16-5------	Aroclor-1232	1.0	U
53469-21-9------	Aroclor-1242	1.0	U
12672-29-6------	Aroclor-1248	1.0	U
11097-69-1------	Aroclor-1254	1.0	U
11096-82-5------	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW30

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320904.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320904.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~128370~~	~~Butylated Hydroxytoluene~~	~~23.900~~	~~27~~	~~NJYB~~
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406412.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406412.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	0.9	J
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	68	
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406412.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~	~~Unknown~~	~~6.910~~	~~7~~	~~J~~
~~2.~~	~~Unknown~~	~~8.230~~	~~20~~	~~J~~
3.	Unknown	8.440	10	J
4.	Unknown	10.140	13	J
5.	Unknown	10.790	27	J
6.	Unknown	10.860	24	J
7.	Unknown	11.540	78	J
8. 87412	1(3H)-Isobenzofuranone	15.260	5	NJ
9. 80057	Phenol, 4,4'-(1-methylethyli	24.300	7	NJ
10.				
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW30

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339912

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_183.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW31

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320903.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320903.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1. 128370~~	~~Butylated Hydroxytoluene~~	~~23.890~~	~~30~~	~~NJBY~~
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406411.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED 2 067

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406411.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406411.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 4

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.920	7	J
2.	822673	2-Cyclohexen-1-ol	7.530	2	NXJ
3.	930687	2-Cyclohexen-1-one	8.440	2	NXJ
4.		Unknown	10.140	11	J
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW31

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339911

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_182.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW32

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320906.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10U ~~1~~	~~J~~
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320906.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406414.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406414.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	30	
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406414.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.920	6	J
2. 822673	2-Cyclohexen-1-ol	7.520	3	NXJ
3. 930687	2-Cyclohexen-1-one	8.440	2	NXJ
4.	Unknown	10.140	25	J
5.	Unknown	11.600	2	J
6. 87412	1(3H)-Isobenzofuranone	15.250	6	NJ
7. 80057	Phenol, 4,4'-(1methylethylid	24.290	10	NJ
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339914

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3033096_026.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/15/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 04/02/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW23 Dup

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320907.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	104 ~~2~~	~~J~~
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320907.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406415.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406415.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	32	
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406415.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 6

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.920	6	J
2.	822673	2-Cyclohexen-1-ol	7.520	2	NJ
3.	930687	2-Cyclohexen-1-one	8.440	2	NJ
4.		Unknown	10.140	19	J
5.	87412	1(3H)-Isobenzofuranone	15.250	5	NJ
6.	80057	Phenol, 4,4'-(1-methylethyli	24.300	9	NJ
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3033096_028.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/15/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 04/02/96

Injection Volume: 1.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	2.0	U
11104-28-2	Aroclor-1221	4.0	U
11141-16-5	Aroclor-1232	2.0	U
53469-21-9	Aroclor-1242	2.0	U
12672-29-6	Aroclor-1248	2.0	U
11097-69-1	Aroclor-1254	2.0	U
11096-82-5	Aroclor-1260	2.0	U

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW32DDL

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339915DL

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3033096_027.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/15/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 04/02/96

Injection Volume: 1.0(uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2------	Aroclor-1016	20	U
11104-28-2------	Aroclor-1221	40	U
11141-16-5------	Aroclor-1232	20	U
53469-21-9------	Aroclor-1242	20	U
12672-29-6------	Aroclor-1248	20	U
11097-69-1------	Aroclor-1254	20	U
11096-82-5------	Aroclor-1260	20	U

VALIDATED

APD-GW-MW33

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320905.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320905.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75650	2-Propanol, 2-methyl-	9.820	12	NJ
2. 646060	1,3-Dioxolane	12.360	6	NJ
3. 109999	Furan, tetrahydro-	12.760	85	NJ
4. 1072475	1,3-Dioxolane, 4-methyl-	14.100	8	NJ
5. 123911	1,4-Dioxane	16.110	25	NJ
6. 104767	1-Hexanol, 2-ethyl-	24.670	9	NJ
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406413.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	6	J
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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406413.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406413.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/20/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 20

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	8.220	17	J
2.		Unknown	8.440	27	J
3.		Unknown	8.570	34	J
4.		Unknown	8.610	20	J
5.		Unknown Alcohol	9.720	62	J
6.		Unknown Alcohol	9.790	52	J
7.		Unknown	10.170	35	J
8.		Unknown	12.320	36	J
9.	144194	1,3-Pentanediol, 2,2,4-trime	12.430	18	NJ
10.		Unknown	12.990	22	J
11.		Unknown	13.220	17	J
12.		Unknown	14.270	13	J
13.		Unknown	14.350	20	J
14.		Unknown	14.390	12	J
15.		Unknown Alcohol	14.570	16	J
16.		Unknown Alcohol	14.630	11	J
17.		Unknown	15.520	33	J
18.	101100	Propanoic acid, 2-(3-chlorop	18.220	38	NJ
19.		Unknown	22.220	15	J
20.		Unknown	25.540	18	J
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW33

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339913

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3033096_025.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/15/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 04/02/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW34

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319910.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319910.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	104 ~~8~~	~~J~~
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.920	6	J
2. 822673	2-Cyclohexen-1-ol	7.530	3	NXJ
3. 930687	2-Cyclohexen-1-one	8.440	3	NXJ
4.	Unknown	10.150	27	J
5. 87412	1(3H)-Isobenzofuranone	15.250	5	NJ
6. 80057	Phenol, 4,4'-(1-methylethyli	24.290	4	NJ
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30.				

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901

Sample wt/vol: 500 (g/mL) ML Lab File ID: P3031396_176.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/27/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2------	Aroclor-1016	1.0	U
11104-28-2------	Aroclor-1221	2.0	U
11141-16-5------	Aroclor-1232	1.0	U
53469-21-9------	Aroclor-1242	1.0	U
12672-29-6------	Aroclor-1248	1.0	U
11097-69-1------	Aroclor-1254	1.0	U
11096-82-5------	Aroclor-1260	1.0	U

VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MS

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MS

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406416.D

Level: (low/med) LOW Date Received: 02/17/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	53	
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	60	
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	35	
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	42	
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
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	40	
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	66	
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	43	

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MS

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MS

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406416.D

Level: (low/med) LOW Date Received: 02/17/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	58	
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	43	
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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	66	
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	43	
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	5	J
117-84-0	Di-n-octylphthalate	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

VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MSD

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MSD

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0407405.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/07/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	59	
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	62	
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	35	
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	44	
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
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	40	
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	68	
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	1	J
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	42	

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MSD

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MSD

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0407405.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/07/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	69	
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	44	
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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	72	
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	43	
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	6	J
117-84-0	Di-n-octylphthalate	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

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MS

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MS

Sample wt/vol: 500 (g/mL) ML Lab File ID: P3031396_174.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/19/96

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/27/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2------	Aroclor-1016	1.0	U
11104-28-2------	Aroclor-1221	2.0	U
11141-16-5------	Aroclor-1232	1.0	U
53469-21-9------	Aroclor-1242	1.0	U
12672-29-6------	Aroclor-1248	1.0	U
11097-69-1------	Aroclor-1254	1.0	U
11096-82-5------	Aroclor-1260	7.1	P

VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW34MSD

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334901MSD

Sample wt/vol: 500 (g/mL) ML Lab File ID: P3031396_175.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/27/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	7.0	P

VALIDATED

APD-GW-MW35

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319912.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10 U ~~2~~	~~J~~
67-64-1	Acetone	10 U ~~6~~	~~J~~
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319912.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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28.					
29.					
30.					

VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406406.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406406.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	11	
117-84-0	Di-n-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406406.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108930	Cyclohexanol	7.490	96	NXBJ
2.	Unknown	11.610	3	J
3. 87412	1(3H)-Isobenzofuranone	15.260	4	NJ
4.	Unknown	15.510	84	J
5.	Unknown	16.830	4	J
6.				
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27.				
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29.				
30.				

VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35RE

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412403.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35RE

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412403.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	20	
117-84-0	Di-n-octylphthalate	6	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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW35RE

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412403.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108930	Cyclohexanol	7.300	10	NBXJ
2.	Unknown	11.490	9	J
3. 87412	1(3H)-Isobenzofuranone	15.080	6	NJ
4.	Unknown	16.650	11	J
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35RE1

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35RE1

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	19	
117-84-0	Di-n-octylphthalate	10	
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

VALIDATED

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW35RE1

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903RE1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0412405.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/11/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/12/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108930	Cyclohexanol	7.300	12	BXNJ
2.	Unknown	11.490	10	J
3. 87412	1(3H)-Isobenzofuranone	15.080	5	NJ
4.	Unknown	16.650	13	J
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW35

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334903

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_177.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-MW36

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I15.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I15.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VALIDATED

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406410.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

VALIDATED

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406410.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	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	10	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-octylphthalate	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

VALIDATED

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 0406410.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/18/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/06/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. ~~108930~~	~~Cyclohexanol~~	~~7.460~~	~~4~~	~~NBXJ~~
2.	~~Unknown~~	~~7.590~~	~~3~~	~~JB~~
3.	Unknown	10.140	2	J
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VALIDATED

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW36

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335409

Sample wt/vol: 1000 (g/mL) ML Lab File ID: P3031396_181.D

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/14/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/19/96

Concentrated Extract Volume: 10000(uL) Date Analyzed: 03/28/96

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

VALIDATED

APD-GW-TB01

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB01

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335408

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I11.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB01

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960335408

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I11.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. ~~128370~~	~~Butylated Hydroxytoluene~~	~~23.880~~	~~23~~	~~NJBY~~
2.				
3.				
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30.				

VALIDATED

APD-GW-TB02

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB02

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334906

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I09.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB02

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334906

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319I09.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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FORM I VOA-TIC

VALIDATED

APD-GW-TB03

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB03

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334902

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319911.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	4	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB03

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960334902

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0319911.D

Level: (low/med) LOW Date Received: 03/14/96

% Moisture: not dec. _____ Date Analyzed: 03/19/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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VALIDATED

APD-GW-TB04

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO

TB04

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339916

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320908.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VALIDATED

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

TB04

Lab Name: INDUSTRIAL & ENVIRONMENTA Contract: SOW 1/91

Lab Code: IEA Case No.: 1589-137 SDG No.: 03349

Matrix: (soil/water) WATER Lab Sample ID: 960339916

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: 0320908.D

Level: (low/med) LOW Date Received: 03/15/96

% Moisture: not dec. _____ Date Analyzed: 03/20/96

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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27.				
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29.				
30.				

VALIDATED

IEA Assigned Number Index

Case No.: 1589-137

SDG No.: 03349

IEA Lab Sample Number	Sample Number	Abbreviated Sample Number	pH
			2
9603349-01	APD-GW-MW34	MW34	2
9603349-02 ✓	APD-GW-TB03	TB03	2
9603349-03	APD-GW-MW35	MW35	2
9603349-04	APD-GW-MW28	MW28	2
9603349-05	APD-GW-MW29	MW29	2
9603349-06 ✓	APD-GW-TB02	TB02	2
9603354-07	APD-GW-RINSATE	APGW	2
9603354-08 ✓	APD-GW-TB01	TB01	2
9603354-09	APD-GW-MW36	MW36	2
9603354-10	TRIP BLANK 1	TRIP	2
9603354-21	HB03349	HB349	2
9603399-11	APD-GW-MW31	MW31	2
9603399-12	APD-GW-MW30	MW30	2
9603399-13	APD-GW-MW33	MW33 ~~APGW~~	2
9603399-14	APD-GW-MW32	MW32	2
9603399-15	APD-GW-MW32 DUP	MW32D	2
9603399-16 ✓	APD-GW-TB04	TB04	2
9603399-17	TRIP BLANK 2	TB2	2

IEA
An Aquarion Company
3000 WESTON PKWY.
CARY, N.C. 27513
PH # 919-677-0090
FAX # 919-677-0427

CHAIN OF CUSTODY RECORD

NO. 65594

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☒ OTHER CLP

COMPANY: Montgomery Watson

Page 1 of

PROJECT #: 4077.0076

PROJECT NAME: American Chemical Services

SAMPLERS: (SIGNATURE) J. J. Dunkuk

SAMPLE I.D.	DATE	TIME	G	C	STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	CLP VOC's	CLP SVOC's	CLP Pest	CLP Metals	TAL Piss Metals CLP		TAG Numbers
	3/12/96	1815		X	APD-GW-MW28	9		X	3	2	2	1	1		9-25600, 01, 02, 03, 04, 05, 06, 07, 08
	3/13/96	1030		X	APD-GW-MW29	9		X	3	2	2	1	1		9-25609, 10, 11, 12, 13, 14, 15, 16, 17
	↓			X	APD-GW-TB02	3		X	3						9-25558, 59, 60

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
J. J. Dunkuk	3/13/96	1600			
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME
			S Russell	3/14/96	0930

IEA QUOTE NO.	IEA RUSH NO.
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☐ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT

IEA REMARKS

1/0C

FIELD REMARKS

Fed Ex # 3363906663

IEA
An Aquarion Company
3000 WESTON PKWY.
CARY, N.C. 27513
PH # 919-677-0090
FAX # 919-677-0427

CHAIN OF CUSTODY RECORD

NO. 65597

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☒ OTHER CLP

COMPANY: Montgomery Watson

Page 1 of

PROJECT #: 4077.0076

PROJECT NAME: American Chemical Service

SAMPLERS: (SIGNATURE) T.J. Dunkelberger

SAMPLE ID	DATE	TIME			STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	CLP VOC's	CLP SVOC's	CLP Pest	CLP metals	TAL Diss Metals		TAG Numbers
	3/13/96	1740		X	APD-GW-MW30	9		X	3	2	2	1	1		9-25518,19,20,21,22,23,24,25,26
	↓	1750		X	APD-GW-MW33	9		X	3	2	2	1	1		9-25501,02,03,04,05,06,07,08,09

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
T.J. Dunkelberger	3/14/96	1800			
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME
			[illegible]	3/15/96	0930

IEA QUOTE NO.	IEA RUSH NO.
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☐ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT
☒ CHILLED ☐ SEE REMARKS

IEA REMARKS

FIELD REMARKS

Fed Ex # 3363906652

MONTGOMERY WATSON

CHAIN OF CUSTODY RECORD

SPECIAL INSTRUCTIONS:
- [ ] PECFA
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [ ] OTHER:

TURNAROUND
- [ ] 2 WEEKS (standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: American Chemical Service

PROJECT #: 4077.0076

CITY: Griffith

STATE: IN

SAMPLER(S): J.J. Dunbar

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	CLP SVOC's	CLP Pest	CLP Metals	TAL Diss Metals					TAG Numbers / REMARKS	LAB USE ONLY: MATRIX	LAB USE ONLY: LAB NO.
3/14/96	1210	G	APD-GW-MW31		2	2	1	1					9-2 5530 31, 32, 33 34, 35		

SPECIAL INSTRUCTIONS:

RECEIVED: [ ] INTACT [ ] ON ICE TEMP _____ °F

PROJ. MGR.: P. Vagt

3°C

SIGNATURE	PRINT NAME	COMPANY / TITLE	DATE	TIME
RELINQUISHED BY: J.J. Dunbar		MW	3/14/96	1800
RECEIVED BY: [illegible]	D. McCormick	IEA [illegible]	3/15/96	[illegible]
RELINQUISHED BY:				
RECEIVED BY:				

C-O-C No. 011385

NAME OF COURIER: Fed Ex

AIRBILL NUMBER: 3363906652

MONTGOMERY WATSON

CHAIN OF CUSTODY RECORD

SPECIAL INSTRUCTIONS:
- [ ] PECFA
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [ ] OTHER:

TURNAROUND
- [ ] 2 WEEKS (standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: American Chemical Service

PROJECT #: 1077.0076

CITY: Griffith

STATE: IN

SAMPLER(S): T.J. Dunkle

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	CLP VOCs	CLP SVOCs	CLP Pest	CLP Metals	TAL Diss Metals			TAG Numbers	REMARKS	LAB USE ONLY MATRIX	LAB USE ONLY LAB NO.
3/14/96	1120	G	APD-GW-MW32	9	3	2	2	1	1			9-25536,37,38,39,40,41,42,43,44		Water	
	1120		APD-GW-MW32 DUP	9	3	2	2	1	1			9-25544,50,51,52,53,54,55,56,57			
	1210		APD-GW-MW31	3	3							9-25527,28,29			
			APD-GW-TB04	3	3							9-25787,88,89			

ID MW32, one vial received Broken 3/16/96

SPECIAL INSTRUCTIONS:

RECEIVED: [ ] INTACT [ ] ON ICE TEMP _____ °F

PROJ. MGR. P. Vagt

SIGNATURE	PRINT NAME	COMPANY / TITLE	DATE	TIME
RELINQUISHED BY: T.J. Dunkle		MW	3/14/96	1800
RECEIVED BY: [illegible]	D. McCook	TEM Dock Mgr	[illegible]	[illegible]
RELINQUISHED BY:				
RECEIVED BY:				

C-O-C No. 011384

NAME OF COURIER: Fed Ex

AIRBILL NUMBER: 3363906652

IEA
An Aquarion Company

3000 WESTON PKWY.
CARY, N.C. 27513
PH # 919-677-0090
FAX # 919-677-0427

CHAIN OF CUSTODY RECORD

NO. 65595

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☒ OTHER CLP

COMPANY: Montgomery Watson

Page ____ of ____

PROJECT #: 4077.0076

PROJECT NAME: American Chemical Service

SAMPLERS: (SIGNATURE) J. J. Dunhuk

SAMPLE ID	DATE	TIME	GRAB	COMP	STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	CLP VOC's	CLP SVOC's	CLP Pest	CLP Metals	TAL Diss Metals		TAG Numbers
	3/13/96	1000		X	APD-GW-MW34	9		X	3	2	2	1	1		9-25563, 64, 65, 66, 67, 68, 69, 70, 71
	↓	1000		X	APD-GW-MW34 MS/MSD	9		X	3	2	2	1	1		9-25384, 85, 86, 87, 88, 89, 90, 91, 92
	↓			X	APD-GW-TB03	3		X	3						9-25819, 20, 21

THREE one liters for ID MW-34 And one vial received Broken. J. Porter 3/15/96

Two vials for ID. TB03 received broken [illegible] 3/15/96

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
J. J. Dunhuk	3/13/96	1600			
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME
			[illegible]	3/14/96	0930

IEA QUOTE NO.	IEA RUSH NO.
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☐ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT
☐ CHILLED ☐ SEE REMARKS

IEA REMARKS: 4°C

FIELD REMARKS: Fed Ex # 3363900663

IEA
An Aquarion Company
3000 WESTON PKWY.
CARY, N.C. 27513
PH # 919-677-0090
FAX # 919-677-0427

CHAIN OF CUSTODY RECORD

NO. 65596

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☒ OTHER CLP

COMPANY: Montgomery Watson

Page 1 of

PROJECT #: 4077.0076

PROJECT NAME: American Chemical Service

SAMPLERS: (SIGNATURE) J. A. Imahuk

SAMPLE ID	DATE	TIME	COMP	GRAB	STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	CLP VOC's	CLP SVOC's	CLP Pest	CLP Metals	TAL Diss Metals		TAG Numbers
	3/13/96	1420		X	APD-GW-MW35	9		X	3	2	2	1	1		9-25572,73,74,75,76,77,78,79,80

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME
			[illegible]	3/14/96	0900

IEA QUOTE NO.	IEA RUSH NO.
W96 3073	
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☒ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT
☐ CHILLED ☐ SEE REMARKS

IEA REMARKS

4°C

FIELD REMARKS

Fed Ex # 3363906663

IEA
An Aquarion Company

3000 WESTON PKWY.
CARY, N.C. 27513
PH # 919-677-0090
FAX # 919-677-0427

CHAIN OF CUSTODY RECORD

NO. 65593

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☒ OTHER CLP

COMPANY: Montgomery Watson

Page 1 of

PROJECT #: 4077.0076

PROJECT NAME: American Chemical Services

SAMPLERS: (SIGNATURE) T.J. Dunkelberger

SAMPLE I.D.	DATE	TIME	GRAB	COMP	STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	CLP VOC's	CLP SVOC's	CLP Pest	CLP Metals	CLP Diss. Metals		TAG Numbers
	3/12/96	1100		X	APD-GW-RINSATE	9		X	3	2	2	1	1		9-25475, 76, 77, 78, 79, 80, 81, 82, 83
					APD-GW-TB01	3		X	3						9-25484, 85, 86
		1500			APD-GW-MW36	9		X	3	2	2	1	1		9-25581, 82, 83, 84, 85, 86, 87, 88, 89

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
H. Hesse	3/13/96		T.J. Dunkelberger	3/11/96	1400
T.J. Dunkelberger	3/13/96	1600	[illegible]	[illegible]	0930

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME

IEA QUOTE NO.	IEA RUSH NO.
WS603073	
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☒ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT
☐ CHILLED ☐ SEE REMARKS

IEA REMARKS: N/A

FIELD REMARKS: Fed Ex # 3363900663

I

GROUNDWATER ANALYTICAL REPORTS – METALS

IEA **SDG NARRATIVE INORGANIC/METALS FRACTION**

CASE: 1589-137 SDG NO.: 03349 CONTRACT: N\A

Sample Numbers: 960335407 (APGW) 960335407F (APGWF) 960334904 (MW28) 960334904F (MW28F) 960334905 (MW29) 960334905F (MW29F) 960339912 (MW30) 960339912F (MW30F) 960339911 (MW31) 960339911F (MW31F) 960339914 (MW32) 960339915 (MW32D) 960339915F (MW32D) 960339914F (MW32F) 960339913 (MW33) 960339913F (MW33F) 960334901 (MW34) 960334901F (MW34F) 960334903 (MW35) 960334903F (MW35F) 960335409 (MW36) 960335409 (MW36F) for all TAL Metals by method 200.7M. Mercury was analyzed by method 245.5.

This case was closed on 03/15/96. The temperature of the samples upon receipt by Industrial and Environmental Analysts, Inc. (IEA) was 3°C. All samples were received intact.

The pH of all samples for Metals analysis was less than two (2) at the time of sample preparation. with the following exception: sample MW32 was at a pH of seven (7) at the time of sample preparation.

Each sample has been assigned a 9-character IEA lab identification number.

The "E" flag is used on Form 1 to identify a value that is estimated due to the presence of an interference. All Total samples were flagged with an "E" for Potassium and all Dissolved samples were flagged with an "E" for Barium, Iron, and Potassium due to due to interference.

The "*" flag is used to identify that the sample duplicate analysis exceeds the 20% RPD criteria. The following sample(s) are flagged with a "*" for the metal(s) listed:

Sample ID	Metal
All Dissolved Samples	Iron

Samples designated as dissolved, were labeled with a "F".

Any nonconformances associated with the analysis of samples in this case are noted as follows:
The Sample Spike for sample MW34 (MW34S) was inadvertently not spiked during digestion, batch number 03209607. The redigest batch number is 03279609, and was reanalyzed on 03/28/96 on instrument 61T.
All Samples associated with this case that were analyzed on 03/25/96 on instrument 61T, were reanalyzed for Sodium due to a failed CCV at 13:03:08 on 03/25/96. These samples were reanalyzed on 03/25/96 on instrument 61E.

IEA, Inc.
3000 Weston Parkway
Cary, NC 27513

Phone 919-677-0090
Fax 919-677-0427

IEA
An Aquarion Company

IEA PROJECT #: 1589-137

ASSIGNED LAB #	CLIENT I.D.	TRUNCATED I.D.
9603354-07A	APD-GW-RINSATE	APGW
9603354-07B	APD-GW-RINSATE	APGWF
9603354-09A	APD-GW-MW36	MW36
9603354-09B	APD-GW-MW36	MW36F

IEA, Inc.
3000 Weston Parkway
Cary, NC 27513

Phone 919-677-0090
Fax 919-677-0427

IEA
An Aquarion Company

IEA PROJECT #: 1589-137

ASSIGNED LAB #	CLIENT I.D.	TRUNCATED I.D.
9603399-11A	APD-GW-MW31	MW31
9603399-11B	APD-GW-MW31	MW31F
9603399-12A	APD-GW-MW30	MW30
9603399-12B	APD-GW-MW30	MW30F
9603399-13A	APD-GW-MW33	MW33
9603399-13B	APD-GW-MW33	MW33F
9603399-14A	APD-GW-MW32 - Total	MW32
9603399-14B	APD-GW-MW32 - Dissolved	MW32F
9603399-15A	APD-GW-MW32 DUP-Total	MW32D
9603399-15B	APD-GW-MW32 DUP-Dissolved	MW32DF

IEA, Inc.
3000 Weston Parkway
Cary, NC 27513

Phone 919-677-0090
Fax 919-677-0427

IEA
An Aquarion Company

IEA PROJECT #: 1589-137

ASSIGNED LAB #	CLIENT I.D.	TRUNCATED I.D.
9603349-01A	APD-GW-MW34	MW34
9603349-01B	APD-GW-MW34	MW34F
9603349-03A	APD-GW-MW35	MW35
9603349-03B	APD-GW-MW35	MW35F
9603349-04A	APD-GW-MW28	MW28
9603349-04B	APD-GW-MW28	MW28
9603349-05A	APD-GW-MW29	MW29
9603349-05B	APD-GW-MW29	MW29F

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No.:1589_137___SAS No.: _____ SDG No.:03349_

SOW No.: ILM03

EPA Sample No.	Lab Sample ID
APGW	960335407
APGWF	960335407F
MW28	960334904
MW28F	960334904F
MW29	960334905
MW29F	960334905F
MW30	960339912
MW30F	960339912F
MW31	960339911
MW31F	960339911F
MW32	960339914
MW32D	960339915
MW32DF	960339915F
MW32F	960339914F
MW33	960339913
MW33F	960339913F
MW34	960334901
MW34FD	960334901FD
MW34D	960334901D
MW34FS	960334901FS

Were ICP interelement corrections applied ? Yes/No YES

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

Comments: There is no apparent reason for the "E" flags associated with this case.

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

Signature: Ralph C. Weymuller for Name: Donald C. Stogner

Date: 4/2/96 Title: Manager, Inorganics

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No.:1589_137___SAS No.: _____ SDG No.:03349_

SOW No.: ILM03

EPA Sample No.	Lab Sample ID
MW34S	960334901S
MW34F	960334901F
MW35	960334903
MW35F	960334903F
MW36	960335409
MW36F	960335409F

Were ICP interelement corrections applied ? Yes/No YES

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

Comments:

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

Signature: Ralph C. Wayman for Name: Donald C. Stogner

Date: 4/2/96 Title: Manager, Inorganics

U.S. EPA - CLP

10
Instrument Detection Limits (Quarterly)

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No.:1589_137___SAS No.: _____ SDG No.: 03349_

ICP ID Number: 61T_____ Date: 01/15/96

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	13.0	P
Antimony	206.84		60	2.0	P
Arsenic	189.04		10	3.0	P
Barium	493.41		200	1.0	P
Beryllium	313.04		5	1.0	P
Cadmium	226.50		5	1.0	P
Calcium	317.93		5000	18.0	P
Chromium	267.72		10	1.0	P
Cobalt	228.62		50	1.0	P
Copper	324.75		25	1.0	P
Iron	271.44		100	8.0	P
Lead	220.35		3	1.0	P
Magnesium	279.08		5000	7.0	P
Manganese	257.61		15	1.0	P
Mercury			0.2		NR
Nickel	231.60		40	1.0	P
Potassium	766.49		5000	22.0	P
Selenium	196.03		5	2.0	P
Silver	328.07		10	1.0	P
Sodium	330.23		5000	147.0	P
Thallium	190.86		10	3.0	P
Vanadium	292.40		50	1.0	P
Zinc	213.86		20	1.0	P

Comments:

U.S. EPA - CLP

10
Instrument Detection Limits (Quarterly)

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No.:1589_137___SAS No.: _____ SDG No.: 03349_

ICP ID Number: 61E_____ Date: 01/15/96

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium	589.59		5000	36.0	P
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

U.S. EPA - CLP

10
Instrument Detection Limits (Quarterly)

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No.:1589_137___SAS No.: _____ SDG No.: 03349_

ICP ID Number: _____ Date: 01/15/96

Flame AA ID Number : 3200A_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

APD-GW-RINSATE
Total

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

APGW

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960335407

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	13.0	U		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	1.0	U		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	u 121	B		P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	14.0	B		P_
7439-89-6	Iron____	8.0	U		P_
7439-92-1	Lead____	86.7			P_
7439-95-4	Magnesium	u 8.6	B		P_
7439-96-5	Manganese	1.0	U		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	1.0	U		P_
7440-09-7	Potassium	22.0	U	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	36.0	U		P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 17.4	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN VALIDATED

3/90

APD-GW-RINSATE

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

APGWF

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960335407F

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	13.0	U		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	1.0	U	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	u 228	B		P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	u 1.9	B		P_
7439-89-6	Iron____	8.0	U	E*	P_
7439-92-1	Lead____	u 1.4	B		P_
7439-95-4	Magnesium	u 17.7	B		P_
7439-96-5	Manganese	1.0	U		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	1.0	U		P_
7440-09-7	Potassium	u 35.1	B	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	147	U		P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 6.1	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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3/90

APD-GW-MW28

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. Total

MW28

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334904

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	u 27.2	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	95.1	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	79400			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron_____	1840			P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	38100			P_
7439-96-5	Manganese	119			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 2.5	B		P_
7440-09-7	Potassium	3580	B	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	14100			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 8.3	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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3/90

APD-GW-MW 28

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

FILTERED

MW28F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334904F

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	13.0	U		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	95.7	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	79700			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron____	1740		E*	P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	37900			P_
7439-96-5	Manganese	117			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 2.5	B		P_
7440-09-7	Potassium	3430	B	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	14500			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 8.9	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

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3/90

APP-GW-MW29
Total

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1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW29

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334905

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	131	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	62.0	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	65200	_		P_
7440-47-3	Chromium_	16.4	_		P_
7440-48-4	Cobalt___	1.0	B		P_
7440-50-8	Copper___	u 5.8	B		P_
7439-89-6	Iron_____	3030	_		P_
7439-92-1	Lead_____	u 4.6	_		P_
7439-95-4	Magnesium	33500	_		P_
7439-96-5	Manganese	218	_		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	20.1	B		P_
7440-09-7	Potassium	7040	_	E	P_
7782-49-2	Selenium_	u 2.2	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	50700	_		P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 19.7	B		P_
_____	Cyanide__	_____	_		NR
_____	_____	_____	_		__

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD-GW-MW29

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW29F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334905F

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	13.0	U		P_
7440-36-0	Antimony_	3.4	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	69.7	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	75800			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron____	2390		E*	P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	39500			P_
7439-96-5	Manganese	229			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	U 5.8	B		P_
7440-09-7	Potassium	7760		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	60200			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	U 9.5	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD-GW-MW30

Total

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW30

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339912

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 84.3	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	u 3.6	B		P_
7440-39-3	Barium___	181	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	99100	_		P_
7440-47-3	Chromium_	8.9	B		P_
7440-48-4	Cobalt___	1.4	B		P_
7440-50-8	Copper___	u 1.1	B		P_
7439-89-6	Iron_____	5980	_		P_
7439-92-1	Lead_____	u 1.9	B		P_
7439-95-4	Magnesium	51000	_		P_
7439-96-5	Manganese	223	_		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	21.9	B		P_
7440-09-7	Potassium	4980	B	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	40900	_		P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 8.0	B		P_
_____	Cyanide__		_		NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD - GW - MW30

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW30F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339912F

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 36.9	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	162	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	92200			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	B		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron____	3820		E*	P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	48400			P_
7439-96-5	Manganese	203			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 15.3	B		P_
7440-09-7	Potassium	4910	B	E	P_
7782-49-2	Selenium_	u 2.1	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	39500			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 4.7	B		P_
_____	Cyanide__				NR
_____	_____				

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD-GW-MW31

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. Total

MW31

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339911

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 88.5	B		P_
7440-36-0	Antimony_	2.7	B		P_
7440-38-2	Arsenic__	u 4.1	B		P_
7440-39-3	Barium___	200			P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	80900			P_
7440-47-3	Chromium_	13.6			P_
7440-48-4	Cobalt___	2.0	B		P_
7440-50-8	Copper___	u 3.6	B		P_
7439-89-6	Iron_____	2640			P_
7439-92-1	Lead_____	u 2.1	B		P_
7439-95-4	Magnesium	33900			P_
7439-96-5	Manganese	122			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	32.6	B		P_
7440-09-7	Potassium	3870	B	E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	17500			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 8.2	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW31F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339911F

Level (low/med): LOW__ Date Received: 03/15/96

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_	u 31.5	B		P_
7440-36-0	Antimony_	2.6	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	195	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	79800			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.1	B		P_
7440-50-8	Copper___	u 2.2	B		P_
7439-89-6	Iron_____	1770		E*	P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	33800			P_
7439-96-5	Manganese	117			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	40.7			P_
7440-09-7	Potassium	3970	B	E	P_
7782-49-2	Selenium_	u 2.3	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	17700			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 8.6	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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Total

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW32

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339914

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	766			P
7440-36-0	Antimony_	2.0	U		P
7440-38-2	Arsenic__	u 3.7	B		P
7440-39-3	Barium___	62.6	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium__	1.0	U		P
7440-70-2	Calcium__	49100			P
7440-47-3	Chromium_	9.2	B		P
7440-48-4	Cobalt___	1.0	U		P
7440-50-8	Copper___	u 3.4	B		P
7439-89-6	Iron_____	1550			P
7439-92-1	Lead_____	u 2.1	B		P
7439-95-4	Magnesium	23200			P
7439-96-5	Manganese	219			P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	8.6	B		P
7440-09-7	Potassium	5560		E	P
7782-49-2	Selenium_	2.0	U		P
7440-22-4	Silver___	1.0	U		P
7440-23-5	Sodium___	55000			P
7440-28-0	Thallium_	3.0	U		P
7440-62-2	Vanadium_	1.0	U		P
7440-66-6	Zinc_____	u 16.0	B		P
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

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EPA SAMPLE NO.

MW32F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339914F

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 37.3	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	54.2	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	52600			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron_____	u 32.3	B	E*	P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	25100			P_
7439-96-5	Manganese	212			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 3.7	B		P_
7440-09-7	Potassium	6230		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	61600			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 7.7	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD - GW - MW32 Dup
Total

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW32D

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339915

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	1090	_		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	u 3.8	B		P_
7440-39-3	Barium___	72.7	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	56500	_		P_
7440-47-3	Chromium_	10.6	_		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	u 1.6	B		P_
7439-89-6	Iron_____	1880	_		P_
7439-92-1	Lead____	u 1.5	B		P_
7439-95-4	Magnesium	26800	_		P_
7439-96-5	Manganese	250	_		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	9.7	B		P_
7440-09-7	Potassium	6470	_	E	P_
7782-49-2	Selenium_	u 2.1	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	63400	_		P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 9.6	B		P_
_____	Cyanide__		_		NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW32DF

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339915F

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 51.1	B		P_
7440-36-0	Antimony_	2.2	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	56.2	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	54500			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron_____	u 15.5	B	E*	P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	26300			P_
7439-96-5	Manganese	220			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 2.8	B		P_
7440-09-7	Potassium	6660		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	64700			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 4.1	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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APD-GW-MW33
Total

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW33

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339913

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 165	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	u 4.5	B		P_
7440-39-3	Barium___	902			P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.4	B		P_
7440-70-2	Calcium__	248000			P_
7440-47-3	Chromium_	15.4			P_
7440-48-4	Cobalt___	6.1	B		P_
7440-50-8	Copper___	u 4.6	B		P_
7439-89-6	Iron_____	24600			P_
7439-92-1	Lead_____	u 3.7			P_
7439-95-4	Magnesium	56900			P_
7439-96-5	Manganese	686			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	48.2			P_
7440-09-7	Potassium	13900		E	P_
7782-49-2	Selenium_	u 3.3	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	188000			P_
7440-28-0	Thallium_	3.8	B		P_
7440-62-2	Vanadium_	1.8	B		P_
7440-66-6	Zinc_____	u 34.2			P_
	Cyanide__				NR

Color Before: BROWN____ Clarity Before: CLEAR_ Texture: _____

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW33F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960339913F

Level (low/med): LOW__ Date Received: 03/15/96

% 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_	u 44.0	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	u 4.1	B		P_
7440-39-3	Barium___	991		E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.3	B		P_
7440-70-2	Calcium__	259000			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	5.5	B		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron_____	26300		E*	P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	60300			P_
7439-96-5	Manganese	711			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	32.7	B		P_
7440-09-7	Potassium	15500		E	P_
7782-49-2	Selenium_	u 2.8	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	203000			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.7	B		P_
7440-66-6	Zinc_____	u 18.4	B		P_
	Cyanide__				NR

Color Before: BROWN____ Clarity Before: CLEAR_ Texture: _____

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. Total

MW34

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334901

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	u 59.7	B		P_
7440-36-0	Antimony_	2.1	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	151	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	78500			P_
7440-47-3	Chromium_	2.9	B		P_
7440-48-4	Cobalt___	1.3	B		P_
7440-50-8	Copper___	u 2.9	B		P_
7439-89-6	Iron____	4360			P_
7439-92-1	Lead____	u 1.8	B		P_
7439-95-4	Magnesium	46000			P_
7439-96-5	Manganese	138			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 3.8	B		P_
7440-09-7	Potassium	5810		E	P_
7782-49-2	Selenium_	u 2.7	B		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	26600			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.1	B		P_
7440-66-6	Zinc____	u 11.7	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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VALIDATED

3/90

APD-GW-MW34

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

FILTERED

EPA SAMPLE NO.

MW34F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334901F

Level (low/med): LOW__ Date Received: 03/14/96

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_	13.0	U		P_
7440-36-0	Antimony_	2.7	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	126	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	73700			P_
7440-47-3	Chromium_	1.4	B		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	u 1.8	B		P_
7439-89-6	Iron_____	890		E*	P_
7439-92-1	Lead_____	1.0	U		P_
7439-95-4	Magnesium	42600			P_
7439-96-5	Manganese	126			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 4.9	B		P_
7440-09-7	Potassium	5240		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	25000			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc_____	u 10.6	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

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APD-GW-MW35

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. Total

MW35

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334903

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	u 75.9	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	54.2	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	32300			P_
7440-47-3	Chromium_	6.9	B		P_
7440-48-4	Cobalt___	1.2	B		P_
7440-50-8	Copper___	6.1	B		P_
7439-89-6	Iron____	1160			P_
7439-92-1	Lead____	u 1.9	B		P_
7439-95-4	Magnesium	22200			P_
7439-96-5	Manganese	87.8			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	16.5	B		P_
7440-09-7	Potassium	7130		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	16000			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 8.4	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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VALIDATED

3/90

APD-GW-MW35

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. FILTERED

MW35F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960334903F

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	13.0	U		P_
7440-36-0	Antimony_	2.9	B		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	50.6	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	30100			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.0	U		P_
7440-50-8	Copper___	u 1.3	B		P_
7439-89-6	Iron____	8.0	U	E*	P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	21800			P_
7439-96-5	Manganese	65.8			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 7.3	B		P_
7440-09-7	Potassium	7090		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	15800			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 5.2	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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3/90

APD-GW-MW36

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

Total

EPA SAMPLE NO.

MW36

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960335409

Level (low/med): LOW__ Date Received: 03/14/96

% 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_	u 55.8	B		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	140	B		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	70600			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.1	B		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron____	2890			P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	48100			P_
7439-96-5	Manganese	145			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	12.3	B		P_
7440-09-7	Potassium	6990		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	25900			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 7.2	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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3/90

APD-GW-MW36
FILTERED

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW36F

Lab Name: INDUSTRIAL_AND_ENVIRONMEN Contract: _____

Lab Code: IEA___ Case No:1589_137___ SAS No.: _____ SDG No.: 03349_

Matrix (soil/water): WATER Lab Sample ID: 960335409F

Level (low/med): LOW__ Date Received: 03/14/96

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_	13.0	U		P_
7440-36-0	Antimony_	2.0	U		P_
7440-38-2	Arsenic__	3.0	U		P_
7440-39-3	Barium___	141	B	E	P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	72000			P_
7440-47-3	Chromium_	1.0	U		P_
7440-48-4	Cobalt___	1.3	B		P_
7440-50-8	Copper___	1.0	U		P_
7439-89-6	Iron____	2830		E*	P_
7439-92-1	Lead____	1.0	U		P_
7439-95-4	Magnesium	48800			P_
7439-96-5	Manganese	151			P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	u 12.5	B		P_
7440-09-7	Potassium	6960		E	P_
7782-49-2	Selenium_	2.0	U		P_
7440-22-4	Silver___	1.0	U		P_
7440-23-5	Sodium___	26700			P_
7440-28-0	Thallium_	3.0	U		P_
7440-62-2	Vanadium_	1.0	U		P_
7440-66-6	Zinc____	u 8.4	B		P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

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3/90

J

EVALUATION OF ACS PRODUCTION WELLS

MEMORANDUM

MONTGOMERY WATSON

2100 Corporate Drive
Addison, IL 60101

Tel: (708) 691-5020
Fax: (708) 691-5133

Date: April 22, 1996

Subject: Evaluation of Production Wells
ACS NPL Site

Six industrial wells, labeled IW1 through IW6 are located on the ACS facility. Wells IW1 through IW4 are currently used for production at the ACS facility. Industrial wells IW5 and IW6 have been abandoned by ACS personnel. The purpose of this memo is to summarize the current status of each of the ACS production wells, report the recent sampling results, and make recommendations to permanently close all six production wells at the ACS facility.

Existing Production Wells

The four active wells at the ACS facility are IW1, IW2, IW3, and IW4. A copy of the Water Well Record for well IW3 is attached. It indicates that the well was drilled by cable tool to a total depth of 265 feet. Then, a 4-inch casing was set to a depth of 131 feet below ground surface. The primary water production for the well would be from an open hole in the bedrock from a depth of 131 to 265 feet below ground surface. Water Well Records have not been found for the other three existing wells.

During February 1996, water samples were collected from IW1, IW2, IW3, and IW4, and submitted for CLP level VOC analysis. The following summarize the status of each well and the findings from the sampling.

IW1 ACS refers to this well as the *Reclaim Production Well.* All water used from this well is for make-up in a non-contact cooling water system. The well is also available for fire protection, using a booster pump. A sample of water was submitted for CLP analysis. Results indicated the presence of tetrachloroethene (10 ug/L, trichoroethene (5 ug/L), acetone (15 ug/L), 2-butanone (11 ug/L), 4-methyl-2,pentanone (7 ug/L) and several other VOCs at 2 to 5 ug/L. Concentrations for all compounds except acetone and 2-butanone were estimated because they were below the method detection limit.

IW2 ACS refers to this well as the *Boiler Well.* When the ACS facility was connected to the public water supply on January 8, 1996, the well was converted to an emergency back-up water supply well. This well was the primary feed well to the main office, and for the boiler system to make steam. Drinking water in the office was treated by a reverse osmosis system. No VOCs were detected in a CLP VOC scan of water from this well.

IW3 ACS refers to this well as the *Additives Facility Production Well.* It's primary use is for fire protection, using a booster pump. It is also available for minimal process use. No VOCs were detected in a CLP VOC scan of water from this well. A Water Well Record is attached for this well.

IW4 ACS refers to this well as the *Epoxol Well.* This well supplies process water in the Epoxol building, and also provides water for employee showers in the locker room. The water is not used as a drinking supply. A water cooler is used in the building to supply bottled water. Trace levels of toluene, ethylbenzene and xylenes were detected in a sample from this well, analyzed for CLP VOCs. Concentrations were 1 ug/L, 4 ug/L, and 15 ug/L respectively. Concentrations for toluene, ethylbenzene were estimated because they were below the method detection limit.

Time-series sampling was conducted on production well IW1 during February 1995 to further evaluate the water quality. The valve for IW1 was turned on and the well was allowed to pump for eight hours. Nine samples were collected sequentially over the eight hours of pumping. The samples were analyzed in the on-site field GC. The flow rate was also recorded when each sample was collected. Table 1 summarizes the flow rate and the analytical results.

Previously Abandoned ACS Production Wells

The two wells designated as IW5 and IW6 are no longer used by ACS. ACS estimates that IW5 was taken out of service in the early 1970's and IW6 was taken out of service in the mid-1960's. In July and August of 1995, ACS personnel interviewed long-term employees to determine the locations of IW5 and IW6. Two wells were subsequently found (the locations are shown on attached Figure 2-29 from the Pre-Design Work Plan). At each location, the well head and casing was found approximately three feet below the present ground surface.

An Indiana Department of Natural Resources Water Well Record (Attached) indicates that IW5 was cased through the upper aquifer and open in the lower alluvial aquifer. ACS believes that IW6 was similarly constructed. Each well was fitted with a well-point, a one-inch diameter extraction pipe, and a jet pump to supply water. From each well, ACS personnel removed the one-inch extraction piping. Then the existing two-inch diameter casing was extended above the present ground surface and closed with a threaded cap. This work was done at IW5 on August 2, 1995 and at IW6 on July 28, 1995.

In February 1996, IW5 and IW6 were inspected and evaluated in accordance with the Lower Aquifer Investigation Work Plan.

IW5 This well is locating near the blending facility. The surface exposure is a 2-inch diameter steel or galvanized metal pipe with a threaded cap, sticking up approximately two inches above the ground surface. The PID reading immediately upon removing the threaded cap was 43 ppm. Water was measured at a depth of approximately 3.3 feet below ground surface. During the inspection, an obstruction was encountered 3.5 feet below ground surface. ACS personnel attempted to removed the obstruction but simply pushed it a few inches deeper. Therefore it was not possible to determine the total depth of the well.

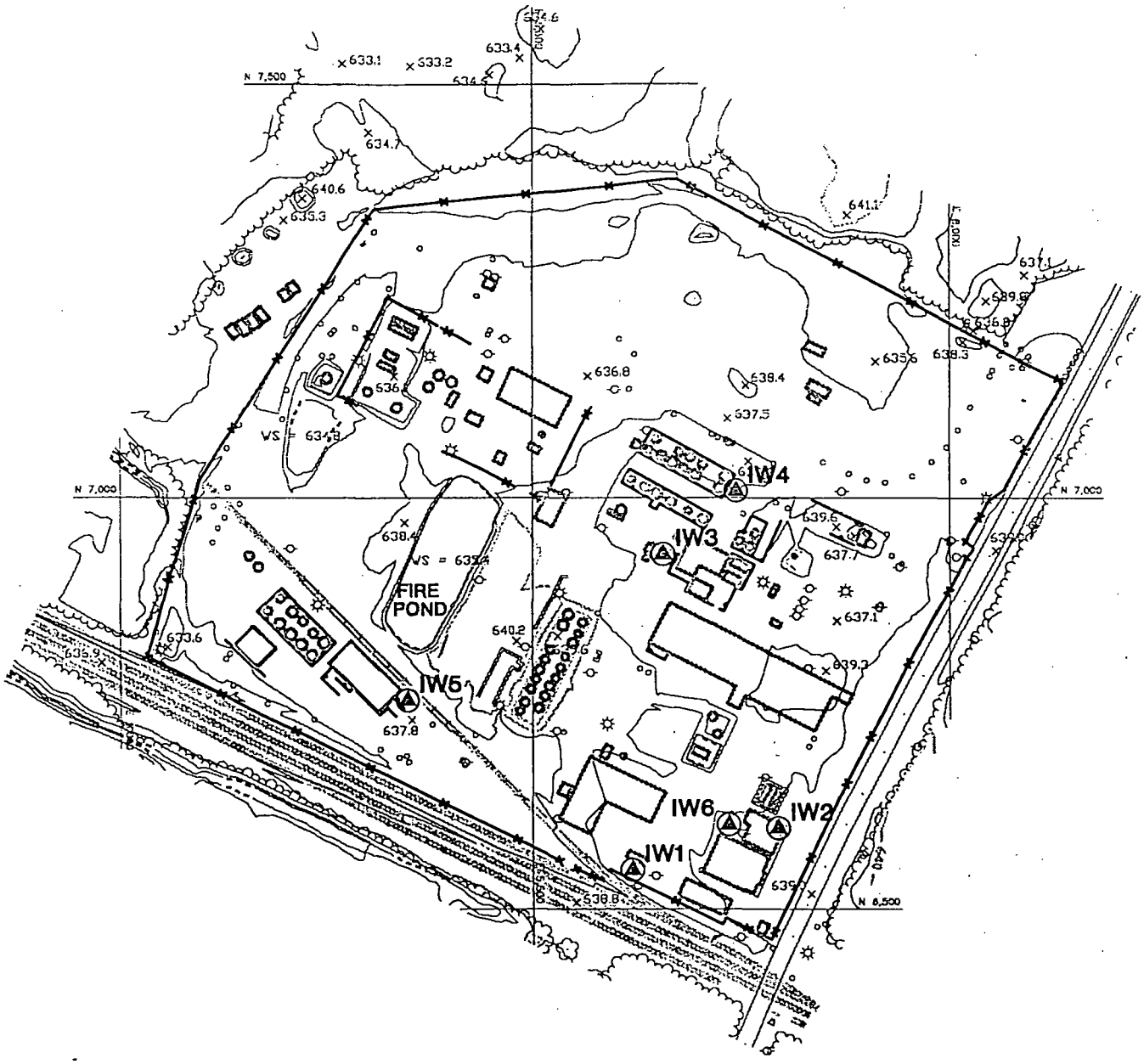
IW6 This well is located just outside the main office building at the ACS facility. The two-inch steel or galvanized pipe sticks up approximately two feet above the ground surface. A threaded cap was removed from the well. No obstructions were encountered in the well. The water level was found to be 3.4 feet below ground surface. The oil/water interface probe used to measure the depth to water did not indicate the presence of oil or free-phase liquid on top of the water. However, the probe had an oily sheen upon withdrawal from the well. To eliminate the potential of carrying the sheen-material deeper into the aquifer, the probe was not lowered deeper in the well. Upon withdrawal from the well, the probe had accumulated a coating of white residue, where it had bumped against the inside of the casing.

Proposal to Permanently Close The ACS Production Wells

It is recommended that all six production wells at the ACS facility be permanenently closed as soon as possible. Although some detail is known about the boreholes for IW1 and IW5 from the Water Well Records, little is known about the well construction and casing integrity. ACS has only been able to assume that the outher four wells have similar construction. The inspection of IW5 and IW6 and the sampling results from IW1 through IW4 suggest that each of these six wells represents a potential migration pathway from the upper to the lower aquifer.

As of January 1996, the ACS facility has been connected to a public water supply and therefore, no longer needs to depend upon the existing on-site production wells. Therefore, it essential that wells be abandoned and the existing well casings be sufficiently sealed to eliminate them as potential ongoing and future migration pathways between the upper and lower aquifers at the site. The specific details to abandon and seal each well are being worked out with drilling subcontractors and will be provided to U.S. EPA as soon as agreements with ACS Inc. and a subcontractor are worked out.

PJV/
C:\ACS-IW.DOC



LEGEND

- IW1 — INDUSTRIAL WATER WELL LOCATION AND NUMBER
- FENCE LINE
- RAILROAD TRACK
- TOPOGRAPHIC CONTOUR

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC.
2. VERTICAL DATUM IS U.S.G.S. DATUM. CONTOUR INTERVAL IS 2ft.
3. WELLS NUMBER 5 AND 6 ARE INACTIVE.

north

0 200 400

SCALE IN FEET

FIGURE 2-29

Developed By PMS,DAP	Drawn By TMS,TPB,LCL	PRODUCTION WELL LOCATION MAP	Drawing Number 4077.0030 A48
Approved By	Date 8/17/95	PRE-DESIGN WORK PLAN AMERICAN CHEMICAL SERVICE, INC. NPL SITE GRIFFITH, INDIANA	MONTGOMERY WATSON
Reference			
Revisions 1 IW5 AND IW6 RELOCATED. 08-13-95			

Management Other
Technical Review Project Manager
Graphic Standards Lead Professional
QUALITY CONTROL
This document has been developed for a specific application and may not be used without the written approval of Montgomery Watson.

ACS: IW3

(2)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

5
3 025

WATER WELL RECORD

ELL LOCATION

(Fill in completely - Refer to instruction sheet)

unty in which well was drilled Lake Civil Township Calumet Twp

iving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

AME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner American Chemical Co Address Calfax Street - Griffith, In

Building Contractor Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Ad 9703 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Everett Farmer

WELL INFORMATION

Depth of well: 265 ft Date well was completed: Feb 24-1972

Diameter of casing or drive pipe: 4" Total Length: 131'

Diameter of liner (if used): Total Length:

Diameter of Screen: Length: Slot Size:

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☑ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested 2 Rate g.p.m. 20 Drawdown -0- ft.

Pu ng Test: Hours Tested 2 Rate g.p.m. 10 Drawdown -0- ft.

(Drawdown is the differenc between static level and wate level at end of test)

Signature Adelma S. Gagliardi

Date March 13-1972

American Oil

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 9W SW ¼ SE ¼ NE SEC 2 Subdivision Name

Topo Map _____ 1000 Ft W of EL. Ground Elevation 635

Field Located By DTK Date 7/31/86 _____ Ft N of SL. Depth to bedrock 131

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation 504

Location accepted w/o verification by _____ 1750 Ft S of NL. Aquifer elevation _____ Lot Number _____

Manager of Corp. verified well locations.

[4 deep wells]

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Clay	2	90
Weathered	90	110
Shale	110	131
Limestone	131	265

ACS: 1W3

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

575775
465220

WWRS

H (17)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled: Lake Civil Township: Calumet

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner: American Chemical Address: Gelpat St. Griffith, Ind.

Building Contractor: Address:

Name of Well Drilling Contractor: John Farmer & Sons Well & Pump Service Inc

Address: 9703 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Jarold Farmer

WELL INFORMATION

Depth of well: 74 ft Date well was completed: Sept. 14-1971

Diameter of casing or drive pipe: 2" Total Length: 69 ft

Diameter of liner (if used): Total Length:

Diameter of Screen: 1 1/4" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☑ For Industry ☑ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 11. ft

Bailer Test: Hours Tested 1 Rate 15 g.p.m. Drawdown None ft.

Pumping Test: Hours Tested 2 Rate 15 g.p.m. Drawdown None ft.

(Drawdown is the differe between static level and w level at end of test)

Signature: Coleman J. Guglielmo

Date: Oct. 9-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

American Chem

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 9W NW ¼ NE ¼ SE SEC 2 Subdivision Name _____

Topo Map _____ 1000 Ft W of EL. Ground Elevation 635

Field Located By [illegible] Date ISBH 8/12/81 2450 Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation 560 Permit Number _____

GW STRATEGY PROJECT - ISBH

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
5	0	Sand
19	5	Sand
62	19	Yellow Clay
74	62	Yellow Sand

635
560

K

LABORATORY ANALYTICAL REPORTS – PRODUCTION WELL SAMPLING

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW1-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215401

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E08.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/12/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	14	
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	3	J
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	11	
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	5	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	2	J
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	2	J
108-10-1	4-Methyl-2-Pentanone	7	J
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	J
108-88-3	Toluene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	5	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWIW1-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215401

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E08.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/12/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000078-83-1	1-PROPANOL, 2-METHYL-	11.61	12	JN
000123-91-1	1,4-DIOXANE	13.78	9	JN
	TRICHLOROBENZENE ISOMER	17.95	11	J
	UNKNOWN HYDROCARBON	18.00	11	J
	TRICHLOROBENZENE ISOMER	27.67	5	J
000087-68-3	1,3-BUTADIENE, 1,1,2,3,4,4-H	27.95	8	JN
000091-20-3	NAPHTHALENE	28.06	9	JN
	TRICHLOROBENZENE ISOMER	28.47	12	J
000128-37-0	BUTYLATED HYDROXYTOLUENE	31.32	28	JNYB

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW1-91

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215402

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213506.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	3	J
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	5	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	
108-88-3	Toluene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWIW1-91

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215402

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213506.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000128-37-0	BUTYLATED HYDROXYTOLUENE	25.76	46	JNY

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW2-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215403

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E10.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWIW2-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215403

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E10.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000128-37-0	BUTYLATED HYDROXYTOLUENE	25.74	12	JNYB

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW3-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215404

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E11.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW4-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215405

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213505.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	1	J
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	.4	J
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	13	

FORM I VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWIW4-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215405

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213505.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	SUBSTITUTED BENZENE	22.26	5	J
	TRIMETHYL BENZENE ISOMER	23.33	14	J
000128-37-0	BUTYLATED HYDROXYTOLUENE	25.64	62	JNY

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWITB-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215406

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213504.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWITB-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215406

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0213504.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000128-37-0	BUTYLATED HYDROXYTOLUENE	25.65	60	JNY

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ACS-GWIW3-01

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215404

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E11.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW3-01MS

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215404MS

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E12.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	59	
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	57	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	59	
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	56	
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	56	
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ACS-GWIW3-01MSD

Lab Name: IEA-NC Method: SOW 1/91

Lab Code: IEA Case No.: 1589-132 SDG No.: 02154

Matrix: (soil/water) WATER Lab Sample ID: 960215404MSD

Sample wt/vol: 5 (g/mL) ml Lab File ID: 0212E13.D

Level: (low/med) LOW Date Received: 02/07/96

% Moisture: not dec. Date Analyzed: 02/13/96

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

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	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	59	
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	57	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	59	
10061-02-6	Trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	57	
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-90-7	Chlorobenzene	56	
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

FORM I VOA

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PRIVATE WELL DATABASE INFORMATION FOR THE SOUTHERN VICINITY OF THE ACS NPL SITE

MONTGOMERY WATSON

April 2, 1996

Mr. Phil Bonneau
Indiana Department of Natural Resources
402 West Washington Street
Indianapolis, IN 46204

Re: Well Logs

Dear Mr. Bonneau:

Enclosed is a check for $25.40 for the well log information we discussed earlier in the week (T35N, R9W, Sections 1, 2, 3, 10, 11, 12, and T36N, R9W, Sections 34, 35, 36). I understand that we can receive the information in dBASE format on a 3.5" floppy disk. Please send the information to:

Mr. Clayton Heffter
Montgomery Watson
2100 Corporate Drive
Addison, Illinois 60101
(708) 691-5000

If possible, please send the information via FedEx, using Montgomery Watson's account number 1056-2019-5. In the reference space, please enter 4077.0075. It would be very helpful if you could include a receipt in the package.

Thank you for your help with this request. If you have any questions, please call me at (708) 691-5023, or Peter Vagt at (708) 691-5020.

Sincerely,

MONTGOMERY WATSON AMERICAS, INC.

Clayton C. Heffter
Environmental Scientist

CCH/cch/PJV
J:\4077\0075\WELLSRVY.DOC
4077.0075

2100 Corporate Drive
Addison, Illinois
60101

Tel: 708 691 5000
Fax: 708 691 5133

Serving the World's Environmental Needs

INDIANA DEPARTMENT OF NATURAL RESOURCES

PATRICK R. RALSTON, DIRECTOR

Division of Water
402 W. Washington St., Rm. W264
Indianapolis, Indiana 46204-2748
317-232-4160
FAX: 317-233-4579

April 4, 1996

Mr. Clayton Heffter
Montgomery Watson
2100 Corporate Drive
Addison, IL 60101

Dear Mr. Heffter:

Please find enclosed a diskette containing two DBF files, MW_4_1D and MW_4_1L. These files contain the primary well record information (*D) and the lithologic data (*L) respectively. These two tables are linked by the reference number associated with each well record.

You will also find the following enclosed:

- receipt for payment
- copy of original fax for data request
- list of all data fields from the database with associated type, size and description

If you should have any problems, or need further information, please call (317)233-4571.

Sincerely,

Phillip R. Bonneau
Geologist

"EQUAL OPPORTUNITY EMPLOYER"

PRINTED ON RECYCLED PAPER

DOW -- GROUNDWATER WELL LOG DATABASE

Structure of the master, DNR table. This table holds the bulk of the information from the water well record, and is tied to the lithologic table through the reference number (key field).

Field Name	Field Type	Description
Refno	N*	Reference number, only key field
Div	A2	Source ID - division
Group	A2	Source ID - group
Compdate	D	Well completion date
Drive	A150	Driving direction to well
County-1	A15	County name, linked to COUNTY look-up table
Civilt	A20	Civil township
Twn-1	A4	Verified Congressional township
Rng-1	A4	Verified Congressional range
Quar1	A4	Smallest quarter, linked to QUARTER look-up table for value checking
Quar2	A4	Middle quarter, a/a
Quar3	A4	Largest quarter, a/a
Sec-1	N	Verified section number
Topo	A25	Topographic map well is on, linked to QUADLU look-up table
Subdiv	A25	Subdivision name
Lotno	A5	Lot number within subdivision
Feetns	N	Feet N of the south sec. line
Feetsn	N	Feet S of the north sec. line
Feetew	N	Feet E of the west sec. line
Feetwe	N	feet W of the east sec. line
Utmx	N	UTM East value
Utmy	N	UTM North value
Grndelev	N	Wellsite ground elevation, established from topographic quad
Depth	N	Total well depth
Bedrocke	N	Bedrock elevation - from log
Bedrockd	N	Bedrock depth
Aquelv	N	Bottom of the aquifer, if gravel
Static	N	Static water level
Typetest	A3	Method used during production test, linked with TYPETEST

		look-up table
Pumprate	N	Test production rate - pump test
Pumphour	N	Duration of pump test
Pumpdw	N	Drawdown during pump test
Bailerrt	N	Test production rate - bailing test
Bailerhr	N	Duration of bailing test
Bailerdr	N	Drawdown during bailing test
Welltype	A3	From old records, was well drilled, gravel pack, driven, etc., linked with TYPEWELL look-up table
Welluse	A3	Intended use of well, home, stock, etc., linked with USEWELL look-up table
Useother	A15	Alternative to welluse, monitoring, etc.
Method	A3	Well installation method, linked with DRILLMET look-up table
Met_othr	A12	Alternative to method of installation, hollow stem auger, etc.
Casingl	N	Total length of casing used
Casingd	N	Casing diameter
Casingm	A12	Casing material
Screenl	N	Total length of screen used
Screend	N	Screen diameter
Screenm	A12	Screen material
Slot	A12	Slot size in screen
Linertot	N	Length of liner used
Linerdia	N	Liner diameter
Pumpset	N	Depth of pump setting
Typepump	A3	Type of pump used, linked to TYPEPUMP look-up table
Pumpothr	A15	Alternative to typepump, wind mill etc.
Quality	A15	General water quality, often see hardness, smell, iron, etc.
Groutm	A20	Type of grout material used
Groutf	N	Top of grout material
Groutt	N	Bottom of grout material
Methodg	A20	Method used to install grout
Groutbag	N	Number of bags of grout used
Sealing	A20	Type of sealing material used, listed under well abandonment
Filledf	A7	Top of seal material
Filledt	A7	Bottom of seal material
Methods	A15	Method used to install sealant

Sealbags	N	Number of bags of sealant
Owner	A30	Well owner at time of drilling
Ownerad	A50	Address of owner
Ownerzc	N	Zip code of owner
Ownertx	A13	Telephone number of owner
Driller	A30	Well driller
Drillad	A50	Drillers address
Drillzc	N	drillers zip code
Drilltx	A13	Drillers telephone number
Operator	A30	Equipment operator
License	A10	Department of Natural Res. Water Well Drillers License Number
Date_com	D	Date of record completion
Cbuilder	A30	Name of contractor or housing developer in new addition
Buildad	A50	Address of contractor
Buildzc	N	Contractors zip code
Buildtx	A13	Contractors telephone number
Fieldby	A12	Initials of the individual that field located well
Field_dt	D	Date on which well was field located
Courtby	A12	Location was established at local courthouse
Court_dt	D	Date of courthouse locating
Classby	A12	Individual classifying well log
Class_dt	D	Date of log classification, both classification fields are related to the oldest well records and not the current ones
Accwo	A20	Initials and comment on well locations acquired by other than owner contact
Accwo_dt	D	Date of alternative field location
County	A15	County, as supplied by driller
Twn	A4	Congressional township as supplied by driller
Rng	A4	Range as supplied by driller
Sec	N	Section as supplied by driller
Entered by	A4	Initials of data entry person
WELLNAME	A15	Currently used in making reports

	Owner Address	Owner Name	TWN_1	RNG_1	QUAR1	QUAR2	QUAR3	SEC_1	LOTNO	FEETNS	FEETSN	FEETEW	FEETWE	UTMX	UTMY	DEPTH	AQUELV	STATIC
1	1043 REDAR RD, GRIFFITH, IN	LEON CHARBONNEAU	35N	9W	SW	NW	SW	1		1600		100		465617.4410	4595484.2750	60	587	27
2	1609 E MAIN ST, GRIFFITH, IN	GARY COWLEY	35N	9W	NE	NW	NE	1			150		1500			75	559	22
3	1130 REDER RD GRIFFITH, IN	WM AUGSTEN	35N	9W	NW	SE	SW	1		900		1550				42	591	20
4	1130 REDER RD GRIFFITH, IN	WM AUGSTEN	35N	9W	NW	SE	SW	1		700		1750		466075.0000	4595225.0000	61	570	25
5	1705 E MAIN ST, GRIFFITH, IN	GRIFFITH AVIATION	35N	9W	NW	NE	NE	1			200		1050	466850.0000	4596575.0000	56	567	9
6	[illegible]1 E MAIN ST GRIFFITH, IN 46322	G & N AIRPORT	35N	9W	NE	NW	NE	1			100		1600	466660.0000	4596580.0000	65	569	
7	[illegible]24 PORTER, CROWN POINT, IND	LARRY KAZIMER	35N	9W	NE	SE	SE	1		1300			500	467010.0000	4595375.0000	110	520	20
8	1130 REDAR RD, GRIFFITH, IN 46319	R.W. AUSTGEN	35N	9W	NE	SW	SW	1		950		1350		465975.0000	4595300.0000		586	21
9	1409 E MAIN ST, GRIFFITH, IN (BODY SHOP)	DAVE GLIDEWELL	35N	9W	NW	NE	NW	1			200	1500		466010.0000	4596560.0000	50	586	15
10	301 S COLFAX ST, GRIFFITH, IN	GRIFFITH CHEEVER PARK	35N	9W	NE	NW	NW	1			700	1000		465830.0000	4596425.0000		578	3
11	MAIN ST GRIFFITH, IN	SALESBURY ENGINEERING	35N	9W	NE	NE	NW	1			250	2200		466225.0000	4596570.0000	82	553	
12	1048 REDER ST., GRIFFITH, IN	SYLVESTER REDER	35N	9W	SW	NW	SW	1		1500		100		465575.0000	4595450.0000	55	580	25
13	GRIFFITH, IN	CHESAPEAKE AND OHIO RR	35N	9W		NW	SE	2						465370.0000	4595590.0000	82		18
14	TOWN OF GRIFFITH, IN		35N	9W	NE	NE	NW	2			150	2350		464631.1680	4596627.7420	82	549	19
15	[illegible]	AMERICAN CHEMICAL	35N	9W	NW	NE	SE	2		2450			1000	466225.0000	4595774.0000			
16	COLFAX ST GRIFFITH, IN	AMERICAN CHEMICAL	35N	9W	SW	SE	NE	2			2750		1000	465225.0000	4595815.0000	265		
17	S. BROAD ST GRIFFITH,IND	CHARLES DEAN	35N	9W				2								49		
18	GRIFFITH, IND.	KERN FOUNDRY	35N	9W			NE	2								81		18
19	COLFAX ST GRIFFITH, IN	AMERICAN CHEMICAL	35N	9W	NW	NE	SE	2		2450			1000	465220.0000	4595775.0000	74	560	22
20	1617 S CLINE AVE GRIFFITH, IN	JAMES COAKE JR	35N	9W	SW	NW	SW	2		1500		100		463950.0000	4595450.0000	61	569	
21	1002 REDER ROAD GRIFFITH, IN	LILLIAN CANTRELL	35N	9W	SW	NE	SE	2		1600			1000	465225.0000	4595500.0000	83	564	28
22		CHESAPEAKE AND OHIO RXR	35N	9W		SE	NW	2						464480.0000	4596020.0000	148		
23	1699 S CLINE AVE GRIFFITH, IN	ANDREW CHMIELEWSKI	35N	9W	NW	SW	SW	2		750		100		463950.0000	4595225.0000	52	578	
24	MAIN ST., GRIFFITH, IN	KEEN FOUNDREY	35N	9W		NW	SE	2								63		17
25	1904 S COLFAX GRIFFITH IN	CRANE MEYERS	35N	9W			SE	2								60		25
26	1810 E. MAIN ST,	CHAS. KAIN	35N	9W			NW	2								65		10
27	920 AVE H, GRIFFITH, IN	DIVISION MOTORS	35N	9W	SW	SW	SE	3		100			2300	463301.7350	4595021.7030	60	568	10
28	942 AVE H, GRIFFITH, IN	TOM MORLEY	35N	9W	SW	SW	SE	3		100			2500	463191.7003	4595042.4280	60	568	10
29	GRIFFTH, IN	BUCKEYE PIPE LINE COMPANY	35N	9W		SE	NE	3								40		8
30	GRIFFITH, INDIANA	IND. PIPE CO.	35N	9W		SE	NE	3								69	561	8
31	9342 CLINE AVE., HIGHLAND, IN	LOUIS LA MANTO	35N	9W				3								80		12
32	1704 S CLINE AVE, GRIFFITH, IN 46319	J. SPARKS	35N	9W	SE	SE	SE	3		500			150	463860.0000	4595150.0000		567	21
33	[illegible]		35N	9W	SW	SW	SW	3						462400.0000	4595100.0000	540		
34	[illegible]	GUY CRODY	35N	9W	SE	SE	SE	3		500			200	463875.0000	4595170.0000	131		6
35	743 S CLINE AVE GRIFFITH, IN	MR. PINKSTAFF	35N	9W				3								69		
36	1240 S CLINE AVE, GRIFFITH, IN 46319	REX CONSTRUCTION	35N	9W	NW	SE	NE	10			1850		1000	463623.4020	4594420.6660	59	567	17
37	1420 S CLINE AVE, GRIFFITH, IN 46319	REX CONSTRUCTION CO, INC	35N	9W	NE	SE	NE	10			1900		100	463897.7250	4594407.4620	62	564	8
38	SCHERVILLE, IN	SCHERWOOD CLUB-B. CHRISTIANSON	35N	9W			SE	10								300		
39	331 GOLFVIEW DR, SCHERERVILLE, IN 46375	DAVID & PATRICIA CHORBA	35N	9W	NE	SE	SW	10		1100		2400		463040.0000	4593725.0000		602	15
40	1012 HWY 330, SCHERERVILLE	KERNESSA DAVIS	35N	9W	SE	SW	SE	11		100			1950	464945.1050	4593409.8530	40	611	10
41	1012 S WOOD ST GRIFFITH, IN	WILLIAM SHOFROTH	35N	9W	NW	NW	NE	11			250	2700		464745.9030	4594917.7490	70	567	10
42	1016 S ARBORGAST, GRIFFITH, IN 46319	DOROTHY NEYHART	35N	9W	NE	NW	NE	11			250		1600	465062.0090	4594845.0950		596	8
43	1747 S FAIRBANKS ST, GRIFFITH, IN	RAY NICHELS	35N	9W	SW	SE	SE	11			100		1150	465160.5304	4593407.3010		602	3
44	1601 S CLINE, GRIFFITH, IN	ED GENTER	35N	9W	NW	NW	SW	11		2350		200		463995.0350	4594107.0630	100	535	25
45	1142 ARBOGAST GRIFFITH, IN	JIM DEMAREE	35N	9W	SE	NW	NE	11			1150		1450	465109.3490	4594642.5470	45	587	5
46	139 JAMES ST GRIFFITH, IN	MOLDEN PARKER	35N	9W	NW	SW	NE	11			1600	400		464025.0000	4594500.0000	50	578	
47	1026 S ABERGAST ST GRIFFITH, IN	KITT EVANS	35N	9W	SE	NW	NE	11			1100		1450	465110.0000	4594660.0000	51	580	
48	136 E PHILLIPS RD GRIFFITH, IN 46319	JAMES NORDEN	35N	9W	NE	SE	SE	11		1200			200	465500.0000	4593730.0000	55	580	10
49	309 AVENUE H, GRIFFITH, IN 46319	VIRGINIA BAUSER	35N	9W	NE	NE	NW	11			100		2400	464800.0000	4594975.0000		578	24
50	1105 S CLINE AVE GRIFFITH, IN	JOHN PRICE	35N	9W	NW	NW	NW	11			450	100		463980.0000	4594850.0000	57	575	17
51	1009 S WOOD ST, GRIFFITH, IN	ARTHUR HEGEDNS	35N	9W	NW	NW	NE	11			150		2650	464755.0000	4594950.0000	53		
52	1106 S BROAD GRIFFITH, IN	ARTHUR GOSE	35N	9W	NE	NW	NW	11			650	1200		464280.0000	4594805.0000	61	570	8
53	1201 S CLINE	FRANK ROZICH	35N	9W	SW	NW	NW	11			1000	100		463945.0000	4594700.0000	56	570	10
54	PO BOX 366, SCHERREVILLE, IN	FLOYD GORLY	35N	9W				11								50		25
55	916 HWY 330 GRIFFITH, IN	RAY ZYLO	35N	9W			SW	11								40		10
56	130 W PHILIJS RD GRIFFITH, IN	ED ARNDT	35N	9W			SE	11								47		5
57	122 JAMES ROAD GRIFFITH IND.	DONALD DOCHERTY	35N	9W				11								60		12
58	1433 S BROAD ST GRIFFITH IN	TIMS LANDSCAPING SERVICE	35N	9W				11								46		5
59	142 E PHILLIPS RD, GRIFFITH,IN	DARRELL HAMER	35N	9W	NW	SW	SW	12		1100		600		465723.8246	4593699.9940	67	575	32
60	200 PHILLIPS RD, GRIFFITH, IN	HARRY COFFMAN	35N	9W				12								71		20
[illegible]	[illegible]7, CROWN POINT, IN	BOB KOLISH	35N	9W				12								61		35
62	118E PHILIPS RD GRIFFITH IN	BILL JOHNSON	35N	9W		SW	SW	12								60		10
63	GRIFFITH, IND	MAPES CONSOLIDATED PAPER CO.	36N	9W				34								81		2
64	827 GLEN PARK AVE., GRIFFITH, IN	CITIZENS TV	36N	9W	NW	NE	NE	34			100		1200	463555.0000	4598280.0000	87	530	15
65	540 N. CLINE AVE., GRIFFITH, IN	DOUGLAS WALDRON	36N	9W	SE	SE	NE	34			2100		150	463890.0000	4597665.0000	36	590	
66		GLEN SLANCY	36N	9W	NE	SE	NE	34			1900		600	463745.0000	4597730.0000			
67	NORTH MAIN STREET, GRIFFITH, IND	PACKAGING CORP. OF AMERICA	36N	9W				34								83		20
68	917 WEST ASH ST GRIFFITH, IN	JAMES FITZSIMONS	36N	9W	SE	NW	NE	34			800		1450	463472.3970	4598050.0420	55	563	1

WELLTYPE	WELLUSE	USEOTHER	Driving directions
D	H		
D	H		
D	H		1130 W. 58TH 1130-B
D	H		1130 - C C ON MAP
D	I		GRIFFITH AIRPORT
D	O	BATHROOMS	
D	H		WELL IS LOCATED ON 10624 PORTER ST., CROWN POINT, IND.
D	H		1130 - A (A ON MAP)
D	I		1409 MAIN ST RR 6 AND COLFAX, SOUTH ON COLFAX TO MAIN ST, EAST 4 BLOCKS
D	P		LOCATION OF WELL AT 301 S. COLFAX ST, GRIFFITH, IND 46319 GRIFFITH CHEEVER PARK.
D	H		
D	H		.5 MILE EAST OF GRIFFITH ON COUNTY ROAD P3
D	I		GRIFFITH CHESAPEAKE AND OHIO RR
			OLD GRIFFITH PUMPING STATION - NOTE THERE IS NO LONGER A WELL HERE
			ADDITION ON 575 PLANT
D	H		
V	H		JRN 8/11/93 NOT IN PHONE BOOK.
G	I		GRIFFITH, IND 8/11/93 (JRN) NOT IN PHONE BOOK.
D	I		
D	H		
D	H		
D			
D	H		
D	I		WHERE ON MAIN ST? ARE THESE SEPARATE WELLS?
	H		WELL IS LOCATED AT 1904 S COLFAX GRIFFITH IND
	H		HY 65 TO RT. 6, W. 4 MI. TO COLFAX, S. 1 MI. TO MAIN ST., E. 3/4 MI. TO 1810 E. MAIN ST, HOUSE N. SIDE, WELL SE. SIDE OF HOME
O		CAR DEALER	HWY 65 TO RT 30, WEST 8 MILES TO CLINE AVE, NORTH 4 MILES TO DEAD END THAT'S AVE H, WEST 1 MILE TO 920, POLE BARN ON NORTH SIDE
O	H		HWY 65 TO RT 30, WEST 8 MILES TO CLINE AVE, NORTH 2 MILES TO AVE H, WEST 1 MILE TO 942 HOUSE ON NORTH SIDE
D	H		
D	H		
D	H		3RD HOUSE NORTH OF AVE H ON CLINE AVE, GRIFFITH, IN. HOUSE ON WEST SIDE OF STREET
V	H		
D	H		
D	I	OFFICE BATHRMS	
D			WEST HALF OF SE .25 (8/11/93 JRN NOT IN PHONE BOOK)
D	R		US 30 TO AUSTIN AVE, NORTH TO GOLFVIEW DR, EAST TO 331
O	H		HWY 65 TO RT 30, WEST 8 MILES TO CLINE AVE, NORTH 1 MILE TO RT 330, EAST 1 MILE TO 1012, HOUSE ON NORTH SIDE
	H		HWY 65 TO RT 6, WEST 8 MILES TO BROAD ST IN GRIFFITH, SOUTH 4 MILES TO AVE H, EAST 1 MILE TO WOOD ST, SOUTH TO SECOND HOUSE ON WEST SIDE
D	H		
D	H		
	H		1601 S CLINE, GRIFFITH, IN
	H		CLINE AVE NORTH TO OLD 330, EAST TO FAIRBANKS, NORTH TO 1142 ARBOGAST
D	H		
D	H		
D	H		SOUTH SIDE OF HOUSE SW CORNER 8 FT AWAY
D	H		AVENUE H IS DIVISION AVE.
D	H		
D	H		
D	H		
D.	H		
D	H		ABOUT 3 MILES WEST OF US55 ON US30 ON THE NORTH SIDE OF US30.
	H		HY 65 TO RT 30 GO W 8 MI TO CLINE AVE GO N TO HWY 330 GO E 1/4 MI TO 916 HOUSE ON N SIDE WELL ON SW CORNER OF HOUSE
	H		HY65 TO RT30 GO W TO CLINE AVE GO N TO STOP SIGN (HWY 330) GO E TO FAIRBANKS ST. GO N TO PHILYN RD GO W TO HOUSE #130 ON S SIDE WELL AT NE CORNER OF H
	H		SR65 TO RT6 GO W 8 MI TO BROAD ST GO S 6 MI TO JAMES RD GO W 2ND HOUSE ON S SIDE OF RD, WELL ON S SIDE OF HOUSE.
	H		1433 BROAD ST GRIFFITH, FROM RT 6 S ON BROAD ST 3 MI TO 1433 S BROAD ST, HOUSE ON E SIDE OF BROAD ST, WELL AT SW SIDE OF HOUSE
D	H		
D	H		NORTH OF NEW ELLIOT
D	H		(JRN 8/11/93 NOT IN PHONE BOOK)
	H		HY 65 TO RT 30 GO W 6 MI TO BURN ST. GO N 1 1/2 MI TO 73RD AVE GO W 1 MI TO CALFAX ST. GO N 3/4 MI TO PHILIPS RD. GO E 6TH HOUSE S SIDE WELL BEHIND HO
D	I		CORNER OF SOUTH EAST INTER SECTION OF KLINMAN RD. AND 45TH ST. LOCATED IN GRIFFITH, IND.
G	H		
			GO BACK TO 1980 NEAR GRIFFITH HIGH SCHOOL
	I		40FT N OF W MAIN ST. 12FT W OF R.R. SIDING SE CORNER OF PROPERTY N OF MAIN ST.
	H		HWY 65 TO RT 6, WEST 5 MILES TO CLINE AVE, SOUTH 2 MILES TO 45TH AVE, WEST 1 ST, SOUTH ON WIGGS ST, GO .25 MILE TO ASH ST, WEST TO 217

69	1220 W. ELM PL., GRIFFITH,IN	HAL REUTH	36N	9W			SE	34								74		30
70	624 COLFAX ST, GRIFFITH, IN	BUD RHYNE	36N	9W	NE	SE	NE	35			1550		100	465510.6310	4597760.9530	65	554	15
71	724 N. HARVEY ST., GRIFFITH, IN	JERRY STEELE	36N	9W	SW	NW	NW	35			700	600		464100.0000	4598060.0000	56	562	
72	1108 E. MAIN ST., GRIFFITH, IN	SILVER STREAK LEASING	36N	9W	SE	SE	SE	35		150			500	465370.0000	4596700.0000	50	587	15
73	712 E. ELM ST., GRIFFITH, IND	RODGER JEWELL	36N	9W	SE	SW	NE	35			2600		1800			50	575	12
74	617 E. ASH ST., GRIFFITH, IN	MR. LOVIN	36N	9W	SE	SW	NE	35						464930.0000	4598055.0000	38	580	
7[illegible]	[illegible] BOX 477, HAMMOND, IN	JOE WASKO	36N	9W	NW	NE	NW	35			100	1550		464425.0000	4598250.0000	197	420	35
76	1015 S. COLUMBIA ST., GRIFFITH, IN	MICHAEL PAPPAS	36N	9W	NW	SE	SE	35		750			750	465325.0000	4596875.0000	30	607	4
77	GRIFFITH, IN	MAPES CONSOLIDATED	36N	9W		SW	SW	35								80		18
78	GRIFFITH, IND	TOWN OF GRIFFITH	36N	9W		NE	SW	35								85	545	15
79	GRIFFITH, IND	TOWN OF GRIFFITH	36N	9W				35								84		14
80			36N	9W		SW	SW	35								79		7
81	GRIFFITH, IND	MAPES CONSOLIDATED MAN. CO.	36N	9W	SW	SW	SW	35								78	552	7
82	GRIFFITH, IND	MAPES CONSOLIDATED PAPER CO.	36N	9W	SW	SW	SW	35		100		100				82		18
83	GRIFFITH, IND	MAPES CONSOLIDATED PAPER CO.	36N	9W	SW	SW	SW	35		100		600		464100.0000	4596710.0000	63		20
84	GRIFFITH, IND	TOWN OF GRIFFITH	36N	9W				35								87		23
85	300 W. MAIN ST., GRIFFITH, IN 46319	PACKAGING CORP. OF AMERICA	36N	9W	NW	SW	SW	35		700		50		463950.0000	4596875.0000	80	552	20
86	GRIFFITH, IND	MAPES CONSOLIDATED PAPER CO.	36N	9W		SW	SW	35								60		11
87		KEEN FOUNDRY	36N	9W				35								59		19
88			36N	9W				35								70		15
89	1523 49TH E. ELM ST., GRIFFITH, IN	MR. VAN FLEET	36N	9W				35								50		
90	4900 MONROE AVE GARY IN		36N	9W			SW	35								45		5
91	147 OAK ST. GRIGGTH IN	ROBERT CONAWAY	36N	9W			NW	35								60		21
92		PACKAGING CORP OF AMERICA	36N	9W				35								86		
93		TOWN OF GRIFFITH	36N	9W		NE	SW	35						597250.0000	4464675.0000	85		15
94	4680 ROSS ROAD GARY, IN	DEBRA SUMNER	36N	9W	SW	NE	NE	36			1250		850	466902.2550	4597851.2496	60	565	15
95	4826 CHERRY ST, GRIFFITH, IN	BRIAN MCGING	36N	9W	SE	SE	NE	36			2350		500	467027.1744	4597509.7190	58	579	10
96	1990 E. ELM ST, GRIFFITH , IN	HARVEY	36N	9W	SE	SE	NE	36			2500		100	467070.1650	4597454.3270	65	573	15
97	5016 CALHOUN ST, GRIFFITH, IN 46319	WACHOWSKI	36N	9W	SE	NW	SW	36		1350		1250		465924.8450	4597055.5340		590	27
98	201 N COLFAX, GRIFFITH, IN	RON AUSTGEN	36N	9W	SW	SW	SW	36		600		150				70	566	15
99	1336 E MILLER ST, GRIFFITH, IN		36N	9W	SE	NW	SW	36		1900		1150		465846.8830	4597214.3460	60	574	15
100	GRIFFITH, IN	JOHN RASINKO	36N	9W				36								71		
101	4635 45TH ST. GARY, IN	CARL ERIKSON	36N	9W	NE	NE	NE	36			100		100	467115.0000	4598200.0000	60	557	14
102	[illegible]05 E. ELM ST., GRIFFITH, IN	MR. H.B. BARENS	36N	9W	NW	NE	SE	36		2500			1000	466870.0000	4597380.0000	65	573	
10[illegible]	[illegible]14 CALHOUN ST., GRIFFITH, IN	MR. DEVINE	36N	9W	SE	NW	SW	36		1500		1250		465925.0000	4597100.0000	60	578	
104	1818 E. ELM ST., GRIFFITH, IN	ERNEST VAN BYSSUM	36N	9W	SW	SE	NE	36						466835.0000	4597480.0000	50	586	13
105	4733 W. 45TH ST., GARY, IN	FRANK JELENEK	36N	9W	NW	NE	NE	36			100		1000	466875.0000	4598200.0000	51	566	
106	5016 ADDISON ST., GRIFFITH, IN	GEORGE KLUTTS	36N	9W	SW	NE	SW	36		1600		1850		466110.0000	4597125.0000	46	594	31
107	531 N CALFAX ST., GRIFFITH, IN 46319	DAVID RUSSELL	36N	9W	SW	SW	NW	36			2350	100		465600.0000	4597575.0000		571	10
108	4542 ROSS RD., GARY	TOM BROWNWELL	36N	9W	NW	NE	NE	36			300		1150			60	558	7
109	4646 S. ROSS RD., GRIFFITH, IN	B.JAMES SOLON	36N	9W	SE	NW	NE	36			1200		1350	466750.0000	4597875.0000	42	583	
110	1400 E. TOUGHY AV	AMOCO OIL CO.	36N	9W				36								18		13
111	5013 CALHOUN ST., GRIFFITH, IN 46319	GREGORY BURGE	36N	9W	SW	NE	SW	36		1500		1400		465975.0000	4597150.0000		587	26
112	1525 E. ELM ST., GRIFFITH, IN	RUSSELL BANISTER	36N	9W				36								40		
113	GRIFFITH, IN	HARVEY'S DIME STORE	36N	9W				36								63		21
114	813 NORTH CALFAX ST., GRIFFITH, IN 46319	THOMAS CZAPLA	36N	9W	NW	NW	NW	36			350	100		465600.0000	4598150.0000		573	3
115	1603 E. ELM, GRIFFITH,IN	HANK VAN DYKE	36N	9W			SE	36								75		10
116	209 N. COLFAX, GRIFFITH,IN	JIM KELBY	36N	9W			SW	36								64		26
117	1914 E ELM ST GRIFFITH IN	JAY CASH	36N	9W			SW	36								65		10
118	1613 E. ELM ST, GRIFFITH,IN	MERIDITH WELSH	36N	9W			SE	36								65		10
119	4812 WRIGHT ST., GARY IN	HELEN JONGSMA	36N	9W			NE	36								78		15
120			36N	9W			SW	36								80		20
121	3992 W. 46TH ST, GARY,IN	FULTON'S	36N	9W			SE	36								50		10
122	5003 CALHOUN, GRIFFITH,IN	LINDA ELINDONZO	36N	9W			SW	36								65		15
123	1614 ELM ST.,GRIFFITH,IN	COFFEE	36N	9W			NE	36								80		20
124	2112 E ELM ST GRIFFITH IND	VERA KLJAJIC	36N	9W			NW	36								50		15

	I		MAIN ST. E. OF RT. 41(INDIANPOLIS BLVD) 2 MI. TO WIGGS, N. TO MILLER ST, W. TO ELM PL., TO LILLIAN, HOUSE N.E. CORNER OF ELM+ LILLIAN
O	H		HWY 65 TO RT 6, WEST 8 MILES TO COLFAX ST, SOUTH 2 MILES TO 624 COLFAX, HOUSE ON WEST SIDE, WELL AT SIDE OF HOUSE (NORTH)
D	H		
D	I		
D	H		
D	H		AROUND 4600S
D	H		119 E. GLEN PARK AVE., GRIFFITH, IND.
G	H		1015 S. COLUMBIA ST., GRIFFITH, IN 46319 SW CORNER OF HOUSE
	I		
G	I		30FT. E. OF CLINE AVE. 700FT. N. OF MAIN ST. BEHIND PLANT - WELL #5A
V	H		
	H		HWY 65 TO RT30,W .25 MI TO BROADWAY,N 4 MI TO 49TH AVE, W 2 BLKS TO MONROE ST HOUSE ON SW CORNER OF 49TH AND MONROE WELL AT NW SIDE OF HOUSE
	H		
D			45' N OF EAST WEST ST 60' W OF SE CORNER OF PLANT
D	P		
O	H		HWY 65 TO RT 6, WEST TO ROSS RD, SOUTH TO HOUSE ON WEST SIDE OF ROAD
O	H		HWY 65 TO RT 6, WEST 8 MILES TO RODD RD, SOUTH .5 MILE TO ELM, EAST 1 BLOCK TO CHERRY ST, NORTH TO 2ND HOUSE ON WEST SIDE
O	H		HWY 65 TO RT 30, WEST 8 MILES TO CLINE AVE, NORTH TO 73RD AVE, EAST 1 MILE TO COLFAX, NORTH 3 MILES TO ELM, EAST 2 MILES TO 1990, HOUSE ON NORTH SIDE
D	H		RT 41 NORTH TO MAIN ST HIGHLAND, RIGHT TO COLFAX, LEFT TO MILLER, RIGHT TO CALHOUN, RIGHT TO END OF STREET, HOUSE ON RIGHT
O	I		1 BLOCK NORTH COLFAX AND MAIN ST, GRIFFITH, IN
	H		HWY 65 NORTH TO RT 6, WEST 10 MILES TO CLINE AVE, SOUTH 4 MILES TO EAST MILLER ST, EAST TO TEE IN RD, HOUSE IS 2ND FROM END OF ROAD, NORTH SIDE
V	H		
D	H		
D	H		
D	H		
D	H		
D	H		
D	H		
D	H		
D	H		TAKE RT55 E ON 45TH AVE. ABOUT 2.5MILES TO ROSS RD. OR RT6 W FROM RT55 ABOUT 2.5MILES TO ROSS RD. GO S ABOUT ONE MILE.
D	H		
	O	TEST	HAMMOND, INDIANA, 165TH & CALUMET. NW CORNER.
D	H		
V	H		
D	H		DIME STORE PARKING LOT
D	H		
	H		HY 65 N TO RT 6, W. 8 MI. TO COLFAX, S. 2 MI. TO ELM ST, E. 1 MI. TO 1603 HOUSE S. SIDE, WELL IN FRONT
	H		1/8 MI. N. OF MAIN ST. ON COLFAX TURN E. 1.500 FT.
	H		HWY 65 TO RT 6, W 5 MI TO COLFAX ST, S 3 MI TO ELM ST, E 1 MI TO 1914 E ELM, HOUSE ON N SIDE, WELL AT S W CORNER OF HOUSE
	H		HY 65 TO RT 6, W. 4 MI. TO COLFAX ST, S. 1 MI. TO ELM ST, E. 3/4 MI. TO 1613 ELM,HOUSE S. SDIE OF ELM, WELL AT SW. SIDE OF HOME
	H		HY 65 TO RT 6, W. 6 MI. TO COLFAX, S. 1 MI. TO ELM ST., E. 1 MI. TO WRIGHT ST, N. 4TH HOUSE ON W. SIDE OF WRIGHT ST, WELL AT S.E. SIDE OF HOME
	H		HY 65 TO RT 6, W. 4 MI. TO COLFORD ST. S. 1 MI. TO MILLER ST, E. 1/4 MI. TO 1342 HOUSE N. SIDE WELL AT N.E. SIDE OF HOME
	H		HY 65 TO RT. 6 W. 4 MI. TO CLEVELAND ST.,S. 1 MI. TO 47TH AVE,W. 3/4 MI. TO WHITCOMB ST.,N. 1/4 MI. TO 46TH ST.,W. 2ND HOUSE N. SIDE OF 46TH.
	H		US 6 W. TO COLFAX, S. ON COLFAX,TO MILLER ST,E. TO CALHOURN,S.HOUSE ON S. S.E. CORNER OF MILLER+ CALHOUN
	H		HY 65 TO RT 6, W. 5 MI. TO COLFAX ST, S. 1 MI. TO ELM ST., E. 1 MI. TO 1614 HOUSE ON N. SIDE OF ELM, WELL S.E. SIDE OF HOME
	H		HWY 65 TO RT 6, W 4 MI TO CLINE AVE, S 1 MI TO ELM ST, E .75 MI TO 2112 E ELM ST, HOUSE ON N SIDE OF ELM, WELL AT S/W SIDE OF HOUSE