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167782
12.7

REPLY TO:

ENVIRONMENTAL RESPONSE DIVISION
KNAPPS CENTRE
PO BOX 30426
LANSING MI 48909-7926

January 14, 2000

Dr. Mark P. Brown, Sr. Vice President
Blasland, Bouck & Lee, Inc.
P.O. Box 66
Syracuse, New York 13214-0066

Dear Dr. Brown:

This letter is in response to the cover letter that was attached to the *Allied Paper, Inc. Operable Unit (Allied OU); Addendum to Technical Memorandum 7*, (ATM 7) dated October 25, 1999 submitted by Blasland, Bouck & Lee, Inc. (BBL) on behalf of Millennium Holdings, Inc. (MHI). Based on the cover letter, the Michigan Department of Environmental Quality (MDEQ) understands that BBL has expressed a concern regarding MDEQ revisions to text and that the MDEQ believes a site-wide groundwater remedy is necessary.

The MDEQ has concluded that the polychlorinated biphenyl (PCB) analytical data included in ATM 7 indicates widespread groundwater contamination. Elevated PCB concentrations were recorded at several different monitor well locations across the site in both filtered and unfiltered groundwater samples. The data (graph) attached to the cover letter, that attempts to demonstrate the "hydraulic connection" between Monitor Well MW-122AR and a former residual dewatering lagoon is not adequate. BBL's attempt to focus on only the double-cased monitor well data, and the possible hydraulic connection is not appropriate and could lead to misunderstanding of the groundwater contamination.

It should be noted that at the October 28, 1999 progress meeting, various MDEQ staff expressed concern to BBL and MHI that they were not considering groundwater contamination at the Allied OU to be widespread, as data indicates. Instead, it appeared as though BBL and MHI were limiting groundwater evaluation and possible remedial action to only the area near Monitor Well MW-122AR. Based on the dialogue of that meeting, the MDEQ understands BBL and MHI now consider groundwater contamination a site-wide issue.

In general, the MDEQ revised ATM 7 based on the following:

- BBL made incorrect statements consisting of several paragraphs of text that described groundwater and surface water monitoring activities that were never conducted.
- Text, tables, and diagrams were revised to make them consistent with each other and accurate.
- BBL statements implied data were collected in accordance with MDEQ reviewed and approved workplans.
- Text revisions objectively present data in a manner that minimizes the likelihood of misleading the reader.

The Phase 7 remedial investigation groundwater data was collected by BBL without MDEQ knowledge, and the MDEQ did not have an opportunity to review, comment, or approve the Phase 7 scope of work as required by the site Administrative Order by Consent. When the MDEQ was made aware of the Phase 7 sampling, the MDEQ requested that the Phase 7 groundwater-sampling event information be included with the final ATM 7.

Pursuant to BBL's request, the MDEQ will include the ATM 7 cover letter and *Addendum to Technical Memorandum 7*, dated October 25, 1999 in the Administrative Record for the Allied OU. The MDEQ will also attach this response to the cover letter so that it is also included in the administrative record. We appreciate the opportunity to share our analysis of these issues with you.

Sincerely,



Keith M. Krawczyk
Environmental Quality Analyst
Superfund Section
Environmental Response Division
517-335-4103

cc: Mr. Doug K. Cowin, Blasland, Bouck & Lee, Inc.
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Mr. John Suppnick, Michigan Department of Environmental Quality
Mr. Alan J. Howard, Michigan Department of Environmental Quality
Ms. Claudia Kerbawy, Michigan Department of Environmental Quality
Mr. George Carpenter, Michigan Department of Environmental Quality
Mr. Scott Cornelius, Michigan Department of Environmental Quality
Mr. John Bradley, Michigan Department of Environmental Quality
File V1, Allied

Transmitted Via Federal Express

October 25, 1999

Mr. Scott D. Cornelius
MDEQ-ERD
Superfund Section
P.O. Box 30426
Lansing, MI 48909-7926

Re: Addendum to Technical Memorandum 7
Allied Paper, Inc. Operable Unit
Project #: 645.51.402 #2

Dear Scott:

This letter transmits two copies of the Final Addendum to Technical Memorandum 7, which describes the methods and results of supplemental groundwater investigations for the Remedial Investigation at the Allied Paper, Inc. Operable Unit (Allied OU). As requested, 15 additional copies will follow. In addition, this letter presents technical issues that Blasland, Bouck & Lee, Inc. (BBL) and the Michigan Department of Environmental Quality (MDEQ) have discussed while preparing this document, and to which we have agreed to disagree. On behalf of Millennium Holdings, Inc. (MHI), BBL requests that this letter be included along with the Final Addendum to Technical Memorandum 7 in the Administrative Record for the Allied OU.

Significant portions of the text of this report were prepared, revised, included or removed specifically at the direction of the MDEQ. Of particular concern is the MDEQ's deletion of the following conclusions to which it had previously agreed in a meeting between representatives of the MDEQ and MHI on March 3, 1999:

"The results of six phases of groundwater sampling and analysis suggest that PCB are present in groundwater and may be mobile in the vicinity of MW-122AR and MW-22AR at the Allied OU. Therefore, for remedial planning purposes it will be assumed that PCB are moving towards Portage Creek in groundwater."

and replacement with the following:

"The results of the groundwater sampling that has been conducted at the Allied OU confirms that PCB are present in groundwater, and that groundwater flow direction is generally toward Portage Creek. Consequently, an evaluation of groundwater remedial alternatives should be conducted."

BBL is concerned that the MDEQ will interpret the revised conclusions to indicate that a site-wide groundwater remedy is necessary at the Allied OU.

PCB have been detected in groundwater samples collected from eleven locations at the Allied OU, shown on attached Figure 1. BBL evaluated whether artifacts of well construction contributed to the detection of

PCB in groundwater by installing and sampling double-cased replacement wells immediately adjacent to five of the eleven original wells which yielded groundwater samples containing PCB. These wells were designated MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR. (Replacement wells were not installed for MW-2S, MW-5, MW-121A, or MW-121B because these wells were abandoned during the USEPA Removal Action. Replacement wells were not installed near MW-8A or MW-120B because these wells are located upgradient of the groundwater-surface water interface zone.) At the request of the MDEQ, two additional double-cased replacement wells (MW-5R and P-1R) were installed as part of this program.

Groundwater samples were collected from the double-cased wells during sampling Phases 5, 6, and 7. The investigation results confirmed PCB to be present only in groundwater samples collected from Monitoring Wells MW-22AR and MW-122AR. BBL believes that the detection of PCB in groundwater samples collected from Monitoring Wells MW-22AR and MW-122AR is attributable to the presence of PCB-containing surface water in the immediately adjacent lagoons.

During the period of groundwater investigation, water was ponded in the lagoons due to the low hydraulic conductivity of the underlying paper residuals. To evaluate the hydraulic connection between surface water in the lagoons and groundwater in the immediately adjacent wells, BBL compared staff gage readings of surface water held in Former Residuals Dewatering Lagoon (FRDL) #1 to groundwater elevations in the adjacent Monitoring Well MW-122AR during the period of May through October 1998. It was during this period that water in the lagoons was removed in anticipation of the Removal Action to be conducted by the U.S. Environmental Protection Agency (USEPA). These data are presented graphically on Attachment 1, and selected data are shown below.

Date	Lagoon #1 Water Elevation (feet - no datum)	Change in Water Level (feet)	MW-122AR Water Elevation (feet above mean sea level)	Change in Water Level (feet)
May 6, 1998	2.6	--	792.94	--
August 5, 1998	-1.6	-4.2	788.81	-4.93
October 3, 1998	-2.2	-4.8	785.84	-7.10

The high degree of hydraulic connection between surface water and groundwater is clearly demonstrated by the high correlation between water levels in the lagoon and water levels in the monitoring well. As previously communicated to the MDEQ, BBL believes that standing water in the lagoons is the primary source of PCB to groundwater in these areas, which is strongly supported by the hydraulic connection data.

MHI recently agreed to install and operate a groundwater extraction system in the area of the Bryant Historic Residuals Dewatering Lagoon (HRDL) and FRDLs as part of an interim remedial measure. This system is intended to satisfy the MDEQ's concerns that groundwater may mound behind sheet piling to be installed within the perimeter berm, and potentially mobilize and transport PCB toward Portage Creek. However, our agreement to install and operate an extraction system in this limited area of the site is not intended to affect or prejudice the remedy for the remainder of the Allied OU, which will be fully evaluated in the upcoming Feasibility Study.

If you have any questions or would like to discuss this issue further, please contact me at 920/991-0014.

Mr. Scott D. Cornelius
October 25, 1999
Page 3 of 3

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Douglas K. Cowin / TL, A

Douglas K. Cowin, P.G.
Manager

Enclosure

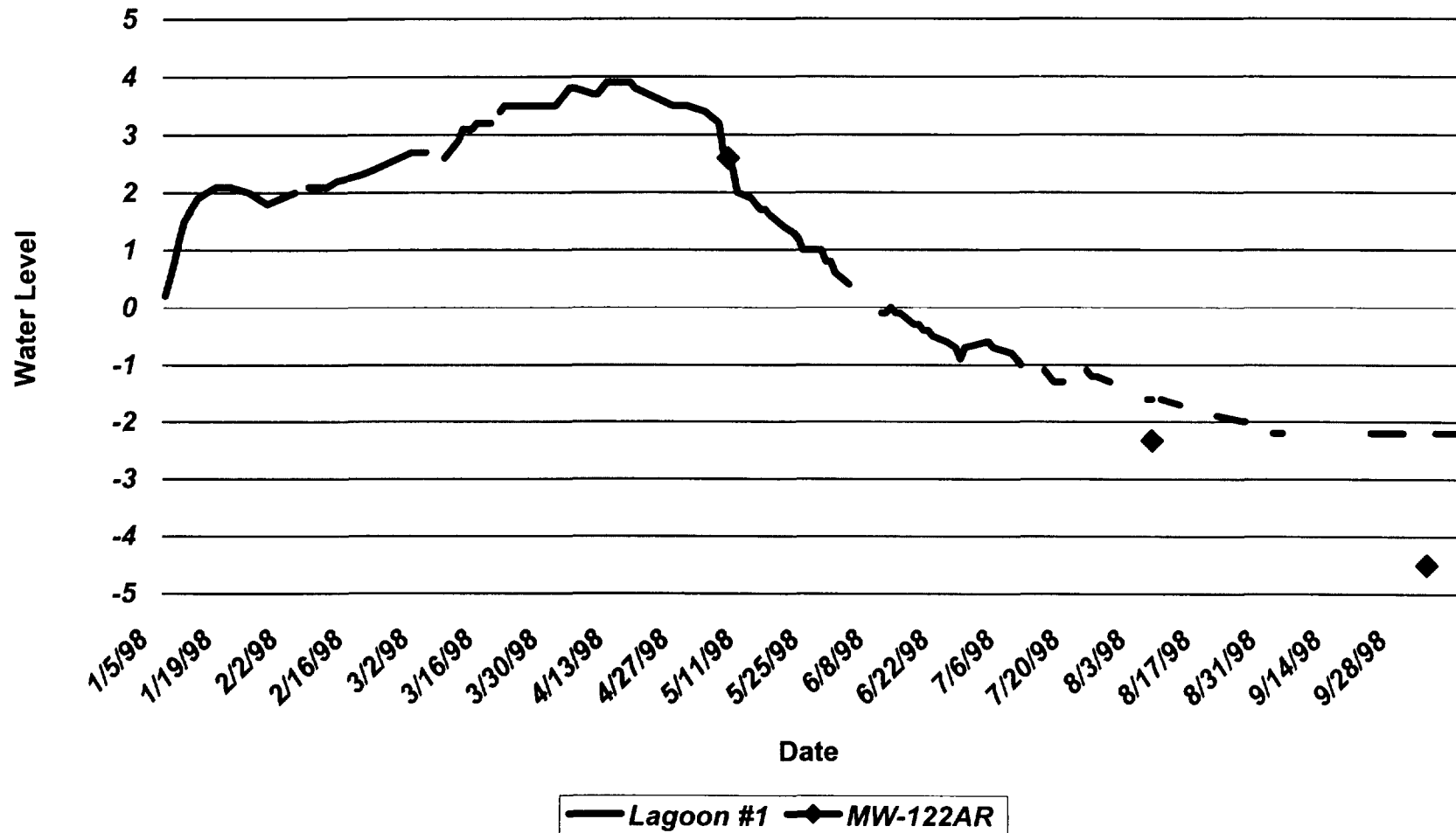
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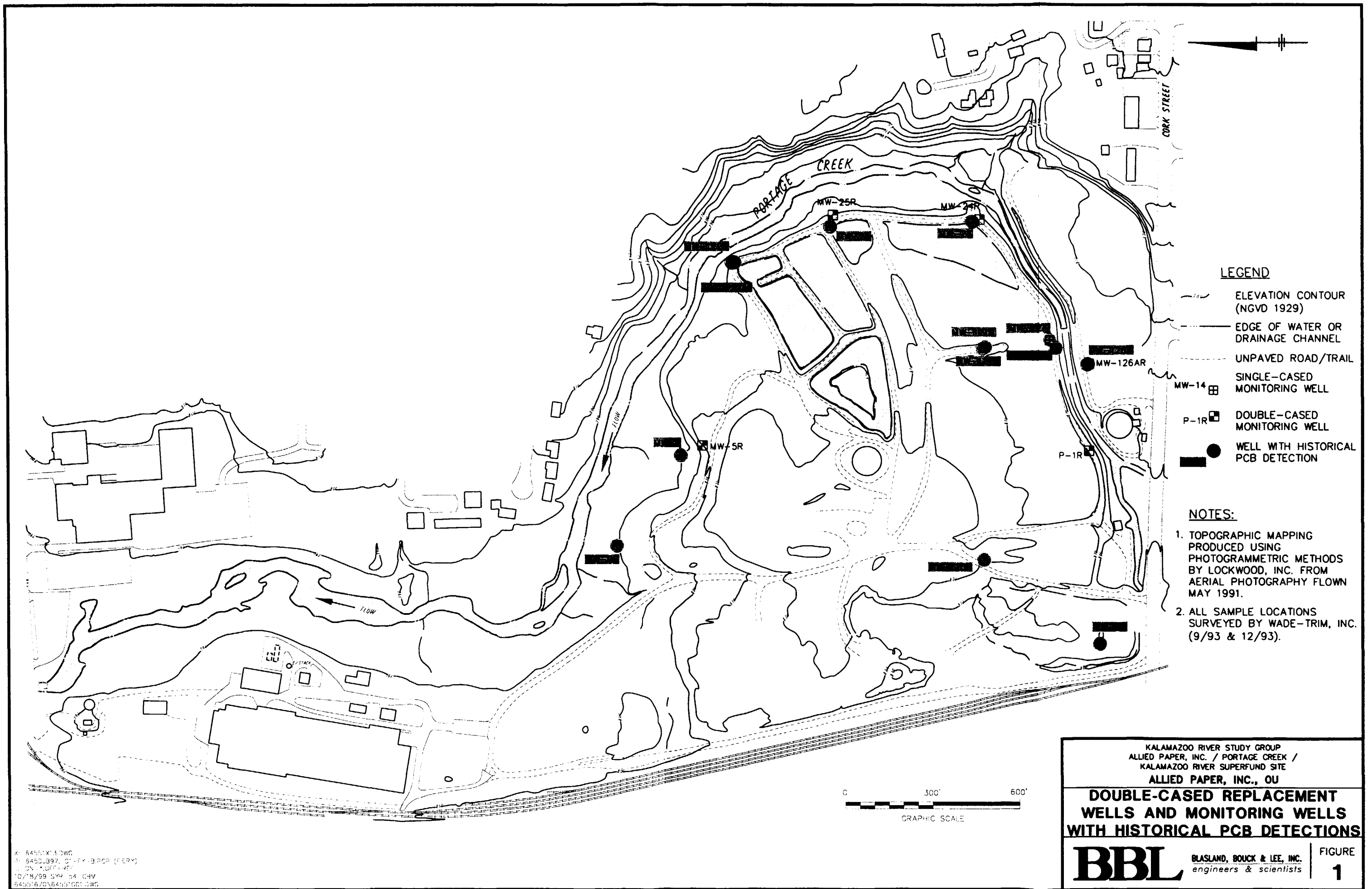
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cc: Bonnie A. Barnett, Esq., Drinker, Biddle & Reath
Joyce S. Schlesinger, P.E., Environ
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Mark P. Brown, Ph.D., Blasland, Bouck & Lee, Inc.

Attachment 1

**Lagoon #1 and MW-122AR Water Levels
Allied Paper, Inc. Operable Unit**





*Allied Paper, Inc.
Operable Unit*

*Addendum to
Technical Memorandum 7
Volume 1 of 2*

Allied Paper, Inc./Portage Creek/
Kalamazoo River Superfund Site
Kalamazoo, Michigan

October 1999



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1. Introduction

This report documents the results of supplemental groundwater sampling conducted in 1995, 1997 and 1998 by Blasland, Bouck & Lee, Inc. (BBL) on behalf of Millennium Holdings, Inc. (MHI). The sampling was completed as part of the Remedial Investigation (RI) of the Allied Paper, Inc. Operable Unit (OU) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site, located within the city of Kalamazoo, Michigan (Figure 1). This report has been completed as an addendum to Technical Memorandum 7 Report, dated August 1997, which described the findings of the first round of groundwater sampling (Phase 1), conducted in 1993, as well as other RI activities previously conducted at the OU. This Addendum consists of two volumes; Volume I includes text, tables, diagrams, and Appendices A, B, C, and D, whereas Volume II includes Appendix E.

1.1 Background

Supplemental sampling events were conducted in 1995 (Phase 2), 1997 (Phases 3 and 4), and 1998 (Phases 5, 6, and 7). The sampling generally focused on evaluating groundwater for the presence of polychlorinated biphenyls (PCB) and to determine whether the detection of PCB in groundwater is attributable to artifacts of well construction, or if they are representative of ambient groundwater conditions. Sample locations (e.g., MW-2S) are shown in Figure 2.

1.2 Rationale for Groundwater Sampling Events

Phase 2 Groundwater Sampling Event

Prior to the Phase 2 groundwater-sampling event, samples were collected from 52 monitoring wells (and a leachate sample from Monitoring Well MW-125P, and a groundwater seep identified as Rivulet 2) as part of the Phase 1 sampling. The Phase 1 samples were analyzed in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP), which uses a method detection limit (MDL) of 1.0 microgram per liter ($\mu\text{g/L}$) for PCB. The Michigan Department of Environmental Quality (MDEQ) requested that a second sampling event be conducted using a lower MDL for PCB analyses. Therefore, in October of 1995, the Phase 2 sampling was conducted and groundwater was collected for analyses from each of the 52 monitoring wells. However, as a result of accidental loss of samples collected from Monitoring Wells MW-1, MW-124A, and MW-124B at the laboratory prior to analysis, groundwater was re-sampled at these locations in December 1995.

Phase 3 Groundwater Sampling Event

Upon review of the site hydrogeology, well construction records, and Phase 1 and Phase 2 PCB groundwater analytical data that indicated the presence of PCB at 11 of the 52 groundwater sample locations, BBL hypothesized that the PCB detected in some or all of the groundwater samples may be the result of PCB-contaminated artifacts of well construction. The Phase 3 sampling event was conducted in March 1997 to evaluate this hypothesis. Ten of the 11 monitoring well locations where PCB had been detected were re-sampled. Both filtered and unfiltered groundwater samples, as well as the filter media used in filtering particles from the filtered groundwater samples were analyzed for PCB and total organic carbon (TOC) in this phase of sampling to test the hypothesis. Monitoring Well MW-24 was not re-sampled due to observed damage to this well.

This evaluation of the "well-artifact hypothesis" was conducted with the following understanding:

- Particles retained by a 1 micrometer (μm) filter are assumed to be immobile in the groundwater environment under natural flow conditions. Therefore, the detection of PCB in filtered particulate samples may demonstrate that PCB are present in an immobile state and indicate that PCB may be present as an artifact of well construction.

- Detection of PCB in an unfiltered groundwater sample at a concentration greater than that in the corresponding filtered sample may demonstrate that portion of the PCB is associated with large particles (greater than 1 μm). Because the MDL in the particulate sample may be much higher than the MDL used for the groundwater samples, failure to detect PCB in the particulate sample would not demonstrate the absence of PCB in the immobile state.
- Detection of PCB in filtered groundwater samples would demonstrate that PCB are present either in the particulate phase at less than 1 μm (colloid size) or in the dissolved phase, or in some combination of these two phases. This detection would indicate that PCB may be mobile in the groundwater and may not be an artifact of well construction.

Phase 4 Groundwater Sampling Event

The results of the March 1997 Phase 3 sampling event appeared to BBL to support the observation that PCB concentrations decreased with each successive sampling event. BBL hypothesized that the purging of water from the wells served to flush potential artifacts of well construction from the boreholes, consequently, the Phase 4 sampling was planned.

The "well-artifact hypothesis" was further assessed in the Phase 4 sampling event, conducted in July 1997. This sampling event consisted of a purge and sample sequence where a volume of water (e.g., 10-gallons) was purged from Monitoring Wells MW-120B and MW-121B, then a sample was collected. The process was repeated a total of three times, with a groundwater sample being collected after each purge sequence. The goal of this phase of sampling was to evaluate if additional purging removed PCB-contaminated particulate matter that may have been introduced into the monitoring wells during construction, thereby reducing PCB concentrations. If this hypothesis were true, PCB concentrations would be lower than those recorded in the Phase 3 sampling, as well as after each purging sequence. Monitoring Wells MW-120B and MW-121B were selected by BBL as representative monitoring wells that reflect site conditions.

Phase 5 Groundwater Sampling Event

Prior to the Phase 5 sampling event, five double-cased monitoring wells were installed, including MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR near Portage Creek at locations toward the outside of the berm, near the Historic Residuals Dewatering Lagoon (HRDL) and Former Residual Dewatering Lagoons (FRDLs). These double-cased monitoring wells were installed near single-cased Monitoring Wells MW-22A, MW-24, MW-25, MW-122A, and MW-126A, respectively. Elevated PCB concentrations were detected in groundwater samples collected from these single-cased monitoring wells (as well as in groundwater collected from six other monitoring well locations) during previous sampling events. In addition, two other double-cased monitoring wells (MW-5R and P-1R) were installed prior to collecting Phase 5 samples. Monitoring Well MW-5R was installed approximately 100 feet up-gradient of existing Monitoring Well MW-5, outside of the Former Bryant Mill Pond, whereas Monitoring Well P-1R was installed in the berm at a location between Piezometer P-1 and Monitoring Well MW-23, near the southern boundary of the Allied OU.

Double-cased monitoring wells were installed to further evaluate groundwater remedial alternatives, with the understanding that if PCB are present in groundwater, then a range of groundwater remedial alternatives will be developed and evaluated. The locations of the double-cased wells that were installed were selected to allow the monitoring wells to remain in place during such activities as berm stabilization, regrading of waste material, and capping of the HRDL and FRDLs, and to maximize the potential for their future use in a groundwater monitoring network.

Phase 6 Groundwater Sampling Event

The Phase 6 sampling event consisted of collecting groundwater samples from six (MW-22AR, MW-24R, MW-25R, MW-5R, MW-126R, and P-1R) of the seven double-cased monitoring wells in August 1998, and from Monitoring Wells MW-22AR and MW-122AR on October 3, 1998. The analytical results provide additional baseline data from the double-cased monitoring wells, prior to the start of the Time-Critical Bryant Mill Pond Removal Action. The removal activities will be described in the Allied Paper, Inc., Operable Unit 1, Remedial Investigation Report.

Phase 7 Groundwater Sampling Event

The Phase 7 sample event was conducted by BBL on behalf of MHI to provide additional data from the double-cased monitoring wells. This phase of sampling was conducted voluntarily by MHI, and the MDEQ was not consulted in determining which wells were sampled.

The Phase 7 sample event was conducted to evaluate groundwater quality in the area of the Bryant HRDL and FRDLs during the ongoing time-critical Removal Action activities. Groundwater samples were collected from Monitoring Wells MW-5R, MW-22R, MW-24R, MW-122AR, and P-1R. A groundwater sample was not collected from Monitoring Well MW-25R because it had been damaged by USEPA contractors during the Removal Action. At MHI's discretion, Monitoring Well MW-126AR was not sampled because PCB had not been detected in groundwater samples collected during Phases 5 and 6, and because groundwater conditions at this location were not expected to have changed as a result of the Removal Action activities.

2. Investigation Activities

This section presents the scope and methods of investigative activities that were conducted during groundwater sampling Phases 2 through 7.

2.1 Groundwater and Surface Water Monitoring

On two occasions (September 9 and September 27, 1993) prior to the Phase 1 sampling event, groundwater elevations were measured at most monitoring well locations, and surface water elevation was measured at the location of Creek Gauge CG-1 (see Figure 2). These measurements were collected to verify that steady-state or near steady-state flow towards Portage Creek existed.

Groundwater elevation and surface water elevation were measured at Monitoring Well MW-122A and Creek Gauge CG-1, respectively, on five occasions in the week prior to conducting the Phase 2 sampling. Measurements were collected on September 21, 22, 24, 25, 27, and 28, 1995, and the groundwater-sampling event was initiated on October 2, 1995. On October 13, 1995, following the completion of the Phase 2 groundwater sampling event, groundwater elevations were measured at most monitoring well locations and the surface water elevation was measured at the location of CG-1. During subsequent groundwater sampling events (Phases 3 through 7), groundwater elevations were measured only at the monitoring wells being sampled.

In addition to the groundwater and surface water elevation measurements, measurements of pH, specific conductivity, temperature, turbidity, oxidation reduction potential, and dissolved oxygen were recorded on several occasions prior to monitoring well purging, and then at regular intervals during the purging. When the measurements indicated that the parameters were stabilized, groundwater samples were collected. A final set of measurements of these parameters was obtained at the time of sample collection.

Table 2-1 summarizes the groundwater elevations that were collected and the surface water elevation measurements. Table 2-2 lists the field measurements at the time of sampling for pH, specific conductivity, temperature, turbidity, oxidation reduction potential, and dissolved oxygen. General water quality parameters and monitoring data were recorded in field notes and/or groundwater sampling logs and are included in Appendix A.

2.2 Phase 2 Groundwater Sampling Event

Phase 2 groundwater sampling was conducted October 2 through 12, 1995. As a result of accidental laboratory loss of groundwater samples collected from Monitoring Wells MW-1, MW-124A, and MW-124B, re-sampling was conducted at these locations on December 13 and 14, 1995. Monitoring wells were sampled using a submersible pump in accordance with the established protocols. The purge rate was consistent with the sampling rate, and did not exceed 500 milliliters per minute (ml/min), with the exception of the sampling at Monitoring Well MW-18. At this location flow could not be adjusted to less than 625 ml/min using the submersible pump. Water levels were monitored during purging and sampling to avoid significant drawdown of the well. Calculated well volumes and volumes of water purged are summarized in Table 2-3.

Groundwater samples were shipped to Severn Trent Laboratories (previously known as Aquatec, Inc. and ITS Environmental Laboratories), hereafter referred to as project laboratory, for PCB analyses using USEPA SW-846 Method 8081. Chain-of-custody documentation is included as Appendix B.

2.3 Phase 3 Groundwater Sampling Event

Groundwater samples were collected from Monitoring Wells MW-2S, MW-5, MW-8A, MW-22A, MW-25, MW-120B, MW-121A, MW-121B, MW-122A, and MW-126A between March 4 and March 6, 1997 using a submersible pump in accordance with low-flow sampling protocols. Monitoring Well MW-24 was damaged and not sampled.

Filtered and unfiltered samples were collected from each of the 10 monitoring wells. Samples were filtered using a pre-cleaned, pre-weighed glass fiber filter with a nominal pore size of 1 μm to retain groundwater particulate larger than 1 μm . One filter was dedicated for each monitoring well. Unfiltered groundwater samples were collected without the filtering devices. In accordance with the Work Plan addendum (BBL, 1997), and as discussed with and approved by the MDEQ oversight representative, the samples were collected in the following order: 1) filtered groundwater sample; 2) unfiltered groundwater sample; and 3) particulate sample. The filtered groundwater sample consisted of approximately the first two liters of water passed through the filter. Unfiltered samples consisted of two liters of water obtained directly from the pump discharge.

The groundwater samples were submitted to the project laboratory for analysis of TOC by USEPA SW-846 Method 9060 and for analysis of PCB by USEPA SW-846 Method 8081 with a target MDL of 0.2 $\mu\text{g/L}$.

A particulate sample was collected at each monitoring well by passing approximately 20 gallons (76 liters) of groundwater through a series of pre-weighed 1 μm pore size glass fiber filters, with the exception of MW-126A which retained sufficient particulate after approximately 7 gallons were filtered. Adequate particulate samples for analysis were not obtained from Monitoring Wells MW-25 and MW-121B due to insufficient groundwater recharge from these wells (i.e., pumped dry).

Filter particulate samples were submitted for TOC analysis by USEPA SW-846 Method 9060 and for PCB analysis by USEPA SW-846 Method 8081.

2.4 Phase 4 Groundwater Sampling Event

Groundwater samples were collected from Monitoring Wells MW-120B and MW-121B in the Phase 4 sampling event, and BBL considered sampling of these monitoring wells as representative of site conditions. Three groundwater samples were collected from each monitoring well. The groundwater purging and sampling activities were consistent with the protocols followed during the previous groundwater sampling event. Each well was purged at a constant and consistent flow rate between 250 and 500 ml/min prior to each sample collection. Monitoring well purging was to continue until field parameters stabilized and approximately 10 gallons of water were removed prior to the first sample collection. However, this was accomplished only at Monitoring Well MW-120B. Due to the low yield of Monitoring Well MW-121B at a purging rate of 500 ml/min, only approximately 2.5 gallons of groundwater were purged prior to collection of the initial sample. The second and third samples were collected after purging an additional three and two gallons, respectively. Following each purge sequence, the well was allowed to recharge sufficiently to allow for sample collection.

The collection of groundwater samples was accomplished using low-flow positive displacement pumps in which the flow control mechanism exerts direct control over the action of the sample delivery mechanism. At each monitoring well, the sample collection flow rate was set at the flow rate used during purging. Unfiltered groundwater samples were collected and submitted to the project laboratory and analyzed for PCB by USEPA SW-846 Method 8081.

2.5 Phase 5 Groundwater Sample Event

Double-cased Monitoring Wells MW-22AR, MW-24R, MW-25R, MW-122AR, MW-126AR, MW-5R, and P-1R were installed and developed prior to collecting Phase 5 groundwater samples. Groundwater samples were collected from each of the double-cased monitoring wells during this phase of sampling. A duplicate sample was collected from Monitoring Well MW-25R, and a matrix spike/matrix spike duplicate (MS/MSD) sample was collected from Monitoring Well P-1R. A rinse blank was collected from the pump after decontamination. All of the samples were contained in laboratory-provided amber glass bottles, labeled, custody sealed, and recorded on the chain-of-custody. The samples were placed in coolers packed with ice and bubble wrap, and shipped to the

project laboratory for analysis of PCB by USEPA SW-846 Method 8082. Field notes with daily log notes and groundwater-sampling logs are included in Appendix A. Chain-of-custody forms are included in Appendix B.

2.5.1 Monitor Well Installation and Development

The installation of double-cased wells, conducted between March 18 and April 2, 1998, was intended to minimize the potential for introducing PCB-containing particles to the wells during construction. Double-cased Monitoring Wells MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR were constructed with screen lengths and depths corresponding approximately to those of MW-22A, MW-24, MW-25, MW-122A, and MW-126A, respectively. Double-cased Monitoring Well P-1R was installed as a water table well, with a ten-foot screen intersecting the water table, as determined in the field. Four pilot borings were advanced prior to installing Monitoring Well MW-5R in an attempt to identify the location of a former effluent channel that conveyed residual material from the former clarifier to the Bryant Mill Pond. However, the former effluent channel was not located, and Monitoring Well MW-5R was installed in the last of the four pilot borings.

Field notes, soil boring logs, and construction logs for wells installed during the Phase 5 event, as well as a memorandum describing well installation and development methods, are included in Appendix C.

2.6 Phase 6 Groundwater Sampling Event

Groundwater was collected from six of the seven double-cased monitoring wells (excluding MW-122AR) in August 1998, and from Monitoring Wells MW-22AR and MW-122AR in October 1998 for the Phase 6 groundwater sampling event. During the August 1998 sampling, Monitoring Well MW-122AR was purged dry. Due to the very low water level and slow groundwater recharge observed, the volume of water collected by the electric submersible pump sampling method was insufficient for laboratory analysis. BBL also believed that an unusual PCB pattern was detected in the sample collected from Monitoring Well MW-22AR, and therefore, groundwater samples were collected from these two monitoring wells again on October 3, 1998. However, water levels observed in these monitoring wells had dropped further by this date, and with the consent of the MDEQ oversight representative they were sampled using a peristaltic pump. An advantage to using a peristaltic pump for sample collection is that water samples can be collected from the very bottom of a well. A disadvantage of this method is that very fine sediments that accumulate in a monitoring well over time can also be removed along with the water sample, resulting in turbid samples that may not be representative of ambient conditions.

2.7 Phase 7 Groundwater Sampling Event

On December 15, 1998, the Phase 7 groundwater sampling event occurred. BBL collected groundwater samples from Monitoring Wells MW-5R, MW-22AR, MW-24R, MW-122AR, and P-1R. Adequate groundwater levels allowed for the sampling of each of the five monitoring wells that were sampled, including Monitoring Well MW-122AR. Groundwater was pumped at a rate of 200 ml/min for 25 minutes from MW-122AR, and turbidity readings were consistent with other wells and other sampling events conducted in accordance with the sampling protocols.

2.8 QA/QC Review of Data

Analytical data reports for groundwater and filter particulate samples collected during sampling Phases 2 through 7 underwent quality assurance/quality control (QA/QC) review and evaluation to assess overall analytical precision and accuracy according to applicable USEPA National Functional Guidelines and the QAPP. A total of 11 sample delivery groups (SDGs) were reviewed and evaluated. Table 2-4 presents a summary of the SDGs and their associated samples.

Laboratory analysis precision was assessed by BBL by comparing the analytical results between MS and MSD samples. Field duplicates were also analyzed and relative percent differences (RPD) calculated for each pair of duplicate analyses. To assess the analytical method's accuracy, other indicators such as surrogate spike and blank spike recovery data were examined. The results of the QA/QC data review of analytical results are documented in Appendix D. A complete set of the laboratory analytical reports is presented in Appendix E.

3. Investigation Results

3.1 Groundwater and Surface Water Elevation Measurement Results

Groundwater and surface water elevations that were collected indicate steady-state groundwater flow toward Portage Creek. These measurements are summarized in Table 2-1.

3.2 Groundwater Quality Parameter Field Measurement Results

General water quality parameters measured during all phases of sample collection included pH, specific conductivity, temperature, and turbidity, whereas, oxidation reduction potential and dissolved oxygen were also measured in Phases 4 through 6. These data were recorded on groundwater sampling forms that are included in Appendix A. Final measurements are summarized in Table 2-2.

Groundwater pH ranged from 5.1 to 11.3 standard units. Specific conductivity values ranged from 0.40 to 1.84 milliSiemens per centimeter (mS/cm). Temperature of the groundwater samples ranged from 6°C to 23°C, and turbidity measurements ranged from 1 to 1,660 nephelometric turbidity units (NTU). Oxidation reduction potential ranged from -17 to -131 millivolts, and dissolved oxygen ranged from 0.5 to approximately 7.4 milligrams per liter (mg/L).

3.3 Groundwater Quality Analytical Results

PCB analytical results for groundwater sampling events Phases 2 through 7 are summarized in Table 3-1.

3.3.1 Phase 2 Groundwater Quality Analytical Results

PCB were detected in groundwater collected from Monitoring Wells MW-2S, MW-5, MW-8A, MW-22A, MW-24, MW-120B, MW-121A, MW-121B, MW-122A, and MW-126A. Reported estimated PCB concentrations ranged from 0.20 to 1.4 µg/L. All detections were quantified as Aroclor 1242.

PCB were detected in groundwater samples collected from three monitoring wells in Phase 2 (MW-2S, MW-122A, and MW-126A) which had not yielded detectable concentrations of PCB in the Phase 1 samples. The MDL used for PCB analyses during Phase 1 (1.0 µg/L) was higher, however, than that used in Phase 2.

3.3.2 Phase 3 Groundwater Quality Analytical Results

The Phase 3 analytical results indicated elevated PCB concentrations in both filtered and unfiltered groundwater samples collected from nine of the 10 wells that were sampled, including Monitoring Wells MW-2S, MW-5, MW-8A, MW-22A, MW-120B, MW-121A, MW-121B, MW-122A, and MW-126A. Groundwater collected from Monitoring Well MW-25 had non-detectable concentrations of PCB, using a method detection limit of 0.070 and 0.050 µg/L for unfiltered and filtered samples, respectively.

Notwithstanding small well-by-well differences, there were no significant differences in the overall analytical results (PCB concentrations) of the filtered and unfiltered samples. PCB concentrations in the unfiltered groundwater samples ranged from 0.078 to 1.0 µg/L, whereas the PCB concentrations ranged from 0.072 to 1.1 µg/L in the filtered groundwater samples.

Particulate sample PCB results are presented in Table 3-2. PCB concentrations were quantified above the calculated MDLs in particulate samples retained on the filters from three (MW-2S, MW-22A, MW-126A) of the ten wells sampled. Solid-phase PCB concentrations associated with particulate matter retained on five (MW-5, MW-8A, MW-120B, MW-121A, and MW-122A) filters were below the calculated MDLs for those samples. Particulate samples from Monitoring Wells MW-25 and MW-121B were not collected due to the lack of a sufficient

quantity of water to filter in order to retain an adequate particulate sample. Overall, the particulate sample analytical results were inconclusive with regard to the well-artifact hypothesis.

3.3.2.1 Total Organic Carbon Analytical Results

TOC concentrations in the filtered groundwater samples and three of the unfiltered groundwater samples (MW-2S, MW-5, and MW-8A) were rejected due to significant QC problems. TOC concentrations in the unfiltered groundwater samples ranged from an estimated 11 mg/L (MW-121A) to 20.6 mg/L (MW-126A). TOC concentrations associated with particulate retained on the filters were reported above the calculated MDLs for seven of the samples (including MW-126A duplicate) and ranged from 33.1 milligrams per kilogram (mg/kg) (MW-121A) to 462 mg/kg (MW-22A).

3.3.3 Phase 4 Groundwater Quality Analytical Results

The results for all three Phase 4 samples collected from Monitoring Well MW-120B indicate higher levels of PCB (approximately 0.4 $\mu\text{g/L}$) in groundwater than the PCB concentrations detected in the Phase 3 filtered (0.26 $\mu\text{g/L}$) and unfiltered (0.11 $\mu\text{g/L}$) samples. In addition, there was no significant change in PCB concentrations between purge events of Phase 4. The results of the three unfiltered groundwater samples obtained from MW-120B during the Phase 4 sampling event indicate an initial PCB concentration of 0.41 $\mu\text{g/L}$, 0.42 $\mu\text{g/L}$ after the second purge sequence, and 0.39 $\mu\text{g/L}$ following the third purge sequence.

The results of the initial Phase 4 groundwater sample obtained from MW-121B indicated a PCB concentration of 0.30 $\mu\text{g/L}$. PCB concentrations in the two subsequent samples obtained from this well decreased to 0.29 $\mu\text{g/L}$ and 0.25 $\mu\text{g/L}$, respectively. The PCB concentrations detected in the three Phase 4 groundwater samples collected from Monitoring Well MW-121B are nearly identical (actually higher in two cases) than the Phase 3 unfiltered sample.

Overall, the results tend to refute the hypothesis that PCB levels decrease with continued purging of wells or with filtering of the samples.

3.3.4 Phase 5 Groundwater Quality Analytical Results

Each of the seven double-cased monitoring wells that were installed was sampled during the Phase 5 sampling event. The validated laboratory results indicate the presence of PCB only in the sample collected from Monitoring Well MW-122AR, at a concentration of 0.60 $\mu\text{g/L}$ (Table 3-1).

3.3.5 Phase 6 Groundwater Quality Analytical Results

PCB were detected in one of six samples collected on August 5 and 6, 1998 from the double-cased monitoring wells along the exterior berm of the HRDL and FRDLs. The estimated PCB concentration of 0.13 $\mu\text{g/L}$ detected in the MW-22AR sample was tentatively quantified as Aroclor 1232, which is not consistent with previous analytical results, which generally were quantified as Aroclor 1242, rather than Aroclor 1232. In addition, an insufficient volume of water was collected from MW-122AR for laboratory analysis, and a sample could not be analyzed for PCB in the August 1998 sampling visit. As a consequence, Monitoring Wells MW-22AR and MW-122AR were re-sampled on October 3, 1998. The analytical results indicate the detection of a highly weathered Aroclor 1242 at estimated concentrations of 0.089 $\mu\text{g/L}$ in MW-22AR and 0.33 $\mu\text{g/L}$ in MW-122AR.

Consistent with the previous sampling phase, the groundwater samples collected on October 3, 1998 were not filtered prior to analysis in the laboratory. The MW-122AR sample was collected from the bottom of the well using a peristaltic pump that resulted in a highly turbid sample. The high level of turbidity associated with this sample indicates that it might not have been representative of ambient groundwater conditions.

3.3.6 Phase 7 Groundwater Quality Analytical Results

Five of the seven double-cased monitoring wells (MW-22AR, MW-24R, MW-122AR, MW-5R, and P-1R) were sampled by BBL on December 15, 1998. Monitoring Well MW-25R was damaged and not sampled, and groundwater samples were not collected from MW-126AR. Analytical results indicate elevated estimated PCB concentrations in groundwater samples collected from Monitoring Well MW-22AR (0.080 $\mu\text{g/L}$) and MW-122AR (0.44 $\mu\text{g/L}$). Sufficient groundwater in the monitoring wells allowed for sampling in accordance with the established protocols, and the samples are considered representative of ambient groundwater conditions.

3.4 QA/QC Review of Data

Appendix D contains a summary of the QA/QC Review of Data - Summary of Precision and Accuracy Assessment. In general, all PCB analytical data were accepted, however, many sample analytical results have been qualified and/or estimated. Much of the TOC data has been rejected. An assessment of analytical precision for the particulate samples was not conducted due to a limited sample mass.

3.5 Conclusions

The results of the groundwater sampling that has been conducted at the Allied OU confirms that PCB are present in groundwater, and that groundwater flow direction is generally toward Portage Creek. Consequently, an evaluation of groundwater remedial alternatives should be conducted.

Figure 3 depicts groundwater flow direction based on elevations measured on October 13, 1998.

Tables

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

TABLE 2-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER AND SURFACE WATER ELEVATIONS

Location	Reference Elevation ⁽¹⁾	Water Level Elevation ⁽²⁾												
		9/9/93	9/27/93	12/14/93	5/16/94	6/15/94	9/21/95	10/13/95	3/6/97	7/29/97	5/6/98	8/5/98	10/3/98	12/15/98
MW-1	833.19	797.64	797.69	797.49	-	826.39	-	797.01	-	-	-	-	-	-
MW-2	793.29	789.25	789.31	789.12	788.81	788.85	-	788.76	-	-	-	-	-	-
MW-2S	791.12	787.67	788.30	787.46	-	787.73	-	787.57	787.56	-	-	-	-	-
MW-3	797.14	787.14	787.22	787.06	-	-	-	786.53	-	-	-	-	-	-
MW-4	801.60	790.82	-	790.79	-	-	-	-	-	-	-	-	-	-
MW-5	791.77	787.56	787.96	787.81	-	-	-	787.50	787.95	-	-	-	-	-
MW-5R	811.87	-	-	-	-	-	-	-	-	-	792.26	791.82	-	792.13
MW-6	812.70	798.01	-	797.77	-	-	-	797.25	-	-	-	-	-	-
MW-7	818.94	800.95	800.01	799.72	799.81	799.79	-	799.09	-	-	-	-	-	-
MW-7B	818.30	798.64	800.35	798.46	798.50	798.54	-	797.85	-	-	-	-	-	-
MW-8	810.20	799.07	799.08	-	798.88	798.80	-	798.54	798.39	-	-	-	-	-
MW-8A	810.74	799.02	798.59	798.84	798.82	798.79	-	798.67	-	-	-	-	-	-
MW-9	802.97	795.97	-	795.93	-	-	-	793.70	-	-	-	-	-	-
MW-10	810.09	794.79	-	-	-	-	-	794.22	-	-	-	-	-	-
MW-11	808.99	799.07	799.20	799.13	-	-	-	798.13	-	-	-	-	-	-
MW-12	809.21	788.19	-	787.91	-	-	-	786.92	-	-	-	-	-	-
MW-12R	808.30	788.22	788.62	786.87	-	787.47	-	786.89	-	-	-	-	-	-
MW-13	790.66	788.08	-	788.28	788.11	-	-	787.69	-	-	-	-	-	-
MW-14	786.79	785.40	-	785.37	-	-	-	-	-	-	-	-	-	-
MW-15	795.24	786.71	786.84	786.70	-	-	-	786.17	-	-	-	-	-	-
MW-16B	803.61	787.18	787.33	787.23	-	-	-	786.73	-	-	-	-	-	-
MW-16C	804.14	793.14	793.13	792.99	-	-	-	792.38	-	-	-	-	-	-
MW-17A	810.28	791.62	791.65	791.50	791.53	791.33	-	791.11	-	-	-	-	-	-
MW-17B	810.07	791.77	791.83	791.69	791.73	791.52	-	791.29	-	-	-	-	-	-
MW-18	793.47	789.74	789.92	789.72	789.77	789.72	-	789.61	-	-	-	-	-	-
MW-19BR	822.06	795.89	797.12	795.90	796.41	795.72	-	795.29	-	-	-	-	-	-

(See Notes on Page 4)

TABLE 2-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER AND SURFACE WATER ELEVATIONS

Location	Reference Elevation ⁽¹⁾	Water Level Elevation ⁽²⁾												
		9/9/93	9/27/93	12/14/93	5/16/94	6/15/94	9/21/95	10/13/95	3/6/97	7/29/97	5/6/98	8/5/98	10/3/98	12/15/98
MW-19C	822.09	795.50	795.54	795.54	795.81	795.35	-	794.89	-	-	-	-	-	-
MW-19D	821.98	795.40	795.57	795.53	795.79	795.33	-	794.87	-	-	-	-	-	-
MW-20	810.99	796.60	796.73	796.47	796.50	796.34	-	795.89	-	-	-	-	-	-
MW-20B	811.49	796.46	796.75	796.37	796.49	796.24	-	793.73	-	-	-	-	-	-
MW-21	804.25	799.69	-	799.44	-	-	-	798.92	-	-	-	-	-	-
MW-22	810.35	794.87	-	794.70	794.59	-	-	794.29	-	-	-	-	-	-
MW-22A	810.33	795.43	795.79	795.23	795.63	794.95	-	794.43	796.14	-	-	-	-	-
MW-22AR	807.81	-	-	-	-	-	-	-	-	-	795.28	794.31	794.00	794.31
MW-22B	810.37	796.23	796.56	796.32	796.58	796.37	-	795.96	-	-	-	-	-	-
MW-23	813.13	796.25	796.29	796.06	796.11	795.98	-	795.85	-	-	-	-	-	-
MW-24	807.63	790.13	790.50	789.65	-	807.63	-	789.21	-	-	-	-	-	-
MW-24R	809.13	-	-	-	-	-	-	-	-	-	789.35	789.18	-	789.47
MW-25	808.95	789.68	789.84	789.01	-	-	-	787.77	789.79	-	-	-	-	-
MW-25R	808.53	-	-	-	-	-	-	-	-	-	789.57	787.99	-	-
MW-26	792.10	790.10	790.18	790.06	-	-	-	790.39	-	-	-	-	-	-
MW-30	796.58	782.52	-	782.33	782.18	782.28	-	781.9	-	-	-	-	-	-
MW-101	783.83	779.15	-	779.38	-	-	-	-	-	-	-	-	-	-
MW-102	783.64	776.94	-	776.84	-	781.18	-	776.36	-	-	-	-	-	-
MW-103	783.83	781.83 ⁽³⁾	-	781.81	781.33	781.70	-	-	-	-	-	-	-	-
MW-104	785.75	784.13 ⁽³⁾	784.27	783.99	783.93	784.05	-	783.58	-	-	-	-	-	-
MW-105	783.95	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	783.82	781.48	781.75	781.51	-	-	-	781.29	-	-	-	-	-	-
MW-107	797.47	783.34	-	785.17	783.37	783.17	-	782.27	-	-	-	-	-	-
MW-108	787.13	785.11	785.70	-	-	-	-	784.93	-	-	-	-	-	-
MW-109	785.44	783.32	-	784.17	784.21	-	-	-	-	-	-	-	-	-
MW-110	787.57	784.32	-	784.09	-	784.27	-	784.32	-	-	-	-	-	-
MW-111	787.97	787.32 ⁽³⁾	-	787.35	-	-	-	787.23 ⁽³⁾	-	-	-	-	-	-

(See Notes on Page 4)

TABLE 2-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER AND SURFACE WATER ELEVATIONS

Location	Reference Elevation ⁽¹⁾	Water Level Elevation ⁽²⁾												
		9/9/93	9/27/93	12/14/93	5/16/94	6/15/94	9/21/95	10/13/95	3/6/97	7/29/97	5/6/98	8/5/98	10/3/98	12/15/98
MW-112	791.62	789.25	789.48	789.28	-	-	-	789.05	-	-	-	-	-	-
MW-113A	796.70	790.50	-	788.19	790.45	790.51	-	790.23	-	-	-	-	-	-
MW-113B	796.63	788.11	-	790.47	788.40	788.01	-	787.12	-	-	-	-	-	-
MW-114	797.48	790.68	790.74	790.60	-	-	-	790.37	-	-	-	-	-	-
MW-115	795.48	787.47	-	787.35	-	-	-	787.01	-	-	-	-	-	-
MW-116	794.12	783.55	-	783.62	-	-	-	783.11	-	-	-	-	-	-
MW-120A	822.21	800.32	800.77	800.69	801.21	800.57	-	799.46	799.79	-	-	-	-	-
MW-120B	821.85	795.05	799.07	798.87	798.85	798.68	-	798.27	-	798.48	-	-	-	-
MW-121A	812.42	796.07	796.81	796.04	796.27	795.64	-	795.81	797.02	-	-	-	-	-
MW-121B	812.30	796.08	797.30	796.11	796.41	795.70	-	795.59	796.53	795.67	-	-	-	-
MW-122A	806.51	788.01	788.12	788.86	789.91	787.19	786.97	785.84	790.99	-	-	-	-	-
MW-122AR	806.62	-	-	-	-	-	-	-	-	-	792.94	788.01	785.84	789.88
MW-122B	806.18	788.35	788.51	788.31	788.37	788.08	-	787.68	-	-	-	-	-	-
MW-123A	805.79	791.86	791.82	791.67	793.06	791.60	-	790.01	-	-	-	-	-	-
MW-123B	805.59	789.40	791.87	790.79	791.89	790.49	-	790.94	-	-	-	-	-	-
MW-124A	843.74	812.26	812.99	811.21	811.41	810.82	-	809.75	-	-	-	-	-	-
MW-124B	844.43	803.74	805.01	803.55	803.68	803.43	-	802.92	-	-	-	-	-	-
MW-125A	810.05	792.62	792.72	792.65	792.45	792.27	-	792.57 ⁽⁴⁾	-	-	-	-	-	-
MW-125B	809.92	796.34	797.15	797.34	797.67	797.62	-	797.95	-	-	-	-	-	-
MW-125P	810.38	801.01	800.84	800.41	800.57	800.68	-	-	-	-	-	-	-	-
MW-126A	805.68	795.48	796.57	795.46	795.63	795.45	-	795.22	795.94	-	-	-	-	-
MW-126AR	805.12	-	-	-	-	-	-	-	-	-	795.06	794.72	-	-
MW-126B	805.18	796.06	796.45	796.13	796.46	796.10	-	795.73	-	-	-	-	-	-
MW-127A	791.65	787.35	787.69	787.58	787.40	787.10	-	787.34	-	-	-	-	-	-
MW-128A	788.65	772.20	772.61	772.37	772.52	772.32	-	771.59	-	-	-	-	-	-
P-1	809.49	794.14	-	802.25	802.75	-	-	-	-	-	-	-	-	-
P-1C	801.91	DRY	-	DRY	DRY	-	-	-	-	-	-	-	-	-

(See Notes on Page 4)

TABLE 2-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER AND SURFACE WATER ELEVATIONS

Location	Reference Elevation ⁽¹⁾	Water Level Elevation ⁽²⁾												
		9/9/93	9/27/93	12/14/93	5/16/94	6/15/94	9/21/95	10/13/95	3/6/97	7/29/97	5/6/98	8/5/98	10/3/98	12/15/98
P-1R	809.73	-	-	-	-	-	-	-	-	-	796.28	796.23	-	795.89
P-2	807.07	794.20	-	793.79	794.70	-	-	-	-	-	-	-	-	-
P-2C	801.53	DRY	-	DRY	DRY	-	-	-	-	-	-	-	-	-
P-3	805.82	791.58	-	791.02	793.08	-	-	DRY	-	-	-	-	-	-
P-3C	799.65	790.52	-	790.07	792.15	-	-	-	-	-	-	-	-	-
CG-1	788.78	-	783.92	-	-	-	783.53	783.44	-	-	-	-	-	-

Notes:

¹ Units of feet above mean sea level.

² Elevation of the top of the well's inner casing was used as reference.

³ Water was above ground surface within these wells.

⁴ Measurement taken October 11, 1995.

- No measurement taken.

Refer to field notes (Appendix A) for additional water level data collected for individual wells during sampling from October 2 to 12, 1995.

TABLE 2-2

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLING FINAL MEASURED FIELD PARAMETERS

Location	Date Collected	pH	Water Temperature (C) ¹	Specific Conductivity (mS/cm) ²	Turbidity (NTU) ³	ORP (mV)	DO (mg/L)
Phase 2							
MW-1	12/13/95	6.3	14	1.06	4	1	1.5
MW-2	10/04/95	6.6	15	1.05	5	NA	1.7
MW-2S	10/04/95	6.5	19	1.22	5	NA	NA
MW-3	10/05/95	6.4	15	1.27	10	-1	3.3
MW-5	10/04/95	6.4	16	1.37	13	-10	4.0
MW-7	10/09/95	7.5	19	0.67	20	-12	2.3
MW-7B	10/10/95	8.7	13	0.40	18	68	2.7
MW-8	10/10/95	7.1	16	0.70	17	3	1.6
MW-8A	10/10/95	6.5	18	1.01	31	4	2.1
MW-11	10/04/95	7.0	14	0.69	24	NA	3.0
MW-12	10/06/95	6.9	17	1.07	31	-30	4.2
MW-12R	10/06/95	6.9	16	1.22	20	-38	3.6
MW-15	10/05/95	6.4	15	1.47	8	3	1.3
MW-16B	10/05/95	6.8	15	0.75	8	-32	3.3
MW-16C	10/05/95	7.3	15	0.50	13	-65	2.3
MW-17A	10/10/95	6.5	19	1.37	32	-33	2.1
MW-17B	10/10/95	6.5	16	1.33	17	-18	2.2
MW-18	10/04/95	7.1	14	0.74	4	NA	1.6
MW-19BR	10/11/95	6.6	17	1.29	37	-10	1.4
MW-19C	10/11/95	6.8	15	1.08	17	0	1.7
MW-19D	10/11/95	6.9	15	1.03	17	-16	1.5
MW-20	10/10/95	7.2	16	0.94	19	-30	2.8
MW-20B	10/10/95	7.2	16	0.79	21	-38	2.9
MW-21	10/09/95	7.4	18	0.64	23	41	2.7
MW-22A	10/03/95	6.3	18	1.71	26	NA	1.4
MW-22B	10/03/95	7.0	14	0.97	11	NA	2.6
MW-23	10/11/95	6.8	16	0.72	35	-15	1.1
MW-24	10/03/95	6.3	16	1.19	8	NA	2.7
MW-25	10/06/95	7.0	17	0.98	130	32	NA
MW-26	10/03/95	6.9	14	0.95	13	NA	3.6
MW-104	10/05/95	7.0	16	1.09	21	-61	4.3
MW-106	10/05/95	7.3	16	0.68	31	-56	3.5
MW-108	10/05/95	7.3	15	0.70	39	-47	3.3
MW-112	10/04/95	6.6	16	1.30	6	-17	3.7
MW-114	10/06/95	7.4	16	0.79	16	17	3.3
MW-120A	10/09/95	6.3	19	1.68	19	-26	2.4
MW-120B	10/09/95	6.5	18	1.36	43	-34	2.4
MW-121A	10/09/95	6.9	18	0.81	21	-46	2.9
MW-121B	10/09/95	7.2	15	0.73	43	64	2.2
MW-122A	10/03/95	6.5	18	0.61	13	NA	NA
MW-122B	10/03/95	6.5	16	0.75	52	NA	3.8
MW-123A	10/09/95	6.4	18	1.26	24	-2	3.8
MW-123B	10/09/95	7.2	16	0.68	55	-45	3.6
MW-124A	12/14/95	6.5	17	1.52	13	66	6.2
MW-124B	12/14/95	6.6	12	1.35	81	54	3.3
MW-125A	10/11/95	6.8	18	1.23	18	14	2.9
MW-125B	10/11/95	7.4	17	0.80	19	31	2.9
MW-125P	10/12/95	5.1	19	0.80	169	86	0.8
MW-126A	10/11/95	6.5	18	1.38	108	4	1.7
MW-126B	10/11/95	7.1	16	1.11	30	-26	2.3
MW-127A	10/04/95	6.8	19	1.33	27	-46	3.3
MW-128A	10/12/95	7.2	23	0.76	58	-14	NA
Phase 3							
MW-2S	03/06/97	6.8	10	1.04	1	NA	NA

(See Notes on Page 2)

TABLE 2-2

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLING FINAL MEASURED FIELD PARAMETERS

Location	Date Collected	pH	Water Temperature (C) ¹	Specific Conductivity (mS/cm) ²	Turbidity (NTU) ³	ORP (mV)	DO (mg/L)
MW-5	03/06/97	6.7	8	1.30	7	NA	NA
MW-8A	03/06/97	6.7	14	0.95	3	NA	2.7
MW-22A	03/06/97	6.6	10	1.56	4	NA	NA
MW-25	03/04/97	7.1	12	1.00	94	NA	NA
MW-120B	03/04/97	6.4	15	1.61	7	NA	0.9
MW-121A	03/05/97	6.7	14	1.55	3	NA	0.7
MW-121B	03/05/97	7.2	10	0.71	18	NA	NA
MW-122A	03/04/97	7.0	6	1.03	42	NA	4.1
MW-126A	03/05/97	6.3	12	1.86	840	NA	NA
Phase 4							
MW-120B	07/29/97	6.5	17	1.60	18	-48	0.5
MW-121B	07/29/97	8.2	13	0.87	12	-131	3.5
Phase 5							
P-1R	05/06/98	5.6	13	1.11	30	-34	1.7
MW-5R	05/07/98	6.5	17	1.83	7	-78	0.8
MW-22AR	05/06/98	6.7	15	0.95	25	-17	3.1
MW-24R	05/07/98	11.3	12	1.83	49	83	3.2
MW-25R	05/06/98	6.1	16	1.80	2	-81	5.9
MW-122AR	05/06/98	7.0	17	0.88	1660	-80	4.8
MW-126AR	05/07/98	6.7	14	1.61	37	-37	3.1
Phase 6							
P-1R	08/05/98	6.9	16	0.99	42	-113	2.2*
MW-5R	08/06/98	6.4	16	1.63	19	-36	4.6*
MW-22AR	08/06/98	6.7	20	1.06	29	-102	0.9*
MW-24R	08/05/98	11.0	15	0.95	69	-49	1.7*
MW-25R	08/05/98	6.4	17	1.84	5	-73	5.6*
MW-122AR	08/06/98	5.9	19	0.90	949	-7	7.4*
MW-126AR	08/06/98	6.4	15	1.50	16	-7	2.5*
MW-22AR	10/03/98	6.3	14	0.88	7	NA	5.1
MW-122AR	10/03/98	6.4	15	0.86	>1000	NA	4.0
Phase 7							
P-1R	12/15/98	8.9	14	1.32	25.6	NA	NA
MW-5R	12/15/98	7.7	16	2.10	20.2	NA	NA
MW-22AR	12/15/98	7.4	13	1.75	18.3	NA	NA
MW-24R	12/15/98	9.6	16	0.89	67.2	NA	NA
MW-122AR	12/15/98	7.2	17	2.06	32.2	NA	NA

Notes:¹ Units in degrees Celsius (°C). Temperature presented is the initial reading prior to sampling.² Units in milliSiemens per centimeter (mS/cm).³ Units in nephelometric turbidity units (NTU).

Measurements taken after sample had been obtained.

Water quality data represent final measurements after purging the well.

ORP - Oxidation Reduction Potential

DO - Dissolved Oxygen

mV - milliVolts

mg/L - milligrams per Liter

NA - Not available

* - Estimated value, converted from a percent of saturation measurement.

TABLE 2-3

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLING PURGE VOLUMES

Well	Date Collected	Volume of Water In Well (gal)	Well Volumes of Water Purged During Sampling	Volume of Water Purged During Sampling (gal)	Volume of Water Passed through Filter Media (gal)
Phase 2					
MW-1	12/13/95	1.7	2.7	4.5	NA
MW-2	10/04/95	1.9	2.6	5.0	NA
MW-2S	10/04/95	0.7	5.7	4.0	NA
MW-3	10/05/95	2.7	1.3	3.5	NA
MW-5	10/04/95	0.8	6.3	5.0	NA
MW-7	10/09/95	2.2	1.4	3.0	NA
MW-7B	10/10/95	4.6	1.4	6.5	NA
MW-8	10/10/95	3.9	1.3	5.0	NA
MW-8A	10/10/95	1.3	3.9	5.0	NA
MW-11	10/04/95	6.5	0.9	6.0	NA
MW-12	10/06/95	3.4	1.0	3.5	NA
MW-12R	10/06/95	3.5	1.4	5.0	NA
MW-15	10/05/95	5.1	1.0	5.0	NA
MW-16B	10/05/95	3.0	2.0	6.0	NA
MW-16C	10/05/95	7.0	1.0	7.0	NA
MW-17A	10/10/95	2.1	1.2	2.5	NA
MW-17B	10/10/95	5.0	1.1	5.5	NA
MW-18	10/04/95	5.7	1.8	10.0	NA
MW-19BR	10/11/95	2.3	3.0	7.0	NA
MW-19C	10/11/95	4.3	1.2	5.0	NA
MW-19D	10/11/95	6.6	1.1	7.0	NA
MW-20	10/10/95	1.6	2.8	4.5	NA
MW-20B	10/10/95	3.2	1.6	5.0	NA
MW-21	10/09/95	1.6	2.5	4.0	NA
MW-22A	10/03/95	1.1	3.2	3.5	NA
MW-22B	10/03/95	5.7	1.1	6.0	NA
MW-23	10/11/95	2.2	3.4	7.5	NA
MW-24	10/03/95	2.0	2.5	5.0	NA
MW-25	10/06/95	1.5	1.2	1.8	NA
MW-26	10/03/95	1.5	5.3	8.0	NA
MW-104	10/05/95	1.2	3.5	4.0	NA
MW-106	10/05/95	1.4	3.2	4.5	NA
MW-108	10/05/95	1.8	1.9	3.5	NA
MW-112	10/04/95	2.2	1.8	4.0	NA
MW-114	10/06/95	6.2	0.7	4.5	NA
MW-120A	10/09/95	0.6	5.8	3.5	NA
MW-120B	10/09/95	1.5	3.0	4.5	NA
MW-121A	10/09/95	1.7	2.1	3.5	NA
MW-121B	10/09/95	2.8	1.8	5.0	NA
MW-122A	10/03/95	0.6	7.9	5.0	NA
MW-122B	10/03/95	7.2	0.7	5.0	NA
MW-123A	10/09/95	0.7	4.3	3.0	NA
MW-123B	10/09/95	2.8	1.1	3.0	NA
MW-124A	12/14/95	0.8	2.6	2.0	NA
MW-124B	12/14/95	2.8	0.9	2.5	NA
MW-125A	10/11/95	1.5	2.3	3.5	NA
MW-125B	10/11/95	4.2	1.1	4.5	NA
MW-125P	10/12/95	0.8	3.3	2.5	NA
MW-126A	10/11/95	2.1	1.7	3.5	NA
MW-126B	10/11/95	4.0	1.0	4.0	NA
MW-127A	10/04/95	0.8	3.3	2.5	NA
MW-128A	10/12/95	0.7	14.3	10.0	NA

(See Notes on Page 2)

TABLE 2-3

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLING PURGE VOLUMES

Well	Date Collected	Volume of Water In Well (gal)	Well Volumes of Water Purged During Sampling	Volume of Water Purged During Sampling (gal)	Volume of Water Passed through Filter Media (gal)
Phase 3					
MW-2S	03/06/97	0.8	7.9	6.1	20.5
MW-5	03/06/97	0.9	6.8	6.1	20.5
MW-8A	03/06/97	1.4	4.6	6.2	20.5
MW-22A	03/06/97	1.4	4.2	5.9	21.3
MW-25	03/04/97	1.8	0.8	1.5	NC
MW-120B	03/04/97	1.7	3.1	5.3	20.3
MW-121A	03/05/97	1.8	3.4	6.2	20.2
MW-121B	03/05/97	1.8	2.5	4.5	NC
MW-122A	03/04/97	1.4	2.6	3.6	20.4
MW-126A	03/05/97	2.2	2.8	6.2	7.0
Phase 4					
MW-120B	07/29/97	1.6	18.7	30.0	NA
MW 121B	07/29/97	3.2	2.7	8.5	NA
Phase 5					
P-1R	05/06/98	2.5	4.0	10.0	NA
MW-5R	05/07/98	1.4	3.6	5.0	NA
MW-22AR	05/06/98	0.6	3.3	2.0	NA
MW-24R	05/07/98	1.2	0.4	0.5	NA
MW-25R	05/06/98	1.0	4.0	4.0	NA
MW-122AR	05/06/98	1.5	4.6	7.0	NA
MW-126AR	05/07/98	2.2	3.2	7.0	NA
Phase 6					
P-1R	08/05/98	2.2	4.5	10.0	NA
MW-5R	08/06/98	1.3	3.1	4.0	NA
MW-22AR	08/06/98	0.5	3.0	1.5	NA
MW-24R	08/05/98	1.0	1.0	1.0	NA
MW-25R	08/05/98	1.0	4.0	4.0	NA
MW-122AR	08/06/98	0.6	3.3	2.0	NA
MW-126AR	08/06/98	2.1	2.9	6.0	NA
MW-22AR	10/03/98	0.4	4.5	1.8	NA
MW-122AR	10/03/98	0.3	1.7	0.5	NA
Phase 7					
P-1R	12/15/98	1.8	3.7	6.5	NA
MW-5R	12/15/98	1.0	4.0	4.0	NA
MW-22AR	12/15/98	0.3	7.3	2.2	NA
MW-24R	12/15/98	0.9	1.3	1.2	NA
MW-122AR	12/15/98	0.7	1.9	1.3	NA

Notes:

NA - Not Applicable

NC - Particulate sample not collected due to well purging dry.

TABLE 2-4

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITEALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLE DESIGNATIONS

Sample Delivery Group	Sample ID	Date	Duplicate	Location	Matrix	Analysis	MS/MSD
54217	A66100	10/03/95		MW-122B	Groundwater	PCB	
	A66101	10/03/95		MW-122A	Groundwater	PCB	
	A66102	10/03/95		MW-24	Groundwater	PCB	
	A66103	10/04/95		MW-11	Groundwater	PCB	
	A66104	10/03/95		MW-26	Groundwater	PCB	
	A66105	10/03/95		MW-22B	Groundwater	PCB	
	A66106	10/03/95		MW-22A	Groundwater	PCB	
	A66108	10/04/95		MW-2	Groundwater	PCB	X
	A66109	10/04/95		MW-2S	Groundwater	PCB	
	A66110	10/04/95	A66111	MW-18	Groundwater	PCB	
	A66112	10/04/95		MW-5	Groundwater	PCB	
	A66113	10/04/95		MW-112	Groundwater	PCB	
	A66114	10/04/95		MW-127A	Groundwater	PCB	
	A66115	10/05/95		MW-106	Groundwater	PCB	
	A66116	10/05/95		MW-108	Groundwater	PCB	
	A66117	10/05/95	A66118 ¹	MW-104	Groundwater	PCB	
54265	A66119	10/05/95		MW-15	Groundwater	PCB	
	A66120	10/05/95		MW-3	Groundwater	PCB	
	A66121	10/05/95		MW-16B	Groundwater	PCB	
	A66122	10/05/95		MW-16C	Groundwater	PCB	
	A66124	10/06/95		MW-12	Groundwater	PCB	
	A66125	10/06/95		MW-12R	Groundwater	PCB	
	A66126	10/06/95		MW-25	Groundwater	PCB	
	A66127	10/06/95		MW-114	Groundwater	PCB	
	A66128	10/09/95		MW-123B	Groundwater	PCB	
	A66129	10/09/95	A66130	MW-123A	Groundwater	PCB	
	A66131	10/09/95		MW-121A	Groundwater	PCB	
	A66132	10/09/95		MW-121B	Groundwater	PCB	
	A66133	10/09/95		MW-120A	Groundwater	PCB	
	A66134	10/09/95		MW-120B	Groundwater	PCB	X
	A66135	10/09/95		MW-7	Groundwater	PCB	
54324	A66136	10/10/95		MW-7B	Groundwater	PCB	
	A66137	10/09/95		MW-21	Groundwater	PCB	
	A66139	10/10/95		MW-20	Groundwater	PCB	
	A66140	10/10/95		MW-20B	Groundwater	PCB	
	A66141	10/10/95		MW-17A	Groundwater	PCB	
	A66142	10/10/95		MW-17B	Groundwater	PCB	
	A66143	10/10/95		MW-8	Groundwater	PCB	
	A66144	10/10/95		MW-8A	Groundwater	PCB	
	A66145	10/11/95		MW-19C	Groundwater	PCB	X
	A66146	10/11/95	A66147	MW-19D	Groundwater	PCB	
	A66148	10/11/95		MW-19BR	Groundwater	PCB	
	A66149	10/12/95		MW-125P	Leachate	PCB	
	A66150	10/11/95		MW-125A	Groundwater	PCB	
	A66151	10/11/95		MW-125B	Groundwater	PCB	
	A66152	10/11/95		MW-126A	Groundwater	PCB	
	A66153	10/11/95		MW-126B	Groundwater	PCB	
54384	A66154	10/11/95		MW-23	Groundwater	PCB	
	A66156 ²	10/12/95	A66157 ²	MW-124A	Groundwater	PCB	
	A66158 ²	10/12/95		MW-124B	Groundwater	PCB	
	A66159 ²	10/12/95		MW-1	Groundwater	PCB	
55702	A66161	10/12/95		MW-128A	Groundwater	PCB	
	A66165	12/13/95		MW-1	Groundwater	PCB	
	A66166	12/14/95		MW-124A	Groundwater	PCB	
	A66167	12/14/95		MW-124B	Groundwater	PCB	

(See Notes on Page 2)

TABLE 2-4

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITEALLIED PAPER, INC. OPERABLE UNIT
GROUNDWATER SAMPLE DESIGNATIONS

Sample Delivery Group	Sample ID	Date	Duplicate	Location	Matrix	Analysis	MS/MSD
64153	A66169	03/04/97		MW-122A	Groundwater	PCB & TOC	
	A66169-F	03/04/97		MW-122A	Groundwater	PCB & TOC	
	A66169-FIL	03/04/97		MW-122A	Groundwater	PCB & TOC	
	A66170	03/04/97		MW-25	Groundwater	PCB & TOC	
	A66170-F	03/04/97		MW-25	Groundwater	PCB & TOC	
	A66171	03/04/97		MW-120B	Groundwater	PCB & TOC	
	A66171-F	03/04/97		MW-120B	Groundwater	PCB & TOC	
	A66171-FIL	03/04/97		MW-120B	Groundwater	PCB & TOC	
	A66172	03/05/97		MW-121A	Groundwater	PCB & TOC	X
	A66172-F	03/05/97		MW-121A	Groundwater	PCB & TOC	X
	A66172-FIL	03/05/97		MW-121A	Groundwater	PCB & TOC	
	A66173	03/05/97		MW-121B	Groundwater	PCB & TOC	
	A66173-F	03/05/97		MW-121B	Groundwater	PCB & TOC	
	A66174	03/05/97	A66175	MW-126A	Groundwater	PCB & TOC	
	A66174-F	03/05/97	A66175-F	MW-126A	Groundwater	PCB & TOC	
	A66174-FIL	03/05/97	A66175-FIL	MW-126A	Groundwater	PCB & TOC	
	A66176	03/06/97		MW-22A	Groundwater	PCB & TOC	
	A66176-F	03/06/97		MW-22A	Groundwater	PCB & TOC	
	A66176-FIL	03/06/97		MW-22A	Groundwater	PCB & TOC	
64176	A66177	03/06/97		MW-2S	Groundwater	PCB & TOC	
	A66177-F	03/06/97		MW-2S	Groundwater	PCB & TOC	
	A66177-FIL	03/06/97		MW-2S	Groundwater	PCB & TOC	
	A66178	03/06/97		MW-5	Groundwater	PCB & TOC	
	A66178-F	03/06/97		MW-5	Groundwater	PCB & TOC	
	A66178-FIL	03/06/97		MW-5	Groundwater	PCB & TOC	
	A66179	03/06/97		MW-8A	Groundwater	PCB & TOC	
	A66179-F	03/06/97		MW-8A	Groundwater	PCB & TOC	
	A66179-FIL	03/06/97		MW-8A	Groundwater	PCB & TOC	
	A66180	03/06/97		Rinse Blank	Water	PCB & TOC	
66002	A66182	07/29/97	A66183	MW-120B	Groundwater	PCB	
	A66184	07/29/97		MW-120B	Groundwater	PCB	X
	A66185	07/29/97		MW-120B	Groundwater	PCB	
	A66186	07/29/97		MW-121B	Groundwater	PCB	
	A66187	07/29/97		MW-121B	Groundwater	PCB	
	A66188	07/29/97		MW-121B	Groundwater	PCB	
KAL073	A66198	05/06/98		P-1R	Groundwater	PCB	X
	A66190	05/06/98		MW-22AR	Groundwater	PCB	
	A66191	05/06/98	A66192	MW-25R	Groundwater	PCB	
	A66193	05/06/98		MW-122AR	Groundwater	PCB	
	A66194	05/07/98		MW-24R	Groundwater	PCB	
	A66195	05/07/98		MW-5R	Groundwater	PCB	
	A66196	05/07/98		MW-126AR	Groundwater	PCB	
70130	A66199	08/05/98		P-1R	Groundwater	PCB	X
	A66200	08/05/98	A66201	MW-25R	Groundwater	PCB	
	A66202	08/05/98		MW-24R	Groundwater	PCB	
	A66204	08/06/98		MW-22AR	Groundwater	PCB	
	A66205 ³	08/06/98		MW-122AR	Groundwater	PCB	
	A66206	08/06/98		MW-5R	Groundwater	PCB	
KAL076	A66207	08/06/98		MW-126AR	Groundwater	PCB	
	A66208	10/03/98		MW-122AR	Groundwater	PCB	
KAL079	A66209	10/03/98		MW-22AR	Groundwater	PCB	
	A66250	12/15/98		P-1R	Groundwater	PCB	
KAL079	A66251	12/15/98		MW-22AR	Groundwater	PCB	
	A66252	12/15/98		MW-24R	Groundwater	PCB	
	A66253	12/15/98		MW-122AR	Groundwater	PCB	
	A66254	12/15/98	A66255	MW-5R	Groundwater	PCB	X

Notes:¹Duplicate contained in SDG 54265.²Sample lost at laboratory; no analysis performed.³No analysis performed.

Samples A66107, A66123, A66138, A66155, A66160, A66168, A66189, A66197, and A66203 were rinse blanks.

PCB - Polychlorinated biphenyls

TOC - Total organic carbon

MS/MSD - Matrix spike/matrix spike duplicate analysis

TABLE 3-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITEALLIED PAPER, INC. OPERABLE UNIT
LABORATORY PCB ANALYTICAL RESULTS (ug/L)

PHASE 2 - 1995 SAMPLING ANALYTICAL RESULTS							
Location Sample ID Date Collected	MW-1 A66165 12/13/95	MW-2 ⁽¹⁾ A66108 10/04/95	MW-2S A66109 10/04/95	MW-3 A66120 10/05/95	MW-5 A66112 10/04/95	MW-7 A66135 10/09/95	MW-7B A66136 10/10/95
Aroclor-1242	ND (0.20 U)	ND (0.22 U)	0.20 JN	ND (0.21 U)	0.57 JN	ND (0.20 U)	ND (0.21 U)
Total PCB	ND	ND	0.20 JN	ND	0.57 JN	ND	ND

Location Sample ID Date Collected	MW-8 A66143 10/05/95	MW-8A A66144 10/10/95	MW-11 A66103 10/04/95	MW-12 A66124 10/06/95	MW-12R A66125 10/06/95	MW-15 A66119 10/05/95	MW-16B A66121 10/05/95
Aroclor-1242	ND (0.21 U)	1.0 J	ND (0.21 U)	ND (0.20 U)	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)
Total PCB	ND	1.0 J	ND	ND	ND	ND	ND

Location Sample ID Date Collected	MW-16C A66122 10/05/95	MW-17A A66141 10/10/95	MW-17B A66142 10/10/95	MW-18 A66110 10/04/95	MW-18 (dup) A66111 10/04/95	MW-19BR A66148 10/11/95	MW-19C ⁽¹⁾ A66145 10/11/95
Aroclor-1242	ND (0.22 U)	ND (0.20 U)	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)	ND (0.20 U)	ND (0.21 U)
Total PCB	ND	ND	ND	ND	ND	ND	ND

Location Sample ID Date Collected	MW-19D A66146 10/11/95	MW-19D (dup) A66147 10/11/95	MW-20 A66139 10/10/95	MW-20B A66140 10/10/95	MW-21 A66137 10/09/95	MW-22A A66106 10/03/95	MW-22B A66105 10/03/95
Aroclor-1242	ND (0.21 U)	ND (0.20 U)	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)	1.4 JN	ND (0.21 U)
Total PCB	ND	ND	ND	ND	ND	1.4 JN	ND

Location Sample ID Date Collected	MW-23 A66154 10/11/95	MW-24 A66102 10/03/95	MW-25 A66126 10/06/95	MW-26 A66104 10/03/95	MW-104 A66117 10/05/95	MW-104 (dup) A66118 10/05/95	MW-106 A66115 10/05/95
Aroclor-1242	ND (0.20 U)	0.32 JN	ND (0.20 U)	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)
Total PCB	ND	0.32 JN	ND	ND	ND	ND	ND

Location Sample ID Date Collected	MW-108 A66116 10/05/95	MW-112 A66113 10/04/95	MW-114 A66127 10/06/95	MW-120A A66133 10/09/95	MW-120B ⁽¹⁾ A66134 10/09/95	MW-121A A66131 10/09/95	MW-121B A66132 10/09/95
Aroclor-1242	ND (0.21 U)	ND (0.22 U)	ND (0.20 U)	ND (0.22 U)	0.62 J	1.3 J	0.22 J
Total PCB	ND	ND	ND	ND	0.62 J	1.3 J	0.22 J

Location Sample ID Date Collected	MW-122A A66101 10/03/95	MW-122B A66100 10/03/95	MW-123A A66129 10/09/95	MW-123A (dup) A66130 10/09/95	MW-123B A66128 10/09/95	MW-124A A66166 12/14/95	MW-124B A66167 12/14/95
Aroclor-1242	0.22 JN	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)	ND (0.20 U)	ND (0.20 U)	ND (0.20 U)
Total PCB	0.22 JN	ND	ND	ND	ND	ND	ND

(See Notes on Page 3)

TABLE 3-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITEALLIED PAPER, INC. OPERABLE UNIT
LABORATORY PCB ANALYTICAL RESULTS (ug/L)

PHASE 2 - 1995 SAMPLING ANALYTICAL RESULTS (continued)							
Location Sample ID Date Collected	MW-125A A66150 10/11/95	MW-125B A66151 10/11/95	MW-125P A66149 10/12/95	MW-126A A66152 10/11/95	MW-126B A66153 10/11/95	MW-127A A66114 10/04/95	MW-128A A66161 10/12/95
Aroclor-1242	ND (0.20 U)	ND (0.20 U)	ND (0.21 U)	0.24 J	ND (0.21 U)	ND (0.21 U)	ND (0.21 U)
Total PCB	ND	ND	ND	0.24 J	ND	ND	ND

PHASE 3 - 1997 SAMPLING ANALYTICAL RESULTS								
Location Sample ID Date Collected	MW-2S A66177 03/06/97	MW-2S A66177-F ⁽²⁾ 03/06/97	MW-5 A66178 03/06/97	MW-5 A66178-F ⁽²⁾ 03/06/97	MW-8A A66179 03/06/97	MW-8A A66179-F ⁽²⁾ 03/06/97	MW-22A A66176 03/06/97	MW-22A A66176-F ⁽²⁾ 03/06/97
Aroclor-1242	0.11 J	0.072	0.29 J	0.31	0.71 J	0.42 J	0.99	0.34
Total PCB	0.11 J	0.072	0.29 J	0.31	0.71 J	0.42 J	0.99	0.34

Location Sample ID Date Collected	MW-25 A66170 03/04/97	MW-25 A66170-F ⁽²⁾ 03/04/97	MW-120B A66171 03/04/97	MW-120B A66171-F ⁽²⁾ 03/04/97	MW-121A ⁽¹⁾ A66172 03/05/97	MW-121A ⁽¹⁾ A66172-F ⁽²⁾ 03/05/97	MW-121B A66173 03/05/97	MW-121B A66173-F ⁽²⁾ 03/05/97
Aroclor-1242	ND (0.070 U)	ND (0.050 U)	0.11	0.26	1.0	1.1	0.28	0.20
Total PCB	ND	ND	0.11	0.26	1.0	1.1	0.28	0.20

Location Sample ID Date Collected	MW-122A A66169 03/04/97	MW-122A A66169-F ⁽²⁾ 03/04/97	MW-126A A66174 03/05/97	MW-126A A66174-F ⁽²⁾ 03/05/97	MW-126A (dup) A66175 03/05/97	MW-126A (dup) A66175-F ⁽²⁾ 03/05/97
Aroclor-1242	0.078	0.073	0.26	0.19	0.28	0.20
Total PCB	0.078	0.073	0.26	0.19	0.28	0.20

PHASE 4 - 1997 SAMPLING ANALYTICAL RESULTS							
Location Sample ID Date Collected	MW-120B-A A66182 07/29/97	MW-120B-A (dup) A66183 07/29/97	MW-120B-B ⁽¹⁾ A66184 07/29/97	MW-120B-C A66185 07/29/97	MW-121B-A A66186 07/29/97	MW-121B-B A66187 07/29/97	MW-121B-C A66188 07/29/97
Aroclor-1016	ND (0.20 U)	ND (0.20 U)	ND (0.20 U)	ND (0.20 U)	0.30	0.29	0.25
Aroclor-1242	0.41	0.42	0.39	0.39	ND (0.20 U)	ND (0.20 U)	ND (0.20 U)
Total PCB	0.41	0.42	0.39	0.39	0.30	0.29	0.25

PHASE 5 - 1998 SAMPLING ANALYTICAL RESULTS								
Location Sample ID Date Collected	MW-22AR A66190 05/06/98	MW-25R A66191 05/06/98	MW-25R (dup) A66192 05/06/98	MW-122AR A66193 05/06/98	MW-24R A66194 05/07/98	MW-5R A66195 05/07/98	MW-126AR A66196 05/07/98	P-1R ⁽¹⁾ A66198 05/06/98
Aroclor-1242	ND (0.054 U)	ND (0.051 U)	ND (0.052 U)	0.60	ND (0.051 U)	ND (0.052 U)	ND (0.051 U)	ND (0.051 U)
Total PCB	ND	ND	ND	0.60	ND	ND	ND	ND

(See Notes on Page 3)

TABLE 3-1

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITEALLIED PAPER, INC. OPERABLE UNIT
LABORATORY PCB ANALYTICAL RESULTS (ug/L)

PHASE 6 - 1998 SAMPLING ANALYTICAL RESULTS							
Location Sample ID Date Collected	MW-22AR A66204 08/06/98	MW-24R A66202 08/05/98	MW-25R A66200 08/05/98	MW-25R (dup) A66201 08/05/98	MW-5R A66206 08/06/98	MW-126AR A66207 08/06/98	P-1R ⁽¹⁾ A66199 08/05/98
Aroclor-1232	0.13 JN	ND (0.050 U)	ND (0.050 U)	ND (0.055 U)	ND (0.050 U)	ND (0.050 U)	ND (0.050 U)
Total PCB	0.13 JN	ND	ND	ND	ND	ND	ND

Location Sample ID Date Collected	MW-22AR A66209 10/03/98	MW-122AR A66208 10/03/98
Aroclor-1242	0.089 JN	0.33 JN
Total PCB	0.089 JN	0.33 JN

PHASE 7 - 1998 SAMPLING ANALYTICAL RESULTS						
Location Sample ID Date Collected	MW-22AR A66251 12/15/98	MW-24R A66252 12/15/98	MW-122AR A66253 12/15/98	MW-5R ⁽¹⁾ A66254 12/15/98	MW-5R (dup) A66255 12/15/98	P-1R A66250 12/15/98
Aroclor-1232	0.080 J	ND (0.055 U)	0.44 JN	ND (0.051 U)	ND (0.051 U)	ND (0.051 U)
Total PCB	0.080 J	ND	0.44 JN	ND	ND	ND

Notes:⁽¹⁾ MS/MSD of this sample was analyzed.⁽²⁾ Phase 3 samples were also analyzed for PCBs in filtered groundwater. All other samples were analyzed for PCBs in unfiltered groundwater only.

ND - Not detected

Phase 4 - A,B,C - Sequential samples collected following purging of approximately 10 gallons prior to sampling.

Notes Explaining Data Qualifiers:

J - The compound was positively identified. However, the associated numerical value is an estimated concentration only.

JN - The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

UJ - The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

TABLE 3-2

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

ALLIED PAPER, INC. OPERABLE UNIT
PHASE 3 LABORATORY ANALYTICAL RESULTS FOR GROUNDWATER TOC
AND PARTICULATE FILTER MEDIA

Sample Identification	TOC in Unfiltered Groundwater (mg/L)	TOC in Filtered Groundwater (mg/L)	TOC in Particulate Filter Media (mg/kg)	PCB in Particulate Filter Media (ug/kg)
MW-2S	R	R	141	2200
MW-5	R	R	46.3	ND (800 U)
MW-8A	R	R	<1.0	ND (2300 U)
MW-22A	14.2J	R	462	2000
MW-25	16.7J	R	NA	NA
MW-120B	19.7J	R	49.7	ND (1800 U)
MW-121A	11J	R	33.1	ND (1400 U)
MW-121B	13.6J	R	NA	NA
MW-122A	20.2J	R	<0.5	ND (1100 U)
MW-126A	20.6	R	204	680
MW-126A (Duplicate)	20.5	R	278	620

Notes:

NA - Not analyzed

ND - Not detected

Notes Explaining Data Qualifiers:

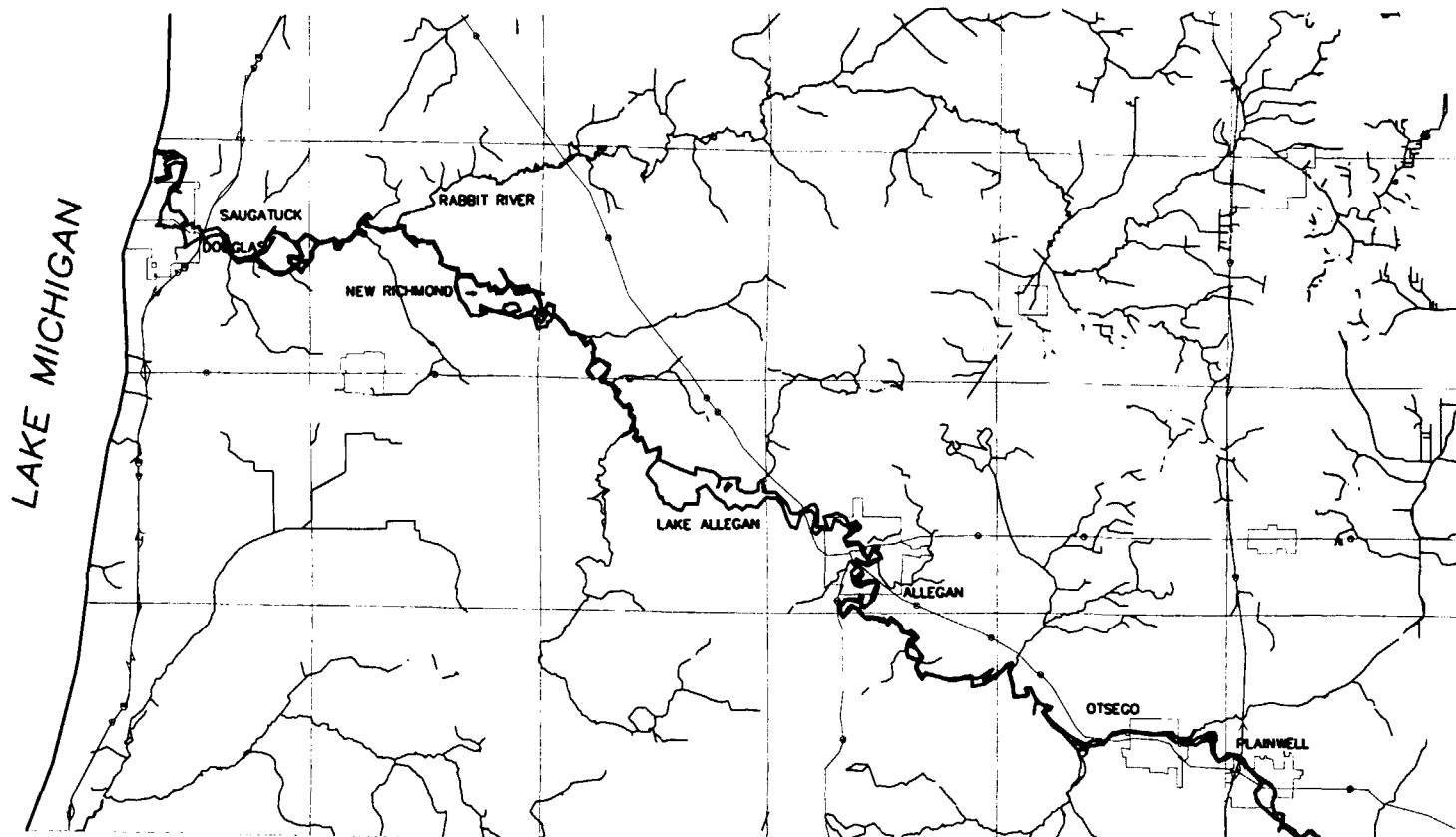
J - The compound was positively identified; however, the associated numerical value is an estimated concentration only.

R - The sample results are rejected due to quality control problems, including a detection of 19 ppm TOC in the filtered rinse blank.

U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Figures

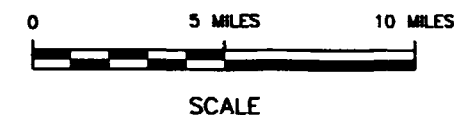
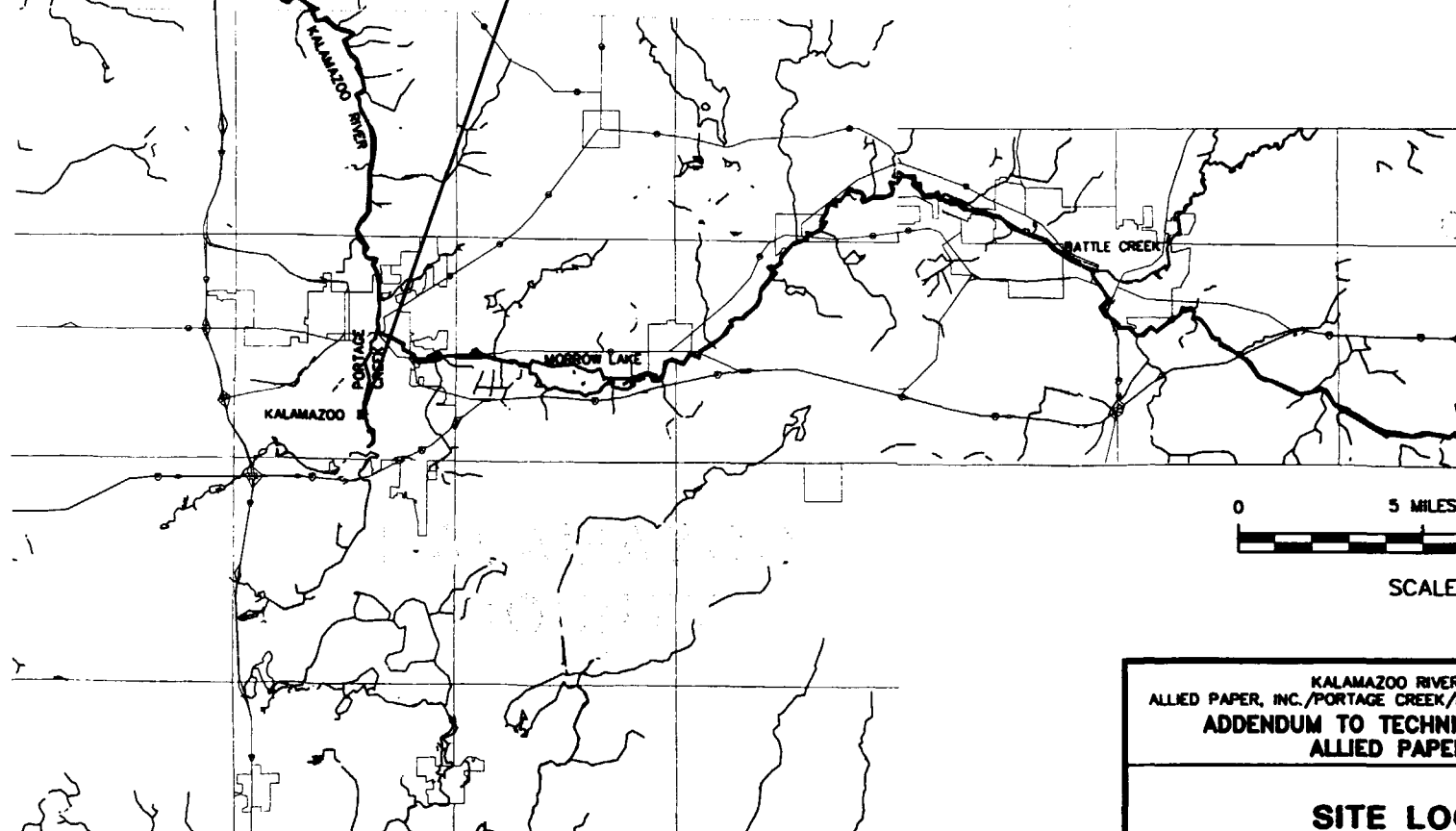
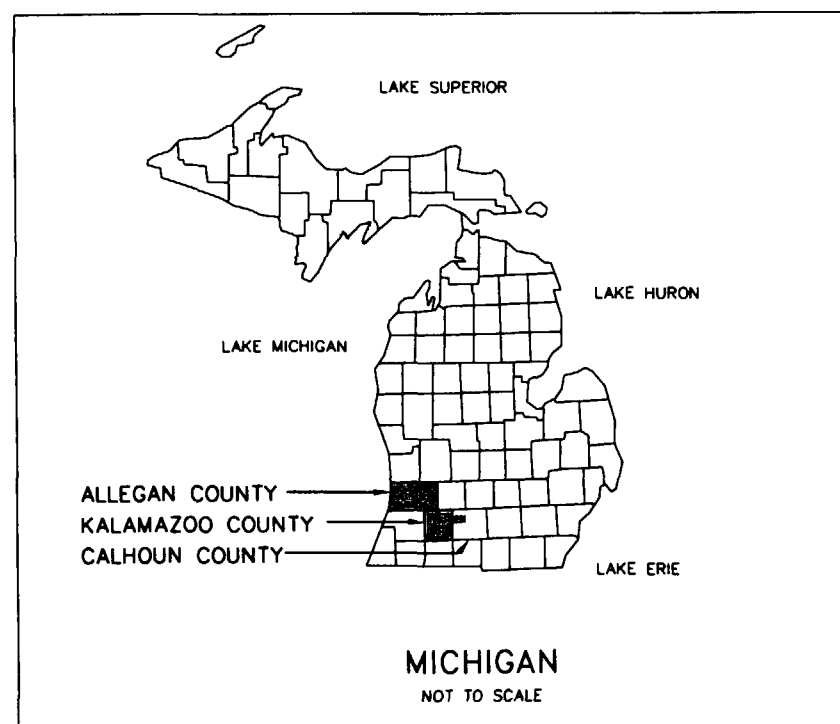
BLASLAND, BOUCK & LEE, INC.
e n g i n e e r s & s c i e n t i s t s



ALLIED PAPER, INC., OU

NOTE:

ALLEGAN, KALAMAZOO AND CALHOUN COUNTY MAPPING
OBTAINED FROM MICHIGAN RESOURCE INFORMATION SYSTEM.

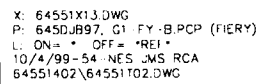


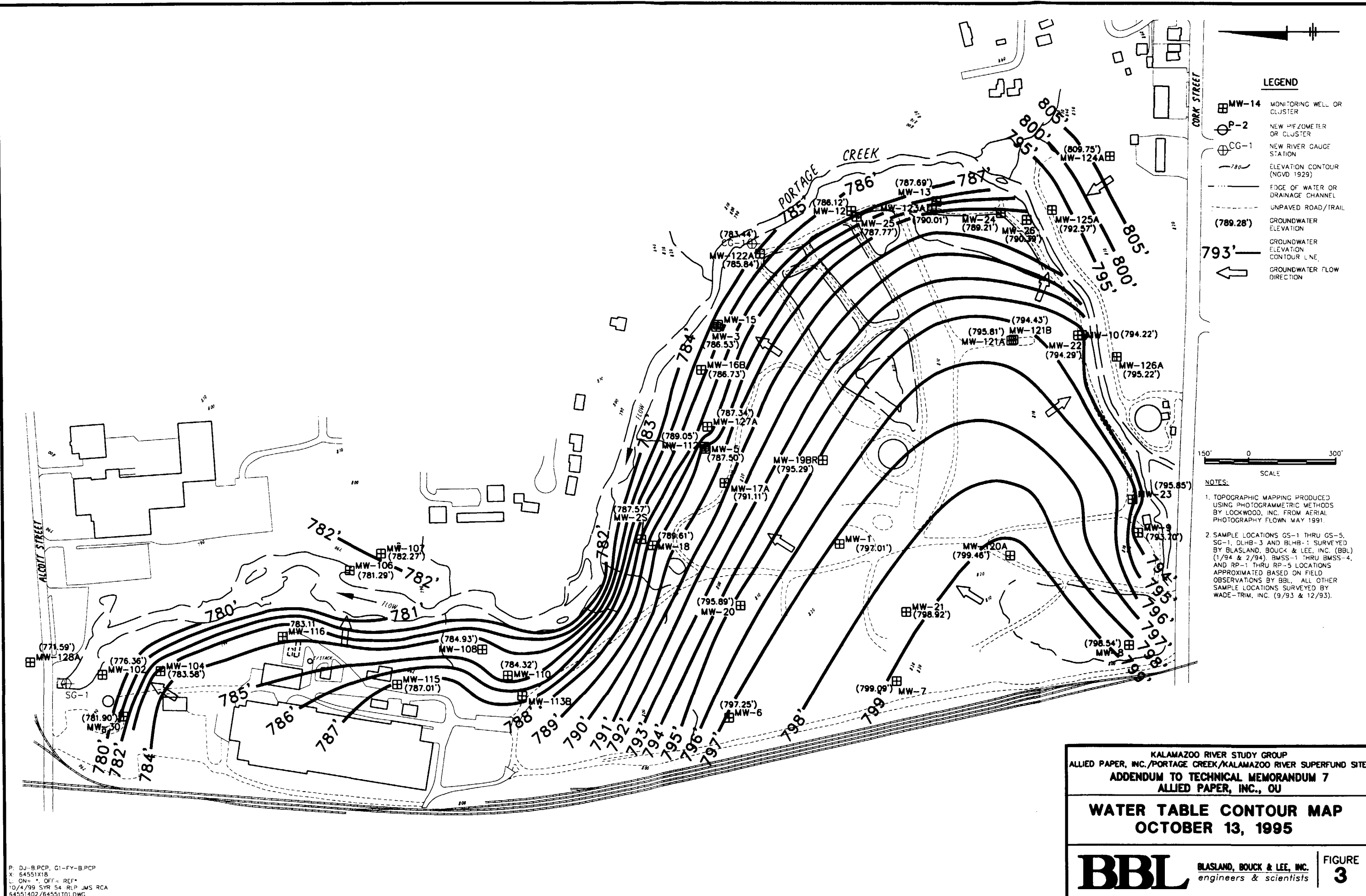
KALAMAZOO RIVER STUDY GROUP
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
ADDENDUM TO TECHNICAL MEMORANDUM 7
ALLIED PAPER, INC., OU

SITE LOCATION

BBL BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
1





P: DJ-B.PCP, G1-FY-B.PCP
X: 64551X18
L: ON= " OFF= REF"
10/4/99 SYR 54 RLP JMS RCA
64551402/64551101.DWG

Appendices

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Appendix A

Groundwater Sampling Field Documentation

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

10-2-95
 Day 106 - Kalamang - All day
 weather: Sunny - 70°F
 Time: 0700; SAP, RDK, JIS at Airport
 Departure

1015 - Arrive into Kalamang
 - JIS went to office for preparation
 - RDK + SAP picked up generator and
 FED. Ex packages.
 11:30 - RDK + SAP Arrive at Field office
 JIS is there.
 - JIS says the day will be used for
 preparation and no sampling.
 - $\overline{A66100}$ = starting sample number (JIS)
 - uppackage FED. Ex Supplies

1200 - Leave for lunch
 1245 - Return from lunch
 1300 - Leave for site (SAP, JIS, RDK)
 - going towards N end of site
 - Right on to Portage & the left on to
 Alcott

MM284 new gate
 - a guy is telling us in the gate and giving us
 keys to cut houses & gate.
 - dump water in roll-off (GVR) MARK Framingham
 - MM123A+B are flush-mounts in land

10-295 DAILY LOG (cont)

- get to MW 106 Thru Stryker parking lot
- MW 124A + B are behind Car Wash on Cork Street; Go thru man gate JIS don't go on and off pavement
- gates on Cork St. just beyond car wash 1st = Monarch
- 1406 - leaving to get more keys to wells back at office.
- 1455 - Return to office.
 - Fixing Grundfos Pump
- 1600 - Leave to get supplies (SAP + RDK)
- 1715 - ARRIVE AT HOTEL

Water levels from Allied Site

10-2-95

DTW (TOIC)

MW 122A

20.34'

CG1

5.37'

SAP

10-3-95 KALAMAZOO GROUND WATER
SAMPLING AT ALLIED SITE (DAY 2).

60°F and Raining
MDNR OVERSIGHT - John Bradley ~ 08:00
DAILY FIELD LOG

0630 - SAP, RDK + JIS Leave for Breakfast

0715 - ARRIVE AT OFFICE

0800 - ARRIVE AT SITE

- SETUP at MW 22A+B

0 - MW 22B has rusted lock, JIS going to
office to get bolt cutters

0820 - RDK calibrated Horiba LI-10 water quality
checker.

0944 - all set up (pumps)

0845 - Start sampling at MW 22A

1010 Sampled MW-22B (#A66100)

1030 Sampled MW-22A (#A66101)

1100 Arrive at MW-24 and MW-11, begin setup

1135 Start taking pumps at MW-24

1245 Sampled MW-24 (#A66102)

1302 - Didn't sample MW-11, went dry
come back after lunch and try
- left for lunch

1330 - return from lunch

- begin setup at MW-26 (Artesian Well)

(4)

10-3-95

1356 - obtain DTWB at MW-26 - level in stick up

1500 - Sampled MW-26 (#A66104) - Artesian Well

gives in line caused problems with monitoring
flow control

1550 - Arrive at MW 22A+B

1710 - Sampled MW 22B at 1710 (A66105)

1730 Sampled MW 22A (#A66106)

1745 - leave MW 22A+B and go back to MW-11

1805 - leave site

- checked water level at MW-11
and was 38.08

- John Bradley (MDNR) said to
sample on the next morning

1820 - arrive at office

1845 RDK + SAP SAMPLE (#A66107) RINSE
BLANK. SAMPLED USING DECONTAMINATED
GLOVES + ARBOR SPRINGS FILTERED
H2O.

- App

KB 515

(5)

STARTING at MW122A + B

cluster

10-3-75

	DTW (row) TD	Time
MW122A	20.29	3-1.14
MW122B		0825

5.41 (From ^{mountain} steeped strike) 0830

Well	MW122A	MW122B
Time	0845	0900

747

545

(6)

KB 515

(7)

10-4-95 DAY 3 - GUV Samplings at
Kokomajoo Allied Site using low -
Flow TECHNIQUE.

@ 0700 - Cold ~ 45-50° Foggy

0715 - ARRIVE at Field office (SAP, RDK + JIS)

- As per JIS Dissolved Oxygen
readings will be taken only on
the final reading at time of sampling.

0750 - ARRIVE at Site, START at mu-11
when ~~the~~ ^{the pump} is already in place.

- SAP + RDK setup

0800 - SAP + RDK Sampled mu-11 (#Ab6103)

0830 - SAPs RDK arrive at mu-2 + mu-2S

JIS is "Bush-walking"

0840 - SAP + RDK Sampled mu-2 (Ab6108)

- also did 115-115D ~~and 115-115E~~

0845 - SAP + RDK Sampled mu-2S (Ab6109)

1020 - SAP + RDK set up mu-11S at same
location as mu-2 and mu-2S.

1100 - SAP ~~left~~ left to go to mu-122A +
C51 to take water levels

1140 - SAP returned

1140 - RDK Sampled mu-18 w/ duplicates
(Ab6111) and (Ab6110)

- Ab6110 at 1140 and Ab6111 at 1150

1202 - RDK, RDK + JIS leave for lunch

(8)

1245 - SAP + RDK arrive at mu-5 and mu-112

- JIS is locating wells again

1440 - SAP + RDK sample mu-5 (#Ab6112)

1440 - SAP, RDK Sampled mu-112 (#Ab6113)

1440 - Setup at mu-127A

1400 - RDK, SAP Sampled mu-127A (#Ab6114)

1635 - RDK + SAP leave field and head to office.

- JIS already there.

1650 - SAP + RDK arrived at office

- package samples (RDK + SAP)

1735 - leave for FDP EX (SAP + RDK)

1815 - Back at Hotel (RDK + SAP)

file

10-4-95

GW and Stream-Water interaction levels.

	DTW (TIC)	TIME
mw122A	19.98'	1129
GG.1	5.37'	1131

SAP

(10)

10-5-95

Kalamazoo. Allied S. & GW Sampling
USING LOW-Flow Technique.

DAY 4 - John Brackley (MDNR)

Overcast and -60°F, slight breeze

0730 - SAP, RDK + JIS ARRIVE at
Field office

0800 - SAP, RDK + JIS arrive at MW-106

land STRYKER Parking lot

0915 - SAP + RDK Sampled MW-106 (#A66115)

0950 - SAP, RDK, JIS + John Brackley arrive at
MW-108 in Bryant Mill fund.

1115 - SAP + RDK Sampled MW-108 (#A66116)

1145 - leave for lunch

1230 - SAP, RDK + JIS arrive at MW-104

1345 - Sampled MW-104 (#A66117)

1400 - Sampled duplicate of MW-104 (#A66118)

1440 - Arrive at MW-2 and MW-15

1530 - RDK + SAP Sampled MW-3 (#A66120)

1545 - RDK + SAP Sampled MW-15 (#A66119)

1607 - leave for MW-16B and MW-16C

1740 - RDK, SAP + JIS Sampled MW-16B (#A66121)

1746 - RDK, SAP + JIS Sampled MW-16C (#A66122)

1810 - leave field

1824 - Arrive at Field office (SAP + RDK)

1845 - Complete Rinse Blank (#A66123)

1900 - used Egan's Groundwater Pumping/Injection Dredging
leave for Hotel.

(11)

KB 515

10-6-95 - DAY 5

Kelamieo Allied Site - GWS

Sampling using low flow technique

60°F and Rainy

SAP, RDR, JS + John Goodley (MDNR)

Bill from MDNR (1000)

0700 - SAP, RDR + JS arrive at office

0800 - SAP, RDR + JS leave for site

0830 - SAP takes levels at MW122A + G1

0835 - Arrive at MW-12, MW12A, + MW25

0845 - Running very hard, we stop and wait for it to let up.

0948 - SAP, RDR, JS take MW-12 and MW12C
1030 - SAP, RDR, JS take MW123A + B

1055 - Sampled A 66124

1147 - MW 25 went dry

1200 - Break for lunch (SAP, JS)

1300 - Come back and check after lunch

1310 - JS + SAP Back from lunch

1345 - Restart pump on MW 25

1350 - well dry again

1460 - SAP + JS leave for MW-114

1515 - SAP + JS sampled MW114 (A 66107)

1520 - SAP + JS return to MW 25

1540 - SAP, JS sample MW-25 (A 66124)

1600 - leave field

1600 - Arrive at office and begin processing samples for FIDEX

(12)

10-9-95 - DAY 6

Kelamieo Allied Site - GWS Sampling

Using Low Flow Technique

50°F and Partly cloudy (slight breeze) - 730

0800 - SAP takes water level at current stream

0840 - SAP, RDR setup on MW123A + B

0930 - MW123B is shallowly from MW123A.

also sampled a duplicate here (A 66130)

1000 - SAP, RDR Sampled MW123A (A 66125)

1033 - SAP + RDR Finish MW123A + B

1033 - SAP + RDR Finish MW123A + B

54

KB 515

(13)

10-6-95

GW & Stream Water
Levels

DTW	Time
19.98'	0828
5.32'	0830

mw122A

(61

10-9-95 Kalamazoo Alfred St
Civ. Sampling Using Low-Flow Technique
SAP & RDK50°F, Partly Cloudy & Light breeze (0800)
Bill Smith Bulio (REDK)0800, SAP takes water level reading at
drum at North end of side.~~0800 SAP takes water level reading at~~
~~drum SAP~~

0840 SAP + RDK Set up at mw123A & B

0930 SAP + RDK Sample mw123A (#A66137)

also sample a duplicate here (#A66136)

1000 SAP + RDK Sampled mw123B (#A66128)

1033 SAP + RDK finish mw123A + B and

mw121A and mw121B

1040 Arrive at mw121A + B

1200 SAP went for lunch

1215 RDK Sampled mw121A (#A66131)

mw121B went dry, try later

1300 SAP + RDK arrive at mw120A + mw120B

1400 SAP + RDK Sampled mw120B (#A66134)

also did mw120A.

1410 SAP + RDK Sampled mw120A (#A66133)

1500 SAP + RDK arrive at mw120A and mw120B

1615 SAP + RDK Sampled mw120B (#A66135)

1648 mw120B went dry

(15)

KB 515

9-9-95 field notes (cont)

- 1710 SAP + RDK arrive at mw 21
 1800 SAP + RDK sample mw 21 (46613?)
 1826 SAP + RDK took water level
 at mw 21B
 1827 SAP + RDK took water level at
 mw 121B
 1850 SAP + RDK sampled mw 121B
 (466132)
 1850 SAP + RDK leave site
 1910 SAP + RDK return to office
 1930 SAP + RDK complete Rinse Blank
 using Grandfos Pump and Arbor
 Springs Distilled Water

10-9-95 Water level Readings

	DEW (711)	Time
DAM	10.45'	0800
mw 104	2.13'	0809
SC61	5.32'	0822
mw 122A	20.29'	0823

(16)

KB 515

(17)

10-10-95 Kalama 300 - Allied
Site 6W Sampling WING Low
Flow Technology

RDK + SAP

50°F and foggy (0730)

Bill Bolio (MIDNIX)

0730 - SAP + RDK Arrive at site
- SAP takes water levels at
cement dam

0800 SAP + RDK arrive at MW-7B

0815 SAP + RDK Sampled MW-7B

0830 SAP + RDK set up on MW 20 and ~~mw 20~~

0935 SAP + RDK Sampled mw-20B (A66140) ^{mw-20B}

0930 SAP + RDK Sampled mw-20 (A66139)

0910 SAP + RDK arrive at mw 17A and

1200 SAP + RDK sample mw 17A (A66141) ^{mw 17B}

1100 SAP + RDK sample mw 7B (A66142)

1320 SAP + RDK changed labels on mw 123A
and mw 123B - switched labels.

1330 SAP + RDK Arrive at mw 8 and
mw 8A

1500 SAP + RDK Sampled mw-8 (A66143)

1515 SAP + RDK Sampled. mw-8A (A66144)

1600 RDK + SAP leave field

1630 Prepare samples for FedEx

1800 Leave office

(18)

KB 515

(19)

10-10-95 - Gnd - Stream water elev.

	DTW	Time
Dam	10.69'	0744
mw104	2.16'	0749
CG-1	5.33'	0753
MW-12A	20.45'	0754

10-11-95 Kalamazoo Gnd. Sampling at Allied Site using low-flow SAP+RDL ~50°F and cloudy (0710)

0710 SAP+RDL leave office and go to field

0750 SAP+RDL arrive at mdr, mw19c and mw19D

0850 Sampled mw-19C (A66145) - also completed M5 WSD

0925 Sampled mw-19D (A66146), Duplicate (A66147) at 0935

- Dr. John Brubaker (MDNR) Arrives

1015 SAP+RDL sampled mw BR (A66148)

1035 SAP+RDL wait on pump

1050 SAP+RDL leave for lunch to avoid rush

avoid rush

1110 SAP+RDL arrive at mw125A, B and P

1245 sample mw125A (A66150)

1430 sample mw125B (A66151)

- mw125 P went dry

1510 - arrive at mw 120A + B

- SAP+RDL Sampled mw 120B (A66153)

- SAP+RDL Sampled mw 120A (A66152)

(20)

KB 515

(21)

10-11-95

Continued

- 1750 SAP + RDK buy gas for generator
 1800 Arrive at MW-23
 1830 SAP + RDK completed rinse blank
 (A66155) using ^{dear} Grundfos pump
 and Arbor Springs bottled water
 1900 SAP + RDK Sampled MW-23
 (A66154)
 1920 RDK and SAP leave site
 1930 RDK and SAP arrive at office
 2000 RDK and SAP leave for Hotel

SAP

(22)

10-11-95

Stream water Elevations

	DTW (TIC)	TIME
DAM	10.603'	0730
MW104	2.15	0734
CG-1	5.33	0740
MW122A	20.52'	0740

SAP

KB 515

10-12-95 Kalamazoo 610 Sampling

at Allied Site

6:05 and Cloudy (0700)

SAP + RDK

John Bradley (MWDK)

0700 RDK and SAP arrive at

office

0720 RDK and SAP arrive at MW12SP

to attempt sampling; water level

has only raised 0.8' from (10/1/95)

0730 SAP + RDK arrive at

0930 - SAP + RDK sampled MW12A (A66156)

0945 - SAP + RDK sampled Dup of MW12A (A66157)

1030 RDK and SAP sampled MW-12A

(A66158)

1100 RDK + SAP leave for lunch

1130 SAP + RDK arrive at MW-1

1215 SAP + RDK complete rinse blank

(A66160) using deionized

Groundfos pump and distilled water

from Arbor Springs.

1235 RDK + SAP sampled MW-1 (A66159)

1300 RDK + SAP arrived at MW128A

1435 RDK + SAP sample MW128A (A66161)

high amount of iron colloidal material
caused problems with parameters
and purge rate

(24)

10-12-95

- Could not fill 2 bottles for

Sampling. the frequency of the pump
rate was too high and could not be
water came out.

1510 - SAP + RDK returned to MW12SP

1545 - SAP + RDK sampled MW12SP (A66149)

1600 - SAP + RDK leave site

1615 - SAP + RDK returned to (309) in Reentry

- prepare samples for FedEx

1744 - Prepare DEP Metis and PID for

Shipping back to Response Reentry

Via FedEx.

1825 - Ship out above at FedEx

- RDK sent Florida and BBL

Trashear to Legian

+ 100 feet of cord and BBL

Groundfos pump to Rogers Elmer

ST

KB 515

(31)

10-12-95 GW-Stream Water
Elevations

DTW (TIC)

Time

DAM
MW104
CG1
MW122A

SAP

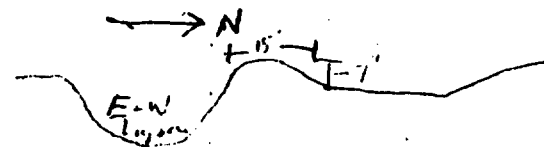
(26)

10-13-95 Kalamazoo Allied Site
GW Elevations

SAP and RDK

65°F and clear skies (0750)

- 0730 RDK and SAP arrive at office
- 0750 RDK and SAP arrive at site
to get water levels
- 1100 Return to office to get wrenches
and bolt cutters.
- 1130 SAP and RDK break for lunch
- 1200 SAP and RDK return to site in
search of non-sampled wells
- 1315 RDK+SAP leave Allied site
- 1330 RDK+SAP get camera at site and
leave for former King Mill site
- 1400 RDK+SAP arrive at King Mill site
- 1540 RDK+SAP leave King Mill site
- 1550 RDK+SAP arrive at office
- 1605 RDK+SAP return to King Mill site



1630 leave King Mill Site

KB 515

(27)

10-13-95. GW Elevations

Well ID	DTW (ft)	Time	Notes
MW122A	17.06'	0750	
MW106	2.53'	0802	
MW-107	15.20'	0800	
Convent Intake (Dam)	10.85'	0806	SG-1
MW-104	2.17'	0813	
MW-108	2.20'	0820	
MW-113B	9.51'	0825	
MW-113A	6.47'	0826	
MW-114	7.11'	0827	
MW-18	3.86'	0834	
MW-2	4.53'	0835	
MW-25	3.55'	0836	
MW-17B	18.78'	0843	
MW-17A	19.17'	0844	
MW-16B	16.88'	0847	
MW-16C	11.76'	0849	
MW-5	4.27'	0852	
MW-112	2.57'	0854	
MW-127A	4.31'	0855	
MW-3	10.61'	0902	
MW-15	9.07'	0904	
MW-122B	18.50'	0906	
MW-122A	20.67'	0907	

10-13-95 GW Elevations (cont)

Well ID	DTW (TIC)	Time
CG-1	5.34'	0908
MW-12R	21.41'	0911
MW-12	22.29'	0913
MW-25	21.18'	0914
MW-12B	16.71'	0917
MW-12A	16.61'	0920
MW-11	10.86'	0925
MW-24	18.42'	0927
P3	DRY??	0929
MW-13	2.97'	0932
MW-26	1.71'	0937
MW-10	15.87'	0941
MW-22	16.06'	0942
MW-22B	14.41'	0944
MW-22A	15.90'	0945
MW-23	17.28'	0950
MW-9	9.27'	0954
MW-120A	22.75'	0956
MW-120B	23.58'	0957
MW-8A	12.07'	1001
MW-8	11.66'	1004
MW-21	5.33'	1007
MW-1	36.18'	1011

(30)

10-13-95 GW Elevations (cont)

Well ID	DTW (TIC)	Time
MW-148E	26.72'	1014
MW-19C	27.20'	1015
MW-19D	27.11'	1016
MW-7	19.85'	1019
MW-7B	20.45'	1020
MW-6	15.45'	1025
MW-20B	17.76'	1027
MW-20	15.10'	1028
MW-120A	10.46'	1034
MW-120B	9.45'	1035
MW-125A	18.58'	1039 may not be recovered
MW-125B	11.97'	1041 2 dips prior = 17.42'
MW-125P	—	NA - WT not recovered from GW sampling
MW-124A	33.99'	1050
MW-124B	41.51'	1051
MW-102	7.28'	1210
MW-116	11.01'	1224
MW-115	8.47'	1230
MW-110	3.25'	1240
MW-111	0.74'	1241
MW-123A	15.78'	1254 casing settled cap was loose
MW-123B	14.65'	1255 poss. big water infiltration to top
MW-30	14.68'	1303
MW-30B	10.67'	1312 No label on well may be MW-30B 91.58' STD

KB 515

RIVER GAUGE ELEVATIONS

AUGUST 15, 1995

WADE-TRIM, INC.
1204 HARRISON ST.
FLINT, MICHIGAN 48502

OPERABLE UNIT	GAUGE	ELEVATION
ALLIED SITE	CG-1	788.78
KING LANDFILL	RG-3	771.33
	RG-4	756.22
	RG-5	756.82
	CG-1	757.83
WILLOW SITE	RG-2	760.18
	RG-1	760.66
12st STREET	RG-5	704.09
	RG-4	710.24

KB 515



LTI Environmental Engineering

A Division of Limno-Tech, Inc.

September 29, 1995

Mr. Jim Saxton
Engineers and Geoscientists
Blasland, Bouck and Lee
6723 Towpath Rd., Box 66
Syracuse, NY 13214

Re: Allied Paper Operable Unit

Dear Jim:

Attached please find the water level information you requested for the Allied Operable Unit in Kalamazoo, Michigan. We have previously transmitted this information to you by phone. At the request of Blasland, Bouck and Lee, LTI collected static groundwater elevation data from groundwater monitoring well MW122a and measured the level in Portage Creek at the CG-1 staff gage. This information will be used in preparation for the upcoming round of groundwater sampling at the Allied Operable Unit, and to evaluate the whether there is a reversal of flow between Portage Creek and the groundwater at the site.

The static elevation at MW122a was measured on September 21, 22, 24, 25, 27, and 28, 1995, using a Solinst probe. The water level reading represents the measured depth from the top of casing to the static water level. The water level reading in Portage Creek was also measured on the same days at staff gage CG-1, which is adjacent to MW122a. The water level reading represents the distance from the survey mark on the gage to the stream surface.

If you have any questions or require additional information, please call me.

Sincerely,
LTI Environmental Engineering


Cathy Whiting
Project Engineer

CW/mrh

j:\jd7\ri_f\bbstat.doc

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-1
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SAP
 Date 10/12/95 Time In 1145 Out 1300
 Weather Sunny, ~70°F

WELL INFORMATION

	TIC	TCC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	46.62	
Water Table Depth	36.14	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	10.48
Volume of Water in Well	1.7 gal
Pumping Rate of Pump	3.25 gal/min
Volume of Bailor	
Minutes of Pumping	55 min
Number of Bails	

STARTED pumping @ 1150
 STOPPED pumping @ 1245
 Sampled @ 1235
 Sampled @ 285 gal/min
 Sample # A66159
 Cooler # 4B

Sample # A66160 = Rinse Batch
 Sampled @ 1215

EVACUATION INFORMATION

Volume of water removed from well 5.64
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) Gravimetric
 Evacuation Rate: 3.25 gal/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	25	44	30	27	27					26
Temperature (°C)	17.0	17.5	18.1	18.7	18.8					19.8
pH	7.08	7.03	6.93	6.93	6.93					6.92
Conductance (mS/cm)	0.93	0.95	0.95	0.95	0.95					0.95
ORP	0.78	0.37	-0.06	-0.00	-0.27					-0.35
Water Level (TIC)	37.19	37.14	37.00	36.75	36.91					36.87

DO mg/L 2.62
 Calibration Standard Readings 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

TO 285 gal/min WATERBATH SAMPLED CLEAR, COLORLESS, ODORLESS - FUDGE RATE SLOWED

SAMPLE DESTINATION

Laboratory AD-TECH

Via 60-X Sent By: ROK

ROK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-2
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well Allied
 Sampling Personnel RDIC, SLD
 Date 10/4/95 Time In 0830 Out 1200
 Weather 60°F, overcast

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	16.31'	
Water Table Depth	4.54'	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	11.77'
Volume of Water in Well	1.96 gal
Pumping Rate of Pump	425 gal/min
Volume of Bailor	
Minutes of Pumping	63 min
Number of Bails	

STARTED pumping @ 0900
 STOPPED pumping @ 1003
 SAMPLED @ 0940
 SAMPLED @ 400 ml/min
 SAMPLE # A66108
 SAMPLE # A66108 MS
 SAMPLE # A66108 MSD

COOLER # 1B

EVACUATION INFORMATION

Volume of water removed from well 5 gal
 Did well go dry? Y N

Evacuation Method: Bailor () Pump (X) Grout/OS
 Evacuation Rate: 425 gal/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	79	13	7	5						5
Temperature (°C)	13.1	14.4	14.7	14.9						15.2
pH	6.48	6.46	6.52	6.54						6.62
Conductance (mS/cm)	1.04	1.06	1.06	1.06						1.05
ORP <u>NA</u>										
Water Level (TIC)	4.71	4.71	4.71	4.70						6.42

DO mg/L

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLES CLEAR, colorless, odorless

SAMPLE DESTINATION

Laboratory ADUATECH

Via: Fedex Sent By: ADK

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-25
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROX SAP
 Date 10/4/95 Time In 0930 Out 1200
 Weather 60°F overcast

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	8.04'	
Water Table Depth	3.54'	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	9.5'
Volume of Water in Well	0.7 gal
Pumping Rate of Pump	400 ml/min
Volume of Bailor	
Minutes of Pumping	53 min
Number of Bails	

STARTED Pumping @ 0905
 STOPPED Pumping @ 1150 0958
 SAMPLED @ 0945
 SAMPLED @ UNKNOWN RATE (TOOK ~10 min.)
 Fill BOTH BOTTLES
 SAMPLE # AL6109

COOLER # 1A

EVACUATION INFORMATION

Volume of water removed from well 4.6 gal
 Did well go dry? Y (N)
 Evacuation Method: Bailor () Pump (X) GRUNDFOS
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	27	9	9	6						5
Temperature (°C)	15.8	17.9	17.5	17.8						18.6
pH	6.52	6.48	6.50	6.49						6.49
Conductance (mS/cm)	1.05	1.16	1.17	1.20						1.22
ORP <u>NA</u>										
Water Level (TIC)	4.26'	4.65'	4.04'	4.40						4.23'

DO mg/L not
 Calibration Standard Readings 10: _____ 4: _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Pump is set as low as it can go. ROX raised flow rate to
reduce flow rate. Initial flow rate ~ 100 ml/min (reason for dramatic drop in flow rate to
400 ml/min @ 0907. Difficult in maintaining 400 ml/min flow rate. Pump rate kept slowing
down even though head remained constant or increased. Sample rate unknown/variable. Sampled clear,
colorless, odorless

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FED-X

Sent By: ROX

SIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-3
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well Allied
 Sampling Personnel RDK, SAP
 Date 10/5/95 Time In 1430 Out 1610
 Weather OVERCAST, ~55°F Rain

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	27.26	
Water Table Depth	17.55	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	16.21
Volume of Water in Well	2.5 gal
Pumping Rate of Pump	400 ml/min
Volume of Bailor	—
Minutes of Pumping	42
Number of Bails	—

EVACUATION INFORMATION

Volume of water removed from well 3.56A1
 Did well go dry? Y N

Evacuation Method: Bailor () Pump X Genosys
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	7.6	36	16	11						10
Temperature (°C)	13.8	14.9	15.2	15.4						15.4
pH	6.51	6.38	6.42	6.41						6.42
Conductance (mS/cm)	1.25	1.32	1.28	1.28						1.27
ORP	020	007	-002	-003						-001
Water Level (TIC)	10.66	10.62	10.63	10.62						10.62

no ng/L
 Calibration Standard Readings

10:

4:

7

3.31

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial purge rate is 400 ml/min
Sample clear, colorless, odorless

SAMPLE DESTINATION

Laboratory

ADWATECH

Via:

FD-X

Sent By:

RDK

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-5
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/4/95 Time In 1300 Out 1940
 Weather PARTLY Sunny, 65°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2.1	
Well Depth	9.2	
Water Table Depth	4.3	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	4.9'
Volume of Water in Well	0.8 GAL
Pumping Rate of Pump	600 ml/min
Volume of Bailor	
Minutes of Pumping	32 min
Number of Bails	

STARTED Pumping @ 1340
 STOPPED Pumping @ 1412
 SAMPLED @ 1410
 SAMPLED @ 500 ml/min
 SAMPLE # A66112

COOLER # 1B

EVACUATION INFORMATION

Volume of water removed from well 5.61
 Did well go dry? Y N

Evacuation Method: Bailor () Pump X GRANDFOS
 Evacuation Rate: 600 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	388	31	20							13
Temperature (°C)	14.7	15.8	16.00							16.1
pH	6.53	6.45	6.42							6.43
Conductance (mS/cm)	1.36	1.37	1.37							1.37
ORP (mV)	-004	-010	-011							-010
Water Level (TIC)	4.49'	4.48	4.48							4.48

DO mg/L

Calibration Standard Readings 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

600 ml/min is lowest pump rate possible due to low Elevation.
slow to 500 ml/min naturally at 1400 SAMPLED CLEAR, COLORLESS, odorless

SAMPLE DESTINATION

Laboratory AQUARECH

Via: FD-X Sent By: RDK

SJS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-7

Key No. _____

PID Background 0.0Well 0.0Site Well ALLIEDSampling Personnel ADK, SVDDate 10/7/75Time In 1500Cut 1700Weather Sunny, 70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	33.27	
Water Table Depth	19.51	

Slug Test? (Y/N) NRedevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	13.71
Volume of Water in Well	2.2641
Pumping Rate of Pump	250.2/min
Volume of Bailor	
Minutes of Pumping	50 min
Number of Bails	

STARTED pump @ 1535
 STOPPED pump @ 1625
 SAMPLED @ 1615
 SAMPLED @ 250.2/min
 SAMPLE # A66135
 COILER # 3A

EVACUATION INFORMATION

Volume of water removed from well 3.641Did well go dry? Y (N) (N)Evacuation Method: Bailor () Pump (X) GLUPESEvacuation Rate: 250.2/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	56	45	25	20						20
Temperature (°C)	17.3	18.3	18.6	18.6						18.7
pH	7.51	7.51	7.51	7.49						7.46
Conductance (mS/cm)	0.662	0.665	0.665	0.664						0.670
ORP	-022	-016	-016	-013						-012
Water Level (TIC)	19.87	19.87	19.87	19.87						17.87

Calibration Standard Readings DO mg/L

10;

4;

7

2.34

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CLAR, COLLOIDS, ALUMINUM

SAMPLE DESTINATION

Laboratory ADARCTVia: ROXSent By: ADICROX
Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-7B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SAD
 Date 10/10/95 Time In 1500 Out 1700
 Weather 10/10/95 Sunny 70°C

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	48.57	
Water Table Depth	28.41	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	28.16
Volume of Water in Well	4.6 gal
Pumping Rate of Pump	200 ml/min
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 6.5 gal
 Did well go dry? (Y) N

Evacuation Method: Bailor () Pump (X) 6 strokes
 Evacuation Rate: 200 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	End
Turbidity (NTU)	94	32	28	28	28	24	26	28	29	18	
Temperature (°C)	16.1	16.4	17.2	17.5	18.0	18.3	18.7	18.8	19.0	13.0	
pH	7.64	7.66	7.68	7.58	8.67	8.70	8.82	8.89	9.07	8.67	
Conductance (mS/cm)	0.366	0.333	0.350	0.319	0.347	0.351	0.341	0.351	0.348	0.319	
ORP	-047	-060	-051	-026	-034	-035	-051	-046	-052	068	
Water Level (TIC)	20.64	24.25	27.27	30.31	34.01	35.83	38.47	41.14	42.71	44.58	

DO mg/L _____

Calibration Standard Readings _____ 10: _____ 4: _____ 7 _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Later. TO 32.29°C 1815 well went dry at 1648 will it recover? Sample
sampled clear, colorless, odorless 17°C 2043' 0.080 10/10/95

SAMPLE DESTINATION

Laboratory ADUARCH

Via: FD-X Sent By: ROK

ADK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-8
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAD
 Date 10/10/85 Time In 1330 Out _____
 Weather Sunny - 70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	35.15	
Water Table Depth	11.64	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	23.91
Volume of Water in Well	3.9 gal
Pumping Rate of Pump	400 ml/min
Volume of Bailer	
Minutes of Pumping	1420 60 min
Number of Bails	

STARTED pumping @ 1400
 STOPPED pumping @ 1500
 SAMPLED @ 1500
 SAMPLED @ 400 ml/min
 SAMPLE # A66143
 COOLER # 3B

EVACUATION INFORMATION

Volume of water removed from well 5 gal

Did well go dry? Y (N)

Evacuation Method: Bailer () Pump OR blower

Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	85	111	28	22	27	20				17
Temperature (°C)	15.8	16.1	15.9	16.2	16.3	16.6				16.2
pH	8.34	7.25	7.22	7.04	7.14	7.12				7.10
Conductance (mS/cm)	0.377	0.492	0.671	0.694	0.691	0.695				0.699
ORP	-033	001	011	022	022	010				003
Water Level (TIC)	11.81	11.82	11.81	11.81	11.80	11.80				11.80

DO (mg/L) 1.55
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial pump rate is 300 ml/min; increased to 400 ml/min at 1410; sample was clear, colorless, odorless

SAMPLE DESTINATION

Laboratory AQATECH

Via: ROA

Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-8A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALIEN
 Sampling Personnel RDK, SAA
 Date 10/10/85 Time In 1330 Out _____
 Weather Sunny ~70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>26.08</u>	
Water Table Depth	<u>22.08</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>2.0'</u>
Volume of Water in Well	<u>1.32 GAL</u>
Pumping Rate of Pump	<u>300 ml/min</u>
Volume of Bailer	
Minutes of Pumping	<u>67 min</u>
Number of Bails	

STARTED pumping @ 1415
 STOPPED pumping @ ~~1445~~ SAP 1522
 SAMPLED @ 1515
 SAMPLED @ 300 ml/min
 SAMPLE # A66144
 COOLER # 3B

EVACUATION INFORMATION

Volume of water removed from well 5 gal
 Did well go dry? Y N

Evacuation Method: Bailer () Pump (X) GRUNDFOS
 Evacuation Rate: 300 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>999+</u>	<u>2.77</u>	<u>1.61</u>	<u>55</u>	<u>41</u>	<u>35</u>				<u>31</u>
Temperature (°C)	<u>15.5</u>	<u>16.7</u>	<u>17.3</u>	<u>17.7</u>	<u>17.7</u>	<u>17.62</u>				<u>18.0</u>
pH	<u>6.17</u>	<u>6.16</u>	<u>6.29</u>	<u>6.38</u>	<u>6.41</u>	<u>6.45</u>				<u>6.50</u>
Conductance (mS/cm)	<u>1.13</u>	<u>1.10</u>	<u>1.08</u>	<u>1.03</u>	<u>1.03</u>	<u>1.01</u>				<u>1.01</u>
ORP	<u>044</u>	<u>044</u>	<u>046</u>	<u>039</u>	<u>032</u>	<u>026</u>				<u>009</u>
Water Level (TIC)	<u>12.50'</u>	<u>12.52'</u>	<u>12.52'</u>	<u>12.52'</u>	<u>12.51'</u>	<u>12.51'</u>				<u>12.50</u>

DO (mg/L) 2.10
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

INITIAL PURGE rate is 300 ml/min
SAMPLED CLEAR, COLORLESS, ODORLESS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: fed-1

Sent By: RDK

RDK
 Field Sampling Coordinator

20.08
12.08
8

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. A111ED
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well A111ED
 Sampling Personnel RICK SAG
 Date 10/13/95 Time In 1:10 Out _____
 Weather Partly, 60°F

WELL INFORMATION

	TIC	TCC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>51.10</u>	
Water Table Depth	<u>11.14</u>	

STARTED PUMPING @ 1140
 STOPPED PUMPING @ 1240
 SAMPLED @ 0800 (well dry)
 SAMPLED @ 250 ml/min
 SAMPLE # A166103

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>39.96</u>
Volume of Water in Well	<u>6.5 GAL</u>
Pumping Rate of Pump	<u>200 ml/min</u>
Volume of Bailor	
Minutes of Pumping	<u>60 min</u>
Number of Bails	

COOLER H1A

EVACUATION INFORMATION

Volume of water removed from well 6.61
 Did well go dry? (Y) N

Evacuation Method: Bailor () Pump X Grindfos
 Evacuation Rate: 200 ml/min

10/4/95

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	99	99	99	88	85	85				24
Temperature (°C)	13.5	14.1	14.4	14.5	14.1	14.8				14.3
pH	7.58	7.61	7.59	7.58	7.63	7.62				6.97
Conductance (mS/cm)	0.457	0.459	0.460	0.466	0.465	0.471				0.688
ORP <u>DD mg/L</u>	385	3.16	2.94	2.85	2.98	2.97				3.00
Water Level (TIC)	9.45	14.00	17.65	23.08	29.70	39.90				

Calibration Standard Readings _____ 10: _____ 4: _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

DIFFICULT MAINTAINING INITIAL PUMP RATE DUE TO
DECREASE IN HEAD (COULD NOT DECREASE TO 100 ml/min) WELL DRY @ 1240. WEL
KT RECOVER & SAMPLE @ 40.2' TIC @ 1530 IT @ 38.09 @ 1800
IT @ 27.47 @ 0800 ON 10/4/95 SAMPLED CLEAR, COLORED, ODORLESS

SAMPLE DESTINATION

Laboratory AQUATECH Via: FED X Sent By: _____

SJS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-12
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RCK, SAD, JLS
 Date 10/6/95 Time In 0836 Out _____
 Weather CLOUDY, SLIGHT RAIN, -55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	43.28	
Water Table Depth	22.13	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	21.10
Volume of Water in Well	3.44 gal
Pumping Rate of Pump	100 ml/min
Volume of Bailor	
Minutes of Pumping	100 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 3.5 gal
 Did well go dry? Y N

Evacuation Method: Bailor () Pump (x) Grout for
 Evacuation Rate: 100 ml/min

	0915	0925	0935	0945	0955	1005	1015		1055
Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	56	68	81	79	72	65	56		31
Temperature (°C)	12.2	14.0	14.9	15.7	16.5	16.6	16.4		16.7
pH	7.25	7.13	7.26	7.27	6.98	6.97	6.96		6.89
Conductance (mS/cm)	0.743	0.758	0.772	0.94	0.96	0.98	1.03		1.07
ORP (mV)	141	017	-025	-032	-043	-044	-043		-030
Water Level (TIC)	22.65'	25.96	28.45'	30.15'	32.19	32.86	32.78		32.46

DO (mg/L) _____
 Calibration Standard Readings _____ 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

slight screen in initial sample; initial pumping rate is 300 ml/min

SAMPLE DESTINATION

Laboratory ADARCH

Via: fed-x Sent By: JLS

JLS
 Field Sampling Coordinator

NOTE: - There is not a copy of boring logs for this well, JLS says screened in clay unit.
 - Hard to maintain pump rate because of rapid drawdown

45.28
 22.13
 23.15

21.1
 .163

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-12R
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROD, S.A.D., JLS
 Date 10/6/95 Time In 0830 Out _____
 Weather OVERCAST, SLIGHT RAIN, ~55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	42.85	
Water Table Depth	21.28	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	21.57
Volume of Water in Well	3.52 gal
Pumping Rate of Pump	250 ml/min
Volume of Bailer	
Minutes of Pumping	38 min
Number of Bails	

STARTED pumping @ 0932
 STOPPED pumping @ 1030
 SAMPLED @ 1025
 SAMPLED @ 1023
 SAMPLE # A66125
 COILER # 2B

5' screen

EVACUATION INFORMATION

Volume of water removed from well 5 gal
 Did well go dry? Y N

Evacuation Method: Bailer () Pump (X) GRUNDOS
 Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	39	45	64	50	32					20
Temperature (°C)	13.3	15.1	15.7	15.8	16.1					16.3
pH	8.31	8.07	7.12	7.03	6.95					6.90
Conductance (mS/cm)	1.19	1.20	1.19	1.17	1.20					1.22
ORP	-033	-073	-043	-049	-037					-038
Water Level (TIC)	22.03	23.97	24.08	24.69	24.73					24.77

DO mg/L _____
 Calibration Standard Readings _____ 10: _____ 4: _____ 7: _____ 3.64

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial pumping rate is 225 ml/min; at 1002 pumping rate is 300 ml/min
sample is colorless, odorless and clear

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FED-X Sent By: JLS

JLS
 Field Sampling Coordinator

NOTE:

7.15
 42.85
 21.28
 21.57

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-15
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RAK, SFD
 Date 10/5/95 Time In 1430 Out 1610
 Weather DRAST, ~55°F Rain

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	39.78'	
Water Table Depth	8.98'	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	31.00
Volume of Water in Well	5.05 GAL
Pumping Rate of Pump	350 ml/min
Volume of Bailor	—
Minutes of Pumping	57
Number of Bails	—

EVACUATION INFORMATION

Volume of water removed from well 5.61
 Did well go dry? Y N

Evacuation Method: Bailor () Pump (X) GENOSIS
 Evacuation Rate: 350 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	130	234	46	14	8					8
Temperature (°C)	13.7	14.3	14.5	14.6	14.6					14.7
pH	7.11	6.44	6.33	6.34	6.34					6.35
Conductance (mS/cm)	0.772	1.26	1.43	1.46	1.47					1.47
ORP (mV)	006	010	005	004	001					003
Water Level (TIC)	9.07	9.13	9.12	9.13	9.13					9.12

DO = 9/L

Calibration Standard Readings 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

sample clear, colorless, odorless initial purge rate is 350 ml/min

SAMPLE DESTINATION

Laboratory ARMA TECH

Via: Fedex

Sent By: RAK

SIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-116B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/5/95 Time In 1615 Out _____
 Weather CLEAR, -55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	7"	
Well Depth	35.02	
Water Table Depth	16.77	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	18.25'
Volume of Water in Well	3.641
Pumping Rate of Pump	450 ml/min
Volume of Bailer	
Minutes of Pumping	52
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 6.641
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump DO 6.641
 Evacuation Rate: 450 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	37	22	17	12	10					8
Temperature (°C)	14.2	15.4	15.4	15.4	15.4					15.4
pH	8.38	7.12	6.87	6.76	6.76					6.75
Conductance (mS/cm)	.334	.604	.684	.722	.741					.747
ORP	-090	-037	-033	-030	-031					-032
Water Level (TIC)	17.37	17.33	17.37	17.34	17.37					17.37

DC mg/L

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

sample clear, colorless, odorless initial purge rate 450 ml/min

SAMPLE DESTINATION

Laboratory AQATECH

Via: FD-X

Sent By: AK

JES
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-16C
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDX, SAP
 Date 10/5/95 Time In 1615 Out _____
 Weather Overcast, ~55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	57.92	
Water Table Depth	11.67	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	43.25
Volume of Water in Well	2.61
Pumping Rate of Pump	300 ml/min
Volume of Bailor	
Minutes of Pumping	71
Number of Bails	

STARTED Pumping @ 1635
 STOPPED Pumping @ 1746
 SAMPLED @ 330 ml/min
 SAMPLED @ 1740
 SAMPLE # A66122
 COOLER # 2A

SAMPLE # A66123 = RINSE BLANK
 SAMPLED @ 1900

EVACUATION INFORMATION

Volume of water removed from well 2.61
 Did well go dry? Y N

Evacuation Method: Bailor () Pump DO GRAB
 Evacuation Rate: 300 ml/min

1635 1645 1655 1705 1715 1725 1735 1745

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	93	200	54	39	20	15	14			13
Temperature (°C)	14.4	15.0	15.1	15.1	15.2	15.2	15.2			15.3
pH	10.02	7.88	8.46	7.69	7.36	7.34	7.32			7.33
Conductance (mS/cm)	.142	.134	.289	.438	.471	.485	.496			.503
ORP	-193	-148	-049	-077	-067	-066	-066			-065
Water Level (TIC)	12.20	12.83	13.20	13.29	13.26	13.24	13.22			13.20

NO mg/L
 Calibration Standard Readings 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial purge rate is 300 ml/min
 SAMPLED CRAP, COARSE, COARSE

SAMPLE DESTINATION

Laboratory AQ. ATECH

Via: ROX Sent By: ROX

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. AAW-17A
 Key No. _____
 PID Background C.C. Well C.C.

Site Well ALLIED
 Sampling Personnel ROK, SAP
 Date 12/10/95 Time In 1000 Cut _____
 Weather SLIGHT OVERCAST, ~55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2.1	
Well Depth	38.35	
Water Table Depth	19.14	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	13.11
Volume of Water in Well	2.1 gal
Pumping Rate of Pump	150 ml/min
Volume of Bailer	
Minutes of Pumping	125
Number of Bails	

STARTED PUMPING @ 1030
 STOPPED PUMPING @ 1235
 SAMPLED @ 1200
 SAMPLED @ 150 ml/min
 SAMPLE # ~~11614~~ A66141
 COOLER # 3B

EVACUATION INFORMATION

Volume of water removed from well 2.5 gal
 Did well go dry? Y N

Evacuation Method: Bailer () Pump (X) BRUNNEN
 Evacuation Rate: 150 ml/min

		1030	1040	1050	1100	1110	1120	1130	1140	1150	1235
Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	32	31	26	36	44	38	37	35	38	32	
Temperature (°C)	14.7	15.9	16.7	17.6	18.1	17.9	18.1	18.0	18.3	18.5	
pH	6.47	6.42	6.42	6.44	6.44	6.41	6.42	6.45	6.44	6.50	
Conductance (mS/cm)	1.37	1.39	1.39	1.39	1.39	1.38	1.38	1.38	1.37	1.37	
ORP	033	018	010	-002	-012	-013	-012	-014	-023	-033	
Water Level (TIC)	19.76	20.91	21.35	21.60	21.80	21.80	21.80	21.84	21.78	21.72	

DC (mg/L) _____
 Calibration Standard Readings _____ 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE CLEAR, COLORLESS, ODORLESS

SAMPLE DESTINATION

Laboratory AQATECH

Via: FED-X Sent By: ROK

ROK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-17B
 Key No. _____
 PID Background 00 Well 00

Site Well 1711FD
 Sampling Personnel RDK, SAP
 Date 10/10/95 Time In 1000 Out _____
 Weather SLIGHT DRIZZLE, ~55°F

WELL INFORMATION

	TC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	49.23	
Water Table Depth	18.93	

Slug Test? (Y/N) N
 Redvelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	30.42
Volume of Water in Well	5.0 GAL
Pumping Rate of Pump	350 mL/min
Volume of Bailor	
Minutes of Pumping	75 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 5.5 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) GENIOS
 Evacuation Rate: 350 mL/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	45	2.2	1.7	1.7	1.5	1.6	1.6			1.7
Temperature (°C)	14.7	15.2	15.6	16.1	16.0	16.0	16.0			15.8
pH	6.57	6.47	6.45	6.46	6.44	6.45	6.46			6.47
Conductance (mS/cm)	1.24	1.34	1.35	1.34	1.34	1.33	1.33			1.33
ORP	231	236	213	-004	-015	-017	-012			-018
Water Level (TIC)	19.11	19.08	19.07	19.04	19.04	19.04	19.04			19.04

DO mg/L
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CLEAR, COLORLESS, ODORLESS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: EXP-X Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-18
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK SAP
 Date 10/4/95 Time In 1015 Out 1200
 Weather 60°F OVERCAST

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>39.01</u>	
Water Table Depth	<u>3.83</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>35.18'</u>
Volume of Water in Well	<u>5.7 gal</u>
Pumping Rate of Pump	<u>625 ml/min</u>
Volume of Bailer	
Minutes of Pumping	<u>60 min</u>
Number of Bails	

STARTED pump @ 1040
 STOPPED pump @ 1140
 SAMPLED @ 1140
 SAMPLED @ 625 ml/min
 SAMPLE # A66110
 COOLER #1 A
 SAMPLE # A66111 (duplicate of #A66110)
 COOLER #1 B SAMPLED @ 1150

EVACUATION INFORMATION

Volume of water removed from well 10.641
 Did well go dry? Y N
 Evacuation Method: Bailer () Pump (X) GRANDFOS
 Evacuation Rate: 625 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>45</u>	<u>16</u>	<u>5</u>	<u>5</u>	<u>4</u>	<u>4</u>				<u>4</u>
Temperature (°C)	<u>13.7</u>	<u>14.0</u>	<u>14.1</u>	<u>14.0</u>	<u>14.0</u>	<u>14.0</u>				<u>14.0</u>
pH	<u>7.66</u>	<u>7.20</u>	<u>7.14</u>	<u>7.15</u>	<u>7.13</u>	<u>7.16</u>				<u>7.14</u>
Conductance (mS/cm)	<u>0.339</u>	<u>0.638</u>	<u>0.719</u>	<u>0.730</u>	<u>0.735</u>	<u>0.738</u>				<u>0.739</u>
ORP										
Water Level (TIC)	<u>4.35'</u>	<u>4.34</u>	<u>4.35</u>	<u>4.35</u>	<u>4.35</u>	<u>4.35</u>				<u>4.35</u>

DO mS/L
 Calibration Standard Readings 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SLIGHT SPUR NOTICED IN INITIAL LARGE HEAD PUMP RATE = 625 ml/min
(CA) NOT SIGN. DRAIN RATE DUE TO LARGE HEAD AND SAMPLING CONDITIONS & SLOWED INITIAL
SAMPLED CLEAR, COLORLESS, ODORLESS, NO SPURS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FEDX Sent By: RDK

JFS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-19BR
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SJD
 Date 10/1/85 Time In 0745 Cut 1045
 Weather CLEAR, ~50°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	40.65	
Water Table Depth	26.7	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	13.94
Volume of Water in Well	2.3641
Pumping Rate of Pump	400 ml/min
Volume of Bailer	
Minutes of Pumping	6.0 min
Number of Bails	

STARTED pumping @ 0715
 STOPPED pumping @ 1015
 SAMPLED @ 1015
 SAMPLED @ 400 ml/min
 SAMPLE # ALQ148
 COOLER # 4A

EVACUATION INFORMATION

Volume of water removed from well 7.641
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump ☒ Grout for
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	227	15.9	10.3	6.2	5.0	4.4				37
Temperature (°C)	13.5	15.3	15.6	15.8	16.2	16.4				16.5
pH	6.86	6.65	6.65	6.60	6.60	6.60				6.57
Conductance (mS/cm)	1.22	1.27	1.28	1.28	1.28	1.28				1.29
ORP	000	007	000	-002	-0010	-013				-40
Water Level (TIC)	27.20	27.03	27.08	27.10	27.06	27.06				27.09

DO mg/L
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial pumping rate is 400 ml/min
SAMPLED CRACK, COLLECTED, & LOCKED

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RDK

Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-12C
 Key No. _____
 PID Background 00 Well 00

Site Well FIELD
 Sampling Personnel RDC, SAP
 Date 10/11/95 Time In 0745 Out 1045
 Weather OVERCAST, 75°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	53.37	
Water Table Depth	27.14	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	26.23
Volume of Water in Well	4.3 gal
Pumping Rate of Pump	400.2/m.w
Volume of Bailor	
Minutes of Pumping	65 min
Number of Bails	

STARTED PUMP @ 0805
 STOPPED PUMP @ 0910
 SAMPLED @ 0850
 SAMPLED @ 900 min
 SAMPLE # AG6145
 COILER # 4A

MS/MSD SAMPLED FREE
~~#666~~
 # AG6145 MS
 # AG6145 MSD

EVACUATION INFORMATION

Volume of water removed from well 56.1
 Did well go dry? Y N

Evacuation Method: Bailor () Pump VA GRAND FOS
 Evacuation Rate: 400.2/m.w

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	44	21	18	17	18					17
Temperature (°C)	11.7	13.6	14.2	14.4	14.7					15.0
pH	7.35	7.08	6.95	6.86	6.85					6.81
Conductance (mS/cm)	1.11	1.12	1.12	1.08	1.08					1.02
ORP	121	109	063	035	019					000
Water Level (TIC)	27.22	27.22	27.22	27.22	27.22					27.22

DO mg/L _____
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial pump rate is 400 m/w
SAMPLED CRAP, COARSE, AND LESS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RD-X Sent By: RDC

RDC
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-19D
 Key No. _____
 PID Background 00 Well 00

Site Well RIIIFD
 Sampling Personnel RDIC, SLD
 Date 10/11/95 Time In 0745 Out 1045
 Weather OVERCAST, ~50°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	167.33	
Water Table Depth	27.39	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	40.74
Volume of Water in Well	6.6 gal
Pumping Rate of Pump	250 ml/min
Volume of Bailor	
Minutes of Pumping	100 min
Number of Bails	

STARTED Pumping @ 0800
 STOPPED Pumping @ 0940
 SAMPLED @ 0925
 SAMPLED @ 250 ml/min
 SAMPLE # A66146
 COOLER # 4A

SAMPLE # A66147 = D.DOF
 # A66146
 SAMPLED @ 0935

EVACUATION INFORMATION

Volume of water removed from well 7.6L
 Did well go dry? Y N

Evacuation Method: Bailor () Pump X Grupos
 Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	30	23	19	17	16	16	16	16	15	17
Temperature (°C)	11.0	12.3	13.2	13.5	13.7	14.2	14.2	14.5	14.3	14.8
pH	7.40	7.16	7.01	7.04	7.05	7.03	7.03	6.95	6.99	6.91
Conductance (mS/cm)	1.17	1.17	1.14	1.08	1.06	1.04	1.04	1.02	1.02	1.03
ORP	122	122	078	040	020	008	-008	-008	-007	-016
Water Level (TIC)	23.65'	28.70	27.57	27.65	27.58	27.33	27.39	27.76	27.72	27.66

DO (mg/L) 1.47
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial pump rate is 250 ml/min
SAMPLES CLEAR, CIRCLES, CIRCLES

SAMPLE DESTINATION
 Laboratory AQATECH

Via: Fed-X Sent By: RDIC
RDIC
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-30
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAG
 Date 10/10/95 Time In 0830 Out 1000
 Weather Sunny, ~55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	24.83	
Water Table Depth	15.08	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	9.75
Volume of Water in Well	1.6 GAL
Pumping Rate of Pump	500 ml/min
Volume of Bailor	
Minutes of Pumping	40 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 4.564
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) GROUND FOS
 Evacuation Rate: 500 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	13.7	32	18	18						19
Temperature (°C)	13.4	15.1	15.6	15.7						16.1
pH	6.80	7.18	7.21	7.19						7.18
Conductance (mS/cm)	0.733	0.92	0.93	0.94						0.94
ORP	092	034	-005	-022						-030
Water Level (TIC)	15.10	15.11	15.11	15.11						15.11

DO mg/L
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CLEAR, COILIES, ODDKISS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FED-X Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MMW-206
 Key No. _____
 PID Background 00 Well 00

Site Well ALLIED
 Sampling Personnel RDK, SJD
 Date 10/18/95 Time In 0830 Out 1000
 Weather Sunny, 55°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	35.08	
Water Table Depth	15.69	

Slug Test? (Y/N) N
 Redvelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	19.39
Volume of Water in Well	3.2 GAL
Pumping Rate of Pump	400 ml/min
Volume of Bailer	
Minutes of Pumping	55 min
Number of Bails	

STARTED pumping @ 0845
 STOPPED pumping @ 0940
 SAMPLED @ 0935
 SAMPLED @ 400 ml/min
 Sample # A66140
 COOLER # 3B

EVACUATION INFORMATION

Volume of water removed from well 5 GAL
 Did well go dry? Y N

Evacuation Method: Bailer () Pump (X) 6.5 m/s
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	306	128	103	50	34	23				21
Temperature (°C)	13.2	15.1	15.5	15.7	16.2	16.4				16.4
pH	7.35	7.28	7.22	7.30	7.25	7.22				7.21
Conductance (mS/cm)	0.722	0.740	0.784	0.789	0.791	0.794				0.790
ORP	123	093	056	006	-020	-032				-035
Water Level (TIC)	15.90	15.85	15.83	15.80	15.86	15.86				15.86

DO mg/L

Calibration Standard Readings

10;

4;

7

2.87

MISCELLANEOUS OBSERVATIONS/PROBLEMS

INITIAL PUMP RATE 300 ml/min, INCREASED TO 400 ml/min
C 0910 DUE TO LOW DEPLETION. SAMPLED CIPAC, CIPACSS, CIPACSS

SAMPLE DESTINATION

Laboratory

AQUATEM

Via:

RDX

Sent By:

RDK

RDK

Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-21
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROX SAP
 Date 10/19/95 Time In 1:00 Out 1:15
 Weather Sunny ~ 70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	15.13	
Water Table Depth	5.30	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	7.83
Volume of Water in Well	1.6 gal
Pumping Rate of Pump	350 gal/min
Volume of Bailer	
Minutes of Pumping	50 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 46.41
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump X LRM-FOS
 Evacuation Rate: 350 gal/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	9.99	7.2	3.3	2.1						2.3
Temperature (°C)	16.8	17.4	18.0	17.6						17.7
pH	7.84	7.46	7.44	7.42						7.40
Conductance (mS/cm)	0.572	0.633	0.636	0.635						0.642
ORP	NA	046	047	042						041
Water Level (TIC)	5.36	5.35	5.35	5.35						5.35

DO mS/L
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CLEAR, COLORLESS, ODORLESS

SAMPLE DESTINATION

Laboratory ADUATECH

Via: FED-X Sent By: RPK

RAIC
 Field Sampling Coordinator

STARTED PUMP @ 1720

STOPPED PUMP @ 1810

SAMPLED @ 1800

SAMPLED @ 350 gal/min

SAMPLE # A66137

CODER # ~~3B~~
3A

SAMPLE # A66138 = RINSE BAWK
 SAMPED @ 1930
 CODER # 3B

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-22A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SJP
 Date 10/3/95 Time In 1600 Out _____
 Weather overcast, ~60°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	22.74	
Water Table Depth	15.88	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	16.42
Volume of Water in Well	1.16 gal
Pumping Rate of Pump	400 ml/min (FAIR)
Volume of Bailer	
Minutes of Pumping	60 min
Number of Bails	

STARTED PUMPING @ 1629
 STOPPED PUMPING @ 1729

SAMPLED @ 1720
 SAMPLED @ 225 ml/min
 SAMPLE # A66106

SAMPLE # A66107 - RINSE BAWK
 SAMPLED @ 1845

COOKER # 1A

EVACUATION INFORMATION

Volume of water removed from well 3.56 gal
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) GENSPOS
 Evacuation Rate: 400 ml/min (FAIR)

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	97	195	810	35	21					26
Temperature (°C)	14.9	17.4	17.8	17.6	17.6					17.7
pH	6.17	6.22	6.25	6.27	6.28					6.26
Conductance (mS/cm)	1.71	1.71	1.70	1.70	1.69					1.71
OPF DO mg/L	2.85	3.22	3.48	3.80	3.25					1.37
Water Level (TIC)	16.35	16.70	16.69	16.88	16.85					16.85

Calibration Standard Readings _____ 10: _____ 4: _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

PUMPING RATE SIGNIFICANTLY AS WELL DROPPED @ 1642. RATE
RATE ~ 300.2/min @ 1645. PUMP RATE @ 225 ml/min. SAMPLED CLEAR, COLORLESS, SLIGHT OOR

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RDX Sent By: RDK

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-22B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDE, SAP
 Date 11/3/95 Time In 11:00 Out _____
 Weather overcast 60°F

WELL INFORMATION

	TIC	TCC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	49.52	
Water Table Depth	14.37	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	35.15'
Volume of Water in Well	5.7 gal
Pumping Rate of Pump	400 ml/min
Volume of Bailor	
Minutes of Pumping	51 min
Number of Bails	

STARTED Pumping @ 1618
 STOPPED Pumping @ 1709
 SAMPLED @ 1710
 SAMPLED @ 500 ml/min
 SAMPLE # A66105

COOLER # 1A

EVACUATION INFORMATION

Volume of water removed from well 6 gal
 Did well go dry? Y N

Evacuation Method: Bailor () Pump (X) GENOSYS
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	85	999+	245	26	12					11
Temperature (°C)	12.6	13.5	13.7	14.0	13.9					14.1
pH	7.18	6.86	6.96	6.98	6.97					6.96
Conductance (mS/cm)	0.721	0.95	0.98	0.98	0.96					0.97
ORP DO mg/L	4.48	2.73	1.106	2.71	2.68					2.62
Water Level (TIC)	14.61	14.62	14.72	14.72	14.68					14.67

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CRAP, COARINESS, ROCKS

SAMPLE DESTINATION

Laboratory

ARLATECH

Via:

Fed-X

Sent By:

RDK

JIS

Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-23
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel _____
 Date 10/11/95 Time In 1800 Out _____
 Weather Sunny, ~20°C

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	30.45	
Water Table Depth	17.25	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	13.20'
Volume of Water in Well	2.2 gal
Pumping Rate of Pump	500 ml/min
Volume of Bailer	
Minutes of Pumping	60 min
Number of Bails	

STARTED pumping @ 1805
 STOPPED pumping @ 1905
 SAMPLED @ 1900
 SAMPLE @ 500 ml/min
 SAMPLE # A66154
 COOLER # 4B

SAMPLE # A66155 = RINSE BLANK
 SAMPLED @ 1830
 COOLER # 4B

EVACUATION INFORMATION

Volume of water removed from well 2.5 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) GRUNDFOS
 Evacuation Rate: 500 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	71000	747	258	89	41	47				75
Temperature (°C)	16.7	16.6	16.9	16.2	16.1	16.0				16.1
pH	7.01	6.93	6.81	6.83	6.83	6.83				6.81
Conductance (mS/cm)	0.736	0.737	0.224	0.714	0.717	0.717				0.716
ORP	0.36	0.14	-0.06	-0.13	-0.14	-0.14				-0.15
Water Level (TIC)	17.33	17.33	17.34	17.34	17.34	17.34				17.34

DO ml/L
 Calibration Standard Readings _____ 10: _____ 4: _____ 7

1.07 ml/L

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial pump rate is 500 ml/min
SAMPLED CRAP, COOLERS, ACCESS

SAMPLE DESTINATION

Laboratory AQATECH

Via: RD-X Sent By: ROK

ROK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-24
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAC
 Date 10/3/95 Time In 1110 Out 1300
 Weather RAINY, 60°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>30.48</u>	
Water Table Depth	<u>18.47</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>12.01'</u>
Volume of Water in Well	<u>2.0 GAL</u>
Pumping Rate of Pump	<u>250 mL/min</u>
Volume of Bailer	<u>25 mL</u>
Minutes of Pumping	<u>25 min</u>
Number of Bails	

STARTED Pumping @ 1135
 STOPPED Pumping @ 1250
 Sampled @ 1245
 Sampled @ ~200 mL/min
 Sample # A66102

COOLER # 1A

EVACUATION INFORMATION

Volume of water removed from well 5 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump X Grout for
 Evacuation Rate: 250 mL/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>213</u>	<u>105</u>	<u>35</u>	<u>18</u>	<u>15</u>	<u>12</u>	<u>9</u>			<u>8</u>
Temperature (°C)	<u>13.60</u>	<u>16.1</u>	<u>15.7</u>	<u>15.5</u>	<u>16.4</u>	<u>15.6</u>	<u>16.1</u>			<u>16.2</u>
pH	<u>6.82</u>	<u>6.97</u>	<u>6.79</u>	<u>6.35</u>	<u>6.34</u>	<u>6.31</u>	<u>6.29</u>			<u>6.29</u>
Conductance (mS/cm)	<u>0.663</u>	<u>0.741</u>	<u>0.721</u>	<u>1.02</u>	<u>1.10</u>	<u>1.15</u>	<u>1.18</u>			<u>1.19</u>
ORP <u>DO mg/L</u>	<u>215</u>	<u>2.27</u>	<u>2.20</u>	<u>2.23</u>	<u>2.77</u>	<u>2.67</u>	<u>2.65</u>			<u>2.49</u>
Water Level (TIC)	<u>19.55</u>	<u>20.19</u>	<u>21.19</u>	<u>21.22</u>	<u>20.08</u>	<u>21.6</u>	<u>20.34</u>			<u>20.45</u>

Calibration Standard Readings _____ 10: _____ 4: _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

S. REAK SEAL LOOSE. DIFFICULT MAINTAINING PROPER RATE.
SAMPLED, CLEAR, COLORLESS, ODORLESS.

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FEDEX Sent By: RDK

JES
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. M10-25
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well Allied
 Sampling Personnel RDK, SJD, SIS
 Date 10/6/95 Time In 0830 Out 1545
 Weather Overcast

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	30.30	
Water Table Depth	21.07	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	9.23
Volume of Water in Well	1.50
Pumping Rate of Pump	100 ml/min
Volume of Bailor	
Minutes of Pumping	32 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 1.75 gal.
 Did well go dry? (Y) N Evacuation Method: Bailor () Pump (X) Grupos

Evacuation Rate: 100 ml/min
1115 1125 1135 1145 1315 1325 1335 1530

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	1.72	184	392	615	294	195	195			130
Temperature (°C)	14.1	15.4	17.3	18.6	15.2	17.4	19.2			17.1
pH	8.95	7.78	7.03	6.81	6.78	6.83	6.81			7.00
Conductance (mS/cm)	0.374	0.423	0.501	0.645	0.97	0.96	0.97			0.98
ORP	-111	-062	-046	-045	-064	-043	-055			0.32
Water Level (TIC)	22.04'	23.43	25.50'	dry	23.72	25.17	dry			25.4'

DO (mg/L)
 Calibration Standard Readings 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial purge rate is 100 ml/min. Well went dry at 1147.
Restarted pump at 1310 at pumping rate of 100 ml/min; well dry again at 1335; returned to well for 3.4
time, to sample. Total volume removed is ~3 gal.

SAMPLE DESTINATION

Laboratory AQUATECH

Via: Fed-X Sent By: SIS

SIS
 Field Sampling Coordinator

TE: is hard to maintain steady purge rate due to rapid drawdown

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-104
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/5/95 Time In 1256 Out 1415
 Weather overcast, ~60°F, windy

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>9.04</u>	
Water Table Depth	<u>2.13</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>6.91'</u>
Volume of Water in Well	<u>1.15 GAL</u>
Pumping Rate of Pump	<u>350 ml/min</u>
Volume of Bailor	
Minutes of Pumping	<u>50 min</u>
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 4.6M
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump per Gromfos
 Evacuation Rate: 350 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>4.2</u>	<u>8.5</u>	<u>53</u>	<u>1340</u>	<u>1350</u>					<u>21</u>
Temperature (°C)	<u>14.3</u>	<u>15.5</u>	<u>15.7</u>	<u>15.9</u>						<u>16.0</u>
pH	<u>7.06</u>	<u>7.03</u>	<u>6.96</u>	<u>6.97</u>						<u>7.00</u>
Conductance (mS/cm)	<u>1.04</u>	<u>1.09</u>	<u>1.09</u>	<u>1.09</u>						<u>1.09</u>
ORP	<u>050</u>	<u>-037</u>	<u>-043</u>	<u>-055</u>						<u>-061</u>
Water Level (TIC)	<u>2.24'</u>	<u>2.24'</u>	<u>2.24'</u>	<u>2.26'</u>						<u>2.26'</u>

DO mg/L

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

at 1310 purge rate is 350 ml/min, needed to prime line in order to regulate flow. PURGE RATE SLOWED TO 300 ml/min. SAMPLED CLEAR, COLORLESS, odorless.

SAMPLE DESTINATION

Laboratory AQUATECH

Via: BOX Sent By: RDK

SIS
 Field Sampling Coordinator

KB 515

8"
9.04
- 2.13
6.91

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-102
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/5/95 Time In 0830 Out 0945
 Weather overcast, ~55°F, windy

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	11.08	
Water Table Depth	2.53	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	8.55'
Volume of Water in Well	1.46A
Pumping Rate of Pump	400/300 ml/min
Volume of Bailor	
Minutes of Pumping	53 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 4.56A
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) Grout
 Evacuation Rate: 400/300 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	999+	90	78	55	38					31
Temperature (°C)	12.7	14.6	15.3	15.6	15.7					15.9
pH	7.94	7.52	7.44	7.38	7.40					7.34
Conductance (mS/cm)	0.591	0.676	0.621	0.620	0.679					0.628
ORP (mV)	115	-029	-046	-049	-053					-056
Water Level (TIC)	2.90'	2.64'	2.63'	2.62'	2.62'					2.62'

DO mg/L

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

at lowest pump rate, purge rate was ~1.5 gal/min, had to crimp line in order to restrict flow to 400 ml/min; at 0850, purge rate slowed to 300 ml/min naturally. SAMPLED CLEAR, COLORLESS, ODORLESS.

SAMPLE DESTINATION

Laboratory AQUA TECH

Via: FD-X Sent By: RDK

S.S.
 Field Sampling Coordinator

KB 515

11.08
 - 2.53
 8.55

GROUNDWATER SAMPLING FIELD LOG

Well No. PAW-108
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/5/95 Time In 1000 Out 1200
 Weather BURRCAST, ~60°F, windy

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>13.15</u>	
Water Table Depth	<u>2.15</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>11.00</u>
Volume of Water in Well	<u>1.8 GAL</u>
Pumping Rate of Pump	<u>300 ml/min</u>
Volume of Bailor	
Minutes of Pumping	<u>55 min</u>
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 3.5 GAL
 Did well go dry? Y (N)
 Evacuation Method: Bailor () Pump (X) Genafos
 Evacuation Rate: 300 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>2.1800</u>	<u>52.3</u>	<u>13.3</u>	<u>6.7</u>	<u>4.3</u>					<u>3.9</u>
Temperature (°C)	<u>13.1</u>	<u>14.3</u>	<u>14.7</u>	<u>14.9</u>	<u>14.9</u>					<u>15.1</u>
pH	<u>7.105</u>	<u>7.35</u>	<u>7.32</u>	<u>7.28</u>	<u>7.25</u>					<u>7.25</u>
Conductance (mS/cm)	<u>0.603</u>	<u>0.681</u>	<u>0.693</u>	<u>0.694</u>	<u>0.675</u>					<u>0.695</u>
ORP	<u>004</u>	<u>-027</u>	<u>-033</u>	<u>-040</u>	<u>-042</u>					<u>-047</u>
Water Level (TIC)	<u>2.56</u>	<u>2.49</u>	<u>2.48</u>	<u>2.49</u>	<u>2.49</u>					<u>2.49</u>

DO mg/L
 Calibration Standard Readings 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

INITIAL FLOW RATE ~1.5 GPM, HAD TO CRIMPER LINE TO SLOW AFTER RATE TO 300 ml/min. SAMPLED CLEAR, COLORED, DARKNESS.

SAMPLE DESTINATION

Laboratory ADL/TECH

Via: Fedex

Sent By: RDK

SIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-120A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SAP
 Date 10/19/95 Time In 1300 Out 1500
 Weather Sunny ~70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>26.15</u>	
Water Table Depth	<u>22.71</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>3.44</u>
Volume of Water in Well	<u>0.66 gal</u>
Pumping Rate of Pump	<u>250 ml/min</u>
Volume of Bailor	
Minutes of Pumping	<u>50 min</u>
Number of Bails	

STARTED PUMP @ 1320
 STEPPED PUMP @ 1410
 SAMPLED @ 1410
 SAMPLED @ 250 ml/min
 SAMPLE # A66133
 COILER # 3A

EVACUATION INFORMATION

Volume of water removed from well 3.56 gal
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) GRUNDFOS
 Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>640</u>	<u>6.22</u>	<u>10.7</u>	<u>29</u>	<u>20</u>					<u>19</u>
Temperature (°C)	<u>17.1</u>	<u>18.7</u>	<u>18.7</u>	<u>19.5</u>	<u>17.5</u>	<u>17.3</u>				<u>19.3</u>
pH	<u>6.31</u>	<u>6.27</u>	<u>6.28</u>	<u>6.35</u>	<u>6.35</u>					<u>6.33</u>
Conductance (mS/cm)	<u>1.61</u>	<u>1.68</u>	<u>1.64</u>	<u>1.64</u>	<u>1.71</u>					<u>1.68</u>
ORP	<u>026</u>	<u>-001</u>	<u>-019</u>	<u>-021</u>	<u>-023</u>					<u>-026</u>
Water Level (TIC)	<u>23.45</u>	<u>23.71</u>	<u>24.92</u>	<u>24.64</u>	<u>24.62</u>	<u>NA</u>				<u>NA</u>

DO mg/L _____
 Calibration Standard Readings 10: _____ 4: _____ 7 _____ 2-36

MISCELLANEOUS OBSERVATIONS/PROBLEMS

difficult maintaining flow rate due to head of water being located near pump - caused air in line; sample was clear, colorless, odorless

SAMPLE DESTINATION

Laboratory AQARCH

Via: GDX Sent By: ROK

ROK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-120B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RNE, SMD
 Date 10/7/15 Time In 1320 Out 1500
 Weather Sunny, ~70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2.1</u>	
Well Depth	<u>32.78</u>	
Water Table Depth	<u>23.52</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>9.46'</u>
Volume of Water in Well	<u>1.56 gal</u>
Pumping Rate of Pump	<u>300 ml/min</u>
Volume of Bailer	
Minutes of Pumping	<u>55 min</u>
Number of Bails	

STARTED pumping @ 1325
 STOPPED pumping @ 1430
 SAMPLED @ 1400
 SAMPLED @ 300 ml/min
 SAMPLE # A66134
 COOLER # 3A

M2 → A66134M3 taken at this location
 MSD → A66134MSD taken at this location

EVACUATION INFORMATION

Volume of water removed from well 4.56 gal
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) GRANDFOS
 Evacuation Rate: 300 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>584</u>	<u>60</u>	<u>44</u>	<u>40</u>						<u>73</u>
Temperature (°C)	<u>16.7</u>	<u>17.5</u>	<u>17.8</u>	<u>17.8</u>						<u>18.1</u>
pH	<u>6.50</u>	<u>6.52</u>	<u>6.52</u>	<u>6.54</u>						<u>6.53</u>
Conductance (mS/cm)	<u>1.36</u>	<u>1.35</u>	<u>1.36</u>	<u>1.37</u>						<u>1.36</u>
ORP	<u>002</u>	<u>-024</u>	<u>-031</u>	<u>-036</u>						<u>-034</u>
Water Level (TIC)	<u>23.80</u>	<u>23.66</u>	<u>23.66</u>	<u>23.65</u>						<u>23.64</u>

Calibration Standard Readings DD ml/L 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

ODORS

perked at 300 ml/min. m2 - MSD taken, SAMPLES (KAR, GIGRESS)

SAMPLE DESTINATION

Laboratory ADLATCH

Via: FED-EX Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-121A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK SAP
 Date 10/9/95 Time In 1035 Out 1300
 Weather Sunny, ~65°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>26.49</u>	
Water Table Depth	<u>16.25</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>9.74</u>
Volume of Water in Well	<u>1.66 gal</u>
Pumping Rate of Pump	<u>300 ml/min</u>
Volume of Bailor	
Minutes of Pumping	<u>76 min</u>
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 3.56 gal
 Did well go dry? Y (N)

Evacuation Method: Bailor () Pump (X) Grout/Log
 Evacuation Rate: 300 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>400</u>	<u>60</u>	<u>34</u>	<u>29</u>	<u>26</u>	<u>25</u>	<u>24</u>			<u>21</u>
Temperature (°C)	<u>13.9</u>	<u>16.0</u>	<u>16.2</u>	<u>16.8</u>	<u>16.8</u>	<u>17.3</u>	<u>17.3</u>			<u>17.5</u>
pH	<u>7.15</u>	<u>7.03</u>	<u>6.92</u>	<u>6.94</u>	<u>6.93</u>	<u>6.92</u>	<u>6.91</u>			<u>6.92</u>
Conductance (mS/cm)	<u>0.629</u>	<u>0.643</u>	<u>0.739</u>	<u>0.756</u>	<u>0.773</u>	<u>0.799</u>	<u>0.803</u>			<u>0.810</u>
ORP	<u>-018</u>	<u>-038</u>	<u>-046</u>	<u>-046</u>	<u>-046</u>	<u>-015</u>	<u>-050</u>			<u>-046</u>
Water Level (TIC)	<u>17.29</u>	<u>17.35</u>	<u>17.24</u>	<u>17.21</u>	<u>17.21</u>	<u>17.20</u>	<u>17.20</u>			<u>17.18</u>

00 mg/L
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CRACK, COLECKS, ON VAKS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RDX Sent By: RDK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-121B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SGP
 Date 10/17/95 Time In 10:35 Out 1845
 Weather Sunny, ~65°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	35.97	
Water Table Depth	18.95	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	17.07
Volume of Water in Well	2.861
Pumping Rate of Pump	150 ml/min
Volume of Bailor	
Minutes of Pumping	29 min
Number of Bails	

STARTED pump in @ 1100
 STOPPED pump @ 1219/well dry
 SAMPLED @ 1830
 SAMPLED @ 150 ml/min
 SAMPLE # A66132
 CODIER # 38

EVACUATION INFORMATION

Volume of water removed from well 5.61
 Did well go dry? Y N

Evacuation Method: Bailor () Pump X GRANDIS
 Evacuation Rate: 150 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	442	292	111	86	77	70	318	91		43
Temperature (°C)	14.7	15.2	15.5	15.8	16.3	16.8	16.9	17.9		17.8
pH	7.25	7.19	7.19	7.16	7.17	7.17	7.17	7.10		7.20
Conductance (mS/cm)	0.760	0.753	0.751	0.754	0.750	0.750	0.750	0.750		0.726
ORP	014	-031	-051	-057	-053	-064	-069	-064		064
Water Level (TIC)	16.99	18.82	20.32	21.29	23.25	26.48	28.06	30.45		24.05

DD mg/L
 Calibration Standard Readings 10; 4; 7 2.22

MISCELLANEOUS OBSERVATIONS/PROBLEMS

PURCHAS @ 150 ml/min, well is apparently not producing. It is going to go dry. Will not sample until under RUI SBAHARS. @ 1158, FLOW CUT OFF, HAD TO RESTART FLOW, TURBIDITY INCREASED DRAMATICALLY. Pump cut off @ 1205 HAD TO RESTART. AND CANNOT @ 1212 well dry @ 1219. Pump ~ 2' from bottom will let release, sample

SAMPLE DESTINATION

Laboratory AQ. RECH Via: ROK Sent By: ROK

SAMPLED CLEAR, COLOURLESS, ODOURLESS

ROK
 Field Sampling Coordinator

✓ @ 29.48' @ 1245
 ✓ @ 20.45' @ 1815, will sample

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-122A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SAP
 Date 10/3/95 Time In 0815 Out 1100
 Weather SLIGHT RAIN, OVERCAST, 60°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	7"	
Well Depth	24.14'	
Water Table Depth	20.29'	

Slug Test? (Y/N) N
 Redvelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	3.85'
Volume of Water in Well	0.63 gal
Pumping Rate of Pump	250 ml/min
Volume of Bailer	
Minutes of Pumping	912 min
Number of Bails	

STARTED PUMPING @ 0900
 STOPPED PUMPING @ 1036
 SAMPLED @ 1030
 SAMPLE # AL6101
 SAMPLE @ 225 ml/min

CODE #1A

EVACUATION INFORMATION

Volume of water removed from well 5.64
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) Grout
 Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	71000	161	18	133	38	18	16	18	14	13	
Temperature (°C)	16.4	17.6	17.6	17.6	17.6	17.6	17.6	17.8	17.9	18.2	
pH	5.93	5.89	6.13	6.20	6.23	6.37	6.40	6.48	6.48	6.50	
Conductance (mS/cm)	0.646	0.617	0.621	0.610	0.619	0.613	0.608	0.608	0.607	0.607	
~~ORP~~ DO mg/L	0.87	3.88	4.40	4.34	4.37	4.52	3.98	3.97	3.90		
Water Level (TIC)	21.20	21.98	22.15	22.15	22.08	22.02	21.99	22.01	22.85	23.07	

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

@ 1012, AIR SURGE IN LINE, TURBIDITY VERY HIGH.
SKIPPED CIPAC, COLPOCIS, OROKIS

SAMPLE DESTINATION

Laboratory AQUATECH

Via: ROK Sent By: ROK

JES
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-122B
 Key No. _____
 PID Background C.O. Well 00

Site Well ALLIED
 Sampling Personnel ROK, SAD
 Date 10/3/95 Time In 0815 Out 1111
 Weather SLIGHT RAIN, OVERCAST, 60°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	62.6'	
Water Table Depth	44.1'	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	44.15'
Volume of Water in Well	2.2 gal
Pumping Rate of Pump	250 ml/min
Volume of Bailer	
Minutes of Pumping	104 min
Number of Bails	

STARTED Pumping @ 0845
 STOPPED Pumping @ 1029
 SAMPLED @ 1010
 SAMPLE # A66100
 SAMPLED @ 200 ml/min
 SA

COOLER # 1A

EVACUATION INFORMATION

Volume of water removed from well 5 gal
 Did well go dry? Y N

Evacuation Method: Bailer () Pump (X) 62 ml/min

Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	37	641	358	234	168	125	105	88	77	52
Temperature (°C)	15.1	14.2	15.2	15.4	15.7	15.7	15.7	15.8	15.8	15.9
pH	6.06	5.76	5.88	6.11	6.21	6.37	6.38	6.46	6.50	6.52
Conductance (mS/cm)	0.724	0.763	0.737	0.749	0.754	0.753	0.753	0.753	0.753	0.753
ORP DO mV/L	1.0	3.70	3.68	3.65	3.70	3.78	3.78	3.81	3.82	3.80
Water Level (TIC)	19.80'	19.84'	19.71'	19.69'	19.69'	19.70'	19.69'	19.67'	19.65'	19.65'

Calibration Standard Readings 10: _____ 4: _____ 7: _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

STARTED Pumping @ 0845 ml/min. Slowed to 250 ml/min @ 0847 due to LARGE DRAW DOWN. PUMP RATE NATURALLY Slowed to 200 ml/min. SAMPLED CLEAR, COLORLESS, O.DORLESS.

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FEDEX Sent By: ROK

SES
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-123A
 Key No. _____
 PID Background 00 Well 00

Site Well A11-70
 Sampling Personnel RDX SAN
 Date 10/9/95 Time In 0830 Out 1030
 Weather partly sunny, 50°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	14.77	
Water Table Depth	15.76	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	4.25
Volume of Water in Well	0.764
Pumping Rate of Pump	175 ml/min
Volume of Bailor	
Minutes of Pumping	80 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 3.641
 Did well go dry? Y (N) 0845 0855 0905 0915 0925 1005
 Evacuation Method: Bailor () Pump (X) Gravelos
 Evacuation Rate: 175 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	99.9	4.24	26.7	10.1	3.3					24
Temperature (°C)	14.7	15.7	17.6	17.7	17.7					17.8
pH	6.62	6.48	6.39	6.35	6.35					6.38
Conductance (mS/cm)	1.16	1.16	1.18	1.20	1.21					1.26
ORP	229	220	213	-001	-004					-002
Water Level (TIC)	16.22	16.26	16.43	16.39	16.38					16.30

DO mL
 Calibration Standard Readings 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

at 0925 SAMPLED CLEAR, COLORLESS, ODORLESS
initial purge rate is 200 ml/min, purge rate slowed to 175 ml/min

SAMPLE DESTINATION

Laboratory AQUATECH Via: Fed-X Sent By: RDX
RDX
 Field Sampling Coordinator

* DISCREPANCY IN WHAT WELL IS LABELED
 VS RECORDED DEPTH

KB 515

AS PER BILL MCLUNE, WELL LABELS CHANGED 10/10/95

GROUNDWATER SAMPLING FIELD LOG

Well No. 14W-123B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RVC, SLD
 Date 10/10/95 Time In 0830 Out 1030
 Weather Partly Sunny, 50°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	31.51	
Water Table Depth	14.96	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	17.05
Volume of Water in Well	2.8641
Pumping Rate of Pump	1.75 ml/min
Volume of Bailor	
Minutes of Pumping	70 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 3.641
 Did well go dry? Y (N) N

Evacuation Method: Bailer () Pump X GRANDIOS
 Evacuation Rate: 1.75 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	999.5	9.65	3.41	132	91	72				55
Temperature (°C)	13.2	14.4	15.4	15.7	15.6	15.4				15.7
pH	7.01	7.03	6.43	7.01	7.01	7.05				7.16
Conductance (mS/cm)	0.622	0.626	0.679	0.674	0.669	0.667				0.687
ORP	-010	-027	-036	-047	-034	-009				-045
Water Level (TIC)	15.20	15.40	15.42	15.38	15.37	15.36				15.35

DO mg/L 10; 4; 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

NO PROBLEMS

pump rate slowed to 1.75 ml/min SAMPLED CLEAR, CLOUDY

SAMPLE DESTINATION

Laboratory AQUATECH

Via: Fedex Sent By: RAR

RVC
 Field Sampling Coordinator

* DISCREPANCY IN WHAT WELL IS
 LABELED VS RECORDED DEPTHS
 AS PER BILL MCCUNE, WELL LABELS CHANGED 10/10/95

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-124A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel JIS, EWB
 Date 12/14/95 Time In 8:00 Out _____
 Weather OVERCAST, DRIZZLING, 40's

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	39.05	
Water Table Depth	34.30	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	4.75
Volume of Water in Well	.76
Pumping Rate of Pump	400 ml/min
Volume of Bailer	
Minutes of Pumping	60
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 2.0 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) GRUNDFOS
 Evacuation Rate: 400 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	245	48	398	136						13
Temperature (°C)	9.7	13.8	14.8	16.3						16.8
pH	6.45	6.49	6.47	6.44						6.53
Conductance (mS/cm)	1.47	1.49	1.51	1.54						1.52
ORP	+64	+65	+63	+61						+66
Water Level (TIC)	35.26	NA*	NA*	NA*						NA*

DO (mg/l) _____
 Calibration Standard Readings _____ 10: _____ 4: _____ 7: _____ 6.19

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Very turbid, colorless, light brown
 * WATER PROBE CRUSHED ON TOP OF PUMP

SAMPLE DESTINATION

Laboratory Agnetech

Via: F-1 E2 Sent By: JIS

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-124B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALIED
 Sampling Personnel ROK, SAP
 Date 10/17/95 Time In 0730 Cut 1100
 Weather cast, ~50°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	7"	
Well Depth	61.18	
Water Table Depth	41.52	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	19.66
Volume of Water in Well	3.2 gal
Pumping Rate of Pump	~150 ml/min
Volume of Bailor	
Minutes of Pumping	1.05
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well ~6.0 gal
 Did well go dry? (Y) N

Evacuation Method: Bailor () Pump GRANDFOS

Evacuation Rate: ~150 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	97	74	83	61	455	250	133	185	110	66	
Temperature (°C)	12.2	13.0	14.2	15.4	14.5	12.0	16.5	16.8	17.3	17.5	
pH	4.39	9.61	9.31	8.69	7.99	8.25	7.91	8.48	7.53	7.21	
Conductance (mS/cm)	1.27	1.30	1.37	1.22	1.21	1.23	1.24	1.25	1.29	1.33	
ORP	112	101	095	096	102	074	066	050	069	084	
Water Level (TIC)	42.66	44.64	45.92	47.33	47.55	49.68	52.45	54.35	52.26	55.48	

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

PUMPING RATE MORE CONSTANT PUMP RATE IMPOSSIBLE - 0830-0835 PUMP OFF, TANK CAME
DRIVE RATE ~150 ml/min. DECREASING HEAD & SUCH A LOW
DRY Pump; Well went dry at 0945

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RD-X Sent By: ROK

ROK
 Field Sampling Coordinator

	0940	1045
Turbidity	45	29
Temp.	18.2	16.0
pH	7.25	7.26
Cond	1.37	1.39
ORR	093	058
WT	56.00	47.55
DO mg/L		3.9

Time	DTW (TIC)
0946	54.82
1020	46.60

KB 515

1

GROUNDWATER SAMPLING FIELD LOG

Well No. MW - 124B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel JIS, EWIS
 Date 12/14/95 Time In 8:00 Out _____
 Weather OVERCAST, BRIZZY, 40'S

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	61.8	
Water Table Depth	43.50	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	17.68
Volume of Water in Well	2.8
Pumping Rate of Pump	500 ml/min
Volume of Bailer	
Minutes of Pumping	70*
Number of Bails	

STARTED PUMPING @ 9:10
 STOPPED PUMPING @ 10:45
 SAMPLED @ 9:50
 SAMPLED @ 400 ml/min
 SAMPLE # A66167
 COOLER II

EVACUATION INFORMATION

Volume of water removed from well 2.5 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) GRUNDFOS
 Evacuation Rate: 500 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	31	30	38	59						81
Temperature (°C)	10.0	9.9	11.1	14.1						11.7
pH	6.71	6.76	6.70	6.73						6.63
Conductance (mS/cm)	1.32	1.33	1.34	1.34						1.35
ORP	+21	+39	+50	+54						+54
Water Level (TIC)	43.24	44.83	45.12	46.76						44.65

DO (mg/L) _____
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

* GENERATOR RAN OUT OF GAS IN MIDDLE OF SECOND SAMPLE, WE REFUELED AND CONTINUED.
 + wind, odorless, pale brown

SAMPLE DESTINATION

Laboratory AquaTech

Via: FedEx Sent By: JIS

JIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-135A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/11/95 Time In 1115 Out 1500
 Weather Sunny, 70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	36.97	
Water Table Depth	17.48	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	9.49
Volume of Water in Well	1.56A
Pumping Rate of Pump	250 ml/min
Volume of Bailor	
Minutes of Pumping	60
Number of Bails	

STARTED pumping @ 1200
 STOPPED pumping @ 1300
 SAMPLED @ 1245
 SAMPLED @ 175 ml/min
 SAMPLE # A66150
 COOLER # 4A

EVACUATION INFORMATION

Volume of water removed from well 3.56A

Did well go dry? Y N

Evacuation Method: Bailor () Pump (X) Gravimetric

Evacuation Rate: 250 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	30	16	17	18	19					18
Temperature (°C)	14.9	16.4	16.8	16.9	17.2					17.9
pH	6.62	6.64	6.61	6.61	6.70					6.75
Conductance (mS/cm)	1.16	1.20	1.21	1.21	1.23					1.23
ORP	051	042	043	029	018					014
Water Level (TIC)	19.07	18.94	18.94	18.98	18.97					18.93

DO (mg/L) _____
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial pump rate is 250 ml/min Air in line more
 constant pump rate @ 250 ml/min IMPOSSIBLE. SAMPLED 175 ml/min DUE TO DIFFICULTY MAINTAINING
 STEADY PUMP RATE. SAMPLED CLEAR, COLORLESS, ODOLESS.

SAMPLE DESTINATION

Laboratory AQATECH

Via: RDK

Sent By: ADK

RDK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. mw-125B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel ROK, SID
 Date 10/11/95 Time In 1115 Out 1500
 Weather Sunny, 70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	<u>2"</u>	
Well Depth	<u>37.65</u>	
Water Table Depth	<u>11.95</u>	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	<u>25.70'</u>
Volume of Water in Well	<u>4.2 gal</u>
Pumping Rate of Pump	<u>150 ml/min</u>
Volume of Bailer	
Minutes of Pumping	<u>95 min</u>
Number of Bails	

STARTED pumping @ 1310
 STOPPED pumping @ 1445
 SAMPLED @ 1430
 SAMPLED @ 150 ml/min
 SAMPLE # A66151
 COOLER # 4A

EVACUATION INFORMATION

Volume of water removed from well 4.5 gal
 Did well go dry? Y N

Evacuation Method: Bailer () Pump X GRUNN
 Evacuation Rate: 150 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	<u>95</u>	<u>35</u>	<u>30</u>	<u>28</u>	<u>29</u>	<u>23</u>	<u>23</u>	<u>21</u>		<u>19</u>
Temperature (°C)	<u>15.4</u>	<u>15.9</u>	<u>16.4</u>	<u>16.5</u>	<u>16.4</u>	<u>16.6</u>	<u>16.4</u>	<u>16.6</u>		<u>16.6</u>
pH	<u>7.52</u>	<u>7.47</u>	<u>7.46</u>	<u>7.46</u>	<u>7.45</u>	<u>7.43</u>	<u>7.44</u>	<u>7.44</u>		<u>7.44</u>
Conductance (mS/cm)	<u>0.757</u>	<u>0.748</u>	<u>0.784</u>	<u>0.789</u>	<u>0.791</u>	<u>0.783</u>	<u>0.795</u>	<u>0.794</u>		<u>0.796</u>
ORP	<u>-017</u>	<u>-006</u>	<u>000</u>	<u>004</u>	<u>009</u>	<u>020</u>	<u>020</u>	<u>025</u>		<u>031</u>
Water Level (TIC)	<u>12.15</u>	<u>16.64</u>	<u>16.89</u>	<u>16.89</u>	<u>16.85</u>	<u>16.83</u>	<u>16.85</u>	<u>16.86</u>		<u>16.85</u>

DO mg/L _____
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial pump rate is 150 ml/min, slowest A.R.G.E.
PNE AT/AJABLE. SAMPLED CLEAR, COLORLESS, ODORLESS.

SAMPLE DESTINATION

Laboratory ADLATCH

Via: ROK Sent By: ROK

ROK
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-125P
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SFD
 Date 10/11/95 Time In 1115 Out _____
 Weather Sunny, ~70°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	16.77	
Water Table Depth	12.17	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	4.60
Volume of Water in Well	0.75 GAL
Pumping Rate of Pump	150 mL/min
Volume of Bailer	
Minutes of Pumping	47 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 2.5 GAL
 Did well go dry? (Y) N

Evacuation Method: Bailer () Pump (X) Grout
 Evacuation Rate: 150 mL/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	2100	2100	361	238	370					169
Temperature (°C)	16.8	17.0	16.8	17.4	19.2					19.1
pH	5.74	5.56	5.93	4.89	5.02					5.10
Conductance (mS/cm)	0.723	0.724	0.791	0.930	0.771					0.777
ORP	056	099	114	118	106					056
Water Level (TIC)	12.30	13.29	13.87	14.25	15.16					NA

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

INITIAL PULVE H2O BLACK, HEAVY ODOUR, VERY TURBID
DIFFICULT MAINTAINING PUMP RATE, 150 mL/min LONGEST PUMP RATE ATTAINABLE. WELL DRY @ 1232
WELL 125 PROCEED 1 SAMPLE SAMPLED STAINED LT BLACK, SLIGHTLY TURBID, HEAVY H2S ODOUR

SAMPLE DESTINATION

Laboratory AQUATECH

Via: RDX Sent By: RDK

RDK

Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-126A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RAL SMO
 Date 10/11/95 Time In 1500 Out 1740
 Weather SUNNY 75°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	23.37	
Water Table Depth	10.48	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	12.37
Volume of Water in Well	2.1 GAL
Pumping Rate of Pump	100 ml/min
Volume of Bailor	
Minutes of Pumping	120
Number of Bails	

STARTED pumping @ 1520
 STOPPED pumping @ 1720
 SAMPLED @ 1700
 SAMPLED @ 100 ml/min (ESTIMATED)
 SAMPLE # A66152
 COILER # 4A
 DIFFICULT TO maintain

EVACUATION INFORMATION

Volume of water removed from well 3.5 GAL
 Did well go dry? N

Evacuation Method: Bailor () Pump (X) 6 minutes
 Evacuation Rate: 100 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	120	423	462	443	309	254	217	194	148	135
Temperature (°C)	15.4	16.3	16.9	17.3	17.5	17.8	17.9	17.8	17.9	18.2
pH	6.50	6.51	6.51	6.52	6.52	6.52	6.52	6.54	6.54	6.56
Conductance (mS/cm)	1.35	1.37	1.38	1.40	1.40	1.46	1.39	1.39	1.37	1.39
ORP	637	225	222	013	011	009	008	005	005	002
Water Level (TIC)	10.43	11.43	11.44	11.42	11.38	11.44	11.42	11.38	11.37	11.37

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS DIFFICULT MAINTAINING PUMP RATE, HEAD DECREASING @ 100 ml/min
SAMPLED SLIGHTLY TURBID, COMPLEX, SLIGHT ODR

SAMPLE DESTINATION

Laboratory AQUATECH

Via: FEDEX Sent By: RAL

RAL
 Field Sampling Coordinator

TIME Final 1720
 TURBIDITY 108
 TEMP (°C) 18.3
 pH 6.53
 COND (mS/cm) 1.38
 ORP 004
 WATER REL 11.45
 DO 1.73

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-126B
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALIED
 Sampling Personnel RDE, SJD
 Date 10/11/95 Time In 1500 Out 1740
 Weather Sunny 75°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	34.28	
Water Table Depth	9.47	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	24.81
Volume of Water in Well	4.61
Pumping Rate of Pump	150 L/min
Volume of Bailor	
Minutes of Pumping	120 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 4.61
 Did well go dry? Y N

Evacuation Method: Bailor () Pump (X) 6.6m/s
 Evacuation Rate: 150 L/min

		1505	1520	1530	1540	1550	1600	1610	1620	1630	1640
Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	47	122	63	54	45	44	44	35	33	32	
Temperature (°C)	15.8	15.5	15.7	15.7	15.9	16.0	16.0	16.1	16.1	16.3	
pH	7.35	7.14	7.08	7.06	7.07	7.05	7.06	7.04	7.08	7.08	
Conductance (mS/cm)	0.916	1.08	1.09	1.10	1.10	1.11	1.11	1.13	1.11	1.11	
ORP	058	030	004	-002	-013	-014	-018	-020	-024	-025	
Water Level (TIC)	10.02	10.17	10.16	10.15	10.13	10.15	10.15	10.17	10.18	10.18	

Calibration Standard Readings _____ 10: _____ 4: _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED C.R.A.E. COMPLESS, O.D.R.E.S.S

SAMPLE DESTINATION

Laboratory AQ. ARCH

Via: FDX Sent By: ADK

ADK
 Field Sampling Coordinator

TIME (min.)
 TURBIDITY 1705
 TEMP (°C) 16.4
 pH 7.08
 COND (mS/cm) 1.11
 ORP -026
 WATER (L) 10.17
 DO 2.25 mg/L

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. MW-127A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well ALLIED
 Sampling Personnel RDK, SAP
 Date 10/4/95 Time In 1440 Out 1630
 Weather SUNNY 75°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	8.95'	
Water Table Depth	4.44'	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

WATER WELL INFORMATION

Length of Water Column	4.51
Volume of Water in Well	0.25 gal
Pumping Rate of Pump	125 ml/min
Volume of Bailer	
Minutes of Pumping	70 min
Number of Bails	

STARTED pumping @ 1500
 STOPPED pumping @ 1610
 SAMPLED @ 1600
 SAMPLED @ ~175 ml/min
 SAMPLE # A66114

COOLER # 1B

EVACUATION INFORMATION

Volume of water removed from well 2.5 GM
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump (X) Groutos
 Evacuation Rate: 125 ml/min

Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	268	177	148	138	61	46				27
Temperature (°C)	15.2	16.8	18.2	19.0	19.0	19.0				19.2
pH	6.84	6.77	6.75	6.67	6.73	6.74				6.77
Conductance (mS/cm)	1.37	1.36	1.35	1.34	1.34	1.34				1.33
ORP	-006	-024	-034	-039	-043	-047				-046
Water Level (TIC)	4.90	5.20	5.23	5.53	5.60	5.63				5.63

DO (mg/L) 3.25
 Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED CLEAR, COLORLESS, odorless

SAMPLE DESTINATION

Laboratory AQATECH

Via: FD-X Sent By: RDK

SIS
 Field Sampling Coordinator

KB 515

GROUNDWATER SAMPLING FIELD LOG

Well No. 1N-128A
 Key No. _____
 PID Background 0.0 Well 0.0

Site Well AI-ED
 Sampling Personnel RDK, SAP
 Date _____ Time In 1300 Out 1510
 Weather Sunny ~75°F

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing		
Well Diameter	2"	
Well Depth	21.17	
Water Table Depth	17.06	

Slug Test? (Y/N) N
 Redevelop? (Y/N) N

STARTED pumping @ 1320
 STOPPED pump @ 1245
 SAMPLED @ 1435
 SAMPLED @ ~250 ml/min
 SAMPLE # A66161
 COOLER # 4B

WATER WELL INFORMATION

Length of Water Column	4.11
Volume of Water in Well	0.7 GAL
Pumping Rate of Pump	250 ml/min
Volume of Bailer	
Minutes of Pumping	85 min
Number of Bails	

EVACUATION INFORMATION

Volume of water removed from well 10 GAL
 Did well go dry? Y (N)

Evacuation Method: Bailer () Pump 10 GENDOS
 Evacuation Rate: ~250 ml/min

		1320	1330	1340	1350	1400	1410	1420	1430	
Parameter	Initial	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Time (min.)	Final
Turbidity (NTU)	994+	133	69		37	48	28	58		
Temperature (°C)	18.7	20.3	20.9		21.9	18.9	21.9	22.8		
pH	7.00	7.04	7.10		7.20	7.24	7.24	7.22		
Conductance (mS/cm)	1.40	1.16	1.04		0.96	0.727	0.743	0.759		
ORP	027	030	029		018	024	003	014		
Water Level (TIC)	17.22	17.19	17.20	17.36	17.16	17.22	17.15	17.15		

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

initial purge rate is 250 ml/min; initial discharge was dark orange-brown (iron) possible iron bacteria? slowed to ~250 ml/min at 1345 (collected 1.0 ml, no problems at 1500 due to purging max iron, high temp due to sun radiation; at 1400 increased purge rate to clear line of iron, 300 ml/min at 1420. Sampled slightly turbid, colorless, odorless

SAMPLE DESTINATION

Laboratory AQUACIT Via: RDX Sent By: RDK

Field Sampling Coordinator

NO FINAL PARAMETERS AVAILABLE. DURING SAMPLING, IRON BACTERIA?? SO DENSE IN BOTTOM OF TUBING THAT FLOW STOPPED WHILE FILLING 2nd ANALYTICAL BOTTLE. 2nd BOTTLE ONLY FILLED 1/4 OF THE WAY. PUMP RATE WAS @ MAX BUT ONLY PUMPING ~250 ml/min. AFTER SAMPLING, PUMP WAS SHUT OFF - TURNED BACK ON. +20 WAS VERY TURBID & DENSE. EVENTUALLY H2O CLEARED AFTER PURGING AND
 ADDITIONAL 5 GALLONS

GROUND-WATER SAMPLING LOG

Well No. MW-ZS
 Key No. _____
 Date/Time 3/6/97

Site Name Allied OU
 Sampling Personnel KCF, GAR, PRC
 Weather 30°F light snow

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	8.28		
Water Table Depth	3.56		
Depth to Casing Below Grade	—		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	4.72
Volume of Water in Well	12.79 gallons
Pumping Rate of Pump	425 ml/min
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

14:00 filling corbels
 pump rate is starting to fluctuate
 slightly we have to manually
 maintain the rate

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump ()
 Did well go dry? Y N

[Grufos pump & dedicated tubing]

Evacuation Rate

Parameter	12:35 Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 45 min pumping	After 50 min pumping	After 55 min pumping	After ___ min pumping	After ___ min pumping
Water Level	4.24	4.24	4.24	4.24	4.24	4.04	4.14	4.20	4.10	
Temperature	9.42	9.61	9.88	9.88	10.02	10.15	10.05	10.05	14.8	
pH	6.92	6.82	6.82	6.81	6.80	6.80	6.80	6.80	6.82	
Conductance	1.030	1.037	1.038	1.036	1.037	1.037	1.037	1.038	1.040	
Turbidity	25.5	7.1	3.2	2.9	1.7	1.3	1.3	1.3	30.5	

pump adjusted 2 Hz
 to maintain flow (425 ml)
 & water level

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT _____

SAMPLE ID _____

Temperature	10.05 °C
Conductivity	1.038
pH	6.80
Turbidity	1.3
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10: 7 4: X 7 Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Rob Felt
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-5
 Key No. _____
 Date/Time 3/6/97

Site Name Allied OU
 Sampling Personnel RGP, GAR, RRC
 Weather 30°F Light Snow

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	<u>2"</u>		
Well Depth	<u>9.44</u>		
Water Table Depth	<u>3.82</u>		
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>5.88</u>
Volume of Water in Well	
Pumping Rate of Pump	<u>425 ml</u>
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump () [Grufos pump & dedicated tubing]

Did well go dry? Y N

Parameter	Initial	Evacuation Rate								
		After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 45 min pumping	After 50 min pumping	After 55 min pumping	After ___ min pumping	After ___ min pumping
Water Level	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>	<u>4.02</u>	<u>4.02</u>	<u>4.02</u>	<u>4.02</u>	<u>4.02</u>		
Temperature	<u>7.76</u>	<u>8.25</u>	<u>8.13</u>	<u>8.41</u>	<u>8.16</u>	<u>8.22</u>	<u>7.96</u>	<u>8.15</u>		
pH	<u>6.62</u>	<u>6.65</u>	<u>6.64</u>	<u>6.62</u>	<u>6.65</u>	<u>6.65</u>	<u>6.63</u>	<u>6.66</u>		
Conductance	<u>1.353</u>	<u>1.323</u>	<u>1.312</u>	<u>1.310</u>	<u>1.304</u>	<u>1.302</u>	<u>1.304</u>	<u>1.303</u>		
Turbidity	<u>72.8</u>	<u>25.5</u>	<u>15.5</u>	<u>4.9</u>	<u>5.1</u>	<u>7.3</u>	<u>6.5</u>	<u>6.7</u>		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 17:45

SAMPLE ID A66178

Temperature	<u>8.15</u>
Conductivity	<u>1.30</u>
pH	<u>6.66</u>
Turbidity	<u>6.7</u>
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10; X 4; X 7 Type of Meter Horiba YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Ref. [Signature]
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MU-8
 Key No. _____
 Date/Time 3/6/97 19:00

Site Name Allied CU
 Sampling Personnel RGP GAR RRC
 Weather 30°F Light Snow

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	20.32		
Water Table Depth	11.81		
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	8.5'
Volume of Water in Well	1.4991
Pumping Rate of Pump	400 ml/min
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailer () Pump ☒ [Grufos pump & dedicated tubing]
 Did well go dry? Y ☒ Evacuation Rate 400 ml

Parameter	8:10 Initial	After 15 min pumping	After 25 min pumping	After 35 min pumping	After 45 min pumping	After 50 min pumping	After 55 min pumping	After 60 min pumping	After ___ min pumping	After ___ min pumping
Water Level	12.46	12.42	12.38	12.40	12.41	12.40	12.42	12.40		
Temperature	11.94	13.74	13.49	14.35	14.24	14.13	14.18	14.49		
pH	6.21	6.05	6.31	6.19	6.26	6.60	6.70	6.70		
Conductance	1.055	1.046	1.016	1.001	0.993	0.990	0.990	0.989		
Turbidity	105	30.3	15.3	11.3	7.3	7.0	7.4	7.2		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 22:00

SAMPLE ID A66179

Temperature	14.16
Conductivity	0.950
pH	6.70
Turbidity	2.6
ORP	
Dissolved Oxygen	2.65

9:10 - 10:00
 10:00 - 10:40
 10:40 - 11:25
 11:25 - 12:15

Calibration Standard Readings _____ 10; X 4; X 7 Type of Meter YSI 610 D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Prof. Robert
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing
 TOC = Top of outer casing

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-22 A
 Key No. _____
 Date/Time 3/6/97

Site Name Allied Oil
 Sampling Personnel RGP GAR RRC
 Weather 30°F light snow

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	23.00		
Water Table Depth	14.19		
Depth to Casing Below Grade	—		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	450 ml/min
Volume of Bailor	—
Minutes of Pumping	
Number of Bails	—

Cleaned
flow through cell

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump ☒ [Grunfos pump & dedicated tubing]
 Did well go dry? Y (N) Evacuation Rate 450 ml/min
8:20 8:30 8:40 8:45 8:50 8:55 9:00

Parameter	8:10 Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 35 min pumping	After 40 min pumping	After 45 min pumping	After 50 min pumping	After ___ min pumping	After ___ min pumping
Water Level	15.66	15.74	15.90	15.92	15.94	15.94	15.95	15.94		
Temperature	7.00	9.02	9.3	9.70	9.74	9.75	9.65	9.80		
pH	5.77	6.49	6.56	6.59	6.58	6.58	6.42	6.56		
Conductance	1.575	1.624	1.592	1.587	1.579	1.567	1.560	1.56		
Turbidity	6.0	4.5	9.8	14.8	31.7	54.5	3.0	3.5		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 9:00

SAMPLE ID A66176

Temperature	9.80
Conductivity	1.56
pH	6.56
Turbidity	3.5
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10: X 4: X 7 Type of Meter YSI-610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Rob Petrich
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-25
 Key No. _____
 Date/Time 3/4/97 8:20

Site Name Allied Oil
 Sampling Personnel RGP GAR RRC
 Weather 30°F Cloudy

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	Y		
Well Diameter	2"		
Well Depth	30.56		
Water Table Depth	19.16		
Depth to Casing Below Grade	H-2		

dry at 9:08
pumped 3:10-3:30
collect filtered PCB+TC C
3:45 Pester pump to collect TC+TC R Dr TC C

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	11.2
Volume of Water in Well	1.8
Pumping Rate of Pump	200 ml/min
Volume of Bailor	—
Minutes of Pumping	—
Number of Bails	—

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailer () Pump (X) [Grufos pump & dedicated tubing]
 Did well go dry? (Y) N Evacuation Rate 200 ml/min

Parameter	8:44 Initial	After 1 min pumping 9:00	After 2 min pumping 9:05 AM	After ___ min pumping	After 3:10 PM min pumping	After 3:27 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	22.90	22.86	24.68		21.92	24.0				
Temperature	8.73	8.36	10.55		9.95	12.09				
pH	8.56	8.68	9.27		7.01	7.13				
Conductance	0.346	0.490	0.450		1.27	1.00				
Turbidity	19.2	139.0	90.3		150	94				

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 15:20

SAMPLE ID A66170

Temperature	12.09
Conductivity	1.00
pH	7.13
Turbidity	94
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10: X 4: X 7 Type of Meter YSI 610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Ref. [Signature]
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-121A
 Key No. _____
 Date/Time 3/5/97

Site Name Allied CU
 Sampling Personnel RGP GAR RRC
 Weather 30°F OVERCAST Wind from west

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	26.75		
Water Table Depth	15.40		
Depth to Casing Below Grade	~~26.70~~		

Slug Test? (Y/N) NRedevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	400 ml/min
Volume of Bailer	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailer () Pump (X) [Grufos pump & dedicated tubing]

Did well go dry? Y (N)

Evacuation Rate 400 ml/min

	9:25	9:35	9:45	9:55	10:05	10:15	10:25	10:35	10:45	10:55	11:05
Parameter	Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 50 min pumping	After 60 min pumping	After 70 min pumping	After 80 min pumping	After 90 min pumping	After 100 min pumping
Water Level	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40
Temperature	12.87	12.97	13.14	13.29	13.36	13.45	13.46	13.43	13.45	13.51	13.51
pH	6.10	6.77	6.74	6.73	6.72	6.72	6.71	6.70	6.70	6.70	6.70
Conductance	0.800	1.197	1.340	1.440	1.462	1.493	1.501	1.506	1.522	1.526	1.526
Turbidity	81.1	28.0	20.1	14.6	14.4	12.1	9.5	7.2	6.6	4.8	4.8

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 10:30SAMPLE ID A66172

Temperature	13.60
Conductivity	1.546
pH	6.70
Turbidity	2.5
ORP	
Dissolved Oxygen	0.69

Calibration Standard Readings _____ 10: _____ X 4: _____ X 7 Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Field Sampling Coordinator Rob Patchett

Notes:

TIC = Top of inner casing.
TOC = Top of outer casing.BGL = Below ground level.
gpm = Gallons per minute.C = Degrees Centigrade.
mS/cm = MilliSiemens per centimeter.SU = Standard unit.
NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-120B
 Key No. _____
 Date/Time 3/4/97 16:30

Site Name Allied Cell
 Sampling Personnel GAH, RGP, RRC
 Weather partly cloudy, 30-35°F

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	33.24		
Water Table Depth	22.42		
Depth to Casing Below Grade			

Slug Test? (Y/N) NRedevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	10.8'
Volume of Water in Well	1.7 gal
Pumping Rate of Pump	450 ml/min
Volume of Bailor	_____
Minutes of Pumping	_____
Number of Bails	_____

EVACUATION INFORMATION

Volume of Water Removed from Well 2000 ml Evacuation Method: Bailer () Pump ☒ [Grufos pump & dedicated tubing]
 Did well go dry? Y ☒ N ☐ Evacuation Rate 450 ml/min

Parameter	16:50 Initial	After 10 min pumping	After 40 min pumping	After 50 min pumping	After 55 min pumping	After 70 min pumping	After 75 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	22.62	22.60	22.60	22.60	22.60	22.60	22.60			
Temperature	12.10	14.20	14.96	15.01	15.07	15.17	15.60			
pH	6.28	6.41	6.40	6.40	6.40	6.40	6.40			
Conductance	1.522	1.577	1.587	1.596	1.601	1.606	1.609			
Turbidity	126.0	66.7	21.1	16.4	14.7	18.4	16.6			

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 17:45SAMPLE ID A66171

Temperature	15.06
Conductivity	1.610
pH	6.39
Turbidity	6.5
ORP	0.93
Dissolved Oxygen	0.93

Calibration Standard Readings _____ 10: X 4: X 7 Type of Meter YSI-610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Field Sampling Coordinator Rob Patek

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-121B
 Key No. _____
 Date/Time 3/5/97 7:30

Site Name Allied CU
 Sampling Personnel RGP GAR RRC
 Weather 30°F Overcast moderate wind from the west

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	36.20		
Water Table Depth	15.78		
Depth to Casing Below Grade	~~26.20~~		

*the well recovered to
 21.1' at 13:00 so we
 collected sample*

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	11.29
Volume of Water in Well	1.84
Pumping Rate of Pump	2.00 ml/min
Volume of Bailer	
Minutes of Pumping	
Number of Bails	✓

EVACUATION INFORMATION

Volume of Water Removed from Well 4.5g Evacuation Method: Bailer () Pump (X) [Grufos pump & dedicated tubing]
 Did well go dry? (Y) N Evacuation Rate 200 ml/min

Parameter	8:10 Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 50 min pumping	After 60 min pumping	After 70 min pumping	After ___ min pumping	After ___ min pumping
Water Level	16.12	19.40	21.56	23.63	26.10	27.80	30.50			
Temperature	8.75	10.06	10.62	11.72	12.53	13.63	14.18			
pH	7.69	7.29	7.71	7.76	7.75	7.71	7.69			
Conductance	0.657	0.788	0.706	0.705	0.705	0.711	0.715			
Turbidity	94.4	33.8	38.0	39.0	31.3	29.7	29.5			

**Dry @ 9:15
 4.5 gals*

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1330

SAMPLE ID A66173

Temperature	10.2
Conductivity	11.7 0.713
pH	7.19
Turbidity	18.3
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10: _____ X 4: _____ X 7 Type of Meter YSI-610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Rob Poter
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-122A
 Key No. 1
 Date/Time 3/4/97 9:25

Site Name Allied Oil
 Sampling Personnel R.G. GARR, KRC
 Weather 50°F, Overcast

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	<u>✓</u>		
Well Diameter	<u>2"</u>		
Well Depth	<u>24.59</u>		
Water Table Depth	<u>13.52</u>		
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>8.86</u>
Volume of Water in Well	<u>1.44</u>
Pumping Rate of Pump	<u>400 ml/min</u>
Volume of Bailer	<u> </u>
Minutes of Pumping	<u> </u>
Number of Bails	<u> </u>

EVACUATION INFORMATION

Volume of Water Removed from Well 12000 ml Evacuation Method: Bailer () Pump (X) [Grufos pump & dedicated tubing]
 Did well go dry? Y (N) Evacuation Rate

Parameter	9:45 Initial	After <u>10:05</u> min pumping	After <u>10:05</u> min pumping	After <u>10:10</u> min pumping	After <u>10:15</u> min pumping	After <u>10:20</u> min pumping	After <u> </u> min pumping	After <u> </u> min pumping	After <u> </u> min pumping	After <u> </u> min pumping
Water Level	<u>16.40</u>	<u>16.32</u>	<u>16.40</u>	<u>16.40</u>	<u>16.50</u>	<u>16.50</u>				
Temperature	<u>4.03</u>	<u>4.65</u>	<u>4.92</u>	<u>5.03</u>	<u>4.93</u>	<u>5.11</u>				
pH	<u>7.22</u>	<u>7.10</u>	<u>7.10</u>	<u>7.10</u>	<u>7.10</u>	<u>7.10</u>				
Conductance	<u>1.017</u>	<u>1.026</u>	<u>1.033</u>	<u>1.033</u>	<u>1.036</u>	<u>1.034</u>				
Turbidity	<u>1350.6</u>	<u>57.2</u>	<u>42.3</u>	<u>29.4</u>	<u>29.9</u>	<u>25.3</u>				

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 10:25 11:00 SAMPLE ID A66167

Temperature	<u>6.21</u>	<u>21.00</u>
Conductivity	<u>1.033</u>	
pH	<u>6.95</u>	
Turbidity	<u>42</u>	
ORP	<u>4.74</u>	
Dissolved Oxygen	<u>4.14</u>	

Calibration Standard Readings 10; X 4; X 7 Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION

Analysis Requested PCB tot & diss TOC tot & diss Laboratory Aquatech Via Fed Ex Sent By GAR

Rob. Patterson
 Field Sampling Coordinator

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-126 A
 Key No. _____
 Date/Time 3/5/97

Site Name Allied CU
 Sampling Personnel RGP GAR RRC
 Weather 35°F overcast

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	23.62		
Water Table Depth	9.74		
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	14.1'
Volume of Water in Well	2.2 gal
Pumping Rate of Pump	400 ml/min
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

We are having a hard time getting the pump to perform at a constant rate. It seems like the impellers are losing efficiency. We have to keep resetting the pump. It appears that air is getting entrained in the line.

When we reset the pump we plug the discharge to prevent a backflow of water through the line. This helps eliminate surging of the well.

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailer () Pump ☒ [Grunfos pump & dedicated tubing]
 Did well go dry? Y N _____ Evacuation Rate _____

Parameter	14:40 Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 50 min pumping	After 60 min pumping	After 70 min pumping	After 80 min pumping	After 90 min pumping
Water Level	11.45	11.40	11.68	11.76	11.86	11.76	11.86	11.86		
Temperature	8.15	10.10	12.42	14.02	14.81	14.46	13.20	12.10		
pH	5.77	6.29	6.29	6.31	6.30	6.31	6.30	6.31		
Conductance	1.905	1.888	1.890	1.867	1.873	1.863	1.865	1.858		
Turbidity	55.0	438.9	95.7	1446.0	711.5	775.0	771.3	840		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 15:50

SAMPLE ID A66174

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10; X 4; X 7 Type of Meter YSI 610 D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION

Analysis Requested _____ Laboratory _____ Via _____ Sent By _____

Field Sampling Coordinator [Signature]

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

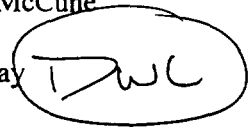
BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.



To: William T. McCune
From: David W. Lay 
Re: KRSO - Allied Operable Unit Groundwater Sampling

Date: 8/1/97
cc: MPB, DLP, & file

On July 28 through 30, 1997, David W. Lay (DWL) and Matthew W. Erbe (MWE) performed the supplemental groundwater sampling event at the Allied Paper, Inc, Operable Unit (Allied OU) in Kalamazoo, Michigan. The sampling program was implemented following the scope of work provided in a June 11, 1997 letter from Blasland, Bouck & Lee, Inc. (BBL) to the Michigan Department of Environmental Quality (MDEQ) titled Supplemental Groundwater Purging and Sampling, Allied Paper, Inc. Operable Unit. All field work at the Allied OU was observed by Mr. John Bradley of the MDEQ.

Groundwater samples were collected from two wells (MW-120B, and MW-121B) using two separate submersible pumps. The wells were purged, and sampled at a constant rate ranging between 250 milliliters per minute (ml/min) to 500 ml/min. Field parameters including temperature, pH, specific conductivity, dissolved oxygen, ORP, and turbidity were measured at regular intervals during purging, and immediately following each sample collection using a YSI 6820 flow through cell.

Three groundwater samples were collected from monitoring well MW-120B, one following field parameter stabilization, sample number A66182, with a duplicate sample A66183, and two samples collected at ten gallon intervals, sample numbers A66184, and A66185, respectively. A matrix spike/matrix spike duplicate sample was collected with A66184.

Three groundwater samples were also collected from monitoring well MW-121B. This well purged dry, therefore, it was allowed to recover prior to the initial sample collection, numbered A66186. The well was then purged, allowed to recover, and sampled two additional times, sample numbers A66187, and A66188. Following the final sample collection, a rinse blank (A66189) was collected using spring water provided by Arbor Springs Water, which was used for all rinse blank samples during the original remedial investigation in 1993. The rinse blank was collected from one of the pumps after decontamination procedures with an Alconox and deionized water solution and deionized water rinse.

All of the samples were contained in laboratory provided amber glass bottles, labeled, custody sealed, and recorded on the chain of custody. The samples were placed in coolers packed with ice and vermiculite, and shipped to Intertek Testing Services in Colchester, Vermont using the Federal Express overnight shipping service. All of the samples were submitted for analysis of polychlorinated biphenyls using USEPA Method 8081.

Attached are copies of the field notebook pages with the daily log notes, the groundwater sampling logs, and the chain of custody.

26

Sample ID A66181
 2 filters 98499
 used for Filter Blank sent to the lab.

Daily Field Log

27
7/28/97

1400 DUL & MWE on site at Allied
 CV. collecting glw. elevations with
 manual "popper" (feet & inches)

MW-8A = 12' 0"

MW-120A = 21' 8 1/2"

MW-20 = 14' 8 1/4"

MW-128A = 16' 11" (2)

MW-30

Popper not giving accurate measurements,
 will wait for electric water level indicator.
 Drove along Portage Creek to indicate
 areas with steep banks.

1530 - DUL & MWE of site.

Picked up equipment & FedEx, and rented
 generator at Gagan.

1716 MWE Calibrates YSI - No solutions in packaging
 contacted C.C. Lynch & Associates. Jeff Melvin
 informs that YSI was calibrated 7/25/97 prior
 to shipping. Sp. Cond. 10 μ S/cm
 pH: 7.4, 9.0 Turbidity 0.100 NTU
 DO - % Saturation ORP - Zobel Solution
 Calibration check w/ Distilled Water

28

7/25/97

Dist. by Merjco, Inc. Grand Rapids, MI

041250541197

Temp 27.25°C

Ambient ~80°F

DO % = 96.5

pH = 8.52

TRB = 2.2 NTU

SpC = 0.016 MS/cm

DO = 7.65

ORP = 180.0

Solution Merck Essential Lab, NY @ 25°C

pH 7.0 7.24 green

pH 8.0 4.15 red

pH 10.0 10.24 blue

1745

DWL has decanned both gaskets
pumps with Alcon DI solution
with a DI rinse placed in
clean plastic bags for use in the
morning

1800

- DWL & MWE off site (office) to hotel

(continued) 29

7/29/97

LIMY FIELD LOG

0630 - DWL & MWE on site at field office,
loading up equipment and supplies
for groundwater sampling at Allied CV

WEATHER: FEW CLOUDS, SLIGHT BREEZE
FROM WEST, ~60°

0758 - John Bradley (MDEQ) on site,
preparing to move to Allied CV.

0826 On site at Allied CV, setting up
on well MW-121B

0705 - Pump did not operate correctly, pulled
pump & replaced teflon tape around wires
(ALST HAVE PUMP FIXED). Pump set 1' off
well bottom.

0948 - Began pumping MW-121B again.

1027 - DWL & MWE off site (SEE NEXT PAGE)

1115 - DWL & MWE on site

1117 - John Bradley also on site, setting
up on MW-120B. Pump set 2.5' above
bottom.

1246 - collected 1st sample A66182 after signal
and stabilized parameters.

1300 - Duplicate sample A66183 collected
from same time (A66182).

1310 - John Bradley off site.

30
7/29/92

Daily LOG

MW-121B DEPTH TO WATER = 16' 7 1/2" (TD)
TOTAL WELL DEPTH = 36' 2"

1 WELL VOLUME = 3.2 gal

0948 Began pumping at ~250 ml/min
(well drawing down, constantly
adjusting flow rate.)

1008 - Maintaining pumping rate between
50-250 ml/min

1116 - WELL PUMPED DRY AFTER ~4
GALLONS REMOVED.

1121 - Dropping purged water into Allen's
treatment system, then Duct tape
offsite to FedEx to pick up meter.
John Bradley also off site.

1114 Duct & Meter on site, checking
water level at MW-121B = 27.55'

1600 Depth to water at MW-121B = 19.72'

1615 - Collected sample A66186, purging
well dry in order to collect 2nd sample.

1630 Depth to water (MW-121B) 23.80'

1640 - Collected A66186, pumping dry.

31

MW-120B

1120 - DEPTH TO WATER = 23.37' (TD)
33.20' (TD)

1 WELL VOLUME = 1.6 gal

1138 - Began pumping at ~450 ml/min, using
2nd Grunfos pump for MW-120B

1152 - Flow RATE ~418 ml/min

1159 - Flow RATE ~400 ml/min

1210 - Flow RATE ~375 ml/min

1214 - Flow RATE ~475 ml/min

1246 - Collected sample A66182 + Dsp. A66185
- Continue purging 10 additional gallons.

1330 - Pumping rate ~450 ml/min

1415 - pumping rate ~500 ml/min.

1428 - marked 1438 on sample + loc collected
Sample A66184 + MS/MSD after 10 additional
gallons purged.

1435 - pumping rate ~500 ml/min.

John Dwi

1455 - Pumping rate ~500 ml/min.

1534 - Collected A66185 after 10 additional gallons
(30 total) purged

7/29/47 DAILY FIELD LOG
 1455 John Bradley on site. Collected A66184 + MS/MSD all ca. 10 additional gallons purged. John Bradley off site.
 1458
 1525 John Bradley on site.
 1534 Collected A66185 after 30 g. (total) purged. Prepare to move back on MW-121B.
 1600 Have moved back to MW-121B.
 1615 Collected A66186 from MW-121B.
 1620 John Bradley off site. Will meet back at MW-121B at 1830 to collect 2nd sample.
 1730 Well pumped dry, will allow to recover.
 1736 Dust + mud off site to ent.
 1815 Dust + mud on site, remove pump/ equipment from MW-120B.
 1825 Settling up on MW-121B.
 1825 John Bradley on site.
 1840 Collected A66187 from MW-121B, and pumping dry.
 1848 John Bradley off site for day.
 1900 Cleared up site, off site for day.

7/30/47 DAILY FIELD LOG
 0610 - Dust + mud on site, settling up to collect final sample from MW-121B.
 WEATHER: No clouds, no wind, a SE.
 0655 John Bradley on site.
 0710 Collected sample A66188.
 0720 John Bradley off site.
 Dust + mud pulling equipment from MW-121B.
 0735 Equipment loaded. Dust + mud off site to office.
 0745 Dust + mud at office, packing up equipment + unloading van.
 0830 - Decontaminating both pumps with Alconox. 1 DI solution + DI Rinse.
 0850 Collected A66189 - Rinse blank using Alconox - 5 rinses. Water, which was used in the past (5 ml. glass containers).
 Shipping Granator pump w/ water wires to Syk. for repair.
 0900 - Packaging equip + samples for Fed Ex. all bottles labeled, custody sealed + recorded on log. Cylinders packed with vermiculite and ice, w/ camp blank, sealed + taped shut.
 1101 - On site monitoring water elevations.
 1325 - Dust + mud off site.

34

7/30/97

MW-12115

0615

DEPTH TO WATER = 17.27' (TID)

0701

DEPTH TO WATER = 17.21'

0710 Collected sample A66188 after
~ 1500 ml purged.

35

GROUND WATER

ELEVATIONS (TID)

MW-121A = 16.49'

MW-128A = 16.81'

MW-30 = ~~18.12~~ 14.19'

MW-113A = 6.46'

MW-20 = 14.74'

MW-6 = 15.09'

MW-7 = 19.45'

MW-21 = 4.99'

MW-120A = 21.80'

MW-8 = 11.59'

MW-126A = 10.28'

MW-125A = 18.57'

MW-9 = 7.19'

MW-23 = 17.20'

MW-22A = 15.65'

MW-26 = 18.05'

MW-25 = 21.05'

MW-122A = 18.75'

MW-3 = 10.01'

MW-16B = NA

MW-17A = 18.82'

MW-28 = 3.72'

MW-19B2 = NA

(Ground water seep into well)

GROUND-WATER SAMPLING LOG

Well No. MW-120B
 Key No. 3210
 Date/Time 7/29/97

Site Name KRSG - ALLIED OU
 Sampling Personnel DWL & MWE
 Weather FEW CLOUDS, SUNNY, SLIGHT BREEZE

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth			33.20'
Water Table Depth			23.37'
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	9.83
Volume of Water in Well	1.6 gal
Pumping Rate of Pump	450 mL/min
Volume of Bailer	
Minutes of Pumping	65
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 10 gal Evacuation Method: Bailer () Pump (☒) [Grufos pump & dedicated tubing]
 Did well go dry? Y ☒ N Evacuation Rate 0.5 L/min

Parameter	11:38 Initial	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 50 min pumping	After 55 min pumping	After 60 min pumping	After 65 min pumping	After ___ min pumping
Well Level	23.50	23.54	23.53	23.51	23.52	23.50	23.54	23.54	23.54	
Temperature	17.57	17.28	17.70	16.70	16.98	17.45	17.50	17.88	18.04	
pH	6.84	6.75	6.88	6.93	6.78	6.67	6.80	6.72	6.78	
Conductance	1.539	1.560	1.572	1.574	1.580	1.590	1.590	1.593	1.594	
Turbidity	986.2	335.2	195.0	114.4	91.0	79.2	82.3	80.3	79.4	
DO	1.05	0.72	0.49	0.48	0.29	0.03	0.47	0.55	0.48	

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 12:46

SAMPLE ID

Temperature	17.84
Conductivity	1.599
pH	5.70
Turbidity	61.4
ORP	-26.5
Dissolved Oxygen	0.20

Water Level 23.54'

Calibration Standard Readings _____ 10: _____ 4: _____ 7 Type of Meter YSI 6820

MISCELLANEOUS OBSERVATIONS/PROBLEMS initial water is clear/green-gray, no odor

SAMPLE DESTINATION

Analysis Requested _____

Field Sampling Coordinator _____

Laboratory _____ Via _____ Sent By _____

Notes:

TIC = Top of inner casing. BGL = Below ground level. C = Degrees Centigrade. SU = Standard unit. mg/L = Milligrams per liter.
 TOC = Top of outer casing. gpm = Gallons per minute. mS/cm = MilliSiemens per centimeter. NTU = Nephelometric Turbidity Units

GROUND-WATER SAMPLING LOG

page 2 of 3

Well No. MW-120 B
 Key No. 3210
 Date/Time 7-29-97

Site Name KRS6 - Allied OU
 Sampling Personnel DWL + MWE
 Weather Few Clouds, Sunny, Slight breeze mid to low 70's

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter			
Well Depth			
Water Table Depth			
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	
Volume of Bailor	
Minutes of Pumping	95
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 20 gal Evacuation Method: Bailer () Pump (✓) [Gruntos pump & dedicated tubing]

Did well go dry? Y (N) Evacuation Rate 0.5 L/min

Parameter	11:38 Initial	After 10 min pumping	After 10 min pumping	After 20 min pumping	After 30 min pumping	After 40 min pumping	After 50 min pumping	After 55 min pumping	After 60 min pumping	After ___ min pumping
Water Level	See	23.53	23.54	23.54	23.54	23.53	23.53	23.53		
Temperature	page	17.13	17.63	17.67	17.94	18.03	18.07	18.19		
pH	1	6.66	6.48	6.42	6.38	6.40	6.49	6.47		
Conductance		1.589	1.597	1.596	1.585	1.585	1.585	1.587		
Turbidity		46.9	48.5	41.9	34.7	34.6	36.2	36.7		

DO 0.42 0.22 0 0.44 0.40 A66184

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT

Temperature	16.91
Conductivity	1.591
pH	6.59
Turbidity	27.9
ORP	-51.3
Dissolved Oxygen	0.65

Water Level

Calibration Standard Readings 10: 4: 7 Type of Meter

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Sample lt. yellow, no odor, slight turbidity

SAMPLE DESTINATION

Analysis Requested

Field Sampling Coordinator

Laboratory Via Sent By

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-120 B
 Key No. 3210
 Date/Time 7-29-97

Site Name KRS6 - Allied OU
 Sampling Personnel DWL + MWE
 Weather Few Clouds, Sunny, Light Breeze

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter			
Well Depth			
Water Table Depth			
Depth to Casing Below Grade			

Slug Test? (Y/N) N

Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	
Volume of Bailor	
Minutes of Pumping	<u>50</u>
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 30 gal Evacuation Method: Bailor () Pump (☒) [Grufos pump & dedicated tubing]

Did well go dry? Y N

Evacuation Rate 0.54 min
1448 1508 1518 1528 1532 1538

Parameter	11:38 Initial	After 10 min pumping	After 20 min pumping	After 220 min pumping	After 234 min pumping	After 240 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level		<u>23.57</u>	<u>23.56</u>	<u>23.55</u>	<u>23.55</u>	<u>23.55</u>				
Temperature		<u>17.51</u>	<u>17.46</u>	<u>17.54</u>	<u>17.12</u>					
pH		<u>6.49</u>	<u>6.48</u>	<u>6.49</u>	<u>6.41</u>					
Conductance		<u>1.591</u>	<u>1.593</u>	<u>1.593</u>	<u>1.590</u>					
Turbidity		<u>19.2</u>	<u>19.6</u>	<u>18.5</u>	<u>14.3</u>					

DO 0.32 0.40 0.55 NA
 GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1534

SAMPLE ID A66185

Temperature	<u>17.43</u>
Conductivity	<u>1.595</u>
pH	<u>6.53</u>
Turbidity	<u>17.8</u>
ORP	<u>-48.2</u>
Dissolved Oxygen	<u>0.46</u>

Water Level 23.59

Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS Final purge is pale yellow

SAMPLE DESTINATION

Analysis Requested _____

Field Sampling Coordinator _____

Laboratory _____ Via _____ Sent By _____

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. NW-121 B
 Key No. 3210
 Date/Time 2/29/97

Site Name KRSG - Allied OU
 Sampling Personnel DWL + MWE
 Weather Sunny Few clouds Mid 70° light breeze

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter			
Well Depth			
Water Table Depth			
Depth to Casing Below Grade			

Slug Test? (Y/N) _____

Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 8.5L Evacuation Method: Bailer () Pump (☒) [Grunfos pump & dedicated tubing]
 Did well go dry? (Y) N Evacuation Rate 500 ml/min

Parameter	Initial	After 3 min pumping	After 5 min pumping	After 7 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level		30.14	30.15	NA	DRY					
Temperature		16.72	16.96	17.07	@					
pH		7.56	7.52	7.5	18:50					
Conductance		0.844	0.846	NA						
Turbidity		162.4	262.3	341.9						

DO/ORP 2.21/-124.6 2.03/-127.5 1.51/-122.3
 GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 18:34

SAMPLE ID AL6186

Temperature	16.28
Conductivity	0.855
pH	7.57
Turbidity	66.9
ORP	-129.8
Dissolved Oxygen	2.38

Water level 28.47
 Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION _____

Analysis Requested _____

Field Sampling Coordinator _____

Laboratory _____ Via _____ Sent By _____

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-121B
 Key No. 3210
 Date/Time 7/29/97-0

Site Name KRSG - ALLIED OV
 Sampling Personnel DWL & MWE
 Weather SLIGHT CLOUDS, SUNNY, SLIGHT BREEZE

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	YES		
Well Diameter	2"		
Well Depth			36.17
Water Table Depth			16.63
Depth to Casing Below Grade			

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	19.54
Volume of Water in Well	3.2 gal
Pumping Rate of Pump	500 ml/min
Volume of Bailer	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 2.3 gal Evacuation Method: Bailer () Pump (✓) [Grunfos pump & dedicated tubing]
 Did well go dry? (Y) N Evacuation Rate DRY

Parameter	Initial	After 10 min pumping	After 20 min pumping	After 29 min pumping	After 16:22 min pumping	After 16:28 min pumping	After 16:30 min pumping	After 16:31 min pumping	After 16:31 min pumping
Water Level			122.4	NA	127.39	128.63	129.5	129.5	129.5
Temperature	13.05	14.14	14.83	16.87	15.37	16.04	16.13		
pH	6.72	7.78	7.90	7.88	7.43	7.45	7.48		
Conductance	0.815	0.736	0.725	NA	0.876	0.841	0.027		
Turbidity	277.0	1565.0	1575.4	1586.9	138	364.8	50		

DD 5.17 2.45 2.29 8.36 1640 1.83 1.63 1.4 AL66187
 GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT SAMPLE ID

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter YSI 6820

MISCELLANEOUS OBSERVATIONS/PROBLEMS clear, odorless, moderately turbid.

SAMPLE DESTINATION

Analysis Requested _____

Field Sampling Coordinator _____

Laboratory _____ Via _____ Sent By _____

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-121B
 Key No. 3210
 Date/Time 7/30/97/0700

Site Name KRS6 - ALLIED DU
 Sampling Personnel DWL & MWE
 Weather NO CLOUDS, NO WIND ~ 58°

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter			
Well Depth			
Water Table Depth			
Depth to Casing Below Grade			

Slug Test? (Y/N) _____ Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	
Volume of Bailer	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well 22 gal Evacuation Method: Bailer () Pump () [Grnfos pump & dedicated tubing]
 Did well go dry? Y N Evacuation Rate _____

Parameter	Initial	After 2 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level		24.78								
Temperature		13.23								
pH		7.89								
Conductance		6.863								
Turbidity		55.9								

DO 2.31/-124.6
 GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 7:10 SAMPLE ID _____

Temperature	12.71
Conductivity	0.871
pH	5.22
Turbidity	12.0
ORP	-130.8
Dissolved Oxygen	3.50

Sample # A66188

Water Level 23.54
 Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Sample was clear colorless no odors.
low turbidity

SAMPLE DESTINATION

Analysis Requested _____

Field Sampling Coordinator _____

Laboratory _____ Via _____ Sent By _____

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = Millisiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

MEMORANDUM



To: William T. McCune

From: David W. Lay *DWL*

Re: KRSG - Allied Operable Unit Groundwater Sampling

Date: 5/8/98

cc: MPB, DKC, AEG, & file

On May 6 and 7, 1998, David W. Lay (DWL) and Brian T. Loomis (BTL) performed the supplemental groundwater sampling event at the Allied Paper, Inc, Operable Unit (Allied OU) in Kalamazoo, Michigan. The sampling program was implemented following the scope of work provided in a March 3, 1998 letter from Blasland, Bouck & Lee, Inc. (BBL) to the Michigan Department of Environmental Quality (MDEQ) titled *Allied Paper, Inc. Operable Unit Monitoring Well Installation*. The groundwater sampling field work at the Allied OU was observed by Mr. Bill Bolio, and Mr. John Bradley of the MDEQ.

Groundwater samples were collected from the seven recently installed double-cased monitoring wells (P-1R, MW-5R, MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR) using a Grunfos submersible pump. The wells were purged and sampled at a constant rate ranging between 400 milliliters per minute (ml/min) to 500 ml/min. Field parameters including temperature, pH, specific conductivity, and turbidity were measured at regular intervals during purging, and also measured for dissolved oxygen and ORP immediately following each sample collection using a YSI 610D flow through cell.

Each groundwater sample was issued an individual sample number, as listed below:

Monitoring Well	Sample Number
P-1R	~~A66189~~ <i>A66198</i>
MW-22AR	A66190
MW-25R	A66191
MW-122AR	A66193
MW-24R	A66194
MW-5R	A66195
MW-126AR	A66196

A duplicate sample was collected from monitoring well MW-25R (sample number A66192). A matrix spike/matrix spike duplicate sample was collected from monitoring well P-1R (sample number ~~A66189~~). The rinse blank (sample number A66197) was collected from the pump after decontamination procedures with an Alconox and deionized water solution and deionized water rinse. *A66198*

All of the samples were contained in laboratory provided amber glass bottles, labeled, custody sealed, and recorded on the chain of custody. The samples were placed in coolers packed with ice and bubble wrap, and shipped to Intertek Testing Services in Colchester, Vermont using the Federal Express overnight shipping service. All of the samples were submitted for analysis of polychlorinated biphenyls using USEPA Method 8081.

Attached are copies of the field notebook pages with the daily log notes, the groundwater sampling logs, and the chain of custody.

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5/6/98

DAILY FIELD LOG

WEATHER: PARTIALLY OVERCAST, 66.5°, NO WIND

0800 - DAVE LAY (DWD) & BRIAN LOOMIS (BTL) on site at Allied OU. received gate keys from Mark Flanagan (Fretco), setting up to pump well P-1R.

0830 DWD & BTL off site to pick up supplies.

0850 Back on site, Bill Bolio (DBO) on site.

0905 BTL calibrating YSI 610D water quality meter - was precalibrated prior to shipping.

1039 - Turbidity readings for P-1R are false, automatic probe cleaner for YSI, dropped readings from 300 to 18.

11:08 Decontaminated the Grubbswell Alconox & DI rinse.

1126 Setting up on MW-22AR
Pump set at @ 15' bgs.

1211 DWD, BTL, Bill off site for lunch, will allow the well to recover (MW-22AR).

1300 DWD & BTL on site.

1305 Bill on site.

1343 Setting up on MW-25AR

37

Pump set at 20' bgs.

P-1R $\nabla = 13.45'$ (TIC)

TOTAL DEPTH = 28.01' (TIC)

WATER COLUMN = 14.56'

1 WELL VOLUME = 2.5 gal

3 WELL VOLUME = 7.5

0928 pump on at 500 ml/min

0933 still pumping @ 500 ml/min

0938 - Pumping @ 500 ml/min

0947 - Pumping @ 500 ml/min

0958 - Pumping @ 480 ml/min

1001 - Pumping @ 480 ml/min

1008 - " " 460 ml/min

1023 ~ 360, adjusted up to @ 500 ml/min

1033 Pumping @ 480 ml/min

SAMPLE # ~~AL6688~~ w/ MIS/MSD **AL66190**

MW-22AR $\nabla = 12.55'$ (TIC) TOTAL = 16.0'

WATER COLUMN = 3.5' 1 VOLUME = 0.6 gal

HAVING TO CONTINUOUSLY ADJUST PUMP TO MAINTAIN FLOW. **SAMPLE # AL66190**

1153 pumping at 440 ml/min

1201 " " 280 ml/min, just maintaining, w/o going dry

1204 - Well went dry.

1301 = W/L = 12.68' (TIC)

1310 = 13.64' = ∇

[MW-25AR] $\Sigma = 18.96'$ (TIC)
 Total Depth = 24.92'
 Volume = 1921 WATER column = 6.04
 1400 = pumping rate = 500 ml/min
 1406 = " " 400 ml/min, turned
 up to 500 ml/min
 continuously adjusting pump rate to
 maintain 500 ml/min
 1421 = pumping rate = 500 ml/min
 1426 " " = 500 ml/min
 1430 - Collected Sample # A6619
 (1500 = Duplicate Sample # A66192)
 [MW-122AR] $\Sigma = 13.68'$ (TIC)
 Total Depth = 22.28' (TIC)
 Water column = 8.6'
 Volume = 1.58
 1510 - Began purging.
 Pump set at 19' (6 tic)
 1527 - Pumping rate = 480 ml/min
 1605 - Collected sample A66193

1700 - FILLING LOG
 1500 - Selling up at MW-122AR
 Mark Flanagan (Fried) came by to
 say they are leaving, we will be locked
 at 1539: Pump vapor locked, then broke flowing
 at increased gpm, causing a raised
 turbidity.
 1630: Selling up on MW-24P
 1730 - All off site.

Sample ID = AL6194

MW-24E $\bar{V} = 16.78'$
 Total Depth = 26.60'
 Water Column = 6.8'
 Volume = 1.2 gal
 Pump set at 24 lbs.

1641: Began pumping.
 1646: Well dry after 105 gal purged.
 Pump lowered to 25.5' + pumpoff.
 1709: $\bar{V} = 20.43'$
 5/7/98

0801: $\bar{V} = 19.78'$ - well has fully recovered.
 0807: Pump on, collecting sample.

MW-5E $\bar{V} = 19.61$

Total Depth = 27.90
 Water Column = 8.3'
 Volume = 1.4 gal
 Pump set at 25' (Tic)

1000 - Pumping rate 500 mL/min
 Sample ID = AL6195

DAILY FIELD LOG

5/7/98

WEATHER: OVERCAST, DRIZZLING, NO WIND.
 0720: Duct & BTL on site, setting up for 1-lb day.

0800: Duct not on site yet, preparing to collect sample from MW-24E.

0850: Completed at MW-24E, decommed pump, no Duct, Duct & BTL to look for Duct. Pick up ice.

0912: Duct BTL on site, John Bradley (DRA) also on site. Setting up on MW-SR.

0932: Pump on, flow rate @ 520 mL/min.
 1021: Decommed pump with Alconox & DI

1033: Setting up on MW-12GAC.

1200: John Bradley off site.
 1225: Duct & BTL released purge water into Alconox treatment system and off site.
 1330: Duct & BTL at field office, collected rinse blank (Sample # AL6197) using decommed gyntos pump & CAS DI water.

42

MW-126AE $\bar{V} = 10.06'$

TOTAL DEPTH = 23.28'

WATER COLUMN = 13.22' VOLUME = 229.1

1048 pump on at 0.500 m/min

1053 pumping rate 500 m/min

1100 Pumping rate 500 m/min

1145 - Collected sample 12H AL6196

WATER LEVELS

MW-125A = 7.70' (TD)

MW-126A = 9.54' (TD)

43

GROUND-WATER SAMPLING LOG

Well No. P-1R
 Key No. MATECO KEY
 Date/Time 5/6/98/1040

Site Name Allied OU
 Sampling Personnel DWL & BTL
 Weather PARTIALLY OVERCAST @ 65°, NO WIND

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	YES		
Well Diameter	2"		
Well Depth	28.01		
Water Table Depth	13.45		
Depth to Casing Below Grade	—		

Slug Test? (Y/N) NRedevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	14.56
Volume of Water in Well	2.5
Pumping Rate of Pump	~ 500 ml/min
Volume of Bailer	NA
Minutes of Pumping	72
Number of Bails	NA

EVACUATION INFORMATION

Volume of Water Removed from Well 10 Evacuation Method: Bailer () Pump (X)
 Did well go dry? Y (N) Evacuation Rate 500 ml/min

[Grunfos pump & dedicated tubing]

Parameter	0928 Initial	After 0955 min pumping	After 0940 min pumping	After 0945 min pumping	After 0950 min pumping	After 0955 min pumping	After 1000 min pumping	After 1006 min pumping	After 1010 min pumping	After 1015 min pumping
Water Level	13.88	13.78	13.74	13.70	13.70	13.73	13.71	13.69	13.68	13.66
Temperature	10.91	12.41	12.98	13.33	13.51	13.76	13.66	13.79	13.89	14.06
pH	6.21	6.54	6.88	6.74	6.60	7.15	7.20	5.88	6.27	6.25
Conductance	0.634	0.987	1.109	1.150	1.152	1.144	1.144	1.136	1.142	1.135
Turbidity	65	47.1	87.9	59.7	42.7	36.6	44.3	60	64.6	108.2

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT

1053

SAMPLE ID

A66189 A66188

Temperature	13.49
Conductivity	1.113
pH	5.58
Turbidity	29.5
ORP	-33.5
Dissolved Oxygen	% -18.6 / -1.71

	1020	1025	1030	1035	1040
Temp	13.65	13.75	13.73	13.71	13.74
pH	14.22	14.27	13.93	13.95	14.06
Cond	7.07	7.16	5.31	6.67	7.10
Turbidity	1.130	1.116	1.126	1.124	1.115
	131.5	166	194.3	267.0	16.1

Calibration Standard Readings

10;

4;

7 Type of Meter

VSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Also collected MS/MSD (6 bottles total)

SAMPLE DESTINATION

ITS

Analysis Requested

PCBS

Field Sampling Coordinator

Laboratory

ITS

Via

FEDEX

Sent By

DWL

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-22AR
 Key No. MARECO KEN
 Date/Time 5/6/98 / 1310

Site Name ALLIED OU
 Sampling Personnel DWL + BTL
 Weather same clouds, ~70°, slight breeze

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	<u>YES</u>		
Well Diameter	<u>2"</u>		
Well Depth	<u>16.0'</u>		
Water Table Depth	<u>12.53'</u>		
Depth to Casing Below Grade	<u>-</u>		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>3.5</u>
Volume of Water in Well	<u>0.6 gal</u>
Pumping Rate of Pump	<u>→</u>
Volume of Bailor	<u>NA</u>
Minutes of Pumping	<u>20</u>
Number of Bails	<u>NA</u>

← HAVING TO CONTINUOUSLY ADJUST PUMP TO MAINTAIN FLOW W/O RUNNING WELL DRY

w/c below top of pump (>14.1')

EVACUATION INFORMATION

Volume of Water Removed from Well 2 gal Evacuation Method: Bailor () Pump ✓
 Did well go dry? Y N Evacuation Rate VARIOUS

[Grinfos pump & dedicated tubing]

Parameter	1144 Initial	After 1144 min pumping	After 1154 min pumping	After 1159 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	<u>13.16</u>	<u>13.74</u>	<u>13.27</u>	<u>13.77</u>						
Temperature	<u>11.02</u>	<u>11.92</u>	<u>13.27</u>	<u>13.77</u>						
pH	<u>4.87</u>	<u>5.61</u>	<u>6.31</u>	<u>6.51</u>						
Conductance	<u>0.993</u>	<u>0.956</u>	<u>0.982</u>	<u>1.002</u>						
Turbidity	<u>149.9</u>	<u>15.98</u>	<u>7.3</u>	<u>16.4</u>						

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1324

SAMPLE ID A66190

Temperature	<u>15.2</u>
Conductivity	<u>0.949</u>
pH	<u>6.70</u>
Turbidity	<u>25</u>
ORP	<u>-16.5</u>
Dissolved Oxygen	<u>3.07 (% 30.2)</u>

w/c = 714.1' (TOP OF PUMP)

Calibration Standard Readings 10: ___ 4: ___ 7: ___ Type of Meter YSI 610TD

MISCELLANEOUS OBSERVATIONS/PROBLEMS 1204, well went dry, will allow to recover & sample

SAMPLE DESTINATION ITS

Analysis Requested PCBs

Field Sampling Coordinator D-J

Laboratory ITS Via FEDEX Sent By DWL

Notes:

TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

MW35R

GROUND-WATER SAMPLING LOG

Well No.

Key No.

Date/Time

Site Name

Sampling Personnel

Weather

~~MATECO KEY~~

MATECO KEY

5/6/98/1430

ALLIED ON

DWL & BTL

SUNNY, ~70°, SLIGHT BREEZE

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	YES		
Well Diameter	2"		
Well Depth	24.92		
Water Table Depth	18.96		
Depth to Casing Below Grade	-		

Slug Test? (Y/N)

N

Redevelop? (Y/N)

N

WELL WATER INFORMATION

Length of Water Column	6'
Volume of Water in Well	1 gal
Pumping Rate of Pump	500 ml/min
Volume of Bailer	NA
Minutes of Pumping	31
Number of Bails	NA

< continuously adjusting pumping rate to maintain 500 ml/min.

EVACUATION INFORMATION

Volume of Water Removed from Well

4

Evacuation Method: Bailer () Pump (X)

[Grufos pump & dedicated tubing]

Did well go dry? Y (N)

N

Evacuation Rate

500 ml/min

Parameter	1359 Initial	After 1405 min pumping	After 1410 min pumping	After 1415 min pumping	After 1420 min pumping	After 1425 min pumping	After 1430 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	19.64	19.40	19.33	19.38	19.46	19.47	19.45			
Temperature	13.79	14.03	15.47	15.51	15.19	14.66	14.47			
pH	6.58	6.08	6.47	6.49	4.52	5.95	6.35			
Conductance	1.882	1.739	1.719	1.725	1.740	1.742	1.741			
Turbidity	54.6	56.4	35.3	31.5	11.10	4.4	3.9			

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT

1440

SAMPLE ID

A66191

Temperature	15.56
Conductivity	1.800
pH	6.14
Turbidity	1.7
ORP	-80.6
Dissolved Oxygen	5.85 (61.2%)

DUPLICATE = A66192

TIME = 1500

Calibration Standard Readings

10;

4;

7

Type of Meter

YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION

ITS

Analysis Requested

PCBS

Field Sampling Coordinator

Laboratory

ITS

Via

FEDEX

Sent By

DWL

Notes:

TIC = Top of inner casing.
TOC = Top of outer casingBGL = Below ground level.
gpm = Gallons per minute.C = Degrees Centigrade.
mS/cm = MilliSiemens per centimeter.SU = Standard unit.
NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-122AR Site Name ALLIED OU
 Key No. Mateco Key Sampling Personnel DWLF BGL
 Date/Time 5/6/98/1605 Weather OVERCAST, ~70° Breezy

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	Yes		
Well Diameter	2"		
Well Depth	22.28		
Water Table Depth	13.68'		
Depth to Casing Below Grade	-		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	8.6'
Volume of Water in Well	1.5 gal
Pumping Rate of Pump	500 ml/min
Volume of Bailor	NA
Minutes of Pumping	55
Number of Bails	NA

< constant adjustment to maintain flow.

EVACUATION INFORMATION

Volume of Water Removed from Well 1.7 gal Evacuation Method: Bailer () Pump X
 Did well go dry? Y N Evacuation Rate 500 ml/min

[Grinfos pump & dedicated tubing]

Parameter	1510 Initial	After 1515 min pumping	After 1520 min pumping	After 1525 min pumping	After 1530 min pumping	After 1535 min pumping	After 1540 min pumping	After 1550 min pumping	After 1600 min pumping	After 1605 min pumping
Water Level	14.22	14.70	14.90	15.30	15.61	15.68	16.60	16.28	16.48	16.93
Temperature	15.88	16.75	17.68	17.88	17.92	18.19	17.03	18.92	18.43	18.63
pH	6.42	6.50	6.96	6.77	6.96	6.86	6.91	7.00	6.97	6.97
Conductance	0.853	0.834	0.848	0.851	0.855	0.854	0.860	0.849	0.850	0.848
Turbidity	137.1	476.7	348.1	159.2	86.8	133.2	1286	292.1	281.8	170

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT

SAMPLE ID A66193

Temperature	16.72
Conductivity	0.877
pH	7.04
Turbidity	1664.5
ORP	-79.8
Dissolved Oxygen	49.1% / 476

Calibration Standard Readings 10; 4; 7 Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Sample water light grey, moderately turbid, well was going dry

SAMPLE DESTINATION

Analysis Requested ITS
PCBs

Field Sampling Coordinator TD

Laboratory ITS Via FEDEX Sent By DWL

Notes:

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 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-24R Site Name ALLIED CV
 Key No. MATECO KEY Sampling Personnel DWL & BTL
 Date/Time 5/6/98 - Weather Overcast ~70°, slight breeze
5/7/98/0815

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	<u>YES</u>		
Well Diameter	<u>2"</u>		
Well Depth	<u>26.60</u>		
Water Table Depth	<u>19.78</u>		
Depth to Casing Below Grade	<u>-</u>		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>6.8</u>
Volume of Water in Well	<u>1.2</u>
Pumping Rate of Pump	<u>500ml/min</u>
Volume of Bailor	<u>NA</u>
Minutes of Pumping	<u>10</u>
Number of Bails	<u>NA</u>

- adjusting rate to maintain

EVACUATION INFORMATION

Volume of Water Removed from Well 0.5 gal Evacuation Method: Bailor () Pump (X)
 Did well go dry? (Y) N Evacuation Rate 500ml/min

[Grufos pump & dedicated tubing]

Parameter	1641 Initial	After ___ min pumping	1710 After ___ min pumping	1715 After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	<u>21.62</u>		<u>22.75</u>	<u>23.85</u>						
Temperature	<u>14.06</u>		<u>14.28</u>	<u>11.55</u>						
pH	<u>11.68</u>		<u>11.78</u>	<u>11.89</u>						
Conductance	<u>1.964</u>		<u>2.051</u>	<u>2.166</u>						
Turbidity	<u>95.8</u>		<u>190.2</u>	<u>183.5</u>						

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 0820

SAMPLE ID A66194

Temperature	<u>11.84</u>
Conductivity	<u>1.831</u>
pH	<u>11.34</u>
Turbidity	<u>48.7</u>
ORP	<u>83.4</u>
Dissolved Oxygen	<u>3.23 (29.4%)</u>

SAMPLED AT FLOW RATE OF ~400ml/min

23.66 (TIC)

Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

1646 - Well dry / Dropped pump to ~25.5'
1710 = 20.43 - began pumping 2nd time
1718 - Well dry after ~0.5gal purged, will allow to recover overnight.

SAMPLE DESTINATION ITS

Analysis Requested PCBS

Field Sampling Coordinator DJ

Laboratory ITS Via FEDEX Sent By DWL

Notes.

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 TOC = Top of outer casing

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-SR Site Name Allied OU
 Key No. Mateco Key Sampling Personnel DWLT BTL
 Date/Time 5/7/93 / 1010 Weather Overcast, @65°, 10 wind.

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	YES		
Well Diameter	2"		
Well Depth	27.90		
Water Table Depth	19.61'		
Depth to Casing Below Grade	-		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	8.3'
Volume of Water in Well	6.4 gal
Pumping Rate of Pump	@500 ml/min - Continuously adjusting to maintain rate.
Volume of Bailor	NA
Minutes of Pumping	45
Number of Bails	NA

EVACUATION INFORMATION

Volume of Water Removed from Well 59.1 Evacuation Method: Bailer () Pump X [Grunfos pump & dedicated tubing]
 Did well go dry? Y (N) Evacuation Rate @500 ml/min

Parameter	0952 Initial	0957 After ___ min pumping	0942 After ___ min pumping	0947 After ___ min pumping	0952 After ___ min pumping	0957 After ___ min pumping	1002 After ___ min pumping	1007 After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	20.9	19.91	20.16	19.95	20.34	20.38	20.10	20.05		
Temperature	13.6	14.96	16.19	16.35	17.13	15.79	15.78	16.43		
pH	6.96	6.65	6.60	6.57	6.55	6.53	6.52	6.52		
Conductance	1.631	1.687	1.719	1.752	1.771	1.807	1.817	1.812		
Turbidity	39.3	22.0	16.7	11.7	11.6	5.7	4.8	7.1		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1011SAMPLE ID A66195

Temperature	16.59
Conductivity	1.828
pH	6.52
Turbidity	6.5
ORP	-78.3
Dissolved Oxygen	0.75 (7.62%)

Calibration Standard Readings 20.38 10: _____ 4: _____ 7: _____ Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION ITSAnalysis Requested PCBSField Sampling Coordinator D-JLaboratory ITS Via FEDEX Sent By DWL

Notes

TIC = Top of inner casing
TOC = Top of outer casingBGL = Below ground level
gpm = Gallons per minuteC = Degrees Centigrade
mS/cm = MilliSiemens per centimeterSU = Standard unit
NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter

GROUND-WATER SAMPLING LOG

Well No. MW-126AR
 Key No. Mateco Key
 Date/Time 5/7/98 / 7:45

Site Name Allied OU
 Sampling Personnel DWL + BTL
 Weather Overcast, 65°, slight breeze

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	YES		
Well Diameter	2"		
Well Depth	23.28		
Water Table Depth	10.06		
Depth to Casing Below Grade	—		

Slug Test? (Y/N) N Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	13.22'
Volume of Water in Well	6.2 gal
Pumping Rate of Pump	500 ml/min
Volume of Bailer	NA
Minutes of Pumping	55
Number of Bails	NA

EVACUATION INFORMATION

Volume of Water Removed from Well 7.2 Evacuation Method: Bailer () Pump (X) (Grunfos pump & dedicated tubing)
 Did well go dry? Y N Evacuation Rate 500 ml/min

Parameter	1048 Initial	1055 After ___ min pumping	1105 After ___ min pumping	1115 After ___ min pumping	1125 After ___ min pumping	1134 After ___ min pumping	1143 After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	11.26	11.40	11.74	11.74	11.76	12.12	12.17			
Temperature	11.82	12.42	13.59	14.45	14.29	14.07	14.54			
pH	5.54	6.43	6.47	6.49	6.47	6.46	6.46			
Conductance	1.625	1.612	1.604	1.620	1.606	1.592	1.611			
Turbidity	116.7	46.6	14.5	28.8	7.0	14.7	16.6			

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1150SAMPLE ID A66196

Temperature	13.66
Conductivity	1.43
pH	6.72
Turbidity	24.613 36.5
ORP	-37.1
Dissolved Oxygen	3.08 (27%)

Calibration Standard Readings 13.30 10; 4; 7 Type of Meter YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION ITSAnalysis Requested PCBSField Sampling Coordinator D-SLaboratory ITS Via FEDEX Sent By DWL

Notes

TIC = Top of inner casing
 TOC = Top of outer casing.

BGL = Below ground level
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

MEMORANDUM



To: William T. McCune
From: David W. Lay *DWL*
Re: KRSG - Allied Operable Unit Groundwater Sampling

Date: 8/18/98
cc: MPB, DKC, AEG, & file

On August 5 and 6, 1998, David W. Lay (DWL) and Brian T. Loomis (BTL) performed the supplemental groundwater sampling event at the Allied Paper, Inc. Operable Unit (Allied OU) in Kalamazoo, Michigan. The sampling program was implemented following the scope of work provided in a March 3, 1998 letter from Blasland, Bouck & Lee, Inc. (BBL) to the Michigan Department of Environmental Quality (MDEQ) titled *Allied Paper, Inc. Operable Unit Monitoring Well Installation*. The groundwater sampling field work at the Allied OU was observed by Mr. John Bradley of the MDEQ.

Groundwater samples were collected from the seven double-cased monitoring wells (P-1R, MW-5R, MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR) using a Grunfos™ submersible pump. The wells were purged and sampled at a constant rate ranging between 400 milliliters per minute (ml/min) to 500 ml/min. Field parameters including temperature, pH, specific conductivity, turbidity, dissolved oxygen and ORP were measured at regular intervals during purging using a YSI 610D flow through cell.

Each groundwater sample was issued an individual sample number, as listed below:

Monitoring Well	Sample Number
P-1R	A66199
MW-25R	A66200
MW-24R	A66202
MW-22AR	A66204
MW-122AR	A66205
MW-5R	A66206
MW-126AR	A66207

A duplicate sample was collected from monitoring well MW-25R (sample number A66201). A matrix spike/matrix spike duplicate sample was collected from monitoring well P-1R (sample number A66199). The rinse blank (sample number A66203) was collected from the pump after decontamination procedures with an Alconox and deionized water solution and deionized water rinse.

All of the samples were contained in laboratory provided amber glass bottles, labeled, custody sealed, and recorded on the chain of custody. The samples were placed in coolers packed with ice, vermiculite, and bubble wrap, and shipped to Intertek Testing Services in Colchester, Vermont using the Federal Express overnight shipping service. All of the samples were submitted for analysis of polychlorinated biphenyls using USEPA Method 8081.

Attached are copies of the field notebook pages with the daily log notes and the groundwater sampling logs.

(4)

1340 - Pump out site

(11)

1340 - Pump out site

4/5/98

1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

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1340 - Pump out site at Alameda

1340 - Pump out site at Alameda

11/

10/10/70

10/10/70

11/10

10/10/70

10/10/70

SEARCHED. ACCIDENT. INJURY. 10/10/70

0720 ON SITE (DATA FILE) SETTING UP

ON MUD 220AE

11:13.5 FINE LEPID 10.13

0145 OBSERVATIONS OF SCUMPS

ALSO IN ALGAE. FRANK OF

REMARKS

EVIDENCE OF SCUMPS OBSERVED

ON MUD. FRANK OF FRANKS CREEK

FRANKS CREEK OF FRANKS CREEK

FRANKS CREEK OF FRANKS CREEK

FRANKS CREEK OF FRANKS CREEK

FRANKS

SHARP MUDS APPROXIMATELY 54'

ON LEPID 10.13.5

THE SCUMPS BEGIN TO APPROXIMATELY

11' EAST OF P-2.

11'

11' EAST OF P-2.

11' EAST OF P-2.

11' EAST OF P-2.

11' EAST OF P-2.

11' EAST OF P-2.

0810. RUMORED. MUD 220AE DEPT AFTER

1.5 GAL. RUMORED. DUE TO BIL OFF SITE

FOR BREAKFAST. ALLOW WELL TO REMAIN

0815. MUD WITH JOHN BRADLEY, NOTIFIED

HIM OF OUR PROBLEMS. WILL MEET US BACK

ON SITE @ 9

0854. BACK ON SITE. MUD 220AE 11:10

0900. (INITIALLY SET TO SAMPLE. (ALG. 20.1)

0905. WELL TRY AFTER 1/2 BOTTLE FILLED.

0928. COLLECTED REMAINDER OF SAMPLE

0940. GENTLY SET UP AT MUD-122AE

0945. JOHN BRADLEY ON SITE.

1000. PUMP ON AT MUD-122AE.

1014. WELL WEAT TRY. LAUNDED PUMP TO

JOHN ABOVE WELL. BACK 1 SAMPLE PUMPING.

1022. WELL TRY. PUMP OFF. ALLOWING WELL

TO RECOVER. MUD WILL SAMPLE UPON

RECOVERY (Y = 21.45')

1028. Y = 20.75 (TIC)

1035. Y = 20.65 (TIC)

1100. Y = 20.50 (TIC) (collecting sample)

1105. JOHN BRADLEY OFF SITE

1115. COLLECTED SAMPLE ALGAL. FROM MUD-122AE

1120. MUDDED BACK OF DEPT WELL. OBTAINED

PUMP W/ ALGAL 1 ON

1131 - SETTING UP C&I MW-5R

V = 20 (5' / 10') TOTAL DEPTH 28.05'

1143 - BEGAN PUMPING AT MW-5R (1st RUN)

1147 - ADJUSTED PUMPING RATE TO 500 ml/min

1151 - PUMPING RATE STEADY AT 500 ml/min

1207 - PUMPING RATE = 400 ml/min

1215 - COLLECTED SAMPLE A66206 FROM
MW-5R. (4 GAL PURGED)

1245 - SETTING UP FOR MW 126AR

1250 - BEGAN PUMPING MW 126AR @ 500 ml/min
PUMP 2' AT BASE.

1254 - PUMPING AT 500 ml/min

1316 - PUMPING AT 500 ml/min.

1330 - COLLECTED SAMPLE A66207 FROM
MW-126AR

1345 - DUMPED PUMP WATER W/ ALLIED TO
WATER TREATMENT UNIT.

1350 - PUMP OFF FOR 20 MIN.

GROUND-WATER SAMPLING LOG

Well No. P-12
 Key No. NA
 PID Background NA Well NA
 Sample ID A16599
 Duplicate Sample ID _____
 MS/MSD ID YES

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL + STL
 Date 8/5/94 Time In 1330 Time Out 1515
 Weather cloudy, no wind ~ 70°

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>23.25'</u>	
Water Table Depth	<u>4.5'</u>	

BL 13.5'

Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>13.7'</u>
Volume of Water in Well	<u>2.2 gal</u>
Pumping Rate of Pump	<u>400 ml/min</u>
Volume of Bailer	<u>NA</u>
Minutes of Pumping	<u>46</u>
Number of Bails	<u>NA</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 10 gal
 Did well go dry? Y (N)
 Evacuation Method: Bailer () Grundfos pump (X) Peristaltic pump ()
 Evacuation Rate 500 ml/min

Sample Analyzed for:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	<u>X</u>	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Preservatives:

Sampled @ 1500

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	13:44 Initial	Time (min) 1356	Time (min) 1401	Time (min) 1407	Time (min) 1415	Time (min) 1427	Time (min) 1432	Time (min) 1440	Time (min) 1445
Temperature (celsius)	13.58	15.33	14.01	14.79	14.71	14.29	14.29	14.26	14.62
Conductance (ms/cm)	1.047	1.070	1.068	1.051	1.042	1.022	1.002	1.003	0.992
pH	6.48	6.79	6.76	6.76	6.77	6.77	6.78	6.78	6.80
Turbidity (NTU)	1474.5	459.5	358.0	212.3	117.1	102.4	83.9	41.4	14.3
DO (mg/L) %	-2.2	5.7	5.2	4.3	4.1	3.4	3.2	3.0	2.8
ORP (mV)	-103.5	-122.2	-120.2	-122.1	-116.2	-122.4	-123.0	-124.5	-124.4
DTW (TIC)	13.4	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	<u>15.34</u>
Conductance (ms/cm)	<u>0.993</u>
pH	<u>6.87</u>
Turbidity (NTU)	<u>42.5</u>
DO (mg/L)	<u>22.0</u>
ORP (mV)	<u>-113.3</u>
DTW (TIC)	<u>13.85</u>

← still dropping

Calibration Standard Readings _____ 10: _____ 4: _____ 7: VSI-610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS SAMPLE LT. GREY, LOW TURBIDITY
COLLECTED MS/MSD - 6 BOTTLES TOTAL

SAMPLE DESTINATION	ITS ENVIRONMENTAL	FEDEX
Laboratory	<u>QBE Laboratories</u>	Via <u>Personal Delivery</u>
Laboratory	_____	Via _____
Laboratory	_____	Via _____
		Sent by _____
		Sent by _____
		Sent by _____

Field Sampling Coordinator _____

GROUND-WATER SAMPLING LOG

Well No MW-2SR
 Key No -
 PID Background NA Well NA
 Sample ID A66200
 Duplicate Sample ID A66201
 MS/MSD ID -

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL
 Date 3/5/98 Time In 1605 Time Out 1655
 Weather OVERCAST, SLIGHT BREEZE

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>25.10</u>	
Water Table Depth	<u>20.54</u>	

Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>4.56</u>
Volume of Water in Well	<u>1 gal</u>
Pumping Rate of Pump	<u>440 gal/min</u>
Volume of Bailer	<u>NA</u>
Minutes of Pumping	<u>33</u>
Number of Bails	<u>NA</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 490
 Did well go dry? Y N
 Evacuation Method: Bailer () Grundfos pump ☒ Peristaltic pump ()
 Evacuation Rate 440 gal/min

Sample Analyzed for:

Preservatives:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	☒	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Sampled @ 1650

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	Initial	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)
Temperature (celsius)	<u>16.11</u>	<u>16.83</u>	<u>17.76</u>	<u>17.47</u>	<u>18.23</u>	<u>17.93</u>	<u>18.43</u>		
Conductance (ms/cm)	<u>1.830</u>	<u>1.835</u>	<u>1.833</u>	<u>1.830</u>	<u>1.833</u>	<u>1.835</u>	<u>1.836</u>		
pH	<u>6.46</u>	<u>6.35</u>	<u>6.42</u>	<u>6.41</u>	<u>6.44</u>	<u>6.43</u>	<u>6.44</u>		
Turbidity (NTU)	<u>9.7</u>	<u>48.2</u>	<u>15.6</u>	<u>10.5</u>	<u>7.8</u>	<u>7.2</u>	<u>3.3</u>		
DO (mg/L)	<u>13.7</u>	<u>7.7</u>	<u>6.1</u>	<u>5.7</u>	<u>5.0</u>	<u>5.0</u>	<u>5.6</u>		
ORP (mV)	<u>-61.7</u>	<u>-73.3</u>	<u>-76.3</u>	<u>-69.0</u>	<u>-74.1</u>	<u>-68.4</u>	<u>-77.2</u>		
DTW (TIC)	<u>20.8</u>	<u>20.85</u>	<u>20.96</u>	<u>20.96</u>	<u>20.96</u>	<u>20.96</u>	<u>20.96</u>		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	<u>16.77</u>
Conductance (ms/cm)	<u>1.838</u>
pH	<u>6.44</u>
Turbidity (NTU)	<u>4.7</u>
DO (mg/L)	<u>15.6</u>
ORP (mV)	<u>-75.1</u>
DTW (TIC)	<u>20.96</u>

Calibration Standard Readings _____ 10; _____ 4; _____ 7

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE (LEAK - COLLECTED BLIND)
DUP, TIME = 1730 (A66201)

SAMPLE DESTINATION

Laboratory OBG Laboratories Via Personal Delivery Sent by _____
 Laboratory _____ Via _____ Sent by _____
 Laboratory _____ Via _____ Sent by _____

Field Sampling Coordinator _____

GROUND-WATER SAMPLING LOG

Well No. MW 24R
 Key No. _____
 PID Background NA Well NA
 Sample ID AL0202
 Duplicate Sample ID NA
 MS/MSD ID NA

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL BTL
 Date 8/5/98 Time In 1720 Time Out 1935
 Weather overcast drizzle

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>3"</u>	
Well Depth	<u>26.60'</u>	
Water Table Depth	<u>19.75'</u>	

Redevelop? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	<u>6.65</u>
Volume of Water in Well	<u>1 gal</u>
Pumping Rate of Pump	<u>200 ml/min</u>
Volume of Bailer	<u>—</u>
Minutes of Pumping	<u>—</u>
Number of Bails	<u>—</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 1 gal
 Did well go dry? Y N
 Evacuation Method Bailer () Grundfos pump X Penstaltic pump ()
 Evacuation Rate _____

Sample Analyzed for:

Preservatives:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	<u>X</u>	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Sampled @ 1930

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	1730 Initial	Time (min) 1741	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)
Temperature (celsius)	<u>12.96</u>	<u>14.54</u>							
Conductance (ms/cm)	<u>1.021</u>	<u>944</u>							
pH	<u>7.41</u>	<u>10.98</u>							
Turbidity (NTU)	<u>252.3</u>	<u>68.7</u>							
DO (mg/L)	<u>7.0</u>	<u>-64.5</u>							
ORP (mV)	<u>96.5</u>	<u>-49.1</u>							
DTW (TIC)	<u>22.0</u>	<u>27.0</u>							

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	<u>13.25</u>
Conductance (ms/cm)	<u>—</u>
pH	<u>—</u>
Turbidity (NTU)	<u>—</u>
DO (mg/L)	<u>—</u>
ORP (mV)	<u>—</u>
DTW (TIC)	<u>29.05</u>

← WELL WENT DRY

Calibration Standard Readings _____ 10: _____ 4: _____ 7: VSI-610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLED WELL ONCE RECOVERED TO 20.45' (TIC)

SAMPLE DESTINATION

Laboratory	<u>OBG Laboratories</u>	Via	<u>Personal Delivery</u>	Sent by	_____
Laboratory	_____	Via	_____	Sent by	_____
Laboratory	_____	Via	_____	Sent by	_____

Field Sampling Coordinator _____

GROUND-WATER SAMPLING LOG

Well No MW-22AR
 Key No _____
 PID Background NA Well NA
 Sample ID A66204
 Duplicate Sample ID _____
 MS/MSD ID _____

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL + BTL
 Date 8/6/98 Time In 0730 Time Out _____
 Weather OVERCAST, RAINING @ 65°

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>16.13'</u>	
Water Table Depth	<u>13.50'</u>	

Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	<u>2.63</u>
Volume of Water in Well	<u>0.5 gal.</u>
Pumping Rate of Pump	<u>520 ml/min</u>
Volume of Bailer	<u>—</u>
Minutes of Pumping	<u>—</u>
Number of Bails	<u>—</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 1.5 gal
 Did well go dry? Y N
 Evacuation Method: Bailer () Grundfos pump X Peristaltic pump ()
 Evacuation Rate —

Sample Analyzed for:

Preservatives:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	<u>X</u>	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Sampled @ 0900

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	0740 Initial	Time (min) 0745	Time (min) 0750	Time (min) 0755	Time (min) 0800	Time (min)	Time (min)	Time (min)	Time (min)
Temperature (celsius)	<u>15.47</u>	<u>15.76</u>	<u>17.63</u>	<u>19.48</u>	<u>2.48</u>				
Conductance (ms/cm)	<u>1.034</u>	<u>1.027</u>	<u>1.024</u>	<u>1.031</u>	<u>1.063</u>				
pH	<u>5.55</u>	<u>6.37</u>	<u>6.58</u>	<u>6.62</u>	<u>6.67</u>				
Turbidity (NTU)	<u>189.5</u>	<u>130.5</u>	<u>30.8</u>	<u>18.0</u>	<u>28.7</u>				
DO (mg/L)	<u>9.6</u>	<u>54.5</u>	<u>31.7</u>	<u>23.4</u>	<u>0.3</u>				
ORP (mV)	<u>-55.3</u>	<u>-66.8</u>	<u>-76.8</u>	<u>-80.9</u>	<u>-102.1</u>				
DTW (TIC)	<u>13.85</u>	<u>14.40</u>	<u>14.40</u>	<u>14.40</u>					

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	
Conductance (ms/cm)	
pH	
Turbidity (NTU)	
DO (mg/L)	
ORP (mV)	
DTW (TIC)	

WELL WAS DRY

Calibration Standard Readings _____ 10: _____ 4: _____ 7 1/51 610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS WELL DRY AT 0800, ALLOW TO RECOVER + SAMPLE.

SAMPLE DESTINATION

Laboratory	<u>OBG Laboratories</u>	Via	<u>Personal Delivery</u>	Sent by	_____
Laboratory	_____	Via	_____	Sent by	_____
Laboratory	_____	Via	_____	Sent by	_____

Field Sampling Coordinator _____

GROUND-WATER SAMPLING LOG

Well No MW-122AR
 Key No —
 PID Background — Well —
 Sample ID Aldo205
 Duplicate Sample ID —
 MS/MSD ID —

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL + BTL
 Date 8/6/98 Time In 0940 Time Out —
 Weather OVERCAST, ~70°

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>22.37'</u>	
Water Table Depth	<u>18.6'</u>	

Redevelop? (Y/N) —

WELL WATER INFORMATION

Length of Water Column	<u>3.78</u>
Volume of Water in Well	<u>0.6 gal</u>
Pumping Rate of Pump	<u>100 ml/min</u>
Volume of Bailer	<u>—</u>
Minutes of Pumping	<u>15</u>
Number of Bails	<u>—</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 2 gal
 Did well go dry? ☒ Y ☐ N
 Evacuation Method: Bailer () Grundfos pump (X) Penstaltic pump ()
 Evacuation Rate —

Sample Analyzed for:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	☒	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Preservatives:

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	1000 Initial	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)
Temperature (celsius)	<u>16.7</u>	<u>10.15</u>							
Conductance (ms/cm)	<u>678</u>	<u>18.71</u>							
pH	<u>5.91</u>	<u>5.89</u>							
Turbidity (NTU)	<u>108.1</u>	<u>998.8</u>							
DO (mg/L)	<u>7</u>	<u>21.1</u>	<u>84.5</u>						
ORP (mV)	<u>-32.9</u>	<u>-6.3</u>							
DTW (TIC)	<u>19.9</u>	<u>21.15</u>							

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	
Conductance (ms/cm)	
pH	
Turbidity (NTU)	
DO (mg/L)	
ORP (mV)	
DTW (TIC)	

well
went
dry

Calibration Standard Readings 10: 4: 7 YSI 610D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Well dry @ 1005 Approx 1 gal pumped. Pump lowered and well dry again

SAMPLE DESTINATION

Laboratory OBG Laboratories Via Personal Delivery Sent by —
 Laboratory — Via — Sent by —
 Laboratory — Via — Sent by —

Field Sampling Coordinator —

GROUND-WATER SAMPLING LOG

Well No MW-5R
 Key No -
 PID Background - Well -
 Sample ID A66206
 Duplicate Sample ID -
 MS/MSD ID -

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL + BTL
 Date 8/6/98 Time In 1130 Time Out 1230
 Weather OVERCAST ~ 70°

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>28.05</u>	
Water Table Depth	<u>20.05</u>	

Redevelop? (Y/N) -

WELL WATER INFORMATION

Length of Water Column	<u>8'</u>
Volume of Water in Well	<u>1.3 gal</u>
Pumping Rate of Pump	<u>500 ml/min</u>
Volume of Bailer	<u>-</u>
Minutes of Pumping	<u>30</u>
Number of Bails	<u>-</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 4 GAL
 Did well go dry? Y (N)
 Evacuation Method: Bailer () Grundfos pump (X) Peristaltic pump ()
 Evacuation Rate ~480 ml/min

Sample Analyzed for:

Preservatives:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	<u>(X)</u>	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Sampled @ 1215

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	1140 Initial	Time (min) 1148	Time (min) 1150	Time (min) 1155	Time (min) 1200	Time (min) 1205	Time (min) 1210	Time (min)	Time (min)
Temperature (celsius)	<u>14.34</u>	<u>15.35</u>	<u>17.04</u>	<u>17.48</u>	<u>17.19</u>	<u>16.83</u>	<u>16.82</u>		
Conductance (ms/cm)	<u>1.524</u>	<u>1.559</u>	<u>1.578</u>	<u>1.641</u>	<u>1.633</u>	<u>1.627</u>	<u>1.632</u>		
pH	<u>6.43</u>	<u>6.36</u>	<u>6.36</u>	<u>6.36</u>	<u>6.36</u>	<u>6.35</u>	<u>6.35</u>		
Turbidity (NTU)	<u>245.5</u>	<u>157.2</u>	<u>65.6</u>	<u>43.1</u>	<u>25.0</u>	<u>21.7</u>	<u>18.6</u>		
DO (mg/l)	<u>29.8</u>	<u>19.2</u>	<u>13.2</u>	<u>12.7</u>	<u>9.2</u>	<u>7.3</u>	<u>6.5</u>		
ORP (mV)	<u>-57.1</u>	<u>-54.6</u>	<u>-52.9</u>	<u>-50.4</u>	<u>-48.0</u>	<u>-46.3</u>	<u>-45.9</u>		
DTW (TIC)	<u>20.90</u>	<u>20.76</u>	<u>20.53</u>	<u>20.50</u>	<u>20.50</u>	<u>20.60</u>	<u>20.60</u>		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	<u>16.36</u>
Conductance (ms/cm)	<u>1.630</u>
pH	<u>6.42</u>
Turbidity (NTU)	<u>19.2</u>
DO (mg/l)	<u>48.5</u>
ORP (mV)	<u>-56.4</u>
DTW (TIC)	<u>20.60</u>

Calibration Standard Readings _____ 10: _____ 4: _____ 7: YSI 610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE CLEAR, LT. BROWN

SAMPLE DESTINATION

Laboratory ITS
QBO Laboratories
 Laboratory _____
 Laboratory _____

Via

FEDEX
Personal Delivery

Via

Via

Sent by

Sent by

Sent by

Field Sampling Coordinator

GROUND-WATER SAMPLING LOG

Well No. MW-126AR
 Key No. —
 PID Background — Well —
 Sample ID AG6207
 Duplicate Sample ID —
 MS/MSD ID —

Site Name ALLIED GROUND-WATER SAMPLING
 Sampling Personnel DWL + BTL
 Date 8/6/98 Time In — Time Out —
 Weather OVERCAST ~70°

WELL INFORMATION

	TIC	TOC
Reference Point Marked on Casing	<u>YES</u>	
Well Diameter	<u>2"</u>	
Well Depth	<u>23.36</u>	
Water Table Depth	<u>10.4</u>	

Redevelop? (Y/N) —

WELL WATER INFORMATION

Length of Water Column	<u>13'</u>
Volume of Water in Well	<u>2 gal</u>
Pumping Rate of Pump	<u>500 ml/min</u>
Volume of Bailer	<u>—</u>
Minutes of Pumping	<u>40</u>
Number of Bails	<u>—</u>

EVACUATION INFORMATION

Volume of Water Removed from Well 6 gal
 Did well go dry? Y N
 Evacuation Method: Bailer () Grundfos pump X Peristaltic pump ()
 Evacuation Rate —

Sample Analyzed for:

Preservatives:

TCL VOCs	()	4 degrees celsius
TCL SVOCs	()	4 degrees celsius
TCL PCBs	<u>X</u>	4 degrees celsius
TAL Metals unfiltered	()	4 degrees celsius & HNO3
Cyanide unfiltered	()	4 degrees celsius & NaOH
Ammonia	()	4 degrees celsius & H2SO4
Mercury filtered	()	4 degrees celsius & HNO3
Mercury unfiltered	()	4 degrees celsius & HNO3
Carbonate/Bicarbonate	()	4 degrees celsius
Chloride	()	4 degrees celsius
Sulfate	()	4 degrees celsius
TDS	()	4 degrees celsius
TSS	()	4 degrees celsius

Sampled @ 1330

GROUND-WATER CHARACTERISTICS DURING PURGING

Parameter	1250	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)	Time (min)
	Initial	1255	1300	1305	1310	1315	1325		
Temperature (celsius)	<u>13.03</u>	<u>14.72</u>	<u>14.97</u>	<u>14.70</u>	<u>14.63</u>	<u>14.35</u>	<u>14.16</u>		
Conductance (ms/cm)	<u>1.482</u>	<u>1.530</u>	<u>1.542</u>	<u>1.536</u>	<u>1.538</u>	<u>1.532</u>	<u>1.522</u>		
pH	<u>5.45</u>	<u>6.24</u>	<u>6.27</u>	<u>6.27</u>	<u>6.27</u>	<u>6.27</u>	<u>6.27</u>		
Turbidity (NTU)	<u>157.1</u>	<u>41.0</u>	<u>23.7</u>	<u>29.8</u>	<u>14.7</u>	<u>13.9</u>	<u>9.1</u>		
DO (mg/L)	<u>30.0</u>	<u>7.3</u>	<u>4.5</u>	<u>4.3</u>	<u>3.5</u>	<u>3.2</u>	<u>3.1</u>		
ORP (mV)	<u>5.2</u>	<u>-18.2</u>	<u>-19.6</u>	<u>-21.1</u>	<u>-20.5</u>	<u>-20.7</u>	<u>-20.6</u>		
DTW (TIC)	<u>14.6</u>	<u>11.85</u>	<u>12.05</u>	<u>12.10</u>	<u>12.2</u>	<u>12.55</u>	<u>12.75</u>		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED

Temperature (celsius)	<u>15.17</u>
Conductance (ms/cm)	<u>503</u>
pH	<u>6.36</u>
Turbidity (NTU)	<u>16.3</u>
DO (mg/L)	<u>2.7</u>
ORP (mV)	<u>-7.2</u>
DTW (TIC)	<u>2.90</u>

Calibration Standard Readings 10; 4; 7 YSI 610-D

MISCELLANEOUS OBSERVATIONS/PROBLEMS SAMPLE CLEAR

SAMPLE DESTINATION

Laboratory ITS Via FEDEX Sent by —
 Laboratory — Via — Sent by —
 Laboratory — Via — Sent by —

Field Sampling Coordinator —

GROUND-WATER SAMPLING LOG

Well No. MW 122A Site Name Allied Operable Unit
 Key No. 10/3/98 Sampling Personnel BTL
 Date/Time 10/3/98 Weather overcast

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	22.55		
Water Table Depth	20.78		

Slug Test? (Y/N) N Redesign? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	1.77
Volume of Water in Well	.29
Pumping Rate of Pump	~150 ml/min
Volume of Baker	
Minutes of Pumping	5
Number of Bats	

EVACUATION INFORMATION

Volume of Water Removed from Well 52 Evacuation Method: Baker () Pump And (Groutless pump & dedicated tubing)
 Did well go dry? (Y) N Evacuation Rate ~150 ml/min

Parameter	Initial	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level										
Temperature	13.7	14.7								
pH	6.41	6.41								
Conductance	2829	0.864								
Turbidity	71000	71000								

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT NASAMPLE ID A66208

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

well

Calibration Standard Readings TO: --- Type of Meter Misc for Limnotech

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION

Analysis Requested

ITS
Rob Patchett
 Field Sampling Coordinator

Total PCB's

Laboratory ITS via Fed Ex Sent By BTL

Notes:

TIC = Top of inner casing
 TOC = Top of outer casing

BGL = Below ground level
 gpm = Gallons per minute

C = Degrees Centigrade
 mS/cm = millisiemens per centimeter

SU = Standard unit
 NTU = Nephelometric Turbidity Unit

mg/L = milligrams per liter

GROUND-WATER SAMPLING LOG

Well No. MW 22R Site Name Allied Operable Unit
 Key No. Sampling Personnel Bea
 Date/Time 10/3/98 Weather overcast & cool

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	16.2		
Water Table Depth	15.8		

Slug Test? (Y/N) N Recovered? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	2.35
Volume of Water in Well	.39
Pumping Rate of Pump	~~100-200~~ 100-200 ml/min
Volume of Bailer	—
Minutes of Pumping	56
Number of Bais	—

EVACUATION INFORMATION

Volume of Water Removed from Well 1.85 gal Evacuation Method: Bailer () Pump X [Grinder pump & aerated tubing]
 Did well go dry? ② N Evacuation Rate 100-200 ml/min

Parameter	Initial	After 9 min pumping	After 21 min pumping	After 56 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level										
Temperature	13.6	13.8	13.5	13.5						
pH	6.27	6.31	6.33	6.28						
Conductivity	2.850	0.871	0.875	0.878						
Turbidity	6.75	1.97	2.29	6.95						

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1315SAMPLE ID A66209

Temperature	13.5
Conductivity	.878
pH	6.28
Turbidity	6.95
ORP	—
Dissolved Oxygen	5.1 %

Calibration Standard Readings — 10. — 5. — 7 Type of Meter Misc from Limotek

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION

Analysis Requested

ITS
RES RATCHETT
 Field Sampling Coordinator

TOTAL PCB's

Laboratory ITS Via Fed Ex Sent By BTG

Notes

TIC = Top of inner casing
 TOC = Top of outer casing

BGL = Below ground level
 gpm = Gallons per minute

C = Degrees Celsius
 mS/cm = millisiemens per centimeter

g/L = Grams per liter
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter

10/14/88	Weather	Sunlight	Wind	Temp	Humidity	Clouds	Precip	Notes	Remarks	Signature
0130	Bz on the	Dilledel	Some	Wider	Fouage	from	the	furthest	up stream	bridge location
Personnel:	Baker	T	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L
Baker	T	L	L	L	L	L	L	L	L	L

10/3/28

Mh?

07/12 - 20.18

Total Supply	22.55
--------------	-------

early column - 1.77 feet

Well Done - 29 Oct

2 well behaved - w/ full

<u>Time</u>	<u>Day</u>	<u>Temp</u>	<u>Cond</u>	<u>Loco</u>
11	24	80		

1119	C. 11	8.1	137	8.29	7600
------	-------	-----	-----	------	------

1124	6.41	4.0	14.7	.814	7100
------	------	-----	------	------	------

Day 4 11/29 Pumping rate

at approximately 180-200 ml/min

~0.5 gallons produced before

well vent dry. Lots of

sediment/ sand in rock.	
-------------------------	--

recharge of 0.7 feet in					
-------------------------	--	--	--	--	--

13	15	minutes	after prep
----	----	---------	------------

Was short of	
--------------	--

1200

None out to MW-22R. great

set up to finish Pumping

Am	allowing	mu-122	the
	an		

Reclining on the floor

80%	W.I.T	put it on
-----	-------	-----------

2.5 in	and	for	for
--------	-----	-----	-----

[illegible]

70% - 100%

MM	ZZ	YY
----	----	----

Oct - 13.81

02.71 - 1034-21

ok colind 2.31 ft

well known, 39 galls

2	well	valve	79.0	gal
---	------	-------	------	-----

Sampling well with peristaltic pump

and poly things.

12/2/20

52

10/9/98				10/3/98			
MU-22R							
Time	PH	DO	Temp	Cond	Temp	Cond	Temp
1219	6.67	4.4	13.2	.875	6.45		
1228	6.31	4.8	13.8	.871	1.91		
1240	6.35	5.1	13.5	.815	2.29		
1315	6.28	5.1	13.5	.878	6.85		
MU 22 12 sample 1 of				1335	In water for readings to		
1245 Two 1 lb. bottles				get to 80% of original			
were collected Sample				1.42 feet of water needs to			
be in the well, Current				water column is 1.14 feet.			
A66209							
was used for MU 22R.							
1340 Allowing well to recharge							
1350 Packed gel - cell moved							
back to MU 122-A6.							
Depth to water 21.4 feet							
after approx 2 hours of recharge							

GROUND-WATER SAMPLING LOG

Well No. MW 122A
 Key No. _____
 Date/Time 10/2/98

Site Name Allied Operable Unit
 Sampling Personnel BTL
 Weather overcast

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing	_____		
Well Diameter	2"		
Well Depth	22.55		
Water Table Depth	20.78		

Slug Test? (Y/N) NRecovery? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	1.77
Volume of Water in Well	.29
Pumping Rate of Pump	~150 ml/min
Volume of Water	_____
Duration of Pumping	5
Number of Bats	_____

EVACUATION INFORMATION

Volume of Water Recovered from Well 5 gal Evacuation Method: Siphon () Pump And
 Did well go dry? (Y) N Evacuation Rate ~150 ml/min

(Ground pump & detached tubing)

Parameter	Initial	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level										
Temperature	13.7	14.7								
pH	6.41	6.41								
Conductance	2829	0.864								
Turbidity	71000	~1000								

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT NASAMPLE ID A66208

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Well

Calibration Standard Readings _____ Type of Meter Misc for Linnotech

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION ITSAnalysis Requested TOxic PCB'sField Sampling Coordinator Rob PatchettLaboratory ITS vs Fed EXSent By BTL

Notes:

TIC = Top of inner casing.
TOC = Top of outer casing.BGL = Below ground level
gpm = Gallons per minute.C = Degrees Celsius
mg/L = milligrams per literEU = Standard unit
NTU = Nephelometric Turbidity Unit

mg/L = milligrams per liter

GROUND-WATER SAMPLING LOG

Well No. MW 22R Site Name Allied Operable Unit
 Key No. _____ Sampling Personnel BCL
 Date/Time 10/3/98 Weather overcast & cool

WELL INFORMATION

	TIC	TOC	RGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	16.2		
Water Table Depth	15.0		

Slug Test? (Y/N) N Recovery? (Y/N) N

WELL WATER INFORMATION

Length of Water Column	2.39
Volume of Water in Well	0.39
Pumping Rate of Pump	~~100-200~~ ml/min
Volume of Saver	—
Minutes of Pumping	56
Number of Stals	—

EVACUATION INFORMATION

Volume of Water Removed from Well 1.8 gal Evacuation Method: Saver () Pump X
 Did well go dry? (D) N Evacuation Rate 100-200 ml/min (Drunk pump & decontaminated tubing)

Parameter	Initial	After 1 min pumping	After 2 min pumping	After 3 min pumping	After 4 min pumping	After 5 min pumping	After 6 min pumping	After 7 min pumping	After 8 min pumping	After 9 min pumping	After 10 min pumping
Water Level											
Temperature	13.6	13.8	13.5	13.5							
pH	6.27	6.31	6.33	6.28							
Conductance	0.850	0.871	0.875	0.878							
Turbidity	6.45	1.97	2.29	6.95							

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1315SAMPLE ID A66209

Temperature	13.5
Conductivity	0.878
pH	6.28
Turbidity	6.95
ORP	—
Dissolved Oxygen	5.1%

Calibration Standard Readings — 10; — 5; — 7 Type of Meter Misc from Linvotek

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION ITSAnalyte Requested total PCB's

P. G. RATCHETT
 Field Sampling Coordinator

Laboratory ITS via Fed. Ex Sent By BTL

Notes:
 TIC = Top of inner casing
 TOC = Top of outer casing

BCL = Bottom of last
 with a Culture per method.

C = Degress Corrigends
 MBM = Micrograms per milliliter

BU = Blank and
 NTU = Nephelometric Turbidity Units

RGL = Milligram per liter



To: William T. McCune

From: Robert G. Patchett

Re: KRSG - Allied Operable Unit Groundwater Sampling

Date: 2/4/99

cc: MPB, DKC, AEG, & file

On December 15, 1998, Robert G. Patchett (RGP) and Jennifer A. Sandorf (JAS) performed a supplemental groundwater sampling event at the Allied Paper, Inc, Operable Unit (Allied OU) in Kalamazoo, Michigan. The sampling program was implemented following the scope of work provided in a March 3, 1998 letter from Blasland, Bouck & Lee, Inc. (BBL) to the Michigan Department of Environmental Quality (MDEQ) titled *Allied Paper, Inc. Operable Unit Monitoring Well Installation*. The groundwater sampling field work at the Allied OU was observed by Mr. John Bradley of the MDEQ.

Groundwater samples were collected from five double-cased monitoring wells (P-1R, MW-5R, MW-22AR, MW-24R, and MW-122AR) using a Grunfos™ submersible pump. The wells were purged and sampled at a constant rate ranging between 200 milliliters per minute (ml/min) to 700 ml/min. Field parameters including temperature, pH, specific conductivity, and turbidity were measured at regular intervals during purging using a YSI 610D flow through cell. Groundwater monitoring well MW-25R was damaged during construction activities associated with the Bryant Mill Pond removal action activities therefore the well could not be sampled.

Each groundwater sample was issued an individual sample number as listed below:

Monitoring Well	Sample Number
P-1R	A66250
MW-24R	A66252
MW-22AR	A66251
MW-122AR	A66253
MW-5R	A66254

A duplicate sample was collected from monitoring well MW-5R (sample number A66255). A matrix spike/matrix spike duplicate sample was collected from monitoring well P-1R (sample number A66254). The pump was decontaminated prior to each use with an Alconox and deionized water solution and deionized water rinse.

All of the samples were contained in laboratory provided amber glass bottles, labeled, custody sealed, and recorded on the chain-of-custody. The samples were placed in coolers packed with ice, vermiculite, and bubble wrap, and shipped to Severn Trent ITS Laboratory in Colchester, Vermont using the Federal Express overnight shipping service. All of the samples were submitted for analysis of polychlorinated biphenyls using USEPA Method 8081.

Copies of the groundwater sampling logs and chain-of-custody form are attached.

(40)

DAILY FIELD LOG (CONT.)

8/6/98

DWL

- 1131- SETTING UP ON MW-SR
 1140- $\nabla = 20.05'$ (TID) TOTAL DEPTH = 28.05'
 1147- BEGAN PUMPING AT MW-SR (2' OFF BASE)
 1151- ADJUSTED PUMPING RATE TO 500 ml/min
 1207- PUMPING RATE STEADY AT 2470 ml/min
 1215- PUMPING RATE = 480 ml/min
 1215- COLLECTED SAMPLE A66206 FROM MW-SR. (4 GAL PURGED)
 1245- SETTING UP ON MW-12GAR
 1250- BEGAN PUMPING MW-12GAR @ 500 ml/min
 1254- PUMPING AT 500 ml/min
 1316- PUMPING AT 500 ml/min
 1330- COLLECTED SAMPLE A66207 FROM MW-12GAR
 1345- DUMPED PARGE WATER W/ISALLOD ON WATER TREATMENT UNIT.
 1350- DWL + BTL OFF SITE.

(41)

12/15/98

8:30 RGR JAS on-site to

sample wells 8-1R, MW-22R,
 MW-24R, MW-122AR, MW-5R & MW-25R
 40° of Clear, mod wind from west

MW-25R has been damaged and
 cannot be sampled

Cleaning Grounded Pump &
 water level Probe with
 Alconox & Distilled water
 prior to use on-site.

Mr John Bradley from the
 MDEQ is on site

we will begin water level
 measurements prior to sampling

	<u>TIC</u>	<u>Depth</u>	<u>Condition</u>
MW-22AR	13.00'	16.20	good
MW-25R	*7.86'	14.78	Sheared at grade
MW-122AR	16.74	22.46	good
P-1R	13.84'	28.52	good
MW-5R	19.74'	28.06	good
MW-24R	19.66	26.78	good

RPS for ground water sampling
 Logs are used for sample
 collection notes.

~~P-1R~~ 12/15/98

Grundfos Pump is used for
 sampling all the wells

ground water samples will be
 sent to Seven Trust Lab
 in Colchester VT. overnight

a Duplicate sample was collected
 at MW-5R & MS/MSD

17:30 RGP & JTS off site



Inchape Testing Services
Aqualtec Laboratories

Chain-of-Custody Record

55 South Park Drive
Colchester, VT 05446

TEL: (802) 655-1203
FAX: (802) 655-1248

PAGE 1 OF 1

COMPANY INFORMATION		COMPANY'S PROJECT INFORMATION				SHIPPING INFORMATION		VOLUME/CONTAINER TYPE/ PRESERVATIVE (NOTE 4)				
Name: <u>United Laboratories, Inc.</u>		Project Name: <u>Kalamazoo</u>				Carrier: <u>Fed Ex</u>		PCB / Amberlite	-	-	-	-
Address: <u>612 S. Thompson St.</u>		Project Number: <u>645.51</u>				Airbill Number: <u>806974087693</u>						
Telephone: <u>315/446-9120</u>		Sampler Name(s): <u>R. Patchett</u>				Date Shipped: <u>12/16/98</u>						
Facsimile: _____		J. Sambrf				Hand Delivered: ☐ yes ☒ no						
Contact Name: <u>Louise Indick</u>		INCHCAPE LABORATORY INFORMATION				Quote #:		Client Code:				
SAMPLE IDENTIFICATION (NOTE 1)		COLLECTION DATE		GRAB	COMPOSITE	MATRIX	ANALYSIS/REMARKS (NOTE 2,3)		NUMBER OF CONTAINERS			
A66250	P-1R	12/15/98		X		Water			2			
A66251	MW-22R	↓		X		↓			2			
A66252	MW-24R	↓		X		↓			2			
A66253	MW-122AR	↓		X		↓			2			
A66254	MW-5R	↓		X		↓	MS/MSD volume included		5			
A66255	MW-5R Dup.	↓		X		↓			2			
BBL sample #5 were not included on the Lab C.O.C.												
Relinquished by: (signature)		DATE	TIME	Received by: (signature)		NOTES TO SAMPLER(S): (1) Limit Sample Identification to 6 characters, if possible; (2) Indicate designated Lab Q.C. sample and type (e.g.: MS/MSD/REP) and provide sufficient sample; (3) Field duplicates are separate sample; (4) e.g.: 40 ml/glass/H ₂ SO ₄ Notes to Lab: <u>Run Kalamazoo Specific Software</u>						
Relinquished by: (signature)		DATE	TIME	Received by: (signature)								
Relinquished by: (signature)		DATE	TIME	Received for Laboratory by: (signature)								

GROUND-WATER SAMPLING LOG

Well No. P1R
 Key No.
 Date/Time

Site Name KRSQ - Allied O U
 Sampling Personnel R.G. Patchett, J. A. Sandorf
 Weather

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter			
Well Depth	28.52		
Water Table Depth	13.84		

28.52
13.84

Slug Test? (Y/N) Redevelop? (Y/N)

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	0.20 gpm
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

10 to 15 Replenished water
on Tuesday, 2000

EVACUATION INFORMATION

Volume of Water Removed from Well Evacuation Method: Bailer () Pump () [Grufos pump & dedicated tubing]
 Did well go dry? Y N Evacuation Rate 100 ml/min

Parameter	Initial	After 5 min pumping	After 10 min pumping	After 15 min pumping	After 20 min pumping	After 25 min pumping	After 30 min pumping	After 35 min pumping	After ___ min pumping	After ___ min pumping
Water Level	15.34	14.42	14.44	14.44	14.42	14.40	14.40	14.40		
Temperature	22.71	56.22	56.0	56.04	56.12	56.10	56.55	56.55		
pH	8.02	8.48	8.50	8.42	8.0	8.75	8.93	8.91		
Conductance	13.22	13.38	13.32	13.13	13.09	13.23	13.24	13.25		
Turbidity	53.3	17.0	17.7	23.5	3.5	21.6	19.1	25.6		

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 11:10

SAMPLE ID 406 250

Temperature	13.25
Conductivity	56.5 °F
pH	8.91
Turbidity	25.6
ORP	
Dissolved Oxygen	

Calibration Standard Readings 10: 4: 7 Type of Meter

MISCELLANEOUS OBSERVATIONS/PROBLEMS

SAMPLE DESTINATION Seven Trent ITS
 ANALYSIS REQUESTED PCB

R. G. Patchett
 Field Sampling Coordinator

Laboratory Via Sent By Fed Ex

Notes:
 TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = Millisiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-5R
 Key No. _____
 Date/Time 12/15

Site Name KRSG - Allied O U
 Sampling Personnel R.G. Patchett, J. A. Sandorf
 Weather Sunny breezy, 70°F

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	28.06		
Water Table Depth	19.74		

Slug Test? (Y/N) N Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump ☒ [Grunfos pump & dedicated tubing]
 Did well go dry? Y N Evacuation Rate 500 ml/min

Parameter	10:31 Initial	After 5 min pumping	After 10 min pumping	After 15 min pumping	After 20 min pumping	After 25 min pumping	After 30 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	20.58	20.62	20.78	20.73	20.80	20.9	20.88			
Temperature	59.47	60.07	60.45	60.44	60.57	60.21	60.20			
pH	7.30	7.69	7.77	7.77	7.71	7.78	7.79			
Conductance	1575	2000	2003	2090	2030	2097	2097			
Turbidity	14.4	110.9	69.6	35.6	26.0	21.0	20.2			

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT _____

SAMPLE ID A66254

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Collect Dup. A66255
 + MS/MSD

Calibration Standard Readings _____ 10: _____ 4: _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION PCB2 Severn Trent ITS
 ANALYSIS REQUESTED _____

Rob Patchett
 Field Sampling Coordinator

Laboratory _____ Via _____ Sent By Fed Ex

Notes:
 TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MilliSiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-122AR
 Key No. _____
 Date/Time 12/15/95 1336
1500

Site Name KRSG - Allied O U
 Sampling Personnel R.G. Patchett, J. A. Sandorf
 Weather Sunny, 75F

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	<u>7"</u>		
Well Depth	<u>22.46</u>		
Water Table Depth	<u>16.74</u>		

Slug Test? (Y/N) _____ Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	<u>200 ml/min</u>
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump ☒ [Grufos pump & dedicated tubing]
 Did well go dry? Y N Evacuation Rate 200 ml/min

Parameter	1530 Initial	After 5 min pumping	After 10 min pumping	After 15 min pumping	After 20 min pumping	After 25 min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping	After ___ min pumping
Water Level	16.64	18.44	18.33	19.3	19.37	20.28				
Temperature	57.67	58.81	60.71	61.35	62.68	62.99				
pH	7.83	7.41	7.51	7.47	7.36	7.23				
Conductance	3035	2058	2050	2050	2049	2058				
Turbidity	586.6	179.1	57.4	31.7	26.3	32.2				

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 1545SAMPLE ID A66253

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS _____

SAMPLE DESTINATION Severn Trent ITSANALYSIS REQUESTED PCB

Rob Patchett
 Field Sampling Coordinator

Laboratory _____ Via _____ Sent By Fed Ex

Notes:
 TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degree Centigrade.
 mS/cm = Millisiemens per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. MW-24R
 Key No. _____
 Date/Time 12/15/98 1330

Site Name KRSG - Allied O U
 Sampling Personnel R.G. Patchett, J. A. Sandorf
 Weather Sunny 75°F

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	26.73		
Water Table Depth	19.66		

Slug Test? (Y/N)

N

Redevelop? (Y/N)

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	300 mL/min
Volume of Bailer	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well

Evacuation Method: Bailer () Pump ()

[Gruntos pump & dedicated tubing]

Did well go dry? (Y) N

Evacuation Rate

300 mL/min1405

Parameter	1356 Initial	After 1 min pumping	After 5 min pumping	After 10 min pumping	After 15 min pumping	After 20 min pumping	After 25 min pumping	After 30 min pumping	After 35 min pumping	After 40 min pumping
Water Level		22.14	23.55	24.92	25.18					
Temperature	54.21	55.4	55.95	58.6	60.1					
pH	8.11	8.46	8.75	9.49	9.6					
Conductance	533.0	902.0	902	1015	886					
Turbidity	51.3	1197.0	442	140	672					

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT

SAMPLE ID

A66252

Temperature	
Conductivity	
pH	
Turbidity	
ORP	
Dissolved Oxygen	

Calibration Standard Readings

10;

4;

7

Type of Meter

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Initial depth Pump went dry. Lower it to bottom

SAMPLE DESTINATION

Sevren Trent ITS

ANALYSIS REQUESTED

PCB

Field Sampling Coordinator

Laboratory

Via

Sent By

Fed Ex

Notes:

TIC = Top of inner casing.
TOC = Top of outer casing.BGL = Below ground level.
gpm = Gallons per minute.C = Degrees Centigrade.
mScm = Millistems per centimeter.SU = Standard unit.
NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

GROUND-WATER SAMPLING LOG

Well No. AW 22 + R
 Key No. _____
 Date/Time 2/5/85 11:52

Site Name KRSG - Allied O U
 Sampling Personnel R.G. Patchett, J. A. Sandorf
 Weather Sunny, light snow, 45°F

WELL INFORMATION

	TIC	TOC	BGL
Reference Point Marked on Casing			
Well Diameter	2"		
Well Depth	16.20		
Water Table Depth	13.50		

Slug Test? (Y/N) _____ Redevelop? (Y/N) _____

WELL WATER INFORMATION

Length of Water Column	
Volume of Water in Well	
Pumping Rate of Pump	400 ml/min
Volume of Bailor	
Minutes of Pumping	
Number of Bails	

EVACUATION INFORMATION

Volume of Water Removed from Well _____ Evacuation Method: Bailor () Pump ☒ [Gruntos pump & dedicated tubing]

Did well go dry? ☒ N 11:58 Evacuation Rate 400 ml/min 12:03 12:08 pump 13:02

Parameter	Initial	After 5 min pumping	After 1 min pumping	After 1 min pumping	After 1 min pumping	After 5 min pumping	After 1 min pumping	After 1 min pumping	After 1 min pumping	After 1 min pumping
Water Level	13.30	14.71	14.05			13.88				
Temperature	51.88	54.30	57.7	57.9		55.2	55.5			
pH	7.2	7.47	7.61	7.79		7.32	7.35			
Conductance	1884	1892	1885	1903		1765	1866			
Turbidity	35.1	24.7	11.5	9.3		43.1	18.1			

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED AT 13:10

SAMPLE ID A66251

Temperature	55.89
Conductivity	1752
pH	7.41
Turbidity	18.3
ORP	
Dissolved Oxygen	

Calibration Standard Readings _____ 10; _____ 4; _____ 7 Type of Meter _____

MISCELLANEOUS OBSERVATIONS/PROBLEMS Well was dry @ 12:08, R.G.P. & J.A. went to lunch

SAMPLE DESTINATION Seven Trent ITS

ANALYSIS REQUESTED PCB

Field Sampling Coordinator R.G. Patchett

Laboratory _____ Via _____ Sent By Fed Ex

Notes:
 TIC = Top of inner casing.
 TOC = Top of outer casing.

BGL = Below ground level.
 gpm = Gallons per minute.

C = Degrees Centigrade.
 mS/cm = MILLISIEMENS per centimeter.

SU = Standard unit.
 NTU = Nephelometric Turbidity Units

mg/L = Milligrams per liter.

Appendix B

Chain-of-Custody Records

BLASLAND, BOUCK & LEE, INC.
e n g i n e e r s & s c i e n t i s t s

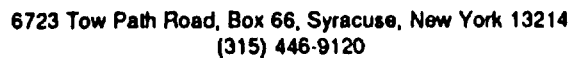
6723 Tow Path Road, Box 66, Syracuse, New York 13214
(315) 446-9120

FEDX AIRBILL # 1372320596

COOLER #1A

CHAIN OF CUSTODY RECORD

PROJECT NO		PROJECT NAME																	
645.51		Allied - OU		KRS6															
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SAMPLE TYPE			NO. OF CONTAINERS	TCB'S	TEMPERATURE						REMARKS		
						SOLID	WIPE	WATER											
A66100	(mw-122A)	10/3/95	1010		X			X	2	X									
A66101	(mw-122A)	10/3/95	1030		X			X	2	X									
A66102	(mw-24)	10/3/95	1245		X			X	2	X									
A66103	(mw-1)	10/4/95	0800		X			X	2	X									
A66104	(mw-26)	10/3/95	1500		X			X	2	X									
A66105	(mw-22A)	10/3/95	1710		X			X	2	X									
A66106	(mw-28A)	10/3/95	1720		X			X	2	X									
A66107	(TEMP BLANK)	10/3/95	1845		X			X	2	X									
A66109	(mw-25)	10/4/95	0945		X			X	2	X									
A66110	(mw-B)	10/4/95	1140		X			X	2	X									
TEMP BLANK								X	1		X								
SAMPLED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)					
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)					
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)				DATE/TIME		REMARKS									



Fed-X AIRBILL # 1372320596
CARRIER # B

PROJECT NO		PROJECT NAME															
(045.5)		ALLIED-OU KRSB															
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SAMPLE TYPE			NO. OF CONTAINERS							REMARKS	
						SOLID	WIPE	WATER									
A/G6108	(mw-2)	10/4/75	0940		X			X	2	X							
A/G6108 MS	(mw-2)	10/4/75	0940		X			X	2	X							
A/G6108 MSD	(mw-2)	10/4/75	0940		X			X	2	X							
A/G6111	DUP of A/G6110 MW-18	10/4/75	1150		X			X	2	X							
A/G6112	(mw-5)	10/4/75	1410		X			X	2	X							
A/G6113	(mw-112)	10/4/75	1420		X			X	2	X							
A/G6114	(mw-12A)	10/4/75	1600		X			X	2	X							
FMP BLANK								X	1		X						
SAMPLED BY: (SIGNATURE) <i>Ronald D. [Signature]</i>		DATE/TIME		RECEIVED BY: (SIGNATURE)						RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)	
RELINQUISHED BY: (SIGNATURE) <i>Ronald D. [Signature]</i>		DATE/TIME 10/4/75 / 1800		RECEIVED BY: (SIGNATURE)						RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)	
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)						DATE/TIME		REMARKS PLEASE SEND RESULTS TO LAURIE JOHNSON					

PLEASE SEND RESUMES TO LAURIE JOHNSON
@ PPL



COPY - ORIGINAL ON FILE
SDG # 54217 ETR # 54263

FED-X AIRBILL # 6786168174
COOLER # 2A

Blasland, Bouck & Lee, Inc.

6723 Tow Path Road, Box 66, Syracuse, New York 13214
(315) 446-9120

KB54502952

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME					NO. OF CONTAINERS	PCB'S	TEMPERATURE				REMARKS		
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SAMPLE TYPE									
						SOLID								WPE	WATER
A66115		10/5/95	0915		X			X	2	X					
A66116		10/5/95	1115		X			X	2	X					
A66117		10/5/95	1345		X			X	2	X					
A66118		10/5/95	1400		X			X	2	X					
A66119		10/5/95	1545		X			X	2	X					
A66120		10/5/95	1530		X			X	2	X					
A66121		10/5/95	1730		X			X	2	X					
A66122		10/5/95	1740		X			X	2	X					
A66123		10/5/95	1900		X			X	2	X					
A66124		10/6/95	1030		X			X	2	X					
EMP BLANK									1		X				
SAMPLED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)	
[Signature]		10/6/95 1630													
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				RELINQUISHED BY: (SIGNATURE)				DATE/TIME		RECEIVED BY: (SIGNATURE)	
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)				DATE/TIME		REMARKS					
				[Signature]				10/7/95 1100		PLEASE SEND RESULTS TO LAURIE JOHNSON @ BBL					



FED-X AIRBILL # 6786168174
COOLER # 2B

000003

[illegible]

PLEASE SEND RESULTS TO LAURIE JOHNSTON
@BBL



Blasland, Bouck & Lee, Inc.

6723 Tow Path Road, Box 66, Syracuse, New York 13214
(315) 446-9120

FED-X AIRBILL # 1372320600
COOLER # 3A

KB54502954

CHAIN OF CUSTODY RECORD

PROJECT NO		PROJECT NAME							NO. OF CONTAINERS	PCB'S	BY	DATE	TIME	REMARKS
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SAMPLE TYPE								
						SOLID	WIPE	WATER						
045.51	ALLIED - O.U.	KRS6												
A66128		10/9/75	1000		X			X	2	X				
A66129		10/9/75	0930		X			X	2	X				
A66130		10/9/75	0945		X			X	2	X				
A66131		10/9/75	1215		X			X	2	X				
A66133		10/9/75	1410		X			X	2	X				
A66134		10/9/75	1400		X			X	2	X				
A66134/MS		10/9/75	1400		X			X	2	X				
A66134/MSD		10/9/75	1400		X			X	2	X				
A66135		10/9/75	1615		X			X	2	X				
A66137		10/9/75	1800		X			X	2	X				
EMP BLANK									1		X			
SAMPLED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)				
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)		DATE/TIME		REMARKS						

Maureen J. [Signature]

10/11/75 1030

PLEASE SEND RESULTS TO LAURIE JOHNSON @ BBL



Blasland, Bouck & Lee, Inc.

6723 Tow Path Road, Box 66, Syracuse, New York 13214
(315) 446-9120

FED-X AIRBILL # 1372320600
COOLER # 3B

KB54502955

0000007

CHAIN OF CUSTODY RECORD

PROJECT NO		PROJECT NAME							NO. OF CONTAINERS	TEMP	TEMP	REMARKS
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SAMPLE TYPE						
						SOLID	WIPE	WATER				
6HS.51		ALLIED - O.U.							KRS6			
Ade132		10/1/85	1830		X			X	2	X		
Ade136		10/10/85	0815		X			X	2	X		
Ade138		10/9/85	1930		X			X	2	X		
Ade139		10/10/85	0930		X			X	2	X		
Ade140		10/10/85	0935		X			X	2	X		
Ade141		10/10/85	1200		X			X	2	X		
Ade142		10/10/85	1130		X			X	2	X		
Ade143		10/10/85	1500		X			X	2	X		
Ade144		10/10/85	1515		X			X	2	X		
TEMP BLANK									1	X		
SAMPLED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		
Randy D/h												
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		
Randy D/h		10/10/85 1800										
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)		DATE/TIME		REMARKS				
				Nurseen L		10/11/85 1030		PLEASE SEND RESULTS TO LARIE JOHNSON @ BBL				

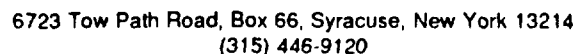


KED-X AIRBILL # 1372320611
COOLER # 4A

000006

CHAIN OF CUSTODY RECORD

[illegible]



000005

KB54502961

CHAIN OF CUSTODY RECORD

MARKS
PLEASE SEND RESULTS TO LAURIE JOHNSON
C BBL



CHAIN OF CUSTODY RECORD

[illegible]

KB54502967

000003



100001

PROJ. NO.		PROJECT NAME													
SAMPLERS: (Signature)															
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers					REMARKS				
						P/B - Total	P/B - Filtrated	TOC	DOS *	P/B / TOC	Microscopic Analysis				
MW166A	3/4/97	11:00		X	A66167	8	2	2	2	2	Filter Weights				
MW166A	3/4/97	11:00		X	A66167-01	1				1	1.1296 grams				
MW166A	3/4/97	11:00		X	A66167-02	1				1	1.1307 grams				
MW166A	3/4/97	11:00		X	A66167-03	1				1	1.1291 grams				
MW166A	3/4/97	11:00		X	A66167-04	1				1	1.1315 grams				
MW166A	3/4/97	11:00		X	A66167-05	1				1	1.1304 grams				
MW166A	3/4/97	11:00		X	A66167-06	1				1	1.1287 grams - Please Archive				
						* Please note P/B - Filtrated DOS samples were filtered in the field									
Relinquished by: (Signature)						DATE		TIME		Received by: (Signature)					
Relinquished by: (Signature)						DATE		TIME		Received by: (Signature)					
Relinquished by: (Signature)						DATE		TIME		Received for Laboratory by: (Signature)					



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

000005

PROJ. NO.		PROJECT NAME												REMARKS	
SAMPLERS: (Signature)															
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB - Total	PCB - Filtered *	Toc	Dos #	PCB/Toc				
MW-25	3/4/97	12:20		X	A66-170	8	2	2	2	2					
												Filter Weights			
MW-120B	3/4/97	12:45		X	A66-171	8	2	2	2	2					
MW-120B	3/4/97	12:45		X	A66-171-08	1				1		1.1009 grams			
MW-120B	3/4/97	12:45		X	A66-171-09	1				1		1.1040 grams			
MW-120B	3/4/97	12:45		X	A66-171-10	1				1		1.1030 grams			
MW-120B	3/4/97	12:45		X	A66-171-12	1				1		1.1043 grams			
												* Please note PCB filtered + Dos. samples were filtered in the field			
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)					
[Signature]		3/5/97	12:00												
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)					
Relinquished by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)		DATE	TIME	Remarks:							
				[Signature]		3/6/97	0930	To: ITS Lab F.I. Ex # 3310501201							



300000

PROJ. NO.		PROJECT NAME																									
SAMPLERS: (Signature)																											
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB - Total	PCB - Filtered *	DOC #	MS/MSD	PCB/TGC	REMARKS															
MW-121A	3/5/97	10:30		x	A6617C	24	6	6	6	6	x	Filter Weights															
MW-121A	3/5/97	10:30		x	A6617C-13	1					1	1.0951 grams															
MW-121A	3/5/97	10:30		x	A6617C-14	1					1	1.1005 grams															
MW-121A	3/5/97	10:30		x	A6617C-15	1					1	1.0774 grams															
MW-121A	3/5/97	10:30		x	A6617C-16	1					1	1.0964 grams															
MW-121B	3/5/97	10:30		x	A6617C	8	2	2	2	2																	
						* Please note PCB Filtered + DOC samples were filtered in the field																					
Relinquished by: (Signature)						DATE		TIME		Received by: (Signature)						Relinquished by: (Signature)		DATE		TIME		Relinquished by: (Signature)					
Relinquished by: (Signature)						DATE		TIME		Received by: (Signature)						Relinquished by: (Signature)		DATE		TIME		Relinquished by: (Signature)					
Relinquished by: (Signature)						DATE		TIME		Received for Laboratory by: (Signature)						DATE		TIME		Remarks:							



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME												
645-51500		Allied Oil												
SAMPLERS: (Signature)														
<i>Theresa Kalam...</i>														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB - Total	PCB - Filtered *	TOC	Dioxin *	PCB/TOC	Microscopic Analysis	REMARKS	
AW-126A	3/5/97	16:30		✓	ALL-174	8	2	2	2	2			Filter Weights	
AW-126B	3/5/97	16:30		✓	ALL-174-13	1				1			1.0931 grams	
AW-126C	3/5/97	16:30		✓	ALL-174-20	1				1			1.0961 grams	
AW-126D	3/5/97	16:30		✓	ALL-174-22	1				1			1.0973 grams	
AW-126E	3/5/97	16:30		✓	ALL-174-24	1				1			1.0976 grams	
AW-126F	3/5/97	16:30		✓	ALL-174-26	1				1			1.0993 grams	
AW-126G	3/5/97	16:30		✓	ALL-174-28	1				1			1.1043 grams - Please Archive	
AW-125	3/4/97	16:30		✓	ALL-170-07	1					1		1.1326 grams - Please Archive	
AW-121B	3/5/97	13:30		✓	ALL-173-17	1					1		1.1019 grams - Please Archive	
						* Please note PCB, Filtered & Dioxin samples were filtered in the field								
Relinquished by: (Signature)			DATE	TIME	Received by: (Signature)			Relinquished by: (Signature)			DATE	TIME	Relinquished by: (Signature)	
<i>Theresa Kalam...</i>			3/6/97	18:00										
Relinquished by: (Signature)			DATE	TIME	Received by: (Signature)			Relinquished by: (Signature)			DATE	TIME	Relinquished by: (Signature)	
Relinquished by: (Signature)			DATE	TIME	Received for Laboratory by (Signature)			DATE	TIME	Remarks:				
					<i>[Signature]</i>			3/7/97	0915	To ITS Labs Fed. Ex # 3370501212				

000005



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME											
645-31500		Allied OLA											
SAMPLERS: (Signature)													
<i>[Signature]</i>													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB Total	PCB Filt'd	TOC	DOC*	PCB/TOC	REMARKS	
D1	3/3/97	-		X	ALG-175	8	2	2	2	2		Filt'd Weights	
D1	3/3/97	-		X	ALG-175-19	1				1		1.0978 grams	
D1	3/3/97	-		X	ALG-175-21	1				1		1.0959 grams	
D1	3/3/97	-		X	ALG-175-23	1				1		1.0995 grams	
D1	3/3/97	-		X	ALG-175-25	1				1		1.0941 grams	
D1	3/3/97	-		X	ALG-175-27	1				1		1.0948 grams	
Composite and analysis for PCB & TOC													
ML-22A	3/6/97	7:00		X	ALG-176	8	2	2	2	2		Filt'd Weights	
ML-22A	3/6/97	7:00		X	ALG-176-29	1				1		1.1063 grams	
ML-22A	3/6/97	7:00		X	ALG-176-30	1				1		1.0981 grams	
ML-22A	3/6/97	7:00		X	ALG-176-31	1				1		1.0921 grams	
ML-22A	3/6/97	7:00		X	ALG-176-32	1				1		1.0952 grams	
Composite and analysis for PCB & TOC													
* Please note PCB Filt'd by DOC													
samples were filtered in the field													
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)			
<i>[Signature]</i>		3/6/97	15:00										
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)			
Relinquished by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)		DATE	TIME	Remarks:					
				<i>[Signature]</i>		3/7/97	0915	To ITS LCL Fol Ex # 33705001212					



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

10000000

PROJ. NO.		PROJECT NAME											
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB Total	PCB Filtered *	TOC	DOC *	PCB/TOC	REMARKS	
MW-25	7/6/97	17:00		X	A66177	8	2	2	2	2		Filter Weights	
MW-25	7/6/97	17:00		X	A66177-33	1				1		1.1317 grams	
MW-25	7/6/97	17:00		X	A66177-34	1				1		1.1312 grams	
MW-25	7/6/97	17:00		X	A66177-35	1				1		1.1273 grams	
MW-25	7/6/97	17:00		X	A66177-36	1				1		1.1290 grams	
MW-25	7/6/97	17:00		X	A66177-37	1				1		1.1253 grams	
MW-5	7/6/97	17:45		X	A66178	8	2	2	2	2		Filter Weights	
MW-5	7/6/97	17:45		X	A66178-33	1				1		1.0766 grams	
MW-5	7/6/97	17:45		X	A66178-37	1				1		1.0901 grams	
MW-5	7/6/97	17:45		X	A66178-40	1				1		1.1018 grams	
MW-5	7/6/97	17:45		X	A66178-41	1				1		1.0979 grams	
* Please note PCB Filtered & DOC													
Samples were filtered in the field													
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)			
		7/7/97	13:30										
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)			
Relinquished by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)		DATE	TIME	Remarks:					
						3/8/97	1630	To ITS Labs F.I. Ex # 3370501245					

**6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120**

CHAIN OF CUSTODY RECORD

500005

[illegible]

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files



INTERTEK TESTING SERVICES

Environmental Laboratories 55 South Park Drive Colchester, VT 05446 (802) 655-1203

CHAIN OF CUSTODY RECORD

Report to: Company: BLAND, BUCK & LEE Address: 6723 TOWPATH RD. SYRACUSE, NY 13214 Contact: DAVID LAY Phone: (315) 446-9120 Fax: _____ Contract/Quote #: _____	Invoice to: Company: SAME Address: _____ Contact: _____ Phone: _____ PO/SO #: 64551	ANALYSIS REQUESTED (Diagonal lines with handwritten note: PCBs USEPA METHOD 8081)	Lab use only Due Date: _____ Temp. of coolers when received (C°): 1 2 3 4 5 Custody Seal N / Y Intact N / Y Screened For Radioactivity ☐
--	--	---	---

Sampler's Name DAVID LAY **Sampler's Signature** *[Signature]*

Proj. No. 64551 **Project Name** KRSL ALLIED CU **No./Type of Containers** 19

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	AVG 1 LL	250 ml	P/O	Lab Sample ID (Lab Use Only)
W	7/27	1216		X	AL66182		2			X
		1300			AL66183		2			X
		1438			AL66184		2			X
		1438			AL66184 MS/MSD		2			X
		1534			AL66185		2			X
		1615			AL66186		2			X
		1840			AL66187		2			X
W	7/30	0710		X	AL66188		2			X
					TEMP BLANK	2				
W	7/30	1850		X	AL66189		2			X

Turn around time ☒ Priority 1 or ☒ Standard ☐ Priority 2 or 50% * ☐ Priority 3 or 100% * ☐ Priority 4 ERS (Dallas Only) * Must Coordinate with Project Manager **Shipment For Case Complete** ☐ Yes ☐ No

Relinquished by: (Signature) <i>[Signature]</i>	Date: 7/27/97	Time: 0724	Received by: (Signature) <i>[Signature]</i>	Date: 7-31-97	Time: 0940	Remarks Client's delivery of samples constitutes acceptance of ITS Environmental Laboratories terms and conditions contained in the Price Schedule.
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	

Matrix WW - Wastewater W - Water S - Soil SD - Solid L - Liquid A - Air Bag C - Charcoal tube SL - Sludge O - Oil

ITS cannot accept verbal changes. Please Fax written changes to



Environmental Laboratories 55 South Park Drive Colchester CT 05446 (802) 655-1203

CHAIN OF CUSTODY RECORD

Report to: Company: <u>BEASLAND, BOYCK/LEE</u> Address: <u>6723 TOWNATH RD</u> <u>SYRACUSE, NY 13214</u> Contact: <u>DAVID LAY</u> Phone: <u>315-446-9120</u> Fax: _____ Contract/Quote #: _____	Invoice to: Company: <u>SMA</u> Address: _____ Contact: _____ Phone: _____ PO/SO #: _____	ANALYSIS REQUESTED PCBs	Lab use only Due Date: _____ Temp. of coolers when received (C°): <table border="1" style="width:100%"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> Custody Seal N / Y Intact N / Y Screened For Radioactivity ☐	1	2	3	4	5
1	2	3	4	5				

Sampler's Name: DAVID LAY Sampler's Signature: [Signature]

Proj. No.			Project Name			No./Type of Containers?													
64551			ALLIED CU																
Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	AG 1 LL	250 ml	P/O	Lab Sample ID (Lab Use Only)									
W	5/6/98	1040		X	~~Ab6 194~~ ~~195~~ ~~196~~ ~~197~~		6												
		1310			Ab6 190		2												
		1430			Ab6 191														
		1500			Ab6 192														
		1605			Ab6 193														
	5/7/98	0815			Ab6 194														
		1010			Ab6 195														
		1145			Ab6 196														
		1330			Ab6 197														
TEMP BLANK																			

Turn around time ☒ Priority 1 or Standard ☐ Priority 2 or 50% * ☐ Priority 3 or 100% * ☐ Priority 4 ERS (Dallas Only) * Must Coordinate with Project Manager Shipment For Case Complete ☐ Yes ☐ No

Relinquished by: (Signature) <u>[Signature]</u>	Date: <u>5/7/98</u> Time: <u>1415</u>	Received by: (Signature)	Date: _____ Time: _____	Remarks Client's delivery of samples constitutes acceptance of ITS Environmental Laboratories terms and conditions contained in the Price Schedule.
Relinquished by: (Signature)	Date: _____ Time: _____	Received by: (Signature)	Date: _____ Time: _____	
Relinquished by: (Signature)	Date: _____ Time: _____	Received by: (Signature) <u>[Signature]</u>	Date: _____ Time: <u>1030</u>	

* Matrix WW - Wastewater W - Water S - Soil SD - Solid L - Liquid A - Air Bag C - Charcoal tube SL - Sludge O - Oil
 * Container VOA - 40 ml vial A/G - Amber / Or Glass 1 Liter 250 ml - Glass wide mouth P/O - Plastic or other

ITS cannot accept verbal changes.
Please Fax written changes to
(802) 655-1248

0000004

THICK TESTING SERVICES

Environmental Laboratories 55 South Park Drive Colchester VT 05446 (802) 655-1203

CHAIN OF CUSTODY RECORD

Report to: Company: <u>Brazzano Bouck & Lee</u> Address: <u>6730 Timpary Rd</u> <u>Syracuse Ny 13214</u> Contact: <u>David Lay</u> Phone: <u>(315) 446-9120</u> Fax: <u>(315) 449-2353</u> Contract/ Quote #: <u>64551</u>		Invoice to: Company: <u>Brazzano Bouck & Lee</u> Address: <u>6730 Timpary Rd</u> <u>Syracuse Ny 13214</u> Contact: _____ Phone: _____ PO/SO #: _____		ANALYSIS REQUESTED		Lab use only Due Date: _____ Temp. of coolers when received (C°): 1 2 3 4 5 Custody Seal N / Y Intact N / Y Screened For Radioactivity ☐							
Sampler's Name <u>DAVE LAY / BRIAN LOCINIS</u>		Sampler's Signature		PCB's (Bore)									
Proj. No. <u>64551</u>		Project Name <u>KRSG - ALLIED SAMPLING</u>				No./Type of Containers ²							
Matrix	Date	Time	C o m p			G l a s s	Identifying Marks of Sample(s)	VOA	AG 1 LL	250 ml	P/O	Lab Sample ID (Lab Use Only)	
W	8/5	1930				X	A 66202		2X			X	
W	8/5	1730				X	A 66201		2X			X	
W	8/5	1650				X	A 66200		2			X	
W	8/5	1500				X	A 66199 MSD/MS		6			X	
W	8/5	2015				X	A 66203		2			X	
W	8/6	0700				X	A 66204		2			X	
W	8/6	1115				X	A 66205		1			X	
W	8/6	1215		X	A 66206		2			X			
W	8/6	1330		X	A 66207		2			X			
Turn around time ☒ Priority 1 or Standard ☐ Priority 2 or 50% * ☐ Priority 3 or 100% * ☐ Priority 4 ERS (Dallas Only) * Must Coordinate with Project Manager													
Relinquished by (Signature) <u>[Signature]</u>		Date: <u>8/6/98</u>		Time: <u>1650</u>		Received by (Signature) <u>[Signature]</u>		Date: <u>8/7/98</u>		Time: <u>0700</u>		Remarks <u>HOLD A66205 FOR ANALYSIS</u>	
Relinquished by (Signature)		Date:		Time:		Received by (Signature)		Date:		Time:			
Relinquished by (Signature)		Date:		Time:		Received by (Signature) <u>[Signature]</u>		Date: <u>8/7/98</u>		Time: <u>0700</u>		Client's delivery of samples constitutes acceptance of ITS Environmental Laboratories terms and conditions contained in the Price Schedule.	
Matrix WW - Wastewater W - Water S - Soil SD - Solid L - Liquid A - Air Bag C - Charcoal tube SL - Sludge O - Oil Container VOA - 40 ml vial A/G - Amber / Or Glass 1 Liter 250 ml - Glass wide mouth P/O - Plastic or other													
ITS cannot accept verbal changes. Please Fax written changes to													

**ITS cannot accept verbal changes.
Please Fax written changes to
(802) 655-1248**

55 South Park Drive, Colchester, VT 05446 Tel: (802) 655-1203

00004

Report to: Company: <u>Environmental Science - ALRT</u> Address: <u>6123 Tenthredin</u> <u>Syracuse Ny 13214</u> Contact: <u>Bill McNamee</u> Phone: <u>(315) 446 7122</u> Fax: <u>315 449 2553</u> Contract/ Quote #:		Invoice to: Company: <u>BB</u> Address: <u>6123 Tenthredin</u> <u>Syracuse Ny 13214</u> Contact: <u>Bill McNamee</u> Phone: <u>(315) 446 7122</u> PO/SO #:		ANALYSIS REQUESTED		Lab use only Due Date:					
Sampler's Name <u>Brian L...</u>		Sampler's Signature <u>[Signature]</u>		BB AG Per Per Patient (315) 446-7122		Temp. of coolers when received (C): 1 2 3 4 5					
Proj. No. <u>64551</u>		Project Name <u>Allied Paper</u>				Custody Seal N / Y					
No./Type of Containers?						Intact N / Y					
						Screened For Radioactivity ☐					
Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	AG 1 L	250 ml	P/O	Lab Sample ID (Lab Use Only)	
S	10/1/98			X	480231			2			
W	10/1/98	1315		✓	A66209		2	2		X	X
W	10/1/98	1600		✓	A66208		1	2		X	X
Relinquished by: (Signature) <u>[Signature]</u> Date: <u>10/5/98</u> Time: <u>1630</u> Received by: (Signature) <u>[Signature]</u> Date: <u>10/5/98</u> Time: <u>0930</u> Remarks: <u>7 DAY TAT on</u> <u>A66209 & A66208</u> Client's delivery of samples constitutes acceptance of Severn Trent Laboratories terms and conditions contained in the Price Schedule.											
Matrix WW - Wastewater W - Water S - Soil SD - Solid L - Liquid A - Air Bag C - Charcoal tube SL - Sludge O - Oil Container VOA - 40 ml vial AG - Amber / Or Glass 1 Liter 250 ml Glass wide mouth P/O - Plastic or other											



Inchcape Testing Services
Aquatec Laboratories

Chain-of-Custody Record

55 South Park Drive
Colchester, VT 05446

TEL: (802) 655-1203
FAX: (802) 655-1248

PAGE 1 OF 1

COMPANY INFORMATION		COMPANY'S PROJECT INFORMATION		SHIPPING INFORMATION		VOLUME/CONTAINER TYPE/ PRESERVATIVE (NOTE 4)					
Name: <u>Blasland, Bouck & Lee, Inc</u>		Project Name: <u>Kalamazoo</u>		Carrier: <u>Fed Ex</u>		PCB / Amber Litter	1	1	1	1	1
Address: <u>6723 Towpath Rd</u> <u>Syracuse NY 13214</u>		Project Number: <u>645.51</u>		Airbill Number: <u>806974087693</u>							
Telephone: <u>315/446-9120</u>		Sampler Name(s): <u>R. Patchett</u> <u>J. Sanderf</u>		Date Shipped: <u>12/16/98</u>							
Facsimile: _____				Hand Delivered: ☐ yes ☒ no							
Contact Name: <u>Laurie Indick</u>				Quote #: _____ Client Code: _____							

SAMPLE IDENTIFICATION (NOTE 1)	COLLECTION		GRAB	COMPOSITE	MATRIX	ANALYSIS/REMARKS (NOTE 2,3)	NUMBER OF CONTAINERS				
	DATE	TIME									
A66250	12/15/98		X		Water		2				
A66251	↓		X		↓		2				
A66252			X				2				
A66253			X				2				
A66254	↓		X		↓	MS/MSD volume included	5				
A66255	↓		X		↓		2				

Relinquished by: (signature) <u>R. Patchett</u>	DATE <u>12/16/98</u>	TIME <u>1030</u>	Received by: (signature)	NOTES TO SAMPLER(S): (1) Limit Sample Identification to 6 characters, if possible; (2) Indicate designated Lab Q.C. sample and type (e.g.: MS/MSD/REP) and provide sufficient sample; (3) Field duplicates are separate sample; (4) e.g.: 40 ml/glass/H ₂ SO ₄ Notes to Lab: <u>Run Kalamazoo Specific Software</u>
Relinquished by: (signature)	DATE	TIME	Received by: (signature)	
Relinquished by: (signature)	DATE <u>12/17/98</u>	TIME <u>0945</u>	Received for Laboratory by: (signature)	

Appendix C

Phase 5 Monitoring Well Installation and Sampling Documentation

BLASLAND, BOUCK & LEE, INC.
engineers & scientists



To: Mark Brown
From: Bill McCune 
Re: Double Cased Well Installation/Development

Date: June 5, 1998
cc: Doug Cowin, Robert Patchett

The following is a summary of information regarding the installation and development of the double cased wells recently completed at the Allied Paper, Inc. Operable Unit (Allied OU) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site.

Double Cased Well Installation

A total of 7 double cased groundwater monitoring wells were installed at the Allied Paper site in Kalamazoo, Michigan between March 18, and April 2, 1998. These wells include P-1R, MW-5R, MW-22AR, MW-24R, MW-25R, MW-122AR, and MW-126AR.

Five of the newly installed monitoring wells were installed adjacent to existing monitoring well clusters. Monitoring well P-1R was installed between Piezometer P-1 and monitoring well MW-23. Monitoring well MW-5R was installed in a location upgradient of the former Bryant Mill Pond, and within the perimeter of the former Type III Landfill. As required by the MDEQ, a total of four pilot borings were advanced prior to installing MW-5R in an attempt to identify the location of the former effluent channel that conveyed residual material from the former clarifier to the Bryant Mill Pond.

The boreholes for the well installations were drilled with a CME 750 ATV drill rig using hollow-stem augers by Mateco Inc. of Grand Rapids, MI. Soil samples were collected continuously with 2-inch x 2-foot long split spoons driven with a 140-lbs auto hammer in accordance with ASTM D-1586-84. Each 2-foot soil sample collected from the borehole was characterized by the on-site geologist using the Unified Soil Classification System (USCS). The following information was recorded in the field notebook and included on the borehole logs: soil types, color, sample recovery, penetration resistance (blow counts and N values), moisture content, consistency, and other notable observations.

Each borehole was initially advanced with 4 1/4 -inch hollow-stem augers to identify the depth of the bottom of the fill material. After identifying the depth of the fill material, the 4 1/4 -inch augers were removed from the borehole and 12-inch inside diameter augers were advanced into the borehole to a target depth identified by the geologist. After the 12-inch augers were advanced into the underlying clay unit, a 10-inch diameter steel casing was lowered to the base of the borehole and tremie grouted into place as the 12-inch augers were removed. After the grouted steel casing had set for at least 48 hours, 4 1/4 -inch hollow-stem augers were lowered through the steel casing to continue the advancement of the borehole with continuous split spoon samples through the native material and the top of the water-table.

After the borehole was advanced to the desired depth, a 2-inch diameter flush threaded, #304 stainless steel riser and 5- or 10-foot well screen with 0.010-inch slots were assembled and lowered to the base of the borehole. As the augers were raised from the borehole, #0 Morie filter sand was placed between the stainless steel well screen and the borehole. The filter sand was installed from the base of the borehole to one foot above the well screen. A two foot thick hydrated bentonite seal was installed above the filter sand followed by a

cement bentonite slurry which was tremied into place from the top of the bentonite seal to one foot below grade. The well was completed at the surface with the installation of a four-inch diameter locking steel protective casing or a flush mount curb box. A set of the draft boring logs/monitoring well construction details are attached.

Drilling and sampling equipment was steam cleaned prior to initiating the monitoring well installation activities, in between each monitoring well location and upon completion of the well installation activities. Equipment cleaning was performed at a decon pad which drains to the on-site treatment system.

Well Development

Following the installation the monitoring wells were developed on April 3 and 4, 1998 to remove the fine sediment that collected in the filter sand during installation and to improve hydraulic communication with the formation. Development was performed by initially surging and bailing each well with a stainless steel bailer. Then a pump was lowered into the well and water was pumped from the well at 1 gallon per minute or less. Water quality parameters consisting of temperature, pH, turbidity, and specific conductance were measured periodically during well development. Development at each well continued until the turbidity was below 5 NTU or until the parameters stabilized to the degree practicable. However, two of the newly completed wells (MW-22AR & MW-24R) failed to produce enough water to sustain pumping. Development of these wells was limited to repeated surging and bailing until a minimum of ten well volumes were removed. The water removed from the wells was placed in the on-site treatment system. A summary of the pumping rates and volumes purged during development is presented on the attached Table 1. This table also presents a summary of the field parameters monitored during development.

WTM,wtm

Table 1

Well Development Final Parameters
Double Cased Wells

Allied Paper Inc. Site
Kalamazoo, MI

Well Designation	P-1R	MW-5R	MW-22AR	MW-24R	MW-25R	MW-122AR	MW-126AR
Pumping Rate (gallons per minute)	1.0	1.0	0.1	* bailed	1.0	0.2	1.0
Total Volume Removed (gallons)	148	120	12	11	93	50	120
Final Temperature (degrees C)	10.6	11.6	10.8	NA	10.2	11.2	11.6
Final pH (standard units)	7.5	5.9	4.3	NA	5.6	5.0	5.9
Final Specific Conductivity (milli mhos)	0.539	13.4	145	NA	12.0	29.2	13.4
Final Turbidity (NTU)	6.0	9.0	4.7	NA	5.2	4.6	9.0

Notes:

* - Monitoring well MW-24R was hand bailed during well development because it would not sustain a pumping rate.

NA - Not Available

Date Start/Finish: 3/21/98 / 3/31/98
 Drilling Company: Mateco
 Driller's Name: Dan Verwoert
 Drilling Method: HSA

Auger Size: 4.25 ID in.
 Rig Type: CME 750 ATV
 Spoon Size: 2 in.

Northing: 280,636.58
 Easting: 12,886,947.84
 Well Casing: 806.62 feet

Borehole Depth: 19.3 ft.
 Ground Surface: 804.0 feet

Geologist: Robert Patchett

Well No: MW-122AR

Client:
 Allied Paper Inc.

Location:
 Kalamazoo River Superfund Site
 Kalamazoo, Michigan

DEPTH	ELEVATION	Sample Run Number	Sample/Int./Type	Blows/8 In.	N	Recovery (ft.)	PID (ppm)	Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 804.0 ft.												4" steel protective casing. 2" diameter, #304 stainless steel riser, 2.5' ags to 9.3' bgs. Cement seal, 0.5' ags to 4' bgs. Cement surface seal, 0-2' bgs. Quick Grout, 2-7.9' bgs, around outer casing. 10" diameter, steel outer casing, 0-7.9' bgs. Bentonite Seal, 4-8.1' bgs. Bottom of outer casing at 7.9' bgs. #10 Mole silica sand pack, 8.1-10.3' bgs. 2" diameter, 0.010" slotted, #304 stainless steel screen, 9.3-10.3' bgs.
											GROUND SURFACE	
		1		2 3 3 3	6	1.1					Brown fine to medium SAND, little Gravel, damp. (FILL)	
		2		4 4 3 2	7	1.4					Lens of black fine Sand, 2.5-2.8' bgs.	
800												
5		3		2 2 2 2	4	1.0						
		4		2 2 2 2	4	2.0					Grades to moist.	
											No sampling conducted, 8-10' bgs.	
785					NA	NA						
10		5		3 2 2 2	4	1.8						
		6		1 2 2 22	4	1.8					As above, becomes wet at 12' bgs.	
790												
6		7		NA	NA	NA					No recovery 14-15.5' bgs. Spoon pushed cobble.	

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Remarks:

Double cased well. Outer casing installed to 7.9' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available.

Saturated Zones

Date / Time	Elevation	Depth
5/8/98 / 1500	792.94	11.06

**Kalamazoo River Superfund Site
Kalamazoo, Michigan**

Well No: MW-122AR

Total Depth = 18.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int./Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm)	Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
		7	/	NA	NA	NA						2" diameter, 0.010" slotted, #304 stainless steel screen, 9.3-10.3' bgs. #10 Merie silica sand pack, 8.1-10.3' bgs. 0.2" stainless steel bottom cap.
		8	/	6 5 28 5	31	1.7					Brown fine to medium SAND, little Gravel, damp. (FILL)	
		9	/	5 4	9	0.9					Gray brown fine SAND and SILT, little fine to medium Gravel, wet. Black SILT and rootlets, damp. (PEAT)	
											Sampling terminated at 10.0' bgs. Borehole augered to 10.3' bgs.	
785												
20												
	780											
25												
	775											
30												
	770											
35												

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Remarks:

Saturated Zones		
Date / Time	Elevation	Depth
5/8/98 / 1500	792.94	11.06

Date Start/Finish: 3/24/98 / 4/01/98
 Drilling Company: Mateco
 Driller's Name: Dan Verwoert
 Drilling Method: HSA

Auger Size: 4.25 ID in.
 Rig Type: CME 750 ATV
 Spoon Size: 2 in.

Northing: 279,422.19
 Easting: 12,886,599.93
 Well Casing: 805.12 feet

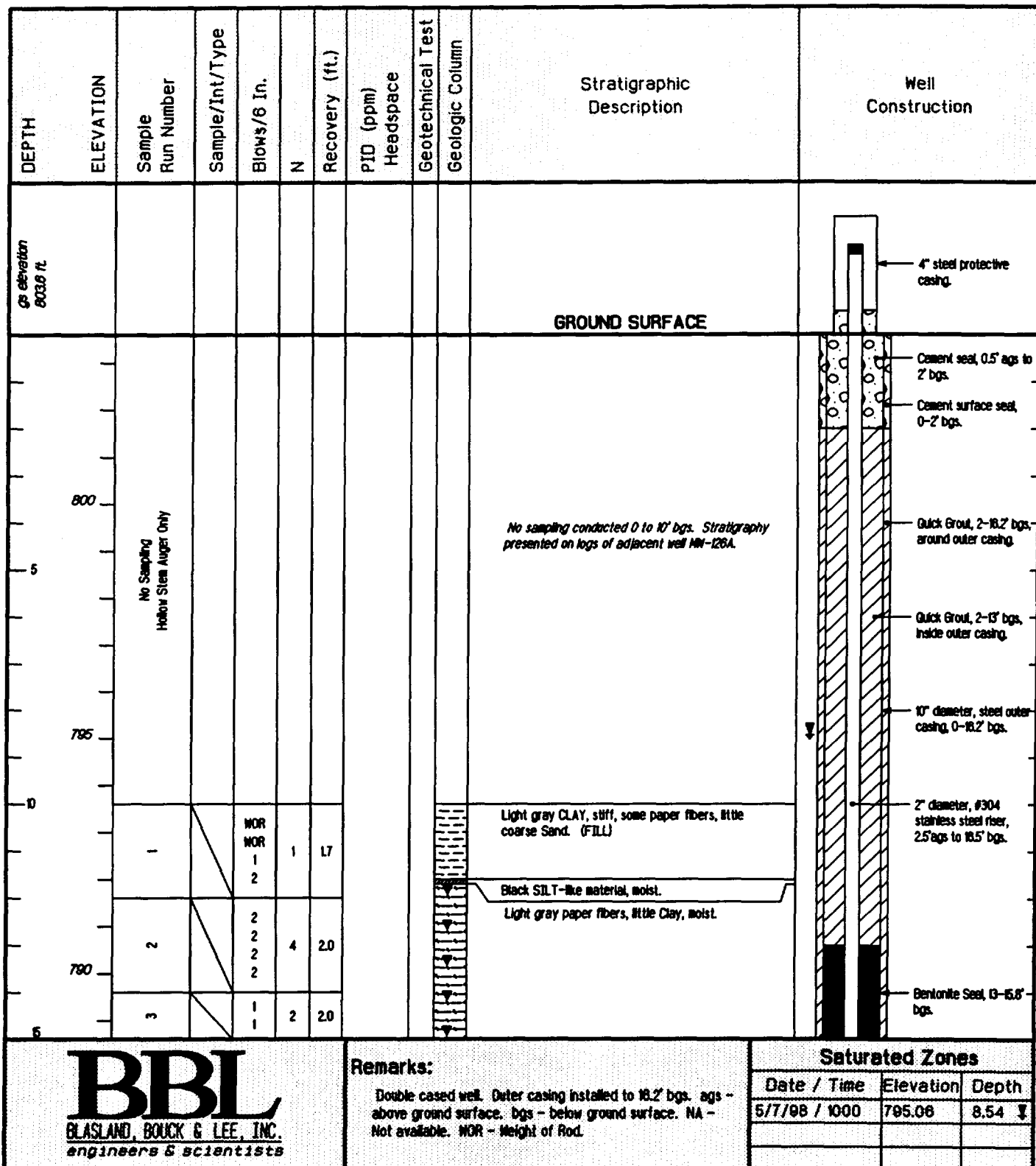
Borehole Depth: 21.5 ft.
 Ground Surface: 803.6 feet

Geologist: Robert Patchett

Well No: MW-126AR

Client:
 Allied Paper Inc.

Location:
 Kalamazoo River Superfund Site
 Kalamazoo, Michigan

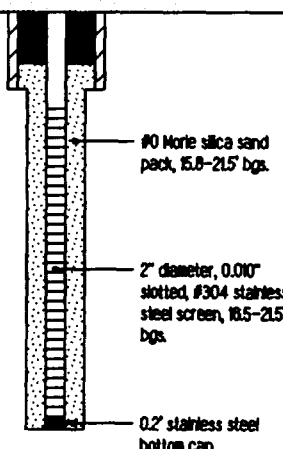


Client:
Allied Paper Inc.

Location:
Kalamazoo River Superfund Site
Kalamazoo, Michigan

Well No: MW-126AR

Total Depth = 21.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int./Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
		3		1 2	2	2.0				Black SILT and fine SAND, some rootlets and decayed leaves, damp. (PEAT)	
		4		1 2 2 8	4	1.8				Becomes wet at 18.5' bgs.	
	785	5		2 10 5 5	15	1.4				Gray brown fine to coarse SAND, some fine rounded Gravel, wet.	
20										Gray mottled CLAY, dense, damp.	
		6		3 6 9 9	15	1.4				Gray SILT and fine SAND, wet.	
										Gray CLAY, dense, damp.	
	780									Borehole augered to 21.5' bgs. Split-spoon sample taken to 22' bgs.	
25											
	775										
30											
	770										
35											

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists	Remarks:	Saturated Zones		
		Date / Time	Elevation	Depth
		5/7/98 / 1000	795.08	8.54

Date Start/Finish: 3/19/98 / 4/01/98 Drilling Company: Mateco Driller's Name: Dan Verwoert Drilling Method: HSA Auger Size: 4.25 ID in. Rig Type: CME 750 ATV Spoon Size: 2 in.	Northing: 279,539.82 Easting: 12,886,681.75 Well Casing: 807.81 feet Borehole Depth: 17 ft. Ground Surface: 808.1 feet Geologist: Robert Patchett	Well No: MW-22AR Client: Allied Paper Inc. Location: Kalamazoo River Superfund Site Kalamazoo, Michigan
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DEPTH	ELEVATION	Sample Run Number	Sample/Int./Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 808.1 ft										GROUND SURFACE	6" flushmount steel cover.
		1		NA	NA	NA				Brown medium SAND, some fine Sand, damp.	Cement seal, 0.5' ags to 2' bgs.
	805	2		NA	NA	NA					Cement surface seal, 0-2' bgs.
5		3		9 10 12 12	22	NA				Gray fine to medium SAND, some SILT, damp.	Quick Grout, 2-11' bgs, around outer casing.
										Gray CLAY.	Quick Grout, 2-8' bgs, inside outer casing.
		4		15 15 12 10	27	NA				Gray fine to medium SAND, some SILT, trace Gravel. Spoon pushed medium gravel.	10" diameter, steel outer casing, 0-11' bgs.
800		5		7 7 9 13	16	NA				Gray coarse SAND and fine GRAVEL, little SILT and Clay, trace chders, damp. (FILL)	2" diameter, #304 stainless steel riser, 0.2-11.5' bgs.
10		6		14 17 14 12	31	NA				Gray-brown fine SAND and SILT, some fine angular Gravel, damp.	Bentonite Seal, 9-11' bgs.
				NA						Light gray fine to medium SAND, little fine rounded Gravel, damp.	#10 Morte silica sand pack, 11-17' bgs.
795										COBBLE, no recovery.	
		7		2 2 2 2	4	14				Gray fine to medium SAND and SILT, wet.	2" diameter, 0.010" slotted, #304 stainless steel screen, 11.5-16.5' bgs.
6											

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Remarks:

Double cased well. Outer casing installed to 10' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available.

Saturated Zones

Date / Time	Elevation	Depth
5/8/98 / 1150	795.28	12.82

Client:
Allied Paper Inc.

Well No: MW-22AR

Location:
Kalamazoo River Superfund Site
Kalamazoo, Michigan

Total Depth = 17 ft.

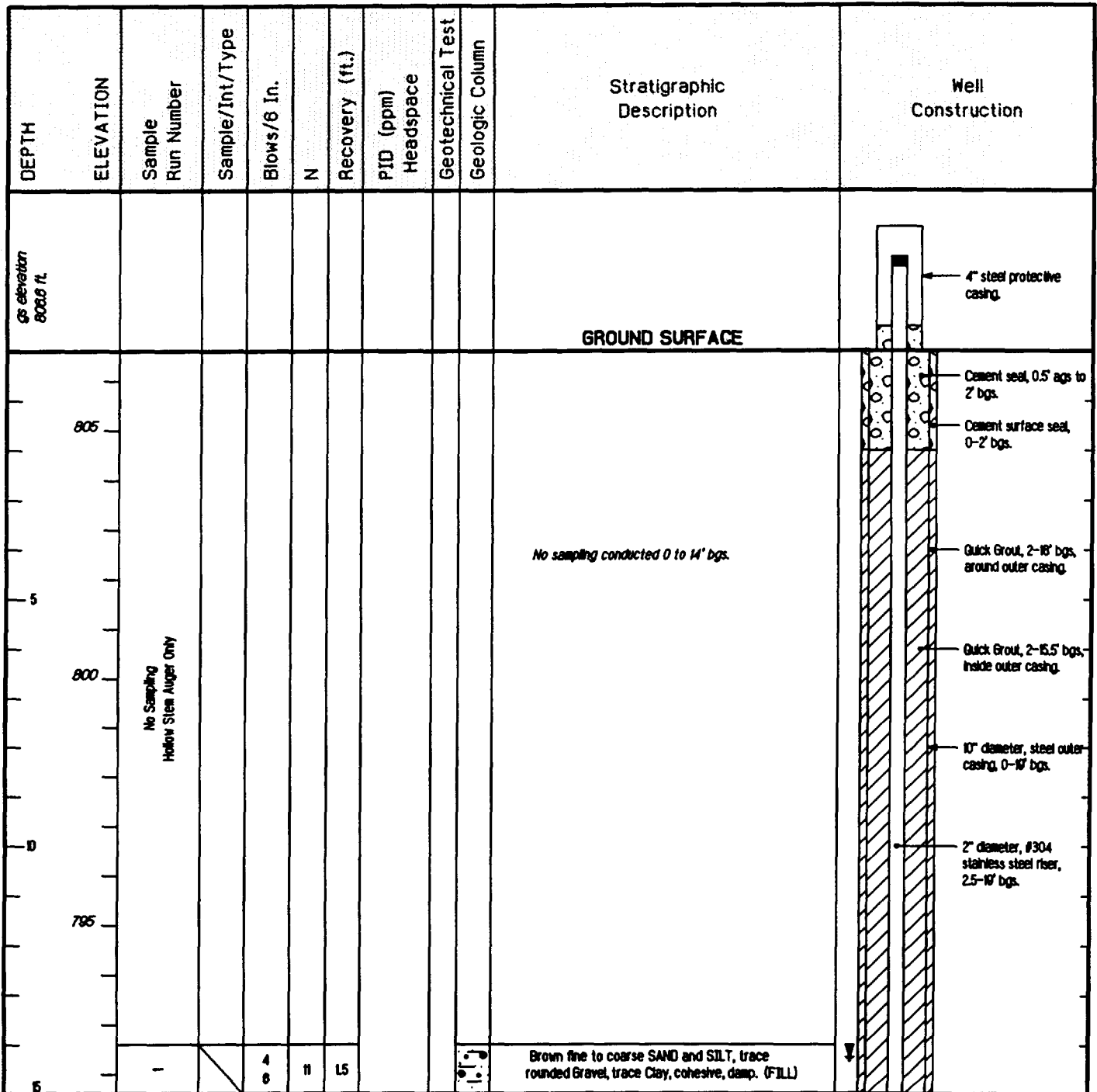
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
		8	MOH	---	2	13				Black SILT and fine SAND, some decayed leaves and roots, moist. (PEAT)	 0.2' stainless steel bottom cap.
										Borehole augered to 17' bgs.	
780											
785											
790											
775											

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Remarks:

Saturated Zones		
Date / Time	Elevation	Depth
5/6/98 / 1150	795.28	12.82

Date Start/Finish: 3/19/98 / 3/27/98 Drilling Company: Mateco Driller's Name: Greg Sawyer Drilling Method: HSA Auger Size: 4.25 ID in. Rig Type: CME 750 ATV Spoon Size: 2 in.	Northing: 279,802.93 Easting: 12,887,108.74 Well Casing: 809.13 feet Borehole Depth: 24 ft. Ground Surface: 806.8 feet Geologist: Robert Patchett	Well No: MW-24R Client: Allied Paper Inc. Location: Kalamazoo River Superfund Site Kalamazoo, Michigan
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Remarks:

Double cased well. Outer casing installed to 18' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available.

Saturated Zones

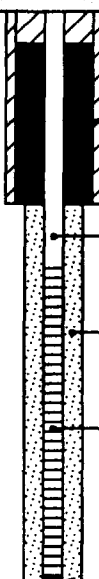
Date / Time	Elevation	Depth
5/6/98 / 1630	792.35	14.25 ↓

**Kalamazoo River Superfund Site
Kalamazoo, Michigan**

Well No: MW-24R

Total Depth = 24 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
790		1		5	11	1.5					
		2		2 2 4 4	6	1.0				Alternating sequences of light gray fine to medium SAND and black SILT with rootlets, wet. (PEAT)	
		3		3 2 2 3	4	1.0				Black SILT and fine SAND, some rootlets, damp. (PEAT)	
		4		8 10 10 4	20	1.5				Gray fine to medium SAND and SILT, some Clay, plastic, damp to moist.	
		5		4 6 9 10	15	1.5				Gray fine to medium SAND, little coarse Sand, little fine Gravel, trace SILT, wet.	
		6		5 9 10 12	19	1.5				Gray CLAY, stiff, plastic, moist.	
780										Borehole augered to 24' bgs. Split-spoon sample taken to 26' bgs.	
775											



Well Construction details:

- Bentonite Seal, 15.5-16' bgs.
- 2" diameter, #304 stainless steel riser, 2.5-16' bgs.
- #10 Mole silica sand pack, 16-24' bgs.
- 2" diameter, 0.010" slotted, #304 stainless steel screen, 19-24' bgs.
- 0.2" stainless steel bottom cap.



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Remarks:

Saturated Zones		
Date / Time	Elevation	Depth
5/6/98 / 1630	792.35	14.25

Date Start/Finish: 3/20/98 / 3/28/98 Drilling Company: Mateco Driller's Name: Greg Sawyer Drilling Method: HSA Auger Size: 4.25 ID in. Rig Type: CME 750 ATV Spoon Size: 2 in.	Northing: 280,319.50 Eastings: 12,887,091.11 Well Casing: 808.53 feet Borehole Depth: 24 ft. Ground Surface: 806.7 feet Geologist: Robert Patchett	Well No: MW-25R Client: Allied Paper Inc. Location: Kalamazoo River Superfund Site Kalamazoo, Michigan
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/8 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 806.7 ft											4" steel protective casing.
										GROUND SURFACE	Cement seal, 0.5' ags to 2' bgs. Cement surface seal, 0-2' bgs. Quick Grout, 2-17' bgs, around outer casing. Quick Grout, 2-15.5' bgs, inside outer casing. 17" diameter, steel outer casing, 0-17' bgs. 2" diameter, #304 stainless steel riser, 2.5' ags to 18' bgs.
805										No sampling conducted 0 to 14' bgs. Stratigraphy presented on logs of adjacent well MW-25.	
800											
795											
790											
785											
780											
775											
770											
765											
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BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists	Remarks: Double cased well. Outer casing installed to 17' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available.	Saturated Zones		
		Date / Time	Elevation	Depth
		5/6/98 / 1330	789.57	17.13

Client:
Allied Paper Inc.

Well No: MW-25R

Location:

Total Depth = 24 ft.

Kalamazoo River Superfund Site
Kalamazoo, Michigan

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
		1		6 4	12	16				Dark gray fine to coarse SAND and SILT, some fine Gravel, damp.	
	760	2		5 4 5 5	9	15				Black SILT and fine SAND, some rootlets, damp. (PEAT)	
		3		6 6 9 12	12	18				Gray fine to coarse SAND, some fine Gravel, little SILT, wet.	
	765	4		2 2 2 3	4	13				Gray fine SAND, little medium Sand, trace fine Gravel, wet.	
		5		4 6 10 16	16	18				Gray fine SAND and SILT, dense, damp.	
	775									Borehole augered to 23.2' bgs. Split-spoon sample taken to 24' bgs.	

Remarks:

Saturated Zones

Date / Time	Elevation	Depth
5/6/98 / 1330	789.57	17.13

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Date Start/Finish: 3/28/98 /
Drilling Company: Mateco
Driller's Name: Dan Verwoert
Drilling Method: HSA

Auger Size: 4.25 ID in.
Rig Type: CME 750 ATV
Spoon Size: 2 in.

Northing: 280,732.0
Easting: 12,886,258.00
Well Casing: 811.87 feet

Borehole Depth: 26.5 ft.
Ground Surface: 810.1 feet

Geologist: Robert Patchett

Well No: MW-5R
Client:
Allied Paper Inc.

Location:
Kalamazoo River Superfund Site
Kalamazoo, Michigan

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 810.1 ft.											
	809	1		6 7 6 4	13	15				Brown fine to coarse SAND, silt fine Gravel, dry. (FILL)	4" steel protective casing
		2		4 8 5 3	13	15				Light gray fine to medium SAND, silt coarse Sand. (FILL)	Cement surface seal, 0.5-2 bgs.
		3		2 2 2	4	12				As above with pieces of plastic and plywood	Cement seal, 0.5' ags to 2' bgs.
	805	4		1 1 1 1	2	0.3					Quick Grout, 2-8' bgs, around outer casing.
		5		2 2 2							Quick Grout, 2-8' bgs, inside outer casing.
		6								Dark gray fine to coarse SAND, some cinders and shag. (FILL)	10" diameter, steel outer casing, 0-20' bgs.
	800	7								As above, light brown from 13.5-13.6' bgs.	2" diameter, #304 stainless steel liner, 15' ags to 20.5 bgs.
		8								Light gray fine SAND and SILT, plastic pieces. (FILL)	

Remarks:

Double cased well. Outer casing installed to 14' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available. MCH - Weight of Rod. MCH - Weight of Hammer.

Saturated Zones

Date / Time	Elevation	Depth
5/1/98 / 930	792.26	17.84'

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Client:
Allied Paper Inc.

Well No: MW-5R

Location:
Kalamazoo River Superfund Site
Kalamazoo, Michigan

Total Depth = 28.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
786		8		5 7	11	0.1					
		9		6 5 3 4	8	1.4				Black fine to coarse SAND, cinders and slag. (FILL) Wooden timber, 17.5-18' bgs.	
		10		4 6 7 8	13	NA				Black fine to coarse SAND and fine rounded GRAVEL, some cinders and decayed wood. Little seam of white clay-like material (<0.5" thick).	
20	790	11		3 3 4 5	7	1.2				Black SILT and fine SAND, with rootlets, damp. (PEAT)	
		12		3 12 19 18	31	1.8				Olive gray CLAY, mottled and plastic, some Silt, trace fine sand, moist. Olive brown fine to medium SAND, little coarse Sand, wet. Gray fine to coarse SAND, little fine Gravel, wet.	
25	785									Borehole augered to 26.5' bgs. Sampling terminated at 24' bgs.	
30	780										

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth
5/7/98 / 930	792.26	17.84

Date Start/Finish: 3/18/98 / 3/25/98 Drilling Company: Mateco Driller's Name: Greg Sawyer Drilling Method: HSA Auger Size: 4.25 ID in. Rig Type: CME 750 ATV Spoon Size: 2 in.	Northing: 279,389.41 Easting: 12,886,271.56 Well Casing: 809.73 feet Borehole Depth: 29 ft. Ground Surface: 810.0 feet Geologist: Robert Patchett	Well No: P-IR Client: Allied Paper Inc. Location: Kalamazoo River Superfund Site Kalamazoo, Michigan
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DEPTH	ELEVATION	Sample Run Number	Sample/Int./Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm)	Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
GS elevation 810.0 ft.	810										GROUND SURFACE	6" flushmount steel cover.
		1		3 4 3 3	7	1.2					Brown fine to coarse SAND, trace fine Gravel, damp. (FILL)	Cement surface seal, 0.5-1.5' bgs.
		2		3 4 4 4	8	1.5						Cement seal, 0.7' ags to 1.5' bgs.
5	805	3		4 3 2 1	5	2.0						Quick Grout, 1.5-14' bgs, around outer casing.
		4		1 2 2 3	4	1.8					Brown fine SAND, SILT and CLAY, cohesive. Brown fine to coarse SAND, trace fine Gravel, damp. (FILL) Slag cinders. (FILL) Brown fine to coarse SAND, some Silt, moist.	Quick Grout, 1.5-15' bgs, inside outer casing.
		5		1 2 2 2	4	0.7						10" diameter, steel outer casing, 0.5-14' bgs.
10	800	6		1 1 1 1	2	0.6					Dark gray fine to medium SAND, little gray Clay, trace black Silt, moist. (FILL)	2" diameter, #304 stainless steel riser, 0.2-11.5' bgs.
		7		WOR WOR 1 1	1	0.7					Gray CLAY. Black organic matter, wet. (PEAT)	
15	795	8		3 4	9	1.3					Dark gray fine to medium SAND, little coarse Sand, little Silt, moist to wet.	Bottom of outer casing at 14' bgs.

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Remarks:

Double cased well. Outer casing installed to 14' bgs. ags - above ground surface. bgs - below ground surface. NA - Not available. WOR - Weight of Rod. WOH - Weight of Hammer.

Saturated Zones

Date / Time	Elevation	Depth
5/8/98 / 900	796.28	13.72 ft.

Client:
Allied Paper Inc.

Well No: P-1R

Location:

Kalamazoo River Superfund Site
Kalamazoo, Michigan

Total Depth = 29 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
28	786	8		5 3	9	L3					
		9		2 8 5 7	10	L2				Black SILT, some fine Sand and rootlets, damp. (PEAT)	
		10		WOH 4 6 4	10	L8				Dark gray fine to medium SAND, little coarse Sand, little SILT, wet.	
20	790	11		5 4 6 8	10	L6				Black SILT, some fine Sand and rootlets, damp. (PEAT)	
		12		2 2 9 9	11	L1				Dark gray fine to medium SAND, some SILT, little coarse Sand, wet.	
		13		4 5 7 9	12	L0				Grades to olive fine to medium SAND, trace SILT, wet.	
25	785	14		2 7 11 13	18	L0				Grades finer with depth.	
30	780									Borehole augered to 29' bgs. Sampling terminated at 28' bgs.	
35	775										

Bentonite Seal, 15'-17.2' bgs.

#10 Merie silica sand pack, 17.2'-28' bgs.

2" diameter, 0.010" slotted, #304 stainless steel screen, 18'-28' bgs.

0.2" stainless steel bottom cap.

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth
5/6/98 / 900	796.28	13.72

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Daily Field Notes

-
- Daily Field Note Forms

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ENGINEERS & SCIENTISTS

Daily Field Notes

Project: Allied Paper
Double Cased Wells

Job No.: 645.51.202

By: R.G. Patchett

Date: 3/17/98

Weather
 Temperature
 Wind
 Humidity
 Surface Conditions

Day	S	M	T	W	T	F	S
Snow							
To 32							
Still							
Dry							
Dry							

Time	Field Notes
11:00	RGP arrives at the K20 field office John Peterson has left me a key to the cork st. gate, getting the supplies I need, gives the key arrive at the cork st. gate to meet Mike drillers. gate key doesn't work. going to the Alcott St. Entrance to see if Frank can give me a key, met Mike Moravic (Linnotech) he will unlock the gate. Mike will put a back in series. Mike also sent gate leading to Lagoon area. + Portage C.
13:00	Driller Taking 1 hr. Lunch We will get water from Frisco Bldg. + Deco at Existing Area P-1R Drillers are set to feed water tank they are getting a hose adapter.
14:00	
17:00	we spent all day setting up, unloading equipment we set up the rig at P-1R we will start drilling in the morning off site
	Greg Sawyer Dan Berwerc

N-1

Daily Field Notes

Project:

Job No.: 645.51.202

By: RGP

Date: 3/18/98

Weather
 Temperature
 Wind
 Humidity
 Surface Conditions

Day	S	M	T	W	T	F	S
Snow							
To 32							
Still							
Dry							
Dry							

Time	Field Notes
7:30	on site RGP & Drillers, start drilling at P-1R, 4 1/4 HSA Pilot hole, Ream to 12 1/4
8:00	Bill Bolio (MDEQ) on-site
9:00	4 1/4 to 14' SS to 16' Doug Cowin and Scott Cornelius + John Bradly agree that we should set the steel casing to 14' in the Ream.
12:00	Augered to 14' w/ 12 1/4 HSA set 10" casing through the augers to 14' everyone off site for lunch
13:00	all on site tomorrow great 10" casing and remove augers. The M-10 Pump on the drill rig isn't working properly
17:00	The casing is grouted + Augers removed at P-1R. We must get more water and deco.
19:00	deco complete, off-site

N-2

Daily Field Notes

Project:

Job No.:

By: RGP

Date: 3/19/98

Weather	S	M	T	W	Th	F	S
Temperature	Snow	Rain	Overcast	Part Clouds	Clear		
Wind	To 32	32-50	50-70	85	85-up		
Humidity	Sil	Mod	High				
Surface Conditions	Dry	Moist	Wet	Frozen			

Time	Field Notes
7:30	RGP on-site drillers are on site setting up at MW-22 AR "We will advance split spurs to identify the depth to the clay down at MW-22 A."
8:00	Bill Bolio on-site
10:00	We didn't observe the clay described at MW-22 A. We think the fill material ends at ~11' & we should be close to the water table so Bill agrees we should set the casing at 11'
12:00	Moyno Pump is repaired. the drillers are having a tough time getting the plug out of the bottom of the 12" HSA
3:30	10" Casing is grouted to 11'
3:45 - 4:30	DeLeon Bill Bolio off-site
5:00	Setup on MW-24 AR
6:00	4 1/4 HSA to 18'. This will be the casing depth off-site.

N-3

Daily Field Notes

Project:

Job No.: 6455/202

By: RGP

Date: 3/20/98

Day:	S	M	T	W	Th	F	S
Weather	Snow	Rain	Overcast	Part Clouds	Clear		
Temperature	To 32	32-50	50-70	85	85-up		
Wind	Sil	Mod	High				
Humidity	Dry	Mod	Humid				
Surface Conditions	Dry	Moist	Wet	Frozen			

Time	Field Notes
7:00	RGP on-site
7:30	drillers on site set 10" casing to 18' w/ 12 1/4 HSA @ MW-24 AR
10:30	Bill Bolio on site we are ready to grout casing
11:30-12:15	Drillers stop cleaning
12:30-13:30	off-site for lunch
	getting water & loading casing
15:00	setting up on MW-25 AR
14:00-15:00	Scott Corneille on-site
16:00	split soon sampled 14-20'

N-4

Day:		S	M	T	W	T	F	S
Weather	Snow	Rain	Clear	Part Clouds	Clear			
Temperature	To 32	50 - 70	50 - 70	85	85 - up			
Wind	WST	Mod	High					
Humidity	Dry	Mod	Humid					
Surface Conditions	Dry	Moist	Wet	Frozen				

Date: 3/21/98

Day:		S	M	T	W	T	F	S
Snow	Rain	Clear		Part Clouds		Clear		
To 32	32 - 60	50 - 70		85		85 - up		
Windy	Moderate	High						
Dry	Moderate	Humid						
Dry	Moist	Wet		Frozen				

[illegible]

Day: S M T W Th F S

Weather	Snow	Rain	Overcast	Part Clouds	Clear
Temperature	To 32	32 - 50	50 - 70	65 - 85	85 - up
Wind	Still	Moder	High		
Humidity	Dry	Moder	Humid		
Surface Conditions	Dry	Moist	Wet		Frozen

Date: 3/24/98

Day					S	M	T	W	T	F	S
Snow	Rain	Overcast	Part Clouds	Clear							
To 32	32 - 50	50 - 70	60	85 - up							
Still	Moder	High									
Dry	Moder	Humid									
Dry	Moist	Wet	Frozen								

Time	Field Notes
10:30	Rd on-site drillers Dan V. & Vince Berner we have since 10:15 we will set-up on MW-126 AR
	Bill Bolio not on-site yet
11:30	Bill Bolio on-site
12-12:30	Lunch
13:00	Start drilling MW-126 AR
16:30	MW-126 AR steel casing is set at 16.2' which is 0.7' into R&T
17:00-18:00	drillers decon. off site

N-8

Daily Field Notes

Project:

Job No.:

By: RG Ratchett

Date: 3/23/98

Weather		Day						
Temperature		S	M	T	W	T	F	S
Wind		Snow	Rain	Overcast	Part Cloud	Clear		
Humidity		To 32	32-50	50-70	70-85	85-up		
Surface Conditions		Wet	Wet	Wet	Wet	Wet	Wet	Wet

Time	Field Notes
7:15	RR on site
7:40	drillers arrive, they need to finish drawing well at NW-186R. then they will move down to the adjacent well.
7:30	down logging complete getting water then set up at P-1R. Bill Eric led down the well since 8:00
8:30	Ready to set up at P-1R
13:30	quilled to 29'. Bill Eric wants to leave the well down set 20-30'. of yellow the water table is a shallow. Bill agrees to move the well to P-29.
12:30-1330	Lunch
14:00	at well
16:30	John Bradley on-site
	Effluent channel for NW-5R
	we agree on the general location.
	we also found a yellow perfect marker post which appears to be on the line Tech Drawing. This agrees with the area we are on.

N-7

Daily Field Notes

Project:

Job No.:

By:

Date: 3/26/98

Weather		Day						
Temperature		S	M	T	W	T	F	S
Wind		Snow	Rain	Overcast	Part Cloud	Clear		
Humidity		To 32	32-50	50-70	70-85	85-up		
Surface Conditions		Wet	Wet	Wet	Wet	Wet	Wet	Wet

Time	Field Notes
7:30	RR on site
8:00	John Bradley on site
	Set up at NW-5R pilot hole #1 adjacent to but west of the yellow pipe
9:45	Set up on NW-5R #2 8' east
11:00	NW-5R #2 complete to 24'
	move to NW-5R #3 8' west of #1
11:30-12:30	Lunch
14:00	Complete NW-5R #3
	Set up on NW-5R #4 6' west of #3

N-8

Daily Field Notes

Project:

Job No.:

By: RGF

Date: 3/27/98

Weather		Day: <u>S</u> <u>M</u> <u>T</u> <u>W</u> <u>T</u> <u>F</u> <u>S</u>	
Temperature	To 32	32-50	Overcast
Wind	50	50-70	Part Clouds
Humidity	50	70	Clear
Surface Conditions	Dry	Moist	Frozen

Time	Field Notes
8:00	RGF on site drilling are set up
	TD advance 12 1/4 HSA at NW-5R
	Drilling proceeds slowly due to the amount of cobble getting caught on the auger
12:00	with casing is set
12:30	Lunch 11-2 drilling casing
2:00	Site cleanup & Decdn
3:00	Set up at NW-24R
	a Cobble at the base of the casing
	The drillers will bring a concrete cutting bit next week to continue NW-24R
4:00	Set up on NW-24R
	It appears that the water level is near the base of the casing so we will install a 5' screen as per John Bradley's instruction
6:00	off site

N-9

Daily Field Notes

Project:

Job No.:

By: RGF

Date: 3/28/98

Weather		Day: <u>S</u> <u>M</u> <u>T</u> <u>W</u> <u>T</u> <u>F</u> <u>S</u>	
Temperature	To 32	32-50	Overcast
Wind	50	50-70	Part Clouds
Humidity	50	70	Clear
Surface Conditions	Dry	Moist	Frozen

Time	Field Notes
7:30	RGF & Drillers on site
	Set up to final grading NW-24R
8:30	NW-24R complete. made the Bill Bolio not on site yet
9:00	Decdn complete set up at NW-25R
	3 feet of gravel in bottom of the casing. Raining. Very heavy at times
	The drillers will shut down & take shelter in their truck during the heavy rain
10:30	with drillers are completing the sand bed in NW-25R
11:00	RGF off site
	while I am gone I will install the well screen & casing installation
	of water completed for 8-11R
	NW-24R & 25R

N-10

Project:

By: RG Patchett

Date: 3/31/98

Day:	S	M	T	W	T	F	S
Snow	Rain	Overcast	Part Clouds	Clear			
To 32	32 - 50	50 - 70	85	85 - up			
Still	Moderate	High					
Dry	Moderate	Humid					
Dry	Moderate	Wet	Frozen				

N-11

Project:

By: RG Patchett

Date: 4/1/98

Day	S	M	T	W	Th	F	S
Snow							
Rain							
Overcast							
Part Cloudy							
Clear							
To 32	32 - 50	50 - 70		85		85 - up	
Still	Moderate	High					
Dry	Moderate	Humid					
Dry	Moist	Wet			Frozen		

N-12

Daily Field Notes

Project: _____

Job No.: _____

By: pr

Date: 4/2/98

Weather
Temperature
Wind
Humidity
Surface Conditions

Day	S	M	T	W	Th	F	S
Snow							
Rain							
Overcast							
Part Clouds							
Clear							
To 32							
32 - 40							
40 - 50							
50 - 60							
60 - 70							
70 - 80							
80 - 90							
90 - 100							
Still							
Light							
Strong							
Dry							
Moist							
Wet							
Frozen							

Time	Field Notes					
7:30	RGP + BTL ON SITE					
10:50	Started pumping [P1-R] Initial water DARK. Cleared quickly					
1200	Stopped pump to get another drum.					
1255	Resumed pumping after lunch					
1350	Field parameters stable Turbidity holding around 6. Stopped pumping and moved on to next well.					
Time	GAL	pH	Temp	Conductivity	Turb	
1105	20	7.68	10.7	0.0235	67	
1106	25	8.58	11.0	0.023	101	
1116	40	8.28	11.3	0.034	20	
1121	48	8.06	11.0	0.258	20	
1126	52	8.61	11.1	0.085	9	
1132	60	7.15	11.4	1.59	8	
1139	70	5.77	11.4	8.91	8	
1145	80	7.67	11.6	0.187	8	
1150	87	7.05	11.5	0.696	15	
1155	99	6.83	11.9	1.21	7	
1200	103	7.21	11.9	0.826	9	
1305	110	8.41	11.0	0.029	25	
1310	117	7.76	10.8	0.219	15	
1315	124	7.16	10.2	0.197	7	
1320	131	7.22	10.2	0.562	6	

N-13

Daily Field Notes

Project: _____

Job No.: _____

By: SL

Date: 4/4/98

Weather
Temperature
Wind
Humidity
Surface Conditions

Day	S	M	T	W	Th	F	S
Snow							
Rain							
Overcast							
Part Clouds							
Clear							
To 32							
32 - 40							
40 - 50							
50 - 60							
60 - 70							
70 - 80							
80 - 90							
90 - 100							
Still							
Light							
Strong							
Dry							
Moist							
Wet							
Frozen							

Time	Field Notes					
	ft from	gal	pH	temp	cond	TURB
	bottom					
1325	2	138	7.07	10.6	256	6
1330	2	148	7.54	10.6	539	6
	MW-5R					
1400	water level: 19.48					
	Depth of well: 27.98 (TOP OF CASING)					
1445	Set up on MW-24R Well					
	pumped dry in about 20 seconds.					
	Drilled down boiler & pump & moved on to MW-25R.					
	Surged well with boiler & brought boiler back to MW-24R.					
	Decoded boiler & bailed MW-24R dry. Bailed approx 5 gal from well throughout the day.					
	MW-24R Depth to bottom: 26.64 ft					
	Depth to water: 19.6 ft					

N-14

Daily Field Notes

Project:

Job No.:

By: BTLDate: 4/2/98Weather
Temperature
Wind
Humidity
Surface Conditions

Day: <table><tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>H</td><td>F</td><td>S</td></tr></table>					S	M	T	W	T	H	F	S
S	M	T	W	T	H	F	S					
Snow	Rain	Overcast	Part Clouds	Clear								
To 32	32 - 50	50 - 70	85	85 - up								
Still	Moder	High										
Dry	Moder	Humid										
Dry	Moist	Wet	Frozen									

Time	Field Notes					
	<u>MW-25R</u> Depth to water: 18.62 Depth to bottom: 28.20 Water column: 4.58					
1602	Began pumping MW-25R					
	From bottom	GAL	pH	Temp	Cond	Turb
1620	.5	20	6.22	10.7	4.37	31
1633	.5	30	6.4	10.2	4.413	44
1640	.5	38	5.6	10.1	39.9	23
1645	.5	45	5.4	10.0	31.9	15
1652	.5	50	5.4	10.1	35.1	13
1658	.5	55	5.4	10.0	40.3	12
1706	.5	67	5.3	9.9	52.8	9
1715	.5	74	5.0	10.1	48.6	8.6
1730	.5	81	4.9	10.0	86.2	14.1
1735	.5	87	5.8	10.0	13.3	11.4
1740	.5	93	5.6	10.2	12	12.5.2
1740	Stopped pumping. Packed up equipment					
1800	Left site.					
	* pumped stayed .5 ft from bottom or well would go dry					

N-15

Daily Field Notes

Project:

Job No.:

By: BTLDate: 4/3/98Weather
Temperature
Wind
Humidity
Surface Conditions

Day: S M T W T H F S				
Snow	Rain	Overcast	Part Clouds	Clear
To 32	32 - 50	50 - 70	85	85 - up
Still	Moder	High		
Dry	Moder	Humid		
Dry	Moder	Wet	Frozen	

Time	Field Notes
	<u>BTL</u>
630	Arrived at field office to finish some paperwork
700	Arrived on site. Drillers decommissioning and setting up on next well.
715	Drillers surged a bailed MW-122-R
	<u>MW-122-R</u>
7:20	Depth to water 10.1 ft
7:22	Started pumping well and well went dry quickly. Water is very dark in color (black). Well will pump for about 15 seconds after 3-4 minutes of recharge. I compressed the end of the tubing to restrict flow & pump ran about 5 minutes before going dry. Drillers are collecting drums and cleaning site.

N-16

Daily Field Notes

Project: _____

Job No.: _____

By: BTLDate: 9/3/98

Weather
Temperature
Wind
Humidity
Surface Conditions

Day: <u>S M T W T H F S</u>					
Snow	Rain	Overcast	Part Clouds	Clear	
To 32	32 - 50	50 - 70	85	85 - up	
Still	Moder	High			
Dry	Moder	Humid			
Dry	Moist	Wet	Frozen		

Time	Field Notes					
807	Water seems to be clearing up at a reduced pump rate. Wells appears to recharge at a rate that will keep up with pump rate.					
	ft from bottom	GAC	pH	Temp	Conc	Turb
843	-	16	7.4	9.2	~~2.45~~ 4.45	186
915	-	23	6.3	9.1	4.19	74
938	-	26	5.6	9.2	15.5	33
955	-	29	5.8	9.2	16.5	18
1010	-	32	5.6	9.5	15.0	43
1030	-	37	5.8	9.2	16.2	87
1100	-	42	5.9	9.3	8.7	21
1115	-	44	5.8	9.1	17.3	12
1130	-	46	5.8	9.1	15.9	27
1145	-	48	5.4	9.2	26.1	14
1200	-	51	4.2	9.2	25.1	16
1220	-	55	8.7	9.1	0.601	9
1230	-	57	7.5	9.2	0.822	9
1240	-	59	7.4	9.1	0.629	9
1315	Left site for lunch & paperwork at office					
1415	BACK ON SITE					
1520	Started pump on MW-5R					

N-17

Daily Field Notes

Project: _____

Job No.: _____

By: BTLDate: 9/3/98

Weather
Temperature
Wind
Humidity
Surface Conditions

Day: <u>S M T W T H F S</u>					
Snow	Rain	Overcast	Part Clouds	Clear	
To 32	32 - 50	50 - 70	85	85 - up	
Still	Moder	High			
Dry	Moder	Humid			
Dry	Moist	Wet	Frozen		

Time	Field Notes					
	^{ft from bottom} GAC	pH	Temp	Conc	Turb	
1534	.5 21	6.16	11.9	6.18	59	
1545	.5 1789	6.33	11.9	4.46	75	
1555	.5 49	6.74	12.4	4.41	70	
1607	.5 10	7.8	12.3	1.17	55	
1620	.5 50	6.16	12.3	6.06	25	
1635	.5 60	4.11	12.3	~~4.46~~	15	
1647	.5 70	4.36	11.8	3.04	19	
1655	.5 78	4.46	12.4	2.31	7	
1703	.5 87	7.98	11.9	—	6.8	
1707	.5 91	4.20	11.8	—	8.8	
1712	.5 96	4.24	12.1	11.4	12.4	
1718	.5 101	4.89	12.1	37.8	8.9	
1722	.5 110	4.91	12.1	66.4	9.9	
1734	.5 120	5.91	11.6	13.4	9.0	
1800	Left THE SITE					
*	Bill Bolivar arrived on site to oversee MW 5R development.					

N-18

Daily Field Notes

Project: _____

Job No.: _____

By: BTLDate: 4/4/98Weather
Temperature
Wind
Humidity
Surface ConditionsDay: S M T W T H F S

Snow	Rain	Overcast	Part Clouds	Clear
To 32	32 - 50	50 - 70	85	85 - up
Still	Mod	High		
Dry	Mod	Humid		
Dry	Moist	Wet		Frozen

Time	Field Notes																																			
700	BTL on site for BTL																																			
710	Arrive at site. Mateco Drilling (Dan) deconed pump and set up on MW-126.																																			
720	Went to office to get a disposable bailer. Mateco's going to bail MW-24R and MW-22R.																																			
750	Started pumping on MW-126R at a reduced pump rate.																																			
	<u>[MW-126R]</u>																																			
	<table border="1"> <thead> <tr> <th></th> <th>GAL</th> <th>pH</th> <th>Temp</th> <th>Cond</th> <th>Turb</th> <th>Bottom</th> </tr> </thead> <tbody> <tr> <td>820</td> <td>25</td> <td>6.12</td> <td>10.4</td> <td>11.6</td> <td>5.4</td> <td>—</td> </tr> <tr> <td>840</td> <td>35</td> <td>5.56</td> <td>11.1</td> <td>7.25</td> <td>2.9</td> <td>—</td> </tr> <tr> <td>900</td> <td>45</td> <td>5.52</td> <td>11.2</td> <td>26.2</td> <td>8</td> <td>—</td> </tr> <tr> <td>910</td> <td>50</td> <td>5.03</td> <td>11.2</td> <td>29.2</td> <td>45</td> <td>—</td> </tr> </tbody> </table>		GAL	pH	Temp	Cond	Turb	Bottom	820	25	6.12	10.4	11.6	5.4	—	840	35	5.56	11.1	7.25	2.9	—	900	45	5.52	11.2	26.2	8	—	910	50	5.03	11.2	29.2	45	—
	GAL	pH	Temp	Cond	Turb	Bottom																														
820	25	6.12	10.4	11.6	5.4	—																														
840	35	5.56	11.1	7.25	2.9	—																														
900	45	5.52	11.2	26.2	8	—																														
910	50	5.03	11.2	29.2	45	—																														
920	Packed meters and moved to MW-22R. Dan deconed pump and set up on MW-22R.																																			
950	Began pumping MW-22R. Recharge is very slow and will not sustain pumping.																																			

N-19

Daily Field Notes

Project: _____

Job No.: _____

By: BTLDate: 4/4/98Weather
Temperature
Wind
Humidity
Surface ConditionsDay: S M T W T H F S

Snow	Rain	Overcast	Part Clouds	Clear
To 32	32 - 50	50 - 70	85	85 - up
Still	Mod	High		
Dry	Mod	Humid		
Dry	Moist	Wet		Frozen

Time	Field Notes																							
1050	DAN (Mateco) set final pad and emptied drums. BTL let MW-22R recharge completely in order to determine well volumes. Static water level was not taken prior to bailing and pumping of well. Well was surged on 4/3/98 and 6 gallons were removed. Roughly 6 more gallons have been bailed or pumped from the well today 4/4.																							
	Depth to water table = 12.00																							
	Total Depth = 17.0																							
	Height of water column = 4.4 ft																							
	One well volume = 2.87 gal																							
	Three well volumes = 8.61 gal																							
	<u>[MW-22R]</u>																							
	<table><tr><th>gal</th><th>pH</th><th>Temp</th><th>Cond</th><th>Turb</th></tr><tr><td>1130</td><td>10</td><td>4.04</td><td>11.1</td><td>129</td><td>15.5</td></tr><tr><td>1140</td><td>11</td><td>4.51</td><td>10.8</td><td>163</td><td>5.72</td></tr><tr><td>1150</td><td>11.5</td><td>4.32</td><td>10.8</td><td>145</td><td>4.71</td></tr></table>	gal	pH	Temp	Cond	Turb	1130	10	4.04	11.1	129	15.5	1140	11	4.51	10.8	163	5.72	1150	11.5	4.32	10.8	145	4.71
gal	pH	Temp	Cond	Turb																				
1130	10	4.04	11.1	129	15.5																			
1140	11	4.51	10.8	163	5.72																			
1150	11.5	4.32	10.8	145	4.71																			
1210	Due to low pump rates 4 well volumes were taken from MW-22R. All of the field parameters stabilized and the turbidity was below 5 NTU.																							

N-20

Day: **S M T W T F S**

Weather	Snow	Rain	Overcast	Part Clouds	Clear
Temperature	To 32	32 - 50	50 - 70	65	85 - up
Wind	Still	Moderate	High		
Humidity	Dry	Moderate	Humid		
Surface Conditions	Dry	Moist	Wet	Frozen	

Date: 4/4/98

Weather	Snow	Rain	Overcast	Part Clouds	<u>Clear</u>
Temperature	To 32	62 - 70	50 - 70	65	65 - up
Wind	Still	<u>Moder</u>	High		
Humidity	Dry	<u>Moder</u>	Humid		
Surface Conditions	Dry	<u>Moist</u>	Wet		Frozen

Time	Field Notes
	Pumping rates on MW-22R were about 1 gallon every ten (10) minutes.
1210	Dan from Mateco went to find locks for the new wells.
	While BTL was pumping MW-22R Dan finished casing MW-122R. In addition Dan continued to bail MW-24R. A total of 6 gallons were bailed from MW-24.
1230	PACKED METERS FOR SHIPMENT AND DROVE THROUGH ENTIRE SITE TO MAKE SURE EVERYTHING WAS CLEANED.
1340	LEFT SITE AFTER LOCKS WERE PUT ON WELLS.

		Day: <table border="1"> <tr> <td>S</td> <td>M</td> <td>T</td> <td>W</td> <td>T</td> <td>H</td> <td>F</td> <td>S</td> </tr> </table>							S	M	T	W	T	H	F	S
S	M	T	W	T	H	F	S									
Weather	Snow	Rain	Overcast	Part Clouds		Clear										
Temperature	To 32	32 - 50	50 - 70	85		85 - up										
Wind	Still	Modest	High													
Humidity	Dry	Modest	Humid													
Surface Conditions	Dry	Moist	Wet	Frozen												

Date:

Weather	Snow	Rain	Overcast	Part Clouds	Clear
Temperature	To 32	32 - 50	50 - 70	85	85 - up
Wind	Still	Moder	High		
Humidity	Dry	Moder	Humid		
Surface Conditions	Dry	Moist	Wet		Frozen

[illegible]

Borehole Headers

- Drilling/Geologist Information
- Drilling Method Information
- Water Levels
- Location Sketches



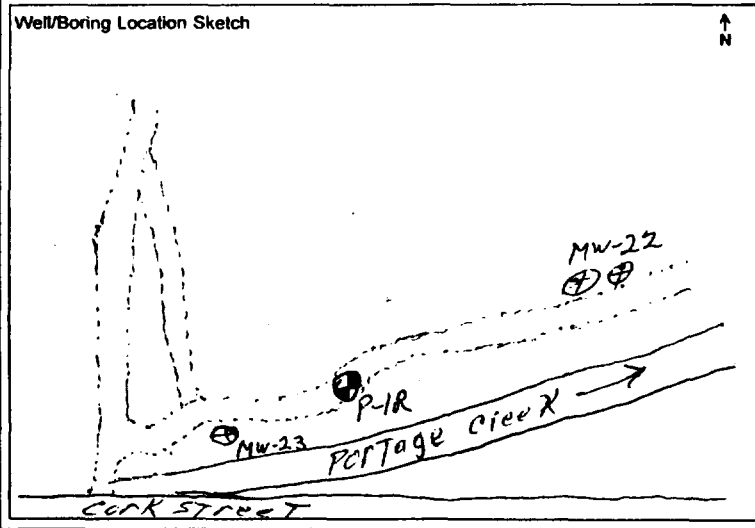
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Borehole Number: P-1R Record Pages BR-3 and BR-23
 Project Name: Allied Paper Rig Type(s): CME-750 ATV
 Site Location: Kalamazoo Drilling Method(s): 4 1/4 & 12 1/4
 Date Started/Finished: 3/18/13/25/98 Bit Size(s): Hollow Stem Augers
 Drilling Company: MATECO Auger Size(s): 4 1/4 & 12 1/4 ID
 Driller's Name: Greg Sawyer Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: 290'
 Geologist's Signature: [Signature] Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

Well/Boring Location Sketch



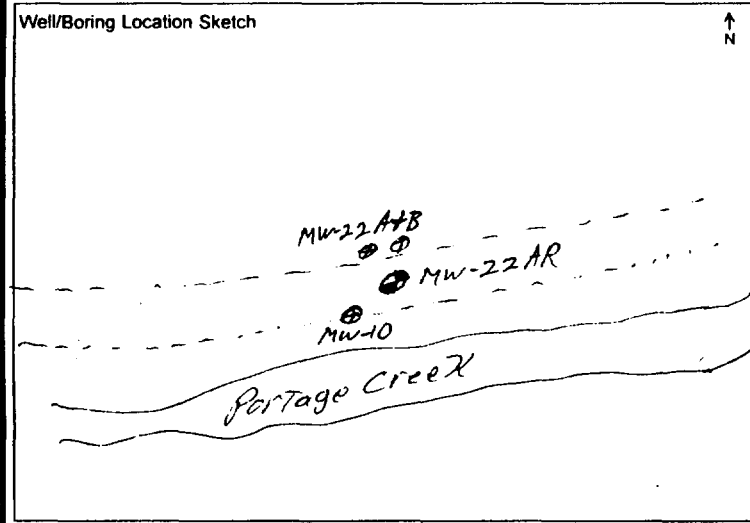
BH - 1

Borehole Number: MW-22AR Record Pages BR-5 to _____
 Project Name: _____ Rig Type(s): CME-750-ATV
 Site Location: _____ Drilling Method(s): HSA
 Date Started/Finished: 3/19 Bit Size(s): _____
 Drilling Company: MATECO Auger Size(s): 4 1/4 & 12 1/4
 Driller's Name: Dan Verwoert Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: _____
 Geologist's Signature: [Signature] Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

Well/Boring Location Sketch



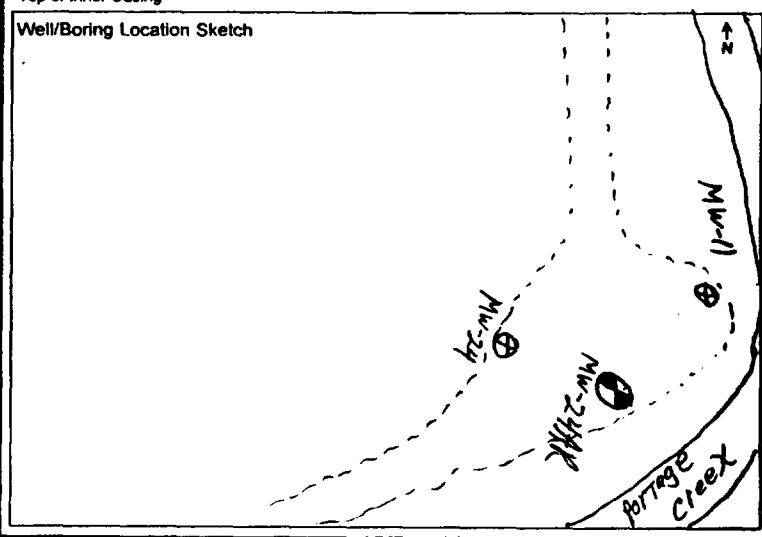
BH - 2

Borehole Number: MW-24AR Record Pages ER-9 to _____
 Project Name: _____ Rig Type(s): CME 750 ATV
 Site Location: _____ Drilling Method(s): Horizontal Auger
 Date Started/Finished: 3/19/3/27/98 Bit Size(s): _____
 Drilling Company: Mateco Auger Size(s): 4 1/4 + 12 1/4"
 Driller's Name: Greg Sawyer Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: 240'
 Geologist's Signature: _____ Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

Well/Boring Location Sketch



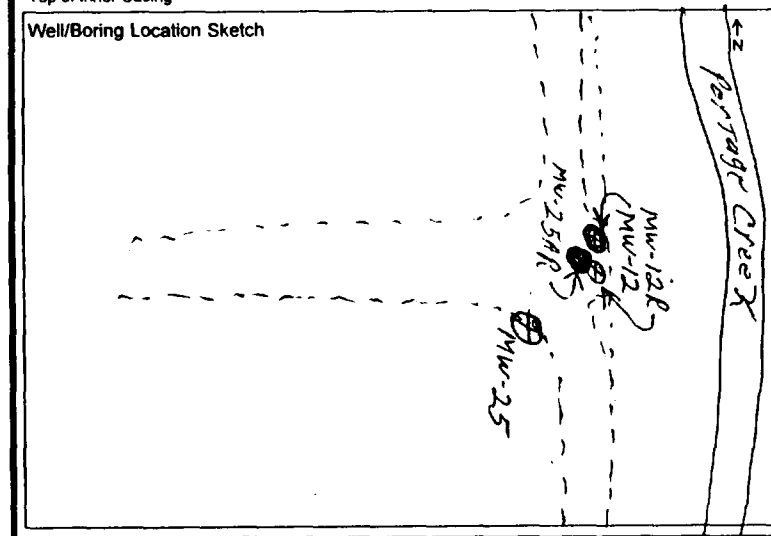
BH - 3

Borehole Number: MW-25AR Record Pages BR-13 to _____
 Project Name: _____ Rig Type(s): CME-750-ATV
 Site Location: _____ Drilling Method(s): HSA
 Date Started/Finished: 3/20/3/28/98 Bit Size(s): _____
 Drilling Company: Mateco Auger Size(s): 4 1/4 + 12 1/4"
 Driller's Name: Greg Sawyer Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: 23.2'
 Geologist's Signature: Rob Patchett Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

Well/Boring Location Sketch



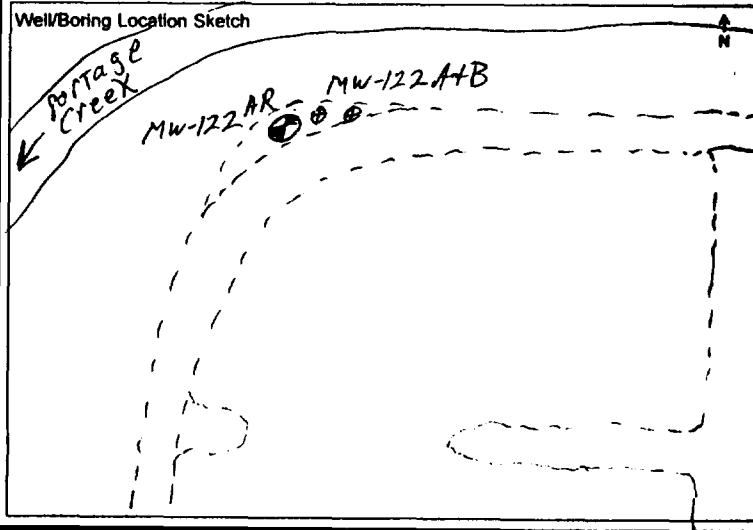
BH - 4

Borehole Number: MW-122AR Record Pages BR-17 to BR-18
 Project Name: _____ Rig Type(s): CME-750 ATV
 Site Location: _____ Drilling Method(s): Hollow Stem Auger
 Date Started/Finished: 3/21 3/31/98 Bit Size(s): _____
 Drilling Company: MATECO Auger Size(s): 4 1/4" x 12 1/4" ID
 Driller's Name: Dan Verwoert Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: 19.3'
 Geologist's Signature: R. Patchett Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

Well/Boring Location Sketch



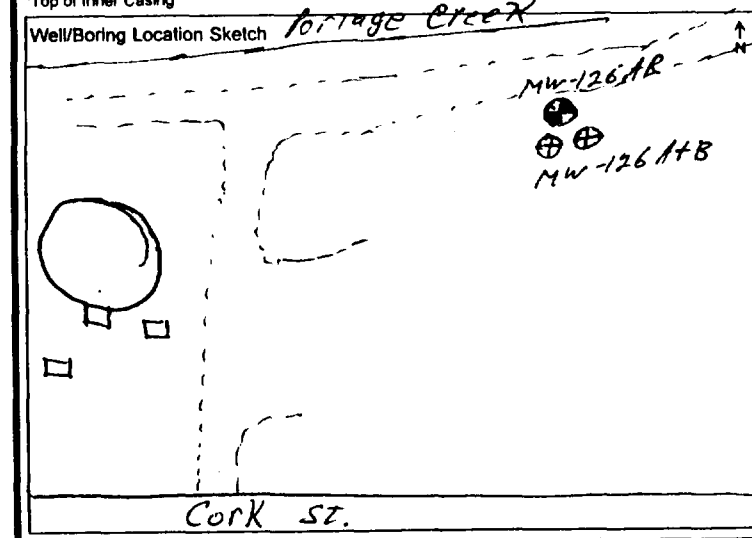
BH - 5

Borehole Number: MW-126AR Record Pages BR-21 to _____
 Project Name: _____ Rig Type(s): CME-750 ATV
 Site Location: _____ Drilling Method(s): Hollow Stem Auger
 Date Started/Finished: 3/24 Bit Size(s): 4 1/4" x 12 1/4" ID
 Drilling Company: MATECO Auger Size(s): 5
 Driller's Name: _____ Auger/Split Spoon Refusal: _____
 Geologist's Name: R.G. Patchett Total Depth of Borehole: _____
 Geologist's Signature: R.G. Patchett Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)

*Top of Inner Casing

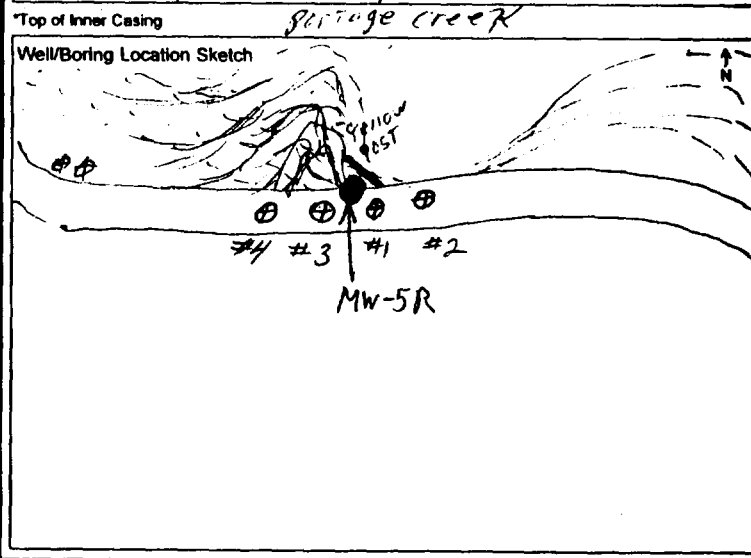
Well/Boring Location Sketch



BH - 6

Borehole Number: MW-5R #1,2,3+4 Record Pages BR-25 to BR-38
 Project Name: _____ Rig Type(s): CME 750 ATV
 Site Location: _____ Drilling Method(s): HSA
 Date Started/Finished: 3/26/98 Bit Size(s): _____
 Drilling Company: MATECO Auger Size(s): 4 1/4
 Driller's Name: Dan V. Auger/Split Spoon Refusal: _____
 Geologist's Name: Rob Patchett Total Depth of Borehole: _____
 Geologist's Signature: [Signature] Total Depth of Corehole: _____

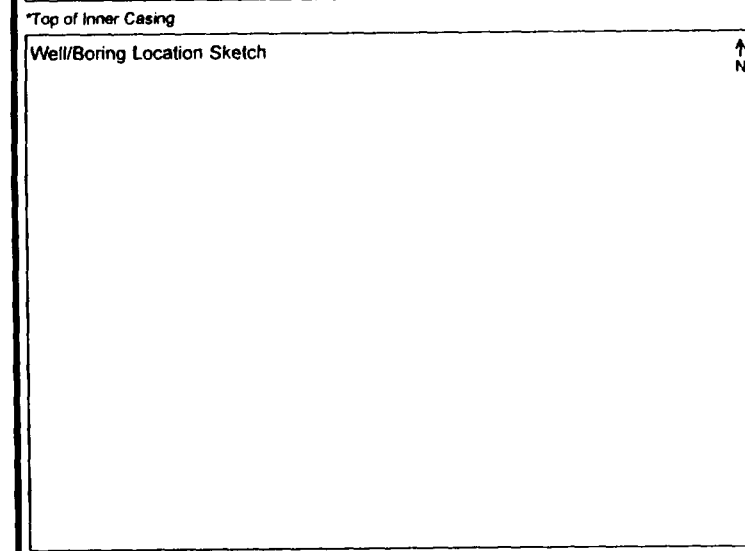
Water Level (TIC)*		
Date	Time	Level (Feet)



BH-7 Clarifier

Borehole Number: _____ Record Pages _____ to _____
 Project Name: _____ Rig Type(s): _____
 Site Location: _____ Drilling Method(s): _____
 Date Started/Finished: _____ Bit Size(s): _____
 Drilling Company: _____ Auger Size(s): _____
 Driller's Name: _____ Auger/Split Spoon Refusal: _____
 Geologist's Name: _____ Total Depth of Borehole: _____
 Geologist's Signature: _____ Total Depth of Corehole: _____

Water Level (TIC)*		
Date	Time	Level (Feet)



BH-8

[illegible]

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Borehole No.: P-1R Page 1 of 2
 Date(s): 3/13/78 Header Page: BH-1
 Geologist: Rob Patchett Signature: _____

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
1	8:12	1	SS	3 4	7	1.2	NA	
2				3 3				
3		2		3 4	8	1.5		
4				4 4				
5	8:20	3		4 3	5	2.0		
6				2 1				
7	8:27	4		1 2	4	1.8		
8				2 3				
9		5		1 2	4	0.7		
10				2 2				
11	8:35	6		1 1	2	0.6		
12				1 1				
13		7		WOR	1	0.7		
14				1 1				
15	9:00 3/8	8		1 2	6	1.5	V	
16				4 6				
17		9						
18								
19		10						

Continued on BR-23
 BR-3

Comments: Drilled w/ 4 1/4 HSA TO 14'
Reamed w/ 12 1/4 HSA TO 14' & SET
10" STEEL CASING at 14'

Stratigraphic Description	Sketch
0- <u>Brown f-c SAND trace SILT</u>	
<u>trace f. gravel Damp (fill)</u>	
<u>5.5-6.5 Brown f SAND, SILT & clay, cohesive</u>	
<u>5.8-6.5 same as 0-5</u>	
<u>6.5-7.0 Black cinders or slag</u>	
<u>7.0-10.5 Brown f-c SAND, some</u>	
<u>SILT moist</u>	
<u>10.5-12.5 Gray & Black f-m SAND, little</u>	
<u>gray clay, trace Black cinders</u>	
<u>moist</u>	
<u>12.5-13 gray clay</u>	clay 12.5'
<u>13-14 black organic Peat wet</u>	peat 14'
<u>14-16 Gray f-m SAND, some SILT</u>	
<u>moist</u>	

BR-4

Borehole No.: MW 22 AR Page 1 of 1

Date(s): 3/19/98 4/1/98 Header Page: BH-2

Geologist: Rob Patchett Signature: Rob Patchett

Depth (feet)	Time	Sample/Run No.	Sample Interval Type	Blows on Sampler	N Value/RQD	Recovery (Ft-in)	PID/FID	Geologic Column (USCS Symbol)
1		1	SS		NA			
2		2			NA			
3								
4				9 10	22			
5		3		12 12				
6				15 15	27			
7		4		12 10				
8				7 7	16			
9		5		9 13				
10				14 17	31			
11		6		14 12				
12								
13	4/1/98		COBBLE					
14	14:30			2 2	4	1.4		
15				2 2				
16				woh 1	2	1.3		
17				1 1				
18								
19								

BR - 5

Comments: advanced 2" split spoons 0-12' w/o HSA
advance 12 1/4 HSA w/ Plug to 11'
Casing grouted in to 11'

Stratigraphic Description	Sketch
0-4.5'	
Brown m. SAND damp, some f. sand	
4.5-5.5'	
Gray f-m SAND, some SILT	
Damp	
5.5-5.6' Lt. Gray Clay	
5.6-7.0' Gray f-m SAND some SILT, Trace	
Gravel. (we were pushing a m. GRAVEL resulting in High Blow counts)	
7.0-7.1' Gray C SAND + f. GRAVEL, Little	
SILT + clay trace cinders Damp	
(f.m.) Brown	
9.0-11.0' Gray f SAND + SILT some f gravel damp (Angular)	
11.0-12' Lt gray f-m SAND, Little f. rounded gravel, damp	
12.5-15' Gray f-m SAND + SILT wet	
15.5-17' Black SILT + f. Sand + decayed leaves + roots (Peat) moist	

BR - 6

Borehole No.: MW-24 JR Page 1 of 1
 Date(s): 3/19/98 3/27/98 Header Page: BH-3
 Geologist: Rob Patchett Signature: Rob Patchett

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft.-In)	PID/FID	Geologic Column (USCS Symbol)
0			HSA no samples					
14	17:00	1	SS	4 6	11	1.5		
16	17:25	2		5 5				
18	17:30	3		2 2	6	1.0		
20	3/27			4 4				
22				3 2	4	1.0		
24				2 3				
26				8 10	20	1.5		
				10 4				
				4 6	15	1.5		
				9 10				
				5 9	19	1.5		
				10 12				

BR - 9

Comments: 4 1/4" HSA to 18', SS to 20' then
Ream the hole to 18' w/ 12 1/4 HSA to
Set 10" Casing to 18'

Stratigraphic Description	Sketch
0-14' no samples	
14-16.5' Brown f-c SAND and SILT Trace f. gravel (rounded) + clay cohesive, damp (fill)	
16.5-17.5 ALTERNATING sequences (3) of lt. gray f-m SAND + Black SILT w/ rootlets (peat) wet (perched)	
17.5-18.5 Black SILT + f. SAND Some rootlets damp (peat)	
18.5-20 Gray f-m SAND + ~~SILT~~ + SILT Some ~~SILT~~ damp to moist, plastic Clay	
20-22 Gray f-m SAND, little C sand little f gravel trace silt wet	
22-23 SAA	
23-24 Gray Clay, stiff moist plastic	
24-26 SAA	

BR - 10

Borehole No.: MW-25R Page 1 of 1Date(s): 3/20 3/28 Header Page: _____Geologist: Rob Patchett Signature: Rob Patchett

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
14	↓							
15	15:30	①	SS	8 6	12	1.6		
16				6 4				
17	15:40	②		5 4	9	1.5		
18				5 5				
19	15:50	3		6 6	12	1.8		
20				9 12				
18	3/28/98			4 16	29	1.3		
				13 9				
20				2 2	4	1.3		
				2 3				
22				4 6	16	1.8		
				10 16				
24								

BR - 13

Comments: _____

Set Steel casing at 17'

Stratigraphic Description	Sketch
14-15' ~~gray~~ 17-18' ~~gray~~ f SAND	
Trace gravel damp	
15-17' ~~gray~~ f-c SAND and SILT	
Some f. gravel damp cohesive	
17-18' Black SILT, some f. sand	
w/ rootlets (peat) damp	
18-19.5' Gray f-c SAND, some f gravel	
Little SILT, wet	
19.5' → Gray f. SAND, little m sand	
Trace f. gravel wet.	
20-22' Gray f-m sand Little c sand	
Wet LOOSE	
22-23' SAA	
23-24' Gray f SAND and SILT	
Dense Damp	

BR - 14

Borehole No.: MW-122AR Page 1 of 1

Date(s): 3/21/98 3/31/98 Header Page: BH-5

Geologist: Rob Patchett Signature: Rob Patchett

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/ROD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
1			SS	2 3	6	1.0		
2				3 3				
3				4 4	7	1.4		
4				3 2				
5				2 2	4	1.0		
6				2 2				
7				2 2	4	2.0		
8				2 2				
9								
10								
11	3/31/98	1130		3 2	4	1.8		
12				2 2				
13				1 2	4	1.8		
14				2 22				
15			cobbles					
16				6 5	31	1.7		
17				26 5				
18				5 4	9	0.9		
19								

BR - 17

Comments: _____

set steel casing at 7.9'

Stratigraphic Description	Sketch
0-8 Brown f-m SAND, little c sand	
Trace f gravel, damp (fill)	
(Black f sand lense 2.5-2.6')	
grades to moist ~7'	
10-14 SAA wet at 12'	
14-15.5 Cobble	
16-17 SAA	
17-17.5 Gray Brown f SAND &	
SILT w/little f-m	
Gravel wet	
17.5-19.0 Black SILT & root ~~FB~~	
Damp (peat)	

BR - 18

Borehole No.: MW-126AR Page 1 of 1
 Date(s): 3/24/98 4/1/98 Header Page: BH-6
 Geologist: Rob Patchett Signature: Rob Patchett

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
10			HSA					
11	13:30	1	SS	WOR	1	1.7		
12				1 2				
13	14:00	2		2 2	4	2.0		
14				2 2				
15	14:15	3		1 1	2	2.0		
16	4/1/98 9:00			1 2	4	1.6		
18				2 8				
20				2 10	15	1.4		
				5 5				
22	9:30			3 6	15	1.4		
				9 9				

BR - 21

Comments: Advance 12" HSA TO 10', COLLECT SS 10-12, 12-14, 14-16 set 10" steel casing at 16.2'

Stratigraphic Description	Sketch
10-11.6 Lt gray clay w/some paper fibers stiff, little sand	
11.6-11.7 Black silt like material moist	
11.7-15.5 Lt gray paper fiber, little clay moist	
15.5 → Black silt + f. sand w/ rootlets + decayed leaves (peat) damp	
16.5 → 17.5 SAA (wet)	
17.5 Gray Brown f-c sand some f. rounded gravel wet	
18-18.5 SAA	
18.5-19.5 gray mottled clay dense damp	
19.5-21.5 gray silt + f. sand wet	
21.5-22 gray clay dense damp	

BR - 22

Continued from BR-3

Borehole No.: P-1R Page 2 of 2
 Date(s): 3/25/98 Header Page: BH-1
 Geologist: Rob Patchett Signature: _____

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft. In)	PID/FID	Geologic Column (USCS Symbol)
14				3 4				
15	11:15		SS	3 4	9	1.3		
16				5 3				
17				2 3	10	1.2		
18				5 7				
19				WUH 4	10	1.8'		
20				6 4				
21	11:50			3 4	10	1.6		
22				6 8				
23	12:05			2 2	11	1.1		
24				9 9				
25	12:25			4 5	12	1.0		
26				7 9				
27				2 7	18	1.0		
28				11 13				
29								
30								

BR - 23

Comments: 4' of grout was in the bottom of the casing
4 1/4 HSA to 14' & STRAIT SPLIT SPOONS

Stratigraphic Description	Sketch
14-17.5'	
DK GRAY f-m SAND, Little C. sand	
LITTLE SILT, moist to wet.	
17.5'-19.0' Black SILT same f. sand and	Sand
ROOTLETS DAMP (PEAT)	peat
19.0-19.6 DK GRAY f-m SAND, Little C sand	Sand
& SILT WET	peat
19.6' PEAT as above damp	
20-23 Same	
23-24 DK GRAY f-m Sand same SILT	
LITTLE C Sand (Rounded QUARTZ)	Sand
WET. grades	
24'-29' gray olive f-m SAND, trace	
SILT wet grades finer w/ depth	

BR - 24

Borehole No.: MW-5R(1) Page 1 of 2
 Date(s): 3/26 Header Page: BH-7
 Geologist: Rob Patchett Signature: _____

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (FI-In)	PID/FID	Geologic Column (USCS Symbol)
2	8:00	1	55" / 2"	5 5 8 5	13	1.5		
4	8:10	2	2" /	5 4 3 2	7	1.6		
6	8:23	3	2" /	1 2 2 1	4	1.5		
8	8:28	4	2" /	1 1 3 3	4	1.7		
10	8:33	5	2" /	2 5 13 6	18	0.5		
12	8:38	6	2" /	6 7 7 6	14	0.3		
14	8:45	7	3" / 55"	6 10 11 6	21	0.4		
16	8:53	8	3" /	3 4 5 11	9	0.8		
18	9:05	9	3" /	13 7		0.2		
20		10	3" /	5 3		0.4		
21	9:12	11	3" /	5 3		0		
		12	3" /	3 4 4 BR-25	8	1.1		

Comments: _____

Stratigraphic Description	Sketch
0-2.5 Brown f+MSAND some C sand Trace SILT Damp Loose (FI:1)	
2.5-2.6 gray f+MSAND Damp	
0.5" Light gray Clay @ 3.4'	
Brown Paper (cardboard) 6.0'	
~~Card B~~	
6-8 Brown & Black Cardboard, Elastic & SAND (land fill waste)	
8-10 SAA wood in the nose of the skin	
10-12 White Tissue Paper in nose of skin 2"	
12-14 White Tissue Paper in nose 2" moist	
B Augers are grinding against something hard maybe METALLIC?	
14-16 Black SAND over 4" of wood w/ Nail & Painted screen mesh moist	
16-17, 17-18, & 18-19 White Paper	
19-21" 6" of bright white Paper Like Tissue Paper	

Geologist: _____ Signature: _____

[illegible]

BR - 27

Comments: _____

[illegible]

BR - 28

Borehole No.: MW-5R #2 Page 1 of 2
 Date(s): 7/26 Header Page: BH-7
 Geologist: _____ Signature: _____

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (ft-in)	PID/FID	Geologic Column (USCS Symbol)
2	9:45	1	2"	5 9 8 5	17	1.4		
4	9:50	2	2"	2 2 2 2	4	1.5		
6	9:55	3	2"	WCH 1 2 2	3	0.8		
8	10:00	4	2"	1 2 2 4	4	0.1		
10		5	3"	4 5 9 12	14	0.4		
12	10:10	6	2"	7 9 3 7	12	0.4		
14	10:22	7	3"	4 6 13 12	19	0.5		
16	10:25	8	2"	3 5 6 9	11	0		
18	10:34	9	3"	7 6 5 6	11	0.2		
20	10:38	10	3"	5 4 2 3	6	0.4		

BR - 29

Comments: _____

Stratigraphic Description	Sketch
0-2 Brown f-C SAND, little f. gravel Trace SILT - damp (fill)	
2-4 DK Brown to gray f-m SAND, little SILT damp	
4-5.5 SAA	
5.5 Paper & wood & plastic trash	
6-8 no Recovery Little lt gray clay in nose	
8-10 Black f-m SAND & plastic & rope	
10-12 SAA w/wood	
12-14 Bright white tissue paper & plastic & wood in a Brown f-m sand matrix	
14-16 no Recovery	
16-18 Paper & wood & sand moist	
18-20 Brown cardboard	

BR - 30

Geologist: _____ Signature: _____

[illegible]

Comments: _____

[illegible]

Borehole No.: MW-5R #3 Page 1 of 2
 Date(s): 3/26 Header Page: BH-7
 Geologist: _____ Signature: _____

Depth (feet)	Time	Sample/Run No	Sample Interval/Type	Blows on Sampler	N Value/ROD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
2	12:50	1	2"	6 7 6 4	13	1.5		
4	12:55	2	2"	4 8 5 3	13	1.5		
6	13:00	3	2"	2 2 2 2	4	1.2		
8	13:05	4	2"	1 1 1 1	2	0.3		
10		5	3"	1 3 17 38	20	0.2		
12	13:20	6	3"	3 3 3 3	6	1.2		
14	13:26	7	3"	WOR 3 5 4	8	1.1		
16	13:30	8	3"	4 6 5 7	11	0.1		
18	13:37	9	3"	6 5 3 4	8	1.4		
20	13:42	10	3"	4 6 7 8	13			

BR - 33

Comments: _____

Stratigraphic Description	Sketch
0-2 Brown f-C SAND, Little f gravel Little SILT DRY	
2-4 lt. gray f-m SAND Little C sand	
4-6 SAA w/ a piece of R/V wood & Plastic in the nose of the spoon Damp	
6-8 lt. gray f-m SAND	
8-10 SAA we MUST be pushing a Piece of Wood	
10-12 gray to Black f-C SAND cinders and slag	
12-14 SAA w/ lt. Brown f-m SAND from 13.5-13.9	
14-16 lt. gray f SAND & SILT & PLASTIC (stuff) in the end of the spoon	
16-17.5 Black f-C SAND, cinders & slag	
17.5-18 wood	
18-20 Black f-C SAND & f. Rounded gravel some cinder & decayed wood. Little seam of white clay like material < 0.3"	

BR - 34

Borehole No.: MW-5R #3 Page 2 of 2

Date(s): 3/26/98 Header Page: _____

Geologist: Rob Pathe Signature: Rob Pathe

[illegible]

BR - 35

Comments: _____

[illegible]

BR - 36

Borehole No.: MW-5R #4 Page 1 of 1

Date(s): 3/26/98 Header Page: BH-7

Geologist: Rob Patchett Signature: _____

Depth (feet)	Time	Sample/Run No.	Sample Interval/Type	Blows on Sampler	N Value/RQD	Recovery (Ft-in)	PID/FID	Geologic Column (USCS Symbol)
0	14:30							
8	HSA ↓							
10	1445	1	3"	3 4 11 7	15	1.3		
12	1450	2	3"	17 50/4	750	0.3		
14	1500	3	3"	6 14 16 14	30	0.3		
16		4	3"	7 8 9 9	17	1.0		
18	1510	5	3"	6 12 9 4	21	1.0		
20	1515	6		3 4 4 9	8	0.6		

BR - 37

Comments: _____

Stratigraphic Description	Sketch
8-9 DK Gray f-c SAND, some SILT	
9-10 Brown f-m SAND and plastic, moist	
10-11 SAA w/ 1" pieces of fiberglass	
12-14 SAA	
14-16 Black f-c SAND little Cinders & slag moist	
16-17.5 3AA	
17.5-18 Black SILT like material Damp spongy & shiny?	
18-20 Black f-c SAND, little Cinders moist	

BR - 38

Geologist: _____ Signature: _____

Depth (feet)	Time	Sample/ Run No.	Sample Interval/ Type	Blows on Sampler	N Value/ROD	Recovery (Ft-In)	PID/FID	Geologic Column (USCS Symbol)
20	1530		2' /	14 21	42	1.0		
22			21 18					
24			2" /	21 30	50	1.3		
26			29 23					
			8 16		28	1.2		
			12 10					

BR - 39

Sketch

20-26' f.m
Black sand & some silt
& decayed organics w/ putrid odor

BR - 40

Well Completion and Development Records

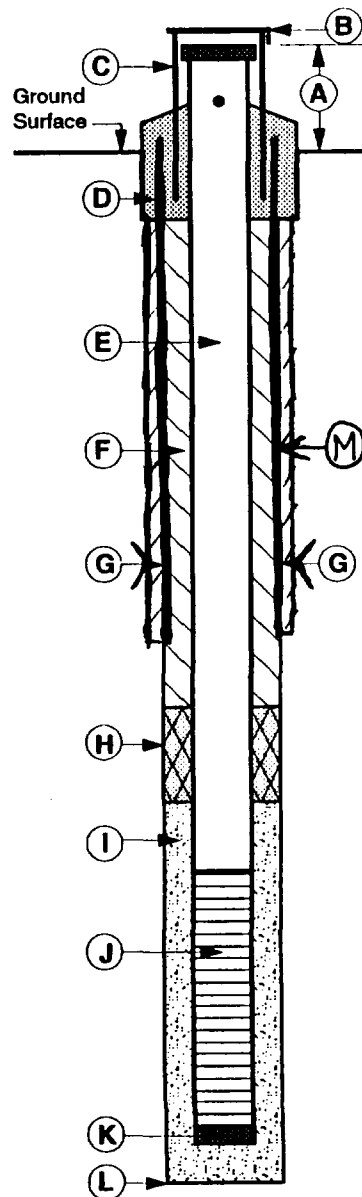
.....

- Well Development Details
- Well Completion Records/Parameter
Measurements



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Screened Monitoring Well Completion Detail



Screened Well # P-1R

A. Stick-Up
Length -0.5

B. Key No., _____

C. Protective Casing
Diameter flush mount
Material 6" cover
Length _____
Depth to Bottom _____

D. Surface Completion
Diameter 2 feet
Depth 1.5 feet
Material concrete

E. Well Casing
Diameter 2"
Material #304 stainless
Length 18.5'
Depth to Bottom 19.0'

F. Grout
Depth to Top 1.5
Depth to Bottom 15.0
Material quick grout

G. Borehole Diameter 8"

H. Bentonite Seal
Depth to Top 15.0
Depth to Bottom 17.2

I. Pack Type/Size
Depth to Top 17.2
Depth to Bottom 29.0
Material #10 Merie

J. Screen
Depth to Top 19.0
Depth to Bottom 29.0
Material #304 stainless
Slot 0.010"

K. Bottom Cap
Material stainless 304
Length 0.0

L. Boring Depth 29'

Additional Information
M. Steel Casing
10" 0.6-14.0'

W - 1

Screened Well # MW-24R Screened Well # MW-24R Screened Well # MW-25R

A. Stick-Up
Length _____

B. Key No., _____

C. Protective Casing
Diameter 4"
Material flush mount
Length _____
Depth to Bottom _____

D. Surface Completion
Diameter _____
Depth _____
Material concrete

E. Well Casing
Diameter 2"
Material stainless steel
Length _____
Depth to Bottom _____

F. Grout
Depth to Top 2
Depth to Bottom 15.5
Material quick grout

G. Borehole Diameter 8"

H. Bentonite Seal
Depth to Top 15.5
Depth to Bottom 18.0

I. Pack Type/Size
Depth to Top 18.0
Depth to Bottom 24.0
Material #10 Merie sand

J. Screen
Depth to Top 19.0'
Depth to Bottom 24.0'
Material stainless steel
Slot 0.010 inch

K. Bottom Cap
Material stainless
Length 0.2'

L. Boring Depth 24.0'

Additional Information
M. Steel Casing
10" at 18'

A. Stick-Up
Length _____

B. Key No., _____

C. Protective Casing
Diameter 4"
Material flush mount
Length _____
Depth to Bottom _____

D. Surface Completion
Diameter _____
Depth _____
Material concrete

E. Well Casing
Diameter 2"
Material stainless steel
Length _____
Depth to Bottom _____

F. Grout
Depth to Top 2
Depth to Bottom 16
Material quick grout

G. Borehole Diameter 8"

H. Bentonite Seal
Depth to Top 9.0'
Depth to Bottom 11.0'

I. Pack Type/Size
Depth to Top 11.0'
Depth to Bottom 17.0'
Material #10 Merie sand

J. Screen
Depth to Top 14.5'
Depth to Bottom 16.5'
Material stainless steel #304
Slot 0.010 inch

K. Bottom Cap
Material stainless
Length 0.2'

L. Boring Depth 16.5

Additional Information
M. Steel Casing
10" at 11'

A. Stick-Up
Length _____

B. Key No., _____

C. Protective Casing
Diameter 4"
Material flush mount
Length _____
Depth to Bottom _____

D. Surface Completion
Diameter _____
Depth _____
Material concrete

E. Well Casing
Diameter 2"
Material stainless steel
Length _____
Depth to Bottom _____

F. Grout
Depth to Top 2
Depth to Bottom 16
Material quick grout

G. Borehole Diameter 8"

H. Bentonite Seal
Depth to Top 16.0
Depth to Bottom 18.0

I. Pack Type/Size
Depth to Top 17.0
Depth to Bottom 23.2
Material #10 Merie sand

J. Screen
Depth to Top 18.0'
Depth to Bottom 23.0'
Material stainless steel #304
Slot 0.010 inch

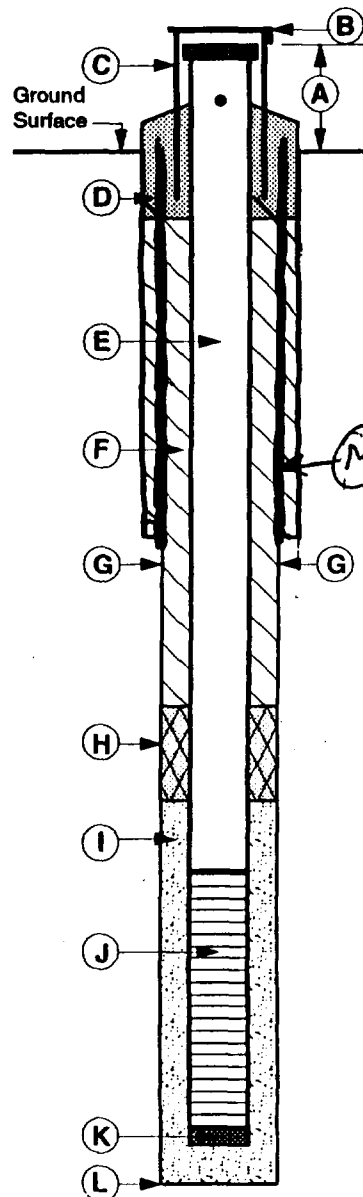
K. Bottom Cap
Material stainless
Length 0.2'

L. Boring Depth 23.2

Additional Information
M. Steel Casing
17' x 10"

W - 2

Screened Monitoring Well Completion Detail



Screened Well # MW-122AR

A. Stick-Up
Length _____
B. Key No., _____
C. Protective Casing
Diameter _____
Material _____
Length _____
Depth to Bottom _____
D. Surface Completion
Diameter 10"
Depth 4.0
Material concrete
E. Well Casing
Diameter 2"
Material stainless steel
Length _____
Depth to Bottom 9.3'
F. Grout
Depth to Top _____
Depth to Bottom _____
Material _____
G. Borehole Diameter _____
H. Bentonite Seal
Depth to Top 4.0
Depth to Bottom 8.1'
I. Pack Type/Size
Depth to Top 8.1'
Depth to Bottom 19.3'
Material #0 Morie Sand
J. Screen
Depth to Top 9.3
Depth to Bottom 19.3
Material #304 stainless steel
Slot 0.010-inch
K. Bottom Cap
Material _____
Length _____
L. Boring Depth 29.3'
Additional Information
M. Steel Casing
7.9' x 10"

W - 3

Screened Well # MW-126AR Screened Well # MW-5R Screened Well # _____
use MW-5R#3
Log

A. Stick-Up
Length _____
B. Key No., _____
C. Protective Casing
Diameter _____
Material _____
Length _____
Depth to Bottom _____
D. Surface Completion
Diameter _____
Depth _____
Material _____
E. Well Casing
Diameter _____
Material _____
Length _____
Depth to Bottom _____
F. Grout
Depth to Top _____
Depth to Bottom _____
Material _____
G. Borehole Diameter _____
H. Bentonite Seal
Depth to Top 13.0'
Depth to Bottom 15.8'
I. Pack Type/Size
Depth to Top 15.8
Depth to Bottom 21.5
Material #0 Morie Sand
J. Screen
Depth to Top 16.5
Depth to Bottom 21.5
Material #304 stainless steel
Slot 0.010 inch
K. Bottom Cap
Material _____
Length _____
L. Boring Depth 21.5'
Additional Information
M. Steel Casing
16.2' x 10"

A. Stick-Up
Length _____
B. Key No., _____
C. Protective Casing
Diameter _____
Material _____
Length _____
Depth to Bottom _____
D. Surface Completion
Diameter _____
Depth _____
Material _____
E. Well Casing
Diameter _____
Material _____
Length _____
Depth to Bottom _____
F. Grout
Depth to Top _____
Depth to Bottom _____
Material _____
G. Borehole Diameter _____
H. Bentonite Seal
Depth to Top 18.0
Depth to Bottom 20.5
I. Pack Type/Size
Depth to Top 20.5
Depth to Bottom 26.5
Material #0 Morie Sand
J. Screen
Depth to Top 21.1
Depth to Bottom 26.1
Material #304 stainless steel
Slot 0.010 inch
K. Bottom Cap
Material _____
Length _____
L. Boring Depth 26.5
Additional Information
M. Steel Casing
10' x 20.0

W - 4

Reference Information

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BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Soil/Rock Description

REQUIRED SOIL/ROCK DESCRIPTION

- Color
- Principal components (capital letters)
- Minor components (and, some, little, trace)
- Structure and bedding
- Field moisture condition
- Fill or geological origin, if known (in parenthesis after moisture condition, see example below)
- Unified Soil Classification System group symbol (soil only)
- Contacts when observed

SOIL DESCRIPTION COMPONENTS INCLUDED WHEN AVAILABLE

- Particle angularity/shape
- Particle sizes
- Density/consistency
- Moisture content
- Organic content
- Hardness of coarse particles (Mohs hardness scale)
- Plasticity of fines
- Cohesiveness
- Pliability
- Odors/discoloration
- Mottling/staining
- Weathering
- Local name, if known
- Items that may indicate age of deposit: archeological artifacts, newspapers, etc.
- Fill component description (cinder, clay, metal, tires, etc.)

ROCK DESCRIPTION INCLUDED WHEN AVAILABLE

- Friability/fissibility
- Thickness
- Particle angularity/shape
- Particle sizes
- Rock Quality Designation (RQD)
- Rock type
- Additional petrographic information
- Texture
- Strength of intact rock
- Weathered state
- Voids
- Description of discontinuities and fillings
- Formation name (if known)
- Water content
- Odors/discoloration

SOIL DESCRIPTION EXAMPLE:

2.5' - 4.5' stiff dark gray low plasticity Clay and Silt, laminated with some light brown silt, some fine sand (moist, Glacio-lacustrine) CL

ROCK DESCRIPTION EXAMPLE:

4.5' - 12.0' reddish brown fine to coarse Sandstone, little angular gravel, trace silt

Unified Soil Classification System					
Major Divisions			Group Symbols	Typical Names	
Coarse-Grained Soils. More than half of materials is larger than No. 200 sieve size	Sand. More than half of coarse fraction is smaller than No. 4 sieve size	Clean gravels	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.	
		Gravels with fines	GM	Silty gravels, gravel-sand silt mixtures.	
			GC	Clayey gravels, gravel-sand-clay mixtures	
	Gravels. More than half of coarse fraction is larger than No. 4 sieve size	Clean sands	SW	Well-graded sands, gravelly sands, little or no fines.	
			SP	Poorly graded sands, gravelly sands, little or no fines.	
		Sands with fines	SM	Silty sands, sand-silt mixtures.	
			SC	Clayey sands, sand-clay mixtures	
Fine-Grained Soils. More than half of materials is smaller than No. 200 sieve size.	Sils and Clay	Low Liquid Limit	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	
			OL	Organic silts and organic silty clays of low plasticity.	
		High Liquid Limit	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	
			CH	Inorganic clay of high plasticity, fat clays.	
			OH	Organic clays of medium to high plasticity, organic silts.	
High organic soils			Pt	Peat and other highly organic silts	

Note: Well graded = poorly sorted and vice versa

Appendix D

QA/QC Review of Data - Summary of Precision and Accuracy Assessment

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Appendix D

QA/QC Review of Data - Summary of Precision and Accuracy Assessment

D.1 Precision and Accuracy Assessment for PCB Laboratory Analyses

Analytical precision was assessed by comparing the percent recoveries of the matrix spike (MS) and matrix spike duplicate (MSD) samples. Field duplicates were also used to assess the overall precision of the laboratory analyses. The relative percent differences (RPDs) between percent recoveries were calculated for each pair of duplicate analyses.

In addition to the MS data, other indicators of accuracy, such as surrogate spike and blank spike recoveries, were examined to assess the analytical method's accuracy.

An overall precision and accuracy summary, as assessed through the review of QA/QC information including MS/MSD recoveries and RPDs between recoveries, matrix spike blank (MSB) recoveries, field duplicate RPD results, surrogate spike recoveries and contamination levels in the blanks, is presented below.

D.1.1 Phase II Groundwater

Data packages for the Allied-OU PCB groundwater sample analyses were reviewed for analytical precision and accuracy. Five sample delivery groups (SDGs) containing the groundwater samples were evaluated. The groundwater SDGs were designated as 54217, 54265, 54324, 54384, and 55702.

PCB Data Quality

All MS/MSD recoveries were within acceptable control limits with Aroclor 1242 recoveries ranging from 74 to 111 percent with an average of 92.7 percent and Aroclor 1254 recoveries ranging from 95 to 111 percent with an average of 104.7 percent. All MSB blank recoveries were within acceptable limits with recoveries for Aroclor 1242 ranging from 53 to 97 percent with an average of 78.3 percent while recoveries for Aroclor 1254 ranged from 75 to 110 percent with an average of 95.3 percent.

The precision of the matrix spike as measured by the RPD between MS and MSD recoveries were within acceptable control limits for all but one RPD. The RPD for Aroclor 1242 ranged from 4 to 40 percent with an average of 19.7 while the RPD for Aroclor 1254 ranged from 6 to 16 percent with an average of 11.7. Based on the non-compliant MS/MSD, RPD and MSB recovery, Aroclor 1242 data were qualified as estimated in the associated samples A66131, A66132, and A66134.

No Aroclors were detected in any of the groundwater field duplicates or their corresponding samples.

The data from two samples, A66101, and A66104, were qualified as estimated due to poor surrogate performance. Overall, surrogate recoveries for tetrachloro-meta-xylene (TCMX) ranged from 43 to 308 percent with an average of 76.4 percent. Recoveries for decachlorobiphenyl (DCB) ranged from 32 to 219 percent with an average of 81.6 percent.

No Aroclors were detected in any method, instrument or rinse blank.

Aroclor 1242 data for samples A66101, A66102, A66106, A66109, A66112, A66131, A66132, A66144, and A66152 have been qualified as estimated due to differences in quantitated values between the two analytical columns. A percent difference (%D) of up to 25 percent (as calculated by the difference between the two values divided by the lower of the two values) is considered acceptable under USEPA guidelines. The %D for these samples, however, ranged from 27 to 68 percent with an average of 52 percent. Since the lower of the two values is reported (as per USEPA-CLP reporting conventions), these differences may indicate that the reported results are biased low. However, based on a review of the data, at least some of the differences can be attributed to positive interference on one of the analytical columns.

D.1.2 Phase III Groundwater

Data packages for two SDGs, designated 64153 and 64176, containing Allied OU groundwater sample data for PCBs and TOC were reviewed and evaluated for analytical precision and accuracy.

PCB Data Quality

With one exception, all MS/MSD recoveries were within control limits with recoveries for Aroclor 1242 ranging from 118 to 157 percent with an average of 138 percent and Aroclor 1254 recoveries ranging from 110 to 118 percent with an average of 114 percent. Recovery for Aroclor 1242 was slightly above control limits in the matrix spike duplicate of sample A66142-F. However, since recovery for this Aroclor was within control limits in the matrix spike and since recoveries for Aroclor 1254 were within control limits in both the matrix spike and matrix spike duplicate, no data was qualified based on the deviation.

The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 4 to 17 percent with an average of 10 percent. The MSB recoveries for Aroclor 1242 ranged from 42 to 103 percent with an average of 79 percent while Aroclor 1254 recoveries ranged from 54 to 108 percent with an average of 81 percent.

Recoveries for both surrogates were above control limits in four samples. Recovery for one surrogate was above control limits in four sample; however, recoveries of the second surrogate were within control limits. Overall, surrogate recoveries for TCMX ranged from 59 to 171 percent with an average of 96 percent. Recoveries for DCB ranged from 62 to 204 percent with an average of 104 percent.

No Aroclors were detected in any method blank or rinse blank.

TOC Data Quality

The MS recovery was within control limits at 87 percent.

All laboratory control sample (LCS) recoveries were within control limits with recoveries ranging from 97 to 101 percent with an average of 99 percent.

Analytical precision as measured by the RPD between the laboratory duplicates was 3 percent.

TOC was detected in both the filtered and unfiltered rinse blanks. Based on the blank content, TOC data for all filtered samples and TOC data for the unfiltered samples A66177, A6178 and A66179 have been rejected and TOC data for the unfiltered samples A66172, A66173 and A66176 have been qualified as estimated with a potential high bias.

D.1.3 Phase III Suspended Sediment

Data packages for two SDGs, designated 64153 and 64176, containing Allied OU suspended sediment sample data for PCBs and TOC were reviewed and evaluated for analytical precision and accuracy.

Since, based on the limited sample mass, no matrix spike or matrix spike duplicate analyses could be performed and since no field duplicates were submitted for analysis, no assessment of analytical precision could be made. Surrogate spike and laboratory control sample recoveries and instrument calibration and blank content were examined to assess the analytical method's accuracy.

An overall precision and accuracy summary, as assessed through the review of QA/QC information, is presented below.

PCB Data Quality

All blank spike recoveries were within control limits with recoveries for Aroclor 1242 ranging from 42 to 88 percent with an average of 65 percent and Aroclor 1254 recoveries ranging from 54 to 94 percent with an average of 74 percent.

All surrogate recoveries were within control limits with recoveries for TCMX ranging from 70 to 91 percent with an average of 84 percent and recoveries for DCB ranging from 78 to 95 percent with an average of 85 percent.

No Aroclors were detected in any method blank or rinse blank.

TOC Data Quality

The LCS recovery was within control limits at 96 percent.

No TOC was detected in the method blank.

D.1.4 Phase IV, V and VI Groundwater

Data packages for four SDGs, designated 66002, KAL073, 70130 and KAL076, containing Allied OU groundwater sample data for PCBs were reviewed and evaluated for analytical precision and accuracy.

PCB Data Quality

All MS/MSD recoveries were within control limits with recoveries for Aroclor 1242 ranging from 74 to 100 percent with an average of 88 percent and Aroclor 1254 recoveries ranging from 74 to 103 percent with an average of 90 percent.

The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 2 to 22 percent with an average of 9 percent. The MSB recoveries for Aroclor 1242 ranged from 56 to 70 percent with an average of 66 percent while Aroclor 1254 recoveries ranged from 66 to 89 percent with an average of 77 percent.

Recovery for one surrogate was above control limits in one sample and recovery for one surrogate was below control limits in six samples. In all cases, recoveries of the second surrogate were within control limits. Overall, surrogate recoveries for tetrachloro-meta-xylene (TCMX) ranged from 52 to 141 percent with an average of 75 percent. Recoveries for decachlorobiphenyl (DCB) ranged from 50 to 100 percent with an average of 79 percent.

One field duplicate was submitted for analysis. No Aroclors were detected in the field sample or the field duplicate.

No Aroclors were detected in any method blank.

Aroclor 1016 was reported as present in samples A66186, A66187 and A66188. The Aroclor most likely present in the samples is actually 1242.

Samples A66198, A66208 and A66209 showed very poor pattern matches to their identified Aroclors. Data for these samples have been qualified as estimated with presumptive evidence of identification.

D.1.5 Phase VII Groundwater

The data packages for one SDG, designated KAL079, containing Allied OU groundwater sample data for PCBs was reviewed and evaluated for analytical precision and accuracy.

PCB Data Quality

All MS/MSD recoveries were within control limits with recoveries for Aroclor 1242 ranging from 80 to 90 percent with an average of 85 percent and Aroclor 1254 recoveries ranging from 78 to 92 percent with an average of 85 percent.

The precision of the matrix spikes as measured by the RPD between the MS and MSD recoveries ranged from 14 to 19 percent with an average of 16 percent. The MSB recoveries for Aroclor 1242 ranged from 66 to 100 percent with an average of 83 percent while Aroclor 1254 recoveries ranged from 70 to 120 percent with an average of 85 percent.

Recovery for one surrogate was below control limits in four samples (A66250, A66251, A66253 and A66255) and in the matrix spike and matrix spike duplicate. Since recovery of the second surrogate was within control limits, no data qualification was warranted based on the deviations. Overall, surrogate recoveries for tetrachloro-meta-xylene (TCMX) ranged from 49 to 109 percent with an average of 99 percent while recoveries for decachlorobiphenyl (DCB) ranged from 61 to 100 percent with an average of 81 percent.

No Aroclors were detected in the method blanks.

Aroclor 1232 was reported as present in sample A66253. However, a review of the sample chromatograms showed a very poor Aroclor pattern match. Based on the evaluation, data for Aroclor 1232 has been qualified as estimated with presumptive evidence of identification in the sample. All other Aroclors have been correctly identified/quantitated.

The response for two continuing calibration standards were above control limits. Based on the responses all positive Aroclor 1242 data have been qualified as estimated with a potential high bias.